

Installation and Start-Up Guide 03/2004 Edition

sinumerik

SINUMERIK 840D/840Di/810D
HMI

SIEMENS

SINUMERIK 840D/840Di/810D

Installation and Start-Up HMI

Installation and Start-Up Guide

Valid for

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SINUMERIK® Documentation

Printing history

Brief details of this edition and previous editions are listed below.

The status of each edition is shown by the code in the "Remarks" columns.

Status code in the "Remarks" column:

A New documentation.

B Unrevised reprint with new order no.

C Revised edition with new status.

If factual changes have been made on the page in relation to the same software version, this is indicated by a new edition coding in the header on that page.

Edition	Order No.	Remarks
12.98	6FC5297-5AE20-0BP0	A
08.99	6FC5297-5AE20-0BP1	C
02.01	6FC5297-6AE20-0BP0	C
11.01	6FC5297-6AE20-0BP1	C
11.02	6FC5297-6AE20-0BP2	C
03.04	6FC5297-6AE20-0BP3	C

This book is part of the documentation on CD-ROM (DOCONCD)

Edition	Order No.	Remarks
09.04	6FC5298-7CA00-0BG1	C

More information is available on the Internet at:

<http://www.siemens.com/motioncontrol>

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Other functions not described in this documentation might be executable in the control. This does not, however, represent an obligation to supply such functions with a new control or when servicing.

We have checked that the contents of this document correspond to the hardware and software described. Nevertheless, differences might exist and therefore we cannot guarantee that they are completely identical. The information given in this publication is reviewed at regular intervals and any corrections that might be necessary are made in subsequent editions. We welcome all recommendations and suggestions.

Preface

Structure of the documentation

The SINUMERIK documentation is organized in three parts:

- General Documentation
- User Documentation
- Manufacturer/Service Documentation

Target group

This documentation is intended for manufacturers of machine tools with the SINUMERIK 840D/840Di/810D control.

Hotline

If you have any queries, please contact the following hotline:

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If you have queries regarding documentation (suggestions, corrections), please send a fax or e-mail to the following addresses:

Fax: +49 (0) 9131 98 - 2176
E-Mail: motioncontrol.docu@erlf.siemens.de

Fax form: See the feedback page at the end of the document.

Internet address

<http://www.siemens.com/motioncontrol>

SINUMERIK 840D powerline

Since 09.2001, the following ccontrols with improved performance are available:

- SINUMERIK 840D powerline and
- SINUMERIK 840DE powerline

You can find a list of available **powerline** modules in the hardware description:

References: /PHD/ Configuring Manual SINUMERIK 840D

SINUMERIK 810D powerline

Since 12.2001, the following controls with improved performance are available:

- SINUMERIK 810D powerline and
- SINUMERIK 810DE powerline.

You can find a list of available **powerline** modules in the hardware description:

References: /PHC/ Configuring Manual SINUMERIK 810D

Objectives

- To support the machine manufacturer in the commissioning and parameterization of the HMI.
- To inform the machine manufacturer / end user of the various ways of expanding the standard help system.
- The instructions explain how the HMI user interface provided by Siemens / the machine manufacturer, can be modified easily by the machine manufacturer / end user to meet their specific requirements. No other additional software tools are required to do this.

Standard scope

The printed version consists of the following manuals:

- /AE1/ Updates/Supplements
- /BE1/ Expanding the Operator Interface
- /HE1/ Help in the Editor
- /IM2/ Starting Up HMI Embedded
- /IM4/ Starting Up HMI Advanced
- /TX1/ Creating Foreign Language Texts with Windows 95/NT
- /TX2/ Creating Foreign Language Texts with Windows 2000/XP

Search aids

To help you find your way around, there is a full list of contents together with a list of chapter contents for each part as well as the following aids in the appendix:

1. References
2. List of abbreviations
3. Index per manual



Important

This Installation and Start-Up Guide is valid for HMI Embedded, HMI Advanced and HT 6.

Safety and warning concept

The following safety and warning information is used in this document.
Explanation of symbols used:



Danger

Indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury or in substantial property damage.



Warning

Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury or in substantial property damage.



Caution

Used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury or in property damage.

Caution

Used without safety alert symbol indicates a potentially hazardous situation which, if not avoided, **may** result in property damage.

Notice

Used without the safety alert symbol indicates a potential situation which, if not avoided, **may** result in an undesirable result or state.

Other information



Important

Appears in the documentation wherever an important fact has to be taken into account.

Note

Appears in the documentation wherever further references are made.



Machine Manufacturer

This symbol appears in this documentation whenever the machine manufacturer can influence or modify the described functional behavior. Please observe the information provided by the machine manufacturer.

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SINUMERIK 840D/840Di/810D

Installation and Start-Up HMI

Updates/Supplements (AE1)

1 Changes from SW 5.3 (04.00) to SW 6.1/6.2 (10.00)	AE1/1-3
2 Changes from NC-SW 6.1 (10.00) to SW 6.3 (11.01) and from HMI-SW 6.1 to SW 6.2	AE1/2-9
3 Changes from NC-SW 6.3 (09.01) to SW 6.4 (11.02) and from HMI-SW 6.2 to SW 6.3	AE1/3-13
4 Changes from the 11.02 Edition to the 03.04 Edition.....	AE1/4-21
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1 Changes from SW 5.3 (04.00) to SW 6.1/6.2 (10.00)

Introduction

The abbreviations listed below in column "Target document" are listed and explained in the list of references in the appendix.

No.	Topic: General tasks	Target document(s)
61_01	New MDs in Online MD	Help in the Editor
61_02	Generating lists	LIS: Lists
61_03	New alarms	DA: Diagnostics Guide

No.	Topic: HW P6.1	Target document(s)
61_04	Qwerty OP: Key labeling	BH: Operator Components, Manual
61_05	NCU573.3. tech. data update	PHD: Configuring Manual NCU 561.2-573.2
61_06	PCU 20	BA: MMC Operator's Guide BH: Operator Components, Manual
61_07	OP010, OP010C, OP010S	BH: Operator Components, Manual
61_08	NCU 572.3: tech. data update	PHD: Configuring Manual NCU 561.2-573.2
61_09	NCU link, Profibus: Expansion	PHD: Configuring Manual NCU 561.2-573.2
61_10	PP031-MC: updated	BH: Operator Components, Manual

No.	Topic: NC SW 6.1/2 (10.00)	Target document(s)
61_11	NCK-PLC interface updated	LIS: Lists
61_12	Functionality of the NCUs 571-573 updated	PHD: Configuring Manual NCU 561.2-573.2 IAD: SINUMERIK 840D/SIMODRIVE 611D Installation and Start-Up Guide
61_13	Block search via program test Supplements in (ASUBs in all modes and travel to fixed stop)	FB1/K1: Mode group, channel, program operation mode
61_14	Settable block change time with G0	FB2/P2: Positioning axes FB1/S1: Spindles FBSY: Description of Functions Synchronized Actions PG: Programming Guide Fundamentals
61_15	Spindle extensions: gear stage change, synchronous spindle	FB1/S1: Spindles FBSY: Description of Functions Synchronized Actions
61_16	Electronic stop and retraction by the NC	FB3/M3: Coupled axes
61_17	Non-linear axis coupling in ELG	FB3/M3: Coupled axes
61_18	Lead link axis ("reading" axis)	FB2/B3: Several Operator Panels and NCUs
61_19	Sequence control system for the NCU link	FB2/B3: Several Operator Panels and NCUs FB1/G2: Velocities, ..., BA: MMC Operator's Guide
61_20	Drive status for synchronized actions	FB2/B3 Several Operator Panels and NCUs PGA: Programming Guide Advanced
61_21	New NC commands	PGA: Programming Guide Advanced
61_22	Block search extensions	FB1/K1: Mode group, channel, program operation mode
61_23	ISO dialects: Extensions	FBFA: ISO Dialects for SINUMERIK Description of Functions
61_24	5th order polynomial (acceleration-steady axis motions)	FB1/K1: Mode Group, Channels, Program Operation PGA: Programming Guide Advanced HW in FB2/B3: Several Operator Panels and NCUs
61_25	Dynamic response adaptation: increasing the dynamics limit values, keeping the program execution time	FB1/B1: Continuous-path mode

61_26	Automatic change of the exact stop operation G601-G603	FB1/B1: Continuous-path mode
61_27	Compressor Compcad for smooth surfaces	PGA: Programming Guide Advanced
61_28	Smooth tool path velocity	FB1/B1: Continuous-path mode
61_29	Rounding with contour tolerance	FB1/B1: Continuous-path mode
61_30	Non-circular turning	FB2/B3: Several Operator Panels and NCUs
61_31	Frame extensions (system frames)	FB1/K2: Coordinate systems, FB1/S1: Spindles FB2/M5: Kinematic transformation FBSY: Description of Functions, Synchronized Actions PGA Programming Guide Advanced
61_32	Location-of-use and workpiece specific tool offsets	FB1/W1: Tool Compensation FB1/K2: Coordinate systems
61_33	Master/slave as standard solution	FB3/TE3: Master/slave for drives
61_34	Measuring functions on the Profibus	FB1/M5: Measuring
61_35	Retrofittable SM/MT	FBMA: Description of Functions ManualTurn FBSP: Description of Functions ShopMill

No.	Topic PLC SW 6.1 (10.00)	Target document(s)
61_36	Basic PLC program, extensions	FB1/P3: PLC basic program

No.	Topic 611D SW 5.1 (10.00)	Target document(s)
61_37	Descriptions of drive functions extended by SSI encoder	FBA: Description of Functions, Drive Functions DG1
61_38	1FE1 motor MD pulse rate	PJU: Planning Guide Converters
61_39	Additional measuring system without additional closed-loop control module with power module	IAD: SINUMERIK 840D/SIMODRIVE 611D Installation and Start-Up Guide (IAD), Chapters 6 and 10 IAC: SINUMERIK 810D Installation and Start-Up Guide, Chapters 6 and 11

No.	Topic MMC SW 5.3 (10.00)	Target document(s)
61_40	<i>Software selection before initial booting</i>	IAM/IM3: Installation and Start-Up MMC103, Chapter 13
61_41	Accelerated external block search	BA: MMC Operator's Guide, Chapter 4
61_42	Multi-channel block search in program test mode	IAM/IM3: Installation and Start-Up MMC103, Chapter 16 BA: MMC Operator's Guide, Chapter 4
61_43	Automatic master spindle display	BA: MMC Operator's Guide, Chapter 4
61_44	Additional states of skip levels	BA: MMC Operator's Guide, Section 4.6
61_45	Rapid traverse override in the display	BA: Operator's Guide, Section 4.4
61_46	Tool management: code carrier with OEM data and new tool data	FBW: Description of Functions Tool Management
61_47	Extended tool parameters	FBW: Description of Functions Tool Management
61_48	Access protection for basic softkey offset	IAM/IM3: Installation and Start-Up MMC103, Section 12.4
61_49	Tool management: filtered lists/order processing	BA: MMC Operator's Guide, Section 5.3
61_50	Extensions for MMC Wizard	IAM/BE1: Expand the Operator Interface
61_51	Simulation: Match data with NC	BA: MMC Operator's Guide, Section 6.7
61_52	Change-language softkey, independent of the language	BA: MMC Operator's Guide, Section 9.5
61_53	Finishing m:n: distributed concept (server)	FB2/B3: Several Operator Panels and NCUs
61_54	NCU-specific alarm texts for m:n	IAM/IM3: Installation and Start-Up MMC103, Section 4.5
61_55	Changing the Alarm Help and MD Help to pdf Help	IAM/HE1: Online help, Chapter 4

No.	Topic HMI Advanced SW 6.1 (02.01)	Target document(s)
61_56	Conversion of display MDs	BAD: Operator's Guide, HMI Advanced, Installation and Start-Up IAM/IM4: Installing HMI Advanced
61_57	Accelerated external block search	BAD: Operator's Guide, HMI Advanced, Section 4.6
61_58	Multi-channel block search in program test mode	IAM/IM4: Installing HMI Advanced, Chapter 5 BAD: Operator's Guide, HMI Advanced, Section 4.6
61_59	Automatic master spindle display	BAD: Operator's Guide, HMI Advanced, Section 4.2
61_60	Additional states of skip levels	BAD: Operator's Guide, HMI Advanced, Section 4.6
61_61	Rapid traverse override in the display	BAD: Operator's Guide, HMI Advanced, Section 4.4
61_62	Extended tool parameters	FBW: Description of Functions Tool Management
61_63	Access protection for basic softkey offset	IAM/IM4: Installing HMI Advanced, Chapter 5
61_64	Tool management: filtered lists/order processing	BAD: Operator's Guide, HMI Advanced, Subsection 5.3.8 FBW: Description of Functions Tool Management
61_65	Tool management: order of replacement tools	BAD: Operator's Guide, HMI Advanced, Section 5.3 FBW: Description of Functions Tool Management
61_66	Simulation: Match data with NC	IAM/IM4: Installing HMI Advanced, Chapter 5
61_67	Change-language softkey, independent of the language	BAD: Operator's Guide, HMI Advanced, Section 9.5
61_68	NCU-specific alarm texts for m:n	IAM/IM4: Installing HMI Advanced, Section 6.2

No.	Topic HMI Embedded SW 6.1 (02.01)	Target document(s)
61_69	Rapid traverse override in the display	BEM: Operator's Guide, HMI Embedded, Section 4.4
61_70	Automatic master spindle display	BEM: Operator's Guide, HMI Embedded, Section 4.4
61_71	<i>Tool and magazine list from ShopMill</i>	BEM: Operator's Guide, HMI Embedded, Section 5.4
61_72	Extensions for MMC Wizard	IAM/BE1: Expand the Operator Interface
61_73	Editing and activating GUDs and MACs	BEM: Operator's Guide, HMI Embedded, Section 6.4
61_74	Utilization display for Non-Win in percent	BEM: Operator's Guide, HMI Embedded, Section 8.6
61_75	Extension: free contour programming	BEM: Operator's Guide, HMI Embedded, Section 6.5
61_76	Original condition via NC card	BEM: Operator's Guide, HMI Embedded, Section 7.5
61_77	Screen position configuring	IAM/IM2: Installing HMI Embedded: Chapter 5
61_78	Utilization display in percent	BEM: Operator's Guide, HMI Embedded, Section 8.6
61_79	Setting date/hour of the PLC	BEM: Operator's Guide, HMI Embedded, Section 9.3 IAM/IM2: Installing HMI Embedded, Chapter 5
61_80	Override display in G0	BEM: Operator's Guide, HMI Embedded, Section 4.4
61_81	Calculator help + extension	BEM: Operator's Guide, HMI Embedded, Subsection 2.6.9
61_82	Changing the language with "Change language" independent of the language	BEM: Operator's Guide, HMI Embedded, Section 9.4



2

2 Changes from NC-SW 6.1 (10.00) to SW 6.3 (11.01) and from HMI-SW 6.1 to SW 6.2

The abbreviations listed below in column "Target document" are listed and explained in the list of references in the appendix.

Note

Reference is made only to those functions and components that are not included in Chapter 1 and that have been updated.

No.	Topic: General tasks	Target document(s)
63_01	New MDs in Online MD	Help in the Editor
63_02	Generating lists	LIS: Lists
63_03	New alarms	DA: Diagnostics Guide

No.	Topic: HW Release 09.01	Target document(s)
63_04	Qwerty OP: Key labeling	BH: Operator Components, Manual
63_05	SINUMERIK HT6	BH: Operator Components, Manual
63_06	NCU 573.4	PHD: Configuration NCU 561.2-573.4 Manual (HW)
63_07	NCU 572.4	PHD: Configuration NCU 561.2-573.4 Manual (HW)
63_08	810D CCU3	PHC: CCU configuration
63_09	PCU 50	BH: Operator Components, Manual

No.	Topic: NC SW 6.3	Target document(s)
63_10	NCK-PLC interface updated	LIS: Lists
63_11	Single axes	FB2, P2: Positioning axes
63_12	Spindle logic	FB1, S1: Spindles
63_13	DRAM file system for cycle storage	IAD: Installation & Start-up Guide
63_14	Contour handwheel	FB2, H1: Manual travel, handwheel travel
63_15	System frame	FB1, K2: Axis Types, Coordinate Systems, Frames
63_16	3D measurement of inclined surfaces	FB2, M5: Measuring
63_17	Generic 5-axis transformations	FB3, F2: 3 to 5-axis transformation
63_18	Orientation compression	FB3, F2: 3 to 5-axis transformation
63_19	Rotation of the orientation vector	FB3, F2: 3 to 5-axis transformation
63_20	Temperature compensation override for programmed motion in real time	FB1, W1: Tool Compensation
63_21	Taking into account the compensation values location and workpiece-specifically	FB1, W1: Tool Compensation
63_22	Extended system parameters for orientated toolholder	FB1, W1: Tool Compensation
63_23	Modular rotary axes	FB1, R1: Reference point approach FB2, R2: Rotary axes
63_24	Expansions to SW cams	FB2, N3: Software cams, position switching signals
63_25	Gantry synchronization	FB3, G1: Gantry axes
63_26	Extended electronic stop and retraction by the NC	FB3, M3: Coupled axes and ESR PGA: Programming Guide Advanced
63_27	Nonlinear couplings, cascading, curve tables	FB3, M3: Coupled axes and ESR PGA: Programming Guide Advanced
63_28	System variables stored in SRAM for synchronized actions	FBSY: Description of Functions Synchronized Actions IAD: Installation & Start-up Guide
63_29	Involute interpolation	PG: Programming Guide Fundamentals
63_30	Path acceleration by synchronized action	FB1, B1: Continuous-path mode, exact stop, Look Ahead FBSY: Description of Functions Synchronized Actions
63_31	Dry run feedrate mode	FB1, V1: Feedrates
63_32	Control of interpolation buffer	FB1, K1: Mode group, channel, program operation mode

No.	Topic: HMI SW 6.2	Target document(s)
63_33	Network boot PCU50	IAM, IM4: Installation and Start-Up HMI/MMC
63_34	Step7 installation directory, optional	IAM, IM4: Installation and Start-Up HMI/MMC
63_35	PCMCIA cards and SW	IAM, IM4: Installation and Start-Up HMI/MMC
63_36	Diameter symbol for transverse axes	BAD: Operator's Guide, HMI Advanced 2.5.1 BEM: Operator's Guide, HMI Embedded 2.5.1
63_37	Multi-block display with Extcall	BAD: Operator's Guide, HMI Advanced 4.6.5 BEM: Operator's Guide, HMI Embedded 4.6.1, 6.11 IAM, IM2: Installation and Start-up Guide HMI Embedded 3.5
63_38	Inclusion of wear EC/SC	BAD: Operator's Guide, HMI Advanced 5.3.3
63_39	Extension of tool types	BAD: Operator's Guide, HMI Advanced 5.1
63_40	Extended display for grinding tools	BAD: Operator's Guide, HMI Advanced 5.3.4 IAM, IM4: Installation and Start-up Guide, HMI Advanced 5.6.12
63_41	Relocate tools, old location as default	BAD: Operator's Guide, HMI Advanced 5.3.5
63_42	Polar coordinates for contour prog.	BAD: Operator's Guide, HMI Advanced 6.5.6
63_43	Undercut	BAD: Operator's Guide, HMI Advanced 6.5.7
63_44	Settable access rights for part program creation	IAM, IM4: Installation and Start-up Guide, HMI Advanced 4.3.2, 5.6.8
63_45	Secured communication protocol	BAD: Operator's Guide, HMI Advanced 7.4 IAM, IM4: Installation and Start-up Guide, HMI Advanced 5.6.6
63_46	Storable RS232C interface parameters	BAD: Operator's Guide, HMI Advanced 7.5.2
63_47	Softkey layout for network drives	BAD: Operator's Guide, HMI Advanced 4.6.4, 4.6.6 IAM, IM4: Installation and Start-up Guide, HMI Advanced 5.4 BEM: Operator's Guide, HMI Embedded 6.3 IAM, IM2: Installation and Start-up Guide HMI Embedded 5.26
63_48	Channel display selection by PLC	IAM, IM4: Installation and Start-up Guide, HMI Advanced 5.1.15, 5.1.18
63_49	Status display selection in operating screens	IAM, IM4: Installation and Start-up Guide, HMI Advanced 5.1.15
63_50	Provide HMI task number for PLC	IAM, IM4: Installation and Start-up Guide, HMI Advanced 5.1.4
63_51	Mouse operation with HMI Embedded Win 32	BEM: Operator's Guide, HMI Embedded 2.1.7 IAM, IM2: Installation and Start-up Guide HMI Embedded 5.27
63_52	ATA card as logical drive	BEM: Operator's Guide, HMI Embedded 6.10, 9.8 IAM, IM2: Installation and Start-up Guide HMI Embedded 8.5

63_53	Tool management: ShopTurn tools and tool list	BEM: Operator's Guide, HMI Embedded 5.5 IAM, IM2: Installation and Start-up Guide HMI Embedded 5.15
63_54	Plain texts for system frames	BEM: Operator's Guide, HMI Embedded 4.4.7 IAM, IM2: Installation and Start-up Guide HMI Embedded 5.1.3 BAD: Operator's Guide, HMI Advanced 4.4.8 IAM, IM4: Installation and Start-up Guide, HMI Advanced 5.3.3
63_55	Network links, network drives and floppies, protection levels	BEM: Operator's Guide, HMI Embedded 7.5.9, 9.8 IAM, IM2: Installation and Start-up Guide HMI Embedded 3.4, 5.26
63_56	Service Safety Integrated	BEM: Operator's Guide: HMI Embedded 4.4.5, 8.3.3 IAM, IM2: Installation and Start-up Guide HMI Embedded 5.12 BAD: Operator's Guide: HMI Advanced 4.4.5, 8.3.3 IAM, IM4: Installation and Start-up Guide, HMI Advanced 5.1.11
63_57	"Powerline" boot screen	IAM, IM2: Installation and Start-up Guide HMI Embedded 4.2 IAM, IM4: Installation and Start-up Guide, HMI Advanced 4.3.1
63_58	Editing the HMI interface	BEM: Operator's Guide, HMI Embedded 9.5



3

3 Changes from NC-SW 6.3 (09.01) to SW 6.4 (11.02) and from HMI-SW 6.2 to SW 6.3

The abbreviations listed below in column "Target document" are listed and explained in the list of references in the appendix.

Note

Reference is made only to those functions and components that are not included in Chapter 2 and that have been updated.

No.	Topic: General tasks	Target document(s)
64_01	New MDs in Online MD	Help in the Editor
64_02	Generating lists	LIS: Lists
64_03	New alarms	DA: Diagnostics Guide

No.	Topic: HW Release 11.02	Target document(s)
64_04	OP015 TFT width 416 mm (DMG operator panel)	BH: Operator Components, Manual
64_05	Machine control panel (MCP)	BH: Operator Components, Manual
64_06	PCU 70	BH: Operator Components, Manual
64_07	Distributed Installation	BH: Operator Components, Manual
64_08	PCU 50 (V2) with 512 MB	BH: Operator Components, Manual
64_09	New MCP	BH: Operator Components, Manual
64_10	OP015A	BH: Operator Components, Manual
64_11	TP012	BH: Operator Components, Manual
64_12	PP012	BH: Operator Components, Manual
64_13	NCU 571.3	PHD: Configuration NCU 561.2-573.4 Manual (HW)
64_14	NCU 572.4	PHD: Configuration NCU 561.2-573.4 Manual (HW)
64_15	NCU 561.3	PHD: Configuration NCU 561.2-573.4 Manual (HW)
64_16	810D CCU3	PHC: CCU configuration

64_16	Functionality of the NCUs 571-573	PHD: Configuring Manual NCU 561.2-573.4 IAD: Installation & Start-up Guide
64_17	Global measurement	FB2, M5: Measuring
64_18	DRAM file system for cycle storage	IAD: Installation & Start-up Guide
64_19	Wait mark for REPOS	FB1, K1: Mode group, channel, program operation mode
64_20	System variable SP_SEARCH_S	FB1, K1: Mode group, channel, program operation mode
64_21	Block search via program test Supplements in (ASUBs in all modes and travel to fixed stop)	FB1, K1: Mode group, channel, program operation mode FB1, F1: Traversing to fixed stop
64_22	Single axes and spindle logic	FB2, S3: Synchronous spindles FB2, R2: Rotary axes, P2: Positioning axes FB1, P3: PLC basic program FB1, S1: Spindles, W1: Tool compensation FB1, K1: Mode group, channel, program operation mode, VDI Interface Lists
64_23	Overlaid movements	FB1, K1: Mode group, channel, program operation mode, W1: Tool compensation FB2, S5: Synchronized actions (up to SW 3) FBSY: Description of Functions, Synchronized Actions PG: Programming Guide Fundamentals
64_24	Block change	FB2, P2: Positioning axes FB1, S1: Spindle FBSY: Descr. of Functions, Synchr. Actions PG: Programming Guide Fundamentals
64_25	Display of handwheels in the VDI interface	FB2, H1: Manual travel, handwheel travel
64_26	Contour handwheel	FB2, H1: Manual travel, handwheel travel
64_27	Rotary table, 2 methods of operation	FB2, H1: Manual travel, handwheel travel
64_28	Expansions to SW cams	FB2, N3: Software cams, position switching signals
64_29	Spindle extensions	FB1, S1: Spindles FBSY: Description of Functions
64_30	No gear change during dry run	FB1, S1: Spindles FB1, K1: Mode gr, channel, prog. oper. mode
64_31	Automatic gantry synchronization	
64_32	Electronic stop and retraction (NC-ESR): Extensions	FB3, M3: Coupled axes and ESR
64_33	EGON w. curve tables PLU V0015	
64_34	Non-linear coupling in the ELG	FB3, M3: Coupled axes and ESR
64_35	Drive signal dir. from the VDI	FB2, B3: Several operator panels and NCUs
64_36	Drive status for synchronized actions	FB2, B3: Several operator panels and NCUs PGA: Programming Guide Advanced
64_37	Lead link axis	FB2, B3: Several operator panels and NCUs

64_38	Sequence control system for the NCU link	FB2, B3: Several Operator Panels and NCUs FB1, G2: Velocities, setpoint/actual value systems, closed-loop control BA: MMC Operator's Guide
64_39	NC language P6	FB1, K1: Mode group, channel, program operation mode FB1, S1: Spindles FBSY: Description of Functions, Synchronized Actions PGA: Programming Guide Advanced
64_40	Ext. f. block search P6	FB1, K1: Mode group, channel, program operation mode
64_41	Synchronized actions extensions	FBSY: Description of Functions IAD: Installation & Start-up Guide
64_42	Synchr. action for indexed access	FBSY: Description of Functions
64_43	Polynomial, 5th degree	FB1, K1: Mode Group, Channels, Program Operation PGA: Programming Guide Advanced, HW in FB2, B3: Several operator panels and NCUs
64_44	Autom. change of exact stop operation	FB1, B1: Continuous-path mode, exact stop and Look Ahead
64_45	Smoothing with contour tolerance	FB1, B1: Continuous-path mode, exact stop and Look Ahead
64_46	Path acceleration by SYNACT	FB1, B1: Continuous-path mode, exact stop and Look Ahead FBSY: Descr. of Functions Synchronized Actions
64_47	Tool path velocity smoothing	FB1, B1: Continuous-path mode, exact stop and Look Ahead
64_48	Dynamic response adaptation	FB1, B1: Continuous-path mode, exact stop and Look Ahead
64_49	Compressor COMPCAD: Extensions	PGA: Programming Guide Advanced
64_50	Non-circular turning	FB2, B3: Several operator panels and NCUs
64_51	Frame extensions	FB1, K2: Axes, coordinate systems, frames, actual value system for workpiece, external work offset, FB1, S1: Spindles, W1: Tool Compensation FB2, M5: Measuring, FBSY: Description of Functions, Synchronized Actions PGA: Programming Guide Advanced
64_52	System frame for cycles	FB1, K2: Axes, coordinate systems, frames, actual value system for workpiece, external work offset
64_53	3D measurement of inclined surfaces	FB2, M5: Measuring
64_54	Generic 5-axis transformation	FB3, F2: 3 to 5-axis transformation
64_55	Using compr. better for orient. tool	FB3, F2: 3 to 5-axis transformation
64_56	Rotations of orientation vector	FB3, F2: 3 to 5-axis transformation
64_57	Tool length offset for Traori in tool orient.	FB1, W1: Tool Compensation PGA: Programming Guide Advanced

64_58	WZ Corr. WS	FB1, W1: Tool Compensation FB1, K2: Axes, coordinate systems, frames, actual value system for workpiece, external work offset
64_59	Inclined machining with 3+2 axes	FB1, W1: Tool compensation PGA: Programming Guide
64_60	Dry run feedrate mode	
64_61	Control of interpolation buffer	FB, K1: Mode group, channel, program operation mode
64_62	Master-slave extensions	FB3, TE3: Speed/torque coupling, master-slave (TE1: Clearance control - TE3: Speed/torque coupling, master-slave) (TE5: Setpoint Exchange - TE6: MCS coupling)
64_63	Adaptation for 611D Onyx module	IAD: Installation & Start-up Guide FBA: (09.01 Edition)
64_64	Referencing in follow-up mode	FB1, R1: Reference point approach
64_65	Measuring functions on the Profibus	FB2, M5: Measuring
64_66	Tool management - new commands	FBW: Description of Functions Tool Management
64_67	Remote diagnosis: Extensions	FBFE: Description of Functions, Remote diagnostics
64_68	Retrace Support Retrace Support	FB3, TE7: Retrace/Continue Machining Support
64_69	Cycle-independent path-synchronous switching signal output	FB3, TE8: Cycle-independent path-synchronous switching signal output
64_70	Retroloadability of compile cycles	FB3, TE0: Installation and Activation of Compile Cycles
64_71	REDEF	PG: Programming Guide, Fundamentals PGA: Programming Guide Advanced
64_72	Block search and multiple channels, SERUPRO approach	FB1, K1: Mode group, channel, program operation mode
64_73	Fast block change on exact stop	FB2, P2: Positioning axes
64_74	Block change fillets	PGA: Programming Guide Advanced Chapter 5, FB2, P2: Positioning axes
64_75	Axis replacement extensions	PGA: Programming Guide Advanced Chapter 1, FB1, K1: Mode Group, Channels, Program Operation FB2, K5: Mode groups, channels, axis replacement, P2: Positioning Axes P5: Oscillation
64_76	B-axis movable in parallel with tool change	FB2, P2: Positioning Axes P5: Oscillation, FB3, M3: Coupled axes and ESR LIS: Lists
64_77	Acceleration pattern of following axis	FB1, B2: Acceleration PG: Programming Guide, Fundamentals PGA: Programming Guide Advanced
64_78	TANGDEL	PGA: Programming Guide Advanced FB3 T3: Speed/torque coupling, master-slave
64_79	Deletion of all curve tables with CTABDEL	PGA: Programming Guide Advanced, FB3, M3: Coupled axes and ESR

64_80	Electronic gear synchronization	PG: Programming Guide, Fundamentals, PGA: Programming Guide Advanced , FB3, M3: Coupled axes and ESR
64_81	Diagnosis of coupled axes and curve tables	PGA: Programming Guide, Advanced 9.3 FB3, M3: Axes coupling and ESR Chapter 2.2
64_82	Synchr. run difference with sign	PGA: Programming Guide, Advanced (automatically generated) FB3, M3: Coupled axes and ESR
64_83	Curve tables extended: CTABSSV and CTABSEV	PGA: Programming Guide Advanced , FB3 M3: Coupled axes and ESR
64_84	Block display with absolute value	FB, K1: Mode group, channel, program operation mode, BAD: Operator's Guide HMI Advanced BEM: HMI Embedded Operator's Guide
64_85	Precompilation of selected cycles	FB3, V2: Preprocessing
64_86	Block search extensions P6	FB1, K1: Mode group, channel, program operation mode
64_87	ISO 16-G code compatibility G62	FBFA: Description of Functions, ISO Dialects for SINUMERIK, PGM: Programming Guide ISO Milling PGT: Programming Guide: ISO Turning
64_88	ISO dialect extensions	FBFA: Description of Functions, ISO Dialects for SINUMERIK, PGM: Programming Guide ISO Milling PGT: Programming Guide: ISO Turning
64_89	Thread cutting (G33)	FB1, V1: Feedrates
64_90	Extension of synchronized actions	FB1, H2: Output of auxiliary functions to PLC
64_91	Extension of synchronized actions	FBSY: Description of Functions Synchronized Actions
64_92	Checking clamping tolerance	FB1, A2: Various interface signals and A3: Axis Monitoring, Protection Zones
64_93	Example LOOVR and JERKOV	PGA: Programming Guide Advanced
64_94	Frame chain new	FB1, K2: Axes, coordinate systems, frames, actual value system for workpiece, external work offset FB2, M5: Measuring, BNM: User Manual Measuring Cycles
64_95	Frame conversion	FB1, K2: Axes, coordinate systems, frames, actual value system for workpiece, external work offset
64_96	Coordinate transformations	FB2, M5: Measuring
64_97	Cart. Extended interpolation of orientation axes	FB3, F2: 3 to 5-axis transformation, (PGA: Programming Guide, Advanced) (PG: Programming Guide, Fundamentals)
64_98	Cart. manual travel	FB1, K1: Mode group, channel, program operation mode, FB2, H1: Manual travel, handwheel travel FB3, F2: 3 to 5-axis transformation, (PGA: Programming Guide, Advanced)
64_99	Syst. var. for tool orientation	FB3, F2: 3 to 5-axis transformation PGA: Programming Guide Advanced
64_100	Couplings	FB2, P2: Positioning axes

64_101	TCP functionality with 3+2 axes	FB1, W1: Tool Compensation FB3, F2: 3 to 5-axis transformation FBSY: Descr. of Functions Synchronized Actions PGA: Programming Guide, Advanced PG: Programming Guide Fundamentals
64_102	Online tool length offset TRAGEN, TRAORI, TCARR	FB1, W1: Tool Compensation FB3, F2: 3 to 5-axis transformation, FBSY: Descr. of Functions Synchronized Actions PGA: Programming Guide, Advanced PG: Programming Guide Fundamentals
64_103	Referencing in follow-up mode	FB1, R1: Reference point approach
64_104	Motor change on spindle drives	FB1 G2: Velocities, setpoint/actual value systems, closed-loop control
64_105	Referencing with Distance-Coded Encoders	FB1, R1: Reference point approach
64_106	611 Digital Performance 2	FBA: Description of Functions, Drive Functions IAD: Installation & Start-up Guide
64_107	Identification def. 611D modules	FB1, D1: Diagnostic tools
64_108	Position control with PI controller	FB1, G2: Velocities, setpoint/actual value systems, closed-loop control FB3, M3: Coupled axes and ESR, ELG -> FB1, G2: Velocities, setpoint/actual value systems, closed-loop control
64_109	Gauging of the HLA valve characteristic	
64_110	Coupling and uncoupling of rotating spindles	FB3, TE3: Speed/torque coupling, master-slave
64_111	Measuring functions on the PROFIBUS-DP	FB2, M5: Measuring, only MD 13210 expanded HBI: Manual
64_112	SPL-EA_Timing	FBSI: Description of Functions SINUMERIK Safety Integrated
64_113	SI, Step 3 Gen.	FBSI: Description of Functions SINUMERIK Safety Integrated
64_114	SPL function blocks	FBSI: Description of Functions SINUMERIK Safety Integrated
64_115	Series installation and start-up	IAD: Installation & Start-up Guide
64_116	SINUMERIK HT6	IAM, IM2: Installing HMI Embedded BAH: Operator's Guide HT6 (HPU New)
64_117	Retrofittable SM/MT	FBMA: Description of Functions, ManualTurn FBSP: Description of Functions ShopMill
64_118	NCK shutdown path	FBSI: Description of Functions SINUMERIK Safety Integrated
64_119	Ext. safe braking	FBSI: Description of Functions SINUMERIK Safety Integrated FB1, P3: PLC basic program
64_120	SI I/O on Profibus	FBSI: Description of Functions SINUMERIK Safety Integrated
64_121	SI, Step 3 Diagnosis	FBSI: Description of Functions SINUMERIK Safety Integrated
64_122	Acceptance test	FBSI: Description of Functions SINUMERIK Safety Integrated
64_123	SI combined with ESR	FBSI: Description of Functions SINUMERIK Safety Integrated

64_124	Alarms in XML	DA: Diagnostics Guide
64_125	TCARR with workpiece-specific inclusion of wear/EC/SC	FBW: Description of Functions Tool Management
64_126	Always display buffer	FBW: Description of Functions Tool Management
64_127	SINTDC(TMS) link to PARAMTM	FBW: Description of Functions Tool Management

No.	Topic: HMI-SW 6.3	Target document(s)
64_128	Shorten start-up time	IAM, IM4: Installing HMI Advanced
64_129	Halt at cycle end	BAD: Operator's Guide HMI Advanced
64_130	ELG parameter pattern	BAD: Operator's Guide HMI Advanced
64_131	Undo Redo in the editor	BAD: Operator's Guide HMI Advanced
64_132	Extensions for MMC Wizard Count masks, function for bit shifting, a further option bit, selection bit for function GC variant fields with variable decimal place, string processing	IAM, BE1: Expand the Operator Interface
64_133	Geometry processor and C950	BAD: Operator's Guide, HMI Advanced Section 6.5
64_134	Safety: enhanced diagnosis version displays, cycles and def.	BAD: Operator's Guide HMI Advanced
64_135	Display of simulation version	BAD: Operator's Guide HMI Advanced, IAM, IM4: Installing HMI Advanced
64_136	Display of symbol information	BAD: Operator's Guide HMI Advanced, IAM, IM4: Installing HMI Advanced
64_137	Type of feedforward control	BAD: Operator's Guide HMI Advanced
64_138	Drive diagnosis with traffic light	BAD: Operator's Guide HMI Advanced FB1, A2: Various interface signals, FB1, D1: Diagnostic tools
64_139	Compile cycles in series installation and start-up	BAD: Operator's Guide HMI Advanced
64_140	Hardkeys editor/program manager	BAD: Operator's Guide HMI Advanced
64_141	SW CAD reader for CAD link	CAD: Operator's Guide CAD Reader
64_142	HMI Base and HMI Advanced	IAM, IM4: Installing HMI Advanced
64_143	New design	BAD: Operator's Guide HMI Advanced
64_144	Retroloadable compile cycles	IAM, IM4: Installation and Start-up HMI Advanced, IAM, IM2: Installing HMI Embedded
64_145	Service displays HMI ADV	BAD: Operator's Guide HMI Advanced
64_146	Extended display for alarm 27090	FBSI: Description of Functions, Synchronized Actions IAM, IM2: Installing HMI Embedded
64_147	Safety service pattern	IAM IM2: Installing HMI Embedded, BEM: HMI Embedded Operator's Guide
64_148	All-channel display of states with symbols in the header	BEM: HMI Embedded Operator's Guide
64_149	Powerline boot screen editable	IAM, IM2: Installing HMI Embedded

64_150	Block search when executing from network	IAM, IM2: Start-Up HMI Embedded IAM, IM4: Installing HMI Advanced
64_151	Selective program protection	BEM: HMI Embedded Operator's Guide
64_152	Hidden lines in the editor	BEM: HMI Embedded Operator's Guide
64_153	Double editor	BEM: HMI Embedded Operator's Guide
64_154	Copying programs in the background	BEM: HMI Embedded Operator's Guide
64_155	Multiple selection of files	BEM: HMI Embedded Operator's Guide
64_156	Editing on the network drive	BEM: HMI Embedded Operator's Guide
64_157	Geometry processor and C950: Grinding stock allowances	BEM: HMI Embedded Operator's Guide
64_158	System resource display of SRAM, DRAM	IAM, IM2: Start-Up HMI Embedded
64_159	Entry of fits	BEM: HMI Embedded Operator's Guide



4

4 Changes from the 11.02 Edition to the 03.04 Edition

The abbreviations listed below in column "Target document" are listed and explained in the list of references in the appendix.

Note

Reference is made only to those functions and components that are not included in Chapter 3 and that have been updated.

No.	Topic: General tasks	Target document(s)
01	New MDs in Online MD	Help in the Editor
02	Generating lists	LIS: Lists
03	New alarms	DA: Diagnostics Guide

No.	Topic: Hardware	Target document(s)
04	OP012S operator panel	BH: Operator Components Manual
05	TP015A operator panel	BH: Operator Components Manual
06	416 operator panel w/o VLE	BH: Operator Components Manual
07	Direct control key submodule	BH: Operator Components Manual
08	483C machine control panel	BH: Operator Components Manual
09	483 machine control panel	BH: Operator Components Manual
10	310 machine control panel	BH: Operator Components Manual
11	416 machine control panel	BH: Operator Components Manual
12	COM board	BH: Operator Components Manual
13	483C keyboard	BH: Operator Components Manual
14	310C keyboard	BH: Operator Components Manual
15	USB disk drive	BH: Operator Components Manual
16	NCU 571.4	PHD: Configuring Manual NCU 561.2-573.4

No.	Topic: NC SW 7.1	Target document(s)
17	Block search via program test	FB1, K1: Mode group, channel, program operation mode 21PGA: Programming Guide Advanced
18	Ignore Feed Hold	FB221, K1: Mode group, channel, program operation mode FB1, V1: Feedrates PG: Programming Guide Fundamentals PGA: Programming Guide Advanced
19	ASUP extensions	FB1, K1: Mode group, channel, program operation mode
20	Single axes	FB2, P2: Positioning axes PGA: Programming Guide Advanced
21	Spindle extensions	FB1, S1: Spindle PG: Programming Guide Fundamentals
22	Axis replacement extensions	FB1, K2: Axes, coordinate systems, frames, actual value system for workpiece, external work offset
23	Extensions curve tables CTABSP, CTABEP	FB3, M3: Coupled axes and ESR PGA: Programming Guide Advanced
24	Diagnosis of coupled axes and curve tables	FB3, M3: Coupled axes and ESR PGA: Programming Guide Advanced
25	Linear prying at position	FB3, M3: Coupled axes and ESR PG: Programming Guide Fundamentals PGA: Programming Guide Advanced
26	System variable for block type information	PGA: Programming Guide Advanced PG: Programming Guide Fundamentals
27	NC language P6	PG: Programming Guide Fundamentals PGA: Programming Guide Advanced
28	Precompilation for selected cycles	FB3, V2: Preprocessing
29	Auxiliary functions	FB1, H2: Output of auxiliary functions to PLC
30	Smoothing optimization	FB1, B1: Continuous-path mode, exact stop and Look Ahead PG: Programming Guide Fundamentals PGA: Programming Guide Advanced
31	Frame extensions P6 and tool and workpiece measurement	FB1, K2: Axes, coordinate systems, frames, actual value system for workpiece, external work offset FB2, M5: Measuring
32	Workpiece and tool measurement	FB2, M5: Measuring
33	Generic 5-axis transformer Ext. P6	FB1, W1: Tool Compensation FB3, F2: 3-Axis to 5-Axis Transformation
34	Prepared TANGON	PG: Programming Guide Fundamentals PGA: Programming Guide Advanced
35	Programmable offset for orientation axes	FB3, F2: 3-Axis to 5-Axis Transformation PGA: Programming Guide Advanced
36	Programming of orientation polynomials	FB3, F2: 3-Axis to 5-Axis Transformation
37	NC-functions for measuring cycles	FB1, W1: Tool Compensation PG: Programming Guide Fundamentals PGA: Programming Guide Advanced
38	2D WRK: Extensions P7	PG: Programming Guide Fundamentals

No.	Topic: HMI-Advanced SW 6.4	Target document(s)
39	Wizard: Extension for engraving cycle	IAM, BE1: Expand the Operator Interface
40	Warning for PCU50 temperature monitoring	IAM, IM4: Installing HMI Advanced
41	Double channel display as for 840C	BAD: Operator's Guide HMI Advanced
42	Adaptation TFS window	BAD: Operator's Guide HMI Advanced
43	Turret position number in the display	BAD: Operator's Guide HMI Advanced
44	Protection level for PRESET and scratching.	BAD: Operator's Guide HMI Advanced IAM, IM4: Installing HMI Advanced
45	Status display swivel data	BAD: Operator's Guide HMI Advanced
46	Scratching in swiveled plane with rotary axes without encoder	BAD: Operator's Guide HMI Advanced
47	ISO: Adapt machine area to ISO compatibility	FBFA: Description of Functions ISO Dialects
48	Fanuc work offset	FBFA: Description of Functions ISO Dialects
49	Fanuc tool compensation with TOOLMAN / also detailed image	BAD: Operator's Guide HMI Advanced
50	Fanuc tool compensation without TOOLMAN / H-data in details	BAD: Operator's Guide HMI Advanced
51	TM: Always display buffer	FBW: Description of Functions Tool Management
52	TM: Improve / implement HMI-Adv setting location hierarchy	BAD: Operator's Guide HMI Advanced
53	TM: Space status adjacent locations	FBW: Description of Functions Tool Management
54	TM: Extension of search strategies	FBW: Description of Functions Tool Management
55	TM: Visible cutting data per tool type	FBW: Description of Functions Tool Management
56	Extend controls for Wizard	IAM, BE1: Expand the Operator Interface
57	WPD server for simulation / step-time	BAD: Operator's Guide HMI Advanced
58	Step-time	BAD: Operator's Guide HMI Advanced
59	Templates for workpieces	BAD: Operator's Guide HMI Advanced
60	Allow recompile with wizard without #	IAM, BE1: Expand the Operator Interface
61	Simulation: Fast simulation for mold making	BAD: Operator's Guide HMI Advanced
62	Simulation with OEM transformation	IAM, IM4: Installing HMI Advanced
63	Simulation: Inclusion of all tool compensation types	IAM, IM4: Installing HMI Advanced
64	Simulation: Simulation for multi-channel machines	BAD: Operator's Guide HMI Advanced
65	611D drive IB: Measuring functions coupled axes	BAD: Operator's Guide HMI Advanced IAD: SINUMERIK 840D Installation and Start-Up Guide
66	More comprehensive version image, previous images 8-digit	BAD: Operator's Guide HMI Advanced

67	Bring display MD from PCU20 to PCU50	BAD: Operator's Guide: HMI Advanced
68	Display machine data filter	BAD: Operator's Guide: HMI Advanced

No.	Topic: HMI Embedded SW 6.5	Target document(s)
69	Version identifier for cycles	BEM: HMI Embedded Operator's Guide
70	Ensure compatibility with WinXP	IAM, IM2: Installing HMI Embedded
71	Remote diagnosis with PCU20 when PCMCIA slot occupied	IAM, IM2: Installing HMI Embedded
72	Enhanced SW update for PCU20	IAM, IM2: Installing HMI Embedded
73	Reference list for trip recorder	IAM, IM2: Installing HMI Embedded
74	Show remaining dwell	BEM: HMI Embedded Operator's Guide
75	Geometry processor and C950: Grinding stock allowances	BEM: HMI Embedded Operator's Guide
76	Mold making: accelerate HMI Embedded editor	BEM: HMI Embedded Operator's Guide IAM, IM2: Installing HMI Embedded
77	Consistent 8-digit version labels	BEM: HMI Embedded Operator's Guide
78	Netservice	IAM, IM2: Installing HMI Embedded
79	Practical design of the system resources image	BEM: HMI Embedded Operator's Guide IAM, IM2: Installing HMI Embedded
80	Include compile cycles in series start-up	BEM: HMI Embedded Operator's Guide
81	Plain texts for PLC machine data	IAM, IM2: Installing HMI Embedded
82	Upgrade archive in HMI-Embedded	BEM: HMI Embedded Operator's Guide
83	ISO: Display support for ISO cycles	BEM: HMI Embedded Operator's Guide
84	System resource display in diagnostic area	BEM: HMI Embedded Operator's Guide
85	Measuring cycle support in G-Code	IAM, IM2: Installing HMI Embedded
86	Scrolling alarm line	IAM, IM2: Installing HMI Embedded



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1

1 Introduction

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Note

SW version 6 redefines the designations for the operating software packages running on PCU 20, PCU 50 and PC with WinNT.
HMI Embedded WIN32 on PCU 50 and PC can be combined with WinNT and HMI Advanced on a single hardware platform. More detailed information can be found in Chapter 7.

The following names appear in the description
MMC 100.2 also apply for HMI Embedded, HMI Embedded WIN32
MMC 103 also apply for HMI Advanced

1.1 Aims and objectives

"Expanding the Operator Interface" (Wizard) is implemented with an interpreter on MMC/HT6 and configuration files that contain the description of the user interfaces.

The tools package for "Expanding the Operator Interface" enables you to create operator interfaces which display functional expansions designed by the machine manufacturer or end user, or simply to implement your own screen form layout. Preconfigured interfaces supplied by Siemens or the machine manufacturer can be modified or replaced.

The interpreter is available as standard in MMC100.2/HT6, ShopMill and ManualTurn as well as MMC103.

In SW 6 and higher, the functionality in HMI Embedded (corresponds to MMC 100.2) and HMI Advanced (corresponds to MMC103) are available. The terms HMI ... are only used in combination with the functions introduced in SW 6 and higher.

Parts programs for example can be edited on user-created operator interfaces.

Screen forms can be created directly on the control system. An additional graphics tool is needed to produce graphics/display images. For the MMC100.2/HT6 you still need the application disk and the PaintShopPro tool (<http://www.jasc.com>).

The tool box supplied contains configuration examples for new screen forms. You can also use these examples as a template for creating your own forms.

1.2 Scope and principle of operation

1. Open screen forms containing the following elements:
 - Softkeys
 - Variables, tables
 - Texts and Help texts
 - Graphics and Help displays
2. Initiate operations in response to the following actions:
 - Open a screen form
 - Input values (variables)
 - Select a softkey
 - Exit a screen form
3. Restructure screen forms dynamically:
 - Edit and delete softkeys
 - Define and design variable fields
 - Insert, exchange and delete display texts (language-dependent and independent)
 - Insert, exchange and delete graphics
4. Apply protection levels according to user classes
5. Variables
 - Read (NC, PLC and user variables)
 - Write (NC, PLC and user variables)
 - Combine with mathematical, comparison or logic operators
6. Execute functions:
 - Subroutines
 - File functions
 - PI services
 - External functions (MMC 103)
7. Data exchange between screen forms
8. The screen form can be invoked:
 - By activating (start) softkeys
 - Via selection from the PLC (from SW 5.3)

Expanding the Operator Interface is configured by ASCII files, which can be stored either on the NC (MMC100.2/HMI Embedded only) or on the MMC.

These configuration files which contain the description of the operator interface as a whole are created using the ASCII Editor.

The syntax that must be applied in creating these files is described in the following sections.

Note

The programming support functions described in Chapter 4 and the operator interfaces for Siemens cycles in software version 5 and higher have been created with the system tools for expanding the operator interface. As a result, they can be modified as required by the machine manufacturer or end user within the scope described in this chapter.

1.3 Supplementary conditions for use

- It is only possible to switch between screen forms within one MMC operating area.
- User, setting and machine data are initialized on request on the MMC 103.
- User variables may not have the same names as system or PLC variables.
- The screen forms activated by the PLC form a separate operating area for the MMC 103 (similar to measuring cycle displays).

Additionally with MMC 100.2/HT6:

Size and number of configuration files

The entire memory space for all configuration files including texts amounts to 256KB, of which approx. 128KB are occupied by the system; therefore, **128 KB** remain for the **user**.

For PCU 20

256 kB are available to the user.

The maximum number of configuration files on MMC 100.2 is 10.

For PCU 20 and PCU 50

The maximum size of a configuration file is 30 kB.

Size of display files

The total size of the file with compressed images CST.ARJ is 150 kB.
On MMC 100.2, 100 kB of this is used by the system.

Functionality

The following functions are not available:

Search functions:

- SB (search forwards)
- SF (search backwards)

File names

All file names must follow DOS conventions (xxxxxxx.eee).

Displays activated from the PLC

With the MMC 100.2/HT6 it is not possible to select/deselect displays via a separate operating area.

1.4 Syntax rules in this documentation

Key words Vocabulary words are interpreted as part of the syntax in the configuration file.
Key words are in **bold**.

Parameters Parameters can be altered and are replaced by other words/symbols in the configuration file.
Parameters are in *italics*.

Par.xy = value Parameters with corresponding codes (ID parameters) can be used during runtime.
Codes are in **bold**.

Note

When an ID parameter is modified during operation, it is not necessary to specify the parameter if it is unambiguous:

xy = value

[optional syntax] Optional syntax can, but need not, be configured.
machining.
Optional syntax is represented in square parentheses.

Note

If the square parentheses are in **bold** ([...]), then the entry is not optional syntax, but square parentheses which form part of the syntax, i.e. square parentheses in **bold** must be configured.

Example Configuration examples are shown in a different font.

; Comment Comments

- in the configuration examples in this documentation and
 - as syntax elements in the configuration files
- are preceded by a semicolon (;).

Positional parameters Positional parameters are parameters that are defined by their position.
The slash "/" separates the parameter groups. A parameter group comprises one or more individual parameters.

Comma "," separates the individual parameters in the parameter group.

Undefined parameter groups are replaced by a single character "/" as the place holder.

Undefined single parameters are replaced by a single character "," as the place holder.

Placeholders "/" are omitted after the last defined parameter group.

Place holders "," are omitted after the last defined single parameter in a parameter group.

```
//M(Identifier/[Header]/[Graphic]/[Dimension]/[System  
or user variable]/[Graphic position]/[Attributes])  
//M(Mask1/"CYC83"/"c83.bmp"/ , , 300, 200//10)  
  
;Name of identifier: Form1  
;Header: CYC83  
;Graphics: c83.bmp  
;Dimension: Distance from left and top: Standard positions are  
system-dependent, width 300 pixels, height 200 pixels  
;System or user variables: None  
;x-position of Help display: 10 pixels  
;Attribute: None
```

Note

All possible values which can be assumed by a parameter are listed for some positional parameters. Only **one** of the specified values can be assigned.

Identifier=(*Text*[,*Status*][,*Access level*])

with status se0
 se1
 se2
 se3

HS2=("thread", se1)

If alternative parameters are possible, the separator | is placed between the alternatives in the syntax description.

Note

The positions and size of image parameters are specified in pixels with reference to standard displays with 640x480 pixels. In displays with higher resolutions, these positions are converted automatically.

The reference point for positions is the top left corner of the main section of the screen form.

The display of the HT6 has a resolution of 320x240. The values are understood 1:1, i.e. they are not converted.

\$8xxxx

Call a text from a separate text file. Texts used in screenforms can be specified explicitly in configuration files or, particularly in cases where screenforms are to be displayed in different languages, stored separately in text files.

Language-dependent texts can be used for:

- Softkey labels
- Headings
- Help texts
- Any other texts

The screen forms refer to texts in different text files via text identification numbers (number after the \$ character). Text files are usually language-dependent. Entries in control files determine which text files must be activated.

The structure of the configuring environment in Chapter 7 describes how selected text files can be activated for target systems MMC 100.2/HT6 and MMC 103.

The syntax for creating screen form texts in separate files is also to be found in Chapter 7.

"text"

text is text defined by the user which can be entered directly as such in the configuration file.

Notations \$8xxxx and "text" can be used as alternatives.

Note

Commands which have not yet been implemented are specified at a number of places in this document. Please refer to the Index for the corresponding command with page reference.



Notes

2

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2.1 Creating configuration files

Editor

An ASCII editor (e.g. Notepad or the MMC Editor) is used to create configuration files.

Files

The defining data for new operator interfaces are stored in configuration files. These files are automatically interpreted and displayed as screen forms. Configuration files are not stored in the software supplied and must be set up by the user.

Access

Every application uses permanent (MMC100.2, HT6, ShopMill, ManualTurn) or default (MMC 103) start softkeys which can be selected to open newly configured screen forms. Additional start softkeys can be configured on the MMC 103.

Table 2-1 Interrelation start softkey/configuration file (default setting)

Softkey	Configuration File
MMC 100.2/103	
Main screen Machine JOG, horizontal softkey 1	MA_JOG.COM
Main screen Machine MDA, horizontal softkey 1	MA_MDA.COM
Main screen Machine Automatic, horizontal softkey 2	MA_AUTO.COM
Main screen Parameters, horizontal softkey 7	PARAM.COM
Main screen Programming, horizontal softkey 8	PROG.COM
Main screen Services, horizontal softkey 7	SERVICE.COM
Main screen Diagnosis, horizontal softkey 7	DIAG.COM
Main screen Installation and Start-Up, horizontal softkey 7 and on the extended softkey menu horizontal softkeys 6 and 7	STARTUP.COM
Main screen Editor, horizontal softkeys 2 to 5 (assigned)	AEDITOR.COM
Main screen Editor, horizontal softkeys 6 (free) and on the extended softkey menu horizontal softkeys 6 and 7	AEDITOR.COM
ShopMill	
Main screen Machine Auto, horizontal softkey 6	SM_AUTO.COM
Main screen Program, Drilling Vertical softkey 6 Milling Vertical softkey 6 Miscellaneous Vertical softkey 4	SM_PROG.COM
Main screen Messages/Alarms, horizontal softkeys 7 and 8	SM_DIAG.COM
Main screen Tools/Zero Offsets, horizontal softkey 7	SM_PARAM.COM
ManualTurn	
Softkey Operating Area Switchover, horizontal softkeys 2 to 7	MAN_TURN.COM

HT6	
Softkey	Configuration File
Main screen Machine JOG, horizontal softkey 1	H_MA_JOG.COM
Main screen Machine MDA, horizontal softkey 1	H_MA_MDA.COM
Main screen Machine Automatic, horizontal softkey 2	H_MA_AUT.COM
Main screen Parameters, horizontal softkey 7	H_PARAM.COM
Main screen Parameters, horizontal softkey 8	H_PARAM.COM
Main screen Programming, horizontal softkey 8	H_PROG.COM
Main screen Services, horizontal softkey 7	H_SERVIC.COM
Main screen Start-up, horizontal softkey 7	H_STRTUP.COM
Main screen editor, horizontal softkeys 2-3	H_EDITOR.COM
Main screen correction editor, horizontal softkeys 2-4	H_C_EDIT.COM

User keys HT6	
User key U1	H_U1.COM
User key U2	H_U2.COM
User key U3	H_U3.COM
User key U4	H_U4.COM
User key U5	H_U5.COM
User key U6	H_U6.COM
User key U7	H_U7.COM
User key U8	H_U8.COM
Special key S1	H_S1.COM
Special key S2	H_S2.COM
TEACH key	H_TEACH.COM

MMC 100.2/HT6

On the MMC 100.2, HT6, ShopMill and ManualTurn, the system first seeks to access the configuration files in the user cycles directory (NC memory), then in the standard cycles directory and finally in a special DOS directory (Flash File System).

The Flash File System is the preferable option for performance-related reasons.

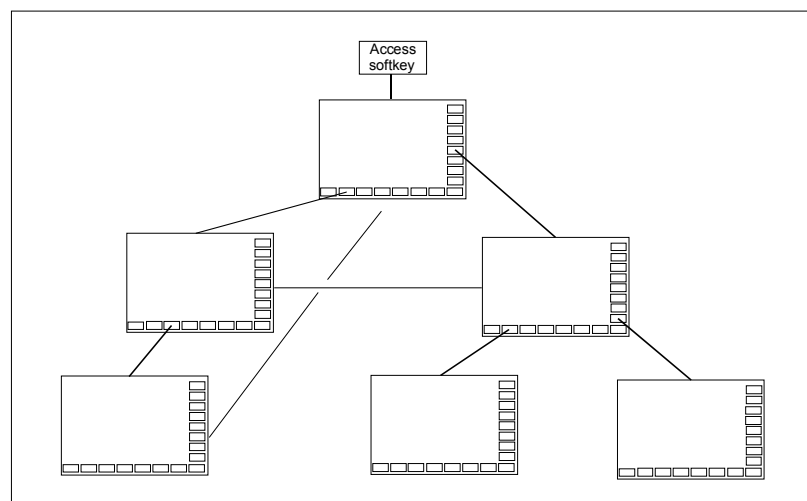
A setting can be made in file COMMON.COM in the standard cycles directory/user cycles directory on the MMC100.2, HT6 to specify whether a configuration file search should be carried out each time access is made (only relevant when the screen forms are being set up directly on the control) or if the file already located and buffered should be used (corresponds to the standard operating scenario). Further information about setting the configuring and operational environments can be found in Chapter 7.

MMC 103

On the MMC 103, the system first seeks to access the configuration files in the user cycles directory and then the standard cycles directory. The search is also made in the manufacturer cycles directory in SW 6.2 and higher.

2.1.1 Principle of the screen form tree

Several interlinked screen forms create a screen form tree. A link exists if you can switch from one screen form into another. You can use the newly defined horizontal/vertical softkeys in your form to call the preceding or any other screen form.



A screen form tree can be created behind each start softkey.

2.1.2 Reverting to the standard application

There are two different ways to close the new user interface and return to the standard application.

You can use the "RECALL" key to close the new user interfaces if you have not configured this key for any other task.



See also Subsection 2.6.3 "RECALL key".

EXIT function

See Subsections 2.6.4 "Screen-form-independent softkeys" and 3.2.1 "Displaying another screen form or softkey".

2.2 Defining a start softkey

In order to access the start screen or a start softkey menu, the start softkey must be defined. The definition block for a start softkey is structured as follows:

Start identifier of start softkey	//S(Start)
Define start softkey	HS1=...
Method	;horiz. SK 1
LM or LS function	PRESS(HS1)
End of method	LM...
	END_PRESS
End identifier of start softkey	//END

//S (Start) ;Start identifier of start softkey

...

//END ;End identifier

The softkey is defined in the start softkey description block (see Subsection 2.6.2 Defining a softkey) and the function "Display screen form" or "Display softkey menu" is assigned in a method (see Subsection 2.2.1 Methods for screen-form-independent softkeys and the elements these softkeys may contain in Subsection 2.2.2 Functions for screen-form-independent softkeys).

If the start softkey definition is designated as a comment (semicolon (;) at beginning of line) or the configuration file removed, the start softkey will not function.

//S(Start)	;Start identifier
HS6= ("1st form")	;Label horizontal softkey 6 with "1 st form"
PRESS(HS6)	;PRESS method for horiz. SK 6
LM("Form1")	;Load function <i>Form 1</i> (<i>Form 1</i> must be defined within the same file).
END_PRESS	;End of PRESS method
HS7= ("2 nd form")	;Label horizontal softkey 7 with "2 nd form"
PRESS(HS7)	;PRESS method for horiz. SK 7
LM("Form2")	;Load function <i>Form 1</i> (<i>Form 2</i> must be defined within the same file).
END_PRESS	;End of PRESS method
//END	;End identifier of start block

MMC 100.2/HT6

Note

The information required to implement a softkey is to be found in Subsection 7.2.1, keyword "Start softkeys".

2.2.1 Methods for screen-form-independent softkeys

Screen-form-independent softkeys are keys that are not called from a screen form, i.e. they are start softkeys and softkey menus, which are configured **before** the first new screen form. These functions are configured using the following method:

PRESS method

The PRESS method is executed when the corresponding softkey is pressed.

PRESS(*Identifier*)

...

END_PRESS

where:

Identifier Name of softkey: HS1-HS8, VS1-VS8
 or RECALL

HS1 = ("other softkey menu")

HS2 = ("no function")

PRESS (HS1)

 LS ("Menu1") ;Load a new softkey menu

END_PRESS

PRESS (HS2) ;empty PRESS method

END_PRESS

2.2.2 Functions for screen-form-independent softkeys

Certain functions can be initiated via screen-form-independent softkeys. The following functions are possible:

- The LM function can be used to load another screen form.
LM("Identifier"[, "File"])
- The LS function can be used to display another softkey menu.
LS("Identifier"[, "File"][, Merge])
- You can use the EXIT function to leave the newly configured operator interfaces and return to the standard application.
- You can use the EXITLS function to exit the current operator interfaces and load a defined softkey menu.
- The EXE function can be used on the MMC 103 to call a program created as an application with the OEM package of the MMC 103 or to start the Free Contour Programming application.
On the MMC 100.2, EXE can only be used to start the Free Contour Programming application.

For more information, see Chapter 3, "Methods".

2.3 Display selection from the PLC (SW 5.3 and higher)

Displays can also be selected from the PLC. An interface is available for signal exchange between the PLC and MMC/HT6.

Interface description

The interface contains:

- The display number
- Control bits from the PLC to the MMC
- Control bits from the MMC to the PLC

As each NCU can be addressed by up to two MMCs/HT6s at the same time in systems with "several operator panel fronts and NCUs", this interface can exist in duplicate.

References: /FB/, B3 "Several Operator Panels and NCUs"

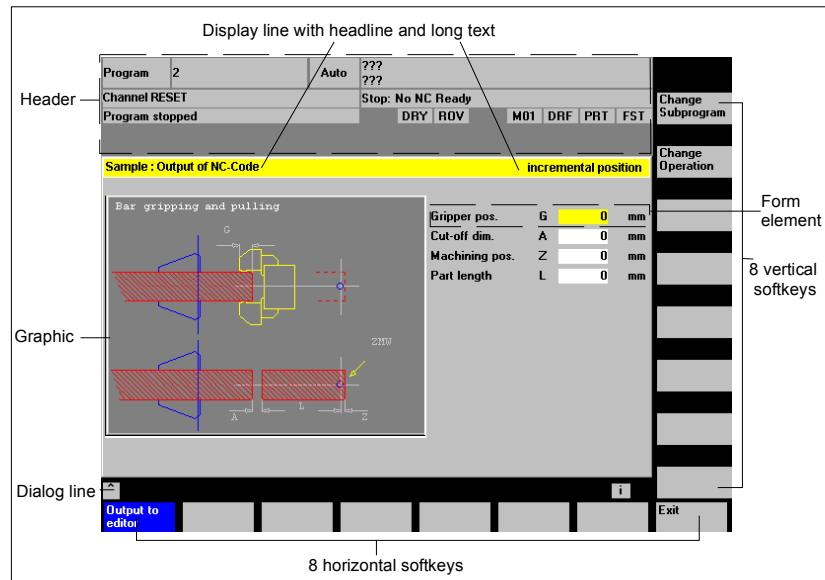
The interface is located in the operator panel front interface (DB19). The interface requires a total of 8 bytes in DB19, 4 bytes for each MMC/HT6.

These PLC displays offer the same means of display and functions as for the displays selected via the softkeys.

For more information about display selection from the PLC, see Chapter 5, "PLC interface".

2.4 Defining a screen form

A screen form is part of an operator interface consisting of a display line, form elements and/or graphic, dialog line and 8 horizontal and 8 vertical softkeys.



The definition of a screen form (form definition block) is basically structured as follows:

Start identifier of form	//M...
Variables	DEF Var1=...
Softkeys	... HS1=...
Methods Actions End of method	... PRESS(HS1) LM... END_PRESS
End identifier of form	//END

Within the screen form definition block, various variables that appear as form elements in the screen form, as well as horizontal and vertical softkeys, are defined first.

Different types of actions are then configured in methods.

The following rules must be observed when configuring screen forms:

- Texts/strings, path names and system or user variables must always be enclosed in quotation marks (" ... ").

- The *Identifier* parameter must be unique and always comprises a minimum of 2 and maximum of 32 characters. The first two characters must be two letters or an underscore and a letter (a-z, A-Z, _).
- The system does not distinguish between upper and lower case type.
- Insertion of a space before or after the equals sign is optional.
- If a command is configured only with a file name, then the file search strategy is as follows:

Table 2-2

Entry	Search in ...
No file name, no path name	COM file of current screen form
File name	User cycles directory Standard cycles directory (including Flash File System on MMC 100.2)
File name and path name	Specified path
File name and NC path name	The system looks for the COM file on the NC, copies it to the MMC and reads it there.

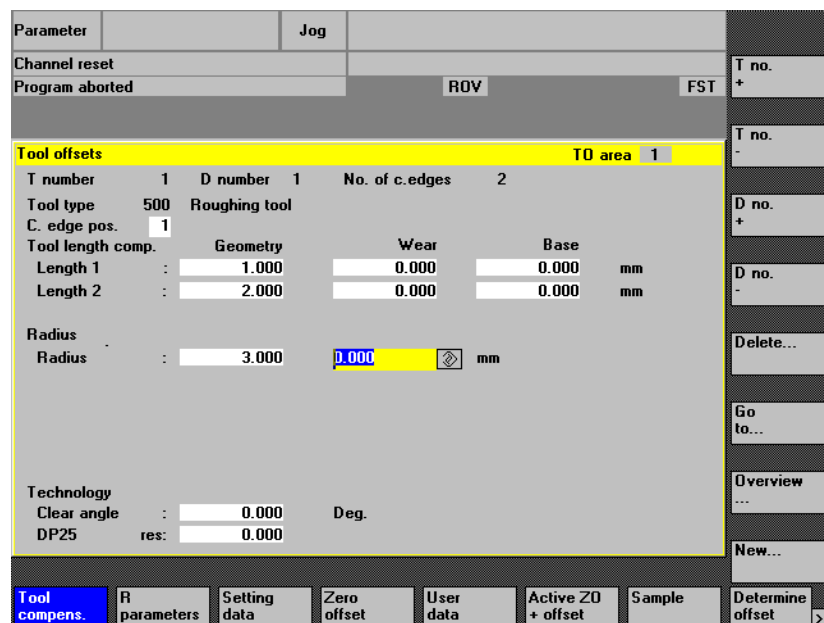
Example

A new screen form is called via start softkey "Example" from the **Parameters** operating area.

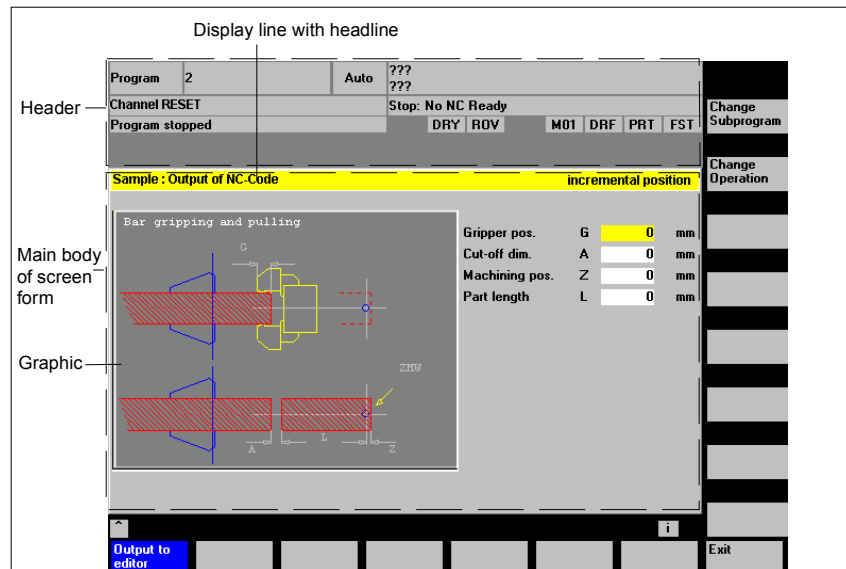
```
//S(Start)
HS7=("Example", ac7, se1)

PRESS(HS7)
  LM("Form1")
END_PRESS

//END
//M(Form1/"Cycles")
HS1=("")
HS2=("")
HS3=("")
HS4=("")
HS5=("")
HS6=("")
HS7=("")
HS8=("")
VS1=("")
VS2=("")
VS3=("")
VS4=("")
VS5=("")
VS6=("")
VS7=("")
VS8=("")
...
;Methods
//END
```



2.5 Screen form properties



The properties of the screen form are defined in the start identifier line of the form screen:

//M(Identifier/[Header]/[Graphic]/[Dimension]/[System or user variable]/[Graphic position]/[Attributes])

where:

Identifier	Name of the screen form
Header	Screen form header as text or call for text (e.g. \$85011) from a language-specific text file (see Section 7.1 General information about the configuring environment).
Graphics	Graphics file (with path) in double quotation marks. See also Chapter 3 "Displays".
Dimension	Position and sized of main body of screen form in pixels (distance from left, distance from top, width, height), measured from the top left corner of the screen. The measurements are separated by commas.
System or user variable	System or user variable to which current cursor position is assigned. The cursor position can be sent to the NC/PLC via the system or user variable. The first variable has the index 1. The sequence matches the configuring sequence of the variables.
Graphic position	Position of graphic (distance from left, distance from top) in pixels, measured from the top left corner of the main body of the screen form. The minimum clearance from the top is 18 pixels. The data is separated by commas.
Attributes	Column alignment CMx (Column Mode) CM0: The column distribution is carried out separately for each row.

CM1: The column distribution for the row with the most columns is valid for all rows.
Default setting: CM0

```
//M(Form1/"CYCLE83"/"c83.bmp"/, , 300, 200/"$R[2]"/10, 20/CM1)
```

The properties Header, Graphic and System or User Variable can be changed in the methods when the application is running:

Hd = *Header*

Hlp = *Graphic*

Var = *System or user variable*

See above for explanation of parameters.

Hd = "CYCLE83 changed"

Hlp = "c83_b.bmp"

Var = \$R[19]

The screen form property **System** can be read during the runtime:

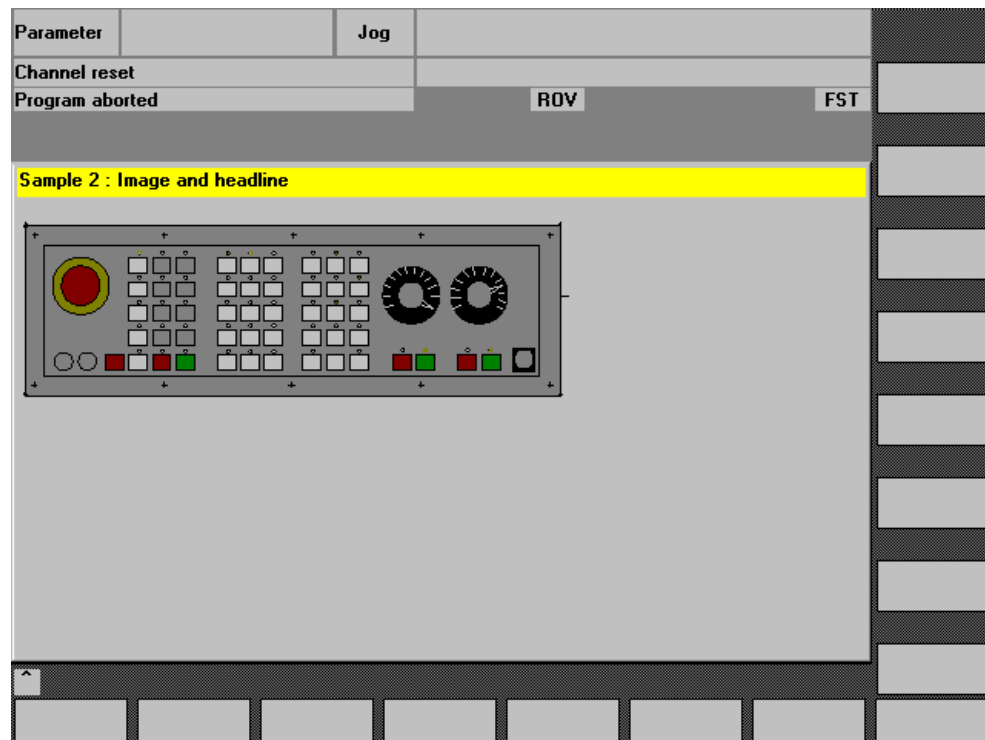
Values:	0	HMI_EMBEDDED is being used
	1	HMI_ADVANCED is being used

Example

```
//S(Start)
HS7=("Example", se1, ac7)

PRESS(HS7)
  LM("Form1")
END_PRESS

//END
//M(Screen form1/"Example 2 : Display graphics"/"MST.BMP")
HS1=("")
HS2=("")
HS3=("")
HS4=("")
HS5=("")
HS6=("")
HS7=("")
HS8=("")
VS1=("")
VS2=("")
VS3=("")
VS4=("")
VS5=("")
VS6=("")
VS7=("")
VS8=("")
...
//END
```



Display for example 2: Display graphics

2.5.1 Screen form appearance/differences

If **HMI Advanced** is installed with **ShopMill** together on an operator panel front, then both systems have a different font types. HMI Advanced has **proportional fonts**, the **JobShop products** and **HMI Embedded** have a **fixed font**.
If the "Expanding the Operator Interface" system is used on HMI Embedded and HMI Advanced, screen forms that are defined identically will appear differently by default.

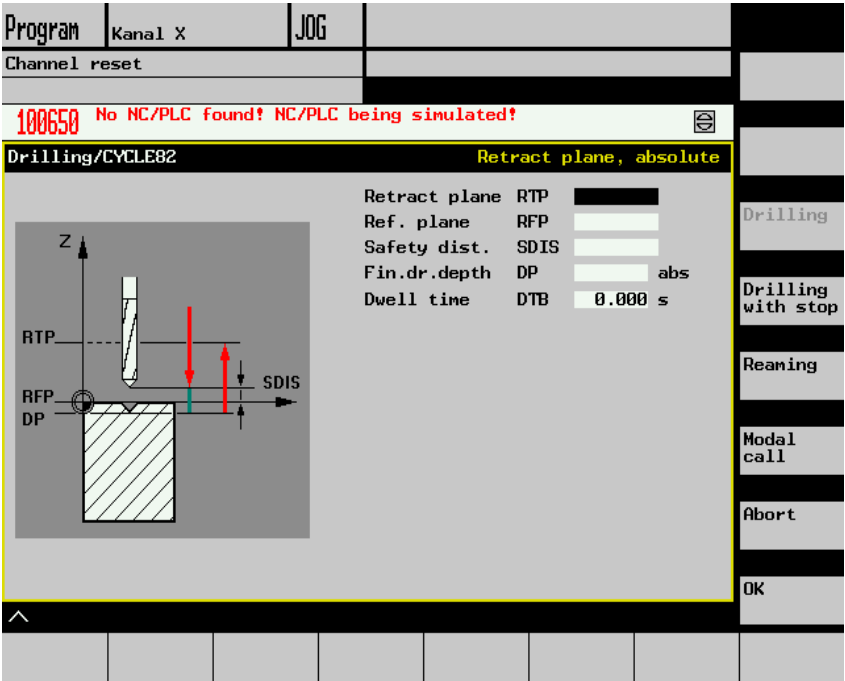


Fig. 2-1 HMI Embedded screen form appearance
Below you can see how, despite being configured identically, the same screen appears differently under HMI Advanced.

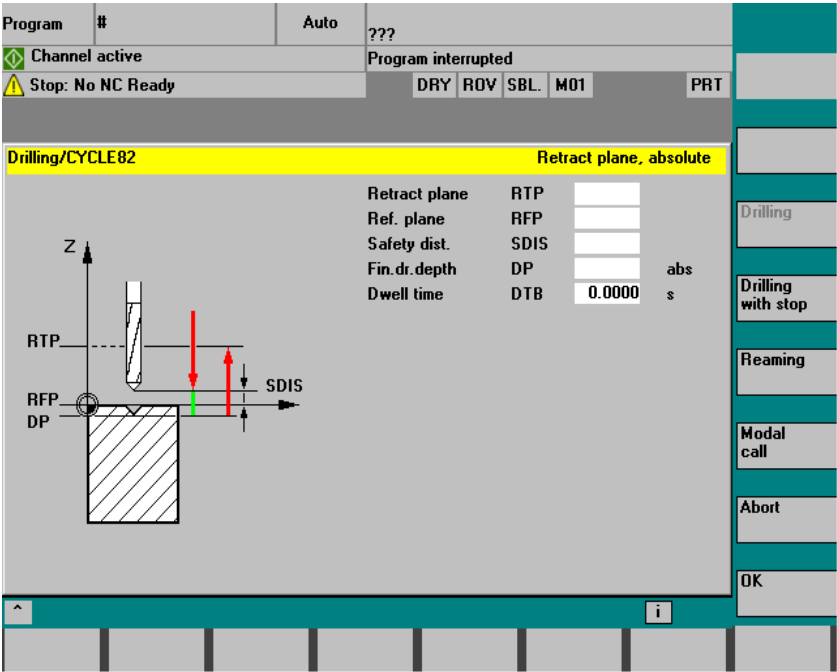


Fig. 2-2 HMI Advanced screen form appearance

Setting for the same screen appearance

The common display mode possible for the systems referred to is **fixed font**. The following setting can be applied in **HMI Advanced** to produce the same screen form appearance:

A setting must be made in file **wizard.ini** to effect the switch to fixed font.

[FONT]

FixedFont=1

The text will be displayed in the current language in fixed font format.

This condition does not apply to the softkey labels.

Unlike the HMI Embedded input field, the HMI Advanced input field contains an input mode pictogram.

This means that the HMI Advanced input is smaller than the HMI Embedded field.

As you can see above, the combination of short text, graphic text, input field and unit text is approximately the same length and contains the same information in both screens.

However, individual fields can be positioned differently in the two HMI versions depending on the length of the text to be displayed and the text field within which it will be contained.

In order for a common configuration file to be used for both versions, the SYSTEM screen form property was created with HMI SW 6.1. See 2.5 "Screen form properties".

The runtime environment can be scanned in the SYSTEM screen form property.

This enables **one** configuration to be used for both target systems.

2.6 Softkeys and hotkeys

The names of the softkeys are predefined.

HSx x 1 - 8 , Horizontal softkeys 1 to 8

VSy y 1 - 8 , Vertical softkeys 1 to 8 (not for HT6)

Not all softkeys need to be assigned.

The names of hotkeys KH are predefined.

UKz z 1 - 8 User keys 1 to 8 (only HT6)

SK1, SK2 Special keys 1 and 2 (only HT6)

TEACH TEACH key (only HT6)

2.6.1 Defining a softkey menu

The term softkey menu is used to refer to all the horizontal and vertical softkeys displayed in a form.

In addition to the existing softkey menus, it is possible to define other menus, which partially or completely overwrite the existing menus.

The definition of a softkey menu (softkey menu definition block) is basically structured as follows:

Start identifier of softkey menu	//S . . .
Define softkeys	HSx = . . .
Methods	PRESS (HSx)
Actions	LM . . .
End of method	END_PRESS
End identifier of softkey menu	//END

//S (*Identifier*) ;Start identifier of the softkey bar

...

//END ;End identifier of the softkey menu

where:

Identifier Name of softkey menu

//S(Menu1) ;Start identifier of softkey menu

HS1= ("OK", ac6, se1) ;Definition of 1st horizontal softkey,
;see Softkey properties

HS2= ("Exit")

HS3= ("\\build1.bmp") ;Display (symbol) on softkey

VS2= ("Sub-form")

VS3= (\$85011, ac7, se2)

PRESS(HS1) ;Start identifier of method

HS1.st="Calculate" ;Change softkey label

...

END_PRESS ;End identifier of method

PRESS(RECALL) ;Start identifier of method

LM ("Form21") ;Load Form function

END_PRESS ;End identifier of method

//END ;End identifier of softkey

2.6.2 Defining a softkey

Properties are assigned to softkeys when the softkeys are defined:

$SK = (Text[, Access\ level][, Status])$ or $HK = (", access\ level)$

where:

SK softkey, e.g. HS1 to HS8,

VS1 to VS8 (not for HT6)

HK hotkey UK1 to UK8, SK1, SK2

and TEACH (HT6 only)

Text

Labeling of softkeys as described in

Section 1.4 "Syntax rules in this documentation"

Creation of text see also Section 7.1 "General information about the configuring environment"

Display: See Subsection 3.1.4 "Displays".

Instead of a text a picture file name

is specified in the following form:

"\\my_pic.bmp" or using a separate text file

\$85199 with the following text in the

(language-specific) text file: e.g.

85100 0 0 "\\c:\pic\my_pic.bmp". An image

to be displayed on a softkey may

be 80 * 34 pixels in size.

Note

A carriage return in the softkey designation is created with %n. A maximum of 2 lines of 10 characters are available in HMI Advanced and 2 lines of 9 characters in HMI Embedded. Two lines of 6 characters each are available to the HT6.

Access level

ac0

...

ac7

Meaning, refer to Table 2-3.

Default setting: AC7

Status

se1 visible

se2 cannot be used (grayed-out)

se3 displayed (last softkey used)

Default setting: se1

VS7= ("Abort", ac1, se3) ;Define softkey VS7 and assign
;the text "Abort", the access level 1
;and the status "displayed".

VS8= ("OK", ac6, se2) ;Define softkey VS8 and assign
;the text "OK", the access level 6
;and the status "cannot be used".

The properties Text, Access Level and Status can be changed in the methods when the application is running:

```
SK.st = Text      "Abort"      ;Softkey e.g. the text "Abort"
SK.ac = Access level      ;Softkey e.g. with access level 4
SK.se = Status      ;Softkey e.g. with Status 2
```

where:

Access Level

0

...

7

Meaning, refer to Table 2-3.

Status

1 visible

2 cannot be used (grayed-out)

3 displayed (last softkey used)

See above for explanation of parameters.

Access level

The meanings of the different protection levels are as follows:

Table 2-3

Protection level	Locked by	Range
ac0	Password	Siemens
ac1	Password	Machine manufacturer
ac2	Password	Service
ac3	Password	User
ac4	Keyswitch position 3	Programmer, machine setter
ac5	Keyswitch position 2	Qualified operator
ac6	Keyswitch position 1	Trained operator
ac7	Keyswitch position 0	Semi-skilled operator

ac0 is the highest protection level and ac7 the lowest. The operator can only access information on the level for which he is authorized and all lower levels.

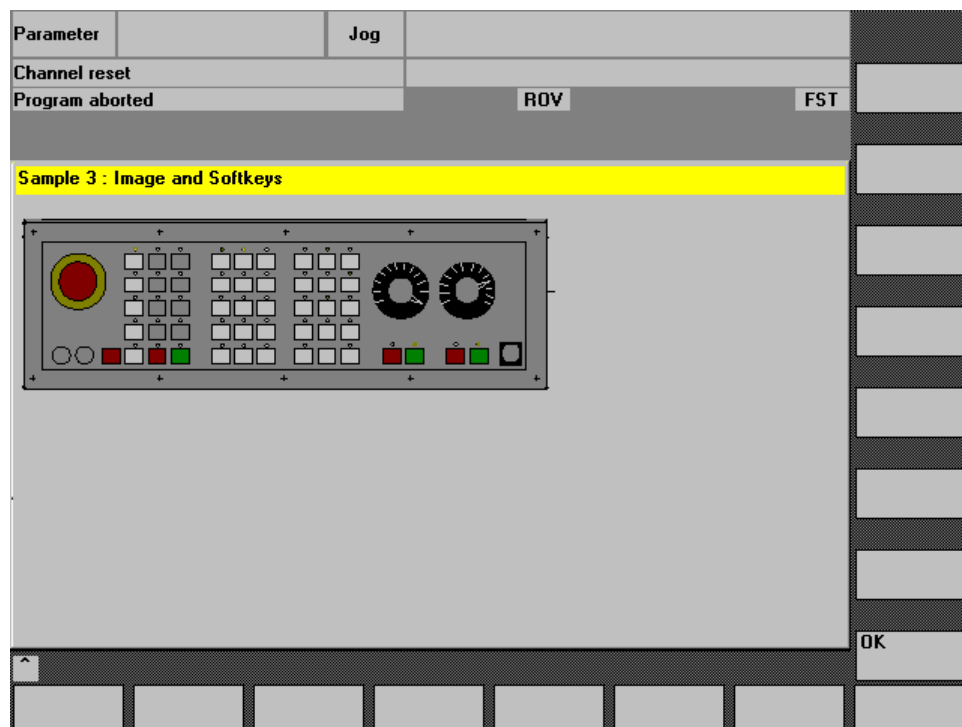
Example

```
//S(Start)
HS7=("Example", ac7, se1)

PRESS(HS7)
  LM("Form3")
END_PRESS

//END
```

```
//M(Screen form3/"Example 3 : Graphics and softkeys"/"MST.BMP")
HS1=("")
HS2=("")
HS3=("")
HS4=("")
HS5=("")
HS6=("")
HS7=("")
HS8=("")
VS1=("")
VS2=("")
VS3=("")
VS4=("")
VS5=("")
VS6=("")
VS7=("")
VS8=("OK", AC7, SE1)
PRESS(VS8)
EXIT
END_PRESS
//END
```



Display for example 3: Graphics and softkeys

2.6.3 RECALL key



In addition to the horizontal and vertical softkeys, a RECALL key is also available. In contrast to the softkeys, the RECALL key does not need to be defined. The properties Status and Access Level can be assigned to it during operation (see Subsection 2.6.2 "Define softkey").

```
PRESS(RECALL)
  RECALL.ac = 1
  LM("Form5")
END_PRESS
```

If you do not assign any action (function, calculation of variables, property changes) to RECALL, you can use it to exit newly configured operator interfaces and return to the standard application.

2.6.4 Screen-form-independent softkeys

Screen-form-independent softkeys are keys that are not called from a screen form, i.e. they are start softkeys and softkey menus, which are configured **before** the first new screen form.

Certain functions can be initiated via screen-form-independent softkeys. Screen-form-independent softkeys can be defined using a number of methods. A description of how to define screen-form-independent softkeys appears in Section 3.1 "Methods".

Screen form elements and displays

Note

More information about defining variables for one or more screen form elements and all relevant information about creating displays appears in Chapter 3 "Syntax for screen form definition".

Notes

3

3 Syntax for Screen Form Definition

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3.1 Methods

Various types of event (exit input field, actuate softkey) can initiate particular actions in screen forms and screen-form-dependent softkey menus (softkey menus, which are called from a newly configured screen form). These actions are configured in methods.

The following table shows the basic principle used to configure a method:

Method	
Actions: - Functions, see Section 3.2 "Functions" - Change properties see Subsection 2.6.2, "Defining a softkey" and Subsection 3.1.2, "Screen form elements" - Calculate with variables see Subs. 3.1.2, "Screen form elements"	PRESS(HS1) LM... LS... Var1.st = ... Var2 = Var3+ Var4... EXIT
End of method	END_PRESS

The following methods can be configured in a screen form:

PRESS method

The PRESS method is executed when the corresponding softkey is pressed. See PRESS methods, softkey bars.

PRESS(SK)

...

END_PRESS

where:

SK Name of softkey: HS1-HS8, VS1-VS8,
 or RECALL plus the following keys:

Keys

PU	PageUP	Screen up	
PD	PageDown	Screen down	
SL	ScrollLeft	Cursor key	Left
SR	ScrollRight	"	Right
SU	ScrollUp	"	Up
SD	ScrollDown	"	Down

The HT6 has the following additional keys:

UK1 - UK8 User keys 1-8
SK1 - SK2 Special keys S1 and S2
TEACH TEACH key

HS1 = ("other softkey menu")
HS2 = ("no function")
PRESS (HS1)
 LS ("Menu1") ;Load new softkey menu

```

    Var2 = Var3 + Var1

END_PRESS
PRESS (HS2)

END_PRESS
PRESS(PU)
    INDEX = INDEX -7
    CALL("UP1")
END_PRESS

```

LOAD method

The LOAD method is executed after the variable and softkey definitions (DEF Var1= ..., HS1= ...) have been interpreted. At this time, the screen form is not yet displayed.

```

LOAD
...
END_LOAD
LOAD                                ;Start identifier of Load method
    Form1.Hd = $85111               ;Assign text from language
                                    ;file as screen form header
    VAR1.Min = 0                    ;Assign Limit Value variable MIN
    VAR1.Max = 1000                 ;Assign Limit Value variable MAX
END_LOAD ;End identifier

```

UNLOAD method

The UNLOAD method is executed before a screen form is unloaded.

```

UNLOAD
...
END_UNLOAD
UNLOAD
    REG[1] = VAR1                   ;Place variable in register
END_UNLOAD

```

CHANGE method

CHANGE methods are executed if a variable value changes, i.e. variable calculations that are performed as soon as a variable value changes are configured within a CHANGE method.

There are two types of CHANGE method, i.e. element-specific and global. The element-specific CHANGE method is executed if the value of a specified variable changes.

CHANGE(*identifier*)

```

...
END_CHANGE

```

where:

Identifier Name of variable

If a system or user variable is assigned to a variable, cyclic updating of the variable value can be configured in a CHANGE method.

```

DEF VAR1=(S////////"DB20.DBB1")      ;A system variable is assigned
                                      ;to Var1
CHANGE(VAR1)
  IF VAR1.Val <> 1
    VAR1.st="Tool OK!"                ;If the system variable value ≠ 1,
                                      ;then the short text of the variable:
                                      ;Tool OK!

    otto=1
  ELSE
    VAR1.st="Caution Error!"          ;If the system variable value = 1,
                                      ;then the short text of the variable:
                                      ;Caution Error!

    otto=2
  ENDIF
  VAR2.Var=2
END_CHANGE

```

The global CHANGE method is executed if the value of any variable changes and no element-specific CHANGE method has been configured.

```

CHANGE()
...
END_CHANGE
CHANGE( )
  EXIT                                ;If any variable value changes,
                                      ;the screen form is closed
END_CHANGE

```

FOCUS method

The FOCUS method is executed if the focus (cursor) is positioned on another field in the screen form.

```

FOCUS
...
END_FOCUS
FOCUS
  DLGL("The focus has been placed on variable"<< FOC <<)
END_FOCUS

```

The FOC function may not be initiated as a result of navigation event. The cursor may only be moved in softkey press blocks, change blocks, ...
The response to cursor left, right, up, down as well as PGUP, PGDN are permanently pre-defined.

Note

Within the focus block, it is not possible to select a different variable, nor can a new screen form be loaded.

OUTPUT method

The OUTPUT method is executed if the GC function is called.

OUTPUT(*Identifier*)

...

END_OUTPUT

where:

Identifier Name of OUTPUT method

Variables and Help variables are configured as an NC code in an OUTPUT method. The individual elements in a code line are linked by means of blanks.

```
OUTPUT(CODE1)
  "CYCLE82(" Var1.val "," Var2.val "," Var3.val ","
    Var4.val "," Var5.val "," Var6.val ") "
END_OUTPUT
```

Block numbers and skip identifiers

The OUTPUT block may not contain line numbers and hide markings if you wish to keep the file numbers and hide markings directly set with active program support in the parts program in the case of recompilations.

Editor changes in the parts program produce the following response:

Condition	Procedure
Number of blocks remains unchanged	Block numbers are retained
Number of blocks is reduced	The highest block numbers are canceled
Number of blocks is increased	New blocks are not numbered

Note

The NC code can be generated in an extra file by means of file functions and transferred to the NC. For more information about NC code generation, see Subsection 3.2.6 "File functions".

3.1.1 Version management in conjunction with OUTPUT blocks

Additional variables can be added to existing screen forms when expanding/refining the operator interface. A version identifier in parentheses is appended to the additional variables in the definition following the variable name: (0 = Original, is not written), 1 = Version 1, 2 = Version 2, ...

Example:

DEF var100=(R//1)	;Original, corresponds to Version 0
DEF var101(1)=(S// "Hello")	;Extension with effect from Version 1

When writing the OUTPUT block, you can specify which variables are written, with reference to a particular version identifier.

Example:

OUTPUT(NC1) ;Only the variables of the original are available
;in the OUTPUT block

OUTPUT(NC1,1) ;The variables of the original and the
;extensions with version identifier 1
;are available in the OUTPUT block

The OUTPUT block for the original version does not need a version identifier, however you can specify it with 0. OUTPUT(NC1) is equivalent to OUTPUT(NC1,0). Version identifier **n** in the OUTPUT block includes all variables of the originals 0, 1, 2, ... up to and including **n**.

The read-only window property VERSION allows the configuration to be adapted in order to handle different versions.
(IF VERSION==1 ...)

When the code is recompiled, VERSION is automatically assigned the version of the recompiled code.

The code is automatically generated with the newest version, even if the code was previously recompiled with an older version.

The GC command always generates the newest version. An additional identifier indicating the generated version is inserted in the user comment of the generated code in versions > 0.

- Variables used previously may not be changed.
- New variables are inserted in the existing (cycle) configuration in arbitrary order.
- It is not permissible to delete variables from a screen form from one version to the next.
- The screen form must contain all variables of all versions.

The newest screen form with all its variables is always displayed.

Example configuration with version identifiers:

```
; Version 0 (default)
//M(XXX)
DEF var100=(R//1)
DEF var101=(S//1"Hello")
DEF TMP
```

```
VS8=("GC")
```

```
PRESS(VS8)
  GC("NC1")
END_PRESS
```

```
OUTPUT(NC1)
var100,,"var101
```

END_OUTPUT

; ***** Version 1, extended definition *****

```
//M(XXX)
DEF var100=(R//1)
DEF var101=(S//"Hello")
DEF var102(1)=(V//"HUGO")
DEF TMP
```

VS8=("GC")

```
PRESS(VS8)
  GC("NC1")
END_PRESS
```

...

```
;Original
OUTPUT(NC1)
var100","var101
END_OUTPUT
```

...

; and the new version in addition

```
;Version 1
OUTPUT(NC1,1)
var100","var101"," var102
END_OUTPUT
```

3.1.2 Screen form elements

The diagram illustrates a screen form layout with the following elements and labels:

- Short text:** Labels for status and mode, including "Program 2", "Auto", "Channel RESET", "Program stopped", "Stop: No NC Ready", "DRY", "ROV", "M01", "DRF", "PRT", and "FST".
- Graphics text:** Labels for "Sample : Output of NC-Code" and "incremental position".
- Input/output fields:** A table of parameters:

Gripper pos.	G	0	mm
Cut-off dim.	A	0	mm
Machining pos.	Z	0	mm
Part length	L	0	mm
- Unit text:** Labels for "Change Subprogram" and "Change Operation".
- Display line with long text:** A horizontal bar labeled "Bar gripping and pulling" containing a technical drawing of a part with dimensions A, L, and Z.
- Main body of the form:** The central area containing the technical drawing and the parameter table.
- Form element:** A vertical bar on the right side of the form.
- Buttons:** "Output to editor" and "Exit" at the bottom.

Screen form elements fill lines in the main body of the form. One or several screen form elements can be defined in each line (see also "Multi-column screen forms").

The term "screen form element" refers to the visible part of a variable, i.e. short text, graphics text, input/output field (I/O field) and unit text.

All variables are valid only in the active screen form.
 Properties are assigned to a variable when it is defined:

Defining variables

```

DEF Identifier =
  1 (Variable type
  2 /[limit values or toggle field or table identifier]
  3 /[Default]
  4 /[Texts (Long text, Short text|Display, Graphics text, Units text)]
  5 /[Attributes]
  6 /[Help display]
  7 /[System or user variable]
  8 /[Position of short text]
  9 /[Position I/O field(Left, Top, Width, Height)]
  10 /[Colors]
  11 /[Help]*)
  
```

* MMC103 only

Note

The small figures above "(" and "/" are only an aid to assigning the parameter groups. They are not part of the syntax. The single parameters to be separated by commas are enclosed in round parentheses.

where:

Identifier	Name of variable
Variable type	Variable type:
	R[x] Real (+ digit for the decimal place)
	I Integer
	Also refer below
	"Integer extensions".
	S[x] String (+ digit for string length)
	C Single character
	B Bool
	V Version (See also "Variable type, variant")
	The variable type must be specified.

Limit values	Limit values for variables: Limit value MIN, limit value MAX The limit values are separated by a comma. Limit values can be entered for types I, C and R in decimal format or as characters in the format "A", "F". The Limit Values parameter works in conjunction with the Limit attribute (see Attributes, Limit). Default setting: Empty
or	
Toggle field	Toggle field: List with predefined entries in the I/O field. The list is initiated by a * ; the entries are separated by commas. The entries can be assigned a value (see "Examples"). The entry for the limit value is interpreted as a list for the toggle field. Entering only a * generates a variable toggle field (see "Variable toggle fields"). Default setting: No default
or	
Table identifiers	Identifiers of a table containing NCK/PLC values of the same type, which can be addressed via a channel block. The table identifier is differentiated from limit values or toggle fields by the addition of a % sign in front of it. Other table element (grid) features are described in 3.1.7. The file containing the table description can be specified by adding a comma after the identifier and then inserting the name of the file.
Default	Default setting of the variables If no default has been configured, and if the variable has not been assigned any system or user variables (see system or user variable property), the first element in the toggle field is assigned. If a toggle field has not been defined, then there is no default, i.e. the variable is allocated the "not calculated" state. Default setting: No default See also the "Default" table.
Texts	Texts: Long text, short text, graphics text, unit text where: Long text: Text in the display line Short text: Name of the screen form element Graphics text: Text refers to the terms in the graphics. Unit text: Unit of screen form element (see graphic above). See also Sections 1.4 and 5.1. The sequence is specified. Default setting: Empty

In SW 6 and higher, instead of the short text, a diagram can also be displayed.

Attributes The attributes influence the following properties:

- **Input mode**
- **Access level**
- **Alignment of short text**
- **Font size**
- **Handling the limit values**
- **Variant variable type**

A definition can be made for each component.

Input mode (the representation refers to the complete line):

wr0	I/O field invisible, short text visible
wr1	Read (the line appears grayed-out)
wr2	Read and write (the line appears grayed-out)
wr3	wr1 with focus
wr4	All elements of the variables are invisible, no focus possible
wr5	The value entered is saved immediately whenever the key is pressed (unlike wr2 – here a save is only performed on exiting the field, or when RETURN is pressed).

Default setting: wr2

Input mode on the PCU 20:

	Only relevant for the I/O field
wr4	Only all elements of the variable are affected.

Access level

Empty	Can always be written
ac0...ac7	Protection levels (see Subsection 2.6.2 Defining a softkey)

If the access level is not adequate, then the first line is displayed grayed-out.
Default setting: ac7

Text alignment, short text

al0	left-justified
al1	right-justified
al2	centered

Default setting: al0

Font size

fs1	Default font size (8 pt.)
fs2	Double font size

Default setting: fs1
The clearances between the lines is defined.
For the default font size, 16 lines can fit into the screen form.
Graphics and unit text can only be configured in the default font size.

Handling the limit values

Limit can be used to check whether the value of the variables is within the specified min. and max. limit values.

- li0 No check
- li1 Check with respect to min.
- li2 Check with respect to max.
- li3 Check with respect to min. and max.

Default setting: Determined by specified limit values

The limit values are separated by a commas, the any sequence is possible.

The attributes do not apply to the toggle fields.

Help display	Help display file: File name The name of the Help display file is in double quotation marks. The display appears automatically (replacing the previous graphic) if the cursor is positioned on this variable. See also Subsection 3.1.4 "Displays". Default setting: Empty
System or user	A system or user data on the NC/PLC variable can be assigned to the variable. The system or user variable appears in double quotation marks. See Section 8.3 "List of accessible system variables" and also References /PGA 1/ "Lists of System Variables".
Position of short text	Position of short text (distance from left, distance from top, width) The positions are specified in pixels and are measured from the top left corner of the main body of the screen form. Data is separated by a comma. See also "Positions".
Position of I/O field	Position of I/O field (distance from left, distance top, width, height). The positions are specified in pixels and are measured from the top left corner of the main body of the screen form. Data is separated by a comma. See also "Positions". If this position changes, the positions of the short text, the graphics text and the unit text also change.
Colors	Colors: Foreground color, background color Value range: 1...10 For colors, see Section 8.2 "Color table". The colors are separated by a comma. Default setting: Foreground color: Black Background color: White

The color settings only apply to the I/O field
(colors cannot be specified for other texts).
The default colors of the I/O field are determined by the

Write mode:

Wr0	Foreground and background color: Window background color,
Wr1	Text color: Black, background color for window
Wr2	Text color: Black, background color: White
Wr3	As wr1
Wr4	As wr0
Wr5	As wr2

Help

Only MMC103:
Help: Help file, Index, Help text
where:
Help file: Path specification of the file (PDF format)
Index: Index in the Help text file to the Help text
Help text: Help text for display in the Help text file

Data is separated by a comma, the sequence is fixed.
The Help file and Help text appear in double quotation marks.
Several Help references can be configured in a loop (Help loop) for each screen form element, i.e. the references are called up in succession and when the last reference closes, the first is displayed again.
If reference is made to the same file/index/Help text in a second or subsequent Help call, the entries do not have to be made (see "Examples").
The Help appears when the cursor is positioned on this field and the Help key is pressed.

The PDF files must be located in the
CUS.DIR\hlp.dir or CST.DIR\hlp.dir directory.

Identical PDF and text files must have the same name.
The name of the PDF file must be written in uppercase letters in the txt file.
See also "Help"

Variant variable type

The Variant variable type is determined by the data type of the last value assignment. Its current status can be queried using the ISNUM or ISSTR function.
In **SW 6** and higher, the display mode can be changed for the type property of a variable (see Subsection 3.1.3).

ISNUM (VAR)

where:

VAR

Name of the variable whose data type must be checked
The result of the scan can be:
FALSE = not a numerical variable (data type = String)
TRUE = numerical variable (data type = Real)

or

ISSTR (VAR)

where:

VAR Name of the variable whose data type must be checked

The result of the scan can be:

FALSE = numerical variable (data type = Real)

TRUE = not a numerical variable (data type = String)

The field type "Variant" is mainly suited to write either variable names or numerical values into the NC code.

IF ISNUM(VAR1) == TRUE

IF ISSTR(REG[4]+2) == TRUE

Integer extensions

The following extensions for determining the **display** in the I/O field and the memory utilization are possible for Integer types:

Table 3-1 2nd character in the extension data type

Display format	
B	Binary
D	Decimal with sign
H	Hexadecimal
No specified validity	Decimal with sign

Examples**Example 1:**

Assign properties Variable Type, Texts, Help, Colors:

DEF Var1 = (R///,"Actual value",,"mm"///"Var1.bmp"///8,2)

Variable type: Real

Limit values or toggle field entries: None

Default: None

Texts:

Long text: None

Short text: Actual value

Graphics text: None

Unit text: mm

Attributes: None

Help display: Var1.bmp

System or user variable: None

Position of short text: No data, i.e. a default position

Position I/O field: No data, i.e. default position

Colors:

Foreground color: 8

Background color: 2

Help: None

Example 2:

Assign properties Variable Type, Limit Values, Attributes, Short Text Position:

```
DEF Var2 = (I/0,10///wr1,al1///,300)
```

Variable type:	Integer
Limit values:	MIN: 0; MAX: 10
Default:	None
Texts:	None
Attributes:	
Input mode:	Is read only
Alignment of short text:	Right-justified
Help display:	None
System or user variable:	None
Position of short text:	
Distance from left:	None
Distance from the top:	None, i.e. default distance from the top left
Width:	300
Position I/O field:	No data, i.e. default position
Colors:	No data, i.e. a default setting
Help:	None

Example 3:

Assign properties Variable Type, Default, System or User Variable, I/O Field

Position:

```
DEF Var3 =(R//10//// "$R[1]"//300,10,200//  
"Help.pdf",1,"Help1")
```

Variable type:	String
Limit values or toggle field entries:	None
Default:	10
Texts:	None
Attributes:	None
Help display:	None
System or user variable:	\$R[1] (R-Parameter 1)
Position, short text:	Default position relative to the I/O field
Position of the I/O field:	
Distance from left:	300
Distance from the top:	10
Width:	200
Colors:	No data, i.e. a default setting
Help:	In the Help.pdf file, the Help with the Help text "Help1" is called on the page with index 1 when the Help key is pressed.

Example 4:

Various entries in toggle field:

```
DEF Var1 = (I/* 0,1,2,3)
```

```
DEF Var2 = (S/* "In", "Out")
```

```
DEF Var3 = (B/* 1="In", 0="Out")
```

;1 and 0 are values, "In" and "Out"
;are displayed

```
DEF Var4 = (R/* ARR1)
```

;ARR1 is the name of an array

Example 5:

Several Help calls per form element (MMC 103 only):

```
DEF Var1 = (R/////////"He lp1.pdf", 1, "He lp1",
, 2, "He lp2", "He lp3.pdf", 3, )
```

;1. Entry in the Help loop

Help file: HELP1.PDF

Index: 1

Help text: Help1

2. Entry in the Help loop

Help file: HELP1.PDF

Index: 2

Help text: Help2

3. Entry in the Help loop

Help file: HELP3.PDF

Index: 3

Help text: Help2

Example 6: Displaying an image instead of a short text

```
DEF VAR1(V///,"\\bild1.bmp" ////160,40,50,50)
```

The size and position of the image is defined under *Position I/O field (left, top, width, height)*.

3.1.3 Changing the type of a variable

In **SW 6** and higher, the display mode can be changed for the type property of a variable.

For integer variables this is display type:

B = binary
D = decimal with sign
H = hexadecimal without sign
+ U for unsigned

For Real, only the number of places after the decimal point can be changed. Changing the basic type is illegal and generates an error message in the file error.com.

Table 3-2 3rd and/or 4th character in extension data type

Variable format for default limit values and calculations	
B	Byte
W	Word
D	Double Word
BU	Byte without sign
WU	Word without sign
DU	Double Word without sign

Examples of valid Integer type definitions:

IB Integer variable 32 bits in binary representation
 IBD Integer variable 32 bits in binary representation
 IBW Integer variable 16 bits in binary representation
 IBB Integer variable 8 bits in binary representation
 I Integer variable 32 bits in decimal representation with sign
 IDD Integer variable 32 bits in decimal representation with sign
 IDW Integer variable 16 bits in decimal representation with sign
 IDB Integer variable 8 bits in decimal representation with sign
 IDDU Integer variable 32 bits in decimal representation without sign
 IDWU Integer variable 16 bits in decimal representation without sign
 IDBU Integer variable 8 bits in decimal representation without sign
 IH Integer variable 32 bits in hexadecimal representation
 IHU Integer variable 32 bits in hexadecimal representation
 IHWU Integer variable 16 bits in hexadecimal representation
 IHBU Integer variable 8 bits in hexadecimal representation

Parameterization example:

Var1.typ = "IBW"
 Var2.typ = "R3"

Default

A variable can assume various states depending on whether a default value, or a system or user variable, or both, is assigned to the variable field (I/O field or toggle field).

Table 3-3

If...			Then...
Field type	Default	System or user variable	Reaction of field type
I/O field	Yes	Yes	Write default value to system or user variable
	No	Yes	Use system or user variable as default value
	Error	Yes	Not calculated, system or user variable is not written into/used.
	Yes	No	Default
	No	No	Not calculated
	Error	No	Not calculated
	Yes	Error	Not calculated
	No	Error	Not calculated
	Error	Error	Not calculated
Toggle	Yes	Yes	Write default value to system or user variable
	No	Yes	Use system or user variable as default value
	Error	Yes	Not calculated, system or user variable is not written into/used.
	Yes	No	Default
	No	No	Default = first element of toggle field
	Error	No	Not calculated
	Yes	Error	Not calculated
	No	Error	Not calculated
	Error	Error	Not calculated

Not calculated: Toggling is not possible until a valid value is assigned to the variable

Positions

The short text and graphics text and the I/O field and unit text are each treated like a unit, i.e. position settings for short text apply to the graphic text and settings for the I/O field and to the unit text.

The configured position entry overwrites the default value, i.e. only one value can be changed.

If no position data is configured for following screen form elements, then the position settings for the preceding screen form element are applied.

If no positions have been specified for any element, then default positions are applied. The column width for the short text and I/O field is calculated as standard for each row from the number of columns and maximum row width, i.e.

column width = maximum row width/number of columns.

The width of the graphics and unit text is predefined and optimized to suit the requirements of programming support. If graphics or unit text has been configured, the width of the short text or I/O field is reduced accordingly.

The order of short text and I/O field can be reversed by position settings.

Help

The Help loop for a screen form element can be extended or deleted during runtime. These functions are available **only** with **MMC 103**.

Extending the Help loop:

ADDHTX (*Identifier, Help file, Index, Help text*)

where:

Identifier	Name of the variable whose Help loop will be extended
Help file	Path specification of the file (PDF format)
Index	Index in the Help file to the Help text
Help text	Help text for display in the Help text file

The Help loop can be extended as required by calling the function repeatedly.
ADDHTX(VAR1, "C:\OEM\HLP\MYHLP.PDF", 15, "Machine data")

Deleting the existing Help loop:

CLRHTX (*Identifier*)

where:

Identifier	Name of the variable whose Help loop is to be deleted

CLRHTX(VAR1)

Toggle field extension

The toggle field extension function can be used to display texts (entries in toggle field) as a function of NC/PLC variables. A variable which is programmed with a toggle field extension can only be read.

```

DEF Identifier =
  (Variable type
   /+ $Text number |
    * value= "\display"[,value="\bild2.bmp"][, ...]
   /[Default]
   /[Texts(Long text, Short text, Graphics text, Units text)]
   /[Attributes]
   /[Help display]
   /[System or user variable]
   /[Position of short text]
   /[Position I/O field(Left, Top, Width, Height)]
   /[Colors]
   /[Help])

```

where:

Variable type	Type of variables specified in the system or user variable
Text number	Number (basis) of the language-specific texts valid as the basis number
System or user variable	System or user variable (offset) used to form the final text number (basis + offset)

For explanation of other parameters, see "Defining variables".

```
DEF VAR1=(IB/+ $85000/15////"DB90.DBB5")
```

When the screen form is opened, the contents of text number \$85015 are displayed in the I/O field. Default value 15 is entered in system variable DB90.DBB5. If the value saved in system variable DB90.DBB5 changes, then the displayed text number \$(85000 + <DB90.DBB5>) is recalculated in response to every change.

Variable toggle fields

It is possible to assign a screen form element a variable toggle field. This means that when the toggle key is pressed, the variable is assigned a value configured in one CHANGE method.

A single asterisk symbol * is entered for the Limit Values or Toggle Field property to identify a variable toggle field when a variable is defined.

```
DEF VAR1=(S/*)
```

Displays dependent on toggle field

The toggle field is overlaid with changing graphic. If the flag byte has the value 1, screen 1 is displayed, for value 2, screen 2. The position and size of the screen is given under *Position I/O field (left, top, width, height)*.

```

DEF VAR1=(IDB/*1="\bild1.bmp",
2="\bild2.bmp"/, "$85000"/wr1/"MB[0]"/160,40,50,50)

```

Multi-column screen forms

Several variables can be displayed in the master screen form section.
In this instance, the variables are all defined within one definition line in the configuration file.

```
DEF VAR11 = (S///"Var11"), VAR12 = (I///"Var12")
```

To make individual variables in the configuration file more legible, the definition lines can be wrapped after every variable definition and following comma.
The key word "DEF" always indicates the beginning of a new line.

```
DEF Tnr1=(I//1/"", "T ", ""/wr1///, 10/20,, 50),
  TOP1=(I///, "Type=" /WR2//"$TC_DP1[1,1]" /80,, 30/120,, 50),
  TOP2=(R3///, "L1=" /WR2//"$TC_DP3[1,1]" /170,, 30/210,, 70),
  TOP3=(R3///, "L2=" /WR2//"$TC_DP4[1,1]" /280,, 30/320,, 70),
  TOP4=(R3///, "L3=" /WR2//"$TC_DP5[1,1]" /390,, 30/420,, 70)
DEF Tnr2=(I//2/"", "T ", ""/wr1///, 10/20,, 50),
  TOP21=(I///, "Type=" /WR2//"$TC_DP1[2,1]" /80,, 30/120,, 50),
  TOP22=(R3///, "L1=" /WR2//"$TC_DP3[2,1]" /170,, 30/210,, 70),
  TOP23=(R3///, "L2=" /WR2//"$TC_DP4[2,1]" /280,, 30/320,, 70),
  TOP24=(R3///, "L3=" /WR2//"$TC_DP5[2,1]" /390,, 30/420,, 70)
```

...

Screen form

Parameter 1 JOG MPF0

Channel RESET

Program abortet ROV FST

TOA-List Input tool type

T	1	Typ=	500	L1=	1.000	L2=	2.000	L3=	3.000
T	2	Typ=	220	L1=	4.000	L2=	5.000	L3=	6.000
T	3	Typ=	200	L1=	7.000	L2=	8.000	L3=	9.000
T	4	Typ=	220	L1=	10.000	L2=	11.000	L3=	12.000
T	5	Typ=	200	L1=	13.000	L2=	14.000	L3=	15.000
T	6	Typ=	200	L1=	16.000	L2=	17.000	L3=	18.000
T	7	Typ=	200	L1=	19.000	L2=	20.000	L3=	21.000
T	8	Typ=	200	L1=	22.000	L2=	23.000	L3=	24.000
T	9	Typ=	200	L1=	25.000	L2=	26.000	L3=	27.000
T	10	Typ=	200	L1=	28.000	L2=	29.000	L3=	30.000
T	11	Typ=	200	L1=	31.000	L2=	32.000	L3=	33.000
T	12	Typ=	200	L1=	0.000	L2=	0.000	L3=	0.000
T	13	Typ=	200	L1=	37.000	L2=	38.000	L3=	39.000
T	14	Typ=	200	L1=	40.000	L2=	41.000	L3=	42.000
T	15	Typ=	200	L1=	43.000	L2=	44.000	L3=	45.000
T	16	Typ=	200	L1=	47.000	L2=	48.000	L3=	49.000

T+ EXIT

When designing multi-column forms, consideration should be given to the capability of the hardware used. e.g.:

HT6 max. 4 columns, max. 60 DEF instructions

PCU 20 max. 10 columns, max. 60 DEF instructions

Variable value

The default property of a variable is its value. When a variable is defined, a value is allocated to it in the form of a default setting, a system or user variable or programmed in the methods, as described below.

Identifier.val = *Variable value*

or

Identifier = *Variable value*

where:

Identifier

Name of variable

Variable value

Value of variable

VAR3 = VAR4 + SIN(VAR5)

VAR3.VAL = VAR4 + SIN(VAR5)

Variable status

The "Variable status" property can be scanned during runtime to find out whether a variable has a valid value. This property can be read and written with the FALSE = 0 setting.

Identifier.vld

where:

Identifier

Name of variable

The result of the scan can be:

FALSE = invalid value

TRUE = valid value

IF VAR1.VLD == FALSE

VAR1 = 84

ENDIF

Changing the variable properties

The properties Limit Values, Help Display, System or User Variable, Texts, Attributes, Colors, Help, Variant Variable Type, Variable Value and Variable Status can be changed in the methods during runtime.

Identifier.min = Limit values MIN

Identifier.max = Limit values MAX

Identifier.lt = Long text

Identifier.st = Short text

Identifier.gt = Graphics text

Identifier.ut = Unit text

Identifier.wr = Input mode

Identifier.ac = Access level

Identifier.al = Alignment of form text

Identifier.fs = Font size

Identifier.li = Limit

Identifier.hlp = Help display

Identifier.**var** = System or user variable
 Identifier.**fc** = Foreground color
 Identifier.**bc** = Background color
 Identifier.**htx** = Help file, Index, Help text
 Identifier.**val** = Variable value
 Identifier.**vid** = Variable status

where:

Input mode:	wr	0	Invisible, exception: Short text
		1	Read (the line appears grayed-out)
		2	Read and write (the line appears grayed-out)
		3	wr1 with focus
		4	All elements of the variables are invisible, no focus possible
		5	The value entered is saved immediately whenever the key is pressed (unlike wr2 - here, a save is only performed on exiting the field, or when RETURN is pressed). The text/value entered is saved immediately. Variable remains in the edit mode.

Input mode on the PCU 20:			Only relevant for the I/O field
	wr	4	Only all elements of the variable are affected.

Access level:	ac	Empty	Can always be written
		0...7	Protection levels see Subsection 2.6.2 "Defining a softkey"

Alignment of short text:	al	0	Left-justified
		1	Right-justified
		2	Centered
Font size:	fs	1	Default font size 8 pt., MMC103 8x12 pixels MMC100.2/HT6 The clearances between the rows is fixed. With default font sizes, 16 rows fit into the screen form.
		2	Double font size
Limit:	li	0	None
		1	Min
		2	Max
		3	Min and Max

For explanation of other parameters, see "Defining variables".

```

HS3.st = "New Text"           ;Change softkey label
Var1.wr = 2                   ;Change input mode
Var4.li = 2                   ;Check whether variable value is
                               ;exceeding maximum limit
  
```

The expression on the right of the equals sign is evaluated and assigned to the variable or variable property.

Addressing system variables indirectly

A system variable can also be addressed indirectly, i.e. as a function of another variable.

```
PRESS(HS1)
  AXIS=AXIS+1
  WEG.VAR="$AA_DTBW["<<AXIS<<"]"
  ;Address axis address via
  variable
END_PRESS
```

Help variables

Help variables are internal arithmetic variables.

Arithmetic variables are defined like other variables, but have no other properties apart from variable value and status, i.e. Help variables are not visible in the screen form. Help variables are of the Variant type.

DEF Identifier

where:

Identifier	Name of Help variables
DEF OTTO	;Definition of a Help variable

A value is assigned to a Help variable in a method.

Identifier.val = Help variable value

or

Identifier = Help variable value

where:

Identifier	Name of the Help variables
Help variable value	Contents of the Help variables

```
LOAD
  OTTO = "Test"           ;Assign Help variable Otto the value "Test"
END_LOAD
LOAD
  OTTO = REG[9].VAL       ;Assign value of register to
                          ;Help variable
END_LOAD
```

The **Status** property can be used to scan the Help variable to find out whether its value is valid. Status is a read only property.

Identifier.vld

where:

Identifier	Name of Help variables

The result of the scan can be:

FALSE = invalid value

TRUE = valid value

```
IF OTTO.VLD == FALSE
```

```
  OTTO = 84
```

```
ENDIF
```

Calculation with variables

Variables are calculated every time you exit an I/O field (using ENTER or TOGGLE key). The calculation is configured in a CHANGE method that is processed every time the value changes.

The variable status (see Variable status) can be used to scan a variable to find out whether its value is valid or not.

```
Var1 = Var5 + SIN(Var2)
Otto = PI * Var4
```


3.1.4 Displays

There are two display categories:

- Displays/graphics in the graphic area in accordance with the display in Section 2.4 "Defining a screen"
- Help displays illustrating, for example, individual variables which are superimposed in the graphic area.
- More Help displays can be configured instead of blocks of text or input/output fields, which you position where you like.

Displays

Maximum size:	560 * 326 pixels	(MMC 100.2 and MMC 103)
	312 * 139 pixels	(HT6)
	688 * 376 pixels	(PCU20 and PCU50 with OP012)

Creating displays on MMC100.2/HT6

To configure displays, please proceed as follows:

- Create the displays using, for example, the Windows 95 Paint application.
- Convert the displays into PCX format with 16 colors (e.g. with PaintShopPro).
- Convert the PCX file where the supplied program **pcxconv.exe** is executed.

The program has the following parameters:

PCXCONV Xpos Ypos Width Height PCXfile attrib colTab

Explanation of parameters:

The parameters Xpos, Ypos, Width, Height define the display section to be converted from the generated display.

I.a. Start with 0 0, that is, in the upper left corner.

Xpos	X-position in pixels (must be an integer multiple of 8)
Ypos	Y-position in pixels
Width	Width in pixels (max. 640) (must be an integer multiple of 8)
Height	Height in pixels (max. 480)
PCXfile	Name of the PCX files (wildcards can be used)
attrib	0 --> 10k-binary files, 1 --> 26k-binary files, 2 --> original size (here, always enter 2; the other options are reserved for internal Siemens purposes)
colTab	Color-Table: standard --> use the color table from the MMC100 standard system cmm --> use the color table for ShopMill

Example: PCXCONV 0 0 80 36 help 2 standard

We recommend generating a batch file that calls PCXCONV in order to convert all of the PCX files into the requested size.

The conversion program BMP2BIN (on the application floppy disk) should be used with software version 6.2 and higher. It supports 256 colors and faster display building.

This application converts BMP bitmaps to an optimized format of the HMI Embedded.

The program has the following parameters:

BMP2BIN BMPfile colTab

Explanation of parameters:

BMPfile	Name of the BMP file (wildcards can be used)
colTab	Name of the color file with color conversion table. This file can be used to assign a color of a BMP pixel to a color in HMI Embedded. However, this is only possible for 16-color bitmaps. For 256 color bitmaps, a color file cannot be transferred. Structure of the color file (example): [BMP] ;BMP color HMI color 1 3 2 2 ... The separator is at least one blank

Please proceed according to the instructions in Subsection 7.2.3 "Procedure with MMC 100.2, HT6".

The described procedure for conversion and archiving is applicable for all displays in the MMC 100.2/HT6.

With MMC 100/WIN32, partial binary or BMP files (packed or compressed) can be processed. MMC 100.2 can process packed or unpacked BMP files. The colors are converted online. For this the files containing the color table (syscol.col, sysbw.col,...) have been extended to include Section [BMP]. This section allocates a color of a BMP pixel to a color of an MMC.

Screens without conversion

With SW 5.3 and higher you can link bit maps into the screens configured with "Expanding the Operator Interface" without first converting them.

It is in fact possible to introduce unconverted images, but we urgently recommend you to convert the BMP images offline using the BMP2BIN application (see further above, application floppy disk), since output is speeded up considerably by doing so.

Preconditions

The screens must have previously been stored in 16-color mode.

Bitmaps with 256 colors are supported in software version 6.2. and higher. You will find the corresponding color table in Section 8.2. "Color table"

Storage locations

The following storage locations are possible (SW 5.3):

- Bitmap unpacked on Flash (WIN32 (MMC103, HMI) unpacked on hard disk)
- In each case one bitmap packed in xxx.bm_, where xxx.bm_ contains file xxx.bmp

As of SW 6:

- Bitmap packed in CST.ARJ (for standard cycle images)
- Bitmap packed in CUS.ARJ (for customer cycle images)
- Bitmap packed in CMA.ARJ (for manufacturer cycle images)

Procedure

Procedure when integrating the bitmaps (customer displays):

Integration on an MMC100.2 / System WIN32:

- Generate the BMP file using Microsoft Paint, Version 4.0 or higher
- Archive the BMP file using the arj.exe supplied (Version 2.41) into the archive CUS.ARJ or alternatively each BMP file in a separate archive with the file name of the BMP file and extension .BM_

Examples:

Alternative 1: Several files per archive:

```
arj a cus.arj my_file1.bmp my_file2.bmp my_file3.bmp my_file4.bmp
```

Alternative 2: One file per archive:

```
arj a my_file1.bm_ my_file1.bmp
```

Limit

Archiving is optional. However you must ensure that the sum of customer screens does not exceed 128KB for the MMC 100.2 hardware.

Archiving individual files (.bm_) has runtime advantages over archiving in a large archive (cus.arj) if you have a large number of customer screens.

If you are working in a WIN32 environment we recommend that you DO NOT archive the BMP files but store them directly in the BIN directory. This therefore eliminates the runtime when extracting.

Add the archive cus.arj, or the individual archive .bm_ using the MMC100.2 application environment (menu item ADD FILES)

This point no longer applies in the WIN32 environment.

Further, from SW 5.3, it is possible to assign any softkey a bitmap by starting the softkey text with 2 backslashes. The text behind the backslashes is then interpreted as the name of the file that contains the bitmap.

e.g. in ALUC.TXT 85000 0 0 "\\mybitmap.bmp"

Notice !

From SW 6.2 onwards, the widths of the bitmaps (No. of pixels) can be specified with any number. There is no longer any requirement for it to be possible to divide them by 8.

Note

The display colors might be shown differently on the MMC 100.2/HT6 than in PaintShopPro. For more information about handling (e.g. search strategies in general and search sequence for displays), see Chapter 7, Chapter 8 "Color table".

Creating displays on the MMC 103

Graphics/displays and Help images can have the following format:

- Bitmap (BMP),
- Metafile (WMF) or
- Icon (ICO).

Graphic programs can be freely selected provided that they are capable of creating the prescribed formats.

Displays must be saved in one of the following **directories**:

\\DH\CUS.DIR\HLP.DIR (User cycles directory)
\\DH\COM.DIR\HLP.DIR (Comments directory)
\\DH\CST.DIR\HLP.DIR (Standard cycles directory)
\\DH\CMA.DIR\HLP.DIR (Manufacturer directory)

3.1.5 Display in display

You can insert further screens in the background (Help screen). Even as a function of the values of the variables.

Like for softkeys you can assign a graphics file to a display field. The height of the displayed graphic (of the I/O field) is specified as the fourth parameter of the positions.

You can define bitmaps in fields (short text, I/O field).

The definition is made with the notation used in "Defining variables" (see Subsection 3.1.2 Screen form elements).

Example:

Short text field is overlaid with graphics

```
DEF VAR1=(S///,"\\bild1.bmp" ////160,40,50,50) ; Type S irrelevant
```

Toggle field overlaid with graphics, the graphic being selected with a PLC flag byte.

```
DEF VAR1=(IDB/*1="\\bild1.bmp",  
2="\\bild2.bmp"//,"$85000"/wr1//""MB[0]"/160,40,50,50)
```

3.1.6 Arrays

Arrays are tables in which data can be stored.
Arrays can be one- or two-dimensional. A one-dimensional array is treated like a two-dimensional array with just one row or column.

Definition

Arrays have start identifier `//A` and end identifier `//END`. The number of rows and columns is optional. An array is structured in the following way:

```
//A(Identifier)
(a/b...)
(c/d...)
...
```

`//END`

where:

Identifier	Name of array
a, b, c, d	Values of array

Note

Values of the String type must be enclosed in quotation marks.

```
//A(Thread)
; Size / Pitch / Core diameter
(0.3 / 0.075 / 0.202)
(0.4 / 0.1   / 0.270)
(0.5 / 0.125 / 0.338)
(0.6 / 0.15  / 0.406)
(0.8 / 0.2   / 0.540)
(1.0 / 0.25  / 0.676)
(1.2 / 0.25  / 0.676)
(1.4 / 0.3   / 1.010)
(1.7 / 0.35  / 1.246)
//END
```

Load

The LA (Load Array) function can be used to load an array from another file.

LA(Identifier [, File])

where:

Identifier	Name of array to be loaded
File	File in which the array is defined

Note

If an array in the current configuration file must be replaced by an array from another configuration file, then both arrays must have the same name.

Extract from file maske.com:

```
DEF Var2 = (S/*ARR5/"Out"/,"Toggle field")
PRESS(HS5)
  LA("ARR5","arrayext.com")      ;Load array ARR5 from file
  arrayext.com
  VAR2 = ARR5[0]                  ;"Above"/"Below"/"Right"/"Left"
                                   ;appears in the toggle field of VAR2
                                   ;instead of "Out/In"

END_PRESS
//A(ARR5)
("Out"/"In")
//END
```

Extract from file arrayext.com:

```
//A(ARR5)
("Top"/"Bottom"/"Right"/"Left")
//END
```

Note

Please note that a valid value must be assigned to a variable after the LA function has been used to assign another array to the toggle field of the variable.

Access

The value of an array access operation can be transferred with property **Value** (*identifier.val*).

Access to one-dimensional array with only one column:

Identifier [Z,[M[,C]]] or *Identifier* [Z,[M[,C]]].val

Access to one-dimensional array with only one row:

Identifier [S,[M[,C]]] or *Identifier* [S,[M[,C]]].val

Access to two-dimensional array:

Identifier [Z,S,[M[,C]]] or *Identifier* [Z,S,[M[,C]]].val

where:

Identifier	Name of array
Z	Row value (row index or search term)
S	Column value (column index or search term)
M	Access mode
	0 = Direct
	1 = searches the row, column directly
	2 = row direct, search the column
	3 = searching
	4 = searches the row index
	5 = searches the column index
C	Compare mode
	0 = Search term must be located in value range of row or column
	1 = Search term must be located exactly

VAR1 = MET_G[REG[3], 1, 0].VAL
;Assign Var1 a value from array MET_G

The row index (row number of the array) or column index (column number of the array) each start at 0.

If a row index or column index points to outside the array, the value 0 or a blank string is output and error variable ERR set to TRUE.

Error variable ERR is also set to TRUE if a search key cannot be found.

"Direct" access mode

With "Direct" access mode ($M = 0$), the array is accessed with the row index in Z and the column index in S. Compare mode C is not evaluated.

"Search" access mode

In the case of access mode $M = 1, 2$ or 3 , the search always commences in row 0 or column 0.

Compare mode

When compare mode $C = 0$ is used, the contents of the search row or search column must be sorted in ascending sequence. If the search key is smaller than the first element or greater than the last, a value of 0 or blank string is output and error variable ERR is set to TRUE.

When compare mode $C = 1$ is used, the search key must be present in the search row or search column. If the key cannot be found, a value of 0 or a blank string is output and error variable ERR is set to TRUE.

Access mode

Table 3-4

Mode M	Row value Z	Column value S	Output value
0	Row index	Column index	Value from row Z and column S
1	Search key, search in column 0	Column index of column from which value is read	Value from row found and column S
2	Row index of row from which return value is read	Search key, search in row 0	Value from row Z and column found
3	Search key, search in column 0	Search key, search in row 0	Value from row and column found
4	Search key, search in column S	Column index of search column	Row index
5	Row index of search row	Search key, search in row Z	Column index

Example

Two arrays are defined below. These are the basis for the following examples.

```
//A(Thread)
(0.3 / 0.075 / 0.202)
(0.4 / 0.1   / 0.270)
(0.5 / 0.125 / 0.338)
(0.6 / 0.15  / 0.406)
(0.8 / 0.2   / 0.540)
(1.0 / 0.25  / 0.676)
(1.2 / 0.25  / 0.676)
(1.4 / 0.3   / 1.010)
(1.7 / 0.35  / 1.246)
//END
```

```
//A(Array2)
( "DES"  "PTCH" / "CDM" )
/
( 0.3 / 0.075 / 0.202 )
( 0.4 / 0.1 / 0.270 )
( 0.5 / 0.125 / 0.338 )
( 0.6 / 0.15 / 0.406 )
( 0.8 / 0.2 / 0.540 )
( 1.0 / 0.25 / 0.676 )
( 1.2 / 0.25 / 0.676 )
( 1.4 / 0.3 / 1.010 )
( 1.7 / 0.35 / 1.246 )
//END
```

Example Access mode 1:

The search key is in Z. This key is always sought in column 0. The value from column S is output with the row index of the search key found.

VAR1 = Thread[0.5,1,1] ;The value of VAR1 is 0.125

Explanation: Search for value 0.5 in column 0 of "Thread" array and output the value found in column 1 of the same row.

Example Access mode 2:

The search key is in S. This key is always sought in row 0. The value from row Z is output with the column index of the search key found.

VAR1 = ARRAY2 [3, "PTCH", 2] ;The value of VAR1 is 0.125

Explanation: Search for column containing "PTCH" in row 0 of array "Array2". Output the value from the column found and the row with index 3.

Example Access mode 3:

A search key is in each of Z and S. The row index is sought in column 0 with the key in Z and the column index in row 0 with the key in S. The value from the array is output with the row index and column index found.

VAR1 = ARRAY2 [0.6 "PTCH", 3] ;The value of VAR1 is 0.15

Explanation: Search for the row with the contents 0.6 in column 0 of array "Array2", search for the column with the contents "STG" in row 0. Transfer the value from the row and column found to VAR1.

Example Access mode 4:

The search key is in Z. S contains the column index of the column in which key is being sought. The row index of the key found is output.

```
VAR1 = Thread[0.125, 1, 4]           ;The value of VAR1 is 2
```

Explanation: Search for value 0.125 in column 1 of array "Thread" and transfer the row index of the value found to VAR1.

Example Access mode 5:

Z contains the row index of row in which key is being sought. The search key is in S. The column index of the search key found is output.

```
VAR1 = Thread[4, 0.2, 5, 1]         ;The value of VAR1 is 1
```

Explanation: Search in row 4 of the "Thread" array for the value 0.2 and transfer the column index of the value found to VAR1. Comparison mode 1 was selected because the values of row 4 are not sorted in an increasing sequence.

Array status

The Status property can be used to scan a configuration file to find out whether an array access operation is supplying a valid value. Status is a read only property.

Identifier [Z, S, [M[,C]]].vld

where:

Identifier Name of array

The result of the scan can be:

FALSE = invalid value

TRUE = valid value

```
DEF MPIT = (R///"MPIT",, "MPIT", ""/wr3)
DEF PIT  = (R///"PIT",, "PIT", ""/wr3)
PRESS(VS1)
  MPIT = 0.6
  IF MET_G[MPIT, 0, 4, 1].VLD == TRUE
    PIT  = MET_G[MPIT, 1, 0].VAL
    REG[4] = PIT
    REG[1] = "OK"
  ELSE
    REG[1] = "ERROR"
  ENDIF
END_PRESS
```

3.1.7 Table element (grid)

Contrary to the array, that displays status data saved in cables which can then be selected, the values of a table element (grid) are continually updated. This involves a tabular representation of values of system variables that can be addressed using **one** block in **one** channel.

Assignment

The table element definition is assigned to a variable definition via a table identifier in accordance with Subsection 3.1.2 "Screen form elements".

The variable definition determines the values to be displayed and the table element definition determines the appearance and the assignment in the screen window.

The grid uses the I/O field-specific properties from the variable definition line.

Screen window

The visible area of the grid is determined by the width and height of the I/O field.

Any rows or columns than cannot be seen can be displayed by scrolling horizontally and vertically.

Table description

The variable description will contain a reference to a table description:

```
DEF Identifier =  
1  
  (Variable type  
2  
  /[limit values or toggle field or table identifier]  
3  
  /[Default]  
4  
  /[Texts (Long text, Short text|Display, Graphics text, Units text)]  
5  
  /[Attributes]  
6  
  /[Help display]  
7  
  /[System or user variable]  
....
```

The other parameters correspond to those described in Subsection 3.1.2 "Screen form elements".

Note

The small figures above "(" and "/" are only intended to enhance legibility.

Table identifiers

Identifiers of a table containing NCK/PLC values of the same type, which can be addressed via a channel block. The table identifier is differentiated from limit values or toggle fields by the addition of a % sign in front of it. The file containing the table description can be specified by adding a comma after the identifier and then inserting the name of the file.

System or user variable

The parameter remains empty for grid, because the column definition lines contain detailed information about the variables to be displayed (see below).

The table description can be provided in a dynamic format.

Load Grid

LG (identifier, table identifier [,file name])

The identifier is the variable identifier to which the table identifier is to be assigned. The file name can be inserted at this point. It identifies the file in which the table description (table block) is stored.

Content of the table block

The table block comprises:

1. A header description
2. 1 to n column descriptions

Header

//G(Table identifier/Table type/Number of rows/[Fixed row attribute], [Fixed column attribute])

Table identifier:

The table identifier is used without a leading % sign. It can only be used once in each screen form.

Table type:

0 (default value)	Standard table for PLC or user data (NCK and channel-specific data)
1	(and others, reserved)

No. of rows:

Number of rows including header

Fixed row attribute:

1	Active
0	Not active

Fixed column attribute:

0	Active
1	Not active

The fixed row or fixed column is not scrolled.

The number of columns is the number of columns configured.

Column definitions

Column definition row:

(type/limit values/empty/long text, column header/attributes/help image/system or OPI variable/column width/offset1, offset2, offset3)

Type	Data type of the values in the column
Limit values	Limit values for variables: Limit value MIN, limit value MAX The limit values are separated by a comma. Limit values can be entered for types I, C and R in decimal format or as characters in the format "A", "F". The Limit Values parameter works in conjunction with the Limit attribute (see Attributes, Limit li). Default setting: Empty

Long text, column header

Attributes	See Subsection 3.1.2 "Screen form elements"
Help display	See Subsection 3.1.2 "Screen form elements"

System or OPI variables

The variables should be PLC or NC variables.

The system or user variable is in double quotation marks
See Section 8.3 "List of accessible system variables" and also References /PGA 1/ "Lists of System Variables". Indexed variables are usually used for table elements. The increments to be used to accumulate each index in order to fill the column are specified in the assigned offset parameter.

Column width	Column width in pixels

Offset1	Step width for the 1st index
Offset2	Step width for the 2nd index
Offset3	Step width for the 3rd index

For PLC or NC variables, the index number is of significance with one or several indices. Only those variables with index are sensibly represented as grid.

Modifying column properties

The column properties which can be modified dynamically (written) are:

Limit values	(min,max),
Column header	(st),
Attributes	(wr, ac and li),
Help display	(hlp) and
OPI variable	(var).

Column properties are modified via the variable identifier in the definition list or via the column index (starting at 1).

Example:

```
Var1[1].st="Column 1"
```

Column properties cannot be read in the Load block.

The wr, ac and li attributes can be specified for column definitions.

See Subsection 3.1.2 "Screen form elements"

Column header from text file

The column header can be entered as text or text numbers (\$8xxxx) and is not scrolled.

String variable

If the variable is a string type variable, the string length must be specified in Type.

Example for a user variable:

```
DEF CHAN string [16] TEXT[41]
```

The column definition for the CHAN variable therefore starts e.g. (S16/...

Processing the values

The values displayed in a grid can be modified directly by the end user within the restrictions of the rights granted by the attributes and within any limits defined.

The next three examples show the assignment between cells and PLC variables in a standard table (table type=0).

The first row shows the column headers.

Example 1:

```
//G(MB_TAB/0/4,1)
(I///,"MB 1 to MB 3"///"MB1"/100/1)
(I///,"MB 4 to MB 6"///"MB4"/100/1)
```

MB 1 to MB 3	MB 4 to MB 6
Value(MB1)	Value(MB4)
Value(MB2)	Value(MB5)
Value(MB3)	Value(MB6)

Example 2 with offset > 1 in the column definition:

```
//G(MB_TAB/0/4/,1)
(I///," MB1, MB3, MB5"///"MB1"/100/2)
(I///," MB2, MB4, MB6"/// "MB2"/100/2)
Rows and columns are assigned as follows:
```

MB1, MB3, MB5	MB2, MB4, MB6
Value(MB1)	Value(MB2)
Value(MB3)	Value(MB4)
Value(MB5)	Value(MB6)

In each row, the index of the variable was increased by the offset (=2).

Example 3 with offset and index number in the column definition:

```
//G(MB_TAB/0/4/,1)
(IB///,"M1.1, M2.1, M3.1"/// "M1.1"/100/1)
(IB///,"M1.1, M2.1, M3.1"/// "M1.1"/100/0.1)
```

M1.1, M2.1, M3.1	M1.1, M1.2, M1.3
Value(M1.1)	Value(M1.1)
Value(M2.1)	Value(M1.2)
Value(M3.1)	Value(M1.3)

In the first column, the first variable index for each row was increased by 1.

(Offset1 = 1)

In the second column, the second variable index for each row was increased by 1.

(Offset2 = 1)

Other system variables

- Ascending numbers can be entered in the first column.

Example: (I///,"Rows"///"0"/60/1)

- Consecutive texts from the language files can be entered in the first column.

Example: (S///,"Rows"///"\$80000"/60/1)

Focus control in the grid

The Row and Col properties can be used to set and calculate the focus within a table.

Syntax **Row** and **Col** properties:

Identifier.Row
Identifier.Col

Row properties:

Each cell in a table has the Val and VId properties.

In order to read and write cell properties, a row and column index must be specified in addition to the variable identifiers from the definition list.

Syntax **Val** properties:

Identifier[row index, column index].Val or identifier [row index, column index]

Syntax **VId** properties:

Identifier[row index, column index]. VId

Example:

Var1[2,3].val=1.203

If a row or column index is not specified, the indices of the focused cell apply.

Example:

Var1[2,3].val=1.203

Is equivalent to:

Var1.Row =2

Var1.Col=3

Var1.val=1.203

3.2 Functions

A variety of functions are available in screen forms and screen-form-dependent softkey menus. These can be activated by specific events (exit input field, actuate softkey) and configured in methods.

3.2.1 Displaying another screen form or softkey

LM function

The LM function can be used to load another screen form.

LM("Identifier","File" [,MSx [, VARx]])

where:

Identifier	Name of the screen form to be loaded
File	Path name (MMC file system or NC file system) of configuration file Default setting: Current configuration file
MSx	Screen form change mode
0:	The current screen form is removed, the new screen form is loaded and displayed. On EXIT (see EXIT function) you revert to the standard application. Parameter MSx can be set to determine whether or not the current screen form is terminated when a screen form is changed. If the current screen form is retained, variables may be transferred to the new screen form. A screen form, which calls another screen form but remains open when the second screen form is displayed is known as a master screen form. A screen form called from a master screen form is known as a sub-screen form. The advantage of the MSx parameter is that when screen forms are replaced, they do not have to be reinitialized every time because the data and layout of the current screen form are retained and data transfer is facilitated.
1:	The current screen form (master screen form) is interrupted when the LM function is activated, the new screen form (sub-screen form) is loaded and displayed. On EXIT, the sub-screen form is terminated and the program reverts to the interruption point of the master screen form. The UNLOAD block is not processed in the master screen form on interruption. Default setting: 0
VARx	List of variables that can be transferred from the master screen form to the sub-screen form. Requirement: MS1 Up to 20 variables, each separated by a comma, can be transferred.

Note

Parameter VARx transfers only the value of the variable in each case, i.e. variables can be read and written in the sub-screen form, but are not visible in it. Variables can be returned from the sub-screen form to the master screen form by means of the EXIT function.

```

PRESS(HS1)
  LM("MASKE2", "C:\CFI\CFI.COM", 1, POSX, POSY,
    DIAMETER)
    ;Interrupt screen form1 and open screen form2. At the same
    ;time, transfer variables POSX, POSY and DIAMETER.
  DLGL("Form2 ended")
    ;On return from screen form2, the following text appears in the
    ;dialog line of screen form1: Screen form2 ended.
END_PRESS

```

LS function

The LS function can be used to display another softkey menu.

LS("Identifier"[, "File"][, Merge])

where:

Identifier	Name of softkey menu
File	Path name (MMC file system or NC file system) of configuration file Default setting: Actual configuration file
Merge	0: All currently displayed softkeys are deleted - the newly configured softkeys are entered 1: Merge, i.e. only newly configured softkeys overwrite existing softkeys, other softkeys remain unchanged and retain their function and text Default setting: 1

Note

Even MMC, ShopMill or ManualTurn standard softkeys can be retained with their existing functionality.

```

Default setting: 0
PRESS(HS4)
  LS("Menu2", , 0) ;Menu2 overwrites existing menu,
                  ;all existing softkeys are deleted
END_PRESS

```

Note

As long as the interpreter has not displayed a screen form, i.e. no LM function has yet been processed, only one LS or one LM command, but no other action, can be configured in the PRESS methods of the definition blocks for the start softkey and softkey menus.

Note

The LS and LM functions may only be called within a softkey PRESS block and will not react if navigation keys are pressed (PU, PD, SL, SR, SU,SD)

EXIT function

The EXIT function is used to search for master forms.
If it finds a master screen form, the currently displayed form is closed and you return to the master screen form. If no master screen form is found, you exit from the newly configured operator interfaces and return to the standard application.

EXIT
PRESS(HS1)
EXIT
END_PRESS

If the current screen form has been called as a sub-screen form with transfer variables, the variables in the sub-screen form can be changed and transferred back to the master screen form.

EXIT[(VARx)]

where:

VARx List of variables or variable values which are transferred from the sub-screen form to the master form.
The variable contents/values are assigned to the variables transferred to the sub-screen form the master screen form via the LM function.
Up to 20 variables/variable values, each separated by a comma, can be transferred.

Note

The sequence of variables/variable values must be the same as the sequence of transfer values programmed for the LM function to preclude assignment errors. Any unspecified variable values will not be changed when the transfer is made. The modified transfer variables are immediately valid in the master screen form on execution of the LM function.

```
//M(Form1)
...
PRESS(HS1)
  LM("Form2","C:\CFI\CFI.COM",1, POSX, POSY,
    DIAMETER)
    ;Interrupt screen form1 and open screen form2. At the same
    ;time, transfer variables POSX, POSY and DIAMETER.
  DLGL("Form2 ended")
    ;On return from screen form2, the following text appears in the
    ;dialog line of screen form1: Screen form2 ended.
END_PRESS
...
//END
```

```
//M(Form2)
...
PRESS(HS1)
  EXIT(5, , CALCULATED_DIAMETER)
      ;Exit screen form2 and return to screen form1 in the row after
      ;LM. At the same time, assign value 5 to variable
      ;Assign the value of the CALCULATED_DIAMETER variables to the
      ;DIAMETER variables. The variable POSY retains its current value.
END_PRESS
...
//END
```

EXITLS function

You can use the EXITLS function to exit the current operator interfaces and load a defined softkey menu.

EXITLS("Softkey menu"[, "Path name"][, Action])

where:

Softkey menu	Name of the softkey menu to be loaded
Path name	Directory path of the softkey menu to be loaded
Action	Instruction to a softkey of the new menu (function is still not available in SW 5.2)

```
PRESS(HS1)
  EXITLS( "Bar1", "COM.DIR\AEDITOR.COM" )
END_PRESS
```

EXE function

The EXE function can be used on the MMC 103 to call a program created as an application with the OEM package of the MMC 103 or to start the Free Contour Programming application.

On the MMC 100.2, EXE can only be used to start the Free Contour Programming application.

EXE (Program name) ; MMC 103 or

EXE (GPROC) ; MMC 100.2

where:

Program name	Name of the program that is to be executed

Note

The EXE function GPROC is only available within the parts program editor.

Note (MMC103)

In order to start EXE, the task index of the EXE function must be entered under [CHILDS] in the application INI file as it is stored in the REGIE.INI file (see OEM documentation).

```
PRESS(VS3)
    EXE(GPROC)          ;Start GPROC.EXE (free
                        ;contour programming)
END_PRESS
```

3.2.2 Read/write PLC/NC variable, MD

The **RNP** (Read **NC** PLC)/**WNP** (Write **NC** PLC) commands can be used to read and write NC or PLC variables.
Each time a WNP or RNP function is processed, NC/PLC variables are re-accessed. This means that an NC/PLC access is always executed in a CHANGE method. It is advisable to use this option in cases where a system or user variable changes value frequently. If an NC/PLC variable is to be accessed only once, then it must be configured in a LOAD or UNLOAD method.

Read

RNP ("*System or user variable*")

where:

System or user variable	Name of NC or PLC variable
VAR2=RNP("\$AA_IN[2]")	;Read NC variable

Write

WNP ("*System or user variable*", *value*)

where:

System or user variable	Name of NC or PLC variable
Value	Value that should be written into the system or user variable. If the value is a String type, it must be enclosed in quotation marks.

```
WNP("DB20.DBB1", 1)          ;Write PLC variable
```

NC variable

All machine data, setting data and R parameters are available, but only certain system variables. A list of all accessible system variables can be found in Section 8.3 or on the MMC 103 under Operating area **Parameters/System variables/Edit view/Insert variable**.

All global and channel-specific user variables (GUDs) can be accessed but local and program-global user variables cannot be processed.

Note

User variables may not have the same names as system or PLC variables.

Table 3-5

Machine data	
Global machine data	\$MN_...
Axis-specific machine data	\$MA_...
Channel-specific machine data	\$MC_...

Table 3-6

Setting data	
Global setting data	\$SN_...
Axis-specific setting data	\$SA_...
Channel-specific setting data	\$SC_...

Table 3-7

System variables	
R parameter 1	\$R[1]

Tool offset data can only be set up by means of PI Service commands (`_N_CRCDN`, `_N_CREACE`, `_N_CREATO`).

New values for settable zero offsets must be activated with command `_N_SETUFR`.

PLC variable

All PLC data are available.

Table 3-8

PLC data	
Byte y bit z of data block x	DBx.DBXy.z
Byte y of data block x	DBx.DBBy
Word y of data block x	DBx.DBWy
Double word y v. of data block x	DBx.DBDy
Real y of data block x	DBx.DBRy
Flag byte x bit y	Mx.y
Flag byte x	MBx
Flag word x	MWx
Flag double word x	MDx
Input byte x bit y	Ix.y or Ex.y
Input byte x	IBx or EBx
Input word x	IWx or EWx
Input double word x	IDx or EDx
Output byte x bit y	Qx.y or Ax.y
Output byte x	QBx or ABx
Output word x	QWx or AWx
Output double word x	QDx or ADx
String y with length z from data block x	DBx.DBSy.z (available from SW 5.3)

Read several variables with one command

From SW 6.1 command MRNP is available.

This command can be used to transfer several system or OPI variables in a single register access, see 3.4 General screen form variable transfer. This access method is significantly faster than reading via individual access attempts.

The system or OPI variables must be included on a command of the same area.

The areas of the system or OPI variables are organized as follows:

- General NC data (\$MN..., \$SN..., /nck/...)

- Channel-spec. NC data (\$MC..., \$SC..., /channel/...)

- PLC data (DB..., MB..., /plc/...)

- Axis-spec. NC data of the same axis (\$MA..., \$SA...)

Structure of the command:

MRNP(Variable name1*Variable name2[* ...], Register index)

In the variable names, "*" is the separator. The values are transferred to register REG[Register index] and those following in the order that the variable names appear in the command.

The following therefore applies:

The value of the first variable is located in REG[Register index]

The value of the second variable is located in REG[Register index + 1], etc., see General screen form variables, "Register" section.

Notice

Please note that the list of variables must not contain more than 500 rows and not exceed the value for registers in Section 3.4 General screen form variables.

Example:

```
MRNP("$R[0]*$R[1]*$R[2]*$R[3]",1)
```

In the previous example, REG[1] to REG[4] are described with the value of variables \$R[0] to \$R[3].

Reading display machine data

Display machine data can be read with RNP (\$MM...) within the LOAD block.

General read/write access to display machine data is not possible using the extend operator interface function.

3.2.3 General functions

Check variables (CVAR)

Using the function CVAR (CheckVariable) it is possible to interrogate as to whether all or only certain variables or Help variables of a screen form are error-free.

A variable is error-free if the state of the variable identifier.vld = 1 (see Subsection 3.1.2 "Screen form elements").

Check all variables for valid contents:

CVAR

Check specific variables for valid contents:

CVAR(VarN)

where:

VarN List of variables to be checked. A total of 29 variables, separated by commas, can be checked. The maximum character length of 500 must not be exceeded.

The result of the scan can be:

1 = TRUE (all variables have valid contents)

0 = FALSE (at least one variable has invalid contents)

It may be useful to check if variables contain a valid value before an NC code with the GC function.

```
IF CVAR == TRUE           ;Check all variables
    VS8.SE = 1             ;If all variables are correct, softkey VS8
                           ;will be visible
ELSE
    VS8.SE = 2             ;If one variable contains
                           ;an invalid value, softkey VS8
                           ;cannot be used
ENDIF

IF CVAR("VAR1", "VAR2") == TRUE
    ;Check variables VAR1 and VAR2
    DLGL ("VAR1 and VAR2 are OK")
    ;If the contents of VAR1 and VAR2 are correct,
    ;"VAR1 and VAR2 are OK" appears in the dialog line
    ;(see DLGL function)
ELSE
    DLGL ("VAR1 and VAR2 are not OK")
    ;If the contents of VAR1 and VAR2 are incorrect,
    ;"VAR1 and VAR2 are not OK" appears in the
    ;dialog line (see DLGL function)
ENDIF
```

Dialog line (DLGL)

It is possible to configure short texts (messages or input tips) for output in the dialog line in response to certain situations.

If default font size is selected:

For MMC 100.2	Appr. 50 characters in the dialog line
For MMC 103	Appr. 100 characters in the dialog line
For HT6	Appr. 48 characters in the dialog line

DLGL ("String")

where:

String Text which is displayed in the dialog line
(notated according to 1.4)

```
IF Var1 > Var2
    DLGL("Value too high!") ;The text "Value too high!" appears
                                ;in the dialog line if variable1 > variable2.
ENDIF
```

Evaluate expression (EVAL)

The EVAL function evaluates a transferred expression and then executes it. With this function, expressions can be programmed during runtime. This can be useful, for example, for indexed access operations to variables.

EVAL(exp)

where:

exp ;Logical expression to be evaluated

```
VAR1=(S)
VAR2=(S)
VAR3=(S)
VAR4=(S)
CHANGE( )
    REG[7] = EVAL("VAR"<<REG[5]) ;The expression in parentheses
                                    ;is the value of VAR3 if the value of
                                    ;REG[5] equals 3. REG[7] is
                                    ;assigned the value of VAR3.
                                    ;(See Section 3.3)
END_CHANGE
```

Conventional configuring of the above function would be performed as follows:

```
VAR1=(S)
VAR2=(S)
VAR3=(S)
VAR4=(S)
CHANGE( )
    IF REG[5] == 1
        REG[7] = VAR1
    ELSE
        IF REG[5] == 2
            REG[7] = VAR2
        ELSE
            IF REG[5] == 3
                REG[7] = VAR3
            ELSE
                IF REG[5] == 4
                    REG[7] = VAR4
                ENDIF
            ENDIF
        ENDIF
    ENDIF
END_CHANGE
```

3.2.4 Subroutines

Repeatedly used configuring instructions or others which define the process for a particular operation can be configured in subroutines. Subroutines can be loaded into the main program or other subroutines at any time and executed as often as necessary, i.e. the instructions they contain do not need to be configured repeatedly. In this case, the screen form and softkey menu definition blocks act as the main program.

Defining a subroutine

Subroutines are identified by the block identifier `//B` and terminated with `//END` in a configuration file. Several subroutines can be defined under each block identifier. A block is structured in the following way:

```
//B(Block name)
SUB (identifier)
```

```
...
END_SUB
[SUB(identifier)
```

```
...
END_SUB]
```

```
...
//END
```

where:

Block name	Name of block identifier
Identifier	Name of subroutine

Note

Variables programmed in subroutines must be defined in the screen form in which these subroutines are called.

```
//B(PROG1)      ;Beginning of block
SUB(UP1) ;Start of the subroutine
...
REG[0] = 5      ;Assign value 5 to register 0
...
END_SUB        ;End of subroutine
SUB(UP2)       ;Start of the subroutine
IF VAR1.val=="Otto"
  VAR1.val="Hans"
RETURN
ENDIF
VAR1.val="Otto"
END_SUB        ;Subroutine end
//END          ;Block end
```

Loading a block (LB)

The LB (LoadBlock) function can be used to load blocks containing subroutines during operation.
LB should be configured in a LOAD method so that the loaded subroutines can be called at any time.

LB("Block name"[,"File"])

where:

Block name	Name of block identifier
File	Path name of configuration file
	Default setting: Current configuration file

LOAD

LB("PROG1") ;Block "PROG1" is located in the current configuration file
;and then loaded

LB("PROG2", "C:\TMP\XY.COM")
;Block "PROG2" is located in configuration file XY.COM in the
;C:\TMP directory and then loaded

END_LOAD

Note

Subroutines can also be defined directly in a screen form so that they do not have to be loaded.

Calling a subroutine (CALL)

The CALL function can be used to call a loaded subroutine from any point in a method.
Subroutine nesting is supported, i.e. you can call a subroutine from another subroutine.

CALL("Identifier")

where:

Identifier	Name of subroutine

//M(FORM1)

VAR1 = ...

VAR2 = ...

LOAD

...

LB("PROG1") ;Load block

...

END_LOAD

CHANGE()

...

CALL("UP1") ;Call the subroutine and execute

...

END_CHANGE

...

//END

Aborting the current subroutine (RETURN)

The RETURN function can be used to prematurely terminate execution of the current subroutine and to return to the branch point of the last CALL command. If no RETURN command is configured in the subroutine, the branch point is not reached again until the end of the current subroutine.

RETURN

```
//B(PROG1)           ;Block start
SUB(UP2)             ;Subroutine start
  IF VAR1.val=="Otto"
    VAR1.val="Hans"
    RETURN           ;If the variable value = Otto,
                    ;the value Hans is assigned to the
                    ;variable and the subroutine
                    ;is terminated at this point
  ENDIF
  VAR1.val="Otto"    ;If the variable value ≠ Otto,
                    ;the value Otto is assigned to the
                    ;variable
END_SUB              ;Subroutine end
//END                ;Block end
```

3.2.5 REFRESH function

The function has no parameters. It can be called in any block (e.g. PRESS ... END_PRESS).

Effect

1. All active variable contents (input/output fields) in the display range are output again with the background and foreground.
2. All active and visible short description texts, graphic texts and unit texts are output again without clearing the text background first.

3.2.6 File functions

File functions can be used to generate NC code from an OUTPUT method and transfer it for execution to the NC.

Generating NC code

The GC (Generate Code) function generates NC code from the OUTPUT method.
GC("Identifier"[,"Target file"][,Opt])

where:

Identifier	Name of OUTPUT block from which code is to be generated
Target file	Path name of target file for MMC or NC file system
Opt	Option for generating comments:
1:	Do not create comments in the generated code CAUTION: This code cannot be recompiled.
0:	Default, generate code with comment for recompileability

No entry for target file:

The GC function can only be used in the Programming Support system and writes the NC code to the file currently open in the Editor.

Recompilation of the NC code is possible.

If the GC function is configured without specification of a target file under **"Expanding the Operator Interface"**, an error message is output when it is executed.

Entry for target file:

The code generated from the OUTPUT block is transferred to the target file. If the target file does not already exist, it is set up in the NC file system. If the target file is stored in the MMC file system, it is stored on the hard disk (MMC 103 only).

User comment lines (information required to recompile code) are not set up, i.e. the code cannot be recompiled.

Note

Invalid variables generate a blank string in generated NC code and an error message in the log book when they are read.

Note

The GC function cannot be called in sub-forms because variables originating from master forms can be used in sub-forms. These variables would not, however, be available in response to a direct call.

When generated code is processed manually with the Editor, the number of characters for values created by the code generation routine must not be changed. Changing these values would make it impossible to recompile the code.

Remedy:

Recompile,

enter changes using the configured screen form (e.g. 99 → 101)

GC

```
//M(TestGC/"Code generation:")
DEF VAR1 = (R//1)
DEF VAR2 = (R//2)
DEF D_NAME
LOAD
  VAR1 = 123
  VAR2 = -6
END_LOAD
OUTPUT(CODE1)
  "Cycle123(" VAR1 "," VAR2 ")"
  "M30"
END_OUTPUT
PRESS(VS1)
  D_NAME = "C:\TMP\MESSEN.MPF"
  GC("CODE1", D_NAME) ;NC code:
                        Cycle123(123, -6)
                        M30
                        Write from OUTPUT method in file
                        C:\TMP\MESSEN.MPF
END_PRESS
```

Note

To store the NC code from the OUTPUT method directly in the NC, the path must be defined as follows:

```
"/_N_MPF_DIR/_N_MESSEN_MPF"
```

Note

With the following functions, both with MMC 100.2 and with MMC 103, DOS paths (e.g. \MPF.DIR\TEST.MPF) are used.

Activate Program (AP)

The AP (Activate Program) function transfers a file from the passive MMC file system to the active NC file system. The file is loaded into the NC and enabled and then deleted in the MMC file system.

With MMC 100.2, this function has the same effect as Set enable.

AP("File")

where:

File	Complete path name of MMC file to be transferred

```
//M(TestGC/"Code generation:")
DEF VAR1 = (R//1)
DEF VAR2 = (R//2)
DEF D_NAME
LOAD
  VAR1 = 123
  VAR2 = -6
END_LOAD
```

```
OUTPUT(CODE1)
  "Cycle123(" VAR1 ", " VAR2 ") "
  "M30"
END_OUTPUT
PRESS(VS1)
  D_NAME = "C:\TMP\MESSEN.MPF"
  GC("CODE1", D_NAME) ;Write code from OUTPUT method in
                        ;file C:\TMP\MESSEN.MPF
END_PRESS
PRESS(HS8)
  D_NAME = "\MPF.DIR\MESSEN.MPF"
  AP(D_NAME)          ;Load file into NC
END_PRESS
```

Passivate Program (PP)

The function PP (Passivate Program) transfers one file from the active file system of the NC into the passive file system of the MMC103. After function PP has been executed, the file is no longer present in the active file system of the NC.

With MMC100.2/HT6 this function has the same effect as Delete enable.

PP("File")

where:

File Complete path name of NC file to be
 NC file

```
PP("\MPF.DIR\MESSEN.MPF")
```

Select Program (SP)

The SP (Select Program) function selects a file in the active NC file system for execution, i.e. the file must be loaded into the NC beforehand.

SP("File")

where:

File Complete path name for
 NC file

```
//M(TestGC/"Code generation:")
DEF VAR1 = (R//1)
DEF VAR2 = (R//2)
DEF D_NAME
LOAD
  VAR1 = 123
  VAR2 = -6
END_LOAD
OUTPUT(CODE1)
  "Cycle123(" VAR1 ", " VAR2 ") "
  "M30"
END_OUTPUT
PRESS(VS1)
  D_NAME = "C:\TMP\MESSEN.MPF"
  GC("CODE1", D_NAME) ;Write code from OUTPUT method in
                        ;file C:\TMP\MESSEN.MPF
END_PRESS
```



```

PRESS(HS8)
  AP (" \MPF.DIR\MESSEN.MPF" )      ;Load the file into the NC
  SP (" \MPF.DIR\MESSEN.MPF" )      ;Select file
END_PRESS

```

Delete Program (DP)

The DP (Delete Program) function deletes a file from the passive MMC or active NC file system.

DP("File")

where:

File Complete path name of file to be deleted

```
DP (" \MPF.DIR\CFI.MPF" )
```

Exists Program (EP)

The EP (Exists Program) function checks whether a particular file is stored in the specified path in the NC or MMC file system.

EP("File", Result)

where:

File Complete path name of file for
 NC file system or MMC file system

Result Name of a variable to which the result of the scan
 is to be assigned

The result of the scan can be:

M = file is stored on MMC

N = file is stored on NC

Blank string = the file neither exists on the MMC nor on the NC

```

EP (" \MPF.DIR\CFI.MPF", VAR1)      ;Check whether file CFI.MPF
                                     ;exists in MMC file system
IF VAR1 == "M"
  DLGL("File is located in MMC file system")
ELSE
  IF VAR1 == "N"
    DLGL("File is located in the NC file directory")
  ELSE
    DLGL("File is neither in the MMC nor in the NC
         file directory")
  ENDIF
ENDIF
ENDIF

```

Copy Program (CP)

The CP (Copy Program) function copies files within the MMC file system or NC file system.

With MMC100.2/HT6, copying is only possible within the NC file system.

CP("Source file", "Target file")

where:

Source file Complete path data of the source file

Target file Complete path data of the target file

```
CP (" \MPF.DIR\CFI.MPF ", " \spf.dir\cfi.nc" )
```

3.2.7 NC functions (PI services)

The PI_SERVICE function can be used to start PI Services (Program Invocation Services) in the NC area from the MMC/HT6 or PLC.

Note

Channel-dependent PI Services always refer to the current channel.
PI Services which require the TO area (PI Services of tool functions) always refer to the TO area allocated to the current channel.

PI_SERVICE (*Service, n parameter*)

where:

Service	Identifier of PI Service
n parameter	List of n parameters of PI Service. The parameters are separated by commas.

For a description of available PI Services, please refer to Section 8.4.

PRESS(HS2)

PI_SERVICE("_N_CREAT0", 55)

END_PRESS

PRESS(VS4)

PI_SERVICE("_N_CRCDN", 17, 3)

END_PRESS

PI_START command (6.3)

The PI_START command executes a PI service based on OEM documentation.

Structure of the command:

PI_START(*transfer string*)

Unlike the OEM documentation, the transfer string should be entered in inverted commas.

Example:

PI_START("/NC,001,_N_LOGOUT")

3.2.8 External functions (only MMC103)

Additional, user-specific functions can be integrated by means of external functions.

External functions are stored in a DLL file and identified by an entry in the definition lines of the configuration file.

FCT *Function name = ("File"/Type of return/Types of fixed call parameters/Types of variable call parameters)*

where:

Function name	Name of external function
File	Complete path name of DLL file
Type of return	Data type of return value for function

Type of fixed call parameter	List of data types of fixed call parameters.

The data types are separated by commas.

Type of variable call parameter	List of data types of variable call parameters (variable or register).

The data types are separated by commas.

The data types of return values and call parameters are R, I, S, C, B.

Use of external functions in the further configuration:

Function name (Call parameter)

where:

Function name	Name of external function
Call parameter	List of all call parameters.

Individual parameters are separated by commas.

Note

An external function must have at least one return parameter.

```
//M(FORM1)
DEF VAR1 = (R)
DEF VAR2 = (I)
DEF RET = (I)
FCT InitConnection = ("c:\user\mydll.dll"/I/R,I,S/I,S)
```

```
                                ;The external function "InitConnection"  
                                ;is declared. The data type of  
                                ;the return value is Integer, the data types  
                                ;of the fixed call parameters are Real,  
                                ;Integer and String, the data types of the  
                                ;variable call parameters are Integer  
                                ;and String.  
LOAD  
  RET = InitConnection(VAR1+SIN(VAR3),13,"Servus",VAR2,  
    REG[2])  
  ;RET is assigned the value of the external  
  function "InitConnection" with call  
  parameters VAR1+SIN(VAR3), 13,  
  Servus, VAR2 and REG[2].  
END_LOAD
```

Extract from DLL file:

```
void __export WINAPI InitConnection(ExtFctStructPtr FctRet,  
ExtFctStructPtr FctPar, char cNrFctPar)  
FctRet->value.i      Return value of function  
FctPar[0]->value.r    1. parameter (VAR1+SIN(VAR3))  
FctPar[1]->value.i    2. parameter (13)  
FctPar[2]->value.s    3. parameter ("Servus")  
FctPar[4]->value.i    4. parameter (reference to VAR2)  
FctPar[5]->value.s    5. parameter (reference to REG[2])  
cNrFctPar            Number of parameters (5)
```

3.3 Language resources for syntax of methods

3.3.1 Binary, hexadecimal and exponential notation of numbers

Numbers can be represented in either binary, decimal, hexadecimal or exponential notation.

Note

When codes are generated with the GC function, only numerical values in decimal or exponential notation are evaluated, but not those in binary or hexadecimal notation.

Binary: 'B01110110'
 Decimal: 123.45
 Hexadecimal: 'HF1A9'
 Exponential: '-1.23EX-3'

Note

Numerical values in binary, hexadecimal and exponential notation must be enclosed in apostrophes.

VAR1 = 'HF1A9'
 REG[0] = 'B01110110'
 DEF VAR7 = (R//'-1.23EX-3')

3.3.2 Operators and functions

Table 3-9

Mathematical operators	
+	Addition
-	Subtraction
*	Multiplication
/	Division
MOD	Modulo operation
()	Parentheses
AND	AND operator
OR	OR operator
NOT	NOT operator

Example:

VAR1.VAL = 45 * (4 + 3)

Bit-serial operators

BOR	Bit-serial OR
BXOR	Bit-serial XOR
BAND	Bit-serial AND
BNOT	Bit-serial NOT
SHL	Shift bits to left
SHR	Shift bits to right

SHL operator

Syntax:

variable = value SHL increment

value value to be shifted
increment number of shift increments

Function:

Bits are shifted to the left using the function **SHL**. You can specify both the value to be shifted and the number of shift increments directly or via a variable.
If the limit of the data format is reached, the bits are shifted beyond the limit without displaying an error message.

Example:

```
PRESS(VS1)
  VAR01 = 16 SHL 2      ;Result = 64
  VAR02 = VAR02 SHL VAR04 ;Convert contents of VAR02 to 32-bit unsigned
                           ;and shift contents to left by number of bits
                           ;specified in VAR04. Then convert
                           ;32-bit value back to format of
                           ;variable VAR02.
END_PRESS
```

SHR operator

Syntax:

variable = value SHR increment

value value to be shifted
increment number of shift increments

Function:

Bits are shifted to the right using the function **SHR**. You can specify both the value to be shifted and the number of shift increments directly or via a variable.
If the limit of the data format is reached, the bits are shifted beyond the limit without displaying an error message.

Example:

```
PRESS(VS1)
  VAR01 = 16 SHR 2      ;Result = 4
  VAR02 = VAR02 SHR VAR04 ;Same effect as SHL but shift to right
```

Table 3-10

Mathematical functions	
SIN(x)	Sine of x
COS(x)	Cosine of x
TAN(x)	Tangent of x
ATAN(x, y)	Arc tangent of x/y
SQRT(x)	Square root of x

Mathematical functions	
ABS(x)	Absolute value of x
SDEG(x)	Conversion to degrees
SRAD(x)	Conversion to radian

Note

The functions operate with radian measure. The functions SDEG() and SRAD() can be used for conversion.

```
VAR1.VAL = SQRT(2)
```

Table 3-11

Constants	
PI	3.14159265358979323846
FALSE	0
TRUE	1

```
VAR1.VAL = PI
```

Table 3-12

Comparison operators	
==	Equal to
<>	Not equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

```
IF VAR1.VAL == 1
  VAR2.VAL = TRUE
ENDIF
```

3.3.3 Conditions

Condition with a command:

IF

...

ENDIF

Condition with two commands:

IF

...

ELSE

...

ENDIF

The nesting depth is unlimited.

3.3.4 Handling strings

String concatenation

Strings can be processed as part of the configuration. These allow text to be displayed dynamically or different texts to be chained for the purpose of code generation.

The following rules must be observed with regard to string variables:

Logic operations are processed from left to right.

Nested expressions are solved from the inside outwards.

No distinction is made between uppercase and lowercase type.

Strings can be deleted simply by assigning a blank string.

Strings can be attached after the equal sign using the operator "<<".

Quotation marks (") in the string are represented by two successive quotation mark symbols.

Strings can be checked for equality in IF instructions.

Examples

Default settings for the following examples:

```
VAR1.VAL = "This is an"
VAR8.VAL = 4
VAR14.VAL = 15
VAR2.VAL = "error"
$85001 = "This is an"
$85002 = "alarm text"
```

Chaining of strings:

```
VAR12.VAL = VAR1 << " Error."
;Result: "This is an error"
```

Deleting a variable:

```
VAR10.VAL = ""
;Result: Blank string
```

Setting a variable with a text variable:

```
VAR11.VAL = VAR1.VAL
;Result: "This is an"
```

Data type matching:

```
VAR13.VAL = "This is the " << (VAR14 - VAR8) << "th error"
;Result: "This is the 11th error"
```

Treatment of numerical values:

```
VAR13.VAL = "Error " << VAR14.VAL << ": " << $T80001 <<
$T80002
;Result:
;"Error 15: This is an alarm text"
IF VAR15 == "Error"
;Strings in IF instruction
VAR16 = 18.1234
;Result: VAR16 equals 18.1234,
;if VAR15 equals "Error"
ENDIF
```

Quotation marks within a string:

```
VAR2="Hello, this is a "" Test"
;Result: Hello, this is a " Test"
```

System or user-variable strings dependent on variable contents:

```
VAR2.Var = "$R[" << VAR8 << "]"
;Result: $R[4]
```

String functions

The string functions described below are available from HMI Advanced software release 6.3 onwards.

The following string functions are available:

- Determine length of string
- Find a character in a string
- Extract substring from left
- Extract substring from right
- Extract substring from mid-string
- Replace substring

String length

Syntax:
LEN(*string* | *varname*)

Parameter:

<i>string</i>	Every valid string expression. NULL is output if string is empty
<i>varname</i>	Any valid declared variable name

Function:
Determine the number of characters in a string.

Note:
Only one of the two parameters is allowed.

Example:
DEF VAR01
DEF VAR02

LOAD
 VAR01="HELLO"
 VAR02=LEN(VAR01) ;Result = 5
END_LOAD

Find a character

Syntax:
INSTR(*start*, *string1*, *string2* [, *direction*])

Parameter:

<i>start</i>	Number, position from which string1 is searched for in string2. This parameter defines the start position for the search. Enter 0 to start searching at the beginning of string2.
<i>string1</i>	Character, that is being searched for.
<i>string2</i>	Chain of characters in which the search is being made
<i>direction</i>	Optional. Defines the search direction. 0: From the left to the right, 1: From the right to the left. If not specified, then direction = 0

Function:
INSTR returns the position of the first occurrence of a specified character in a string.

Note:
0 is returned if string1 does not occur in string2.

Example:

```
DEF VAR01
DEF VAR02

LOAD
  VAR01="HELLO/WORLD"
  VAR02=INST(1,"/",VAR01)           ;Result = 6
END_LOAD
```

Substring from left

Syntax:

LEFT(*string*, *length*)

Parameter:

<i>string</i>	Character string or variable with the string to be processed
<i>length</i>	Number of characters that are to be read out

Function:

LEFT returns a string containing the specified number of characters starting from the left side of a string.

Example:

```
DEF VAR01
DEF VAR02

LOAD
  VAR01="HELLO/WORLD"
  VAR02=LEFT(VAR01,5)               ;Result = "HELLO"
END_LOAD
```

Substring from right

Syntax:

RIGHT(*string*, *length*)

Parameter:

<i>string</i>	Character string or variable with the string to be processed
<i>length</i>	Number of characters that are to be read out

Function:

RIGHT returns a string containing the specified number of characters starting from the right side of a string.

Example:

```
DEF VAR01
DEF VAR02

LOAD
  VAR01="HELLO/WORLD"
  VAR02=RIGHT(VAR01,4)           ;Result = "WORLD"
END_LOAD
```

Substring from mid-string

Syntax:

MIDS(string, start [, length])

Parameter:

string Character string or variable with the string to be processed

start Start from where characters are to be read in the string
length Number of characters that are to be read-out (optional)
If *length* is not specified, then the string is transferred up to the end.

Function:

MIDS returns a string containing the specified number of characters starting at the specified position in the string.

Example:

```
DEF VAR01
DEF VAR02

LOAD
  VAR01="HELLO/WORLD"
  VAR02=MIDS(VAR01,4,4)         ;Result = "LO/W"
END_LOAD
```

Replacing characters

Syntax

REPLACE (*String*, *FindString*, *ReplaceString* [, *Start* [, *Count*]])

Parameter:

<i>String</i>	String , in which the <i>FindString</i> is to be replaced by the <i>ReplaceString</i>
<i>FindString</i>	String to be replaced
<i>ReplaceString</i>	Replacement string (is used instead of the <i>FindString</i>)
<i>Start</i>	Start position from which a search is made or replacement made
<i>Count</i>	Number of characters that are to be searched from the <i>Start</i> position after the <i>FindString</i>

Function:

The **REPLACE** function replaces a character/string in a string by another character/string. It is similar to the basic function of the same name.

Return values:

If...	Return value
<i>String</i> = Blank string	Copy of <i>String</i>
<i>FindString</i> = Blank string	Copy of <i>String</i>
<i>ReplaceString</i> = Blank string	Copy of <i>String</i> , in which all occurrences of <i>FindString</i> are deleted
<i>Start</i> > Len(<i>String</i>)	Blank string
<i>Count</i> = 0	Copy of <i>String</i>

3.4 General screen form variables

Registers

Registers are needed to be able to exchange data between different screen forms. Registers are assigned to a screen form. They are loaded when the first screen form is generated and assigned the value 0 or a blank string.

REG [*x*]

where:

x Number of register with *x* = 0...19

Real or String type = Variant

Registers with *x* ≥ 20 are used by Siemens.

Note

Registers may not be used directly in OUTPUT blocks for generating NC code.

Register value

The assignment of values to registers is configured in a method.

Identifier.val = Register value

or

Identifier = Register value

where:

Identifier	Name of register
Register value	Value of register

```
UNLOAD
    REG[0] = VAR1                ;Assign value of variable 1 to
                                register 0
END_UNLOAD

UNLOAD

    REG[9].VAL = 84              ;Assign value 84 to register 9
END_UNLOAD
```

These registers can then be assigned to local variables again in the next screen form.

```
LOAD
    VAR2 = REG[0]
END_LOAD
```

Note

If a new form is generated from an existing form by means of the LM function, the contents of registers are automatically transferred to the new screen form at the same time and so are available for further calculations in the second screen form.

Register status

The Status property can be used to scan a register for valid contents. Status is a read-only property.

Identifier.vld

where:

Identifier Name of register

The result of the scan can be:

FALSE = invalid value

TRUE = valid value

One possible use for the register scan function is to ensure that a value is written to a register only if the relevant screen form is a "master screen form".

```
IF REG[15].VLD == FALSE      ;Scan validity of register
    REG[15] = 84
ENDIF
VAR1 = REG[9].VLD            ;Assign Var1 the value of the status scan
                                ;of REG[9]
```

Error variable ERR

Variable ERR can be used to check whether the preceding lines have been executed correctly.

ERR

The result of the scan can be:

FALSE = previous line was executed error-free

FALSE = previous line was not executed error-free

Variable ERR is a read only variable.

```

VAR4 = Thread[VAR1, "KDM", 3]      ;Output array value
IF ERR == TRUE                      ;Scan to check whether value has
                                   ;been found in array
    VAR5 = "Array accessing error"  ;If the value has not been found
                                   ;in the array, the value "Array
                                   ;accessing error" is assigned to the
                                   ;variable
ELSE
    VAR5 = "All OK"                ;If the value has been found
                                   ;in the array, the value "All OK"
                                   ;is assigned to the variable
ENDIF

```

Focus FOC

The input focus (current active I/O field) in a screen form is controlled by the FOC function. FOC can be read and written into.

FOC

When FOC is read, the result is the name of the focused variable.

```

IF FOC == "Var1"                    ;Read focus
    REG[1] = Var1
ELSE
    REG[1] = Var2
ENDIF

```

When FOC is written, it is possible to assign either a string or a numerical value. A string is interpreted as a variable name and a numerical value as a variable index. The FOC function may not be initiated as a result of navigation event. The cursor may only be moved in softkey press blocks, change blocks, ...
The response to cursor left, right, up, down as well as PGUP, PGDN are permanently pre-defined.

Note

The FOC function cannot be applied to variables with input mode wr = 0 and wr = 4 or to Help variables.

```

FOC = "Var1"                        ;Input focus is assigned to variable 1
FOC = 3                             ;Input focus is assigned to the 3rd screen form
                                   ;element with WR ≥ 2

```

Entry

The ENTRY variable can be used to check by what method a screen form has been called.

ENTRY

The result of the scan can be:

- 0 = No programming support
- 1 = Programming support (the screen form was called under programming)
- 2 = Programming support + default from previous screen form (sub-screen form)
- 3 = Program support + recompilation
- 4 = Programming support + recompilation with generated comments and # characters
- 5 = Programming support + recompilation with generated comments but no # characters

The ENTRY variable is a read only variable.

```
IF ENTRY == 0
    DLGL("The screen form was not called under Programming")
ELSE
    DLGL("The screen form was called under Programming")
ENDIF
```

S_CHAN

In SW 6.1 and higher, variable S_CHAN can be used to determine the number of the current channel for display or any evaluation purposes.

CURPOS

Using the CURPOS variable, it is possible to call or manipulate the position of the cursor in the active input field of the current screen form. The variable indicates how many **characters** are located **in front of the cursor**. If the cursor is located at the start of the input field, then CURPOS assumes the value of 0. If the value of CURPOS is changed, then the cursor is positioned at the appropriate location in the input field.

In order to be able to respond to changes in the variable value, it is possible to monitor for changes using a CHANGE block. If the value of CURPOS changes, then a jump is made to the CHANGE block and the instructions contained there are executed.

3.5 Error handling, log book

The log book is a file (Error.com) to which error messages generated by syntax interpretation are written.

The operator himself must set up the file in the comment directory (MMC 103).

```
DEF VAR1 = (R)
```

```
DEF VAR2 = (R)
```

```
LOAD
```

```
VAR1 = VAR2 + 1
```

```
;Error message in log book because
```

```
;VAR2 has no value
```

The system does not start to interpret syntax until the start softkey has been defined and a screen form with start and end identifiers and a definition line has been configured.

```
//S(Start)
```

```
HS6=("1st screen form")
```

```
PRESS(HS6)
```

```
LM("Screen form1")
```

```
END_PRESS
```

```
//END
```

```
//M(Form1)
```

```
DEF Var1=(R)
```

```
//END
```

If "**Expanding the Operator Interface**" detects any errors when interpreting the screen form configuration files, these will be stored in the file ERROR.COM

- with MMC 100.2 and HT6 on the RAM drive,

- with MMC 103, in the directory \DH\COM.DIR\.

This file is deleted before every new screen form. It details

- which action was affected by an error,

- the row and column number of the first defective character and

- the whole defective line in the configuration file.

If the screen form was created using the PC test environment, then the error file will be stored in the directory referenced by environment variable RAMDISK

(MMC 100.2/HT6). It can be read together with the communication error log in the "Services" operating area by means of PCIN via the R-232 interface.

Editing in ERROR.COM

MMC 103:

Call the editor in the "Services" or "Start-Up" area.

MMC 100.2/HT6

Operating area "Start-Up", Access mode "Manufacturer", MMC, EDIT, New, E:\ERROR.COM.

Ram disk in on drive I:\ERROR.COM for PCU20 in SW 6.2 and later.



Notes

4

4 Programming Support System

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4.2 Generating new screen forms.....	BE1/4-111
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4.1 Objectives and programming support provided

The purpose of the programming support system is to assist programmers in writing programs using the ASCII Editor.

The system provides the following standard tools for this purpose:

- Cycle support
- Free contour programming
- Blueprint programming
- Recompile
- Simulation

References: /BA/, Operator's Guide

Customized operator interfaces can also be created in the Programming support system. These interfaces are configured using the ASCII Editor and the tools provided by the "Expanding the Operator Interface" system.

Note

For the sake of compatibility, the cycles support (/C...) function is still supported by the description language used in earlier versions and not by the syntax of the "Expanding the Operator Interface" system.

4.2 Generating new screen forms

New operator interfaces are created with tools provided by the "Expanding the Operator Interface" system. However, the procedures applied under Programming support differ in a number of ways. These differences are described in this Section.

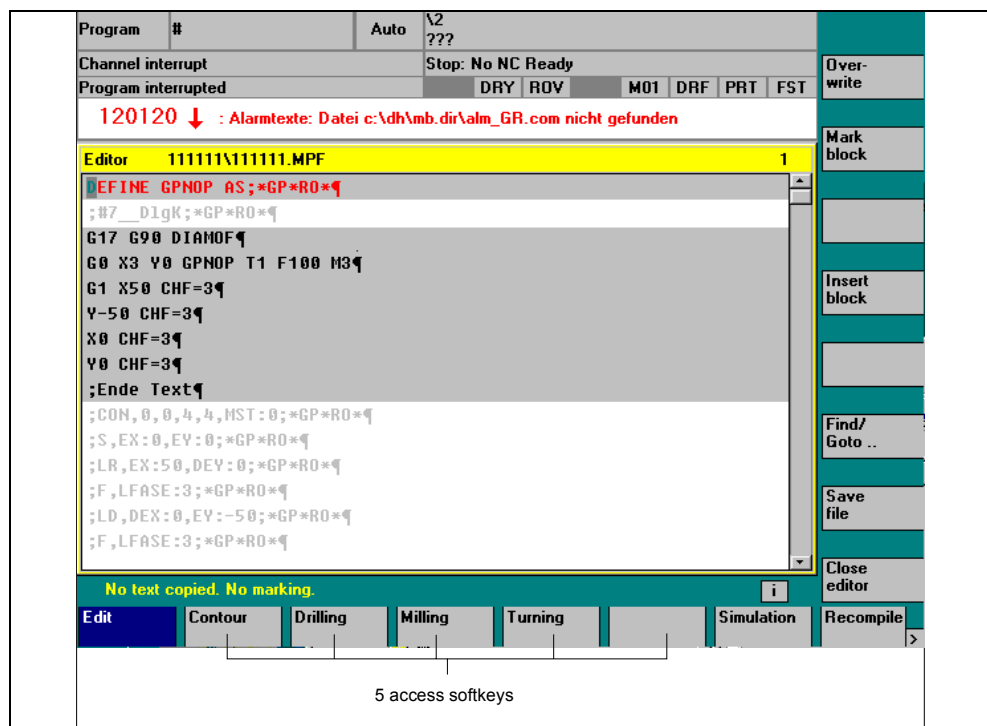
Configuration file

The definition of new screen forms for programming support is stored in configuration file AEDITOR.COM.

Newly configured screen forms can be displayed in the Editor main screen through selection of 5 start softkeys (horizontal softkeys 2, 3, 4, 5 and 6).

The default labels for softkeys 2 to 5 are "Contour", "Drilling", "Milling" and "Turning".

In SW 6.1 and higher, horizontal softkeys 14 and 15 (softkeys 6 and 7 in the expanded menu) are assigned the "Gauge turning" and "Gauge milling" functions.



4.2.1 Special functions

In addition to the functions provided by "Expanding the Operator Interface", the following extra functions are available in the Programming support system:

Find Text

The "Find text" function is used to search for a string from the current cursor position in the NC program currently selected in the Editor and to output its value. Search backwards from the current cursor position:

SB ("String")

Search forwards from the current cursor position:

SF ("String")

where:

String Text to be found

Rules governing text search:

- A blank must be inserted before and after the search key unit, consisting of search string and its value, in the currently selected NC program.
- The system does not search for keys within comment text or other strings.
- The value to be output must be a numerical expression. Expressions in the form of "X1=4+5" are not detected.
- The system recognizes hexadecimal constants in the form of X1='HFFFF', binary constants in the form of X1='B10010' and exponential components in the form of X1='-.5EX-4'.

Note

The value of a string can be output if it contains the following between string and value:

- Nothing
 - Blank space
 - Equality sign
-

X100 Y200

Abc=SB("Y")

;The variable Abc contains the value 200

or

X100 Y 200

Abc=SB("Y")

;The variable Abc contains the value 200

or

X100 Y=200

Abc=SB("Y")

;The variable Abc contains the value 200

Recompile

In the Programming support system, it is possible to recompile NC code that has been generated with the GC function and to display the variable values in the I/O field of the screen form again.

Variables from the NC code are transferred to the screen form.

At the same time, the variable values from the NC code are compared with the calculated variable values from the configuration file. If the values do not coincide, an error message is written to the log book because values have been changed during NC code generation.

If the NC code contains the same variable several times, it is evaluated at the point where it last occurs during recompilation.

A warning is also written to the log book.

Variables which are not utilized in NC code during code generation are stored as user comment. The term "user comment" refers to all information required to recompile codes. User comment must not be altered.

Note

The block consisting of NC code and user comment can be recompiled only if it starts at the beginning of a line.

The configuration file contains the following NC code:

```
DEF VAR1=( I//101)
OUTPUT(CODE1)
  "X" VAR1 " Y200"
  "X" VAR1 " Y0"
END_OUTPUT
```

The following code is then stored in the parts program:

```
;NCG#TestGC#\cus.dir\aeditor.com#CODE1#
;#1#3#
X101 Y200
X101 Y0
;#END#
```

The Editor reads the following during recompilation:

```
X101 Y200
X222 Y0 ;The value for X has changed in
      the parts program (X101 →
      X222)
```

The following value is displayed for VAR1 in the input screen form:
VAR1=222

4.3 General cycle support

Introduction

When using the cycle support in the part program, in front of and behind the cycle call, additional comment lines are generated that are used for re-compilation.

These lines start with ;#

When cycles are called, that were directly noted using the editor (also "old" cycles), then this information is missing. A description is provided in the following text as to how the information for cycles, contained in the lines in ;# can be provided by configuring INI files. This means, that after re-compilation, it will be possible to work with the following using the screen form support:

- Directly noted cycle calls
- Siemens cycle calls
- User cycle calls.

For Siemens cycles, the required configuration files are included in the scope of supply.

For screen forms, generated with expand operator interface, which are used to support user cycles, then the information in the screen form descriptive files can be used for this technique.

In order to define whether cycles with ;# lines are to be processed in the part program, or re-compiled via the configuration files, can be defined for each cycle in the configuration itself.

Using this technique, for the directly noted "old" cycles (SW 4.x), the expansion by ;# lines, required for screen form support, can be optimally generated in the part program.

Requirement:

For these cycles, a configuration generated using "expand operator interface" resources must exist/be generated.

Configuration

The **wizard.ini** file can be stored in the following directories:

..\user
..\oem
..\hmi_adv
..\mmc2

A search is made in the specified directories in this sequence and the information of the section

[MMC_CycleWizard] is then added so that it is up to date.

Entries are located in this section, that refer to cycle packets. For example:

INI_1=bohren.ini
INI_2=drehen.ini
...
INI_n=paket.ini

Cycle-specific entries with the following form are located in the particular *paket.ini* files

[cycleName]	Name of the cycle' as section entry
Mname=	mandatory, screen form name
Dir=	mandatory, directory of the file with the screen form information
Dname=	mandatory, file with screen form information
Output	mandatory, name of the OUTPUT block
Anzp=	mandatory, number of parameters (defined variables)
Version=	optional, cycle version, without data 0
Code_typ=	optional, output with = 0 or without = 1 ;# lines

Example

```
[CYCLE83]
Mname=CYC83
Dir=cst.dir
Output=bohren.ini
Anzp=17
Version=3
Code_typ=0
```

Details

A differentiation is made between various versions of cycles with the same name using the version number.

Main block/secondary block and block numbers in front of the cycle call are kept unchanged.

Cycle call line in the part program:

```
/1234 :44 CYCLE94( , , )
```

After expansion by the string and ;# lines:

```
;NCG#CYC94#\CST.DIR\DREHEN.COM#NC1#1#*NCG;*RO*;*HD*
;#####*NCG;*RO*;*HD*
/1234 :44 CYCLE94( , , )
;#END#*NCG;*RO*;*HD*
```



Notes

5

5 Configuring OP Hotkeys and PLC Keys

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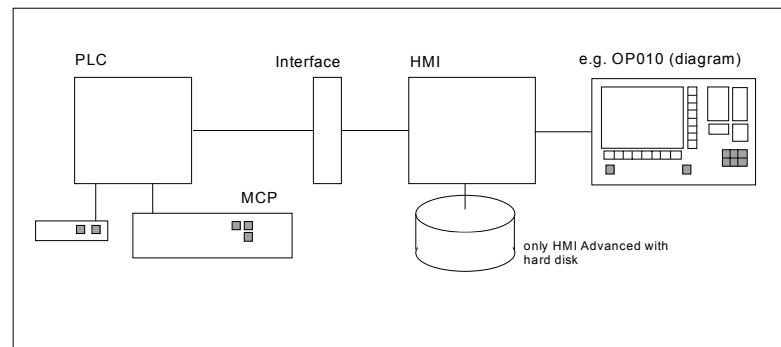
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5.1 Introduction

This Section involves the configuring of

- a group of 6 hotkeys on the OP 010 and OP 010C or Sinumerik keyboards with hotkey blocks
- the optional reconfiguration of the "Machine" and "Menu Select" keys
- keys (e.g. machine console keys) and events evaluated by the PLC, which, as PLC keys or "virtual keys", can initiate configured sequences of operations in the HMI system.

Overview



The 6 OP hotkeys can be used to display any HMI operating area directly. This shortens the usual selection process via the main menu. The standard assignment of the 6 hotkeys can be reconfigured.

The interface between the PLC and the HMI enables a PLC key to be transferred from the PLC to the HMI. The operations initiated on the HMI system in this way can be configured. Key numbers 50 to 254 are available for use by the PLC.

As an option, the "Machine" and "Menu Select" keys can be configured in the same way as the 6 OP hotkeys. They are assigned to HK7 and HK8.

Configuration is carried out using the "Expanding the Operator Interface" system functions described in the previous sections.

Applications

- Selection of operating areas (e.g. Machine, Parameters, etc.)
- Selection of specific submenus (e.g. selection of the alarm screen in the Diagnosis area)
- Initiation of actions (e.g. selection of the tool list in the Parameters area and pressing of softkey HS3)
- Specific selection of menus created using the "Expanding the Operator Interface" system
- Selection of additional screens, depending on the current operating situation, in screens created using the "Expanding the Operator Interface" system.

5.1.1 OP hotkeys

Standard layout

The 6 OP hotkeys are laid out in 2 lines, each of which contains 3 keys:

Line 1

Label (no symbol)	Depends on OP		Program	Offset
	OP10	Machine		
	OP10C	Machine		
	OP10S	Position		
Configured as	HK1		HK2	HK3

Line 2

Label (no symbol)	Prg. Manager	Alarm	Custom
Configured as	HK4	HK5	HK6

Optional HK7 and HK8

The OP keys "Machine" and "Menu Select" can be configured in the same way as HK1 to HK6. They can be used:

To disable the standard functions of these keys and to activate new dedicated functions.

Label (no symbol)	Machine		Menu Select
Configured as	HK7		HK8

Details about HK7 and HK8 can be found in 5.1.3 Configuring the M key and Menu Select as HK7, HK8.

Note

Hot keys 1 and 7 (M key) cannot be determined by the hardware on the OP10S (position of labeling). Hot key 7 is always triggered when one of the keys is pressed. If HK1 is configured, this event can only be triggered by an external (MFII) keyboard.

5.1.2 Assigning functions to keys

When the system is supplied, the assignment of hotkeys to the functions is entered in file **Keys.ini**.

Directories

For HMI Advanced, the file can exist in various directories. These are:

- user
- oem
- add_on *)
- mmc0w32 *)
- mmc2 *)
- hmi_adv *)

The files are executed in the above sequence. Entries in the directory which appears at the beginning of the sequence will disable existing entries in directories which appear later in the sequence.

*) These directories are reserved for Siemens.

The assignments for HK1 to HK6 are supplied, saved as follows in Keys.ini in directory **mmc2** for the **standard** system:

Key	Function
HK1 Position	Machine operating area, last screen
HK2 Program	Program operating area, last screen
HK3 Offset	Parameters operating area, last screen
HK4 Prg. manager	Main screen programming
HK5 Alarm	Diagnosis operating area, alarm screen
HK6 Custom	Default Custom operating area, last screen (user-configured operator interface)

The assignment for **ShopMill/ShopTurn** applications is as follows:

Key	Function
HK1 Position	Machine operating area, last screen
HK2 Program	Program editor, last status
HK3 Offset	Offset area, last status
HK4 Prg. manager	Program directory last status
HK5 Alarm	Diagnosis operating area, alarm screen
HK6 Custom	Default Custom operating area, last screen (user-configured operator interface)

In HMI Embedded, the data in Keys.ini can be adapted using the Software Configuration Kit (SCK):

Entry format

Details about the input format can be found in the "Hotkey event" subsection below. To enable a better understanding of the input format, multiple keypresses will be described first.

Multiple keypress

A function extension determines the sequence when the hotkey is pressed repeatedly:

1. The number "n" in the key data in file Keys.ini represents the number of keypress repeats, thus allowing a separate task/state/action combination to be assigned each time the hotkey is pressed. This means that each time the key is pressed, a change of state can take place and a screen and a softkey can be selected.
2. When the user changes to another operating area, the repeat status of the hotkey is cleared. In the new area, the hotkey is considered not to have been pressed.
It does not matter how the user changed to the other operating area (operating area menu, etc.). In addition, each time a function key is pressed (e.g. softkey, area switchover key, channel switchover key, etc.), the status is reset.
3. Inputting data into fields in the current screen form does not interrupt the repetition sequence. Pressing a softkey in the current screen form interrupts the repetition sequence with the softkey which was used to call the current screen form.

Note

Multiple keypress is possible for HK1–HK8 and for keys HK9–HK49, which are reserved for Siemens.

Configuration file Keys.ini

Every version in the configuration file **Keys.ini** in the above mentioned directories results in the hotkey responses in a section **[KeyConfiguration]**. Every entry (line) defines the response of the system to a specific actuation (in the sense of multiple actuation of specific hotkeys. These are known as hotkey events in the following text.

The **keys.ini** configuration file has a dedicated section for assigning the ini files for PLC keys. Without this entry, the ini files will not be detected. The default settings are as follows:

[HMI_INI_FILES]

Task0=machine.ini

Task1=paramet.ini

Task2=program.ini

Task3=services.ini

Task4=diagnosis.ini

Task5=startup.ini

Task6 = shopmill.ini **alternative** Task6 = shopturn.ini depending on the system,
mandatory!

Task11=custom.ini

Hotkey-Event

Design:

KEY*x.n* = **Task**:=*task*, **State**:=*state*, **Action**:=*action*

The maximum number of attributes which can be assigned to a hotkey event are the 4 attributes in bold print above.

The KEY key attribute identifies the event and must always come first. All other attributes are optional, but at least one other attribute must be specified. These attributes can appear in any sequence in the line.

- Attribute **key** (hotkey)
The value *x.n* contains the hotkey number *x* and a discrete event *n* corresponding to the *n*th activation of the key (when the key is pressed several times in succession).
For example, Key 3.5 addresses the hotkey event for HK3, 6th activation.
The range of values of the hotkey numbers is from 1 - 254.
The range of values for the event *n* is from 0 - 9 (10 keystrokes).
Hotkeys 1 - 8 are assigned to the keys of the Ops (refer to 5.1.1 OP hotkeys).
Hotkeys 9 - 49 are reserved for Siemens. PLC-specific keys from 50 - 254 are also available. These keys are not actual hotkeys, but are used for selecting screen forms via the PLC (virtual keys). Keys 50 - 254 can also be configured without a task. In this case, the event is always assigned to the current task.
- Attribute **Task** (operating area)
A hotkey is assigned to an operating area (task) via a task number. The task number also defines the **horizontal** softkey to which the operating area is assigned in the area switchover menu. This creates a permanent connection between the task number and the corresponding softkey. In the HMI system, there are three softkey menus (two in HMI Embedded) which are reserved for the area switchover function. The default assignments are as follows:

Pressing the area switchover key selects softkey menu 1:

SK1 → Task0

...

SK8 → Task7

Pressing the ETC key accesses softkey menu 2

SK1 → Task0

...

SK8 → Task15

Pressing the ETC key again accesses softkey menu 3 (only possible in HMI Advanced):

SK1 → Task16

...

SK8 → Task23

Pressing the ETC key again returns to softkey menu 1.

In HMI Advanced, the range of values for the task numbers is between 0 and 23. In HMI Embedded it is between 0 and 15.

If no task is specified, the event is assigned to the current task (current operating area).

The task numbers can be accessed:

- From the **Regie.ini** (Control-ini) file for HMI Advanced.
- With the **SCK** (Software Configuration Kit) tool in HMI Embedded.

An application-specific assignment between SKs and operating areas (tasks) can be preset during configuration:

HMI Advanced	Section [TaskConfiguration] in file control.ini
HMI Embedded	SCK "Modify configuration"

- Attribute **State**:

The State attribute can be used to select a specific screen within a task. The range of values depends on the individual application and is limited to between 0 and 65534 (65535 is used by the system). A list of available states is stored in

5.5 List of selectable states in HMI Advanced

5.6 List of selectable states in HMI Embedded

5.7 List of selectable states in ShopMill

5.8 List of selectable states ShopTurn

- Attribute **Action**:

The Action attribute can be used to select a specific softkey within a task. In order to be effective, the attribute must be set from a defined state, e.g. the main menu.

The range of values depends on the individual application and is limited to between 0 and 17 (see below). The Action attribute of particular importance. With a value of ≥ 100 , it activates a display selection via the "Expanding the Operator Interface" system mechanism.

Actions in the value range 0 - 99 are not executed for ShopMill/ShopTurn.

Note

A power ON is required in order for the changes to keys.ini to take effect.

Example of multiple hotkey keypress

The first time the hotkey is pressed, the associated area is activated and a state/action may be initiated in this area (entry 1). Pressing the hotkey again will execute the subsequent entries for this hotkey and an area switchover will not take place. Once all the entries configured for a hotkey have been executed, the cycle is repeated. The entries are always executed in ascending order (from 0-9).

Execution in descending order is not possible. There must be no "event gaps" in the configuration (missing entries). A gap is treated like the end of the chain and processing will restart at Key x.0 the next time a key is pressed.

Configuring example

```
[KeyConfiguration]
KEY1.0 = Task:=0, State:=10, Action:=2    ;Hotkey 1, 1st activation
KEY1.1 = State:=10, Action:=3            ;Hotkey 1, 2nd activation
KEY1.2 = Action:=4                       ;Hotkey 1, 3rd activation
```

Assignment of the softkeys to the action values

Horizontal softkeys SKHi	Action
SKH1	0
SKH2	1
SKH3	2
SKH4	3
SKH5	4
SKH6	5
SKH7	6
SKH8	7

Vertical softkeys SKVi	Action
SKV1	8
SKV2	9
SKV3	10
SKV4	11
SKV5	12
SKV6	13
SKV7	14
SKV8	15

RECALL key	16
ETC key (only for HMI Embedded)	17

5.1.3 Configuring the M key and Menu Select as HK7, HK8

The M key (Machine) and Menu Select key can be optionally configured as hotkeys. This means that these keys lose their original meaning or function. The new functionality is defined using the **Keys.ini** configuration file. If there is a key definition in the configuration file for the key, but no **response** was saved, then the key does not have a function.

Hotkey assignment:

	MF II keyboard	Hotkey
M key (Machine)	SHIFT+F10	HK7
Menu Select (area switchover)	F10	HK8

If there is no **entry** in the Keys.ini configuration file for hotkey 7, the key will not be mapped as a hotkey but will retain its original function (compatible mode). A key definition without a response will be assigned the <empty> attribute (see example).

Examples

```
[KeyConfiguration]
; Activate mapping of the M key to hotkey 7 and set new
; key reaction
Key7.0 = Task:= 3, State := 10

; Activate mapping of the Menu Select key (F10) to
; hotkey 8,
; key has no function
Key8.0 = <empty> ; No reaction assigned
```

5.1.4 Extensions in HMI Advanced

The machine manufacturer can overload the entries in **Keys.ini** in directory mmc2 with his own settings. These settings can be entered in one of the following directories

\user and
\oem

searched earlier during processing. Only deviations in the settings must be stored, not the complete block.

5.1.5 Action: Special cases in HMI Advanced

HMI Advanced

The ETC key, Action 17, has no effect.

5.1.6 Task, State and Action: Special cases in HMI Embedded

- The range of values for the **Task** is limited to between 0 and 15.
- HMI Embedded always selects the **last** screen combination that was active before the task change. (State not configured).
- The range of values for **State** is limited to 0. **Only** the **main menu** of the operating area can be selected.
- The range of values for **Action** is between 0 and 17:
SK horizontal 1 to 8,
SK vertical 1 to 8,
Recall and
etc. limited.

5.2 Selecting screens created with "Expanding the Operator Interface"

An Action value ≥ 100 automatically switches the HMI software to "Expanding the Operator Interface" operational sequences.

If Action ≥ 100 , the configuration of the **INI files** determines which softkey menu or screen form should be displayed and in which state.

5.2.1 INI files and sections

HMI Advanced and HMI Embedded

The following INI files and sections can be configured for the jump entry to "Expanding the Operator Interface":

<u>Operating area</u>	File	Section
<u>Machine:</u>	machine.ini	[KeyConfigurationAuto] [KeyConfigurationMDA] [KeyConfigurationJOG]
<u>Parameter:</u>	paramet.ini	[KeyConfiguration]
<u>Programming:</u>	program.ini	[KeyConfiguration]
<u>Services:</u>	services.ini	[KeyConfiguration]
<u>Diagnostics:</u>	diagnosis.ini	[KeyConfiguration]
<u>Start-up:</u>	startup.ini	[KeyConfiguration]
<u>Custom</u>	custom.ini	[KeyConfiguration]

JobShop

The INI files for the JobShop products ShopMill and ShopTurn are called **shopmill.ini** and **shopturn.ini**.

Both files contain the following sections, in which 5.2.2 Configuration "Expanding the Operator Interface" functions can be configured as described in

[MachineManual]
...
[MachineAutomatic]
...
[ProgramManager]
...
[Program]
...
[MessagesAlarms]
...
[ToolsZeroOffset]
...
[MachineMDI]

5.2.2 Configuration

One or more states (according to the State list) can be configured for each action (≥ 100) and you can also specify which "Expanding the Operator Interface" function is to be initiated.

If nothing is configured in these INI files, no screen forms or softkey menus will appear.

General notation:

Action.State=Screen form/softkey menu to be loaded, configuration file

Action =	The action is Action ≥ 100 configured in the KEYS.INI.
State =	State in which the application is presently in
Configuration file =	File in which the configuration is stored
LS/LM=	"Expanding the operator interface"- commands to load softkeys/screen forms

Examples

[KeyConfiguration]

```
100.10=LS("Softkey1","param.com")
100.30=LM("Form1","param.com")
101.10=LS("Softkey1","param.com")
101.30=LM("Form2","param.com")
102=LM("Form2","param1.com")
```

For the first line, for example, this means:

If an Action 100 is initiated in state (status/screen) 10, the softkey menu configured in file param.com will be displayed with the name softkey1.

For the last line, for example, this means:

If Action 102 is initiated, the screen form with the name screen form2 will be called in the **actual** screen. This screen form is configured in file param1.com.

5.3 PLC interface

5.3.1 Description of the interface

In the PLC interface area DB19. Byte10 is provided for key selection. Here, the PLC can select **one** key between 50 and 254 directly.
(Keys 1 to 49 are reserved for Siemens, keys 50-254 are specific PLC keys.)

Note

In M:N mode, the area for the 2nd HMI interface is DB19.Byte60
See also: Description of Functions B3 "Interfaces in DB19 for M:N".

Acknowledgment

An HMI system acknowledgment is divided into two steps:

1. In the first step, the HMI software transfers the control information 255 to DB19.Byte10.
2. In the second step, the actual acknowledgment takes place on the PLC in which DB19.Byte10 is cleared.

This is necessary in order that, despite the lack of synchronism between the HMI and the PLC, the same key code transferred twice in immediate succession can be detected by the HMI. This defined virtual key activation enables the HMI to identify every PLC key sequence uniquely. The control information is of no significance to the PLC program (transparent) and must not be changed.

Next key input

If the transfer byte is set to 0, the PLC program can specify a new key. The current key request is processed in parallel in the HMI system. The request leads to a switchover to the corresponding task or initiates a state/action command in the current task (configured in **keys.ini**).

Error

If the task switchover cannot be executed, the operator interface will send a message to indicate this.

5.3.2 Requirements of the PLC program

A new request can only be set if the HMI system has acknowledged the previous request (0 in the interface). If the PLC program is deriving the key from an MCP key or from another source, it must provide sufficient intermediate storage for the key to ensure that no data is lost if the key is pressed very quickly.

5.3.3 Display selection from the PLC

There is an interface between the PLC and the MMC/HT6 to select the displays. These PLC displays offer the same means of display and functions as for the displays selected via the softkeys.

Location and structure of the interface

The interface between the MMC/HT6 and the PLC uses the following data:

MMC 1:
DB19.DBW28: Display number
DB19.DBB30: PLC control bits → MMC, PLC byte
DB19.DBB31: Control bits MMC → PLC, MMC byte

MMC 2:
DB19.DBW28: Display number
DB19.DBB80: Control bits PLC → MMC, PLC byte
DB19.DBB81: Control bits MMC → PLC, MMC byte

PLC byte:
Bit0 Display selection
Bit1 Display deselection

MMC byte:
Bit0 Display selection/deselection accepted
Bit1 Display is selected/deselected
Bit2 Display is selected
Bit3 Display is deselected
Bit4 Error, display selection not possible
Bit7 Inactive bit

Two bytes are used for the **display number** to be transferred by the PLC, one byte respectively (PLC byte and MMC byte) for **coordinating** the display selection.

Using the interface

Table 5-1 DB 19 extract, first MMC interface

	PLC → MMC	Selec- tion	Deselec- tion	MMC → PLC	Selection	Deselec- tion
DBW 28	Display number (1)					
Bit	DBB 30			DBB 31		
0	Display selection	1 (2) 0 (4)		Select/de-select accepted	1 (3) 0 (6)	1 (2) 0 (3)
1	Display deselection		1 (1) 0 (4)	Display is being selected " " deselected	0 (3) 1 (5)	0 (3)
2				Display is selected	0 (3) 1 (7)	0 (3)
3				Display is deselected	0 (3)	0 (2) 1 (3)
4				Error, display selection not possible	0	0 (2)
5				-		
6				-		
7				Inactive	0	

The interface is operated by the **PLC OEM program** with the following functions:

Display selection

The relations with the individual steps are shown in the above table by the numbers in brackets (step numbers).

1. The PLC enters the display number in the number word.
2. The PLC sets bit0 in the PLC byte for display selection if bit0 and bit7 are set to zero in the MMC byte.
3. The MMC/HT6 acknowledges to the PLC that it has accepted the display selection by setting bit0 in the MMC byte. At the same time, the value zero is written to bit3 and bit4 in the MMC byte.
4. The PLC resets bit0 in the PLC byte.
5. The MMC/HT6 acknowledges to the PLC that the interpreter has started by setting bit1 in the MMC byte.
6. The MMC resets bit0 in the MMC/HT6 byte.
7. Bit2 is set in the MMC byte if the corresponding display appears.

Display deselection

1. The PLC sets bit1 for display deselection in the PLC byte if bit1 and bit2 are set in the MMC byte and bit7 is reset.
2. The MMC/HT6 acknowledges to the PLC that it has accepted display deselection by setting bit0 in the MMC byte. At the same time, the value zero is written to bit3 and bit4 in the MMC byte.
3. The MMC/HT6 acknowledges the display deselection to the PLC by setting bit3 and resetting bit0, bit1 and bit2 in the MMC byte if the interpreter is terminated.
4. The PLC resets bit1 in the PLC byte.

After display deselection by the PLC or the EXIT command, the MMC/HT6 switches back to the last selected MMC display.

Error when selecting a display

Bit4 is set in the MMC byte if the interpreter has not responded after 20 seconds or if the required display cannot be opened.

The PLC states of the MMCs which do not support PLC display selection are shown via bit7 in the MMC byte; e.g. the MMC 100.2 for switchover between standard and ShopMill interface.

Operating areas

With the **MMC 103**, the displays are shown in a separate operating area similar to the measuring cycle displays. This operating area can be selected manually by means of the sixth softkey (PLC displays) on the second operating area menu. If no PLC display is active when the area is selected, the text "Currently no PLC display active" is displayed in the header. The PLC is informed when the area is selected/deselected manually via bit2 of the MMC byte.

It is also possible to change to other operating areas via the MMC 103's operating area after a display has been selected by the PLC.

With the **MMC 100.2/HT6**, it is not possible to manually select/deselect displays selected by the PLC via an operating area. The PLC display remains in the foreground even after operating area change has occurred.

Configuring PLC displays

The interface is activated by means of the section **[PLC_SELECT]** in the Common.com file during MMC boot. MMC/HT6 searches the directories for the Common.com file in the following sequence:

- User cycles directory (CUS)
- Standard cycles directory (CST)
- Comment directory (COM)

The first file found is evaluated.

Display numbers are assigned to the configured displays in the Common.com file in the section [PLC_SELECT]. In general, the syntax of an assignment line is:

PC*i* = *display name*, *file* ; *Comment*
i Number of the display in the interface
Screen name Display (screen form) identifier
File File in which the display is configured
Example:
[PLC_SELECT] ; Fixed section introduction
PC1= CYC82, drilling.com ; assignment line
PC2= CYCLE90, millthre.com
PC3=...etc.

5.4 Expanded functions for PLC keys

Changes of task and state can also be configured for PLC keys. The number range for the action lies
between 0 – 17 for standard applications
>= 100 for "expanding the operator interface" applications.

The PLC-specific keys are numbered from **50 - 254**.
(50-81 are reserved for OEM applications)

Examples

Example in accordance with Subsection 5.1.2 Assigning functions to keys:

[KeyConfiguration]

HK50.0 = Action:=100

The configuration shown here does not execute a change of task or state and therefore remains in the current task and screen. An Action 100 is forwarded.

A change of task and state could be configured here in exactly the same way.
HK50.0 = Task:=1, State:=10, Action:=100

5.5 List of selectable states in HMI Advanced

Setting tasks in HMI Advanced

In general, the following conditions apply to all tasks:

No configuration:	Maintains current state
Configuration with 0:	Reverts to the initial state of an operating area.

5.5.1 Machine operating area

In the Machine operating area, the status is always dependent on the status of the machine (AUTO, MDA, JOG, REF). The following can be accessed via the PLC key:

1.) The main screen for the relevant mode

State	Mode group	Machine funct.	Display
0	JOG	REF	JOG/REF main screen
0	JOG	none	JOG main screen
0	JOG	REPOS	REPOS main screen
0	MDA	none	MDA main screen
0	MDA	TEACH	MDA/Teach main screen
0	MDA	REF	MDA/REF main screen
0	AUTO	none	Auto main screen

2.) The main actual value screens for each mode (softkey vertical 6)

State	Mode group	Machine funct.	Display
10	JOG	none	Zoom actual values JOG
20	MDA	none	Zoom actual values MDA
30	AUTO	none	Zoom actual values Auto

3.) Possibly still in jog / MDA

State	Mode group	Machine funct.	Display
60	JOG	none	Handwheel selection JOG
70	JOG	none	Increment selection JOG
80	MDA	none	Handwheel selection MDA

Switching between the WCS and MCS is possible via the PLC.

5.5.2 Parameters operating area

It is not possible to move from the current screen in this area.

5.5.3 Program operating area

State	Function	
10	File selection	
20	Program handling	
70	Protocol	

5.5.4 Services operating area

State	Function	
10	Data in	
20	Data out	
90	Series start-up	
60	Setting data	
80	Interface	
40	Manage data	
100	Upgrade	

5.5.5 Diagnosis operating area

The main screen in the Diagnosis operating area is the alarm overview.
The following horizontal softkeys can be used to access other states from this state:

State	Function	
10	Alarms	
20	Messages	
30	Alarm log	
40	Service displays	
50	PLC status	

Messages, alarm log and service displays can always be accessed.

5.5.6 Start-up operating area

The main screen in the Start-up operating area is an overview of the available NC axes and drives.

State	Function	
0	NC axes and drives	
10	Machine data	
40	PLC status	
50	Drive/servo	
60	MMC	

5.5.7 User-specific Custom operating area

See Chapter 6.

5.6 List of selectable states in HMI Embedded

State entries in HMI Embedded

There are only two configuration options for the State in HMI Embedded.

1. No configuration: Maintains current state
2. Configuration with 0: Reverts to the initial state of an operating area.

5.7 List of selectable states in ShopMill

5.7.1 Machine Manual

State	Function	Remarks
19	Manual main screen	
2	T,S,M,...	
21	Set basic ZO	
30	Workpiece zero	
7	Edge z	*)
5	Edge x	
6	Edge y	
8	Corner	*)
9	Hole	*)
10	Spigots	*)
31		*)
11	Calibration probe length	*)
12	Calibration probe radius	
32		*)
50	Measure Tool	
16	Length manual	*)
17	Diameter manual	*)
13	Length auto	*)
14	Diameter auto	*)
51		*)
15	Calibration probe	*)
52		*)
20	MDA	
4	Positioning	
18	Face milling	
1	Settings	

*) These designated functions can be configured with the "Expanding the Operator Interface" system. If this type of configuration is available, it is activated. Otherwise, the standard ShopMill screen will appear.

5.7.2 Machine Auto

State	Function	Remarks
200	Current block display	
210	Program control	
220	Block search	
230		*)
	Simultaneous recording:	
241	Settings	
242	Top view	
243	3-level view	
244	Volume model	

5.7.3 Program Manager

State	Function	
300	NC directory	
310	User path	
320	User path	
330	User path	
340	User path	

5.7.4 Program

State	Function	
400	Program listing	
	Simulation:	
412	Top view	
413	3-level view	
414	Volume model	

5.7.5 Messages Alarms

State	Function	Remarks
500	Messages	
510		*)
520		*)

5.7.6 Tools zero offsets

State	Function	Remarks
600	Tool list	
610	Tool wear	
620	OEM tool list	
630	Magazine	
640	Zero offset	
650	R parameters	
660		*)
	User data:	
680	User data	

5.7.7 Run Screen

State	Function	Remarks
910	Run Screen in manual mode	
920	Run Screen in MDA mode	
930	Run Screen in Automatic mode	

5.8 List of selectable states ShopTurn

5.8.1 Machine Manual

State	Function	Remarks
19	Manual basic screen	
2	T,S,M,...	
21	Set basic ZO	
30	Workpiece zero	
31		*)
34		*)
35		*)
36		*)
37		*)
38		*)
40		*)
50	Measure Tool	
51	Length manual X	*)
52	Length manual Z	*)
53	Tool gauging with zoom-in function	*)
54		*)
55		*)
56	Probe calibration	*)
57		*)
58	Automatic tool gauging X	
59	Automatic tool gauging Z	
20	MDA	
4	Positioning	
80	Stock removal	After "acceptance" 81; output only, screen cannot be accessed
90		*) After "acceptance" 91; output only, screen cannot be accessed
1	Settings	

*) These designated functions can be configured with the "Expanding the Operator Interface" system. If this type of configuration is available, it is activated. Otherwise, the standard ShopTurn screen will appear.

5.8.2 Machine Auto

State	Function	Remarks
200	Current block display	
210	Program control	
220	Block search	
230		*)
	Simultaneous recording:	
242	3-window view	
243	Side view	
244	Front view	
245	Volume model	

5.8.3 Program Manager

State	Function	
300	NC directory	
310	User path	
320	User path	
330	User path	
340	User path	

5.8.4 Program

State	Function	
400	Program listing	
	Simulation:	
412	3-window view	
413	Side view	
414	Front view	
415	Volume model	

5.8.5 Messages Alarms

State	Function	Remarks
500	Messages	
510		*)
520		*)

5.8.6 Tools zero offsets

State	Function	Remarks
600	Tool list	
610	Tool wear	
620	OEM tool list	
630	Magazine	
640	Zero offset	
650	R parameters	
660		*)
670	Spindles	
	User data:	
680	User data	

5.8.7 Run Screen

State	Function	Remarks
910	Run Screen in manual mode	
920	Run Screen in MDA mode	
930	Run Screen in Automatic mode	

Note

Screens marked *) may also have been configured using the "Expanding the Operator Interface" system. In this case, the screen configured by the user is addressed.

In ShopMill and ShopTurn, the active states in DB82 DBW44 are sent to the PLC.

5.9 Hotkey assignment on the MFII keyboard

Hotkey	OP label	MFII key
HK1	Position	SHIFT F11
HK2	Program	END (NB)*
HK3	Offset	Page Down (comment)*
HK4	Prg.Manager	Home (comment)*
HK5	Alarm	Page Up (comment)*
HK6	Custom	SHIFT F12 or Cursor Down (comment)*
HK7	M Machine	SHIFT F10
HK8	Menu Select	F10

*) The key is on the numerical keypad. NumLock must be off.

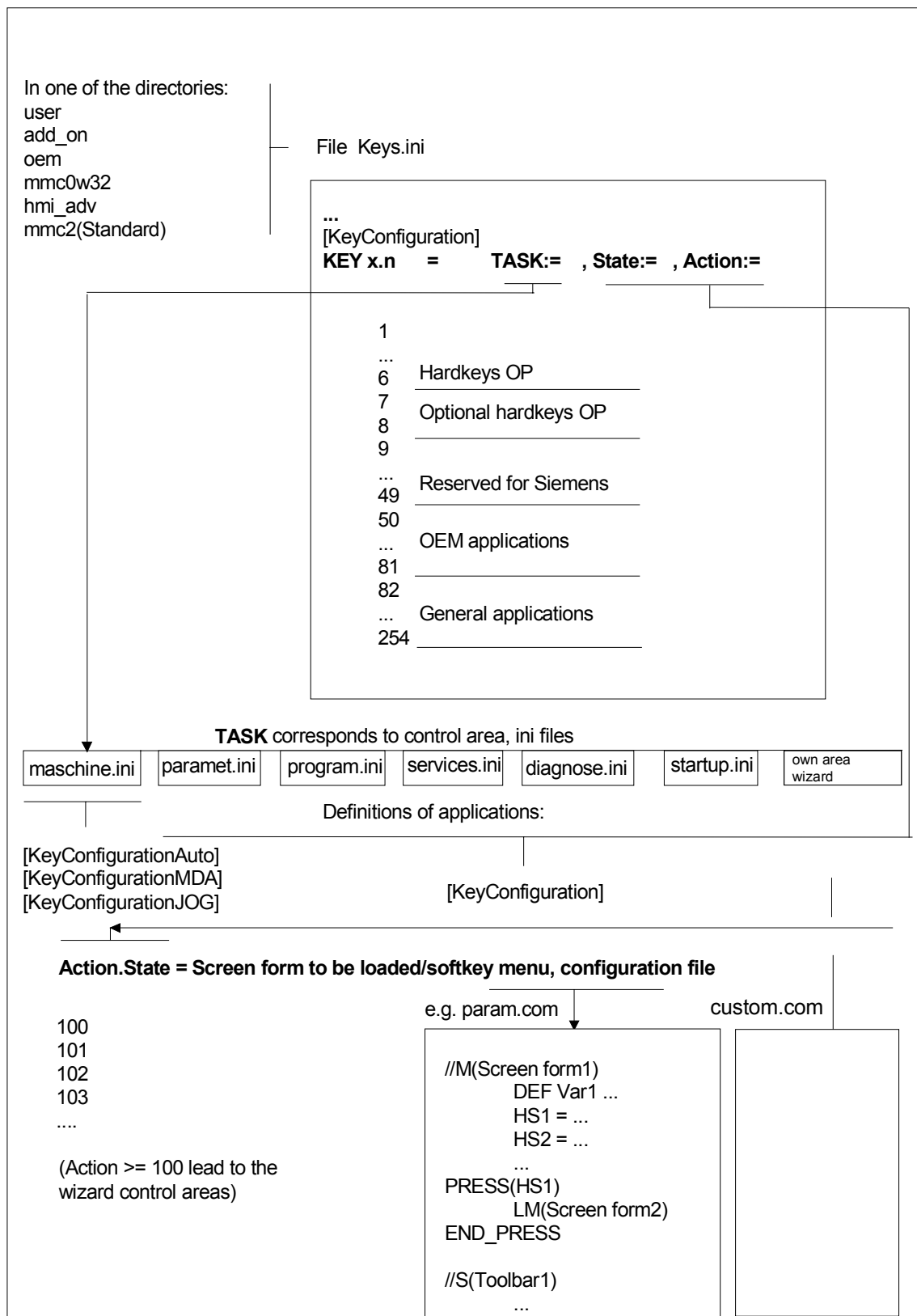
5.10 Examples

Possible entries for Keys.ini

KEY1.0 = Task:=0	Selection of the Machine area in the last screen the first time the key is pressed
KEY1.1 = Task:=0, State:=0	Selection of the Machine area in the start screen the second time the key is pressed
KEY1.2 = State:=0, Action:=3	Selection of the Machine area in the start screen the third time the key is pressed and selection of the 3rd softkey
KEY1.3 = State:=0, Action:=100	Selection of the Machine area in the start screen the fourth time the key is pressed and selection of the "Expand operator interface" function with the action configured under 100 in machine.ini

5.11 Configuration overview

Below is a schematic diagram illustrating the associations between configured OP hotkeys and PLC keys and the "Expanding the Operator Interface" configuration.



5.12 Terms

Hotkeys

6 keys on OP010, OP010C and Sinumerik keyboards with hotkey blocks. Pressing the keys selects an operating area directly.
As an option, 2 additional keys can be configured as hotkeys.

References: /BH/, Operator Components Manual

PLC keys

PLC keys are provided as hotkeys via the PLC interface of the HMI software. Their reactions can be configured in the HMI. They are set up as:

- Keys of the machine control panel
- Signal logical interconnections of the PLC that are evaluated

These are also known as "virtual keys".

SK

Softkey

Virtual keys

See PLC keys.



6

6 Separate Custom Operating Area (SW 6.2)

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6.1 Introduction

The operating areas described thus far can be extended and modified using "Expanding the Operator Interface" tools. Extensions can only be applied to softkeys which have not been used previously. With the resources described in the following, it is possible both in

- HMI Embedded, as well as also in
- HMI Advanced

to configure an autonomous operating area in which all of the 8 horizontal and 8 vertical softkeys are available for an application-specific operator interface. The default name of this operating area is **Custom**.

The Custom operating area can be accessed directly (on OPs with hotkey blocks: OP 010, OP 010C) with:

- the "Custom" hotkey or
- horizontal softkey 4 on the step menu (default setting)
(softkey menu which appears when the ETC key is pressed once in the main screen).

6.1.1 Scope of delivery

HMI Advanced

The CUSTOM operating area is available as standard and can be reset via an entry in file **regie.ini** (control.ini) or assigned to any other horizontal softkey.

HMI Embedded

The CUSTOM operating area is available as standard. It is supplied with the application diskette and can be assigned to any horizontal softkey by the customer using the Software Configuration Kit (SCK.exe).

Details for integrating the Custom operating area into the system can be found in 6.1.5 Integrating the Custom operating area.

6.1.2 Activation on start-up

HMI Advanced

See Integrating the Custom operating area 6.1.5 b).

HMI Embedded

Using the display machine data MD 9016: MM_SWITCH_TO_AREA, you can define in which operator area HMI-Embedded should run-up; whereby, the CUSTOM operating area can be specified.

The value in the MD provides the number of the softkey for the required operating area.

Horizontal softkeys 1 – 8:	1 – 8
Softkeys of the 1st continue bar after pressing ETC:	9 – 16
The standard default setting is 12.	

6.1.3 Activation via keys

With hotkey

The CUSTOM hotkey on the OP 010 and OP 010C always activates this operating area (default). Other additional configurations are possible.

With horizontal softkey

The standard activation is via horizontal softkey 4 in the 1st step menu.

The softkey assignment can be changed for

HMI-Advanced

as specified in 6.1.5 Integrating the Custom operating area
for

HMI-Embedded

using the Software Configuration Kit (SCK).

6.1.4 Features of the Custom area

The CUSTOM operating area displays a standard empty window with a configurable header across the whole area of the local menu.

The CUSTOM operating area also permits a configurable text in the operating area display field in the global menu.

All softkeys are empty and can be assigned as required by the customer using the "Expanding the Operator Interface" definition and provided with "Expanding the Operator Interface" functionality.

When switching from and back to the CUSTOM area, the configured screen which was active before exiting the CUSTOM operating area is active.

6.1.5 Integrating the Custom operating area

HMI Advanced

The operating area is enabled in the **regie.ini** file and is assigned to a softkey.

Example:

Activation via horizontal softkey 4 in the 1st step softkey menu (standard assignment).

a) The entry must be made in section **[TaskConfiguration]**:

```
Task11 = name := custom, Timeout := 12000
```

b) In file control.ini this operating area can also be selected as the standard start-up area. The entry must be made in section **[Miscellaneous]**:

```
PoweronTaskIndex = 11
```

The corresponding lines can be deactivated by adding a ";" comment line at the beginning of the line if the Custom area is not to be selected or should not be activated on start-up.

The area can be assigned to a different softkey by changing the task number.

HMI Embedded

The HMI software for the CUSTOM application evaluates file **custom.ini** and decides whether the area should be displayed. The file contains a section for this purpose (HMI Embedded only):

[Activate]

Activate=True

The operating area is assigned to a horizontal softkey by the customer using the Software Configuration Kit (SCK.EXE), menu option "Modify configuration".

In order for the Custom operating area to be activated by default on start-up, the softkey numbers must be entered in display machine data MD 9016: MM_SWITCH_TO_AREA.

If this display MD has the value -1, HMI Embedded will start up in the operating area specified as the start-up area with the SCK. (When delivered, softkey 1 in the main menu → area MACHINE).

6.2 Configuration and functions

6.2.1 Configuration of the start screen

The inputs in file **custom.ini** are used for the starting screen form and those in file **re_xx.ini** for the operating area name in HMI Advanced.

HMI Advanced	HMI Embedded
Screen form header A text with the screen form header can be entered into this section [Header] . This can be entered as text: Text="XY special functions" or using an alarm text number: Text=\$80XXX in order that the header can be laid-out depending on the language. Text="Custom" is set as default.	
Picture in start-up screen form A path for a screen can be entered in the section [Picture] that is displayed when the application starts up: Picture=\directory\bild.bmp	
Operating area name The name specified appears in the top left of the screen form displayed. In file re_xx.ini, xx indicates the language. (File re_xx.ini only exists in HMI Advanced.) [HSoftkeyTexts] HSK11 = "Custom"	Operating area name The name specified appears in the top left of the screen form displayed. Section [Task name] Notation: Text = \$80xxx
Softkey label The name entered as the operating area name in file re_xx.ini is also displayed on the configured softkey.	Softkey label Section [Softkey] Notation: Text = \$80xxx The text entered is displayed on the softkey assigned. If nothing has been entered, CUSTOM will appear as standard.

All Custom area elements which are used to access other elements, e.g.

- softkey menus
- I/O fields

and their associated functions must be configured using "Expanding the Operator Interface" tools.

In the CUSTOM application, **all** softkeys are available as "Expanding the Operator Interface" softkeys.

These softkeys are configured in file **custom.com** (like the standard version of aeditor.com) as described below.

In HMI Embedded, references must be made in file common.com (access file on the NC for "Expanding the Operator Interface") to custom.com for the customer start softkeys. Common.com is supplied so that all *CUSTOM* operating area softkeys are linked to custom.com.

6.3 Response to operating area changeover

When you change from the **CUSTOM** operating area to another operating area and back again, the window which was active when you closed the CUSTOM operating area reappears the next time you open it.



7

7 Configuring and Working Environment

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7.1 General information about the configuring environment

Scope of delivery

The software which interprets the configuration files for operator interfaces, and provides or activates the functions described in earlier sections, is an integral component of the scope of supply of MMC SW 5.2 and higher. It also includes an ASCII editor for creating the contents of configuration files. (Program editor).

SW version 6 redefines the designations for the operating software packages running on PCU 20, PCU 50 and PC with WinNT:

HMI Embedded runs on PCU 20 with:

OP 010
OP 010C
OP 010S
OP 0012
OP 015 and as

HMI Embedded WIN32 on:

PCU50 and
PC with WinNT as well as

HMI Advanced on:

PCU50
PC with WinNT

JobShop products

The JobShop products ManualTurn, ShopMill and ShopTurn are based on HMI Embedded.

HMI Embedded WIN32 and HMI Advanced can be combined on a single hardware platform. Thus, the JobShop products operating systems are available as alternatives to HMI Advanced on a single hardware platform. The special considerations for configuration and search strategies for this case are described in Section 7.4 HMI Embedded and HMI Advanced on a shared hardware platform.

Creating displays

If the configured screen forms are to include graphics, then a suitable graphics program will be required. The following subsections contain relevant system-specific information.

Differences between systems

Hardware differences:

- MMC 103, HMI Advanced on PCU 50 have a hard disk
- MMC 100.2, HT6, HMI Embedded on PCU 20 only have a user memory and a Flash memory
- HMI Embedded WIN32 on PCU 50 or PC with WIN NT evaluates hard disk configuration data and otherwise operates in the same way as HMI Embedded on PCU 20.

Because of these differences, data is handled differently when creating the configuration files.

Language-dependent texts

Texts used in screen forms can be specified explicitly in configuration files or, particularly in cases where screen forms are to be displayed in different languages, stored separately in text files. The syntax for texts in screen forms and alarm texts is identical. You can choose between:

- incorporation of texts into user alarms (MMC 100.2, HMI Embedded, MMC 103, HMI Advanced, HT6)
- separate files for text in configured screen forms on the NC (MMC 100.2, HMI Embedded, HT6).

More information about this variant for setting up configuration files directly on the control appears in "Storing configuration files".

The selected method must be defined by means of further control file entries on the MMC 100.2, HMI Embedded, HT6.

Language-dependent texts can be used for:

- Softkey labels
- Headings
- Help texts
- Any other texts

Text file names

When text is incorporated into alarm texts ALUC (user cycle alarms)

The method of incorporating text into alarm text files is identical for MMC 100.2, HMI Embedded, HT6 and MMC 103, HMI Advanced.

The names of the language files can be defined by the user and are specified in COMMON.COM.

For more information, see "Structure of the COMMON.COM control file".

Format of a text entry

The text number is assigned to the text within the file by the following method:

8xxxx 0 0 "text"

where:

xxxx 5000 to 9899 (text identification number range reserved for users).

The numbers must only be assigned once.

Text Text that appears in the screen form, enclosed in quotation marks

Examples:

85000 0 0 "Retraction level"

85001 0 0 "Drilling depth"

85002 0 0 "Thread pitch"

85003 0 0 "Pocket radius"

Parameters 2 and 3 are separated by blanks and act as control characters for alarm text output. To ensure that the text format is identical to that of the alarm texts, these two parameters must always be set to 0.

The following control characters may be inserted in text:

%n Line break

%@x Axis name of axis x (x is a number between 1 and 5),
(only MMC 100.2, HMI Embedded, HT6)
Display axis names, **general solution**
MMC 100.2, HMI-Embedded, HT6 and
MMC 103, HMI_Advanced:
NC access to relevant machine data, string functions.

Maximum text lengths

Long text for standard screen size	62 characters or 25 characters for HT6
Screen form header	21 characters or 12 characters for HT6

7.2 MMC 100.2, HMI Embedded, HT6

Central control file COMMON.COM

The file contains the following information for "**Expanding the Wizard directory**":

- Assignment between start softkeys and configuration files
- Assignment of user keys to configuration files (only relevant for HT6)
- Assignment of display numbers to configuration files in PLC interface DB19
- Control entries (size of LOG file, available memory on RANRIVE for configuration files, search criteria for language-dependent texts, search criterion for configuration files)

Details of how to make the appropriate entries in file COMMON.COM for the MMC 100.2, HMI Embedded, HT6 can be found in the next subsection.

Changes to COMMON.COM only take effect following a restart.

Storage location

The central control file COMMON.COM must be stored in one of the following **NC** directories:

1. \CUS ; User cycles directory
2. \CST ; Standard cycles directory
3. \COM ; Comment directory

The system searches through the directories for COMMON.COM in the following order. The first file with this name is evaluated.

The files with the configured form definitions must be stored:

- in one of the three specified directories
- in the Flash memory of the MMC 100.2, HMI Embedded, HT6 (DOS file name conventions apply) BIN directory

Size and number of configuration files

Total size of all configuration files: Approx. 124 KB. Of the 256 KB total available space, approximately 132 KB are allocated to the system. The size of all archive files and texts must not exceed 128 KB (256 KB for HMI Embedded on **PCU 20**). The total permissible number of configuration files is 10.

Displays

A graphics program which can be used to create displays for configured screen forms in PCX format must be supplied by the user if necessary.

Color format: 16 colors.

In SW 6.2 or higher, PCU 20 and PCU 50 .bmp images and their conversions with up to 256 colors can also be used (PCX2BIN application).

Files containing displays in PCX format must be stored in converted, compressed form in the Flash memory. The PCX_CONV tool is available in the application environment for this purpose. Picture files in PCX format must not exceed 64 KB per picture.

Performance

If screen form configuration files are executed from the Flash memory, screen forms are displayed and processed significantly faster. This option should therefore be chosen where possible.

7.2.1 Structure of the COMMON.COM control file

COMMON.COM contains various sections for hardware-specific settings. The [MMC_DOS] section is relevant for expanding the wizard directory on the MMC 100.2, HMI Embedded. Section [HT6] is used for HT6.

Note

The file is supplied together with the cycles. It must always be set up on the NC.

Syntax of COMMON.COM

Comments:

All characters contained within a line after a semicolon ";" are treated as comment and are not evaluated.

[MMC_DOS]/[HT6] ;Start of the DOS or HT6 section

Parameter:

The general notation is:

Parameter=*Value* ;Any number of blanks may be inserted between
;Parameter '=' and *value*.

All parameters are optional.

Possible parameters:

SCxxx=*file* or HCyyy=*file*

SCxxx Softkey Connection (connection between softkey and configuration file). xxx represents an internal softkey identity of the start softkey. See Chapter 2 "Defining a start softkey". The softkey identity must be entered directly after SC. Softkeys will not be displayed unless a softkey connection is defined for them.

File The configuration file which contains the desired softkey and screen form definitions. MMC and HMI file names may only be 8 characters in length. The file extension is added with a dot.

Examples:

SC101= **my_file.com** ; (my_file.com on MMC, HMI, NC)

HCyyy Hotkey connection (a connection between real key and configuration file). yyy represents an internal hotkey identity of the start hotkey (see Subsection "Start softkeys"). The hotkey identity must be entered directly after HC. Only hotkeys for which a hotkey connection has been defined have an effect.

Note

The files names listed in Table 2-1 are already stored as defaults. The matching files must however be set up on the NC or MMC, HMI, HT6 by the user.

LAN1=File

File Language-dependent file which contains the foreground language (1st language) of all configured texts.

LAN2=File

File Language-dependent file which contains the background language (2nd language) of all configured texts.

If parameters LAN1/LAN2 are assigned, then the system looks for language-dependent texts in these files first before searching through the cycle alarm texts. The contents of the files specified by LAN1/LAN2 matches the format of the alarm texts (see Section 7.1 General information about configuring environment). The file names can be freely assigned as part of the secondary conditions according to Section 1.3. COM is the file extension. These text files allow texts to be created directly in online operation which can then be displayed directly in screen forms created online.

CHK_FILE_EXIST=ram

ram This control flag: specifies whether configuration files must be copied each time by the NC or whether a check must be made as to whether the files are already stored on the RAM drive of the MMC 100.2, HMI, HT6. Possible values:

0:

A check whether the file already exists on the RAM drive is not carried out. A search is first carried out in

- the NC user cycles directory, then in
- the NC manufacturer cycles directory, then in
- the NC standard cycles directory, then in
- the NC comments directory and finally in
- the Flash File System on the MMC 100.2, HMI Embedded, HT6

This mode is only set while the configuration files are being set up online on the NC. Changes to configuration files in the NC then become operative immediately on the MMC 100.2, HMI, HT6, slowing down the display building process.

1:

Default setting (if CHK_FILE_EXIST has not been set):

The configuration files are read once into the RAM and executed thereafter from there. (This means:

an improved runtime, but no reaction to changes in the configuration files in the NC).

LOGSIZE=*kB*

KB Size of the LOG file in KB (max. size = 64 KB). A LOG file named ERROR.COM is set up on the RAM disk of the MMC/HT6; its size is determined by this parameter setting.

CHK_FILE_EXIST = *tf*

tf **0:**
The files are always copied into RAMDISK, even if they are already there. Existing files are overwritten.

1:
The files are only copied into RAMDISK, even if they are not already there.
Default setting:
If CHK_FILE_EXIST is not specified, then 1 is assumed. This means that the files are only copied if they are not already there.

RAMDISK_SIZE = *kBrd*

kBrd Size of the available RAMDISK spacing in KB for expanding the wizard directory.
RAMDISK_SIZE can be located at any position - within or outside the sections. If the element occurs several times, then the **first** occurrence is relevant.
Example:
RAMDISK_SIZE=200 ; → 200 KB

The standard value (if the element RAMDISK_SIZE was not specified) is 100 KB.

In SW 6.5 and higher, the default value is 300 KB

If, **after** copying, the selected size has been exceeded, all of the COM files in the directory for expanding the operator interface on the RAMDISK are deleted **before** the next copying operation. (Files for screen forms in the background (for operating area change) are still kept.)

Example of COMMON.COM

```

%_N_COMMON_COM
[MMC_DOS]
sc101=tooth.com           ; MACHINE
                           ; Files are located in the
                           ; Flash memory of the MMC

sc111=mda.com
sc122=auto.com
sc207=param.com           ; PARAMETER
sc314=aeditor.com         ; PROGRAM, Editor
sc315=aeditor.com
sc316=aeditor.com
sc407=dienste.com         ; SERVICES
sc507=diagnose.com        ; DIAGNOSTICS
sc607=inbetrn.com         ; Start-up
sc826=cmm.com             ; ShopMill, Machine, AUTO
sc857=cmm.com             ; Messages/
sc858=cmm.com             ; alarms
sc867=cmm.com             ; Tools, ZO
LAN1=stdlan1.com          ; Configured form texts
                           ; are in stdlan1.com in the
                           ; Flash memory
LAN2=_N_stdlan2_com       ; Background language on NC
CHK_COMMON.COM=1          ; faster processing
                           ; from MMC
LOGSIZE=30                ; 30 kB for LOG of errors in
                           ; the screen forms
[PLC_SELECT]              ; declaration of
                           ; displays that can be called from
                           ; the PLC, see below.
PC1= CYC82, drilling.com   ; display 1
PC2= CYCLE90, millthre.com ; display 2

```

Displays, which can be called from the PLC

If displays are to be called from the PLC for "Expanding the Operator Interface" (from SW 5.3), then it is necessary to create a section [PLC_SELECT].

This section is for assigning the display numbers to the configured displays. In general, the syntax of an assignment line is:

PC<i>i</i>	=	<i>display name, file</i>	;	<i>Comment</i>
<i>i</i>				Number of the display in the interface
<i>Screen name</i>				Display (screen form) identifier
<i>File</i>				File in which the display is configured

Example:

```

[PLC_SELECT]              ;Fixed section introduction
PC1= CYC82, drilling.com   ;assignment line
PC2= CYCLE90, millthre.com
PC3=...etc.

```

In the complete example shown above, the section [PLC_SELECT] is at the end of Common.com.

Structure of the text files acc. to LAN1, LAN2

The syntactic structure of files specified with LAN1/LAN2 is the same as that of alarm texts. See 7.1

Notice:

This mechanism is not compatible with the HMI language concept. It is merely used for the online creation of language-dependent texts (text phase). As soon as the user screens have been created their contents must be copied to the relevant (ALUC.TXT).

The file names can be freely assigned as part of the secondary conditions according to Section 1.3. COM is the file name extension.

The text files are defined with DOS notation (e.g. LAN1=my_text.com).

If LAN1/LAN2 is specified in COMMON.COM, the associated text files are searched for in the following sequence:

1. User cycles directory
2. Standard cycles directory
3. Comment directory
4. Current directory on the MMC

If LAN1/LAN2 is not specified, the search is performed in the user cycle alarm texts (ALUC) and in the standard cycle alarm texts (ALSC) only.

Once the screens have been created the text files specified in LAN1/LAN2 must be read out of the NC and integrated in ALUC.TXT/ALSC.TXT. Before normal operation starts entries LAN1/LAN2 must either be removed or marked as a comment.

Note

To simplify the configuring process on the MMC 100.2, HMI, HT6, a further text file named SPT.COM (temporary alarm text file) is provided, allowing texts to be loaded for \$8xxxx. This file is needed to avoid having to create file ALUC_xx.COM in the EPROM during trial runs.
(xx language code as specified in Table 5-1)

Start softkeys

The start softkeys named here can be used to activate the associated configuration files.

The possible start softkeys for screen forms are predefined. Additional start softkeys are not possible. Access points are specific to operating areas.

SCxxx=File

SCxxx Softkey Connection (link between softkey and configuration file). xxx represents one of the internal softkey identities for start softkeys listed below

File Name of configuration file

Access points in operating area:

MACHINE	SCxxx	Screen form:	
	SC101	MACHINE JOG	Horizontal SK 1
	SC111	MACHINE MDA	Horizontal SK 1
	SC122	MACHINE AUTO	Horizontal SK 2
PARAMETERS	SC207	Main screen of PARAMETERS	Horizontal SK 7
PROGRAM	SC308	Main screen of PROGRAM	Horizontal SK 8
	SC312	1st softkey line of the editor	Horizontal SK 2
	SC313	1st softkey line of the editor	Horizontal SK 3
	SC314	1st softkey line of the editor	Horizontal SK 4
	SC315	1st softkey line of the editor	Horizontal SK 5
	SC316	1st softkey line of the editor	Horizontal SK 6
	SC326	2nd softkey line of the editor	Horizontal SK 6
	SC327	2nd softkey line of the editor	Horizontal SK 7
SERVICES	SC407	Main screen of SERVICES	Horizontal SK 7
DIAGNOSIS	SC507	Main screen of DIAGNOSIS	Horizontal SK 7
START-UP	SC607	Main screen of START-UP	Horizontal SK 7
	SC616	2nd softkey line of the editor	Horizontal SK 6
	SC617	2nd softkey line of the editor	Horizontal SK 7
ManualTurn	SC702	More menu of basic menu	Horizontal SK 2
	SC703	More menu of basic menu	Horizontal SK 3
	SC704	More menu of basic menu	Horizontal SK 4
	SC705	More menu of basic menu	Horizontal SK 5
	SC706	More menu of basic menu	Horizontal SK 6
	SC707	More menu of basic menu	Horizontal SK 7
ShopMill	SC818	Machine Manual operating area	Horizontal SK 8
	SC8131	Machine Manual-Workpiece Zero operating area	Vertical SK 1
	SC8132	Machine Manual-Workpiece Zero operating area	Vertical SK 2
	SC8133	Machine Manual-Workpiece Zero operating area	Vertical SK 3
	SC8134	Machine Manual-Workpiece Zero operating area	Vertical SK 4
	SC8135	Machine Manual-Workpiece Zero operating area	Vertical SK 5
	SC8136	Machine Manual-Workpiece Zero operating area	Vertical SK 6
	SC8137	Machine Manual-Workpiece Zero operating area	Vertical SK 7
	SC8141	Machine Manual-Tool Gauging operating area	Vertical SK 1
	SC8142	Machine Manual-Tool Gauging operating area	Vertical SK 2
	SC8143	Machine Manual-Tool Gauging operating area	Vertical SK 3
	SC8144	Machine Manual-Tool Gauging operating area	Vertical SK 4
	SC8145	Machine Manual-Tool Gauging operating area	Vertical SK 5

SC8146	Machine Manual-Tool Gauging operating area	Vertical SK 6
SC8147	Machine Manual-Tool Gauging operating area	Vertical SK 7
SC826	Machine Auto operating area	Horizontal SK 6
SC8436	Program-Milling operating area	Vertical SK 6
SC8426	Program-Drilling operating area	Vertical SK 6
SC8454	Program-Miscellaneous operating area	Vertical SK 4
SC8951	Program-Miscellaneous-Workpiece Zero operating area	Vertical SK 1
SC8952	Program-Miscellaneous-Workpiece Zero operating area	Vertical SK 2
SC8953	Program-Miscellaneous-Workpiece Zero operating area	Vertical SK 3
SC8954	Program-Miscellaneous-Workpiece Zero operating area	Vertical SK 4
SC8955	Program-Miscellaneous-Workpiece Zero operating area	Vertical SK 5
SC8956	Program-Miscellaneous-Workpiece Zero operating area	Vertical SK 6
SC8957	Program-Miscellaneous-Workpiece Zero operating area	Vertical SK 7
SC8961	Program-Miscellaneous-Tool Gauging operating area	Vertical SK 1
SC8962	Program-Miscellaneous-Tool Gauging operating area	Vertical SK 2
SC8963	Program-Miscellaneous-Tool Gauging operating area	Vertical SK 3
SC8964	Program-Miscellaneous-Tool Gauging operating area	Vertical SK 4
SC8965	Program-Miscellaneous-Tool Gauging operating area	Vertical SK 5
SC8966	Program-Miscellaneous-Tool Gauging operating area	Vertical SK 6
SC8967	Program-Miscellaneous-Tool Gauging operating area	Vertical SK 7

	SC857	Messages/Alarms operating area	Horizontal SK 7
	SC858	Messages/Alarms operating area	Horizontal SK 8
	SC867	Tools/Zero offsets operating area	Horizontal SK 7
	SC8493	Program-G-Code-Editor operating area	Horizontal SK 3 (drilling cycles support) *
	SC8494	Program-G-Code-Editor operating area	Horizontal SK 4 (milling cycles support) *
	SC8495	Program-G-Code-Editor operating area	Horizontal SK 5 (turning cycles support) *
ShopTurn	SC818	Machine Manual operating area	Horizontal SK 8
	SC8141	Machine Manual-Tool Gauging operating area	Vertical SK 1
	SC8142	Machine Manual-Tool Gauging operating area	Vertical SK 2
	SC8143	Machine Manual-Tool Gauging operating area	Vertical SK 3
	SC8144	Machine Manual-Tool Gauging operating area	Vertical SK 4
	SC8145	Machine Manual-Tool Gauging operating area	Vertical SK 5
	SC8146	Machine Manual-Tool Gauging operating area	Vertical SK 6
	SC8147	Machine Manual-Tool Gauging operating area	Vertical SK 7
	SC826	Machine Auto operating area	Horizontal SK 6
	SC8246	Program-Drilling operating area	Vertical SK 6
	SC9456	Program-Milling operating area	Vertical SK 6
	SC9436	Program-Turning operating area	Vertical SK 6
	SC8454	Program-Miscellaneous operating area	Vertical SK 4
	SC857	Messages/Alarms operating area	Horizontal SK 7
	SC858	Messages/Alarms operating area	Horizontal SK 8
	SC867	Tools/Zero offsets operating area	Horizontal SK 7
	SC8493	Program-G-Code-Editor operating area	Horizontal SK 3 (drilling cycles support) *
	SC8494	Program-G-Code-Editor operating area	Horizontal SK 4 (milling cycles support) *

SC8495 Program-G-Code-Editor
operating area

Horizontal SK 5
(turning cycles
support) *

* This involves Siemens screen forms

Start hotkeys for HT6

The start hotkeys named here can be used to activate the associated configuration files.

The possible start hotkeys for screen forms are pre-defined. No additional start hotkeys can be configured. Access points are specific to operating areas.

HCyyy=File

HCyyy hotkey connection (connecting the hotkey with the configuration file). yyy stands for one of the internal hotkey identities listed below for the start hotkeys; file is the name of the configuration file identities for start hotkeys:

HCyyy	Key:
HC1	User key U1
HC2	User key U2
HC3	User key U3
HC4	User key U4
HC5	User key U5
HC6	User key U6
HC7	User key U7
HC8	User key U8
HC11	Special key S1
HC12	Special key S2
HC21	TEACH key

7.2.2 Saving configuration files on the NC and Flash File System

Introduction

While form configuration files are being created or tested, it is useful to store them on the NC so that they can be edited with the program editor and the result checked immediately.

Since configuration files have to be copied to the RAM of the MMC, HMI every time they are accessed by the NC, the resulting access times are long.

For this reason, tested configuration files (except for the control file COMMON.COM) should be transferred to the Flash File System of the MMC and executed from there to achieve the best possible performance.

Configuration files are write-protected once they are stored in the Flash File System.

Displays can only be inserted in screen forms from the Flash File System.

The following sections describe the steps needed to transfer configuration files and displays to the Flash File System on the MMC 100.2, HMI using a PCMCIA card.

Preconditions, tools

You will need a PC with programmer for PCMCIA cards or a PG with integrated programming device for PCMCIA cards.

Software requirements:

- MMC 100.2, HMI, HT6 system environment
- MMC 100.2, HMI, HT6 application environment
- Sinucopy FFS (software to program PCMCIA cards)
- PCIN/SinuCom PCIN (software for file transfer via an RS-232 interface for configuration files from NC to PG/PC if applicable)

Overview

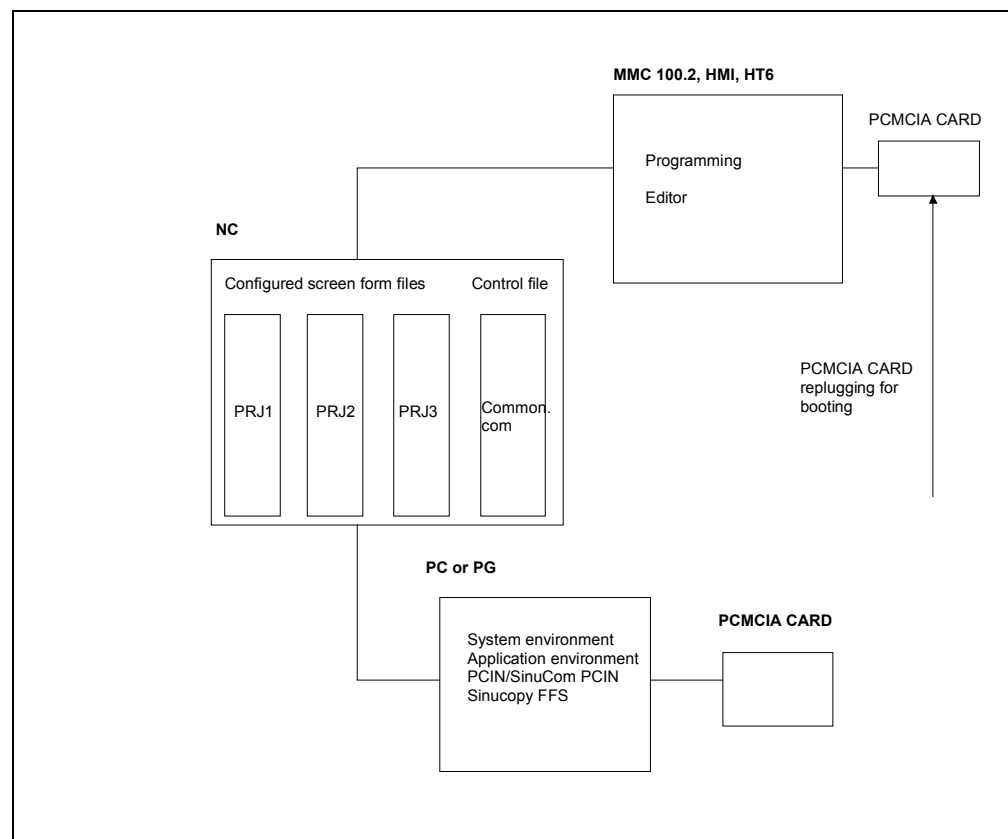


Fig. 7-1 Procedure for generating a PCMCIA card with screen form configuration files

7.2.3 Procedure for MMC 100.2, HMI Embedded, HT6

The following sections restrict themselves to the operations and procedures that are relevant in conjunction with expanding the Wizard directory. More general information is provided in the Start-up Guide.

The following steps must be taken:

- Prepare files
- Creating a PCMCIA card image
- Transfer the PCMCIA card image to the PCMCIA card
- Transfer PCMCIA card to MMC 100.2, HMI Embedded

Prepare files

1. Install the system environment on your PC/PG
2. Install the application environment on your PC/PG
3. Archive your display data and screen form configuration files as follows using the ARJ program supplied:

- * Each file is saved in a separate archive
- * The name of the archive is the same as that of the file, whereby the last character of the file name extension is an '_'.

Examples:

abc.com is stored in abc.co_
my_pic.bin is stored in my_pic.bi_

ARJ is invoked: `arj u my_pic.bi_ my_pic.bin`

4. Check whether the total size of your files meet the requirements outlined in Section 7.2 in terms of definition and size. If not, you must reduce the space required by your display images by the following methods:
 - Smaller formats
 - Less complexity
 - Fewer colors
 - Fewer display images
 - etc.
 - Removing texts

Enter your files in the same way as you did for previous entries.

Alternative:

If you wish to integrate the texts for configuring forms into alarm texts, copy them using an ASCII editor into file

ALUC.TXT in the application environment in the appropriate language-specific directories.

These files are stored in directories:

proj\text\lan

under the directory in which you have installed the **application environment**. **lan** identifies the language:

proj\textld = German
proj\textle = Spanish
proj\textlf = French
proj\textlg = English
proj\textli = Italian

Creating a PCMCIA card image

1. Change to the application environment directory INSTUTIL
 2. Start APP_INST.EXE.
 3. Select item <2> (modify configuration)
 4. Select item <6> (add user specific files to the application)
 5. Enter the full path including the drive of the first required file. If you want to add a further file, acknowledge the query from app_inst "Are you going to copy other files?" with the y key. Repeat this procedure until you have added all the files you want and then confirm the query with the n key.
 6. Change to the main menu of app_inst with the ESC key.
 7. Select "Install all modules on Hardware"
- You then have the choice of transferring the software directly to the MMC 100.2, HMI Embedded via the RS-232 interface or creating a Flash image for the PCMCIA card.
8. Under the conditions outlined above, select "Create Flash Memory Card image"
 9. Specify the directory in which the System environment is installed.
 10. Specify the directory in which the PCMCIA card image is to be stored. The directory must already exist.

Transfer the PCMCIA card image to the PCMCIA card

Then transfer the PCMCIA card image to the PCMCIA card using **SINUCOPY_FFS**.

Transfer PCMCIA card to MMC 100.2, PCU 20, HT6

Take the newly programmed PCMCIA card out of the PG or PCMCIA card programmer on the PC/PG and insert it in the MMC 100.2, PCU 20, HT6. Power up the system and press key 6 while it is running up to branch into the installation menu. Select:

0: Install via PCMCIA

After data transfer has been completed, MMC100.2, PCU20, HT6 will prompt you to withdraw the PCMCIA card. To do this, switch off the MMC 100.2, PCU 20, HT6.

7.2.4 Testing configured screen forms in the PC/PG environment

Preconditions

You have installed the PC version of the MMC 100.2, HMI or HT6 software on your PC/PG.

Procedure

Create **COMMON.COM** in the directory in which you have installed the PC version of the MMC100.2, HMI-Embedded or HT6 SW. The data search takes place according to the search sequence.

Set up the form configuration files and text files in the directory in which you have installed the PC version of the MMC 100.2, HMI.
Start the PC version of the MMC 100.2, HMI or HT6 software.

The file **ERROR.COM**, which contains messages about errors in the screen form configuration files, is stored in the directory to which the environment variable **RAMDISK** refers.

7.3 MMC 103, HMI Advanced

7.3.1 Control file entries

When using MMC 103, HMI Advanced, no standard file entries are required.

7.3.2 Saving configuration files on the hard disk of the MMC 103, HMI

Directories

\DH\CUS.DIR\
\DH\CMA.DIR\
\DH\CST.DIR\
\DH\COM.DIR\

File names

Configuration files with the names listed in Table 2-1 are searched for in directories in the specified order. If files of the same name are stored in different directories, then the first file detected according to the search strategy is interpreted.

File sizes

The sizes of configuration files are not subject to any particular restrictions. It should be noted, however, that large files are processed more slowly.

7.3.3 Saving alarm text files on the hard disk of the MMC 103, PCU50

Directory

\DH\MB.DIR\

File names

ALUC_xx.COM

Texts can be stored in text file ALUC_xx.COM as described in 7.1 General information about the configuring environment.

The text language is assigned on the basis of the text file name. "xx" is replaced by one of the following codes in the text file name:

Table 7-1

Code xx	Language
gr	German
uk	English
fr	French
it	Italian
sp	Spanish
nl	Dutch
fi	Finnish
sw	Swedish
pl	Polish
tr	Turkish
ch	Chinese
tw	Taiwan Chinese
ko	Korean
hu	Hungarian
po	Portuguese
ru	Cyrillic
cz	Czech

ALUC_uk.COM ;File for English texts

7.3.4 Testing configured screen forms in the PC/PG environment

Preconditions

You have installed the PC version of the MMC 103, HMI Advanced software on your PC/PG.

Directories

The directory structure is the same as on the MMC 103, see above. The error log is generated in:

\DH\COM.DIR\ERROR.COM

7.4 HMI Embedded WIN32 and HMI Advanced together on one hardware platform

HMI Embedded WIN32 searches the configuration files for "Expanding the Wizard directory" on the same paths as HMI Advanced. The starting point is the data management path.

The search sequences described below are relevant for ShopMill/ShopTurn if both HMI systems (HMI Advanced and HMI Embedded) are operated in parallel on a single platform. In this case, "Expanding the Wizard directory" under ShopMill/ShopTurn operated under HMI Embedded accesses the same "Expanding the Wizard directory" configuration files as "Expanding the Wizard directory" in standard operation under HMI Advanced.

Supplementary conditions

HMI Embedded WIN32 evaluates the **mmchome** property of section **[DHSTART]** in configuration file **DH.INI** which contains the root directory for the data management path.

DH.INI must be stored in the BIN directory on which MMC0.EXE is started. The maximum length for the data management root directory entry is 100 characters.

7.4.1 General information about searches

Booting

On start-up, HMI Embedded WIN32 uses the entries in the Windows Registry to ascertain where **HMI Advanced** is installed.

In the directory indicated in the registry, a search is made for file **DH.INI** in the subdirectories **..user**, **..loem**, **..add_on**, **..mmc2** in the sequence specified. If **DH.INI** cannot be found there, a search is carried out for the file in the current directory of HMI Embedded WIN32.

Example:

If HMI-Advanced was found on **f:\HMI\HMI-Advanced**, then a search for **dh.ini** is made in the following sequence:

f:\HMI\HMI-Advanced\user

f:\HMI\HMI-Advanced\loem

f:\HMI\HMI-Advanced\add_on

f:\HMI\HMI-Advanced\mmc2

Control variables for search sequences

Identifier	From file	Value 0	Value 1
CHK_FILE_EXIST	Common.com	No search in temp. directory on RAMDISK, HD, network HD	Default: Search in temp. directory on RAMDISK, HD, network HD
pc_test	mmc0.ini	Default: No PC system, NC connection	PC system, no NC connection present

If the definition for CHK_FILE_EXIST has not been commented out in file Common.com, CHK_FILE_EXIST 1 is used.
If mmc0.ini cannot be located, the default value is from pc_test 0 (default status on installation).

The RAMDISK environment variable specifies the path to a directory on which temporary files are stored by HMI Embedded.

The tabulated variables produce the following search sequences:

The files for the "Expanding the Wizard directory" are searched in the following sequence. A hit in the above directory disables the corresponding entries in directories located further down the sequence.

Note

File Common.com is handled differently. See below.

Search in temp. directories, no PC system

A connection to the NC is established.

"Expanding the Wizard directory" directory on the RAM disk
CUS directory in the data management directory specified in dh.ini
CMA directory in the data management directory specified in dh.ini
CST directory in the data management directory specified in dh.ini
COM directory in the data management directory specified in dh.ini

No search in temp. directories, no PC system

A connection to the NC is established.
CUS directory in the data management directory specified in dh.ini
CMA directory in the data management directory specified in dh.ini
CST directory in the data management directory specified in dh.ini
COM directory in the data management directory specified in dh.ini
"Expanding the Wizard directory" directory on the RAM disk

PC system

A connection to the NC is **not** established.

CUS directory in the data management directory specified in dh.ini

CMA directory in the data management directory specified in dh.ini

CST directory in the data management directory specified in dh.ini

COM directory in the data management directory specified in dh.ini

Current directory in HMI Embedded WIN32

Current directory in HMI Embedded WIN32 packed in *.co_

"Expanding the Wizard directory" directory on the RAM disk

If a data management path is defined, it is prioritized and processed before the current directory in order that HMI Embedded WIN32 and HMI Advanced access the **same images**.

The new search mechanism also includes the directories of the data management path, relevant for "Expanding the Wizard directory" and the possible archives for images (cus.arj, cma.arj, cst.arj).

Search sequence for images, individual image before archive

The search mechanism always processes the loop displays first before searching possible archives. For performance reasons, .bin files are searched for before .bmp files. The advantage of this method is that when creating an "Expanding the Wizard directory" dialog box, the images do not have to be archived before they can be displayed, but can simply be played from a relevant directory.

Once the search of the unpacked files has been completed, the archives containing a single file (.bi_, then .bm_) are searched.

Bitmap name with path

Search sequence if no archive is specified and the file name contains a path

Filename.bin on the specified path

Filename.bmp on the specified path

Filename.bin in archive **filename.bi_** on the specified path

Filename.bmp in archive **filename.bm_** on the specified path

Filename.bxx

(partial binary files, which have to be processed for reasons of compatibility with RealMode and when starting Protected Mode). These files are only searched for in the Current directory.

Bitmap name without path

Search sequence if no archive is specified and the file name does not contain a path

1. **Filename.bin** in the **CUS** directory of the data management path
2. **Filename.bmp** in the **CUS** directory of the data management path
3. **Filename.bin** in archive **Filename.bi_** in the **CUS** directory of the data management path
4. **Filename.bmp** in archive **Filename.bm_** in the **CUS** directory of the data management path
5. **Filename.bin** in the **CUS\resolution** directory of the data management path

6. **Filename.bmp** in the **CUS\resolution** directory of the data management path
7. **Filename.bin** in archive **Filename.bi_** in the **CUS\resolution** directory of the data management path
8. **Filename.bmp** in archive **Filename.bm_** in the **CUS\resolution** directory of the data management path
9. **Filename.bin** in the **CMA** directory of the data management path
10. **Filename.bmp** in the **CMA** directory of the data management path
11. **Filename.bin** in archive **Filename.bi_** in the **CMA** directory of the data management path
12. **Filename.bmp** in archive **Filename.bm_** in the **CMA** directory of the data management path
13. **Filename.bin** in the **CMA\resolution** directory of the data management path
14. **Filename.bmp** in the **CMA\resolution** directory of the data management path
15. **Filename.bin** in archive **Filename.bi_** in the **CMA\resolution** directory of the data management path
16. **Filename.bmp** in archive **Filename.bm_** in the **CMA\resolution** directory of the data management path
17. **Filename.bin** in the **CST** directory of the data management path
18. **Filename.bmp** in the **CST** directory of the data management path
19. **Filename.bin** in archive **Filename.bi_** in the **CST** directory of the data management path
20. **Filename.bmp** in archive **Filename.bm_** in the **CST** directory of the data management path
21. **Filename.bin** in the **CST\resolution** directory of the data management path
22. **Filename.bmp** in the **CST\resolution** directory of the data management path
23. **Filename.bin** in archive **Filename.bi_** in the **CST\resolution** directory of the data management path
24. **Filename.bmp** in archive **Filename.bm_** in the **CST\resolution** directory of the data management path
25. **Filename.bin** in the current directory (Bin directory)
26. **Filename.bmp** in the current directory (Bin directory)
27. **Filename.bin** in archive **Filename.bi_** in the current directory (Bin directory)
28. **Filename.bmp** in archive **Filename.bm_** in the curr. directory (Bin directory)
29. **Filename.bin** in archive **CUS.ARJ** in the **CUS** directory of the data management path
30. **Filename.bmp** in archive **CUS.ARJ** in the **CUS** directory of the data management path
31. **Filename.bin** in archive **CUS.ARJ** in the **CUS\resolution** directory of the data management path
32. **Filename.bmp** in archive **CUS.ARJ** in the **CUS\resolution** directory of the data management path
33. **Filename.bin** in archive **CUS.ARJ** in the **CMA** directory of the data management path
34. **Filename.bmp** in archive **CUS.ARJ** in the **CMA** directory of the data management path
35. **Filename.bin** in archive **CUS.ARJ** in the **CMA\resolution** directory of the data management path
36. **Filename.bmp** in archive **CUS.ARJ** in the **CMA\resolution** dir. of the data management path
37. **Filename.bin** in archive **CUS.ARJ** in the **CST** dir. of the data management path
38. **Filename.bmp** in archive **CUS.ARJ** in the **CST** dir. of the data managem. path
39. **Filename.bin** in archive **CUS.ARJ** in the **CST\resolution** directory of the data management path
40. **Filename.bmp** in archive **CUS.ARJ** in the **CST\resolution** directory of the data management path

Steps 29 through 40 are then repeated for CMA.ARJ

41. Filename.bin in archive CMA.ARJ in the CUS directory of the data management path

....

52. Filename.bmp in archive CMA.ARJ in the CST\resolution directory of the data management path

Steps 41 through 52 are then repeated for CST.ARJ

53. Filename.bin in archive CST ARJ in the CUS directory of the data management path

....

64. Filename.bmp in archive CUS.ARJ in the CST\resolution directory of the data management path

65. Filename.bin in archive CUS.ARJ in the current directory (Bin directory)

66. Filename.bmp in archive CUS.ARJ in the current directory (Bin directory)

67. Filename.bin in archive CMA.ARJ in the current directory (Bin directory)

68. Filename.bmp in archive CMA.ARJ in the current directory (Bin directory)

69. Filename.bin in archive CST.ARJ in the current directory (Bin directory)

70. Filename.bmp in archive CST.ARJ in the current directory (Bin directory)

71. Filename.bxx

(partial binary files, which have to be executed for reasons of compatibility with RealMode and when starting Protected Mode).

These files are only searched for in the Current directory.

7.4.2 Search strategy for common.com

The "Expanding the Wizard directory" access configuration file **common.com** is handled differently. In order to bring about the intended behavior of the "Expanding the Wizard directory" system after a change has been made in this file, HMI Embedded WIN32 **must be restarted**.

No PC system

A connection to the NC is established.

CUS directory in the data management directory specified in dh.ini

CMA directory in the data management directory specified in dh.ini

CST directory in the data management directory specified in dh.ini

COM directory in the data management directory specified in dh.ini

"Expanding the Wizard directory" directory on the RAM disk

PC system

A connection to the NC is **not** established.

CUS directory in the data management directory specified in dh.ini

CMA directory in the data management directory specified in dh.ini

CST directory in the data management directory specified in dh.ini

COM directory in the data management directory specified in dh.ini

Current directory in HMI Embedded WIN32

Current directory in HMI Embedded WIN32 packed in *.co_

"Expanding the Wizard directory" directory on the RAM disk

7.4.3 Search sequence for images

The expanded search function for images (bitmaps) in software version 6.02 of HMI Embedded can also be used for images in the "Expanding the Wizard directory" system.

If HMI Embedded WIN32 (ShopMill/ShopTurn) is installed together with HMI Advanced on a single hardware platform, a relevant data management path can be preset.

If a data management path is defined, it is prioritized and processed before the current directory in order that HMI Embedded WIN32 and HMI Advanced access the **same images**.

The new search mechanism also includes the directories of the data management path, relevant for "Expanding the Wizard directory" and the possible archives for images (cus.arj, cma.arj, cst.arj).

The search mechanism always processes the loop displays first before searching possible archives. This results in the following search sequence for images:

- Individual image before archive (.bin files are searched for before .bmp files).
Once the search of the unpacked files has been completed, the archives containing a single file (.bi_, then .bm_) are searched.
- Bitmap name with followed by bitmap name without path

For more information about the search sequence for bitmaps with the various formats, see "General information about searches".

7.5 Special considerations for HT6

Some of the features of the mobile operator component vary from those of the stationary operator components. The display is smaller. The key arrangement and number differs.

Softkey expansion

In addition to the horizontal softkeys (HS1-8) already configured, HT6-specific keys can also be defined. As the HT6 has no vertical softkeys (VS1-8), they cannot be configured.

UK1 to UK8	User keys
SK1 and SK2	Special keys
TEACH	Teach key

Special properties that softkeys do not have:

These keys do not have to be initialized like standard softkeys

HS1=(text, access level, status).

If, however, an access level is to be configured, this is done in the same way, e.g.

UK1=("", access stage)

For each softkey a press block can be configured in which a further softkey bar or screen form can be loaded.

Extensions common.com

Section **[HT6]** has been introduced into the file common.com. The connections for the special HC keys can be entered here.

HC (**H**otkey **C**onnection) represents any one of the keys: UKi, SKi, TEACH

HC1= Test1.com	;A configuration file must be assigned to the relevant
	;key

The key definition in area //(Start) is always loaded in this file.

All HCyyy hotkey connections

see "Structure of the COMMON.COM control file"

Note

If user keys U1–U8, S1 or S2 are operated on the HT6, any open screen created with "expand Wizard directory" is closed. This also applies if no response has been configured for the user key (e.g. with the software development kit or "expand Wizard directory")!



Notes

8

8 Terms, Tables, Lists, Examples

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8.3 List of accessible system variables.....	BE1/8-193
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8.1 Terms

Table 8-1

Term	Explanation
Action	Anything that is configured within a → method: → Functions, → Calculating variables, → Changing properties, ...
Access level	Graduated system of authorization, which makes the accessibility and utilization of functions on the → operator interface dependent on the authorization rights of the user.
Array	Table or list of data
Attribute	Characteristic that assigns an object (→ screen form or → variable) specific, detailed → properties.
Block	Reload unit for → configuration file
Column index	Column number of an array
Configuration file	File or files, which contain definitions and instructions that determine the appearance of → Screen forms and their → Functions.
Definition lines	Program section in which → variables and → softkeys are defined.
Editor	ASCII Editor which with characters can be entered in a file and edited.
Event	Any action, which initiates execution of a → Method: Input of characters, actuation of → Softkeys, ...
Focus	Highlighting on screen which identifies the → Screen form element that is currently selected for editing/monitoring. Screen form element marked by the cursor.
Form-independent softkeys	Softkeys, which are not called from a screen form, i.e. start softkey and softkey menus, which the user configures before the first, new screen form.
Function	Sequence of operations programmed in → Methods as a function of → Parameters.
Graphics	Graphic which is displayed when a screen form is opened.
Help display	Display, which is opened context-sensitively in relation to screen form elements.
Help loop	Several help references can be configured in a loop for each → Screen form element, i.e. the references are called up in succession and when the last reference closes, the first is displayed again.
Help variable	Internal arithmetic variable to which no → Properties can be assigned, i.e. it is not visible in the → Screen form.
HSx	Horizontal → Softkey x
I/O field	Input/output field for displaying and modifying values of variables.
Interpreter	The interpreter automatically converts the defined code from the → Configuration File into a → Screen form and controls its use.
Machine data	Settings of properties of the SINUMERIK system made by Siemens/machine manufacturer/end user and stored in the system. A differentiation is made between: \$MN_... General NC machine data \$MC_... Channel-specific machine data \$MA_... Axis-specific machine data \$MM_... Machine data for operator panel In addition to these, the system also uses → Setting data and Drive machine data.

Term	Explanation
Main body of screen form	Header, long text, graphics and → Screen form elements
ManualTurn	Optimized SINUMERIK application and operator interface for simple turning machines.
Master screen form	→ Screen form, which calls another screen form but remains open when a second screen is displayed.
Method	Programmed sequence of operations which is executed when a corresponding → Event occurs.
MMC 100.2	Computer unit of operator panel front without hard disk
MMC 103	Computer unit of operator panel front with hard disk
NC	Numerical Control: System component of a SINUMERIK system which controls the motional sequences of axes on the basis of → Parts programs.
NC code	Permissible language elements used to write → Parts programs of the SINUMERIK system
NC function	→PI service
Operator interface	The term "operator interface" refers in this document to the information displayed on the screen, including allocated softkeys and some special operator panel front keys.
Parameters	Parameters are variable elements of the programming syntax and replaced by other words/symbols in the → Configuration file.
Parts programs	A program formulated in the NC language, which specifies motion sequences for axes and various special actions.
PI service	→ Function, which, on an → NC, executes a clearly defined operation. PI services can be called from the → PLC and → MMC 100.2/103.
PLC	Programmable Logic Control: Programmable controller, which performs mainly logic operations in the SINUMERIK system.
Programming support system	Provision of → Screen forms to assist programmers in writing → Parts programs with "higher-level" components Free contour programming Cycle support Blueprint programming → Recompile → Simulation directly from the → Editor.
Properties	Characteristics of an object (e.g. of a → variable)
RECALL key	Standard key on front of operator panel
Recompilation	Sections of → NC code can be generated in a → Parts program from input fields in → Screen forms of the → Programming support system. Recompilation is the reverse operation. The input fields, which have created a selected section of NC code, are retrieved from the NC code and displayed in the original screen form.
Register	Memory for data exchange between → Screen forms.
Row index	Row number of an array
Screen form	Screen display of → Operator interface
Screen form definition block	Program section from //M.....//END for defining a → Screen form
Screen form element	Visible component of a → Variable: Short text, graphics text, → I/O field and unit text
Screen form tree	A group of interlinked → Screen forms

Term	Explanation
Screen-form-dependent softkey menu	Softkey menu, which is called from a newly configured screen form.
Setting data	Data that communicates properties of the machine tool to the NC control in a way defined by the system software. In contrast to → Machine data, setting data can be altered immediately by the operator.
ShopMill	Optimized SINUMERIK application and operator interface for 2½D milling operations.
Simulation	Simulation of a → Parts program run (e.g. graphically) without movement of the actual machine axes.
Softkey	Key on front of operator panel, which activates a function displayed on the assigned area of the screen.
Softkey label	Text/image on the screen area, which is assigned to a → Softkey.
Softkey menu	All horizontal or all vertical → softkeys
Softkey menu definition block	Program section from //S.....//END for defining a → Softkey menu
Standard application	→ Operator interfaces that are integrated in standard software.
Start softkey	→ Softkey, with which the first newly created → screen form is started.
Start softkey definition block	Program section from //S(Start).....//END in which a → Start softkey is defined
Sub-screen form	→ Screen form that is called from another screen form (master screen form) without the → Master screen form being closed.
System variables	NC variable providing the NC states for parts program accesses and accesses from → MMC.
Toggle field	A list of values in the → I/O Field; check with toggle field: The value input in a field must be the same as one of the listed values.
User comment	Comment, which is automatically created during → NC code generation.
User variable	The user can declare user-defined variables for optional use in the → parts program or data block.
Variable	Designation of a memory location, which can be displayed in a → Screen form by assigning → Properties and in which input data and the results of arithmetic operations can be entered.
VSx	Vertical → Softkey x

8.2 Color table

Configuring screen forms

The following color table for screen form configuring is available for the MMC 100.2 and MMC 103 (subset of each standard color table):

Table 8-2 Color table

Number	Color
1	Black
2	Red/brown
3	Dark green
4	Light gray
5	Dark gray
6	Blue
7	Red
8	Brown
9	Yellow
10	White

Colors for

MMC 103
MMC 100.2
ManualTurn
ShopMill

may be displayed with slight differences.
On the HT6 gray scales exist.

Bitmap color table

Note

With software version 6.3 and higher, HMI Embedded supports the "New Fashion" option. Some colors in the color palette have changed in this context. You will find more details below.

HMI Advanced

The following color table in the drawing program must be used for bitmaps in HMI Advanced.

Index	Red	Green	Blue
160	255	255	255
161	255	255	180
162	220	220	0
163	255	255	0
164	255	64	255

Index	Red	Green	Blue
165	255	64	128
166	255	64	64
167	255	64	0
168	128	255	255
169	128	255	128
170	120	255	40
171	128	255	0
172	128	64	255
173	128	64	128
174	128	64	64
175	128	64	0
176	64	255	255
177	64	255	128
178	64	255	64
179	64	255	0
180	64	64	255
181	64	64	128
182	64	64	64
183	64	64	0
184	0	255	255
185	0	255	128
186	0	255	64
187	0	255	0
188	0	64	255
189	0	64	128
190	0	64	64
191	0	64	0
192	255	64	255
193	255	128	128
194	200	100	4
195	255	128	0
196	255	0	255
197	255	0	128
198	255	0	64
199	255	0	0
200	128	128	255
201	208	208	228
202	140	140	140
203	128	128	0
204	128	0	255
205	128	0	128
206	128	0	64
207	128	0	0
208	64	128	255
209	0	128	112
210	64	128	64
211	64	128	0
212	0	0	180
213	64	0	128
214	64	0	64
215	64	0	0
216	0	128	255

Index	Red	Green	Blue
217	0	128	128
218	0	128	64
219	0	128	0
220	0	0	255
221	0	0	128
222	20	20	20
223	0	0	0
224	240	248	240
225	224	224	224
226	192	192	192
227	160	160	160
228	128	128	128
229	96	96	96
230	64	64	64
231	32	32	32

HMI Embedded

The following color table in the drawing program must be used for bitmaps in HMI Advanced.

Index	Red	Green	Blue
160	255	255	255
161	255	255	192
162	255	232	127
163	255	255	0
164	255	192	0
165	255	128	0
166	255	64	0
167	255	32	0
168	192	255	255
169	192	255	192
170	192	255	128
171	192	255	0
172	192	192	0
173	192	128	0
174	192	64	0
175	192	32	0
176	128	255	255
177	128	255	192
178	128	255	128
179	128	255	0
180	128	192	0
181	128	128	0
182	128	64	0
183	128	32	0
184	0	255	255

Index	Red	Green	Blue
185	0	255	192
186	0	255	128
187	0	255	0
188	0	192	0
189	128	138	148
190	0	64	0
191	0	32	0
192	208	226	242
193	200	210	220
194	170	180	190
195	141	151	161
196	255	0	255
197	255	0	128
198	255	0	64
199	255	0	0
200	128	192	255
201	0	192	255
202	0	128	255
203	173	185	197
204	128	0	255
205	128	0	128
206	128	0	64
207	128	0	0
208	128	192	192
209	0	192	192
210	0	128	192
211	185	200	215
212	64	0	255
213	64	0	128
214	64	0	64
215	64	0	0
216	255	180	65
217	0	128	128
218	70	170	190
219	0	128	0
220	0	0	255
221	0	0	128
222	0	0	64
223	0	0	0
224	213	220	227
225	214	226	237
226	192	192	192
227	158	158	158
228	128	128	128
229	90	100	110
230	76	86	96
231	32	32	32

Color tables depend on the "New Fashion" option.
In tool box version 6.03.03 and higher, you will find the color tables in
8x0d\examples_tools\wizard.bsp\hmi_emb\...
The file names indicate the application of each table.

- HMI_EMB_OLD_FASHION.PAL :

This color palette should be used for HMI Embedded SW 6.2 and SW 6.3 with Old Fashion

Color indices 160 to 231 are available

- HMI_EMB_NEW_FASHION.PAL :

This color palette should be used for HMI Embedded SW 6.3 with New Fashion

Color indices 160 to 231 are available

- HMI_EMB_OLD_AND_NEW_FASHION.PAL :

This color palette should be used for HMI Embedded SW 6.2 and SW 6.3 independent of Old and New Fashion; the bitmaps generated with this color palette are **identical in appearance for Old and New Fashion**.

Color indices 160, 163, 184, 187, 196, 199, 204, 205, 207, 217, 219, 220, 221, 223, 226 and 228 are available

The previous color table HMI_EMB.PAL is superseded by the tables specified above.

Only colors 160 through 231 can be used. This is the only way to ensure that images look the same on HMI Embedded and HMI Advanced.

Activating a color table from PaintShopPro

File → Open → ... * .bmp

Colors → Open picture palette → ... * .PAL

Apply palette with  Color Indices "Open"

System colors

One of 10 colors can be selected for one screen form element (text, input field, screen form background, etc.). In SW 6.4 and higher, the system colors have been expanded - and there is a difference between the old and new designs (refer to e.g. the header color in the table below). In order to achieve a demarcation between unique and **design-dependent** colors, it has been defined that the unique colors are found between 0 and 128. The design-dependent colors that have been newly introduced as part of this expansion, are defined from index 128. This means, that also when the unique colors are expanded (up to 128), it is prevented that both color types are mixed.

Newly defined colors

Index	Color description	Color	
		Old design	New design
128	System color active field	Yellow	Orange
129	Background color	Gray	Light gray
130	Header color (active)	Yellow	Blue
131	Header font color (active)	Black	White

8.3 List of accessible system variables

Name	Index	Description
\$A_DBB[x]	x = ByteNo	Data byte from/to PLC
\$A_DBD[x]	x = Offset	Double data word (32bit) from/to PLC
\$A_DBR[x]	x = Offset	Real data (32bit) from/to PLC
\$A_DBW[x]	x = Offset	Data word (16bit) from/to PLC
\$A_DLB[index]	index = Offset	Data byte in link area
\$A_DLD[index]	index = Offset	Double data word access in link area
\$A_DLR[index]	index = Offset	Real data in link area
\$A_DLW[index]	index = Offset	Data word in link area
\$A_IN[x]	x = DigitalinputNo	Value of HW digital input
\$A_INA[x]	x = AnaloginputNo	Value of HW analog input
\$A_INCO[x]	x = InputNo	Comparator input NC
\$A_INSE		Ext. NCK input of the safe progr. logic, NCK I/O
\$A_INSED		Image ext. NCK input of the Safe Progr. Logic
\$A_INSEP		Ext. PLC input, Safe Progr. Logic, PLC I/O
\$A_INSEPD		Image ext. PLC inputs of the Safe Progr. Logic
\$A_INSI		Int. NCK input, Safe Progr. Logic, NCK Safety
\$A_INSID		Image int. NCK input Safe Progr. Logic NCK Safety
\$A_INSIP		Int. PLC input Safe Progr. Logic 611D Safety
\$A_LINK_TRANS_RATE		Link transfer rate
\$A_MARKERSI		NCK flag for Safe Progr. Logic
\$A_MARKERSIP		Image, PLC flag for Safe Progr. Logic
\$A_OUT[x]	x = DigitaloutputNo	Value of HW digital output
\$A_OUTA[x]	x = AnalogoutputNo	Value of HW analog output
\$A_OUTSE		Ext. NCK output Safe Progr. Logic NCK I/O
\$A_OUTSED		Image ext. NCK outputs of the Safe Progr. Logic
\$A_OUTSEP		Ext. PLC output, Safe Progr. Logic, PLC I/O
\$A_OUTSEPD		Image ext. PLC outputs of the Safe Progr. Logic
\$A_OUTSI		Int. NCK output Safe Progr. Logic NCK Safety
\$A_OUTSID		Image int. NCK output Safe Progr. Logic NCK Safety
\$A_OUTSID		Image int. PLC input Safe Progr. Logic 611D Safety
\$A_OUTSIP		Int. PLC output Safe Progr. Logic 611D Safety
\$A_OUTSIPD		Image int. PLC output Safe Progr. Logic 611D Safety
\$A_PBB_IN[index]	index = Offset	IN data byte
\$A_PBB_OUT[index]	index = Offset	OUT data byte
\$A_PBD_IN[index]	index = Offset	IN double data word
\$A_PBD_OUT[index]	index = Offset	OUT double data word
\$A_PBR_IN[index]	index = Offset	IN real data
\$A_PBR_OUT[index]	index = Offset	OUT real data
\$A_PBW_IN[index]	index = Offset	IN data word
\$A_PBW_OUT[index]	index = Offset	OUT data word
\$A_TC_FCT		Command number
\$A_TC_LFN		Source location number
\$A_TC_LFO		Source location number
\$A_TC_LTN		Target location number
\$A_TC_LTO		Target location number
\$A_TC_MFN		Source magazine

Name	Index	Description
\$A_TC_MFO		Source magazine number
\$A_TC_MTN		Target magazine number
\$A_TC_MTO		Target magazine number
\$A_TC_STATUS		Command status
\$A_TC_THNO		Number of toolholder
\$A_TC_TNO		T number
\$A_TIMERSI		NCK time for Safe Programmable Logic
\$A_TOOLMLN[x]	x = ToolNo T	Current location
\$A_TOOLMN[x]	x = ToolNo T	Current magazine
\$AA_COUP_ACT[x]	x = Spindle following	Current coupling status following spindle
\$AA_COUP_OFFS[x]	x = Axis	Offset to leading axis/leading spindle, setpoint
\$AA_COUP_OFFS[x]	x = Spindle	Position offset for synchronous spindle, on the setpoint side
\$AA_CURR[x]	x = Axis	Actual current of axis or spindle in A
\$AA_DELT[x]	x = Axis	Distance to go by the axes in WCS
\$AA_DTBB[x]	x = Axis	Axial distance from block beginning in basic coord. system
\$AA_DTBW[x]	x = Axis	Axial dist. from block beg. in WCS
\$AA_DTEB[x]	x = Axis	Axial distance from block end in basic coord. system
\$AA_DTEPB[x]	x = Axis	Axial dist.-to-go infeed oscillation in basic system
\$AA_DTEPW[x]	x = Axis	Axial dist.-to-go infeed oscillation in WCS
\$AA_DTEW[x]	x = Axis	Axial dist. from block end in WCS
\$AA_EG_ACTIVE [a,b]	a = Following axis b = Leading axis	EG coupling active
\$AA_EG_AX[n,a]	n = Index leading axis a = Following axis	EG leading axis number
\$AA_EG_DENOM [a,b]	a = Following axis b = Leading axis	EG coupling factor denominator
\$AA_EG_NUM_LA[a]	a = Following axis	EG no. of leading axes
\$AA_EG_NUMERA [a,b]	a = Following axis b = Leading axis	EG coupling factor numerator
\$AA_EG_SYN[a,b]	a = Following axis b = Leading axis	EG synchronous position leading axis
\$AA_EG_SYNCDIFF [a]	a = Axis identifier	EG synchronism deviation
\$AA_EG_SYNFA[a]	a = Following axis	EG synchronous position following axis
\$AA_EG_TYPE[a,b]	a = Following axis b = Leading axis	EG coupling type
\$AA_ESR_ENABLE [a]	a = Axis	ESR axis enable
\$AA_ESR_ENABLE [a]	a = Axis	ESR enable
\$AA_ESR_STAT[a]	a = axis	ESR status
\$AA_ETRANS[x]	x = FrameNo	Translation (offset) of external frames
\$AA_FXS[x]	x = Axis	Status after travel to fixed stop
\$AA_IBN[x]	x = Axis	Toolholder actual value
\$AA_IEN[x]	x = Axis	Holder active tool rel. to workpiece zero
\$AA_IM[x]	x = Axis	Toolholder
\$AA_IW[x]	x = Axis	Toolholder position, setpoint

Name	Index	Description
\$AA_LEAD_P[x]	x = Axis	Real leading value - position
\$AA_LEAD_SP[x]	x = Axis	Simulated master value - position
\$AA_LEAD_SV[x]	x = Axis	Simulated master value - velocity
\$AA_LEAD_TYP[x]	x = Axis	Source of leading value
\$AA_LEAD_V[x]	x = Axis	Real leading value - velocity
\$AA_LOAD[x]	x = Axis	Drive load in % (for 611D only)
\$AA_MM[x]	x = Axis	Measured value in machine coordinate system
\$AA_MM1[x]	x = Axis	Access to meas. result in MCS
\$AA_MM2[x]	x = Axis	Access to meas. result in MCS
\$AA_MM3[x]	x = Axis	Access to meas. result in MCS
\$AA_MM4[x]	x = Axis	Access to meas. result in MCS
\$AA_MW[x]	x = Axis	Measured value in workpiece coordinate system
\$AA_OFF[x]	x = Axis	Superimposed motion for the programmed axis
\$AA_OFF_LIMIT[x]	x = Axis	Limit value axial offset \$AA_OFF reached
\$AA_OSCILL_REVERSE_POS1[x]	x = Axis	Current reversal position 1 oscill. in synchr. act.
\$AA_OSCILL_REVERSE_POS2[x]	x = Axis	Current reversal position 2 oscill. in synchr. act.
\$AA_OVR[x]	x = Axis	Axial override for motion-synchronous actions
\$AA_POWER[x]	x = Axis	Drive active power in W
\$AA_S[x]	x = SpindleNo	Spindle speed, setpoint
\$AA_SOFTENDN[x]	x = Axis	Software limit position, negative direction
\$AA_SOFTENDP[x]	x = Axis	Software limit position, positive direction
\$AA_STAT[x]	x = Axis	Axis status
\$AA_SYNA_MEM		Free memory for motion-synchronous actions
\$AA_SYNC[x]	x = Axis	Coupling status of following axis in master value coupling
\$AA_TORQUE[x]	x = Axis	Drive torque setpoint in Nm
\$AA_TYP[x]	x = Axis	Axis type
\$AA_VACTB[x]	x = Axis	Axial feed, actual value
Name	Index	Description
\$AA_VACTM[x]	x = Axis	Axial feed, setpoint
\$AA_VACTW[x]	x = Axis	Axial feed, actual value
\$AA_VC[x]	x = Axis	Add. offset for path/axial feed
\$AC_ALARM_STAT		ESR alarm status
\$AC_AXCTSWA[CTn]	CTn = axis cont. no.	Axis container status
\$AC_DELT		Distance to go in the workpiece coordinate system
\$AC_DRF[x]	x = Axis	DRF value
\$AC_DTBB		Distance from block beg. in basic coordinate system
\$AC_DTBW		Distance from the beginning of the block in the workpiece coordinate system
\$AC_DTEB		Distance from block end in basic coordinate system
\$AC_DTEPB		Dist.-to-go, feed oscill. in the tool coordinate system
\$AC_DTEPW		Dist.-to-go infeed oscill. in workpiece coord. system
\$AC_DTEW		Distance from the end of the block in the workpiece coordinate system
\$AC_FCT0[x]	x = polynomial no.	a0 coefficient acc. to polynomial for synchr. action
\$AC_FCT1[x]	x = polynomial no.	a1 coefficient acc. to polynomial for synchr. action
\$AC_FCT2[x]	x = polynomial no.	a2 coefficient acc. to polynomial for synchr. action
\$AC_FCT3[x]	x = polynomial no.	a3 coefficient acc. to polynomial for synchr. action
\$AC_FCTL[x]	x = polynomial no.	Lower limit value after polynomial for synchr. action

\$AC_FCTUL[x]	x = polynomial no.	Upper limit value after polynomial for synchro. action
Name	Index	Description
\$AC_FIFOx[y]	x = FIFONo (1-10) y = ParameterNo	FIFO variables for synchronous actions
\$AC_MARKER[x]	x = MarkerNo	Marker var, counter for motion-synchronous actions
\$AC_MEA		Probe has responded
\$AC_OVR		Path override for synchronous actions
\$AC_PARAM[x]	x = ParameterNo	Dyn. parameter for motion synchronization
\$AC_PATHN		Normalized path parameter
\$AC_PLTBB		Path travel from block beg. in basic coordin. system
\$AC_PLTEB		Path travel from block end in basic coordin. system
\$AC_PRESET[x]	x = Axis	PRESET value
\$AC_PROG		Program status
\$AC_RETPOINT[x]	x = Axis	Return position on contour for repositioning
\$AC_SDIR[x]	x = SpindleNo	Rotat. status
\$AC_SMODE[x]	x = SpindleNo	Spindle mode
\$AC_STAT		Channel status
\$AC_TIME		Time from the start of the block in seconds (including the times for the internally generated intermediate blocks)
\$AC_TIMES		Time from the start of the block in seconds (without the times for the internally generated intermediate blocks)
\$AC_TIMEC		Time from the start of the block in interpolation clock cycles (including clock cycles for the internally generated intermediate blocks)
\$AC_TIMESC		Time from the start of the block in interpolation clock cycles (without the clock cycles for internally generated intermediate blocks)
\$AC_TIMER[x]	x = TimerNo	Timer location in seconds
\$AC_VACTB		Interpolation feedrate, setpoint
\$AC_VACTW		Path velocity in workpiece coordinate system
\$AC_VC		Add. path feed override for synchronous actions
\$AN_AXCTAS[n]		Actual axis container address (rotary position)
\$AN_AXCTSWA [CTn]	CTn = axis container no.	Axis container rotation active
\$AN_ESR_TRIGGER		ESR start signal
\$AN_MARKER[x]	x = MarkerNo	Marker variable for motion synchronous actions
\$MC_DISPLAY_AXIS	Bits 16-31	Machine axis identifier
\$MC_DISPLAY_AXIS	Bits 0-15	Identifier for geometry/auxiliary axis
\$MC_MM_NUM_BASE_FRAMES		Number of base frames in channel
\$MN_EXTERN_LANGUAGE and \$MN_EXTERN_CNC_SYSTEM		CNC system language
\$MN_MAX_CUTTING_EDGE_NO		Maximum value D number
\$MN_MAX_CUTTING_EDGE_PER_TOOL		Max. number of edges per tool
\$MN_MAX_SUMCORR_PERCUTTING_EDGE		Max. number of total offsets per tool

\$MN_MM_KIND_OF_SUMCORR		Properties of total offsets in NCK
\$MN_MM_NUM_CC_MAGAZINE_PARAM		No. par. mag.user.data for a tool magazine
\$MN_MM_NUM_CC_MAGLOC_PARAM		No. par. mag.user.data for tool mag. loc.
\$MN_MM_NUM_CC_MON_PARAM		No. par. monitor. user data for tool edge
Name	Index	Description
\$MN_MM_NUM_GLOBAL_BASE_FRAMES		Number of channel-independent basic frames
\$MN_MM_NUM_SUMCORR		Total number of total offsets in NCK
\$MN_MM_NUM_TOOL_ADAPTER		Max. no. available tool adapter data sets
\$MN_MM_TOOL_MANAGEMENT_MASK		Settings NCK tool management
\$P_BUFR[x,MI]	x = FrameNo	Mirroring of settable frame
\$P_BUFR[x,RT]	x = FrameNo	Rotation of settable frame
\$P_BUFR[x,SC]	x = FrameNo	Scaling factor of settable frame
\$P_BUFR[x,SI]	x = FrameNo	Fine offset for frames
\$P_BUFR[x,TR]	x = FrameNo	Translation of settable frame
\$P_CHBFRMASK		Active channel-specific basic frames
\$P_EG_BC[a]		EG block change criterion
\$P_NCBFRMASK		Active channel independent basic frames
\$P_OFFN		Offset normal
\$P_PFRAME [x,TR] or \$P_ACTFRAME or \$P_IFFRAME		Compilation of active frame
\$P_TOOL		Number of active tool edge
\$P_TOOLL[1]		Active tool length 1
\$P_TOOLL[2]		Active tool length 2
\$P_TOOLL[3]		Active tool length 3
\$P_TOOLND[x]	x = ToolNo	Number of cutting edges
\$P_TOOLNO		Number of active tool
\$P_TOOLR		Active tool radius
\$P_UIFR[x,y,MI]	x=FrameNo, y=Axis	Mirroring of settable frame
\$P_UIFR[x,y,RT]	x=FrameNo, y=Axis	Rotation of settable frame
\$P_UIFR[x,y,SC]	x=FrameNo, y=Axis	Scaling factor of settable frame
\$P_UIFR[x,y,SI]	x=FrameNo, y=Axis	Fine offset for frames
\$P_UIFR[x,y,TR]	x=FrameNo, y=Axis	Translation of settable frame
\$P_UIFRNUM		Index of active set frame
\$R[x]	x = ParameterNo	R parameters
\$SC_PA_ACTIV_IMMED[x]	x = Number protection zone	Immediately active after referencing
\$SC_PA_CENT_ABS [x,0]	x = Number protection zone	Abscissa of arc center of 1st contour element
\$SC_PA_CENT_ABS [x,1]	x = Number protection zone	Abscissa of arc center of 2nd contour element
\$SC_PA_CENT_ABS [x,2]	x = Number protection zone	Abscissa of arc center of 3rd contour element

\$SSC_PA_CENT_ABS [x,3]	x = Number protection zone	Abscissa of arc center of 4th contour element
\$SSC_PA_CENT_ABS [x,4]	x = Number protection zone	Abscissa of arc center of 5th contour element
\$SSC_PA_CENT_ABS [x,5]	x = Number protection zone	Abscissa of arc center of 6th contour element
\$SSC_PA_CENT_ABS [x,6]	x = Number protection zone	Abscissa of arc center of 7th contour element
\$SSC_PA_CENT_ABS [x,7]	x = Number protection zone	Abscissa of arc center of 8th contour element
\$SSC_PA_CENT_ABS [x,8]	x = Number protection zone	Abscissa of arc center of 9th contour element
\$SSC_PA_CENT_ABS [x,9]	x = Number protection zone	Abscissa of arc center of 10th contour element
\$SSC_PA_CENT_ORD [x,0]	x = Number protection zone	Ordinate of arc center of 1st contour element
Name	Index	Description
\$SSC_PA_CENT_ORD [x,1]	x = Number protection zone	Ordinate of arc center of 2nd contour element
\$SSC_PA_CENT_ORD [x,2]	x = Number protection zone	Ordinate of arc center of 3rd contour element
\$SSC_PA_CENT_ORD [x,3]	x = Number protection zone	Ordinate of arc center of 4th contour element
\$SSC_PA_CENT_ORD [x,4]	x = Number protection zone	Ordinate of arc center of 5th contour element
\$SSC_PA_CENT_ORD [x,5]	x = Number protection zone	Ordinate of arc center of 6th contour element
\$SSC_PA_CENT_ORD [x,6]	x = Number protection zone	Ordinate of arc center of 7th contour element
\$SSC_PA_CENT_ORD [x,7]	x = Number protection zone	Ordinate of arc center of 8th contour element
\$SSC_PA_CENT_ORD [x,8]	x = Number protection zone	Ordinate of arc center of 9th contour element
\$SSC_PA_CENT_ORD [x,9]	x = Number protection zone	Ordinate of arc center of 10th contour element
\$SSC_PA_CONT_ABS [x,0]	x = Number protection zone	Abscissa of end point of 1st contour element
\$SSC_PA_CONT_ABS [x,1]	x = Number protection zone	Abscissa of end point of 2nd contour element
\$SSC_PA_CONT_ABS [x,2]	x = Number protection zone	Abscissa of end point of 3rd contour element
\$SSC_PA_CONT_ABS [x,3]	x = Number protection zone	Abscissa of end point of 4th contour element
\$SSC_PA_CONT_ABS [x,4]	x = Number protection zone	Abscissa of end point of 5th contour element
\$SSC_PA_CONT_ABS [x,5]	x = Number protection zone	Abscissa of end point of 6th contour element
\$SSC_PA_CONT_ABS [x,6]	x = Number protection zone	Abscissa of end point of 7th contour element
\$SSC_PA_CONT_ABS [x,7]	x = Number protection zone	Abscissa of end point of 8th contour element
\$SSC_PA_CONT_ABS [x,8]	x = Number protection zone	Abscissa of end point of 9th contour element

\$SSC_PA_CONT_ABS [x,9]	x = Number protection zone	Abscissa of end point of 10th contour element
\$SSC_PA_CONT_NUM[x]	x = Number protection zone	Number of valid contour elements
\$SSC_PA_CONT_ORD[x,0]	x = Number protection zone	Ordinate of end point of 1st contour element

Name	Index	Description
\$SSC_PA_CONT_ORD[x,1]	x = Number protection zone	Ordinate of end point of 2nd contour element
\$SSC_PA_CONT_ORD[x,2]	x = Number protection zone	Ordinate of end point of 3rd contour element
\$SSC_PA_CONT_ORD[x,3]	x = Number protection zone	Ordinate of end point of 4th contour element
\$SSC_PA_CONT_ORD[x,4]	x = Number protection zone	Ordinate of end point of 5th contour element
\$SSC_PA_CONT_ORD[x,5]	x = Number protection zone	Ordinate of end point of 6th contour element
\$SSC_PA_CONT_ORD[x,6]	x = Number protection zone	Ordinate of end point of 7th contour element
\$SSC_PA_CONT_ORD[x,7]	x = Number protection zone	Ordinate of end point of 8th contour element
\$SSC_PA_CONT_ORD[x,8]	x = Number protection zone	Ordinate of end point of 9th contour element
\$SSC_PA_CONT_ORD[x,9]	x = Number protection zone	Ordinate of end point of 10th contour element
\$SSC_PA_CONT_TYP[x,0]	x = Number protection zone	Contour type of 1st contour element
\$SSC_PA_CONT_TYP[x,1]	x = Number protection zone	Contour type of 2nd contour element
\$SSC_PA_CONT_TYP[x,2]	x = Number protection zone	Contour type of 3rd contour element
\$SSC_PA_CONT_TYP[x,3]	x = Number protection zone	Contour type of 4th contour element
\$SSC_PA_CONT_TYP[x,4]	x = Number protection zone	Contour type of 5th contour element
\$SSC_PA_CONT_TYP[x,5]	x = Number protection zone	Contour type of 6th contour element
\$SSC_PA_CONT_TYP[x,6]	x = Number protection zone	Contour type of 7th contour element
\$SSC_PA_CONT_TYP[x,7]	x = Number protection zone	Contour type of 8th contour element
\$SSC_PA_CONT_TYP[x,8]	x = Number protection zone	Contour type of 9th contour element
\$SSC_PA_CONT_TYP[x,9]	x = Number protection zone	Contour type of 10th contour element
\$SSC_PA_LIM_3DIM[x]	x = Number protection zone	Limitation of protection zone applicate
\$SSC_PA_MINUS_LIM[x]	x = Number protection zone	Lower limit of protection zone, applicate
\$SSC_PA_ORI[x]	x = No. protec. zone	Plane assignment of protection zone
\$SSC_PA_PLUS_LIM[x]	x = Number protection zone	Upper limit of protection zone, applicate

\$SC_PA_T_W[x]	x = Number protection zone	Workpiece or tool-related protection zone
\$SN_PA_ACTIV_IMMED[x]	x = Number protection zone	Immediately active after referencing
\$SN_PA_CENT_ABS [x,0]	x = Number protection zone	Abscissa of arc center of 1st contour element
Name	Index	Description
\$SN_PA_CENT_ABS [x,1]	x = Number protection zone	Abscissa of arc center of 2nd contour element
\$SN_PA_CENT_ABS [x,2]	x = Number protection zone	Abscissa of arc center of 3rd contour element
\$SN_PA_CENT_ABS [x,3]	x = Number protection zone	Abscissa of arc center of 4th contour element
\$SN_PA_CENT_ABS [x,4]	x = Number protection zone	Abscissa of arc center of 5th contour element
\$SN_PA_CENT_ABS [x,5]	x = Number protection zone	Abscissa of arc center of 6th contour element
\$SN_PA_CENT_ABS [x,6]	x = Number protection zone	Abscissa of arc center of 7th contour element
\$SN_PA_CENT_ABS [x,7]	x = Number protection zone	Abscissa of arc center of 8th contour element
\$SN_PA_CENT_ABS [x,8]	x = Number protection zone	Abscissa of arc center of 9th contour element
\$SN_PA_CENT_ABS [x,9]	x = Number protection zone	Abscissa of arc center of 10th contour element
\$SN_PA_CENT_ORD [x,0]	x = Number protection zone	Ordinate of arc center of 1st contour element
\$SN_PA_CENT_ORD [x,1]	x = Number protection zone	Ordinate of arc center of 2nd contour element
\$SN_PA_CENT_ORD [x,2]	x = Number protection zone	Ordinate of arc center of 3rd contour element
\$SN_PA_CENT_ORD [x,3]	x = Number protection zone	Ordinate of arc center of 4th contour element
\$SN_PA_CENT_ORD [x,4]	x = Number protection zone	Ordinate of arc center of 5th contour element
\$SN_PA_CENT_ORD [x,5]	x = Number protection zone	Ordinate of arc center of 6th contour element
\$SN_PA_CENT_ORD [x,6]	x = Number protection zone	Ordinate of arc center of 7th contour element
\$SN_PA_CENT_ORD [x,7]	x = Number protection zone	Ordinate of arc center of 8th contour element
\$SN_PA_CENT_ORD [x,8]	x = Number protection zone	Ordinate of arc center of 9th contour element
\$SN_PA_CENT_ORD [x,9]	x = Number protection zone	Ordinate of arc center of 10th contour element
\$SN_PA_CONT_ABS [x,0]	x = Number protection zone	Abscissa of end point of 1st contour element
\$SN_PA_CONT_ABS [x,1]	x = Number protection zone	Abscissa of end point of 2nd contour element
\$SN_PA_CONT_ABS [x,2]	x = Number protection zone	Abscissa of end point of 3rd contour element
\$SN_PA_CONT_ABS [x,3]	x = Number protection zone	Abscissa of end point of 4th contour element

\$SN_PA_CONT_ABS [x,4]	x = Number protection zone	Abscissa of end point of 5th contour element
\$SN_PA_CONT_ABS [x,5]	x = Number protection zone	Abscissa of end point of 6th contour element
\$SN_PA_CONT_ABS [x,6]	x = Number protection zone	Abscissa of end point of 7th contour element

Name	Index	Description
\$SN_PA_CONT_ABS [x,7]	x = Number protection zone	Abscissa of end point of 8th contour element
\$SN_PA_CONT_ABS [x,8]	x = Number protection zone	Abscissa of end point of 9th contour element
\$SN_PA_CONT_ABS [x,9]	x = Number protection zone	Abscissa of end point of 10th contour element
\$SN_PA_CONT_NUM[x]	x = Number protection zone	Number of valid contour elements
\$SN_PA_CONT_ORD[x,0]	x = Number protection zone	Ordinate of end point of 1st contour element
\$SN_PA_CONT_ORD[x,1]	x = Number protection zone	Ordinate of end point of 2nd contour element
\$SN_PA_CONT_ORD[x,2]	x = Number protection zone	Ordinate of end point of 3rd contour element
\$SN_PA_CONT_ORD[x,3]	x = Number protection zone	Ordinate of end point of 4th contour element
\$SN_PA_CONT_ORD[x,4]	x = Number protection zone	Ordinate of end point of 5th contour element
\$SN_PA_CONT_ORD[x,5]	x = Number protection zone	Ordinate of end point of 6th contour element
\$SN_PA_CONT_ORD[x,6]	x = Number protection zone	Ordinate of end point of 7th contour element
\$SN_PA_CONT_ORD[x,7]	x = Number protection zone	Ordinate of end point of 8th contour element
\$SN_PA_CONT_ORD[x,8]	x = Number protection zone	Ordinate of end point of 9th contour element
\$SN_PA_CONT_ORD[x,9]	x = Number protection zone	Ordinate of end point of 10th contour element
\$SN_PA_CONT_TYP [x,0]	x = Number protection zone	Contour type of 1st contour element
\$SN_PA_CONT_TYP [x,1]	x = Number protection zone	Contour type of 2nd contour element
\$SN_PA_CONT_TYP [x,2]	x = Number protection zone	Contour type of 3rd contour element
\$SN_PA_CONT_TYP [x,3]	x = Number protection zone	Contour type of 4th contour element
\$SN_PA_CONT_TYP [x,4]	x = Number protection zone	Contour type of 5th contour element
\$SN_PA_CONT_TYP [x,5]	x = Number protection zone	Contour type of 6th contour element
\$SN_PA_CONT_TYP [x,6]	x = Number protection zone	Contour type of 7th contour element
\$SN_PA_CONT_TYP [x,7]	x = Number protection zone	Contour type of 8th contour element

\$SN_PA_CONT_TYP [x,8]	x = Number protection zone	Contour type of 9th contour element
Name	Index	Description
\$SN_PA_CONT_TYP [x,9]	x = Number protection zone	Contour type of 10th contour element
\$SN_PA_LIM_3DIM [x]	x = Number protection zone	Limitation of protection zone applicate

Name	Index	Description
\$SN_PA_MINUS_LIM [x]	x = Number protection zone	Lower limit of protection zone, applicate
\$SN_PA_ORI[x]	x = Number protection zone	Plane assignment of protection zone
\$SN_PA_PLUS_LIM [x]	x = Number protection zone	Upper limit of protection zone, applicate
\$SN_PA_T_W[x]	x = Number protection zone	Workpiece or tool-related protection zone
\$TC_ADPT...		Adapter data
\$TC_ADPTx; \$TC_ADPTT	x = 1, ... 3,	Number of parameters per adapter
\$TC_DPCE		Transformed edge correction value
\$TC_DPCE		Edge correction value
\$TC_DPCx[y,z]	x=ParamNo,y=Tool No z=EdgeNo	User-defined tool edge parameter
\$TC_DPx[y,z]	x = ParamNo y = ToolNo z = EdgeNo	Edge correction value
\$TC_DPx[y,z]	x = ParamNo y = ToolNo z = EdgeNo	Transformed edge correction value
\$TC_ECP...		Transformed location-dependent setup correction
\$TC_MAMP3		Wear compound strategy
\$TC_MAP1		Type of magazine
\$TC_MAP2		Identifier of the magazine
\$TC_MAP3		Status of magazine
\$TC_MAP4		Link 1 between magazine and next magazine
\$TC_MAP5		Link 2 between magazine and preceding magazine
\$TC_MAP6		Magazine dimension
\$TC_MAP9		Number of active wear group
\$TC_MAPCx[y]	x=ParameterNo y=MagazineNo	Magazine user data for a tool magazine
\$TC_MOP1(x,y) ...\$TC_MOP15(x,y)	x=ToolNo y=EdgeNo	Monitoring data for each tool edge
\$TC_MOP1(x,y) ...\$TC_MOP15(x,y)	x=ToolNo y=EdgeNo	Monitoring data for each tool edge
\$TC_MOPCx[y,z]	x=ParamNo, y=T- Number, z=Edge	Monitoring user data for a tool edge
\$TC_MPPCx[y,z]	x=ParamNo y=MagazineNo z=MagPlaceNo	Magazine location user data for a tool magazine
\$TC_MPPx	x=1,...7	No. of parameters per magazine location
\$TC_SCP...		Transformed position-dependent wear correction
\$TC_SCP...		Location-dependent wear correction
\$TC_SCPx	x=13,...21,...71	No. total offset pars. per total offset block
\$TC_TP1		Duplo number

\$TC_TP10		Tool search type for replacement tools
\$TC_TP11		Tool information for MMC
\$TC_TP2		Tool designation
\$TC_TP3		Size to left in half locations
\$TC_TP4		Size to right in half locations
\$TC_TP5		Size upwards in half locations
\$TC_TP6		Size downwards in half locations

Name	Index	Description
\$TC_TP7		Magazine location type
\$TC_TP8		Tool status
\$TC_TP9		Tool monitoring method
\$TC_TPCx[y]	x = ParameterNo y = ToolNo	User-defined tool parameter
\$TC_TPG1		Spindle number
\$TC_TPG2		Chaining rule
\$TC_TPG3		Minimum wheel diameter
\$TC_TPG4		Minimum grinding wheel width
\$TC_TPG5		Current width of grinding wheel
\$TC_TPG6		Maximum speed of grinding wheel
\$TC_TPG7		Maximum grinding wheel peripheral speed
\$TC_TPG8		Angle of inclination of inclined grinding wheel
\$TC_TPG9		Compensation parameter for GWPS
\$VA_COUP_OFFS[x]	x = Axis	Offset to leading axis / leading spindle, actual value
\$VA_IS[x]	x = Axis	Safe actual position of axis
\$VA_VACTM[x]	x = Axis	Actual-value, load-end axis velocity in MCS system

8.4 List of PI services

PI_SERVICE(*service, n parameter*)

where:

Service Identifier of PI service
n parameter List of PI service parameters. The parameters are separated by a comma.

Table 8-3

Service	Explanation
	Parameters
	Example
<u>_N_ASUP_</u>	An interrupt number in the specified channel is assigned to a parts program stored in the NCK (identified by path name and program name). This PI service is identical to program instruction 'SETINT'.
	<i>Par1</i> Interrupt number (0 – 8) <i>Par2</i> Priority (0–8) <i>Par3</i> Liftfast (0, 1) <i>Par4</i> Block synchronization (0, 1) <i>Par5</i> Path data with max. 32 positions
	Assignment of interrupt 5 to program MPF_DIR/TEST_MPF in the current channel. The interrupt has priority 3 and is executed without rapid lift on the <i>PI_SERVICE("_N_ASUP_",5,3,0,0,"/N_MPF_DIR/N_TEST_MPF")</i>
<u>_N_CANCEL</u>	All alarms with the "Cancel Alarm" classification can be acknowledged with this command. Individual acknowledgment for specific alarms is not possible.

	All alarms with the "Cancel Alarm" classification are reset. <i>PI_SERVICE("_N_CANCEL")</i>

Service	Explanation
	Parameters
	Example
_N_CRCEDN	Create tool edge by specifying the cutting edge number. If the T number of an existing tool is entered in parameter "T Number" of this service, then a tool edge for the existing tool is created (in this case, the parameter "D number", i.e. the number of the edge to be created, has a value range of 1-9). If a positive T number is specified as a parameter and the tool for the T number entered does not exist, then the PI service is aborted. If a value of 0 is entered as the T number (model of absolute D numbers), then the D number values can range from 1 - 31999. The new cutting edge is set up with the specified D number. If the specified cutting edge already exists, then the PI service is aborted in both cases. <i>Par1</i> T number <i>Par2</i> D number T number == 0 ==> 1-31999 T number > 0 ==> 1-9
	A tool edge with number 3 is created for the tool with number 17 in the current TO area. <i>PI_SERVICE(" _N_CRCEDN",17,3)</i>
_N_CREATE	Create a new tool edge for a specified tool. The next-higher available D number is automatically set up. The following blocks in the active file system are affected by this PI service: Tool offsets TO: The relevant tool edge (with ZERO content) is set up Monitoring data TS: (If available) the relevant tool edge (with ZERO content) is set up User edge data TUE: (if available) the respective tool edge is created (with content ZERO) (NCK software versions < 10.x) <i>Par1</i> Tool number 1 to 31999
	After the tool with number 55 has been set up in T area 1, a further 2 edges are created for it. The tool therefore now possesses a total of 3 edges. <i>PI_SERVICE("_N_CREATO",55)</i> <i>PI_SERVICE("_N_CREATE",55)</i> <i>PI_SERVICE("_N_CREATE",55)</i>

Service	Explanation
	Parameters
	Example
_N_CREATO	Create a tool with a specific T number. The following blocks in the active file system are affected by this PI service: Tool directory TV: The tool is entered as an existing tool Tool offsets TO: The first tool edge D1 (with ZERO content) is set up User edge data TUE: (If available) the first tool edge D1 (with ZERO content) is set up User tool data TU: (If available) an empty data block is made available for the tool <i>Par1</i> Tool number 1 to 31999 After the tool with number 55 has been set up in T area 1, a further 2 edges are created for it. The tool therefore now possesses a total of 3 edges. <i>PI_SERVICE(" _N_CREATO",55)</i> <i>PI_SERVICE(" _N_CREACE",55)</i> <i>PI_SERVICE(" _N_CREACE",55)</i>
_N_DELECE	Delete a tool edge. If the T number of an existing tool is entered in parameter "T Number" of this PI service, then the tool edge for the relevant tool is deleted (in this case, the parameter "D number, i.e. the number of edge to be deleted, has a value range of 1-9). If a positive T number is specified as a parameter and the tool for the T number entered does not exist, then the PI service is aborted. If a value of 0 is entered as the T number (model of absolute D numbers), then the D number values can range from 1-31999. If the specified cutting edge does not exist, then the PI service is aborted in both cases. <i>Par1</i> T number of the tool for which the associated tool cutting edge is to be deleted. A setting of 0 indicates that there is no reference to a specific tool (absolute D number). <i>Par2</i> Cutting edge number of tool cutting edge that should be deleted. Value range: T number == 0 ==> 1–31999 T number > 0 ==> 1–9 The tool edge with number 3 for the tool with number 17 in the current TO area is deleted. <i>PI_SERVICE(" _N_DELECE",17,3)</i>

Service	Explanation
	Parameters
	Example
<u>_N_DELETEO</u>	Deletes the tool with all tool edges in all data blocks in which it is stored. The tool is also deleted in the following blocks (if available): TO, TU, TUE, TV, TG (type 400), TD, TS. <i>Par1</i> Tool number 1 to 31999 Deletion of tool with T number 21 in the current T area. <i>PI_SERVICE(" _N_DELETEO",21)</i>
	<i>Par1</i> ID for the search mode 1: Search without calculation 2: Search with calculation 3: Search including the main block analysis
	Start search with calculation in current channel. To start the PI service in a meaningful manner, the data structure for the block search (block SPRAF ; addressing on MMC102 with variable services via /Channel/Search/..) must be filled in beforehand. <i>PI_SERVICE(" _N_FINDBL",2)</i>
<u>_N_LOGIN</u>	A password which sets the current access level is sent to the NCK.
	<i>Par1</i> Password (precisely 8 characters, for less than 8 characters, blanks must be added)
	Transfers a password to the NCK, thus setting another access level. <i>PI_SERVICE(" _N_LOGIN ","TESTWORD")</i>
<u>_N_LOGOUT</u>	The current access level is reset.

	The current access level is reset. <i>PI_SERVICE(" _N_LOGOUT")</i>
<u>_N_SETUFR</u>	The SYSTEM OR USER variables 'linShift', 'mirrorImgActive', 'rotation' and 'scaleFact' in channel-specific data block FU can be used to define up to 8 zero offsets per channel. PI service <u>_N_SETUFR</u> must be called in order to activate these user-defined zero offsets.

	Activation of a user frame. <i>PI_SERVICE(" _N_SETUFR")</i>

8.5 Examples

```
//S(Start)
HS7=("Example", se1, ac7)
PRESS(HS7)
LM("Form4")
END_PRESS
//END

//M(Form4/"Example 4: Machine control panel"/"MST.BMP")

DEF byte=(I/0/0/"Input byte, Standard=0", "Byte
  No.:", ""/wr1/li1///380,40,100/480,40,50)
DEF Feed=(IBB/0/""/"Feed
  Ovrdr.", ""/wr1//EB3"/20,180,100/130,180,100),
  Axistop=(B/0/""/"Feed
  stop", ""/wr1//E2.2"/280,180,100/380,180,50/0,11)
DEF Spin=(IBB/0/""/"Spindle
  Override", ""/wr1//EB0"/20,210,100/130,210,100),
  spinstop=(B/0/""/"Spindle
  stop", ""/wr1//E2.4"/280,210,100/380,210,50/0,11)
DEF custom1=(IBB/0/""/"Customer keys
  1", ""/wr1//EB6"/20,240,100/130,240,100)
DEF custom2=(IBB/0/""/"Customer keys
  2", ""/wr1//EB7"/20,270,100/130,270,100)
DEF By1
DEF By2
DEF By3
DEF By6
DEF By7

HS1=("Input byte", SE1, AC4)
HS2=("")
HS3=("")
HS4=("")
HS5=("")
HS6=("")
HS7=("")
HS8=("")
VS1=("")
VS2=("")
VS3=("")
VS4=("")
VS5=("")
VS6=("")
VS7=("")
VS8=("OK", SE1, AC7)

LOAD
  By1=1
  By2=2
  By3=3
  By6=6
  By7=7
END_LOAD
```

```
PRESS(HS1)
  Byte.wr=2
END_PRESS

CHANGE(Byte)
  By1=byte+1
  By2=byte+2
  By3=byte+3
  By6=byte+6
  By7=byte+7
  Feed.VAR="EB"<<By3
  Spin.VAR="EB"<<Byte
  Custom1.VAR="EB"<<By6
  Custom2.VAR="EB"<<By7
  Axistop.VAR="E"<<By2<<".2"
  Spinstop.VAR="E"<<By2<<".4"
  Byte.wr=1
END_CHANGE

CHANGE(Axistop)
  IF Axistop==0
    Axistop.BC=9
  ELSE
    Axistop.BC=11
  ENDIF
END_CHANGE

CHANGE(Spinstop)
  IF Spinstop==0
    Spinstop.BC=9
  ELSE
    Spinstop.BC=11
  ENDIF
END_CHANGE

PRESS(VS8)
  EXIT
END_PRESS
```

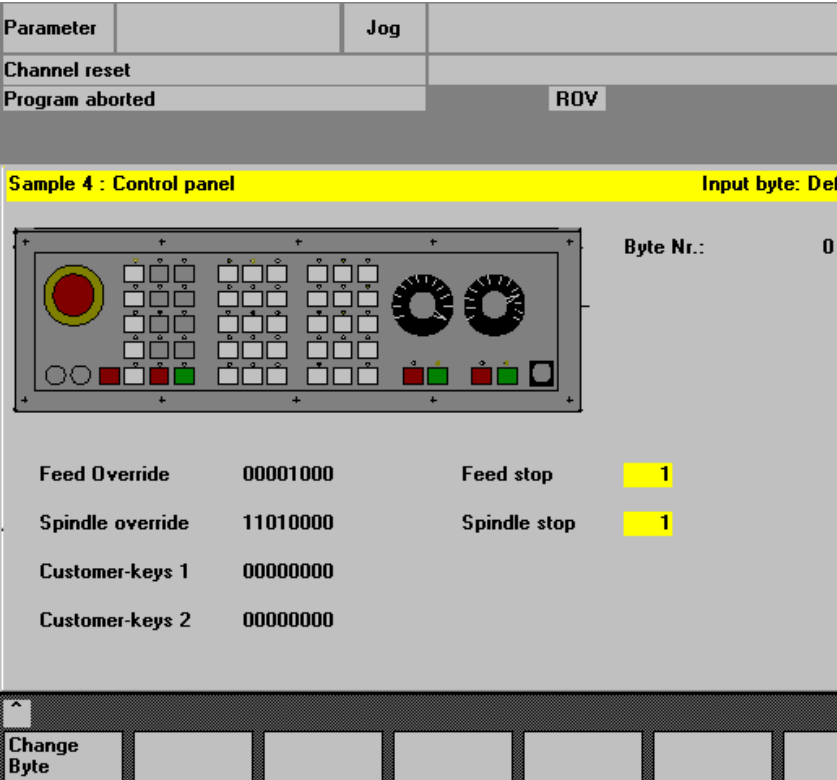


Figure 8-1

Note
You will find further examples in the supplied tool box.

■

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SINUMERIK 840D/840Di/810D

Installation and Start-Up HMI

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1.1 Overview of Programming Help

The following expandable Help systems are available on the control:

1. Programming Help
 - Short Help "ASCII"
 - Long Help "pdf"
 - Additional Help (PDF file) from Short Help "ASCII"
 - Additional Help for input fields of cycle parameterization screens
 - ISO Mode Help
2. Alarm Help
3. Machine Data Help

Their functionality and expandability is described in the following sections.

Hardware

The pdf Help is available for PCU 50/PCU 70 with the HMI Advanced or HMI Embedded Win 32 software.

Software

- HMI Advanced or HMI Embedded Win 32, SW 6.1 or higher
- Adobe Acrobat Reader 4.x (obtainable free in the Internet/in bookshops)
The Adobe Acrobat Reader 4.x software is installed in the SINUMERIK 840D control from SW 5.x as standard.
- Adobe Acrobat 4.x
You will require Adobe Acrobat Distiller 4.x software for converting documents to pdf and editing the pdf documents.

Note

- Adobe Acrobat 4 is available from your local software dealer
 - Cost: around DM 600, with discounts for bulk quantities
 - Adobe Reader 4 is free.
-

Help file directories

Programming Help	F:\	DH\CST.DIR\HLP.DIR (contains any hlp, pdf and txt files)
Alarm/MD Help	F:\	MMC2\HLP (contains any hlp, pdf and txt files)
OPI Help	F:\	HMI_ADV\HLP (contains any hlp, pdf and txt files)

Principle of the pdf Help

The pdf Help needs the following components in the Help file directory:

1. Call file, e.g. PG_GR.TXT, with the parameters
`<pdf file name> <ID> <search string>` for each call
2. Associated pdf file

The Help function is invoked as follows:

- Start Adobe Acrobat Reader (contained in the control)
- Jump to page number (define via index in the document)
- Search for keyword (search function in the Adobe software)

Procedure:

1. Define and generate the jumps in the Help document (e.g. using the standard index function of DTP systems)
2. Save the jump file as a text file
3. For Programming Help only: Assign ID numbers to the programming commands
4. Generate the pdf file

Result:

- A call file (text file) with the parameters
`<pdf file name> <ID> <search string>` for each call
- One or more associated pdf file(s)

Note

For multiple jumps to a topic, each page reference must be written on a new line.

Example:	840d_pg_gr.pdf	44	155
	840d_pg_gr.pdf	45	180
	840d_pg_gr.pdf	46	199

Tip:

In cases where the index is large, the call file can be generated automatically using Microsoft Excel:

- Insert "index file" (*.txt) in Excel
- Insert a column
- Enter the name of the PDF file in the first line.
- Execute "Edit - Fill".
- Copy data and
- Save the file as "txt".

The following syntax should remain:

<code><pdf file name></code>	<code><ID></code>	<code><search string></code>
840d_pg_gr.pdf	44	155

Testing the jumps in the document

To check whether all search keys have been found, proceed as follows:

Start up Adobe Acrobat

Activate the menu item Edit -> Find (Ctrl+F)

Enter search term.

Note

If the search terms were not found, it can be due to the following:

- Error during input
- The texts were incorrectly converted at PDF generation, therefore they could not be found by the search function.

Analysis: Highlight a search term in the Adobe Acrobat, copy it and insert it into a Word document.

Remedy:

- Generate pdf again.
 - Produce the postscript file again using the Adobe printer driver PS 5.1.1 and then convert it using the Acrobat Distiller.
-

Search order

The search order for the Help function is as follows:

1. F:\ USER\HLP
2. F:\ OEM\HLP
3. F:\ ADD_ON\HLP
4. F:\ MMC2\HLP
5. F:\ HMI_ADV\HLP
6. F:\ DH\CUS.DIR\HLP.DIR (User directory)
7. F:\ DH\CMA.DIR\HLP.DIR (Manufacturer directory)
8. F:\ DH\CST.DIR\HLP.DIR (Siemens directory)
9. F:\ DH\COM.DIR\HLP.DIR

1.2 Short Help "ASCII"

The following Help functions are provided in the editor for programming support when editing part programs; they are called by pressing the *"Information key"*:

- Short Help "ASCII"
 1. **Descriptive text for instructions**, context-sensitive with reference to the cursor position in the part program (e.g. G9 "Exact stop - deceleration")
 2. **List of general categories** (e.g. "Preparatory functions", "Travel commands", "Path action", etc.) to which instructions are assigned
 3. **Overview of instructions with descriptive texts**
 4. **Find** in the help window via category or text
 5. **Accept** the selected instruction in the editor
- Long Help "pdf"
 1. Call the **Additional Help** (PDF file) **from the Short Help "ASCII"**, e.g. jump to Programming Guide Fundamentals.
 2. Call the **Additional Help for input fields in the cycle screens** (PDF file)

1.2.1 Expanding/replacing the Help function

The machine manufacturer or end user can integrate additional M and H functions, cycles or macros into the Help system.

Certain text files to which the help function accesses can be expanded (see Section 1.4 "Expanding the Text Files").

The paths of the generated ASCII text files must be entered in the "IF.INI" initialization file or configured under *"Settings"* (user file name).

1.2.2 Entries in the "IF.INI" file

The following sections are available in the "If.ini" file for configuring the Help functions:

- TECHNOLOGY
- TEXTFILES
- CONTEXT
- TEXTSEARCH

TECHNOLOGY section

The relevant technology category of the connected machine can be entered in the [TECHNOLOGY] section so as to limit the display of instruction texts to relevant technology entries, i.e. only entries pertinent to the relevant technology are displayed.

The following technology codes can be specified:

"m" = milling
"t" = turning
"g" = grinding
"s" = nibbling
"p" = punching
"a" = display all technologies

TEXTFILES section

The paths (path\name) used for the Short Help text files on which the help function is based are parameterized in the section [TEXTFILES].

The help function accesses the following text files:

- Siemens "DH\CST.DIR\IFS_GR.COM"
- Machine manufacturer "DH\CMA.DIR\IFM_GR.COM" (any file name)
- End user "DH\CUS.DIR\USER_GR.COM" (any file name)
(is also entered via "Settings")



Important

The path for the Siemens text file "DH\CST.DIR\IFS_GR.COM" **must** exist otherwise an error message is output.

There are different parameterization options for the names of the text files when assigning the text path.

The following table lists the parameterization options and their interpretation by the Help function.

Table 1-1

Parameters for the text file	Interpretation
FileName.com	The language-dependent text file is read out.
File name_XX.com (XX=language code, e.g. "gr" for German. For a list of language codes, see also /IAD/ 840D Installation and Start-Up Guide, Section "Alarm and Message Texts")	The language-dependent text file is read out.

Example: ENDUSER=CUS.DIR\IFM_.COM

First of all, the language-independent text file "IFM.COM" is opened in the path "C:\DH\CUS.DIR\" by default or, if the language-independent text file does not exist, the relevant language-dependent text file (e.g. "IFM.COM") is opened.

Excerpt from txt file "IFM_GR.COM":

```

...
a2//G00/Linear interpolation with rapid traverse (m) Short Help
a2//G01/Linear interpolation with feed (m)
...
a/20/"PGA.PDF",2,"="/=Assignment operator with Long Help
...
a/3/"PG.PDF",17,"ANG"/ANG/Contour angle (s) with Long Help for
cycles
...
m/14/"PGZ.PDF",302,"CYCLE77"/CYCLE77/Circular spigot milling
cycle with Long Help for
cycles
...

```

CONTEXT section

An increased context sensitivity of the Help function can be selected in the [CONTEXT] section. This setting is activated with "1" and deactivated with "0".

(Also parameterized under "Settings").

If the increased context sensitivity is activated and the cursor is positioned to the left of or on an instruction text, then all instructions with the same initial letters are displayed when Help is called.

For example, if the programmer has selected instruction "G1", then all instructions beginning with "G1" (e.g. "G1", "G17", "G18", "G19") are displayed.

If increased context sensitivity has been deactivated with "0", then only the instruction actually selected (if available) is displayed.

TEXTSEARCH section

The text search type can be specified in the [TEXTSEARCH] section. The following search methods can be parameterized:

- 1 = instruction texts only
- 2 = descriptive texts only
- 3 = instruction and descriptive texts

(also entered under "Search").

File IF.INI

[TECHNOLOGY]

"m" = milling
"t" = turning
"g" = grinding
"s" = nibbling
"p" = punching
"a" = display all technologies

[TEXTFILES]

Siemens = DH\CST.DIR\IFS_GR.COM
Machine manufacturer = DH\CMA.DIR\IFM_GR.COM
Machine manufacturer = DH\CMA.DIR\IFI_GR.COM
End user = DH\CUS.DIR\USER_GR.COM

[CONTEXT]

= 0 Context sensitivity not active
= 1 Context sensitivity active

[TEXTSEARCH]

= 1 Text search only according in instruction texts
= 2 Text search only according in description texts
= 3 Text search in instruction and description texts

1.2.3 Expanding the text files

The text files have the following two categories:

1. Topic definition
2. Instruction definition

The following functions can be added to the text files (*.com) of the Help according to the following pattern:

- General categories, i.e. **"groups" of instructions**
- Instructions with **descriptive texts**
- Instructions with Extended Help call
 - Editor Help **"pdf"** or
 - Cycle Help **for input fields in the cycle screens** in which the instruction parameters are entered
- Instructions with **alarm text variables** as descriptive texts.

The corresponding text file provides one line each.

The following screenshot shows an example:

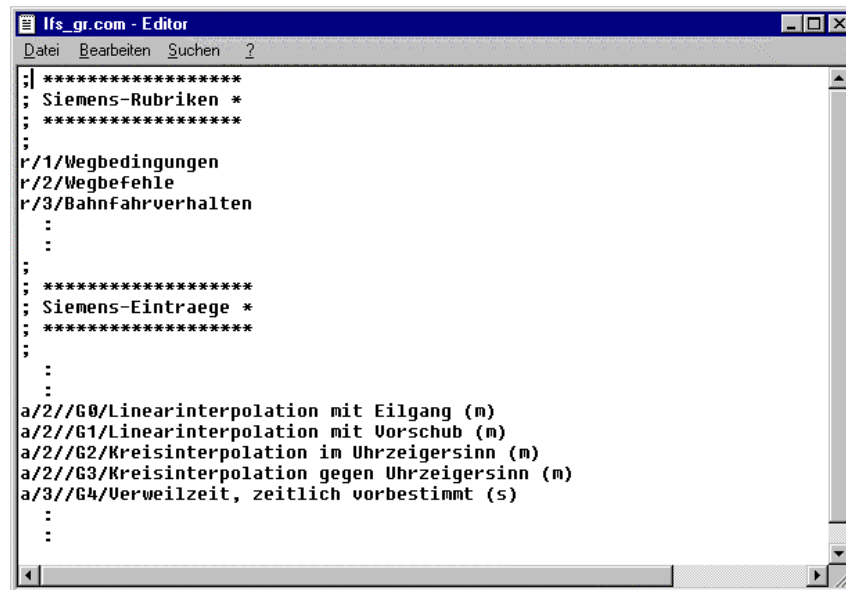


Fig. 1-1 Siemens text file

A category definition contains the following parameters:

Category definition

Technology code "r"/Category ID/Category name

An instruction definition contains the following parameters:

Instruction definition

Technology/Category ID/Extended Help
/Instruction text/Descriptive text

Note

1. With reference to the individual text files, first the Siemens and then the machine manufacturer and last the final user general category are displayed.
 2. The order specified above appears only if the **categories** are defined **first**, followed by the instruction declarations in the text file.
 3. To provide correct sorting of the standard, machine manufacturer and final user instructions, the instructions in the text files must be stored in the **alphabetical** order.
-

1.2.4 Expanding a general category

Adding a new category

A group of instructions via which instructions can be displayed is stored behind a general category heading.

A line for the category definition contains the following 3 parameters:

Category definition

Technology code "r"/Category ID/Category name

In this case, the text file could contain the following line:

`r/2/Travel commands`

`r` is a predefined setting for category declarations.
`2` is the category ID used to assign instructions to the category.
`Travel commands` category name.

The "/" character separates the parameters and may only be used as a text character in the last parameter.

The length of the category name is limited by the display and may not, for example, exceed 40 characters with a standard type size of 8pt.

The following category IDs are reserved:

Table 1-2 Category IDs

Category ID	User
0...49	Siemens
50...99	Machine manufacturer
100 and over	End user

The following category IDs are provided in the Siemens text file as standard:

Table 1-3 Pre-assigned category IDs

Categ. ID	Category name	Categ. ID	Category name
1	Preparatory Functions	13	Program Handling
2	Travel Commands	14	Standard Cycles
3	Path Action	15	Measuring Cycles
4	Feedrate	16	Measurement
5	Spindle	17	Synchronized Actions
6	Axis Handling	18	Interrupt Handling
7	M Functions	19	String/Field operators
8	H Functions	20	Math. Functions/Operators
9	Offsets	21	Definitions
10	Transformations	22	High-Language Elements
11	Tool Management/Compensations	23	Parameters
12	Technology Functions	24	System Variables

1.2.5 Expanding an instruction

Expanding an instruction

An instruction contains description texts, e.g. "G0/linear interpolation with rapid traverse". The category ID is used to assign instructions to the category.

Parameters of the instruction definition

An instruction definition contains the following parameters:

Technology/Category ID/Extended Help/Instruction text/Descriptive text

Example for Editor Help

```
a/20/"PGA.PDF", 2, "="/=/Assignment operator
a                                     Technology milling
20                                  Category ID standard cycles
"PGA.PDF", 2, "="                  Extended Help for command "="
=                                   Instruction text
Assignment operator                 Descriptive text
```

When the above line is entered in one of the user text files (e.g. IFM_GR.COM), the "pga.pdf" Help file for command "=" is called and the corresponding section of the Help file is displayed.

Example for Cycle Help:

```
m/14/"PGZ.PDF", 302, "CYCLE83"/CYCLE83/Milling cycle Deep-hole
drilling
m                                   Milling technology
14                                  Category ID standard cycles
"PGZ.PDF", 302, "RTP"              Extended Help for parameter "RTP"
                                    in cycle parameterization screen
CYCLE83                             Instruction text for CYCLE83
Milling cycle Deep-hole drilling     Descriptive text
```

After the above line has been entered in one of the user text files, the user cycle "CYCLExx" is supported within the Help system. It is displayed if either of the following are entered in the "If.ini" initialization file:

- The technology-independent identifier "a"
- The specific milling machine identifier "m"

The cycle is assigned to "Standard cycles" via category ID "14", i.e. it can also be found by making the appropriate entry in the category search.

The last parameter of the definition contains the descriptive text that is displayed in the corresponding column of the Help system to provide the user with basic information about the function of the cycle.

The "/" character separates the parameters and may only be used as a text character in the last parameter.

Technology

The following characters are used to assign the instruction to a technology type:

"m"	= milling
"t"	= turning
"g"	= grinding
"s"	= nibbling
"p"	= punching
"a"	= display for all technologies

Note

If you wish to assign instructions to several technologies and different categories, the relevant ID codes must be separated by a "comma".

Category ID

The category ID is programmed to assign instructions to a particular category of the category definition and display them under the relevant category heading.

Integrating additional commands

If additional commands with brief description are to be integrated in the Help system, these must be added to the DH\CMA.DIR\ directory in the file IFM_GR.COM (any file name) in accordance with the syntax above. If additional help (Long Help "pdf") is to be called up for these commands, the *"Extended Help"* parameter should be added, as described in the following section.

1.2.6 Configuring the Long Help "pdf"

Calling the Extended Help

A special identifier in the "Extended Help" parameter of the instruction definition allows a Long Help "pdf" file to be called up as online help, in addition to the Short Help. The Long Help can contain detailed information about a selected command, for example. The following calls are possible:

- **Editor Help:** Jump directly to the Help (pdf file) from a term (command) in the Short Help "ASCII" of the program editor
- **Cycle Help:** Jump to the Help (pdf file) from an input field in the cycle screen

Parameters of the instruction definition

Technology/Category ID/Extended Help/Instruction text/Descriptive text

Extended Help

The following entries are possible in the "Extended Help" parameter:

- **Editor Help**
/"Pdf file name", Help ID, "search string"/
- **Cycle Help**
/"Pdf file name", Help ID, "search string" (file name, Help display)/

Two commas must be placed in the "Extended Help" parameter, even if no entry is made.

Example:

The declaration line requires, e.g. the following parameters:

```
m,t/14/"Pdf file name", Help ID, "search string" (file name,
Help display)/CYCLE82/drilling cycle, drilling, counterboring
```

The entries for the "Extended Help" parameter have the following meaning:

Pdf file name

= file from which the descriptive text is to be displayed

Help ID

= unique assignment to term for which Help is to be displayed

search string

= search string in the pdf file to be displayed in the Help text.

(file name, help display)

= name of the file that contains the Help displays and the name of the Help display to be displayed (→ only relevant for Cycle Help)

CYCLE82

= instruction text

Drilling cycle, boring, counterbore

= description text

Sample call:

```
m,t/14/"PGZ.pdf",1,"RTP"(drilling,CYC82)/CYCLE82/drilling
cycle, drilling, counterboring
```

Note

If you wish to access only the Pdf file, only these parameters are permissible in the "Extended Help" section.

e.g.: m,t/14/"PGZ.pdf",1,"RTP"/CYCLE82/drilling cycle, drilling, counterboring

If you wish to display only the Help display, only these parameters are permissible in the "Extended Help" section.

e.g.: m,t/14/(drilling,CYC82)/CYCLE82/drilling cycle, drilling, counterboring

Instruction text

"G17" is one example of an instruction text. This text is transferred to the part program that you are editing when you select *"Transfer to the Editor"*. Instruction texts can be about 12 characters in length.

Descriptive text

The descriptive text is the Help text that describes the instruction more in detail. The length of the descriptive text is limited by the display and must not, for example, exceed 40 characters with a standard type size of 8pt.

Multiple jumps

Multiple Help references can be stored per Help text as a ring (i.e. after the last Help reference, the first Help reference is displayed again).

E.g.: `m,t/14/"Hlp.pdf",1,"Hilfe1",,2,"Hilfe2","Help3.pdf",3,,/
CYCLE82/drilling cycle, drilling, counterboring`

I.e.:

1. Entry in the Help text ring
File: HLP.PDF
Index: 1
Text: Help1
2. Entry in the Help text ring
File: HLP.PDF
Index: 2
Text: Help2
3. Entry in the Help text ring
File: HELP3.PDF
Index: 3
Text: Help2

To avoid repetitions, the components of the previous block are stored, as shown in the example. Only whole blocks are transferred.

Note

- How the pdf files and Help files are embedded in the system is described in Section 2.2 "Embedding PDF files in the Help system".
 - Two commas must be placed in the "Extended Help" parameter, even if no entry is made.
-

1.2.7 Expansion with alarm text variables

Expansion with alarm text variables

A special feature to be noted with respect to parameterizing the section for descriptive texts or category names is that ("Alarm text variables") can be stored in the section in place of descriptive texts.

These variables begin with "\$".

E.g. `m/14//CYCLExx/$888888`

Instead of entering the descriptive text directly into the Help text file, it is stored directly, e.g. under the alarm text variable "\$888888".

The declaration of the descriptive text is thus relocated to a user-specific alarm text file.

Thus you have a language-independent text file.

See /PGZ/, "Programming Guide Cycles", Section "Independence of Language".

1.3 Long Help "pdf"

1.3.1 Function

The following Help functions are provided in the editor for programming support when editing part programs; they are called by pressing the *"Information key"*:

- Short Help "ASCII"
 1. **Descriptive text for instructions**, context-sensitive with reference to the cursor position in the part program (e.g. G9 "Exact stop - deceleration")
 2. **List of general categories** (e.g. "Preparatory functions", "Travel commands", "Path action", etc.) to which instructions are assigned
 3. **Overview of instructions with descriptive texts**
 4. **Find** in the help window via category or text
 5. **Accept** the selected instruction in the editor
- Long Help "pdf"
 1. Call the **Additional Help** (PDF file) **from the Short Help "ASCII"**, e.g. jump to Programming Guide Fundamentals.
 2. Call the **Additional Help for input fields in the cycle parameterization screens** (PDF file)

1.3.2 Expanding the Programming Help

A special identifier in the "Extended Help" parameter of the instruction definition allows a Long Help file to be included in addition to the Short Help (e.g. to display detailed information about a selected command).

The following calls are possible:

- **Editor Help:** Jump directly to the Help (pdf file) from a term (command) in the Short Help "ASCII" of the program editor

Precondition:

A list of additional commands to be displayed in the Short Help has already been created (e.g. IFM_GR.COM), according to the procedure described in Section 1.4 "Expanding the text files", and stored in the control. This enables the "About" key to be used to call the Long Help after the Short Help. Make sure that the list of commands for the Short Help corresponds to the list of commands for the Long Help (concordance).

- **Cycle Help:** Jump to the Help (pdf file) from an input field in the cycle screen

Parameters of the instruction definition:

```
Technology/Category ID/Extended Help/Instruction text/  
Descriptive text
```

"Extended Help":

The following entries are possible in the "Extended Help" parameter:

- **Editor Help**
/"Pdf file name", Help ID, "search string"/
Example: a/20/"PGA.PDF", 2, "="/=Assignment operator
- **Cycle Help**
/"Pdf file name", Help ID, "search string" (file name, help display)/
Example: a/3/"PG.PDF", 17, "ANG"/ANG/Contour angle (s)

Configuring the Long Help pdf: see Subsection 1.4.3 "Expanding the Long Help pdf"

Required files

- IFM_GR.COM text file with program commands and brief description
- *.pdf Help file e.g. 840d_pg_gr.pdf
- *.txt Jump file e.g. 840d_pg_gr.txt

1

Define jump labels in the document

The jumps must be marked with index entry in the document (e.g. WinWord) of which excerpts are to be displayed on the control as pdf. and a single-column index list (page numbers right-justified) produced. If multiple jumps are required for command, assign the appropriate number of index markers first.

2**Create text file**

Copy the single-column index created above (page number right-justified) and save it as a txt file (*.txt).

Example: MEAW 155
 <search term> <page>

The text file for the pdf call has the following syntax:
 <pdf file name> <ID> <page>

Add the name of the pdf file for each line (**without language code**).

Example: 840d_pg_gr.pdf MEAW 155
 <pdf name> <ID> <page>

3**Define ID numbers**

Define unambiguous ID numbers (e.g. 1...n) for the search terms in each document: The ID numbers correspond to the list of instructions of the Short Help "ASCII", since the detailed description is to be displayed for the brief descriptions.

Example: 840d_pg_gr.pdf 44 MEAW 155
 <pdf file name> <ID> <search term> <page>

Now delete the column "search terms", so that the following syntax remains:

Result: <pdf file name> <ID> <page>
 840d_pg_gr.pdf 44 155

4**Generate a pdf file**

Print your document as a postscript file and convert it to "pdf" using the Adobe Acrobat Distiller.

5**Reading files to the control**

The generated files (*.pdf and *.txt) must be copied onto the control, e.g. to directory F:\DH\CUS.DIR\HLP.

Note

In cases where the index is large, the call file can be generated automatically using Microsoft Excel:

- Insert text file (*.txt) in Excel
 - Insert a column
 - Enter the name of the PDF file in the first line.
 - Execute "Edit - Fill".
 - Now delete the column "search terms", so that the following syntax remains:

<pdf file name>	<ID>	<page>
840d_pg_gr.pdf	44	155
 - Copy data and
 - save the file as "txt".
-

1.4 ISO Mode Help

1.4.1 Function

The following 840D-specific Help function is displayed per default:

- Help in the Editor
- Alarm Help
- Machine Data Help

If "ISO dialect 0" Help functions are to be displayed, the data to be displayed must be distinguished, since the same commands can have different meanings, for example.

To do this, the "IF.INI" file has been expanded in the [TEXTFILES] section to include the entry **SiemensI=Cst.dir\ifit_.com** (turning technology) or **SiemensI=Cst.dir\ifim_.com** (milling technology), under which the path (Cst.dir) and name (ifit_.com or ifim_.com) are specified for the ISO Mode Short Help "ASCII".

The relevant Long Help "pdf" can then be called from the Short Help "ASCII".

IF.INI[TEXTFILES]

```
[TEXTFILES]
;text files containing the information shown in the Help
system
Siemens=Cst.dir\Ifs_.com
SiemensI=Cst.dir\ifit_.com or ifim_.com
Manufacturer=
Enduser=
```


Required files

- List of "ISO-dialect 0" commands with associated brief description (see Chapter 1)
- TXT file for jump to PDF file
- PDF file to be displayed in the Help

Program sequence

The Help function checks the following machine data during start-up:

- MD 1880 MM_EXTERN_LANGUAGE
If this MD is activated, the control switches to ISO Dialect 0 mode.
If MD 1880 = 1, MD 20150 is evaluated.
- MD 20150 GCODE_RESET_VALUES[n(current channel),47]
If MD 20150 [47] = 2, the file entered in the INI file under "SiemensI" (ISO Mode) is used
(otherwise the file entered under "Siemens" is used).
- MD 10880 MM_EXTERN_CNC_LANGUAGE
MD 10880 specifies whether the control must be set for turning or milling in ISO mode.

1.4.2 Expanding the ISO Mode Help

If additional descriptions are to be displayed in the ISO mode Help function, they must be added in the form of

- a list of ISO-mode commands with brief description in the file ifit_.com or ifim_.com file in the SiemensI=Cst.dir\ directory (see Section 1.4 "Expanding the text files"),
- a Help description (pdf file) and a text file with the same name in the directory F:\USER\HLP.

Parameters of the instruction definition:

Technology/Category ID/Extended Help/Instruction text/
Descriptive text

"Extended Help":

The following entries are possible in the "Extended Help" parameter:

- Editor Help
/"Pdf file name", Help ID, "page number"/
- Cycle Help
/"Pdf file name", Help ID, "page number" (file name, Help display)/

Configuring the Long Help pdf: see Subsection 1.4.3 "Expanding the Long Help pdf"

Required files

- Ifit_.com or Ifim_.com text file with ISO-mode commands and brief description
- *.pdf e.g. 840d_pgkit_gr.pdf
- *.txt e.g. 840d_pgkit_gr.txt

1

Define jump labels in the document

The jump labels must be marked with an index entry in the document (e.g. WinWord) to be displayed at the control as pdf and a single-column index list (page numbers right-justified) produced.

2

Generate a text file

Copy the single-column index created above (page number right-justified) and save it as a txt file.

Example: G65 155
 <search term> <page>

The text file requires the following syntax to call the pdf file:

 <pdf file name> <search term> <page>

Add the name of the pdf file for each line (**without language code**).

Example: 840d_pgkit.pdf G65 155
 <pdf name> <search term> <page>

3

Define ID numbers

Define unambiguous ID numbers (e.g. 1...n) for the search terms in each document: The ID numbers correspond to the list of instructions of the Short Help "ASCII", since the detailed description is to be displayed for the brief descriptions.

Example: 840d_pgkit.pdf 44 MEAW 155
 <pdf file name> <ID> <search term> <page>

Now delete the column "search terms", so that the following syntax remains:

Result: <pdf file name> <ID> <page>
 840d_pgkit.pdf 44 155

4

Generate a pdf file

Print your document as a postscript file and convert it to "pdf" using the Adobe Acrobat Distiller.

5

Reading files to the control

The files created (*.pdf and *.txt) must be read to the control from the F:\USER\HLP directory.

Note

In cases where the index is large, the call file can be generated automatically using Microsoft Excel:

- Insert text file (*.txt) in Excel
 - Insert a column
 - Enter the name of the PDF file in the first line.
 - Execute "Edit - Fill".
 - Now delete the column "search terms", so that the following syntax remains:

<i><pdf file name></i>	<i><ID></i>	<i><page></i>
840d_pg.pdf	44	155
 - Copy data and
 - save the file as "txt".
-



2

2 Alarm/Machine Data Help

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2.3 Machine Data Help	HE1/2-32
2.3.1 Function	HE1/2-32
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2.1 Overview

The following expandable Help systems are available on the control:

1. Programming Help
 - Short Help "ASCII"
 - Long Help "pdf"
 - Additional Help (PDF file) from Short Help "ASCII".
 - Additional Help for input fields of cycle parameterization screens
 - ISO Mode Help
2. Alarm Help
3. Machine Data Help

Their functionality and expandability is described in the following sections.

Hardware

The pdf Help is available for PCU 50/PCU 70 with the HMI Advanced or HMI Embedded Win 32 software.

Software

- HMI Advanced or HMI Embedded Win 32, SW 6.1 or higher
- Adobe Acrobat Reader 4.x (obtainable free in the Internet/in bookshops)
The Adobe Acrobat Reader 4.x software is installed in the SINUMERIK 840D control from SW 5.x as standard.
- Adobe Acrobat 4.x
You will require Adobe Acrobat Distiller 4.x software for converting documents to pdf and editing the pdf documents.

Note

- Adobe Acrobat 4 is available from your local software dealer
 - Cost: around DM 600, with discounts for bulk quantities
 - Adobe Reader 4 is free.
-

Help file directories

Programming Help	F:\	DH\CST.DIR\HLP.DIR (contains any hlp, pdf and txt files)
Alarm/MD Help	F:\	MMC2\HLP (contains any hlp, pdf and txt files)
OPI Help	F:\	HMI_ADV\HLP (contains any hlp, pdf and txt files)

Principle of the pdf Help

The pdf Help needs the following components in the Help file directory:

1. Call file, e.g. PG_GR.TXT, with the parameters
`<pdf file name> <ID> <search string>` for each call
2. Associated pdf file

The Help function is invoked as follows:

- Start Adobe Acrobat Reader (contained in the control)
- Jump to page number (define via index in the document)
- Search for keyword (search function in the Adobe software)

Procedure:

1. Define and generate the jumps in the Help document (e.g. using the standard index function of DTP systems)
2. Save the jump file as a text file
3. For Programming Help only: Assign ID numbers to the programming commands
4. Generate the pdf file

Result:

- A call file (text file) with the parameters
`<pdf file name> <ID> <search string>` for each call
- One or more associated pdf file(s)

Note

For multiple jumps to one topic, each page reference must be written on a new line.

Example:	840d_pg_gr.pdf	44	155
	840d_pg_gr.pdf	45	180
	840d_pg_gr.pdf	46	199

Tip:

In cases where the index is large, the call file can be generated automatically using Microsoft Excel:

- Insert "index file" (*.txt) in Excel
- Insert a column
- Enter the name of the PDF file in the first line.
- Execute "Edit - Fill".
- Copy data and
- save the file as "txt".

The following syntax should remain:

<code><pdf file name></code>	<code><ID></code>	<code><search string></code>
840d_pg_gr.pdf	44	155

Testing the jumps in the document

To check whether all search keys have been found, proceed as follows:

Start up Adobe Acrobat

Activate the menu item Edit -> Find (Ctrl+F)

Enter search term.

Note

If the search terms were not found, it can be due to the following:

- Error during input
- The texts were incorrectly converted at PDF generation, therefore they could not be found by the search function.

Analysis: Highlight a search term in the Adobe Acrobat, copy it and insert it into a Word document.

Remedy:

- Generate pdf again.
 - Produce the postscript file again using the Adobe printer driver PS 5.1.1 and then convert it using the Acrobat Distiller.
-

Search order

The search order for the Help function is as follows:

1. F:\ USER\HLP
2. F:\ OEM\HLP
3. F:\ ADD_ON\HLP
4. F:\ MMC2\HLP
5. F:\ HMI_ADV\HLP
6. F:\ DH\CUS.DIR\HLP.DIR (User directory)
7. F:\ DH\CMA.DIR\HLP.DIR (Manufacturer directory)
8. F:\ DH\CST.DIR\HLP.DIR (Siemens directory)
9. F:\ DH\COM.DIR\HLP.DIR

2.2 Alarm Help

2.2.1 Function

In SW 6.1 and later, the Machine Data Help is based on the "pdf Help", i.e. a pdf file is opened when the Help function is called and the corresponding alarm is displayed in the control using Adobe Reader 4.

The files containing the alarms data are stored in the following directories:

- Siemens alarms F:\HMI_ADV\HLP,
- Manufacturer alarms F:\DH\CMA.DIR\HLP
- User alarms F:\DH\USER\HLP

File names

The following file names **must be used**, also for additional user alarms (i.e. must **not** be changed):

- ALARM_GR.PDF [German alarms]
- ALARM_UK.PDF [English alarms]
- ALARM_FR.PDF [French alarms]
- ALARM_IT.PDF [Italian alarms]
- ALARM_SP.PDF [Spanish alarms]

The names of the associated txt files (containing the jump list) must correspond as follows:

- ALARM_GR.TXT [German txt file]
- ALARM_UK.TXT [English txt file]
- ALARM_FR.TXT [French txt file]
- ALARM_IT.TXT [Italian txt file]
- ALARM_SP.TXT [Spanish txt file]

Further languages

The alarm texts are available in the following languages:

CH:	Simplified Chinese
TW:	Standard Chinese
KO:	Korean
JA:	Japanese
SW:	Swedish
HU:	Hungarian
PO:	Portuguese
CZ:	Czech
TR:	Turkish
RU:	Russian
PL:	Polish
NL:	Dutch

The language codes for the file names of the user alarms must be used in accordance with the naming conventions specified above (must **not** be changed).

2.2.2 Expanding the Alarm Help

If additional user alarms are to be displayed in the Alarm Help, these must be added in the form of a pdf file and in a txt file of the same name in the C:\USER\HLP directory.

Required files

- *.pdf e.g. alarm_gr.pdf
- *.txt e.g. alarm_gr.txt

1

Define jump labels in the document

The jump labels must be marked with an index entry in the document (e.g. WinWord) to be displayed at the control as pdf single-column index list (page numbers right-justified) produced.

2

Create text file

Copy the single-column index created above (page number right-justified) and save it as a txt file.

Example: 10702 90
<ID> <page>

The search word (alarm number) is the same as the ID No. in this case.

The text file requires the following syntax to call the pdf file:
<pdf file name> <ID> <page>

Insert the name of the pdf file in front of each line.

Example: ALARM_GR.PDF 10702 90
ALARM_GR.PDF 10703 90
ALARM_GR.PDF 10704 91
<pdf name> <ID> <page>

3

Generate pdf file

Print your document as a postscript file and convert it to "pdf" using the Adobe Acrobat Distiller.

4

Incorporate the files to the control

The generated files (*.pdf and *.txt) must be copied onto the control, e.g. to directory F:\DH\USER\HLP.

2.2.3 User comments in Help

The Help for alarms (key [i] in diagnostics) offers the notepad function where customized texts can be saved for the individual alarms. These texts are stored in the directory

F:\USER\RH

and are retained at MMC software installation (from SW 5.1).

Note

Alarm-specific texts can be stored by pressing the key [i] if the MMC Help function was invoked from the alarm overview or alarm log for the respective alarm. It does not work if you select the alarm from the directory.

2.2.4 Converting the Alarm Help from "Win-Help" to PDF Help"

If the Help function is to be converted from Win Help to PDF Help, the procedure is the same as the one describe in the Section "Expanding the Alarm Help" above.

1. **Define jump labels in the document for each alarm number:**
Use an index entry to mark the jump points in the document (e.g. WinWord) that is to be displayed as pdf file at the control and create a single-column index entry (page numbers right-justified).
2. **Create text file:** Copy the single-colum index created above (page numbers right justified) and save it in a ".txt" file.
The text file for the pdf call has the following syntax:
`<pdf file name> <ID> <page>`
 The search word (alarm number) is the same as the ID No. in this case.
 Add the name of the pdf file before each line.
Example:

ALARM_GR.PDF	10702 90
ALARM_GR.PDF	10703 90
ALARM_GR.PDF	10704 91
<code><pdf name></code>	<code><ID> <page></code>
3. **Print out the file** containing the alarm texts **as a Postscript file** (this works on all common platforms). For example, the file extensions are ".prn" for WinWord and ".ps" for Interleaf.
4. **Convert** the Postscript file **to pdf** with adobe Acrobat 4 using the Distiller.
5. **Copy the files** (*.pdf and *.txt) onto the control to directory F:\DH\USER\HLP.DIR.

Note

- If additional user alarms are to be displayed in the Alarm Help, these must be added in the form of a pdf file and in a txt file of the same name in the F:\USER\HLP directory.
 - Please observe the naming conventions stated in Section 4.1.
-

2.3 Machine Data Help

2.3.1 Function

In SW 6.1 and later, the Machine Data Help is based on the "pdf Help", i.e. a pdf file is opened when the Help function is called and the corresponding alarm is displayed in the control using Adobe Reader 4.

The files containing the machine data are stored in the following directories:

- Siemens MDs F:\MMC2\HLP
- User MDs F:\USER\HLP

File names

The following file names **must be used**, also for additional user MDs (i.e. must **not** be changed):

• N_NCK_GR.PDF [German]	N_NCK_UK.PDF [English]
• C_NCK_GR.PDF	C_NCK_UK.PDF
• A_NCK_GR.PDF	A_NCK_UK.PDF
• S_NCK_GR.PDF	S_NCK_UK.PDF
• DISPL_GR.PDF	DISPL_UK.PDF
• DROT_GR.PDF	DROT_UK.PDF
• DLIN_GR.PDF	DLIN_UK.PDF
• HYDRM_GR.PDF	HYDRM_UK.PDF

The names of the associated txt files (containing the jump list) must correspond as follows:

• N_NCK_GR.TXT [German]	N_NCK_UK.TXT [English]
• C_NCK_GR.TXT	C_NCK_UK.TXT
• A_NCK_GR.TXT	A_NCK_UK.TXT
• S_NCK_GR.TXT	S_NCK_UK.TXT
• DISPL_GR.TXT	DISPL_UK.TXT
• DROT_GR.TXT	DROT_UK.TXT
• DLIN_GR.TXT	DLIN_UK.TXT
• HYDRM_GR.TXT	HYDRM_UK.TXT

Layout of the text file

Pdf file without language code	MD No.	Page
DROT.PDF	1000	1
DROT.PDF	1001	1
DROT.PDF	1002	1
...	...	...

Explanation of names

Name	Significance
N_NCK_GR.PDF	General MDs
C_NCK_GR.PDF	Channel-specific MDs
A_NCK_GR.PDF	Axis-specific MDs
S_NCK_GR.PDF	Setting Data
DISPL_GR.PDF	Display MDs
DROT_GR.PDF	Drive MDs, rotary
DLIN_GR.PDF	Drive MDs, linear
HYDRM_GR.PDF	Drive MDs, hydraulics module

2.3.2 Expanding the Machine Data Help

If additional user machine data are to be displayed in the MD Help, these must be added in the form of a pdf file and in a txt file of the same name in the C:\USER\HLP directory.

Required files

- *.pdf e.g. n_nck_gr.pdf
- *.txt e.g. n_nck_gr.txt

1

Define jump labels in the document

The jump labels must be marked with an index entry in the document (e.g. WinWord) to be displayed at the control as pdf and a single-column index list (page numbers right-justified) produced.

2

Create text file

Copy the single-column index created above (page number right-justified) and save it as a txt file.

Example: 10000 170
</ID> <page>

The search word (MD number) is identical to the ID No.
The text file for the pdf call now needs to have the following syntax:
<pdf file name> <search term> <page>

Insert the name of the pdf file in front of each line.

Example: N_NCK_gr.PDF10000 170
N_NCK_gr.PDF10002 170
N_NCK_gr.PDF10010 171
<pdf name> <ID> <page>

3

Generate pdf file

Print your document as a postscript file and convert it to "pdf" using the Adobe Acrobat Distiller.

4

Incorporate the files to the control

The files created (*.pdf and *.txt) must be read to the control from the F:\USER\HLP directory.



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SINUMERIK 840D/840Di/810D

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Introduction

This Installation and Start-Up Guide describes the procedures for installing the PCU 20 with the software HMI Embedded.

For further reading on special NCK, MMC, PLC, or drive functions, please consult the Descriptions of Functions/Manuals (see Section: Documentation).

Names of HMI/MMC:

Up to SW 5: HW and SW: MMC100.2

As of SW 6: HW: PCU 20/50/70

SW: HMI Embedded, HMI Embedded Win32,

1.1 Hardware/software requirements

Hardware

The hardware base for the HMI software (Human Machine Interface) is

- a PCU computer unit together with an
- OP display unit (operator panel)

Software

As standard, the HMI Embedded software is installed on the supplied PCU 20 and contains all files required for the operation of the PCU.

If you want to change the configuration of the installed software or install a new software version, then you must replace the software.

In this case, you can choose whether the replacement software has the standard configuration or a modified configuration.

The complete HMI Embedded software package is supplied on one CD.
See Chapter 7: SW Installation

Required equipment and accessories

You will need the following equipment and accessories to install the software on the PCU:

- A PC or PG with an Omnidrive drive.
MS-DOS and, if required, the SINUCOPY-FFS software must be installed on the PC/PG.

1.2 Documentation

You require the following documentation for the installation and start-up of SINUMERIK 840D:

1. Operator Components Manual /BH/
2. Description of Functions Basic Machine /FB1/
3. Lists /LIS/
4. Diagnostics Guide /DA/
5. Operator's Guide HMI Embedded /BEM/
6. Description of Functions ShopTurn /FBT/
7. Description of Functions ShopMill /FBSP/
8. Programming Guide Cycles /PGZ/

1.3 EMC and ESD measures

1.3.1 RI suppression measures

Shielded signal cables

To ensure safe, interference-free operation of the system, the cables specified in the individual drawings must be used. Both ends of the shield must always be connected conductively with the housings.

Exception:

If non-Siemens devices are connected (printers, programming devices, etc.), you can also use standard shielding cables which are connected at one end.

These external devices may not be connected to the control during normal operation. However, if the system cannot be operated without them, then the cable shields must be connected at both ends. Furthermore, the external device must be connected to the control via an equipotential bonding cable.

Rules for routing cables

In order to achieve the best-possible noise immunity for the complete system (control, power section, machine) the following EMC measures must be observed: Signal cables and load cables must be routed at the greatest possible distance from one another.

Only cables supplied by SIEMENS may be used as signal cables to and from the NC and PLC.

Signal cables must not be laid in the close vicinity of strong magnetic fields (e.g. motors and transformers).

Pulse-carrying HC/HV cables must always be laid completely separately from all other cables.

The distance (interference injection area) between the following cables must be as close as possible:

Signal line and signal line

Signal line and associated equipotential bonding conductor

Equipotential bonding conductor and PE conductor (routed together)



Important

For further information about suppression measures and the connection of shielded cables see

References: /EMC/, EMC Directive

1.3.2 ESD measures



Important

Handling of modules containing devices sensitive to electrostatic discharge:

- When handling electrostatically sensitive devices, make sure that operator, workplace and packing material are properly grounded.
 - Generally, electronic modules must not be touched unless work has to be carried out on them. When handling PC boards make absolutely sure that you do not touch component pins or printed conductors.
 - Components must only be touched if
 - You are permanently grounded with an ESD arm band,
 - You are wearing ESD shoes or ESD shoe grounding strips that are in contact with an ESD floor.Modules must be placed on a conductive surface (table with ESD surface, conductive ESD foam plastic, ESD packing bag, ESD transport container).
 - Never place modules in the vicinity of display units, monitors, or television sets (minimum distance < 10 cm).
 - Modules must never be brought into contact with statically chargeable and highly insulating materials, such as plastic sheeting, insulating table tops, clothing made of synthetic fibers.
 - Measurements of the module must only be performed if
 - The measuring instrument is grounded (e.g. via protective conductor) or
 - Before measuring with a potential-free measuring device the measuring head is discharged briefly (e.g. touch unpainted metal on the control housing).
-



2

2 Overview of PCU HMI Devices

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2.1 Mechanical and electrical installation

The HMI Embedded software is supplied with PC/PG, PCU and SINUMERIK operator panel fronts.

Combination with operator panel front

If an operator panel front (e.g. OP 010) is used, the PCU is first screwed to it and then fixed to the mounting wall with tensioners.

Please note the following during installation:

- Protect the PCU from dust, humidity and heat.
- Do not expose the PCU to direct sun radiation.
- Install the device such that no danger (e.g. by falling down) may result.
- The clearance at the rear of the PCU must be at least 10 mm to ensure sufficient ventilation.
- Do not cover the vent slots.

This procedure is described in:

References: /BH/Operator Components Manual, Operator Panel Front

2.1.1 Components of the PCU 20

The following PCU 20 computer units are available:

SINUMERIK PCU 20 / 8 MB Flash	Order No.: 6FC5210-0DF00-0AA0
SINUMERIK PCU 20 / 16 MB Flash	Order No.: 6FC5210-0DF00-0AA1/ -1AA1

Features of the PCU 20

- User memory (RAM) 16/32 MB
- Onboard flash memory 8/16 MB
- Memory card interface (PC card / memory card)
- Power supply: 24 VDC
- Interfaces:
 - COM1 serial RS232C/V.24 interface (25-pin sub D socket)
 - COM2 serial RS232C/V.24 interface (9-pin sub D socket)
 - PS/2-keyboard (6-pin Mini-DIN)
 - USB interface (4-pin USB socket), for USB keyboard only
 - MPI/DP interface RS485 (9-pin sub D socket), max. 1.5 Mbaud
 - Ethernet connection 10/100 Mbaud (8-pin RJ45 socket)
 - Floppy disk drive interface
 - Interfaces to operator panel front

You can find a detailed description of the PCU as well as the current descriptions of the other components in:

References: /BH/Operator Components, Manual

The PCU 20/50/70 computer unit can be used together with the following operator panel fronts.

OP, operator panel: OP 010, OP 010C, OP 010S,
OP 012, OP 015, OP 015A

TP, touch panel: TP 012, TP015A: Can only be used with customized HMI software.

2.1.2 Accessories

Diskette drive (SW 6.2 and higher)

The external floppy disk drive can be connected to the PCU 20.

The connection for the external diskette drive is located on the left-hand side of the housing.

For more detailed information about the diskette drive see:

References: /BH/Operator Components Manual, 3.5 Diskette Drive.

2.1.3 Interfaces on the right-hand side of housing

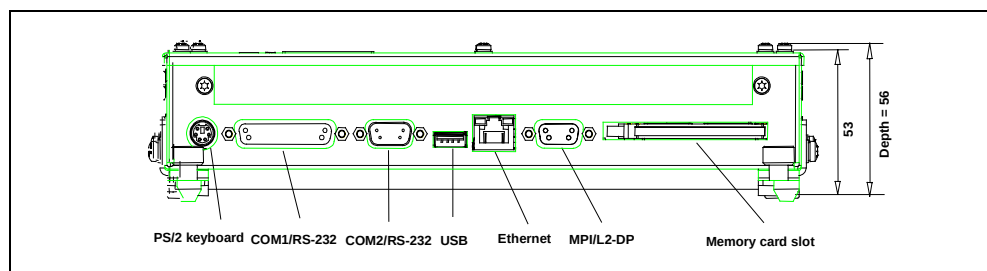


Fig. 2-1 Side view of right-hand side of PCU 20 with interfaces

Table 2-1 Interfaces on right-hand side of housing

Connection		Function
PS/2 mouse/keyboard		PS/2 mouse/keyboard connection
COM1/RS-232	25-pin sub D socket	Serial interface 1 (RS-232-C)
COM2/RS-232	9-pin sub D socket	Serial interface 2 (RS-232-C)
USB	4-pin USB socket	External connection for Universal Serial Bus
Ethernet (SW 6.2 and higher)	8-pin RJ45 socket	Connection for local area network (LAN), SW option
MPI/L2-DP (RS 485)	9-pin sub D socket	Multi-point interface / PROFIBUS DP connection Connection of an S7 programmable controller
Memory card slot	68-pin PC card connector	PC card standard PCMCIA, STRATA or Compact Flash card with adapter

2.1.4 Interfaces on the left-hand side of housing

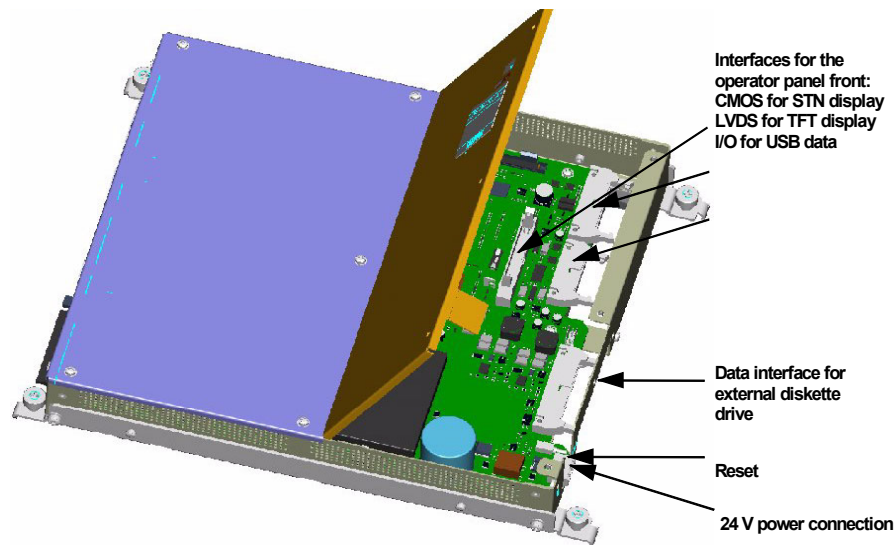


Fig. 2-2 PCU 20 interfaces on left-hand side of housing

2.1.5 Operator panel fronts

The **OP 010 / OP 010S / OP 010C** operator panel fronts feature:

- 10.4" TFT flat screen (color) with a resolution of 640x480 pixels
- Mechanical short-stroke keys with alphanumeric, cursor, control and hotkey keypads: Not on OP 012 and OP 015
- Status LEDs for power supply and overtemperature
- Shift key for switching to the second key level
- USB port at front
- Degree of protection IP 54
- Can be combined with the PCU 20/50/70 component
- Connection for external diskette drive (SW 6.2 and higher)

The **OP 012 / TP 012** operator panel fronts feature:

- 12.1" TFT flat screen (color) with a resolution of 800x600 pixels
- Membrane keyboard with alphanumeric, cursor and control keypads
- Integrated mouse
- Direct keys for connection via direct key module (optional), PP031-MC or directly to I/O devices
- Can be combined with the PCU 20/50/70 component
- Degree of protection IP65

Otherwise as for OP 010

The **TP 012** panel is operated by touching the touch-sensitive display with your finger.

The **OP 015 / OP 015A** and **TP 015A** operator panel fronts feature:

- 15" TFT flat screen (color) with a resolution of 1024x768 pixels
 - Can be combined with the PCU 20/50/70 component
- Otherwise as for OP 012

The **TP 015A** panel is operated by touching the touch-sensitive display with your finger.

Interfaces on the front

Located on the front side

- The USB front interface for the connection of an external keyboard

Note

You will notice that the electromagnetic compatibility of commercially available peripheral devices is usually rated for office use only.
For industrial use, components with a higher degree of certificate are recommended.

Interfaces at the rear

Two cables for connecting the PCU are located at the rear:

- I/O USB cable K1: (Ribbon cable) all signals which in addition to the display interface are used to connect operator panel fronts
- Display cable K2

For OP 015A / TP 015A:

- Interface X11, usually hidden under the blanking plate: Signals from the 16 direct control keys "vertical soft keys".

Memory cards

The following memory cards can be used for operation on the operator components:

Compact Flash card 32 MB	Order no.: 6FC5313-1AG00-0AA0
Compact Flash card 64 MB	Order no.: 6FC5313-2AG00-0AA0

The associated adapter is commercially available, see, for example,
http://www.sandisk.com/oem/pc_adapter.asp

Card reader

You require a commercially available card reader for the above memory cards, a USB card reader which supports the CF cards.

You can find information on how to adapt and set your interface and which connection cable you require in the description of the corresponding device.



3

3 Communication/Initial Requirements

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3.1 Communication within the system

Communication within the system between the operator panel and the NCU/CCU is performed via the operator panel interface, the OPI (1.5 Mbaud) or the MPI interface (187.5 kbaud).

Communication within the system between the operator panel and the PLC (e.g. SIMATIC AS 3XX) is performed via the MPI interface (187.5 kbaud).

3.2 MPI/OPI netiquette

Please take the following basic rules into account when undertaking network installations:

1. The bus line must be terminated at **both ends**. To do this, you switch on the terminating resistor in the MPI connector of the first and last node, and switch off any other terminators.



Important

Only two terminations are permitted.

Bus terminating resistors are integral components of HHU and HPU units.

2. It is necessary to apply **5 V voltage** to at least 1 terminator.
For this, the MPI connector with inserted terminating resistor must be connected to a powered device.



Important

The NC control must be located at the end of the connection*).

3. Drop cables (feeder cable from bus segment to node) should be as short as possible.



Important

Any unassigned spur lines should be removed if possible.

-
- *) Address depending on software version:
Address NCK to MPI = address PLC+1=3
PLC 314

4. Each MPI node must **first** be connected and then enabled.
When disconnecting an MPI node, **first** deactivate the connection, then remove the connector.
5. Either one HHU and one HPU, or two HHUs or two HPUs can be connected to each bus segment. **No** bus terminators must be inserted in the distributor boxes of an HHU or an HPU.

If more than one HHU/HPU are connected to a bus segment, this can be done with an intermediate repeater.

6. The following cables lengths for MPI or OPI for standard use without repeater may not be exceeded:

MPI (187.5 kbaud):	Max. cable length 1000 m in total
OPI (1.5 Mbaud):	Max. cable length 200 m in total

Example A

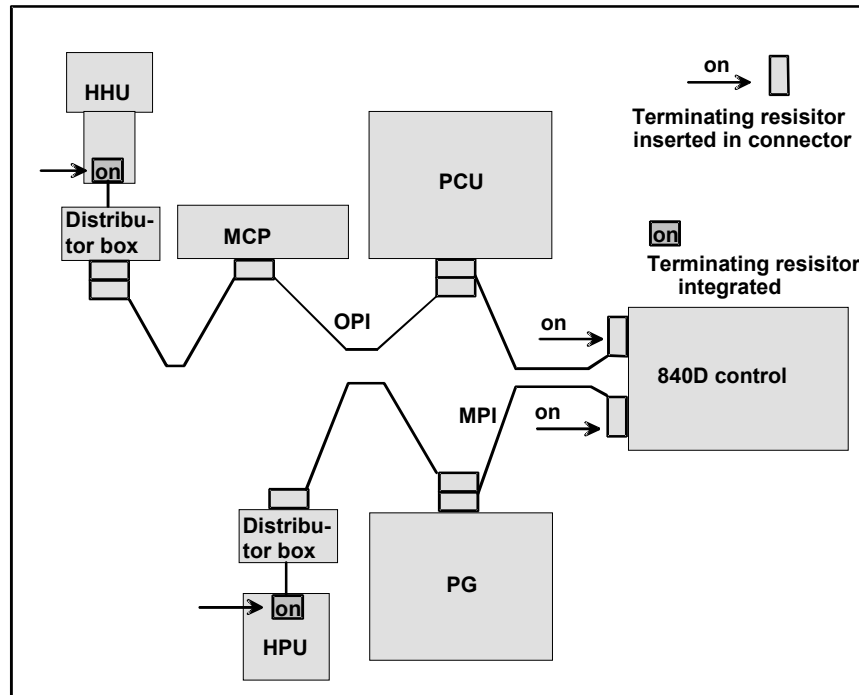


Fig. 3-1 Network installation with two terminating resistors

MPI: HPU, 840D control

OPI: HHU, 840D control

Example B

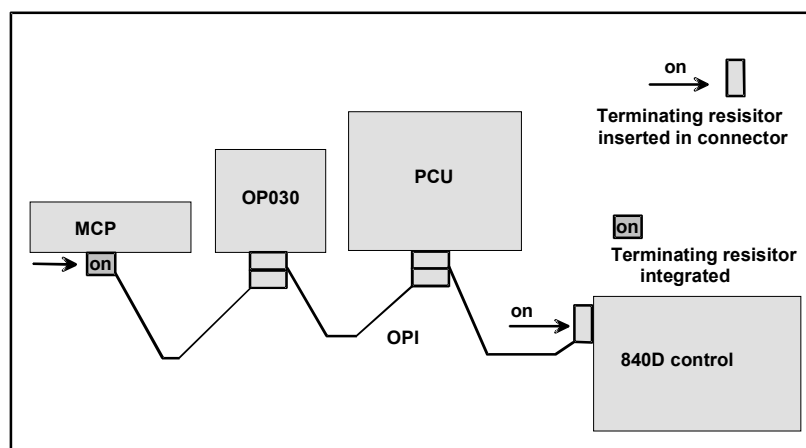


Fig. 3-2 Network installation with two terminating resistors in OPI: MCP, control

3.2.1 Standard configuration

Connection of either one or two machine control panels (interface customer operator panels, hand-held programmers, PP031) and/or a HHU can be performed simply by setting parameters in the basic PLC program (FB1). In this case, parameterization with the STEP 7 tool "Communication Configuration" is not necessary.

References: /FB1/P3: PLC basic program

Standard application

SINUMERIK 840D with PCU and one machine control panel (MCP) or interface customer operator panel on the OPI

Hardware requirements

At least firmware release V 03_01_01 for

- MCP
- Customer operator panel / PP031

Bus addresses

Each node on the MPI/OPI bus must have a bus address (0...31).

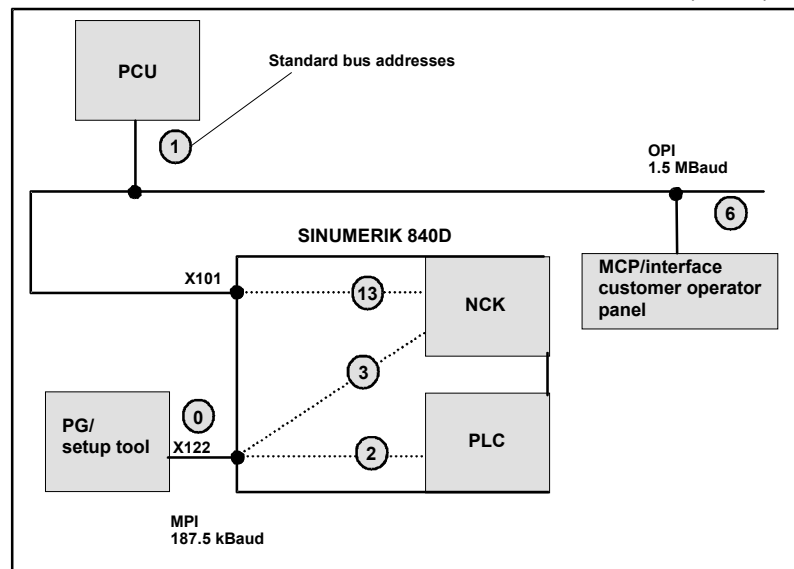


Fig. 3-3 Standard application with SINUMERIK 840D

Bus address and GD circuit



Important

The logical addressing of components in the PLC basic program is performed by means of the bus address parameter setting (for the machine control panel) or the GD circuit (for the handheld operator unit). The GD circuits are always used for physical addressing on the OPI/MPI. Every machine control panel, interface customer operator panel etc. must be addressed with a GD circuit.

In the control, the conversion of the bus address in the associated GD circuit is performed via the PLC program.

The bus address, and therefore the setting of the associated GD circuits, are set on the machine control panel by means of DIP-FIX switches.

On the MPI, however, the same GD circuits are set for different bus addresses for the components machine control panel, interface customer operator panel, PP031 and HPU. Allowance should be made for this when using more than one machine control panel, etc.

The table below shows the relationship between bus addresses and GD circuit.

Table 3-1 Relationship between bus address and GD circuit

Bus addresses on MPI	GD circuit
15, 14, 13	1
12, 11	2
10, 9	3
8, 7	4
6	8
5, 4	5

Example:

Two machine control panels (MCPs) on the MPI are to be connected to one control. The first MCP can be connected to bus address 15 (GD circuit 1), the second to bus address 12 (GD circuit 2).

MPI interface and GD circle

Note

If PLC lateral communication is to be configured on the MPI with the STEP 7 tool "Communication Configuration", for example, and one or several MCPs is/are to be connected to the MPI, it is important to ensure that the GD circles are uniquely assigned. The STEP 7 tool "Communication Configuration" allocates the GD circuits, starting at GD circuit 1, in ascending order. If the MCPs on the OPI are connected, the PLC-PLC communication on the MPI is not affected.

Example:

"Communication Configuration" allocates GD circuits 1 and 2 for PLC-PLC lateral communication. The first MCP on the MPI can be assigned to GD circuit 3 (bus address 9 or 10), and a second MCP can be assigned to GD circuit 4 (bus address 7 or 8).

USB keyboard

If a USB keyboard is connected, a reset must be performed on the PCU: Key combination Ctrl + Q + Input or, if this key combination is not available: "Power OFF".

3.3 Network Manager on the server

The Network Manager, the "Administer SINUMERIK 810D/840D network/diskette drive on the PCU 20" program must be installed, configured and started on each computer which is to release directories for the PCU.

This Network Manager is the PCU's communication partner in network operation.

Delivery

The Network Manager software is supplied on the CD "Administer SINUMERIK 810D/840D network/diskette drive on the PCU 20" with the order number 6FC5253-0AE01-0AA0.

Precondition

The Network Manager is available for the operating systems Windows95/ 98/ ME and WindowsNT/ 2000/ XP.

The PCU and HMI Embedded Network Manager communicate with one another via TCP/IP sockets.

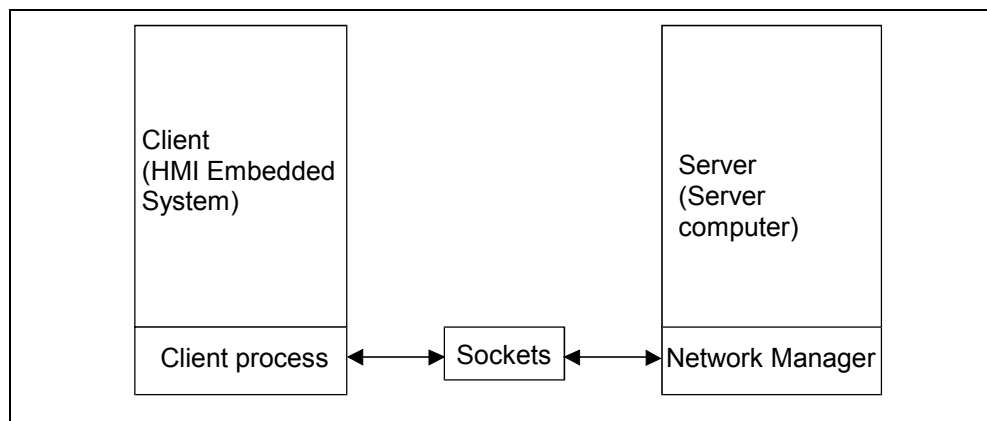


Fig. 3-4 Client/server connection

For the connection to be secure, a password and user name must be set on the client and on the server. These are defined on the client as part of the network startup process.

Any users who need access to the server must be registered in the Network Manager with their name and password.

If no user names have been defined, the system uses a standard user name (PCU20_USER).

3.3.1 Installation/deinstallation

Installation

The HMI Embedded Network Manager is installed by running the "setup.exe" program.

You can specify the following within this installation routine:

- Installation path on the hard disk.
- Folder within the program folder of the Start menu.
- Automatic start of Network Manager every time the operating system starts.
- Network Manager is started immediately after installation.

Deinstallation

The deinstallation of the HMI Embedded Network Manager is performed under: "/Start/Settings/Control Panel/Software". Select the HMI Embedded Network Manager and click "Add/Remove..." to deinstall.

3.3.2 Operation of the Network Manager

Start

Start the Network Manager under "Start/Programs/<name selected during the installation>/HMI Embedded Network Manager".

When you start the Network Manager, an icon is displayed in the status line of the taskbar (Windows) to signal that the manager is active on this particular computer.

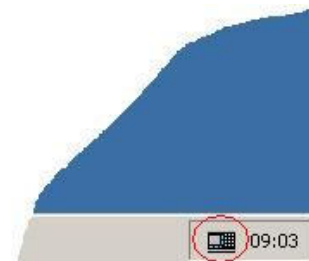


Fig. 3-5 Icon, Network Manager active on computer

Right-click the icon to open the shortcut menu which contains the following entries:

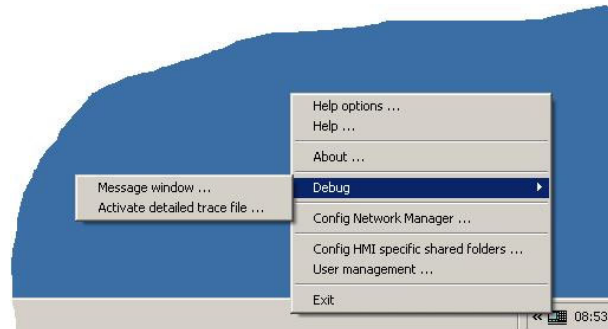


Fig. 3-6 Menu selection

Help options...:	Language setting in HTML Help: English or German
Help...:	Displays the main Help menu for the Network Manager
About...:	Displays the software version of the Network Manager.
Debug	Menu option "Debug" opens another submenu and gives access to debugging functions if, for example, a link cannot be setup between the Network Manager and the PCU. The debugging functions are safeguarded by the system or manufacturer password and may be accessed by authorized persons <u>only</u> . You must <u>not</u> activate this option when the computer is connected to the network as it greatly impairs the speed of the network connection.

Message window... In this dialog box you can check the status of the current connection.

Activate detailed trace file... A trace file is activated which logs all telegrams with their contents. The icon in the status line changes.



Fig. 3-7 Icon, trace file active

- Config Network Manager...: Only possible under WindowsNT/ 2000/ XP:
Switches between a connection with Login and a permanent connection,
see Section: Select connection.
- Config HMI specific shared folders...:
Creates HMI-specific shared folders which can be used only in communication between a PCU and the Network Manager,
see Section: Select connection.
- User management... Creates a list of user names and associated passwords,
see Section: User management
- Exit Closes the Network Manager.

3.3.3 Select connection

Depending on the operating system used, the Network Manager can be operated in two different connection modes.

Right-click the Network Manager icon and select "Config Network Manager..." in the menu. A dialog field is opened in which you can choose between two connection modes.

1. Applies to Windows95/ 98/ ME and WindowsNT/ 2000/ XP.
Connection via the Network Manager
2. Applies only to WindowsNT/ 2000/ XP.
Permanent connection

Connection via Network Manager (Win95/98/2000/ME/NT/XP)

If you select the "Connection with login" connection type, the connection to one or more PCUs only exists as long as the "Network Manager" is activated. This variant requires a login process.

You have the following restrictions with this connection type:

- Running services are exited and the communication control is transferred back to the Network Manager program.
- The "Message window" cannot be reached from a service, i.e. no connection information is sent there.
If you require error messages or logs, you can obtain these via the menu "Debug" -> "Activate detailed trace file..."

Permanent connection (WindowsNT/ 2000/ XP)

If you select "Permanent connection (service)", the connection to the PCUs exists during the entire runtime of the operating system. This connection operates independently of the current user and therefore a login is not required.

Select the menu "Config. Network Manager..." → "Permanent Connection (service)". After you have confirmed with "OK", you are requested to enter the Windows user.

The following window appears:

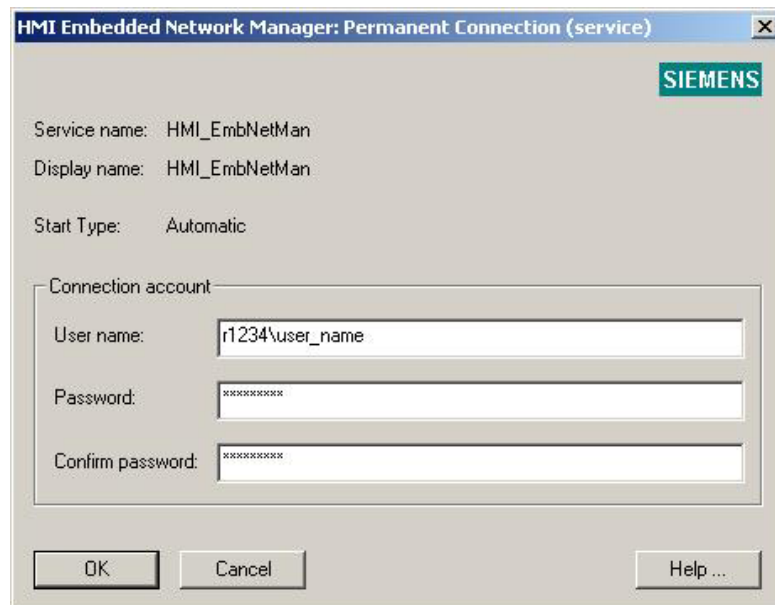


Fig. 3-8 Permanent connection

The status data of the Network Manager are displayed in the upper part of the window.

The following data must be entered in the lower part of the screen:

- Computer or domain name followed by the user name,
- User's password,
- Password confirmation.

The user name need not correspond to the current user, but the "permanent connection" must be authorized to access the directories of the entered user. See section: User administration

Note

Setting up or clearing a permanent connection can take several seconds.

3.3.4 User management

To ensure secure and reliable communication a user with associated password must be entered on every PCU. To grant this PCU access to shared directories on the server, this user must also be entered with his/her password in the user list of the Network Manager.

In this way, each PCU 20 can be exactly assigned to which directories on the respective server computer it should be granted access.

Simple network

Each PCU is shipped with a standard user name "PCU20_USER"; this name is also entered in each Network Manager as soon as it is installed. However, this user name should be used only in a simple point-to-point connection because the data on the server can be accessed within a larger network and secure communication between the PCU and the server cannot be guaranteed if the standard user name is used.

Large network

If you wish to share selected directories with a particular PCU, you must assign appropriate rights to the relevant PCU user in the Network Manager.

Display and edit the user list

Click the HMI Embedded Network Manager icon with the right-hand mouse button. Select "User management". A list of the entered users is displayed. If you double-click the icon with the left-hand mouse button, the "User management" dialog box is also displayed.

You can make the following entries within the "User management..." dialog box:

- New: Create new user.

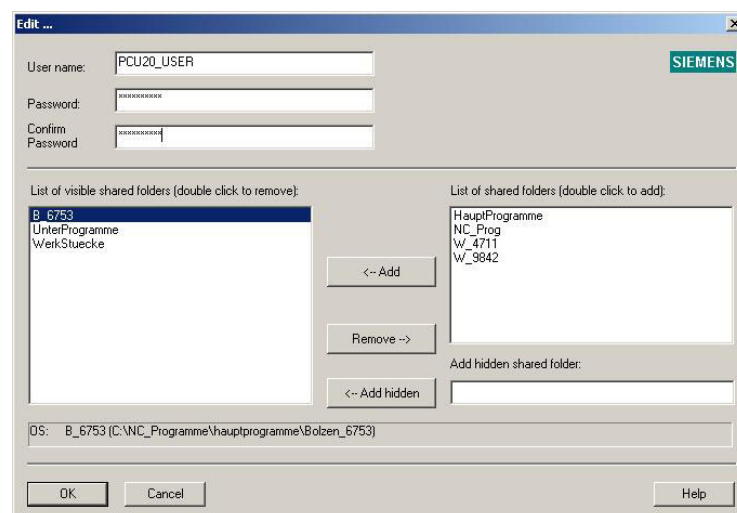


Fig. 3-9 User list

In the top section of the screen, enter the user name (max. 40 characters) and its password (max. 40 characters). Repeat the password in the "Confirm Password" field.

In the central area of the screen, you assign access (operating system shares and HMI-specific shares) to the shared drives on the server computer of the relevant user.

The left-hand field (List of visible shared folders) contains all folders to which the user can be granted access.

The right-hand field (List of shared folders) contains all shared folders to which the Windows user who started the Network Manager has access and all HMI-specific shared folders that have been set up within the Network Manager.

By clicking "← Add" you can add a folder selected in the right-hand field to the left-hand list and thus make it accessible to the user.

By selecting "→ Remove" you can delete a visible folder (on the left-hand side) again.

You can enter hidden shared folders manually in the "Add hidden shared folder" field and click "← Add hidden" to add them to the "List of visible shared folders ..." field.

The directory path of the currently selected shared folder is displayed in the lower area of the screen.

If no directory path is displayed with Windows NT/ 2000/ XP, this indicates that the current user does not possess the appropriate access rights.

This information is always displayed with Windows 95/ 98/ ME as these systems do not feature an access rights administration function.

The abbreviation at the start of the status line has the following meaning:

- OS: Operating system share
- HMI: HMI-specific share

Clicking "OK" will confirm these settings and the dialog box is exited.

Clicking "Cancel" will reject these settings and the dialog box is exited.

Clicking "Help" calls the help function.

- Edit: In this box you can edit an existing user who you have selected. The "Edit..." dialog operates on the same principle as the "New..." dialog.
- Delete: An existing user who you have selected can be deleted. A prompt appears with which you must confirm the actual deletion with "YES". With "NO", you can reject the deletion.

3.3.5 Shared folder for a PCU

1. Creating an operating system share:

If a folder on the server is to be visible from a PCU, it must be enabled as a "shared" folder under Windows. These shared folders can also be used by other computers in the network.

To enable a folder for sharing, click it in the Windows Explorer with the right-hand mouse button:

- Select the item "Share...".
- Select "Share as".
- Enter the share name. You can also assign the rights to the shared folders.

2. Creating HMI-specific shares:

HMI-specific shared folders are for accessing operations from the PCU to servers connected to the computer on which the Network Manager is installed.

When you select menu option "Config HMI specific shared folders..." the following dialog appears:

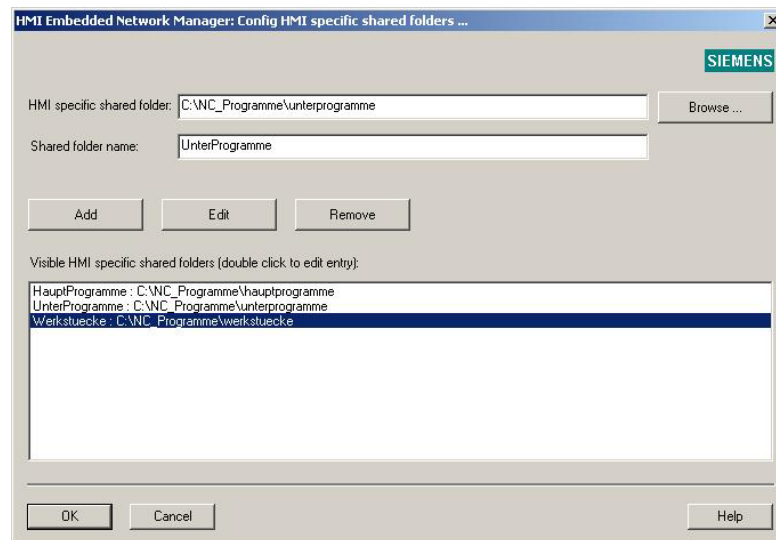


Fig. 3-10

Edit field "HMI specific shared folder":

Entry of the local directory path which is to be visible from the connected PCU.

Directory paths are offered via "Browse...":

Select the desired path and with "OK" it is entered in the edit field.

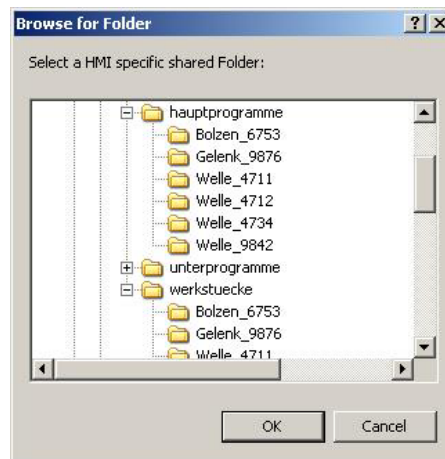


Fig. 3-11

Edit field "Shared folder name":

Assign shared folder name. It can have max. 40 characters and must start with a letter.

Do not use a name which has already been assigned for the operating system share.

The following characters are possible:

- Upper/lower case letters
- Numbers
- Underscore (" _ ")
- Hyphen (" - ").

"Add": Add HMI-specific shared folder to the list field.

System checks the name. If this has already been assigned for the operating system share, it is rejected.

"Edit": Dialog for editing entries already contained in the list.

"Remove": Entries are deleted.

3.3.6 Online help

The "Help..." button appears in various windows and can be used to request the online help.

The help file is available in both English and German.

With the "Help options..." button, you can switch between the two languages.

Precondition

The following programs must be installed on the system:

- Microsoft Internet Explorer 4.0 or higher,
- Microsoft Help HTML Viewer

If the Help HTML Viewer is not available on your computer, the "hhupd.exe" installation routine is started to install the viewer.

The Help HTML Viewer is integrated as standard in WindowsNT/ 2000/ XP and must not be installed again.

3.3.7 Troubleshooting

There is an error in communication between the PCU and the HMI Embedded Network Manager. Check the ports.

Remedy

1. The following ports must be available:

- pcu20_ftp1 6743/tcp
- pcu20_ftp2 6744/tcp
- pcu20_ftp3 6745/tcp
- pcu20_ftp4 6746/tcp
- pcu20_ftp5 6747/tcp
- pcu20_ftp6 6748/tcp
- pcu20_ftp7 6749/tcp
- pcu20_ftp8 6750/tcp
- pcu20_ftp9 6751/tcp
- pcu20_ftp10 6752/tcp
- pcu20_ftp11 6753/tcp
- pcu20_ftp12 6754/tcp
- pcu20_ftp13 6755/tcp
- pcu20_ftp14 6756/tcp
- pcu20_ftp15 6757/tcp

If necessary, these ports are entered in the "services" file every time the HMI Embedded Network Manager is started. If a port is already being used by another program, the program must be uninstalled so that the port can be made available to the Network Manager.

2. Check the software versions

You must use the correct Network Manager software version in each case for the HMI Embedded software version installed.

3.4 Network operation with HMI Embedded (SW 6.2 and higher)

This function is the option "Administer SINUMERIK 810D/840D network/diskette drive on the PCU 20".

The PCU hardware has its own network card and can be integrated in an existing network. If the appropriate option is set, additional horizontal keys are integrated in the Program Manager of the "Machine" and "Program" standard applications; these soft keys symbolize a linked drive or a local drive.

Precondition:

The Network Manager must be installed on the PC to be connected, see Section "Network Manager on the server".

Possible connections

The number of possible connections between the HMI Embedded system and different servers or local drives is limited to four.

3.4.1 Network configuration data

Display machine data

You need to set the following display machine data for authorizing input of configuration data:

MD 9509: MM_USER_CLASS_DIRECTORY_CHG (value 0 ... 7)

The following machine data are available for authorizing the use of the drives that are set up:

MD 9510 MM_USER_CLASS_DIRECTORY1_P

MD 9511 MM_USER_CLASS_DIRECTORY2_P

MD 9512 MM_USER_CLASS_DIRECTORY3_P

MD 9513 MM_USER_CLASS_DIRECTORY4_P

(value 0...7)

TCP/IP protocol

The only protocol supported for configuration within the network startup masks is TCP/IP.

Section "Examples: Network Configuration" describes two possible configuration options:

1. A small self-contained network whose sole purpose is to network the PCU with one or more servers.
2. A large company network.

In the first example, both the HMI Embedded configuration and the Windows configuration are explained in detail. The second example provides an explanation of the HMI Embedded system configuration only, as the company network is already in existence and the company has network administrators to perform the Windows tasks.

3.4.2 HMI system settings

The following settings must be made to set up a small self-contained network:

1. IP addresses:

For each computer you must select an IP address that is unique within the network. For purely private networks, RFC 1597 makes provisions for three address ranges so that there are no conflicts while using the Internet at the same time:

10.0.0.0	>	10.255.255.255	(Class A network)
172.16.0.0	>	172.31.255.255	(Class B network)
192.168.0.0	>	192.168.255.255	(Class C network)

The IP addresses for small networks should be selected from these ranges.

2. Subnet mask:

You need to select a subnet mask that is unique within the entire network.

3. Computer name:
The computer name is optional, as it is only a symbolic identifier and can be replaced by the IP address at any time.
4. User name/password:
The user name and password are used to protect communication between the HMI Embedded system and the associated Network Manager on the server. If you assign a user name and a password, you need to specify them in the Network Manager as well. This means that the HMI embedded system will be recognized as an authorized user. If you don't assign a user name and password, the system enters a standard user (PCU20_USER) and standard password so that the Network Manager can decide whether the request comes from an authorized user or not and refuse it if appropriate.
See Section: User management
5. Monitoring time (timeout)
Set a timeout in seconds so that the connection setup attempts between the HMI Embedded system and the server can be canceled. This timeout is set to a default value (30); please only change this setting if problems occur (valid setting range 10 – 300 seconds).

3.4.3 Examples: Network configuration

HMI Embedded System and one server

The simplest type of small network is to connect an HMI embedded system to an external computer.



Important

As no "hub" is used, you will need a special twisted-pair cable for the point-to-point connection.

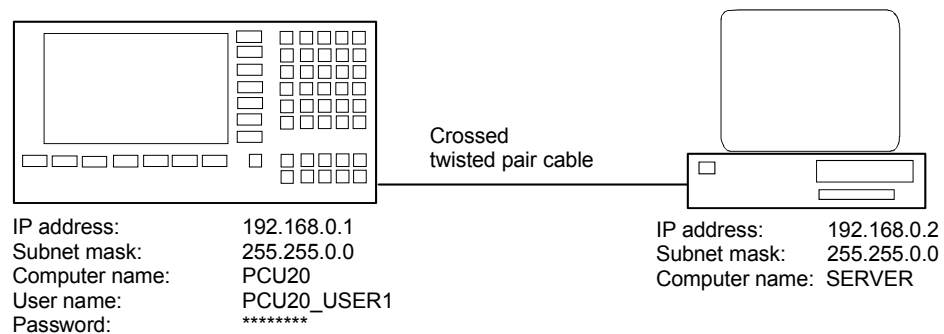


Fig. 3-12 Example: One HMI system / one server

Three HMI Embedded systems and two servers

Also, several external computers can be linked with several HMI embedded systems to form a network, e.g. 3 HMI embedded systems and 2 external computers:

In this configuration the HMI embedded systems cannot access each other's drives.

As a hub is available in this configuration, standard twisted-pair cables are used.

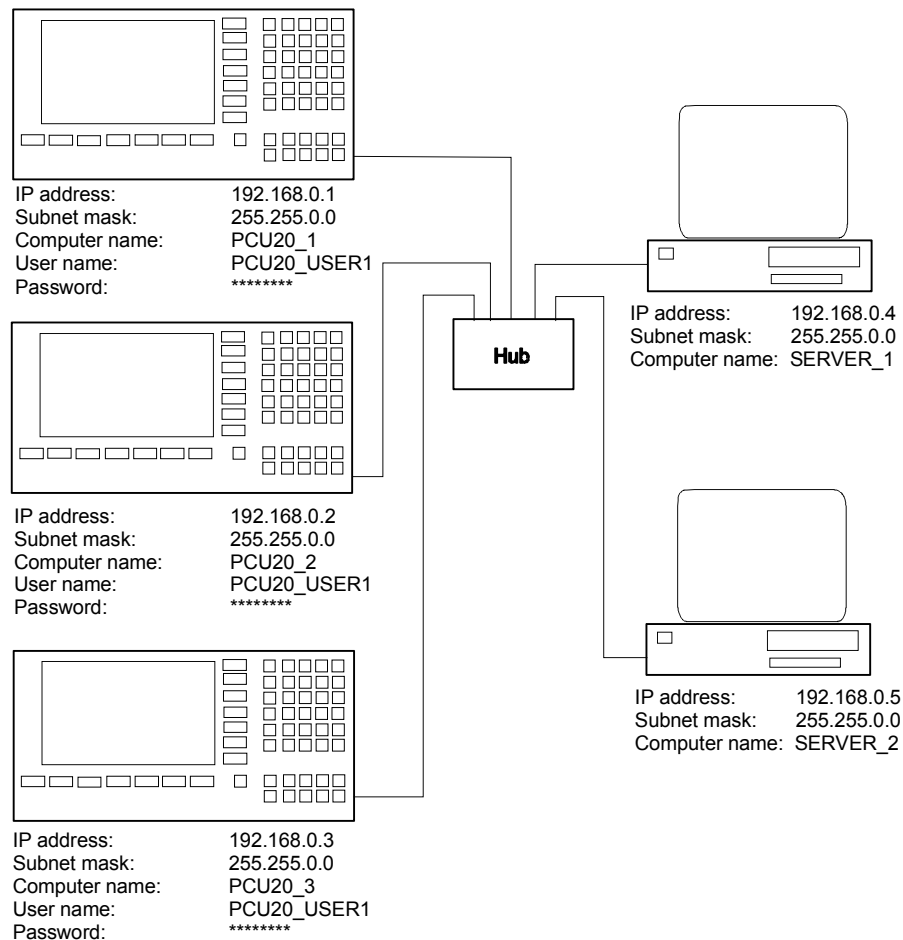


Fig. 3-13 Example: Three HMI systems / two servers

As in this case the same user name was chosen for all three HMI Embedded systems, the same password must be entered on each system too. You can also, however, enter a different user on each HMI Embedded system. The respective users must then be entered in the Network Manager on the servers whose drives are to be displayed.

Company network

A fixed IP address is used to address the company network. You will need to ask your administrator for an IP address for each PCU. The computer name is also provided by the network administrator and corresponds to the IP address that is set. Further, it is necessary to have the correct subnet mask for the network and a default gateway (router). If you intend to use a DNS server, you will also need its IP address and the DNS domain. The data must be entered in the "Startup" operating area under "Logical drives" "Network configuration".

You can select any user name you want, as long as it is known within the Network Manager so that a secure connection can be established.

3.4.4 HMI system procedure

After you have set the machine data, perform a Power On.

A new soft key "Logical drives" is displayed under "Start-up" which gives you access to the following submenus:

- Netw. Config.
- Connections
- Server name
- File types

Network configuration

The network is switched off when the HMI Embedded system starts for the first time.

There are three options:

HMI boot without network

- A network is not started when the HMI Embedded system is booted, therefore no network drives are available. This setting is the default setting at initial system startup. After the first start, the user can specify network data if required.

HMI boot with network:

- At each start, the HMI Embedded system is connected to the network and all network connections are set up.

HMI boot with network if confirmed:

- When the HMI Embedded is booted, a prompt is displayed asking whether to start with or without network. If you don't make a selection within 10 seconds, the system is started without a network connection.

If the network is to be set up, first the setting "HMI boot:" must be set to either "with network" or "with network if confirmed". The remaining fields can now be edited and the following settings entered:

The screenshot shows the 'Network configuration' screen. At the top, there are tabs for 'Startup', 'Kanal X', and 'JOG'. Below these is a 'Channel reset' button. The main area is titled 'Network configuration'. Under 'HMI booting:', there is a checkbox for 'with network without confirmat' which is checked. Below this, there are two columns of settings. The left column includes 'Log:' with a checkbox for 'TCP / IP' (checked), 'DHCP:' with a checkbox for 'No' (checked), 'IP address:' (192 168 0 1), 'Subnet mask:' (255 255 0 0), 'Gateway:' (empty), 'DNS 1:', '2:', '3:' (all empty), 'DNS domain:' (empty), and 'Monit.time:' (30). The right column includes 'Cmpt. name:' (PCU20), 'User:' (PCU20_USER), 'Password:' (empty), 'Confirm' (empty), and 'MAC address:' (01 34 67 9A CD FF). At the bottom, there is a 'Save' button and a section titled '^Select system boot via Select' with tabs for 'Connections', 'Netw. config.', 'Server names', and 'File types'.

Fig. 3-14 Configuring the network

The remaining fields must not be filled in as this small network does not have a DNS server or a default gateway.

Connections: Logical drives

Network connections can be defined or configured in the screen displayed below. The logical drives can either refer to a network connection or to an internal drive, such as a diskette drive, a PCMCIA memory card interface (Compact Flash card) etc.

With internal drives you need to enter the drive letter and the required path if necessary:

- Diskette drive: A:
- Compact Flash card: C:\TEMP

Up to four connections, i.e. four associated soft keys, can be configured.

The soft key designation consists of two columns so that you can enter a text for each line of the soft key.

These soft keys are displayed in a second vertical menu via the "ETC key" or the "Additional..." soft key in the "Program" and "Services" operating areas.

With external drives (network connections) you need to specify the full network path ([\\Computer name\Share name\Path specification](#)), whereby the path name is optional:

[\\R4711\Workpieces\Template](#)

[\\R4812\Workpieces](#)

Network connections	
Logic drives	
	Softkey labeling
	Line 1 Line 2
1	\\R123\WERKST1 R123 WERKST1
2	C: ATA CARD
3	A: FLOPPY
4	

Enter computer and release name

Connect-ions Netw. config. Server names File types

Save

Fig. 3-15 Network connections: Logical drives

The names you specify must be available on the network computer. \\R1234 refers to the network computer in our example. The share name WORKPIECES must be specified on any hard disk drive on this computer.

Server name

In order to assign symbolic names to the computers, the relevant nodes to be addressed within the network must be entered so that their names can be resolved:

Example

Server name:

192.168.0.20 R2345

192.168.0.21 R2346

With these settings computers R2345 and R2346 can be addressed by means of their symbolic names.

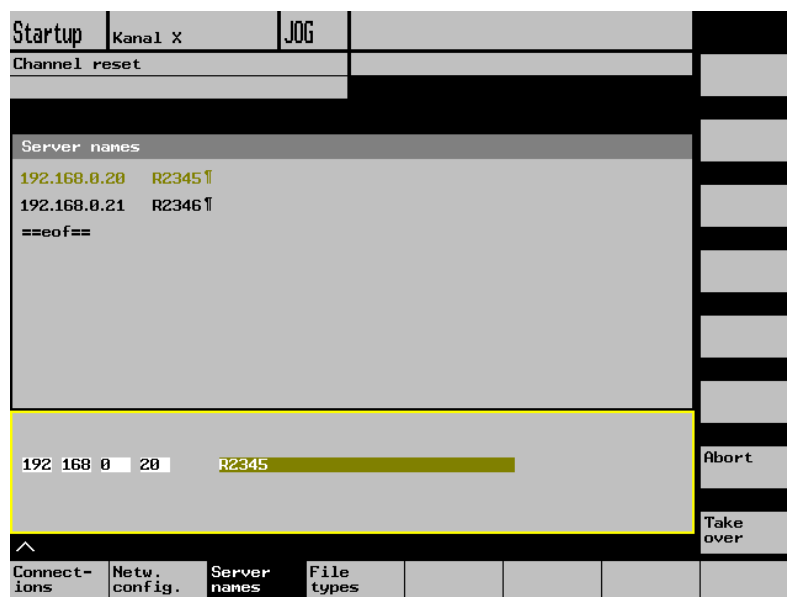


Fig. 3-16 Server names

Operation:

The first entry in the line is the IP address. The second entry is the computer name. The data already specified appears in the upper section of the screen. By selecting soft keys "New" and "Edit" you can go to the lower half of the screen where you can edit entries.

You can change back to the upper section by pressing the "Cancel" soft key (data is not saved) or the "Save" soft key (data is saved).

File types

File types must be set up as required. These types are evaluated and displayed by the PCU.

The Program Manager will use the file extensions to filter which files to display and which to hide. This filter function can be set as follows:

If soft keys "New" or "Edit" are selected, then like with the dialog box "Enter server name", you change to the lower section of the screen and make additional entries or edit existing ones. To exit, press "Cancel" (without changes) or "Save" (with changes).

3.4.5 Accept network data

After changing the configuration data, you must restart the system for the changes to take effect in the HMI Embedded system and the new login process to be performed. You can edit all screens, connections, Netw. Config., server names and file types in succession. After completing your inputs and activating the "Save" soft key, a prompt is displayed asking whether you want to accept the data and restart the system. You can only exit this dialog box by clicking "OK" or "Cancel".

3.4.6 Settings under Windows NT/ 2000/ XP

A network card must already be installed and operational within Windows NT/ 2000/ XP. Then you can install the TCP/IP protocol if it is not yet installed.

Installing the TCP/IP protocol

For installation, go to "Start/Settings/Control Panel/Network/Protocols".
To install the TCP/IP protocol click "Add...".

Configuring the TCP/IP protocol

After it is installed, you can select the TCP/IP protocol.
You can configure the TCP/IP connection via the "Properties" button.
If several computers are to be integrated into the network, each computer must have a unique IP address. The subnet mask must be the same throughout the entire network. Other entries are not necessary.

Assigning the computer name

The computer name is insignificant for the communication between the server and the HMI embedded system, as the assignment of the symbolic name to the IP address takes place within the HMI Embedded system. Several servers are integrated in the network, the symbolic computer name facilitates communication between these computers.

If you want, you can assign a computer name. To do this, go to "Start/Settings/Control Panel/Network/identification":

Example:

Computer name: SERVER_1

Work group: GROUP1

User name / password

If user names and passwords were allocated for the HMI Embedded systems, you need to enter them in the Network Manager for the addressed server in each case. See section: "Network Manager on the server"

3.4.7 Settings under Windows 95/ 98/ ME

A network card must already be installed and operational under Windows 95/ 98/ ME. Then you can install the TCP/IP protocol.

Installing the TCP/IP protocol

To install the protocol, go to "Start/Settings/Control Panel/Network". The installed network components are displayed when you click "Configuration".

Configuring the TCP/IP protocol

Select the TCP/IP connection, click "Properties" to carry out the configuration: Select "IP address" under "Properties for TCP/IP". The screen "Define IP address" appears. Enter the values for the IP Address and Subnet mask. With small networks you do not need to make any more entries in the screens.

Assigning the computer name

The computer name is insignificant for the communication between the server and the HMI Embedded system, as the assignment of the symbolic name to the IP address takes place within the HMI Embedded system. Several servers are integrated in the network, the symbolic computer name facilitates communication between these computers.

To assign the name, go to "Start/Settings/Control Panel/Network/identification":

Example:

Computer name: SERVER_1
Work group: GROUP1

User name / password

If user names and passwords were allocated for the HMI Embedded systems, you need to enter them in the Network Manager for the addressed server in each case. See section: Network Manager on the server

3.5 EXTCALL

Extcall is supported. For security reasons a search is not performed automatically on the logical drives.

During execution the first file is transferred via a quick download operation. For this reason, time-critical reload sections should always be included in the first execution file.

The program to be called must be specified in a unique manner and with the full path and file name.

A prefix part of the path name can be predefined via the channel-specific setting data 42700 SC_EXT_PROG_PATH.

Example:

Full path name in NC program:

```
N10 EXTCALL ("C:\Workpieces\Template.mpf")
```

- with prefix part in setting data:

```
SC_EXT_PROG_PATH = C:\Workpieces\  
N10 EXTCALL("Template.mpf")
```

Note

It is not advisable to execute a program directly from a network drive as there is no guarantee that the network performance will be stable or sufficiently dynamic. We recommend that you transfer programs via the network to an optional plug-in Compact Flash card.

The drive letter of this external storage medium always begins with C:\
The storage media must always be plugged in before the computer boots. They cannot be hot-swapped.

References: /PG/Programming Guide Fundamentals

3.6 Error status screen "Blue screen"

If the system crashes, an error status screen ("Blue Screen") showing current system information is displayed.
The error status screen displays a brief description of the error which has occurred plus all relevant processor registers.

Backup option

A complete system data image is downloaded to an external device.
In a selection menu you can choose the following back-up options:

- Transmission via RS-232-C to an external device,
- to diskette.

System data display

In the event of a system crash, the crash address, the register allocation and any additional information needed for crash analysis are displayed on the screen.

```
Sorry, but HMI Embedded has caused an exception in task XXXXX
Function at XXXXXXXXX with code XXXXX
The type of exception is: XXXXXXXXXXXXXXXXXXXXXXXX
The exception has occurred at cs: XX eip : XXXXXXXXX!
EAX= XXXXXXXXX EBX= XXXXXXXXX ECX= XXXXXXXXX EDX= XXXXXXXXX
EDI= XXXXXXXXX ESI= XXXXXXXXX FLAGS= XXXXXXXXX DS= XXXX ES= XXXX
SS= XXXX ESP= XXXXXXXXX EBP= XXXXXXXXX FS= XXXX GS= XXXX
Additional information:
XXXXXXXXXX loaded at: XXXXXXXXX XXXXXXXXX loaded at: XXXXXXXXX
XXXXXXXXXX loaded at: XXXXXXXXX XXXXXXXXX loaded at: XXXXXXXXX
...
XXXXXXXXXX loaded at: XXXXXXXXX XXXXXXXXX loaded at: XXXXXXXXX
CODE = XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX
      XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX
EIP:  XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX
      XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX
STACK= XXXXXXXXX XXXXXXXXX XXXXXXXXX XXXXXXXXX XXXXXXXXX
      XXXXXXXXX XXXXXXXXX XXXXXXXXX XXXXXXXXX XXXXXXXXX
      XXXXXXXXX XXXXXXXXX XXXXXXXXX XXXXXXXXX XXXXXXXXX
      XXXXXXXXX XXXXXXXXX XXXXXXXXX XXXXXXXXX XXXXXXXXX

Please send the above or saved information to the SINUMERIK Hotline!
email: ad.support@siemens.com
Fill in subject: "HMI Embedded exception (SW XX.XX.XX; date)"
Press 'S' to save data or press 'R' to reboot immediately
```

When you select key:
"S" (Save) you open the menu for saving data,
"R" to restart the PCU.

Menu for saving data

The selected system file is backed up on an external device via a serial interface or to diskette. In this menu you choose the baud rate and the interface for the serial transmission.

If you have installed a floppy drive on your PCU 20 press 'F' to save exception data to floppy disk

To use serial communication interface
set remote device to receive binary data and start in receive mode.
Use key 'B' and key 'C' to change the settings for serial communication:

'C' - com port (HMI) : COMX
'B' - baud rate : XXXXXX

Make sure you use the correct com port and the same baud rate as the receiving station. Then press 'T' to transfer data via serial line. You can also press 'R' to reboot immediately but we recommend you save the data first.

Transfer to diskette

When you select key "F" you start transmission of the exception trace to diskette. The following status message appears:

Please wait - data transmission in progress.

Output via serial interface

Press key "C" to set the interface to which the serial cable on the PCU is connected.

Press key "B" to set the baud rate selected on the external receiving device (PG/PC).

Then set the external device to receive data and start it. Only when you have done this

can you press key "T" to start the transmission. The following status message then appears:

Please wait - data transmission in progress.
If you have problems with the remote device you can
press key 'S' to stop transmission.

Abort transfer

If errors occur in the transmission, or you have set the baud rate incorrectly, you can stop the transmission again by pressing key "S". The following message appears about 2 to 5 seconds after you press key "S":

```
Transmission stopped by pressing key 'S'  
  
press 'S' to return to save menu or 'R' to reboot
```

Press key "S" to return to the menu for saving data.
Press key "R" to initiate a reset.

Transmission finished

Once all the data have been transferred successfully, the following message appears:

```
Transmission finished, XXXXXX bytes saved.  
  
When using serial transmission please check the number of saved bytes  
with the number of bytes received by the remote device.  
If there is any difference please return to the save menu by pressing  
the 'S' key and retry the transmission with a lower baud rate.  
  
Please send the saved information to the SINUMERIK Hotline!  
email: ad.support@siemens.com  
Fill in subject: "HMI Embedded exception (SW XX.XX.XX; date)"  
  
Press 'S' to return to save menu or 'R' to reboot
```

Note

When you use the serial link, the number of transmitted bytes is also displayed and must match the number of bytes received. If the two numbers are not the same, abort the transmission by pressing key "S", select a lower baud rate and start the transmission again.

3.6.1 Restart

The exception handler attempts an automatic restart in Restart mode.

**Try rebooting - in the event of no reaction after 1 minute,
please switch off/on**

If the PCU has not reacted after 60 seconds, you must restart it manually by switching the power supply to the system or the operator panel front off and then on again.

3.6.2 Transmission times of the system data

The times taken to transfer system data to an external device are as follows:

Baud	Complete image
1200	Approx. 64 min
2400	Approx. 32 min
4800	Approx. 16 min
9600	Approx. 8 min
19200	Approx. 4 min
38400	Approx. 2 min
57600	Approx. 1 min, 2 sec
115200	Approx. 40 sec.
Floppy	Approx. 1 min

Note

These times apply on condition that the external device can receive the set baud rate without blocking.



4

4 Switching On/Power Up

- 4.1 Establish readiness for operation IM2/4-48
- 4.2 Ramp-up IM2/4-48

4.1 Establish readiness for operation

Connecting I/O devices

Before you connect the PCU to a power supply, you must connect an operator panel front.

1. Plug the connecting cable of the operator panel front into the relevant sockets on the interface side of the PCU.
2. After the operator panel front has been connected, the device is ready.

Information on how to adapt and set the interface and which connection cable is required, is to be found in the manual of your I/O device.

Note

When connecting I/O devices, please make sure that the components are designed for use in industry!



Caution

When plugging in / unplugging I/O connections (keyboard, mouse, printer, etc.), make sure that the I/O devices and the PCU are disconnected from the power supply. Otherwise they may be damaged.
This does not apply to USB connections.

Connecting the power supply

The PCU is supplied with 24 V direct voltage.

Power supply On/Off

Switch off the 24 V supply.

4.2 Ramp-up

As soon as the power supply is switched on the PCU ramps up automatically and displays a start screen if NC-PLC data communication has been established. If there is no NC-PLC data communication, the following message appears: "Waiting for communication" (black screen).

Powerline

Since software version 6.2, the Siemens ramp-up screens for the NCU/CCU types with "powerline" are specially marked. The control detects the "powerline" module automatically and the name is displayed in the ramp-up screen.



5

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5.1 Access protection via password and keyswitch

Access levels for enabling data areas are implemented in the SINUMERIK 840D. These are subdivided into:

- 4 password levels for Siemens, machine manufacturer and end user.
- 4 keyswitch positions for end user.

This provides a multilevel safety concept for controlling access rights.

Access rights

- 0 to 3 are locked by means of a password and
- 4 to 7 by means of keyswitch positions.

Table 5-1 Protection level concept

Protection level	Locked by	Area
0	Password	Siemens
1	Password: SUNRISE (default)	Machine manufacturer: Development
2	Password: EVENING (default)	Machine manufacturer: Start-up engineer
3	Password: CUSTOMER (default)	End user: Service
4	Keyswitch position 3	End user: Programmer, machine setter
5	Keyswitch position 2	End user: Skilled operator without programming knowledge
6	Keyswitch position 1	End user: Trained operator without programming knowledge
7	Keyswitch position 0	End user: Semi-skilled operator

Access features

- Protection level 0 provides the greatest number of access rights, protection level 7 the least.
- If certain access rights are granted to a protection level, these protection rights automatically apply to any higher protection levels.
- Conversely, protection rights for a certain protection level can only be altered from a higher protection level.
- Access rights on protection levels 0 to 3 are set as Siemens defaults.
- Access rights can be set by querying the current keyswitch positions and comparing the passwords entered. When a password is entered it overwrites the access rights of the keyswitch position.
- Options can be protected on each protection level. However, option data can only be entered in protection levels 0 and 1.

- Access rights for protection levels 4 to 7 are only suggestions and can be altered by the machine tool manufacturer or end user.

5.1.1 Password

Set/reset password

The passwords for the 4 available password levels with their respective access authorization can be entered in the "Diagnostics" operating area through selection of soft key "Set password".

References: /BEM/ Operator's Guide HMI Embedded

A password remains valid until the access authorization is reset with the soft key "Delete password".

Access authorization is therefore not automatically deleted by Power On!

Permitted characters

Up to eight characters can be used in the password. We recommend that you restrict yourself to the character set of the operator panel in selecting a password. Where a password consists of less than eight characters, the additional characters are interpreted as blanks.

Default passwords

The following default passwords are defined for protection levels 1 to 3:

Protection level 1	SUNRISE
Protection level 2	EVENING
Protection level 3	CUSTOMER

Note

The passwords are entered as the defaults on system ramp-up in start-up mode (NCK start-up switch in position 1).

The default passwords should be changed in order to guarantee reliable access protection.

5.1.2 Keyswitch

Protection levels 4 to 7 require a corresponding keyswitch position on the machine control panel. Three keys of different colors are provided for this purpose. Each of these keys provides access only to certain areas. The keyswitch positions are transferred at the PLC interfaces. The associated interface signals are in the DB10, DBB56 and can be evaluated by the PLC user program.

Keyswitch application

The keyswitch can be used to inhibit access to certain data areas. In this way, for example, unintentional changes by the operator in the geometry data (e.g. work offsets) can be excluded.

Keyswitch position 0 has access rights of the lowest priority and position 3 access rights of the highest priority.

Table 5-2 Meaning of the keyswitch positions

Key color	Switch position	DB10, DBB56	Protection level
All (no key used)	0 = Key removal position	Bit 4	7
Black	0 and 1	Bit 5	6-7
Green	0 to 2	Bit 6	5-7
Red	0 to 3	Bit 7	4-7

Influencing the PLC user program

The PLC interface signals "Keyswitch positions 0 to 3" can be input either directly via the keyswitch on the machine control panel or from the PLC user program. If more than one interface signal is set at the same time, the control sets keyswitch position 3.

Redefining protection levels for NC data

The user can change the priority of the protection levels. Only lower priority protection levels can be assigned to machine data, whereas higher or lower priority protection levels can be assigned to setting data.

Example:

```
%_N_SGUD_DEF                ; File for global variables
                             ; $PATH=/_N_DEF_DIR
REDEF $MA_CTRLOUT_SEGMENT_NR APR 2 APW 2
                             ; (APR ... read access)
REDEF $MA_ENC_SEGMENT_NR APR 2 APW 2
                             ; (APW ... write access)
REDEF $SN_JOG_CONT_MODE_LEVELTRIGGRD APR 2 APW 2
M30
```

The file becomes active when the next _N_INITIAL_INI is read in. Different protection levels are specified for writing (changing) or reading (parts program or PLC).

Example:

MD 10000 has protection levels 2/7, i.e. writing requires protection level 2 (corresponding to password) and reading requires protection level 7. In order to access the machine data area, key switch position 3 or more is required.

Undoing protection level changes

In order to undo protection level changes, the original values have to be restored.

Example:

```
%_N_SGUD_DEF                ; File for global variables
                             ; $PATH=/_N_DEF_DIR
REDEF $MA_CTRLOUT_SEGMENT_NR APR 7 APW 2
                             ; (APR ... read access)
REDEF $MA_ENC_SEGMENT_NR APR 0 APW 0
                             ; (APW ... write access)
REDEF $SN_JOG_CONT_MODE_LEVELTRIGGRD APR 7 APW 7
M30
```

5.2 Functions

5.2.1 Configure CAPSLOCK

The key response of CAPSLOCK is set in the MD 9009 KEYBOARD_STATE:

- 0: SingleShift is active after ramp-up
- 1: Setting not relevant!
- 2: CAPSLOCK is active after ramp-up (default setting)

References: /FB1/ A2: Various interface signals

5.2.2 Activate screen darkening

Screen darkening via PLC

You can activate the screen darkening with the PLC in DB19.DBB0. The PLC takes precedence over the entry in MD 9006.

Duration of the screen darkening

The duration (max. 60 minutes) after which the screen is automatically darkened if no key is pressed on the keyboard can be specified via the machine data MD 9006 DISPLAY_BLACK_TIME.

In MD 9006, the function "Screen dark from HMI Embedded" can be started using the following entry:

MD 9006	= 1	< time in minutes, e.g. 1 >
MD 9006	= 60	< time in minutes, e.g. 60 >
MD 9006	= 0	Deactivation of the function (default setting)

References: /FB1/ A2: Various interface signals

Caution

If a high contrast picture is displayed on the TFT display for more than an hour, there is a danger of irreversible display damage due to the so-called "burn-in effect".

In order to avoid this undesired effect, the screen saver must always be active.

5.2.3 Language selection - Change Language

As standard, the HMI software is available in five languages:
English, German, French, Italian, Spanish and simplified Chinese.

Two of these languages can be selected during the installation. During operation, the switchover between the first and the second language is performed via the soft key "Change Language".

Which language is displayed during the controller ramp-up is performed via MD 9003.

In addition to these standard languages, further languages can be loaded via the language CD.

See Chapter 7: Software installation

5.2.4 Switch pocket calculator help on/off

In MD 9991 HMI_HELP_SYSTEMS you can activate or deactivate pocket calculator help.

Bit 0 = 0 help display not active

Bit 0 = 1 help display active (default setting)

5.2.5 Plaintexts for PLC-machine data

As of HMI SW 6.5, you have the possibility of creating your own texts for the PLC machine data.

After the installation, the text for the selected machine data item is displayed below the machine data list in the Set-up operating area.

Syntax

Plaintext number

Number: Number of the machine data item

Plaintext: Plaintext of the machine data item, maximum 62 characters
(The plaintext cannot be enclosed by inverted commas.)

Machine data with different indices:

Number[x] plaintext

x: Index of the machine data item

Note

If a machine data item has different indices and you do not specify an index for the plaintext, the same plaintext appears for all the indices of the machine data item.

Examples:

14504 Number of user data (INT)
 14510[0] First user data item (INT)
 14510[1] Second user data item (INT)

5.2.6 Set date/time

You can set the date and time in the PLC and synchronize the PLC and HMI Embedded date and time.

This function is accessed via the Start-up operating area in the PLC menu by activating the soft key "Set time/date".

If any changes are made to the time and date, the time and date from HMI Embedded are transferred to the PLC.

You can check the synchronization in the "Current:" output field.

The cyclical synchronization of the time can be

- activated/deactivated via the soft keys "Synchronous AUTO/ON" or "Synchronous AUTO/OFF" and
- the duration of the synchronization set via the soft key "Synchronous manual". 10 minutes should be entered as default.
 Minimum value: 0, maximum value: 99.

The values set are retained when the software is rebooted.

Note

Changes can only be made to the PLC operands with the appropriate password.

5.2.7 Set editor

In MD 9460 PROGRAM_SETTINGS you can define the following settings for the editor in the Program operating area:

Bit 0/1	Internal	
Bit 2	= 0	No automatic enabling for programs
	= 1	Automatic enabling for programs
Bit 3	= 0	SK labelling of the contour calculator as text
	= 1	SK labelling of the contour calculator as icons
Bit 4	= 0	Line feed is not hidden in all editors
	= 1	Line feed is hidden in all editors
Bit 5	= 0	HD (hidden) lines are shown
	= 1	HD (hidden) lines remain hidden

The settings in the PROGRAM operating area are retained after a reset.

5.2.8 Display acknowledgement icon for PLC alarm

Via the MD 9055 PLC_ALARM_PICTURE, you can activate or deactivate the following icons:

Value: -1 No icon display
Value: 0 Icon labeled "PLC" is displayed.
Value: 1 "Cancel" icon is displayed.

This functionality refers only to PLC alarms, not to PLC messages.

5.2.9 Alarm display

If several alarms are pending at the same time, only the last alarm is displayed in the alarm and message line. If you want to display the NCK, PLC or HMI alarms alternately, you can set this in the machine data MD 9056 ALARM_ROTATION_CYCLE as of SW 6.5.

The following settings can be made:

< 500: No change of the alarm display, only the last alarm is displayed
500 – 10000: Display duration of an alarm in milliseconds

If a valid display duration is set, each alarm is displayed for this time before being replaced by the next alarm.

Cyclical alarms or program messages are not displayed alternately.

5.2.10 Expand user displays via operator interface

You can create user displays with the function "Expanding the Operator Interface" (Wizard).

References: /IAM/ HMI Installation and Start-Up Guide,
BE1, Expanding the Operator Interface

5.2.11 Replace ramp-up screen

You can set up a directory for customized boot screens in which the selected screens can be stored according to the following scheme:

Screen name

The screen name must be "Logo_oem.bmp".
There can be only one file for each directory.

Resolution

The screens must be copied to the directory with the appropriate resolution (BIN\640, BIN\800 and BIN\1024).

Colors

The screen must be stored as a 256-color bitmap.

Procedure

Before installation (see Chapter 7), you must copy the desired screen "Logo_oem.bmp" into each directory with the appropriate resolution.

Copy the batch file "oem_bmp.bat" from the "tool\oem_bmp" directory on the supplied CD into the BIN\640, BIN\800 and BIN\1024 directories and start the batch file in each of these three directories.

5.2.12 Inch/metric switchover

The availability of the soft key and its functionality can be configured via the MD 10260.

In the "Machine" operating area, you can switch between the inches measuring system and the metric measuring system via a soft key. If you want to display the "Switch to inch" or "Switch to mm" soft key, set the machine data as follows:

MD 10260 CONVERT_SCALING_SYSTEM ≠ 0

References: /FB1/A3: Axis Monitoring, Protection Zones
/FB1/G2: Velocities, setpoint / actual value systems, closed-loop control

5.3 Switch channels / control units

5.3.1 Several channels on one NCU

Function

Using the user interface, you can establish a connection between the HMI Embedded unit and the connected NCU/PLC units in each operating area.

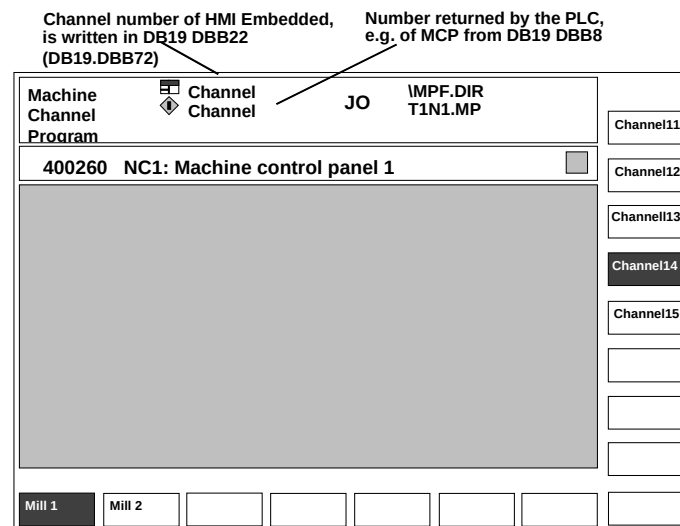


Fig. 5-1 Channel menu

Only the channels of the respective group are displayed. Activate the channel switch key. The currently existing connection is displayed by means of the highlighted soft keys (horizontal, vertical) if the channel menu is active.

Channel switchover

You can switch to other channels by means of the vertically arranged soft keys.

Group switchover

Use the horizontal soft keys to switch over to a different group; the channels of the current group are now displayed on the vertical soft keys. Switchover to another channel (and if necessary to another NC) only takes place upon activation of a vertical soft key.

Note

The soft keys only offer the connections that are really assigned and whose channels are active in the respective NC.

5.3.2 Configuration example of a NETNAMES.INI

Access to the channel menu configuration is granted by extending the file "NETNAMES.INI".

To do this, proceed as follows:

1. Define groups (a max. of 8) in "logChanSetList"
2. Define the NCs and the channels with unambiguous names for the groups in "logChanList"
3. For the channels (max. 8/group) specify
 - The NC name in "logNCName",
 - The channel number on the NC in "ChanNum" and
 - Reserve soft key yes/no (via the command IsAGap" = True/False)

Note

The NC writes the channel number of HMI Embedded in DB19, DBB22 or DB19, DBB72 (2nd interface).

The names in the file NETNAMES.INI are limited to five characters.

1st example: Operator panel front as main operator panel

```
NETNAMES.INI
[own]
owner=    HMI_1
; Description of possible connections
[conn HMI_1]
conn_1=   NCU_1
; Description of significant net parameters
[param network]
bus=      opi; the mpi interface must be used on the SINUMERIK 810D
[param HMI_1]
mmc_typ = 0x20
mmc_bustyp = OPI
mmc_address = 1
mstt_address = 6
name = HMI1
start_mode = ONLINE
[param NCU_1]
nck_address = 12
plc_address = 12
name= NCU1
; Description of a standard channel configuration
[chan HMI_1]
ShowChanMenu    = TRUE ; FALSE -> deactivate the channel menu
DEFAULT_logChanSet = Mill_1
DEFAULT_logChan  = Channel11
logChanSetList   = Mill_1, Mill_2
[Mill_1]
```

```

logChanList      = Channel11, Channel12, Channel13, Channel14, Channel15,
[Channel11]
logNCName        = NCU_1
ChanNum          = 1
[Channel12]
logNCName        = NCU_1
ChanNum          = 2
[Channel13]
logNCName        = NCU_1
ChanNum          = 3
[Channel14]
logNCName        = NCU_1
ChanNum          = 4
[Channel15]
logNCName        = NCU_1
ChanNum          = 5
[Mill_2]
logChanList      = Channel21, Channel22, Channel23, Channel24,
[Channel21]
logNCName        = NCU_1
ChanNum          = 6
[Channel22]
logNCName        = NCU_1
ChanNum          = 7
[Channel23]
logNCName        = NCU_1
ChanNum          = 8
[Channel24]
logNCName        = NCU_1
ChanNum          = 9

```

2nd example: Operator panel front as auxiliary operator panel

```

NETNAMES.INI
[own]
owner=    HMI_2
; Description of possible connections
[conn HMI_2]
conn_1=    NCU_1
; Description of significant net parameters
[param network]
bus=      opi
[param HMI_2]
mmc_typ = 0x10
mmc_bustyp = OPI
mmc_address = 2
mstt_address = 7
name = HMI2
start_mode = OFFLINE
[param NCU_1]
nck_address = 12
plc_address = 12
name      = NCU1
; Description of a standard channel configuration

```

```

[chan HMI_1]
ShowChanMenu      = TRUE ; FALSE -> deactivate the channel menu
DEFAULT_logChanSet = Mill_1
DEFAULT_logChan    = Channel11
logChanSetList     = Mill_1, Mill_2
[Mill_1]
logChanList        = Channel11, Channel12, Channel13, Channel14, Channel15,
[Channel11]
logNCName          = NCU_1
ChanNum            = 1
[Channel12]
logNCName          = NCU_1
ChanNum            = 2
[Channel13]
logNCName          = NCU_1
ChanNum            = 3
[Channel14]
logNCName          = NCU_1
ChanNum            = 4
[Channel15]
logNCName          = NCU_1
ChanNum            = 5
[Mill_2]
logChanList        = Channel21, Channel22, Channel23, Channel24,
[Channel21]
logNCName          = NCU_1
ChanNum            = 6
[Channel22]
logNCName          = NCU_1
ChanNum            = 7
[Channel23]
logNCName          = NCU_1
ChanNum            = 8
[Channel24]
logNCName          = NCU_1
ChanNum            = 9

```

Foreign language texts

The file "chan.txt" is available in several language variants specially for the channel menu. These are stored according to language in text directories "\proj\text\d", (-> German texts), "\proj\ text\g" (-> English texts), etc. The content of "chan.txt" files which do not yet contain any texts is as follows.

Example:

File with OEM name specifications for channel-areas and channels

```
/* text definitions for soft keys in channel switch menu */// name of channel area 1  
and names of channels of channel area 1 */
```

```
/* name of channel area 1 and names of channels of channel area 1 */  
T_CHAN_AREA_1      "Mill_1"  
T_CHAN_AREA_1_CHANNEL_1 " Channel11"  
T_CHAN_AREA_1_CHANNEL_2 " Channel12"  
T_CHAN_AREA_1_CHANNEL_3 " Channel13"  
T_CHAN_AREA_1_CHANNEL_4 " Channel14"  
T_CHAN_AREA_1_CHANNEL_5 " Channel15"  
T_CHAN_AREA_1_CHANNEL_6 ""  
T_CHAN_AREA_1_CHANNEL_7 ""  
T_CHAN_AREA_1_CHANNEL_8 ""
```

```
/* name of channel area 2 and names of channels of channel area 2 */  
T_CHAN_AREA_2      "Mill_2"  
T_CHAN_AREA_2_CHANNEL_1 " Channel21"  
T_CHAN_AREA_2_CHANNEL_2 " Channel22"  
T_CHAN_AREA_2_CHANNEL_3 " Channel23"  
T_CHAN_AREA_2_CHANNEL_4 " Channel24"  
T_CHAN_AREA_2_CHANNEL_5 ""  
T_CHAN_AREA_2_CHANNEL_6 ""  
T_CHAN_AREA_2_CHANNEL_7 ""  
T_CHAN_AREA_2_CHANNEL_8 ""
```

The OEM user can enter texts by inserting them in the blank character strings (see above ")! 8 characters are possible per soft key bar; the carriage return is created with characters "%n": e.g. "NC3Turn%nChann1".

5.3.3 Several channels on several NCUs

You can find a detailed description in the following documentation.

References: /FB2/B3: Several Operator Panels and NCUs

The MMC 100.2 is described in the above document which corresponds exactly to the functionality of HMI Embedded.

5.4 Select tool management

The ShopTurn, ShopMill tool management function is activated via a display machine data.

MD 9414 TM_KIND_OF_TOOLMANAGEMENT	for displaying ShopMill/ShopTurn and
MD 9414 = 1	ShopMill/ShopTurn tool management
MD 9414 = 0	Standard tool management (default setting)

Note

This functionality requires NCK software version 4 and later.

All the information needed for setup can be found in:

References: /FBW/ Description of Functions Tool Management
/FBSP/ Description of Functions ShopMill
/FBT/ Description of Functions ShopTurn

5.5 Fine tool offset

The limit values of the fine tool offset are specified in the machine data

MD 9450 WRITE_TOA_FINE_LIMIT.

When entering the tool wear fine, the difference between the previous value and the new value may not exceed the limit entered here.

The MD 9450 can only be changed if a permissible protection level is entered in MD 9202 USER_CLASS_TOA_WEAR.

References: /FB1/ A2: Various interface signals

5.6 Activate tool offset immediately

MD 9440 ACTIVATE_SEL_USER_DATA can be used to specify that the active tool offset can be activated immediately when the part program is in the "Reset" or "Stop" state.

If you use the function in the reset state, machine data MD 20110 RESET_MODE_MASK bit 0 = reset mode must be set accordingly. Then the tool offset is not reset on a reset.

References: /FB1/K2: Axis Types, Coordinate Systems, Frames,...

5.7 Selecting tools via a D number (flat D no.)

The "flat D number management" can be activated with MD 18102
TYPE_OF_CUTTING_EDGE.

Value = 0 NCK manages the T and D numbers = default setting
Value = 1 Only tools with the D number structure can be selected.

A D number can be assigned just once per tool, i.e. each D number stands for one
and no more than one offset data set.

References: /FB1/W1: Tool offset

5.8 Workpiece template

Workpiece templates for a program can be used for similar programs.
For that purpose, you must create a workpiece with the name _TEMPL_. If you
press the soft key "New", this workpiece is copied and renamed to a new name. All
files in this directory are also copied into the new directory.

Example:

Suppose you want to create a workpiece template with the content "Daten.ini" and
"TEST.MPF":

Workpiece: _TEMPL_
TEMPL.MPF
DATEN.INI
TEST.MPF

Operating sequence:

1. Press soft key "New"
2. Name: Define "ACHSE"
3. The new workpiece "ACHSE" is created with the following files:
ACHSE.MPF
DATEN.INI
TEST.MPF

5.9 Analog spindles

The spindle load from 0 to 100% can be displayed in the spindle window for up to
two analog spindles. For that, the following bytes must be set in DB 19:

Analog spindle: DB19.DBB 6

Analog spindle: DB19.DBB 7

References: /BEM/ Operator's Guide HMI Embedded

5.10 Work offset

Note

The functions of HMI Embedded can be altered in the INI files, display MD or the user interface.

5.10.1 Switching between the new/old work offset display

Via the MD 9459: PA_ZOA_MODE, it is possible to switch between the old and the new work offset display.

MD 9459 = 0 old display, as up to SW 5

Global frames and basic frames are displayed in the work offset screen.

MD 9459 = 1 new display, as of HMI SW 6.1

Global frames, basic frames and also system frames are displayed in the work offset screen.

5.10.2 Changing access protection on base offset soft key

Parameters operating area

MD 9247 MM_USER_CLASS_BASE_ZERO_OFF_PA can be used to set the access level from which the "Base WO" soft key is displayed in the "Work offset" window in the "Parameters" operating area.

At the same time, the base frames are also shown/hidden in the "Work offset" window and in the "Active WO + offsets" window.

Machine operating area

MD 9248 MM_USER_CLASS_BASE_ZERO_OFF_MA can be set to select the access level from which the "Base WO" soft key is displayed in the "Scratching" screen in the Machine operating area and/or G500 can be entered in the work offset field.

5.10.3 Work offset fine and base offset

This function refers to the offset in the screen form "Settable work offset" and "Base work offset".

Another column for the fine offset is inserted alongside the column for entering the offsets.

The inputs are checked against the display machine data

- MD 9203: USER_CLASS_WRITE_FINE
- MD 9451: MM_WRITE_ZOA_FINE_LIMIT

The first data describes the protection level, and the second data the amount of a possible value that can be entered.

The base work offset (base WO) is displayed like a settable work offset and can be selected and modified using the soft key "Base WO" in the screen form "Overview of work offsets".

MD 18600: MM_FRAME_FINE_TRANS = 1 activates the fine offset for all settable FRAMES and the base frame.

If you set MD 18600: MM_FRAME_FINE_TRANS = 0, the fine offset cannot be entered or programmed.

References: /FB1/K2: Axes, Coordinate Systems, Frames,...External Work Offset.

5.10.4 Preset actual value memory, preset, scratching

Introduction

The behavior of the **scratching** and **preset actual value memory, PRESET** functions is influenced by a number of machine data. The selected settings also affect operation. (Display of soft keys and values, saving of input values).

References: /BEM/, HMI Embedded Operator's Guide

With the introduction of system frames in software version 6, two variants are available for the functions. The variants are differentiated by a channel-specific MD:

MD 28082: MM_SYSTEM_FRAME_MASK

Bit:	0	Preset, scratching
	1	External work offset
	2	TCARR, PAROT
	3	TOROT, TOFRAME
	4	Workpiece reference points (SW 6.3 and higher)
	5	Cycles (SW 6.3 and higher)
	6	Frame transformation (SW 6.4 and higher)

Variant 1 **without system frame:**

The MD does not exist (older NCK software versions) or bit 0 for system frame for scratching and preset is not set.

Variant 2 **with system frame:**

Bit 0 for system frame for scratching and preset is not set in the MD.

Display machine data MD 9422: MA_PRESET_MODE defines the PRESET / base offset in the JOG mode.

0: No soft key

1: The old PRESET in the Machine operating area (default).

2: Preset actual value memory:

NCK without system frame: Setting only possible with active G500 in the base offset, otherwise error message.

NCK with system frame: Setting in the system frame possible.

The basic frame is not used with G500 in the system frame.

3: Preset actual value memory: NCK with/without system frame: Setting possible in the currently active frame.

Note

To hide the PRESET, preset actual value memory and scratching soft keys, MD 9220: MM_USER_CLASS_PRESET can be set.

Preset actual value memory

Preset actual value memory with system frame

G500 active

- The values are written to the system frame

G500 not active

- An error message is output.

Preset actual value memory without system frame

G500 active (adjustable frames reset)

- The values are written to the first basic frame (up to software version 4), or (as of software version 5)

depending on the entry in display machine data

MD 9245: MA_PRESET_FRAMEIDX = index of basic frame
to the set basic frame

Scratching

Scratching with system frame

G500 active

- The values are written to the system frame

G500 not active

- The values are written in the currently active frame

You **cannot** choose any tool other than the one in the spindle.

If there is no tool in the spindle, you can choose any tool you want.

Scratching without system frame

G500 active (adjustable frames reset)

- The values are written to the first basic frame (up to software version 4), or (as of software version 5) depending on the entry in display machine data
MD 9245: MA_PRESET_FRAMEIDX = index of basic frame to the set basic frame

G500 not active

The values are written in the currently active frame

G500 not active

An error message is output.

You can select any tool you want.

References: /FB1/ Description of Functions, K2: Frames...

5.10.5 Hide axes

Function

Channel-specific MD 20098 DISPLAY_AXIS can be used to hide axes in the Machine operating area.
All axes are displayed by default.

In this way you can specify separately for the view in the machine or workpiece coordinate system whether or not the axis is displayed:

Bits 0 to 15 Show (=1)/hide (=0) geometrical axes (WCS)
Bits 16 to 31 Show (=1)/hide (=0) machine axes (MCS).

20098	DISPLAY_AXIS		
MD number	Display or hide axis on MMC/HMI		
Default setting: 0xFFFFFFFF		Minimum input limit: 0	Maximum input limit: 0xFFFFFFFF
Changes effective after POWER ON		Protection level: 2/7	Unit: -
Data type: DWORD		Applies from SW: 4.4	
Meaning:	Bits 0 to 15: WCS		
	Bit 0=	1	Show geometrical axis in actual-value windows
		0	Hide geometrical axis in actual-value windows
	Bit 1	1	Show geometrical axis in reference point windows
		0	Hide geometrical axis in actual-value windows
	Bit 2=	1	Show geometrical axis in preset/base offset/scratching/work offset window
		0	Hide geometrical axis in preset/base offset/scratching window
	Bit 3=	1	Show geometrical axis in handwheel selection window
	0	Hide geometrical axis in handwheel selection window.	

	Bits 16 to 31: MCS
Bit 16=	1 Show machine axis in actual-value windows
	0 Hide machine axis in actual-value windows
(Bit 17)	Do not use
Bit 18=	1 Show machine axis in base offset window
	0 Hide machine axis in base offset window
Bit 19=	1 Show machine axis in handwheel selection window
	0 Hide machine axis in handwheel selection window

Special cases

- **Reference point approach and Safety Integrated**
MD 20098 DISPLAY_AXIS is not evaluated in the displays for referencing mode, i.e. in the axis reference point and acknowledge safe position display. All machine axes are always displayed.

Therefore the operator cannot change the values for the base work offset without the appropriate access authorization.

Access authorization 7 is entered as the default value in MD 9247 / 9248.

5.10.6 Display geometry axes

In MD 9421 MA_AXES_SHOW_GEO_FIRST you specify whether the geometry axes are to be displayed at the first position or not (e.g. before the auxiliary axes).

MD 9421 = 1 Display geometry axes at the first position
MD 9421 = 0 Do not display geometry axes at the first position
(default setting)

5.11 Define machine position and rotary axis position

Singularities with special kinematics and robots

When the cartesian point-to-point method (PTP) in workpiece coordinates is used, the position of machine axes is ambiguous at certain points. In order to define these singularities without ambiguity, the position of the machine STAT and the position of the axes TU are defined in addition to the workpiece coordinates for this type of transformation (e.g. 5-axis transformation).

Setting the numerical basis

The STAT- and TU values are displayed in the axis screens (actual-value window, broad actual-value window with feed and zoom display) and entered in the MDA editor during the teach-in procedure.

Whether the values in STAT and TU are displayed in binary, decimal or hexadecimal format is set via the display machine data:

MD 9242: MA_STAT_DISPLAY_BASE	Numerical basis for display of articulated position STAT
MD 9243: MA_TU_DISPLAY_BASE	Numerical basis for display of rotary axis position TU

Possible settings are:

- 02: Display as binary value
- 10: Display as decimal value
- 16: Display as hexadecimal value

These settings apply to both the actual-value window and the editor window.

Example

In the NC program the movement of axes from X120 Y20 Z-50 to X200 Y200 Z-120 looks like this in binary display:

- X=120 Y=20 Z=-50 STAT='B010' TU='B011101'
- X=200 Y200 Z=-120 STAT'B110' TU='B011111'

References: /FB1/ Description of Functions, K2: Frames...

Show/hide STAT and TU

The STAT and TU values are displayed in the axis screens (actual-value windows) and in teach mode (insert block).

You can choose whether or not to show the STAT and TU values by setting the following display machine data:

STAT and TU are not displayed:

MD 9242: MA_STAT_DISPLAY_BASE	= 0	of articulated position STAT
MD 9243: MA_TU_DISPLAY_BASE	= 0	of rotary axis position TU

STAT and TU are displayed:

MD 9242: MA_STAT_DISPLAY_BASE	= 1	of articulated position STAT
MD 9243: MA_TU_DISPLAY_BASE	= 1	of rotary axis position TU

5.12 Program simulation

5.12.1 Turning simulation and program test

PLC signal DB19.DBB20.6 is set to 1 when simulation is activated. This signal can be evaluated for the purpose of switching to program test mode or canceling axis or controller enabling signals (to prevent axes from moving during simulation runs). The signal is reset to 0 when simulation is terminated.

To be able to simulate certain operations during a dry run even though the axis/controller pulses have been disabled, the transfer of status "ext. pulse disable active, terminal 663 open" to the NC must be inhibited.

The machine manufacturer can achieve this by evaluating the above-mentioned PLC signal and activating the dry run simultaneously with NC Start.

If the drive MD 1012 FUNC_SWITCH, Bit 2 = 0 is also set, the status "ext. pulse disable active, terminal 663 open" is not transferred to the NC.

References: /FBA/DB1: Operational messages / alarm responses

5.12.2 Turning simulation

With MD 9020 TECHNOLOGY =1, the turning machine configuration is activated and with it turning simulation.

References: /FB1/ A2: Various interface signals

5.12.3 Milling simulation 3D

This function is a software option called "milling simulation" with the Order No.: 6FC5253-0AE02-0AA0

When the option is set, you can select the function via the "3D Simulation" softkey.

Operation of milling machine simulation is described in:

References: /BEM/ Operator's Guide HMI Embedded

5.13 Free contour programming

The free contour programming is a support tool for the editor. You can generate both simple and complex contours using the contour programming function, see

References: /BEM/ Operator's Guide HMI Embedded, Chapter 6.

The contour elements of the contour chain are displayed by symbols or text.

Via the MD 9020 TECHNOLOGY, you define the basic configuration for the free contour programming of turning/milling.

MD 9020 = 1 Turning machine configuration

MD 9020 $\neq$ 1 Milling machine configuration

Replacing text with symbols

Via the MD 9460 PROGRAM_SETTINGS, Bit 3, you can set whether the soft keys for the selection of the contour elements should be displayed with text or with symbols:

Bit 3 = 0 Soft key with text

Bit 3 = 1 Soft key with symbol

References: /FB1/ A2: Various interface signals

5.14 Measuring cycle support in the G code editor

In HMI Embedded you can integrate screen forms which provide support for programming measuring cycles into the G code editor. These cycles can then be recompiled automatically.

The "measuring cycles" function is a software option with order no. 6FC520-0BX00-0AB0.

For further information about measuring cycle support, please refer to:

References: /BNM/ User's Guide Measuring Cycles

- In the ANWENDER-ZYKLEN\COMMON.COM file, remove the semicolon ";" in front of the following lines:
;SC326 = AEDITOR.COM ;Turning meas. cycles (horizontal soft key 6 on
;the extended soft key bar in the G code editor)
;SC327 = AEDITOR.COM ;Milling meas. cycles (horizontal soft key 7 on
;the extended soft key bar in the G code editor)

In this way, you establish the connection between the soft keys, with which you call the measuring cycle support, and the configuration file of these support screens.

- In the ANWENDER-ZYKLEN\COMMON.COM file, remove the semicolon ";" in front of the following line:
;SC617 = STARTUP.COM ;Start-up operating area (horizontal
;soft key 7 on the extended softkey bar
;in the G code editor)

In this way, you can change the properties of the measuring cycle support in the Start-up operating area.

Change the properties of the measuring cycle support in the "Start-up" ">" "Measuring Cycles" menu.

5.15 Coordinate systems

5.15.1 Actual-value display

In MD 9424 MA_COORDINATE_SYSTEM you can set whether

- the position of the workpiece coordinate system (programmed position, corresponds to the default setting) or
- the holding position of the active tool relative to the workpiece zero must be shown in the actual-value display.

MD 9424 = 0 Display in workpiece coordinate system, WCS
(default)

MD 9424 = 1 Display in settable zero system, SZS
(take-up position of active tool)

References: /FB1/K2: Axes, Coordinate Systems, Frames,...External Work Offset

5.15.2 Position of the coordinate system

You can set the position of the coordinate system for milling in MD 9650 CMM_POS_COORDINATE_SYSTEM.

Table 5-3 Machine data 9650

9650 MD number	CMM_POS_COORDINATE_SYSTEM Position of coordinate system	
Default setting 0	Min. input limit: 0	Unit: -
Data type BYTE		Valid as of SW release: SW 05.01.13
Meaning	With this machine data you adapt the coordinate system of the user interface to the coordinate system of the machine. The coordinate system can assume the following positions.	

Note

You can set the position of the coordinate system for turning in MD 9610 CTM_POS_COORDINATE_SYSTEM.

References: /FB1/K1: Mode group, channel, program operation mode

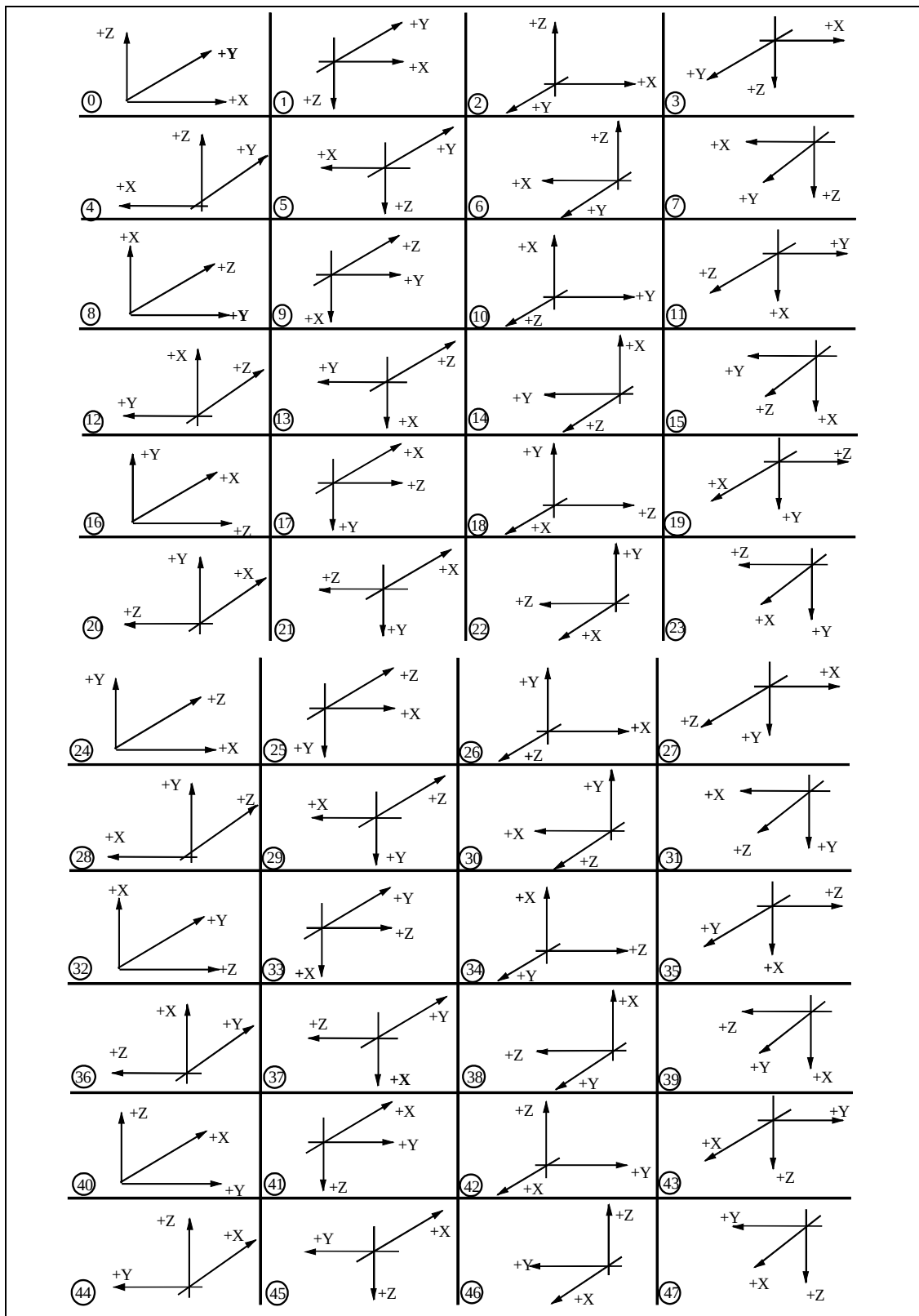


Fig. 5-2 Coordinate system

5.16 Remote diagnostics for HMI Embedded on PCU 20

Remote diagnostics

The remote diagnostics function (ReachOut) is an option.
The remote diagnostics is supplied on a CD-ROM.
The DOS version must be installed and configured on the PCU 20.

The PC card with the remote diagnostics software must be inserted when the PCU 20 is switched on. The card must be started up during the initial ramp-up. (Press key 6 during ramp-up, modem on COM1 or COM2...)

The remote diagnostics software only supports graphics mode 12 (640 x 480, 16 colors). With higher resolution displays, a small centered screen is displayed.

You can find a detailed description of the installation, configuration and operation of the remote diagnostics in

References: /FBFE/Description of Functions: Remote Diagnostics
SINUMERIK, FE1 as well as in the ReadMe file of the remote diagnostics.

Remote diagnostics "RCS Host PCU 20 / RCS Viewer PCU 20" as of HMI SW 6.5

See following section: "Remote diagnostics RCS Host PCU 20 / RCS Viewer PCU 20"

5.17 Remote diagnostics "RCS Host PCU 20 / RCS Viewer PCU 20"

The remote diagnostics software "RCS Host PCU 20" and "RCS Viewer PCU 20" is an option and is available as of HMI Embedded software 6.5.

The remote diagnostics software "RCS Host PCU 20" is already installed on the PCU 20.

For the PC, the remote diagnostics software "RCS Viewer PCU 20 V1.0" is supplied on the remote diagnostics CD
"RCS Viewer (Edition 01/2004)" with the order no.: 6FC6000-6DC01-1BA0.

It is then possible for a service engineer to monitor and influence a controller via its PCU 20 from a remote PC (remote PC = viewer), i.e. the same display is shown on the remote PC as on the PCU 20.

Remote diagnostics has the following services:

- Direct access to the PCU 20 via network
- Data exchange (file transfer)

Precondition

The following hardware and software is required:

- Establish a tunnel connection between the PCU 20 (machine) and the remote PC (viewer), e.g. via hardware router with so-called VPN (Virtual Private Network) functionality, e.g. Cisco 803
- Windows PC (NT4/95/98) with network connection
- "Viewer" application (mmcR.exe) from the remote diagnostics CD (remote PC)
- Ethernet cable
- Network Manager (on the remote PC)
 - Set up logical drive for the data exchange (file transfer)
- "Ping" server application (optional, but recommended) which accepts and manages incoming service requests from the PCU 20. This SW is not part of the scope of delivery!

Connection structure

The example shows the connection via the ISDN network (64 kbit/s). This telephone network provides the capability of connecting to remote LANs via a tunnel using the point-to-point protocol (PPP). The PCU 20 is connected to the ISDN network via the Ethernet interface with a hardware router (with VPN functionality).

Structure example of an ISDN connection:

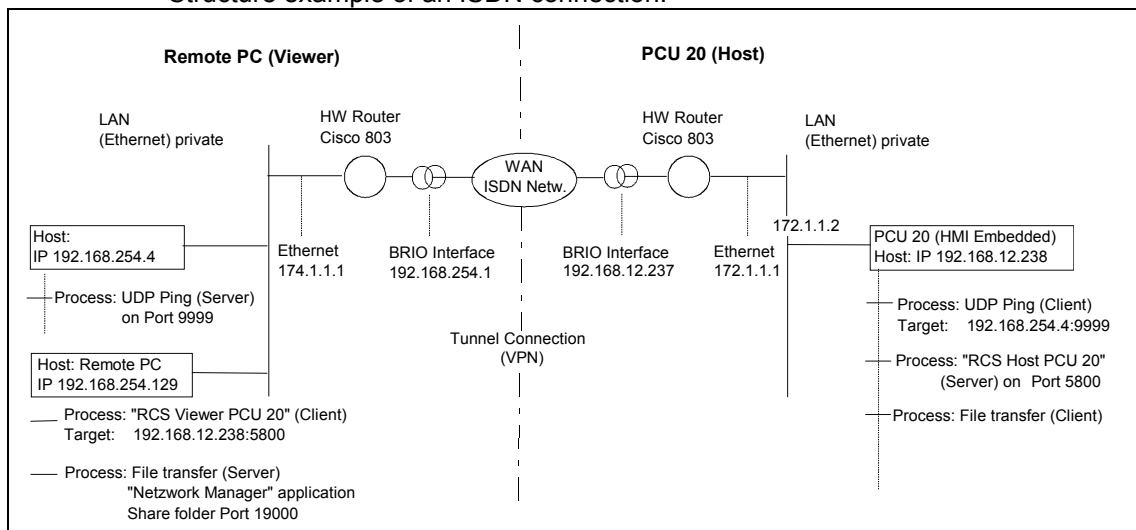


Fig. 5-3 Example: Connection structure of the remote diagnostics

Remote diagnostics sequence

A machine manufacturer who provides this service for a PCU 20 has selected an appropriate topology for a tunnel connection and will provide support when setting up the remote diagnostics.

Usually the remote PC should have a "Ping" server application in its LAN for the log-on and monitoring of the remote diagnostics session. This server has the task of accepting the incoming "Ping" data (e.g. serial number) of the requesting machine and registering the IP address of the requesting PCU 20. This can be implemented, for example, with a simple server application based on the UDP. The IP address, the port and the protocol used for this Ping server is specified by the service provider and must be set on the PCU 20.

The remote diagnostics is initiated by the PCU 20. The PCU 20 is connected to the appropriately configured router via an Ethernet cable and starts the remote diagnostics via the "Diagnostics" operating area and the "Remote diagnostics" soft key.

The PCU 20 then sends cyclical preset "Ping" data to the remote PC and waits for its response. The sending of the "Ping" causes the router to establish the connection (e.g. ISDN switched communication).

When the response is received from the remote PC, the PCU 20 is ready for the data communication for the remote diagnostics. For this, a server process is started on the PCU 20 which is responsible for the exchange of graphic information to the remote PC and the keyboard inputs from the remote PC.

The exchange is performed via the TCP/IP protocol and a "permanently" agreed port, the so-called "RCS Host PCU 20 port". A so-called "Viewer" application (mmcR.exe) is installed on a remote PC as communication partner. As of now, all further activities initiate from the remote PC.

With the arrival of the "Ping" on the PC, the IP address of the requesting PCU 20 is known and the "Viewer" application (mmcR.exe) with this destination IP address can be started on a PC. This application runs as client. The PCU 20 can be monitored and controlled via this remote PC.

The transfer of files between the remote PC and the PCU 20 is handled in the same way as the access to logical drives - so-called Share Folders. A folder (Share Folder), which accepts the transferred files, only has to be selected on the remote PC.

The appropriate settings are automatically made by the system on the PCU 20. The file transfer is performed via a separate communication process ("HMI Network Manager"). This process runs on the remote PC as server. The port used for this is called "Port for share folder" in the following. This server application is automatically called with the start of the "Viewer" application.

5.17.1 Configure "RCS Host PCU 20"

The remote diagnostics software is part of the HMI Embedded software and is activated via a machine data item.

Adapting PCU 20 to router (VPN network)

PCU 20 and router are connected via an Ethernet cable.

If the PCU 20 is already in the network, save the current network configuration. To adapt the network configuration of the PCU 20 to the configuration of the Ethernet interface of the router, proceed as follows:

Start the PCU 20, press the "Start-up" -> "HMI" -> "Netw. config." soft keys and make the following entries:

Startup	Kanal X	JOG
Channel reset		
Network configuration		
HMI booting: ☒ with network without confirmat		
Log:	☒ TCP / IP	Cnpt. name: PCU20
DHCP:	☒ No	User: PCU20_USER
IP address:	192 168 0 1	Password:
Subnet mask:	255 255 0 0	Confirm:
Gateway:		MAC address: 01 34 67 9A CD FF
DNS 1:		
DNS 2:		
DNS 3:		
DNS domain:		
Monit.time:	30	
Save		
^Select system boot via Select		
Connections	Netw. config.	Server names
		File types

Fig. 5-4 Configuration of the Ethernet interface "Router PCU 20"

The entries

- IP address
- Subnet mask
- Gateway

are already specified by the router configuration and are only used as examples here.

When you press the "Save" soft key, the PCU 20 is restarted.

Adapt PCU 20 to the remote PC

In the "Start-up" operating area, press the ETC key ">" and the soft key "Remote diagnostics". The following window appears:

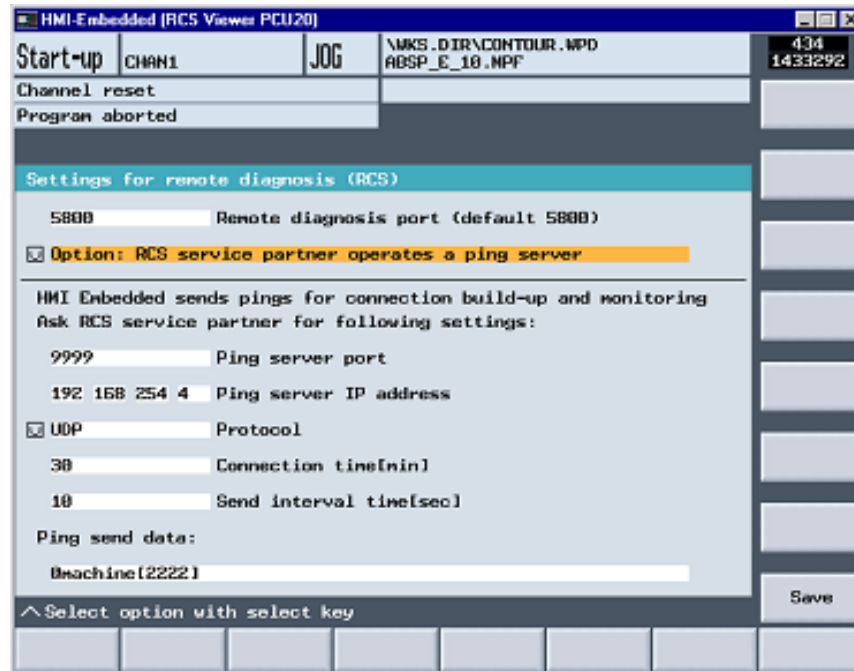


Bild 5-5 Setting up logon server

The port number, default 5800, is entered in the "Port for remote diagnostics (default 5800)" input field for the server process (remote diagnostics). The same port number must be entered in the "Viewer" application on the remote PC.

Option: "RCS service partner operates a Ping server" selected

The option "RCS service partner operates a Ping server" selects that the remote PC operates a Ping server. The other settings must be obtained from the service partner that operates a Ping server:

- Ping server port
- IP address of the PCU 20 (host) on which the "Ping" server runs
- Protocol selection, UDP or TCP/IP
- Connection duration (min): Entry for the maximum time for the duration of the remote diagnostics. After this time expires, the connection is interrupted.
- Transmission interval (sec): The Ping data is transmitted cyclically in this interval from the PCU 20 to the remote PC. This is used for the monitoring of the connection.
- Ping transmission data: Entry of an agreed user data string

Option: "RCS service partner operates a Ping server" deactivated

This option should only be deselected when the initiative for the remote diagnostics is to come from the remote PC (e.g. when the remote PC and the PCU 20 are in the same Intranet and an individual PCU 20 in the LAN is to be accessed from a PC).

When this option is deactivated, no other entries are possible.

Pressing the "Save" soft key terminates the configuration of the server.

Connections for data exchange (file transfer)

In order to be able to perform a file transfer, connection entries (\\<remote_ip>\<share folder name>) are automatically made by the system for the remote diagnostics. These connection entries are used by the "logical drives". The connection for the file transfer is called "REMOTE FOLDER" and appears as a soft key in the "Program" operating area.

If, from the four possible "logical drives", no connection is available, the message "Caution: No configurable share available!" appears.

Deactivate the remote diagnostics by pressing the "Exit" soft key.

Switch to the "Start-up" operating area, press the soft key "Connections" and delete a connection entry.

When you restart the remote diagnostics "RCS Host PCU 20", the connection "REMOTE_FOLDER" is automatically set up and the soft key with the same name generated.

5.17.2 Installing and configuring "RCS Viewer PCU 20"**Precondition**

- Remote diagnostics CD with the "RCS Viewer PCU 20" software
- HMI Network Manager (for data exchange, the file transfer)

Installation

The "RCS Viewer PCU 20" is installed by running the "setup.exe" setup program. The installation path should be noted for the later "Network Manager" installation.

Note

"Network Manager" and "RCS Viewer PCU 20" must be in the same path.

After the first ramp-up, the following message appears:

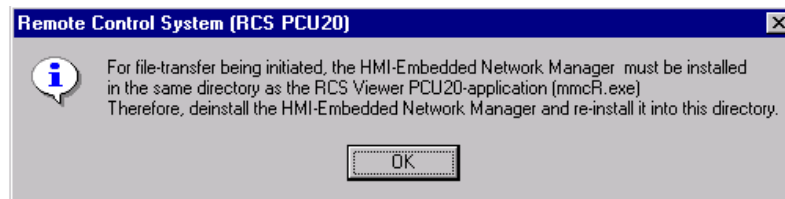


Fig. 5-6 Message

You must then, if you have not already done so, install the Network Manager in the same directory as the "RCS-Viewer PCU 20" application.
Also, during the installation of the Network Manager option, you must click the "No" button twice in the "Select Components" window.

See Chapter 3: "Network Manager on the Server"

Configuration

Start the "Viewer" application "mmcR.exe" on the remote PC. When starting the "mmcR.exe" for the first time, you must select a folder (share folder) on the PC. Data is transferred to and from the PCU 20 via this common folder (file transfer). This folder is managed under the permanent name "REMOTE_FOLDER". The file transfer uses this name only for the identification of the source or the target.

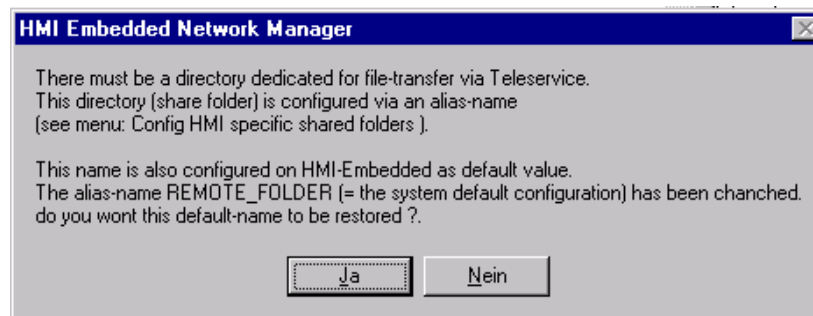


Fig. 5-7 Folder: REMOTE_FOLDER

When you click the "Yes" button, the dialog box for the selection of the storage path appears. Either enter the path in the "Config HMI-specific shared folders..." field or click "Browse..." so that the path can be selected in the Explorer view. Confirm the selection with "OK".

You return to the following window and the selected storage path is displayed:

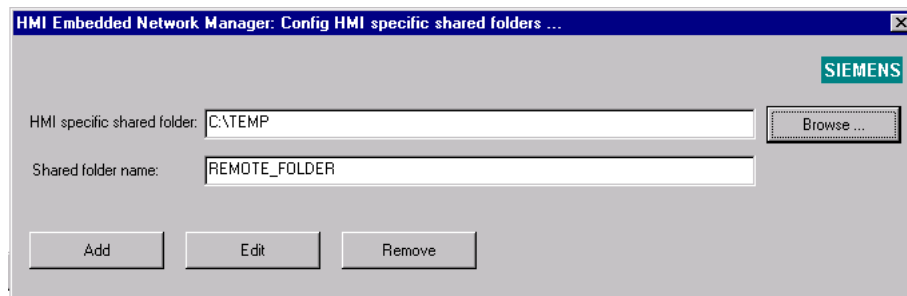


Fig. 5-8 Path selection

Click the "Add" button and then "OK" to conclude the configuration for the file transfer.

Note

The name "REMOTE_FOLDER" cannot be changed as only this name is used as reference on the PCU 20.

Change "RCS Host PCU 20" port

If, for example, due to Firewall settings when the port is only to be enabled for incoming packets, the default setting of the remote diagnostics port changes, select the "RCS Viewer PCU 20 (Remote Control System)" window and click the "Configuration" button.

The following window appears:

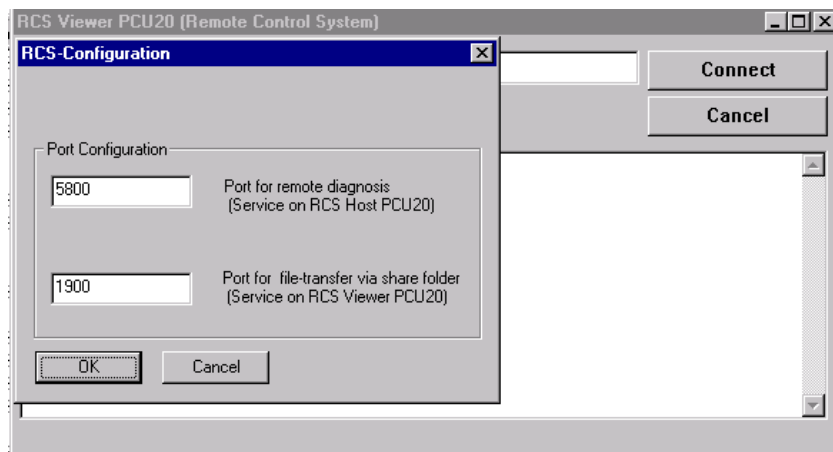


Fig. 5-9 Port setting

Enter another port and save the settings with "OK".

In the next window, the following dialog appears:
"The port-number has been stored.
Please, restart your application. "

Click "OK" and a restart is performed.

"Port for share folder" already used

"RCS Viewer PCU 20" requires the configured port "Port for share folder" on the remote PC for the file transfer. If this port is already used, an error message appears.

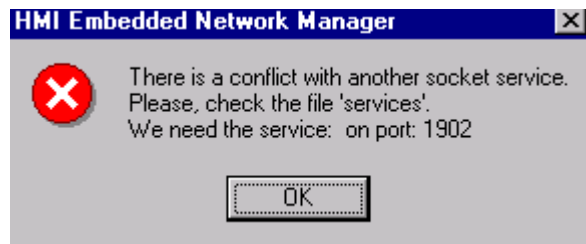


Fig. 5-10 Error message

If this port (e.g. 1902) is after the service entry "pcu20_remote diagnostics 1902/tcp #Siemens..." in the "Services" file, the entire line must be deleted.

5.17.3 Start "RCS Host PCU 20"

PCU 20 (host)

Activate the "RCS Host PCU 20" in the "Diagnostics" operating area via the "Remote diagnostics" and "Start" soft keys.
Status messages provide information on the current state.

When the connection to the remote PC is established, the PCU 20 waits for the "Viewer" application (mmcR.exe) to be started on the remote PC and the communication for the data exchange to be activated.

The message: "Ping server responds" appears.

This communication is performed via the "RCS Host PCU 20 port" which, per default, is applied to port number 5800.

When the message "Communication running" appears, operation of the PCU 20 from the remote PC is possible.

Remote PC (viewer)

When you start the "mmcR.exe", the "RCS Viewer PCU 20" window opens. If a "Ping" server is operated, then the IP address of the PCU 20 is known on the remote PC after the first "Ping" has been received and can be transferred with the call of the "Viewer" application or entered directly in the dialog field:

e.g.: 192.168.12.238

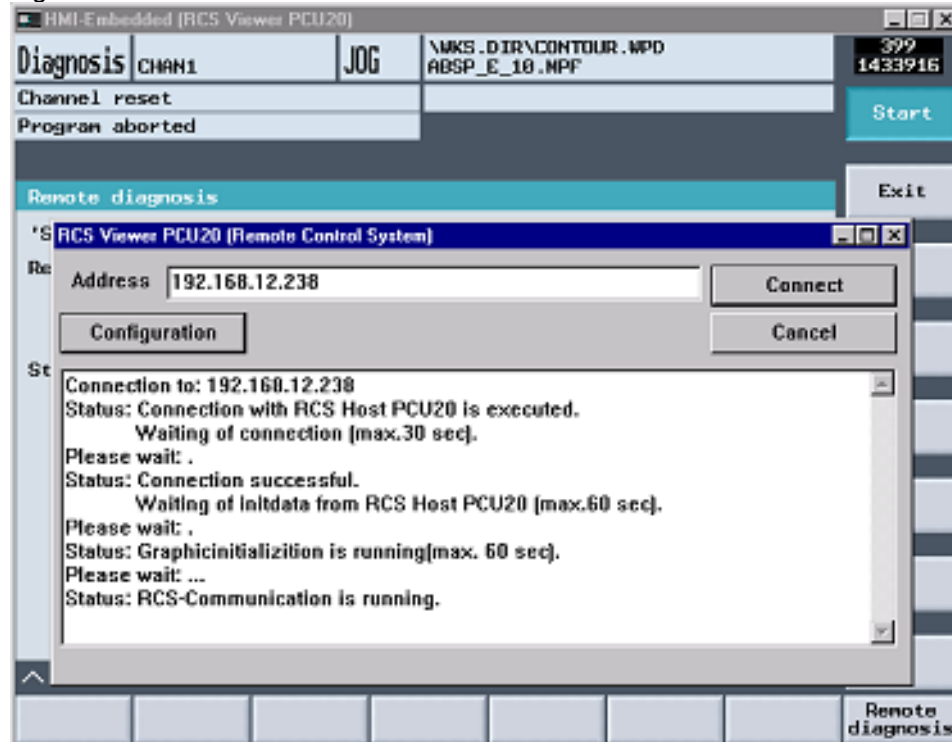


Bild 5-11 Setting connection to PCU

When you click the "Connect" button, the connection with the PCU 20 via the "RCS Host PCU 20 port" is activated. The corresponding status messages are output in the field below. When these are completed, the dialog is reduced and the HMI Embedded interface appears.

File transfer

The file transfer is performed in the "Program" operating area. When you press the "REMOTE FOLDER" soft key, the contents of the selected folder are displayed. The transfer can be performed using the vertical soft keys.

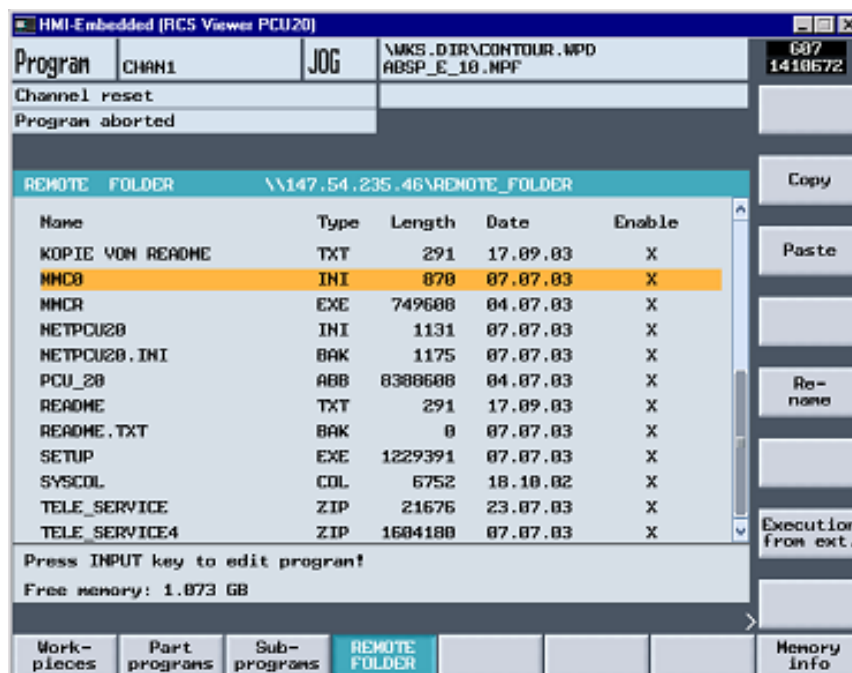


Fig. 5-12 Share folder for file transfer

Selecting another folder

The Network Manager, via which you specify the storage path, is automatically started with the start of the PC application. The icon for the activation of the Network Manager appears in the status line.

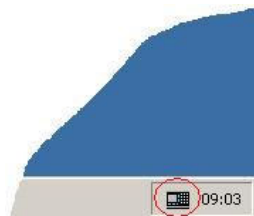


Fig. 5-13 Icon of the Network Manager

Place the cursor on the icon. Right-click the icon to open a menu and select the "Config HMI-specific shared folders..." dialog.

The procedure is the same as in Section: Installing and configuring RCS Viewer PCU 20.

5.18 Display and edit the system resources

Up-to-date information about the system resources currently used (utilization display) can be displayed and edited for the NC and HMI Embedded areas.

Precondition

As different protection levels are assigned to machine data per default, the set access authorization for the editing of machine data must be sufficiently high. Depending on the authorization level, it will be possible to edit data such as cycles and machine data.

Procedure

A soft key menu is displayed when you select the ETC key ">" in the Start-up operating area.

When you select the "NC memory" soft key, the memory overview screen appears, showing the amount of NC user memory currently available for programs and data. The "SRAM" and "DRAM" areas have been provided to enable you to examine or edit those machine data which configure the memory. These areas in turn are divided into further groups.

5.18.1 Static user memory (SRAM)

When you select the "SRAM" soft key, the total memory allocation is displayed and can be modified at the top of the screen.

The memory-configuring machine data are divided into the following groups:

- Tool management
- Global user data
- Curve tables
- Compensation
- File system / program memory
- Protection zones

Start-up	CHAN1	MDI	\SYF.DIR OSTORE1.SYF	
Channel reset				
Program aborted				
700153				
SRAM allocation in bytes (user memory for programs and data)				
Static user memory SRAM after NC reset (in bytes)——				
Total	2063360			
Assigned to file system	696588			
Free	1420384			
Unused memory (in bytes)——				
Tool management	5112			
Global user data	24328			
Curve tables	0			
Compensations	0			
File system / program memory	14936			
Protection zones	-1			
Memory overview	SRAM	DRAM		

Fig. 5-14 Static user memory SRAM

Detailed view

Click the area of interest with the cursor and select the "Details" soft key. The current data for the relevant machine data are then displayed.

The block header contains the number and name of the machine data. The currently set values are output on the lines below.

You can change the memory setting in the gray field after "New value" or "New number" to the right of the field containing the actual value.

This new setting is entered temporarily. Your entry is automatically checked for limits and an appropriate message output in the dialog line if you make a mistake. The total available memory, taking into account any modified values, is displayed in the lower half of the screen.

Soft keys "Axis+" and "Axis-" are displayed for axis-specific machine data.

Soft keys "Channel+" and "Channel-" are displayed for channel-specific machine data.

When you select soft key "Accept", the temporary values of the displayed machine data are transferred to the NC.

You can exit the detail view by selecting the "Cancel" soft key or the Recall key "^".

Note

Once you have pressed soft key "Accept", the "Cancel" soft key is no longer operative, i.e. any changes you have made cannot be undone.

Data backup

When you change the allocation of a memory, alarm 4400 "Machine data alteration will cause reorganization of buffered memory (data loss)" appears.

Since data are not backed up automatically, to avoid data loss you must back up the data yourself by way of an NCK Reset before you transfer the MD change.

Memory allocation: Tool management

In the main SRAM screen, click the "Tool management" area with the cursor and then click the vertical soft key "Details". The following screen appears:

Start-up	CHAN1	JOG	MPFB
Channel reset			
Program aborted		FST	
510009↓			
Tool management			
-18082 MM_NUM_TOOL-			
		Memory change	
Currently set number	40	New number	40
Currently used number	0	SDRAM change	0 Byte
-18088 MM_NUM_TOOL_CARRIER-			
		Memory change	
Currently set number	1	New number	1
Currently used number	1	SDRAM change	0 Byte
Currently free user memory			
		SRAM	695836 Byte
Free user memory after NC reset			
		SRAM	1593392 Byte
Number of tools in NCK (SRAM)			
Tools	Tool edges	Magazine	Magazine OEM
	Tool parameter		
			Tool managment.
			Abort
			Accept

Fig. 5-15 SRAM - Tools

By selecting the horizontal soft keys, you can view or edit the machine data memory values of other subgroups.

"Tools": MD 18082 MM_NUM_TOOL
MD 18088 MM_NUM_TOOL_CARRIER

"Tool edges": MD 18100 MM_NUM_CUTTING_EDGES_IN_TOA
MD 18110 MM_MAX_SUMCORR_PER_CUTTEDGE
MD 18104 MM_NUM_TOOL_ADAPTER

"Magazine": MD 18084 MM_NUM_MAGAZINE
MD 18086 MM_NUM_MAGAZINE_LOCATION

"Magazine OEM":	MD 18090 MM_NUM_CC_MAGAZINE_PARAM MD 18092 MM_NUM_CC_MAGLOC_PARAM
"Tool parameter":	MD 18094 MM_NUM_CC_TOA_PARAM MD 18096 MM_NUM_CC_TDA_PARAM MD 18098 MM_NUM_CC_MON_PARAM
"Tool management":	18080 MM_TOOL_MANAGEMENT_MASK

Memory allocation: Global user data

When you select the "Global user data" area and click the "Details" soft key, you can display and edit the memory settings in the machine data of the following areas:

"GUD files":	MD 18118 MM_NUM_GUD_MODULES MD 18150 MM_GUD_VALUES_MEM
"Number of variables":	MD 18120 MM_NUM_GUD_NAMES_NCK MD 18130 MM_NUM_GUD_NAMES_CHAN

Memory allocation: Curve tables

When you select the "Curve tables" area and click the "Details" soft key, you can display and edit the memory settings in the following machine data:

MD 18400 MM_NUM_CURVE_TABS
MD 18402 MM_NUM_CURVE_SEGMENTS
MD 18404 MM_NUM_CURVE_POLYNOMS

Memory allocation: Compensations

When you select the "Compensations" area and click on the "Details" soft key, you can display and edit the memory settings in the machine data of the following areas:

"Sag compensens.": MD 18342 MM_NUM_CEC_MAX_POINTS[]
These configuring machine data are indexed machine data. The index is set in the top half of the screen.

"E. error compensens.": MD 38000 MM_ENC_COMP_MAX_POINTS[0]
MD 38000 MM_ENC_COMP_MAX_POINTS[1]

There are only two tables for the encoder/spindle compensation interpolation points. There is no need to select an index.

"Q. error compensens.": MD 38010 MM_QEC_MAX_POINTS[0]
There is only one table for quadrant error compensation. There is no need to select an index.

Memory allocation: File system / program memory

When you select the "File system / program memory" area and click on the "Details" soft key, you can display and edit the memory settings in the machine data of the following areas:

"Directories": MD 18310 MM_NUM_DIR_IN_FILESYSTEM
MD 18270 MM_NUM_SUBDIR_PER_DIR

"Files": MD 18320 MM_NUM_FILES_IN_FILESYSTEM
MD 18280 MM_NUM_FILES_PER_DIR

Memory allocation: Protection zones

When you select the "Protection zones" area and click the "Details" soft key, you can display and edit the memory settings in the machine data of the following areas:

"Global prot. zone": MD 18190 MM_NUM_PROTECT_AREA_NCK
"Chann-spec. prot. zone": MD 28200 MM_NUM_PROTECT_AREA_CHAN
MD 28210 MM_NUM_PROTECT_AREA_ACTIVE

5.18.2 Dynamic user memory (DRAM)

When you select the "DRAM" soft key, the total memory allocation is displayed and can be modified at the top of the screen.

To help you optimize memory utilization effectively, the memory-configuring machine data are divided into the following groups:

- Local user data
- REORG
- Cycles
- Interpolation buffer
- Execute from external
- Synchronized actions
- Macros
- Tool management
- Protection zones

Start-up	CHAN1	MDI	\SYF.DIR OSTORE1.SYF
Channel reset			
Program aborted			
700153			
DRAM assignment in bytes (user memory for data)			
-Dynamic user memory DRAM after NC reset (in bytes)-			
Total			23454720
Free			8979512
-Unused memory (in bytes)-			
Local user data			38368
REORG			1364
Cycles			3144
Interpolation buffer			359292
Processing from external source			0
Synchronized actions			0
Macros			21276
Tool management			0
Protection zones			-1
Memory overview	SRAM	DRAM	

Fig. 5-16 Dynamic user memory DRAM

Operating instructions: See Section "Static user memory (SRAM), Detail view"

Additional elements in DRAM memory allocation screen:

Since the memory of some data areas is allocated to dynamic processes, their memory requirements vary. By selecting soft key "Peak values=0", you can reset the peak values of the currently displayed machine data to zero.

Memory allocation: Local user data

In the DRAM main screen, click the "Local user data" area with the cursor and then click vertical soft key "Details" to view and edit the memory settings of the following machine data:

MD 28020 MM_NUM_LUD_NAMES_TOTAL
MD 28040 MM_LUD_VALUES_MEM

Memory allocation: Reorganization

When you select the "REORG" area and click the vertical soft key "Details", you can display and edit the memory settings in the following machine data:

MD 28000 MM_REORG_LOG_FILE_MEM
MD 28010 MM_NUM_REORG_LUD_MODULES

Memory allocation: Cycles

When you select the "Cycles" area and click the "Details" soft key, you can display and edit the memory settings in the following machine data:

MD 18170 MM_NUM_MAX_FUNC_NAMES
MD 18170 MM_NUM_MAX_FUNC_PARAM

Memory allocation: Interpolation buffer

When you select the "Interpolation buffer" area and click the "Details" soft key, you can display and edit the memory settings in the following machine data:

MD 28060 MM_IPO_BUFFER_SIZE
MD 28070 MM_NUM_BLOCKS_IN_PREP

Memory allocation: Execute from external

When you select the "Execution from external source" area and click the "Details" soft key, you can display and edit the memory settings in the following machine data:

MD 18360 MM_EXT_PROG_BUFFER_SIZE
MD 18362 MM_EXT_PROG_NUM

Memory allocation: Synchronized actions

When you select the "Synchronized actions" area and click the "Details" soft key, you can display and edit the memory settings in the machine data of the following areas:

"Synchronized action 1": MD 28250 MM_NUM_SYNC_ELEMENTS
MD 28252 MM_NUM_FCTDEF_ELEMENTS
MD 28258 MM_NUM_AC_TIMER

"Synchronized action 2": MD 28254 MM_NUM_AC_PARAM
MD 28256 MM_NUM_AC_MARKER

Memory allocation: Macros

When you select the "Macros" area and click the "Details" soft key, you can display and edit the memory settings in the following machine data:

MD 18160 MM_NUM_USER_MACROS

Memory allocation: Tool management

When you select the "Tool management" area and click on the "Details" soft key, you can display and edit the memory settings in the following machine data:

MD 18105 MM_MAX_CUTTING_EDGE_NO
MD 18106 MM_MAX_CUTTING_EDGE_PERTOOL

Memory allocation: Protection zones

See Section: Static user memory (SRAM), memory allocation: Protection zones

5.19 Available display machine data

Please refer to the following documentation for a description of all the display machine data:

References: /LIS/ Lists Manual

Legend

Target systems:

Adv	HMI Advanced
Emb	HMI Embedded
HT6	Handheld terminal 6
OP30	Operator panel OP 030
MT	ManualTurn
SM	ShopMill
ST	ShopTurn

Filter:

H01	ShopMill
H02	ShopTurn
H03	ManualTurn
H04	Access levels
H05	Standard machine

MD number	Identifier			Filter	Cross reference:
Unit	Name			Data type	Read/write protection
Target system	Default value	Min. value	Max. value	Effective	SW version
9000	LCD_CONTRAST			H05	CR: A2
-	Contrast			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	15	Power On	-
9001	DISPLAY_TYPE			H05	CR: A2
-	Type of operator panel 9002 external monitor			BYTE	0/0
OP30, Adv, Emb	OP30: 1, Adv: 1, Emb: 1	0	2	Power On	
9002	DISPLAY_MODE				CR: A2
-	(1: black and white, 2: color)			BYTE	3/4
OP30,	OP30: 0,	0	2	Power On	1
9003	FIRST_LANGUAGE			H05	CR: A2
-	Foreground language			BYTE	3/4
OP30, Emb	OP30: 1, Emb: 1	1	2	Power On	1.1
9004	DISPLAY_RESOLUTION			H05	CR: A2
-	Display resolution			BYTE	3/4
OP30, Adv, Emb	OP30: 3, Adv: 3, Emb: 3	0	5	Power On	-
9005	PRG_DEFAULT_DIR			H05	CR: A2
-	Basic setting Program directory			BYTE	3/4
OP30, Emb	OP30: 1, Emb: 1	1	5	IMMEDIATELY	-

9006	DISPLAY_BLACK_TIME			H05	CR: A2
-	Time for screen darkening			BYTE	3/4
OP30, Emb	OP30: 15, Emb: 15	0	60	Power On	SW 2
9007	TABULATOR_SIZE			H05	CR: A2
-	Tabulator length			BYTE	3/4
OP30, Emb	OP30: 4, Emb: 4	0	30	IMMEDIATELY	SW 2
9008	KEYBOARD_TYPE			H05	CR: A2
-	Keyboard type (0: OP, 1: MFII/QWERTY)			BYTE	3/4
Adv, Emb	Adv: 0, Emb: 0	0	1	Power On	SW3.6
9009	KEYBOARD_STATE			H05	CR: A2
-	Keyboard shift response during ramp-up (0: single, 2: CAPSLOCK)			BYTE	3/4
Adv, Emb	Adv: 0, Emb: 2	0	2	Power On	SW3.6
9011	DISPLAY_RESOLUTION_INCH			H05	CR: A2
-	Display resolution for INCH system of measurement			BYTE	3/4
Adv, Emb	Adv: 4, Emb: 4	0	6	Power On	SW5.1
9012	ACTION_LOG_MODE			H05	CR: IM2, IM4
-	Set action mode for action log			INTEGER	1/1
Adv, Emb	Adv: 0xFE, Emb: 254	0	0xFFFF	Power On	SW5.2
9013	SYS_CLOCK_SYNC_TIME			H05	CR: IM1
-	Synchronization time for MMC/HMI time with PLC Synchr. time for HMI/PLC time			REAL	0/0
Emb	Emb: 0	0	199	Power On	SW5.3
9014	USE_CHANNEL_DISPLAY_DATA			H05	CR: FBT, FBSP, EMB, ADV
-	Use channel-specific display MDs			INTEGER	3/4
Adv, Emb	Adv: 0, Emb: 0	0	1	IMMEDIATELY	SW6.3
9015	DARKTIME_TO_PLC				CR: -
-				BOOL	3/4
OP30,	OP30: 0,	***	***	Power On	SW5
9016	SWITCH_TO_AREA			H05	CR: IAM, BE1
-	Default boot menu can be selected			INTEGER	3/4
OP30, Emb	OP30: 20, Emb: -1	-1	10000	Power On	SW6.3
9017	PLC_HOTKEY				CR:
-				STRING	3/4
OP30,	OP30: DB0.DBB0.0,	***	***	Power On	

9020	TECHNOLOGY			H05	CR: A2, FBT
-	Technology for NC prog. and simulation 0: No specific assignment 1: Turning machine configuration <>1: Milling machine configuration			BYTE	3/4
Adv, Emb	Adv: 0, Emb: 1	0	2	Power On	SW6, ST SW6.1
9021	LAYOUT_MODE			H05	CR:
-	Design of the operator interface			BYTE	3/4
Adv, Emb, HT 6	Adv: 1, Emb: 0, HT 6:1	0	1	Power On	SW 6.3

9025	DISPLAY_BACKLIGHT				CR: IM2
-	Display backlight brightness level			BYTE	3/4
	HT6: 15	0	31	Power On	SW 5.3
9026	TEACH_MODE				CR: IM2
-	Teach mode to be activated			REAL	3/4
	HT6: 1	***	***	Power On	SW 5.3
9027	NUM_AX_SEL				CR: IM2
-	Number of axis groups for traversing keys			REAL	3/4
	HT6: 0	0	4	Power On	SW 5.3
9030	EXPONENT_LIMIT			H05	CR: A2
-	Number of digits for display without exponent			BYTE	3/4
Emb	Emb: 6	0	20	Power On	SW 5.1
9031	EXPONENT_SCIENCE			H05	CR: A2
-	Exponent in the technical representation			BYTE	3/4
Emb	Emb: 1	0	1	Power On	SW5.1
9032	HMI_MONITOR			H05	CR: FBT, FBSP, EMB, ADV
-	Determine PLC data for HMI monitor information			STRING	2/4
Adv, Emb	Adv: ", Emb: 0	***	***	Power On	SW6.2

9050	STARTUP_LOGO			H05	CR: FBT, FBSP, EMB, ADV
-	Activate OEM boot screen			BYTE	1/4
Adv, Emb	Adv: 0, Emb: 0	0	1	Power On	SW6.2

9052	SHOW_CHANNEL_SPANNING_STATE			H05	CR: FBT, FBSP
-	Change cross-channel status display			BYTE	2/4
Adv, Emb	Adv: 0, Emb: 0	0	1	Power On	SW6.3
9053	PLC_SYMBOL_SORT			H05	CR:
-	Sorting algorithm for PLC icons			INTEGER	3/4
Adv, Emb	Adv: 0, Emb: 0	0	4	IMMEDIATELY	SW6.3

9054	PLC_SYMBOL_FILTER			H05	CR:
-	Filter settings for PLC icons			REAL	3/4
Adv, Emb	Adv: 0, Emb: 0	0	0xFFFF	IMMEDIATELY	SW6.3
9055	PLC_ALARM_PICTURE			H05	CR:
-	Acknowledgement icon selection for PLC alarms			INTEGER	3/4
Adv, Emb	Adv: 1, Emb: 1	-1	1	Power On	SW6.3
9056	ALARM_ROTATION_CYCLE			H05	CR:
-	Rotation cycle time for the alarm display			INTEGER	3/4
Emb	Emb: 0	0	10000	IMMEDIATELY	SW6.4

9180	USER_CLASS_READ_TCARR			H04, H05	CR: A2
-	Protection level read toolholder offsets			BYTE	3/4
Emb	Emb: 7	0	7	IMMEDIATELY	SW6.1
9181	USER_CLASS_WRITE_TCARR			H04, H05	CR: A2
-	Protection level write toolholder offsets			BYTE	3/4
Emb	Emb: 7	0	7	IMMEDIATELY	SW6.1
9182	USER_CLASS_INCH_METRIC			H04, H05	CR: EMB
-	Protection level inch/metric switchover			BYTE	3/4
Emb	Emb: 7	0	7	IMMEDIATELY	SW6.2
9183	USER_WRITE_TOOLFRAME			H04, H05	CR:
-	Protection level write toolholder			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDIATELY	SW6.4
9184	USER_WRITE_PARTFRAME			H04, H05	CR:
-	Protection level write toolholder reference point			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDIATELY	SW6.4
9185	USER_WRITE_WPFRAME			H04, H05	CR:
-	Protection level write workpiece reference point			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDIATELY	SW6.4
9186	USER_WRITE_CYCFRAME			H04, H05	CR:
-	Protection level write cycle frame			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDIATELY	SW6.4
9187	USER_WRITE_TRAFRAME			H04, H05	CR:
-	Protection level write transformation frame			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDIATELY	SW6.4
9188	USER_WRITE_EXTFRAME			H04, H05	CR:
-	Protection level write external WO			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDIATELY	SW6.4

9200	USER_CLASS_READ_TOA			H04, H05	CR: A2
-	Protection level read tool offsets			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9201	USER_CLASS_WRITE_TOA_GEO			H04, H05	CR: A2
-	Protection level write tool geometry			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9202	USER_CLASS_WRITE_TOA_WEAR			H04, H05	CR: A2
-	Protection level write tool wear data			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9203	USER_CLASS_WRITE_FINE			H04, H05	CR: A2
-	Protection level fine			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 7	0	7	IMMEDIATELY	-

9209	USER_CLASS_WRITE_TOA_ADAPT			H04, H05	CR: A2
-	Protection level write tool adapter data			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	SW5
9210	USER_CLASS_WRITE_ZOA			H04, H05	CR: A2
-	Protection level write settable WO			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9211	USER_CLASS_READ_GUD_LUD			H04, H05	CR: A2
-	Protection level read user variables			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	SW6.1
9212	USER_CLASS_WRITE_GUD_LUD			H04, H05	CR: IM2, IM4, A2
-	Protection level write user variables			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	SW6.1
9213	USER_CLASS_OVERSTORE_HIGH			H04, H05	CR: A2
-	Protection level extended overstore			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9214	USER_CLASS_WRITE_PRG_CONDIT			H04, H05	CR: A2
-	Protection level program control			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9215	USER_CLASS_WRITE_SEA			H04, H05	CR: A2
-	Protection level write setting data			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9216	USER_CLASS_READ_PROGRAM			H04, H05	CR: A2
-	Protection level read part program			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9217	USER_CLASS_WRITE_PROGRAM			H04, H05	CR: A2
-	Protection level write part program			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-

9218	USER_CLASS_SELECT_PROGRAM			H04, H05	CR: A2
-	Protection level Program selection			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9219	USER_CLASS_TEACH_IN			H04, H05	CR: A2
-	Protection level TEACH IN			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9220	USER_CLASS_PRESET			H04, H05	CR: A2
-	Protection level PRESET			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9221	USER_CLASS_CLEAR_RPA			H04, H05	CR: A2
-	Protection level delete R parameters			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9222	USER_CLASS_WRITE_RPA			H04, H05	CR: A2
-	Protection level write R parameters			BYTE	3/4
OP30, Adv, Emb	OP30: 7, Adv: 7, Emb: 7	0	7	IMMEDIATELY	-
9223	USER_CLASS_SET_V24			H04, H05	CR: A2
-	Protection level RS-232 interface parameterization			BYTE	3/4
OP30, Emb	OP30: 7, Emb: 7	0	7	IMMEDIATELY	-
9224	USER_CLASS_READ_IN			H04, H05	CR: A2
-	Protection level read in data			BYTE	3/4
OP30, Emb	OP30: 7, Emb: 7	0	7	IMMEDIATELY	-
9225	USER_CLASS_READ_CST			H04, H05	CR: A2
-	Protection level standard cycles			BYTE	3/4
OP30, Emb	OP30: 7, Emb: 7	0	7	IMMEDIATELY	SW 2
9226	USER_CLASS_READ_CUS			H04, H05	CR: A2
-	Protection level user cycles			BYTE	3/4
OP30, Emb	OP30: 7, Emb: 7	0	7	IMMEDIATELY	SW 2
9227	USER_CLASS_SHOW_SBL2			H04, H05	CR: A2
-	Skip single block2 (SBL2)			BYTE	3/4
Emb	Emb: 7	0	7	IMMEDIATELY	SW3.5
9228	USER_CLASS_READ_SYF			H04, H05	CR: A2
-	Access level for selecting the directory SYF			BYTE	3/4
Emb	Emb: 7	0	7	IMMEDIATELY	SW4.2
9229	USER_CLASS_READ_DEF			H04, H05	CR: A2
-	Access level for selecting the directory DEF			BYTE	3/4
Emb	Emb: 7	0	7	IMMEDIATELY	SW4.2
9230	USER_CLASS_READ_BD			H04, H05	CR: A2
-	Access level for selecting the directory BD			BYTE	3/4
Emb	Emb: 3	0	7	IMMEDIATELY	SW4.2

9242	MA_STAT_DISPLAY_BASE			H05	CR: K2
-	Numerical basis for display of articulated position STAT			WORD	3/4
Adv, Emb	Adv: 10, Emb: 0	0	16	IMMEDIATELY	SW6.1
9243	MA_TU_DISPLAY_BASE			H05	CR: K2
-	Numerical basis for display of rotary axis position TU			WORD	3/4
Adv, Emb	Adv: 10, Emb: 0	0	16	IMMEDIATELY	SW6.1

9246	USER_CLASS_SYS_ZERO_OFF			H04, H05	CR:
-	Access level for writing system frames			BYTE	2/2
Adv, Emb	Adv: 7, Emb: 7	0	7	IMMEDIATELY	Adv. SW6.3, Emb. SW6.2
9247	USER_CLASS_BASE_ZERO_OFF_PA			H04, H05	CR: K2
-	Access level for basic offset PA			BYTE	2/2
Adv, Emb	Adv: 7, Emb: 7	0	7	IMMEDIATELY	SW5.3
9248	USER_CLASS_BASE_ZERO_OFF_MA			H04, H05	CR: IAM, IM1
-	Access level for basic offset MA			BYTE	2/2
Adv, Emb	Adv: 7, Emb: 7	0	7	IMMEDIATELY	SW5.3
9249	USER_CLASS_VERT_MODE_SK			H04, H05	CR: K2
-	Protection level for vertical SKs of area SKs Protection for vertical SKs			DOUBLE	3/4
Emb	Emb: 2004318071	0	0x77777777	IMMEDIATELY	SW6.1
9251	USER_CLASS_TM_SKTLLIST			H04, H05	CR: FBW
-	Display tool list			BYTE	3/4
Emb	Emb: 7	0	7	Power On	S 4.1
9252	USER_CLASS_TM_SKTOOLLOAD			H04, H05	CR: FBW
-	Protection level for loading tools			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9253	USER_CLASS_TM_SKTOOLUNLOAD			H04, H05	CR: FBW
-	Protection level for unloading tools			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9254	USER_CLASS_TM_SKTOOLMOVE			H04, H05	CR: FBW
-	Protection level for relocating tools			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9256	USER_CLASS_TM_SKMGLREPR2			H04, H05	CR: FBW
-	Protection level for displaying 2nd magazine list			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9257	USER_CLASS_TM_SKMGLREPR3			H04, H05	CR: FBW
-	Protection level for displaying 3rd magazine list			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9258	USER_CLASS_TM_SKNCNEWTOOLE			H04, H05	CR: FBW
-	Protection level for creating new tool edges			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1

9259	USER_CLASS_TM_SKNCDELTOOL			H04, H05	CR: FBW
-	Protection level for deleting tools			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9260	USER_CLASS_TM_SKMGBUFFER			H04, H05	CR: FBW
-	Protection level for buffer ON/OFF			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9261	USER_CLASS_TM_SKMGFIND			H04, H05	CR: FBW
-	Protection level for search			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9262	USER_CLASS_TM_SKMGLISTPOS			H04, H05	CR: FBW
-	Protection level for positioning			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9263	USER_CLASS_TM_SKMGNEXT			H04, H05	CR: FBW
-	Protection level for paging to next magazine			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9264	USER_CLASS_TM_SKTLNEWTOOL			H04, H05	CR: FBW
-	Protection level for creating tools			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9265	USER_CLASS_TM_SKTLLREPR1			H04, H05	CR: FBW
-	Protection level for displaying 1st tool list			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9266	USER_CLASS_TM_SKTLLREPR2			H04, H05	CR: FBW
-	Protection level for displaying 2nd tool list			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9267	USER_CLASS_TM_SKTLLREPR3			H04, H05	CR: FBW
-	Protection level for displaying 3rd tool list			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9269	USER_CLASS_TM_SKFINDPLACE			H04, H05	CR: FBW
-	Soft key empty location, displ. Tool list			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9270	USER_CLASS_TM_SKACTPLACE			H04, H05	CR: FBW
-	Protection level for loading to curr. location			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9271	USER_CLASS_TM_SKLDTOOLDAT			H04, H05	CR: FBW
-	Viewing and editing tool data			BYTE	3/4
Emb	Emb: 7	0	7	Power On	SW4.1
9272	USER_CLASS_APPLICATION			H04, H05	CR:
-	Protection level for selecting the operating area			BYTE	3/4
Emb	Emb: 7	0	7	IMMEDI- ATELY	SW6.4

9300	V24_USER_XON			H05	CR: K4
-	User: X on character			REAL	3/4
OP30, Emb	OP30: 17, Emb: 17	0	0xFF	IMMEDIATELY	-
9301	V24_USER_XOFF			H05	CR: K4
-	User: X off character			REAL	3/4
OP30, Emb	OP30: 19, Emb: 19	0	0xFF	IMMEDIATELY	-
9302	V24_USER_EOF			H05	CR: K4
-	User: End of transmission character			REAL	3/4
OP30, Emb	OP30: 26, Emb: 26	0	0xFF	IMMEDIATELY	-
9303	V24_USER_CONTROLS			H05	CR: K4
-	User: Special bits			REAL	3/4
OP30, Emb	OP30: 76, Emb: 76	0	0x3FF	IMMEDIATELY	-
9304	V24_USER_RTS			H05	CR: K4
-	User: Line-controlled			BYTE	3/4
OP30, Emb	OP30: 1, Emb: 0	0	1	IMMEDIATELY	-
9305	V24_USER_BAUD			H05	CR: K4
-	User: Baud rate (300, 600, 1200, 2400, 4800, 9600, 19200) 0 1 ...			BYTE	3/4
OP30, Emb	OP30: 4, Emb: 5	0	8	IMMEDIATELY	-
9306	V24_USER_DATABITS			H05	CR: K4
-	User: Data bits			BYTE	3/4
OP30, Emb	OP30: 1, Emb: 1	0	1	IMMEDIATELY	-
9307	V24_USER_PARITY			H05	CR: K4
-	User: Parity bits			BYTE	3/4
OP30, Emb	OP30: 0, Emb: 0	0	2	IMMEDIATELY	-
9308	V24_USER_STOPBIT			H05	CR: K4
-	User: Stop bits			BYTE	3/4
OP30, Emb	OP30: 0, Emb: 0	0	1	IMMEDIATELY	-
9309	V24_USER_LINE			H05	CR: K4
-	User: RS-232-C interface (COM1/COM2) (COM1/COM2)			BYTE	3/4
Emb	Emb: 1	1	2	IMMEDIATELY	SW5
9310	V24_PRINTER_XON			H05	CR: K4
-	Printer: X on character			REAL	3/4
OP30, Emb	OP30: 17, Emb: 17	0	0xFF	IMMEDIATELY	-
9311	V24_PRINTER_XOFF			H05	CR: K4
-	Printer: X off character			REAL	3/4
OP30, Emb	OP30: 19, Emb: 19	0	0xFF	IMMEDIATELY	-

9312	V24_PRINTER_EOF			H05	CR: K4
-	Printer: End of transmission character			REAL	3/4
OP30, Emb	OP30: 12, Emb: 12	0	0xFF	IMMEDIATELY	-
9313	V24_PRINTER_CONTROLS			H05	CR: K4
-	Printer: Special bits			REAL	3/4
OP30, Emb	OP30: 76, Emb: 76	0	0x3FF	IMMEDIATELY	-
9314	V24_PRINTER_RTS			H05	CR: K4
-	Printer: Line-controlled			BYTE	3/4
OP30, Emb	OP30: 0, Emb: 0	0	1	IMMEDIATELY	-
9315	V24_PRINTER_BAUD			H05	CR: K4
-	Printer: Baud rate (300, 600, 1200, 2400, 4800, 9600, 19200) 0 1 ...			BYTE	3/4
OP30, Emb	OP30: 5, Emb: 5	0	8	IMMEDIATELY	-
9316	V24_PRINTER_DATABITS			H05	CR: K4
-	Printer: Data bits			BYTE	3/4
OP30, Emb	OP30: 1, Emb: 1	0	1	IMMEDIATELY	-
9317	V24_PRINTER_PARITY			H05	CR: K4
-	Printer: Parity bits			BYTE	3/4
OP30, Emb	OP30: 0, Emb: 0	0	2	IMMEDIATELY	-
9318	V24_PRINTER_STOPBIT			H05	CR: K4
-	Printer: Stop bits			BYTE	3/4
OP30, Emb	OP30: 0, Emb: 0	0	1	IMMEDIATELY	-
9319	V24_PRINTER_LINE			H05	CR: K4
-	Printer: RS-232-C interface (COM1/COM2) (COM1/COM2)			BYTE	3/4
Emb	Emb: 1	1	2	IMMEDIATELY	-
9320	V24_PG_PC_XON			H05	CR: K4
-	PG: X on character 9321 PG: X off character			REAL	3/4
OP30, Emb	OP30: 17, Emb: 17	0	0xFF	IMMEDIATELY	-
9321	V24_PG_PC_XOFF			H05	CR: K4
-				REAL	3/4
OP30, Emb	OP30: 19, Emb: 19	0	0xFF	IMMEDIATELY	-
9322	V24_PG_PC_EOF			H05	CR: K4
-	PG: End of transmission character			REAL	3/4
OP30, Emb	OP30: 26, Emb: 26	0	0xFF	IMMEDIATELY	-
9323	V24_PG_PC_CONTROLS			H05	CR: K4
-	PG: Special bits 9324 PG: Line-controlled			REAL	3/4
OP30, Emb	OP30: 144, Emb: 144	0	0x3FF	IMMEDIATELY	-

9324	V24_PG_PC_RTS			H05	CR: K4
-				BYTE	3/4
OP30, Emb	OP30: 0, Emb: 0	0	1	IMMEDIATELY	-
9325	V24_PG_PC_BAUD			H05	CR: K4
-	PG: Baud rate (300, 600, 1200, 2400, 4800, 9600) 0 1 ...			BYTE	3/4
OP30, Emb	OP30: 5, Emb: 5	0	8	IMMEDIATELY	-
9326	V24_PG_PC_DATABITS			H05	CR: K4
-	PG: Data bits			BYTE	3/4
OP30, Emb	OP30: 1, Emb: 1	0	1	IMMEDIATELY	-
9327	V24_PG_PC_PARITY			H05	CR: K4
-	PG: Parity bits			BYTE	3/4
OP30, Emb	OP30: 0, Emb: 0	0	2	IMMEDIATELY	-
9328	V24_PG_PC_STOPBIT			H05	CR: K4
-	PG: Stop bits			BYTE	3/4
OP30, Emb	OP30: 0, Emb: 0	0	1	IMMEDIATELY	-
9329	V24_PG_PC_LINE			H05	CR: K4
-	PG: RS-232-C interface (COM1/COM2) (COM1/COM2)			BYTE	3/4
Emb	Emb: 1	1	2	IMMEDIATELY	-

9400	TOOL_REF_GEO_AXIS1			H05	CR: BA
-	Absolute dimension tool length compensation GEOaxis.1			DOUBLE	3/4
OP30, Emb	OP30: 0, Emb: 0	***	***	IMMEDIATELY	-
9401	TOOL_REF_GEO_AXIS2			H05	CR: BA
-	Absolute dimension tool length compensation GEOaxis.2			DOUBLE	3/4
OP30, Emb	OP30: 0, Emb: 0	***	***	IMMEDIATELY	-
9402	TOOL_REF_GEO_AXIS3			H05	CR: BA
-	Absolute dimension tool length compensation GEOaxis.3			DOUBLE	3/4
OP30, Emb	OP30: 0, Emb: 0	***	***	IMMEDIATELY	-

9410	TM_LOAD_PLACE			H05	CR: BA
-	Number of loading station			INTEGER	3/4
OP30, Emb	OP30: 0, Emb: 0	***	***	Power On	-
9411	TM_NUM_MAG			H05	CR: BA
-	Number of work magazine			INTEGER	3/4
OP30, Emb	OP30: 0, Emb: 0	***	***	Power On	-
9412	TM_DEFAULT_TOOLSIZE			H05	CR: FBW
-	Default for tool size			REAL	3/4
Emb	Emb: 1111	1111	7777	IMMEDIATELY	SW4.1

9414	TM_KIND_OF_TOOLMANAGEMENT			H01, H02, H05	CR: FBW
-	Type of representation of the tool management 0: Old, 1: New (SW 5.2 and higher)			BYTE	3/4
SM, ST, Emb	SM: 1, ST: 1, Emb: 0	0	1	Power On	SW5
9415	TM_DEFAULT_TOOLPLACESPEC			H05	CR: FBW
-	Default value for location type			BYTE	3/4
Emb	Emb: 1	1	99	IMMEDIATELY	SW4.2
9416	TM_DEFAULT_TOOLTYPE			H05	CR: FBW
-	Default for location type			REAL	3/4
Emb	Emb: 120	100	900	IMMEDIATELY	SW4.1
9417	TM_DEFAULT_TOOLSTATE			H05	CR: FBW
-	Default for tool status load			INTEGER	3/4
Emb	Emb: 2	0	255	IMMEDIATELY	SW4.1
9419	TM_DEFAULT_DELETE_TOOL			H05	CR: FBW
-	Default for tool data auto. deletion			BYTE	3/4
Emb	Emb: 0	0	1	IMMEDIATELY	SW4.1
9420	MA_ONLY_MKS_DIST_TO_GO			H05	CR: FBW
-	Distance-to-go display in the Work window 0: Work value 1: Machine value			BYTE	3/4
Emb	Emb: 0	0	1	IMMEDIATELY	SW4.1
9421	MA_AXES_SHOW_GEO_FIRST			H05	CR: K1
-	Actual-value display with leading geo axes			BYTE	3/4
Adv, Emb	Adv: 1, Emb: 1	0	1	IMMEDIATELY	SW 2
9422	MA_PRESET_MODE			H05	CR: K1
-	Selecting PRESET / base offset in JOG 0 No Preset, no preset actual value memory 1 PRESET 2 Preset actual value memory 3 Preset actual value memory s. Online help			BYTE	3/4
Adv, Emb	Adv: 1, Emb: 1	0	3	IMMEDIATELY	SW5
9423	MA_MAX_SKP_LEVEL			H05	CR: K1
-	Max. skip levels in NC program			BYTE	3/4
Adv, Emb	Adv: 1, Emb: 1	1	8	Power On	SW5
9424	MA_COORDINATE_SYSTEM			H05	CR: K2
-	Coord. system for actual-value display 0: Work 1: SZS (settable zero system)			BYTE	3/4
Adv, Emb	Adv: 0, Emb: 0	0	1	Power On	SW5
9425	MA_SCRATCH_DEFAULT_MODE			H05	CR: K2
-	Tool offset calculation scratching			DOUBLE	3/4
Emb	Emb: 0	0	2236962	IMMEDIATELY	5.3

9430	TM_UNLOAD_AND_DELETE				CR: FBO
-				BOOL	3/4
OP30,	OP30: 0,	***	***	Power On	SW5
9431	TM_LOAD_TOOL_NEW				CR: FBO
-				BOOL	3/4
OP30,	OP30: 1,	***	***	Power On	SW5
9432	TM_TOOL_STATE_DEF_VAL				CR:
-				BYTE	3/4
OP30,	OP30: 2,	***	***	Power On	
9433	TM_ACT_SEARCH_AND_POS				CR:
-				BOOL	3/4
OP30,	OP30: 0,	***	***	Power On	
9434	TM_LOAD_LOC1				CR: FBW
-	0: Autom. determination for one magazine			INTEGER	3/7
OP30,	OP30: 0,	***	***	Power On	SW4.2
9435	TM_LOAD_LOC2				CR: FBW
-	0: Autom. determination for one magazine			INTEGER	3/7
OP30,	OP30: 0,	***	***	Power On	SW4.2
9436	TM_LOAD_LOC3				CR: FBW
-	0: Autom. determination for one magazine			INTEGER	3/7
OP30,	OP30: 0,	***	***	Power On	SW4.2
9437	TM_LOAD_LOC4				CR: FBW
-	0: Autom. determination for one magazine			INTEGER	3/7
OP30,	OP30: 0,	***	***	Power On	SW4.2
9438	TM_LOAD_LOC5				CR: FBW
-	0: Autom. determination for one magazine			INTEGER	3/7
OP30,	OP30: 0,	***	***	Power On	SW4.2
9440	ACTIVATE_SEL_USER_DATA			H05	CR: K2
-	Activating the active wear immediately			BYTE	3/4
Adv, Emb	Adv: 1, Emb: 0	0	1	IMMEDIATELY	SW4.3
9450	WRITE_TOA_FINE_LIMIT			H05	CR: K2
mm	Limit value for wear fine			DOUBLE	3/4
Adv, Emb	Adv: 0, Emb: 0.999	***	***	IMMEDIATELY	SW4.2
9451	WRITE_ZOA_FINE_LIMIT			H05	CR: K2
mm	Limit value for offset fine			DOUBLE	3/4
Adv, Emb	Adv: 0, Emb: 0.999	***	***	IMMEDIATELY	SW4.2
9459	PA_ZOA_MODE			H05	CR: K2, IM2
-	Display mode of work offset			BYTE	3/4
Emb	Emb: 1	0	1	IMMEDIATELY	SW 6.1

9460	PROGRAM_SETTINGS			H05	CR: A2
-	Settings in the Program area			INTEGER	3/4
Adv, Emb	Adv: 0, Emb: 5	***	***	IMMEDIATELY	SW5.1
9461	CONTOUR_END_TEXT			H05	CR: A2
-	String to be added at the end of the contour			STRING	3/4
Emb	Emb: "	***	***	IMMEDIATELY	SW5.1

9464	MAX_PROGRAMM_SIZE_CHECK			H05	CR:
-	File size as of which no check is made			INTEGER	3/4
Emb	Emb: 0	***	***	IMMEDIATELY	SW6.4

9477	TO_TRACE			H01, H02, H05	CR:
-	For internal testing purposes			REAL	3/4
SM, ST, Emb	SM: 0, ST: 0, Emb: 0	0	0xFFFF	Power On	
9478	TO_OPTION_MASK			H01, H02, H05	CR:
-	For internal purposes			INTEGER	2/2
SM, ST, Emb	SM: 1, ST: 1, Emb: 0	0	0xFFFF	Power On	
9479	TO_MAG_PLACE_DISTANCE			H02, H05	CR:
mm	Distance between individual magazine locations			DOUBLE	3/4
ST, Emb	ST: Emb: 0	0	10000	Power On	SW6.3
9480	MA_SIMULATION_MODE			H05	CR:
-	Simulation mode			BYTE	3/4
Adv	Adv: -1	-1	2	IMMEDIATELY	SW6.4
9481	MA_STAND_SIMULATION_LIMIT			H05	CR:
-	Limit of the standard simulation in KB			INTEGER	3/4
Adv	Adv: 200	200	2000000	IMMEDIATELY	SW6.4

9500	NC_PROPERTIES			H05	CR: A2
-	NC properties Bit 0: Digital drives Bit 1: Software startup switch Bits 2...4: Reserved			BYTE	3/4
OP30, Emb	OP30: 255, Emb: 255	0	0xFF	IMMEDIATELY	SW 2
9509	USER_CLASS_DIRECTORY_CHG			H04, H05	CR: FBT, FBSP, EMB
-	Protection level for network configuration			BYTE	3/4
Emb	Emb: 1	0	7	IMMEDIATELY	SW6.2
9510	USER_CLASS_DIRECTORY1_P			H04, H05	CR: A2
-	Protection level for network drive 1 prog.			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 1	0	7	IMMEDIATELY	SW6.1
9511	USER_CLASS_DIRECTORY2_P			H04, H05	CR: A2
-	Protection level for network drive 2 prog.			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 1	0	7	IMMEDIATELY	SW6.1

9512	USER_CLASS_DIRECTORY3_P			H04, H05	CR: A2
-	Protection level for network drive 3 prog.			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 1	0	7	IMMEDI-ATELY	SW6.1
9513	USER_CLASS_DIRECTORY4_P			H04, H05	CR: A2
-	Protection level for network drive 4 prog.			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 1	0	7	IMMEDI-ATELY	6.1

9516	USER_CLASS_DIRECTORY1_M			H04, H05	CR: A2
-	Protection level for network drive 1 mach.			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDI-ATELY	6.1
9517	USER_CLASS_DIRECTORY2_M			H04, H05	CR: A2
-	Protection level for network drive 2 mach.			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDI-ATELY	6.1
9518	USER_CLASS_DIRECTORY3_M			H04, H05	CR: A2
-	Protection level for network drive 3 mach.			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDI-ATELY	6.1
9519	USER_CLASS_DIRECTORY4_M			H04, H05	CR: A2
-	Protection level for network drive 4 mach.			BYTE	3/4
Adv, Emb	Adv: 7, Emb: 0	0	7	IMMEDI-ATELY	6.1

9600	CTM_SIMULATION_DEF_X			H01, H02, H03, H05	CR: FBMA, FBSP
-	Simulation default value for X			INTEGER	3/4
SM, ST, MT, Emb	SM: 0, ST: 0, MT: 0, Emb: 0	-10000	10000	Power On	SW2.1 (810D), 4.3 (840D)
9601	CTM_SIMULATION_DEF_Y			H01, H02, H03, H05	CR: FBMA, FBSP
-	Simulation default value for Z			INTEGER	3/4
SM, ST, MT, Emb	SM: 0, ST: 0, MT: 0, Emb: 0	-10000	10000	Power On	SW2.1 (810D), 4.3 (840D)
9602	CTM_SIMULATION_DEF_VIS_AREA			H01, H02, H03, H05	CR: FBMA, FBSP
-	Simulation default value for display area			INTEGER	3/4
SM, ST, MT, Emb	SM: 100, ST: 100, MT: 100, Emb: 100	-10000	10000	Power On	SW2.1 (810D), 4.3 (840D)
9603	CTM_SIMULATION_MAX_X			H01, H02, H03, H05	CR: FBMA, FBSP
-	Simulation of maximum display X			INTEGER	3/4
SM, ST, MT, Emb	SM: 0, ST: 0, MT: 0, Emb: 0	-10000	10000	Power On	SW2.1 (810D), 4.3 (840D)

9604	CTM_SIMULATION_MAX_Y			H01, H02, H03, H05	CR: FBMA, FBSP
-	Simulation maximum display Z			INTEGER	3/4
SM, ST, MT, Emb	SM: 0, ST: 0, MT: 0, Emb: 0	-10000	10000	Power On	840D SW 4.3, 810D SW 2.1
9605	CTM_SIMULATION_MAX_VIS_AREA			H01, H02, H03, H05	CR: FBMA, FBSP
-	Simulation of maximum display area			INTEGER	3/4
SM, ST, MT, Emb	SM: 1000, ST: 1000, MT: 1000, Emb: 1000	-10000	10000	Power On	840D SW4.3, 810D SW2.1
9606	CTM_SIMULATION_TIME_NEW_POS			H01, H02, H03, H05	CR: FBMA, FBT
-	Simulation updating rate of actual value			INTEGER	3/4
SM, ST, MT, Emb	SM: 250, ST: 350, MT: 250, Emb: 100	0	4000	Power On	840D SW4.3, 810D SW2.1, ST SW6.1

9610	CTM_POS_COORDINATE_SYSTEM			H03, H05	CR: FBMA
-	Position of coordinate system for turning			BYTE	3/4
MT, Adv, Emb	MT: 2, Adv: 2, Emb: 2	0	7	IMMEDIATELY	840D SW4.3, 810D SW2.1
9611	CTM_CROSS_AX_DIAMETER_ON			H02, H03, H05	CR: FBMA, FBT
-	Diameter display for active transverse axes			BYTE	3/4
ST, MT, Emb	ST: 1, MT: 1, Emb: 1	0	1	IMMEDIATELY	840D SW4.3, 810D SW2.1, ST 6.1
9619	CTM_G91_DIAMETER_ON			H02, H03, H05	CR: FBMA, FBT
-	Incremental infeed			BYTE	3/4
ST, MT, Emb	ST: 0, MT: 0, Emb: 1	0	1	IMMEDIATELY	840D SW4.3, 810D SW2.1, ST SW6.1
9626	CTM_TRACE			H02, H03, H05	CR: FBMA
-	Test flags internal ManualTurn diagnostics			REAL	3/4
ST, MT, Emb	ST: 1, MT: 1, Emb: 0	0	0xFFFF	IMMEDIATELY	840D SW4.3, 810D SW2.1

9632	CTM_ANGLE_REFERENCE_AXIS			H03, H05	CR: FBMA
-	Angle reference axis 1: 1st axis 2: 2nd axis			REAL	3/4
MT, Emb	MT: 1, Emb: 1	0	1	IMMEDIATELY	840D SW4.4, 810D SW2.4

9650	CMM_POS_COORDINATE_SYSTEM			H01, H02, H05	CR: FBSP, FBT
-	Position of coordinate system			BYTE	3/4
SM, ST, Adv, Emb	SM: 0, ST: 34, Adv: 0, Emb: 0	0	47	IMMEDIATELY	SW4.3, ST SW6.1
9651	CMM_TOOL_MANAGEMENT			H01, H02, H05	CR: FBSP, FBT
-	Tool management strategy			BYTE	3/4
SM, ST, Adv, Emb	SM: 4, ST: 4, Adv: 4, Emb: 4	1	4	Power On	SW6.1, ST SW6.1
9652	CMM_TOOL_LIFE_CONTROL			H01, H02, H05	CR: FBSP, FBT
-	Tool monitoring			BYTE	3/4
SM, ST, Adv, Emb	SM: 1, ST: 1, Adv: 1, Emb: 1	0	1	Power On	SW6.1
9661	CMM_ENABLE_CUSTOMER_M_CODES			H01, H02, H05	CR: FBSP
-	Input of customized M commands			BYTE	3/4
SM, ST, Adv, Emb	SM: 0, ST: 0, Adv: 4, Emb: 0	0	4	Power On	840D SW4.3, 810D SW2.3
9663	CMM_TOOL_DISPLAY_IN_DIAM			H01, H02, H05	CR: FBSP, FBT
-	Display radius/diameter for tool			BYTE	3/4
SM, ST, Adv, Emb	SM: 1, ST: 1, Adv: 1, Emb: 1	0	1	Power On	840D SW4.3, 810D SW2.3, ST SW6.1
9672	CMM_FIXED_TOOL_PLACE			H01, H02, H05	CR: FBSP, FBT
-	Fixed location coding			BYTE	3/4
SM, ST, Adv, Emb	SM: 0, ST: 1, Adv: 0, Emb: 0	0	1	Power On	840D SW4.4, 810D SW2.4, ST SW6.1
9673	CMM_TOOL_LOAD_STATION			H01, H02, H05	CR: FBSP, FBT
-	Number of loading station			BYTE	3/4
SM, ST, Adv, Emb	SM: 1, ST: 1, Adv: 1, Emb: 1	1	2	Power On	840D SW4.4, 810D SW2.4, ST SW6.1
9674	CMM_ENABLE_TOOL_MAGAZINE			H01, H02, H05	CR: FBSP, FBT
-	Display of magazine list			BYTE	3/4
SM, ST, Adv, Emb	SM: 1, ST: 1, Adv: 1, Emb: 1	0	1	Power On	840D SW4.4, 810D SW2.4, ST SW6.1
9676	CMM_DIRECTORY_SOFTKEY_PATH1			H01, H02, H05	CR: FBSP, FBT
-	Path to the drive names in the directory man.			STRING	3/4
SM, ST, Adv, Emb	SM: ", ST: ", Adv: ", Emb: 0	***	***	Power On	840D SW4.4, 810D SW2.4 with SM

9677	CMM_DIRECTORY_SOFTKEY_PATH2	H01, H02, H05	CR: FBSP, FBT
-	Path to the drive names in the directory man.	STRING	3/4
SM, ST, Adv, Emb	SM: ", ST: ", Adv: ", Emb: 0	***	Power On
9678	CMM_DIRECTORY_SOFTKEY_PATH3	H01, H02, H05	CR: FBSP, FBT
-	Path to the drive names in the directory man.	STRING	3/4
SM, ST, Adv, Emb	SM: ", ST: ", Adv: ", Emb: 0	***	Power On
9679	CMM_DIRECTORY_SOFTKEY_PATH4	H01, H02, H05	CR: FBSP, FBT
-	Path to the drive names in the directory man.	STRING	3/4
SM, ST, Adv, Emb	SM: ", ST: ", Adv: ", Emb: 0	***	Power On

9900	MD_TEXT_SWITCH	H05	CR: -
-	Plaintext instead of MD identifier	BOOL	3/4
OP30, Adv, Emb	OP30: 0, Adv: 0, Emb: 0	***	IMMEDIATELY
9950	MD_NC_TEA_FILTER	H05	CR:
-	Display options general machine data	INTEGER	0/0
Emb	Emb: 67108865	***	Power On
9951	MD_NC_TEA_IDX_LIMIT	H05	CR:
-	Index filter for general machine data	INTEGER	0/0
Emb	Emb: 0	***	Power On
9952	MD_AX_TEA_FILTER	H05	CR:
-	Display options axis machine data	INTEGER	0/0
Emb	Emb: 67108865	***	Power On
9952	MD_AX_TEA_FILTER	H05	CR:
-	Display options axis machine data	INTEGER	0/0
Emb	Emb: 67108865	***	Power On
9953	MD_AX_TEA_IDX_LIMIT	H05	CR:
-	Index filter for axis machine data	INTEGER	0/0
Emb	Emb: 0	***	Power On
9954	MD_CH_TEA_FILTER	H05	CR:
-	Display options channel machine data	INTEGER	0/0
Emb	Emb: 33554433	***	Power On
9955	MD_CH_TEA_IDX_LIMIT	H05	CR:
-	Index filter for channel machine data	INTEGER	0/0
Emb	Emb: 0	***	Power On
9956	MD_DRV_TEA_FILTER	H05	CR:
-	Display options drive machine data	INTEGER	0/0
Emb	Emb: 8388609	***	Power On
9957	MD_DRV_TEA_IDX_LIMIT	H05	CR:
-	Index filter for drive machine data	INTEGER	0/0
Emb	Emb: 0	***	Power On

9980	LANGUAGE_SETTINGS			H05	CR:
-	Internal language settings			INTEGER	0/0
Emb	Emb: 513	***	***	Power On	
9990	SW_OPTIONS			H05	CR: FBSP, FBT
-	Enable MMC/HMI SW options			INTEGER	2/2
Adv, Emb	Adv: 0, Emb: 0	***	***	Power On	SW5.3
9991	HMI_HELP_SYSTEMS			H05	CR: FBSP, FBT
-	Enable MMC/HMI help systems Bit 0 = 1 Help for calculator enabled (default)			INTEGER	2/2
Emb	Emb: 1	***	***	Power On	SW6.1
9992	HMI_TESTAUTOMAT_OPTION			H05	CR: FBT, FBSP, EMB
-	Options for HMI automatic test machine			INTEGER	2/2
Emb	Emb: 0	***	***	Power On	SW6.3
9993	HMI_WIZARD_OPTION			H05	CR: FBT, FBSP, EMB
-	Options for the wizard			INTEGER	2/2
Emb	Emb: 0	***	***	Power On	SW6.3
9999	TRACE			H05	CR: -
-	Test flags for internal diagnosis			INTEGER	2/2
OP30, Adv, Emb	OP30: 0, Adv: 0, Emb: 0	0	0xFFFF	Power On	-



6

6 Alarm Texts and Help Files

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6.1 Alarm texts

6.1.1 Alarm text files

Description

The installation operation of the HMI Embedded software (see Chapter 7) transfers the following data from the Update directory on your PC/PG to the PCU:

- Configuration settings,
- Texts,
- The configured user interface,
- The user software

The ways in which the alarm text files can be adapted beforehand are described here.

Preconditions

RS 232C (V.24) cable between the COM1 interface of the PCU 20 and the COM1 or COM2 interface of your PC.

The following description assumes that you have already transferred the software from the HMI Embedded software as described in Chapter 7.

Alarm texts / message texts

The texts are stored on the PC with the Siemens standard entries. You can select the hard disk you want to store them on.

To simplify matters, this disk drive is always referred to as C:. The directory is: C:\mmc 100 pj\proj\text\<LANGUAGE DIRECTORY>.

Files

Depending on the selected language, one of the following letters stands for <LANGUAGE DIRECTORY>:

D	for German
G	for English
F	for French
E	for Spanish
I	for Italian

The alarm file names start with a and end in the extension .txt:

ALZU.TXT	Cycle texts
ALUC.TXT	Cycle alarm and tool management texts
ALC.TXT	Compile cycle alarm texts
ALPU.TXT	PLC alarm/message texts
ALSI.TXT	Alarm texts for Safety Integrated

Editor

For editing you can use the DOS editor "edit" (OEM code page) or under Windows "Notepad" or "Wordpad" (ANSI code page, see Table 6.5). The standard texts contained in the text files can be overwritten by user-specific texts. An ASCII editor, e.g. DOS editor, must be used for this purpose. New entries can be added to alarm text files.

More than one language

The PCU 20 can be set with two online languages. These are referred to as the foreground and background languages. Foreground and background languages of HMI Embedded can be replaced via the installation program.

The installation allows you to choose any combination of two of these languages as the foreground and background language.

See Chapter 7: Software replacement with modified configuration

Master language

The master language is by definition German. It defines the number and order of the alarm/message texts for the languages selected by the user. The number and sequence of the alarm/message texts of the chosen languages and the master language must match.

Note

For the user up to 256 Kbytes are available (e.g. for additional text files, images, PLC user alarms).

6.1.2 Syntax for alarm text files

Alarm numbers

The following alarm numbers are available for the cycle, compile cycle and PLC alarms:

Table 6-1 Alarm numbers for cycle, compile cycle, and PLC alarms

Number range	Description	Effect	Deletion	Name
60000 – 60999	Cycle alarms (Siemens)	Display, interlocking NC start	Reset	ALZ.txt ALZU.txt (user)
61000 – 61999		Display, interlocking NC start, motion standstill	Reset	
62000 – 62999		Display	Cancel	
63000 – 64999	Reserved			
65000 – 65999	Cycle alarms (user)	Display, interlocking NC start	Reset	
66000 – 66999		Display, interlocking NC Start, motion stop after execution of predecoded blocks	Reset	
67000 – 67999		Display	Cancel	
68000 – 69000	Reserved			
70000 – 702463	Compile cycle alarms			ALC.txt
400000 – 499999	PLC alarms general			ALP.txt ALPU.txt (user)
500000 – 599999	PLC alarms for channel			
600000 – 699999	PLC alarms for axis and spindle			
700000 – 702463	PLC alarms for user			
800000 – 899999	PLC alarms for sequence cascades/graphs			

Format of the text file for cycle alarm texts

The number range in the list is not available with every number.

References: /FB1/P3: Lists

The structure of the text file for cycle and compile cycle alarms is as follows:

Table 6-2 Structure of the text file for cycle alarm texts

Alarm number	Display	Help ID	Text or alarm number
60100	1	0	"No D number %1 is programmed"
60101	1	0	60100
...	...	...	...
65202	0	1	"Axis %2 in channel %1 is still moving"
// Alarm text file for cycles in German			

Alarm number

List of alarm numbers

Display

This number defines the alarm display type:

0: Display in alarm line

1: Display in a dialog box

Help ID

(in preparation)

Text or alarm number

The associated text is given in inverted commas with the position parameters.

Characters " and # must not be used in alarm texts. The % character is reserved for displaying parameters.

If an existing text is to be used, this can be done with a reference to the corresponding alarm. 7-digit alarm number instead of "text".

The alarm file can contain comment lines, these must start with "//". The maximum length of the alarm text is 110 characters for a 2-line display. If the text is too long, it is truncated and the symbol " * " added to indicate missing text.

Parameter "%1": Channel number

Parameter "%2": Block number

Format of text file for PLC alarm texts

The ASCII file for PLC alarm texts has the following structure:

Table 6-3 Structure of the text file for PLC alarm texts

Alarm no.	Display	Help ID	Text	Text on HMI
510000	1	0	"Channel %K FDDIS all"	Channel 1 FDDIS all
600124	1	0	"Feed disable axis %A"	Feed disable axis 1
600224	0	0	600124	Feed disable axis 2
600324	1	0	600224	Feed disable axis 3
702463	0	1	"Group index:%A Number:%N"	Group index:24 Number:63
// Alarm text file for PLC alarm				

References: /FB/P3: "PLC Basic Program"

Display

This number defines the alarm display type:

- 0: Display in alarm line
- 1: Display in a dialog box

Help ID

(in preparation)

Text or alarm number

Characters " and # must not be used in alarm texts. The % character is reserved for displaying parameters.

If an existing text is to be used, this can be done with a reference to the corresponding alarm. 6-digit alarm number instead of "text".

- The alarm file can contain comment lines, these must start with "//".
- The maximum length of the alarm text is 110 characters for a 2-line display. If the text is too long, it is truncated and the symbol " * " added to indicate missing text.

Parameter "%K": = 0, e.g. channel number with FC10
(As substitute for %K, the 2nd digit of the 6-digit alarm number is inserted in the alarm text). Digit count from left to right.

Parameter "%A": = 24, the parameter is replaced by the signal group no. (e.g. axis no., user area no., sequence cascade no.)
(As substitute for %A, the 3rd and 4th digits of the alarm number are inserted in the alarm text).

Parameter "%N": = 63, e.g. signal number
(As substitute for %N, the 5th and 6th digits of the alarm number are inserted in the alarm text).

Parameter "%Z": e.g. status number for Higraph
(As substitute for %Z, the supplementary information for the alarm number is inserted in the alarm text). The parameter is relevant only in connection with HIGRAPH programming, 800000...899999).

Note

The alarm number is transferred from the PLC via basic program module FC 10 (this uses PLC system function SFC 52 to send alarms to the HMI).
Supplementary information is not supported.
However, the alarm number can also be transferred to the HMI by means of PLC system function SFC 17, SFC 18 (ALARM S, ALARM SQ). The mechanisms are used, for example, by the PDIAG configuring tool.
The alarm number displayed on the HMI is transferred via SFC parameter EV_ID.
The supplementary information for the alarm number is transferred via SFC parameter SD.

Indexed alarms

Indexed alarms can be used to display additional comments in the alarm line, e.g. an explanation for "action =%"

Table 6-4 Examples:

Alarm no.	Display	Help ID	Text
010203	0	0	"Channel %1 NC Start without reference point (Action=%2<ALNX>)"
016903	1	0	"Channel %1 Action=%2<ALNX> not permitted in current status"
016912	0	0	"Channel %1 Action=%2<ALNX> only possible in reset state"

References: /DA/Diagnostics Guide

6.2 Configuring text files in foreign languages

6.2.1 General

Text files in ANSI format are used. If you wish to use cycle, alarm and message texts from earlier SW versions (DOS format), you must convert them to ANSI format beforehand:

Convert the old text file (OEM cycles text file) to an ANSI text file with "Save As.." in the Windows Editor (WinWord, Notepad, etc.).

Load, combine and save new text file, supplied with SW 6, and converted old text file in the Windows Editor.

Replace the TXT file supplied with software version 6 with the created text file in the corresponding language catalog.

Mixed code pages within a file are not supported.

Header in *.TXT files

```
// CP = XXXX      Number of the code page used for the creation of the file
// IDEO = YES     Yes: Logographic language
                  No: Single-byte language
                  (Default: No)
// ANSI = YES     Yes: ANSI code page
                  No: OEM code page
                  (Default: No)
// UNICODE = No   Yes: Unicode
                  (available soon) No: Single byte
                  (Default: No)
```

6.2.2 Supported languages

To maintain compatibility with text files already existing, the following conversions from OEM to ANSI code pages are supported:

Table 6-5 Languages and ANSI tables / code pages used

Language	Language codes	Code page (DOS)	ANSI table (Windows)
German	D	850	1252
English	G	850	1252
Finnish	P	850	1252
French	F	850	1252
Italian	I	850	1252
Dutch	N	850	1252
Polish	K	852	1250
Portuguese	Y	850	1252
Russian	X	866	1251
Swedish	S	850	1252
Spanish	I	850	1252
Czech	Z	852	1250
Turkish	R	857	1254
Hungarian	U	852	1250

No conversion is required for Asian languages as the ANSI and OEM code pages are identical in this case.

OEM code pages are not supported for languages not listed.



7

7 Software Installation

7.1 Software installation on PCU 20	IM2/7-124
7.1.1 Installation software	IM2/7-124
7.1.2 Software replacement with standard configuration	IM2/7-126
7.1.3 Software replacement with modified configuration	IM2/7-128
7.1.4 Creating an image	IM2/7-139
7.1.5 Uploading an image to the PC card	IM2/7-141
7.1.6 Copying image from PC card to PCU	IM2/7-142

7.1 Software installation on PCU 20

7.1.1 Installation software

As standard, the HMI Embedded software is installed on the supplied PCU 20 and contains all files required for the operation of the PCU.

If you want to change the configuration of the installed software or install a new software version, then you must replace the software.

In this case, you can choose whether the replacement software has the standard configuration or a modified configuration.

Software on CD

The complete HMI Embedded software package is supplied on one CD:
A folder named e.g. "sw_6_x" containing the following is stored on the CD:

- **Documentation:**
Upgrade instructions in English "siemene.txt" and German "siemend.txt".
- **HMI Embedded WIN32:**
HMI software for the installation on the hard disk of a Windows computer.
Up to six languages are available, as standard, these are: English, German, French, Italian, Spanish and simplified Chinese.
- **pcu20 8 MB:**
Creates an 8 MB flash image for the update of a PCU 20 / 8 MB.
Two languages are available, as standard, these are German and English.
- **pcu20 16 MB:**
Creates a 16 MB flash image for the update of a PCU 20 / 16 MB.
Up to six languages are available, as standard, these are: English, German, French, Italian, Spanish and simplified Chinese.

The "Installation diskette" directory contains the following files:

- "Setup.exe", starts the program with which you can create your own flash image, e.g. PCU_20.ABB, i.e. you can modify the following application parameters:
 - Select further languages,
 - Change the MPI parameters (NETNAMES.INI),
 - Adapt parameters for several operator panel fronts / NCUs,
 - Set defaults for display machine data,
 - Adapt and expand alarm text files,
 - Transfer user-defined screens for PLC status,
 - Add additional user screens.
- The files required by Setup.exe, i.e. INSTALL.000 – INSTALL.xxx. (The number of files is dependent on the software version.)
- **tools:**
In this directory, you can store your own screens, e.g. in the folder: "oem_bmp"/"wizard", and the Network Manager in the folder "net server".

Additional languages

A separate language add-on CD is available which allows you to both install additional languages and to replace the existing standard languages.

Precondition

The software can run on a PC or PG under the following operating systems:

- Windows NT (version 4.0 and later)
- Windows 2000
- Windows XP

To store the data on the installation CD and create a flash image for the PC card, there must be at least 30 to 40 MB of free memory available on the PC or PG (a great deal more memory is required for logographic languages such as Korean, Chinese etc.).

Procedure: Software replacement

1. Software replacement with standard configuration
or
software replacement with modified configuration
2. Creating an image
3. Uploading the image to the PC card
4. Copying the image from PC card to PCU, either:
 - Copy completely new Flash image or
 - All files with the exception of the configuration data are to be replaced or
 - Within a software version, all user files are to be retained.

7.1.2 Software replacement with standard configuration

If you want to install the new software with the standard configuration, proceed as follows:

Preparing for installation

- Place the CD in the CD drive of the PC or PG,
- Open the folder "Installation diskette" and
- Start "Setup.exe".

In the first screen you can choose between English and German as the language for the installation preparation menus. Select your chosen language and click "OK".

The next screen will display a default installation path and name for the software package, e.g. "D:\HMI_0_2".

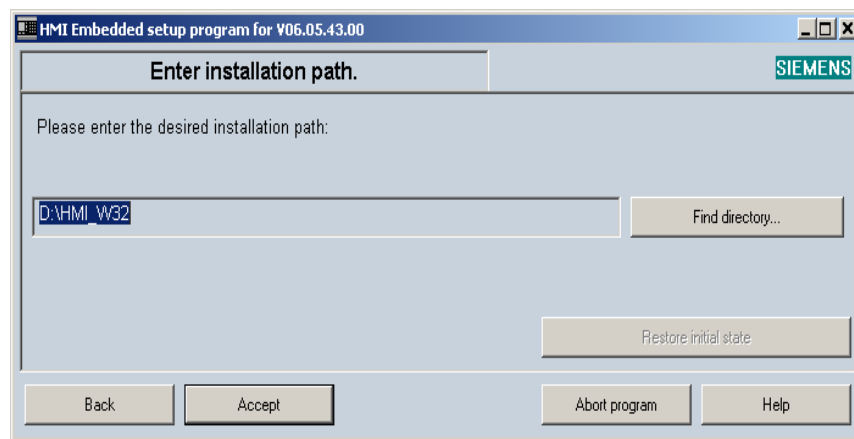


Fig. 7-1 Installation directory

If you want to select another path, click the "Modify" button. You can enter the path and name directly in the input field or open the Explorer by clicking the "Browse.." button. Choose the installation path and confirm by clicking the "Select" button. If you click "Reject", you return to the previous page without having made a selection.

The installation path (standard path or selected path) is then displayed and you can preset it by clicking the "Accept" button.

If you want to replace your selected path with the standard path, click the "Restore original status" button. You are prompted as to whether you want to restore the original status (click "OK"), or whether the current status should be retained (click "Cancel").

You return to this screen (see Fig.: Installation directory), in which the installation path is displayed. When you click "Accept", the next screen for the procedure is displayed.

To continue the installation, click "OK".

If the software is already installed, a prompt will be displayed confirming that the directory already exists and that existing files will be deleted.

If you click the "Cancel" button, you will return to the previous screen.

If you click "OK", the installation will continue and the files will be overwritten.

The current status of the installation preparation process is displayed in the next screen.

Data compilation

Once the preparation is complete, you have the following two options:

1. Install the software at a later time:

Click the "Finish" button to end the installation preparation phase.

All data have now been downloaded from the data medium (CD) to your local hard disk which means that you do not need the CD to continue the installation.

To resume the installation at a later time, simply go to the directory that you specified during the preparation phase and start the "Setup.Exe" routine again.

2. Install the software immediately:

If you click the "Start program" button, you can configure the software immediately.

The "Installation" screen opens in which you can select between two installation program languages, i.e. German and English.

Confirm your selection with "OK".

The "Selected configuration" screen appears. This displays an overview of current user settings.

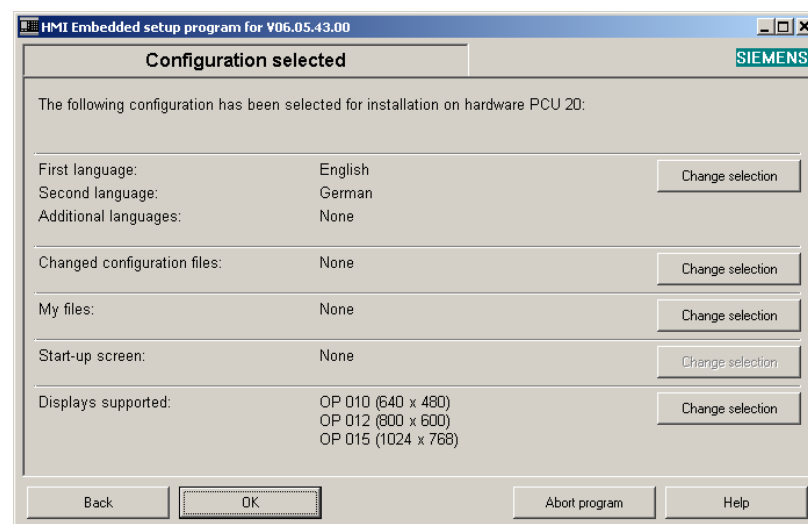


Fig. 7-2 User settings

Confirm these settings with "OK". The data compilation process then commences.

For information on what to do next, see sections:

- Creating an image
- Uploading the software image to the PC card and
- Copying software from PC card to PCU

7.1.3 Software replacement with modified configuration

If you want to modify the application parameters to suit your own requirements, you can do this in a menu-assisted process in software version 6.5 and later.

Preparing for installation

- Place the CD in the CD drive of the PC or PG,
- Open the folder "Installation diskette" and
- Start "Setup.exe".

In the first screen you can choose between English and German as the language for the installation preparation menus.

Select your chosen language and click "OK".

The next screen will display a default installation path and name for the software package, e.g. "D:\HMI_0_2".

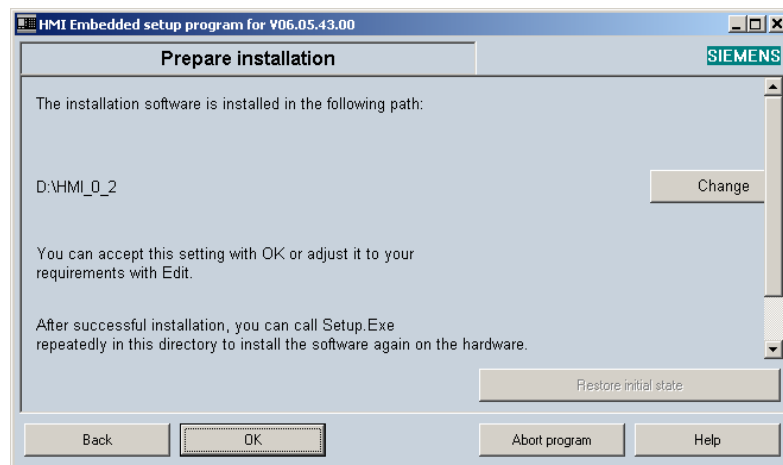


Fig. 7-3 Installation directory

If you want to select another path, click the "Modify" button.

You can enter the path and name directly in the input field or open the Explorer by clicking the "Browse.." button.

Choose the installation path and click the "Select" button. If you click "Back", you return to the previous page without having made a selection.

The installation path (standard path or selected path) is then displayed and you can preset it by clicking the "Accept" button.

If you want to replace your selected path with the standard path, click the "Restore original status" button. You are prompted as to whether you want to restore the original status (click "OK"), or whether the current status should be retained (click "Cancel").

You return to this screen (see Fig.: Installation directory), in which the installation path is displayed. To continue the installation, click "OK".

If the software is already installed, a prompt will be displayed confirming that the directory already exists and that existing files will be deleted.

If you click the "Cancel" button, you will return to the previous screen.

If you click "OK", the installation will continue and the files will be overwritten.

The current status of the installation preparation process is displayed in the next screen.

Data compilation

Once the preparation is complete, you have the following two options:

1. Install the software at a later time:

Click the "Finish" button to end the installation preparation phase.

All data have now been downloaded from the data medium (CD) to your local hard disk which means that you do not need the CD to continue the installation.

To resume the installation at a later time, simply go to the directory that you specified during the preparation phase and start the "Setup.Exe" routine again.

2. Install the software immediately:

If you click the "Start program" button, you can configure the software immediately.

The "Installation" screen opens in which you can select between two installation program languages, i.e. German and English.

Confirm your selection with "OK".

Modifying the configuration

Selected configuration

The "Selected configuration" screen displays an overview of the current user settings.

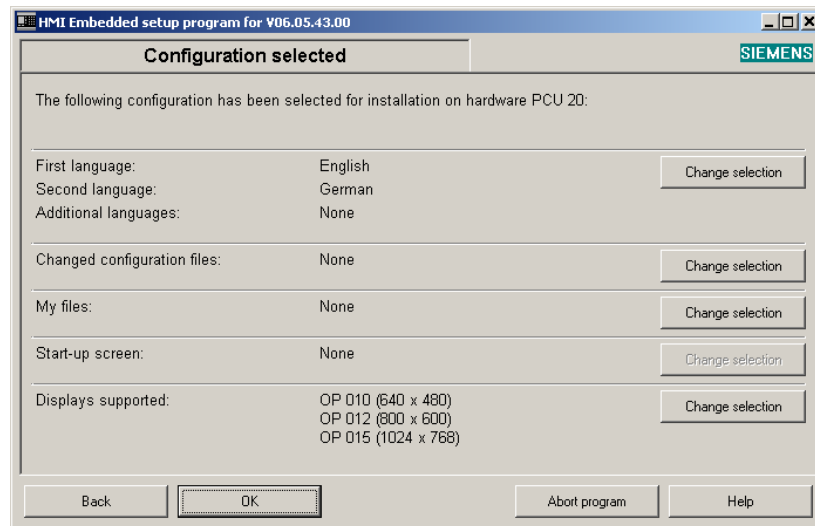


Fig. 7-4 Selected configuration

You can view, edit or add to the user settings listed below. Furthermore, you can also install your own or manufacturer-specific files.

- Language setting
- Modified configuration files
- Your own files
- Boot screen
- Supported displays

If you click the "Change selection" button, you will be able to view further areas and files in which you can make your own settings.

Clicking "OK" will confirm these settings and initiate data compilation.

Note

Some buttons are displayed in all screens and have the following function:

- "Back" takes you back to the previous screen.
 - "Cancel program" allows you to close and exit the program after a confirmation prompt.
 - "Help" displays a dialog box containing a help text.
 - "Restore defaults" is activated only if you have entered your own settings. When you select this button, the defaults defined by Siemens AG are restored again.
When this button is clicked, a prompt appears asking you to confirm restoration of the default settings with "OK" or allowing you to retain your own settings with "Cancel". The button is deactivated again once the original status has been restored.
 - "Reject" enables you to cancel the last setting entered.
 - "Accept" confirms the settings you have made and returns you to the "Selected configuration" screen.
-

Language selection

You are in the "Selected configuration" screen.

If you select the "Change selection" button in the language selection line, you will open the "Select language" screen.

German, English, French, Italian, Spanish and simplified Chinese are available for the PCU 20. All available languages are displayed in a table.

The following selections can be made in the checkboxes in front of the languages:

- 1st and 2nd language, or
- "No 2nd language", and
- "Additional"

Add new languages

If you wish to integrate additional languages, these can be loaded from a separate language CD.

Place the CD in the CD drive of the PC or PG and click the "Add new languages" button.

The dialog box "Extended language selection" appears.
Enter the path of the CD drive manually in the input field or open the Explorer by clicking the "Browse..." button.
Choose a directory and confirm by clicking the "Select" button.
You will then return to the previous screen and the selected path is now displayed.
Click "Accept" to start the installation. You will be able to monitor its progress on the screen.

If languages are already installed, the message "Overwrite language" will appear.
If you have loaded a new language to the installation directory, you will return to the "Select language" screen. This will now show the new language for you to select.

Reset selection:

If you have selected a directory and want to remove it, click the "Reject" button.
The Explorer is then closed. You can click the "Back" button to return to the "Select language" screen.

Modified configuration files

If you click the "Change selection" button in the "Modified configuration files" area, you will open a screen in which you can view, modify or add to the following user- and manufacturer-specific files.

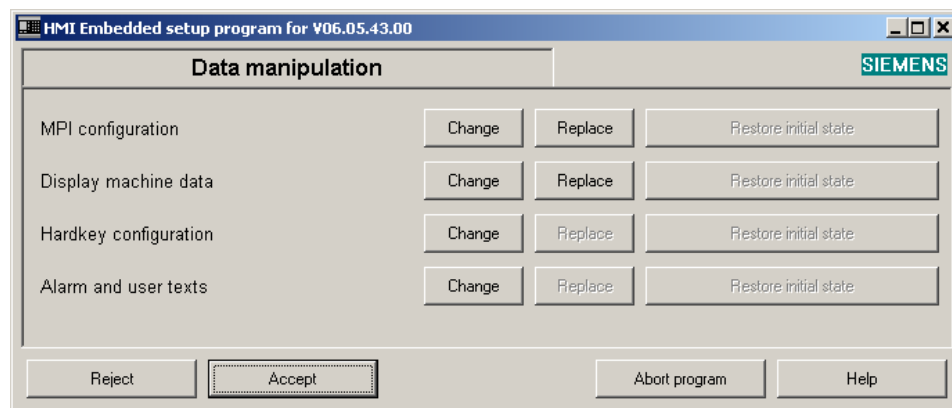


Fig. 7-5 Adapt configuration files

- MPI configuration: Open NETNAMES.INI file
- Display machine data: Open BD.TEA file
- Hardkey configuration: Further subdivision into areas:
 - Configuration file
 - .ini files

- Alarm and user texts:
 - Further subdivision into areas:
 - Texts for channel menu (CHAN.TXT)
 - Cycle texts (ALZU.TXT)
 - Cycle alarm and tool management texts (ALUC.TXT)
 - PLC alarm texts (ALPU.TXT)

Clicking the "Change" button starts the editor in which you can view, modify or add to the values and settings in the opened files. Clicking "Change" in the last two lines opens screens displaying further subcategories of files.

If you want to link a file of your own into the installation environment, click the "Replace" button. The Explorer will then open and you can select this file, e.g. one containing data specific to your own requirements.

MPI configuration

The information needed to set up the links between the PCU and NCU/PLC units and to define their properties is stored in the NETNAMES.INI configuration file.

For example, you want to link a PCU to two NCs. You use the channel switchover key and the channel menu to switch from one NC to the other. The softkey assignments must be configured in file NETNAMES.INI.

Click the "Change" button after "MPI configuration" in the "Data manipulation" screen. The NETNAMES.INI file opens. You can view the settings and modify or add to them if required.

Click the "Replace" button if you want to install your own file.

The Explorer then opens. Select the appropriate file and click the "Select" button. This is then accessed as the installation file.

The actual configuring process is described in the following sections or references:

See Chapter 5: "Switching over channels / operator units",
"Sample configuration of a "NETNAMES.INI" file"

References: /FB2/B3: Description of Functions, Extension Functions,
Several Operator Panels: Section: Configuration file NETNAMES.INI

Display machine data

The default settings for the display machine data are in the BD.TEA file. Clicking the "Change" button opens the BD.TEA file and the machine data with their settings are displayed.

Note

You cannot change the display machine data available for PCU 20 in the NC in the BD.TEA file! You can only alter the default settings for these machine data. Any changes are activated only if the display machine data does not exist in the NC.

If you possess the required access authorization, you can also change the default settings in the "Start-up" operating area while the system is operating.

References: /BEM/Operator's Guide HMI Embedded, Chapter: Start-up

Note

Any default settings for display machine data altered in this menu cannot, however, be changed after the software has been installed!

Select "Replace" to link a file containing user-defined display machine data into the installation environment. Choose the relevant file in the Explorer view and confirm by clicking "Select".

Hardkey configuration

If you click the "Change" button in the "Hardkey configuration" line, the following selections will appear:

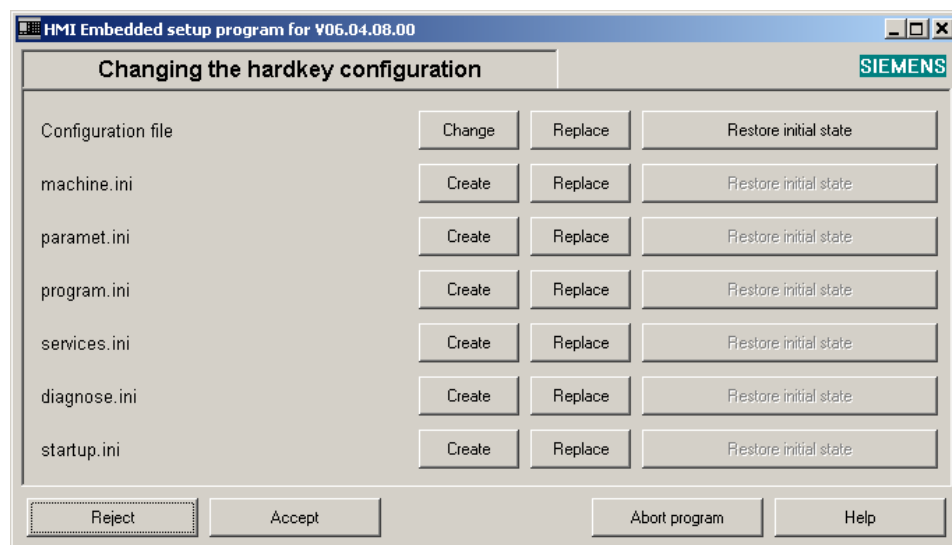


Fig. 7-6 Hardkey configuration

These hardkey configuration files (.ini files) are displayed for selection per default. The configuration file contains the following files.

- machine.ini
- paramet.ini
- program.ini
- services.ini
- diagnosis.ini
- startup.ini

Configuration file:

The ini. files for hardkeys are assigned in configuration file KEYS.INI. Without this entry, the ini files will not be detected.

If you want to change the names and settings of files contained in the configuration file, click the "Change" button.

The editor is then started and the KEYS.INI file opens. You can change, add or delete hardkey names in this file.

Save your change and close the editor.

You will return again to the overview where the current hardkey files are displayed.

If you want to link your own KEYS.INI file into the software environment, click the "Replace" button. Choose the relevant file in the Explorer view and confirm by clicking "Select".

.ini files

The individual hardkeys/softkeys are configured in the .ini files.

If the .ini files do not yet contain any settings, click the "Create" button. A file containing only header data will be opened; you can enter your configuration settings here.

For an exact description of how to configure a hardkey/softkey, please refer to the following documents:

References: /PJE/ HMI Embedded Configuring Package: Configuring a project
/IAM/BE1/ HMI Option Package

If you have your own ini files, you can link them into the installation environment by clicking "Replace", choosing the relevant file and confirming with "Select".

If an ini file has already been set up, the "Create" button is replaced by the "Change" button which you can use to open the file.

Confirm the file settings by clicking the "Accept" button.

Caution

If you click the "Reject" button in the "Change hardkey configuration" screen, **all** settings made in the .ini files and the configuration file are discarded and you then return to the "Data manipulation" screen.

Alarm and user texts

In order to be able to adapt alarm and user texts to the specific requirements of a machine, the alarm and user texts are stored in freely accessible ASCII text files.

If you click the "Change" button in the "Alarm and user texts" line, a screen displaying different categories of user text will appear:

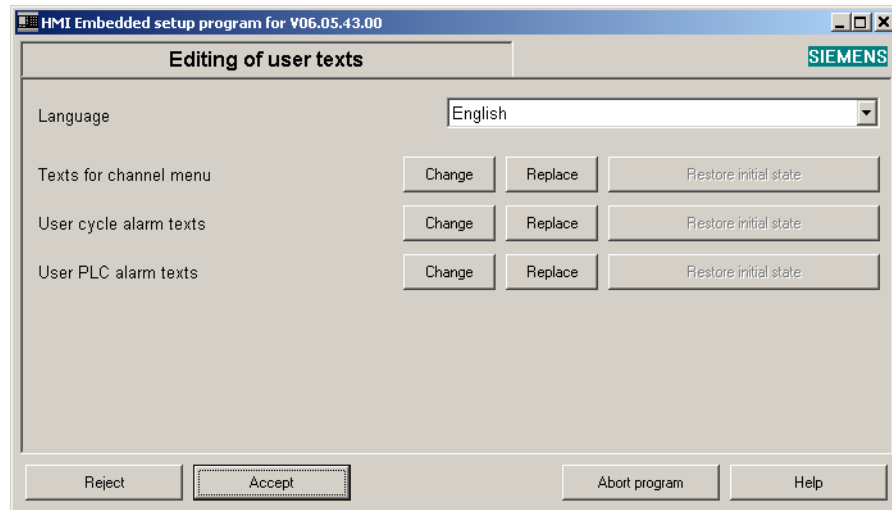


Fig. 7-7 Modifying user texts

You can select the following categories of text:

• Texts for channel menu	(CHAN.TXT)
• Cycle texts	(ALZU.TXT)
• Cycle alarm and tool management texts	(ALUC.TXT)
• User PLC alarm texts	(ALPU.TXT)

Language:

You can select the language for the files to be changed in this box.
The box contains every installed language.

Texts for channel menu:

In order to identify the NCU to be addressed, the texts for the softkeys of the of the appropriate channel menu must be entered in file CHAN.TXT.

If you want to link your own file into the installation environment, click the "Replace" button, select the file and confirm with the "Select" button.

If you click the "Change" button in the "Texts for channel menu" line, you will open the CHAN.TXT file directly in which you can view and modify the configuration.

See Chapter 6: Alarm and message texts

User cycle texts

The cycle texts are integrated in text file ALZU.TXT.

If you want to link your own file into the installation environment, click the "Replace" button, select the file and confirm with the "Select" button.

If you click the "Change" button in the "User cycle texts" line, you will open the ALZU.TXT file directly in which you can view and modify the configuration.

See Chapter 6: Alarm and message texts

User cycle alarm and tool management texts

Cycle alarm texts are integrated in text file ALUC.TXT.

If you want to link your own file into the installation environment, click the "Replace" button, select the file and confirm with the "Select" button.

If you click the "Change" button in the "User cycle alarm texts" line, you will open the ALUC.TXT file directly in which you can view and modify the configuration.

For the exact configuration procedure, please refer to the following documentation:

References: /FBT/ Description of Functions ShopTurn

/FBSP/ Description of Functions ShopMill

User PLC alarms

The alarm text and message files contain only Siemens texts.

Manufacturer-specific PLC alarms or PLC messages can be integrated and anchored in the ALPU.TXT file.

If you want to link your own file into the installation environment, click the "Replace" button, select the file and confirm with the "Select" button.

If you click the "Change" button in the "User PLC alarm texts" line, you will open the ALPU.TXT file directly in which you can view and modify the configuration.

See Chapter 6: Alarm and message texts

Your own files

The integration of user icons and your own screens is performed in two steps:

1. Before the actual installation, you must first switch to the Explorer and copy the desired screens and icons (256 colors *.bmp) and/or a CUS.ARJ (CUS_8.ARJ and CUS_10.ARJ) to the directory with the appropriate resolution (BIN\640, BIN\800 and BIN\1024). Start the batch file CUS_BMP.BAT from the "INSTUTIL" directory of the installation path of the installation diskette. After its completion, start the installation.
2. If you now want to add your own files to the installation environment, click the "Change selection" button after "Own files". In the following screen, select "Other (*.*)".

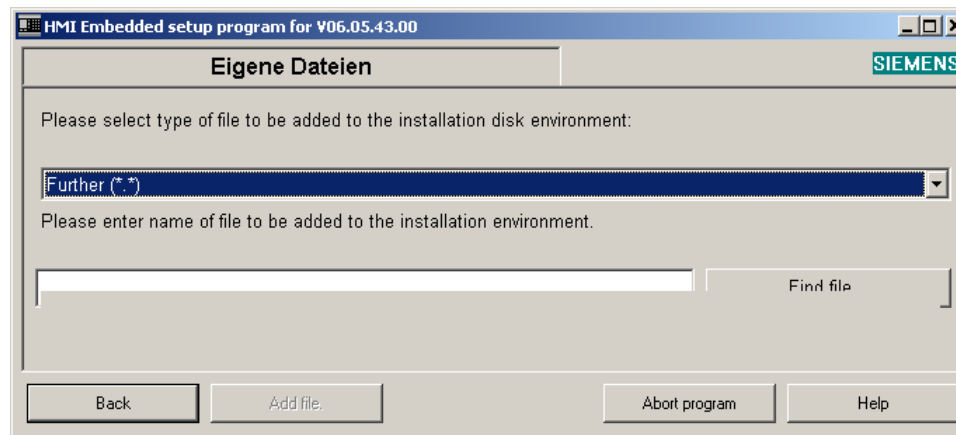


Fig. 7-8 Add own files

Now click the "Browse..." button. The "INSTUTIL" directory is opened and you can select the appropriate files (see below). Confirm your selection with the "Select" button.

For the resolution 640 x 480:

- BIN\640\CUS.ARJ
- BIN\640\CUS.IDX

For the resolution 800 x 600:

- BIN\800\CUS_8.ARJ
- BIN\800\CUS_8.IDX

For the resolution 1024 x 768:

- BIN\1024\CUS_10.ARJ
- BIN\1024\CUS_10.IDX



Important

An error message will appear if you attempt to add files with names that do not comply with the DOS convention (max. 8 characters for name and 3 characters for file extension).

All files you select are displayed with their size and date. At the same time, a "Delete" button is displayed after every file so that you have the option of removing it again after a confirmation prompt.

Ramp-up screen (in preparation)

A selection of ramp-up screens is not yet possible for the PCU 20 via the installation software.

To integrate your own ramp-up screen,
see Chapter 5: Replacing ramp-up screen.

Supported displays

The following operator panels with the appropriate resolution are available for selection:

OP 010 (640 x 480)

OP 012 (800 x 600)

OP 015 (1024 x 768)

Select the appropriate operator panel.

For information on what to do next, see sections:

Creating an image

Uploading the software image to the PC card and

Copying software from PC card to PCU

7.1.4 Creating an image

Once you have finished configuring the software, you will return to the "Selected configuration" screen in which the current settings are displayed.

Click the "OK" button to compile the installation data.

You can monitor the progress of this task in the "Data preparation" screen.

To stop the preparation run and return to the "Selected configuration" screen, click the "Interrupt" button.

When the data compilation is completed, you are prompted to specify the installation type and the storage path for the flash image.

The following screen appears for the PCU 20:

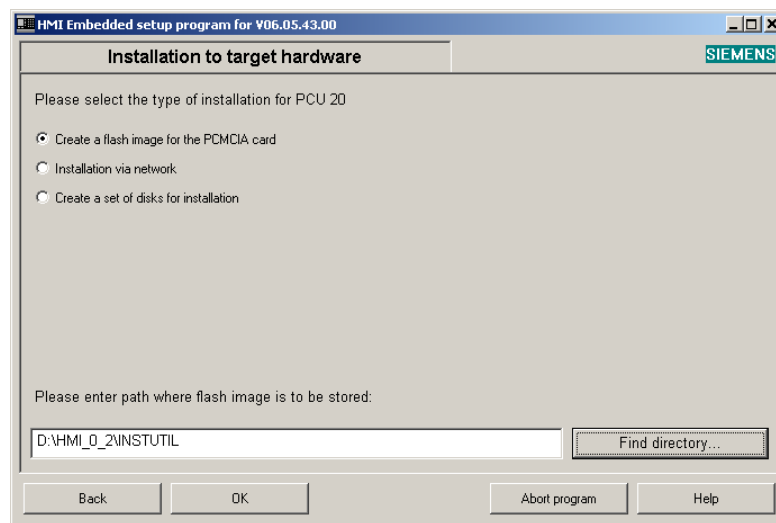


Fig. 7-9 Installation on target hardware

Select the installation to a PC card for the PCU 20:
"Create a flash image for PCMCIA card"

In the input box enter the storage path on your PC for the flash image or open the Explorer by clicking the "Browse .." button and select the path in the Explorer view.

Finally, click the "OK" button to start the flash image creation process itself.

Once the data have been installed, the following messages appear:

On the PCU 20 with 8 MB flash:

"The flash card image for PCU 20 has been successfully created.

It is in F:\0605440a\flash

Please use SINUCOPY to transfer this image to a Flash Memory card or copy this onto a Compact Flash card".

On the PCU 20 with 16 MB flash:

"The flash card image for PCU 20 (16 MB flash) has been successfully created.

It is in (e.g.) F:\0605440a\flash

Please transfer this image to a Compact Flash card".

On the PC/PG with HMI Embedded WIN32:

"The installation on the hard disk for HMI Embedded WIN32 has been successfully completed.

The installation path was (e.g.) D:\HMI_0_2\

If you click the "Back" button, you will return to the previous screen. You can close the installation program by clicking "Exit program".

Image for PCU

For instructions on copying the new image to the PCU 20,

see Section: Uploading an image to the PC card and
 Copying software from PC card to PCU

7.1.5 Uploading an image to the PC card

PCMCIA card name convention

The PCMCIA cards used for the NCU and PCU are very similar in appearance and therefore easily confused with one another. For better identification, the PCMCIA cards have different names:

- "NC card" for the NCU
- "PC card" for the PCU

Card selection

The following memory cards are available:

- For a **PCU 20** with 8 MB internal flash:
 - Linear Flash memory card (8 MB)
 - Compact Flash card (as of 16 MB) with adapter
- For a **PCU 20** with 16 MB internal flash (as of SW 6.3):
 - Compact Flash card (as of 32 MB) with adapter

Supplementary conditions of the cards:

The "PCU_20.ABB" image must be in the Root directory of the Compact Flash card.

- For an 8 MB image, at least a 16 MB Compact Flash card must be used.
- For an 16 MB image, at least a 32 MB Compact Flash card must be used.

Preconditions

- If you want to copy the image to a **Linear Flash Memory Card**, the "SINUCOPY_FFS" software must be installed on your PC.
- If you use a **Compact Flash Card**, the software is copied and inserted with the Windows Explorer.
You require the appropriate adapter for the Compact Flash card.
The "SINUCOPY_FFS" software is no longer required.

Procedure

With a **Linear Flash Memory Card**:

1. Insert the PC card in the card drive on the PC or PG.
2. Start the SINUCOPY-FFS program.
3. Select: "Save system from hard disk to PC card".
4. Select the path and the ABB.file on the PC.
5. Start the upload.

With a **Compact Flash Card with adapter**:

1. Insert the PC card in the card drive on the PC or PG.
2. Select the ABB.file on the hard disk of the PC.
3. Click "Copy" (via the menu or the right-hand mouse button).
4. Select the card drive in which the PC card is inserted.
5. Start the copy procedure by clicking "Paste" (via the menu or the right-hand mouse button).

7.1.6 Copying image from PC card to PCU

Software on PC card

Precondition:

- PC card with new image.
- The controller is switched off.

Procedure:

1. Before switching on the PCU, insert the PC card into the PCMCIA memory card slot of the PCU.
2. Switch on the PCU.
3. Press key "6" on the operator panel several times.
4. A dialog box appears:
 - "-: Update from PC card with default configuration data".
Standard configuration is loaded (the current settings are discarded). The MAC address is checked during ramp-up.

Important

If the network settings were made on another PCU, network access is disabled. A network address must not be assigned more than once.

- "0: Update from PC card without updating configuration data".
The settings saved last on the PCU, e.g. network settings, color settings etc. are retained. The current settings are written to the PC card and are available at the next update as default.

If, for example, you select "0"

5. The following selection will appear: CFG data saved on PC card
"0: Update from PC card"
- Select "0"

Note

If you insert the wrong card in the PCU by mistake, e.g. NC card or an empty card, the following message appears:
"No PCU system software on PC card".

The transfer operation begins and its progress is displayed on the PCU.

Linear Flash Memory Card

When the update is complete, the following message is displayed: "Remove PC card". On removal of the PC card, the control boots and starts up automatically.

Compact Flash Card

When the update is complete, there is an automatic ramp-up.

Software via Network Manager

With the aid of the Network Manager, it is possible to directly access the Compact Flash card inserted PCU via the operator interface.

Precondition

- The Network Manager is installed.
- Compact Flash Memory Card inserted in the PCU.
- The connection to the internal drive, the PCMCIA memory card interface, is already set up.
See Section: Connections, logical drives

Procedure

1. Insert the PC card with the new HMI Embedded software version in the PCMCIA memory card slot of the PCU.
2. In the "Program" or "Services" operating area, select the ETC key or the "Additional..." softkey to get to the second vertical bar.
3. When you press the "Compact Flash Card" softkey, the Explorer with the files of the external drive appears on the screen.
4. Now press the "Start" softkey to start the data transmission.



8

8 Data Backup

8.1 Data backup.....	IM2/8-146
8.1.1 General.....	IM2/8-146
8.2 Data backup for HMI Embedded	IM2/8-148
8.2.1 Data backup.....	IM2/8-148
8.2.2 Data backup of altered machine data.....	IM2/8-153
8.2.3 Activate data transfer via PLC	IM2/8-154
8.3 Reading ISO programs in/out via RS-232-C	IM2/8-158
8.4 Data backup on PC card.....	IM2/8-159
8.5 Data backup for HMI Embedded WIN32 with PCU 50/70	IM2/8-160

8.1 Data backup

8.1.1 General

The procedure is as follows:

You should backup your data

- after start-up,
- after changing machine-specific settings,
- after service (e.g. after replacing hardware or software), in order to resume operation quickly
- during start-up before altering the memory configuration to make sure that no data are lost during start-up.

NCK/PLC/HMI

The entire data backup with the SINUMERIK 840D is divided into

1. Data backup for NCK, drive and operator panel front settings
2. Data backup for PLC

Series start-up

The following methods can be used to back up data, each serving a different purpose.

1. Series start-up

In order to be able to transfer as simply as possible a particular configuration to further controls of the same software version that are e.g. operated on the same machine type, you can create what are called series start-up files. This type of file cannot be modified externally using an ASCII editor.

Series start-up files contain all relevant settings (except for compensation data). Series start-up files must be created for NCK, PLC, PCU 20 for HMI Embedded, and PCU 50/70 for HMI Embedded Win32.

2. Series start-up with compensation data

3. Software upgrade

4. Area-specific archiving

PLC and HMI Embedded data are not subdivided any further.

Required accessories

You will require the following accessories in order to save data:

- PCIN data transmission program for PG/PC
- RS232C (V24) cable 6FX2002–1AA01–0BF0

References: /Z/Catalog NC Z (Accessories)

- PG 740 (or higher) or PC (DOS)

Structure of the file name

Table 8-1 File name structure

<u>N</u>	Area	Unit	-	Type

- The area specifies which data are to be backed up or retrieved (general, channel-specific or axis-specific).
- The unit defines the channel, the axis or the TOA area. No unit has to be specified if the entire area is selected.
- The type determines the data type. During a data backup, the file names are created and output automatically.

Areas

NC	General NC-specific data
CH	Channel-specific data (unit corresponds to the channel number)
AX	Axis-specific data (unit corresponds to the number of the machine axis)
TO	Tool data
COMPLETE	All data of an area
INITIAL	Data for all areas (_N_INITIAL_INI)

Types

TEA	Machine data
SEA	Setting data
OPT	Option data
TOA	Tool data
UFR	User input frames: Settable Work offset, rotations, etc.
EEC	Measuring system error compensation
CEC	Sag/angularity compensation
QEC	Quadrant error compensation
PRO	Protection zone
RPA	R parameters
GUD	Global user data
INI	General initialization program (all data in the active file system)

_N_COMPLETE_TEA	Archiving of all machine data
_N_AX_TEA	Archiving of all axis machine data
_N_CH1_TEA	Archiving of the machine data for channel 1
_N_CH1_GUD	Archiving of global user data for channel 1
_N_INITIAL_INI	Archiving of all data in the active file system

8.2 Data backup for HMI Embedded

8.2.1 Data backup

Via RS-232

Data can be backed up in the following way via the RS232C (V.24) interface:

- **Series start-up:** With selection option for areas
 - NCK (complete)
 - PLC (complete)
- **Area-specific archiving:** Backup or read-in of individual data areas (softkey "Data in", "Data out", and "Data selection").

Error, operational, cycle alarm texts

These texts are part of the operator panel front system software. The texts have to be reloaded when software is updated and hardware replaced. For this, the message texts must be available in the correct format. The texts cannot be read back.

Data backup

1. Connect the PG/PC to the COM1/COM2 interface of the PCU.
2. Select the "Services" operating area, then select the "RS 232-PG/PC" interface with the vertical softkey and check or perform the parameterization of the RS 232 interface via "Settings": (Default setting).

Device type:	RTS/CTS
Baud rate:	9600 baud
Parity:	None
Data bits:	8
Stop bits:	1
Character for XON:	11H(ex)
Character for XOFF:	13H(3x)
Text end character:	1AH(ex)
Format:	Punched tape format, deselected for series startup or for area specific backup of drive data. Select punched tape format for area-specific backup of all other data except drive data.

a. Series start-up (data backup)

3. PCU interface configuration (see above, punched tape format deselected).
4. Start PCIN data transmission program ("Data In") on the PC/PG.

5. On the PCU select "start-up data" (PCU 20 operating area "Services", data output "Data Out"); after pressing the Enter key, the NCK and PLC areas are offered.
6. First select NCK ("NCK" is offered as the name of the archive file) and start the read-out procedure with the softkey "Start". Proceed in the same way for the "PLC" data record.

b. Area-wide archiving

3. PCU interface configuration (see above, select punched tape format for all data except for drive data).
4. Start PCIN data transmission program ("Data In") on the PC/PG and enter a file name.
5. On the PCU 20, select the data area to be output (operating area "Services", data output "Data out").
6. Press the "Data selection" softkey and select the areas to be read out. The area "NC active data", for example, contains the following data:
Machine data
 - Setting data
 - Option data
 - Global and local user data
 - Tool and magazine data
 - Protection zones
 - R parameters
 - Work offsets
 - Drive data
 - Compensation data
 - Display machine data
 - Workpieces, global part programs / subroutines
 - Standard and user cycles
 - Definitions and macrosWhen the areas are being output, the internal identifier used in each case appears in the top line of the display.
7. Start the read-out procedure with the softkey "Start" and answer the prompts on the operator panel front.

Note

For the PLC, data backup can be executed with the SIMATIC tools HiGraph.
Note filter setting for SDBs!

References: /S7HT/ Manual: Using the Tools

This has advantages for the portability of the PLC programs

Loading archiving data

If you wish to read in a complete configuration, you must execute a general reset on the control.

1. Set the protection level to "User" (password CUSTOMER).
2. Connect the PG/PC to the COM1/COM2 interface of the PCU.
3. Select the "Services" operating area on the PCU. Continue with steps listed under "Reading in series start-up" or "Reading in area-specific archive data".

a. Series start-up

4. Select the PCU 20 interface configuration "RS 232-PG/PC" as above, (punched tape format deselected).
5. Start the PCIN data transmission program on the PG/PC by selecting the NCK series start-up file to be read into the control under "Data Out" for transmission.
Select the operating area "Services", "Data In" and start the read-in procedure with the softkey "Start". Acknowledge the input prompts on the PCU 20.
6. Follow the same procedure for the PLC series start-up file after executing an NCK reset and a PLC general reset.
7. After another NCK reset, the control powers up with the imported data sets.

Note

The NCK series start-up file must always be imported before the PLC series start-up file.

b. Area-wide archiving

4. Select the PCU 20 interface configuration "V24-PG/PC" as above and set "punched tape format" (except for drive data).
 - Start the PCIN data transmission program on the PG/PC. Selection of the archive file to be read into the control under "Data Out" for transmission.
 - On the PCU 20, select area "Services", "Data In" and start the read-in procedure with the softkey "Start". The file is automatically detected and loaded accordingly.
5. Read in option data, initiate NCK RESET.
6. Load the machine data file and actuate "NCK RESET". If you then receive messages about a reconfiguration of the memory or restandardization of machine data, then you must read in the machine data file again and RESET the control. Usually, this procedure will have to be performed two or three times.
7. If you want to activate global user data, read out the "N_INITIAL_INI" file (Table 8-2). Read out starts when you select "All data" as for area-wide archiving.
8. Read in archive file for global user data.
9. Read the save "N_INITIAL_INI" file back in to activate the global user data.
10. Then load the other areas.
11. The PLC area must be loaded last after a PLC general reset.

Note

- When you are loading drive data, deselect the punched tape format as well as all special functions on the right of the display of interface settings. Do not actuate softkey "Back up boot file" in the drive data menu until you have reset the control once after loading the drive archive data.
 - Check/correct the interface settings after display of a message regarding memory reconfiguration.
-

Transmission errors

If transmission is aborted with an error, check the following:

- The password has been entered for the correct protection level
- The interface parameters (RS-232-C-PG/PC) are correct
- If LEC data are being read in, MD32700 ENC_COMP_ENABLE must be initially set to 0.
- MD11220 INI_FILE_MODE set to 1 or 2 see:

References: /IAD/Installation and Start-Up Guide

Table 8-2 Data of the _N_INITIAL_INI file

File _N_INITIAL_INI	Data not contained in file _N_INITIAL_INI
• Option data • Machine data • Setting data • Tool offsets • Work offsets • Global user data • Local user data • R parameters	• Modify drive machine data • Compensation data - Leadscrew error compensation - Quadrant error compensation - Sag compensation • Display machine data • Workpieces • Global parts programs • Global subroutines • User cycles • Standard cycles • Definitions and macros

8.2.2 Data backup of altered machine data

Saving altered values MD 11210

In MD 11210 **UPLOAD_MD_CHANGES_ONLY** (MD backup of altered MDs only), it can be set for the backup of the machine and setting data, whether all data or only data differing from the default setting should be output via the RS 232 interface.

11210	UPLOAD_MD_CHANGES_ONLY	
MD number	MD backup of changed MD only	
Default setting: 0	Minimum input limit: 0	Maximum input limit: 255
Change effective: Immediately	Protection level: 2/4	Unit: –
Data type: BYTE	Valid as of SW release: 1 or 4	
Meaning:	Up to SW 3.x Bit 0 Scope of the differential upload with TEA files (area-specific archiving) 0: All data are output 1: Only data which deviate from the standard are output (not valid for INITIAL_INI) If a value of a data item, which is stored as an array, is changed, the complete MD array is output (e.g. MD 10000: AXCONF_MACHAX_NAME_TAB). As of SW 4 Bit 1 Scope of the differential upload with INI files 0: All data are output 1: Only data which deviate from the standard are output (e.g. INITIAL_INI) Bit 2 Changes of a field element 0: Complete array is output 1: Only modified elements of an array are output Bit 3 R parameters (only for INITIAL_INI) 0: All R parameters are output 1: Only R parameters not equal to zero are output Bit 4 Frames (only for INITIAL_INI) 0: All frames are output 1: Only frames not equal to zero are output Bit 5 Tool data, cutting edge parameters (only for INITIAL_INI) 0: All tool data are output 1: Only tool data not equal to zero are output	
Related to		

Note

It might be sensible to back up only altered machine data before a software update if changes have been made to the default machine data settings in the new software version. This applies particularly to machine data which are assigned SIEMENS protection level 0.

Note

MD 11210 UPLOAD_MD_CHANGES_ONLY should be set to "1" or the corresponding bits set to "1". With this setting, the transferred files contain only those data which deviate from the default. This is of advantage with respect to future SW upgrades.

Continue with "Series start-up" or "Area-specific archiving".

8.2.3 Activate data transfer via PLC

A data transfer from/to NCK can be started from the PLC via the RS 232C V.24 interfaces (COM1/COM2).

The PLC transfers jobs to HMI Embedded via the PLC-HMI Embedded interface in DB19. These jobs initiate data transfer operations between HMI Embedded and NCK or external equipment which is connected to COM1 or COM2.

Job byte of PLC:

Table 8-3 DB19.DBB12 (PLC → HMI Embedded)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
RS-232-C In	RS-232-C Out	RS-232-C Ext	RS-232-C stop	COM1 active	COM2 active	Res.	Res.

Table 8-4 Specify standard control file:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Always 0 (curr. file syst.)	PLC index which specifies axis, channel or TO no. Value: 0 - 127						

Specify file:

Table 8-5 DB19.DBB15 (PLC → HMI Embedded)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
PLC line offset in a standard or user control file Value: 0 - 255							

HMI Embedded acknowledgment byte to PLC for current status of V.24 (RS-232-C) interface:

Table 8-6 DB19.DBB24 (HMI Embedded → PLC)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
RS-232-C In	RS-232-C Out	RS-232-C Ext	RS-232-C stop	COM1 active	COM2 active	OK	Error

Job processing

A PLC job is processed according to the following scheme:

1. The PLC may initiate a job only if the acknowledgment byte is 0.
2. HMI Embedded mirrors the job (excluding parameter set) in the acknowledgment byte, signaling to the PLC that a PLC job is being processed.
3. Once the operation is finished (OK or Error), the PLC must respond again and delete the job byte. The PLC receives a "job active" signal for an unfinished job.
4. In response, HMI Embedded sets the acknowledgment byte to 0.

This scheme ensures sequential processing of jobs.

Standard control file

The names of files to be transferred (output) are stored in the following control file "_xxx_":

Line index	File name
N1	_N_INITIAL_INI
N2	_N_COMPLETE_TEA
N3	_N_NC_TEA
N4	_N_CH%d_TEA
N5	_N_AX%d_TEA
N6	_N_COMPLETE_SEA
N7	_N_NC_SEA
N8	_N_CH%d_SEA
N9	_N_AX%d_SEA
N10	_N_COMPLETE_OPT
N11	_N_NC_OPT
N12	_N_CH%d_OPT
N13	_N_AX%d_OPT
N14	_N_CH%d_RPA
N15	_N_COMPLETE_PRO
N16	_N_NC_PRO
N17	_N_CH%d_PRO

```

N18    _N_CH%d_UFR
N19    _N_COMPLETE_GUD
N20    _N_NC_GUD
N21    _N_NC_GD1
N22    _N_NC_GD2
N23    _N_NC_GD3
N24    _N_NC_GD4
N25    _N_NC_GD5
N26    _N_NC_GD6
N27    _N_NC_GD7
N28    _N_NC_GD8
N29    _N_NC_GD9
N30    _N_CH%d_GUD
N31    _N_CH%d_GD1
N32    _N_CH%d_GD2
N33    _N_CH%d_GD3
N34    _N_CH%d_GD4
N35    _N_CH%d_GD5
N36    _N_CH%d_GD6
N37    _N_CH%d_GD7
N38    _N_CH%d_GD8
N39    _N_CH%d_GD9
N40    _N_TO%d_INI
N41    _N_TO%d_TOA
N42    _N_TO%d_TMA
N43    _N_NC_CEC
N44    _N_AX%d_QEC
N45    _N_AX%d_EEC

```

In the case of files with identifier "%d", the channel, axis or tool area number is specified via the PLC (DB19, DBB14).

The standard list cannot be edited.

- Axis and channel numbers can be specified via the PLC (DB19, DBB14).
- Another index (0, 1 - 255) for defining text (file name) can be specified as a line offset within this file. HMI Embedded uses this information to identify the name of the transfer file or job list to be started.

Example: Output via RS 232 C (V.24) (R parameter channel 1)

Precondition:

- Standard list for NC data: See above
- Acknowledgment byte DB19.DBB24 is 0.
- PLC job "RS-232-C Out" DB19.DBB 12.6 = 1
- PLC index for channel 1 DB19.DBB 14 = 1
- PLC line offset DB19.DBB 15 = 14

→ File _N_CH1_RPA is output.

- HMI Embedded signals to the PLC: Reading out control file DB19.DBB24,6 = 1

Error messages to the PLC

The HMI Embedded outputs the following error values to the PLC via DB19.DBB25:

- 0 No error
- 1 Invalid number for control file.
(value in DB19.DBB14 < 127 or invalid)
- 2 Unable to read DB19.DBB15
- 3 Control file /BD.DIR/PLC_IN_OUT_xxx.TEA not found.
(value in DB19.DBB14 invalid)
- 4 Invalid index in control file.
(incorrect value in DB19.DBB15)
- 5 Selected job list in control file could not be opened
(HMI Advanced only)
- 6 Error in job list (job list interpreter returns error)
(HMI Advanced only)
- 7 Job list interpreter returns empty job list
(HMI Advanced only)
- 8 Error during RS-232-C transmission. The error text is entered
in the SERVICES LOG.
- 9 Error while executing job list
(HMI Advanced only)

User control file

- The PLC specifies an index (1 - 127) which determines the control file in which one or more texts (e.g. program names / job list names) are stored, and
- A further index (0, 1 - 255) as line offset to determine the text within this file. HMI Embedded uses this information to identify the name of the transfer file or job list to be started.

Transfer user files

Files that have been created specifically by the user can be stored in specially provided control files (user control list). The control file has the same structure as a part program.

The name of a file can be stored in each line. Line numbering can be used (i.e. N1 to N255). File names are assigned according to a predefined scheme:

The control file is called "_N_PLC_IN_OUT_xxx_TEA", in which xxx (index) stands for a number between 001 and 127. The number is specified in DB19, DBB14, bits 0 to 6, Bit7=1. The control file is stored in the operator data directory (_N_BD_DIR).

It is possible to store either complete paths or just the file names themselves. The names must be specified initially in NCK notation for HMI Embedded. But they can also be extended to the job list notation.

Example User control list "_N_PLC_IN_OUT_003_TEA",

```
N1 _N_OTTO_MPF
N2 /_N_WKS_DIR/_N_OTTO_WPD/_N_OTTO_MPF
N3 .....
```

If index 0 is specified, all files listed in the control file will be output.
The line numbers (N1 to N255) must be generated starting at 1 and incremented by 1 for each line.

Multiple operator panel fronts/NCUs (m:n)

Data transmission is performed via the operator panel front currently connected to the NCU.



Machine manufacturer

See machine manufacturer's specifications.

For a description of DB 19, please refer to:

References: /FB/ A2: Various interface signals

8.3 Reading ISO programs in/out via RS-232-C

Note

FANUC 0 control system programs can be read in and out as ISO programs.

ISO programs can be read in and out of HMI Embedded in punched tape format.
The punched tape format for ISO programs (ISO punched tape format) is not the same as Siemens HMI Embedded punched tape format.

The new ISO format settings are activated in display machine data
"MM_ISO_ACTIVE" (9390) ("MM_ISO_ACTIVE" = 1).

8.4 Data backup on PC card

With the PCU 20, the existing PC card plug-in unit can be used with various cards as an additional external program memory.

Memory cards

The following commercially available SANDISK cards are recommended:

SDP3B- 32-101

SDP3B-128-101

Cards available from Siemens:

- STRATA PC CARD with the card driver SINUCOPY FFS or SinuCom FFS
- Compact Flash Card with adapter

Supplementary conditions of the cards:

The "PCU_20.ABB" image must be in the Root directory of the Compact Flash Card.

- For an 8 MB image, at least a 16 MB Compact Flash Card must be used.
- For an 16 MB image, at least a 32 MB Compact Flash Card must be used.

Saving complete internal image

As of SW 6.5, it is possible to save a complete internal image, i.e. the current software version together with the OEM data, on an external card.

Procedure:

- Insert the card in the deactivated PCU 20.
- Switch on the PCU 20.
- The PCU ramps up and when the serial number appears, press key 6 on the operator panel several times.
- The following selection of update variants appears:

"-: Update from PC card with default configuration data".
Standard configuration is loaded (the current settings are discarded). The MAC address is checked during ramp-up.



Important

If the network settings were made on another PCU, network access is disabled. A network address must not be assigned more than once.

"0 : Update from PC card without updating configuration data".

The settings saved last on the PCU, e.g. network settings, color settings etc. are retained. The current settings are written to the PC card and are available at the next update as default.

Configured network data are:

- NETNAMES.BIN and CHAN.Sxx
- NETPCU20.INI
- BASIC.SYM and BASIC024.SYM
- CUSTOM.INI

"8 : Copy/save internal flash to PC card (incl. configuration and OEM data)".

The entire flash image of the PCU 20 is transferred to the PC card or Compact Flash Card.

"+" : Add/replace separate files to internal flash"

User-specific files, such as expand operator interface, PLC status screens, etc. added to or removed from the flash image. A floppy disk drive or a Compact Flash Card can be used, for example, as data source/target.

- To save the complete internal image, press the "8".

8.5 Data backup for HMI Embedded WIN32 with PCU 50/70

Data backup including hard disk backup is described in:

References: /IAM/IM4: Installing HMI Advanced



9

9 Diagnostics

9.1 Action log	IM2/9-162
9.1.1 Log file	IM2/9-164
9.1.2 Display log file / set action log	IM2/9-165
9.1.3 Read out log file	IM2/9-165
9.2 Software version display	IM2/9-166

9.1 Action log

The Action log function can be used to log operating sequences.

Function

The following functions are available:

- Logging of alarms
- Logging of key actuation
- Output of log file via RS-232-C (V.24).

The action log is password-encrypted (protection level less than/equal to 3).
Can be enabled/disabled via MD 9012 ACTION_LOG_MODE.

Note

The precondition for the Action Log function is that the "Start-up" operating area is installed.

9012	ACTION_LOG_MODE		
MD number	Action log settings		
Default: 255	Min. input value: 0	Max. input value: 0xffff	
Changes effective after POWER ON	Protection level (R/W) 2/2	Unit: -	
Data type: DWORD			
Meaning	This MD can be used to enable/disable the action log and to define a choice of the data to be logged.		
	Bit 0	= 1	Action log ON (default)
		= 0	Action log OFF
	Bit 1	= 1	HMI Advanced: Variable services (write accessing of geometrical data, e.g. tool offset) are logged. Meaning of the variables, see help in operating area Parameters under Variable Views (default).
		= 0	Variable services are not logged.
	Bit 2	= 1	HMI Advanced: PI services (e.g. program selection) are logged, for meaning of variables see help in operating area Parameters under Variable Views (default).
		= 0	PI services are not logged
	Bit 3	= 1	HMI Advanced: Domain services (e.g. load/unload program) are logged (default).
		= 0	Domain services are not logged.
	Bit 4	= 1	Changes to the alarm status are logged (default).
		= 0	Changes to the alarm status are not logged.
	Bit 5	= 1	Key actuations are logged (default).

	= 0	Key actuations are not logged.
Bit 6	= 1	Channel status / override is logged (default).
	= 0	Channel status / override is not logged
Bit 7	= 1	HMI Advanced: Softkey actuations and menu changes are logged. For Siemens internal use only (default) HMI Embedded: Identification number (ID) of the open and closed window is logged. For Siemens internal use only (default).
	= 0	Softkey actuations and menu changes are not logged.

If the action log is enabled, the files that can be logged are logged by default. The following events can be logged:

Alarm status

All displayed NC/PLC and HMI Embedded alarms and messages can be logged.

Key actuation

All operator panel front and MF2 key actuations can be logged.

Channel status / override

NC/PLC statuses can be logged using information about the channel status and the position of the override switch. At least in parts, if they can be recorded by time, these statuses are used to verify the operation of the MCP.

Window ID

The identification number of a screen is logged when it is opened or closed.

9.1.1 Log file

The log file is output in English.

File structure

The log file is divided into 4 columns:

- Date
- Time
- NCU name
- Event

Example of a log file:

Date	Time	Event specification
26.02.1999	07:45:20	HMI booting (conn.no: 0, MM_ACTION_LOG_MODE: ff, entries: 4094)
26.02.1999	07:45:20	Alarm 300701 Axis X1, drive 2 start-up required
29.09.1999	18:59:10	Key: 68 KEY_SELECT_MODE (0)
29.09.1999	18:59:07	Open window: 20005
29.09.1999	18:59:07	Close window: 20020

Output of the window name

As of SW 6.5, the window name, if known, is displayed in addition to the window ID in the action log.

E.g.:

```
....  
27.02.2002      18:59:07      Open window: (10001) Alarm
```

For older software versions, you can find an assignment of the window IDs to the window names in the "Documentation \ Window Lists" directory on the software CD.

For each software version, there is an assignment file which contains the version ID in the file name (e.g. 060507.txt for the software version P06.05.07).

You can see which software version is installed on the PCU at the start of the log file.

9.1.2 Display log file / set action log

Display log file

The display is password-protected.

The current log file is displayed on the screen of the operator panel front in the "Diagnostics" operating area in the "Service Displays" -> Action Log menu in the "Action Log File" screen.

If a crash file exists, the softkey "Crash Data" is also displayed, with which the crash file can be displayed.

The vertical softkey "Data Out -> RS-232-C (V.24)" can be used to output and archive the log file.

Set action log

The action log settings are password-encrypted.

The screen "Action log settings" is displayed in the menu HMI Embedded in the Start-up operating area. Here you can:

- enable/disable the logging
- select the data to be logged
 - alarm status change
 - key actuation
 - channel status/override
 - window IDs

The selected setting must be confirmed by pressing the softkey "OK".

9.1.3 Read out log file

The log file output is password-encrypted.

There are two possible ways to output the log file:

1. via the Diagnostics operating area in the menu Service Displays -> Action Log -> Read-out via RS-232C or
2. via the boot menu.

A boot menu is displayed whenever a crash event exists (PLC bit DB19, byte0, bit6). The bit is set and reset from the PLC at the user interface (as with key lock, screen darkening, etc.). HMI Embedded evaluates the rising edge of the signal (i.e. a transition from 0 to 1) and creates the log file when the signal comes. HMI Embedded only reads the data, i.e. the signal must be reset from the PLC/user program.

If the bit is already set when HMI Embedded is booted, HMI Embedded does not respond to the value of the bit (only after it has been reset and set again).

- The log file _AC_LOGP.TXT is read out either during the boot process or can be read out in the Diagnosis operating area until the system is next switched off. The file is then deleted.
- Reboot of the control with
- Prompt: "Action log detected! Read out V.24? ([Y]/N)"
- If you acknowledge this question with "Yes", the log will be read out via RS 232 C (V.24).

Requirement: The interface parameters of RS 232 C (V.24) must be set accordingly.

Note

A latency must be observed between two signals to make sure that the second signal can be processed.

9.2 Software version display

Function

The version data of the installed system software are output in the version display.

Procedure

- Select the "Diagnostics" operating area
- Select the "Service displays" softkey
- Select the "Version" softkey

You can display the version data of the following areas via the horizontal softkeys:

- Version data of the NCU
- Version data of the HMI
- Version data of the cycles (user, manufacturer, standard cycles)



10

10 Configure Windows in the NC Program

10.1	Structure of the statements	IM2/10-168
10.2	Statement examples	IM2/10-169
10.3	Sample program 1: MMC command without acknowledgment.....	IM2/10-171
10.4	Sample program 2: Hold time and optional text variables	IM2/10-172
10.5	Sample program 3: MMC command with synchronous acknowledgment mode.....	IM2/10-173
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Introduction

With software version 4.4 and higher, you can configure your own dialog windows (dialog screens) and display them on HMI Embedded.
The appearance of the dialog windows is configured purely by text (COM file in the cycles directory). The dialog window is opened and closed by function calls from the parts program.
User-configured dialog windows do not modify the HMI system software (operator interface).
You cannot call user-defined dialog windows simultaneously in different channels, i.e. you can only use the MMC command with a 1:1 link.
The "Configure Windows in the NC Program" function is also referred to as the "command channel".

Application

One possible application of user dialog windows is, for example, to selectively assign current values to particular user variables (GUD) prior to a parts program run.

10.1 Structure of the statements

Syntax

MMC ("operating area, command, Com file, dialog box name, user data definition file, graphics file, display time or acknowledgment variable, text variables...", "Acknowledgment mode")

Operating area

Name of softkey with which the configured user dialogs can be called. Default entry: "CYCLES", appears as "Cycles" on softkey 7 (with Win32: Softkey 14) and can be reached via the "ETC" key.

Command

Picture_on select screen
Picture_off deselect screen

Com file

Name of the dialog box file (max. 8 characters, in the user cycles or standard cycles directory CST.DIR). The dialog screen design is defined here. The dialog screen is used to display user variables and/or comment texts.

Dialog screen name

The individual screens are selected via the dialog screen names.

User data definition file

GUD file accessed on reading/writing of variables.

Graphics file

File name of a BMP graphic to be inserted.

See Operator Interface book, BE1: Chapter, Screen elements, pictures

Display time or acknowledgment variable

Display time

in acknowledgment mode "N"

Acknowledgment variable

in acknowledgment mode "A"

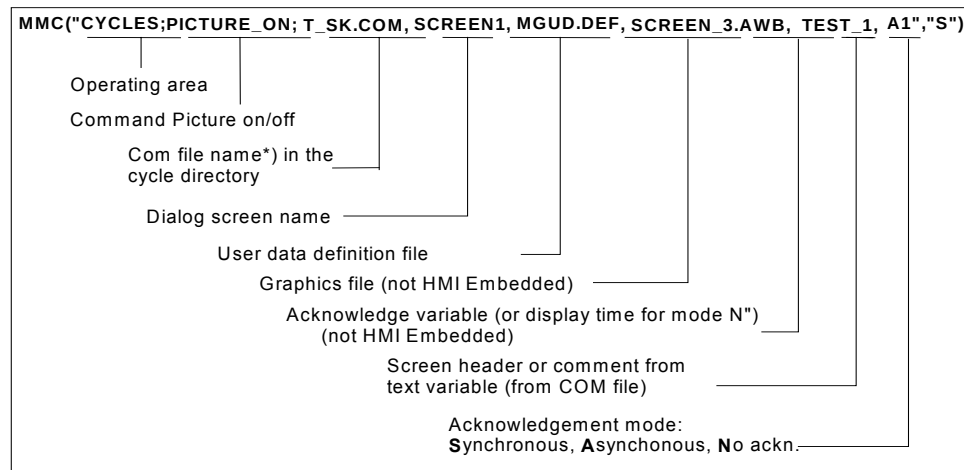
Text variables

Screen header or comment text from a text variable in the COM file.

Acknowledgment mode

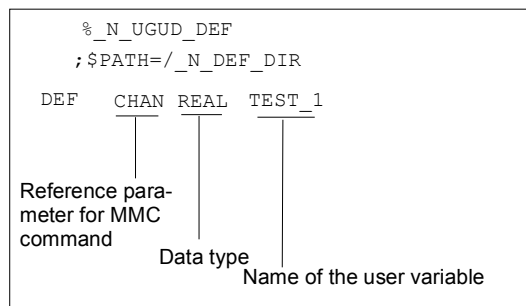
"S"

Synchronous, acknowledgment via "OK" softkey

10.2 Statement examples**MMC command in the parts program**

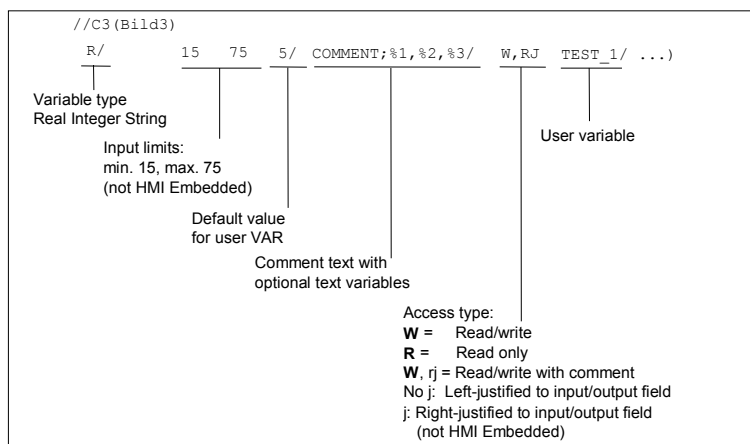
*) On the MMC103 / PCU 50, the file is named T_SK_GR.COM for example, but is called here without language identifier "GR".

User variables (in the definition directory)



Dialog screen file (in the cycle directory)

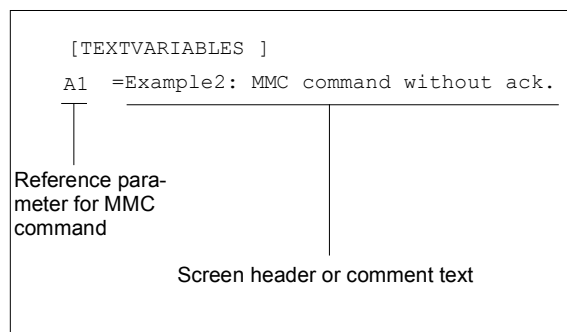
(*.COM)



Note

For variable names, text variables and cycle names, capital letters must be used.

Text variables



10.3 Sample program 1: MMC command without acknowledgment

Part program

```
N10 MMC ("CYCLES, PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , , A1",
        "N")
N20 TEST_1 = 1
N25 G4 F10
N30 MMC ("CYCLES, PICTURE_OFF", "N")
N40 M30
```

Dialog screen file (*.COM)

```
//C1(SCREEN1)
(R///USER VAR TEST_1/W/TEST_1///)
```

Text variable

```
TEXT VARIABLES]
A1 =.....Example1: MMC command without acknowledgment.....
```

Sequence

The user variable TEST_1 from GUD4.DEF with header A1 is displayed for a short time.

The display time comes from parts program block N25.

The screenshot shows a graphical user interface for an HMI. At the top, there is a title bar with the text "Example 1: MMC command without acknowledgement". Below the title bar, the main display area shows the text "ANW.VAR TEST_1" followed by a numeric input field containing the value "1.000000" and a small square button. To the right of the main display area, there is a vertical column of seven small square buttons. At the bottom of the screen, there is a horizontal row of eight small square buttons.

10.4 Sample program 2: Hold time and optional text variables

Part program

```
N10 MMC ("CYCLES, PICTURE_ON, T_SK.COM, SCREEN6, GUD4.DEF, , 10,  
      T1, G1", "N")  
N15 G4 F15  
N30 MMC ("CYCLES, PICTURE_OFF", "N")  
N40 M30
```

Dialog screen file (*.COM)

```
//C6(screen6)  
(R///USER VAR TEST_1,%1/W/TEST_1///)
```

Text variable

[TEXT VARIABLES]

T1 = Example2: Hold time and optional text variables...

G1 = Optional text variable

The 7th parameter is interpreted as the display time for the mode without acknowledgment (10 seconds).

The contents of the table are then deleted. The screen form remains on the screen until Picture_off is selected.

The 8th parameter (T1) is the text variable for the screen header. If there is no entry, the operating area name (cycles) is displayed.

The parameters 9 to 23 are optional text variables (in this case "G1=optional text variable").

In this COM file, the optional text variables must be loaded with default values in the "[Text variables]" section.

Sequence

The comment text from the COM file (USER VAR TEST_1) is expanded in this example at the position of the first wild card (%) by the contents of the text variable "G1optional text variable". By calling the text variables contained in the MMC command (9th to 23rd parameters), messages or names can be "composed" in this way.

10.5 Sample program 3: MMC command with synchronous acknowledgment mode

Part program

```
N15 MMC ("CYCLES, PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , , F1",
        "S")
N18 STOPRE
N20 TEST_1 = 5
N25 MMC ("CYCLES, PICTURE_OFF", "N")
N30 M30
```

Dialog screen file (*.COM)

```
//C1(SCREEN1)
(R///USER VAR TEST_1/W/TEST_1///)
```

Text variable

F1 = ...Example3: MMC command with synchronous acknowledgment mode...

Sequence

The user variable Test_1 is displayed until the "OK" softkey is pressed.

The user variable has also been overwritten with the value 5 here.

Without STOPRE, this assignment would be carried out **before** the keyboard input (after it with STOPRE!).

10.6 Sample program 4: Positioning the input and output field

By specifying position parameters in the COM file, you can insert the comment field, or input and output field, at any position within the display area.

```
N15 MMC ("CYCLES, PICTURE_ON, T_SK.COM; Screen2,  
      GUD4.DEF,,,C1", "S")  
N20 TEST_3 = 5  
N30 MMC ("CYCLES, PICTURE_OFF", "N")  
N40 M30
```

Dialog screen file (*.COM)

//C2(Screen12)

(R//Var.Name/R/TEST_3/6000,2800,8000/ 200,3000,7500)

Position of the comment field:

Position of the input/output field

Initial value = 0 → automatic positioning to default value
No value → Standard positioning as with PCU20

The two parameters each consist of three numerical values; these specify the position and length of the field. The values are specified in Twips, with 15 Twips roughly corresponding to one pixel.
The field height is defined as being 250 Twips.

Meaning of values:

(./6000,2800,8000/....)

Clearance from left screen edge

Clearance to upper screen edge

Length of the field

It is possible to graphically configure 16 comment and 16 input or output fields.
Where there are more than 16 fields, they can be controlled via a scroll bar.

Example 4: Position parameter

ANW.VAR TEST_2

1.000000

OK

To ensure that the cursor control works seamlessly, the configured fields must overlap one another (see below):

Example 4: Position parameter

1.000000

1.000000

1.000000

1.000000

OK

10.7 Sample program 5: Insert pictures

You also have the option of inserting graphics, e.g. pictures created with Paintbrush, in the dialog screen by specifying a graphics file.

A comment text for the picture can also be preassigned via the Com file. You can position this comment text by specifying position parameters.

Note

You can only move the picture itself by repositioning it in the graphics program.

Part program

```
N10 MMC ("CYCLES, PICTURE_ON, T_SK.COM, SCREEN8, GUD4.DEF,  
        GRA.BMP, , M1", "S")  
N20 MMC ("CYCLES, PICTURE_OFF", "N")  
N30 M30
```

Dialog screen file (* .COM)

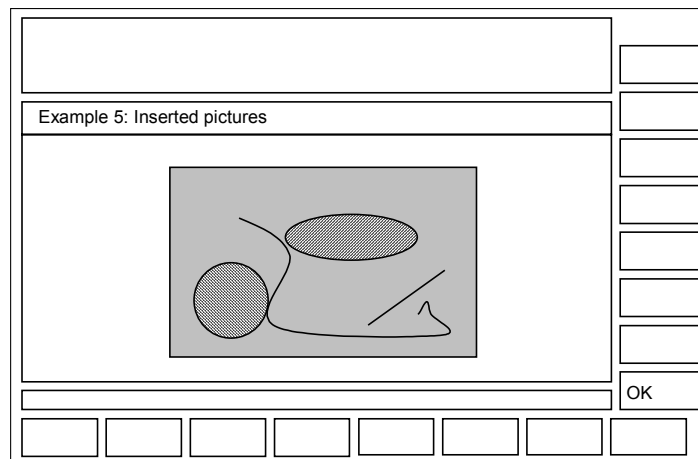
```
//C8(SCREEN8)  
(I/// Insert picture no. 2///4000,3000,7500)  
(I/// Created with Paintbrush ///4000,3250,7500)
```

Text variable

M1 = ...Example5: Insert picture.....

Pictures are created, e.g. with the drawing tool "Paintbrush".

Picture size: 300X500 pixels, you can only change the picture size in Paintbrush.



10.8 Sample program 8: Asynchronous acknowledgment mode with softkeys

Softkeys can be preprogrammed in the COM file for display in asynchronous mode, linked with the acknowledgment variable and evaluated in the parts program.

Part program

```

N10   QUIT_1 = "START"
N20   MMC ("CYCLES, PICTURE_ON,T_SK.COM, SCREEN3,GUD4.DEF,,
        QUIT_1,K1","A")
N30   LABEL0:
N40   STOPRE
N50   IF MATCH (QUIT_1,"SK1") >= 0 GOTOF LABEL1
N60   IF MATCH (QUIT_1,"SK2") >= 0 GOTOF LABEL2
N70   GOTOB LABEL0
N80   LABEL2:
N90   MMC ("CYCLES, PICTURE_ON,T_SK.COM, SCREEN1,GUD4.DEF,,,
        N1","N")
N100  G4F10
N110  LABEL1:
N120  MMC ("CYCLES, PICTURE_OFF","N")
N130  M30

```

Dialog screen file

(* .COM)

```

//C3(Screen3)
(S/// USER VAR QUIT_1/W/QUIT_1//)
[TEXT VARIABLES]
K1 = ..Example8: MMC command with asynchronous acknowledgment mode
N1 = ..Example8: Screen2

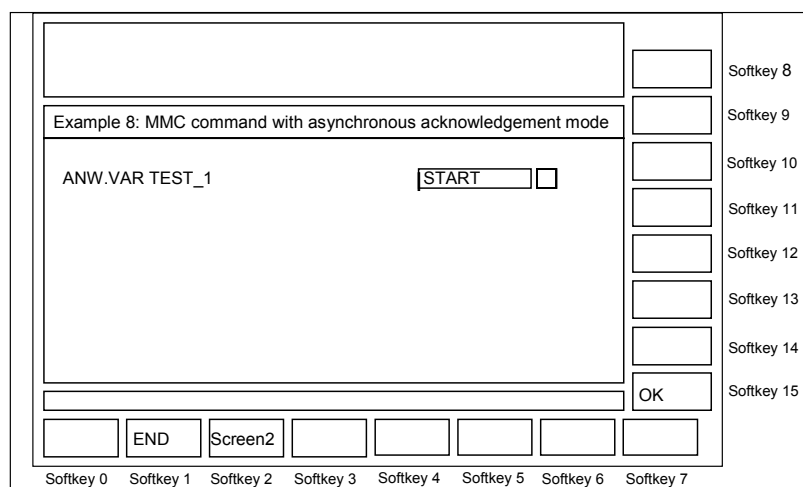
```

Text variable

```

[SCREEN3]
SK1 = END
SK2 = Screen2

```



Sequence

The screen called via the asynchronous MMC command continues to be displayed until one of the two configured softkeys is actuated:

With softkey "END", the user dialog is immediately exited.

With softkey "Screen2", a further screen is then displayed for 10s.

Program

- The acknowledgment variable is defined as a string.
Length of the string: ≥ 20
(Values < 20 are evaluated internally only, **SK0 ... SK15** are entered at position 17...20 on actuation of the softkey).
- The string is assigned a value in the parts program and any old softkey information is deleted.
- Before the parts program can branch as a function of the acknowledgment variable, the block search must be halted by the STOPRE command.
- `IF Match (Quit_1, " SK1")  $\geq$  0 GotoF Label1`
searches for a string within the string
If no softkey is actuated, the loop runs again.

10.9 List of files for the dialog screen files

Parts programs

```
%_N_MMC_EXAMPLE1_MPF
N10 MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , , A1",
        "N")
N20 TEST_1 = 1
N25 G4 F10
N30 MMC("CYCLES, PICTURE_OFF", "N")
N40 M30
```

```
%_N_MMC_EXAMPLE2_MPF
N10 MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN6, GUD4.DEF, , , 10,
        T1, G1", "N")
N15 G4 F15
N20 MMC("CYCLES, PICTURE_OFF", "N")
N25 M30
```

```
%_N_MMC_EXAMPLE3_MPF
N15 MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , , F1",
        "S")
N20 TEST_1 = 5
N30 MMC("CYCLES, PICTURE_OFF", "N")
N40 M30
```

```
%_N_MMC_EXAMPLE4_MPF
N15 MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN2, GUD4.DEF, , , C1",
        "S")
N20 TEST_3 = 5
N30 MMC("CYCLES, PICTURE_OFF", "N")
N40 M30
```

```
%_N_MMC_EXAMPLE5_MPF
N15 MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN8, GUD4.DEF,
        GRA.BMP, , M1", "S")
N30 MMC("CYCLES, PICTURE_OFF", "N")
N40 M30
```

```
%_N_MMC_EXAMPLE8_MPF
N10   QUIT_1 = "START"
N20   MMC("CYCLES, PICTURE_ON,T_SK.COM,SCREEN3,GUD4.DEF,,
        QUIT_1,K1","A")
N30   LABEL0:
N40   STOPRE
N50   IF MATCH (QUIT_1,"SK1") >= 0 GOTOF LABEL1
N60   IF MATCH (QUIT_1,"SK2") >= 0 GOTOF LABEL2
N70   GOTOB LABEL0
N80   LABEL2:
N90   MMC("CYCLES, PICTURE_ON,T_SK.COM,SCREEN1,GUD4.DEF,,,
        N1","N")
N100  G4 F10
N110  LABEL1:
N120  MMC("CYCLES, PICTURE_OFF","N")
N130  M30
```

Dialog screen files (*.COM)

```
_%_N_T_SK_GR.COM
; $PATH=/_N_CST.DIR
//C1(SCREEN1)
(R///USER VAR TEST_1/W/TEST_1///)
//C2(SCREEN2)
(R///USER VAR TEST_2/W/TEST_2/6000,2800,8000/200,3000,7500)
//C3(SCREEN3)
(S///USER VAR QUIT_1/W/QUIT_1///)
//C4(SCREEN4)
(R///USER VAR TEST_1/W/TEST_1/4000,250,2000/6000,250,1500/)
(R///USER VAR TEST_2/W/TEST_2/4000,1000,2000/6000,1000,1500/)
(R///USER VAR SINUM_1/W/SINUM_1/0,250,2500/1900,250,2000/)
(R///USER VAR SINUM_3/W/SINUM_3/0,1000,2500/1900,1000,2000/)
//C5(SCREEN5)
(R///USER VAR TEST_2/r,rj/TEST_2///)
//C6(SCREEN6)
(R///USER VAR TEST_1,%1/W/TEST_1///)
//C7(SCREEN7)
(R///USER VAR TEST_1/W,RJ/TEST_1///)
(I///)
(R///Actual value from axis1/R/$actual value)
(R//1/R parameter12/W/$R[12])
//C8(SCREEN8)
(I///Insert picture no.///4000,3000,7500)
(I///Created with Paintbrush///4000,3250,7500)
```

Text variable definition

[TEXT VARIABLES]

A1 = Example1: MMC command without acknowledgment

T1 = Example2: Hold time and optional text variables

C1 = Example4: Position parameters

G1 = Optional text variable

F1 = Example3: MMC command with synchronous acknowledgment mode

I1 = Type of access to user variable

K1 = Example8: MMC command with asynchronous acknowledgment mode

M1 = Example5: Insert picture

N1 = Example8: Screen2

[SCREEN3]

SK1 = END

SK2 = Screen2

SK3

SK4

[OPiVar]

\$Actual value=/Channel/machineaxis/actToolbasePos[u1,1]

\$R[12]=/Channel/Parameter



11

11 Installation and Start-Up of SINUMERIK HT6

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Introduction

This chapter describes how to install and start up the HT 6.
For further reading on special NCK, MMC, PLC or drive functions, please consult the Descriptions of Functions/Manuals (see Section: Documentation)

11.1 Hardware and software requirements

11.1.1 Hardware

The handheld terminal HT 6 comprises a flat screen, softkeys, keypad, override rotary switch, emergency switch and enable key, as well as interfaces and power supply.

The HT 6 combines the functions of the HMI and MCP.

Required equipment and accessories

In order to install the software on the HT 6 you require

1. A PC or PG with CDROM drive, keyboard and mouse
2. A PC or PG with Omnidrive for writing to the PC card
3. Linear flash memory card

Linear flash memory cards are used for both the NCU and the HT 6. These cards look identical and are therefore easily mistaken. We will distinguish between them below by referring to the card for the

- NCU as the "NCU card" and
- the card for the HT 6 as the "PC card".

11.1.2 Software

The software used to install the HT 6 software is pre-installed on the HT 6 when it is shipped.

The complete HT 6 software package as of SW 6.4 is supplied on one CD:
A folder named e.g. "sw_6_x" containing the following is stored on the CD:

- Documentation:
Upgrade instructions in English "siemende.txt" and German "siemendd.txt"
- Directory "flashabb"
This directory contains the PC card image HT6.ABB of the standard system/application software in English and German.
- Directory "Installation diskette"
This directory contains the following files:
 - "Setup.exe", starts the routine with which you can create your own flash image HT6.ABB, i.e. you can modify the following application parameters:
 - Select other languages (if enough memory is available),
 - Change the MPI parameters (NETNAMES.INI),
 - Adapt parameters for several operator panel fronts / NCUs,

- Set defaults for display machine data,
- Modify system files "AUTOEXEC.BAT" and "CONFIG.SYS",
- Adapt and expand alarm text files.
- The files required by Setup.exe, i.e. INSTALL.000 – INSTALL.xxx. (The number of files is dependent on the software version.)

If you want to change the configuration of the installed software or install a new software version, then you must replace the software.
In this case, you can choose whether the replacement software has the standard configuration or a modified configuration.

The five available interface languages are English, German, French, Spanish and Italian.

Additional languages

A separate language add-on CD is available which allows you to both install additional languages and to replace the existing standard languages.

Precondition

The software can run on a PC or PG under the following operating systems:

- Windows 98
- Windows Me
- Windows NT (version 4.0 and later)
- Windows 2000
- Windows XP

To store the data of the installation CD and create a flash image (8 MB) for the PC card, there must be at least 30 to 40 MB of free memory available on the PC or PG.

If you wish to install pictographic languages such as Korean or Chinese, you will need significantly more memory.

Procedure: Software replacement

1. Software replacement with standard configuration
or
software replacement with modified configuration
2. Create an image
3. Upload the image to the PC card
4. Load the image from the PC card to the HT 6

11.1.3 Documentation

You will require the following documentation to install and start up the HT 6:

- /BH/ Operator Components Manual, Section: Handheld Terminal HT 6
- /BH/ SINUMERIK 840Di Manual, Section: Handheld Terminal HT 6
- /FB1/ P3/ Description of Functions Basic Machine, Section: HT 6
Signals to Interfaces
- /FB2/ B3/ Description of Functions Extension Functions, Section:
Several Operator Panel Fronts
- /IAC/Installation & Start-Up Guide, Section: Handheld Terminal HT 6
- Lists /LIS/
- Diagnostics Guide /DA/
- Installation & Start-Up Guide, HMI Option Package /IAM/BE1/
- Operator's Guide HT 6 /BAH/

11.2 Software replacement with standard configuration

If you want to accept the standard configurations of the new software, follow the procedure below:

Preparing for installation

- Place the CD in the CD drive of the PC or PG,
- Open the folder "Installation diskette" and
- Start "Setup.exe".

In the first screen you can choose between English and German as the language for the installation preparation menus.

Select your chosen language and click "OK".

The next screen will display a default installation path and name for the software package, e.g. "E:\HMI_HT6".

If you want to specify a different path, select the "Change" button and the following screen will appear:

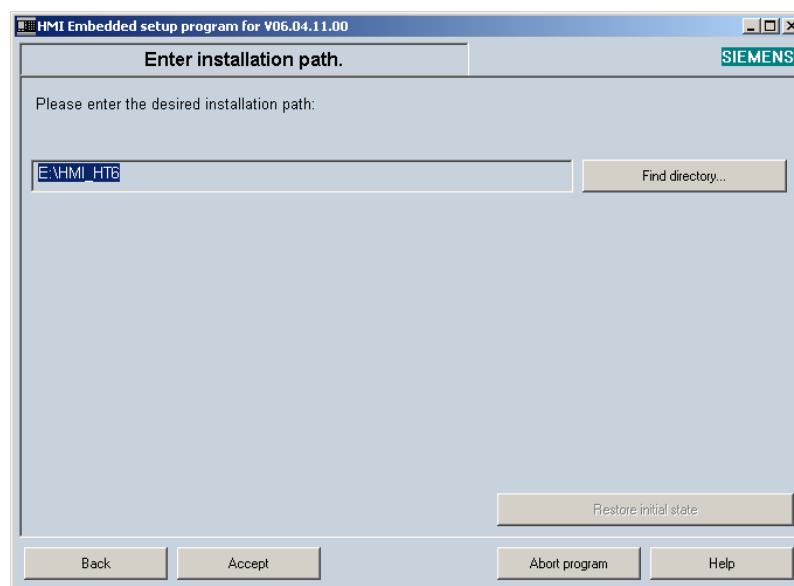


Fig. 11-1 Installation directory

You can enter the path and name directly in the input field or open the Explorer by clicking the "Find directory.." button.

Choose the installation path by clicking the "Select" button. The installation path is then displayed and you can preset it by clicking the "Accept" button.

You then return to the previous screen (see screenshot above) where the installation path will be displayed.

Click the "OK" button to continue the installation.

If the software is already installed, a prompt will be displayed confirming that the directory already exists and that existing data will be deleted.
If you click the "Cancel" button, you will return to the previous screen.
If you click "OK", the installation will continue and the files will be overwritten.

The current status of the installation preparation process is displayed in the next screen.

Once the preparation is complete, you have the following two options:

1. Install the software at a later time:
Click the "Finished" button to end the preparation phase and continue the installation at a later point in time. All data have now been downloaded from the data medium (CD) to your local hard disk which means that you do not need the CD to continue the installation.
To resume the installation at a later time, simply go to the directory that you specified during the preparation phase and start the "Setup.Exe" routine again.
2. Install the software immediately:
If you click the "Start program" button, you can configure the software immediately.
The "Installation" screen opens in which you can select between two installation program languages, i.e. German and English. Confirm your selection with "OK".

The "Selected configuration" screen appears. This displays an overview of current user settings.

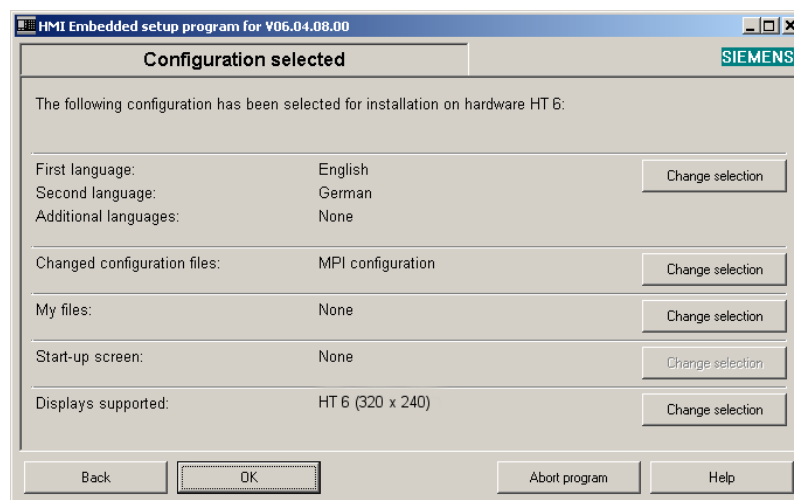


Fig. 11-2 User settings

Confirm these settings with "OK".
The data compilation process then commences.

For information on what to do next, see sections:

- Creating an image
- Uploading the software image to the PC card and
- Loading the software from the PC card to the HT 6

11.3 Software replacement with modified configuration

If you want to modify the application parameters to suit your own requirements, you can do this in a menu-assisted process in software version 6.4 and later.

11.3.1 Preparing for installation

- Place the CD in the CD drive of the PC or PG,
- Open the folder "Installation diskette" and
- Start "Setup.exe".

In the first screen you can choose between English and German as the language for the installation preparation menus.
Select your chosen language and click "OK".

The next screen will display a default installation path and name for the software package, e.g. "E:\HMI_HT6".

If you want to specify a different path, select the "Change" button and the following screen will appear:

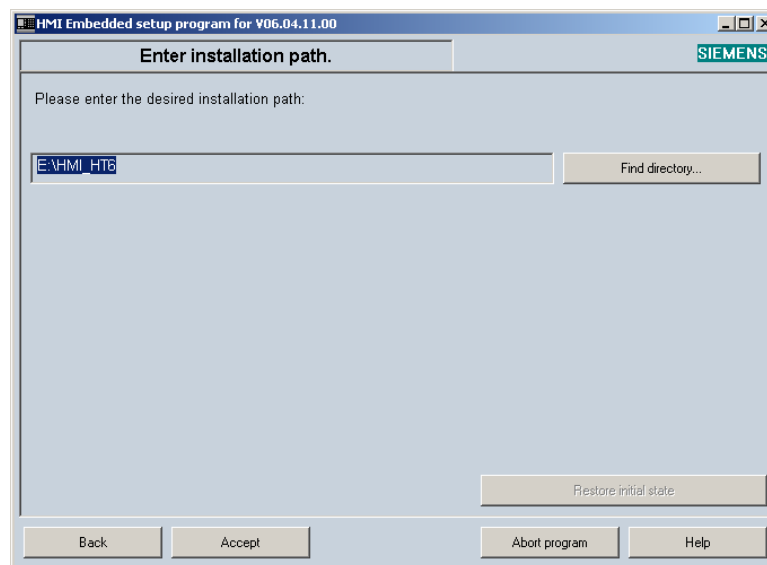


Fig. 11-3 Installation directory

You can enter the path and name directly in the input field or open the Explorer by clicking the "Find directory.." button.

Choose the installation path by clicking the "Select" button.
The installation path is then displayed and you can preset it by clicking the "Accept" button.

Click the "OK" button to continue the installation.

If the software is already installed, a prompt will be displayed confirming that the directory already exists and that existing files will be deleted.
If you click the "Cancel" button, you will return to the previous screen.
If you click "OK", the installation will continue and the files will be overwritten.

The current status of the installation preparation process is displayed in the next screen.

Once the preparation is complete, you have the following two options:

1. Install the software at a later time:
Click the "Finish" button to end the installation preparation phase.
All data have now been downloaded from the data medium (CD) to your local hard disk which means that you do not need the CD to continue the installation.
To resume the installation at a later time, simply go to the directory that you specified during the preparation phase and start the "Setup.Exe" routine again.
2. Install the software immediately:
If you click the "Start program" button, you can perform the actual configuration.
The "Installation" screen opens in which you can select between two installation program languages, i.e. German and English.
Confirm your selection with "OK".

11.3.2 Modifying the configuration

Selected configuration

The "Configuration selected" screen displays an overview of the current user settings.

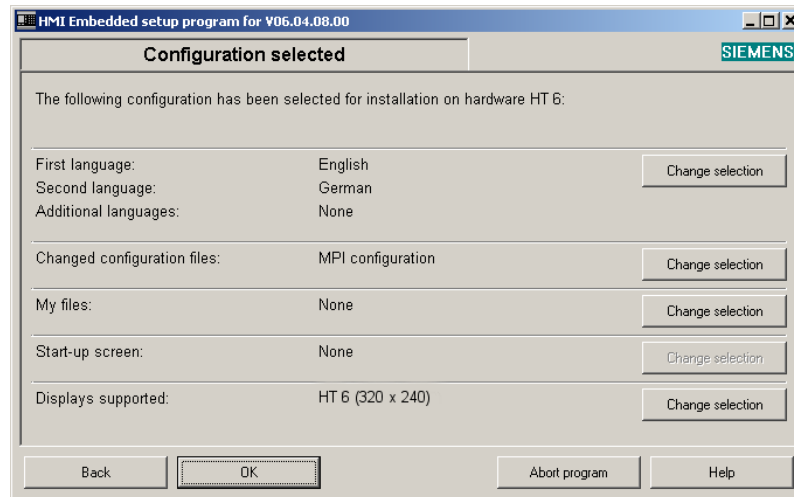


Fig. 11-4 Selected configuration

You can view, edit or add to the user settings listed below. Furthermore, you can also install your own or manufacturer-specific files.

- Language setting
- Modified configuration files
- Your own files
- Boot screen (HT 6 does not have a boot screen)
- Supported displays

If you click the "Change selection" button, you will be able to view further areas and files in which you can make your own settings.

Clicking "OK" will confirm these settings and initiate data compilation.

Note

Some buttons are displayed in all screens and have the following function:

- "Back" takes you back to the previous screen.
 - "Cancel program" allows you to close and exit the program after a confirmation prompt.
 - "Help" displays a dialog box containing a help text.
 - "Restore defaults" is activated only if you have entered your own settings. When you select this button, the defaults defined by Siemens AG are restored again.
When this button is clicked, a prompt appears asking you to confirm restoration of the default settings with "OK" or allowing you to retain your own settings with "Cancel". The button is deactivated again once the defaults have been restored.
 - "Reject" enables you to cancel the last setting entered.
 - "Accept" confirms the settings you have made and returns you to the "Selected configuration" screen.
-

Select language

You are in the "Selected configuration" screen.

If you select the "Change selection" button in the language selection line, you will open the "Select language" screen.

A table of available languages is displayed: You can make your selections for the 1st and 2nd languages, or choose "No 2nd language", by activating the corresponding checkboxes.

Add new languages:

If you wish to integrate additional languages, these can be loaded from a separate language CD.

Place the CD in the CD drive of the PC or PG and click the "Add new languages" button.

The dialog box "Extended language selection" appears.

You can enter the CD drive path manually in the input field or open the Explorer view by clicking the "Find directory.." button.

Choose a directory and confirm by clicking the "Select" button.

You will then return to the previous screen in which the selected path is now displayed. Click "Accept" to start the installation. You will be able to monitor its progress on the screen.

If languages are already installed, the message "Overwrite language" will appear. If you have loaded a new language to the installation directory, you will return to the "Select language" screen. This will now show the new language for you to select.

Reset selection:

If you have selected a directory and want to remove it, click the "Reject" button. The Explorer is then closed. You can click the "Back" button to return to the "Select language" screen.

Modified configuration files

If you click the "Change selection" button in the "Modified configuration files" line, you will open a screen in which you can view, modify or add to the following user- and manufacturer-specific files.

- MPI configuration: The NETNAMES.INI file opens
- Display machine data: The BD.TEA file opens
- Hardkey configuration: Further subdivision into areas:
 - Configuration file
 - .ini files
- Alarm and user texts: Further subdivision into areas:
 - Texts for channel menu (CHAN.TXT)
 - User cycle texts (ALUC.TXT)
 - User PLC alarm texts (ALPU.TXT)

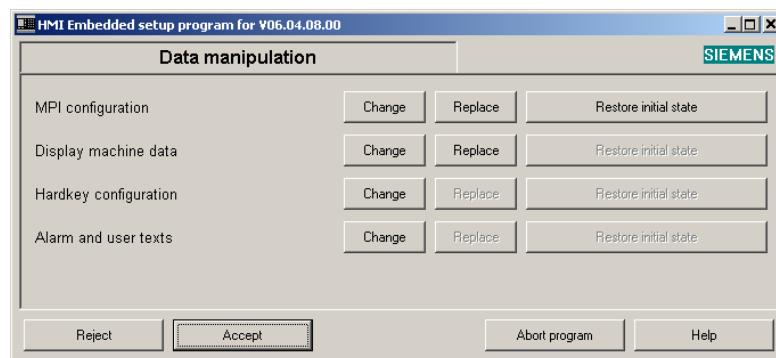


Fig. 11-5 Adapt configuration files

Clicking the "Change" button starts the editor in which you can view, modify or add to the values and settings in the opened files. Clicking "Change" in the last two lines opens screens displaying further subcategories of files.

If you want to link a file of your own into the installation environment, click the "Replace" button. The Explorer will then open and you can select this file, e.g. one containing data specific to your own requirements.

MPI configuration

The information needed to set up the links between the HT 6 and NCU/PLC units and to define their properties is stored in the NETNAMES.INI configuration file.

For example, you want to link an HT 6 to two NCs. You use the channel switchover key and the channel menu to switch from one NC to the other. The softkey assignments must be configured in file NETNAMES.INI.

Click the "Change" button after "MPI configuration" in the "Adapt configuration files" screen. The NETNAMES.INI file opens. You can view the settings and modify or add to them if required.

Click the "Replace" button if you want to install your own file. The Explorer then opens. Select the appropriate file and click the "Select" button.

This is then accessed as the installation file.

The actual file configuration is described in the following sections or references

see Section: "Switching over channels/operator units",
Sample configuration of a "NETNAMES.INI" file

References: /FB2/B3: Description of Functions, Extension Functions,
Several Operator Panels: Sect.: Configuration file NETNAMES.INI

Display machine data

The defaults for the display machine data are stored in file BD.TEA.

If you click the "Change" button, file BD.TEA opens and displays the machine data and their settings.

Note

You cannot change the display machine data for HT 6 in file BD.TEA! You can only alter the default settings for these machine data.
Any changes are activated only if the display machine data does not exist in the NC.

If you possess the required access authorization, you can also change the default settings in the "Start-up" operating area while the system is operating.

References: /BAH/HT 6 Operator's Guide, Section: Start-up

Note

Any default settings for display machine data altered in this menu cannot, however, be changed after the software has been installed!

Select "Replace" to link a file containing user-defined display machine data into the installation environment. Choose the relevant file in the Explorer view and confirm by clicking "Select".

Hardkey configuration

If you click the "Change" button in the "Hardkey configuration" line, the following selections will appear:

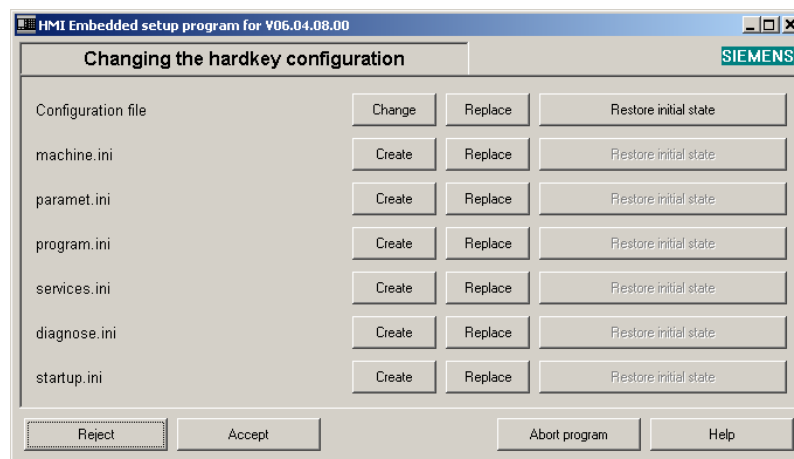


Fig. 11-6 Hardkey configuration

These hardkey configuration files (.ini files) are displayed for selection per default. The configuration file contains the following files.

- machine.ini
- paramet.ini
- program.ini
- services.ini
- diagnosis.ini
- startup.ini

Configuration file:

The .ini files for hardkeys are assigned in configuration file KEYS.INI. Without this entry, the ini files will not be detected.

If you want to change the names and settings of files contained in the configuration file, click the "Change" button.

The editor is then started and the KEYS.INI file opens. You can change, add or delete hardkey names in this file.

Save your change and close the editor.

You will return again to the overview where the current hardkey files are displayed.

If you want to link your own KEYS.INI file into the software environment, click the "Replace" button. Choose the relevant file in the Explorer view and confirm by clicking "Select".

.ini files

The individual hardkeys/softkeys are configured in the .ini files.

If the .ini files do not yet contain any settings, click the "Create" button. A file containing only header data will be opened; you can enter your configuration settings here.

For an exact description of how to configure a hardkey/softkey, please refer to the following documents:

References: /PJE/ HMI Embedded Configuring Package: Configuring a project
/IAM/BE1/ HMI Option Package

If you have your own ini files, you can link them into the installation environment by clicking "Replace", choosing the relevant file and confirming with "Select".

If an ini file has already been set up, the "Create" button is replaced by the "Change" button which you can use to open the file.

Confirm the file settings by clicking the "Accept" button.

Caution

If you click the "Reject" button in the "Change the hardkey configuration" screen, **all** settings made in the .ini files and the configuration file are discarded and you then return to the "Adapt configuration files" screen.

Alarm and user texts

In order to be able to adapt alarm and message texts to the specific requirements of a machine, the alarm and message texts are stored in freely accessible ASCII text files.

If you click the "Change" button in the "Alarm and user texts" line, a screen displaying different categories of user text will appear:

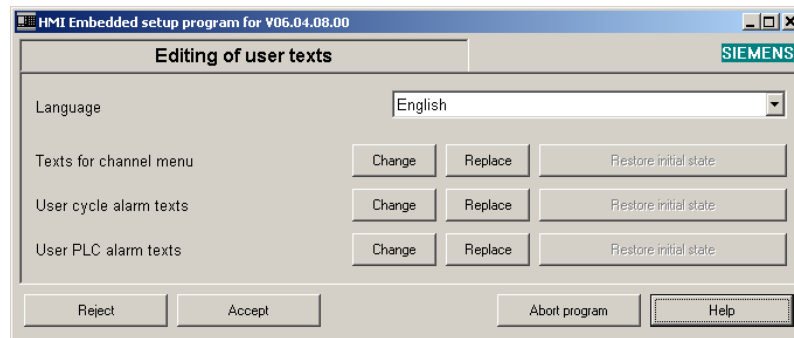


Fig. 11-7 Modifying user texts

You can select the following categories of text:

- Texts for channel menu
- User cycle alarm texts
- User PLC alarm texts

Language:

You can select the language for the files to be changed in this box. The box contains every installed language.

Texts for channel menu:

In order to identify the NCU to be addressed, the texts for the labeling of softkeys on the operator panel must be entered in file CHAN.TXT.

If you want to link your own file into the installation environment, click the "Replace" button, select the file and confirm with the "Select" button.

If you click the "Change" button in the "Texts for channel menu" line, you will open the CHAN.TXT file directly in which you can view and modify the configuration.

See Section: Alarm and message texts

User cycle alarm texts

You can insert your own alarm and message texts in the text files. Cycle alarm texts are integrated in text file ALUC.TXT.

If you want to link your own file into the installation environment, click the "Replace" button, select the file and confirm with the "Select" button.

If you click the "Change" button in the "User cycle alarm texts" line, you will open the ALUC.TXT file directly in which you can view and modify the configuration.

See Section: Alarm and message texts

User PLC alarms

Manufacturer-specific PLC alarms or PLC messages can be integrated and anchored in the ALPU.TXT file.

The alarm text and message files contain only Siemens texts.

If you want to link your own file into the installation environment, click the "Replace" button, select the file and confirm with the "Select" button.

If you click the "Change" button in the "User PLC alarm texts" line, you will open the ALPU.TXT file directly in which you can view and modify the configuration.

See Section: Alarm and message texts

Your own files

If you want to add your own files to the installation environment, click the "Change selection" button after "Own files".

The following screen opens:

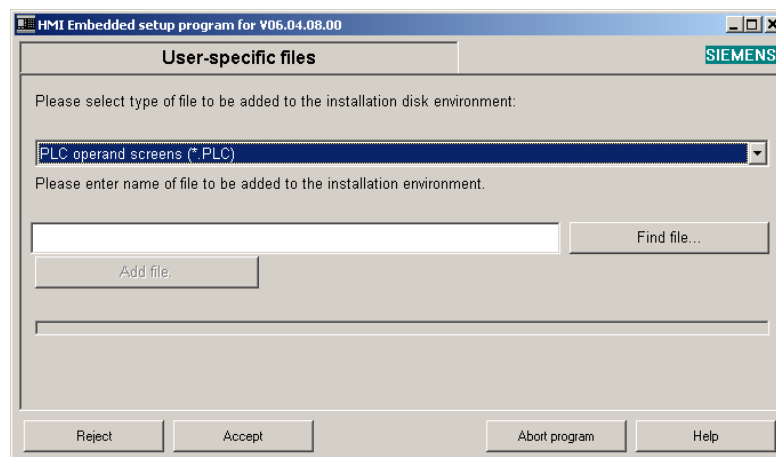


Fig. 11-8 Add own files

The file is selected on the basis of a file type filter. You can enter the file type directly in the first input box or use the arrow to open the drop-down list of the following file types:

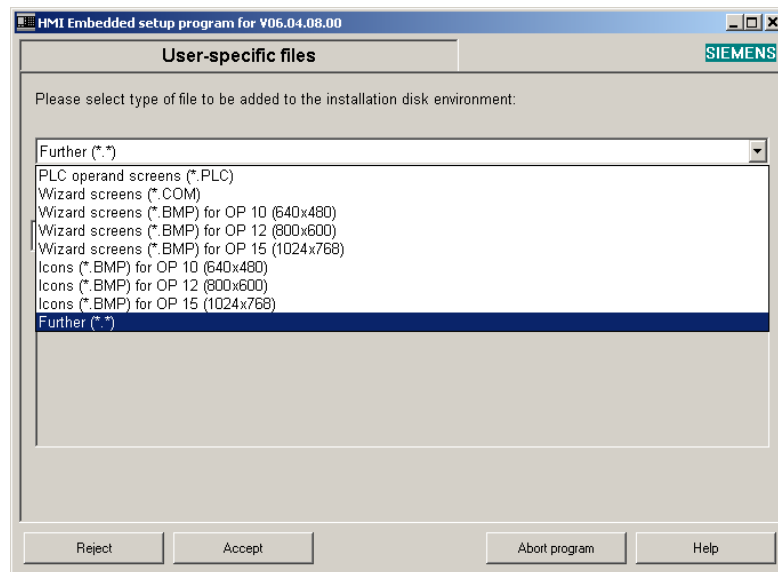


Fig. 11-9 File type

After you have selected a file type, click the "Browse" button. Choose the corresponding file in the Explorer view and confirm by clicking "Select".



Important

An error message will appear if you attempt to add files with names that do not comply with the DOS convention (max. 8 characters for name and 3 characters for file extension).

All files you select are displayed with their size and date. At the same time, a "Delete" button is displayed after every file so that you have the option of removing it again after a confirmation prompt.

Boot screen

A boot screen cannot be selected for the HT 6.

Supported displays

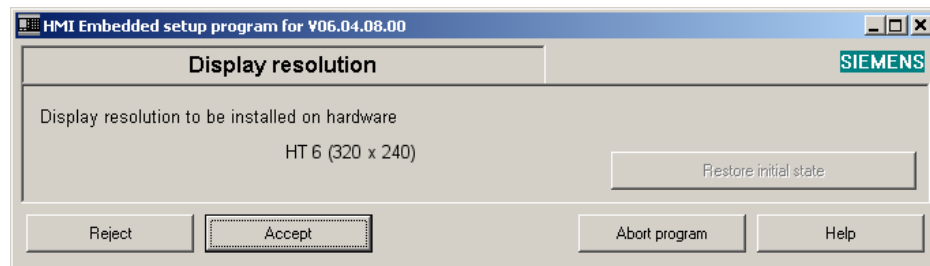


Fig. 11-10 Display resolution

The only resolution available for the HT 6 is 320 x 240; no alternative resolutions can be selected.

For information on what to do next, see sections:

- Creating an image
- Uploading the software image to the PC card and
- Loading the software from the PC card to the HT 6

11.4 Creating an image

Once you have finished configuring the software, you will return to the "Selected configuration" screen in which the current settings are displayed.

Click the "OK" button to compile the installation data.

You can monitor the progress of this task in the "Data preparation" screen.

To stop the preparation run and return to the "Selected configuration" screen, click the "Interrupt" button.

Once the data have been compiled, the following screen appears:

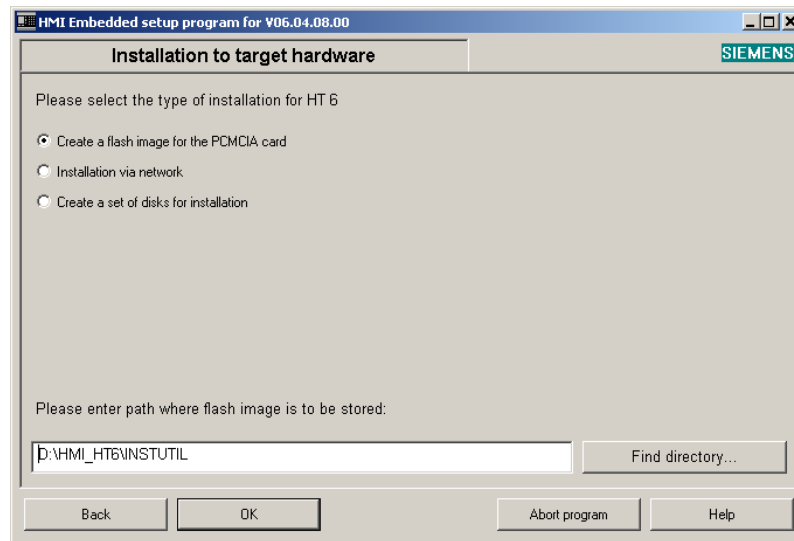


Fig. 11-11 Installation on target hardware

Select the installation to a PC card:
"Create a flash image for PCMCIA card"

In the input box, enter the storage path on your PC for the flash image or open the Explorer by clicking the "Find directory.." button and select the path in the Explorer view.

Finally, click the "OK" button to start the flash image creation process itself.

Once the data have been installed, the following message appears:

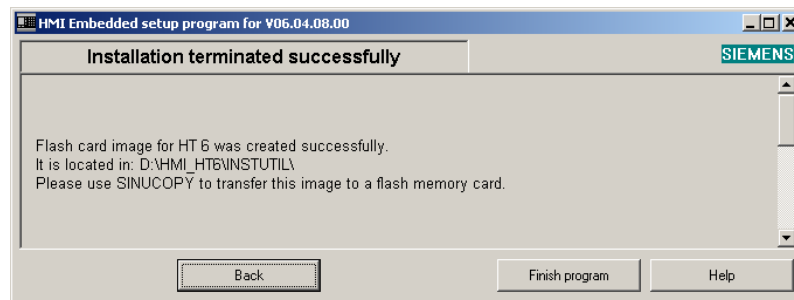


Fig. 11-12 Installation completed

If you click the "Back" button, you will return to the previous screen. You can close the installation program by clicking "Finish program".

Image for PCU

For instructions on copying the new image to the HT 6,
see Section: Uploading an image to the PC card and
 Copying software from PC card to PCU

11.5 Uploading the image to the PC card

Preconditions

If you want to copy the image to a linear flash memory card, the "SINUCOPY_FFS" software must be installed on your PC.

Procedure

With a **Linear Flash memory card**:

1. Insert the PC card in the card drive on the PC or PG.
2. Start the SINUCOPY-FFS program.
3. Select: "Save system from hard disk to PC card".
4. Select the path and the ABB.file on the PC.
5. Start the upload.

11.6 Loading the image from the PC card to the HT 6

Take the PC card containing the new image HT6.ABB.

1. Insert the PC card in the PC card drive on the HT 6.
2. Press the Reset key on the HT 6 and wait for the software version and serial number to appear.
3. Press key "6" on the HT 6.
This starts updating mode.
4. A dialog box appears,
"0: Transfer from PC card to HT 6"
1: Transfer via RS-232-C is not supported for HT 6!
"3: Select Setup for Teleservice"
Select "0: Update from PC card"
5. When the update is complete, the following message is displayed:
"Remove PC card".
6. As soon as you remove the PC card the HT 6 boots automatically and starts up with the new software.

Note

With software version 6.4 or later, an error message will appear if you select "0:Update from PC card" and have inserted by mistake the wrong card, e.g. the NC card, or an empty card, in the HT 6.

11.7 Alarm and message texts

By changing the relevant texts or files, or creating new ones, it is possible to adapt them flexibly to your own requirements.

Standard text files

You should not modify the standard text files in order to adapt alarm and messages texts, as these standard files are overwritten when the software is updated and you will therefore lose any changes to them.

User-specific text files

Store your own alarm and message texts in separate text files.

Editor

You should use the editor (Notepad) called by the installation software to make any changes to files.
If you use a different editor to edit text files, make sure that you store them in ASCII format afterwards.

11.7.1 Adapt texts for channel menu

In order to identify the NCU to be addressed, the texts for the labeling of softkeys on the operator panel must be entered in file CHAN.TXT.

Foreign language texts

The file CHAN.TXT is available in several language variants specially for the channel menu. These are stored according to language in text directories "\proj\text\d", (-> German texts), "\proj\ text\g" (-> English texts), etc. The content of "CHAN.TXT" files which do not yet contain any texts is as follows.

Example:

File with OEM name specifications for channel-areas and channels.
/* text definitions for softkeys in channel switch menu *//* name of channel area 1 and names of channels of channel area 1 */

```
T_CHAN_AREA_1           "Milling1"
T_CHAN_AREA_1_CHANNEL_1 "Channel11"
T_CHAN_AREA_1_CHANNEL_2 "Channel12"
T_CHAN_AREA_1_CHANNEL_3 "Channel13"
T_CHAN_AREA_1_CHANNEL_4 "Channel14"
T_CHAN_AREA_1_CHANNEL_5 "Channel15"
T_CHAN_AREA_1_CHANNEL_6 ""
T_CHAN_AREA_1_CHANNEL_7 ""
T_CHAN_AREA_1_CHANNEL_8 ""
```

```

/* name of channel area 2 and names of channels of channel area 2
*/T_CHAN_AREA_2           "Milling1"
T_CHAN_AREA_2_CHANNEL_1  "Channel21"
T_CHAN_AREA_2_CHANNEL_2  "Channel22"
T_CHAN_AREA_2_CHANNEL_3  "Channel23"
T_CHAN_AREA_2_CHANNEL_4  ""
T_CHAN_AREA_2_CHANNEL_5  ""
T_CHAN_AREA_2_CHANNEL_6  ""
T_CHAN_AREA_2_CHANNEL_7  ""
T_CHAN_AREA_2_CHANNEL_8  ""

/* name of channel area 3 and names of channels of channel area 3
*/T_CHAN_AREA_3
T_CHAN_AREA_3_CHANNEL_1  ""
T_CHAN_AREA_3_CHANNEL_2  ""
T_CHAN_AREA_3_CHANNEL_3  ""
T_CHAN_AREA_3_CHANNEL_4  ""
T_CHAN_AREA_3_CHANNEL_5  ""
T_CHAN_AREA_3_CHANNEL_6  ""
T_CHAN_AREA_3_CHANNEL_7  ""
T_CHAN_AREA_3_CHANNEL_8  ""
:
:
etc.

```

The OEM user can enter texts by inserting them in the blank character strings (see above)!

Six characters are possible per softkey bar; the carriage return is created with characters "%n": e.g. "NC3%nChann1".

11.7.2 User cycle text file

The following alarm numbers are available for the cycle and PLC alarms:

Table 11-1 Alarm numbers for cycle alarms

Number range	Description	Effect	Deletion	Name
60000 – 60999	Cycle alarms (Siemens)	Display, interlocking NC start	Reset	ALUC.txt
61000 – 61999		Display, interlocking NC start, motion standstill	Reset	
62000 – 62999		Display	Cancel	
63000 – 64999	Reserved			
65000 – 65999	Cycle alarms (user)	Display, interlocking NC start	Reset	
66000 – 66999		Display, interlocking NC Start, motion stop after execution of predecoded blocks	Reset	

Number range	Description	Effect	Deletion	Name
67000 – 67999		Display	Cancel	
68000 – 69000	Reserved			

Format of the text file for cycle alarm texts

The number range in the list is not available with every number.

References: /FB1/P3: Lists

The text file for cycle alarms is structured as follows:

Table 11-2 Structure of the text file for cycle alarm texts

Alarm number	Display	Help ID	Text or alarm number
60100	1	0	"No D number %1 is programmed"
60101	1	0	60100
...	...	...	...
65202	0	1	"Axis %2 in channel %1 is still moving"
// Alarm text file for cycles in German			

Alarm number

List of alarm numbers

Display

This number defines the alarm display type:

0: Display in alarm line

1: Display in a dialog box

Help ID

(in preparation)

Text or alarm number

The associated text is given in inverted commas with the position parameters. Characters " and # must not be used in alarm texts. The % character is reserved for displaying parameters.

If an existing text is to be used, this can be done with a reference to the corresponding alarm. 7-digit alarm number instead of "text".

The alarm file can contain comment lines, these must start with "//". The maximum length of the alarm text is 110 characters for a 2-line display. If the text is too long, it is truncated and the symbol " * " added to indicate missing text.

Parameter "%1": Channel number

Parameter "%2": Block number

11.7.3 PLC alarm texts

The following alarm numbers are available for PLC alarms:

Number range	Description	Name
400000 – 499999	PLC alarms general	ALPU.txt
500000 – 599999	PLC alarms for channel	
600000 – 699999	PLC alarms for axis and spindle	
700000 – 799999	PLC alarms for user	
800000 – 899999	PLC alarms for sequence cascades/graphs	

Format of text file for PLC alarm texts

The ASCII file for PLC alarm texts has the following structure:

Table 11-3 Structure of the text file for PLC alarm texts

Alarm no.	Display	Help ID	Text	Text on HT 6
510000	1	0	"Channel %K FDDIS all"	Channel 1 FDDIS all
600124	1	0	"Feed disable axis %A"	Feed disable axis 1
600224	1	0	600124	Feed disable axis 2
600324	1	0	600224	Feed disable axis 3
703210	1	1	"User text"	User Text
...				
703211	1	1	"User text%A ..."	User Text Axis 1 ...
// Alarm text file for PLC alarm				

Display

This number defines the alarm display type:

0: Display in alarm line

1: Display in a dialog box

Help ID

(in preparation)

Text or alarm number

The associated text is given in inverted commas with the position parameters. Characters " and # must not be used in alarm texts. The % character is reserved for displaying parameters.

If an existing text is to be used, this can be done with a reference to the corresponding alarm. 6-digit alarm number instead of "text".

The alarm file can contain comment lines, these must start with "/". The maximum length of the alarm text is 110 characters for a 2-line display. If the text is too long, it is truncated and the symbol " * " added to indicate missing text.

Parameter "%K": e.g. channel number with FC10
(the 2nd digit of the 6-digit alarm number is inserted in the alarm text to replace %K). Digits are counted from left to right.

Parameter "%A": The parameter is replaced by the signal group no. (e.g. axis no., user area no., sequence cascade no.)
(the 3rd and 4th digits of the alarm number are inserted in the alarm text to replace %Z).

Parameter "%N": e.g. signal number
(the 5th and 6th digits of the alarm number are inserted in the alarm text to replace %Z).

Parameter "%Z": e.g. status number for Higraph
(the supplementary information for the alarm number is inserted in the alarm text to replace %Z).

Note

The alarm number is transferred from the PLC via basic program module FC 10 (this uses PLC system function SFC 52 to send alarms to the HMI). Supplementary information is not supported. However, the alarm number can also be transferred to the HMI by means of PLC system function SFC 17, SFC 18 (ALARM S, ALARM SQ). The mechanisms are used, for example, by the PDIAG configuring tool. The alarm number displayed on the HMI is transferred via SFC parameter EV_ID. The supplementary information for the alarm number is transferred via SFC parameter SD.

Indexed alarms

Indexed alarms can be used to display additional comments in the alarm line, e.g. an explanation for "action =%"

Table 11-4 Examples

Alarm no.	Display	Help ID	Text
010203	0	0	"Channel %1 NC Start without home position (action=%2<ALNX>)"
016903	0	0	"Channel %1 Action=%2<ALNX>not permitted in current status"
016912	0	0	Channel %1 Action=%2<ALNX> only possible in reset state"

References: /DA/Diagnostics Guide

11.7.4 Editing of text files

You can modify text files (e.g. alarm text files) stored in the system.

To do this, follow the instructions below:

1. Upload the file to a PC (or programming device) via the RS-232-C interface,
2. Edit and save the file,
3. Download the file to the HT 6 again.

Example:

You want to assign the text "SampleText" to alarm number 700007 (DB2.DBX180.7).

Procedure:

1.
 - a. Set up an RS-232-C link between the HT 6 and your PC,
 - b. Boot the HT 6 and PC,
 - c. In the "Services" operating area on the HT 6, select menu "Data Out", menu "Texts" [in our case "Language 1" (German),
 - d. In the working window which then opens, select a menu line [in our case "PLC alarm texts (user)"],
 - e. Start a data transfer program (e.g. PCIN) on the PC, at the same time specifying the storage path and name for the file to be edited, (e.g. "Alarm1.txt")
 - f. Activate the "Start" softkey in the HT 6 working window.

The alarm text file is then transferred to the PC where it is saved under the name you selected.

2.
 - a. Edit the file on the PC. Each line contains an alarm text number with associated explanatory text.
 - b. Generate a new line at the end of the file by pressing the <RETURN> key,
 - c. Type in a new entry: 700007 0 0 "SampleText",
 - d. Save and close the file.
3.
 - a. Activate the data transfer from the PC (see 1.e) with "Send Data",
 - b. As for 1.c, but select menu "Data In",
 - c. In the working window which then opens, keeping the default settings, start the data transfer to the HT 6 by selecting softkeys "Start" and "OK".

The HT 6 boots automatically when the data have been transferred. The modified alarm text file is then operative.

11.8 Switch channels / control units

11.8.1 Connections for multi-channel systems

If two HMI units are assigned to one NC/PLC unit (M:N), the PLC must first scan the interfaces to determine which of them is active. Icons can be requested by the PLC only for the active HMI unit.

Note

- On the HT 6 the channel menu for m:n systems consists of two stages.
- In the first stage you select the channel group and in the second stage, the channel.

For details please see the following

References: /BAH/ HT 6 Operator's Guide and the
/FB2/ B3: Several Operator Panel Fronts on Several NCUs

On 1:1 systems, switchover is not performed via the channel menu, but with the softkey "channel".

Configuration file NETNAMES.INI

The configuration file NETNAMES.INI contains the parameters of the individual hardware components and specifies how they are interconnected and how they work with one another.

This file is located in the flash image HT6.ABB and must be flashed with the PC card.

Note

The NETNAMES.INI file cannot be loaded via the RS-232-C interface!

Using the user interface, you can establish a connection between the HT 6 unit and the connected NCU/PLC units in each operating area.

References: /BAH/HT 6 Operator's Guide

Note

The softkeys only offer the connections that are really assigned and whose channels are active in the respective NC.

In the case of "m:n systems" all PLC communications tasks are mapped onto single variable accesses to keep the PLC resources required to a minimum.

11.8.2 Configuration example: Adapting NETNAMES.INI

Access to the channel menu configuration is granted by extending the file "NETNAMES.INI".

To do this, proceed as follows:

1. Define groups (max. 8) in "logChanSetList".
2. Define the NCs and the channels with unambiguous names for the groups in "logChanList".
3. For the channels define
 - NC names in "logNCName",
 - Channel no. on the NC in "ChanNum" and
 - Reserve softkey yes/no (using command IsAGap" = True/False).

Note

The NC writes the channel number of the HT 6 in DB19, DBB22 or DB19, DBB72 (2nd interface).

The names in the file NETNAMES.INI are limited to five characters.

Example:

NETNAMES.INI

[own]

owner = HT6_1

; Description of possible connections

[conn HT6_1]

conn_1 = NCU_1

conn_2 = NCU_2

; Description of significant net parameters

[param network]

bus = btss ; on the SINUMERIK 810D the MPI interface must be used

[param HT6_1]

mmc_typ = 0x10 ; secondary operator panel

mmc_bustyp = OPI

mmc_address = 14

mstt_address = 14

name = HT6

start_mode = OFFLINE

[param NCU_1]

type = NCU_573

nck_address = 12

plc_address = 12

```
name = NCU1
[param NCU_2]

type = NCU_573
nck_address = 14
plc_address = 14

name = NCU2
[chan HT6_1]
DEFAULT_logChanSet = Milling1
DEFAULT_logChan = Channel13
ShowChanMenu = TRUE
logChanSetList = Milling1, Milling2
[Milling1]
logChanList = Channel11, Channel12, Channel13, Channel14, Channel15
[Channel11]
logNCName = NCU_1
ChanNum = 1
[Channel12]
logNCName = NCU_1
ChanNum = 2
[Channel13]
logNCName = NCU_1
ChanNum = 3

[Channel14]
logNCName = NCU_1
ChanNum = 4

[Channel14]
logNCName = NCU_1
ChanNum = 5
[Fräsen2]
logChanList = Channel21, Channel22, Channel23
[Channel21]
logNCName = NCU_2
ChanNum = 1
[Channel22]
logNCName = NCU_2
ChanNum = 2
[Channel23]
logNCName = NCU_2
ChanNum = 3
```

11.9 PLC

The task of the PLC is to control functional sequences specific to the machine. It is implemented as a software PLC.

For instructions on how to start up the PLC, see

References: /FB1/P3, PLC Program Start-Up

11.9.1 PLC data

Date and time

You have the option of setting the time and date on the PLC and of synchronizing the time and date on the PLC and HT 6.

This function is accessed via the "Start-up" operating area in the "PLC" screen by activating the softkey "Date%
Time".

If any changes are made to the time and date, the time and date of the HT 6 are transferred to the PLC.

You can check the synchronization in the "Current time:" output field.

Cyclical synchronization of the time:

- The time duration with active "autom. ON" is specified in the field "Synchronization time".
- "Sync. manual" synchronizes the PLC and HT 6 immediately.

The values set are retained when the software is rebooted.

Note

Changes can only be made to the PLC operands with the appropriate password.

Note

If you operate the HT 6 via the MPI card of the PC, the system time of the PC is altered when the two devices are synchronized.

11.10 Diagnostics

11.10.1 Action log

Function

The Action log function can be used to log operating sequences.
The following functions are provided:

- Logging of alarms
- Logging of key actuation
- Output of log file via RS 232 C (V.24)

The action log is protected by a password (protection level ≤ 3)
and can be activated/deactivated via MD 9012 ACTION_LOG_MODE

Note

The precondition for the Action Log function is that the "Start-up" operating area is installed.

9012	ACTION_LOG_MODE		
MD number	Action log settings		
Default: 255	Min. input value: 0	Max. input value: 0xffff	
Changes effective after POWER ON		Protection level (R/W) 2/2	Unit: -
Data type: DWORD	Applies as of SW 5.2		
Meaning	This MD can be used to enable/disable the action log and to define a choice of the data to be logged. Bit 0 = 1 Action log ON (default) = 0 Action log OFF Bit 1 = 1 HMI Advanced: Variable services (write accessing of geometrical data, e.g. tool offset) are logged. For meaning of variables, see help in operating area Parameters under Variable Views (default) = 0 Variable services are not logged. Bit 2 = 1 HMI Advanced: PI services (e.g. program selection) are logged, for meaning of variables see help in operating area Parameters under Variable Views (default) = 0 PI services are not logged. Bit 3 = 1 HMI Advanced: Domain services (e.g. load/unload program) are logged (default) = 0 Domain services are not logged. Bit 4 = 1 Changes to the alarm status are logged (default)		

	= 0	Changes to the alarm status are not logged.
Bit 5	= 1	Key actuations are logged. (default)
	= 0	Key actuations are not logged.
Bit 6	= 1	Channel status/override is logged (default).
	= 0	Channel status/override is not logged.
Bit 7	= 1	HMI Advanced: Softkey actuations and screen changes are logged. For Siemens internal use only (default)
		HMI Embedded: Identification number of opened and closed screens is logged. For Siemens internal use only (default)
	= 0	Softkey actuations and screen changes are not logged.

If the action log is enabled, the files that can be logged are logged by default. The following events can be logged:

Alarm status

All displayed NC/PLC and HT 6 alarms and messages can be logged.

Key actuation

All operator panel front and MF2 key actuations can be logged.

Channel status / override

NC/PLC statuses can be logged using the information regarding the channel status and the position of the override switch. At least in parts, if they can be recorded by time, these statuses are used to verify the operation of the MCP.

Window ID

The identification number of a screen is logged when it is opened or closed.

Log file

The log file is output in English.
The log file is divided into four columns:

File structure

- Date
- Time
- NCU name
- Event

On the HT 6 the log file is not flashed, i.e. after every power off/on or reset the old contents are erased.

Example of a log file:

Date	Time	Event specification
26.02.1999	07:45:20	HMI booting (conn.no: 0, \$MM_ACTION_LOG_MODE: ff, entries: 4094)
26.02.1999	07:45:20	Alarm 300701 Axis X1, drive 2 requires start-up
29.09.1999	18:59:10	Key: 68 KEY_SELECT_MODE (0)
29.09.1999	18:59:07	Open window: 20005
29.09.1999	18:59:07	Close window: 20020

Display log file

The log file output is password-protected.

The current log file is displayed on the screen of the operator panel front in the "Diagnostics" operating area when you select softkey "Service Displays" -> "Action log" in the "Action log log file" screen.

If a crash file exists, the softkey "Crash Data" is also displayed, with which the crash file can be displayed.

Set action log

The action log settings are password-encrypted.

The screen "Action log settings" is displayed in the screen "HMI" -> "Action log" in the Start-up operating area.

You can change the following settings:

- Enable/disable the logging
- Select the data to be logged
 - alarm status change
 - key actuation
 - channel status / override
 - window IDs

The selected setting must be confirmed by pressing the softkey "Save Settings".

Reading out the log file

The log file output is password-encrypted.

There are two possible ways to output the log file:

1. By selecting softkeys "Service Displays" -> "Action log" in the Diagnosis operating area. The log file is read out and archived with vertical softkey "Data Out -> RS-232-C".

2. Via the boot menu.

A boot menu is displayed whenever a crash event exists (PLC bit DB19, byte0, bit6). The bit is set and reset from the PLC at the user interface (such as also key lock, screen darkening). The HT 6 evaluates the rising edge of the signal (i.e. a transition from 0 to 1) and creates the log file when the signal arrives. The HT 6 only reads the data, i.e. the signal must be reset from the user program (PLC).

If the bit is already present when the HT 6 boots, the HMI will not react to the value of the bit (only after resetting and setting).

- The log file _AC_LOGP.TXT is read out either during the boot process or can be read out in the Diagnostics operating area within the time when the MMC is switched off. The file is then deleted.
- Reboot the control system.
- Prompt: "Crash Log found! Read out V24? ([Y]/N)"
- If you acknowledge this question with "Yes", the log will be read out via RS 232 C (V.24).

Requirement: The interface parameters of RS 232 C (V.24) must be set accordingly.

Note

A latency must be observed between two signals to make sure that the second signal can be processed.

11.10.2 Error status screen "Blue screen"

If the system crashes, an error status screen ("Blue Screen") showing current system information is displayed.

The error status screen displays a brief description of the error which has occurred plus all relevant processor registers.

Backup option

A complete system data image is downloaded to an external device.
The data are backed up via the RS-232-C interface to an external medium.

System data display

In the event of a system crash, the crash address, the register allocation and any additional information needed for crash analysis are displayed on the screen.


```

Sorry, but HMI Embedded has caused an
exception in task XX with code XXXXX
The exception has occurred in Fct.:
XXXXXXXX at cs : XX eip : XXXXXXXX
DS= XXXX  EAX= XXXXXXXX  EBX= XXXXXXXX
ES= XXXX  ECX= XXXXXXXX  EDX= XXXXXXXX
FS= XXXX  EDI= XXXXXXXX  ESI= XXXXXXXX
GS= XXXX  FLAGS= XXXXXXXX
SS= XXXX  ESP= XXXXXXXX  EBP= XXXXXXXX
Please send the screen information or
saved data to the SINUMERIK Hotline!
email: ad.support@siemens.com
Fill in subject:
"HMI Emb exception (SW XX.XX.XX;date)"
Press '1' to save data
Press other key for next page

```

When you select key
"1", you go to the screen for saving data,
with any other key, you go to the next screen.

```

Additional information:
XXXXXXXX:XXXXXXXX XXXXXXXX:XXXXXXXX
...
XXXXXXXX:XXXXXXXX
CODE = XX XX XX XX XX  XX XX XX XX XX
EIP:   XX XX XX XX XX  XX XX XX XX XX
STACK= XXXXXXXX  XXXXXXXX  XXXXXXXX
       XXXXXXXX  XXXXXXXX  XXXXXXXX
       XXXXXXXX  XXXXXXXX  XXXXXXXX
Press '1' to save data or press '9' to
reboot immediately

```

When you select key
"1", you go to the screen for saving data,
key "9" reboots the HT 6.

Screen for saving data

The selected system data file is uploaded via the serial interface. In this screen you

```

To use serial communication interface
use key '3' to change the
settings for serial communication:
'3' - baud rate : XXXXXX
Make sure you use the same baud rate
as the receiving station.
Then press '2' to transfer data via
serial line. You can also press '9'
to reboot immediately, but we
recommend you save the data first.

```

choose the baud rate and the interface for the serial transmission.

Press key "3" to set the baud rate selected on the external receiving device (PG/PC).

Set the external receiving device to "Receive" and start.

Start the transmission by pressing key "2".

```
Please wait - data
transmission in progress.

If you have problems with the remote
device you can press key '1' to
stop transmission.
```

You can stop the transmission by pressing "1" (in the event of transmission error or incorrect baud rate)

The following message appears about 2 to 5 seconds after you press key "1":

```
Transmission stopped by pressing
key '1'

Press '1' to return to save menu or
,9' to reboot
```

Press key "1" to return to the screen for saving data.
Initiate a reset by pressing key "9".

Once all the data have been transferred successfully, the following message appears:

```
Transmission finished
XXXXXX bytes saved.

Please check the number of saved bytes
with the number of bytes received by
the remote device. If there is any
difference please return to the save
menu by pressing the '1' key and retry
with a lower baud rate.

Please send the saved information to
the SINUMERIK Hotline!
email: ad.support@siemens.com
Fill in subject:
"HMI Emb exception (SW XX.XX.XX;date)"
Press '1' to return to save menu or
''9' to reboot
```

Note

When you use the serial link, the number of transmitted bytes is also displayed and must match the number of bytes received. If the two numbers are not the same, abort the transmission by pressing key "1", select a lower baud rate and start the upload again.

Restart

The exception handler attempts an automatic restart in Restart mode.

```
Try rebooting - in the event of no
reaction after 1 minute,
please switch Off/On
```

If the HT 6 has not reacted after 60 seconds, you must restart it manually by switching the power supply to the system or the operator panel front off and then on again.

11.11 Miscellaneous

11.11.1 NCK reset

It is possible to initiate an NCK Power-On Reset from the HT 6.

Operating sequence

Select the operating area "Start-up" and press the softkey
"NC"

"Start-up NC"

You can choose between:

- "Normal mode"
- "Start-up mode"
- "Software update"

11.11.2 NCK machine data setting for teach-in

Set the following machine data to ensure correct positioning of the block display in
SBL mode:

MD 10702 \$MN_IGNORE_SINGLEBLOCK_MASK Bit 4 = 1

This setting ensures that the program halts after the first machine function block
when a part program is started from reset with SBL active and not immediately
after the initialization sequence (Init. block).

11.11.3 Activate screen darkening

You can activate the screen darkening function by setting machine data:

MD 9006 DISPLAY_BLACK_TIME (maximum 60 minutes).

In MD 9006, the function "Screen dark from MMC" can be started using the
following entry:

MD 9006 = 1 < time in minutes, e.g. 1 >

MD 9006 = 60 < time in minutes, e.g. 60 >

Deactivation of function

MD 9006 = 0 Deactivation of function

11.11.4 Set screen brightness

You can adjust the screen brightness using two different methods.

1. By programming machine data 9025 DISPLAY_BACKLIGHT, you can vary the brightness from
 0 = dark to
 31 = very bright.
 The default setting is 25.
2. You can adjust the brightness via softkeys in the "Start-up" operating area. Select softkey "System" in the "Start-up" operating area. Then select softkey "Brightness". The softkey menu changes and you can adjust the backlighting by selecting softkeys "brighter" or "darker".

11.11.5 Enable/disable teach mode acceptance

By setting MD 9026 TEACH_MODE, you enable or disable the transfer of teach blocks.

NB_MM_TEACH_MODE = 1 Teach block is transferred.

NB_MM_TEACH_MODE = 2 Acceptance of the teach block can be disabled by the PLC via DB19.DBX13.0 (disable teach acceptance).

DB19.DBX13.0 = 0 Teach block is transferred.

DB19.DBX13.0 = 1 Teach block is not transferred. The message "Teach not permitted" is displayed

11.11.6 Several axis systems

The HT 6 has 6 traversing keys with which axes can be moved in the plus or minus direction. If the machine has more than 6 axes, the axes to be controlled by the 6 traversing keys can be grouped into so-called "axis systems". You can define a maximum of 4 axis systems. You can also define axis systems for machines with less than 7 axes.

You can select the axis system by clicking on "CONTROL PANEL FUNCTION", and softkey "Trav. Key".

If the traversing keys are to control 6 axes or less, it is not necessary to create any axis system groups.

To set up a number of axis systems, proceed as follows:

- Set the number of axis systems in machine data 9027.

9027 = 0: The HT 6 software automatically calculates the number of axis systems (number of machine axes divided by 6)

9027 > 0: Number of axis systems (max. 4)

- The status of softkey "Trav. Key" is passed from the HT 6 to the PLC in signal Ebn+2 Bit6 (AXSEL0).
Signal = 1 Key actuated
Signal = 0 Key not actuated.
- In the PLC user program, specify which axes are to be controlled by the traversing keys and the axis system to which the axes belong.

For an exact description, please see:
References: /FB1/P3 Basic PLC Program
- Set signal Abn+2 Bit6 (AXSEL0) to transfer the selected axis system from the PLC to the HT 6. The selected axis system is displayed to the right of the override in the status display (ASY2/ASY3/ASY4).
No text is displayed for axis system 1 (i.e. ASY1 is not shown).

11.11.7 Showing/hiding status (STAT) and turn (TU)

Singularities with special kinematics and robots

When the cartesian point-to-point method (PTP) in workpiece coordinates is used, the position of machine axes is ambiguous at certain points. In order to define these singularities without ambiguity, the position of the machine STAT and the position of the axes TU are defined in addition to the workpiece coordinates for this type of transformation (e.g. 5-axis transformation).

Show/hide STAT and TU

The STAT and TU values are displayed in the axis screens (actual-value windows) and in teach mode (insert block).

You can choose whether or not to show the STAT and TU values by setting the following display machine data:

STAT and TU are not displayed:

MD 9242: MA_STAT_DISPLAY_BASE	= 0	of articulated position STAT
MD 9243: MA_TU_DISPLAY_BASE	= 0	of rotary axis position TU

STAT and TU are displayed:

MD 9242: MA_STAT_DISPLAY_BASE	= 1	of articulated position STAT
MD 9243: MA_TU_DISPLAY_BASE	= 1	of rotary axis position TU



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SINUMERIK 840D/840Di/810D

Installation and Start-Up HMI

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1

1 General Preparations

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Introduction

This Installation and Start-Up Guide describes the procedures for commissioning the PCU 50/70 with the HMI Advanced software. For further reading on special NCK, MMC, PLC, or drive functions, please consult the Descriptions of Functions/Manuals (see "Required documentation").

Note

The HMI Advanced software can also run on the MMC 103 with Windows NT4.0, order number 6FC5 2110-0DB21-3AA1. (Intel Pentium 200 MHz, 64 MB RAM). The HMI Advanced software, which must be ordered separately, should be loaded using the pre-installed basic software, as described for the PCU50.

1.1 Hardware/software requirements

Software

Depending on the order details, the HMI Advanced software may be pre-loaded on the PCU 50/70 on delivery. If the HMI Advanced software is not pre-loaded on the PCU 50/70 (e.g. PCU50 supplied with no system software), the HMI software can be installed onto the PCU 50/70 from the Service menu using the CD supplied (see Chapter 7 Software installation). The same applies to software updates.

Required equipment and accessories

In order to install the software onto the PCU 50/70 with HMI Advanced you will need

1. PC/PG with
2. CD drive
3. Network connection or parallel cable

Operating systems

The HMI software can run on Windows NT 4.0 or Windows XP. Please refer to the Operator Components Manual /BH/ for possible assignments of the PCU 50/70 variants to the operating systems that can be used.

1.2 Documentation

You require the following documentation for the installation and start-up of SINUMERIK 840D:

1. Operator Components Manual /BH/
Order number: 6FC5 297-6AA50-0AP0
2. Description of Functions, Basic Machine /FB/ (Part 1)
Order number: 6FC5 297-6AC20-0AP0
3. Lists /LIS/
Order number: 6FC5 297-6AB70-0AP0
4. Diagnostics Guide /DA/
Order number: 6FC5 297-6AA20-0AP0
5. Operator's Guide HMI Advanced /BAD/
Order number: 6FC5 298-6AF00-0AP0
Operator's Guide HMI Advanced

1.3 EMC/ESD measures

1.3.1 Interference suppression measures

Shielded signal cables

To ensure safe, interference-free operation of the system, the cables specified in the individual drawings must be used. Both ends of the shield must always be conductively connected to the equipment housing.

Exception:

- If non-Siemens devices are connected (printers, programming devices, etc.), you can also use standard shielding cables which are connected at one end.

These external devices may not be connected to the control during normal operation. However, if the system cannot be operated without them, then the cable shields must be connected at both ends. Furthermore, the external device must be connected to the control via an equipotential bonding lead.

Rules for routing cables

In order to achieve the best-possible noise immunity for the complete system (control, power section, machine) the following EMC measures must be observed:

- Signal cables and load cables must be routed at the greatest possible distance from one another.
- Only use SIEMENS signal cables for connecting to and from the NC or PLC.
- Signal cables must not be laid in the close vicinity of strong external magnetic fields (e.g. motors and transformers).

- Pulse-carrying HC/HV cables must always be laid completely separately from all other cables.
- The distance (interference injection area) between the following cables must be as close as possible:
 - Signal cable and signal cable
 - Signal cable and associated equipotential bonding lead
 - Equipotential bonding lead and protective conductor incorporated in lead.



Important

For more information about interference suppression measures and connection of shielded cables, please refer to

References: /EMC/, EMC Installation Guidelines

1.3.2 ESD measures



Important

Handling of modules containing devices sensitive to electrostatic discharge:

- When handling electrostatically sensitive devices, make sure that operator, workplace and packing material are properly grounded.
- As a general principle, avoid touching electronic components unless the work to be performed makes this unavoidable. Therefore, when handling PCBs, make sure that you never touch any submodule pins or conducting paths.
- Components must only be touched if
 - You are permanently grounded with an ESD arm band,
 - You are wearing ESD shoes or ESD shoe grounding strips that are in contact with an ESD floor.
- Modules must be placed on a conductive surface (table with ESD surface, conductive ESD foam plastic, ESD packing bag, ESD transport container).
- Never place modules in the vicinity of display units, monitors, or television sets (minimum distance < 10 cm).
- Modules must never be brought into contact with statically chargeable and highly insulating materials, such as plastic sheeting, insulating table tops, clothing made of synthetic fibers.
- Measurements of the module must only be performed if
 - The measuring instrument is grounded (e.g. via protective conductor) or
 - Before measuring with a potential-free measuring device the measuring head is discharged briefly (e.g. touch unpainted metal on the control housing).



2

2 Overview of HMI Devices

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2.1 Mechanical and electrical design

2.1.1 Operator panel fronts

The HMI Advanced software runs with the following SINUMERIK operator panel fronts for use with the **PCU 50/70**: **OP 010**, **OP 010S**, **OP 010C**, **OP 012**, **TP012**, **TP015A**, **OP 015** and **OP015A**.

When it is used with an operator panel front, the **PCU 50/70** is first screwed to the panel front and then secured to the mounting panel with fixing devices.

The procedure is described in the /BH/ **Operator Components Manual**, in the section on operator panel fronts.

Example of an operator panel front

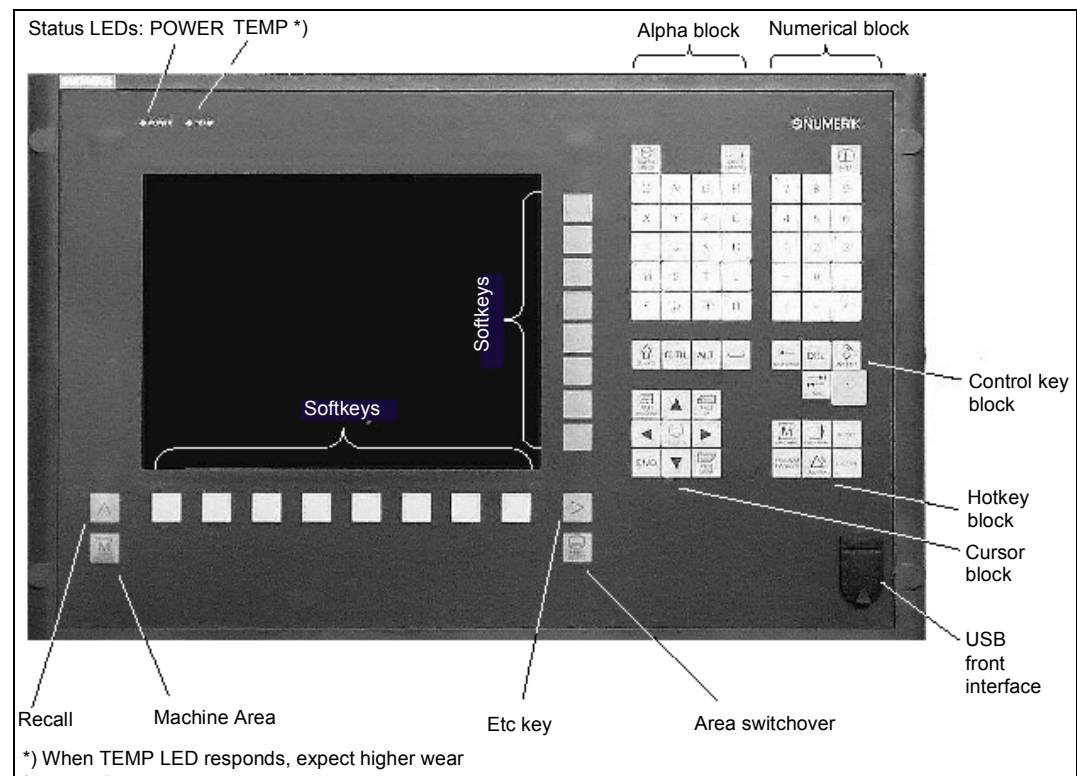


Fig.: 2-11 View of operator panel front OP 010

2.1.2 PCU 50 component

Example of a PCU: PCU 50 ≤ 500 MHz, Perspective view with the hard disk installed

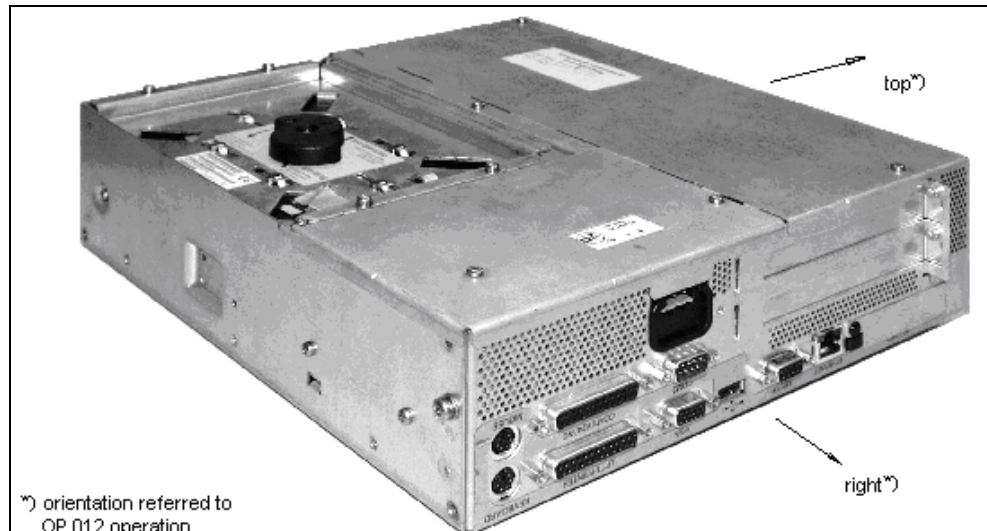


Fig. 2-1

The description applies to the following devices:

Processor	Operating system	Other features	Order no. 6FC5 2...
Pentium II, 333 MHz	NT 4.0	-	...10-0DF01-0AA0
		incl. HMI Advanced	...10-0DF02-0AA0
		incl. MCI board	...20-0AA00-1AA0
Pentium III, 500 MHz	NT 4.0	-	...10-0DF05-0AA0
		incl. MCI board	...20-0AA01-1AA0
Celeron, 566 MHz	NT 4.0	-	...10-0DF20-0AA0
		incl. MCI board	...20-0AA20-0AA0
	XP	-	...10-0DF21-2AA0
Celeron, 1.2 GHz	NT 4.0	-	...10-0DF22-0AA0
		incl. MCI board	...20-0AA22-0AA0
	XP	-	...10-0DF22-2AA0

2.1.3 PCU 70 component

Processor	Operating system	Other features	Order no. 6FC5 2...
Pentium III, 500 MHz	NT 4.0	-	...10-0DF04-0AA0



Notes

3

3 Communication / Basic Conditions

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3.1 Internal communication

Internal communication between the operator panel front and the NCU/CCU takes place via the operator panel front interface, the OPI (1.5 Mbaud) or the MPI interface (187.5 kbaud).

Internal communication between the operator panel front and the PLC (e.g. SIMATIC AS 300) takes place via the MPI interface (187.5 kbaud).

3.2 Network operation with Windows NT 4.0/XP

The PCU50 contains a network connection by default.

The network connection is pre-installed in so far as all that is required for TCP/IP communication, after plugging in the Ethernet cable, is to enter the IP address of the PCU or select the use of a DHCP server.

IP address input

To do this, select

Start-> Settings-> Control Panel-> Network, "Protocols" tab, and set Properties to TCP/IP Protocol.

ID for the PCU50/70

At this stage at the latest, the PCU must be given a unique computer name to identify it in the network. Select

Start->Settings->Control Panel->Network, "Identification" tab to enter an appropriate identifier.

3.3 Components supplied (HMI)

Systems as supplied from the factory can consist of:

- Hardware
- Basic PCU software
- HMI system software for Sinumerik

3.3.1 Hardware

Hardware

The operating basis for HMI software is

- a computer unit together with an
- OP... operator panel

"PCU" is the term used for the computer unit on which the HMI (human-machine interface) software runs from HMI software release 6.0 onwards.

Features of the OPs

A detailed description of the OPs can be found in

References: /BH/, Operator Components Manual.

The previous chapter also includes an overview of the OPs.

Note

Details of how to replace PCU and OP/TP components can also be found in the Operator Components Manual. Please refer to the latest /BU/ NC 60 order catalog for available component combinations.

Features of the PCUs

A detailed description of the PCUs can be found in

References: /BH/, Operator Components Manual.

Depending on the PCU model, either Windows NT 4.0 or Windows XP may be installed on the PCU hard disk. For PCU models that offer both options, please specify the operating system you require by means of the appropriate order number.

3.3.2 Basic PCU software

The basic software that comes pre-installed on the PCU comprises the following components:

NT 4.0	XP version
• MS Windows NT 4.0 SP6a, English version	MS Windows XP Pro SP1 English version
• Internet Explorer 5.0, English version	6.0
• MS-DOS SW 6.21 and higher	6.21
• MPI driver SW 5 and higher	5
• Norton Ghost Version 6 and higher	7.5
• Norton Ghost Walker Version 6 and higher	7.5

Note

Instructions on how to use the basic software can be found in the file
C:\Siemensd.rtf
For the versions of the Service menu (and Windows NT) system components
contained in the basic software, please refer to the file *C:\BaseVers.txt*.

The basic PCU software can be expanded with

- Siemens HMI system software for operating the Sinumerik or
 - OEM software
- for customized system software.

The expansion is carried out from a **Service menu**, which comes with the basic software.

Service menu

The Service menu is written in DOS.

Software installations and updates are started from the Service menu and (after rebooting the system) executed by Windows NT/XP.

Data backup functions (backup/restore) are also carried out using the Service menu.

The boot manager allows you to choose between booting a Sinumerik system and the Service menu.

3.3.3 Boot manager

When booting the PCU, the boot manager menu allows you to choose between the SINUMERIK system and the Service menu:

- **SINUMERIK: SINUMERIK system**
This takes you to HMI system software start or (for service purposes) to the **SINUMERIK desktop (Windows NT/XP)**.
- [hidden menu entry]: **Service menu**
The Service menu in DOS is used
 - to transfer software for installation (e.g. if there is no network available) and
 - to back up data.
- [hidden menu entry]: **Recovery console (XP only)**
Details of this can be found in the original MS literature under "Starting Windows Recovery Console".

3.3.4 Software distribution on the hard disk

In order to keep the software applications separate, the hard disk of the PCU is divided into 4 partitions with different file systems.

The partitioning of the hard disk corresponds to the partitioning that is required in order to install the HMI system software on the PCU under Windows NT 4.0 or Windows XP. Windows XP can be used with PCU 50 V2 (566 MHz or 1.2 GHz, 10 GB hard disk or larger).

- 3 primary partitions and 1 expanded partition are created. (Hard disks below 4.8 GB in size are not supported).
- As well as Windows NT 4.0 or Windows XP (with the HMI system software), DOS (with the Service menu) can also be booted (dual booting).
- Depending on the order details, the HMI system software may be pre-loaded on delivery. It is installed subsequently by the customer the first time the system is booted.
- For data security reasons, the HMI system software, the Windows NT system software and DOS are distributed by the Service menu to different partitions. The following illustration shows how partitioning is used in the installation of the HMI system software (the partition names are shown in *italics*).

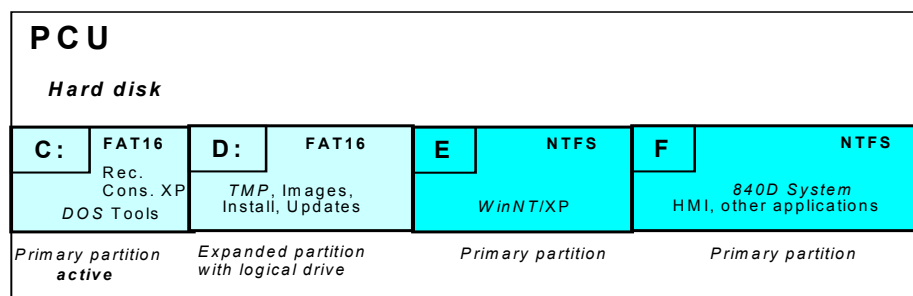


Figure 3-1 Use of partitioning on installation of the HMI system software

Contents of the partitions

The individual partitions are intended for the following data:

Partition C

Partition C contains DOS 6.2 together with the tools and scripts created by the Service menu (e.g. Ghost tools).

Partition D

Partition D is used for Ghost images, i.e. stored images (e.g. those supplied with the system) and local backup images. The Windows NT system software, which can be copied for installing drivers or as an update, for example, is also stored there. Partition D also contains the installation directory to which the software to be installed is copied from a remote PG/PC before the actual installation process.

Partition E

Partition E is reserved for the Windows NT/XP system software.

Partition F

Partition F is the applications partition. Applications such as the HMI system software (including data management and temporary data), HMI-OEM applications, STEP7 and customer-specific applications (e.g. Protocol) run here.

Note

The size of the partitions shown in Figure 3-1 depends on the size of the hard disk and the type of Windows operating system.

Note

We strongly recommend that you install all applications in Partition F only.

Free areas

The following hard disk memory space is available on the PCU 50 and PCU 70:

Drive D: 1.8 GB reserved for local backups

Drive F: 3 GB in addition to the pre-installed 5-language HMI Advanced which is reserved for user data (programs, applications, languages, data, etc.).

High memory allocation in drive F: can mean that a local partition backup becomes so big that it can no longer be stored locally on drive D:. If that happens, the GHOST image (hard disk backup) must be stored on an external device.

3.3.5 Software installation and software activation variants

Windows NT 4.0 or XP is pre-installed on the PCU.

The Windows system together with the Service menu described below form the "basic Windows software":

- SINUMERIK desktop (under Windows NT/XP):
The Windows area is intended for the service function, which can use the Windows features to commission the control.
Here you can:
 - Install HMI system software from the network
 - Install additional software (e.g. install additional languages)
 - Change INI files/hardware configuration (e.g. install drivers)
 - Set up the processing environment for the HMI software
 - Authorize SIMATIC Step7
 - Perform system checks (e.g. version check, disk check, etc.)
 - Install and configure UPS software

The other features of the SINUMERIK desktop can be found under

- Service menu (in DOS)

The Service menu is used for software installation and data backup.

Here you can:

- Transfer/expand HMI system software
- Install HMI system software from a network
- Save data to the hard disk (backup/restore)

The basic functions of the Service menu are described in section 3.4. It can be activated when the system is booted. See 3.3.6.

Calling the SINUMERIK desktop

1. When the system is booting up, select the "SINUMERIK" menu in the boot manager and then, when the version number appears in the bottom right of the background display, press "3".
2. Enter the password.
3. Select the first menu, "**SINUMERIK Desktop**", and press Enter to confirm.

The SINUMERIK desktop is displayed. The basic functions of the SINUMERIK desktop are described in section 3.5 Basic functions of the SINUMERIK desktop.

3.3.6 Service menu

The Service menu offers

- Functions for installing/updating the HMI system software
- Functions for backing up/restoring data
See Chapter 7 for details.
- Basic functions (see 3.4 Basic functions of the Service menu)

Calling the Service menu

1. When booting up the system, select the **second**, hidden menu option in the boot manager, below the "SINUMERIK" menu option.
The basic menu for the Service menu opens.
2. Enter the password if requested.
The menu structure is illustrated below:

The following functions are available in the **Service menu**:

Main menu	Function
1	Install/update SINUMERIK system: Installation and addition or updating of the SINUMERIK system
1	Install from Floppy Disk
2	Install via Serial/Parallel Line: Serial connection V.24/parallel connection
3	Install from Network Drive: network connection
1	Manage Network Drives
1	Connect to Network Drives, enter connection details
2	Show connected Network Drives, display connections
3	Disconnect from all Network Drives, disconnect all conn.
4	Change Network Settings , change connection settings
1	Change Machine Name (for DOS-Net only)
2	Change User Name
3	Toggle Protocol
4	Toggle logon to domain (Yes or No)
[5]	Change Domain Name
[6]	Change TCP/IP settings
1	Toggle "Get IP Addresses" (automatically or manually)
2	Change IP Address
3	Change Subnetmask
4	Change Gateway
5	Domain Name Server
6	Change DNS Extension
9	Back to previous menu
9	Back to previous menu
9	Back to previous menu
4	Change Install Directory
[5]	Install from (network drive), if set up
9	Back to previous menu
5	REBOOT: restart the system
9	Return to Main Menu: Back to main menu

Main menu	Function	
2	SINUMERIK Tools and Options: Load additional tools and enable options.	
1	Activate STEP7 for PCU, see notes below	
9	Return to Main Menu: Back to main menu	
3	DOS Shell: call the DOS command interpreter, drive C:\ is displayed, type "exit" to leave the DOS shell.	
4	Start Windows: The Windows functions can be used here	
1	Standard Windows (without starting SINUMERIK HMI)	
4	Original SINUMERIK HMI Environment, started next time the system is booted	
5	Current SINUMERIK HMI Environment, started next time the system is booted	
9	Return to Main Menu: Back to main menu	
5	SINUMERIK System Check: test the file system for consistency, restore consistency with SCANDISK if necessary.	
7	Backup/Restore:	
1	Hard disk Backup/Restore with GHOST	
	1	Configure GHOST Parameters: Set parameters (interface, path, network connection) for Norton Ghost
	1	Set Connection Mode PARALLEL (LPT:)
	2	Set Connection Mode LOCAL/NETWORK
	3	Change Backup Image File Name
	4	Change Restore Image File Name
	5	Change Machine Name (for Windows and DOS net)
	1	Input Machine Name MANUALLY
	2	Generate Machine Name RANDOMLY
	9	Back to previous menu
	6	Manage Network Drives (see above)
	7	Change Split Mode
	1	NO Splitting
	2	Splitting
	9	Back to previous menu
	2	Harddisk Backup: back up hard disk
	3	Harddisk Restore: copy data to hard disk
	1	Windows XP
	1	Standard Partitioning (default)
	2	User-defined Partitioning
	3	Image-defined Partitioning
	2	Windows NT/2000 (submenu same as for Windows XP)
	3	Windows 95 (submenu same as for Windows XP)
	4	WfW3.11 (submenu same as for Windows XP)
	5	DOS (spare part) (submenu same as for Windows XP)
	9	Back to previous menu
	4	Switch to other version of GHOST
	9	Back to previous menu: return to previous menu

Main menu	Function
7 4	Partition Backup/Restore with GHOST: Save partition contents from C:, E:, F: to D: or copy back from D: to C:, E:, F:.
	1 Configure Ghost Parameters
	1 Change Maximum Backup Images
	2 Define Emergency Backup Image
	9 Back to previous menu
	2 Partition Backup, LOCAL Mode
	3 Partition Restore, LOCAL Mode
	4 Partition E (Windows) Restore, Mode LOCAL
	8 Delete Image
	9 Back to previous menu
9	Return to Main Menu: Back to main menu
8	Start PC Link: install software from a CD-ROM (Interlink/Interserve)
9	Reboot: restart the system

Configuring the Service menu

The Service menu options can be configured as follows:
show/hide [a]
use specific product name (instead of SINUMERIK) [b]
edit text [c]

To configure the Service menu, create the file **envparam.bat** in the **Tools** directory in partition **C:** and enter the following commands:

Entry no.	DOS command	Text/function if =True	Text/function if =False	Default
1 [a]	set _INSTALL	1 Install/Update SINUMERIK System	Not displayed	True
2 [a]	set _TOOLS	2 SINUMERIK Tools and Options	Not displayed	True
4 [a]	set _SERVICE	4 Start Windows (Service Mode)	Not displayed	True
6 [a]	set _REBOOT	6 Reboot System (Warmboot)	Not displayed	False
[a]	set _HMI	Display submenu with HMI functions	Not displayed	True

String entries:

9 [c]	set _ENDTXT	= <i>String</i>	Reboot (Warmboot)
[b]	set _PRODUCTLINE	= <i>String</i>	SINUMERIK

Calling the Recovery Console

1. When booting up the system, select the **third**, hidden menu option in the boot manager, below the "SINUMERIK" menu option.
The system displays: Starting Windows Recovery Console.
Please refer to the original MS literature for more details.

3.4 Basic functions of the Service menu

3.4.1 Authorizing SIMATIC Step7 for SINUMERIK hardware

Preconditions

The SIMATIC Step7 software V5.x for SINUMERIK hardware is already installed.

Operator action

While the PCU is booting (after switching the control off and then on again):

- 1. Select the Service menu [hidden menu option] in the boot manager**
The following menu is displayed:

PLEASE SELECT
1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link
9 Reboot (Warmboot)
Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

- 2. Select option 2**

The system will ask you to enter the password:

passwd:

3. Enter one of the passwords for authorization levels 0 – 2.

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT
1 Activate Step7 for PCU
9 Return to Main Menu
Your Choice [1, 9] ?

Authorizing

4. Select option 1

Booting

The system will then reboot automatically.

The actual authorization takes place next time Windows NT/XP is booted, before the HMI system software is started.

Note

Authorization can also be performed on the SINUMERIK desktop by starting the function "STEP7 Authorizing".

3.4.2 Setting the original SINUMERIK HMI environment

The original HMI environment settings are restored. To this end the contents of directories

- ADD_ON
- USER
- OEM

are saved. The directories are then cleared.

Operator action

While the PCU is booting (after switching the control off and then on again):

1. Select the Service menu [hidden menu option] in the boot manager

The following menu is displayed:

PLEASE SELECT
1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link
9 Reboot (Warmboot)
Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

2. Select option 4

The following menu is displayed:

PLEASE SELECT
1 Standard Windows (without starting SINUMERIK HMI)
4 Original SINUMERIK HMI environment
5 Current SINUMERIK HMI environment
9 Return to Main Menu
Your Choice [1, 4, 5, 9]?

Setting the environment

3. Select option 4

The system will ask you to enter the password:

passwd:

4. Enter one of the passwords for authorization levels 0 – 2.

- System
- Manufacturer
- Service

Booting

The system will then reboot automatically.

The function is actually executed next time Windows is booted, before the HMI system software is started.

Note

The original settings for the HMI environment can also be restored on the SINUMERIK desktop by starting the function "Original SINUMERIK HMI Environ".

3.4.3 Setting the current SINUMERIK HMI environment

Restoration of the original HMI environment can be canceled, i.e. the saved directory contents can be copied back.

Operator action

While the PCU is booting (after switching the control off and then on again):

1. Select the Service menu [hidden menu option] in the boot manager

The following menu is displayed:

PLEASE SELECT
1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link
9 Reboot (Warmboot)
Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

2. Select option 4

The following menu is displayed:

PLEASE SELECT
1 Standard Windows (without starting SINUMERIK HMI)
4 Original SINUMERIK HMI environment
5 Current SINUMERIK HMI environment
9 Return to Main Menu
Your Choice [1, 4, 5, 9]?

Setting the environment

3. Select option 5

The system will ask you to enter the password:

passwd:

4. Enter one of the passwords for authorization levels 0 – 2.

- System
- Manufacturer
- Service

Booting

The system will then reboot automatically.

The function is actually executed next time Windows is booted, before the HMI software is started.

Note

Restoration of the original settings for the HMI environment can also be canceled on the SINUMERIK desktop by starting the function "Current SINUMERIK HMI Environ".

3.4.4 Starting DOS Shell

Operator action

While the PCU is booting (after switching the control off and then on again):

1. Select the Service menu [hidden menu option] in the boot manager

The following menu is displayed:

PLEASE SELECT
1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link
9 Reboot (Warmboot)
Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

Starting DOS Shell

2. Select option 3

The system will ask you to enter the password:

passwd:

3. Enter one of the passwords for authorization levels 0 – 2.

- System
- Manufacturer
- Service

You are now in the DOS Shell.

Exiting DOS Shell

To leave the DOS Shell, type *exit*.

3.4.5 Starting the SINUMERIK desktop (Windows NT/XP)

Next time the system boots up, the SINUMERIK desktop (Windows NT/XP) is started instead of the HMI system software.

Operator action

While the PCU is booting (after switching the control off and then on again):

1. Select the Service menu [hidden menu option] in the boot manager

The following menu is displayed:

PLEASE SELECT
1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link
9 Reboot (Warmboot)
Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

Starting DOS Shell

2. Select option 4

The following menu appears:

PLEASE SELECT
1 Standard Windows (without starting SINUMERIK HMI)
4 Original SINUMERIK HMI environment
5 Current SINUMERIK HMI environment
9 Return to Main Menu
Your Choice [1,4, 5, 9]?

Starting the SINUMERIK desktop

3. Select option 1

Booting

The system will then reboot automatically.
Instead of the HMI system software, the SINUMERIK desktop (Windows NT/XP) is started.

Note

The SINUMERIK desktop can also be started while the system is booting by pressing 3 when the version number of the basic software appears in the background display (within a 3-second time frame).

3.4.6 Checking the hard disk

All partitions (C:, D:, E:, F:) on the hard disk are checked.

Operator action

While the PCU is booting (after switching the control off and then on again):

1. Select the Service menu [hidden menu option] in the boot manager

The following menu is displayed:

PLEASE SELECT
1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link
9 Reboot (Warmboot)
Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

Checking the hard disk

2. Select option 5

Booting

The system will then reboot automatically.

The function is actually executed next time Windows NT/XP is booted, before the HMI system software is started.

Note

The hard disk can also be checked on the SINUMERIK desktop by starting the function "Check SINUMERIK System".

3.4.7 Checking the basic software version

The versions of the Service menu and Windows NT system components included in the basic software are listed in the file *C:\BaseVers.txt*.
Alternatively, HMI Explorer on the SINUMERIK desktop can be activated.

Operator action

1. Follow the procedure in 3.4.4 Starting DOS Shell to start a DOS Shell.

Checking the version

2. Enter: type BaseVers.txt

The version information is listed.

Exiting DOS Shell

To leave the DOS Shell, type *exit*.

Booting

In the boot screen the version of the basic PCU software appears in the bottom right of the display.

3.5 Basic functions of the SINUMERIK desktop

3.5.1 Installing/updating HMI system software

In addition to the Service menu (DOS), the SINUMERIK desktop can also be used for installing or updating HMI system software. This applies primarily to installation/update programs transferred to the PCU via the Windows network.

Installations/updates can be carried out in two ways:

- The installation/update process is started direct from the SINUMERIK desktop by executing the installation/update program (as in Windows).
- The installation/update application is copied into the *D:\INSTALL* directory. Next time the PCU is booted, the installation/update process is started automatically. The HMI system software is not started until the installation/update is completed.

Note

Installing/updating the HMI system software via the Service menu (DOS) is described in 7.2.

3.5.2 Setting the original SINUMERIK HMI environment

The function "Original SINUMERIK HMI Environ" is available as a script file on the SINUMERIK desktop. When this function is executed, the original settings are restored, i.e. the contents of the directories

- F:\ADD_ON
- F:\USER
- F:\OEM
- C:\RUNOEM

are saved. The directories are then cleared.

Note

The function can also be initiated in the Service menu (DOS), see 3.4.2 Setting the original SINUMERIK HMI environment.

It is then executed when Windows NT is started (before the HMI system software starts), without the need to open the SINUMERIK desktop.

3.5.3 Setting the current SINUMERIK HMI environment

The function "Current SINUMERIK HMI Environ" is available as a script file on the SINUMERIK desktop. When this function is executed, restoration of the original settings is canceled, i.e. the saved directory contents are copied back.

Note

The function can also be initiated in the Service menu (DOS) as described in 3.4.3 Setting the current SINUMERIK HMI environment. It is then executed when Windows is started (before the HMI system software starts), without the need to open the SINUMERIK desktop.

3.5.4 Authorizing SIMATIC Step7 for SINUMERIK hardware

The function "STEP7 Authorizing" is available as a script file on the SINUMERIK desktop. When this function is executed, the SIMATIC Step7 software is authorized, provided that it has already been installed.

Note

The function can also be initiated in the Service menu (DOS) as described in 3.4.1 Authorizing SIMATIC Step7 for SINUMERIK hardware. It is then executed when Windows is started (before the HMI system software starts), without the need to open the SINUMERIK desktop.

3.5.5 Connecting a serial mouse

The two COM interfaces are set up by default so that serial devices excluding serial mice can be used.

To use a serial mouse, in the [operating systems] section of the bootloader file *C:\Boot.ini* remove the option *[NoSerialMice]* in the entry for Windows startup. In the Control Panel, under *Mouse* (Start→ Settings→ Control→ Panel→ Mouse), *General* tab, you must also set the mouse type to serial.

Note

A PS/2 mouse will not work with this setting.

3.5.6 Error analysis

Checking the hard disk

The function "Check SINUMERIK System" is available as a script file on the SINUMERIK desktop. All partitions (C:, D:, E:, F:) on the hard disk are checked when this function is executed.

Note

The function can also be initiated in the Service menu (DOS) as described in 3.4.6 Checking the hard disk. It is then executed when Windows is started (before the HMI system software starts), without the need to open the SINUMERIK desktop.

Creating dump information

Windows NT/XP is configured so that in the event of a system crash (blue screen) it creates a dump with the current system information. The dump is stored in the file *D:\Memory.dmp*.

Checking the basic software version

The file *C:\BaseVers.txt* contains version information relating to the Service menu and Windows NT/XP system components included in the basic software.

Checking versions of the HMI system software

The Windows program "HMI Explorer" is included on the SINUMERIK desktop. When this program is called, detailed version information relating to the HMI system software applications installed and to Windows NT/XP is displayed.

HMI Explorer

In some cases HMI applications can be started and uninstalled individually from HMI Explorer.

Log file

Whenever the system is booted, information is written to a block in the file *D:\\$\$Base.log*, which contains the date, time and nature of administrative interventions.

3.5.7 Configuration

Starting OEM programs

OEM programs can be started immediately before the HMI system software is started up. This requires these programs (or links to them) to be stored in subdirectories of the directory *C:\RunOEM*.

Programs in the *C:\RunOEM\SeqOnce* subdirectory are started **once** and **sequentially**, i.e. a program is not started until the previously started program is completed.

Programs in the *C:\RunOEM\Seq* subdirectory are started **sequentially whenever the system is booted**, i.e. a program is not started until the previously started program is completed.

Programs in the *C:\RunOEM\ParOnce* subdirectory are started **once** and **simultaneously**. They run in parallel with the HMI system software.

Programs in the *C:\RunOEM\Par* subdirectory are started **simultaneously whenever the system is booted**. They run in parallel with the HMI system software.

The subdirectories are executed in the order listed above.
The programs within a subdirectory are started in the chronological order in which they were placed in the subdirectory.

In addition to programs, data files can also be placed in the subdirectories. They are then opened according to their file type. For example, ".txt" files are opened with Notepad, ".htm" files with Internet Explorer.

Reference documents

The documents SIEMENS D and SIEMENS E on the SINUMERIK desktop contain notes, explanations and conditions relating to the basic software that is currently loaded.

Configuring HMI users

You can configure the nominated Windows user under which the HMI system software is always started (= HMI user). The local Windows user 'auduser' is the default HMI user setting. However, in place of 'auduser' the HMI user can also be any other Windows user that is set up under Windows as a local user or domain user and has administrator rights. HMI users can be registered by means of the following registry entries:

Reference			Default
	Key	HKLM\SOFTWARE\Siemens\SINUMERIK\Basesoftware\<version>\HMIManager	
User		Input	HMIUserName (STRING) auduser
Domain		Input	HMIUserDomainName (STRING) local

For the HMIUserDomainName you should enter:

for a domain user:	"<domainname>"
for a local user:	"(local)"

When the operator logs on as the (currently registered) HMI user, the HMI system software is started automatically when the system boots. If the operator logs on as a Windows user other than the HMI user, the SINUMERIK desktop opens.

The operator does not normally need to log on explicitly, as the system is configured so that the operator logs on automatically as the HMI user. To log on as another Windows user, the operator must press and hold down the **Shift key** on the PS2 keyboard or on an external USB keyboard (this function is not available on an OP...) as soon as the boot screen appears. The Windows **Logon screen** then opens, in which the operator must enter the name and password of the chosen Windows user.



4

4 Power On / Booting

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4.1 Switching on

Preconditions

Before you connect the PCU to the power supply, you must unlock the hard disk and connect an operator panel front and the I/O devices (keyboard and display or monitor).

1. With the power supply to the PCU 50/70 switched off, plug the leads for the I/O devices into the appropriate sockets on the interface side of the PCU.
2. Once the I/O devices have been connected, the device is ready.

Information on how to adapt and set the interface and which connection cable is required, can be found in the User's Manual for your I/O device.

Connecting the power supply

The PCU 50/70 is supplied with 24 V direct voltage.

References: /BH/, Operator Components Manual

Switching on and switching off

There is no mains switch, so the power supply is connected and disconnected by plugging in or unplugging the mains connector (see above).

Note

When connecting I/O devices, please make sure that the components are designed for use in industry.



Caution

When plugging in/unplugging I/O connections (keyboard, mouse, printer, etc.), make sure that the I/O devices and the PCU are disconnected from the power supply. Otherwise they may be damaged.

This does not apply to USB connections.

4.2 Booting

Function

When the system is started for the **first** time, the software pre-loaded on the hard disk (SINUMERIK products, including HMI Advanced software if applicable), is installed under Windows NT/XP as follows:

Welcome to SINUMERIK
These SINUMERIK products will be installed now:

<product 1>
<product 2>
<product 3>
...

Install NOW

Install at NEXT REBOOT

CANCEL Installing

The buttons can be selected by pressing the Tab key and activated by pressing Enter.

Effect of the buttons:

Install NOW:

All the products displayed are installed one after another in the sequence in which they are listed. If a reboot is required to activate the installation, it is executed immediately after installation of the corresponding program. The system may therefore be rebooted several times until all products are installed.

Install at NEXT REBOOT:

The screen above is displayed again the next time the system is rebooted. Nothing is installed immediately.

CANCEL Installing

Nothing is installed and the screen is not displayed again the next time the system is rebooted. Other installations can then only be carried out explicitly in Windows mode by activating the setup.exe programs directly in the setup directories. Should you wish to install individual products at a later date, you will have to start up HMI Explorer from the SINUMERIK desktop. See 3.4.5. Then in HMI Explorer choose the Install menu option and select the product you wish to install.

Initial situation

The hard disk of the PCU is pre-partitioned for SINUMERIK 840D operation and further SINUMERIK applications on delivery and the software required for a basic start-up is installed:

- The boot software and other software needed for start-up are stored on C:

The drives E: and F: are empty.

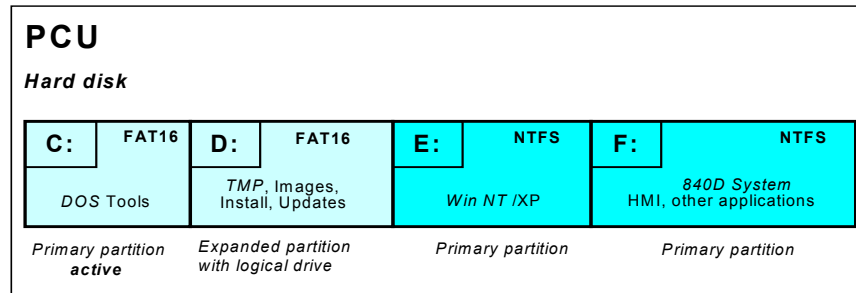


Figure 4-1 Partitioning on installation

4.3 Influencing HMI booting

Using files

The actions executed on booting are controlled by the contents of initialization files.

REGIE.INI

The applications to be started are entered in the REGIE.INI file. This file can be edited, see Chapter 5.

; Notes on other entries can be found in the OEM documentation

References: MMC/HMI OEM Package, Chapter 6

Accelerated WIN XP startup

Windows **XP** allows you to shorten the startup process (Hibernate) if certain conditions are met.

Features:

- The Windows XP desktop image is stored in a file when the system is shut down and activated again in accelerated startup.

- When this file is written to the hard disk, the power supply to the PCU can be disconnected without the loss of relevant information.
- Reactivating the operating system image file is far quicker than restarting Windows XP as a full reboot.

Preconditions:

- All Windows XP drivers and all applications must support accelerated mode (Hibernate) in order to execute Hibernate along with applications. For Touch Panel drivers this may not be the case. Accelerated mode is therefore unavailable for systems with TP0xx.
- The Windows system must be activated in standard mode (not service mode).

Use:

Since one or more applications/drivers cannot be closed in Hibernate mode, only a limited Hibernate can be executed. All HMI Advanced applications must be closed. Only the Windows XP image can be saved by Hibernate and restored the next time the system is rebooted.

Reactivating the Windows XP image is slightly faster than restarting Windows completely. All applications must be restarted once Windows XP has been reactivated.

**Important**

The "Hibernate" function has been tested in the standard configuration of HMI Advanced. If add-on and OEM software components are installed, the user should test this function.

Configuration

Selection of the suitable variant for an XP system and its configurations is configured in the file regie.ini. See Chapter 5.

NETNAMES.INI

In M:N configuration the startup of the operator panel front(s) can be modified in the file NETNAMES.INI, see Chapter 5, and

References: /FB2/, B3, Multiple Operator Panels and NCUs

Using the user interface

The following functions for the startup of the operator panel front can be modified by means of the user interface in the "Startup" operating area:

- Language localization
- MPI/OPI address
- Color settings for the user interface

Using the Service menu

Specific software versions, for example, can be loaded for the next reboot by means of the Service menu, see Chapter 7 "Software installation/data backup".

4.3.1 Changing the boot screen

Software version 6.1 and lower

If the standard background boot screen is unsuitable, it can be replaced by a more suitable screen.

Replace the screen in **E:\Winnt.40\System32\MMC840D.BMP** with a more suitable screen with the same filename.

Screen properties:

The required screen resolution is 640 x 480 to 1024 x 768 (depending on the OP), with 256 colors.

Software version 6.2 and higher

From this software version onwards, Siemens boot screens for NCU models 572.3, 573.3 and CCU3 are specifically identified with the word "powerline". You can set up a directory tree for manufacturer-specific boot screens in which the selected screens can be stored according to the diagram below:

Directory tree of the manufacturer-specific boot screens:

F:\OEM\IB\DATA\<Nck type>\<Resolution>\<Bild.bmp>

Nck type stands for:

Default
3000 (802D)
2000 (810D)
0 (840D)
5000 (840Di)

Resolution:

640 (dpi)
800
1024

If you want the same screen to be used each time (NCU-independent screen), it can be saved in the "default" directory in the required resolutions.

If you want to display different screens for different NCUs, they must be stored in the <NckType>\<Resolution> subdirectories in the appropriate resolution.

Screen name

<Name>.bmp

You can choose any name you want, but you can store only one file per directory.

Resolution

The screens must be created with a graphics tool in the resolution indicated by the subdirectory name and stored in the corresponding directory. The HMI software selects the screen according to the NCK type and the resolution of the operator panel.

Colors

The screen must be set to 256 colors.

Note

When the system is booted for the first time, a standard screen is displayed because there is no viable connection to the NC. Thereafter, the screen corresponding to the hardware in use is displayed.

Screens from earlier versions

Provided that the points above regarding directory tree, resolution and name of the screen files are observed, the screens can continue to be used.

4.3.2 Access authorizations when creating programs

Function

When the data management server is booted, the server reads

- the data chart SCHEMA.BIN followed by
- the plain text identifier from the appropriate language dll

In the boot phase the data management server checks whether there are entries for modified standard access authorizations in the file dh.ini.

The data management server uses these settings to update its internal image of the data management chart with the modified access authorizations.

The access authorizations described in the entries are now used as standard access authorizations for the selected data.

Entries that do not match the existing chart are ignored.

Formats and data type

The entries have the following format:

```
\wks.dir\*.wpd\*.mpf = 75775  
\mpf.dir\*.mpf = 75775
```

All entries are located in the [Accessmasks] section
A standard access mask can be agreed for each data type and filing location.

An entry comprises the path at which data of the data type can be created and the new standard access mask.

The paths are composed of the data type identifiers.

In the example above, "\wks.dir*.wpd*.mpf" consists of the data types for

workpiece directories	"wks.dir"
workpieces	"*.wpd"
part programs	"*.mpf".

The new standard access mask 75775, with which new part programs are created, is defined in all workpieces. Access mask 75775 stands for:

Access mask

7	Read access for all	0 to 7	are permissible
5	Write access from protection level 5	0 to 7	are permissible
7	Execution access is set	0 or 7	are permissible
7	Display access for all	0 to 7	are permissible
5	Delete access from protection level 5	0 to 7	are permissible

Restrictions

When the HMI database is installed, data is always created with the access authorizations defined in the standard data chart.

Access authorizations for nodes such as wks.dir cannot be changed.

Example

```
[Accessmasks]
\wks.dir\*.wpd\*.mpf = 75775
\mpf.dir\*.mpf = 75775
\cus.dir\*.spf = 33773
```

4.3.3 Keyboard features (PCU50/70) for HMI Advanced

CAPSLOCK

The CAPSLOCK function is used to lock conversion of lower case to upper case letters. It is used with external SINUMERIK keyboards. If lower case letters occur, they can be added by means of the SHIFT commands function.

The function is only active when HMI Advanced is running, not in standard Windows NT/XP operation.

Pressing the key sequence CTRL and SHIFT in succession reverses the function so that upper case letters that occur are converted into lower case letters.

Pressing the CTRL, SHIFT sequence again switches back to conversion from lower case to upper case letters. There is no limit on the time elapsing between pressing CTRL and SHIFT, but no other character can be entered between CTRL and SHIFT.

Activation

The function is activated by the display machine data 9009
\$MM_KEYBOARD_STATE activated.

0: CAPSLOCK off
2: CAPSLOCK on

This data is only evaluated on startup. If the MD is changed, the system must be rebooted.

Screen display

When lower case letters are activated, an icon of the SHIFT key appears in the dialog line.

Restrictions

- When the CAPSLOCK function is activated, the SHIFT key has no effect on letter keys.
- In standard Windows applications CTRL/ALT key sequences only work in lower case mode.
- Switching to lower case mode is not available on the integral keyboards on the OP 010/OP 12.
- The CTRL + Shift switching sequence only works with PS2 keyboards and external USB PC keyboards, not with panel keyboards.

4.4 HMI Advanced with SITOP UPS

Application

SITOP UPS:

6EP1931-2DC31 (6A module with serial interface) or
6EP1931-2EC31 (15A module with serial interface) or
6EP1931-2DC41 (6A module with USB interface) or
6EP1931-2EC41 (15A module with USB interface)

can be used in conjunction with HMI Advanced in the event of a failure in the power supply to the PCU50/70 to continue operation for a limited period using the backup battery and to shut down the HMI properly before the battery runs out.

Preconditions

- HMI Base 06.03.14
- SITOP software version 2.5 and higher
 - configuration manager
 - monitoring programare installed.
- The SITOP UPS hardware is connected

The necessary programs are set up as part of the HMI Advanced installation.



Important

The "SITOP UPS" function has been tested in the standard configuration of HMI Advanced. If add-on and OEM software components are installed, the user should test the shutdown of the entire system.

Procedure

Start the configuration manager in Windows mode. In the parameters area for the buffer memory enter the path of the program that you want to close HMI Advanced and shut down the PCU in the event of a power failure. The path name is:

E:\WINNT.40\System32\hmiexit.exe

Parameterization

Parameterization is carried out in the file:

E:\WINNT.40\System32\hmiexit.ini in the Actions section.

[Actions]

#Waiting time in seconds for closing HMI Advanced applications

Wait = 120

Action on expiration of the waiting time

ForceShutdown = True

The default settings are shown above. With ForceShutdown = True, a Windows shutdown is executed on expiration of the waiting time, regardless of the status of the HMI applications (recommended).

With ForceShutdown = False, Windows is not shut down.

References:

More information can be found in the product descriptions with the corresponding order number.

4.5 Boot errors

The following errors can occur when the operator panel front is booted:

- Hard disk is still locked
Remedy: Unlock hard disk
- NCU or CCU does not boot,
Software and hardware do not match (e.g. NC PC card with software for NCU 572.2 inserted in an NCU 573.2)
NC card or hardware faulty
Remedy: See /IAD/ Installation & Start-Up Guide 840D or /IAC/ Installation & Start-Up Guide 810D
- PCU 50 does not boot,
Remedy: See /BH/ Operator Components Manual, PCU 50 section
- No connection to NCU/CCU: alarm 120202 is output

The operator panel front is connected to the NC and the PLC via a serial bus. This alarm occurs if the HMI is started for the first time and the NC/PLC has not yet finished booting or communication with these components is faulty. When this alarm occurs, all display values connected with the NC/PLC become invalid. Such faults are normal while the controls are starting up (e.g. after resetting).

The alarm disappears automatically as soon as the fault situation has ended. If the alarm continues, a wide variety of causes may be to blame (e.g. line break, NC/PLC not booted, faulty address/ baud rate configuration on one of the bus nodes, etc.).

4.6 BIOS setup

Factory settings

Some of the settings vary according to the PCU type:
 PCU 50 with 333 MHz or 500 MHz, referred to as **V1**, and
 PCU 50 with 566 MHz or 1.2 GHz, referred to as **V2**.

The following standard BIOS parameters are factory-set on the PCU50 device:

Description	Setting for PCU 50 V1	V2 (if different)
Main		
System time ¹⁾	hh:mm:ss	
System date	MM/DD/YYYY	
Disk A:	1.44 MB, 3 1/2" (connected externally => disable additional HD test)	
Primary master C:	10056 MB (currently) or higher	10056 MB (currently) or higher
Primary slave	None	
Secondary master	None	
Secondary slave	None	
Memory cache	Write back	
Boot options		
Quick boot mode	Enabled	
SETUP prompt	Enabled	
POST errors	Enabled	
Floppy check	Disabled	
Summary screen	Enabled	Disabled
Keyboard features		
Num Lock	Off	Off
Key click	Disabled	
Keyboard auto-repeat rate	30/s	
Keyboard auto-repeat delay	1/2s	
Hardware options		
PCI-MPI/DP:	Enabled	
On-board Ethernet	Enabled	
Ethernet address	08000624xxxx	
LAN remote boot		Enabled
Cardbus/PCMCIA slot	Enabled	
Fan control		Enabled
SafeCard functions	Enabled	
Legacy USB support	Enabled	Enabled
CRT/LCD selection	SIMULTANEOUS	
CRT 640 x 480	75 Hz	
CRT 800 x 600	75 Hz	
CRT 1024 x 768	75 Hz	
LCD screensize	Graph & text expanded	
DSTN contrast	154	
Trackball / PS2 mouse	Auto	

Advanced

COM/LPT	Configuration	
Internal COM1	Enabled	
Base I/O address	3F8	
Interrupt	IRQ4	
Internal COM2	Enabled	
Base I/O address	2F8	
Interrupt	IRQ3	
Internal LPT1	Enabled	
Mode	EPP	EPP
Base I/O address	378	Not applicable for EPP
Interrupt	IRQ7	
DMA channel	DMA 10	Not applicable for EPP

PCI configuration:

PCI device slot 1

Option ROM scan	Enabled
Enable master	Enabled
Latency timer	0040 h

PCI device slot 2

Option ROM scan	Enabled
Enable master	Enabled
Latency timer	0040 h

on-board PCI

Ethernet

Option ROM scan	Disabled
Enable master	Disabled
Latency timer	0040 h

PCI/PnP ISA IRQ exclusion

IRQ3	Available
IRQ4	Available
IRQ5	Available
IRQ7	Available
IRQ9	Available
IRQ10	Available
IRQ11	Reserved
PCI IRQ line 1	Auto-select
PCI IRQ line 2	Auto-select
PCI IRQ line 3	Auto-select
PCI IRQ line 4	Auto-select

5

Installed O/S	Other
Reset configuration data	No
Floppy disk controller	Enabled
Local bus IDE adapter	Primary & secondary, both
Large disk access mode	DOS
Hard disk pre-delay	Disabled
Memory gap at 15MB	Disabled

Security

Supervisor password is	Disabled
User password is	Disabled
Set supervisor password	[Enter]
Set user password	[Enter]
Password on boot	Disabled
Fixed disk boot sector	Normal
Floppy disk access	Supervisor

Power

APM	Enabled
Power savings	Disabled
Standby timeout	Off
Suspend timeout	Off
Hard disk timeout	Disabled
Fan control	Enabled

Boot sequence

Hard drive	Hard drive
Removable devices	Removable devices
Floppy disk drive	CD-ROM drive
ATAPI CD-ROM drive	IntelBootAgent (IBA)

Version

Component	SINUMERIK PCU 50	
BIOS version	V07.01.07	V02.03.04
BIOS number	-A5E00054959A-DS02	- A5E00124434-ES01
MPI/DP firmware	V01	
CPU type	<i>PENTIUM II</i>	<i>PENTIUM III</i>
CPU speed	333 MHz or higher	866 MHz
CPU ID		
Code revision		

¹⁾ *Italics: Automatic setting, cannot be changed*

4.6.1 Changing the BIOS settings

If additional components are added or installed, in some cases they have to be declared to the system in the BIOS setup.

You can activate this via the operator panel front as described below.

1. Boot the device.
2. When you see the prompt to activate BIOS setup, press <F2> (corresponds to horizontal softkey 2 on the OP). The BIOS setup menu appears.
3. In the menu, use the cursor keys to navigate to the selection field you require.
4. Change the setting using the + key (press <SHIFT> and <X> at the same time) or the <--> key (in the numerical keypad).
5. Press the right or left cursor keys to access other setup menus if required.
6. Press <Escape> (<Alarm Cancel> key) to go to the "Exit" menu. (Alternatively, keep pressing the right cursor key).
7. Press the <Input> key to quit the setup menu.

The system will then boot as described in Subsection 7.6.1 of the Operator Components Manual.

Note

Changes to the BIOS settings, with the exception of the boot sequence and the LPT mode (EPP, EPC), require an OEM agreement to be signed.

Notes

5

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5.1 Functions

The functions of HMI Advanced can be altered in the INI files, display MD or the user interface.

5.1.1 Alarm protocol

There is a choice of two different methods for outputting alarms. The choice depends on the

- application and the
- disk loading.

The relevant inputs are made in the file MBDDE.INI.

Disk loading

Writing to alarm files always places a load on the same hard disk regions. Various methods can be chosen with the following control options.

There are a number of strategies for reducing the load on the disk. Multiple protocol files can be maintained in parallel on the disk. With the multiple file strategy, each time the HMI is started the next file is selected. This reduces the load on the disk hardware, in the area of both data and directory information. In addition, this strategy detects physical disk errors in the data area on startup and avoids them by reallocating memory space.

The multiple file strategy can be selected by means of the DiskCare Ini file entry

```
File:      "mbdde.ini",
Section:   [PROTOCOL],
Entry:     "DiskCare".
```

The following values are possible:

DiskCare=-1	The MBDDE server controls the alarm protocol in the memory. The alarm protocol is saved to the hard disk if it is displayed in the diagnostics operating area or if the Alarm Cancel key is actuated.
DiskCare=0	The data is written to the protocol file immediately.
DiskCare=n	Changes to the alarm status are written to the protocol file if no change occurs within n seconds. In addition, the alarm protocol is saved to the hard disk if it is displayed in the diagnostics operating area or if the Alarm Cancel key is actuated.
DiskCare=-n	n>1 specifies the number of parallel alarm files to be maintained.

The file "mbdde.ini" is evaluated on startup. The unused alarm files and the current protocol file are located in the mmc2 directory. The names of these hidden files (attribute "hidden") consist of an 8-digit hexadecimal number with the extension ".alr". The names of files in which write errors are detected on startup also consist of an 8-digit hexadecimal number, but with the extension ".al_".

Protocol file size

The size of the protocol file (ring buffer) can be defined in the file MBDDE.INI.

[Alarms]

Records = *value* ; Size of protocol file
Default value: 150
Minimum value: 18
Maximum value: 32000

With standard value 150, 75 alarms can be displayed. 2 records are needed for each alarm.

Selecting alarms by feature

Filter entries in MBDDE.INI can be used to control the messages logged in the protocol file.

[PROTOCOL]

Filter=*Expression*

Expression expresses selection features and is constructed as follows:

Syntax

[IDENTIFIER][RELATION][FEATURE][OPERATORS]

IDENTIFIER:

- No. Alarm number
- Prio Priority
- Mode Message line/alarm line or dialog box
- Type Alarm type (PowerOn, Cancel, etc.)
- From Source of alarm
- AckVar Acknowledgment variable

RELATION:

- '=' Equal to
- '<' Less than
- '>' Greater than
- '!' Not

FEATURE:

- Numbers
- Strings

OPERATORS

- ',' Comma denotes logical OR, *only within* a filter.
- ' ' Space/blank denotes logical AND *between* individual filters.
- '|' Pipe denotes logical OR *between* individual filters.

Examples:

Filter=Type<3

Only POWERON and RESET alarms are logged.

Filter=From:NCU_1

Only alarms from NCU_1 are logged

Filter=From:NCU_1 Type:1,3

Only POWERON and CANCEL alarms from NCU_1 are logged

5.1.2 Activating data transfer via PLC

Data transfer from/to NCK with the following properties can be started via the PLC:

- Data transfer from the hard disk in or from the NCK (workpiece directory, part program, etc.) using **job lists**.
- The "Job lists" function in HMI Advanced allows full part program handling, such as loading, unloading, selecting or executing, from the hard disk.

References relating to job lists: /IAD/ Installation and Start-Up Guide 840D, Chapter 11
 /BA/ Operator's Guide MMC 103, Chapter 2

By means of the interface between the PLC and HMI in DB19 the PLC gives the HMI jobs that initiate a data transfer between the HMI (hard disk) and NCK.

Specify the user control file:

Table 5-1 DB19.DBB16 (PLC → HMI)

Bit7	Bit6	Bit5	Bit4	Bit 3	Bit 2	Bit 1	Bit 0
always 1 (appr. file syst.)	PLC index for the user control file Value: 1 - 127						

Specify the job list:

Table 5-2 DB19.DBB17 (PLC → HMI)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
PLC line offset in the user control file Value: 1 - 255							

Job byte of PLC:

Table 5-3 DB19.DBB13 (PLC → HMI)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Selection	Load	Unload					

Acknowledgment byte from HMI for the current data transfer status:

Table 5-4 DB19.DBB26 (HMI → PLC)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Selection	Load	Unload		Active	Error	OK	res. PLC

Job processing

A PLC job is processed according to the following scheme:

1. The PLC may only initiate a job in the job byte if the acknowledgment byte is 0.
2. The HMI mirrors the job (excluding the parameter set) in the acknowledgment byte (signaling to the PLC that a PLC job is being processed). The PLC receives a "job active" signal for an unfinished job.
3. Once the operation is finished (OK or Error), the PLC must respond again and delete the job byte.
4. In response, the HMI sets the acknowledgment byte to 0.

This scheme ensures sequential processing of jobs.

User control file

The names of the job lists to be executed are stored by default in the control file PLC_IN_OUT_xxx.TEA in the display machine data directory (/BD.DIR), where "xxx" represents a number between 001 and 127. The file contains a maximum of 127 references to job lists.

The user must create this file.

The PLC sets an index (1-127) via DB19.DBB16, which determines the control file in which the job list names are stored.

Example User control file PLC_IN_OUT_003.TEA

```
N1      /WKS.DIR/OTTO.WPD/OTTO.JOB
N2      /WKS.DIR/WELLE.WPD/KANAL1.JOB
N3      ...
N4      ...
```

The line numbers (N..) can be omitted.
The file can be edited.

Example: Loading a job list

Requirement:

- Existing file PLC_IN_OUT_003.TEA
 - N1 job list A
 - N2 job list B
 - N3 job list C
- Acknowledgment byte DB19.DBB26 is 0.
- Define PLC index for the control file (DB 19, DBB16 = 131)
- Define PLC line offset 2 (DB 19, DBB17 = 2)
- PLC job: Load (DB 19, DBB13,6=1)
 - Job list B is loaded
- HMI signals to the PLC: Job list is loaded (DB19.DBB26,6=1)

Note

This function is not available if the MACHINE operating area is suppressed from the HMI startup.

Error messages to the PLC

The HMI outputs the following error values to the PLC via DB19.DBB27:

- 0 No error
- 1 Invalid number for control file.
(value in DB19.DBB16 < 127 or invalid)
- 2 Unable to read DB19.DBB15
- 3 Control file /BD.DIR/PLC_IN_OUT_xxx.TEA not found.
(value in DB19.DBB16 invalid)
- 4 Invalid index in control file.
(incorrect value in DB19.DBB17)
- 5 Selected job list in control file could not be opened
- 6 Error in job list (job list interpreter returns error)
- 7 Job list interpreter returns empty job list
- 9 Error while executing job list

Multiple operator panel fronts/NCUs (m:n)

In an m:n system, assignment of HMI Advanced to a netmaster NCU/PLC takes place in the NETNAMES.INI. The bus address of the NCU is configured in the [param network] section.

For example:

```
[param network]
netmaster= NCU_LEFT
```

This setting for the netmaster NCU/PLC means that data transfer is only activated by the NCU/PLC with the symbolic name NCU_LEFT.



Machine manufacturer

See machine manufacturer's specifications.

For a description of DB 19, please refer to
/FB/, A2, Various Interface Signals

5.1.3 Informing the PLC of the current HMI task number (HMI version 6.2 and higher)

Task number

A task describes the position at which an operating area is attached in the HMI area menu, i.e. the highest level.

The following fixed relationship exists between softkey bars in the area menu and tasks:

1st softkey bar:

Softkey	1	2	3	4	5	6	7	8
Task number	0	1	2	3	4	5	6	7

2nd softkey bar:

Softkey	1	2	3	4	5	6	7	8
Task number	8	9	10	11	12	13	14	15

3rd softkey bar:

Softkey	1	2	3	4	5	6	7	8
Task number	16	17	18	19	20	21	22	23

Which task number is assigned to which application is stored/configured in the [TaskConfiguration] section of the file REGIE.INI (see 5.6.14 REGIE.INI).

From software version 6.3 and higher, a 4th softkey bar can be used for OEM applications.

4th softkey bar:

Softkey	1	2	3	4	5	6	7	8
Task number	96	97	98	99	100	101	102	103

Task numbers 24 to 95 are already reserved for child tasks of standard applications or for specific OEM tasks. The associated label texts can be entered in the language-specific files re_xx.ini.

Application

For manufacturer-configured user interfaces, correct concurrence of key strokes on the machine operator panel and the operating areas/screens displayed is essential.

Example:

The function "Move unit" is selected in a screen form. On the MCP are "forward" and "backward" traversing keys, which are used to move the unit in real time.

To prevent a new screen from opening before the traversing key movement has been completed, due to a change of operating area in the HMI for example, the PLC is always able to know and check the current task number.

Configuration

The current task number is transferred to the PLC in a data block area, which can be specified in display machine data 9032: HMI_MONITOR as a string in the following format:

DBxx.DBByy

where:

xx is the number of a data block

yy is the byte number of the 1st byte of the transfer area (word limit)

The transfer area is 8 bytes long.

The transfer takes place in the 1st byte. Bytes 2 to 8 are reserved.

Note

Check that the specified area is not already occupied by input bytes, output bytes or flag bytes.

The block numbers and byte area are not checked.

Updating

The task number in the 1st byte is updated

- on every task change by the HMI
 - when the connection is changed to a different NC in M:N
- For the duration of unspecified states (e.g. during changeover to another NC in M:N) the special value 255 is transferred as the task number.

Value range

The task number can assume values from 0 to 95, including the operating areas configured by the user.

All visible tasks in the main menu (0 to 31) and the hidden child tasks (32 to 95) are therefore displayed.

5.1.4 Fine zero offset and base offset

This function refers to the offset in the screen form "Settable zero offset" and "Base zero offset".

Another column for the fine offset is inserted alongside the column for entering the offsets. The inputs are checked against the display machine data

- MD 9203: USER_CLASS_WRITE_FINE Access level for protection
- MD 9451: MM_WRITE_ZOA_FINE_LIMIT Amount of change

Actual value display: settable zero system

Using MD 9424: MA_COORDINATE_SYSTEM you can set whether

- the position of the workpiece coordinate system (programmed position, corresponds to the default setting) or
- the take-up position of the active tool relative to the workpiece zero

is displayed in the actual value display

MD 9424	= 0	Display in workpiece coordinate system, WCS (default)
MD 9424	= 1	Display in settable zero system, SZS (take-up position of active tool)

5.1.5 Defining the machine position and rotary axis position (version 6.1 and higher)

Singularities in special kinematics and robots

In the Cartesian point to point process (PTP) in workpiece coordinates the position of the machine axes is ambiguous in some places. In order to give a unique description of these singularities for such transformations (e.g. 5-axis transformation), the position of the machine STAT and the position of the axes TU are also described in addition to the workpiece coordinates.

Setting the numerical basis

The STAT and TU values are displayed in the axis screens (actual-value window, broad actual-value window with feed and zoom display) and entered in the MDA editor during the teach-in procedure.

Whether the values in STAT and TU are displayed in binary, decimal or hexadecimal format is set via the display machine data:

MD 9242: MA_STAT_DISPLAY_BASE	Numerical basis for display of moving joint STAT
MD 9243: MA_TU_DISPLAY_BASE	Numerical basis for display of rotary axis position TU

Possible settings are:

02:	Display as binary value
10:	Display as decimal value
16:	Display as hexadecimal value

These settings apply to both the actual-value window and the editor window.

Example

In the NC program the movement of axes from X120 Y20 Z-50 to X200 Y200 Z-120 looks like this in binary display:

- X=120 Y=20 Z=-50 STAT='B010' TU='B011101'
- X=200 Y200 Z=-120 STAT='B110' TU='B011111'

5.1.6 Block search in program test mode, multi-channel (not version 6.1)

Function

The NC is operated in program test mode for this block search, so that interactions between channel and synchronous actions and between multiple channels are possible within an NCU.

During "Block search in program test mode", all auxiliary functions of the NC are output to the PLC and the parts program commands for channel coordination (WAITE, WAITM, WAITMC, Replace axis, Write variables) are carried out by the NC. This means

- that the PLC is updated during this block search and
- machining operations involving multiple channels are processed correctly within the block search.

Activation

The function is activated by the "Prog.test contour" softkey.

The NC then starts the block search and switches the selected program in the current channel to program test mode:

- the auxiliary functions of the parts program are output by the NC to the PLC
- no axis movements are executed.

If during the block search the NC finds one of the parts program commands WAITE, WAITC or WAITMC, the NC waits for the specified partner channels, regardless of the current mode of these partner channels (e.g. normal program execution, program test, search via program test, etc.).

When the NC reaches the specified target block in the current channel, the NC stops the block search and deselects program test mode; the auxiliary functions of the target block are **no** longer output.

Dialog message

A dialog message appears as soon as all the channels involved in the current search have exited program test mode. This message indicates that, depending on the particular parts program, Repos offsets may have been produced in the channels involved in the block search during the search and will be retracted by the NC through interpolation the next time it starts. You must acknowledge this message.

Any repositioning offsets (in the individual channels) can be executed manually one by one in JOG mode, before program execution is continued at the point in the program reached by the block search by pressing the "NC Start" key.

Search configurations

"Block search in program test mode" supports the following configurations:

1. Block search in the **currently selected** channel
(the currently selected channel is the channel selected by the HMI)
2. Block search in the **currently selected** channel **and** in **all** channels in which the **same workpiece** as in the current channel is selected
3. Block search in the **currently selected** channel **and** in **all** channels that are in the **same mode group** as the current channel
4. Block search **in all** channels of the NC

Configurations **2** to **4**:

No block search is performed in the other channels (in contrast to the current channel); in the other channels program test mode is active until a stop condition (e.g. WAITMC) is detected.

Setting the search configuration

The various configurations are activated by means of the MACHINE.INI file.
The following entries are possible in the [BlockSearch] section:

[BlockSearch]

SeruproConfig

- =1 Block search in **currently selected** channel (default)
- =2 Block search in **currently selected** channel **and** in **all** channels with the **same workpiece**
- =3 Block search in **currently selected** channel **and** in **all** channels with the **same mode group**
- =4 Block search **in all** channels

Changes take effect immediately, i.e. with the next search.

Deactivate function

The following entries are possible in the [BlockSearch] section:

[BlockSearch]

SeruproEnabled

- =0 Function inactive
- =1 Function active (default)

Changes take effect immediately, i.e. with the next search.

5.1.7 Configuring language selection

Language-dependent

If there are more than 2 language options on the control, the "Select language" softkey can be configured in the main setup screen in order to change languages via the menu.

The entry "SkSelectLngInsteadSkChangeLng" in the "IB.INI" file in the "[LANGUAGE]" section controls whether the "SELECT LANGUAGE" softkey in the main setup screen should be replaced by the "**CHANGE LANGUAGE**" softkey. If there is no "SkSelectLngInsteadSkChangeLng" entry, only "Change language" is available.

The values of "SkSelectLngInsteadSkChangeLng" have the following meanings:

- False:** "Change language" softkey to change between foreground and background language as before (default value).
- True:** "Select language" softkey to select one of the installed languages.
This allows users to choose between more than two languages online by making the appropriate selection.

With the setting TRUE (Select language) the following values must be added to the entries in the "[LANGUAGE]" section in the "MMC.INI" file:

```
LanguageList= ... ,      GR
FontList= ... ,          Europe
FontListKO= ... ,        Europe2
LbList= ... ,             German
```

Note

With Select language the first language is not provided as a choice. By listing the first language in the language list again (and therefore also in the corresponding font settings) the first language also appears in the language selection menu.

Parameterization

The names of the soft keys are predefined.

HSx	x 1 - 8 ,	Horizontal soft keys 1 to 8
VSy	y 1 - 8 ,	Vertical softkeys 1 to 8

Not all softkeys need to be assigned.

Properties are assigned to softkeys in the softkey definition line:

SK = (Text[, Status][, Access level])

where:

SK	Softkey, e.g.	HS1 to HS8, VS1 to VS8

Text	Labeling of softkeys as described in 1.5 For creation of texts, see also Section 5.1 in part BE1 of this publication.

Picture: See Subsection 2.6.1 Pictures in BE1.

Instead of a text a picture file name
is specified in the following form:

"\\my_pic.bmp" or via a separate text file

\$85199 with the following text in the
(language-specific) text file: e.g.

85100 0 0 "\\F:\pic\my_pic.bmp". A picture to be displayed
on a softkey should measure
34 * 79 pixels.

Note

A carriage return in the softkey text is created with %n. A maximum of 2 lines of 9 characters each are available.

Status	se1	visible
	se2	disabled (gray text)
	se3	highlighted

Default setting: se1

Access level	Access level:
ac0	
...	
ac7	

For meaning see 5.1.8 Access protection.
Default setting: AC7

Examples:

VS7=("Abort", se3, ac1) ;Define softkey VS7 and assign
the text "Abort", the status
"highlighted" and the access level 1.

VS8=("OK", se2, ac6) ;Define soft key VS8 and assign
the text "OK", the status
"disabled" and the access level 6.

The properties Text, Status and Access Level can be changed in the methods
while the application is running.

SK.st = Text
SK.se = Status
SK.ac = Access level

where:

Status	1	visible
	2	disabled (gray text)
	3	highlighted (last softkey used)

Access level	0
	...
	7
	For meaning see Subsection 5.1.8 Access protection.

See above for explanation of parameters.

HS1.st = "Abort" ;Assign the text "Abort" to softkey HS1
HS2.se = 2 ;Assign the status "disabled" to softkey HS2
HS2.ac = 4 ;Assign the access level 4 to softkey HS2
(programmers, machine setters area).

5.1.8 Access protection

Access levels for enabling data areas are implemented in the SINUMERIK840D. There are access levels 0 to 7;

0 is the highest and
7 is the lowest level.

Locking of access levels.

Access levels

- 0 to 3 are locked by means of a password and
- 4 to 7 by means of keyswitch positions.

The operator only has access to information corresponding to this particular access level and the levels below it. Machine data is routinely assigned different access levels.

Access level 4 (keyswitch position 3) or more is required to display machine data. To start up the system the appropriate access level must generally be enabled by entering the password "EVENING".

Note

For information about changing access levels, please refer to

References: /BA/, Operator's Guide
/FB/, A2, Various Interface Signals

Table Access level concept		
Access level	Locked by	Range
0	Password	Siemens
1	Password: SUNRISE (default)	Machine manufacturer
2	Password: EVENING (default)	Installation engineer, service
3	Password: CUSTOMER (default)	End user
4	Keyswitch position 3	Programmer, machine setter
5	Keyswitch position 2	Qualified operator
6	Keyswitch position 1	Trained operator
7	Keyswitch position 0	Semi-skilled operator

Access levels 0 to 3 require the input of a password. The password for level 0 provides access to all data areas. The passwords can be changed after activation (not recommended). If the passwords have been forgotten, for example, then the system must be reinitialized (NCK general RESET). This resets all passwords to the defaults for this software version.

Access levels 0-3

The password remains valid until it is reset with the softkey "DELETE PASSWORD".

POWER ON does not reset the password.

Access levels 4-7

Access levels 4 to 7 require a corresponding keyswitch setting on the machine control panel. Three keys of different colors are provided for this purpose. Each of these keys provides access only to certain areas. The associated interface signals are located in DB10, DBB56.

Table Meaning of keyswitch positions		
Key color	Keyswitch pos.	Access level
All (no key used)	0 = Key removal position	7
Black	0 and 1	6-7
Green	0 to 2	5-7
Red	0 to 3	4-7

Redefining access levels for NC data

The user can change the priority of the access levels. Only lower priority access levels can be assigned to machine data, whereas higher or lower priority access levels can be assigned to setting data.

Example:

```
%_N_SGUD_DEF                ; File for global variables
                             ; $PATH=/_N_DEF_DIR
REDEF $MA_CTRLOUT_SEGMENT_NR APR 2 APW 2
                             ; (APR ... read access)
REDEF $MA_ENC_SEGMENT_NR APR 2 APW 2
                             ; (APW ... write access)
REDEF $SN_JOG_CONT_MODE_LEVELTRIGGRD APR 2 APW 2
M30
```

The file becomes active when the next _N_INITIAL_INI is read in. Different access levels are specified for writing (changing) or reading (parts program or PLC).

Example:

MD 10000 is protected by access levels 2/7, i.e. writing requires access level 2 (corresponding to password) and reading requires access level 7. In order to access the machine data area, key switch position 3 or more is required.

Undoing access level changes

In order to undo access level changes, the original values have to be restored.

Example:

```
%_N_SGUD_DEF                ; File for global variables
                             ; $PATH=/_N_DEF_DIR
REDEF $MA_CTRLLOUT_SEGMENT_NR APR 7 APW 2
                             ; (APR ... read access)
REDEF $MA_ENC_SEGMENT_NR APR 0 APW 0
                             ; (APW ... write access)
REDEF $SN_JOG_CONT_MODE_LEVELTRIGGRD APR 7 APW 7
M30
```

Access levels for NC language commands

From software version 7.1 onwards, certain NC language commands can be linked to access levels in order to restrict their use to authorized users.

References: /PGA/, Chapter 3 Access levels for NC language commands

5.1.9 Changing access protection for the base offset softkey

Parameters operating area

MD 9247 MM_USER_CLASS_BASE_ZERO_OFF_PA can be used to set the access level from which the "Base ZO" softkey is displayed in the "Zero offset" window in the "Parameters" operating area. At the same time, the base frames also appear hidden/unhidden in the "Zero offset" window and in the "Active ZO + offsets" window.

Machine operating area

MD 9248 MM_USER_CLASS_BASE_ZERO_OFF_MA can be set to select the access level from which the "Base ZO" softkey is displayed in the "Scratching" screen in the Machine operating area and/or G500 can be entered in the zero offset field.

5.1.10 Hiding axes

Function

Channel-specific MD 20098 DISPLAY_AXIS can be used to hide axes in the Machine operating area.

All axes are displayed by default.

Axes can be hidden in the following windows in the machine area.

- Small axis window (5 axes, default setting machine)
- Wide axis window (5 axes with feed and override)
- Large axis window (8 axes, large font)

In this way you can specify separately for the view in the machine or workpiece coordinate system whether or not the axis is displayed:

Bits 0 to 15 Show (=1)/hide (=0) geometrical axes (WCS)
Bits 16 to 31 Show (=1)/hide (=0) machine axes (MCS)

20098	DISPLAY_AXIS		
MD number	Display or hide axis on MMC/HMI		
Default setting: 0xFFFFFFFF		Minimum input limit: 0	Maximum input limit: 0xFFFFFFFF
Changes effective after POWER ON		Access level: 2/7	Unit: -
Data type: DWORD		Applies from version 4.4	
Meaning:	Bits 0 to 15: WCS		
	Bit 0=	1	Show geometrical axis in actual-value windows
		0	Hide geometrical axis in actual-value windows
	Bit 1	1	Show geometrical axis in reference point window
		0	Hide geometrical axis in actual-value windows
	Bit 2=	1	Show geometrical axis in preset/base offset/scratching/zero offset window
		0	Hide geometrical axis in preset/base offset/scratching window
	Bit 3=	1	Show geometrical axis in handwheel selection window
		0	Hide geometrical axis in handwheel selection window
	Bits 16 to 31: MCS		
	Bit 16=	1	Show machine axis in actual-value windows
		0	Hide machine axis in actual-value windows
	(Bit 17)		Not assigned
	Bit 18=	1	Show machine axis in base offset window
	0	Hide machine axis in base offset window	
Bit 19=	1	Show machine axis in handwheel selection window	
	0	Hide machine axis in handwheel selection window	

Special cases

- **Reference point approach and Safety Integrated**

MD 20098 DISPLAY_AXIS is not evaluated in the displays for referencing mode, i.e. in the axis reference point and acknowledge safe position display. All machine axes are always displayed.

Therefore the operator cannot change the values for the base zero offset without the appropriate access authorization.

Access authorization 7 is entered as the default value in MD 9247 / 9248.

5.1.11 Changing the coordinates system for actual-value display

Function

- Via the MD you can define whether the actual values are to be displayed
- without programmed offset = WCS or

including programmed offsets = SZS (settable zero offset system).

Example:

Program	WCS display	SZS display
....		
N110 X100	100	100
N120 X0	0	0
N130 \$P_PFRAME=CTTRANS(X,10)	0	0
N140 X100	100	110
N150 ...		



Machine manufacturer

To set the actual-value display:
see the machine manufacturer's information.

5.1.12 Activating the active tool offset immediately

Function

Display machine data 9440: ACTIVATE_SEL_USER_DATA can be used to ensure that the active tool offset is activated as soon as the parts program is in the "Reset" or "Stop" state.

References: /FB/, Description of Functions, Fundamentals, K2 Axes, Coordinate Systems...



Caution

The offset is applied after NC Start of the Reset in response to the next programmed axis movement in the parts program.

5.1.13 Checking for boot viruses

SYSLOCK V2

The SYSLOCK program is used for the basic detection of boot sector and partition table viruses. This takes advantage of the fact that for technical reasons all viruses of this type must install themselves in a memory area just below the 640 KB limit. These viruses then manipulate the BIOS so that it reduces the available memory and displays it as 639 KB, for example.

The SYSLOCK driver uses this characteristic to detect a virus infection. In this way both known viruses and those not yet identified by the usual virus scanners can be detected.

The main advantage of SYSLOCK over conventional anti-virus products is that there is no need for regular anti-virus software updates.

On the other hand SYSLOCK cannot identify individual viruses or disinfect a system affected by a virus.

This requires a full virus scanner product (e.g. Trend OfficeScan from Trend Micro, Inc.).

Virus alarm

If the program detects that the size of the main memory has changed since it was first initialized, a virus alarm and the following system responses are initiated:

- The program is paused for 30 seconds
- A message is displayed on the screen
- A message is logged in the file C:\SYSLOCK.LOG. This file only exists if a virus alarm was registered last time Syslock was started.

If a virus message is received, the system must be checked and disinfected with a full virus scanner. The conventional procedure should be used for disinfecting boot viruses:

1. Start the system from a clean, i.e. virus-free, boot disk.
2. Open the virus scanner and disinfect the system.

Once the system has been successfully disinfected, SYSLOCK.EXE automatically recognizes it as being "clean".

5.1.14 Cross-channel status display with icons (version 6.2 and higher)

Function

The status of

- channels
- spindles
- machine states (if applicable) or
- of machine states only

can be output with icons in the program status line (header).

As well as SINUMERIK icons, manufacturer-defined icons can also be used (configurable with the HEADER.INI file and DB19 DBB32-34).

Activation

The function is activated by MD 9052 SHOW_CHANNEL_SPANNING_STATE > 0.

Changes in MD 9052 take effect after a POWER ON.

SINUMERIK icons

The following SINUMERIK icons are available (name in brackets):

Channel status



Channel RESET (NC_RESET.BMP)



Channel active (NC_START.BMP)



Channel stopped (NC_STOP.BMP)

Feed stop



Feed not enabled (FEEDSTOP.BMP)

Spindle status



or



Spindle rotating left or right (SPNDLEFT.BMP or SPNDRGHT.BMP)



Spindle not enabled (SPNDSTOP.BMP)



Spindle STOP (SPNDM05.BMP)

Storing the SINUMERIK icons

The SINUMERIK icons are stored in

F:\HMI_ADV\ICONS\640 (for 640x480 screen)
F:\HMI_ADV\ICONS\800 (for 800x600 screen)
F:\HMI_ADV\ICONS\1024 (for 1024x768 screen)

Dimensions

The dimensions of the SINUMERIK icons are as follows:

Resolution 640x480: 16x16 pixels
Resolution 800x600: 20x20 pixels
Resolution 1024x768: 27x26 pixels

Colors

TrueColor

Note

When using the "Reversible spindles" or "Axis container" functions, the spindle status is output **before** the spindle reversal or assignment to axis/spindle container, i.e. the spindle number displayed under spindle status is the "logical" spindle.

**A.
SINUMERIK status display**

The following **four predefined displays** are available:

- Channel status (active, stopped, RESET) with superimposed spindle stop and feed stop
- Channel status (active, stopped, RESET) with superimposed feed stop
- Channel status (active, stopped, RESET)
- Spindle status (rotation left, rotation right, spindle stop, spindle halt M05)

Display 1

The channel status, feed stop and spindle status are output as an icon at the display position. The channel status icons can be superimposed with the "Spindle not enabled" or "Feed not enabled" icon. The following **hierarchy** applies (from highest to lowest priority):

1. Channel STOP (Highest priority)
2. Spindle not enabled
3. Feedrate is not enabled
4. Channel active
5. Channel RESET

Syntax:

```
ChanStatFeedStopSpindleStop = <Channel number>  
Spindles = <Spindle number1>, ..., <Spindle number n>  
Channel number:   Number of channel  
Spindle number:   Numbers of the "logical" spindles to be included  
                   (programmed in the DIN code with S1 to Sn, with more  
                   than one applicable entry the higher number is displayed)
```

Display 2

The channel status and spindle status are output as an icon at the display position. (Spindle status can be output separately, for example, see "Display 4"). The channel status icons can be superimposed with the "Feed not enabled" icon. The following hierarchy applies (from highest to lowest priority):

1. Channel STOP (Highest priority)
2. Feedrate is not enabled
3. Channel active
4. Channel RESET

Syntax:

```
ChanStatFeedStop = <Channel number>  
Channel number:   Number of channel
```

Display 3

The channel status is output as an icon at the display position. (Feed stop is also output in the feed window in the machine operating area, for example).

Syntax:

```
ChanStat = <Channel number>  
Channel number:   Number of channel
```

Display 4

The spindle status is output as an icon at the display position.

Syntax:

```
SpindStat = <Spindle number> , Chan <Channel number>  
Spindle number:   Number of (logical) spindle  
Channel number:   Number of channel optional
```

If the channel number is not specified, then the spindle status for the current channel is displayed. If the channel is changed, the display is updated accordingly.

Configuration with HEADER.INI

The assignment of the cross-channel status display is defined in the HEADER.INI file and can optionally be configured with SINUMERIK and/or user icons.

Note

- Empty positions need not be specified.
- Predefined status displays can be switched off in the HEADER.INI file in the OEM or USER directories with the value <empty>, e.g.
ChanStatFeedStopSpindleStop = <empty>.
- The complete HEADER.INI file can be found in Section 5.7.

16 display positions

There are 16 display positions defined in the program status line (header), each SINUMERIK icon occupying two positions: number + icon.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SKP1	DRY	ROV	SBL1	M01	M17	DRF	PRT								

Fig. 5-1

The SINUMERIK icons are assigned to a fixed output position. A section is created in the HEADER.INI configuration file for each position used.

Sample view of the program status line with SINUMERIK icons for 4 channels and 2 spindles:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SKP1	DRY	ROV	SBL1	M01	M17	DRF	PRT								

Fig. 5-2

These displays always have the predefined channel or spindle number.

Example:

The status displays for 2 channels and 1 spindle should always be output at the first, third and fifth display position.

HEADER.INI file:

```
[Pos1]                ; first display position
ChanStatFeedStopSpindleStop = 3
Spindles=1, 2          ; channel status of channel 3 is displayed,
                        ; superimposed with feed disable for channel 3 and
                        ; spindle disable for spindles 1 and 2

[Pos3]                ; third display position
ChanStatFeedStop = 2   ; channel status of channel 2 is displayed
                        ; superimposed with feed disable for channel 2

[Pos5]                ; fifth display position
SpindStat= 3           ; spindle status for spindle 3 is displayed
```

The following display, for example, appears in the program status line:

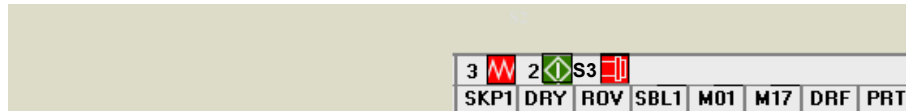


Fig. 5-3

Deactivation

Icon displays configured in this way can be deactivated if user status displays are used as described in B. Create empty entries in a user-specific HEADER.INI file (not in the HMI_ADV directory, because it will be overwritten again when the software is upgraded).

Example:
[Pos5]
SpindStat=<EMPTY>

B. User status display

Additionally (or alternatively), PLC-controlled (DB x, DBB y) user icons can be output, which are linked to specific machine states.

Procedure:

- Agreement of icons and positions (1.)
 - Control of icon call by PLC (2.)
1. Enter the name of the user icons and the associated positions in the HEADER.INI file in the UserIcons section under identifiers UI_0 to UI_31.

```
[UserIcons]
UI_0= <Icon_00.bmp> , <Position>
      ; UI_0:          Identifier
      ; Icon_00.bmp:   Name of user icon (8 characters.bmp)
      ; Position:      Display position (1 to 16)
```

```
...
UI_31= <Icon_31.bmp> , <Position>
```

USER_ICON_BASE = DBx.DBBy

Further on in the UserIcons section:

DBx.DBBy: User-specified double word for controlling icon selection.

If a bit is set for a user icon, the associated UI_x entry must exist, otherwise nothing is displayed.

To display an icon according to the above agreement, the PLC sets the corresponding bit in the double word. For example:

To display the icon assigned to UI_0 → set bit 0.

...

To display the icon assigned to UI_31 → set bit 31.

If the bit is reset by the PLC, the associated icon is cleared from the display.

Example:

UI_3=Icon_01.bmp,12.

Setting bit 3 displays the icon "Icon_01.bmp" at position 12 if no other icon with a higher identifier (>UI_3) and the same position (,12) is active.

Possible applications

- 32 alternative images for a position, each selected with a different bit (currently only one active selection bit)
- 2 alternative images for each of the permissible 16 positions, each position requires 2 of the 32 selection bits (maximum 16 active selection bits at any one time)
- Combination thereof with a total of max. 32 images for the max. 16 positions (max. 16 active selection bits at any one time)
- More than 16 selection bits, see Superimposition

With **unique** selection a maximum of 16 bits are set simultaneously in the 4 selection bytes for different positions.

Superimposition

With **non-unique** selection (bits for multiple identifiers whose image is to be displayed at the same position):

The image with the lower identifier number is superimposed with the image with the higher identifier number for the same position. Non-unique selection can also be used with less than 16 active selection bits. The PLC can deliberately use this superimposition to overlay less important displays (with lower identifier numbers) with important displays (high identifier numbers).

Note

If two HMI units are assigned to one NC/PLC unit (M:N), the PLC must first determine from the control interface which of the HMI interfaces is active. Icons can only be requested by the PLC for the active HMI unit.

This function is available if it is activated by means of the following machine data.

9052	SHOW_CHANNEL_SPANNING_STAT		
MD number	Change cross-channel status display		
Default value: 0	Min. input value: 0	Max. input value: 1	
Changes effective after POWER ON	Access level (R/W) 4/1	Unit: -	
Data type: STRING	Applies from version 6.2		
Meaning	Cross-channel status display: 0 = Display previous program status in header 1 = Display in program status line in header according to configuration in Header.ini file.		

5.1.15 Inverting the spindle icon in the spindle display (version 6.2 and higher)

The channel-specific MD 9033 MA_DISPL_INVERT_DIR_SPIND_M3 can be used to invert the spindle icon display: normal or inverted display is possible. For example, if you want the same icon to be displayed at M4 for the counter-spindle as at M3 for the main spindle, set bit[n]=1 (see inverting M3/M4 at the control interface).

9033	MA_DISPL_INVERT_DIR_SPIND_M3		
MD number	Spindle direction display		
Default value: 0x0000	Min. input value: 0x0000	Max. input value: 0x7FFFFFFF	
Change effective after: IMMEDIATE	Access level (R/W) 3/4	Unit: -	
Data type: LONG	Applies from version 6.2		
Meaning	Spindle direction display: Bit[n]=0 M3 displayed as clockwise rotation in the icon Bit[n]=1 M3 displayed as counter-clockwise rotation in the icon n = spindle number – 1 (i.e. bit 0 is spindle S1) Note: With the corresponding setting for MD 9014: USE_CHANNEL_DISPLAY_DATA MD 9033 can be managed channel specifically in the NC.		

5.1.16 Configurable displays in the header (version 6.2 and higher)

In JOG and MDA modes the PLC can display two-line texts in the "Program name" field in the header (e.g. selected slide, activated handwheel). This can be configured using the PLC (see Alarm display).

Text length

The maximum length of the texts to be displayed is 30 characters per line.

Syntax

The texts can consist of

- one language-specific part (from the alarm/message text file *.COM) and
- 3 parameters (%1, %2, %3)

User PLC-DB

The display is configured via a user PLC-DB.

- The number of the DBx with DBBy should be entered by the user in the HEADER.INI file as follows:
[UserTextInfo]
USER_TEXT_BASE=DBx.DBBy
where x = data block number, y = first byte in block. See Chapter
If this interface is specified, the text length limit
Text length = 33
must also be activated.
- The name of the PLC alarm text file (e.g. "alpu_") should be entered by the user in the MBDDE.INI file in the [TextFiles] section under "UserPLC":
[TextFiles]
UserPLC=alpu_

User PLC-DB interface

Two lines can be used for the display in the header:

- Program path line
- Program name line

The user DB interface provides

- a start data byte (job detection by HMI) and
- secondary bytes, with which
 - a number,
 - an axis index and
 - a text (length 12 characters/special characters)

can be output.

If "00" is written to a byte in text input, the HMI evaluates this as the end of the text. Inputs after this "00" are not displayed.

Table 5-5 User PLC-DB interface for displays in the program path/program name line

Program path line	Start DBBx	Start DBWx +1	Start DBBx +3	Start DBBx +4	Start DBBx +5-17
Data type	Byte	Word	Byte	Byte	String
Meaning	Bit0=1: there is something to do all bytes=1: job is acknowledged by HMI all bytes=0: PLC can write to interface again	Offset for text from alpu_xx.com to be displayed, 700000 is base address and is always summed internally =0: Delete line	Number from 0 to 255 (corresponds to 1st parameter %1)	Index from -127 ...128 negative number (-1=0xFF, -2=0xFE) is machine axis index, positive number is channel axis index The index is then converted to an axis name before being displayed. (corresponds to 2nd parameter %2)	Character string max. 12 characters (corresponds to 3rd parameter %3)
Program name line	Start DBBx +20	Start DBWx +21	Start DBBx +23	Start DBBx +24	Start DBBx +25-37
Data type	Byte	Word	Byte	Byte	String
Meaning	As above	As above	As above	As above	As above

Start DBBx

HMI detects a job and acknowledges it (all bytes=0).

Start DBWx+1

Start DBWx+1 contains the offset for a text number based on 700,000 (user PLC texts). If this parameter = 0, the corresponding line is deleted.

Start DBBx+3

Start DBBx+3 contains a number that is displayed without being converted.

Start DBBx+4

Start DBBx+4 contains an axis index.

- Negative value = machine axis index (AXCONF_MACHAX_NAME_TAB [Index-1], MD 10000),
- Positive value = channel axis index (AXCONF_CHANAX_NAME_TAB [Index-1], MD 20080),

These indices always refer to the channel currently displayed in the HMI. The index is converted to an axis name before being displayed.

Start DBB+5

Start DBBx +5 to +17 contains a character string comprising a maximum of 12 characters.

Note

Bit0=1 can only be set in Start DBBx for a new job if

- all bytes from the previous job were reset to zero and
 - the parameters for the new job Start DBBx+1 to Start DBBx+5 have been set correctly.
 - Special characters that have a special meaning within the syntax for this function (" , % , \$, #) must not appear within the user's character string (Start DBB+5...).
-

Structuring the PLC program

The PLC program should be structured so that

- all parameters are provided first and
- then the first byte is set.

The data for the program name line (second line) are located 20 bytes after the start byte.

Acknowledgment mechanism between HMI and PLC

For the Start DBBx there is an acknowledgment mechanism that ensures that the HMI and PLC agree:

- The PLC sets bit0 to 1 "Display user text in header". The function request can only be set by the PLC if bit0 has the value zero.
- After displaying the text in the header the HMI writes zero again in bit0 and the interface is enabled for the PLC for the next action.

Response in M:N

In the M:N function the two text lines must be cleared in passive switching.

In active switching, as in area switching, the content of the variables is evaluated and displayed.

Example

Task

In JOG and MDA modes the following texts should be output in the "Program name" field in the header:

- "Handwheel acting on axis ..." in the first line with the appropriate axis name
- "Slide ... active" in the second line with the appropriate slide number.

Procedure

1. Identify the PLC-HMI interface in the HEADER.INI file, e.g. DB60.DBB10
2. Enter the name of the PLC user text file in MBDDE.INI,
e.g.
[TextFiles]
UserPLC=alpu_
3. Enter texts in the PLC user text file,
e.g.
700100 0 0 "Handwheel acting on axis %2"
700101 0 0 "Slide %1 active"
4. Initiate text display from the PLC and describe the interface, e.g. for the first display line:
DB60.DBW11 = 100
DB60.DBB14 = 2
DB60.DBB10 = 1
e.g. for the second display line:
DB60.DBW31 = 101
DB60.DBB33 = 1
DB60.DBB30 = 1

Result

With the following axis configuration:
MD 20080 AXCONF_CHANAX_NAME_TAB[0] = "X"
MD 20080 AXCONF_CHANAX_NAME_TAB[1] = "Y"
MD 20080 AXCONF_CHANAX_NAME_TAB[2] = "Z"
the display is as follows:

"Handwheel acting on Y axis"	(first display line)
"Slide 1 active"	(second display line)

5.1.17 Selecting the channel/spindle from the PLC (version 6.2 and higher)

Channel selection

Channel selection and display is initiated as follows (display in "Channel name" field):

DB 19, DBB 32 = 01000001 [binary]	Channel selection
DB 19, DBB 33 = <channel number>	Channel number
	FF for next channel

Spindle selection

Spindle selection is initiated as follows (display in spindle window):

DB 19, DBB 32 = 01000010 [binary]	Spindle selection
DB 19, DBB 33 = <spindle number>	Spindle no. to be displayed

Error identifiers

The following error codes, which identify errors in the function request from the PLC to the HMI, are stored in DB 19, DBB 36:

Value	Meaning
0	No error
1	No function number (DBB32 bit 0-5)
2	Invalid parameter
3	Error when writing HMI-internal variable
10	Channel not present (DBB33)

Acknowledgment mechanism between HMI and PLC

Via DB 19.DBB32 bit 6, 7 there is an acknowledgment mechanism that ensures that the HMI and PLC agree on the channel selection:

- The PLC sets bit6 to 1 "Function request". The function request can only be set by the PLC if bits 6 and 7 have the value zero.
- After displaying the text in the header the HMI writes zero again in bit 6 and the interface is enabled for the PLC for the next action.

Note

If two HMI units are assigned to one NC/PLC unit (M:N), the PLC must first determine from the control interface which of the HMI interfaces is active. Channel/spindle displays can only be requested by the PLC for the active HMI unit. The interface for selecting channel/spindle displays for the 2nd HMI unit is located in DB19, DBB82-86. The use is the same as described for DBB32-36.

5.1.18 User-specific operating trees

Up to version 6.2, in entries in the [TaskConfiguration] section in **REGIE.INI**, the arrangement of softkeys for standard applications can be changed and the text for softkeys specified in **RE_xx.INI** (where xx = language abbreviation). The addition of user applications had to be limited to those softkeys not used in the standard applications. With the software enhancements from version 6.2 onwards, **skeleton applications** can be created with the following **additional options**:

- Free design of operating tree: creation of new operating levels, new arrangement of softkeys for previous operating levels and the new operating levels.
- Integration of internal applications into the operating levels (OEM applications).
- Calling of standard applications from any operating level, including defined submenus.
- Using the "Skeleton application" function, existing operating areas used in HMI Advanced can be combined and selected with a new softkey – simply by means of **configuration**. This releases operating areas/softkeys in the main menu for dedicated operating areas (OEM applications).
- The "Skeleton application" function can be used repeatedly to define a subordinate operating level from an existing operating level. This allows free operating tree design.
- A skeleton application can define up to 16 horizontal and 8 vertical softkeys.

When you leave an operating area that was selected from a skeleton application, you return to the higher-level menu of the skeleton application.

The following standard applications can be selected from a skeleton application:

- Machine
- Parameters
- Services
- Program
 - Simulation
 - HMI settings
- Diagnostics
- Startup and
- OEM applications

From the skeleton application a particular function of an operating area that is accessible from it can be selected specifically. (e.g. Program → Simulation, all standard possibilities are given in the table below).

A skeleton application can provide its own home screen as a bitmap file or display a standard image.

Configuration principle

New operating levels are created by skeleton applications and attached to existing operating levels. The assignments of horizontal and vertical softkey bars to skeleton applications can be configured.

Configuration files

Configuration is carried out in the following files:

REGIE.INI
TASKCONF.INI
RE_xx.INI

- **REGIE.INI** Calls the skeleton application(s), standard applications

In **REGIE.INI** an interpreter task **mntmmc** is specified as a task in which the `CmdLine:="SectionName1"` parameter indicates the section in which additional information about the inserted skeleton application in the **TASKCONF.INI** file is located.

More details can be found in the individual initialization files in 6.6.14 and 5.6.15.

- **TASKCONF.INI** Description of the softkeys and the operating areas that can be called with them, background picture or texts for the softkey labels. Details are given in the section specified in the `CmdLine` attribute, as described above. once.
- **RE_xx.INI** Softkey labels in the skeleton application for the language with the abbreviation xx.

Examples

The following sample entries should clarify the procedure:

REGIE.INI

Skeleton application for **user-specific operating trees**. See also 6.6.14

; Sample entry

Task7 = name := **mntmmc**, cmdline := "SectionName1", Timeout := 60000

The task number (7 in this case) is assigned to the softkey that calls the skeleton application.

Task0: Horizontal softkey 1

...

Task7: Horizontal softkey 8

mntmmc is the name of a standard task for interpreting the softkeys in the skeleton application in **TASKCONF.INI** and for activating them.

The value of **cmdline** indicates the section in the TASKCONF.INI file in which the softkey assignments in the skeleton application are described in detail. There may be more than one Task<No.>= name := **mntmmc**, ... entry if several sections in TASKCONF.INI have been defined with skeleton application parameters. This also allows operating trees to be designed with multiple levels.

TASKCONF.INI

```
[SectionName1]
; REGIE.INI must contain a reference to the freely selectable section name.
; Sample entries:
; The Services application should be activated when the skeleton
; application is started for the first time

; The StartIndex entry specifies the softkey index that activates the
; desired task when the program is started
; Services with StartIndex 5 in this example

StartIndex = 5

; Home screen for the skeleton application, for more details see below
Picture= Skeleton1.bmp

; the first softkey is assigned the Program task (task index 2) as child (Hsk1IsTask=0)
; with the <root> parameter, the softkey texts specified for German (via default)
; and English (UK)

Hsk1Task=2
Hsk1IsTask=0

; application-specific parameter: In this case, return to base level for the
; Program application, parameter: <root>
Hsk1Command=<root>
Hsk1SkText=Program           ; No language specified is the default setting
                             ; for all non-configured languages
Hsk1SkText _UK=Program       ; softkey label in English (_UK)

; the fifth softkey is assigned the Services task (task index 3) as child (Hsk1IsTask=0)
; with the empty command parameter, the softkey texts specified for the default German
; (_GR) and English (_UK)

Hsk5Task=3
Hsk5IsTask =0
Hsk5Command=
Hsk5SkText=SERVICES
Hsk5SkText _GR=Services
Hsk5SkText _UK=service

; Access authorizations for the "Services" softkey
Hsk5AccessLevel= 3

; the 2nd softkey in the ETC bar is assigned the Setup task (task index 5) as child
; (Hsk10IsTask=0) with empty command parameter,
; the softkey texts specified for German (_GR) and English (_UK)
```



```

Hsk10Task=5
Hsk10IsTask=0
Hsk10Command=
Hsk10SkText_GR=setup
Hsk10SkText_UK=setup

; TerminateTask=          see below

; Hsk16=ExitButton        see below

```

Assignment of softkey numbers

The following assignments apply for Hsk and StartIndex:

```

1 - 8:      Horizontal softkeys 1 - 8
9 - 16     Horizontal softkeys in the ETC softkey bar
17 - 24    Vertical softkeys 1 - 8
25 - 32    Softkey bar for OEM applications, see 5.1.3

```

Language-dependence of softkeys

The softkeys are labeled according to the current language setting. The softkeys are updated whenever the language is changed. If the softkey text for the current language (**Hsk<SoftkeyIndex>SkText_<Language>=...**) is not found, the softkey is assigned the default text (Entry (**Hsk<SoftkeyIndex>SkText=...**) or, if there is no default text, the task index.

Skeleton applications as child tasks

The skeleton application can also be started from a dedicated process as a child application. The skeleton application then returns to the starting application with a recall and terminates if applicable:

```

; The application is terminated on return
Hsk<SoftkeyIndex>TerminateTask=1          ; <> 0 terminate
or
; The application is not terminated on return. This is the default setting
Hsk<SoftkeyIndex>TerminateTask=0          ; 0 do not terminate

```

Home screen for the skeleton application

Unless otherwise specified with Picture= ..., a blank background is displayed. A dedicated picture stored as a bitmap in the **oem** directory can be specified, e.g.

```
Picture=BackgroundSkeleton1.bmp
```

The screen is displayed when the skeleton application is selected or on return from an application called by the skeleton application. Entering 1 rather than a picture file causes the "Setup" screen to be displayed (default).

Note

If **StartIndex** and a picture are configured, the picture is superimposed as soon as the skeleton application is selected and the application configured with StartIndex opens. If the picture is larger than the window available in the current operating device, the part from the center of the picture that fits in the window is displayed.

Access authorizations

The softkeys in the skeleton application can be secured with access authorizations.

0: System

...

7: Keyswitch position 0

; Example:

; Access authorizations for the "Services" softkey

Hsk5AccessLevel= 3

NCK-dependent softkeys

With

Hsk<SoftkeyIndex>NckLink=1

in the corresponding softkey entries in TASKCONF.INI a softkey can be bound to the existence of an intact connection to the NCK. The softkey can then only be used when the connection exists. Default is 0: no check.

Exit button

An exit button can be configured to close the **entire HMI operating area**. It is defined in TASKCONF.INI in the section for the corresponding skeleton application. In the example below the exit button is assigned to the 8th softkey in the ETC bar.

Hsk16Task=ExitButton

Shortened configuration in TaskConf.INI

The above configuration of TASKCONF.INI for a softkey in the skeleton application can be simplified for the following entries when standard operations are addressed:

Hsk<SoftkeyIndex>Task= x/y

x Operating area

y Command or state= i

Example:

Hsk1Task=Program/<root>

has the same meaning as the full configuration:

Hsk1Task=2
Hsk1IsTask=0
Hsk1Command=<root>
Hsk1SkText=Program

x	y	Explanation
Machine	<root>	Go to the Machine home screen (task 0) with recall to the highest level for return. The softkey text is <i>Machine</i> .
Parameters	<root>	Go to the Parameters home screen (task 1) with recall to the highest level for return. The softkey text is <i>Parameters</i> .
Program	<root>	Go to the Program home screen (task 2) with recall to the highest level for return. The softkey text is <i>Program</i> .
Service	<root>	Go to the Service home screen (task 3) with recall to the highest level for return. The softkey text is <i>Service</i> .
Diagnostics	<root>	Go to the Diagnostics home screen (task 4) with recall to the highest level for return. The softkey text is <i>Diagnostics</i> .
Diagnostics	State=10	Go to the Diagnostics home screen with recall to the highest level for return and selection of the alarm screen. The softkey text is <i>Alarms</i> .
		Note: The entire horizontal diagnostics softkey bar can be used.
Diagnostics	State=20	Go to the Diagnostics home screen with recall to the highest level for return and selection of the message screen. The softkey text is <i>Messages</i> .
Diagnostics	State=30	Go to the Diagnostics home screen with recall to the highest level for return and selection of the alarm protocol screen. The softkey text is <i>Alarm protocol</i> .
Diagnostics	State=40	Go to the Diagnostics service screen with recall to the highest level for return. The softkey text is <i>Service displays</i> .
Diagnostics	State=50	Go to the Diagnostics PLC status screen with recall to the highest level for return. The softkey text is <i>PLC status</i> .
Setup	<root>	Go to the Setup home screen (task 5) with recall to the highest level for return. The softkey text is <i>Setup</i> .
Setup	State=10	Go to the Machine data screen with recall on exiting the level. The softkey text is <i>Machine data</i> .

Setup	State=40	Go to the PLC overview screen in Setup with recall on exiting the level. The softkey text is <i>PLC</i> .
Setup	State=50	Go to the Drive overview screen in Setup with recall on exiting the level. The softkey text is <i>Drives/Servo</i> .
IBSetup	<root>	Go to the Settings home screen (task 34) with recall to the highest level for return. The softkey text is <i>System settings</i> .
Simulation	<root>	Go to Simulation (task 27) . A modal dialog is opened which is used to select the program to be simulated. The simulation is aborted by pressing Cancel. The softkey text is <i>Simulation</i> .

Other interfaces in the standard applications

The following standard applications can be addressed with these:

- Parameters
- Diagnostics
- Startup

The following commands should be noted to the right of the equals sign in the softkey command definition:

Hsk<SoftkeyIndex>**Command**=Commando1; Commando2; ... or
Vsk<SoftkeyIndex>**Command**=Commando1; Commando2; ...

A semi-colon is used as a separator between multiple commands.

Example:

; Hide some softkeys in the horizontal softkey bar for
; standard operation

Hsk1Command=DisableHsk(1, 3-4)

Commands:

DisableHsk(<SoftkeyList>)

The horizontal softkeys are removed from the *softkey list*. Individual softkeys can be separated by commas or softkey ranges <from> - <to> specified, e.g. DisableHsk(1,3,5-7).

Note

Softkeys in the ETC bar cannot be removed.

DisableVsk(<SoftkeyList>)

The vertical softkeys are removed from the *softkey list*. Individual softkeys can be separated by commas or softkey ranges <from> - <to> specified, e.g. DisableVsk(1,3,5-7).

DoVsk=<SoftkeyIndex>

The action of the vertical softkey (1-8) is initiated.

Recall(<StatusList>)

On reaching a status from the list the application returns to the calling application. The statuses can be separated by commas or specified as ranges <from> - <to>, e.g. Recall(1,5-7,48).

Highlight=<SoftkeyIndex>

The horizontal (1 – 8) or vertical (9 – 16) softkey is displayed with a blue background when the application is called.

ZuMat=<StatusMatrix>

The status matrix (e.g. dg\dg.zus) transferred is read and replaces the original status matrix.

RE_GR.INI

[HSoftkeyTexts]

HSK7 = "Special menu" // 20

The creation of OEM applications in HMI Advanced is described in:

References: / HMI Configuring Package /

Please contact your local sales office for the latest electronic documentation.

5.1.19 Cycles in the DRAM

In version 6.2, cycles could be saved in the DRAM of the NC. This left more SRAM memory available for parts programs and workpieces.

DRAM use

In the Setup area the HMI Advanced user interface allows users with the appropriate authorizations to define the use of the DRAM and if necessary to alter its size (MD 18351: MM_DRAM_FILE_MEM_SIZE). Changing the DRAM can in some cases also lead to a change in the SRAM, resulting in a complete memory reorganization.

**Important**

You must save all relevant data before changing the memory sizes or reconfiguring the memories.

Cycles in the DRAM

MD 11290: DRAM_FILESYSTEM_MASK can be used to set which objects should be loaded in the DRAM:

Bit0-n = 0:

The files for the specified directory are to be stored in the SRAM

1:

The files for the specified directory are to be stored in the DRAM

Depending on MD 11291: DRAM_FILESYST_SAVE_MASK
a copy is kept in the FFS on the NC card.

Bit0 CST directory (Siemens cycles)

Bit1 CMA directory (machine-manufacturer cycles)

Bit2 CUS directory (user cycles)

Saving in the Flash File System (FFS)

MD 11291: DRAM_FILESYST_SAVE_MASK can be used to set which objects should be saved in the DRAM on the FFS:

Bit0-n = 0: No files are saved..

If the control is switched off, the files on the NCK are lost.

1: If the files are in the DRAM, they are saved in the FFS
on the NC card.

Bit0 CST directory (Siemens cycles)

Bit1 CMA directory (machine-manufacturer cycles)

Bit2 CUS directory (user cycles)

Saving in the FFS avoids having to reload the objects on startup.



Important

Direct changes to objects stored in the DRAM and saved in the FFS are not enabled. Only cycles should be specified for saving in the FFS.

Any changes that are required must be made before loading onto the HMI.

Direct changes to objects in the DRAM that are not saved on the FFS are lost on Power Off.

5.1.20 Image provision for classic/new layout variants

On the HMI user interface there are various display options for the menus, depending on the display MD 9021: LAYOUT_MODE. If only images supplied by Siemens can be used, no other actions are required.

Switching sequence

When MD 9021: LAYOUT_MODE is changed, the following sequence takes place the next time the system is booted.

- The image files for the desired layout are extracted into the resolution-specific subdirectories.
- The HMI is adjusted to the DLL files belonging to the desired layout.

By default, zip files in the data management system (DM directory) and in the subdirectories of the HMI installation directory (hmi_adv, mmc2) are opened.

If you also want to include user-specific images for layout-dependent displays, they must be placed in a zip archive for each layout variant. Details of user-specific images are configured in the **LAYOUTSW.INI** file. See 5.6.20.

The LAYOUTSW.INI file with user modifications can be stored in the **oem** or **user** directories.

A distinction is made between:

- Image archives in the data management system (e.g. cycle images) and
- Image archives for the user or oem directories

The following details must be entered in the **[all]** section in LAYOUTSW.INI for each layout variant:

- The number of DLLs (applies to both layout variants)
- The number of directories in which there are archives to be opened in the data management system DM (applies to both layout variants)
- The number of HMI directories in which there are archives to be opened in the user or oem directories (applies to both layout variants)

together with the directories in the **[Directories]** section in which the archives for the images in the DM area and the images in the HMI area in user/oem are located.

In the **[Design_x]** section (where x = 0 for New Design and x = 1 for Classic Design) the following details are specified:

- DLLs to be used
- files to be opened
- the screen color depth to be set

The specified DLLs must correspond to the number in **[all]**.

Files to be opened:

The information is specified in the following entries:

HMI_ZipName_i = *.zip where i = running number 0, 1, 2, ... and
DM_ZipName_i = *.zip where i = running number 0, 1, 2, ...

The design to be activated is the design found in MD 9021: LAYOUT_MODE on startup.

5.1.21 User additions in the service overview

The **DgOvw.ini** file can be used to define additional signals in the drive diagnostics. The file must be created explicitly in the directory mmc2 or addon, oem, user.

If the file is present, the signals configured in it are evaluated and displayed in Diagnostics → "Service Overview" service displays.

Language-specific and non-language-specific texts can be configured in it.

Language-specific texts are located in language-specific INI files in the mmc2\language (or addon,oem,user...) directory with the name

DgOvwTxt_<language abbreviation>.ini.

A log file called **dgovw.log** is created in the user directory, in which error messages that occur when the dgovw.ini file is compiled are output.

Structure of the DgOvw.ini file

```
[GLOBAL]
NrOfSignals=
[BMP]
100="<Bitmapname>"
101="..."
.
.
[SIG1]
text=
Item=
expr=
.
.
[SIG2] .
.
.
[SIG<n>]
.
.
```


Meaning of the entries:**NrOfSignals:**

Number of additional signals. The signals are located in the [SIG<nr>] section, where <nr> goes from 1 to NrOfSignals (continuously and with no gaps).

Text:

either

language-specific text in the form \$T<TextNr>

where <TextNr> is a number in the language-specific ini file DgOvw_xx.ini (where xx is the language abbreviation).

or

non-language-specific text "<any text>".

"<any text>" is expressed exactly as it is written in this ini file.

Item: (see description of the OPI)

The following configuration possibilities exist for the area or line index:

<CH> for the channel number in which the axis is active

<AX> for the axis number

<DRV> for the drive number of the associated axis

<PLC_CH> for a PLC channel DB; is replaced by 20+channel number of the channel in which the axis is active.

<PLC_AX> for a PLC axis DB; is replaced by 30+axis number

e.g.: Item = /Channel/MachineAxis/impulseEnable[u<CH>, <AX>].

In this case the current channel would be used for <CH> and the current axis number for <AX>.

The value obtained can be evaluated by bits or as a whole number.

expr:

This can be an IF statement or a bitmap assignment.

Syntax:

expr=<IF_Statement> or

expr=<Bmp_Assignment>

<IF_Statement>::= **IF** <BoolExpression> **THEN** <Statement>**ELSE**<Statement>

<Bmp_Assignment>::= **BMP** = <BitmapNr>

<Statement>::= <EntryName> or

<Statement>::= <Bmp_Assignment>

<BoolExpression>::= <Val> or

<BoolExpression>::= <Val><OP><Value>

<Val>::= # or

<Val>::= #.<BitNr>

<BitNr>::=Bit number to be evaluated (0..31)

<OP>::= <, >, =, >=, <=, <>

An expression must occupy **one** line.

<EntryName>::= any name, which must be defined in the same section as expr. It is treated in the same way as expr.

<BitmapNr>::= Number of a bitmap.

The numbers 0 to 99 are reserved for Siemens.

Internal bitmaps must be defined in the [BMP] section (see below). The predefined numbers have the following meaning:

0:		do not display bitmap
1:	OK	display bitmap 
2:	Not OK	display bitmap 
3:	Error => alarm is active	display bitmap 
4:	Not applicable	display bitmap 
5:	No drive allocated	display bitmap 
6:	Communication error	display bitmap 

[BMP]

Any internal bitmaps can be specified in this section. The first bitmap in the [BMP] section must have number 100, the second 101, etc.

The name must be specified in double inverted commas. If no path is stated, the system searches for the bitmap in mmc2 or addon, oem, user..., otherwise in the stated path.

Example: signal for measuring system 1 active:

```
[GLOBAL]
NrOfSignals=1
[BMP]
100="test.bmp"
101="c:\tmp\test2.bmp"

[SIG1]
text= "Measuring system 1 active"
Item= /Nck/MachineAxis/encChoice[u1, <AX>]
expr= if #=1 then BMP=100 else expr2
expr2= if #=0 then BMP=101 else BMP=2
```

Structure of the DgOvwTxt_xx.ini file

xx in the file name stands for the language abbreviation for the language-specific file.

The only section is the [TEXT] section.

The individual tests are listed here in the form:

\$T<Text-Nr>= "<any text>".

Values from 1000 to 32767 are permitted for <Text Nr> and may only occur once.

Values below 1000 are reserved for Siemens.

This file has to exist for all languages that are required. (Language abbreviation as in mmc.ini). It is stored in the directory mmc2(user,addon, oem ...)\language

5.2 Simulation data matching

This function can be used to simulate machining on screen. Data evaluated by the simulation has to be copied into data management in the Dialog programming\Simulation data directory (\DP.DIR\SIM.DIR).

When the simulation program is started the following functions can be selected with the *Data matching* softkey:

- Match setup data
- Match tools
- Match machine data
- Match cycles

5.2.1 Simulation data

Files used

On initialization/startup of simulation HMI Advanced reads the following files (if present) from the data management directory \DP.DIR\SIM.DIR:

UMAC.DEF	User macros
SMAC.DEF	System macros
SMAC_SC.DEF	"
MMAC.DEF	Machine manufacturer macros
UGUD.DEF	Global user data
SGUD.DEF	Global system data
MGUD.DEF	Global machine manufacturer data
GUD4.DEF	NC user data 4
GUD5.DEF	NC user data 5
GUD6.DEF	NC user data 6
GUD7.DEF	NC user data 7
GUD7_SC.DEF	"
GUD8.DEF	NC user data 8
GUD9.DEF	NC user data 9
CH(c)_RPA.INI	R parameters (channel-specific)
CH(c)_GUD.INI, NC_GUD.INI	User data (channel-specific, global)
CH(c)_SEA.INI, NC_SEA.INI	Setting data (channel-specific, global)
AX_SEA.INI	Axis setting data
CH(c)_UFR.INI, NC_UFR.INI	Zero offsets (channel-specific, global)
CH(c)_PRO.INI	Protection zones (channel-specific)
NC_CEC.INI	Sag/angularity
TO_INI.INI	Tool data (complete)
INITIAL.INI	NCK initialization data
DPCUSCYC.COM	Description of user cycle interfaces

Booting

The above files, if present, are read when the simulation application boots.

Of the initialization data INITIAL.INI, only the machine data are read by the simulation application during booting.

The files (CH(c)_xxx.INI, NC_xxx.INI and AX_SEA.INI) are read in date stamp sequence, starting with the oldest file.

DPCUSCYC.COM:

The file DPCUSCYC.COM (mapping of user cycle interfaces) is only read if in the DPSIM.INI file in the [PRELOAD] section

CYCLES=0 or
CYCLEINTERFACE=1 is set.

The following cases are possible:

1. CYCLES=0
The corresponding cycles are not loaded into the simulation until they are called by the simulation interpreter for the first time.
2. CYCLES=1
All NCK and HMI Advanced cycles are preloaded when the simulation application is started (eliminating cycle reload times during simulation).
3. If a cycle of the same name exists in HMI Advanced and NCK, the NCK cycle is loaded. If a cycle of the same name exists in \CUS.DIR, \CMA.DIR and \CST.DIR, it is found and loaded first in \CUS.DIR, then in \CMA.DIR and finally in \CST.DIR.
4. CYCLES=1 and CYCLEINTERFACE=0
The cycle interfaces are formed directly by simulation. This means that all cycles (in \CUS.DIR, \CMA.DIR and \CST.DIR in HMI Advanced and NCK) have to be loaded in advance (occupying program memory in the simulation NC).

Note

The CMA.DIR directory (manufacturer cycles) only exists from version 5.3/6.1 and higher.

NC cycles

The NC cycles (CUS.DIR, CMA.DIR and CST.DIR) are copied as an image into the corresponding directories in data management. The location is determined in the DPSIM.INI file by the CYCLE entry (\DP.DIR\SIM.DIR) in the [MAIN] section. Matching takes place on starting the HMI and with every cycle match. This provides optimized access to the cycles and automatic creation of the images of the cycle interfaces.

Displaying the axis names/axis values

The display of axis names and axis values in simulation can be configured in the DPSIM.INI file and applies to all channels.

By default the first 3 geometrical axes are displayed. In addition, any other channel axes can also be displayed. Assignment takes place in the [LINKS] section

[LINKS]

ACT_POS_DISPL_1=1

ACT_POS_DISPL_2=2

ACT_POS_DISPL_3=3

ACT_POS_DISPL_4=0

ACT_POS_DISPL_5=0

Value = 0 The associated space in the display is freed

Value = 1 The associated default geometrical axis is displayed

Value = 1 to n Geometrical axis is displayed
(n = 1 to number of generated axes)

The indices of the geometrical/channel axes are permitted as values (1 to number of axes), axes that are not present are ignored. A maximum of 5 axis names and values can be displayed simultaneously.

Formatting

For the formatting of the axis values the number of digits (3 to 15) can be specified.

[LINKS]

ACT_POS_DIGITS=10

The number of digits after the decimal point (maximum number of digits) is read from the simulation initialization data via MD 9004 DISPLAY_RESOLUTION or MD 9011 DISPLAY_RESOLUTION_INCH.

Hiding axes

From NC software version 5.3, the geometrical/channel axes can be hidden via MD 20098 DISPLAY_AXIS. Bit 0 (display in the actual-value windows) is evaluated for the simulation.

As a maximum, as many axes can be displayed with their values that are not hidden with ACT_POS_DISPL_<x> with 0, i.e. as a maximum the first 5 unhidden geometrical/channel axes in sequence.

Note

The more space that is required to display the axes, the less space is available to display the actual block. Axis display can optionally be switched off from the Settings/Options on/off menu in the "Actual position" field (within the Display options field).

Search strategy

If a program (with no path) is required by the simulation, the following directories are searched:

1. File in current NCK workpiece directory
2. File in current HMI Advanced workpiece directory
3. File in NCK subroutine/main program directory
4. File in HMI Advanced subroutine/main program directory
5. File in NCK user cycle directory
6. File in HMI user cycle directory
7. File in NCK manufacturer directory
8. File in HMI manufacturer directory
9. File in NCK standard cycle directory
10. File in HMI standard cycle directory

If a program is not present in the simulation, it is loaded from the NC or from the HMI.

All programs (apart from cycles) that are loaded into the simulation are deleted from the simulation again in the event of a workpiece change. If one of these programs is needed again by the simulation, it is reloaded.

Program selection

If a parts program for a workpiece is selected for the simulation, the following actions are executed:

1. All tools are cleared with the file TO_CLEAR.INI (in HMI_ADV\DP\SIM) (if present).
2. If WPD_INI_MODE is set to 1 (see point 5) and if a TOA file with the selected program name exists in the workpiece directory, this file is loaded into the active file system for the simulation (otherwise file TO_INI.INI if it exists in the data management system in \DP.DIR\SIM.DIR).
3. If tool management is active, the file TO_ADDON.INI (in HMI_ADV\DP\SIM) is also loaded into the simulation and executed.
4. Workpieces: an initialization file with the workpiece name is loaded into the simulation
5. Workpieces:
 - MD 11280 WPD_INI_MODE = 1
All files (RPA, GUD, SEA, UFR, PRO, CEC, TMA) with the part program names are loaded into the passive file system in the simulation. Program-specific TOA files are loaded directly into the active file system for the simulation, all tools are first cleared and then, if tool management is active, the file TO_ADDON.INI (in HMI_ADV\DP\SIM) is loaded into the simulation and executed.
 - MD 11280 WPD_INI_MODE = 0 (as before)
A TOA file with the workpiece name (search sequence NC, then HMI) is loaded into the simulation, otherwise the first TOA file for the workpiece (search sequence NC, then HMI) is loaded into the simulation.

The parts program is then loaded into the simulation and selected.

If another parts program from the same workpiece is selected for the simulation, it is loaded into the simulation together with the associated data (if MD 11280 WPD_INI_MODE = 1) and then selected.

If a parts program from another workpiece is selected, the previous workpiece is removed from the simulation.

If a workpiece is selected for the simulation, the parts program with the workpiece name is loaded into the simulation together with its data and the workpiece selected. If the parts program with the workpiece name does not exist, an error message is output.

Channel change

Only one channel/program at a time can be simulated in the simulation, i.e. direct synchronization across channels is not possible.

Using the "Channel/spindle" softkey, programs can be assigned to specific channels to be executed one after another.

The preset channel is channel 1 or the first channel in the simulation. Before programs are selected, the simulation is switched to the channel for the current program.

MD 11280 WPD_INI_MODE = 1:

The system checks whether a TOA file with the current program name exists. If it does,

- the tools are cleared
- the TOA file is loaded into the active file system for the simulation and
- (if tool management is active), the file TO_ADDON.INI (in HMI_ADV\DP\SIM) is loaded into the simulation and executed.

All files (RPA, GUD, SEA, UFR, PRO, CEC, TMA) with the part program names are then loaded into the passive file system in the simulation.

The programs in the channel/spindle list are executed one at a time in the specified sequence with each "NC start" of the simulation; with each program change the graphics status is retained as a blank specification for the next program. Hidden programs are skipped.

After the last program the graphic is cleared – after prompting – and the simulation starts again with the first program.

5.2.2 Displaying simulation data

The files loaded into the simulation are displayed by means of the **Data matching/loaded data** softkey

User programs

All programs currently copied into the simulation are displayed. They are deleted from the simulation again when a different workpiece is selected.

Changes to these programs via the compensation editor are made directly in the HMI or NCK, and the modified programs are automatically copied into the simulation. If these programs are modified externally (e.g. via Services), the change is detected at the time of the next simulation selection and the programs concerned are copied into the simulation.

If files exist for the current workpiece (extension RPA, GUD, SEA, UFR, PRO, CEC, TOA, TMA), they are loaded into the simulation when the workpiece is selected. These files are retained when the workpiece is changed and their date stamp is monitored.

If these files are modified externally (e.g. via Services/Programs), the change is detected at the time of the next simulation selection and the files concerned are automatically loaded into the passive file system for the simulation.

User cycles

All user cycles loaded into the simulation are displayed. If the cycles have not been loaded before, the cycle interfaces must be defined in the file DPCUSCYC.COM. The cycles are then copied into the simulation when required. Changes to the cycles are not detected automatically and must be detected by means of the "Match cycles" softkey.

All user cycles loaded into the simulation are displayed.

Manufacturer cycles

All manufacturer cycles loaded into the simulation are displayed. If the cycles have not been loaded before, the cycle interfaces must be defined in the file DPCUSCYC.COM. The cycles are then copied into the simulation when required. Changes to the cycles are not detected automatically and must be detected by means of the "Match cycles" softkey.

All manufacturer cycles loaded into the simulation are displayed.

Standard cycles

All standard cycles loaded into the simulation are displayed. The cycles are then copied into the simulation when required. Changes to the cycles are not detected automatically and must be detected by means of the "Match cycles" softkey.

All user cycles loaded into the simulation are displayed.

Basic data

The initialization data (INITIAL.INI), tool data (TO_INI.INI) and definition files (*.DEF) loaded into the simulation are displayed.

The files (CH(c)_xxx.INI, NC_xxx.INI and AX_SEA.INI) are displayed under "Loaded data".

The date stamp for these files is evaluated. If these files are modified externally (e.g. via Services), the change is detected at the time of the next simulation selection and the files concerned are automatically loaded into the simulation.

5.2.3 Expansion of geometrical tool data in the simulation

Previously tools could be shown with their cutting edge, shaft and holder, which were calculated internally from data from the NC.

With the expansion of the geometrical tool data, it is now possible to show only the cutting edge ("**flying edge**") in the simulation image, without the shaft and holder. Additional/deviating parameters can also be incorporated into the simulation on a tool-by-tool basis.

The definition is produced by means of the **SimToGeo.ini** file, which is stored in one of the directories \USER, \OEM, \ADD_ON or \HMI_ADV. This file is not supplied with the system as standard.

Other requirements

- Activate the "**flying edge**" function in DPTWP.INI or DPMWP.ini
- Machine data: define memory for OEM parameters
- Create file SimToGeo.ini, insert link in file

Link

The SimToGeo.ini file must contain an entry that establishes a link to the NCK tool data. This is located in the [Settings] section.

Link=TC_DPCx where x = 1 to 10 or

Link=TC_DPCSx where x = 1 to 10

We recommend using the parameter TC_DPCS1 as the link entry for new projects, as this has been specially reserved for this purpose. A different link setting should only be used if the parameter TC_DPCS1 is already in use in an existing project. With Link=TC_DPCS1, for example, for every tool for which entries exist in SimToGeo.ini, an entry \$TC_DPCS1[t,d]= <Identifier> must be specified, where t = tool number and d = duplo number in the NCK tool data. Identifier must be noted as a real number, e.g. 500.1, where the number before the decimal point can represent a tool type and the number after the decimal point allows a further distinction.

The associated values in SimToGeo.ini then appear below the corresponding identifier, e.g.

Example: [500.1] ; Roughing tool 1
tool_type = 500
...

Optional parameters for orienting milling cutters:

TC_DPV3= ; 1 = +X, -1 = -X
TC_DPV4= ; 1 = +Y, -1 = -Y
TC_DPV5= ; 1 = +Z, -1 = -Z

Only **one** of these entries may be used. A free tool orientation cannot be entered.

Note

- Tools are still displayed in the 3 main planes, XY, YZ or ZX.
 - If a tool cannot be displayed, a polymarker is displayed.
 - With the SimToGeo.ini file the tool_type can be defined differently from the NC settings. If the corresponding cutting edge parameters (e.g. \$TC_DPCS1[t,d]) can be set, a link to/evaluation by SimToGeo.ini geometrical data is also possible.
 - A complete sample file with entries for each permissible tool type can be found in Subsection 5.6.10.
-

Machine data settings

MD 18206: MM_NUM_CCS_TOA_PARAM=1
 ; Number of OEM data per cutting edge 0 to 10
MD 18204: MM_TYPE_CCS_TOA_PARAM[0]=4
 ; Data type 4 = Real
MD 18080: MM_TOOL_MANAGEMENT_MASK='H4'
 ; Set aside memory for OEM data

Startup procedure

1. Activate the "Flying edge" function in DPTWP.INI or DPMWP.INI, for lathes or milling respectively, [Setup] section:

```
[SETUP]
;*** only SW6.4 or later ***
;Display tool only as cutting edge-"flying edge" (on/off)
TOOL_AS_CUTTING_EDGE=ON                   ;default = OFF
```

2. Define machine data or memory for OEM parameters:

```
$MN_MM_TOOL_MANAGEMENT_MASK=4      ; For SimToGeo.ini
                                      ; Set bit 2=1
```

If MD have already been assigned, the bit must also be set

Define memory and type for SIEMENS-OEM parameter \$TC_DPCS1

```
$MN_MM_NUM_CCS_TOA_PARAM=1          ; TC_DPCS1 is reserved
$MN_MM_TYPE_CCS_TOA_PARAM[0]=4      ; Data type Float for
                                      ; TC_DPCS1
```

or

Define memory and type for USER-OEM parameter \$TC_DPC1

```
$MN_MM_NUM_CC_TOA_PARAM=1           ; TC_DPC1 is reserved
$MN_MM_TYPE_CC_TOA_PARAM[0]=4       ; Data type Float for TC_DPC1
```

3. Set up SimToGeo.ini:

Define link entry for Siemens or User OEM parameter and expand geometrical data.

This is done using the OEM variable (\$TC_DPCS1/\$TC_DPC1).

The value of this variable determines the geometrical block that is used.

For example, the entry for tool 1 cutting edge 1 (T1D1) \$TC_DPCS1[1,1]=500.1 would be referred to the geometrical data block [500.1] in the SimToGeo.ini file. It is possible for more than one tool to refer to the same geometrical data block.

Add expanded geometrical tool data.

This is done in blocks, which are distinguished by float number identifiers, for instance. For example [500.1].

[Settings]

```
Link=TC_DPCS1      ; Link to TO_INI.INI, Siemens OEM
Link=TC_DPC1       ; Link to TO_INI.INI, USER OEM
```

```
[500.1]            ;T1 D1 Roughing tool type500 SL3 L1=100, L2=55, R1
tool_type=500      ;Tool type then $TC_DP1 not required
insert_length=10   ;TC_DP8, insert length
holder_angle=105   ;TC_DP10, holder angle, not rake angle
reference_direction=3 ;TC_DP11, cutting angle
clearance_angle=5  ;TC_DP24, clearance angle
```

4. Link to tool data/TO_INI.INI:

```
CHANDATA(1)
$TC_DPCS1[1,1]=500.1 ; Siemens OEM T1 D1 roughing tool SL3 type 500
$TC_DPC1[1,1]=500.1 ; User OEM
$TC_DP1[1,1]=500
$TC_DP2[1,1]=3
$TC_DP3[1,1]=100
$TC_DP4[1,1]=55
```

5.2.4 Data matching in simulation

The data to be evaluated by the simulation must be located in the data management system in \DP.DIR\SIM.DIR. They are read each time the simulation application is started.

Note

The data can be adjusted manually using the editor in the SERVICES operating area, but if improper changes are made there is a risk that the simulation will not be able to start. You should therefore save the files systematically in case the data cannot be retrieved from the NC.

The **Data matching** menu provides the following functions:

Match tools

The NC tool data for all channels are copied into the TO_INI.INI file and then activated in the simulation. Existing tools are removed beforehand. The function is offered automatically whenever simulation is selected if tool data in the NC have changed.

Match machine data

- All definition files (UMAC.DEF, SMAC.DEF, MMAC.DEF, UGUD.DEF, SGUD.DEF, MGUD.DEF, GUD4.DEF – GUD9.DEF) that are active in the NC are copied to the corresponding files in the HMI. Files that are not active in the NCK are deleted from the HMI. All files (CH(c)_xxx.INI, AX_SEA.INI, NC_xxx.INI) are deleted with the exception of the tool data.
- The machine data from the INITIAL.INI file are interpreted by the simulation. We recommend setting MD 11210: UPLOAD_MD_CHANGES_ONLY = 0.

Data are not activated until the simulation is restarted!

The data are stored in the data management system in \DP.DIR\SIM.DIR.

Note

If you do not wish the definition files in the data management directory to be matched with the NC, you can set this in DPSIM.INI.

```
[MAIN]
```

```
MATCH_NCU_ENVIRONMENT=0
```

```
; Only the INITIAL.INI file is copied from the NC.
```

```
MATCH_NCU_ENVIRONMENT=1      (default)
```

```
; Definition files in the
```

```
; data management directory are also matched with the NC.
```

Match cycles

Cycle changes are not monitored by the simulation. Cycles are

- either copied automatically into the simulation when required (PRELOAD/CYCLES=0)
- or copied in full into the simulation when the simulation application is started (PRELOAD/CYCLES=1).

If a cycle is changed, it must be copied into the simulation using the "Match cycles" softkey. Only cycles that have changed since they were last accessed are copied into the simulation (along with newly imported cycles). Cycles in the simulation that have since been deleted are deleted from the simulation. If an automatic cycle interface is not used, the simulation must be restarted.

Match setup data

The following data selection can be used to load data from the active file system in the NC into the simulation:

- R parameters (RPA)
- User data (GUD)
- Global user data
- Zero offsets (UFR)
- Global zero offsets
- Setting data (SEA)
- Global setting data
- Axis-specific setting data
- Protection zones (PRO)
- Sag/angularity (CEC)

The data can be selected in any combination. The channels are selected using softkeys (if there is more than one channel for simulation); the current channel is offered as default.

Channel-specific data are only offered if the selected channel is present on the NCK.

The selected data are copied into corresponding files in the data management system in \DP.DIR\SIM.DIR using the "OK" softkey and loaded into the simulation. Existing files are overwritten without prompting.

If data are selected for all channels, any associated channel-specific files that are present are deleted; channel-specific files are always created or overwritten.

Before the data are loaded into the simulation, a "channel reset" is performed for the simulation.

If an error occurs when copying from the NCK, the transfer can be repeated or aborted (Abort/Repeat dialog box). If an error occurs when loading into the simulation or a simulation alarm is triggered, the transfer is aborted.

Pressing the "OK" softkey saves the current data selection and displays it again the next time the dialog box is opened.

Mirroring tools

Differently oriented tool carriers (e.g. in different NC channels) can be used in the same machine tool, for which the TOA length compensation parameters are subject to machine tool-specific frame transformations (e.g. MIRROR) and have to be specified differently from the usual settings.

To support this arrangement in the orientation of graphics tools, the SIM graphics module DPSMASCH.DLL has been expanded to include, among other things, an almost universal evaluation of the TOA parameters. For example, \$TC_DP3[n, m] = . . . can also be evaluated with negative values, with the convention that by default, **positive lengths** generally lead to machining "behind the turning center" and **negative lengths** to machining "in front of the turning center".

Special NC instructions may also be needed in the corresponding user cycles for tool carrier selection to ensure that the simulation proceeds with the correct orientation of the graphics tools, e.g.

```
...  
IF $P_SIM  
  $SC_MIRROR_TOOL_LENGTH=1 ; tool length compensation  
  mirror mirrored axes in SIM  
ENDIF
```

...
Use (milling and lathe version):
The sign-compliant evaluation of the TOA parameters at the interface to the graphics module means that no operator action is required.

Rotating the coordinate system

The orientation of the coordinate system for simulation views (until now largely incomplete in the lathe version) can be altered and adjusted for example to rotary machines.

The INI entry [VIS] PLANE_VIEW=.. (in ..\user\dpmwp.ini for the milling version and dptwp.ini for the lathe version) can be modified for this purpose.

In order for advantage to be taken of these possibilities in machines that differ from the standard orientations,

- the value range for the entry has been published (B/F: back/front, U/D: up/down, L/R: left/right) and
- the lathe functions (including the resulting views: external, half section, full section, surface area) expanded accordingly (wire-frame model retained as before).
- In some cases (lathes) the entries have been made directly accessible from the user interface:

[VIS]

```
..
;Plane viewpoint default for standard milling: BDL(BackDownLeft)
;possible BDL, BUL, BUR, BDR, FDL, FUL, FUR or FDR
PLANE_VIEW=BDL
or
```

[VIS]

```
..
;Plane viewpoint default for standard horizontal lathes: BDR(BackDownRight)
;for vertical lathes with +Z upward: BDL or with +Z downward: FUL (** from SW5.3
***)
;possible BDL, BUL, BUR, BDR, FDL, FUL, FUR or FDR
PLANE_VIEW=BDR
```

Note

Entries other than BDR, BDL or FUL are of no use for lathes at present.

Use (lathe version only):

To support vertical lathe orientations, the existing "Set spindle" form has been expanded to include an additional "Machine orientation" frame group with initially 3 Mc option controls:

- "horizontal standard" (*default: PLANE_VIEW=BDR*),
- "vertical, downward feed" (*PLANE_VIEW=BDL*) and
- "vertical, upward feed" (*PLANE_VIEW=FUL*).

Using the "Change default" softkey the adjustments made here can also be used as a permanent reference for all new workpieces.

Optimizations

1. **"Unwinding diameter surface area" input monitoring**
In the lathe version, in conjunction with the blank inputs, the consistency of the "External diameter" and "Unwinding diameter surface area" parameters is checked and if necessary adjusted automatically (e.g. if the external diameter reduces) and incorrect entries are signaled (e.g. empty input field for unwinding diameter).
2. Tool counter-point path ("without tool data") is temporarily retained when a tool data source (e.g. "with tools", etc.) is selected.

In order for the correct selection and deselection of tool compensations (LK, FRK, SRK) to be checked visually, it is useful to be able to visually compare the tool counter-point path when tool compensations are deselected and the tool path when tool compensations are selected.

From version 5.3.8 onwards, the tool counter-point path produced from a simulation run "without tool data" is therefore generally retained for the first subsequent simulation run "with tool data" (tool paths with and without tool compensations are overlaid for one SIM session). Thereafter the tool paths are reset as usual at the start of each simulation.

5.2.5 Memory configuration for simulation

Function

To avoid having to carry out memory settings in NC machine data if additional memory is needed for the simulation, these settings can be carried out in the DPSIMNCK.INI file in the [DP_SIMNCK] section.

The default values for the simulation are entered in the DPSIMNCK.INI file in the [DP_SIMNCK] section, generally eliminating the need for additional memory settings in the NC. **These offset values have a cumulative effect on machine data with the same name.**

Negative values are ignored.

DPSIMNCK.INI [DP_SIMNCK]

The following entries with default values are contained in the [DP_SIMNCK] section:

```
...
[DP_SIMNCK]
DP_SIMNCK_MM_NUM_GUD_MODULES_OFFSET = 0
    corresponding machine data:
    18118 MM_NUM_GUD_MODULES

DP_SIMNCK_MM_NUM_GUD_NAMES_NCK_OFFSET = 5
    corresponding machine data:
    18120 MM_NUM_GUD_NAMES_NCK

DP_SIMNCK_MM_NUM_GUD_NAMES_CHAN_OFFSET = 30
    corresponding machine data:
    18130 MM_NUM_GUD_NAMES_CHAN

DP_SIMNCK_MM_GUD_VALUES_MEM_OFFSET = 20
    corresponding machine data:
    18150 MM_GUD_VALUES_MEM

DP_SIMNCK_MM_NUM_USER_MACROS_OFFSET = 10
    corresponding machine data:
    18160 MM_NUM_USER_MACROS
```


DP_SIMNCK_MM_NUM_MAX_FUNC_NAMES_OFFSET = 40
corresponding machine data:
18170 MM_NUM_MAX_FUNC_NAMES

DP_SIMNCK_MM_NUM_MAX_FUNC_PARAM_OFFSET = 350
corresponding machine data:
18180 MM_NUM_MAX_FUNC_PARAM

DP_SIMNCK_MM_MAX_SIZE_OF_LUD_VALUE_OFFSET = 400
corresponding machine data:
18242 MM_MAX_SIZE_OF_LUD_VALUE

...

5.2.6 Simulation with OEM transformations

For OEM-specific adjustments, e.g. for Compile cycles, the standard configuration, which is normally located in *<InstallationPath>\dp\dpsim.tea*, can be overwritten. To do this, you must create a *dpsim.tea* file containing the desired adjustments (e.g. different values for *TrafoType*) in the *<InstallationPath>\OEM* directory. The settings in this *dpsim.tea* are evaluated last and take priority over the default settings in *<InstallationPath>\dp\dpsim.tea*.

5.2.7 Accelerating simulation startup

Simulation startup

The simulation application is normally started only on request by the operator. This prevents the system from being overloaded by the software components that have to be loaded.

At the same time, however, this significantly increases the start time for the simulation when it is called for the first time. The start time is the time from selecting the simulation to execution of the first NC command ("visible" result).

Loading during HMI startup

To accelerate simulation startup, the loading times can be transferred to the HMI startup. The settings for this are carried out in the REGIE.INI file (OEM or USER directory).

[StartupConfiguration]

Startup12 = name:=dpncsim, Timeout:=0

[TaskConfiguration]

Task27 = name := dpsim, Timeout := 30000

Note

The entry used in the [StartupConfiguration] section must not have been used anywhere else. Check this in the REGIE.INI file in the MMC2, ADD_ON, OEM and USER directories.

Loading during SimNCK startup

Configuration files for the NC environment (tool data, cycles) are loaded when the SimNCK is started. This means that only the program to be executed and its subroutines need to be loaded into the simulation NCK. This startup procedure is controlled by means of the [PRELOAD] and [MAIN] sections in the DPSIM.INI file. The simulation start time can also be reduced as follows:

[PRELOAD]

CYCLES=1

All cycles (from NCK and hard disk) are preloaded when the simulation NCK is started with DPNCSIM.EXE.

TOOLS=1

The files for the tool mapper (TO_INI.INI and TO_ADDON.INI) are preloaded when the simulation NCK is started (if applicable).

5.3 Parameterization with ini files

5.3.1 Editing Ini files

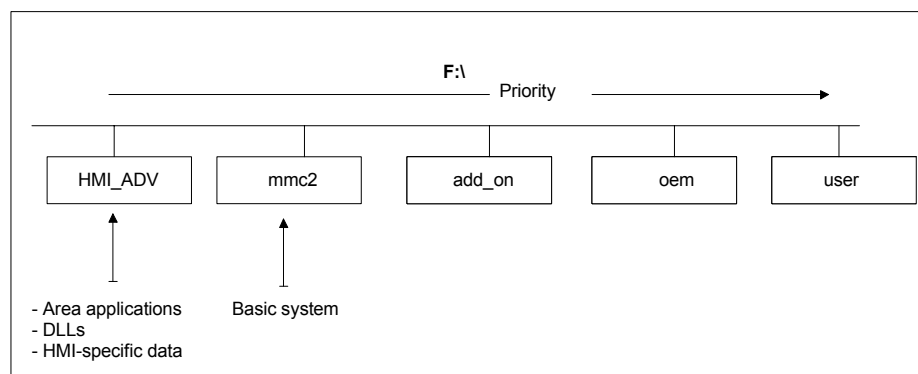
Notation

[xxx]	; Section identification
Identifier=value	; Value assignment ; Introduction of comment. Comments generally ; designate assignable values
,	; Separator (comma) for multiple assignments
REM	; Introduction of comment

General

1. The system directory structure is organized in such a way that user changes are retained if the software is upgraded. There is a clear separation between:
 - HMI system software and
 - customer-specific additions.
2. The system directories "MMC2" and HMI_Adv (and their subdirectories) are intended to be read only. They contain the original software supplied. They are only overwritten if the software is upgraded.

User changes to the original software are made in parallel directories. The content of these directories is unaffected by a software upgrade. The diagram below shows the priority sequence. This means that entries in the directory to the right overwrite corresponding entries in directories to the left.



The directories contain the following contents:

- **HMI_ADV:**
The directory contains area applications, DLLs and HMI-specific data.
- **mmc2:**
System directory for basic HMI software.
- **add_on:**
Directory for additional Siemens products
(e.g. AUTOTURN, DIGITALISIEREN, SINDNC,...)
This can have the same directory structure (e.g. language subdirectory) and directory contents as mmc2. Entries for the add-on product in regie.ini and re_*.ini, for example, are also stored here.
- **oem:**
Directory for OEM users in which internal OEM applications are located. This can have the same directory structure (e.g. language subdirectory) and directory contents as mmc2. Entries for the OEM product in regie.ini and re_*.ini, for example, are also stored here.
- **user:**
User directory in which customer differences from the ini files supplied are stored. **Changes** to the appearance of the user interface, which can be made by the user by means of settings on the HMI user interface, are also stored here (e.g. language setting, file selection, file manager view, etc.). Other settings that do not concern OEM or add-on products are also stored in the **user** directory, e.g. alarm server settings.
Changes to "auxiliary files", e.g. assignment of specific access authorizations for functions, or hiding of specific softkeys, also have to be stored in the **user** file.

In principle, only **entry differences** in the ini files as compared with the originals in mmc2 are stored in the parallel directories to mmc2. For example, if an OEM application is added to "oem", a complete "regie.ini" is not created; only the modified sections are stored in "oem".

"Regie.ini" would then look like this, for example:

[TaskConfiguration]
Task7:=oem1appl, ...

Note

None of the INI files in the "MMC2" and "HMI_Adv" directory may be modified.

Procedure for user-specific entries

1. Copy the INI file in the "MMC2" directory that you require
2. In the F:\USER directory create an empty INI file with the same name as in "MMC2" (if necessary also create subdirectories in USER, e.g. LANGUAGE).

Note

Do not copy the entire file from "MMC2"! Only copy the differences.

3. In the INI file in the USER directory simply copy the header for the section you wish to change and write the new or modified entry below it.

Example:

Entry in MBDDE.INI for PLC error message/operating message and scrolling through alarm lines

MBDDE.INI in USER:

;Section header

[TextFiles]

User PLC = F:\DH\MB.DIR\MYPLC_

[Alarms]

;Scroll through alarm lines

Rotation Cycle = 1000

The same procedure applies for the F:\ADD_ON and F:\OEM directories.

\ADD_ON is reserved for Siemens products, e.g. AUTOTURN.

All OEM applications should be installed in \OEM

**Important**

The associated entries, e.g. in REGIE.INI, should be modified in these directories and **not** in \MMC2!

Switching off settings

If there are specific entries in a lower-priority directory that you wish to be disabled in a higher-priority directory, you can do this by specifying an <empty> entry instead of a value.

Example:

Directory mmc2, file xxx.INI:

[<Section>]

<Identifier> = <value>

Directory user, file xxx.INI:

[<Section>]

<Identifier> = **<empty>**

Maximum file length

The maximum file length for INI files in Windows systems is 60 KB. If this limit is exceeded, entries at the end are ignored.

Remedy: Omit the full comments in USER\PARAMT.ini, for example, since they are also included in MMC2\PARAMT.INI.

5.3.2 Tool management

All the information needed for setup can be found in:

References: /FBW/, Description of Functions Tool Management.

5.3.3 MD for actual-value setting, scratching, PRESET

Introduction

The behavior of the **scratching** and **actual-value setting**, **PRESET** functions is influenced by a number of machine data. The selected settings also affect operation. (Display of softkeys and values, saving of input values).

References: /BAD/, Operator's Guide HMI Advanced

With the introduction of system frames in software version 6, two variants are available for the functions. The variants are differentiated by a channel-specific MD:

MD 28082: \$MC_SYSTEM_FRAME_MASK

Bit:	0	Preset actual-value memory, scratching
	1	External zero offset
	2	TCARR, PAROT
	3	TOROT, TOFRAME
	4	Workpiece reference points
	5	Cycles
	6	Transformations

Variant 1 **without system frame**:

The MD does not exist (older NCK software versions) or bit 0 for system frame for scratching and actual-value setting is not set.

Variant 2 **with system frame**:

Bit 0 for system frame for scratching and actual-value setting is not set in the MD.

The display machine data MD 9422: \$MM_MA_PRESET_MODE defines the PRESET/base offset function in JOG mode.

0: No soft key

- 1: The old PRESET in the Machine operating area (default)
- 2: Preset actual value memory
- 3: Preset actual-value memory, see online help

Note

MD 9220: \$MM_USER_CLASS_PRESET can also be set to hide the PRESET – actual-value setting and scratching softkeys.

Preset actual value memory

Set actual value with system frame

G500 active

- The values are written to the system frame

G500 not active

- An error message is output.

Set actual value without system frame

G500 active (adjustable frames reset)

- The values are written to the first base frame (version 4 and lower)
or (version 5 and higher)
depending on the entry in display machine data 9245:
\$MM_MA_PRESET_FRAMEIDX = index of base frame
in the specified base frame

G500 not active

- An error message is output.

Scratching

When this is selected the active frame is offered. A different frame can be selected with the entry in the "Zero offset" field.

Scratching with system frame (software version NCK 6.4)

With G500 in the "Zero offset" field, the values are written to the system frame.
With a value other than G500 in the "Zero offset" field, the values are written to the frame defined in the field.

You **cannot** choose any tool other than the one in the spindle.

If there is no tool in the spindle, you can choose any tool you want.

Scratching without system frame

With G500 in the "Zero offset" field, the values are written to the first base frame (version 4 and lower).

From software version 5 onwards, the values are written to the base frame according to the entry in display MD 9245: \$MM_MA_PRESET_FRAMEIDX = base frame index.

With a value other than G500 in the "Zero offset" field, the values are written to the frame defined in the field.

You can select any tool you want.

5.3.4 Executing from the hard disk in M : N

NETNAMES.INI

Included in this file are descriptions of the following:

- Configuring the channel menu for multi-channel systems
- Configuring the assignments of multiple HMI/MMC components and multiple NCU components. (M : N configurations)
- If multiple HMI/MMC components are assigned to one NCU, those that are to be provided by the parts program in "Execute externally (hard disk)" must be specified
- Reference to file with symbols for the PLC signals

In order to execute external programs located on the hard disk of the HMI in the data management system from the parts program with the program command EXTCALL, the following entries, for example, are required in the NETNAMES.INI file in the "Connection part" section:

; Detection part MMC identification

```
[own]
owner=    MMC_3
```

; Description of possible connections
; Connection part

```
[conn MMC_3]
conn_1=   NCU_1
conn_2=   NCU_2
conn_3=   NCU_3
conn_4=   NCU_4
EXTCALL_conns=conn_1, conn_2, conn_3, conn_4
; conn_i   Identifier for the NCUs from which the HMI
           can be accessed. See note below
```

; Description of significant net parameters
[param network]
bus = opi

```
; MMC definitions
[param MMC_3]
mmc_type = 0x40
mmc_.....
```

```
; NCU components definition
[param NCU_1]
type =NCU_573
nck_address= 11
plc_address= 11
name      = NCU1
...
; Reference to the file with symbols for PLC signals from NCU_1
PlcSymbolFile=PlcSym
```

Note

The entry EXTCALL_Conns ... is only needed in the main operating field in the NETNAMES.INI file, not in the secondary operating fields.

Details can be found in

References: /FB/, B3 Multiple Operator Panel Fronts and NCUs

5.3.5 Editor

AEDITOR.INI

Information about the ASCII editor can be found in the aeditor.ini file. The

[MEMORY] section defines the size of the editable files.
MemFactor=f ; f stands for 8 MB units. Permissible values are 1<=f<=31
; corresponding to 8 MB to 248 MB

Editor access authorizations can be modified in

[ACCESSLEVEL]
GlobalReplace=6
SettingHiddenCheck=7
Enable_Simulation = 7
; Softkey simulation can be hidden
; in the editor

[MMC_Wizard]
AEDITOR=AEDITOR.COM ; BE1

For more details see 5.6.4

5.4 Setting up access to external drives/computers

SINDNC software

With the SINDNC software, you can link your control to external network drives or other computers. This makes it possible, for example, to execute parts programs from other computers.

This access option is available under order number 6FC5 463-0FA03-0AA0. It applies for use in SINDNC, ShopMill, ShopTurn and HMI Advanced.

Precondition

- A network drive connection is set up on the HMI (hardware + software) and activated in the Windows environment for the HMI.

The SINDNC software must be installed.

The display machine data

```
9676      CMM_DIRECTORY_SOFTKEY_PATH1="Path1"
9677      CMM_DIRECTORY_SOFTKEY_PATH2="Path2"
9678      CMM_DIRECTORY_SOFTKEY_PATH3="Path3"
9679      CMM_DIRECTORY_SOFTKEY_PATH4="Path4"
```

can be used to identify up to 4 paths of network drives to the HMI software. Complete paths must be entered. The paths are displayed on softkeys.

Operation

The softkeys are available in the **Machine** area under Program overview --> ETC and in the **Program** area.

In HMI Advanced **version 6.2** and higher, if network drives have been defined, the first three are directly accessible from the horizontal softkey bar, while if a fourth network drive has been defined it can be accessed from --> ETC. If network drives exist, the softkeys for the cycle directories are located in the continuation bar --> ETC.

Configuring drives/computers

MD 9676: CMM_DIRECTORY_SOFTKEY_PATH1 to MD 9679 are used to enter the names of the external drive/computer with/without a directory. Up to 4 connections can be set up.

Connections can be specified as

- DOS path (e.g. "E:" or ("G:\VORBERE\MPF_DAT")) or
- network address, consisting of node identifier, share name and directory (e.g. "\\R111\<ShareName>\MPF_DAT")

in MD 9676 to 9679.

Example:

```
MD9677 CMM_DIRECTORY_SOFTKEY_PATH2=F:\R4711
        ; Drive + directory
MD9678 CMM_DIRECTORY_SOFTKEY_PATH3=\\R4712\PART1\SHAFT1.DIR
        ; Computer name, share name with directory
MD9679 CMM_DIRECTORY_SOFTKEY_PATH4=\\R4713\Part2\MPF_DAT.DIR
        ; Computer name, share name with directory
```

The network connection specified in MD9676
CMM_DIRECTORY_SOFTKEY_PATH1 is reserved for SINUMERIK ShopMill or
ShopTurn.

Configuring texts for softkeys

Plain text identifiers for selecting network drive connections with softkeys can be stored as language-specific user (alarm) texts under numbers 89901 to 89905 in a user text file that is known to the message block (see MBDDE.INI, [TextFiles] section). Text number 89901 correlates here to MD 9676
CMM_DIRECTORY_SOFTKEY_PATH1, etc.

Example:

```
mbdde.ini:
...
[TextFiles]
USER_PLC=F:\DH\MB.DIR\MYTXT_

MYTXT_GR.COM:
89901 0 0 "" Reserved
89902 0 0 "F:\R4711" Softkey text for softkey 2
89903 0 0 "R4712/ MMC1" Softkey text for softkey 3
89904 0 0 "R4713/ MMC2" Softkey text for softkey 4,
                        (2 spaces denote a line break)
...
```

HMI display

The network drives are offered

- in the MACHINE operating area in the extended SK (softkey) bar after the "Program overview" softkey
- in the PROGRAM operating area as an extended softkey bar in the main menu
- in the SERVICES operating area under Manage data (if 4 network drives are configured, 3 are displayed directly as horizontal softkeys, the fourth is accessed by pressing the ETC button)
- in the SERVICES operating area under Data on and Data off under the second vertical softkey Network drives ...

The softkeys in the various (expanded) softkey bars are assigned according to MD 9676 (SK1) to 9679 (SK4) (i.e. with gaps if applicable). The plain text identifier is used as the softkey text. If no text is configured, the value of the corresponding MD is shown. In version 6.2 and higher, the arrangement of the softkeys is as described above under "Operation".

Error messages

The network drive configuration is evaluated when the HMI is started. This evaluation does not check whether the connection actually exists. This check is only made when the drive is selected during use. If the configured path cannot be accessed, the error message "No files available for display" appears.

5.5 Setting the display MD parameters

5.5.1 Display machine data

The meaning of the display MD is described in

References: /LIS/, Lists, Machine Data for the Operator Panel

More detailed descriptions of each MD can be found in the online help.

They can be modified if necessary by operators with the appropriate access authorizations.

Their use is described in

/BAD/, Operator's Guide HMI Advanced

5.5.2 Transferring display MD from HMI Embedded systems

When upgrading a system from HMI Embedded with PCU 20 to HMI Advanced with PCU 50/70, it can be useful to transfer tried and tested display MD, particularly when using ShopMill/ShopTurn.

This can be done with standard controls in HMI Embedded and HMI Advanced.

Details can be found in the /BAD/ 9.6.3 Transferring display MD from HMI Embedded.

5.6 Ini files

Only the **modifiable parts** of the INI files are listed in this section. All other parts must not be changed.

5.6.1 MMC.INI

[GLOBAL]

MMCScreenOffTimeInMinutes = 5 ; latency for the screensaver
; screensaver on delay

; 1 makes servers such as NCDDE, MBDDE,
; DM servers visible, i.e. they can be moved to
; the foreground by pressing ALT + TAB
; to allow them to be configured for a trace
; (for servicing).

ServerVisible=1

```
connectiontype=0      ; Standard connection SINUMERIK
                        ; 810D/840D
                        = 1      Connection to 840Di
```

[CONTROL]

```
Resolution=0           ; Resolution: 0=fixed (640x480), 1=variable, default:0
                        ; BaseScreen specifies the resolution, for which the
                        ; applications originally were developed (typically: 640x480)
                        ; BaseScreen - default: 640x480
BaseScreen=640x480
```

```
                        ; If a mouse is connected to the control, the mouse pointer is
                        ; positioned by default in the top right corner of the screen.
                        ; The entry below can be used to switch this behavior off.
```

```
MoveCursor=0
```

[WP_SELECT]

```
                        ; for displaying a message that TOA/TMA-data on NCK will
                        ; be overwritten
                        ; TOA_WARNING_MESSAGE=yes/no
```

```
TOA_WARNING_MESSAGE=yes
```

[HEADER]

```
BAGOn=0                ; BAGOn=0      Mode display in header off
                        ; BAGOn=1      ; Mode display in header on (default)
                        ; No value specified corresponds to the default
```

5.6.2 NETNAMES.INI

This file is used for setting M:N assignments for control units and NCUs. See

References: /FB/, B3, Multiple Operator Panel Fronts and Multiple NCUs,
Distributed Systems
and the definition of channel groups if there is a 1:1 assignment between the
control unit and the NCU.

Channel menu

Access to the channel menu configuration is granted by extending the file
"NETNAMES.INI".

Procedure

To do this, proceed as follows:

1. Define groups (a max. of 24) in "logChanSetList"
2. Define NCs and channels with unique names for the groups in "logChanList".
3. For channels define the NC name in "logNCName",
 - the channel no. on the NC in "ChanNum" and
 - the Reserve yes/no softkey (using the command "IsAGap" = True/False).
4. For the HMI define the default machine "DEFAULT_logChanGrp" and the default channel in "DEFAULT_logChan" for startup

Note

The NC writes the channel number for the HMI in DB19, DBB22.

The example below is simplified in 1:1 assignment of HMI : NCU in that conn_2 is omitted and all channels are located on NCU_1

Example:

```

NETNAMES.INI
[own]
owner = MMC_1
; Description of possible connections
[conn MMC_1]
conn_1 = NCU_1
conn_2 = NCU_2
; Description of significant net parameters
[param network]
bus = opi ; the MPI interface must be used on the SINUMERIK 810D

[param MMC_1]
mmc_address = 1
[param NCU_1]
nck_address = 12
plc_address = 12
; core name for the PLC symbol files for representing signals with symbols
PlcSymbolFile= ...

[param NCU_2]
nck_address = 14
plc_address = 14
; core name for the PLC symbol files for representing signals with symbols
PlcSymbolFile= ...

[chan MMC_1]

DEFAULT_logChanGrp = Milling1
DEFAULT_logChan = Channel13
ShowChanMenu = TRUE
logChanSetList = Milling1, Milling2
[Milling1]
logChanList = Channel11, Channel12, Channel13, Channel14, Channel15

```

```
[Channel11]          ; logical channel
logNCName = NCU_1    ; logical NCU name see above
ChanNum = 1          ; channel number within NCU
[Channel12]
logNCName = NCU_1
ChanNum = 2
[Channel13]
logNCName = NCU_1
ChanNum = 3

[Channel14]
logNCName = NCU_1
ChanNum = 4
[Channel15]
logNCName = NCU_1
ChanNum = 5
[Milling2]
logChanList = Channel21, Channel22, Channel23, Channel24, Channel25
[Channel21]
logNCName = NCU_2
ChanNum = 1
[Channel22]
logNCName = NCU_2
ChanNum = 2
[Channel23]
logNCName = NCU_2
ChanNum = 3
[Channel24]
logNCName = NCU_2
ChanNum = 4
[Channel25]
logNCName = NCU_2
ChanNum = 5
```


5.6.3 MBDDE.INI

Reducing the load on the hard disk

Writing to alarm files always places a load on the same hard disk regions. Various methods can be chosen with the following control options. Details are described in

5.1.1 Alarm protocol.

The multiple file strategy can also be selected by means of the DiskCare Ini file entry

File: "mbdde.ini",
Section: [PROTOCOL],
Entry: "**DiskCare**". See below.

[Alarms]

```

; determines the maximum size of the alarm list
MaxNo=200
; determines the order in which the alarms are inserted in the alarm
list
; possible values:
; FIRST: puts newer alarms at the top of the list
; LAST: inserts the newest alarm at the bottom
ORDER=LAST
; the alarm/message line is able to scroll through the alarms
; possible values:
; 0 or negative value: no scrolling
; 500 - 32767: interval in ms

```

RotationCycle=0
; determines if the alarm server should connect to ALARM_S/SQ
; or not
; possible values:
; 0 Alarm_S/SQ not handled
; 1 Alarm_S/SQ handled (default)

Alarm_S=1
; if Alarm_S/SQ handling is enabled this key determines if Quits
; should be entered into the alarm protocol
; possible values:
; 0 Alarm_SQ quits are not entered into the alarm protocol
; (backward compatible)
; 1 Alarm_SQ quits are entered into the alarm protocol (default)

Protocol_Alarm_SQ=1
; path and file names of the alarm text lists
; The filename fragments must not exceed 6 chars, because it is
; extended automatically by the message module according to the
; selected language.

; The alarm texts in the files specified under UserMMC, UserNCK ...
; overload the corresponding texts of the files defined in MMC, NCK ...
; Therefore the user should modify files according to the needs of his
; system exclusively in UserMMC, UserNCK ...

; Creating alarm text with any DOS editor may cause problems with special
; characters like ä, ö or ü. To import DOS-generated files in any case,
; add a blank and the string "DOS" after the name of the text file.

; Example: UserPLC=F:\dh\mb.dir\myplc_ DOS

; If you add or remove the parameter DOS, you have to actuate (new date
; of file) the corresponding file (*.com) otherwise the change is not
; accepted.

[TextFiles]

MMC=F:\MMC_52\dh\mb.dir\alm_
NCK=F:\MMC_52\dh\mb.dir\aln_
PLC=F:\MMC_52\dh\mb.dir\alp_
ZYK=F:\MMC_52\dh\mb.dir\alz_
CZYK=F:\MMC_52\dh\mb.dir\alc_
STANDARD_CYCLES=F:\MMC_52\dh\mb.dir\alsc_
SHOPMILL_MANUALTURN_CYCLES=
MEASURE_CYCLES=F:\MMC_52\dh\mb.dir\almc_
PLC_PMC=
USER_CYCLES=
UserMMC=
UserNCK=
UserPLC=
UserZYK=
UserCZYK=
UserSTANDARD_CYCLES=
UserSHOPMILL_MANUALTURN_CYCLES=
UserMEASURE_CYCLES=
UserUSER_CYCLES=
UserPLC_PMC=

[net TextFiles]

; NCU_RECHTS=F:\dh\mb.dir\rechts (Name of NCU=Path of texts)
 ; NCU_MITTE=F:\dh\mb.dir\mitte
 ; NCU_LINKS=F:\dh\mb.dir\links
 ; Maximum 8 entries

[IndexTextFiles]

ALNX=F:\MMC_52\dh\mb.dir\alnz_

; default definition of the priorities of the different alarm types

[DEFAULTPRIO]

CANCEL=100
 RESET=100
 POWERON=100
 NCSTART=100
 PLC=100
 PLCMSG=100
 MMC=100

; This section defines different characteristics of the protocol that
 ; specifies how particular error messages are to be registered.

[PROTOCOL]

; Criteria for selecting the alarm messages to be recorded. The notation
 ; is described in SINUMERIK 840D OEM package MMC User's Manual.

Filter=Expression

; Details of how to form filter expressions to control the
 ; messages logged can be found in: 5.1.1 Alarm protocol

; Characterizes the numbers of entries in the log file. If the actual
 ; number exceeds this value, the server starts to overwrite old entries
 ; (principle: ring buffer)

Records=150

; Mode of alarm protocol writing

; if a number less than 0 is specified,

; the protocol file is not automatically updated

; if 0 is specified the protocol file is immediately updated

; if a number above 0 is specified,

; the protocol file is updated after the specified
 ; number of seconds elapsed with no intermediate
 ; alarm state changes.
 ; the protocol file is always updated when you send the
 ; DDE-Command:
 ; "AlarmProt" to the MBDDE-server
 ; (principle: ring buffer)

DiskCare=-1 # attention: the mode changed from V4 to V5!

- ; This section specifies the names and paths of the help files that
- ; contain help texts in the WinHelp format.
- ; This list include a maximum of 10 entries.
- ; The filename fragments must not exceed 6 chars, because it is extended
- ; automatically by the message module according to the selected language.
- ; For additional information see SINUMERIK 840D OEM package
- ; MMC User's Manual.

[Helpcontext]

File0=hlp\alarm_

; Configuration of the colors of the alarm/message line

[COLOR]

ForeColor_Alarm=000000FF
BackColor_FirstAlarm=00FFFFFF
ForeColor_FirstAlarm=000000FF
BackColor_Message=00FFFFFF
ForeColor_Message=00000000
BackColor_ApplMessage=00FFFFFF
ForeColor_ApplMessage=0000FF00
BackColor_Alarm=00FFFFFF

5.6.4 AEDITOR. INI

[MEMORY]

- ; default factor for maximum size of file
- ; valid values are: from 1 to 31
- ; factor x (1<=x<=31) means: you can edit a file up to a maximum size of
- x * 8 MB
- ; for example: factor 1 = maximum size of 8 MB, 31 = 248 MB
- ; attention: a higher factor needs more RAM
- ; the application can override this default factor

MemFactor=2

- ; default factor for maximum size of buffer file for editing NC domains
- ; see explanation for MemFactor above
- ; the factor should be high enough for the whole NCU memory
- ; the application cannot override this default factor

MemNCFactor=2

- ; Number of steps (input lines!), that the ASCII editor
- ; can **reset** (Undo)/**restore** (Redo).
- ; Default=0: No Undo/Redo steps can be activated
- ; > 0 max. 32767 only applies if the setting for UndoHandling does not equal 2.

NrOfUndoSteps=10

- ; Mode for Undo/Redo handling (synchronization with application):
- ; UndoHandling=0 Automatic: Application responds immediately to Ctrl+Z,
- ; CTRL+Y, Default

```

; UndoHandling=1 Active application is informed that Ctrl+Z, CTRL+Y has been
;                actuated, response depends on application
; UndoHandling=2 No Undo/Redo function
UndoHandling=0

; Also applies to NC files
; EnableUndoOnNc=1    NC file is also processed with Undo/Redo
;                    With this mode it takes longer to prepare the NC file for
;                    processing in the HMI.
; EnableUndoOnNc=0    NC file is not processed with Undo/Redo
;                    ; (Default)
EnableUndoOnNc=0

[STEPS]
; maximum number of blocks to search for a step, 0 == no limit
MaxNrOfBlocks=1500

[ACCESSLEVEL]
GlobalReplace=6
SettingHiddenCheck=7
Enable_Simulation=7      ; Access level for softkey simulation in editor

```

5.6.5 COMIC.NSK

```

REM ----- TYPICAL COMIC START
REM CHANNEL 1

TOPIC(machineswitch) COMIC_START("COMIC001MachineSwitch
"/Channel/Configuration/mmcCmd[u1],/Channel/Configuration/mmcCmdQuit[u1])

REM CHANNEL 2

TOPIC(machineswitch) COMIC_START("COMIC002MachineSwitch
"/Channel/Configuration/mmcCmd[u2],/Channel/Configuration/mmcCmdQuit[u2])

```

5.6.6 DINO.INI

```

[ACCESSLEVEL]
USER=3                ; Read authorization for series setup
                     ; Customer password (default)
PROGRAMMER=4          ; Setup authorization for series setup
                     ; corresponds to keyswitch 3 (default)

[Function]
                     ; 0 : ISO-formatted paper tape is not supported
                     ; 1 : ISO-formatted paper tape is supported
IsoActive=0
                     ; 1: ask before overwriting CFG_RESET.INI, 0: don't ask

Ask_for_CFG_RESET.INI=0

```

; Directory to store ISO-formatted programs from
; ISO paper tape archive
; Not changeable by user interface (supported if IsoActive=1)
ISO-Path=/_N_WKS_DIR/_N_SHOPMILL_WPD
; writing ISO paper tape archive:
; 1: accept ISO programs only in ISO path,
; 0: accept in all directories
; Not changeable by user interface (supported if IsoActive=1)
AcceptOnlyISO-Path=1

; 1: first unpack and then delete ZIP files while reading
; an IBN archive,
; 0: don't unpack, but store ZIP files in database
; not changeable by user interface
UnPack=1

; time to wait after a PLC memory reset in seconds
Wait for PLC=20

; reading internal pc-formatted archive that is not a setup archive:
; 0: destination of the unpacked files is determined through any
; existing files with same name, if no such file exist destination
; is MMC
; else: destination is determined from the file header, i.e. from the
; location where the file was read from
TakeDestinationFromHeader=0

; PG settings, changed by user interface
[V24-Conf 0]

; Settings for saved protocol
; correspondingly for [V24-Conf 1]
; handshake + protocol
; possible values for handshake are:
; 1: XON/XOFF,
; 2: RTS/CTS
; possible values for protocol are:
; 0: only handshake,
; 50: ZMODEM
; for example: 52 for ZMODEM protocol with RTS/CTS
; handshake
; 2 only RTS/CTS handshake
; allowed values are: 1, 2, 12, 22, 32, 52
Protocol=2

Note

"Only handshake" or "ZMODEM with RTS/CTS" are the only protocols offered in the HMI.

```
; take in consideration only for XON/XOFF protocol
; 0: don't send XON, 1: send XON by receiving data
; not changeable by user interface
Send XON=0
```

; V24 settings, changed by user interface

[V24-Conf 1]

Note

"Only handshake" or "ZMODEM with RTS/CTS" are the only protocols offered in the HMI.

```
...
; take in consideration only for XON/XOFF protocol
; 0: don't send XON, 1: send XON by receiving data
; not changeable by user interface
Send XON=0
```

5.6.7 DPDH.INI

```
[ACCESSLEVEL]
PROGRAMMER=4
OPERATOR=5
ENABLE_DIALPROG=0
SetStandardWpSave=2
ENABLE_SIMULATION=7
```

5.6.8 DH.INI

```
[ACCESSMASKS]
See 4.3.2
```

5.6.9 DPSIM.INI

```
[ACCESSLEVEL]
; minimum level for changing setup standard:
SETUP=1
USER=3
OPERATOR=5

[MAIN]
; <>0: simulate program external modal (see also
; EXTERN_SIZE,EXTERN_CHECK)
EXTERN_MODAL=0
```

```

; simulate program extern modal, if program
; size >= EXTERN_SIZE
; only if EXTERN_MODAL<>0
EXTERN_SIZE=150000
; only if EXTERN_MODAL<>0
EXTERN_CHECK=1

; <>0: reset tool data, if new workpiece is selected
; =0: use current tool data, if new workpiece is selected
SIM_LOAD_TOOLS=1

[PRELOAD]
;=1: TO_INI.INI and TO_ADDON.INI are preloaded by DPNC SIM.EXE
;=0: TO_INI.INI and TO_ADDON.INI are loaded by simulation
TOOLS=0
;= 1: all cycles are preloaded by DPNC SIM.EXE
; if section MAIN, entry CYCLE is set, additionally all cycles from
shadow directory are preloaded by DPNC SIM.EXE
;= 0: cycles are loaded by simulation, if cycle is called
CYCLES=1
;=2: load for simulation to \CUS.DIR, \CMA.DIR or \CST.DIR (default)
; load only cycles from NCK
; only evaluated if [MAIN]CYCLE is set and [PRELOAD]CYCLES=1
;=0: load all cycle (from NCK and MMC) for simulation to
; \CUS.DIR, \CMA.DIR or \CST.DIR
; only evaluated if [MAIN]CYCLE is set and [PRELOAD]CYCLES=1
;=1: use the cycle interface in \DP.DIR\SIM.DIR
CYCLEINTERFACE=2

```

5.6.10 SIMTOGEO.INI

Sample file with the details required for the individual tool types.
If Link is set to 0 in the [Settings] section, the other entries in SimToGeo.ini are redundant.

```

[Settings]
; this entry is dependent on settings such as
;
; MD 18206: $MN_MM_NUM_CCS_TOA_PARAM=1
; MD 18207: $MN_MM_TYPE_CCS_TOA_PARAM[1]=4
; MD 18080: $MN_MM_TOOL_MANAGEMENT_MASK='H4'
;
; if wanted and / or other oem parameters are used the index can be changed
; ( e.g. TC_DPCS4 if $MN_MM_NUM_CCS_TOA_PARAM=4 )
; or any other oem variable as TC_DPCS1 can be used :
;
; LINK=TC_DPC7
;
; MD 18096: $MN_MM_NUM_CC_TOA_PARAM=7
; MD 18097: $MN_MM_TYPE_CC_TOA_PARAM[7]=4
; MD 18080: $MN_MM_TOOL_MANAGEMENT_MASK='H4'
;
LINK=0 ; example LINK=TC_DPCS1

```


; example data sets [500.1] tool_type=500 insert_length= holder_angle= reference_direction= clearance_angle=	; unique identifier (t,d) for roughing tool 1 ; tool type, if not set, \$TC_DP1 is ; used ; TC_DP8, insert length ; TC_DP10, holder angle ; TC_DP11, cutting direction ; TC_DP24, clearance angle
[500.2] tool_type=510 insert_length= holder_angle= reference_direction= clearance_angle=	; unique identifier (t,d) for finishing tool 1 ; tool type, if not set, \$TC_DP1 is ; used ; TC_DP8, insert length ; TC_DP10, holder angle ; TC_DP11, cutting direction ; TC_DP24, clearance angle
[520.1] tool_type=520 insert_length= reference_direction=	; unique identifier (t,d) for plunging tool 1 ; tool type, if not set, \$TC_DP1 is ; used ; TC_DP8, insert length ; TC_DP11, cutting direction
[530.1] tool_type=530 insert_length= reference_direction=	; unique identifier (t,d) for parting tool 1 ; tool type, if not set, \$TC_DP1 is ; used ; TC_DP8, insert length ; TC_DP11, cutting direction
[540.1] tool_type=540 reference_direction=	; unique identifier (t,d) for thread-cutting tool 1 ; tool type, if not set, \$TC_DP1 is ; used ; TC_DP11, cutting direction
[160.1] tool_type=160 tip_angle= ;TC_DPV3= ;TC_DPV4= ;TC_DPV5=	; unique identifier (t,d) for boring-threading- milling cutter ; tool type, if not set, \$TC_DP1 is ; used ; TC_DP10, tip angle ; 1=+X; -1=-X ; 1=+Y; -1=-Y ; 1=+Z; -1=-Z
[151.1] tool_type=151 width= ;TC_DPV3= ;TC_DPV4= ;TC_DPV5=	; unique identifier (t,d) for saw ; tool type, if not set, \$TC_DP1 is ; used ; TC_DP9, width ; 1=+X; -1=-X ; 1=+Y; -1=-Y ; 1=+Z; -1=-Z

```

; ata set for tool_types 200-299
[200.001]                ; unique identifier (t,d)
tool_type=                ; tool type, if not set, $TC_DP1 is
                        ; used
tip_angle=                ; TC_DP24, tip angle
; TC_DPV3=                ; 1=+X; -1=-X
; TC_DPV4=                ; 1=+Y; -1=-Y
; TC_DPV5=                ; 1=+Z; -1=-Z

; default tool data sets reserved by SIEMENS AG for later use
; default data sets are recognized by non digit values
; examples
; [500]                    ; number corresponding to tool type, roughing tool
; insert_length=          ; TC_DP8, insert length
; holder_angle=           ; TC_DP10, holder angle
; reference_direction=     ; TC_DP11, cutting direction
; clearance_angle=        ; TC_DP24, clearance angle

; [510]                    ; number corresponding to tool type, finishing tool
; insert_length=          ; TC_DP8, insert length
; holder_angle=           ; TC_DP10, holder angle
; reference_direction=     ; TC_DP11, cutting direction
; clearance_angle=        ; TC_DP24, clearance angle

```

5.6.11 MASCHINE.INI

The [AccessLevel] section in the "maschine.ini" file can be used to set access authorizations for functions. The file includes detailed comments.

[ACCESSLEVEL]

```

;
; 7 = Keyposition 0 everyone in front of the machine,
;       ; Suggestion: Permission only for NC start, no selection of
;       ; part program
; 6 = Keyposition 1 machine operator, production shop-floor operators
;       ; Suggestion: Permission to select Part-Program, no editing
; 5 = Keyposition 2 machine setter (more experienced), the one to set up tools
;       ; and test and run in new Part-Programs
;       ; Suggestion: Permission to modify (edit) Part-Programs
; 4 = Keyposition 3 not yet used, same permissions as 5

```

```

; 1 = only manufacturer of machine, System specialist
;
; 0 = only manufacturer of Numeric Control (Siemens Experts)

; on delivery all users are authorized for (almost) all work

JOG_PRESET=7 ; Preset or Set actual value at mode JOG mode
                ==>5 Suggestion machine setter
JOG_HAND=7    ; Handwheel in JOG mode
                ==>6 Suggestion operator
JOG_ANKRATZ=7 ; Scratch
                ==>6 Suggestion operator
JOG_INCREM=7  ; Set increment in JOG mode
                ==>6 Suggestion operator
JOG_SYNAKT=7  ; Synchronous actions in JOG mode
                ==>5 Suggestion machine setter
JOG_V_ISTW=7  ; Watch windows of Actual-values,
                ==>7 Suggestion everyone
                ; Spindles, G-Functions, Aux.-Functions,
                ; Feedrate, Tools or Axis feedrate in JOG mode
JOG_V_ZOOM=7  ; Zoom actual values in JOG mode
                ==>7 Suggestion everyone
JOG_INCHMET=7 ; Switch inch/metric in JOG mode
                ==>6 Suggestion operator

REF_SISITEC=4 ; Commit safety integrated Ref.Point
                ==>4 key 3 to stay compatible

MDI_PROGBE=7  ; Program control at MDI mode
                ==>6 Suggestion operator
MDI_HAND=7    ; Handwheel in MDI mode
                ==>6 Suggestion operator
MDI_EDITOR=7  ; Edit program in MDI mode
                ==>5 Suggestion machine setter
MDI_ED_DAT=7  ; Editor functions in MDI mode
                ==>5 Suggestion machine setter
MDI_ED_CLR=7  ; Clear buffer in MDI mode
                ==>5 Suggestion machine setter
MDI_V_ISTW=7  ; Watch windows of Actual-values,
                ==>7 Suggestion everyone

```

MDI_V_ZOOM=7 ; Spindles, G-Functions, Aux.-Functions,
; Feedrate, Tools or Axis feedrate in MDI mode
; Zoom actual values in MDI mode
==>7 Suggestion everyone

MDI_SYNAKT=7 ; Synchronous actions in MDI mode
==>5 Suggestion machine setter

MDI_DATEI=4 ; File functions in MDI mode

MDI_INCHMET=7 ; Switch inch/metric in MDI mode
==>6 Suggestion operator

AUTO_OVERST=7 ; Overstore in AUTO mode
==>5 Suggestion machine setter

AUTO_DRF=7 ; DRF in AUTO mode
==>6 Suggestion operator

AUTO_PROGBE=7 ; Program control in AUTO mode
==>6 Suggestion operator

AUTO_SASUCH=7 ; Blocksearch in AUTO mode
==>6 Suggestion operator

AUTO_HAND=7 ; Handwheel in AUTO mode
==>6 Suggestion operator

AUTO_KORREK=7 ; Correct program in AUTO mode
==>5 Suggestion machine setter

AUTO_V_ISTW=7 ; Watch windows of Actual-values,
==>7 Suggestion everyone
; Spindles, G-Functions, Aux.-Functions,
; Feedrate, Tools or Axis feedrate in AUTO mode

AUTO_V_ZOOM=7 ; Zoom actual values in AUTO mode
==>7 Suggestion everyone

AUTO_V_NCPR=7 ; Program overview in AUTO mode
==>6 Suggestion operator

AUTO_OP_NCPR=7 ; load + select program in AUTO mode
==>6 Suggestion operator

AUTO_ED_NCPR=7 ; Alter enable status of Prog in AUTO mode
==>5 Suggestion machine setter

AUTO_SYNAKT=7 ; synchronous actions in AUTO mode
==>5 Suggestion machine setter

AUTO_INCHMET=7 ; Switch inch/metric in AUTO mode
==>6 Suggestion operator

[Customer]

MDASingleSTEP=yes

ONLY_MKS_ToolBaseDistToGo=no

NcVersionCheck=true

; Due to performance issues the functionality offered with respect to
; Block correction, block view and block search depends on the
; Nc-version currently used.
; However, to get access to the whole functionality, regardless of the
; Nc version in use,
; set the flag NcVersionCheck to False.

[BlockSearch]

; Shows (SeruproEnabled=1) or
; hides (SeruproEnabled=0)
; the softkey used to do a block search in mode "programtest".
; The softkey appears in both dialogs
; "Blocksearch Searchposition" and "Blocksearch Searchpointer"

SeruproEnabled=1

; When doing a block search in mode "programtest" you can do
; a multi-channel block search. There are 4 channel configurations which
; define the NC-channels being affected by the block search:
; SeruproConfig =
; 1: selected/active channel
; 2: selected/active channel and all channels having selected the same
; workpiece as the active channel
; 3: selected/active channel and all channels belonging to the active
; channel's mode group
; 4: all NC channels

SeruproConfig=1

[SetZero]

; Display_Sign_Switch switch the sign of the toollength in the scratch picture

; Display_Sign_Switch=0 mean - toollength
; Display_Sign_Switch=1 mean + toollength

Display_Sign_Switch=1

5.6.12 PARAM.INI

[ACCESSLEVEL]

READ_SYSVAR=7

EDIT_VIEW=7

;Tool compensation user data
;Tool-specific parameters

[ToolParams]

UserDataParamName1=T_Param_1
UserDataParamName2=T_Param_2
UserDataParamName3=T_Param_3
UserDataParamName4=T_Param_4
UserDataParamName5=T_Param_5
UserDataParamName6=T_Param_6
UserDataParamName7=T_Param_7
UserDataParamName8=T_Param_8
UserDataParamName9=T_Param_9
UserDataParamName10=T_Param_10

;Cutting edge-specific parameters

[ToolEdgeParams]

UserDataParamName1=D_Param_1
UserDataParamName2=D_Param_2
UserDataParamName3=D_Param_3
UserDataParamName4=D_Param_4
UserDataParamName5=D_Param_5
UserDataParamName6=D_Param_6
UserDataParamName7=D_Param_7
UserDataParamName8=D_Param_8
UserDataParamName9=D_Param_9
UserDataParamName10=D_Param_10

The tool compensation (turning) is calculated in **Diameter** when the selected axis is equal to the traverse axis and the entry CalDiaVal=1 is set in the **[Bezugma]** section in the Param.ini file.

5.6.13 PARAMTM.INI

Full details of the possible parameter settings are described in the tool management description.

References: /FBW/ Description of Functions Tool Management

5.6.14 REGIE.INI

[Miscellaneous]

```

; needed if regie is to support an 'EXIT' button
; set 'ExitButton' to True, and 'ExitButtonIndex'
; identifies index of exit button

; The softkey-text for this button MUST be entered
; into \mmc2\language\re_xx.ini
; where xx is the language abbreviation e.g.:
; re_gr.ini (German text)
; re_uk.ini (English text)

```

ExitButton = True

ExitbuttonIndex = 15

```

; Protection level for exit button
ExitButtonAccessLevel = 7
; Dialog box to ask user
ExitButtonQueryUser = True
; Notes on other entries can be found in the
; OEM documentation

; Activating temperature monitoring for PCU50
; TemperatureMonitoring = True
TemperatureMonitoring = False ; Preset from

```

References: MMC/HMI OEM Package, Chapter 6

Hibernate in Windows XP only (see 4.3)

To set (future) Hibernate variants (see 4.3), the Miscellaneous section includes the **HibernateMode** parameter.

HibernateMode = ...

The following values can be set:

HibernateMode = Off

Default setting. Hibernate saves and Hibernate reboots are not performed.

HibernateMode = Normal

A type-1 Hibernate is performed. This means that HMI Advanced first closes all applications and then starts a Hibernate in Windows XP. In HMI software version 6.3 onwards, this is the default for 840D systems with Windows XP.

HibernateMode = Advanced Is **not** performed.

The HibernateMode parameter is ignored in systems with Windows NT 4.0. These systems always perform a standard shutdown. Rebooting leads to a complete restart of Windows and applications.

[TaskConfiguration]

```
; 3rd bar
; Task16 = name := oemframe, cmdline := "sysmeter", Timeout := 10000,
; ClassName := "SysMeter", HeaderOnTop := False, PreLoad := False

; 4th bar : located to task 96 - 103 (SW 6.3 and later)
;Task96 = name := oem, Timeout := 10000
;Task97 = name := oem, Timeout := 10000
;Task98 = name := oem, Timeout := 10000
;Task99 = name := oem, Timeout := 10000
;Task100 = name := oem, Timeout := 10000
;Task101 = name := oem, Timeout := 10000
;Task102 = name := oem, Timeout := 10000
;Task103 = name := oem, Timeout := 10000
```

The 3rd horizontal softkey bar is only displayed if a task or the EXIT button is assigned to Task16 or higher in the bar. See above.

The 4th horizontal softkey bar is only displayed if a task or the EXIT button is assigned to Task96 or higher in the bar. See above.

User-specific operating trees

The entries required for user-specific operating trees are described in 5.1.20.

5.6.15 TASKCONF.INI

```

[CONTROL]
MDIList=MntMMC\MntMMC.mdi
ControlFile=MntMMC\MntMMC.zus
ScreenTwips=1

[DEBUG]
;MDISize 0 = Debug, 1 = Full screen
MDISize=0

;Buttons: 0 = button invisible, 1 = button visible
Stop_Button=1

; Here you can configure a skeleton application. Instead of APPLICATION, use
; the section name configured in regie.ini. For every section name assigned in
; regie.ini with Taski = name:= mntmmc cmdLine:= "SectionName", ...
; a standalone section must be configured here.

[APPLICATION]
; Hsk1.. - Hsk8.. (horizontal softkeys)
; Hsk9.. - Hsk16.. (ETC softkeys)
; Vsk1.. - Vsk8.. (vertical softkeys)

; background picture (default : none)
; 1      : machine configuration
; <filename> : load bitmap from OEM directory
Picture=

; index [1,.. initial application (default : none)
StartIndex=

; 0      : permanent task (default)
; <> 0 : terminate task at recall
TerminateTask=

;=====;
; for each softkey (Hsk1 - Hsk16 / Vsk1 - Vsk8) ;
;=====;

; taskid (see regie.ini) or logical task name (program/<root> or ExitButton)
; !!! ExitButton, display button for shutdown of HMI-Adv !!!
Hsk1Task=

; 0      : recall to calling process (default)
; <> 0 : terminate application at recall (appends ;TerminateTask to Hsk1Command)
;        must be supported by application !
Hsk1TerminateTask=

; 0 : SwitchToChild (default)
; 1 : SwitchToTask -> switch only to task
; 2 : SwitchToTask2 -> switch to child of specified task (if it exists)
Hsk1IsTask=

```

```
; command string evaluated by application (default : empty)
Hsk1Command=

; accesslevel for softkey (0 - 7, default : 7)
Hsk1AccessLevel=

; 0      : no link to NCK
; <> 0 : link softkey to NCK (lock softkey while no connection to NCK)
Hsk1NckLink=

; default softkey text, ignored for logical task name
Hsk1SkText=

; language depending softkey text, ignored for logical task name
Hsk1SkText_GR=
Hsk1SkText_UK=
```

5.6.16 DG.INI

Softkey access in the Diagnostics operating area can be set individually by entering the access level.

Enter the required access level in file DG.INI in the [AccessLevel] section:

[ACCESSLEVEL]

```
ALARMS=7           ; Alarms

SERVICE=7         ; Service displays

COMMUNIC-LOG=3     ; Communication log
PLC=3              ; PLC status
PLC-CHANGE=2       ; PLC status:
                   ; Softkey change value, softkey reset value
                   ; Softkey commit value
                   ; Locked by manufacturer
REMOTE-DIAGNOSIS=4 ; Remote diagnosis
FILE=7             ; File functions
RUN-LOG=7          ; Softkey action log, locked by user
```

Acknowledging PLC alarms

You can configure the icon for acknowledging PLC alarms. You can choose which 20 x 20 pixel bitmap is displayed in the diagnostics alarm screen for PLC-generated alarms (via FC 10).

The chosen pixel image should tell the user which button to press to acknowledge alarms generated by DB2.

The chosen button should correspond to the signal specified in the Quit acknowledgement parameter by FC 10. For example:

```
Call FC 10
      ToUserIF:=TRUE
      Quit:=DB21.DBX7.7    //Channel 1 RESET
```

Select a value for the image to be displayed in the [ALARM_PICTURE] section:

[ALARM_PICTURE]

```
;0 = Image for PLC button
;1 = Image for Cancel button
;2 = Image for Reset button
;3 = Image for HMI button
;4 = Image for user-defined button
```

ButtonImage=1

If 4 is selected (user-defined button), then the corresponding image must be defined as

ButtonNameUser="name.bmp"

Any value can be chosen for *name*.

We recommend making the entry in dg.ini in the USER or OEM directory.

The image must be located in one or more of the following directories:

```
;F:\User\Icons\640
;F:\User\Icons\800
;F:\User\Icons\1024
;F:\Oem\Icons\640
;F:\Oem\Icons\800
;F:\Oem\Icons\1024
```

It is automatically adjusted to the current screen resolution. A version of the image must be located in the directory containing the images in the current resolution.

5.6.17 IB.INI

Softkey access in the Setup operating area can be set individually by entering the access level.

Enter the required access level in file IB.INI in the [AccessLevel] section. The operating languages are defined in the [Language] section.

[ACCESSLEVEL]

RESET =2	;NCK reset	NCK reset
CHG_SCL_SYS=5	;change scaling system	Inch/metric measurements
MASCHDAT =4	;Machine data	Machine data
DRIVE_CFG=2	;drive configuration	Drive configuration
BOOTFILE=2	;Boot file	Boot file
MOT_CTRL=2	;Motor/Valve selection	Motor/valve selection
VIEW=2	;User views + Display options	User views and display options
NC_ADDR=2	;NCK address	NCK address
SETUP_SWITCH=2	;start-up switch	IBN switch
PLC_STATE=3	;plc state	PLC status
PLC_DATE=3	;plc date	PLC date
PLC-CHANGE=2	;PLC status:	
	;Sk-Change Value	(Change)
	;Sk-Reset Value	(Reset)
	;Sk-Commit Value	(Accept change)
		Locked by manufacturer
DRIVE_SERVO=2	;Drives/Servo	Drives/servo
SET_COL=3	;colours	Colors
SYST_SETTINGS=4	;system settings	System settings
SET_LANG=2	;Language	Language
SET_BTSS=2	;Operator panel	Operator panel front
OPTION=2	;Options	Options
EDIT=1	;Editor	Editor
DOS=1	;DOS shell	DOS Shell
TOOL_MNG=3	tool management	Tool management
FILE=7	;File functions	File functions

PASSWD=3	;Set/Delete password	Set and delete password
CHG_PASSWD=7	;SK "password ..."	"Password..." softkey
CHANGE_LANG=7	;change Language	Change language

[LANGUAGE]

;Softkey select language instead of softkey change language in the main
;menu of area setup.

;False: Softkey change language to toggle between the foreground
;and background language.

;True: Softkey select language instead of softkey change language
;to select one of the installed languages. To use this add the ;following values
to the entries of the LANGUAGE section in the ;mmc.ini:

```
;LanguageList= ... , GR
;FontList= ... , Europe
;FontListKO= ... , Europe2
;LList= ... , deutsch
```

SkSelectLngInsteadSkChangeLng=False

Note

In the [HELP_EXTENSION] section the HelpFileExtension parameter must be set to 0 (WinHelp) if you want old, OEM-specific help files with the extension *.hlp to be displayed.

5.6.18 IF.INI

The following sections are available in the "If.ini" file for configuring the Help functions:

- TECHNOLOGY
- TEXTFILES
- CONTEXT
- TEXTSEARCH

TECHNOLOGY section

The relevant technology category of the connected machine can be entered in the [TECHNOLOGY] section so as to limit the display of instruction texts to relevant technology entries, i.e. only entries pertinent to the relevant technology are displayed.

The following technology codes can be specified:

"m"	= milling
"t"	= turning
"g"	= grinding
"s"	= nibbling
"p"	= punching
"a"	= display all technologies

TEXTFILES section

The paths (path\name) used for the Short Help text files on which the help function is based are parameterized in the section [TEXTFILES].

The help function accesses the following text files:

Siemens "DH\CST.DIR\IFS_GR.COM"

Machine manufacturer "DH\CST.DIR\IFM_GR.COM" (any file name)

End user "DH\CST.DIR\USER_GR.COM" (any file name)

(Also entered via "Settings")



Important

The path for the Siemens text file "DH\CST.DIR\IFS_GR.COM" must exist otherwise an error message is output.

The entry for Siemens is specified in conjunction with **ISO language** as:

SiemensI=file

where file equals **ifit_xx.com** for turning or

where file equals **ifim_xx.com** for milling.

There are different parameterization options for the names of the text files when assigning the text path.

The following table lists the parameterization options and their interpretation by the Help function.

Table 5-6

Parameters for the text file	Interpretation
FileName.com	The language-dependent text file is read out.
File name _XX.com (XX=language code, e.g. "gr" for German. For a list of language codes, see also /IAD/840D Installation and Start-Up Guide, Section "Alarm and Message Texts")	The language-specific text file is read out.
Filename_.com	In this setting the non-language-specific test file is read first, if present, otherwise the language-specific text is read.

Example: ENDUSER=CUS.DIR\IFM_.COM

First of all, the non-language-specific text file "Ifm.com" is opened in the path "C:\DH\CUS.DIR\" by default or, if the non-language-specific text file does not exist, the relevant language-specific text file (e.g. "IFM_GR.COM") is opened.
Extract from Short Help txt file "IFM_GR.COM":

```
...
a2//G00/Linear interpolation with rapid traverse (m)
a2//G01/Linear interpolation with feed (m)
a2//G02/Circular interpolation in clockwise direction (m)
...
```

CONTEXT section

An increased context sensitivity of the Help function can be selected in the [CONTEXT] section. This setting is activated with "1" and deactivated with "0". (Also entered under "Settings").

If the increased context sensitivity is activated and the cursor is positioned to the left of, next to or on an instruction text, then all instructions with the same initial letters are displayed when Help is called.

For example, if the programmer has selected instruction "G1", then all instructions beginning with "G1" (e.g. "G1", "G17", "G18", "G19") are displayed.

If increased context sensitivity has been deactivated with "0", then only the instruction actually selected (if available) is displayed.

TEXTSEARCH section

The text search type can be specified in the [TEXTSEARCH] section. The following search methods can be parameterized:

- 1 = instruction texts only
 - 2 = descriptive texts only
 - 3 = instruction and descriptive texts
- (Also entered under "Search").

File IF.INI

[TECHNOLOGY]

; "m" = milling
; "t" = turning
; "g" = grinding
; "s" = nibbling
; "p" = punching
; "a" = display all technologies

; Notation in the section e.g.:

Technology=m

[TEXTFILES]

; Siemens = DH\CST.DIR\IFS_GR.COM
; SiemensI= DH\CST.DIR\IFIT_GR.COM ISO turning or
; SiemensI= DH\CST.DIR\IFIM_GR.COM ISO milling
; Machine manufacturer = DH\CST.DIR\IFM_GR.COM
; Machine manufacturer = DH\CST.DIR\IFI_GR.COM
; End user = DH\CST.DIR\USER_GR.COM
; Notation in the section e.g.:

Siemens=Cst.dir\ifs_gr.com

SiemensI=Cst.dir\ifit_gr.com

Manufacturer= ...

End user=

[CONTEXT]

; = 0 Context sensitivity not active
; = 1 Context sensitivity active
; Notation in the section e.g.:

Extended_Sensitivity=1

[TEXTSEARCH]

; = 1 Text search for instruction texts only
; = 2 Text search for descriptive texts only
; = 3 Text search for instruction and descriptive texts
; Notation in the section e.g.:

Search type=3

5.6.19 OEMFRAME.INI

[SysMeter]

; let OEMFrame just look for Windows which have been
; created by the OEMApp
; default is 0 (means NO)

;fSearchOnlyForTaskWindow=1

; let OEMFrame delay INIT_COMPLETE, if set to -1,
; OEMFrame will not send any WM_INITCOMPLETE at all,
; this value must be given in microseconds

;nDelayInitComplete=10000

; switching WS_SYSMENU, WS_MINIMIZEBOX and WS_MAXIMIZEBOX off

WindowStyle_Off = 720896

; other possible task entries aren't used

WindowStyle_On =

x =

y =

Width =

Height =

5.6.20 LAYOUTSW.INI

If user-specific pictures are to be used in layout switching as defined in MD 9021: LAYOUT_MODE, the file must be extended and stored in the **user** or **oem** directory. (See 5.1.22)

; ini - File for Changing the Layoutmode at startup

[all]	; Statements for both layout types
DllCount=5	; Number of DLLs; must be increased if ; other DLLs are specified in [Design_0] ; and [Design_1]
DH_Zip_Dir_Count=1	; Number of directories in [Directories] for pictures ; in the data management system
HMI_Zip_Dir_Count=2	; Number of directories in [Directories] for pictures ; outside the data management system
IgnoreHigherResolution=1	; With higher color resolution of OP ; ignore BitsPerPixel ; 0: the screen resolution is switched according to ; BitsPerPixel (default)

[Directories] ; Directories containing Zip files with *.bmp
DH_Zip_Dir_0=cst.dir\hlp.dir ; Directory/directories below dh,
; e.g. cus.dir\hlp.dir, cma.dir\hlp.dir

; Directory/directories below
; the HMI installation directory

HMI_Zip_Dir_0=hmi_adv
HMI_Zip_Dir_1=mmc2

; Entries for layout variant **New** as per MD 9021
[Design_0] ; List of DLLs in ...\mmc2\
Dll_0=ascediNew.dll
Dll_1=DispCtrlNew.dll
Dll_3=mmcctr32New.dll
Dll_2=McHeaderOld.dll
Dll_4=McGridModNew.dll

DH_ZipName_0=cst_0.zip ; Name of zip file in the DM area for New
; other files with user pictures, if applicable, e.g.
; cus_0.zip

HMI_ZipName_0=hmi_adv_0.zip ; Name of zip file outside data
; management system for New
HMI_ZipName_1=mmc2_0.zip ; Identify 2nd zip file outside DM for New,
; continue with HMI_ZipName_i (i = 2, 3, ...) adjust number in [all]

BitsPerPixel=16 ; Resolution for Design New

[Design_1] ; Entries for layout variant **Old** as per MD 9021
Dll_0=ascediOld.dll ; List of DLLs in ...\mmc2\
Dll_1=DispCtrlOld.dll
Dll_3=mmcctr32Old.dll
Dll_2=McHeaderOld.dll
Dll_4=McGridModOld.dll

DH_ZipName_0=cst_1.zip ; Name of zip file in the DM area for Old
; other files with user pictures, if applicable, e.g.
; cus_0.zip

HMI_ZipName_0=hmi_adv_1.zip ; Name of zip file outside data
; management system for Old

HMI_ZipName_1=mmc2_1.zip ; Identify 2nd zip file outside the DM for Old,
; continue with HMI_ZipName_i (i = 2, 3, ...) adjust number in [all]

BitsPerPixel=8 ; Resolution for Design Old

[internal]
;Do not change this part! Do not change!
TraceEnabled=0

5.6.21 DGOVW.INI

This file is used to configure user-specific additional signals in Diagnostics → Service displays, "Service overview" screen. Configured signals are added below the standard signals in this screen and can be viewed there (scrolling may be required). For configuration details and an **example see 5.1.21**. The file must be explicitly stored in one of the directories mmc2 or addon, oem, user.

```
[GLOBAL]
; Number of additional signals
NrOfSignals=
; Bitmaps with customized icons to be displayed
[BMP]
100="<Bitmapname>"
101="..."
.
.
; One section per signal
[SIG1]
text=
Item=
expr=
.
.

[SIG2] .
.
.
[SIG<n>]
.
.
```

5.6.22 DGOVWTEXT_XX.INI

xx in the file name stands for the language abbreviation for the language. The file contains the language-specific texts for user-specific signals in the service overview. See also 5.1.21. It must be explicitly stored in the directories mmc2 or user, addon, oem \language.

```
[TEXT]

; $T<Nr> = "Language-specific text"
; <Nr> stands for values from 1000 to 32767, values below 1000 are reserved.
; Example:
$T1001="Signal s"
```

5.6.23 HMIDesk.ini

Default settings: an explanation of the settings can be found in 9.2.2.

[Global]

;Global configuration data

;Definition of desktops (minimum 2, maximum 4)

NumberOfDesktops = 2

;Control mode for mouse operation: Taskbar

ControlMode = Icon

KeyboardControl = False

[Desktop1]

[Desktop2]

;Active desktop with taskbar

Explorer = True

;

;Automatic start of an application after creating the desktop

;Start Regie

StartupApplication = "rngkrnl.exe"

;

;Desktop with customized color scheme

SetHMIColors = True

;

;Definition of start time

CreateDesktop = Immediately

;

;

;Keep user interface in foreground in window mode

WindowOnTop = False

[Desktop3]

[Desktop4].

5.7 System settings

Introduction

Key system settings are carried out in the following files:

- MMC.INI
- NETNAMES.INI
- REGIE.INI

Details of the location of these files on the HMI hard disk and of how to work with these files in parallel directories can be found in 5.3.1 Editing Ini files. Section 5.6 INI files describes the features that can be modified by the user. The settings listed below relate to features that can be modified.

Other entries in the files can be made using the operating sequences available in the user interface. These entries should not be edited directly because of the risk of introducing errors.

5.7.1 MMC.INI

Screen saver

The delay time before the screen saver is activated can be adjusted:

Section: GLOBAL
Entry: MMCScreenOffTimeInMinutes



Important

The HMI screen saver and Windows screen saver must not be used at the same time.

- HMI screen saver: protection for screen and backlight
 - Windows screen saver: protection for screen only (blank screen)
-

Server

You can choose to display the server name with:

Section: GLOBAL
Entry: ServerVisible

5.7.2 NETNAMES. INI

Channel menu

The grouping of multiple channels in an NCU and the channel assignments to NCUs if multiple NCUs are used in M:N mode can be configured in the NETNAMES.INI file.

M:N assignments

In the NETNAMES.INI file you can determine which operating components can operate which NCUs. The following details are specified:

- Names of the operating components
- Names of the NCUs
- Communication links between them
- Clear assignments for startup

Details can be found in

References: /FB/, B3 Multiple Operator Panel Fronts and NCUs

Multi-channel display

In order to be able to use the multi-channel display (dual-channel display) in the Machine operating area, [MULTI_CHAN_i] sections are required:

[MULTI_CHAN_i]

CHAN_2 = k

"i" denotes the channel number in the current NCU.

The 2nd channel displayed is specified in the CHAN_2 entry CHAN_2 = k

Note

When the channel menu is selected, all entries under [MULTI_CHAN_i] are ignored.

This default configuration only applies when switching from 1-channel to 2-channel display. If 2-channel display is active and a channel is switched within the display, the other channel remains unaffected.

Example for the default configuration of 2-channel display:

An NCU has 6 channels. (1,2,3,6,7,8). The channel combinations 1-6, 2-7 and 3-8 are to be displayed together by default:

[MULTI_CHAN_1]

CHAN_2 = 6

[MULTI_CHAN_2]

CHAN_2 = 7

[MULTI_CHAN_3]

CHAN_2 = 8

[MULTI_CHAN_6]

CHAN_2 = 1

```
[MULTI_CHAN_7]  
CHAN_2 = 2
```

```
[MULTI_CHAN_8]  
CHAN_2 = 3
```

Note: Each of the paired channels appears once in [MULTI_CHAN_i] and once as the 2nd channel in CHAN_2=i.

5.7.3 REGIE.INI

EXIT button

If you want the sequence control in the HMI software to support an Exit button, you should make the following settings:

[Miscellaneous]

```
ExitButton=True
```

```
ExitButtonIndex = index
```

The text for identifying the softkey text must be entered in

```
F:\mmc2\language\re_xx.ini
```

 where xx is the language identifier.

```
ExitButtonAccessLevel=7  
; Dialog box to ask user  
ExitButtonQueryUser = True
```

5.7.4 HEADER.INI

Status display with icons

The function "Status display for SINUMERIK control across multiple channels" in the program status line is controlled by means of the HEADER.INI file and can be changed by the machine manufacturer. Manufacturer-defined icons can also be used in addition to standard icons.

[CondStopIcons]

DefaultIcon=CondWait.bmp;0 = No stop state

1=CondStop.bmp	;No NC ready
2=CondStop.bmp	;No ModeGroup ready
3=CondStop.bmp	;EMERGENCY STOP active
4=CondStop.bmp	;Alarm active with stop
5=CondStop.bmp	;M0/M1 active
6=CondStop.bmp	;Block ended in SBL mode
7=CondStop.bmp	;NC Stop active
8=CondStop.bmp	;Read-in enable missing
9=CondStop.bmp	;Feedrate enable missing
10=CondWait.bmp	;Dwell active
11=CondWait.bmp	;Aux. function acknowledgment missing
12=CondStop.bmp	;Axis enable missing
13=CondWait.bmp	;Exact stop not reached
14=CondWait.bmp	;Waiting for positioning axis
15=CondWait.bmp	;Waiting for spindle
16=CondWait.bmp	;Waiting for other channel
17=CondStop.bmp	;Waiting for feed override
18=CondStop.bmp	;Error in NC block
19=CondStop.bmp	;Waiting for external NC blocks
20=CondWait.bmp	;Waiting for synchronous action
21=CondWait.bmp	;Block search active
22=CondStop.bmp	;No spindle enable
23=CondStop.bmp	;Axis feed override 0
24=CondWait.bmp	;Waiting for tool change acknowledgment
25=CondWait.bmp	;Gear step change
26=CondWait.bmp	;Waiting for position control
27=CondWait.bmp	;Waiting for thread cut
28=CondWait.bmp	;Reserved
29=CondWait.bmp	;Waiting for punching
30=CondWait.bmp	;Waiting for safe operation
31=CondWait.bmp	;No channel ready
	;Version 4.1 and higher
32=CondStop.bmp	;Oscillation active
	;Version 4.1 to \$[[SW440000]]
33=CondWait.bmp	;Axis replacement active
	;Prevents block change because an axis replacement has started,
	;version 4.1 and higher
34=CondWait.bmp	;Axis container rotation
	;Version 4.4 and higher
35=CondWait.bmp	;AXCT: following axis active
	;Axis container replacement, version 5.2 and higher
36=CondWait.bmp	;AXCT: leading axis active
	;Axis container replacement, version 5.2 and higher
37=CondWait.bmp	;AXCT: follow up mode active
	;Axis container replacement, version 5.2 and higher

38=CondWait.bmp ;AXCT: internal status change
 ;Axis container replacement, version 5.2 and higher
 39=CondWait.bmp ;AXCT: Axis/spindle disable
 ;Axis container replacement, version 5.2 and higher
 40=CondWait.bmp ;AXCT: Corr. motion active
 ;Axis container replacement: superimposed motion from version 5.2 and higher
 41=CondWait.bmp ;AXCT: Axis replacement active
 ;Axis container replacement, version 5.2 and higher
 42=CondWait.bmp ;AXCT axis interpolator active
 ;Axis container replacement, version 5.2 and higher
 43=CondWait.bmp ;Waiting for compile cycle
 ;Version 5.2 and higher
 44=CondWait.bmp ;Access to system variable
 ;Version \$[[200200]] and higher
 45=CondStop.bmp ;Search target found
 ;Block search has found search target and the NCK has stopped.
 46=CondWait.bmp ;Rapid return started
 ;Version \$[[SW410000]] and higher.
 47=CondWait.bmp ;AXCT: Waiting for spindle stop
 ;Axis container replacement, version \$[[SW430000]] and higher.
 48=CondWait.bmp ;Machine data matching
 ;New configuration, version \$[[SW430000]] and higher.
 49=CondWait.bmp ;Axis replacement: axis in coupling
 ;Version \$[[SW450000]] and higher
 50=CondWait.bmp ;Axis replacement: Liftfast active
 ;Version \$[[SW450000]] and higher
 51=CondWait.bmp ;Axis replacement: New-Config active
 ;Version \$[[SW450000]] and higher
 52=CondWait.bmp ;Axis replacement: AXCTSW active
 ;Version \$[[SW450000]] and higher
 53=CondWait.bmp ;Axis replacement: Waitp active
 ;Version \$[[SW450000]] and higher
 54=CondWait.bmp ;Axis in another channel
 ;Axis replacement, version \$[[SW450000]] and higher
 55=CondWait.bmp ;Axis replacement: axis PLC axis
 ;Version \$[[SW450000]] and higher
 56=CondWait.bmp ;Axis replacement: axis reciprocating axis
 ;Version \$[[SW450000]] and higher
 57=CondWait.bmp ;Axis replacement: axis jog axis
 ;Version \$[[SW450000]] and higher
 58=CondWait.bmp ;Axis replacement: command axis
 ;Version \$[[SW450000]] and higher
 59=CondWait.bmp ;Axis replacement: axis OEM axis
 ;Version \$[[SW450000]] and higher
 60=CondWait.bmp ;coupled following axis
 ;Axis replacement, version \$[[SW450000]] and higher
 61=CondWait.bmp ;coupled following axis
 ;Axis replacement, version \$[[SW450000]] and higher
 62=CondWait.bmp ;coupled slave axis
 ;Axis replacement, version \$[[SW450000]] and higher

[Pos1]

ChanStatFeedStopSpindleStop = 1 ;Channel status channel 1 is displayed,
 ;superimposed with

```

Spindles = 1,2                                ;Feed disable channel 1 and
                                              ;spindle disable
                                              ;for spindles 1 and 2

[Pos3]
SpindStat = 1                                ;Spindle status for spindle 1
;ChanStatFeedStop = 3                       ;Channel status for channel 3 is displayed,
                                              ;superimposed
                                              ;with feed disable for channel 3

[Pos5]
ChanStat = 2                                ;Channel status for channel 2 is displayed
;SpindStat = 3                              ;Spindle status for spindle 3 is
                                              ;displayed

[Pos7]
ChanStat = 3                                ;Channel status for channel 3 is displayed
;SpindStat = 3                              ;Spindle status for spindle 3 is
                                              ;displayed

[Pos9]
ChanStatFeedStopSpindleStop = 1             ;Channel status for channel 1 is displayed,
                                              ;superimposed
Spindles = 1                                ;with feed disable for channel 1 and
                                              ;spindle disable for spindle 1

[Pos11]
ChanStatFeedStop = 2                       ;Channel status for channel 2 is displayed,
                                              ;superimposed
                                              ;with feed disable for channel 2

[Pos13]
SpindStat = 2                              ;Spindle status for spindle 2

[Pos15]
ChanStatFeedStopSpindleStop = 1             ;Channel status for channel 1 is displayed,
                                              ;superimposed
Spindles = 1                                ;with feed disable for channel 1 and
                                              ;spindle disable for spindle 1
;

[UserIcons]
;UI_0 = <name.bmp> , <Position>             ;Name of icon, position
...
;UI_31 = <name.bmp> , <Position>            ;Name of icon, position
;USER_ICON_BASE = DBxx.DBByy
                                              ; xx data block with
                                              ; control double word for user icons
                                              ; yy start byte for double word.

[UserTextInfo]
;USER_TEXT_BASE = DBxx.DBByy
                                              ; xx data block with
                                              ; interface for user messages in
                                              ; header
                                              ; yy start byte for interface

```

```
; TextLength = 33      ; Activate text limit if  
                        ; user texts are used
```

5.7.5 KEYS.INI

Entries in this file allow hard keys on the operator panel fronts OP 010 and OP 010c or SINUMERIK keyboards with hotkey block and PLC softkeys to be used.

See: /BE1/, Configuring OP Hotkeys and PLC Keys.



Notes

6

6 Alarm / MD Texts, Alarm Help Files

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6.1 Alarm texts

6.1.1 Alarm text files

Storing the text files

Files containing error texts are stored on the hard disk in the directory F:\dh\mb.dir\ . The error text files provided for use are activated in file f:\mmc2\mbdde.ini.

Structure of MBDDE.INI

Extract from **MBDDE.INI** relating to the configuration of alarm text files:

```
...
[Textfiles]
MMC=f:\dh\mb.dir\alm_
NCK=f:\dh\mb.dir\aln_
PLC=f:\dh\mb.dir\plc_
ZYK=f:\dh\mb.dir\alz_
CZYK=f:\dh\mb.dir\alc_
UserMMC=
UserNCK=
UserPLC=f:\dh\mb.dir\myplc_
UserZyk=
UserCZyk=
...
```

A detailed description of MBDDE.INI can be found in Subsection 5.4.3.

Standard files

On the hard drive of the HMI the standard texts are stored in ASCII format in the following files:

MMC	F:\dh\mb.dir\alm_XX.com
NCK	F:\dh\mb.dir\aln_XX.com
PLC	F:\dh\mb.dir\alp_XX.com
ZYK	F:\dh\mb.dir\alz_XX.com
CZYK	F:\dh\mb.dir\alc_XX.com

In these file names, "XX" stands for the code of the appropriate language. The **standard files** should **not be changed** by the user to store his or her own error texts. If these files are replaced by new ones when the HMI software is upgraded, then the added or modified user-specific alarms will be lost. Users should store their own error texts in user files.

User files

Users can replace the error texts stored in the standard files

- with their own texts, or
- add new ones.

To do this, copy additional files into directory **f:\dh\mb.dir** (MBDDE alarm texts) via the Services operating area. The names of these text files are set in file **f:\mmc2\mbdde.ini**. An editor is provided in the **Diagnostics\Setup\MMC** area for this purpose.

Examples of the configuration of two additional user files (texts for PLC alarms, altered NCK alarm texts) in file MBDDE.INI:

```
...
User MMC =
User NCK = F:\dh\mb.dir\mynck_
User PLC = F:\dh\mb.dir\myplc_
User ZYK =
User CZYK =
...
```

The texts from the user files overwrite standard texts with the same alarm number. Alarm numbers which do not already exist in the standard texts are added.

Note

To prevent a modified MBDDE.INI file from being overwritten when the software is updated, it must be stored in the designated USER path
<InstallationPath>\user\mbdde.ini.

Editor

Any **ASCII editor** (e.g. the DOS editor **edit**) can be used for editing files. When editing the text files with a different editor, make sure that they are then saved in ASCII format.

**Language-specific
alarm texts**

Language assignment of the user alarm texts is carried out using the name of the text file. The appropriate code and the extension .com are added to the user file name entered in mbdde.ini:

Language	Code
German	gr
English	uk
French	fr
Italian	it
Spanish	sp

The language code for other non-standard languages can be found in Table 6-1.

Example

File for customized German PLC alarm texts

MYPLC_GR.COM:

```
%_N_MYPLC_GR_COM      ; } only required for reading via V.24  
;$Path=/_N_MB_DIR      ; } only required for reading via V.24  
700000 0 0 "DB2.DBX180.0 set"  
700000 0 0 "No lubrication pressure"  
....
```

Note

Changes to alarm texts do not take effect until the HMI is powered up again.
When creating text files, make sure that the correct date and time are set on the PC. Otherwise, the user texts may not appear on screen.

6.1.2 User alarm structure

Alarm numbers

For cycle, compile cycle and PLC alarms the following alarm numbers can be used:

Number range	Description	Effect	Deletion
60000 - 60999	Cycle alarms (Siemens)	Display, NC start disable	Reset
61000 - 61999		Display, NC start disable, stop motion after executing the pre-decoded blocks	Reset
62000 - 62999		Display	Cancel
63000 - 64999	Reserved		
65000 - 65999	Cycle alarms (user)	Display, NC start disable	Reset
66000 - 66999		Display, NC start disable, stop motion after executing the pre-decoded blocks	Reset
67000 - 67999		Display	Cancel
68000 - 69000	Reserved		
70000 - 79999	Compile cycle alarms		
400000 - 499999	PLC alarms general		
500000 - 599999	PLC alarms for channel		
600000 - 699999	PLC alarms for axis and spindle		
700000 - 799999	PLC alarms for user		
800000 - 899999	PLC alarms for sequence cascades/graphs		

Format of the text file for cycle alarm texts

The number range in the list is not available with every number (see **References:** /FB/ P3, "Basic PLC Program", Lists)

The structure of the text file for cycle and compile cycle alarms is as follows:

Alarm number	Display	Help ID	Text or alarm number
60100	1	0	"No D number %1 is programmed"
60101	1	0	60100
...	...	...	...
65202	0	1	"Axis %2 in channel %1 is still moving"
// Alarm text file for cycles in German			

6.1.3 Help for alarms

Creating user-specific online help texts is described in part HE1 of this publication.

6.2 Plain texts for PLC machine data

Application-specific plain texts for PLC machine data:

For PLC machine data

14510[i] User data (INT) i = 0 ... 255

14512[i] User data (HEX) i = 0 ... 255

14514[i] User data (FLOAT) i = 0 ... 31

application-specific and language-dependent plain texts can be configured for each index.

Text files with the name

NCTEA_xx.TXT (xx = language abbreviation GR, UK, ...) can be created in the following directories:

user\language,

add_on\language and

oem\language and have the following format:

<number of entries> ; number of entries

<MD-number>.<index> <text> ; number of index texts

Example:

3

14510.0 My text for PLC-MD 14510.0

14510.3 Text for PLC-MD 14510.3

14514.0 My text for float data 14514.0

6.3 Languages

6.3.1 Configuring foreign languages

If you wish to create alarm and message texts externally, they should be produced with the code pages, ANSI tables and fonts listed in the tables below.

The alarm and message texts are stored in the MBDDE alarm texts directory.

Convert the old text file to an ANSI text file using "Save As.." in the Windows Editor (WinWord, Notepad, etc.).

Load the new text file and converted old text file into the Windows editor and merge them.

Save the new text file and copy it to the "MBDDE alarm texts" directory in the HMI for the target.

6.3.2 Supported languages

Table 6-2 Languages and ANSI tables/code pages used

Language	Language codes	Code page (DOS)	ANSI table (Windows)
German	GR	850	1252
English	UK	850	1252
Spanish	SP	850	1252
Italian	IT	850	1252
French	FR	850	1252
Chinese (simplified)	CH	936	-
Chinese (traditional)	TW	950	-
Korean	KO	949	-
Japanese	JA	932	-
Swedish	SW	850	1252
Hungarian	HU	852	1250
Portuguese	PO	850	1252
Czech	CZ	852	1250
Turkish	TR	857	1254
Russian	RU	855	1251
Polish	PL	852	1250
Dutch	NL	850	1252
Finnish	FI	850	1252
Danish	DK	850	1252

6.3.3 Assignment between ANSI tables and fonts

Table 6-3 ANSI table 1250 (Central Europe)

Font	File name	Name of font
Arial	Cearial.ttf	Arial CE (TrueType)
Arial bold	Ceariabd.ttf	Arial CE Bold (TrueType)
Arial italic	Ceariali.ttf	Arial CE Italic (TrueType)
Arial bold italic	Caeriabi.ttf	Arial CE Bold Italic (TrueType)

Table 6-4 ANSI table 1251 (Cyrillic)

Font	File name	Name of font
Arial	Aricyr.ttf	Arial Cyr (TrueType)
Arial bold	Aricyb.ttf	Arial Cyr Bold (TrueType)
Arial italic	Aricyri.ttf	Arial Cyr Italic (TrueType)
Arial bold italic	Aricyrbi.ttf	Arial Cyr Bold Italic (TrueType)

Table 6-5 ANSI table 1252 (West Europe)

Font	File name	Name of font
Arial	Windows default	Arial (TrueType)
Arial bold	Windows default	Arial Bold (TrueType)
Arial italic	Windows default	Arial Italic (TrueType)
Arial bold italic	Windows default	Arial Bold Italic (TrueType)

Table 6-6 ANSI table 1254 (Turkish)

Font	File name	Name of font
Arial	Trar.ttf	Turkish Arial (TrueType)
Arial bold	Trarbd.ttf	Turkish Arial Bold (TrueType)
Arial italic	Trari.ttf	Turkish Arial Italic (TrueType)
Arial bold italic	Trarbi.ttf	Turkish Arial Bold Italic (TrueType)

6.3.4 Setup

Languages that are not included as standard must be installed as described in Section 7.2.

An additional tool is implicitly required for Asian languages (e.g. NJWIN). The appropriate fonts are installed automatically with this.

When each language module is installed, the appropriate fonts are installed by the tool at the same time, and all necessary entries made in mmc.ini and in the registry.

Notice:

Windows 95 and Windows NT registries are not compatible in terms of fonts !

During setup
DLLs, text files (machine data files) and language-specific INI files are stored in the "\\mmc2\\language" directory,
the alarm texts in the "\\dh\\mb.dir" directory.

6.3.5 Changing language

If you want to configure other languages in the control, a "Select language" softkey can be configured (see 5.1.4).

The name of the text file is used to assign language-specific user alarm texts. The appropriate code and the extension .com are added to the user file name entered in MBDDE.INI.

6.3.6 NCU-specific alarm texts with multiple operator panels/NCUs

Function

If multiple operator panel fronts/NCUs (M : N) are used, NCU-specific alarm texts can be created and managed in the MMC.

This function requires entries to be made in the MBDDE.INI file in the [netTextFiles] section. The file is located in the C:\USER directory.

The entries for the NCUs must match the entries in section [paramNCU_Bez] of the current NETNAMES.INI file.

The NETNAMES.INI file in connection with the function "Multiple operator panel fronts/NCUs" is described in

References: /FB2/ B3 Multiple Operator Panel Fronts and NCUs.

Search sequence

To output an NCU-specific alarm, the associated text is searched for in the following sequence:

1. NCU-specific texts
2. Non-NCU-specific texts

Path for alarm texts

Like the other alarm texts, the NCU-specific alarm texts (e.g. NC1_GR.COM) should be stored in the C:\DH\MB.DIR\ directory.

Entry in MBDDE.INI

Example:
[net TextFiles]
NCU_1=C:\DH\MB.DIR\NC1_GR.COM
NCU_2=C:\DH\MB.DIR\NC2_GR.COM
NCU_3=C:\DH\MB.DIR\NC3_GR.COM

6.4 Operating messages

PLC operating messages are created and handled in the same way as alarm texts.

6.5 System limits

- 5000 customized alarms/messages can be created in each language
- The following hard disk memory space is available on the PCU 50 and PCU 70:
Drive D: 1.8 GB reserved for local backups
Drive F: 3 GB in addition to the pre-installed 5-language HMI Advanced which is reserved for user data (programs, applications, languages, data, etc.).
High memory allocation in drive F: can mean that a local partition backup becomes so big that it can no longer be stored locally on drive D:. If that happens, the GHOST image (hard disk backup) must be stored on an external device.
- Maximum size of editable files 56 MB
- A maximum of 100,000 files can be stored in total in the data management system. The number of files in each directory (each *.WPD workpiece directory in the case of workpieces) is limited to 1000 files.



7

7 Installation Variants / Data Backup

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7.1 General

This chapter describes the installation and updating of additional software along with data backup and restore processes based on the pre-installed "Basic PCU software with Windows NT 4.0/XP".

The description refers to the hardware and software components supplied as standard, as described in Section 3.3. The key tools are the Service menu and SINUMERIK desktop, also described in Subsection 3.3.6, and the Norton Ghost program (see 7.3.1).

The following possibilities are available for backing up and restoring software and data:

- Parallel connection between HMI and PG/PC
- Ethernet connection between HMI and PG/PC
- Local partition backup on the HMI hard disk

7.2 Settings for network drives

Correctly established network connections are absolutely essential to the network drive functions described below. A general overview of network connections is therefore provided here.

7.2.1 Requirements of the PG/PC

- PG/PC with Windows NT 4.0/XP or Windows 95 or Windows 98
- **Set up NETBEUI** (Windows 95/98/NT only)
Set up NETBEUI protocol (can be loaded via the Control Panel:
Start→Settings→Control Panel→"Network" symbol→Protocols tab→ "Add":
NETBEUI.)
- Set up NETBEUI (Windows XP only)
Follow the instructions in the MS Knowledge Base article Q301041
- **Determine the computer name** of the PG/PC with Windows 95/98/NT
via the Control Panel:
Start→Settings→Control Panel→"Network" symbol→Identification tab→
"Computer name" e.g.: r3344
- Determine the computer name of the PG/PC with Windows XP
via the Control Panel:
Start→Settings→Control Panel→"System" symbol→Computer Name tab,
"Change" button, e.g.: r3344
- **Set shared directory**
Give shared access to the directory in which the software to be installed is
stored.
PC/PG with **Windows NT4**:
In the desktop click the directory to which shared access is to be given.
File → Properties, Sharing tab
Assign share name: (e.g. HMINEW).

- Comment: any
 User limit: any
 "Permissions..." button
 Enter permission (e.g. User1 [local user] or "anyone" with access type: "read").
PG/PC with Windows 95/98:
 Assign share name (e.g. HMINew).
 Enter access authorization.
 Assign password if necessary.
PG/PC with Windows XP:
 Select the directory to be shared and click the right mouse key. Click "Sharing and Security...". Select the "Sharing" tab, activate "Share this folder" and assign a share name and comment if required. Click the "Permissions" button to set the access rights for users and then click "OK" to leave the Permissions window and the Share window.
- Cable connected
 Cable for point-to-point connection in Ethernet port: Ethernet cable of type "Converted Twisted Pair cable".
 - *PG/PC with Windows 95/98:*
 Share level selected
 under Start→Settings→Control Panel→Network symbol:→Access Control tab→
 "Share level"

7.2.2 Settings from the Service menu on the PCU

Some of the Service menu functions below use network drives as the source or destination in software installation or system backup/restore. The necessary settings can be made with the **Manage Network Drives** menu, which is available at the appropriate points in the operator menu.

This menu can be accessed as follows:

Main menu (Service menu) →

1 Install/Update SINUMERIK System →

Enter password

3 Install from Network Drive →

1 Manage Network Drives

You can then choose from the following network management functions:

- 1 Connect to Network Drives
- 2 Show connected Network Drives
- 3 Disconnect from all Network Drives
- 4 Change Network Settings

- 9 Back to previous menu

The following submenus are available for the individual menu options:

1 Connect to Network Drives

Type your passwd:

Enter the password permitting the user to retrieve data (e.g. software) from or write data (e.g. PCU images) to the shared directory on the networked PG/PC.

PG/PC with Windows NT/XP:

Password for a local user of the PG/PC

PG/PC with Windows 95/98:

Any user name, password identical to the password for directory sharing (if specified).

Letter for Network Drive:

Enter the letter of the PCU drive from which the connection must be accessed (e.g. "G")

Directory to be mounted (e.g. \\r3344\HMINEW):

Enter the computer name of the PG/PC and the name of the directory (share name) that you wish to access.

A screen form opens containing data for the PG/PC connection:

```
Machine Name           : PCU_1_Name
User Name              : auduser
Transport Protocol     : NETBEUI
Logon to domain        : No
Connect Network Drive (last): G: (\\r3344\HMINEW)
```

PLEASE SELECT

- 1 Connect to Network Drive
- 2 Show connected Network Drives
- 3 Disconnect from all Network Drives
- 4 Change Network Settings

9 Back to previous Menu

Your choice [1, 2, 3, 4, 9]:?

2 Show connected Network Drives

The current status of the connected drives is displayed:

Status	Local Name	Remote Name
OK	G:	\\r3344\HMINEW
OK	H:	\\r3344\HMI_P1

Press any key to continue ...

3 Disconnect from all Network Drives

Press any key to continue ...

All network connections are terminated.

4 Change Network Settings

The following submenu appears:

```

1 Change Machine Name (for DOS-Net only)
2 Change User name
3 Toggle Protocol (NETBEUI or TCP/IP)
4 Toggle logon to domain (Yes or No)
[5 Change Domain Name]
[6 Change TCP/IP settings]

9 Back to previous menu

Your choice [1, 2, 3, 4, [5,] [6,] 9] ?
  
```

Change Network Settings menu options:

1 Change Machine Name (for DOS-Net only)

An overview and hint are displayed:

CURRENT NETWORK SETTINGS:

Machine Name	:	
User Name	:	USER
Transport Protocol	:	NETBEUI
Logon to domain	:	No

PLEASE SELECT:

1 Change Machine Name (for DOS Net only)

2 Change User name

3 Toggle Protocol (NETBEUI or TCPIP)

4 Toggle logon to domain (Yes or No)

9 Back to previous Menu

Your choice [1,2,3,4,5,6,7,9]?1

HINT: This change is temporary for the DOS net only!

On the next Windows start, this Machine Name is reset to the Windows Machine Name.

If you want to set the Machine Name permanently, please use "Change Machine Name (for Windows and DOS net)" in the upper menu hierarchy!

OLD Machine Name: ...
NEW Machine Name: ...

Note

If a new name is not entered, the old name is retained.

2 Change User name

OLD User Name: ...
NEW User Name: ...

The note for option 1 applies here too.

3 Toggle Protocol (NETBEUI or TCP/IP)

Each time you press 3 you toggle from the current protocol to the other one. The current protocol setting is displayed in the header for the connection.

Note

If a connection has already been established with NETBEUI, you must restart the system to toggle to TCP/IP. If a connection has not yet been established, you can toggle to the other protocol immediately.

If a connection has already been established with TCP/IP, you must restart the system to toggle to NETBEUI.

If you toggle to TCP/IP as the current protocol, the extended Change Network Settings screen includes the additional option **6 Change TCP/IP settings**.

Screen form to toggle from TCPIP → NETBEUI, connection already established:

CURRENT NETWORK SETTINGS:

Machine Name : PCUXXXXXXX
User Name : auduser
Transport Protocol : TCPIP, get IP Addresses automatically via DHCP
Logon to domain : No

PLEASE SELECT:

- 1 Change Machine Name (for DOS Net only)
- 2 Change User name
- 3 Toggle Protocol (NETBEUI or TCPIP)
- 4 Toggle logon to domain (Yes or No)
- 6 Change TCPIP settings

9 Back to previous Menu

Your choice [1,2,3,4,5,6,7,9]?3

WARNING:

You already had a connection with TCPIP, now you want to toggle the protocol.

You can do this (and save the changes),
but then you can't connect again without rebooting!

Do you really want to toggle the protocol [Y,N]?

4 Toggle logon to domain (Yes or No)

If Toggle logon to domain is acknowledged with Y, and the domain password is stored in the password list, the system connects to the server immediately and activates the associated login script, if defined.

If Toggle logon to domain is acknowledged with N, a dialog for entering domain and password appears. The same applies if the domain password is not included in the password list.

Domain logon is only activated if Y is set.

5 Change DOMAIN Name.

This can be used in the same way as the name changes in options 1 and 2.

If Toggle logon to domain was acknowledged with N, the additional option in the Change Network Settings menu

5 Change DOMAIN Name disappears.

6 Change TCP/IP settings

The following suboptions for the TCP/IP protocol are offered:

1 Toggle "Get IP Addresses" (automatically or manually)

2 Change IP Address

3 Change Subnetmask

4 Change Gateway

5 Domain Name Server

6 Change DNS Extension

9 Back to previous menu

Your choice [1, 2, 3, 4, 5, 6, 9]?

Using the suboptions:

1 Toggle "Get IP Addresses"

This option toggles between **automatically** and **manually**. If automatically is set, IP addresses are retrieved via DHCP. A suitable Domain Name Server (DNS) must be used.

If manually is set, the IP address is entered directly under **2 Change IP Address**.

Note

All IP address/subnetmask entries in this screen form must be entered with a space as separator rather than the usual full stop.

Example: 192 168 3 2 instead of 192.168.3.2

2 Change IP Address

If "Get IP Addresses" is set to manually, the IP address of the PG/PC is entered here. DHCP cannot be selected.

3 Change Subnetmask

If "Get IP Addresses" is set to manually, the subnetmask of the PG/PC is entered here. DHCP cannot be selected. Notation is the same as for IP address with a **space** as separator.

Old subnetmask: ...

New subnetmask: <Subnetmask>

4 Change Gateway

If "Get IP Addresses" is set to manually, the gateway is entered here. The gateway is entered as an IP address.

Old gateway: ...

New gateway: <IP address>

5 Domain Name Server

If "Get IP Addresses" is set to automatically via DHCP, the IP address of the Domain Name Server (DNS) is entered here. DHCP normally knows a suitable Domain Name Server. If the DNS has the appropriate assignment of computer and IP address, no entry is required here.

6 Change DNS Extension

The extension of the Domain Name Server is entered here, e.g. siemens.com

Back to previous menu

When you exit the menu, you are prompted to confirm whether you want to save the network connection parameter settings.

7.3 Software installation/update

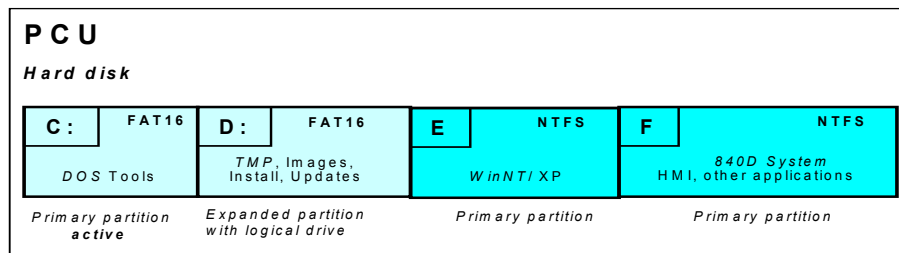
7.3.1 First boot for initial startup

General procedure

The hard disk of the PCU is pre-partitioned for SINUMERIK 840D operation and further SINUMERIK applications on delivery and the software required for a basic start-up is installed:

- The boot software and other software needed for start-up are stored on C:

Partitions E: and F: are empty.



Partitioning during initial start-up

When the system is started for the **first** time, the software pre-loaded on the hard disk (SINUMERIK products, including HMI Advanced software if applicable), is installed under Windows NT/XP as follows:

Welcome to SINUMERIK
These SINUMERIK products will be installed now:

<product 1>
<product 2>
<product 3>
...

Install NOW

Install at NEXT REBOOT

CANCEL Installing

The buttons can be selected by pressing the Tab key and activated by pressing Enter.

Effect of the buttons:

Install NOW:

All the products displayed are installed one after another in the sequence in which they are listed. If a reboot is required to activate the installation, it is executed immediately after installation of the corresponding program. The system may therefore be rebooted several times until all products are installed.

Install at NEXT REBOOT:

The screen above is displayed again the next time the system is rebooted. Nothing is installed immediately.

CANCEL Installing

Nothing is installed and the screen is not displayed again the next time the system is rebooted. Other installations can then only be carried out explicitly in Windows mode by activating the setup.exe programs directly in the setup directories.

7.3.2 Installing via a parallel link with a FAT16 file structure

Preconditions

You will need a PC or a PG with a CD ROM drive.
INTERSVR is used on the external PG/PC to transfer the software to the PCU. It can only be operated under DOS/Win3.11/Win95/Win98 if the PG/PC has a hard disk partition with a FAT16 file structure (not FAT32 !).

General procedure

This function transfers the HMI software to be installed to D:\INSTALL. The actual installation is carried out by Windows NT on the next boot provided the software includes an exe file, e.g. "setup.exe".



Important

Before you attempt to install the software, make sure that there is sufficient memory available on partition D of the hard disk.

Transfer

You must use the **parallel** (not the serial) interface to transfer the HMI software.

Operator actions

1. Switch off the PCU
2. Using the parallel connecting cable (PC-Link cable, LapLink cable), connect the parallel port LPT on the PG/PC to port LPT on the PCU.

Transfer type	PC/PG	PCU
parallel	LPT1	LPT (25-pin)

3. Copy the HMI_Advanced directory from the CD to drive C:\ on the hard disk of your PG/PC and rename it "MMC2". If there is insufficient memory available on drive C:\ or it does not have a FAT16 file structure, you can also use another local hard disk drive (e.g. D:\). The software cannot be installed directly from the CD.
4. Installation of the HMI software is started by calling it from the Windows menu Start -> Run -> Intersvr C: (or the drive on which the MMC2 directory is located).
IMPORTANT: When your PC/PG is in this state, the PCU MUST be switched off. (If the PCU is switched on, switch it off now).
5. SWITCH ON the PCU and select "Service menu" in the boot manager. (Hidden menu option, see 3.3.6 Service menu).

The following menu is displayed:

PLEASE SELECT: 1 Install/Update SINUMERIK System 2 SINUMERIK Tools and Options 3 DOS Shell 4 Start Windows (Service Mode) 5 SINUMERIK System Check 7 Backup/Restore 8 Start PC Link 9 Reboot (Warmboot) Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

6. Select option 1

The system prompts you for a password with:

passwd:

Enter one of the passwords for authorization levels 0 - 2

- System
- Manufacturer
- Service

The following menu is displayed

PLEASE SELECT MEDIUM: 1 Install from Floppy Disk 2 Install via Serial/Parallel Line 3 Install from Network Drive 5 REBOOT 9 Return to Main Menu Your Choice [1,2,3,5,9]?

7. **Select menu option 2** Install via Serial/Parallel Line.
8. The data transfer begins. The system boots to Windows and the installation is started automatically.
9. Depending on the installation concept for the application to be loaded, follow the application-specific prompts until the installation is complete.
10. The PCU is rebooted once the installation is complete.
11. End PC/PG server mode by pressing Alt + F4.

7.3.3 Installing via a parallel connection with a FAT32 file structure

General procedure

This function transfers the HMI software to be installed to D:\INSTALL. The actual installation is carried out by Windows on the next boot provided the software includes an exe file, e.g. "setup.exe".



Important

Before you attempt to install the software, make sure that there is sufficient memory available on partition D of the hard disk.

Preconditions

You will need a PC or a PG with a CD ROM drive.

You will also need a full keyboard on the PCU.

To install the software you will need the CD ROM with the system software.

Transfer

You must use the parallel (not the serial) interface to transfer the HMI software installation.

When to use

This method must be used if your PC/PG only has partitions with a FAT32 file structure.

Operator actions

1. Copy INTERLNK.EXE from the HMI directory on the CD to WINDOWS\COMMAND on the PC/PG. Insert the following line in CONFIG.SYS:
device=c:\windows\command\interlnk.exe /AUTO
2. Switch off the PCU.
3. Using the parallel connecting cable (PC-Link cable, LapLink cable), connect the parallel port LPT on the PC to port LPT on the PCU.
4. SWITCH ON the PCU
select "**Service menu**" in the boot manager [hidden menu entry]

PLEASE SELECT: 1 Install/Update SINUMERIK System 2 SINUMERIK Tools and Options 3 DOS Shell 4 Start Windows (Service Mode) 5 SINUMERIK System Check 7 Backup/Restore 8 Start PC Link 9 Reboot (Warmboot) Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

5. Select option 8

The system prompts you for a password with:

passwd:

6. Enter one of the passwords for authorization levels 0 - 2
 - System
 - Manufacturer
 - Service
7. Now copy the entire contents of the HMI_Advanced directory on the CD to the D:\INSTALL directory on the PCU. On completion of the transfer close INTERSVR on the PCU by pressing Alt + F4. The system boots to Windows.
8. In Windows NT/XP: The software is now installed automatically with InstallShield from the PCU. You can operate the InstallShield prompt boxes with TAB and the cursor keys (TAB corresponds to the END key on the OP0xx).
9. The system starts up after the PCU has rebooted.

7.3.4 Installation via a network link

General procedure

This function transfers the HMI software to be installed to D:\INSTALL on the PCU. The actual installation is carried out by Windows on the next boot provided the software includes an exe file, e.g. "setup.exe".



Important

Before you attempt to install the software, make sure that there is sufficient memory available on partition D of the hard disk.

Note

If you are using a different language version of the Windows system, the terms used in the following setting operations may be different. The sequence of operations as specified below, however, is always the same.

Operator actions

While the PCU is booting (after switching the control off and then on again):

1. Select the "Service Menu" [hidden menu option] in the boot manager.

The following menu is displayed:

PLEASE SELECT: 1 Install/Update SINUMERIK System 2 SINUMERIK Tools and Options 3 DOS Shell 4 Start Windows (Service Mode) 5 SINUMERIK System Check 7 Backup/Restore 8 Start PC Link 9 Reboot (Warmboot) Your Choice [1,2,3,4,5,7,8,9]?

2. Select option 1.

The system prompts you for a password with:

passwd:

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT MEDIUM: 1 Install from Floppy Disk 2 Install via Serial/Parallel Line 3 Install from Network Drive 5 REBOOT 9 Return to Main Menu Your Choice [1,2,3,5,9]?

3. Select option 3.

An input screen form is displayed in which you can specify settings for the network if necessary. See 7.2 **Settings for network drives**

Connect to network drive

```

PLEASE SELECT
    1 Manage Network Drives

    4 Change Install Directory

    9 Back to previous Menu

Your choice [1, 4, 5, 9]:?
  
```

4. **Select option 1** to specify the settings for a network connection. A screen form containing the detailed network functions is opened.

```

PLEASE SELECT
    1 Connect to Network Drives
    2 Show connected Network Drives
    3 Disconnect from all Network Drives
    4 Change Network Settings

    9 Back to previous Menu

Your choice [1, 2, 3, 4, 9]:?
  
```

5. **Select option 1.**

Type your password:

6. **Enter password**

Enter the password permitting the user to retrieve the software from the shared directory on the networked PG/PC. (For details of user settings see 7.2.2).

PG/PC with Windows NT/XP:

Password for a local user of the PG/PC

PG/PC with Windows 95/98:

Any user name, password identical to the password for directory sharing (if specified).

Letter for Network Drive:

Enter the letter of the PCU drive from which the connection must be accessed (e.g. "G")

Directory to be mounted (e.g. \\r4711\dir66):

Enter the computer name of the PG/PC and the name of the directory (share name) that you wish to access.

A screen form opens containing data for the PG/PC connection:

Machine Name	: PCU_1_Name
User Name	: auduser
Transport Protocol	: NETBEUI
Logon to domain	: No
Connect Network Drive (last):	G: (\r3344\HMINew)

PLEASE SELECT

- 1 Connect to Network Drive
- 2 Show connected Network Drives
- 3 Disconnect from all Network Drives
- 4 Change Network Settings

9 Back to previous Menu

Your choice [1, 2, 3, 4, 9]:?

7. Press 9 twice

The following menu is displayed:

PLEASE SELECT

1 Manage Network Drives

4 Change Install Directory

5 Install from G:

9 Back to previous Menu

Your choice [1, 4, 5, 9]:?

The newly activated network connection can be installed with option 5.
If the software to be installed is located in a subdirectory of the shared directory,
you can change the installation directory as follows.

Change installation directory on the connected drive

You can change the installation directory on the connected PG/PC:

8. Select option 4.

An input screen form appears in which you can specify the installation directory
(e.g. HMI_INST):

Old Install Directory:	G:\
New Install Directory:	G:\HMI_INST

You can now start the transfer:

PLEASE SELECT: 1 Manage Network Drives 4 Change Install Directory 5 Install from G:\HMI_INST 9 Back to previous Menu Your Choice [1,4,5,9]?

9. Select option 5.

Install

- The system starts the transfer from the PG/PC to the PCU.
- The PCU is automatically rebooted after the transfer.
- Select "SINUMERIK" in the boot manager. The software that has just been transferred is now installed, menu-assisted in some cases.

The system checks whether the D:\INSTALL directory already contains files.

Note

If the software cannot be copied to the D:\INSTALL directory on the PCU, then the system cannot start the installation.

Installation via a network connection is now complete.

Back to previous menu

When you exit the menu, you are prompted to confirm whether you want to save the network connection parameter settings.

7.4 Data backup/restore with a parallel connection

7.4.1 The Norton Ghost utility

The entire contents of hard disks can be saved as a disk image using the Norton Ghost utility. These disk images can be stored on various data carriers for a later restoration of the hard disk. Norton Ghost is factory-installed on replacement PCU hard disks and on the hard disk of the PCU module. Norton Ghost is used in some of the backup and restore procedures described below. More information is available on the Internet at www.ghost.com.

7.4.2 PCU hard disk to PG/PC, CD

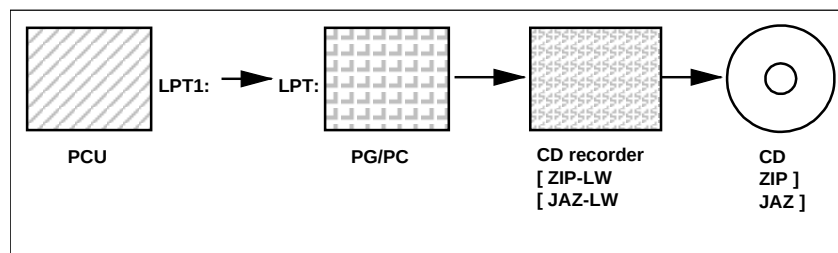


Fig. 7-4 Backing up the hard disk

Preconditions

- Ghost version 6.x/7.x is installed on the PCU and on the PG/PC.

Note

The PCU and PG/PC must both be using either 6.x or 7.x. Windows XP requires version 7.x.

- The directory in which the backup image is to be stored exists on the PG/PC.
- There is sufficient free memory on the PG/PC
- One of the operating systems MS-DOS 6.X, Windows 3.x, Windows 95 or Windows 98 is present on the PG/PC.
- The PCU and PG/PC are connected with the parallel cable (6FX2002-1AA02-1AD0) or a LapLink cable.
- In the BIOS of the PCU and of the PG/PC, the parallel interface is set to EPP or ECP.

Operator actions

While the PCU is booting (after switching the control off and then on again)

1. **Select the "Service Menu" [hidden menu option] in the boot manager.**

The following menu (main Service menu screen) is displayed:

PLEASE SELECT:

1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link

9 End (Warmboot)

Your Choice [1,2,3,4,5,7,8,9]?

2. **Select option 7.**

The system prompts you for a password with:

3. **Enter one of the passwords for authorization levels 0 - 2.**

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT:

1 Harddisk Backup/Restore with GHOST
4 Partitions Backup/Restore with GHOST (locally)
5 ADDM Backup/Restore

9 Back to Main Menu

Your Choice [1,4, 5,9]?

4. Select option 1.

The following menu is displayed:

```
GHOST Connection Mode: Parallel
GHOST Version: 6.01 (build = ...)

      PLEASE SELECT:

      1 Configure GHOST Parameters
      2 Harddisk Backup to <Path>, Mode ...
      3 Harddisk Restore from <Path>, Mode ...
      4 Switch to other version of GHOST (6.x/7.x)

      9 Back to previous Menu

Your Choice [1, 2, 3, 4, 9]?
```

Note

The paths are default settings and depend on the drive.
You can change these path names.

4 Switch to other version of GHOST (6.x/7.x)

This function switches between the versions of GHOST displayed. See note above.

"Optional" start

The following steps down to the next separator line are only applicable if you need to change the default settings for GHOST.

Set Ghost parameters

5. Set the parameters for Norton Ghost:

<1> "Configure GHOST Parameters":

The following menu is displayed:

```
      PLEASE SELECT:

      1 Set Connection Mode PARALLEL (LPT:)
      2 Set Connection Mode LOCAL/NETWORK
      3 Change Backup Image Filename
      4 Change Restore Image Filename
      5 Change Machine Name (for Windows and DOS net)
      6 Manage Network Drives (see 7.2)
      7 Change Split Mode

      9 Back to previous Menu

Your Choice [1, 2, 3, 4, 5, 6, 7, 9]?
```

Here you can set the interface type, the backup image path and the backup image split mode.

Set interface

- **Change interface:**
Select <1> Set Connection Mode PARALLEL (LPT:)
(default) and confirm

Notice:

For the parallel connection described here the interface type must always be set to PARALLEL.

Set backup image

- Change the backup image path:
<3> Change Backup Image Filename (enter the full path name for the backup file on the PG/PC, e.g. C:\SINUBACK\PCU\HMI.GHO).
Select, enter path and confirm.

Split backup image

- Backup image split mode

<7> Change Split Mode
Choose whether you wish to split the backup image into portions and, if so, enter the split size (max. split size: 2048 MB; default split size: 640 MB). The names of the split files are assigned as follows:
<name>.gho
<name>.001
<name>.002
<name>. ...

Back to previous menu

- Return to previous menu

<9> Back to previous Menu
Prompt: Save GHOST parameters? Answer Yes

"Optional" end

The following steps are always applicable.

Back up hard disk

6. Back up the hard disk

<2> Harddisk Backup to <pathname>, Mode PARALLEL

Choosing this menu option opens the following menu if local partition data backups already exist (see Backup/restore partition):

PLEASE SELECT: 1 Backup WITHOUT Local Images 2 Backup WITH Local Images Your Choice [1,2]?

If you do NOT want to backup local images (substantial reduction in transfer time and memory), choose 1 instead of 2.

Note

Local images are data backups of partitions C, E, F on the local partition D of the PCU. See 7.5.

- A message window then opens:
You are prompted to check whether the connection between the PCU and PG/PC has been established.
The destination path for the directory in which the backup image is to be stored on the PG/PC is displayed.
You are prompted to check whether this directory exists on the PG/PC.
- *PG/PC:*
In a DOS window or at the DOS level enter the command
ghost -lps to start Norton Ghost.
- *PCU:*
Type "Y" in the message box to acknowledge and start the backup.
The Norton Ghost message box appears with:
display of the transfer progress
display of the paths used
details of the amount of data to be transferred

7. PCU

Aborting the backup triggers the prompt:
Do you want to try to backup again [Y,N] ?
Press "N" to return to the main menu.
Press "Y" to restart the backup from scratch.

Back to previous menu**< 9> "Back to previous Menu"**

Returns you to the previous menu.

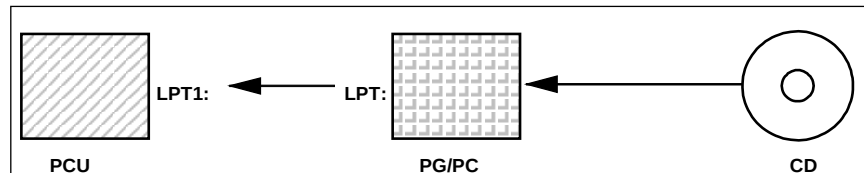
7.4.3 Restoring the PCU hard disk from PG/PC, CD

Fig. 7-5 Restoring the hard disk contents

Preconditions

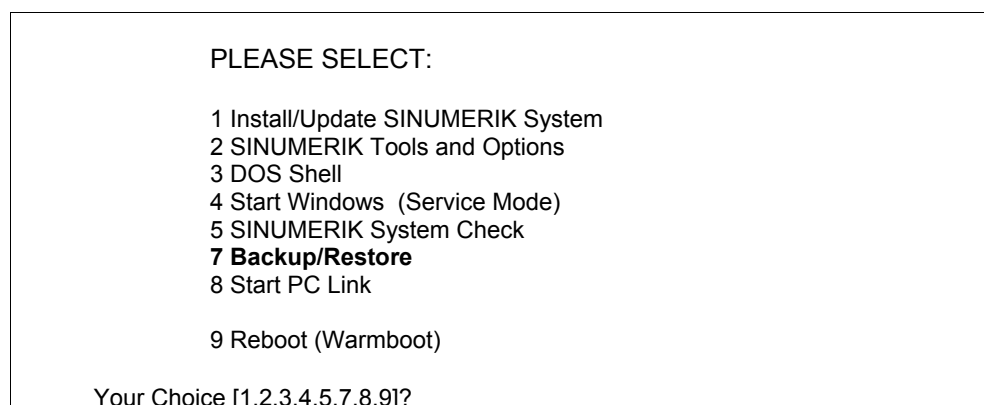
- Ghost version 6.x is installed on the PCU and on the PG/PC.
- The directory in which the restore image is stored exists on the PG/PC.
- One of the operating systems MS-DOS 6.X, Windows 3.x, Windows 95 or Windows 98 is present on the PG/PC.
- The PCU and PG/PC are connected with the parallel cable (6FX2002-1AA02-1AD0) or a LapLink cable.
- In the BIOS of the PCU and of the PG/PC, the parallel interface is set to EPP or ECP.

Operator actions**1. Switch on the PG/PC and insert the CD in the drive.**

While the PCU is booting (after switching the control off and then on again)

2. Select the "Service Menu" [hidden menu option] in the boot manager.

The following menu is displayed:

**3. Select option 7.**

The system prompts you for a password with:

passwd:

4. Enter one of the passwords for authorization levels 0 - 2.

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT:

1 Harddisk Backup/Restore with Ghost
4 Partitions Backup/Restore with Ghost

9 Return to Main Menu

Your Choice [1, 4, 9]?

5. Select option 1.

The following menu is displayed:

PLEASE SELECT:

1 Configure GHOST Parameters
2 Harddisk Backup to <Path>, Mode ...
3 Harddisk Restore from <Path>, Mode ...

9 Back to previous Menu

Your Choice [1, 2, 3, 9]?

Note

The paths are default settings and depend on the drive. You can change these path names.

"Optional" start

The following steps are only applicable if you wish to change the default settings.

Set Ghost parameters

6. Set the parameters for Norton Ghost.

<1> "Configure GHOST Parameters":

The following menu is displayed:

PLEASE SELECT: 1 Set Connection Mode PARALLEL (LPT:) 2 Set Connection Mode LOCAL/NETWORK 3 Change Backup Image Filename 4 Change Restore Image Filename 5 Change Machine Name (for Windows and DOS net) 6 Manage Network Drives 7 Change Split Mode 9 Back to previous Menu Your Choice [1, 2, 3, 4, 5, 6, 7, 9]?

Here you can set the interface type and the restore image path.

Set interface

6.1 Change interface:

Select <1> Set Connection Mode PARALLEL (LPT:)

(default) and confirm.

Notice:

For the parallel connection described here the interface type must always be set to PARALLEL.

Set restore image

6.2 Change the restore image path:

<4> Change Restore Image Filename

(Enter the full path name for the "HMI.GHO" restore file on the PG/PC, e.g. D:\SINUBACK\PCU\HMI.GHO). Select, enter path and confirm.

Back to previous menu

6.3 Return to the previous menu

<9> Back to previous Menu

Prompt: Save GHOST parameters ? Answer Yes.

"Optional" end

The following steps are always applicable.

Restore hard disk

7. Copy the hard disk contents

<3> Harddisk Restore from <pathname>, Mode PARALLEL

Option 3 opens the following menu:

For partitioning the disk it's important to know the SYSTEM BASE of the imaged configuration.	
Please select the SYSTEM BASE the image was created by!	
PLEASE SELECT:	
[Base software NT vers. 7.3.2]	[Base software XP vers. > 7.3.2]
1 Windows NT	1 Windows XP
2 Win95	2 Windows NT
3 WfW3.11	3 Win95
4 DOS (spare part)	4 WfW3.11
	5 DOS (spare part)
9 Back to previous Menu	9 Back to previous Menu
Your Choice [1, 2, 3, 4, 9]?	Your Choice [1, 2, 3, 4, 5, 9]?

Select the operating system on which the restore image is based. This affects the type of hard disk partitioning that is performed.

When you select the appropriate operating system, another menu opens:

What kind of disk partitioning do you want?
1 Standard Partitioning (default)
2 User-defined Partitioning
3 Image-defined Partitioning
Your Choice [1, 2, 3]?

Specify whether you want a standard hard disk partitioning, i.e. with a fixed number and size of partitions (depending on the operating system), or whether you want to define the partitioning yourself. In the **first** case Norton Ghost automatically sets the partition parameters, whereas in the **second** case the user sets the partition parameters in Norton Ghost.

In the **third** case the partition is taken from the GHOST image.

* When this menu is chosen, a message box appears in which you are prompted to check whether the connection between the PCU and PG/PC has been established. The path on the PG/PC from which the restore image is to be copied is displayed.

You are prompted to check whether the restore image file exists on the PG/PC.

* *PG/PC:*

In a DOS window or at the DOS level enter the command
ghost -lps to start Norton Ghost.

* *PCU:*

Type "Y" in the message box to acknowledge and start the restore process.

* *PCU:*

The Norton Ghost message box appears with:
display of the transfer progress
display of the paths used
details of the amount of data to be transferred

* To abort the transfer if necessary

PG/PC: Press "Control" + "C"

The PCU boots.



Caution

A boot disk is required to boot the PCU.

Booting

8. After a successful restore you must reboot the system.

7.4.4 Replacement hard disk/replacement PCU

HMI

The procedure for restoring the data backup of a complete HMI hard disk, so that all user and system data are available in the event of servicing, is described below.

Norton Ghost

Using Norton Ghost[®] the entire contents of a PCU hard disk can be stored as a disk image file. This disk image file can be stored on various data carriers for a later restoration of the hard disk.

Norton Ghost[®] is factory-installed on every PCU module and on replacement hard disks.

For further information please go to "www.ghost.com" or refer to the previous section.

Note

Recommendation:

Archive the hard disk backup (hard disk image) including the Norton Ghost utility on CD.

Restoring a data backup

Preconditions:

- Ghost is installed on the PG.
 - A new replacement hard disk has been obtained.
 - The HMI is connected to the PC/PG with a parallel cable
 - The operating system Windows 3.x or Windows 95 is installed on the PC/PG and a CD drive is available.
1. Install the new replacement hard disk in the PCU or install the new HMI (see instructions supplied with the hard disk)
 - Click the hard disk into place
 - Plug in the connecting cable from the hard disk to the PCU
 - Secure the hard disk with the 4 knurled screws
 - Release the transport lock: Turn towards "operating" until it engages.

References: /BH/Operator Components, Manual

Note

The replacement hard disk does not include the Windows NT operating system or HMI system software.

2. Switch on the PG and insert the CD in the drive.
 3. Switch the control off and then on again and in the boot manager select the Service menu. Select menu "4: Backup/Restore"
 4. Select: **7 Backup/Restore**
 5. Enter password
 6. Select menu **1 "Hard disk backup/restore with Ghost"**
 7. Set parameters for Norton Ghost:
 - **<1> Configure Ghost parameters:**
see above
 - **<3> Harddisk Restore** from <pathname>, Mode **PARALLEL**
- * When this menu is chosen a message box appears in which:
you are prompted to check whether the connection
between the HMI and PG/PC has been established.
The image file of the HMI to be restored is selected.

* *PG/PC:*

In a DOS window or at the DOS level enter the command
ghost -lps to start Norton Ghost.

* *MMC:*

Start the restore process by acknowledging the message window (Yes).

* *MMC:*

The Norton Ghost message box appears with:
display of the transfer progress
display of the paths used
details of the amount of data to be transferred

Note

If the data transfer is interrupted during the restore process, the system on the hard disk will be incomplete. An HMI boot disk containing the MS-DOS_6.x boot software and the Norton Ghost utility will be needed.

– **<9> Back** to previous menu
Return to the main menu

8. **After a successful restore:**
The HMI is booted automatically.

Duration: Approx. 15-20 minutes to generate a 130 MB compressed disk image of a 540 MB hard disk via LPT.

7.5 Data backup/restore with an Ethernet connection

7.5.1 Backing up the PCU hard disk to a PG/PC hard disk

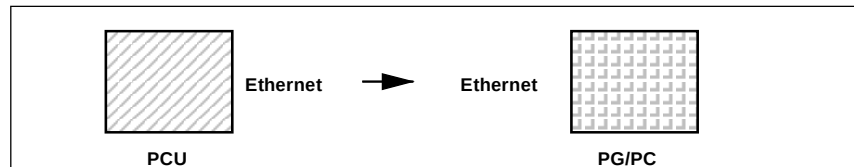


Fig. 7-6 Backing up the hard disk

Preconditions

- Ghost version 6.x/7.x ($\geq 7.x$ required for Windows XP) is installed on the PCU and on the PG/PC.
- The Ghost versions on the PCU and the PG/PC must be the same.
- The directory in which the backup image is to be stored exists on the PG/PC.
- There is sufficient free memory on the PG/PC
- Windows (any version) is installed on the PG/PC.
- The PCU and PG/PC are connected with an Ethernet cable.

Operator actions

While the PCU is booting (after switching the control off and then on again):

1. Select the "Service Menu" [hidden menu option] in the boot manager.

The following menu is displayed:

PLEASE SELECT:

- 1 Install/Update SINUMERIK System
- 2 SINUMERIK Tools and Options
- 3 DOS Shell
- 4 Start Windows (Service Mode)
- 5 SINUMERIK System Check
- 7 Backup/Restore**
- 8 Start PC Link

- 9 Reboot (Warmboot)

Your Choice [1,2,3,4,5,7,8,9]?

2. Select option 7.

The system prompts you for a password with:

passwd:

3. Enter one of the passwords for authorization levels 0 - 2.

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT:

1 Harddisk Backup/Restore with GHOST
4 Partitions Backup/Restore with GHOST (locally)
5 ADDM Backup/Restore

9 Back to Main Menu

Your Choice [1,4,9]?

Select option 1.

The following menu is displayed:

PLEASE SELECT:

1 Configure GHOST Parameters
2 Harddisk Backup to <Path>, Mode ...
3 Harddisk Restore from <Path>, Mode ...
4 Switch to other Version of GHOST

9 Back to previous Menu

Your Choice [1,2,3,9]?

Note

The paths are default settings and depend on the drive.
You can change these path names.

"Optional" start

The following steps are only applicable if you wish to change the default settings.

Set Ghost parameters**Set the parameters for Norton Ghost****<1> Configure GHOST Parameters**

The following menu is displayed:

PLEASE SELECT:

1 Set Connection Mode PARALLEL (LPT:)
2 Set Connection Mode LOCAL/NETWORK
3 Change Backup Image Filename
4 Change Restore Image Filename
5 Change Machine Name (for Windows and DOS net)
6 Manage Network Drives
7 Change Split Mode

9 Back to previous Menu

Your Choice [1, 2, 3, 4, 5, 6, 7, 9]?

Here you can set the interface type, the network connection, the backup image path and the backup image split mode.

Set interface

- **Change interface:**
Select **<2> Set Connection Mode LOCAL/NETWORK** and confirm.

Notice:

For the network connection described here the interface type must always be set to LOCAL/NETWORK.

Connect to network drive

- **Establish/change network connection:**
<6> Manage Network Drives

See 7.2 for details.

Set backup image

- **Change the backup image path:**
< 3 > Change Backup Image Filename:
Enter the complete path for the backup file on the PG/PC, e.g.
C:\SINUBACK\PCU\HMI.gho

Split backup image

- **Backup image split mode:**
<7> Change Split Mode

Choose whether you wish to split the backup image into portions and, if so, enter the split size (max. split size: 2048 MB; default split size: 640 MB). The names of the split files are assigned as follows:

<name>.gho
<name>.001
<name>.002
<name>. ...

Back to previous menu

- Return to the previous menu:
< 9 > Back to previous Menu

Prompt: Save GHOST parameters ? Answer Yes.

"Optional" end

The following steps are always applicable.

Back up hard disk

You can now start the transfer:

Back up the hard disk

< 2 > Harddisk Backup to <pathname>, Mode LOCAL/NETWORK

Selecting this option opens the following menu if local partition data backups are available: (See Backup/restore partitions).

PLEASE SELECT: 1 Backup WITHOUT Local Images 2 Backup WITH Local Images Your Choice [1,2]?

If you do NOT want to back up local partition data (substantial reduction in transfer time and memory), select:

Option 1 **"Backup WITHOUT Local Images"**, otherwise select option 2 **"Backup WITH Local Images"**.

- * A message window then opens:

You are prompted to check whether the connection between the PCU and PG/PC has been established.
The destination path for the directory in which the backup image is to be stored on the PG/PC is displayed.

You are prompted to check whether this directory exists on the PG/PC.

- * *PCU*:

Type "Y" in the message box to acknowledge and start the backup.

- * *PCU*:

The Norton Ghost message box appears with:
display of the transfer progress
display of the paths used
details of the amount of data to be transferred.

PCU

Aborting the backup triggers the prompt:
Do you want to try to backup again [Y,N] ?
Press N to return to the main menu.
Press "Y" to restart the backup from scratch.

Back to previous menu

<9> **"Back to previous Menu".**
Returns you to the previous menu

Disconnect from network drives:

You can terminate all connections to the PG/PC. See 7.2.

7.5.2 Restoring the PCU hard disk from the PG/PC hard disk

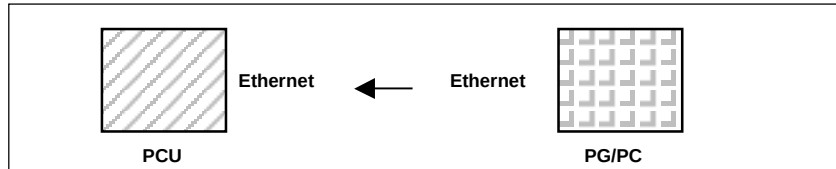


Fig. 7-7 Restoring the hard disk contents

Preconditions

- Ghost version 6.x/7.x is installed on the PCU and on the PG/PC.
- The directory in which the restore image is stored exists on the PG/PC.
- Windows (any version) is installed on the PG/PC.
- The PCU and PG/PC are connected with an Ethernet cable.

Operator actions

1. **Switch on the PG/PC and insert the CD in the drive.**
While the PCU is booting (after switching the control off and then on again):
2. **Select the "Service Menu" [hidden menu option] in the boot manager.**

The following menu is displayed:

PLEASE SELECT:

1 Install/Update SINUMERIK System
 2 SINUMERIK Tools and Options
 3 DOS Shell
 4 Start Windows (Service Mode)
 5 SINUMERIK System Check
7 Backup/Restore
 8 Start PC Link

9 Reboot (Warmboot)

Your Choice [1,2,3,4,5,7,8,9]?

3. **Select option 7.**
The system prompts you for a password with:

passwd:

4. Enter one of the passwords for authorization levels 0 - 2.

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT:

1 Harddisk Backup/Restore with Ghost
4 Partitions Backup/Restore with Ghost
5 ADDM Backup/Restore

9 Return to Main Menu

Your Choice [1, 4, 5, 9]?

5. Select option 1.

The following menu is displayed:

PLEASE SELECT:

1 Configure GHOST Parameters
2 Harddisk Backup to <Path>, Mode ...
3 Harddisk Restore from <Path>, Mode ...
4 Switch to other Version of GHOST

9 Back to previous Menu

Your Choice [1, 2, 3, 4, 9]?

Note

The paths are default settings and depend on the drive. You can change these path names.

"Optional" start

The following steps are only applicable if you wish to change the default settings.

Set Ghost parameters

6. Set the parameters for Norton Ghost

< 1 > Configure GHOST Parameters

The following menu is displayed:

PLEASE SELECT:

- 1 Set Connection Mode PARALLEL (LPT:)
- 2 Set Connection Mode LOCAL/NETWORK
- 3 Change Backup Image Filename
- 4 Change Restore Image Filename
- 5 Change Machine Name (for Windows and DOS net)
- 6 Manage Network Drives [See 7.2]
- 7 Change Split Mode

- 9 Back to previous Menu

Your Choice [1, 2, 3, 4, 5, 6, 7, 9]?

Here you can set the interface type, the network connection, the backup image path and the restore image path.

Set interface

6.1 Change interface:

Select <2> Set Connection Mode LOCAL

and confirm.



Important

For the network connection described here the interface type must always be set to LOCAL/NETWORK.

Connect to network drive

6.2 Establish/change network connection

<6> Manage Network Drives

See 7.2:

Set restore image

6.2 Change the image path:

< 4 > Change Restore Image Filename

Enter the complete path for the HMI.gho restore file on the PG/PC, e.g.
C:\SINUBACK\PCU\HMI.gho

Back to previous menu

6.3 Return to the previous menu:

< 9 > Back to previous Menu

Prompt: Save GHOST parameters ? Answer Yes.

"Optional" end

Restore hard disk

Restore contents of hard disk

<3> Harddisk Restore from <pathname>, Mode LOCAL

Selecting this option opens the following menu:

For partitioning the disk it's important to know the SYSTEM BASE of the imaged configuration. Please select the SYSTEM BASE the image was created by! .	
PLEASE SELECT:	
[Base software NT vers. 7.3.2] 1 Windows NT 2 Win95 3 WfW3.11 4 DOS (spare part) 9 Back to previous Menu Your Choice [1, 2, 3, 4, 9]?	[Base software XP vers. > 7.3.2] 1 Windows XP 2 Windows NT 3 Win95 4 WfW3.11 5 DOS (spare part) 9 Back to previous Menu Your Choice [1, 2, 3, 4, 5, 9]?

Select the operating system on which the restore image is based. This affects the type of hard disk partitioning that is performed.

When you select the appropriate operating system, another menu opens:

What kind of disk partitioning do you want?

1 Standard Partitioning (default)
2 User-defined Partitioning
3 Image-Partitioning

Your Choice [1, 2, 3]?

Specify whether you want a standard hard disk partitioning, i.e. with a fixed number and size of partitions (depending on the operating system), or whether you want to define the partitioning yourself. In the first case Norton Ghost automatically sets the partition parameters, whereas in the second case the user sets the partition parameters in Norton Ghost. In the third case the image to be loaded determines the partitioning.

< 9 > Back to previous Menu

Return to the previous menu

On initial startup or restore only (selected automatically with Ghost or Restore):
select the following option from the menu "1 Configure GHOST Parameters"

Set the PCU network name

If your machine is part of a NETWORK, it needs a machine name that is unique in the overall network.

The restore image brings along a machine name.
You can change this machine name now.

CAUTION:

The machine name shouldn't be changed, if

1. the restore image is a backup image of your machine
AND
2. the name of your machine hasn't been changed since
creating the backup image.

NOTE for networks that require Microsoft Domain security:

Whenever you change the machine name (even if you input a name identical to the machine name contained in the restore image), your machine and its users will NO LONGER belong to the Microsoft network domain.
(See also the Microsoft documentation)

Press any key to continue . . .

Do you REALLY want to input a new machine name?

- If you want to input the new machine name MANUALLY,
1. don't use "\[;]|<>+=?,?*" and blanks AND
 2. the new machine name has to be EXACTLY as long as the old machine name used within the restore image.

If you don't want to input a new machine name, the machine name used within the restore image keeps valid.

HINT: if you want to input a machine name with a different length, you have to do this in Windows!

PLEASE SELECT:

- 1 Input Machine Name MANUALLY
- 2 Input Machine Name RANDOMLY

9 No new Machine Name

Your Choice [1,2,9]?

You can choose to enter a computer name for the PCU yourself or have a name generated automatically:

* Enter name yourself:

< 1 > Input Machine Name MANUALLY

An input screen form is opened in which the new 10-character name can be entered. On pressing Enter to confirm the name is changed in the system.
Default name: PCUxxxxxxx [10 characters].

* Enter name automatically:

< 2 > Input Machine Name RANDOMLY

A name is generated automatically and changed in the system. If required, the name can be viewed in Windows from the Control Panel

NT: Start->Settings->ControlPanel->Network:Identification

XP: Start->Settings->Control Panel->"System" icon->Computer Name tab

* *PCU:*

The Norton Ghost message box appears with:

display of the transfer progress

display of the paths used

details of the amount of data to be transferred.

If serial startup is performed from a GHOST image, the current PCU name must be set rather than the name contained in the GHOST image.

The new computer name (including the name generated randomly with option 2) and the new system ID (SID) are assigned to the PCU with the Ghostwalker utility.

On completion of the Ghostwalker sequence the operator is given the opportunity to repeat the restore process. This is necessary if the first restore process did not proceed correctly (e.g. connection problems, aborted by operator, etc.).

If there is no operator activity within 5 seconds the PCU is automatically restarted.

The computer name can be changed in Windows if required.

It seems that Ghost Restore succeeded. But if there was no connection or a cancel of the Restore, Ghost reports NO Errors! So you have the chance to: PLEASE SELECT: 1 Reboot the System (default after 5 Seconds) 2 Try the Harddisk Restore again 9 Back to previous Menu Your Choice [1, 2, 9]?

You can change the computer name again at a later stage by selecting option 5 "Change Machine Name (for Windows and DOS net)" in the submenu Backup/Restore-> Harddisk Backup/Restore with GHOST->Configure GHOST Parameters. This change is also made via Ghostwalker.

Booting

8. After a successful restore you must reboot the system.



Important

If the restore process was interrupted, the system on the hard disk will be incomplete. In this situation a boot disk with Norton Ghost and the network software is required. The boot disk is available from eSupport.

7.6 Replacing the hard disk

The mechanical and electrical steps involved in replacing the HMI hard disk are described in:

References: /BH/, Operator Components Manual

To load/restore software and data for the new hard disk, follow the instructions in:

- 7.3 Software installation/update
- 7.4 Data backup/restore with a parallel connection
- 7.5 Data backup/restore with an Ethernet connection

7.7 Backing up and restoring PCU partitions locally

7.7.1 Backing up/restoring partitions in general

In addition to backing up the entire contents of the hard disk onto an external drive, you can also back up partitions C:, E:, and F: of the PCU locally onto partition D: of the PCU (partition data backup).

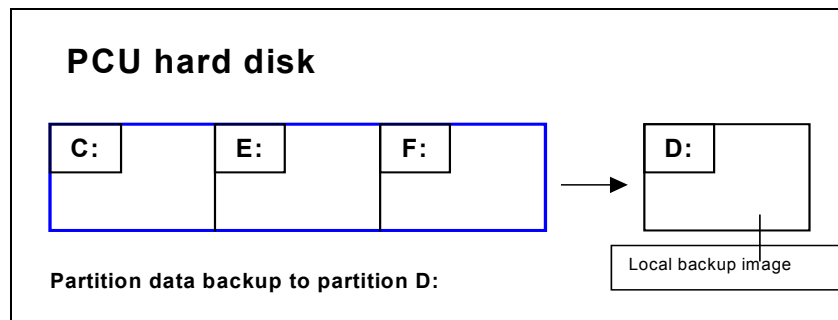


Fig. 7-8 Partition data backup

The local backup image generated by a partition data backup can be used to restore partitions C:, E: and F: again if necessary (partition data restore).

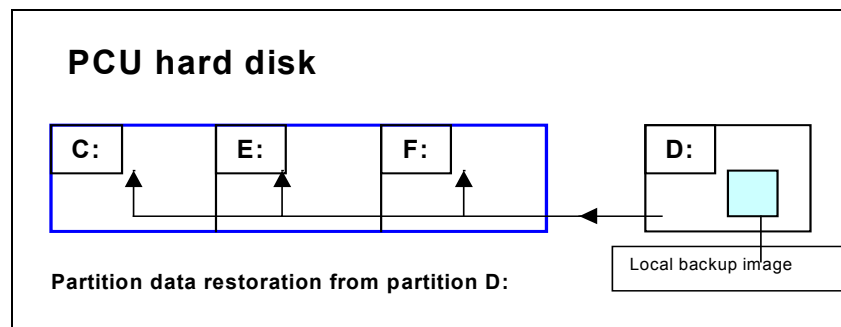


Fig. 7-9 Partition data restore

In addition, a local backup image can be used to restore partition E: (Windows) only, if required. This can be necessary if, for example, Windows can no longer be booted after a system failure or uncontrolled shutdown of the PCU (partition E data restore).

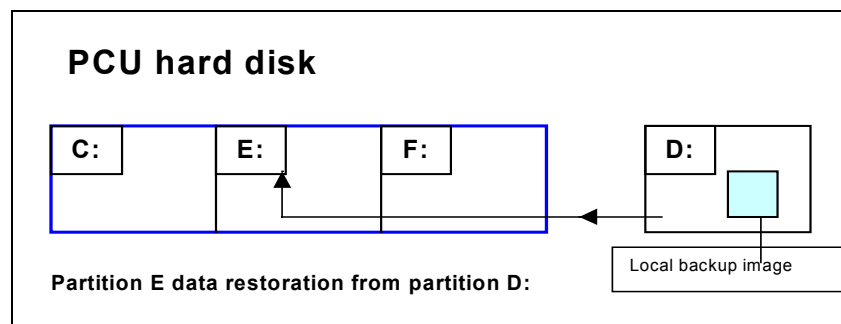


Fig. 7-10 Partition E restore

For a partition data restore process or a partition E data restore process, any of the local backup images located on partition D: can be used in theory.

Naturally, however, for a partition E data restore the local backup image to be used must be chosen with care: the registry entries for all applications installed on partition F: will need to be present on the partition E: to be restored.

It is therefore a good idea to always define a specific local backup image (emergency backup image) that can be restored in an emergency (Windows no longer bootable) by means of a partition E data restore, without affecting the operation of applications that are installed.

Definition of a local backup image for a possible emergency and simple starting of the partition E data restore in the event of an emergency are supported in the Service menu.

The maximum number of local backup images that can be stored simultaneously on partition D: (≤ 7) can be set.

7.7.2 Backing up partitions

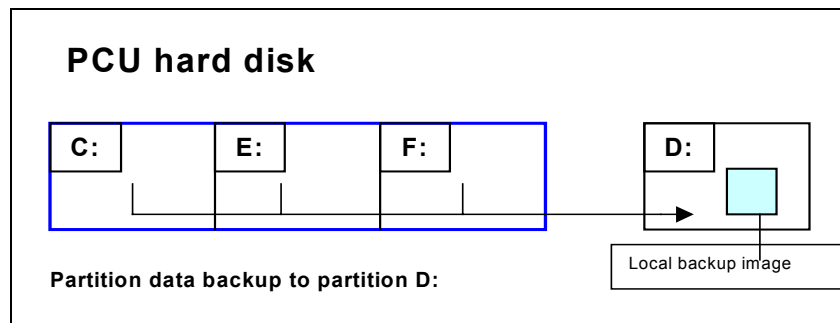


Fig. 7-11 Partition data backup

Operator actions

While the PCU is booting (after switching the control off and then on again):

1. **Select the "Service Menu" [hidden menu option] in the boot manager.**

The following menu is displayed:

PLEASE SELECT: 1 Install/Update SINUMERIK System 2 SINUMERIK Tools and Options 3 DOS Shell 4 Start Windows (Service Mode) 5 SINUMERIK System Check 7 Backup/Restore 8 Start PC Link 9 Reboot (Warmboot) Your Choice [1,2,3,4,5,7,8,9]?

2. **Select option 7.**

The system prompts you for a password with:

passwd:

3. **Enter one of the passwords for authorization levels 0 - 2.**

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT: 1 Harddisk Backup/Restore with GHOST 4 Partitions Backup/Restore with GHOST (locally) 5 ADDM Backup/Restore 9 Back to Main Menu Your Choice [1, 4, 5, 9]?

4. Select option 4.

The following menu is displayed:

PLEASE SELECT: 1 Configure GHOST Parameters 2 Partitions Backup, Mode LOCAL 3 Partitions Restore, Mode LOCAL 4 Partition E (only Windows) Restore, Mode LOCAL 8 Delete Image 9 Back to previous Menu Your Choice [1, 2, 3, 4, 8, 9]?

"Optional" start

The following steps are only applicable if you wish to change the default settings.

Change max. backup images

5. Set the maximum number of local backup images (max. 7) < 1 > Configure GHOST Parameters:

The following menu is displayed:

GHOST Connection Mode: LOCAL Maximum Backup Images : 1 Current Backup Images : 0 PLEASE SELECT: 1 Change Maximum Backup Images 2 Define Emergency Backup Image 9 Back to previous Menu Your Choice [1,2,9]?

To change the maximum number of local backup images, select option 1:

Enter a new number (max. 7).

- Prompt: Save GHOST parameters? Answer Yes.

Back to previous menu

< 9 > Back to previous Menu

Returns you to the previous menu

"Optional" end

The following steps are always applicable.

Back up partitions

6. Select option 2.

< 2 > Partitions Backup, Mode LOCAL

You are prompted for the **name** under which the new local backup image is to be stored, e.g. BACKUP1. Length of name: **max. 7 characters**.

Under "**Description**" you are asked whether you want to store an additional description for the local backup image, e.g. "Data backup1 by Hugo". In the restore process this additional description is offered as a selection text in the list of available backup images (if there is no description, the name of the backup image is displayed in the list).

You are asked whether you want the new local backup image to be used as an emergency backup image too (and an existing emergency backup image to be deleted).

The partition data backup to D: is then started.

A file is created in the IMAGES directory in D: for each partition, e.g. BACKUP1.gh1, BACKUP1.gh3, BACKUP1.gh4. In the restore process they are recognized as logically belonging to one backup image.

On completion of the partition data backup the message "Backup finished" is displayed.

Back to previous menu

< 9 > Back to previous Menu

Returns you to the previous menu

7.7.3 Restoring partitions

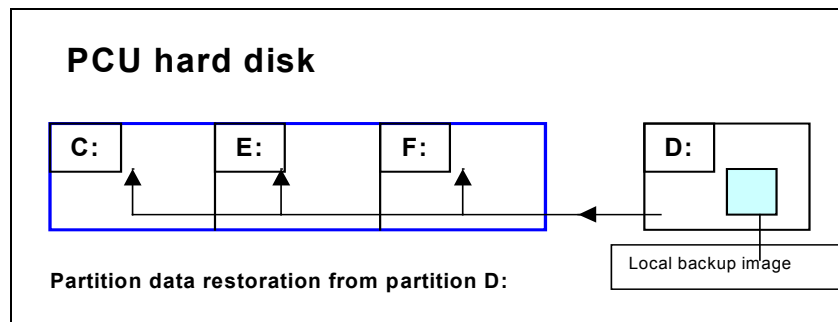


Fig. 7-12 Partition data restore

Operator actions

While the PCU is booting (after switching the control off and then on again):

1. **Select the "Service Menu" [hidden menu option] in the boot manager.**

The following menu is displayed:

```

PLEASE SELECT:

1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link

9 Reboot (Warmboot)

Your Choice [1,2,3,4,5,7,8,9]?
  
```

2. **Select option 7.**

The system prompts you for a password with:

```

passwd:
  
```

3. Enter one of the passwords for authorization levels 0 - 2.

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT:	
	1 Harddisk Backup/Restore with GHOST
	4 Partitions Backup/Restore with GHOST (locally)
	5 ADDM Backup/Restore
	9 Back to Main Menu
Your Choice [1, 4, 5, 9]?	

4. Select option 4.

The following menu is displayed:

PLEASE SELECT:	
	1 Configure GHOST Parameters
	2 Partitions Backup, Mode LOCAL
	3 Partitions Restore, Mode LOCAL
	4 Partition E (only Windows) Restore, Mode LOCAL
	8 Delete Image
	9 Back to previous Menu
Your Choice [1,2,3,4,8,9]?	

Restore partition

5. Select option 3.

< 3 > Partitions Restore, Mode LOCAL

You are asked which local backup image you wish to restore, e.g. "Data backup1 by Hugo".

PLEASE SELECT IMAGE:	
	1 PCU Base Software V06.00.02 Win NT 4.0
	[02-01-2000: 05:32:32pm]
EMERG	2 Data backup1 by Hugo [02-03-2000; 04:53:24pm]
	...
	9 Back to previous menu
Your Choice [1, 2, ..., 9]?	

Select the backup image you require.

On confirming your choice the warning "All data will be overwritten" is displayed and restoration of the chosen backup image to partitions C:, E: and F: is started.

On completion of the partition data restore the message "Restore finished" is displayed.

After each restore process partitions E: and F: are checked by the test program CHKDSK the next time Windows is started.

The system is rebooted between checking E: and F:.

7.7.4 Restoring Partition E: (Windows) to PCU

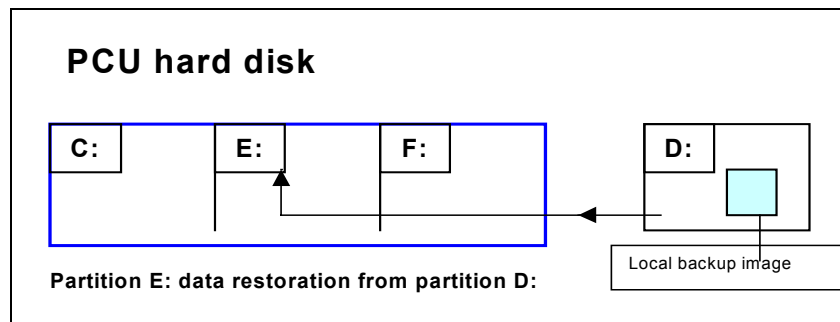


Fig. 7-13 Partition E data restore

Operator actions

While the PCU is booting (after switching the control off and then on again)

1. Select the "Service Menu" [hidden menu option] in the boot manager.

The following menu is displayed:

```

PLEASE SELECT:

1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link

9 Reboot (Warmboot)

Your Choice [1,2,3,4,5,7,8,9]?
  
```

2. Select option 7.

The system prompts you for a password with:

```

passwd:
  
```

3. Enter one of the passwords for authorization levels 0 - 2.

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT:

1 Harddisk Backup/Restore with GHOST
4 Partitions Backup/Restore with GHOST (locally)
5 ADDM Backup/Restore

9 Back to Main Menu

Your Choice [1, 4, 5, 9]?

4. Select option 4.

The following menu is displayed:

PLEASE SELECT:

1 Configure GHOST Parameters
2 Partitions Backup, Mode LOCAL
3 Partitions Restore, Mode LOCAL
4 Partition E (only Windows) Restore, Mode LOCAL
8 Delete Image

9 Back to previous Menu

Your Choice [1,2,3,4,8,9]?

Restore partition E

5. Select option 4.

< 4 > Partition E (only Windows) Restore, Mode LOCAL

You are asked for the local backup image whose partition E: (= Windows partition) you wish to restore, e.g. "Data backup1 by Hugo".

PLEASE SELECT:

- as for **Restore partition**

Select the backup image you require:

On confirming your choice, the warning:

"The Windows partition will be overwritten" is displayed and restoration of partition E: is started.

On completion of the partition E data restore the message "Restore finished" is displayed.

The next time Windows NT is started, partition E: is checked by the test program CHKDSK.

7.7.5 Deleting a backup image

Operator actions

While the PCU is booting (after switching the control off and then on again)

1. Select the "Service Menu" [hidden menu option] in the boot manager.

The following menu is displayed:

PLEASE SELECT:

- 1 Install/Update SINUMERIK System
- 2 SINUMERIK Tools and Options
- 3 DOS Shell
- 4 Start Windows (Service Mode)
- 5 SINUMERIK System Check
- 7 Backup/Restore**
- 8 Start PC Link
- 9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

2. Select option 7.

The system prompts you for a password with:

passwd:

3. Enter one of the passwords for authorization levels 0 - 2.

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT:

1 Harddisk Backup/Restore with GHOST
4 Partitions Backup/Restore with GHOST (locally)
5 ADDM Backup/Restore

9 Back to Main Menu

Your Choice [1, 4, 5, 9]?

4. Select option 4.

The following menu is displayed:

PLEASE SELECT:

1 Configure GHOST Parameters
2 Partitions Backup, Mode LOCAL
3 Partitions Restore, Mode LOCAL
4 Partition E (only Windows) Restore, Mode LOCAL
8 Delete Image

9 Back to previous Menu

Your Choice [1, 2, 3, 4, 8, 9]?

Delete backup image

5. Select option 8. < 8 > Delete Image

From the list of backup images, select the one you wish to delete.

The system asks you whether you really want to delete the image.

Confirm with "Y" to delete the backup image.

Back to previous menu

< 9 > Back to previous Menu

Returns you to the previous menu

7.7.6 Defining an emergency backup image

Operator actions

While the PCU is booting (after switching the control off and then on again):

1. Select the "Service Menu" [hidden menu option] in the boot manager.

The following menu is displayed:

PLEASE SELECT: 1 Install/Update SINUMERIK System 2 SINUMERIK Tools and Options 3 DOS Shell 4 Start Windows (Service Mode) 5 SINUMERIK System Check 7 Backup/Restore 8 Start PC Link 9 Reboot (Warmboot) Your Choice [1,2,3,4,5,7,8,9]?

2. Select option 7.

The system prompts you for a password with:

passwd:

3. Enter one of the passwords for authorization levels 0 - 2.

- System
- Manufacturer
- Service

The following menu is displayed:

PLEASE SELECT:

1 Harddisk Backup/Restore with GHOST
4 Partitions Backup/Restore with GHOST (locally)
5 ADDM Backup/Restore

9 Back to Main Menu

Your Choice [1, 4, 5, 9]?

4. Select option 4.

The following menu is displayed:

PLEASE SELECT:

1 Configure GHOST Parameters
2 Partitions Backup, Mode LOCAL
3 Partitions Restore, Mode LOCAL
4 Partition E (only WinNT) Restore, Mode LOCAL
8 Delete Image

9 Back to previous Menu

Your Choice [1,2,3,4,8,9]?

Defining an emergency backup image

5. Select option 1.

< 1 > **Configure GHOST Parameters:**

The following menu is displayed:

PLEASE SELECT:

1 Change Maximum Backup Images
2 Define Emergency Backup Image

9 Back to previous Menu

Your Choice [1, 2, 9]?

6. Select option 2.

You are asked which local backup image you want to use as the emergency backup image (this choice can be changed at any time).

PLEASE SELECT EMERGENCY IMAGE:

1 PCU Base Software V06.00.02 Win NT 4.0
[02-01-2000: 05:32:32pm]

EMERG 2 Data backup1 by Hugo
[02-03-2000; 04:53:24pm]

3 Data backup2
[02-05-2000; 07:07:14pm]

N No Emergency Image

9 Back to previous Menu

Your Choice [1, 2, 3, N, 9]?

Choose the backup image you require, e.g. "Data backup2".
The code "EMERG" for current emergency backup image is displayed against the chosen backup image:

PLEASE SELECT EMERGENCY IMAGE:

1 PCU Base Software V06.00.02 Win NT 4.0
[02-01-2000: 05:32:32pm]

2 Data backup1 by Hugo
[02-03-2000; 04:53:24pm]

EMERG 3 Data backup2
[02-05-2000; 07:07:14pm]

N No Emergency Image

9 Back to previous Menu

Your Choice [1, 2, 3, N, 9]?

Back to previous menu

< 9 > Back to previous Menu
Returns you to the previous menu

7.7.7 Restoring an emergency backup to partition E

If Windows can no longer be booted after a system failure or uncontrolled shutdown of the PCU, partition E: can be restored with the backup image defined in 7.7.6.

a) Based on a local backup image
(see Subsection 7.7.2)

Requirement: One of the passwords for levels 0 to 2.

b) Based on the **emergency** backup image (provided that a local backup image has been defined as the emergency backup image, see Subsection 7.7.6)

Requirement: One of the passwords for levels 0 to 3

Partition E data restoration from the emergency backup image can be started directly from the main menu.

Operator actions

While the PCU is booting (after switching the control off and then on again)

1. **Select the "Service Menu" [hidden menu option] in the boot manager.**

The following menu is displayed:

PLEASE SELECT: 1 Install/Update SINUMERIK System 2 SINUMERIK Tools and Options 3 DOS Shell 4 Start Windows (Service Mode) 5 SINUMERIK System Check 7 Backup/Restore 8 Start PC Link 9 Reboot (Warmboot) E Restore Windows Partition E (Emergency) Your Choice [1, 2, 3, 4, 5, 7, 8, 9, E]?

2. **Select option E.**

The system prompts you for a password with:

passwd:

3. Enter one of the passwords for authorization levels 0-3.

- System
- Manufacturer
- Servicer
- Customer

The warning "The Windows partition E: will be overwritten" is displayed and after a further prompt restoration of partition E: is started.

On completion of the partition E data restore the message "Restore finished" is displayed.

The next time Windows NT is started, partition E: is checked by the test program CHKDSK.

7.8 SINUMERIK desktop (Windows)

The SINUMERIK desktop can be used as the service mode for servicing, in that it can use **Windows functions** to set up the control.

It is used as a platform for network operation (e.g. for installing HMI system software), for setting the processing environment for the HMI system software or for system operations such as SIMATIC STEP7 authorization, hard disk check, version check, etc.

For details, please refer to 3.5 Basic functions of the SINUMERIK desktop.

7.8.1 Network operation

The PCU contains a network connection by default

Windows NT	Windows XP
The network connection is pre-installed in so far as all that is required for TCP/IP communication, after plugging in the Ethernet cable, is to enter the IP address of the PCU or select the use of a DHCP server.	Connect the Ethernet cable for TCP/IP communication. The default setting is DHCP.
To do this, select Start→Settings→Control Panel→Network, Protocols tab, and set the properties to TCP/IP Protocol.	The settings can be adjusted in Start→Settings→Network Connections→Local Area Connection→Properties.
At this stage at the latest, the PCU must be given a unique computer name to identify it in the network. Select Start→Settings→Control Panel→Network, Identification tab to enter an appropriate name.	At this stage at the latest, the PCU must be given a unique computer name to identify it in the network. Select Start→Settings→Control Panel→System, Computer Name tab, Change button to enter an appropriate name.

In addition to the TCP/IP protocol, the NETBEUI protocol is also pre-installed for network operation.

7.8.2 Reinstalling Windows components

Windows NT	Windows XP
Directory I386 from the Windows NT CD is stored on the PCU in D:\Updates\Base\I386 to allow drivers, for example, to be reinstalled.	There is a Windows XP recovery CD with Service Pack 1, with which individual components can be reloaded.
In addition, D:\Updates\Base contains software components that may need to be reinstalled following the installation of third-party applications.	
1. \MDAC21.SP2: Data Access Components V2.1 SP2 (Y2K-compatible)	
2. \SP6a: Windows NT 4.0 Service Pack 6a	See above
3. \DRIVERS\SYSTEM.INI keyboard table (copy to E:\WinNT.40 if required)	3. \DRIVERS\SYSTEM.INI keyboard table (copy to E:\Windows if required).
4. \DRIVERS\E100B: network software	Included in recovery CD.
5. \DDEFIX The installation path to be entered for "Install New Fix" is: D:\Updates\Base\DDEFIX\hotfix.inf	
6. \VBFIX Visual Basic Hot fix	
The 6 system components are installed by D:\Updates\Base\instspa6a.exe.	The components have to be installed individually if required.

7.8.3 Installing SIMATIC STEP7 for SINUMERIK hardware

SIMATIC STEP7 V5.1 can be loaded/transferred to the PCU50 as an add-on.

Windows NT	Windows XP
Item supplied SIMATIC STEP7 V5.1 for PCU50/ 70/MMC103 on CD Order No.: 6FC5252-5AY01-1AG0 Components: SIMATIC STEP 7 V5.1 SP2 and AddOn for SINUMERIK 810D/840D(i) Form in which supplied: , Data volume: approx. 430 MB	Item supplied SIMATIC STEP7 V5.2 for PCU50/ 70 on CD Order No.: 6FC5252-5AY01-2AG0 Components: SIMATIC STEP 7 V5.2 and AddOn for SINUMERIK 810D/840D(i) Form in which supplied: , Data volume: approx. 480 MB
System requirements PCU50/70 with basic software 6.1.9 or higher Recommendation: Mouse connection Installation of this software requires: a network connection or an external CD-ROM drive.	System requirements PCU50/70 with basic software 7.3.2 or higher Recommendation: Mouse connection Installation of this software requires: a network connection or an external CD-ROM drive.

Note (NT)

If STEP7 5.0 is already installed, we recommend that you uninstall it and delete the associated directory Add_on\step7.



Important

The "MPI Drivers" pack on the PCU 50/70/MMC103 is part of the HMI/MMC103 software and must not be uninstalled.

The software comprises three installation packages, STEP7 V5.1 SP3 and an add-on for use with SINUMERIK 810D/840D(i). This add-on is entered in the system under the name "SINUMERIK 810D/840D V2.2".	The software comprises three installation packages, STEP7 V5.2 and an add-on for use with SINUMERIK 810D/840D(i). This add-on is entered in the system under the name "SINUMERIK 810D/840D V2.6".

Operation in Windows NT

This procedure also applies to MMC103 with Windows NT 4.0.
You must follow the installation sequence described here !

1. Start up the PCU50 in the Windows NT desktop (via Service menu option 4, then 1).
2. Create access to the STEP7 CD (via a network or an external CD-ROM drive).
3. Switch to the STEP7_V5.1 directory on the CD and call SETUP.EXE.
The installation is operator-controlled. You will be prompted to enter the ID number (see CD label). For the basic PC software version 6.1.9, the installation directory must be
F:\Add_on\step7;
from version 6.1.10 onwards any directory on F: can be used.

Press "Skip" to acknowledge the prompt for the authorization disk.
On completion of this setup there is **no need to boot** the PCU50.

4. Switch to the Sinumerik_Add_on directory on the CD and call SETUP.EXE.
The installation is operator-controlled.
On completion of this setup you must **boot** the PCU50. Boot to the Windows NT desktop again.
5. Call the desktop icon "STEP7 Authorizing". STEP7 is now authorized and can now be used to start the HMI Advanced software (2nd menu bar in the area menu, protected with access level 3).

The following entries are made automatically in **F:\Add_on\loemframe.ini**:
[s7tgtopx]
; with HMI Advanced: eliminate minimize/maximize buttons
; of the Step7 window
WindowState_Off=196608
; with HMI Advanced: switch to previous task when Step7 is terminated
nSwitchToTaskAfterTermination= -2

6. These entries may also need to be modified in OEM configurations.

Operation in Windows XP

Operation is the same as for Windows NT, except that the software version for STEP7 must be **5.2** or higher.

Note

STEP7 must not be installed in partitions D: or E:.

If the message "WARNING: Application rngofrm didn't post InitComplete" appears the next time the system is booted after installing STEP7 under HMI Advanced, reboot the PCU50.

If STEP7 version 5.1 is installed on the control and subsequently you wish to reinstall version 5.0, after uninstalling version 5.1 and before installing version 5.0 the directory

F:\mmc2\step7\dat

must be deleted completely.

7.9 PCMCIA interface software

The PCU 50/70 HMI components include an interface for PCMCIA components. The procedure for setting up the software interfaces differs for Windows NT and Windows XP.

7.9.1 PCMCIA interface software for Windows NT

CardWare V6.0 for Windows NT, order number 6FC5 264-6BX10-0AG0 (single license), is designed to allow storage devices/peripherals to be used at this interface.

Delivery

The software is supplied on CD together with a readme file (in English).

Preconditions

Windows NT 4.0 with Service Pack 6 is required.

Installation

Establish a connection between the PCU 50/70 and the CD drive as described in "Setting up access to external drives/computers".

Start SETUP.EXE on the CD.

Follow the user prompts in InstallShield.

Usable media

Following installation of the CardWare V6.0 software, the PCMCIA interface is ready to operate (Plug & Play) the following components (tested for PCU 50):

- PCMCIA network card 3Com Megahertz 589E
- PCMCIA card Xiron RealPort Ethernet 10/100 + Modem56 REM56G - 100
- PCMCIA flash card Toshiba TH6SS160402A (40 MB)
- SanDisk 32 MB flash disk PCMCIA/PC CARD ATA
- Callunacard 1040 MB Type III hard disk drive

The manufacturers of the CardWare V6.0 software run a knowledge base on their website, where you can find other PCMCIA components that are supported.

Notes on use

Ensure that before removing a flash card you switch the card to "Slot Power Off".
(See README.TXT)

SINUCOPY is not designed to be used with this software and has not been tested with it.

After starting up Windows NT 4.0, CardWare takes around 30 seconds to become active. This has no effect on PCU 50/70 booting with standard HMI Advanced.

CardWare V6.0 is not designed for Windows 2000.

Restrictions

The current restrictions can be found in PRODIS.

Address of software supplier

APSoft
Sonnenstraße 26b
85622 Feldkirchen, Germany
Internet: www.tssc.de
Phone: +49 (89) 900 479 0
Fax: +49 (89) 900 479 11

7.9.2 PCMCIA interface software for Windows XP

Standard PCMCIA applications are supported directly by Windows XP.

7.10 Directory structure of HMI Advanced

Area applications are located in the "HMI_ADV" directory.
The directory structure (in order of priority) is as follows:

- HMI_ADV
- MMC2
- ADD_ON
- OEM
- USER

The HMI_ADV software includes

- area applications with INI files
- DLLs and
- HMI-specific data.

MMC2 includes:

- servers and COM objects
- master control and
- associated INI and NSK files with MMC.INI from HMI base.

ADD_ON, OEM and USER are used in the same way as before

Design limits for the data management system

Data management limits (DM):

A maximum of 100,000 files can be stored in the following data management directories:

- Workpieces
- Parts programs
- Subprograms
- User cycles
- Standard cycles
- Manufacturer cycles

The number of files in each directory (each *.WPD workpiece directory for workpieces) is limited to 1000 files.

The total of 100,000 does not apply to the other DM directories, however each directory is also limited to a maximum of 1000 files, e.g. a maximum of 1000 archives in the archive directory. Network drives are also limited to a maximum of 1000 files in each directory.

The options that are available depend on the file size and the available memory space. A large number of files slows down the display building for directory displays.



8

8 Diagnostics

8.1 Action log	IM4/8-242
8.1.1 Log file	IM4/8-245
8.1.2 Displaying the log file/setting the action log	IM4/8-245
8.1.3 Outputting the log file.....	IM4/8-246
8.2 Software version display	IM4/8-247

8.1 Action log

The Action log function can be used to log operating sequences.
The following functions are provided

- Logging of alarms
- Logging of key actuations (SINUMERIK ShopMill, ShopTurn, ManualTurn)
- Output of log file via RS 232 C (V.24)
- The action log is password-protected.
- It can be switched on and off via
 - MD 9012 ACTION_LOG_MODE or
 - the "Action log settings" screen form in the Setup operating area.

9012		ACTION_LOG_MODE		
MD number		Action log settings		
Default value: 254		Min. input value: 0		Max. input value: 0xffff
Changes effective after POWER ON		Access level (R/W) 2/2		Unit: -
Data type: DWORD		Applies from version 5.2		
Meaning		This MD can be used to enable/disable the action log and to define a choice of the data to be logged. Bit 0 = 1 Action log ON (default) = 0 Action log OFF Bit 1 = 1 MMC 103: Variable services (write access to geometrical data, e.g. tool compensation) are logged For the meaning of variables refer to the help texts in the Parameters operating area under Variable Views (default) = 0 Variable services are not logged Bit 2 = 1 MMC 103: PI services (e.g. program selection) are logged, for the meaning of variables refer to the help texts in the Parameters operating area under Variable Views (default) = 0 PI services are not logged Bit 3 = 1 MMC 103: Domain services (e.g. load/unload program) are logged (default) = 0 Domain services are not logged Bit4 = 1 Changes to the alarm status are logged (default) = 0 Changes to the alarm status are not logged Bit5 = 1 Key actuations are logged - SINUMERIK ShopMill, ShopTurn, ManualTurn only (default), not in HMI Advanced = 0 Key actuations are not logged Bit6 = 1 Channel status/override is logged (default) = 0 Channel status/override is not logged Bit7 = 1 MMC 103: Softkey actuations and menu changes are logged. For Siemens internal use only (default) = 0 Softkey actuations and menu changes are not logged		

Action log settings screen

In the "Action log settings" screen in the Setup operating area, "MMC -> System settings" menu, you can set

- the actions of the control you want to be logged.
 - Logging on/off
 - Logged data:
 - alarm status change
 - channel status/override
 - data writing
 - file access
 - instructions

- Action log settings:
 - Write interval file (logging frequency in seconds), default - 1
 - File size of log file, default 4 MB
 - Path for log file (enter path)
 - Logged alarms:

The alarms entered here (entered by their alarm number, separated by commas) are a direct trigger for the current action log to be saved to the hard disk.

If the action log is switched on, the files that can be logged are recorded by default. The following events can be logged:

Variable services

All variables that are written via an input field (e.g. write access to geometrical data such as tool compensation and zero offsets) can be logged. A declaration of the variables can be called by means of the Help function in the Parameters operating area under Variable Views.

PI services

All PI services (e.g. program selection, file deletion, tool deletion) can be logged. A declaration of the variables can be called by means of the Help function in the Parameters operating area under Variable Views.

Domain services

All domain services (e.g. load/unload program) can be logged.

Alarm status

All NC/PLC and MMC alarms and messages that are displayed can be logged.

Channel status/override

NC/PLC statuses can be logged using information about the channel status and the position of the override switch. At least some of these statuses, where they can be recorded by time, are used to verify the operation of the MCP.

8.1.1 Log file

The log file is output in English.

File structure

The log file is divided into 4 columns:

- Date
- Time
- NCU name
- Event

Example of a log file:

Date	Time	NCU name	Event specification
01.09.99	06:22:48	local	
=====			
01.09.99	06:22:48	local	ACTIONLOG: HMI Booting (OutputSelect:0x0 CommitLatency:-1 , FileSize:40000)
01.09.99	06:22:48	local	ACTIONLOG: Monitored Variable /Plc/Datablock/Byte[c19,0]
01.09.99	06:22:48	local	ACTIONLOG: Monitored Variable /Channel/ProgramInfo/msg
01.09.99	06:22:48	MachineSwitch	ACTIONLOG: variable " /Channel/ProgramInfo/msg " =
01.09.99	06:24:52	NCU840D	application:RE;state:-992;softkey:-1;etc:0
01.09.99	06:24:52	NCU840D	application:RE;state:-990;softkey:-1;etc:0
01.99.99	06:25:05	NCU840D	application:RE;state:-992;softkey:-1;etc:0
01.09.99	06:37:58	local	ACTIONLOG: HMI Terminates

8.1.2 Displaying the log file/setting the action log

Display log file

The display is password-protected.

The current log file is displayed on the screen of the operator panel front in the Diagnostics operating area in the Service Displays -> Action Log menu in the "Action Log File" screen.

The vertical softkey "Read out via V.24" can be used to output and archive the log file.

Set action log

The action log settings are password-protected.

The "Action log settings" screen can be opened from the MMC -> System settings -> Action log menu In the Setup operating area. Here you can:

- switch logging on and off
- select the data to be logged
 - alarm status change
 - softkey actuation
 - channel status/override
 - data writing
 - file access
 - instructions

The selected setting must be confirmed by pressing the "Save settings" softkey.

8.1.3 Outputting the log file

The log file can be read out from the boot menu.

A boot menu is displayed whenever a crash event exists (PLC bit DB19, byte0, bit6).

The bit is set and reset from the PLC at the user interface (as with key lock, screen darkening, etc.).

The MMC evaluates the rising edge of the signal (i.e. a transition from 0 to 1) and creates the log file when the signal comes. The MMC only reads the data, i.e. the signal must be reset from the PLC/user program.

If the bit is already set when the MMC boots, the MMC does not respond to the value of the bit (until it is reset and set again).

Reading out the file

The procedure for reading out log files is as follows:

Operating sequence

1. Switch on the control and select Setup mode (press "6" when the DOS or Windows screen appears).
2. In the Service menu choose the "A__Actionlog" menu (press "A"). The "A__Actionlog" menu is only available if a log file exists.
3. The current log files (AC_LOGA.TXT and AC_LOGB.TXT) are copied to the part program directory. The message "The action log is filed in the part program directory for output (files AC_LOG?.TXT)" is then displayed.
4. Press any key to return to the main menu.
5. After rebooting the control you can read out the log files (e.g. onto a floppy disk) from the Services operating area in the Data Out -> Via V.24 menu.

Reading out the file after a system crash

If events cause the control to crash, crash files are created from the log files in the data management system. If you are unable to select the Service menu, you should proceed as follows:

Operating sequence

1. Switch on the control.
2. As the system boots you are prompted for crash files from the log file. If one or more crash files exists, the following message appears: "The action log (crash) is filed in the part program directory for output (files AC_LOG?.TXT). Please confirm that you will file out the files immediately after start of MMC(V24, Disk,...)".
The current crash files (AC_LOGP1.TXT to AC_LOGPn.TXT) are copied to the part program directory.
3. After booting the control you can read out the log files (e.g. onto a floppy disk) from the Services operating area in the Data Out -> Via V.24 menu.

8.2 Software version display

Function

The version data of the installed system software are output in the Version display.

Procedure

1. Select the DIAGNOSTICS area
2. Select the "Service displays" softkey
3. Select the "Version" softkey

The NCK software versions are displayed first by default. To view the HMI software versions, press the "MMC" softkey.



Notes

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9 Installing HMI Software on PC

9.1 Installing HMI software on the PC	IM4/9-250
9.2 HMI Advanced on a standalone desktop	IM4/9-251
9.2.2 Configuring the desktop switch application	IM4/9-253

9.1 Installing HMI software on the PC

Precondition

- Target system: PC
- Operating system: Windows NT 4.0 with SP 6
- Software: None
- NC connection: CP5511, CP5611
- "Small fonts" must be selected under "Control Panel/Display, Settings".

Software

- Name: HMI Advanced for PC/PG
- Installation language: German/English
- Distribution medium: CD
- Uninstallable: Yes

Destination path

Any

Software components

- MPI driver V5.0
- NCDDE server
- Alarm server
- Data/archive server
- Language tool
- Startup tool
- Standard HMI system

Operating sequence

1. Insert the CD in the CD drive
2. Start setup.exe
3. Select a language
4. Specify the destination folder
5. Select:
 - Online (with communication to NC)
The system asks whether you wish to install the MPI drivers
 - Local (without communication to NC, with NC simulation)
6. Select technology for programming/simulation
 - Milling
 - Turning
7. The system lists all the entries you have made.
8. On confirmation the copy process starts
9. At the end of the copying process you are prompted to restart the PC.

9.2 HMI Advanced on a standalone desktop

Introduction

Using HMI Advanced software on a standard PC creates restrictions that can lead to problems with the use of other programs. Installing HMI Advanced on a standalone desktop, as described below, resolves these problems.

The following problems are avoided:

- Windows that cannot be moved or minimized
- Special keyboard and keyboard filter functions
- Overcrowded taskbar
- Changes to color scheme
- Focus control in connection with OEM software
- All applications of a standard PC run on one desktop.

Solution

Through the dynamic creation of a standalone desktop for the HMI Advanced software, the above restrictions are avoided on this desktop. In addition, up to three desktops can be defined without these restrictions. Various methods can be used to switch between the HMI Advanced software desktop and the other desktops at any time.

Desktop creation is configurable.

Availability

The solution is only available for standard PCs, not for PCU 50/70. It requires HMI Advanced version 6.4 or higher.

General features

- In addition to a standard desktop that is always present, one or more desktops are created dynamically.
- HMI Advanced software is loaded into a dynamically created, standalone desktop.
- All existing desktops are provided with a user interface that allows switching to another desktop at any time.
- The desktop can be configured with the **HMIDesk.ini** file.

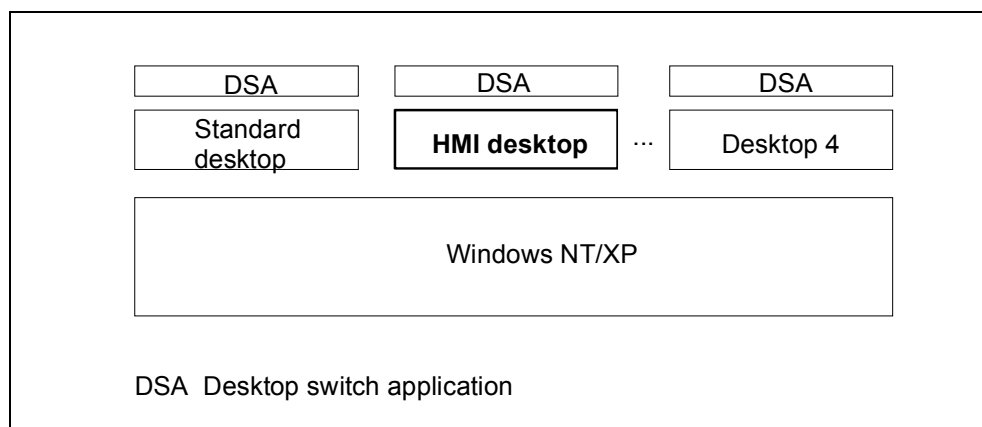


Fig. 9-1 Separate desktops for HMI software and other applications



Important

1. The task manager key combination **CTRL-ALT-DEL** only works in the standard desktop. In dynamic desktops the task manager can only be called directly from the taskbar.
 2. When a dynamic desktop is closed, the application that is started automatically by inclusion in HMIDesk.ini is closed with the desktop. Manually started applications continue to run, however. The applications can no longer be used, however, since they are not displayed in other desktops. If the dynamic desktop is started again later, applications that are still running are visible again and can continue to be used.
 3. All **external applications** (ProTool, Transline) that use the *basic HMI Advanced system* must be started on the HMI desktop if they are to be executed in parallel with HMI Advanced.
Background: The master control subsystems cannot be used beyond desktop limits because Windows restricts **window communications to one desktop**.
 4. **16-bit applications** are always started by Windows NT/XP in the login desktop and so do not work in a dynamic HMI desktop. The desktop switcher can therefore not be used if 16-bit applications are being used in HMI Advanced.
In this case HMI Advanced must be started in the conventional way. This restriction is only relevant to NT systems because XP systems no longer support 16-bit HMI Advanced applications (explicitly disabled by the master control).
-

9.2.1 User interface for the desktop switch application

The user interface for the desktop switch application can be configured.
Options:

- Keyboard hotkeys
- Dialog boxes
- Icons in the taskbar

Hotkeys

Alt-1	Switches to desktop 1 (user's standard desktop)
Alt-2	Switches to desktop 2 (HMI Advanced desktop in standard configuration)
Alt-3	Switches to desktop 3 (optional additional user desktop)
Alt-4	Switches to desktop 4 (optional additional user desktop)

Dialog boxes



When configured accordingly (see below) this dialog box can be displayed on screen in the current desktop. Click the left-hand side to activate the standard desktop (1), click the right-hand side to activate the HMI desktop.

Note

If WindowOnTop = FALSE is configured (see below), the box must be moved to the front first by pressing Alt-Tab if it is covered by the application.

Icons in the taskbar



The configured desktops are displayed on the right of the taskbar. The active desktop is highlighted. To switch desktops, click the desktop number you require.

- 1 Standard desktop
- 2 HMI desktop
- (3, 4) Other desktops optional

Note

Since the taskbar is covered up in the HMI desktop, the user must first make it visible by pressing the left or right Window key in order to be able to actuate the corresponding desktop icons.

9.2.2 Configuring the desktop switch application

The application is configured in the **HMIDesk.ini** file.
The assignment of standard settings to this file can be found in 5.6.23.

Global section

In [Global] the number of desktops required can be set with **NumberOfDesktops** = n. The 2nd to 4th desktops are created dynamically. Permissible values for n are 2, 3, 4. For each dynamic desktop, additional settings must be specified in [Desktopn].

ControlMode =	Icon	; Icons in the taskbar (see Explorer below)
	Window	; Standalone dialog window (see WindowOnTop below)
KeyboardControl =	TRUE	; Switching is possible with Alt-1 , Alt-2 ,... dialog window or taskbar
	FALSE	; Switching is only possible with dialog window or taskbar

Desktop n section

StartupApplication = "Path\Program.exe"

An application is started automatically after creating a desktop. On closing the desktop this application is closed by the desktop switcher. Closing of the desktop is synchronized with the closing of the application. During this synchronization the desktop switcher cannot process any other requests. The synchronization is aborted if the application is still being executed after 15 seconds. In this case the desktop is closed too.

Note

For the HMI desktop (2) the path and associated program name, which point to the current HMI installation, are set automatically.

Explorer =	TRUE	; Desktop is provided with Explorer and a taskbar, in which the icons for the configured desktop appear.
	FALSE	; Desktop is not provided with Explorer or a taskbar ; The desktop can only be selected via Alt-1, Alt-2, ... on the keyboard, or via the dialog window

WindowOnTop =	TRUE	; If ControlMode = Window present, the dialog window for the desktop switch application is always visible.
	FALSE	; Dialog window can be covered

CreateDesktop =	Immediately	; Start desktop immediately
	Delayed	; Start desktop when selected

SetHMIColors =	True	; With SetHMIColors the HMI desktop (desktop 2) uses a separate color scheme, with the advantage that this color scheme does not affect other desktops. This attribute is intended exclusively for use with HMI Advanced, as this uses its own color scheme that in some cases is very different from the Windows standard.

False ; Desktops are displayed with the standard Windows color scheme, even the HMI desktop.

When switching between desktops, the desktop switcher sets the appropriate color scheme automatically.

Desktop 1 is the user's standard desktop, which is set up automatically by the operating system after logging on. For the standard desktop only the desktop-specific property WindowsOnTop = True can be configured.

Activation

Start HMIDesk.exe in the installation directory for HMI Advanced. The configured desktops are created. HMI Advanced is started automatically in desktop 2 as the startup application. (Default entry).

Default behavior when creating a desktop

An active desktop is created with the taskbar. The desktop switcher window is hidden. The desktop switcher is operated by icons in the taskbar.



Notes

10

10 Configure Window Using NC Program

10.1	Setup	IM4/10-258
10.2	Structure of instructions	IM4/10-259
10.3	Example instructions	IM4/10-260
10.4	Example program 1: MMC command without acknowledgment	IM4/10-262
10.5	Example program 2: Display time and optional text variables	IM4/10-263
10.6	Example program 3: MMC command with synchronous acknowledgment mode	IM4/10-265
10.7	Example program 4: Positioning the input and output field	IM4/10-266
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Introduction

With software version 4.4 and higher, you can configure your own dialog windows (dialog screens) and display them on the MMC/HMI Embedded/HMI Advanced. The appearance of the dialog windows is configured purely by text (COM file in the cycles directory). The dialog window is opened and closed by function calls from the parts program.

This does not affect the HMI/MMC system software (user interface).

User-defined dialog windows cannot be called simultaneously in different channels.

The "Configure Windows in the NC Program" function is also referred to as the "command channel".

Application

One possible application of user dialog windows is, for example, to selectively assign current values to particular user variables (GUD) prior to a parts program run.

10.1 Setup

Up to 2 channels:

The "command channel" is activated by default for channels 1 and 2.

- **More than 2 channels:**

For MMC 103/PCU50 the "command channel" must be activated (if the SIEMENS measuring cycles have not yet been installed).

This requires a modification to be made to the file C:\MMC2\COMIC.NSK in the Setup operating area:

- Select the file **c:\mmc2\comic.nsk** in the "Setup" operating area with the "MMC" – "Editor" – "Load" softkeys
- Insert the following text (after channel 1 and 2):
REM CHANNEL
TOPIC(machineswitch) COMIC_START(COMIC001MachineSwitch"...)
[compare the text for channels 1 and 2]

When the control is restarted (off/on), the command channel is activated for the corresponding channel.

10.2 Structure of instructions

Syntax

MMC ("operating area, command, Com file, dialog box name, user data definition file, graphics file, display time or acknowledgment variable, text variables...", "Acknowledgment mode")

Parameters:

Operating area

Name of softkey with which the configured user dialogs can be called. Default entry: CYCLES, displayed as "Cycles" on softkey 14 and accessible via the ETC key.

Command

Picture_on select screen
Picture_off deselect screen

Com file

Name of the dialog box file (max. 8 characters, in the user cycles or standard cycles directory CST.DIR). The dialog screen design is defined here. The dialog screen is used to display user variables and/or comment texts.

Dialog screen name

The individual screens are selected via the dialog screen names.

User data definition file

GUD file accessed on reading/writing of variables.

Graphics file

File name of a BMP graphic to be inserted.

- If the graphics file is stored in the CST.DIR directory, the name of the graphics file must be changed to *.AWB (the control does not accept *.bmp).
- If the graphics file is stored in the "Dialog Programming/Help" directory, the name *.BMP can be retained.

From HMI version 6.2 onwards, *.bmp files are stored in resolution-specific subdirectories:

These are:

For standard cycles:

\\CST.DIR\\HLP.DIR\\640.DIR	For 640 dpi resolution
\\CST.DIR\\HLP.DIR\\800.DIR	For 800 dpi resolution
\\CST.DIR\\HLP.DIR\\1024.DIR	For 1024 dpi resolution

For user cycles:

\CUS.DIR\HLP.DIR\640.DIR
\CUS.DIR\HLP.DIR\800.DIR
\CUS.DIR\HLP.DIR\1024.DIR

For 640 dpi resolution
For 800 dpi resolution
For 1024 dpi resolution

For manufacturer cycles:

\CMA.DIR\HLP.DIR\640.DIR
\CMA.DIR\HLP.DIR\800.DIR
\CMA.DIR\HLP.DIR\1024.DIR

For 640 dpi resolution
For 800 dpi resolution
For 1024 dpi resolution

Display time or acknowledgment variable

Display time	in acknowledgment mode "N"
Acknowledgment variable	in acknowledgment mode "A"

Text variables

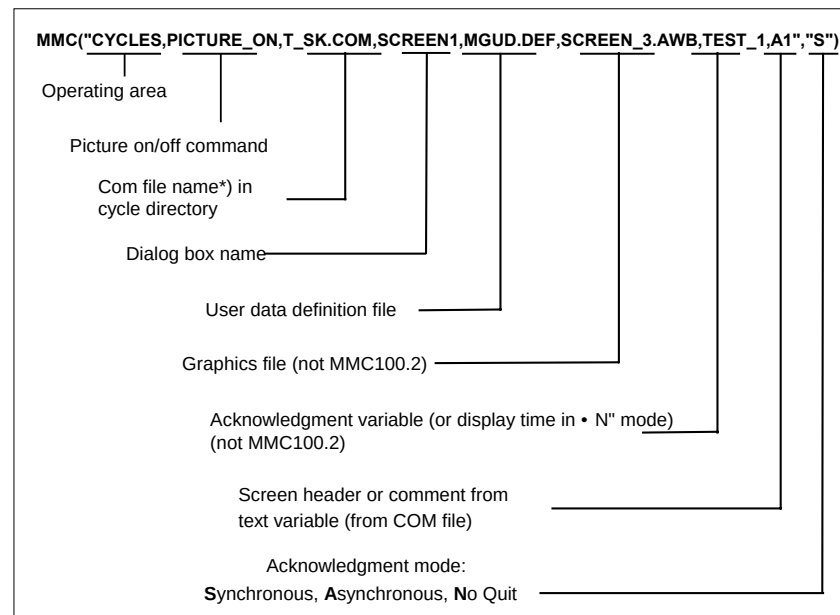
Screen header or comment text from a text variable in the COM file

Acknowledgment mode

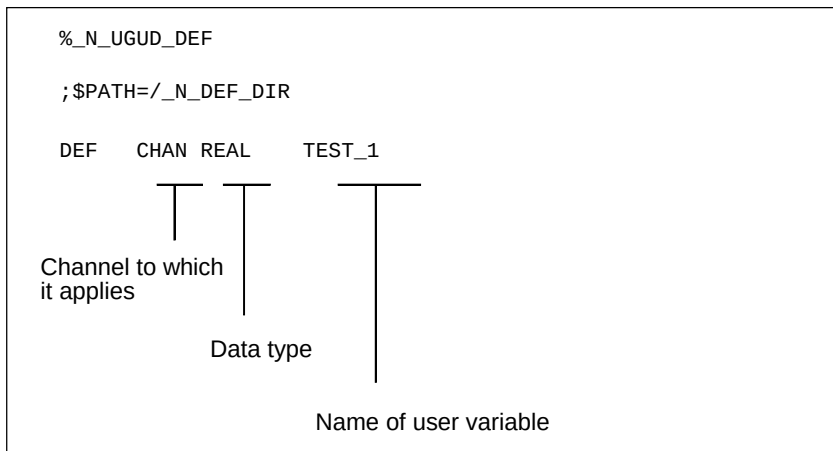
"S" Synchronous, acknowledgment via "OK" softkey

10.3 Example instructions

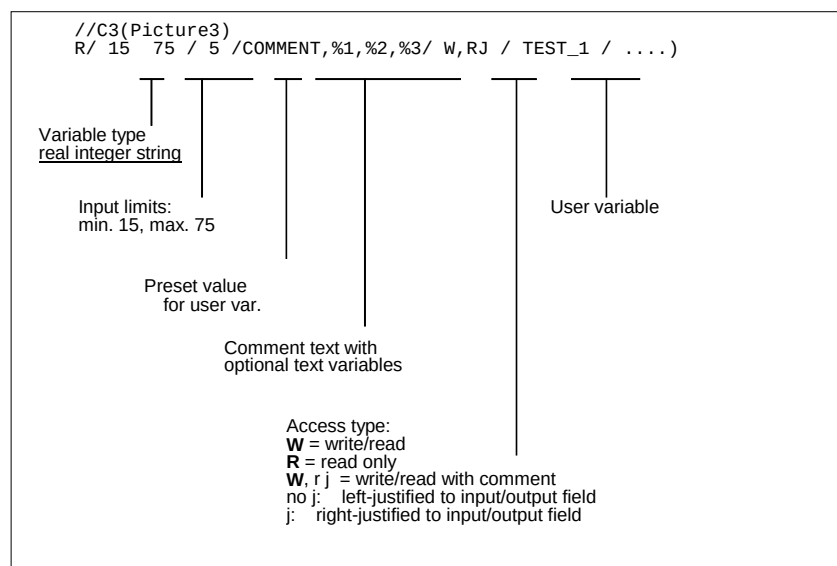
MMC command in the parts program



*) On the MMC103/ PCU50, the filename is T_SK_GR.COM, but here the language identifier "GR" is omitted.

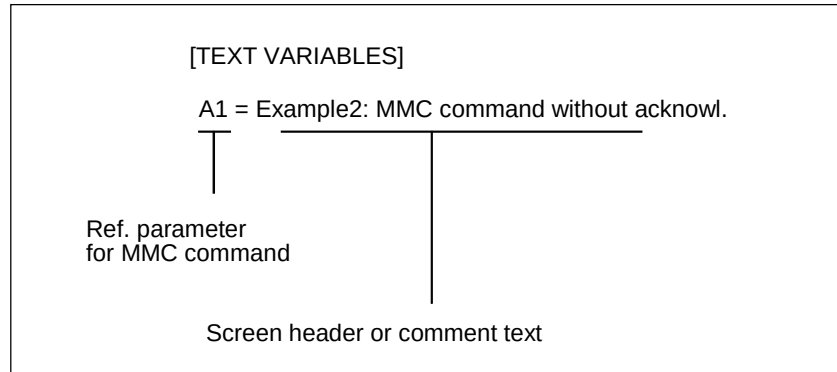
User variables (in the definition directory)**Dialog screen file (in the cycle directory)**

(*.COM)

**Note**

For variable names, text variables and cycle names, capital letters must be used.

Text variables



Softkey assignment for screen calling

Softkey assignment for MMC command with asynchronous acknowledgment mode.

[SCREEN3]

SK1 = END

SK2 = Screen2

Softkeys SK0 to SK15 can be configured

10.4 Example program 1: MMC command without acknowledgment

Parts program

```
N10 MMC("CYC., PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF,,, A1", "N")
N20 TEST_1 = 1
N25 G4 F10
N30 MMC("CYCLES, PICTURE_OFF", "N")
M30
```

Dialog screen file (*.COM)

```
//C1(SCREEN1)
(R///USER VAR TEST_1/W/TEST_1///)
```

Text variable

```
TEXT VARIABLES]
A1 =.....Example1: MMC command without acknowledgment.....
```

Sequence

The user variable TEST_1 from GUD4.DEF with header A1 is displayed for a short time.

The display time comes from parts program block N25.

The screenshot shows a graphical user interface (HMI) screen. At the top, there is a large rectangular area. Below it, a smaller rectangular area contains the text "Example 1: MMC command without acknowl.". Underneath this, there is a larger rectangular area containing the text "USER VAR TEST_1" followed by a numeric input field displaying "1.000000" and a small square checkbox. To the right of the main content area, there is a vertical column of seven small rectangular buttons. At the bottom of the screen, there is a horizontal row of eight small rectangular buttons.

10.5 Example program 2: Display time and optional text variables

Parts program

```
N10 MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN6, GUD4.DEF, , 10,
        T1, G1", "N")
N15 G4 F15
N30 MMC("CYCLES, PICTURE_OFF", "N")
M30
```

Dialog screen file (*.COM)

```
//C6(screen6)
(R///USER VAR TEST_1,%1/W/TEST_1///)
```

Text variable

[TEXT VARIABLES]

T1 = Example2: Display time and optional text variables...
G1 = Optional text variable

The 7th parameter is interpreted as the display time for the mode without acknowledgment (10 seconds).

The contents of the table are then deleted. The screen form remains on the screen until Picture_off is selected.

The 8th parameter (T1) is the text variable for the screen header. If there is no entry, the operating area name (cycles) is displayed.

The parameters 9 to 23 are optional text variables (in this case "G1=optional text variable").

In this COM file, the optional text variables must be loaded with default values in the "[Text variables]" section.

Example 2: Display time and optional text variable

USER VAR TEST_1, optional text variable 1.000000 ☐

Sequence

The comment text from the COM file (USER VAR TEST_1) is expanded in this example at the position of the first wild card (%1) by the contents of the text variable "G1optional text variable". By calling the text variables contained in the MMC command (9th to 23rd parameters), messages or names can be "composed" in this way.

10.6 Example program 3: MMC command with synchronous acknowledgment mode

Parts program

```
N15 MMC("CYC.", PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , , F1", "S")
N18 STOPRE
N20 TEST_1 = 5
N25 MMC(CYCLES, PICTURE_OFF", "N")
M30
```

Dialog screen file (*.COM)

```
//C1(SCREEN1)
(R///USER VAR TEST_1/W/TEST_1///)
```

Text variable

F1 = ...Example3: MMC command with synchronous acknowledgment mode...

Sequence

The user variable Test_1 is displayed until the "OK" softkey is pressed.

The user variable has also been overwritten with the value 5 here.

Without STOPRE, this assignment would be carried out **before** the keyboard input (after it with STOPRE).

10.7 Example program 4: Positioning the input and output field

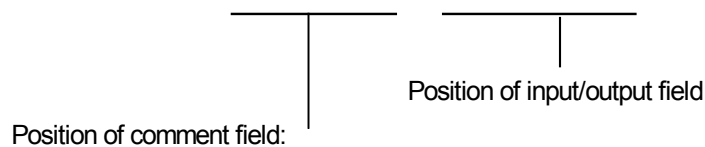
By specifying position parameters in the COM file, you can insert the comment field, or input and output field, at any position within the display area.

```
N15 MMC("CYCLES, PICTURE_ON, T_SK.COM; Screen2,  
      GUD4.DEF, , , C1", "S")  
N20 TEST_3 = 5  
N30 MMC("CYCLES, PICTURE_OFF", "N")  
N40 M30
```

Dialog screen file (*.COM)

```
//C2(Screen12)
```

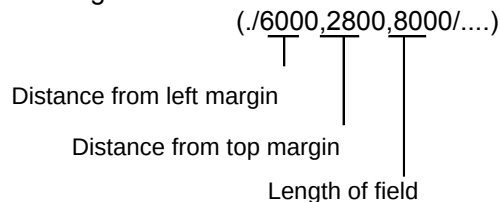
```
(R//Var.Name/R/TEST_3/6000,2800,8000/ 200,3000,7500)
```



First value = 0 → Automatic positioning at default value
No value entered → Default positioning as in PCU20

The two parameters each consist of three numerical values; these specify the position and length of the field. The values are specified in Twips, with 15 Twips roughly corresponding to one pixel.
The field height is defined as being 250 Twips.

Meaning of values:



It is possible to graphically configure 16 comment and 16 input or output fields.
Where there are more than 16 fields, they can be controlled via a scroll bar.

Example 4: Position parameters

USER VAR TEST_2

1.000000

OK

To ensure that the cursor control works seamlessly, the configured fields must overlap one another (see below):

Example 4: Position parameters

1.000000

1.000000

1.000000

1.000000

OK

10.8 Example program 5: Insert images

You also have the option of inserting graphics, e.g. images created with Paintbrush, in the dialog screen by specifying a graphics file.

A comment text for the image can also be preassigned via the Com file. You can position this comment text by specifying position parameters.

Note

You can only move the image itself by repositioning it in the graphics program.

Parts program

```
N10 MMC("CYC.", PICTURE_ON, T_SK.COM, SCREEN8, GUD4.DEF, GRA.AWB, ,  
        M1", "S")  
N20 MMC("CYCLES, PICTURE_OFF", "N")  
N30 M30
```

Dialog screen file (* .COM)

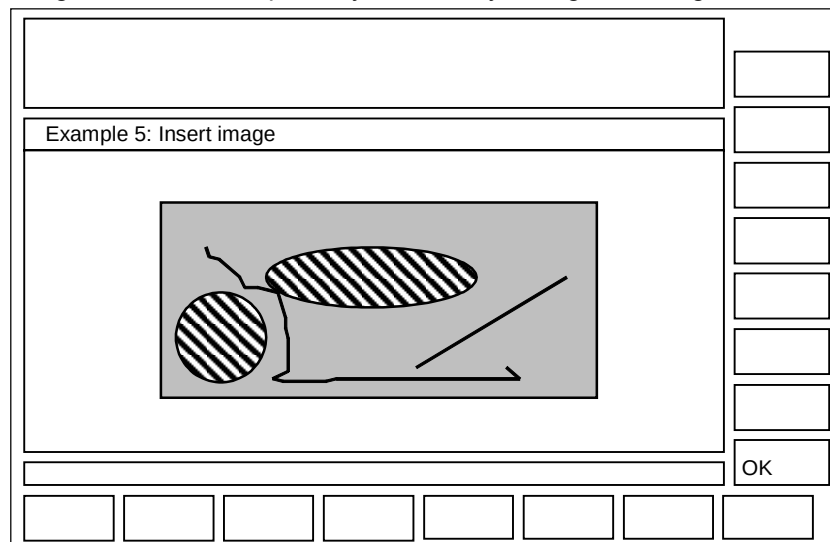
```
//C8(SCREEN8)  
(I/// Insert image no. 2///4000,3000,7500)  
(I/// Created with Paintbrush ///4000,3250,7500)
```

Text variable

M1 = ...Example5: Insert image.....

Images are created, e.g. with the drawing tool "Paintbrush".

Image size: 300X500 pixels, you can only change the image size in Paintbrush.



10.9 Example program 7: OPI variables

It is also possible to display **OPI variables** using the Com file.

Parts program

```
MMC("CYCLES,PICTURE_ON,T_SK.COM,SCREEN7,GUD4.DEF,,TEST_1,J1","S")
```

Dialog screen file

(*.COM)

```
//C7(Screen7)
(R///Test_1/R/Test_1)
(I///); (Interpreted as space line))
(R///Actual value from axis 1/R/$actual value)
(R//1/R parameter 12/W/$R[12])
```

Text variable

```
J1 = ...Example7: OPI variables
[OPiVar]
$Actual value=/Channel/machineaxis/actToolbasePos[u1,1]
$R[12]=/Channel/Parameter/r[u1,12]
```

Example 7: OPI variables

USER VAR TEST_1	1.000000	☐
Actual value from Axis1	20.00000	
R parameter12	1.000000	☐

OK

Sequence

A space line is created under the variable TEST_1.
The actual axis value is read-only.

R12 is preset with 1.

10.10 Example program 8: Asynchronous acknowledgment mode with softkeys

Softkeys can be preprogrammed in the COM file for display in asynchronous mode, linked with the acknowledgment variable and evaluated in the parts program.

Parts program

```
N10   QUIT_1 = "START"
N20   MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN3, GUD4.DEF, ,
        QUIT_1, K1", "A")
N30   LABEL0:
N40   STOPRE
N50   IF MATCH (QUIT_1, "SK1") >= 0 GOTOF LABEL1
N60   IF MATCH (QUIT_1, "SK2") >= 0 GOTOF LABEL2
N70   GOTOB LABEL0
N80   LABEL2:
N90   MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , ,
        N1", "N")
N100  G4F10
N110  LABEL1:
N120  MMC("CYCLES, PICTURE_OFF", "N")
N130  M30
```

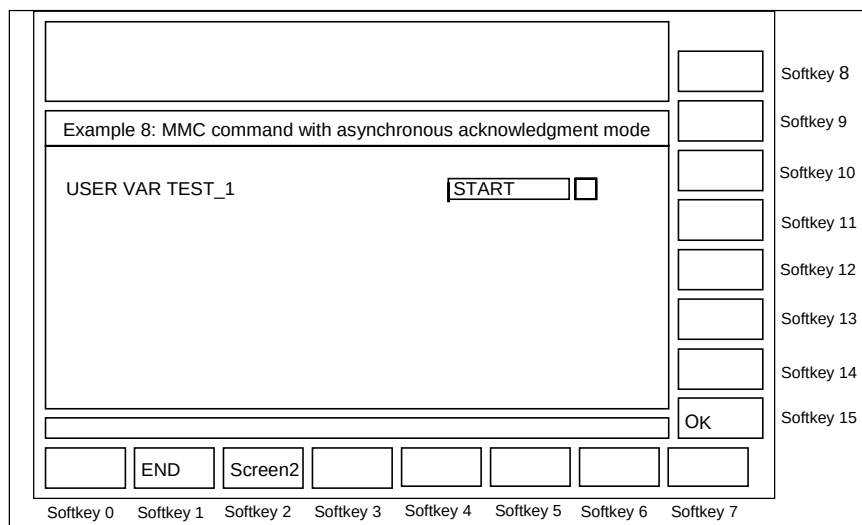
Dialog screen file

(*COM)

```
//C3(Screen3)
(S/// USER VAR QUIT_1/W/QUIT_1/)
[TEXT VARIABLES]
K1 = ..Example8: MMC command with asynchronous acknowledgment mode
N1 = ..Example8: Screen2
```

Text variable

```
[SCREEN3]
SK1 = END
SK2 = Screen2
```



Sequence

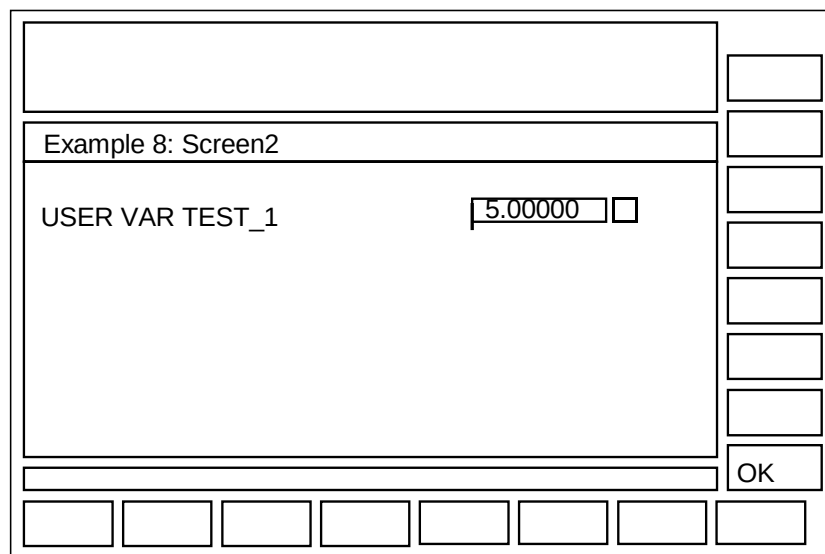
The screen called via the asynchronous MMC command continues to be displayed until one of the two configured softkeys is actuated:

The "END" softkey closes the user dialog immediately.

The "Screen2" softkey then displays another screen for a period of 10 s.

Program

- The acknowledgment variable is defined as a string.
Length of the string: ≥ 20
(Values < 20 are evaluated internally only,
SK0 ... SK15 are entered at position 17...20 on actuation of the softkey).
- The string is assigned a value in the parts program and any old softkey information is deleted.
- Before the parts program can branch as a function of the acknowledgment variable, the block search must be halted by the STOPRE command.
- IF Match (Quit_1, " SK1") ≥ 0 GotoF Label1
searches for a string within the string
If no softkey is actuated, the loop runs again.



10.11 List of files for the dialog screen files

Parts programs

%_N_MMC_EXAMPLE1_MPF

```
N10 MMC("CYC., PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , , A1", "N")
N20 TEST_1 = 1
N25 G4 F10
N30 MMC("CYCLES, PICTURE_OFF", "N")
M30
```

%_N_MMC_EXAMPLE2_MPF

```
N10 MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN6, GUD4.DEF, , , 10,
      T1, G1", "N")
N15 G4 F15
N20 MMC("CYCLES, PICTURE_OFF", "N")
M30
```

%_N_MMC_EXAMPLE3_MPF

```
N15 MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , , F1",
      "S")
N20 TEST_1 = 5
N30 MMC("CYCLES, PICTURE_OFF", "N")
M30
```

%_N_MMC_EXAMPLE4_MPF

```
N15 MMC("CYC., PICTURE_ON, T_SK.COM, SCREEN2, GUD4.DEF, , , C1", "S")
N20 TEST_3 = 5
N30 MMC("CYCLES, PICTURE_OFF", "N")
M30
```

%_N_MMC_EXAMPLE5_MPF

```

N15 MMC("CYCL.", PICTURE_ON, T_SK.COM, SCREEN8, GUD4.DEF, GRA.BMP, ,
      M1", "S")
N30 MMC("CYCLES, PICTURE_OFF", "N")
M30

```

%_N_MMC_EXAMPLE6_MPF

```

N10 MMC("CYC.", PICTURE_ON, T_SK.COM, SCREEN4, GUD4.DEF, , , H1", "S")
N20 TEST_2 = 12
N30 MMC("CYC.", PICTURE_ON, T_SK.COM, SCREEN5, GUD4.DEF, , , I1", "S")
N35 MMC("CYCLES, PICTURE_OFF", "N")
N40 M30

```

%_N_MMC_EXAMPLE7_MPF

```

N15 MMC("CYC.", PICTURE_ON, T_SK.COM, SCREEN7, GUD4.DEF, , , J1", "S")
N20 TEST_1 = 5
N30 MMC("CYCLES, PICTURE_OFF", "N")
M30

```

%_N_MMC_EXAMPLE8_MPF

```

N10   QUIT_1 = "START"
N20   MMC("CYCLES, PICTURE_ON, T_SK.COM, SCREEN3, GUD4.DEF, ,
      QUIT_1, K1", "A")
N30   LABEL0:
N40   STOPRE
N50   IF MATCH (QUIT_1, "SK1") >= 0 GOTOF LABEL1
N60   IF MATCH (QUIT_1, "SK2") >= 0 GOTOF LABEL2
N70   GOTOB LABEL0
N80   LABEL2:
N90   MMC("CYCLES,
PICTURE_ON, T_SK.COM, SCREEN1, GUD4.DEF, , , N1", "N")
N100   G4 F10
N110 LABEL1:
N120 MMC("CYCLES, PICTURE_OFF", "N")
N130 M30

```

Dialog screen files (*.COM)**%_N_T_SK_GR.COM**

```
;$PATH=/_N_CST.DIR
```

```

//C1(SCREEN1)
(R///USER VAR TEST_1/W/TEST_1///)
//C2(SCREEN2)
(R///USER VAR TEST_2/W/TEST_2/6000,2800,8000/200,3000,7500)
//C3(SCREEN3)
(S///USER VAR QUIT_1/W/QUIT_1///)
//C4(SCREEN4)
(R///USER VAR TEST_1/W/TEST_1/4000,250,2000/6000,250,1500/)
(R///USER VAR TEST_2/W/TEST_2/4000,1000,2000/6000,1000,1500/)
(R///USER VAR SINUM_1/W/SINUM_1/0,250,2500/1900,250,2000/)
(R///USER VAR SINUM_3/W/SINUM_3/0,1000,2500/1900,1000,2000/)
//C5(SCREEN5)
(R///USER VAR TEST_2/r,rj/TEST_2///)
//C6(SCREEN6)
(R///USER VAR TEST_1,%1/W/TEST_1///)
//C7(SCREEN7)
(R///USER VAR TEST_1/W,RJ/TEST_1///)

```

```
(I///)  
(R///Actual value from axis1/R/$actual value)  
(R//1/R parameter12/W/$R[12])  
//C8(SCREEN8)  
(I///Insert image no.///4000,3000,7500)  
(I///Created with Paintbrush///4000,3250,7500)
```

Text variable definition

```
[TEXT VARIABLES]  
A1 = Example1: MMC command without acknowledgment  
T1 = Example2: Display time and optional text variables  
C1 = Example4: Position parameters  
G1 = Optional text variable  
F1 = Example3: MMC command with synchronous acknowledgment mode  
H1 = Example6: Cursor assignment  
I1 = Type of access to user variable  
J1 = Example7: OPI VARIABLES  
K1 = Example8: MMC command with asynchronous acknowledgment mode  
M1 = Example5: Insert image  
N1 = Example8: Screen2  
[SCREEN3]  
SK1 = END  
SK2 = Screen2  
SK3  
SK4  
[OPIVar]  
$Actual value=/Channel/machineaxis/actToolbasePos[u1,1]  
$R[12]=/Channel/Parameter
```



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SINUMERIK 840D/840Di/810D

Installation and Start-Up HMI

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1

1 Introduction

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1.1 General

Since the nineties, Microsoft has been working incredibly hard to meet the requirements of global information processing and software development. As well as supporting as many languages as possible, they have also been striving to develop a single operating system to support all languages, unlike the language-specific operating system versions used in the past. As part of this project, many system components and applications have gradually been converted to the cross-language Unicode platform.

Although these conversions will have in many cases gone unnoticed by users, the procedure adopted to the subject addressed in these instructions will vary fundamentally depending on the operating system being used. The procedure recommended for Windows 2000/XP is much simpler than that for Windows 95/NT4. We therefore recommend that you upgrade to the new system. The instructions for the older systems have been included simply for reasons of compatibility and will no longer be subject to editorial revisions.

Using Windows 95 or Windows NT 4

Follow the instructions in this document:

References: /IAM_TX1: Create foreign language texts with Windows 95/NT

Using Windows 2000 or Windows XP

Follow the instructions in this document:

References: /IAM_TX2: Create foreign language texts with Windows 2000/XP

1.2 Preconditions

This document describes the procedure for *creating a text* with the following specifications:

- The text is to be created on a Microsoft Windows operating system (Windows 95 or Windows NT 4).
- The text is to be created in a *language* not identical to the language of the operating system (= default language).
- This description uses *German* as the default language for all examples provided herein. However, the procedure described will work just as well with all localized variants of Microsoft Windows.
- The text is to be created as what is known as a *text file*, i.e. without formatting information such as font, font size, underline, etc. Therefore, in addition to text characters, the text will only contain ASCII control characters such as tab, CR and LF.

- The language of the text requires a different Windows *code page* to that of the default language, i.e. the target language does not belong to the same language family as the default language.
- The text file is to be coded using this code page, not as a Unicode file.
- The target language does not belong to the pictorial languages using a double-byte character set (Japanese, Korean, Chinese) or to the languages using what is known as complex scripting (Arabic, Hebrew, Urdu, etc.). For the pictorial languages, refer to the information provided in Section 4.1 "Problems and remedies".
- The means used to create the text are to be as simple as possible, i.e. if at all possible, no additional software should need to be installed.

Text types for HMI Embedded and HMI Advanced

The following text types can be modified in the individual systems:
Table 1-1

Text types	Systems
Alarm texts Add texts for user interface Application texts for all operating areas incl. softkey texts	HMI Embedded with PCU 20
Alarm texts Add texts for user interface Texts for the Help in the editor Machine data Softkey texts for all operating areas	HMI Advanced with PCU 50/70

1.3 Language families

A language family is a group of languages for which Microsoft operating systems use the same code page. Microsoft uses the term "language group"

Language family	Windows code page	Language
Central European	1250	Albanian, Croat, Polish, Romanian, Serbian (Latin), Slovakian, Slovenian, Czech, Hungarian
Cyrillic	1251	Bulgarian, Macedonian, Russian, Serbian (Cyrillic), Ukrainian, White Russian
Western	1252	German, English, Finnish, French, Indonesian, Icelandic, Italian, Netherlands, Norwegian, Portuguese, Swedish, Spanish
Greek	1253	Greek

Language family	Windows code page	Language
Turkish	1254	Turkish
Baltic	1257	Estonian, Latvian, Lithuanian

Table 1-2 Language families

Operating system and target language from one language family

If the language of the operating system (e.g. German) belongs to the same language family as the target language (e.g. Portuguese), some difficulties may occur when entering certain characters.

Remedy:

- Switch the keyboard or
- Use the ALT+digit combination to enter these characters, or
- Use the Windows "character map"

In this case, no further problems should occur. Section 2.4 and Chapter 3 need not be observed.

Operating system and target language from different language families

If the language of the operating system (e.g. German) does not belong to the same language family as the target language (e.g. Hungarian), difficulties will occur when entering and displaying certain characters.

1.4 Windows tools

Standard scope

This document describes the use of the Windows program "WordPad" and other aids, which are included in the standard scope of the Microsoft Windows operating system, but are not necessarily installed on your particular PC.

The procedure described here requires that you did not exclude certain components from your Windows installation. You should have installed the following components:

- WordPad (required)
- Language pack (required)
- Character map (recommended)

Checking the installation

The components listed above may already be installed on your computer. To check your installation, proceed as follows:

- Open the "Control Panel" (in the "Start" menu under "Settings").
- Open the "Software" entry in the "Control Panel".
- Open the "Windows Setup" tab in the Software dialog box.
- Make sure that the "Language pack" option is checked.

Older versions of Windows 95 only support the Greek, Cyrillic and Central European (or "Eastern European") language families.

Newer versions of Windows 95 (4.00.950b, known as OSR2, OEM Service Release 2) also support Baltic and Turkish.

These components are not listed in Windows NT 4. Windows NT 4 supports most European languages as standard.

- Make sure that the "WordPad" subcomponent is installed under "Accessories". To do so, select "Accessories" and click on "Details".
- Make sure that the "Character Map" subcomponent is installed under "Accessories".

Post-installing components not yet installed

If the components or subcomponents mentioned above are not yet installed, please install them before you continue. To do so, check the appropriate boxes. Keep the system CD-ROM to hand to install the components. You may need the system CD-ROM again later to install the appropriate keyboard.

Windows 98

Windows 98 Version 5.00 includes WordPad. With this version, however, it is not possible to create text files, which do not belong to the same language family as the system language.

Recommended

Use Windows 95 or Windows NT 4.

1.5 Terms

Default user

If you have activated user management in Windows 95, there is a special user without name and password - the default user. Copy the settings of this user to create a new user.

Logging in as the default user

1. To log in as the default user, press the ESC key when the log-in dialog box appears.
 - When logging in, the keyboard settings of the default user are active.
2. If you are using a keyboard layout other than that of the default user, then (Windows 95!) the "Start → Exit → Exit all applications and log in using another name" process will remove the current keyboard layout from the memory without loading the keyboard layout for the default user. The log-in screen form will then no longer function.

To avoid this, proceed as follows:

- Before you log out, either reset the keyboard settings to the original keyboard layout
- Or restart Windows.

If the log-in screen form is already blocked, proceed as follows:

- Press Ctrl-Alt-Del and choose "Shut down".
- Or press ESC (to log in as the default user) and select "Start → Exit → Restart Windows".

Diacritical characters

(diacritical = distinguishing)

In most cases, a relatively small supplementary character is attached to a letter to give the letter a specific stress, a specific pronunciation or even a new meaning.

A list of diacritical characters appears in Section 3.1 "Special characters...". If the combination of basic letters and diacritical characters belongs in a language-specific alphabet, this combination is contained in the appropriate Windows character sets (code page, Unicode) as a separate character.

Use of diacritical characters

A diacritical character is used:

- To designate the combined character (e.g. Ç = G cedilla, Ö = O-tilde)
- For combined input (see Section 3.4) if there is no dedicated key for the required combined character
- For output (only in typographically compound texts): Diacritical characters and basic letters are output separately; any combinations are possible, e.g. with ancient languages and phonetics.

In all other cases, the combined letter is always considered as a compound unit. In some cases, however, the combined letter is incorrectly also treated as the diacritical character.

Input Method Editor (IME)

An aid for entering CJK characters (CJK: Abbreviation for Chinese, Japanese and Korean).

Language property

A property (attribute), which is managed in Microsoft text processing programs as other text properties per character. In such cases, the program will remember the language to which the character, the character sequence, the word or the whole sentence belongs.

Word and WordPad support this property, NotePad does not. In both programs, this property is not directly visible.

Saving the language property

Word documents also save this property, but text files do not.

This property is used (evaluated) for the spell checker (Word) and for the automatic keyboard switchover (see Section 3.7).

It is specified by the default keyboard setting (with text from text files, new files) and by the current keyboard setting (newly entered text).

Changing the language property

In Word, the language property can be changed using the "Tools → Language" menu command. In WordPad, this property cannot be changed.

In WordPad, the language property is independent of the font language family. For example, a Cyrillic character can possess the language property "German". Modifications are only possible in the following cases:

- When the keyboard is automatically switched to another language, WordPad will also switch the font language family to the appropriate language family.

- When changing the "Font language family" text property, WordPad will automatically change to the appropriate keyboard setting if a keyboard setting with the appropriate language property exists. However, this change is undone with the next time a key is pressed.

Managing the language property

The language property is managed internally as a combination of main language and sublanguage, e.g. "French (Canada)".

Microsoft sometimes uses the designation "locale" for the language property, whereby this term also covers properties such as currency, date format, decimal separators, etc.

Language family

A language family is a group of languages, which uses the same code page. This requires the use of the same basic alphabet (e.g. Latin or Cyrillic), but it does not mean that the alphabet of all languages of this group is the same.

Instead of font files stored separately for each code page, Windows NT4 and Windows 95 (with "language pack" installed) use what are known as "Big Fonts", i.e. fonts that contain the character set for several code pages, saving memory capacity for common characters.

The appropriate subset for this total character set is not selected via code page numbers but via the language family. However, there is a 1:1 assignment between Windows code page and language family.

Section 1.2 contains a list of the language families in Table 1-1.

Default language

The term "default language" is used in this guide for the language of the operating system, i.e. German in a German version of Windows and English in an English version of Windows.

Default keyboard setting

One setting is defined as the default keyboard setting under "Control Panel" → Keyboard in the "Language" (Windows 95) or "Input" (Windows NT 4) tab. This setting is selected when the dialog is opened.

The default keyboard setting consists of a language property and a keyboard layout.

This language property of the default keyboard setting need not tally exactly with the default language.

Unicode

A 16-bit character set with which no more code pages are required. Unicode programs cannot interpret characters on a code-page-specific basis, which means that their appearance does not change according to the font language family selected.

Undeletable line feed

At the end of the text file, WordPad displays a last line feed, which can be selected (highlighted), but not deleted.

The font properties of this line feed can be changed, but not the language property. When positioning the cursor at the end of the file, the font properties and the language property of this line feed will be used for the text added at the end of the file.

A new, empty file also contains such an undeletable line feed. To see the undeletable line feed, select the whole empty file, as described in Section 2.2. It will not be saved with the file.



2

2 Editing Files

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2.1 Starting WordPad

Start the "WordPad" program (under Start → Programs → Accessories).
The procedure for editing files will vary depending on whether you want to create a new file or edit an existing file.

2.2 Creating a new file

When "WordPad" starts up, an empty document will appear. "WordPad" can manage multi-language texts. The new file will be treated as belonging to the language set as the default setting on the keyboard. However, this may be ignored initially if the keyboard does not need to be switched (see Chapter 3 "Changing the keyboard layout").

1. Use the mouse to select the whole empty document by clicking on it, e.g. to the left of the cursor.

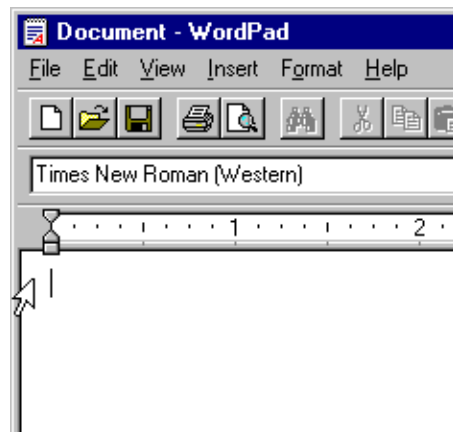


Figure 2-1

→ Click →



Figure 2-2

2. Set the font and language family, as described in Section 2.4.

2.3 Opening an existing file

1. In Word Pad, select "Open" from the "File" menu.
2. From the "Open" dialog box, choose the "Text Documents (*.txt)" setting under "Files of type". Search for the file you want to open and then click on "Open". If your file has a different extension, then select "All Documents (*.*)" from the "Files of type" menu.

The file opens. WordPad can manage multi-language texts. Since the text file does not contain language information, the text is treated as belonging to the language set as the default setting on the keyboard. However, this may be ignored initially if the keyboard does not need to be switched (see Chapter 3 "Changing the keyboard layout").

No text attributes are stored in the text file, meaning that the text will under certain circumstances be displayed using the wrong code page and language-specific special characters will not appear correctly. Therefore, first you must set the font and the language family.

3. To do so, choose the entry "Select All" from the "Edit" menu or press Ctrl-A to select the whole file.
4. Set the font and language family (see Section 2.4).

2.4 Setting the font and language family

- Select an appropriate font, together with the desired language family.
- For improved differentiation between language-specific special characters such as ü, ù, û, ũ, and û or even í, ì, ı and i , it is advisable to select a font with a fixed character width (i.e. not a proportional font) and to choose a reasonable font size such as Courier New 12 or larger:

ü, ù, û, ũ, û, í, ì, ı, i.

You should also select the language family according to the

- list in Section 2.4.



Important

These settings have to be made again every time the file is opened.

You can choose the font in two different ways: Figure 2-3

Font list box

1. In the font list box, the language family is specified in brackets after the font name in the editing line. All fonts that support several fonts appear several times.

If the format bar is not visible, use "View" to activate it.

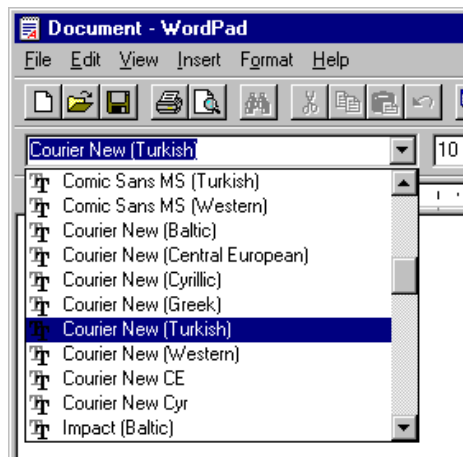


Figure 2-3

Font dialog box

2. Use the font dialog box to select the font type and language family separately.

Choose the "Font" command from the "Format" menu to open the font dialog box.

From the "Font" menu, choose the name of the font, and from "Script", the language family of the font.

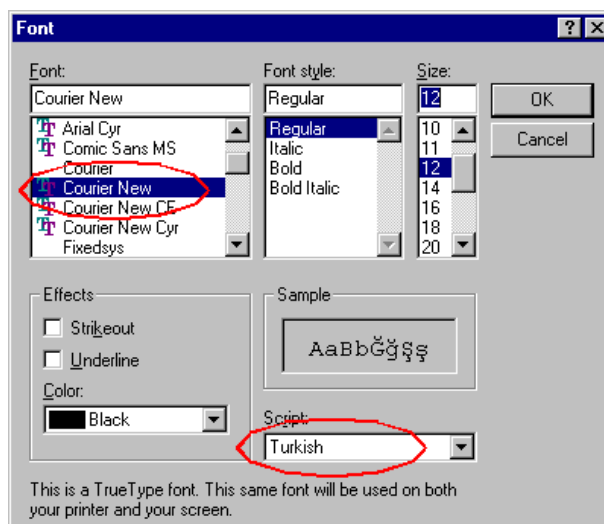


Figure 2-4

These settings will change the appearance, but not the coding, of the existing text.

Example: Character 140 Western: € Cyrillic: ₴

Windows 98

Under Windows 98, the existing text remains unchanged, i.e. the formatting with the desired font language family remains without effect. In WordPad Version 5.0, the characters are saved internally in Unicode so that changing the language family would be the same as changing the code page.

Example: Unicode U+0152: € Unicode U+040A: ₴

Note

It is not possible to use Windows 98 for this purpose.

2.5 Checking settings

1. First check whether the desired font type and the language family are displayed in the format bar.

If a language family other than that selected is displayed, you may have an unsuitable installation:

- The language pack may not be installed. Check whether the Windows "language pack" component is installed, as described in Section 1.3.
- Your Windows system may include a variant of WordPad, which does not permit the language family settings you have chosen for the existing text (WordPad Version 5.00 and higher, e.g. Windows 98). In this case, you should use an older Windows version, e.g. Windows 95 or Windows NT 4.

Special characters belonging to various language families

2. If you have opened an existing file, check visually whether the special characters contained therein are displayed correctly. The sequence is always 2.3 – 2.4 – 2.5.

Since some special characters appear in several language families, you should focus on those characters that do not appear in other languages or language families:

Table 2-1 Special characters

Language family	Characters that only occur here	Characters that also occur in other language families
Baltic languages	éĖġĠıİķĶļĻņNūŪųŮ	ĀāĒēĢċČāĀāĀöÖöŠš ūŮžŽ
Central European	ąĄćĆęĘłŁśŚżŻ (Polish) čČěĚřŘůŮ (Czech) őŐűŰ (Hungarian)	óÓ áÁéÉíÍýÝžŽ áÁéÉíÍóÓöÖúÚüÜ
Turkish	ĞğıİşŞ	çÇöÖüÜ

3. Type a special character to test whether your settings are correct. If you have opened an existing file, no text must be selected (for example press Ctrl-End to go to the end of the file).
Use the input method ALT+numerical keypad to type a special character, which is displayed differently in each language.

Example:

Table 2-2 Example: Special characters

Entry	Language family	Display
ALT+0254	Baltic	Ž
ALT+0254	Greek	Ω
ALT+0254	Cyrillic	Ю
ALT+0254	Central European	Ť
ALT+0254	Turkish	Ş
ALT+0254	Western	Ð

2.6 Saving files

Save the text entered as a *text file*:

1. Choose the "Save As ..." command from the "File" menu in WordPad.

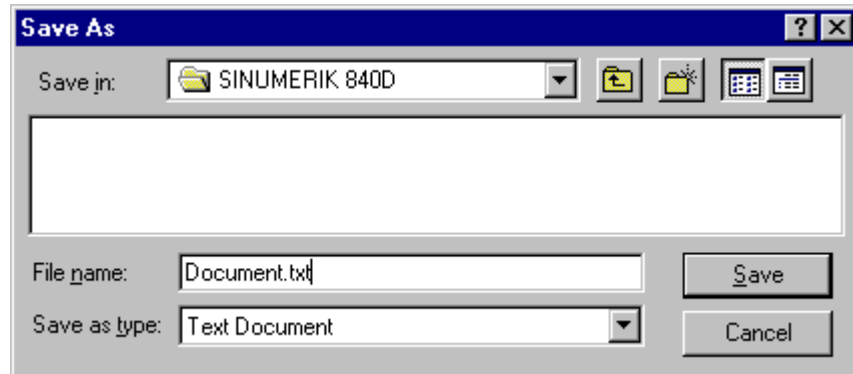


Figure 2-5

2. Choose the "Text Document" setting under "Save as type".
3. Type the complete name with extension (e.g. ".txt") in the "File name" field. WordPad will not generate this extension automatically. If you keep the ".doc" extension, the text file will be saved with this name and interpreted as a Word document.

4. The following message will appear the first time you click on "Save":

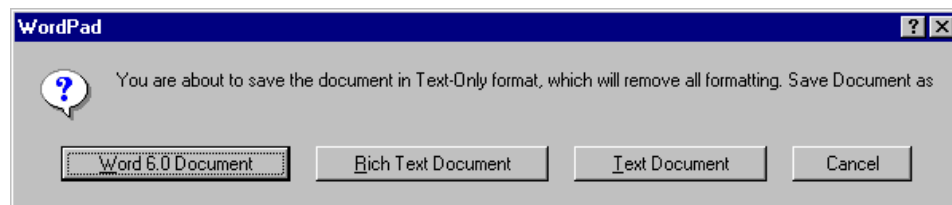


Figure 2-6

5. Click on "Text Document".

Your file will now be saved as a text file. When the document is next opened, font type, language family and language property will be reinitialized, as these properties are not saved.

Retaining the language property

If you are using the variable keyboard layout with the correct language assignment (see Section 3.7), you may first want to maintain the language properties of the text entered in order to continue editing the file later. To do so, select the file type "Word for Windows 6.0" when saving and use the ".doc" extension.

After you have finished your work, save the file as a text document to obtain the final file format.



3

3 Input of Text

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3.1 Special characters belonging to various language families

Latin language family

With the Latin-based language families (Baltic, Central European, Turkish, Western), you can enter most of the characters, namely the basic Latin alphabet, directly with your (e.g. Western) keyboard.

Most of the special characters, such as Å å Ä ä Ç ç É é Ê ê Ì ì Í í Î î Ñ ñ Ö ö Ó ó Ò ò Ù ù, consist of the Latin letters A-Z a-z combined with diacritical characters, such as acute ´, breve ˘, cedilla ¸, circumflex (caret) ^, colon (dieresis) ¨, point º, double-acute ¨, grave accent ` , háček ˇ, macron ¯, ogonek (nasal hook, crooked hook) ˛, squiggle °, slash /, hyphen – or tilde ~.

Other characters of the alphabet are special letters (Ð ð, Æ æ, Æ æ, Æ æ) or ligatures (Æ æ, Æ æ, Æ æ). Language-specific abbreviations and punctuation marks are also used, e.g. for the endings of the ordinal numbers in Spanish (ª and º) as well as upturned exclamation and interrogation marks (¡ and ¿).

The input methods described below apply only for Latin-based language families without limitations.

Greek/Cyrillic language family

The input of texts using Greek or Cyrillic fonts is subject to some special features, which must be observed.
Refer to Section 3.8.

3.2 Numerical input

Press and hold down the ALT key and enter zero followed by the three-digit decimal coding for the desired special character on the numerical keypad. Then release the ALT key.

Example (Turkish):

ALT+0222 results in Ş (S with cedilla).

To produce this character, you will only need the character map of the appropriate code page (see Section 1.2).

You will find overview tables for the code pages e.g. at Microsoft at:

<http://msdn.microsoft.com/library/default.asp?URL=/library/books/devintl/s2570.htm>

3.3 Input via the character map (Windows 95 only)

Windows NT 4 offers the Unicode character map. Here you can use this method only if you also switch the keyboard layout to the target language (see Section 3.7). This method is therefore described here only for Windows 95.

Selecting the character map

In the Start menu, select Programs → Accessories → Character Map to open the character map.

Under "Font", choose the same font as you have selected for the text file. Depending on the version of your Windows 95 operating system, you will see the language families listed as font type variants:

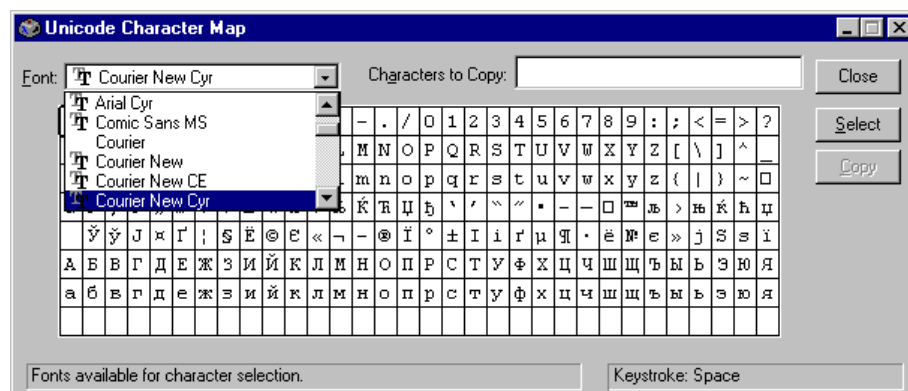


Figure 3-1

Language codes

The following codes are used for the language families:

Baltic	Baltic
Greek	Greek
Cyrillic	Cyr
Central European	CE
Turkish	Tur
Western	None

Precondition

In more recent versions of Windows 95 (4.00.950b, known as OSR2, OEM Service Release 2), all language families mentioned in Section 1.2 will appear here. If you are using the original version of Windows 95 (with or without Service Pack 1), you may not be offered these language versions. In this case, you cannot use this method.

Entering characters

1. Choose the characters you wish to enter.
2. After each character, click on "Select".
3. Once you have selected all characters, click on "Copy".
The characters will be copied to the clipboard.
4. Go back to WordPad and press Ctrl-V.
The characters are pasted from the Clipboard into the text

Note

The characters are always inserted with font size 12.
The font you selected in the "Character Map" program is assigned to the characters as a font setting when they are inserted into WordPad. If this font is not the same as the one you selected previously in WordPad, this will produce a font mix or even a font family mix in WordPad.

3.4 Compound input

With many compound special characters, it is possible to enter first the diacritical character and then the letter. The diacritical character will not appear at first and will then be combined with the letter to form a special character.

Example

For example, press the ´ (acute) and "a" keys one after the other to obtain a copy of the character á (a-acute).

The keys with the diacritical characters, which are thus dealt with in a special way, are marked in the descriptions of the keyboard layouts with a special color.

Keyboard layout

The table below shows some keyboard layouts for the diacritical characters supported:

Table 3-1

Keyboard assignments	Acute	Grave accent	Circumflex	Háček	Breve	Ogonek	Point	Colon	Cedilla	Double-acute	Squiggle	Tilde
	´	`	ˆ	ˇ	˘	˙	•	:	¸	¨	°	~
German	X	X	X									
French		X	X					X				X
Polish	X		X	X	X	X	X	X	X	X	X	

	Acute	Grave accent	Circumflex	Háček	Breve	Ogonek	Point	Colon	Cedilla	Double-acute	Squiggle	Tilde
Spanish	X	X	X					X				X
Czech	X		X	X	X	X	X	X	X	X	X	
Hungarian	X		X	X	X	X		X	X	X	X	
US International	X	X	X					X				X

Obtain a graphical representation of your keyboard layout to learn which key combinations produce the diacritical characters.

Keyboard layout in pictorial format

Images of the keyboard layouts can be obtained from Microsoft via the Internet at the following address:

<http://www.microsoft.com/globaldev/keyboards/keyboards.asp>

If you press the space bar after the diacritical character, you will see the character itself.

Note

It may be advisable to switch the keyboard layout to "US International", which is essentially the same as the American keyboard but also contains 5 diacritical characters and provides many special characters.

3.5 Permanent changes to the keyboard layout (without quick switchover)

You can use the procedure described in this Section to change the keyboard layout for your whole user interface, i.e. also for Windows itself. This is the simplest method of changing the keyboard layout.

Under Windows 95, you can only use this variant. Under Windows NT 4, you can also set up the keyboard so that it can be switched over (see Section 3.6).

Changing the keyboard layout

To change the keyboard layout (description of the dialogs here as in Windows 95), proceed as follows:

1. Keep the installation CD for your operating system to hand.
2. In the Start menu, select Settings → Control Panel.
3. On the "Control Panel", click on "Keyboard".
4. Select the "Language" tab (in NT 4: "Input Locales"). Here you will see the existing "Keyboard Language" (left-hand column; NT 4: "Input locales") and "Key Settings" (right-hand column) assignments.
One entry is defined by default:

Your default language (the language of your operating system) with your default keyboard layout. This entry is selected and specified below as the default entry.

At least one entry exists (the default entry).

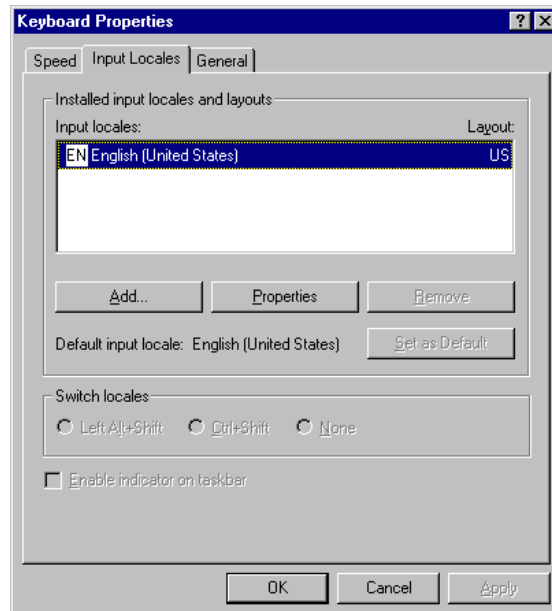


Figure 3-2

5. Make sure that the default entry is selected and click on "Properties". The "Language Properties" dialog box (NT 4: "Input Locale Properties") will appear.
6. Select a suitable keyboard layout for the target language and click on OK.

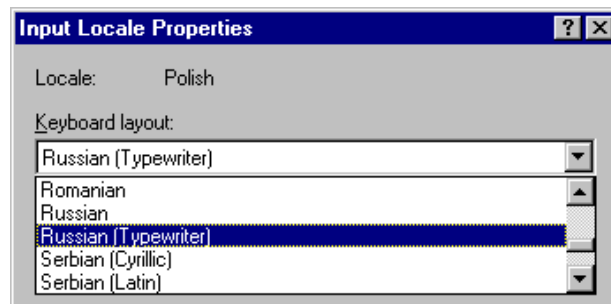


Figure 3-3

7. Click on "OK" to quit the dialog. Some keyboard drivers may now be loaded from the CD, meaning that you will have to restart Windows.

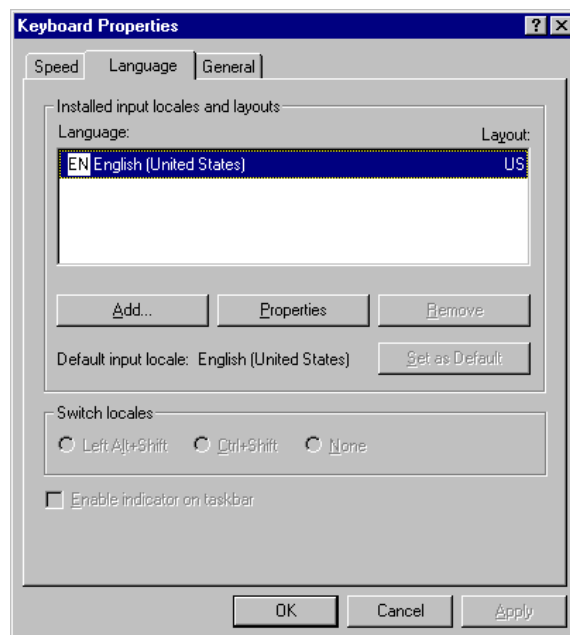


Figure 3-4

Note

Important for Windows 95:

Do not try to set up the target language as such using "Add".
Some additional conditions still need to be met
(see Section 3.6).

Result

You will create text with a keyboard layout suitable for the target language. The text display has already been adapted by setting the font with the language family as described in detail above.

Your default language, e.g. German, will be used unchanged as a text language property managed internally by WordPad (i.e. WordPad will assume that your texts will be created in German). If you were to transfer text to Word using the copy and paste function, the German spell checker would be used.

If you were to set the target language as the keyboard language, although the language property would be correct, you would still have to take some additional issues into account (see Section 3.7).

Note

- All menus will also use the switched keyboard layout. You will no longer find your key combinations with Alt and the appropriate letter key (e.g. Alt-D for the "File" menu) or Ctrl + letter key (e.g. Ctrl-V for "Paste") and could even inadvertently initiate a wrong command. You should therefore use the mouse or, in menus, the arrow keys.
 - Obtain a copy of the keyboard layout in pictorial format. For appropriate Internet addresses, see Section 3.4.
 - In order to work with the keyboard layout to which you are accustomed, i.e. to switch back to your original keyboard layout, you must repeat the procedure described, this time selecting your original keyboard layout.
 - Before you shut down your PC, you must switch back to your original keyboard layout. If your screen saver is password-protected, you may experience difficulties entering the password.
 - If you use a user ID under Windows 95, the function "Exit all applications and log in using another" may only work if you first have switched back to your original keyboard layout.
 - For the Windows log-in, the keyboard layout set for the default user is used. To log in as the default user, press the ESC key when the log-in dialog box appears.
-

Necessity to change the keyboard layout

When is a change in the keyboard layout necessary?

- If you have to enter a lot of text.
- If your translator is accustomed to a certain language-specific keyboard.
- If you are German and only need to make minor changes to existing files, you can use the German keyboard layout, as long as you do not need to enter a large number of special characters which are not available on the German keyboard.

You can enter these characters using the numerical keypad or character map.

Example

In Hungarian, for example, you could enter these characters as follows:

ő Ő ú Ű numerical

ö Ö ü Ű directly

á Á é É í Í ó Ó ú Ű combined input

3.6 Variable changes to the keyboard layout (with quick switchover)

Recommendation for Windows NT4

Recent experience has shown that we can recommend the variable keyboard layout only for Windows NT 4. Under Windows 95, this procedure does not function satisfactorily.

This procedure is only recommended if you have to switch the keyboard frequently.

Changing the keyboard layout (NT4 only):

1. Keep the installation CD for your operating system to hand.
2. In the Start menu, select Settings→Control Panel.
3. In the "Control Panel", click on "Keyboard".
4. Select the "Input Locales" tab.
You will see here at least one assignment for "Input locales" (left-hand column) and "Layout" (right-hand column) already set up.
One entry is defined by default: Your default language (the language of your operating system) and your default keyboard layout. This entry is selected and specified below as the default entry.

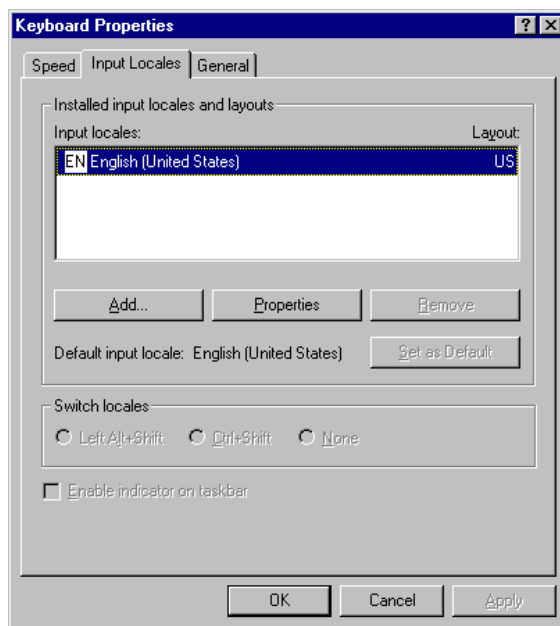


Figure 3-5

5. Click on "Add". The "Add Input Locale" dialog box will appear.

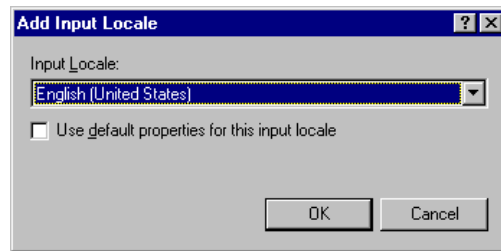


Figure 3-6

6. Select your default language, e.g. German. Do not select the target language for your text!

Note

Windows NT 4 will again offer the languages already set up here although Windows 95 will not.

7. Disable the "Use default properties for this input locale" field.
8. Click on "OK". The "Input Locale Properties" dialog box will appear.
9. Select a suitable keyboard layout for the target language and click on "OK". The layout already selected will not appear again here.

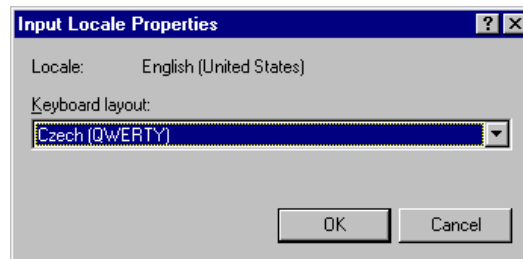


Figure 3-7

10. Use "Switch locales" to select how you wish to switch the keyboard layout. If you select "None", you can only switch using the mouse.
11. Check "Enable indicator on taskbar". This enables the option to switch over quickly using the mouse.
12. Click on "OK" to quit the dialog. Some keyboard drivers may now be loaded from the CD, meaning that you will have to restart Windows.

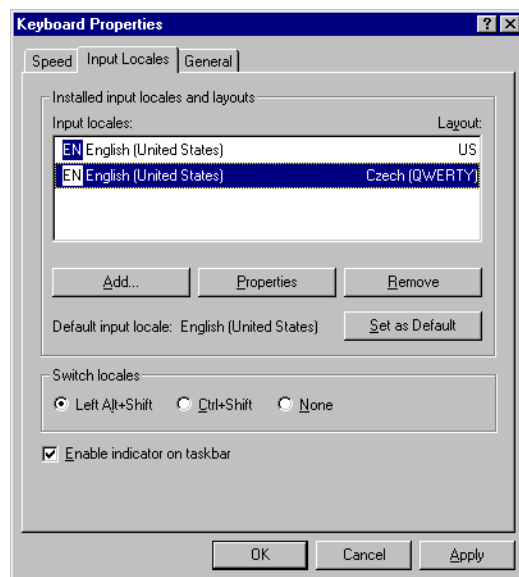


Figure 3-8

Result

You will create text with a keyboard layout suitable for the target language (for the input of your texts in a foreign language) or with your previous default keyboard layout (for the remaining operation). You can switch between the two layouts as required.

The text display has already been adapted by setting the font with the language family as described in detail above.

Your default language, e.g. German, will be used unchanged as a text language property managed internally by WordPad (i.e. WordPad will continue to assume that your texts will be created in German). If you were to transfer text to Word using the copy and paste function, the German spell checker would be used.

If you were to set the target language as the keyboard language, although the language property would be correct, you would still have to take some additional issues into account (see Section 3.7).

Now, a small blue field with a two-letter language abbreviation should appear in the taskbar indicating the language you have set:

If you position the mouse pointer on this field (without clicking on it), the complete setting is displayed (language and keyboard layout).

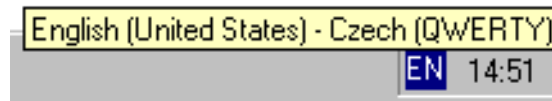


Figure 3-9

If you click with the left mouse button on this field, the languages you have set will be displayed in a small menu.

The current setting is marked by an arrow.

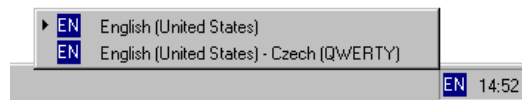


Figure 3-10

If you click with the right mouse button on this field, an abridged version of the "Keyboard Properties" dialog box can be accessed via the "Properties" menu option.



Figure 3-11

Keyboard layout specific to input window

The Windows operating system will memorize the current keyboard layout for each input window.

- The keyboard layout is switched automatically if you switch to another window.
- A new window is always started with the default setting. After starting WordPad, you may have to reselect the keyboard layout.
- Open the window in which you want to enter texts before you select the keyboard settings for this window.

Additional information

- If you unhide a dialog in WordPad, e.g. Format→Font, the keyboard may automatically revert to the default layout.
-

-
- If you do not want to switch back to the second keyboard layout so often, you can also declare the new, second combination with the special keyboard layout as the *default* in the "Keyboard Properties" dialog box:
To do this, select the second entry and click on "Set as default".

Please note that the display text "Standard input locale: German (Germany)" does not change because only the language property, and not the keyboard layout, is displayed. Both settings have the same language property.

You can identify the current default setting as follows:

- Click "OK" to close the dialog.
- Open it again. The setting now selected is the default setting.

Please note that all new windows, the Start menu and the desktop will now also use the new keyboard layout. See also the warning notes with regard to screen savers in the previous section.

Menu operation

All menus will also use the switched keyboard layout. You may no longer find certain key combinations with ALT and the letter key or Ctrl with a letter key or may even inadvertently initiate a wrong command. You should therefore use the mouse or, in menus, the arrow keys.

Keyboard layout in pictorial format

Obtain a copy of the keyboard layout in pictorial format. For the appropriate Internet addresses, see Section 5.1.

Checking the keyboard layout

Compare the keyboard layouts and note a key with two different assignments. If you are not sure, press this key when entering the text to test which layout is active.

Example: If the German keyboard layout is active, pressing key "1" (letter keypad) will produce a "1", and if the Czech keyboard layout is active, a "+".

Switchover

Switching method via keyboard:

"Left Alt + SHIFT" and

"Ctrl + SHIFT"

3.7 Variable keyboard layout with the correct language assignment

The correct language assignment is described here only for the sake of completeness and for improved clarity; in most cases, however, the simpler variant (see Section 3.5/3.6) will suffice.

This section describes the steps to be taken to ensure that the *language property of the keyboard setting* (not to be confused with the keyboard layout itself) matches the target language.

Recommendation for Windows NT4

The variable keyboard layout with the correct language assignment is currently only recommended for Windows NT 4.

First set up the keyboard switchover feature, then start WordPad

Before you enter the text, you must decide whether or not you want to use this keyboard setting method. When starting WordPad, e.g. with the German language property, do not try to switch it subsequently to the Polish or Hungarian language property.

If you have already started WordPad, save the work you have done so far and quit the program. Make out the keyboard settings (see below) and restart WordPad.

3.7.1 Supplementary conditions for the variable keyboard layout

Although you need to enter certain sections of the text with the German keyboard layout and edit these later with the German keyboard layout, other sections of the text need to be created and edited with the keyboard layout of the target language.

Examples

This can be necessary in the following cases:

- With Greek and Cyrillic texts, the Latin letters and other ASCII characters are missing in the appropriate keyboard layouts.
- With some keyboard layouts, e.g. Czech, the digits cannot be accessed on the standard keyboard level.
- The arrangement of the Latin letters deviates substantially from the arrangement to which you are accustomed to (e.g. Turkish-F keyboard layout).
- As a German native speaker, you wish to prepare part of the text and have only a second part created by your translator.

3.7.2 Concept of the keyboard language property

For the keyboard, Windows manages pairs consisting of language ("Input Locale") and keyboard layout.

The *keyboard language* selected determines which *language property* is assigned to the characters entered.

The associated *keyboard layout* determines which key produces which character. Several of these settings can be set up between which it is possible to switch. One setting is defined as the default setting.

The keyboard driver assigns a *language property* to the key characters entered.

This defines that this *piece of text has been created in this language*.

The simpler keyboard switchover variant described in the previous sections leaves this language property of the key characters in the original status, i.e. in the default language of the operating system (German). It is also possible to assign e.g. the property *German* to a Polish "Ł".

Keyboard setting under Windows NT 4

Under Windows NT 4, several *keyboard settings* can possess the same *language property*, although different *keyboard layouts* must be assigned (An example appears in the previous section.) This is not possible under Windows 95.

The procedure normally intended by Microsoft assumes two or more *keyboard settings* with different language properties, each with a *keyboard layout* matching the appropriate language:

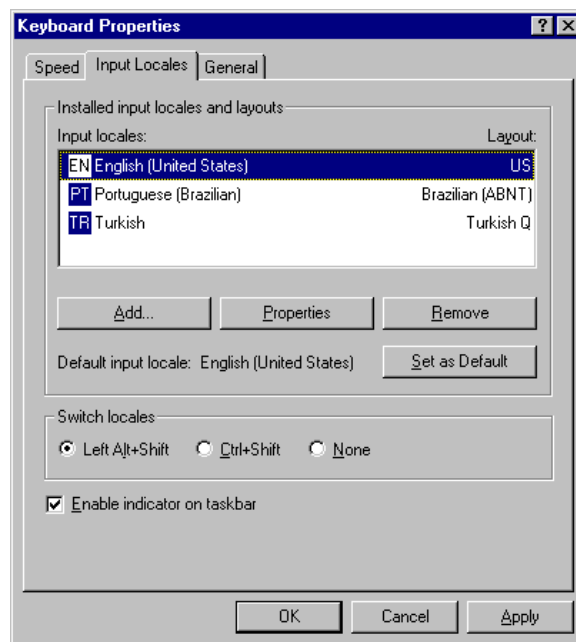


Figure 3-12

3.7.3 Managing the language property in word processing programs

This language property transmitted by the keyboard is evaluated, in particular, by word processing programs such as Word (Word 97 and higher), etc. and - like other text properties - supported separately for each character. Examples of such text properties with which you will be familiar include font name, font size, font style, font language family, underlining and many more. The *language* text property is not so obvious.

In particular, Microsoft Word and Outlook use this property to carry out the spell check for the appropriate language. WordPad also supports this language property, although simple text editors such as NotePad do not.

Changing language properties

Whereas in Word you can change this language property subsequently ("Tools"→"Language" menu), in WordPad, it remains to a large degree hidden and cannot be changed. Even changing the language family when setting the font (see Section: 2.4) will not change this property!

If, in Word, Outlook or WordPad, for example, you position the cursor in the center of a **bold** word, all characters entered subsequently will also be inserted in **bold**.

The language property of the text is treated in the same way: If several different languages are set up, Word, Outlook and even WordPad will switch the keyboard automatically when the cursor moves, so that the keyboard language matches the language property of the cursor position.

However, this property can generate significant confusion if parts of the text are assigned an incorrect language property by mistake. You must therefore exercise caution when using the language switchover feature.

3.7.4 Language property for text files in WordPad

Word and WordPad are designed not only to support the language property of the individual characters but also to save them (in Word format) and make them available the next time the file is opened.

If you edit texts with WordPad (as described in detail above) but save them as a text file, the language property will be lost when saving, as will all the other text properties.

Language property is reinitialized

When reopening the file, WordPad will reinitialize the language property of the whole text:

1. The *entire text* is assigned the language of the default keyboard setting as the language property. This will come into effect if you position the cursor in the existing text.

2. At the end of each file, there is a line feed (or end of paragraph), which can be selected, but not deleted. If you use WordPad to create a new file (see Section 2.2), this file will also contain this undeletable line feed. To view this line feed, select the entire empty document (see Section 2.2). This line feed is also assigned the language of the default keyboard setting as the language property. This will come into effect if you position the cursor at the end of the document.

This produces in the following screen form:

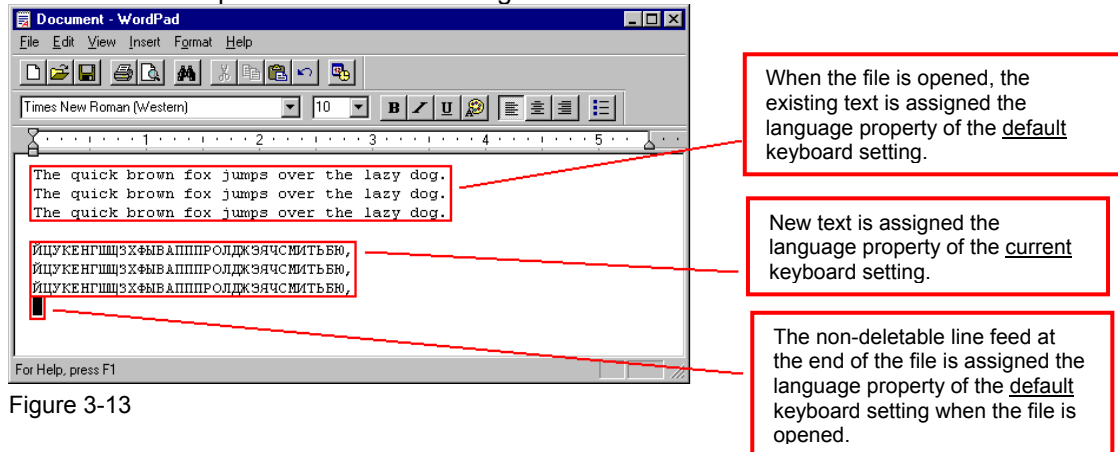


Figure 3-13



Important

Language properties assigned in this way cannot be changed in WordPad.

Example

Carry out the following example to understand the effects:

1. Set up two keyboard settings (Windows NT 4):

Table 3-2

Taskbar	Language	Keyboard assignments
DE	German (Germany)	German (Germany)
CS	Czech	Czech

2. Set (or keep) German as the default setting.
3. Disable the "Auto hide" property in the taskbar property window and enable the "Always on top" property. The taskbar will thus always remain visible and you can check the language setting. (Click with the right mouse button on a free space in the taskbar and then on "Properties" to adjust the taskbar properties.)
4. Open WordPad with an empty file.
5. Format the empty file with "Courier New (Central European)", as described in Chapter 2, by selecting the undeletable line feed, and then the font type. Now watch the taskbar. You will see that the keyboard has automatically been switched to Czech.
6. Once you cancel the selection again or enter a character, the keyboard will revert to German. Formatting with the font and the font language family did not change the language property of the *undeletable line feed*. This line feed has "inherited" the language property German from the default setting of the keyboard.
7. Switch the keyboard, e.g. to Czech, as described in the previous section (either click with the mouse on the icon in the taskbar or use the key combination "Left Alt + SHIFT" or "Ctrl + SHIFT").
8. Enter some Czech text.

On a German keyboard, use the numerical keys 2345 for example to enter the Czech háček characters ěščř. Then press ENTER. The text will now appear as shown below.

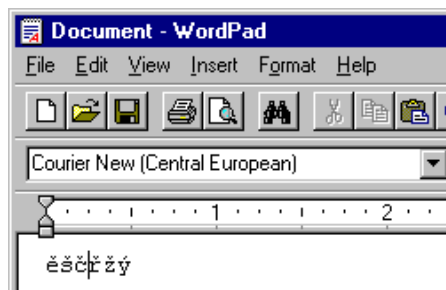


Figure 3-14

9. Press the ArrowUp key ↑ and enter a few more Czech characters in the first line. Press the ArrowDown key ↓ and watch the taskbar. The keyboard has switched to German again. Explanation: Until now, the second line contained only the undeletable last line feed, which still possesses the language property *German*. Even the font has switched to "Courier New (Western)".
10. Position the cursor at the end of the first line. The keyboard will revert, e.g. to Czech, because the first line has been entered with the language property Czech. Press ENTER again and type a few Czech characters. You can now enter Czech text without undue problems.
11. As soon as you position the cursor at the end of the file again, the setting will revert to German!

Example: You want to type the word "Haček". Only at the third letter, the "č", do you realize that the keyboard has been switched to German, because a "4" appears. Delete the "4", switch the keyboard back to Czech and continue typing.

A small section in the center of the text, i.e. the first two letters "Ha" of this word, now have the language property *German*. Whenever you position the cursor there, the keyboard will revert to German.

12. Save this file as a text file (see Section 2.6) and quit WordPad. Then restart WordPad and open this file. The Czech characters will now appear incorrectly.
13. Format the whole text with "Courier New (Central European)", as described in Section 2.3. The Czech characters will appear correctly again. The keyboard is switched to Czech.
14. Position the cursor at any point in the text (the keyboard will switch to German), switch the keyboard explicitly to Czech and enter the Czech text.
15. However, as soon as you position the cursor at another point in the previous text (with the mouse or arrow keys), the keyboard will revert to German. Result: Although the Czech characters are displayed correctly, the old text possesses the language property German.
16. Worse still, whenever the keyboard switches to German due to the position of the cursor, the font "Courier New (Western)" will appear in the format bar even though the characters to the left and right of the cursor have been formatted with "Courier New (Central European)". Only when the cursor moves again (e.g. RightArrow key →) will the correct font reappear.

Result

A mixture of smaller sections with different language properties and font type family properties may be produced.

Remedy in NT4

In Windows 95 only possible subject to restrictions (see Subsection 3.7.6)

1. Set up two keyboard settings - one with German and one with your target language:

Table 3-3

Taskbar	Language	Keyboard assignments
DE	German (Germany)	German (Germany)
CS	Czech	Czech

2. Leave the "Keyboard Properties" dialog box open for now.
3. Select the line that contains your target language (e.g. Czech) and click on "Set as default". Then click "OK" to quit the dialog box.
4. Disable the "Auto hide" property in the taskbar property window and enable the "Always on top" property. The taskbar will thus always remain visible and you can check the language setting. (Click with the right mouse button on a free space in the taskbar and then on "Properties" to adjust the taskbar properties.)

If you start WordPad, the undeletable line feed at the end of the file will be assigned the language property Czech (or of your target language).

If you open an existing text file with WordPad, the existing text will also be assigned the language property of your target language.

If you do not switch the keyboard explicitly to German, the keyboard setting will remain unchanged in your foreign language.

3.7.5 Text with several language properties

Table with two language properties

To create a multi-column text in which, e.g. the first column possesses the German language property and the second column, e.g. Russian, proceed as follows:

- Switch to the German keyboard and enter the first column of the first line. Then switch to the Russian keyboard and enter the second column:
- [Text 103][Mode 28] "йцукенгшщзхъфывапролджэячсмить"
- Select the whole line, copy it to the clipboard by using Ctrl-C and paste it several times by pressing Ctrl-V. You will obtain two columns; the left one is German, and the right one Russian, and this is not only the font language family, but also the language property so that the keyboard is switched automatically when the two text columns are edited:

Table 3-4

[Text 103][Mode 28]	"йцукентгшщзхъфывапроджэячсмить "
[Text 103][Mode 28]	"йцукентгшщзхъфывапроджэячсмить "
[Text 103][Mode 28]	"йцукентгшщзхъфывапроджэячсмить "
[Text 103][Mode 28]	"йцукентгшщзхъфывапроджэячсмить "
[Text 103][Mode 28]	"йцукентгшщзхъфывапроджэячсмить "
[Text 103][Mode 28]	"йцукентгшщзхъфывапроджэячсмить "

German

Russian

Saving language properties

If you want to save the file, keeping the language property, then continue editing it subsequently with its language properties, save the file in WordPad first in the "Word for Windows 6.0" format.

Only after complete editing, select "Save As ..." and then "Text file" as the file type.

Note

Make sure that you do not inadvertently use characters, which are not contained in the code page of your target language, e.g. the superscript digits ^{1 2 3} and the fractions $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ are not contained in code pages 1250 (Central European) and 1251 (Cyrillic)!

If the whole text is formatted with the same font language family, you are still in compliance with the code page.

3.7.6 Restrictions in Windows 95

Set up the keyboard layout of your target language and set this language as the default setting, as described above. If you click on "Accept" or "OK", the following message may appear with some languages:



Figure 3-15

The acceptance as the default language may not take effect. Restart Windows. The new default setting will then be effective.

If you have the original version of Windows 95 or the original version with Service Pack 1, then the definition of the target language as the default keyboard setting may only take effect on the undeletable line feed at the end of the file and not on the language property of existing text when opening a text file.

This restriction does not apply to version Windows 95 OSR2 ("OEM Service Release 2").

3.8 Special considerations when working with Greek and Cyrillic texts

Note

If you are creating texts in Greek or Cyrillic fonts for the first time, you **MUST** read this section!

In terms of language, the Greek and Cyrillic alphabets are considered as separate and independent alphabets, and not as an extension of the Latin alphabet.

This means that Greek and Cyrillic letters, which in their appearance are identical to Latin letters, are not the same characters and may therefore also not be coded identically.

This is also evidenced to some extent by the fact that despite uppercase letters looking identical, the corresponding lowercase letters look different.

Table 3-5 Examples

Font	Characters	Meaning
Latin	P, p	Latin letter P
Greek	P, ρ	Greek letter RHO
Cyrillic	P, p	Cyrillic letter ER
Latin	H, h	Latin letter H
Greek	H, η	Greek letter ETA
Cyrillic	H, h	Cyrillic letter EN

Example

The effects of incorrect coding can be fatal:
Suppose you write the Russian word for "NO" ("НЕТ") using Latin letters instead of "HET" using Cyrillic letters. Initially, you will not notice a difference. However, if you use the "Ignore uppercase/lowercase letters" search option when searching for "HET" in lowercase letters, you will not find the incorrectly coded spelling.

Keyboard layout for Greek/Cyrillic font

For this reason, the keyboard layouts for the Greek and Cyrillic fonts have been designed so that the Latin letters are not available at all, not even via AltGr key combinations. These keyboard layouts normally only have two levels (standard and SHIFT).

Keyboard layout for the Russian font

In the Russian keyboard layout, some ASCII special characters, such as # \$ [] { } ' ` | ~ &, are also missing.

With these languages, you will therefore not normally be able to manage without the variable change of the keyboard layout with the possibility of switching over, as described in Sections 3.6 and 3.7.



Important

Switch the keyboard to Latin only if absolutely necessary! When doing so, do not switch over for individual letters, only for complete words and sentences. Under no circumstances may words with different coding be used!

Note

Find out whether and to what extent certain German, English or international abbreviations (e.g. DIN/ISO) may or must be written using Latin fonts or whether a conversion (ДИН/ИСО) should be preferred according to the conventions of the country in question.

The key assignment for combinations such as Ctrl-C, Ctrl-V, Ctrl-Z, Alt-A etc. normally depends on the U.S. American keyboard layout.



4

4 Problems and Remedies

4.1 Problems and remedies	TX1/4-46

4.1 Problems and remedies

Keyboard layout switches unintentionally

Problem:

You have set your keyboard to the target language and have already entered some texts. However, when you want to change something at another point in the text, the German **keyboard layout** appears to be **active** again.

Remedy:

You have set up at least two keyboard settings with different language properties. In Windows 95, set up only one keyboard setting (see Section 3.5) or, in Windows NT 4, use the same language property for all keyboard settings. Then save your file and restart WordPad.

Version of Windows 95

Problem:

Identifying the version of **Windows 95**

Remedy:

Open Settings→Control Panel→System. You will find the system version on the "General" page. The following version numbers are displayed here:

4.00.950 Windows 95, original version

4.00.950a Windows 95, original version, with "Service Pack 1 for Windows 95"

4.00.950b Windows 95, OEM Service Release 2

The latter version is only available as a full version, not as an update.

Microsoft Word 6.0 or Word 97

Problem:

Using **Microsoft Word** instead of **WordPad**

Remedy:

When creating texts in Word, observe the following:

- If you already have an existing text file and you want to use Word 6.0, open the file in Word 6.0 and format the text as described in Section 2.3.
- If you already have an existing text file and you want to use Word 97, then open and format the file in WordPad, as described in Section 2.3, then save the file as a "Word for Windows 6.0" file. Open this file in Word 97.
- Enter your text in Word, as described. The information about different input methods in Chapter 3 also applies here.
- Save your text as a Word document (*.doc). When doing so, the text properties, such as font type and language property, will not be lost.
- When reopening the file, you need not set the font again.
- Disable the automatic conversion of straight quotes (") to smart quotes (") along with any other automatic formatting settings, to avoid incorrect special characters.

- If required, you can change the language property of parts of the text using "Tools"→"Change Language".
- Not all Word versions switch the keyboard based on the language property. In such cases, you can ignore the language property.
- In Word 6.0, you will be offered the font family with language family, as described in Section 3.2.
- In Word 97, you cannot set the font language family! A character displayed incorrectly is coded incorrectly. Enter the character again or check the steps you have completed so far.

Finally, convert your file to a text file, as described in below. If you will need to edit the text later again in Word, create a copy of your Word document.

Converting a Microsoft Word document into a text file

Problem:

Converting a **Microsoft Word document** into a **text file**.

Remedy:

You have created a Word document in your target language and now want to convert it into a text file.

If you are using Word 6.0, you can use either Word or WordPad to open the Word file and save it as a text file.

- If you are using Word 97 or a later version, first save the file in Word as a "Word 6.0/95" document then carry out the conversion with WordPad.
- Alternatively, you can also use "Copy" and "Paste" to accept the text into WordPad. Word97 files internally use Unicode.

You should always finish by checking the result (open and format the text file with WordPad as described in Section 2.3). When doing so, take into account the special characters and compare with the Word document. If individual special characters do not appear correctly, you may have used characters that do not appear in the code page of the target language.

Hungarian keyboard layout

Problem:

In the Hungarian keyboard layout, the key combination AltGr+8 is marked in color as a diacritical character. However, a dot will appear in the middle (character 183 "Middle dot").

Remedy:

This is obviously an error in the documentation or in the keyboard driver. In the Polish or Czech keyboard layout, this key combination will correctly produce the diacritical character "Dot above letter", e.g. for é and ž.

WordPad 5.0

Problem:

WordPad 5.0 does not work.

Remedy:

Like Word 97, WordPad 5.0 uses Unicode. Here you cannot use the font language property to set the code page with which the characters are to be displayed, since the code pages are no longer used.

A code page character can be interpreted with different code pages and thus also be displayed differently. A Unicode character has exactly one defined interpretation, which cannot be changed.

Windows 98 or Windows Millennium Edition

Problem:

Functionality of the procedure described for **Windows 98** or **Windows Millennium Edition**

Remedy:

Windows 98 and higher features WordPad 5.0, which cannot be used as described. If necessary, check the version of WordPad by searching for the Wordpad.exe in the Explorer and unhiding the "Properties" dialog box.

WordPad will be located in one of the following directories:

C:\Program Files\Accessories\Wordpad.exe or

C:\Program Files\Windows NT\Accessories\Wordpad.exe

No Central European or Cyrillic language family

Problem:

No font types with "Central European", etc. are appearing in the font list in WordPad.

Remedy:

Check whether the **language pack is installed**, as described in Chapter 1.

No Baltic or Turkish fonts

Problem:

Font types with "Central European", "Cyrillic" and "Greek" are appearing in the font list in WordPad, but not "**Baltic**" and "**Turkish**".

Remedy:

Your version of Windows 95 is probably too old. Use Windows 95 OSR2 (OEM Service Release 2).

Language family list box grayed out

Problem:

The "Font" list box for selecting the language family in the Font dialog box is **grayed out** so that **no language family can be selected**.

Remedy:

You have selected a section of text to which different language family properties are still assigned. Use the font list box in the format bar. You may have to unhide the format bar first. Use the menu command "View→Format Bar" to hide or unhide the format bar.

Log-in no longer possible

Problem:

If you are using the function "Start→Exit→Exit all applications and log-in using another name" under Windows 95, you can **no longer log in**.

Remedy:

If you are using a keyboard layout other than that of the default user, then (Windows 95!) the "Start → Exit→ Exit all applications and log in using another name" process will remove the current keyboard layout from the memory without loading the keyboard layout for the default user. The log-in screen form will then no longer function.

To avoid this, proceed as follows:

Before you log out, either reset the keyboard settings to the original keyboard layout or restart Windows.

If the log-in screen form is already blocked, proceed as follows:

Press Ctrl-Alt-Del and choose "Shut down"

or press ESC (to log in as the default user) and then choose "Start→Exit→Restart Windows".

Creating text files in Chinese, Japanese or Korean

Problem:

Creating text files in **Chinese, Japanese or Korean**

Remedy:

To enter these languages, in particular, an Input Method Editor (IME) is required. This is a tool for composing the ideographs, which are contained in the language-specific variants of Windows, on a European keyboard.

You will therefore need:

A translator who is a native speaker of your target language

A Windows operating system in the target language

In addition, observe the following:

Please distinguish carefully between Chinese (Simplified) and Chinese (Traditional). The former is used in the PR of China, whereas the latter is used in Taiwan. These two variants are coded differently and therefore have to be treated differently. You should therefore also make sure that this is clearly specified in your translation order.

Make sure that your texts are created as a text file. It is also common to use the following terms for the codes used:

Language	Code page	Designation
Chinese (Simplified)	936	GB2312
Chinese (Traditional)	950	Big 5
Japanese	932	Shift-JIS
Korean	949	Hangul, Wansung, KSC 5601

Converting CJK text files in Word format into a text file

Problem:

You have already received texts in Chinese, Japanese or Korean from your translator. Unfortunately, these texts are stored in Word format. You want to **create a text file** from them.

Remedy:

You will need the language pack for the appropriate language for your operating system.

Microsoft only allows you to download this type of language pack in conjunction with an Input Method Editor (IME). Appropriate notes and download options can be found, e.g. at:

<http://www.microsoft.com/windows/ie/features/ime.asp>

Please note that the IME is offered for each language both with and without the language pack. You will need, in particular, the language pack.

IME can only be used directly (i.e. direct input of Asian characters) on European Windows systems with the Microsoft software of the latest generation, e.g. in input fields of the Internet Explorer 5, as well as with Word 2000. The IME is therefore offered primarily for the Internet Explorer.

Once you have installed the appropriate language pack, you should be able to display the Word file correctly.

Format the text using a suitable font. The following fonts are contained in each language pack:

Language	Font
Chinese (Simplified)	MS Hei or MS Song
Chinese (Traditional)	MingLiU
Japanese	MS Mincho or MS Gothic
Korean	Gulim

Please note that on an Asian Windows operating system, the names of these font types may also be written in this font so that illegible characters may initially appear in the font list box.

Once you have assigned the right font type to the whole text, the characters should be displayed correctly. If necessary, request a fax copy of the text for comparison. First save this version of the Word file once more with another name.

Now you can convert the text to a text file, as described in this section under "Converting a Microsoft Word document into a text file". If the original text was created using Word 97 or a later version, an intermediate step is required via the "Word 6.0" format, as described above.



5

5 References

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5.1 References for text creation

For more information about text creation, please refer to:

Publication: *Developing International Software, Second Edition*
Microsoft Press, October 2002, ISBN 0-7356-1583-7

<http://www.microsoft.com/MSPress/books/authors/auth5717.asp>

Online version:

http://www.microsoft.com/globaldev/getwr/dis_v2/default.msp

1st edition (*Developing International Software for Windows 95 and Windows NT*)

Overview tables of the Microsoft code pages

<http://www.microsoft.com/globaldev/reference/WinCP.msp>

Pictures of Microsoft keyboard layouts can be found at the following address:

<http://www.microsoft.com/globaldev/reference/keyboards.aspx>

Print-friendly version:

http://www.microsoft.com/globaldev/dis_v1/disv1.asp?DID=dis45d&File=S25B8.asp

Microsoft Global Software Development

Detailed descriptions of various aspects of international software

<http://www.microsoft.com/globaldev>

Unicode

Tables, definitions, standards and tools

<http://www.unicode.org>



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SINUMERIK 840D/840Di/810D

Installation and Start-Up HMI

Creating Foreign Language Texts with Windows 2000 / XP (TX2)

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1

1 Introduction

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1.3 Language families.....	TX2/1-5
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1.1 General

Since the 1990s, Microsoft have put considerable effort into satisfying global demands for information processing and software development.

In addition to supporting as many languages as possible, one of the aims was to be able to support all languages with the same uniform operating system, as opposed to the language-specific versions of operating systems which were used before.

As part of these efforts, many of the system components and applications were gradually converted to the cross-language platform Unicode.

Although in many cases the user would have been completely unaware of this conversion process, in terms of the subjects discussed in this guide fundamentally different procedures need to be adopted depending on which version of the operating system is used.

The procedure recommended for Windows 2000/XP is much simpler than the one recommended for Windows 95/NT4. Therefore it makes sense to change over to the new systems. The guide for older systems is only included for reasons of compatibility and will no longer be maintained or kept up to date.

Using Windows 95 or Windows NT 4

Follow these instructions:

References: //IAM_TX1: Creating foreign language texts with Windows 95/NT

Using Windows 2000 or Windows XP

Follow these instructions:

References: //IAM_TX2: Creating foreign language texts with Windows 2000/XP

1.2 Preconditions

This document describes the procedure for creating a text with the following preconditions:

- The text is to be created on a Microsoft Windows operating system (Windows 2000 or Windows XP).
- The text is to be created in a language not identical to the language of the operating system (= default language).
- The present description uses German as the default language for all examples provided herein. However, the described procedure will work just as well with a different language as the default Windows language.
- The text is to be created as a so-called text file, i.e. without formatting such as font types, font sizes, underscores etc. This means that, apart from the text characters, the file will only contain ASCII control characters like Tab, CR and LF (tab indent, carriage return and line feed).

- The language of the text requires a different Windows code page to that of the default language, i.e. the target language does not belong to the same language family as the default language.
- The text file is to be coded using this code page, not as a Unicode file.
- The means used to create the text are to be as simple as possible, i.e. especially without the need to install any additional software.
- For the purposes of this guide, it is assumed that you have installed Microsoft Word 2000 (or a later version) and are familiar with using it.

Text types for HMI Embedded and HMI Advanced

The following text types can be changed in the individual systems:

Table 1-1

Text types	Systems
Alarm texts Adding texts for the user interface Application texts for all operating areas incl. softkey texts	HMI Embedded with PCU 20
Alarm texts Adding texts for the user interface Texts for the Help function in the editor Machine data Softkey texts for all operating areas	HMI Advanced with PCU 50/70

1.3 Language families

A language family is a group of languages for which Microsoft operating systems use the same code page. Microsoft uses the term "language group"

Table 1-2 Language families

Language family	Windows code page	Language
Central European	1250	Albanian, Croat, Polish, Romanian, Serbian (Latin), Slovakian, Slovenian, Czech, Hungarian
Cyrillic	1251	Bulgarian, Macedonian, Russian, Serbian (Cyrillic), Ukrainian, White Russian
Western	1252	German, English, Finnish, French, Indonesian, Icelandic, Italian, Dutch, Norwegian, Portuguese, Swedish, Spanish
Greek	1253	Greek
Turkish	1254	Turkish

Language family	Windows code page	Language
Baltic	1257	Estonian, Lettish, Lithuanian
Japanese	932	Japanese
Chinese	936	Simplified Chinese
Korean	949	Korean
Chinese	950	Standard Chinese (Traditional Chinese)

Operating system and target language from the same language family

If the language of the operating system (e.g. German) belongs to the same language family as the target language (e.g. Portuguese), then some difficulties could possibly occur with the input of certain characters. However, there will be no problems displaying these characters with a simple text editor.

Remedy:

- Use the Windows "Character Map"
(see Section 3.2: Entering characters with the character map) or
- Switch over the keyboard
(see Section 3.4: Using a different keyboard layout) or
- Use the ALT+digit combination to enter characters
(see Section 3.5: Numerical text input)

There should not be any further problems in this case. Use a simple text editor (e.g. Notepad) and save the texts in the usual way.

Chapter 2 does not apply.

Operating system and target language from different language families

If the language of the operating system (e.g. German) does not belong to the same language family as the target language (e.g. Hungarian), difficulties will occur with both inputting and displaying the characters in a simple text editor (Notepad).

1.4 Tools used

Standard scope

This document describes the use of Microsoft Word 2000 and other tools which may not necessarily be installed on your PC.

You should have installed the following components:

- Microsoft Word 2000 (required)
- Windows 2000/XP: Language Support for East Asian characters (necessary for these languages)
- Windows 2000/XP: Character Map (recommended)

Checking the installation of the Language Support for East Asian languages

Installation of the Language Support for East Asian languages is performed differently for Windows 2000 and Windows XP.

Please refer to Section 3.9 for details: Special requirements for East Asian languages

1.5 Terms

Code page

A list of characters which forms the character set for one or more languages. A code which is unique within this code page is assigned to each of the characters in the list.

All of the code pages used under Windows share the ASCII range (codes 0 to 127).

A distinction is made between single-byte code pages and multiple-byte code pages.

In single-byte code pages (all European languages), each character is represented with a single byte. Accordingly, single-byte code pages comprise a maximum of 256 characters.

Multiple-byte code pages (Asian languages) contain both characters which can be stored as a single byte as well as characters which are stored with two (or more) bytes. The shared ASCII range is contained as a range of single-byte characters.

There is a 1:1 assignment between Windows code page and language family. Section 1.3 (Language family) contains a list of the language families in Table 1-1.

Diacritical characters

(diacritical = distinguishing)

In most cases, a relatively small supplementary character, which is attached to a letter to give the letter a specific stress, a specific pronunciation or even a new meaning.

Section 3.1 (Special characters in different language families) contains a list of diacritical characters.

If the combination of basic letters and diacritical characters belongs in a language-specific alphabet, this combination is contained in the appropriate Windows character sets (code page, Unicode) as a separate character.

Use of diacritical characters

A diacritical character is used

- to designate the combined character (e.g. Ģ = G cedilla, Õ = O tilde),
- for the combined input if there is no separate key that possesses the required combined character (see Section 3.4: Using a different keyboard layout),
- in Vietnamese and Thai for normal coding in text files,
- for output (only in typographically compound texts): Diacritical characters and basic letter are output separately, whereby any combinations are possible, e.g. for ancient languages and phonetics.

In all the other cases, the combined letter is always considered as a compound unit.

In some cases, however, the combined letter is incorrectly referred to as the diacritical character.

Input Method Editor (IME)

An aid for entering the CJK characters (CJK: Abbreviation for Chinese, Japanese and Korean).

Language family

A language family is a group of languages which uses the same code page. This requires the use of the same basic alphabet (e.g. Latin or Cyrillic), but it does not mean that the alphabet of all languages of this group is the same.

There is a 1:1 assignment between Windows code page and language family. Section 1.3 (Language family) contains a list of the language families in Table 1-1.

Font files (TrueType fonts)

Windows 2000 and Windows XP do not use font files stored separated by the code page, but instead so-called "Big Fonts"; these are fonts that contain the character set for several code pages, saving memory capacity for the common characters. With Word 2000, the selection of characters from this total character set is performed via the Unicode coding, not via the code page coding. This makes it impossible to mix up characters with the same code in different code pages.

Default language

The term "default language" is used in this guide for the language of the operating system, i.e. German for a German Windows environment and English for an English Windows environment.

Default keyboard setting

Windows 2000:

Under "Control Panel" → "Keyboard", one of the settings in the "Input" tab is defined as the default keyboard setting. This setting is indicated with a check mark on the left.

Windows XP:

Under "Control Panel" → "Regional and Language Options", in the tab "Languages", click under the heading "Text Services and Input languages" on the button "Details..." to reach the dialog "Text Services and Input languages". Here you can see the default keyboard setting in the "Settings" tab under the heading "Default Language and Region Support".

Windows 2000 and Windows XP:

The default keyboard setting consists of a language property (left) and a keyboard layout (right).

This language property of the default keyboard setting need not absolutely match the default language.

Text file

The term "Text file" is used to describe a file which does not contain any formatting (font type, font size, underscore, bold, italics etc.) or embedded objects (pictures, tables, graphics, footnotes etc.).

This means that, apart from the text characters, the file will only contain ASCII control characters like Tab, CR and LF (tab indent, carriage return and line feed).

The text characters are taken from a particular code page.

Occasionally, text files are also incorrectly referred to as ASCII files.

This is only correct if a text file only contains ASCII characters (codes 0 to 127) and is therefore code page invariant.

Unicode

A 16-bit character set for which code pages are no longer required.

All character codes are unique, without needing to specify the code page.

Unicode programs like Word 2000 do not offer code page-dependent interpreting of characters and thus also cannot display characters differently by assigning a font or language property.



2

2 Editing Files with Word 2000

2.1 Overview	TX2/2-12
2.2 Creating a new text file	TX2/2-12
2.3 Opening an existing file	TX2/2-13
2.4 Saving text files.....	TX2/2-15
2.5 Codes for SINUMERIK HMI.....	TX2/2-18

2.1 Overview

This section describes how text files can be edited using Microsoft Word 2000.

Word 2000 does not edit text files directly. Instead, it converts them to Word files upon opening. During saving Word can then convert the edited text back into a text file.	We recommend saving an additional version of the text file as a Word file and using this version as the basis for future editing. It is then no longer necessary to open and convert the file.

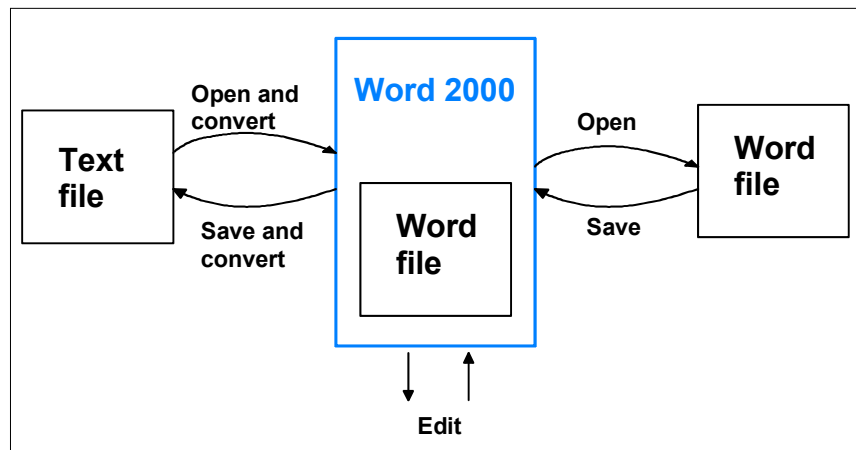


Fig. 2-1

2.2 Creating a new text file

Create a new text file in the usual way, using one of the following methods:

- In Windows Explorer click on the command "File" → "New" → "Text File".
- Launch Notepad without a file. A new empty file is then opened. Then select the command "File" → "Save".
- Make a copy of an existing text file you wish to use as a template for the new text file.

Now open the text file with Word 2000 in the way described in the next section.

2.3 Opening an existing file

1. In Word 2000, select "Open..." from the "File" menu.
2. From the "Open" dialog box, choose the setting "Encoded Text Files (*.txt)" under "Files of type".
If your file does not end in ".txt" then you will need to rename it first so that it does end in ".txt".

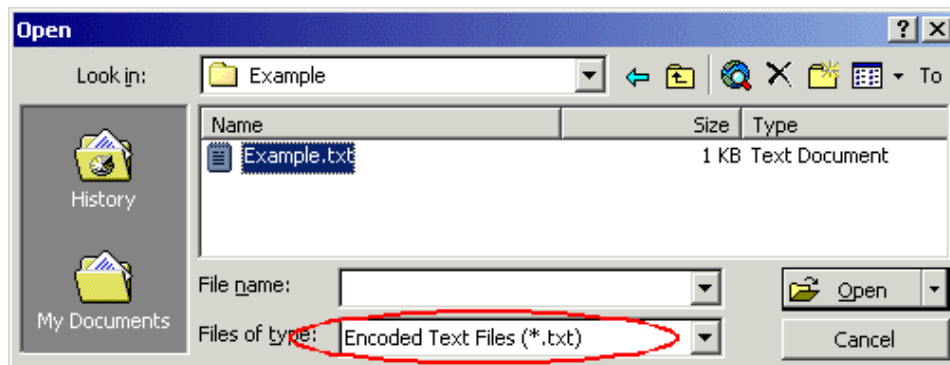


Fig. 2-2

3. Choose the file you would like to open and click on "Open".

Instead of steps 1-3, you can also use one of the standard shortcuts:

- In Word you can use the list of the recently used files.
- Drag and drop the text file from Explorer to the Word icon on your desktop.
- If Word has already been launched, drag and drop the text file from Explorer to the title bar of the Word window.

4. Note what happens next.
Continue with "Convert File" (see point 5.) if this dialog box opens.
Continue with "File Conversion" (see point 6.) if this dialog box opens.

If however the file is opened straight away with neither the "Convert File" nor the "File Conversion" dialog boxes opening up, then Word has probably opened the file incorrectly under the assumption that the text has been written using the default language.

Be careful with special characters. The special characters will appear incorrectly if the code page of the text file is not the same as the code page of the default language.

In this case, go to "Extras" → "Options..." and open the Options dialog for Word. Click on "General" and select the option "Confirm conversion at Open". When this option is active the additional dialog "Convert File" (see point 5.) will appear every time, but when the option is inactive it is skipped. Afterwards close the file and start again from point 1.

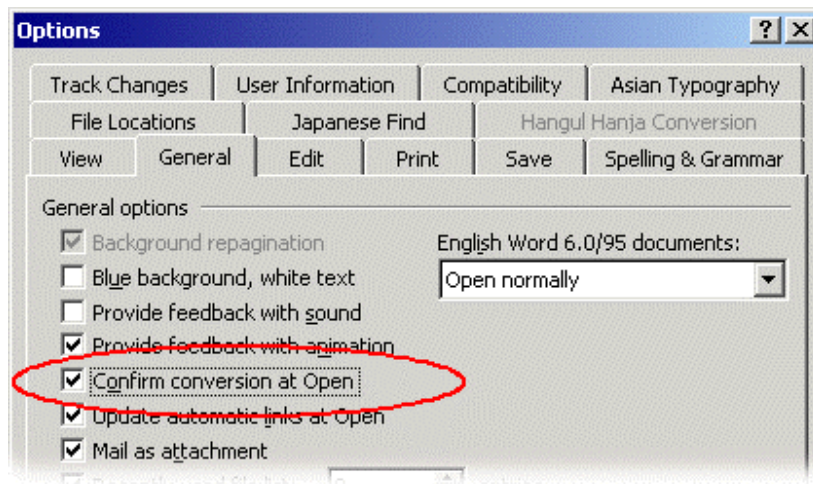


Fig. 2-3

5. The "Convert File" dialog box will appear.
Choose "Encoded Text" again and click on "OK".

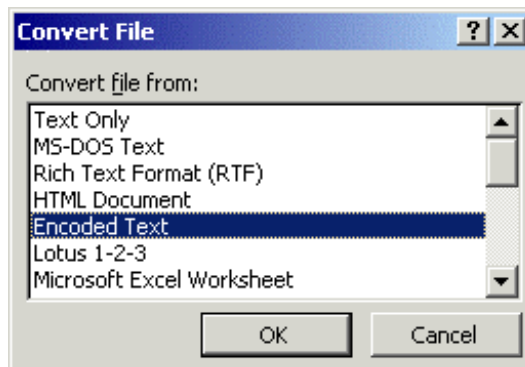


Fig. 2-4

6. The "File Conversion" dialog box opens.
If "Text Only" is selected, activate "Other encoding".
Select the correct encoding (Word will make a suggestion which will not necessarily be correct).
Section 2.5 (Codes for SINUMERIK HMI) lists which encoding is suitable in Table 2-1.
Check the preview area while doing this.

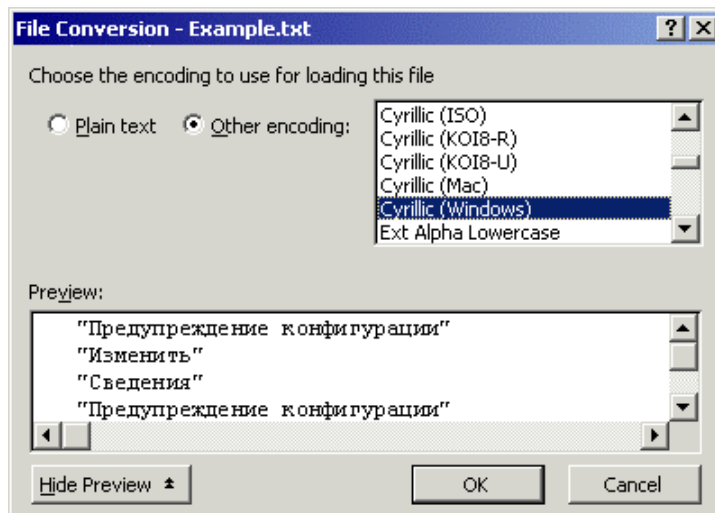


Fig. 2-5

7. Click on "OK".

The file is opened and converted to a Word file at the same time.
The existing text is formatted using a default font.

2.4 Saving text files

Save the entered text as a "Text File".

1. In Word 2000, select "Save As..." from the "File" menu.

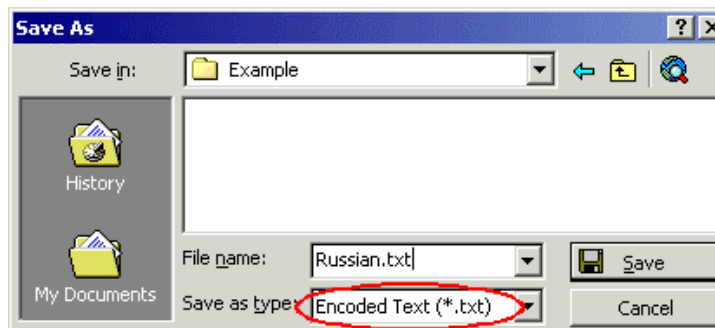


Fig. 2-6

2. Choose the option "Encoded Text (*.txt)" under "Save as type".
3. Enter the name of the file in the "File name" box and click on "Save".

4. A warning dialog appears:

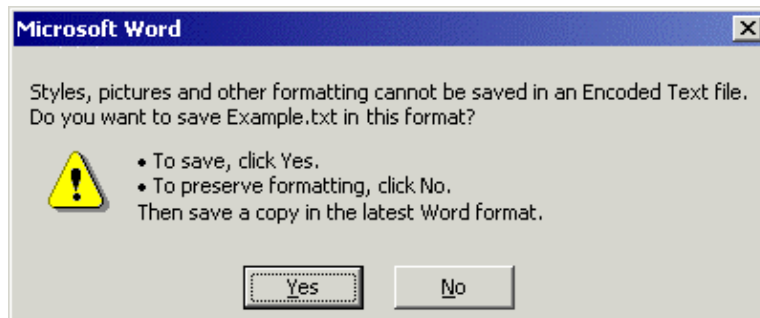


Fig. 2-7

This warning tells you that saving the file as a text file may result in formatting information and graphics objects being lost.

This message will even appear if there are no special formatting or graphics objects in the text.

Click "Yes" to confirm.

5. The "File Conversion" dialog window will then appear.

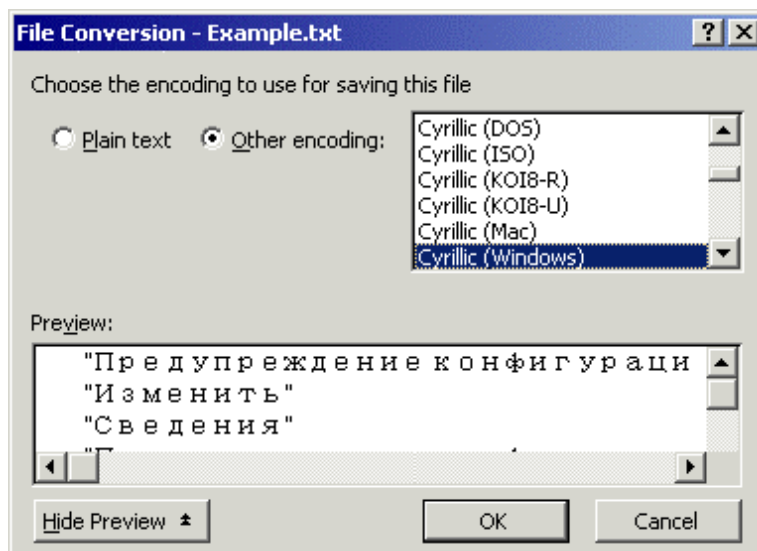


Fig. 2-8

Select the encoding which is suitable for your target language and click on "OK". Section 2.5 (Codes for SINUMERIK HMI) lists which encoding is suitable in Table 2-1.

Your file is now saved as a text file and encoded using the selected code page in the process.

If you have selected a completely unsuitable code then a warning is displayed in the dialog box.

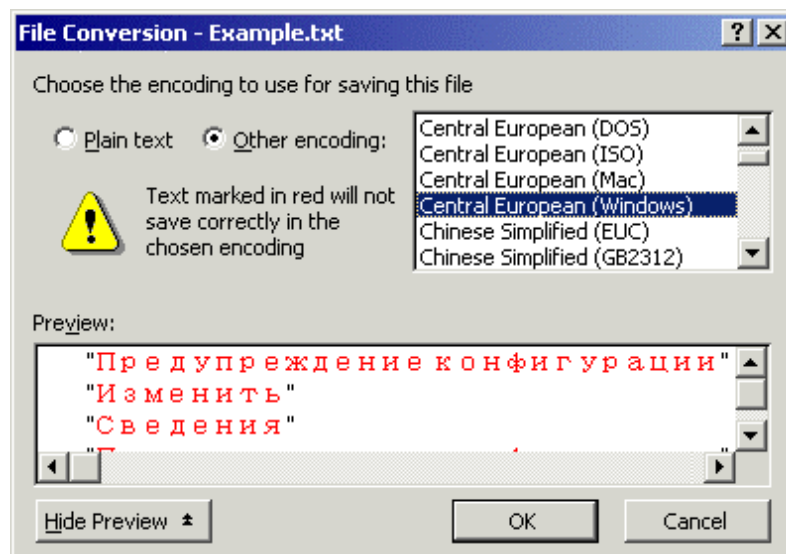


Fig. 2-9

This warning will also appear if you have selected the correct code but your file contains characters which are not permitted, such as Latin mutated vowels in a Cyrillic text.

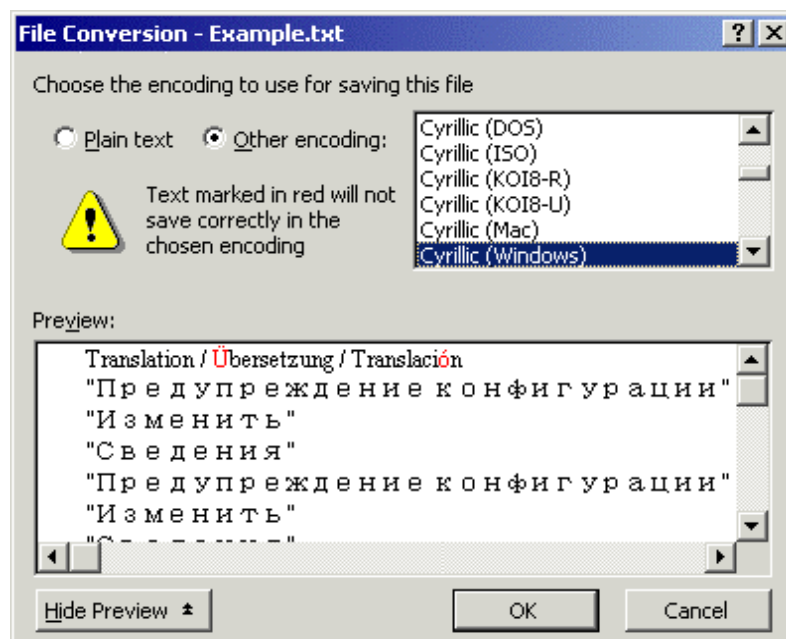


Fig. 2-10

If you choose to ignore the warning then all characters which cannot be encoded are replaced with a question mark.

2.5 Codes for SINUMERIK HMI

If you open or save a file in the way shown in
Section 2.3 (Opening an existing file) or
Section 2.4 (Saving text files),
then code page designations are assigned rather than code page numbers.

Depending on the installation of your system, many other codes may be listed,
including those for Unix (ISO), Apple (Mac), OEM (DOS) and mainframe (EBCDIC)
platforms.
Please use the Windows (ANSI) codes for SINUMERIK HMI.

Use the following codes to open and save files (shown in alphabetical sequence in
accordance with the Word listing):

Table 2-1 Codes

Description	Code page
Traditional Chinese (Big5)	950
Simplified Chinese (GB2312)	936
Japanese (Shift-JIS)	932
Korean	949
Cyrillic (Windows)	1251
Central European (Windows)	1250
Turkish (Windows)	1254
Western European (Windows)	1252



3

3 Input of Text

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3.1 Special characters of various language families

Latin language family

With the Latin-based language families (Baltic, Central European, Turkish, Western), you can enter most of the characters, namely the basic Latin alphabet, directly with your (e.g. Western) keyboard.

Most of the special characters, such as Å å â ã ç é ê ì í î ï ð ñ ò ó ô õ ö ù ü are made up of the Latin letters A-Z a-z and diacritical characters such as acute ´,

breve ˘, cedilla ¸, circumflex (caret) ^, point ¨, colon (dieresis, trema) ¨, double-acute ¨, grave accent ` , háček (caron) ˇ, macron ¯, ogonek (nasal hook, crooked hook) ˛, squiggle °, slash /, hyphen – or tilde ~.

Other characters of the alphabet are special letters (ð þ , ð ð , ß) or ligatures (Ææ , Ææ , Ūū). These are supplemented by language-specific abbreviations and punctuation marks, e.g. for the endings of the ordinal numbers in Spanish (ª and º) as well as the exclamation and interrogation marks put upside down (¡ and ¿).

The input methods described in the following will apply without restrictions to the Latin-based language families.

Greek/Cyrillic language family

Certain special considerations need to be taken into account when inputting texts using Greek or Cyrillic fonts.

Please refer to Section 3.8: Special considerations when working with Greek and Cyrillic texts.

East Asian languages

Certain special considerations also need to be taken into account when creating texts in Japanese, Chinese or Korean.

Please refer to Section 3.9: Special considerations when working with East Asian texts.

Disruptive Word options

Deactivate the following options in Word to prevent unwanted characters from reaching the text:

In the dialog "Extras" → "AutoCorrect.." go to the "AutoFormat as you type" tab under "Apply as you type":

"Automatic bulleted lists",
"Automatic numbered lists".

Under "Replace as you type":

""Straight quotes" with "Smart quotes"".

"English ordinals (1st) with superscript"

"Fractions (1/2) with fraction character (½)"

"Symbol characters (–) with symbols (—)"

If you do leave any of the options active then you can always use Ctrl+Z to undo any automatic corrections. As a general rule this will give the same results as if the option was deactivated.

3.2 Input via the Character Map

Note

The character map integrated in Word (menu commands "Insert" → "Symbol...") is not suitable for creating code page-encoded text files, as it cannot be limited to the relevant code page.
Use the "Character Map" system program as described below.

Selecting the character map

1. On the start menu, choose "Programs" → "Accessories" → "System Tools" → "Character Map" to start the "Character Map" tool.
2. From "Font", choose the same font type as you have selected for the text file.

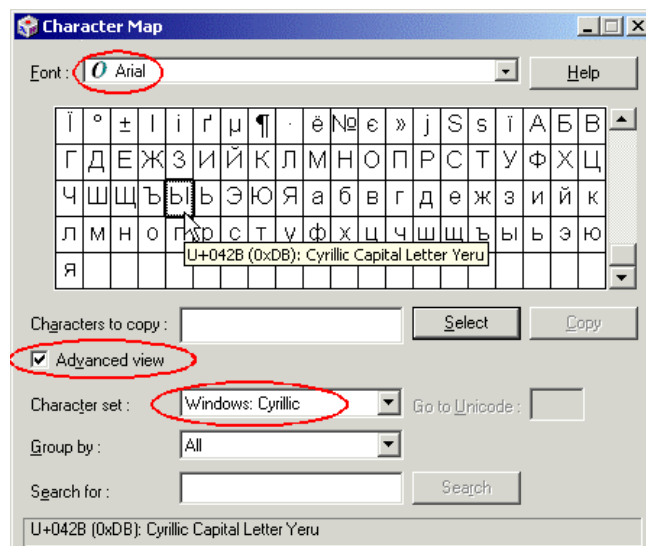


Fig. 3-1

3. Activate the box "Advanced view".

4. Under "Character set" select the code page for your text file in order to restrict the number of available characters to this code page.
The code pages are identified as follows:

Table 3-1 Encoding of text files

Description	Code page
Windows: Chinese (Taiwan)	950
Windows: Chinese (PROC)	936
Windows: Japanese	932
Windows: Korean	949
Windows: Cyrillic	1251
Windows: Eastern European	1250
Windows: Turkish	1254
Windows: Western	1252

Entering characters

1. Choose a character you want to enter.
The information bar at the bottom will display the Unicode code (U+..., hexadecimal), the code page code (in brackets) and the clear text description of the character.
If you have set up the keyboard layout accordingly (see Section 3.4: Using a different keyboard layout), the keystroke combination for entering the character numerically will appear at the bottom right in the status bar (see Section 3.5: Numerical text entry).

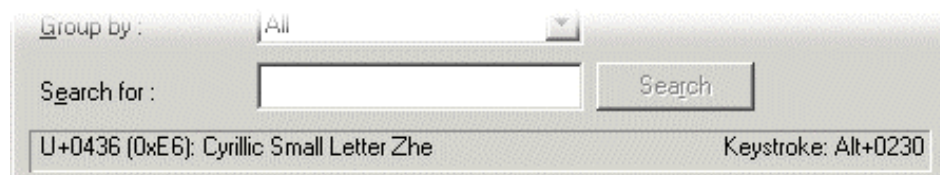


Fig. 3-2

2. Click on "Select".
The character is copied into the "Characters to copy" field.
3. Repeat steps 1 and 2 for further characters.
4. After you have selected all the characters, click on "Copy".
The characters are copied from the "Characters to copy" field to the clipboard.
5. Go back to Word 2000 and press Ctrl-V.
The characters are pasted from the Clipboard into the text.

3.3 Compound input

With many of the compound special characters it is possible to enter the diacritical character first and then the letter. The diacritical character will not appear at first and is then combined with the letter to form a special character.

Example

With a German keyboard layout, press for example the keys ´ (acute) and "a" one after the other to obtain the character á (a-acute).

The keys with the diacritical characters, which are thus dealt with in a special way, are marked with a special color in the descriptions of the keyboard layouts.

Keyboard assignments

The table below shows some keyboard layouts for the supported diacritical characters:

Table 3-2

Keyboard assignments	Acute	Grave accent	Circumflex	Háček	Breve	Ogonek	Pixel	Colon	Cedilla	Double-acute	Squiggle	Tilde
	´	`	ˆ	ˇ	˘	˙	•	:	¸	¨	°	~
German	X	X	X									
French		X	X					X				X
Polish	X		X	X	X	X	X	X	X	X	X	
Spanish	X	X	X					X				X
Czech	X		X	X	X	X	X	X	X	X	X	
Hungarian	X		X	X	X	X		X	X	X	X	
U.S International	X	X	X					X				X

Obtain a graphical representation of your keyboard layout to learn which key combinations produce the diacritical characters.

Keyboard layout in picture form

Images of the keyboard layouts can be obtained from Microsoft via the Internet at the following address:

<http://www.microsoft.com/globaldev/reference/keyboards.aspx>

If you press the space bar after the diacritical character, you will see the character itself.

Note

It can be useful to switch the keyboard layout to "U.S. International" which corresponds mainly to the American keyboard, but additionally contains 5 diacritical characters and provides many special characters.

3.4 Using a different keyboard layout

Necessity for changing the keyboard layout

When is a change in the keyboard layout necessary?

- If you have to enter a lot of text.
- Your translator, who is used to a certain language-specific keyboard, wants to use your PC.

However, if you (as a German) only need to make smaller changes to existing files, then the German keyboard layout may be enough provided there are only a few special characters which cannot be represented with the German keyboard. You can enter these characters using the Character Map.

Example

In Hungarian for example, you would have to enter these characters as follows:

- őŰűŰ (O double-acute, U double acute) via the character map
- öÖüÜ directly
- áÁéÉíÍóÓúÚ compound input

3.4.1 Concept of the keyboard language property

Windows manages pairs for the keyboard consisting of language ("Input language") and keyboard layout.

The set keyboard language determines which language property is assigned to the entered characters.

The associated keyboard layout will determine which key produces which character.

Several such settings can be set up and switched between. One of the settings is defined as the default setting.

The keyboard driver assigns the entered key characters a "language property".

This defines that this piece of text has been created in this language.

Windows uses the term "Input language" as this can be used not only to switch the language properties, but also to select settings such as currency, date format etc.

3.4.2 Setting up a keyboard layout under Windows 2000

Proceed as follows to select a new keyboard layout:

1. From the Start menu, select "Settings" → "Control Panel" and click on "Keyboard".
2. Select the "Input Locales" tab.

If a symbol like **DE** is displayed in the right-hand task bar then you can also right-click on this symbol and select the command "Properties" to speed up steps 1 and 2.

You will see here at least one assignment "Input language" (left-hand column) and "Keyboard layout" (right-hand column) already set up. One entry is defined by default: Your default language (the language of your operating system) and your default keyboard layout. This entry is selected and indicated with a check mark on the left.

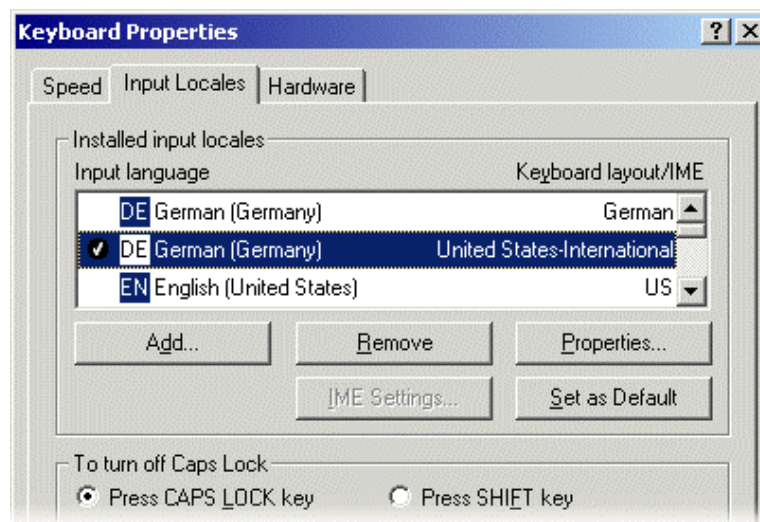


Fig. 3-3

3. Click on "Add".
The dialog box "Add Input Locale" is opened.

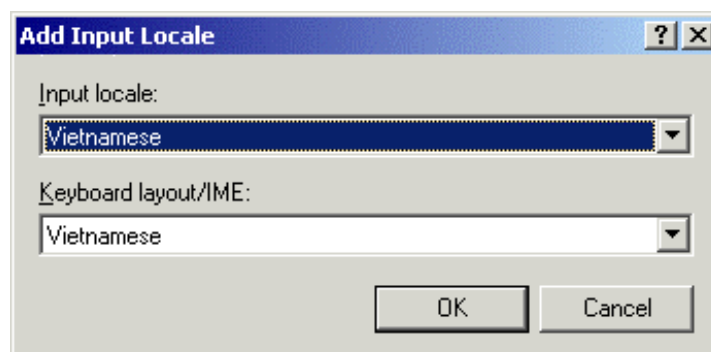


Fig. 3-4

4. In the dialog "Add Input Locale", select a language under "Input language" and the associated keyboard layout under "Keyboard layout".
The language ("Input language") may also be the same as the default language or as some other language for which you have already set up a keyboard layout. However, in this case you will not be able to make such a good distinction between the two keyboard layouts, as Windows usually only displays the language ("Input language").
5. Click on "OK". The dialog box "Add Input Locale" is closed. You then return to the "Keyboard Properties" window.
6. Use "Hot keys for input locales" to select the way how you want to switch the keyboard layout. If you select "none", you can only switch using the mouse.



Fig. 3-5

7. Activate the option "Enable indicator on taskbar". This provides you with the possibility of switching over quickly using the mouse.
8. Click on "OK" to quit the dialog.

3.4.3 Setting up a keyboard layout under Windows XP

Proceed as follows to select a new keyboard layout:

1. From the Start menu, select "Settings" → "Control Panel" and click on "Regional and Language Options".
2. Click on the "Languages" tab and click on the button "Details..." under the heading "Text Services and Input Languages".

If a symbol like **DE** is displayed in the right-hand task bar then you can also right-click on this symbol and select the command "Properties" to speed up steps 1 and 2.

3. The dialog "Text Services and Input Languages" is opened. Select the "Settings" tab.

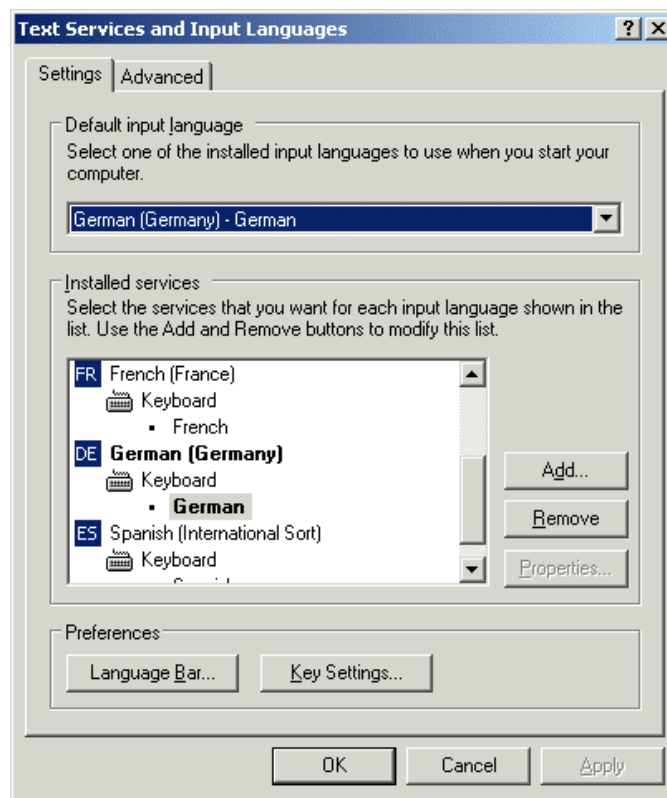


Fig. 3-6

4. Click on "Add".
The dialog box "Add Input Locale" is opened.

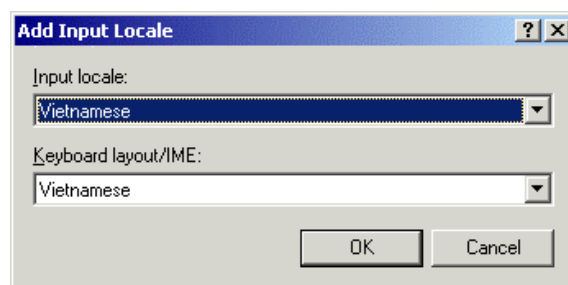


Fig. 3-7

5. In the dialog "Add Input Locale", select a language under "Input locale" and the associated keyboard layout under "Keyboard layout".
The language ("Input language") may also be the same as the default language or as some other language for which you have already set up a keyboard layout. However, in this case you will not be able to make such a good distinction between the two keyboard layouts, as Windows usually only displays the language ("Input locale").

6. Click on "OK". The dialog box "Add Input Locale" is closed. You then return to the "Text Services and Input Languages" window.
7. Use "Key settings..." to select the way how you want to switch the keyboard layout. If you select "none", you can only switch using the mouse.
8. Under the "Language Bar" you can select whether and how the current keyboard layout is displayed in the task bar or in a special button bar.
9. Click on "OK" to quit the dialog.

3.4.4 Usage

You can now create text with a "keyboard layout" suitable for the target language (for the input of your texts in a foreign language) or with your previous default keyboard layout (for the remaining operation). You can switch between the two layouts as required.

Now, a small blue field with a two-letter language abbreviation should appear in the task bar for the language you have set:

If you position the mouse pointer on this field (without clicking on it), the setting is displayed.

If the selected keyboard layout is the default layout for the selected language (e.g. "Turkish" – "Turkish Q"), then only the language ("Turkish") is displayed, otherwise the complete settings with language and keyboard layout will be displayed ("Turkish – Turkish F").



Fig. 3-8

If you click with the left mouse button on this field, the languages you have set will be offered in a small menu.

The current setting is marked by an arrow (Windows XP does this with a check).



Fig. 3-9

If you click with the right mouse button on this field, an abbreviation of the dialog box "Keyboard Properties" is displayed above the "Properties" menu option.

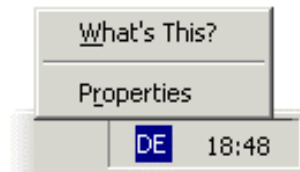


Fig. 3-10

Further settings are offered under Windows XP. Among other things you can also arrange this display as an Input language bar independently of the task bar, for example at the top edge of the screen.

Keyboard layout specific to input window

The Windows operating system will memorize the current keyboard layout for each input window.

- The keyboard layout is switched automatically if you switch to another window.
A new window is always started with the default setting. After starting Word, you may have to reselect the keyboard layout.
- Enable the window in which you want to enter texts before you select the keyboard settings for this window.

Menu operation

All menus in the active program will also use the changed keyboard layout. You will possibly no longer find certain key combinations with ALT and the letter key or Ctrl with a letter key or even initiate a wrong command by mistake. You should therefore use the mouse or, in menus, the arrow keys.

Other information

If you do not want to switch back to the other keyboard layout quite as frequently, you can also declare the new combination with the special keyboard layout as the default target language in the "Keyboard Properties" (Windows 2000) or "Text Services and Input Languages" (Windows XP) dialog box:

Windows 2000:

Select the new entry and click on the button "Set as default".
The default setting is indicated with a check mark on the left.

Windows XP:

Select the new setting under "Default Language and Region Support".

Please note that all new windows, the Start menu and the desktop will now also use the new keyboard layout.

Keyboard layout in picture form

You can obtain the keyboard layout in picture form.
For appropriate Internet addresses, see Section 5.1. References for text creation

Checking the keyboard layout

Compare the keyboard layouts and note a key with two different assignments. If you are not sure, press this key when entering the text to test which layout is active.

Example: If the German keyboard layout is active, pressing key "1" (letter group) will produce a "1", and if the Czech keyboard layout is active, a "+".

Note

Check whether the automatic option for switching over the keyboard has been activated in Word. Inadvertent switching of the keyboard layout by Word can cause confusion.

Section 3.7 (Multi-language Word files) describes situations in which the automatic keyboard switchover function is useful and how to activate and deactivate it.

3.5 Numerical text entry

Note

In contrast to the previous method with WordPad in Windows 95/NT 4, you can only use the numerical input with Word 2000 if you have selected a corresponding keyboard layout (see Section 3.4: Using a different keyboard layout).

Press the ALT key, and while holding down the key, enter zero and then the three-digit decimal coding of the desired special character on the numerical key group. Only then release the ALT key.

Example (Turkish):

ALT+0222 results in Ş (S with cedilla).

To produce this character, you will only need the character map of the appropriate code page (see Section 1.3: Language family).

You will find overview tables of the code pages e.g. at Microsoft under
<http://www.microsoft.com/globaldev/reference/WinCP.mspx>

From these tables, combine the headers for the column and row (hexadecimal 00 to FF) and convert this number to form a decimal number (0 to 255).

The 4-digit hexadecimal numbers contained in the individual table fields are the corresponding Unicode codes which can be used for identification of a character, but they cannot be used for numerical input of that character.

Section 3.2 (Input via the Character Map) also describes where the key combination is displayed in the Character Map.

3.6 Language properties in Word files

Language property

In Word, a property (attribute) is managed separately for each character similarly to other text properties (bold, underscore).

In the language properties, Word will remember the language to which the character, the character sequence, the word or the whole sentence belongs.

The language property is independent of the font. For example, a Cyrillic character can possess the language property "German".

The language property is managed internally as a combination of main language and sublanguage, e.g. "French (Canada)".

Microsoft sometimes uses the designation "Region scheme" for the language property, whereby this term also covers properties, such as currency, date format, decimal separators etc.

Effects of the language property

This property is used (evaluated) for the spell checker and for the automatic keyboard switchover (see Section 3.7: Multi-language Word files).

If you do not wish to use either the spell checker or the automatic keyboard switchover function, there is generally no need to worry about the language properties. In this case do not forget to deactivate the automatic keyboard switchover function.

Saving the language property

Microsoft Word saves this property in Word files (*.doc). If a document is saved as a text file (*.txt) then this property is lost along with the other text properties.

If you wish to use the language property, it therefore makes sense to use a Word file to edit the texts and to keep it for subsequent changes. Whenever the editing reaches a stage where you want to stop you can then save the document as a text file following the procedure described in Section 2.4 (Saving text files).

Displaying the language property

In Word 2000, the current language property is displayed in the status bar at the bottom edge of the window.

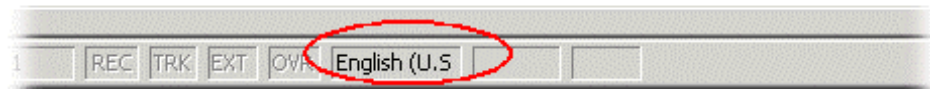


Fig. 3-11

Setting the language property

Proceed as follows to set the language property for a text:

1. Highlight the part of the text for which you wish to set the language property, or press CTRL+A to select the entire text.
2. Then select the command "Extras" → "Language" → "Set Language...".
3. In the "Language" dialog box you can choose the correct language. Click on "OK" when you are done.

Quick setting of the language property

In Microsoft Word 2000 you can insert a combined display and selection box into a symbol bar. This both displays the current language property and enables you to set the language as well.

Proceed as follows to insert this field into a symbol bar:

1. In the "Extras" menu select the command "Customize..."

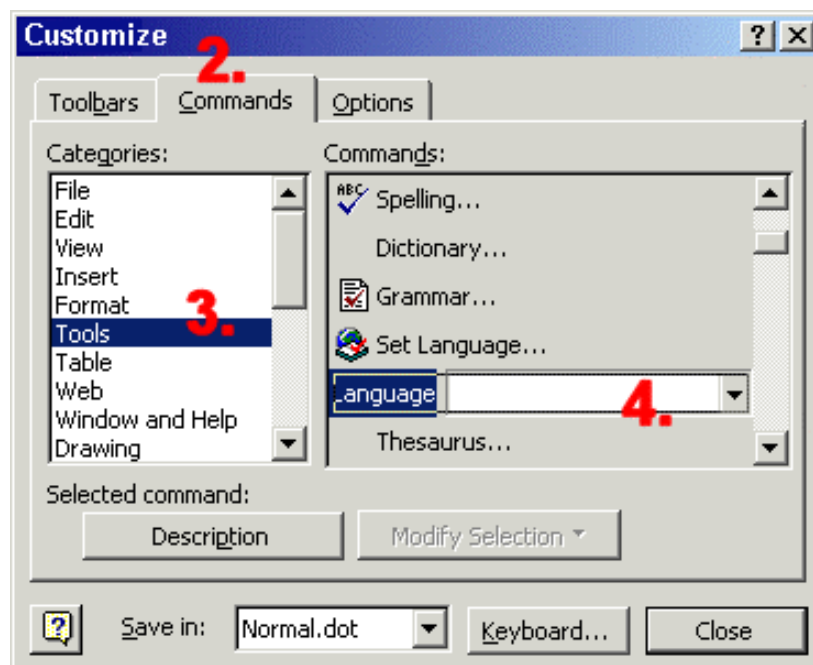


Fig. 3-12

2. In the "Customize" dialog box select the "Commands" tab.
3. Select "Tools" from the list of categories on the left.
4. Then select "Language" from the list of commands on the right (see Fig.).
5. Drag and drop this entry with the left mouse button into a symbol bar.

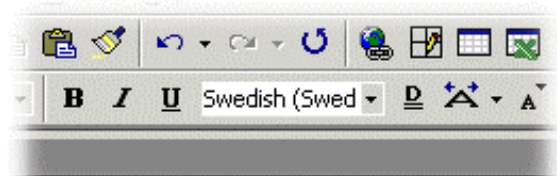


Fig. 3-13

6. Close the dialog box.

With this selection box you can then change the selected language for any part of the text.

Automatic setting of the language property

Word 2000 automatically sets the language property in the following situations:

- When opening a file of type "Encoded Text File" (see Section 2.3: Opening an existing text file).
- New text entered with the keyboard is automatically assigned the selected keyboard language.
- If the automatic recognition option is selected then Word will try to assign the entered words to a language once they are complete and then automatically sets the language property.

Note

The "Detect language automatically" function can often deliver confusing results, particularly in technical texts.

This option is usually pre-activated as a default setting.

Recommendation: Deactivate the "Detect language automatically" option.

Proceed as follows to deactivate the automatic language recognition option:

1. Make sure that no part of the text has been highlighted and select the command "Tools" → "Language" → "Set Language...".
2. In the "Language" dialog box deactivate the option "Detect language automatically" and click on "OK".

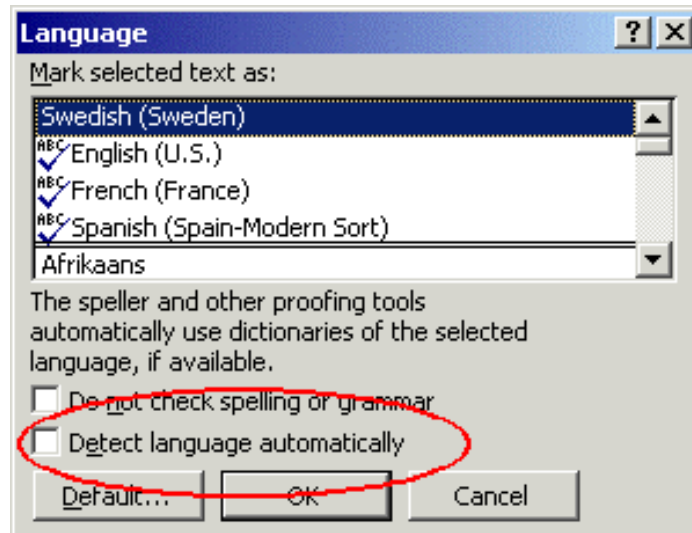


Fig. 3-14

3.7 Multi-language Word files

In certain cases it may be useful to deliberately set different language properties for different parts of the text in a Word file.

Boundary conditions for multi-language Word files

You want to enter certain parts of the text with the German keyboard layout and then also edit these parts later on with the German keyboard layout, whereas other parts of the text are to be created and edited with the keyboard layout of the target language.

Examples

This can be necessary in the following cases:

- With Greek and Cyrillic texts, the Latin letters and other ASCII characters are missing in the appropriate keyboard layouts.
- With some keyboard layouts, e.g. Czech, no access to the digits is granted on the standard keyboard level.
- The arrangement of the Latin letters deviates substantially from the arrangement to which you are accustomed to (e.g. Turkish-F keyboard layout).

- You as a German want to prepare one part of the text, and a second part is to be created by your translator.

Table with two language properties

To create a multi-column text in which for example the first column possesses the language property "German" and the second column for example "Russian", you can proceed as follows:

- Switch to the German keyboard and enter the first column of the first line. Then switch to the Russian keyboard and enter the second column:
[Text 103][Mode 28] "йцукентгшщзхъфывапролджэячсмить"
- This does not need to be a Word table with borders and fields. You can also use a simple line and separate the different parts with spaces.
- Select the whole line, copy this to the clipboard by using Ctrl-C and paste this line several times by pressing Ctrl-V. This will give you two columns with German on the left and Russian on the right.

Table 3-3

[Text 103][Mode 28]	"йцукентгшщзхъфывапролджэячсмить"
[Text 103][Mode 28]	"йцукентгшщзхъфывапролджэячсмить"
[Text 103][Mode 28]	"йцукентгшщзхъфывапролджэячсмить"
[Text 103][Mode 28]	"йцукентгшщзхъфывапролджэячсмить"
[Text 103][Mode 28]	"йцукентгшщзхъфывапролджэячсмить"
[Text 103][Mode 28]	"йцукентгшщзхъфывапролджэячсмить"
German	Russian

Automatic keyboard switching

In order to automatically have the correct keyboard layout when working on different parts of the text in Word, go to "Extras" → "Options" and activate the option "Auto-Keyboard switching" in the "Edit" tab.

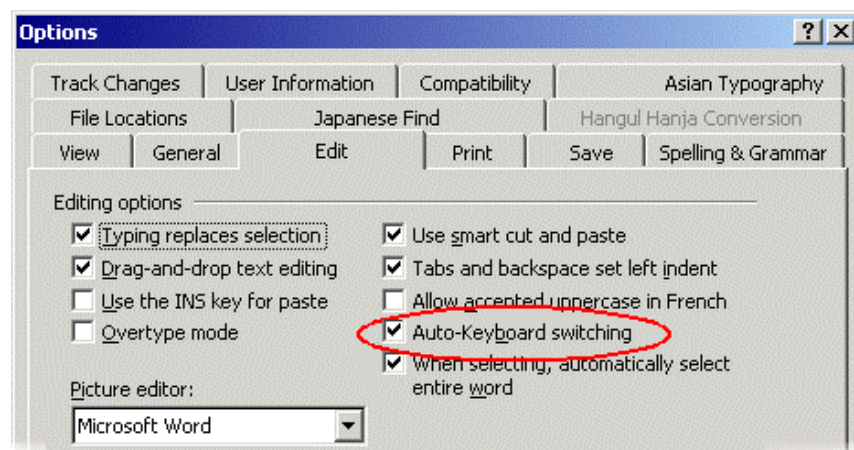


Fig. 3-15

Note

Accidental use of the automatic keyboard switching function can be confusing. Only use this option when the above boundary conditions are met.

Active keyboard layout always visible

To make sure you know what is going on, you can adjust the task bar to always display the currently active keyboard layout.

1. Right-click on the task bar and select "Properties".
2. Activate the option "Always on top".
3. Deactivate the option "Automatically in the background".

With Windows XP you are also free to position the Input language bar anywhere you want on the screen. To do this, click on the button for switching over the keyboard (e.g. **DE**) in the task bar and select "Restore Language and Region Support Bar".

Another option is to activate the switchover of the keyboard in Word:

1. In the "Extras" menu select the command "Customize..."

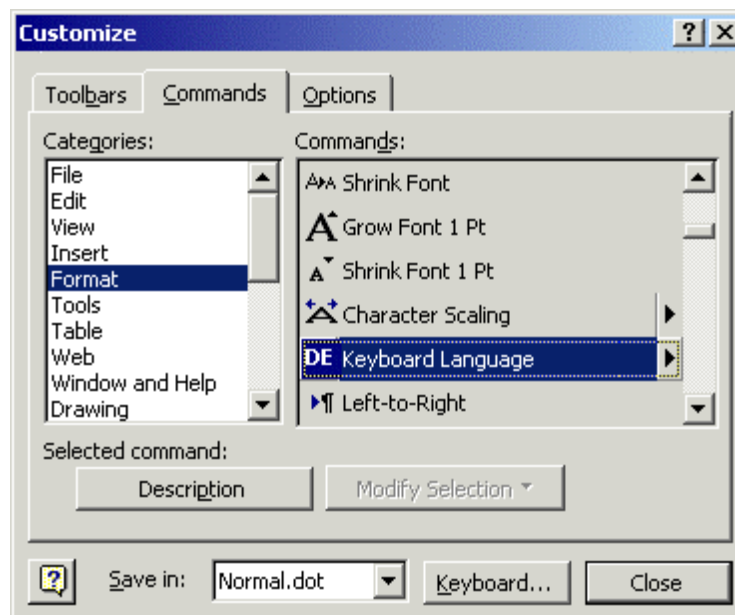


Fig. 3-16

2. In the "Customize" dialog box select the "Commands" tab.
3. Select "Format" from the list of categories on the left.

4. Then select "DE Keyboard Language" from the list of commands on the right (see Fig.).
5. Drag and drop this entry with the left mouse button into a symbol bar.

3.8 Special considerations when working with Greek and Cyrillic texts

Note

If you create texts in the Greek or Cyrillic language for the first time, then you **MUST** read this section!

From the view of the language sciences, the Greek and Cyrillic alphabets are considered as separate and independent alphabets, and not for example as an extension of the Latin alphabet.

This means that Greek and Cyrillic letters which in their appearance are identical to Latin letters, are not the same characters and may therefore also not be coded identically.

In some cases this becomes evident by the fact that although certain letters look the same in upper case, the corresponding lower case letters look different.

Table 3-4

Font	Characters	Meaning
Latin	P, p	Latin letter P
Greek	Ρ, ρ	Greek letter RHO
Cyrillic	Р, р	Cyrillic letter ER
Latin	H, h	Latin letter H
Greek	Η, η	Greek letter ETA
Cyrillic	Н, н	Cyrillic letter EN

Example

Incorrect coding could have the following consequences:
 Supposed you write the Russian word for "NO" ("НЕТ") using Latin letters instead of "HET" using Cyrillic letters. Initially you will see no difference. However, the search for "нет" in lower case letters with the search option "Ignore uppercase/lowercase letters" will not find the incorrectly coded spelling.

Keyboard layout for Greek/Cyrillic font

For this reason, the keyboard layouts for the Greek and Cyrillic fonts have been designed in such a way that the Latin letters are not available at all, not even via AltGr key combinations. These keyboard layouts have normally only two levels (standard and SHIFT).

Keyboard layout for the Russian font

In the Russian keyboard layout, there are also some ASCII special characters which are missing, such as # \$ [] { } ' ` | ~ & .
For these languages it therefore makes sense to use Word files with two languages as described in Section 3.7 Multi-language Word files.

Note

Switch the keyboard to Latin only if this is absolutely necessary! When doing so, do not switch over for individual letters, but only for complete words and sentences.

Never use words with mixed codings!

Note

Find out whether and to what extent certain German, English or international abbreviations (e.g. DIN/ISO) may or must be written using Latin fonts, or whether a conversion (ДИН/ИСО) is more appropriate according to the conventions of the country in question.

The key assignment for combinations, such as Ctrl-C, Ctrl-V, Ctrl-Z, Alt-A, etc. normally follow the US keyboard layout.

3.9 Special considerations when working with East Asian texts

Precondition

To author or correct texts in Japanese, Chinese or Korean, you will need to have installed the corresponding expansion package for the operating system.

Checking the system installation for Windows 2000

To check your installation, proceed as follows:

- Open the Control Panel ("Start" → "Settings" → "Control Panel").
- In the "Control Panel", select "Regional Options".
- Click on the "General" tab in the "Regional Options" dialog box.
- You can see the installed language families in the lower part of the window under "Language settings for the system".
- Check whether the language family you want to use has been activated.

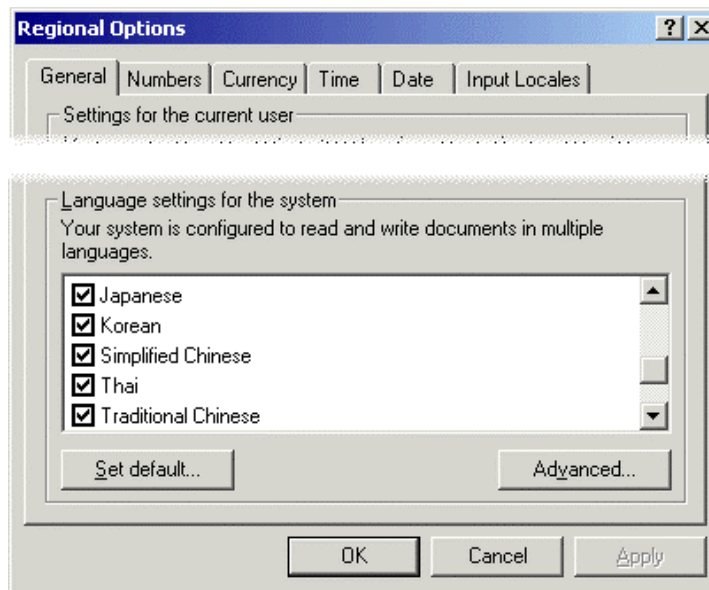


Fig. 3-17

You may require the Microsoft installation CD to install any missing components. You will also require Administrator Rights to perform the installation.

Checking the system installation for Windows XP

In the Control Panel open the dialog box "Regional and Language Options". Check the "Languages" tab to see whether the option "Install files for East Asian languages" has been selected.

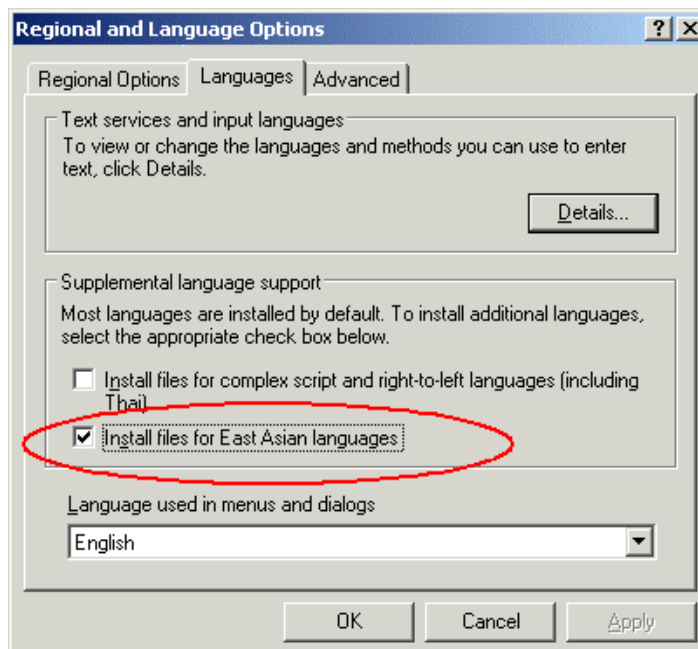


Fig. 3-18

You will not usually need the installation CD to reinstall the files for East Asian languages in Windows XP, as the files are already present on the hard drive in compressed form.

You will however require Administrator Rights to perform the installation.

Input

An Input Method Editor (IME) is used for inputting. This is a tool which is used to put together the pictograms on a European keyboard and can be activated analogously to a keyboard layout.

You will normally need a translator who speaks the target language as his/her mother tongue to operate the IME system.

From Windows 2000 it is no longer necessary to have the Windows operating system in the target language.

Full-width European characters

In the code pages for the East Asian languages, two versions of many of the European characters (Latin letters, numbers and the characters # \$ % & etc.) are included:

1. Normal (narrow, half-width) version.

This is the set of ASCII characters which is compatible with European code pages.

2. Double-width (full-width) version.

These versions of the characters are twice as wide and are not compatible with the ASCII characters.

If you are using characters with a functional significance it is important to use the ASCII versions.

Correct example (SINUMERIK alarm text, Japanese):

014195 0 0 "DコードとG 4 9が同時に指令されています (Ch%1 %2)"

Fig. 3-19

The circled characters are:

014195 0 0 Identifier and attributes

Blank space Syntactical separator

Quotes Text delimiters

%1, %2 Parameter variables

Only the ASCII versions must be used for these characters.

Note

In the remaining part of the text it is quite acceptable to use full-width characters for better readability (as in the example here for G49).

Caution

There is even a full-width version of the space character (ideographic space). You can only recognize this character from its width by selecting it.

Incorrect example:

014195 0 0 "DコードとG 4 9が同時に指令されています (Ch%1 %2)"

Fig. 3-20

The circled characters are full-width variants which have been used incorrectly.

Note

When placing a translation order, tell the translator that only the narrow, ASCII-compatible characters must be used for characters with a functional significance.

Simplified/traditional Chinese

Note

Please make a careful distinction between simplified Chinese and traditional (or standard) Chinese. The former is used in the PR of China, whereas the latter is used in Taiwan. These two variants are coded differently and therefore have to be treated differently. You should therefore also make sure that this is clearly specified in your translation order.

Creating texts

When you are creating texts in Japanese, Chinese or Korean, it definitely makes sense to initially create a Word file.
There should be no problems if you are using Word 2000 to exchange documents with your external translator.
Afterwards you can then convert this Word file into a text file in the way described in Section 2.4 (Saving text files).

■

4

4 Problems and Remedies

4.1 Problems and remedies.....	TX2/4-44

4.1 Problems and remedies

Keyboard layout switches unintentionally

Problem:

The keyboard occasionally switches to a different layout while inputting text without this being explicitly requested.

Remedy:

Check the option for automatic switchover of the keyboard as described in Section 3.7: Multi-language Word files.
Deactivate this option.

Language properties are changed inadvertently

Problem:

After creating a text with the keyboard in a certain layout (e.g. Polish), you notice that parts of the text have German or English as the language.

Remedy:

Deactivate the automatic language recognition option as described in Section 3.6: Language properties in Word files.

Hotkeys no longer work

Problem:

Certain commands (Ctrl+C, Alt+T etc.) no longer work.

Remedy:

As a result of assigning a different keyboard layout, the keyboard shortcuts have changed for certain commands. Use the mouse while you are working with the other keyboard layout.

Individual texts not working

Problem:

In some cases the finished text files do not work in the SINUMERIK Runtime system.
Individual texts or lines of text are obviously not being read correctly.

Remedy:

Check the formal text criteria:

Are all of the characters which have a functional significance correctly encoded?

- If inverted commas are a requirement, check whether Word has converted the straight inverted commas (ASCII characters) that were entered into typographic quotation marks. Some disruptive Word options are listed in Section 3.1: Special characters of various language families.
- If the texts in question are East Asian texts, check the coding of the non-Asian characters, see Section 3.9: Special requirements for East Asian texts.
If full-width characters have been used for functional characters, replace them with the corresponding ASCII variants.

Yen character (Japanese) or Won character (Korean) in the text**Problem:**

The translator has obviously used a Yen character ¥ or a Won character ₩ wherever you would expect a backslash "\".

Remedy:

This is not necessarily a mistake.

Instead, this has historic reasons. For many years the Yen character has been used in Japan and the Won character in Korea in place of the backslash character. This representation was kept once the PC users in those countries had got used to using this representation in path names (where you would otherwise expect the backslash character). However, internally this is still the backslash character. In the fonts "MS Gothic" (Japanese) and "Batang" (Korean) the backslash symbol is represented as a currency character.

However, it is also possible that the Yen character (Unicode U+00A5) or Won character (Unicode U+20A9) was actually entered instead of the backslash character (Unicode U+005C).

To check this, reformat the text in Word using a different font, e.g. "Courier New". If you see the backslash character in its normal representation then everything is in order.

However, if you can still see the currency symbol or a symbol which is not a valid symbol then you should correct the character and replace it with a backslash. Afterwards revert back to the normal font (MS Gothic or Batang).



5

5 References

5.1	References for text creation.....	TX2/5-48

5.1 References for text creation

For further information about creating texts, please refer to:

Book: *Developing International Software, Second Edition*

Microsoft Press, October 2002, ISBN 0-7356-1583-7

<http://www.microsoft.com/MSPress/books/authors/auth5717.asp>

Online version:

http://www.microsoft.com/globaldev/getwr/dis_v2/default.mspx

1st edition (*Developing International Software For Windows 95 and Windows NT*):

http://www.microsoft.com/globaldev/dis_v1/disv1.asp

Overview tables of the Microsoft code pages

<http://www.microsoft.com/globaldev/reference/WinCP.mspx>

Pictures of the keyboard layouts in Microsoft can be found at the following address:

<http://www.microsoft.com/globaldev/reference/keyboards.aspx>

For printing:

http://www.microsoft.com/globaldev/dis_v1/disv1.asp?DID=dis45d&File=S25B8.asp

Microsoft Global Software Development

Detailed explanations on various aspects of international software

<http://www.microsoft.com/globaldev>

Unicode

Tables, definitions, standards and tools

<http://www.unicode.org>



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A Appendix

A.1 References

General Documentation

/BU/	SINUMERIK & SIMODRIVE, Automation Systems for Machine Tools Catalog NC 60 Order number: E86060-K4460-A101-B1-7600
/IKPI/	Industrial Communication and Field Devices Catalog IK PI Order number: E86060-K6710-A101-B2-7600
/ST7/	SIMATIC Products for Totally Integrated Automation and Micro Automation Catalog ST 70 Order number: E86060-K4670-A111-A8-7600
/ZI/	MOTION-CONNECT Connections & System Components for SIMATIC, SINUMERIK, MASTERDRIVES, and SIMOTION Catalog NC Z Order number: E86060-K4490-A001-B1-7600

Electronic Documentation

/CD1/	The SINUMERIK System DOC ON CD (includes all SINUMERIK 840D/840Di/810D/802- and SIMODRIVE publications) Order number: 6FC5298-7CA00-0BG0	(09.04 Edition)

User Documentation

/AUK/	SINUMERIK 840D/810D Short Guide AutoTurn Operation Order number: 6FC5298-4AA30-0BP2	(09.99 Edition)
/AUP/	SINUMERIK 840D/810D Operator's Guide AutoTurn Graphic Programming System Programming / Setup Order number: 6FC5298-4AA40-0BP3	(02.02 Edition)
/BA/	SINUMERIK 840D/810D Operator's Guide MMC Order number: 6FC5298-6AA00-0BP0	(10.00 Edition)
/BAD/	SINUMERIK 840D/840Di/810D Operator's Guide HMI Advanced Order number: 6FC5298-6AF00-0BP3	(03.04 Edition)
/BAH/	SINUMERIK 840D/840Di/810D Operator's Guide HT 6 Order number: 6FC5298-0AD60-0BP3	(03.04 Edition)
/BAK/	SINUMERIK 840D/840Di/810D Short Guide Operation Order number: 6FC5298-6AA10-0BP0	(02.01 Edition)
/BAM/	SINUMERIK 810D/840D Operation/Programming ManualTurn Order number: 6FC5298-6AD00-0BP0	(08.02 Edition)
/BAS/	SINUMERIK 840D/840Di/810D Operation/Programming ShopMill Order number: 6FC5298-6AD10-0BP2	(11.03 Edition)
/BAT/	SINUMERIK 840D/810D Operation/Programming ShopTurn Order number: 6FC5298-6AD50-0BP2	(06.03 Edition)
/BEM/	SINUMERIK 840D/810D Operator's Guide HMI Embedded Order number: 6FC5298-6AC00-0BP3	(03.04 Edition)
/BNM/	SINUMERIK 840D/840Di/810D User's Guide Measuring Cycles Order number: 6FC5298-6AA70-0BP3	(03.04 Edition)
/BTDI/	SINUMERIK 840D/840Di/810D Motion Control Information System (MCIS) User's Guide Tool Data Information Order number: 6FC5297-6AE01-0BP1	(06.04 Edition)

/CAD/	SINUMERIK 840D/840Di/810D Operator's Guide CAD-Reader Order number: (part of the online help)	(03.02 Edition)
/DA/	SINUMERIK 840D/840Di/810D Diagnostics Guide Order number: 6FC5298-7AA20-0BP0	(03.04 Edition)
Manufacturer/Service Documentation		
a) Lists		
/LIS/	SINUMERIK 840D/840Di/810D SIMODRIVE 611D Lists Order number: 6FC5297-7AB70-0BP0	(03.04 Edition)
b) Hardware		
/ASAL/	SIMODRIVE 611, MASTERDRIVES VC/MC Planning Guide General Section for AC Induction Motors Order number: 6SN1197-0AC62-0BP0	(10.03 Edition)
/APH2/	SIMODRIVE 611 Planning Guide AC Induction Motors 1PH2 Order number: 6SN1197-0AC63-0BP0	(10.03 Edition)
/APH4/	SIMODRIVE 611 Planning Guide AC Induction Motors 1PH4 Order number: 6SN1197-0AC64-0BP0	(10.03 Edition)
/APH7S/	SIMODRIVE 611 Planning Guide Induction Motors 1PH7 Order number: 6SN1197-0AC66-0BP0	(03.04 Edition)
/APH7M/	MASTERDRIVES MC Planning Guide AC Induction Motors 1PH7 Order number: 6SN1197-0AC65-0BP0	(04.04 Edition)
/APL6/	MASTERDRIVES VC/MC Planning Guide Induction Motors 1PL6 Order number: 6SN1197-0AC63-0BP0	(03.04 Edition)
/BH/	SINUMERIK 840D/840Di/810D Operator Components Manual Order number: 6FC5297-6AA50-0BP3	(11.03 Edition)
/BHA/	SIMODRIVE Sensor User's Guide (HW) Absolute Position Sensor with Profibus-DP Order number: 6SN1197-0AB10-0YP2	(03.03 Edition)

/EMV/	SINUMERIK, SIROTEC, SIMODRIVE, SIMOTION (03.04 Edition) Planning Guide EMC Installation Guideline Order number: 6FC5297-0AD30-0BP2
	The current Declaration of Conformity is available under the following Internet address: http://www4.ad.siemens.de
	Please enter the ID No.: 15257461 in the "Find"/"Search" field (upper right) and click "go".
/GHA/	SINUMERIK/ SIMOTION (02.03 Edition) ADI4 - Analog Drive Interface for 4 Axes Manual Order number: 6FC5297-0BA01-0BP1
/PFK6/	SIMODRIVE 611, MASTERDRIVES MC (05.03 Edition) Planning Guide Synchronous Servomotors 1FK6 Order number: 6SN1197-0AD05-0BP0
/PFK7/	SIMODRIVE 611, MASTERDRIVES MC (01.03 Edition) Planning Guide Synchronous Servomotors 1FK7 Order number: 6SN1197-0AD06-0BP0
/PFS6/	MASTERDRIVES MC (07.03 Edition) Planning Guide Synchronous Servomotors 1FS6 Order number: 6SN1197-0AD08-0BP0
/PFT5/	SIMODRIVE 611 (05.03 Edition) Planning Guide Synchronous Servomotors 1FT5 Order number: 6SN1197-0AD01-0BP0
/PFT6/	SIMODRIVE 611, MASTERDRIVES MC (01.04 Edition) Planning Guide Synchronous Servomotors 1FT6 Order number: 6SN1197-0AD02-0BP0
/PFU/	SINAMICS, MASTERDRIVES (09.03 Edition) MICROMASTER SIEMOSYN Motors 1FU8 Order number: 6SN1197-0AC80-0BP0
/PHC/	SINUMERIK 810D (11.02 Edition) Configuring Manual CCU (HW) Order number: 6FC5297-6AD10-0BP1
/PHD/	SINUMERIK 840D (11.03 Edition) Configuring Manual NCU (HW) Order number: 6FC5297-6AC10-0BP3
/PJAL/	SIMODRIVE 611, MASTERDRIVES MC (01.04 Edition) Planning Guide Synchronous Servo Motors General Section for 1FT / 1FK Motors Order number: 6SN1197-0AD07-0BP1

/PJAS/	SIMODRIVE 611, MASTERDRIVES VC/MC Planning Guide for AC Induction Motors Content: General Section, 1PH2, 1PH4, 1PH7, 1PL6 Order number: 6SN1197-0AC61-0BP0	(06.04 Edition)
/PJFE/	SIMODRIVE Planning Guide Synchronous Built-In Motors 1FE1 Three-Phase AC Motors for Main Spindle Drives Order number: 6SN1197-0AC00-0BP5	(03.04 Edition)
/PJF1/	SIMODRIVE Installation Guide Built-In Synchronous Motors 1FE1 051.-1FE1 147. Three-Phase AC Motors for Main Spindle Drives Order number: 610.43000.02	(12.02 Edition)
/PJLM/	SIMODRIVE Planning Guide Linear Motors 1FN1, 1FN3 ALL General Information on the Linear Motor 1FN1 Three-Phase AC Linear Motor 1FN1 1FN3 Three-Phase AC Linear Motor 1FN3 CON Connections Order number: 6SN1197-0AB70-0BP4	(06.02 Edition)
/PJM2/	SIMODRIVE 611, MASTERDRIVES MC Planning Guide for Synchronous Servo Motors Content: General Section, 1FT5, 1FT6, 1FK6, 1FK7, 1FS6 Order number: 6SN1197-0AC20-0BP0	(03.04 Edition)
/PJTM/	SIMODRIVE Planning Guide Integrated Torque Motors 1FW6 Order number: 6SN1197-0AD00-0BP1	(05.03 Edition)
/PJU/	SIMODRIVE 611 Planning Guide Inverters Order number: 6SN1197-0AA00-0BP6	(02.03 Edition)
/PKTM/	MASTERDRIVES Planning Guide Complete Torque Motors 1FW3 Order number: 6SN1197-0AC70-0BP0	(03.04 Edition)
/PMH/	SIMODRIVE Sensor Planning/Installation Guide Hollow-Shaft Measuring System SIMAG H Order number: 6SN1197-0AB30-0BP1	(07.02 Edition)
/PMH2/	SIMODRIVE Sensor Configuring/Installation Guide Hollow-Shaft Measuring System SIMAG H2 Order number: 6SN1197-0AB31-0BP0	(03.04 Edition)
/PMHS/	SIMODRIVE Installation Guide Measuring System for Main Spindle Drives SIZAG2 Toothed-Wheel Encoder Order number: 6SN1197-0AB00-0YP3	(12.00 Edition)

/PMS/ SIMODRIVE (03.04 Edition)
Planning Guide
ECO Motor Spindle for Main Spindle Drives 2SP1
Order number: 6SN1197-0AD04-0BP1

/PPH/ SIMODRIVE (12.01 Edition)
Planning Guide **1PH2/1PH4/1PH7 Motors**
AC Induction Motors for Main Spindle Drives
Order number: 6SN1197-0AC60-0BP0

/PPM/ SIMODRIVE (11.01 Edition)
Planning Guide
Hollow-Shaft Motors for Main Spindle Drives **1PM4 and 1PM6**
Order number: 6SN1197-0AD03-0BP0

c) Software
/FB1/

SINUMERIK 840D/840Di/810D/FM-NC (03.04 Edition)
Description of Functions **Basic Machine (Part 1)**
(the various sections are listed below)
Order number: 6FC5297-7AC20-0BP0

A2	Various Interface Signals
A3	Axis Monitoring, Protection Zones
B1	Continuous Path Mode, Exact Stop and Look Ahead
B2	Acceleration
D1	Diagnostic Tools
D2	Interactive Programming
F1	Travel to Fixed Stop
G2	Velocities, Setpoint/Actual Value Systems, Closed-Loop Control
H2	Output of Auxiliary Functions to PLC
K1	Mode Group, Channels, Program Operation Mode
K2	Axis Types, Coordinate Systems, Frames, Actual-Value System for Workpiece, External Zero Offset
K4	Communication
N2	EMERGENCY STOP
P1	Transverse Axes
P3	Basic PLC Program
R1	Reference Point Approach
S1	Spindles
V1	Feeds
W1	Tool Compensation

/FB2/

SINUMERIK 840D/840Di/810D

(03.04 Edition)

Description of Functions **Extended Functions (Part 2)**

including FM-NC: Turning, Stepping Motor
(the various sections are listed below)

Order number: 6FC5297-7AC30-0BP0

A4	Digital and Analog NCK I/Os
B3	Several Operator Panels and NCUs
B4	Operation via PG/PC
F3	Remote Diagnosis
H1	Jog with/without Handwheel
K3	Compensations
K5	Mode Groups, Channels, Axis Replacement
M1	Kinematic Transformation
M5	Measurement
N3	Software Cams, Position Switching Signals
N4	Punching and Nibbling
P2	Positioning Axes
P5	Oscillation
R2	Rotary Axes
S3	Synchronous Spindles
S5	Synchronized Actions (SW3 and lower, higher /FBSY/)
S6	Stepper Motor Control
S7	Memory Configuration
T1	Indexing Axes
W3	Tool Change
W4	Grinding

/FB3/

SINUMERIK 840D/840Di/810D

(03.04 Edition)

Description of Functions **Special Functions (Part 3)**

(the various sections are listed below)

Order number: 6FC5297-7AC80-0BP0

F2	3-Axis to 5-Axis Transformation
G1	Gantry Axes
G3	Cycle Times
K6	Contour Tunnel Monitoring
M3	Coupled Motion and Leading Value Coupling
S8	Constant Workpiece Speed for Centerless Grinding
S9	Setpoint Exchange
T3	Tangential Control
TE0	Installation and Activation of Compile Cycles
TE1	Clearance Control
TE2	Analog Axis
TE3	Master-Slave for Drives
TE4	Transformation Package Handling
TE5	Setpoint Exchange
TE6	MCS Coupling
TE7	Retrace Support
TE8	Path-Synchronous Switch Signal
V2	Preprocessing
W5	3D Tool Radius Compensation

/FBA/	SIMODRIVE 611D/SINUMERIK 840D/810D (03.04 Edition) Description of Functions Drive Functions (the various sections are listed below) Order number: 6SN1197-0AA80-1BP1 DB1 Operation Messages/Alarm Reactions DD1 Diagnostic Functions DD2 Speed Control Loop DE1 Extended Drive Functions DF1 Enable Commands DG1 Encoder Parameterization DL1 Linear Motor MD DM1 Calculation of Motor/Power Section Parameters and Controller Data DS1 Current Control Loop DÜ1 Monitors/Limitations
/FBAN/	SINUMERIK 840D/SIMODRIVE 611 DIGITAL (02.00 Edition) Description of Functions ANA MODULE Order number: 6SN1197-0AB80-0BP0
/FBD/	SINUMERIK 840D (07.99 Edition) Description of Functions Digitizing Order number: 6FC5297-4AC50-0BP0 DI1 Start-Up DI2 Scanning with Tactile Sensors (scancad scan) DI3 Scanning with Lasers (scancad laser) DI4 Milling Program Generation (scancad mill)
/FBDM/	SINUMERIK 840D/840Di/810D (09.03 Edition) Description of Functions NC Program Management DNC Machines Order number: 6FC5297-1AE81-0BP0
/FBDN/	SINUMERIK 840D/840Di/810D (03.03 Edition) Motion Control Information System (MCIS) Description of Functions DNC NC Program Management Order number: 6FC5297-1AE80-0BP0 DN1 DNC Plant / DNC Cell DN2 DNC IFC SINUMERIK
/FBFA/	SINUMERIK 840D/840Di/810D (11.02 Edition) Description of Functions ISO Dialects for SINUMERIK Order number: 6FC5297-6AE10-0BP3
/FBFE/	SINUMERIK 840D/810D (03.04 Edition) Motion Control Information System (MCIS) Description of Functions Remote Diagnosis Order number: 6FC5297-0AF00-0BP3 FE1 Remote Diagnosis (ReachOut) FE3 RCS Host / RCS Viewer (pcAnywhere)

/FBH/	SINUMERIK 840D/840Di/810D HMI Configuration Package Order number: (supplied with the software)	(11.02 Edition)
	Part 1 User's Guide Part 2 Description of Functions	
/FBH1/	SINUMERIK 840D/840Di/810D HMI Configuration Package ProTool/Pro Option SINUMERIK Order number: (supplied with the software)	(03.03 Edition)
/FBHL/	SINUMERIK 840D/SIMODRIVE 611 digital Description of Functions HLA Module Order number: 6SN1197-0AB60-0BP3	(10.03 Edition)
/FBIC/	SINUMERIK 840D/840Di/810D Motion Control Information System (MCIS) Description of Functions TDI Ident Connection Order number: 6FC5297-1AE60-0BP0	(06.03 Edition)
/FBMA/	SINUMERIK 840D/810D Description of Functions ManualTurn Order number: 6FC5297-6AD50-0BP0	(08.02 Edition)
/FBO/	SINUMERIK 840D/810D Description of Functions Configuring OP 030 Operator Interface (the various sections are listed below) Order number: 6FC5297-6AC40-0BP0 BA Operator's Guide EU Development Environment (Configuring Package) PSE Introduction to Configuring of Operator Interface (IK Screen Kit: Software Update and Configuration)	(09.01 Edition)
/FBP/	SINUMERIK 840D Description of Functions C-PLC Programming Order number: 6FC5297-3AB60-0BP0	(03.96 Edition)
/FBR/	SINUMERIK 840D/840Di/810D Description of Functions RPC SINUMERIK Computer Link Order number: 6FC5297-6AD61-0BP0 NFL Host Computer Interface NPL PLC/NCK Interface	(01.04 Edition)
/FBSI/	SINUMERIK 840D/SIMODRIVE Description of Functions SINUMERIK Safety Integrated Order number: 6FC5297-6AB80-0BP2	(11.03 Edition)
/FBSP/	SINUMERIK 840D/840Di/810D Description of Functions ShopMill Order number: 6FC5297-6AD80-0BP2	(11.03 Edition)

/FBST/	SIMATIC Description of Functions FM STEPDRIVE/SIMOSTEP Order number: 6SN1197-0AA70-0YP4	(01.01 Edition)
/FBSY/	SINUMERIK 840D/810D Description of Functions Synchronized Actions Order number: 6FC5297-7AD40-0BP2	(03.04 Edition)
/FBT/	SINUMERIK 840D/810D Description of Functions ShopTurn Order number: 6FC5297-6AD70-0BP2	(03.04 Edition)
/FBTC/	SINUMERIK 840D/810D IT Solutions Description of Functions Tool Data Communication SinTDC Order number: 6FC5297-5AF30-0BP0	(01.02 Edition)
/FBTD/	SINUMERIK 840D/810D IT Solutions Description of Functions Tool Information Systems (SinTDI) with Online Help Order number: 6FC5297-6AE00-0BP0	(02.01 Edition)
/FBTP/	SINUMERIK 840D/840Di/810D Motion Control Information System (MCIS) Description of Functions TPM Total Productive Maintenance Order No.: Document is supplied with the software	(01.03 Edition)
/FBU/	SIMODRIVE 611 universal/universal E Description of Functions Closed-Loop Control Component for Speed Control and Positioning Order number: 6SN1197-0AB20-0BP0	(06.04 Edition)
/FBU2/	SIMODRIVE 611 universal Installation Guide (included with every SIMODRIVE 611)	(04.02 Edition)
/FBW/	SINUMERIK 840D/810D Description of Functions Tool Management Order number: 6FC5297-6AC60-0BP1	(11.02 Edition)
/HBA/	SINUMERIK 840D/840Di/810D Manual @Event Order number: 6AU1900-0CL20-0BA0	(03.02 Edition)
/HBI/	SINUMERIK 840Di Manual SINUMERIK 840Di Order number: 6FC5297-7AE60-0BP0	(03.04 Edition)

/INC/	SINUMERIK 840D/840Di/810D System Description Commissioning Tool SINUMERIK SinuCOM NC Order No.: (an integral part of the online help for the start-up tool)	(06.03 Edition)
/PJE/	SINUMERIK 840D/810D Description of Functions Configuring Package HMI Embedded Software Update, Configuration, Installation Order number: 6FC5297-6EA10-0BP0	(08.01 Edition)
/PS/	SINUMERIK 840D/810D Planning Guide Configuring Syntax This publication is included with the software and available as a pdf file	(09.03 Edition)
/POS1/	SIMODRIVE POSMO A User's Guide Distributed Positioning Motor on PROFIBUS DP Order number: 6SN2197-0AA00-0BP6	(08.03 Edition)
/POS2/	SIMODRIVE POSMO A Installation Guide (enclosed with POSMO A)	(08.03 Edition)
/POS3/	SIMODRIVE POSMO SI/CD/CA User's Guide Distributed Servo Drive Systems Order number: 6SN2197-0AA20-0BP6	(06.04 Edition)
/POS4/	SIMODRIVE POSMO SI Installation Guide (enclosed with POSMO SI)	(08.03 Edition)
/POS5/	SIMODRIVE POSMO CD/CA Installation Guide (enclosed with POSMO CD/CA)	(08.03 Edition)
/S7H/	SIMATIC S7-300 Installation Manual Technological Functions Order number: 6ES7398-8AA03-8BA0 - Reference Manual: CPU Data (Hardware) - Reference Manual: Module Data	(2002 Edition)
/S7HT/	SIMATIC S7-300 Manual STEP 7, Fundamentals, V. 3.1 Order number: 6ES7810-4CA02-8BA0	(03.97 Edition)
/S7HR/	SIMATIC S7-300 Manual STEP 7, Reference Manuals, V. 3.1 Order number: 6ES7810-4CA02-8BR0	(03.97 Edition)
/S7S/	SIMATIC S7-300 FM 353 for Stepper Drive Positioning Module Order together with configuring package	(04.02 Edition)
/S7L/	SIMATIC S7-300 FM 354 for Servo Drive Positioning Module Order together with configuring package	(04.02 Edition)

/S7M/	SIMATIC S7-300 FM 357.2 Multimodule for Servo and Stepper Drives Order together with configuring package	(01.03 Edition)
/SP/	SIMODRIVE 611-A/611-D SimoPro 3.1 Program for Configuring Machine-Tool Drives Order number: 6SC6111-6PC00-0BA□ Order from: WK Fürth	
d) Installation & start-up		
/BS/	SIMODRIVE 611 analog Description Start-Up Software for Main Spindle and Asynchronous Motor Modules Version 3.20 Order number: 6SN1197-0AA30-0BP1	(10.00 Edition)
/IAA/	SIMODRIVE 611A Installation and Start-Up Guide Order number: 6SN1197-0AA60-0BP6	(10.00 Edition)
/IAC/	SINUMERIK 810D Installation and Start-Up Guide (including description of SIMODRIVE 611D start-up software) Order number: 6FC5297-6AD20-0BP1	(11.02 Edition)
/IAD/	SINUMERIK 840D/SIMODRIVE 611D Installation and Start-Up Guide (including description of SIMODRIVE 611D start-up software) Order number: 6FC5297-7AB10-0BP0	(03.04 Edition)
/IAM/	SINUMERIK 840D/840Di/810D Installation and Start-Up Guide HMI Order number: 6FC5297-6AE20-0BP3 AE1 Updates/Supplements BE1 Expanding the Operator Interface HE1 Online Help IM2 Start-Up HMI Embedded IM4 Start-Up HMI Advanced TX1 Creating Foreign Language Texts with Windows 95 / NT TX2 Creating Foreign Language Texts with Windows 2000 / XP	(03.04 Edition)



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To
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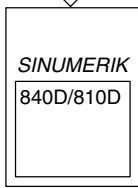
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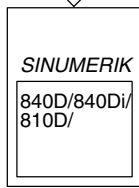
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Overview of SINUMERIK 840D/840Di/810D Documentation (04.2004)

General Documentation



Brochure

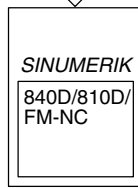


Catalog
Ordering Info.
NC 60 *)

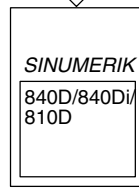


Safety Integrated
Application
Manual

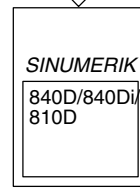
User Documentation



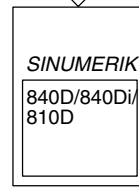
AutoTurn
– Short Guide
– Programming/
Setup



Operator's Guide
– HT 6

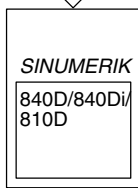


Diagnostics
Guide *)

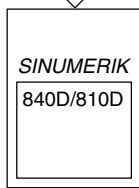


Operator's Guide *)
– Short Guide
– HMI Embedded
– HMI Advanced

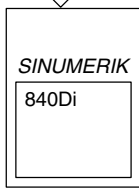
User Documentation



Programming Guide
– Short Guide
– Fundamentals *)
– Advanced *)
– Cycles
– Measuring Cycles
– ISO Turning/Milling
– Lists **System Variables**

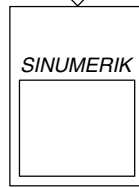


Operator's Guide
– **ManualTurn**
– Short Guide ManualTurn
– **ShopMill**
– Short Guide ShopMill
– **ShopTurn**
– Short Guide ShopTurn



System Overview

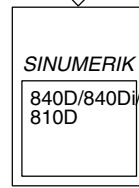
Manufacturer/Service Documentation



Configuring
(HW) *)
– 810D
– 840D

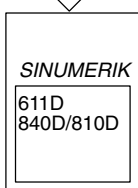


Operator
Components
(HW) *)



Description of Functions
– **ManualTurn**
– **ShopMill**
– **ShopTurn**

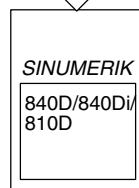
Manufacturer/Service Documentation



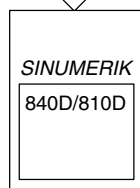
Description of Functions
Synchronized
Actions



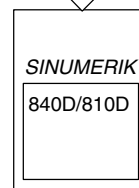
Description of Functions
Drive Functions *)



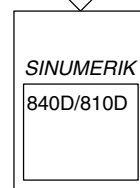
Description of Functions
– Basic Machine *)
– Extended Functions
– Special Functions



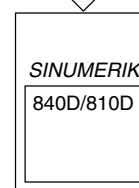
Description of Functions
Tool Management



Configuring Kit
HMI Embedded



Description of Functions
Operator Interface
OP 030

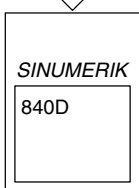


MCIS
– Computer Link
– Tool Data Inform. Syst.
– NC Data Management
– NC Data Transfer
– Tool Data Communication

Manufacturer/Service Documentation



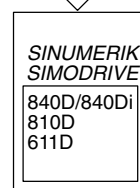
Description of Functions
SINUMERIK
Safety Integrated



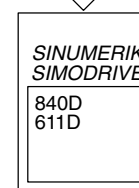
Description of Functions
Digitizing



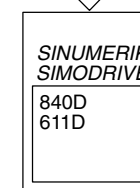
Installation & Start-Up
Guide *)
– 810D
– 840D/611D
– HMI



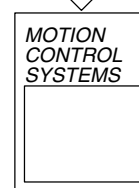
– Lists *)



Description of Functions
Linear Motor

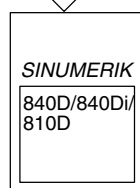


Description of Functions
– **Hydraulics Module**
– **Analog Module**



EMC
Guidelines

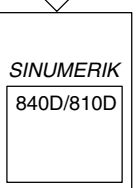
Manufacturer/Service Documentation



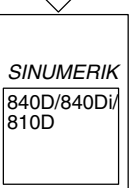
Description of Functions
ISO Dialects for
SINUMERIK



Manual
(HW + Installation
and Start-Up)

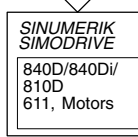


Description of Functions
Remote Diagnosis



Manual
@ Event

Electronic Documentation



DOC ON CD *)
The SINUMERIK System

*) These documents are a minimum requirement

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