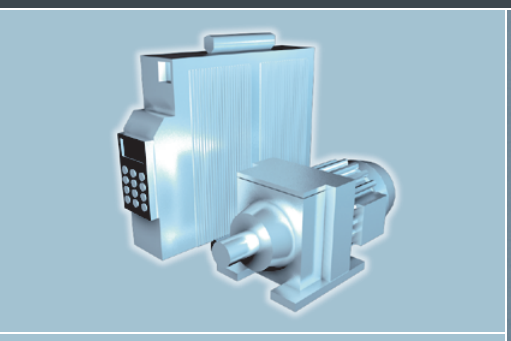
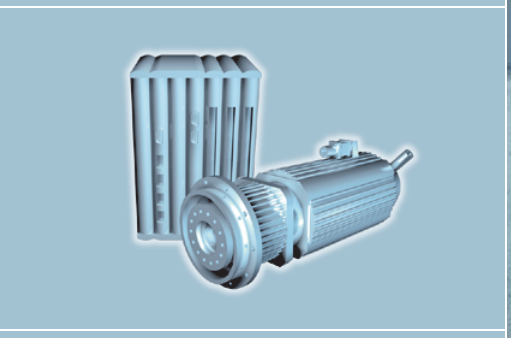
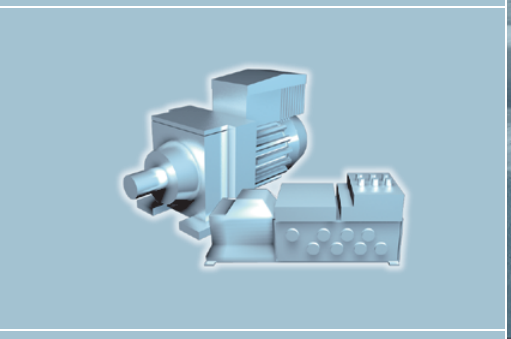
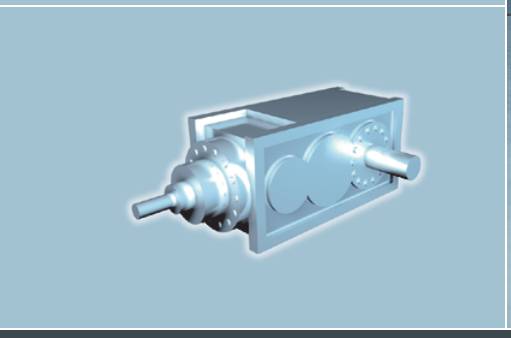
SEW EURODRIVE









DOP11A Operator Terminals

EE410000

Edition 05/2006

11424214 / EN

System Manual

SEW EURODRIVE

1 Important Notes

1.1 Safety and warning instructions

Always observe the safety and warning instructions in this documentation.

Hazard

Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

Warning

Indicates an imminently hazardous situation caused by the product which, if not avoided, WILL result in death or serious injury. You will also find this signal to indicate the potential for damage to property.

Caution

Indicates a potentially hazardous situation which, if not avoided, MAY result in minor injury or damage to products.

Note

Indicates a reference to applications, for example for startup, or other useful information.

Documentation reference

Indicates a reference to a document, such as operating instructions, catalog or a data sheet.

You must adhere to the operating instructions to ensure:

- Fault-free operation
- Fulfillment of any rights to claim under limited warranty

Consequently, read the operating instructions before you start working with the unit!

The operating instructions contain important information on servicing. Therefore, keep the operating instructions close to the unit.

1.2 Notes on terminology

The operator terminals of the DOP11A series (Drive Operator Panel) can communicate with SEW frequency inverters and selected programmable logic controllers (PLC) via different communication paths at the same time.

For simplicity sake, we will be referring to **both units (PLC and inverter)** as **controller** in this document.

1.3 Designated use

The operator terminals of the DOP11A series are units for operation and diagnostics of industrial and commercial systems.

Do not start up the unit (take it into operation in the designated fashion) until you have established that the machine complies with the EMC Directive 89/336/EEC and that the conformity of the end product has been determined in accordance with the Machinery Directive 98/37/EC (with reference to EN 60204).

1.4 Operational environment

The following uses are prohibited unless the units are expressly designed for the purpose:

- Use in potentially explosive areas.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc. You will find a list of the approved materials in the appendix.
- Use in non-stationary applications that are subject to mechanical vibration and shock loads in excess of the requirements in EN 50178.

1.5 Safety functions

The operator terminals of the DOP11A series may not execute any safety functions without master safety systems.

Use higher-level safety systems to ensure protection of equipment and personnel.

1.6 Liability for defects

Incorrect handling or any action performed that is not specified in these operating instructions could impair the properties of the product. In this case, you lose any right to claim under limited warranty against SEW-EURODRIVE GmbH & Co KG.

1.7 Product names and trademarks

The brands and product names in these operating instructions are trademarks or registered trademarks of the titleholders.

1.8 Disassembly and waste disposal

- Complete or partial recycling of the operator terminal is subject to local regulations.
- Note that the following components contain substances that may represent a health hazard and cause environmental pollution: Lithium battery, electrolyte condensers and display.

2 Safety Notes

2.1 General information

- Read the safety notes carefully.
- Check the delivery for transport damage. If damage is found, advise your supplier.
- The terminal fulfills the requirements of article 4 of EMC directive 89/336/EEC.
- Do not use the terminal in an environment with high explosive hazard.
- SEW-EURODRIVE is not liable for modifications, changes, additions and / or alterations to the product.
- Use only spare parts and accessories manufactured according to SEW-EURODRIVE specifications.
- Read the installation and operating instructions completely and carefully prior to installation, use or repair of the terminal.
- Never allow fluids to penetrate the slots or holes in the terminal. This may lead to a fire or cause the equipment to become live.
- Operation of the terminal is restricted to qualified personnel.

2.2 Installation and startup

- The terminal has been designed for stationary installation.
- Place the terminal on a stable base during installation. The terminal may be damaged if it is dropped.
- Install the terminal according to the accompanying installation instructions.
- The unit must be grounded according to the accompanying installation instructions.
- The installation must be performed by qualified personnel.
- Route high-voltage cables, signal cables and supply cables separately from one another.
- Make sure that the voltage and polarity of the electrical power source are correct before you connect the terminal to the power supply.
- The openings in the housing are designed to allow air to circulate and must not be covered over.
- Do not install the terminal in locations where it will be exposed to a powerful magnetic field.
- **Do not install or operate the terminal where it will be exposed to direct sunlight.**
- The peripheral equipment must be suitable for the application.
- On certain terminal models, the display glass is covered with a laminated foil to protect it from scratches. Pull off the foil carefully following installation to prevent static electricity causing damage to the terminal.

- Make sure that **preventive measures** and **protection devices** correspond to the **applicable regulations** (e. g. EN 60204 or EN 50178).

  Required preventive measures: Ground the unit

  Required protection devices: Overcurrent protective devices

2.3 Transportation/storage

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. Do not operate the operator terminal if it is damaged.

Use suitable, sufficiently rated handling equipment if necessary.

Possible damage caused by incorrect storage!

Store the operator terminal in a dry, dust-free room if it is not to be installed straight away.

2.4 Operating notes

- Always keep the terminal clean.
- **Emergency stop and other safety functions should not be controlled from the terminal.**
- Do not touch the keys, displays, etc. with sharp objects.
- Bear in mind that the terminal is ready to operate even if the backlighting no longer functions. This means keyboard and touchscreen inputs will still be registered.

2.5 Service and maintenance

- The agreed limited warranty applies.
- Clean the display and face of the terminal with a soft cloth and mild detergent.
- Repairs must be performed by qualified personnel.

3 Unit Information, Installation and Hardware

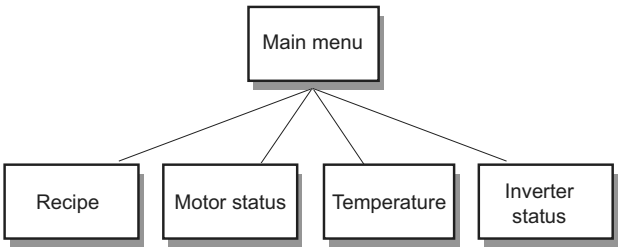
3.1 Introduction

Requirements in modern industrial environments are steadily increasing and operator tasks at machines or on production lines are becoming increasingly more complex and involve more responsibility. The operator must be able to obtain information on the current status quickly and easily, and be able to influence the operation of the machine immediately. The functions in control systems are also increasing and becoming more advanced, enabling more complicated processes to be controlled efficiently. The operator terminals make human-machine communication simple and safe even for the most advanced processes.

The graphical operator terminals have been developed to meet the requirements for human-machine communication when controlling or monitoring different applications in the manufacturing and process industries, etc. They simplify the operators work since they can easily be adapted to the working environment, This means the operator can continue to use the concepts her or she is familiar with.

Projects can be built up as menu hierarchies or sequences in the terminal. A menu hierarchy consists of a main menu (with, for example, an overview) and a number of underlying menus with more detailed information on special sections. The operator normally selects which menu is to be shown.

The menus in the operator terminals are called blocks.



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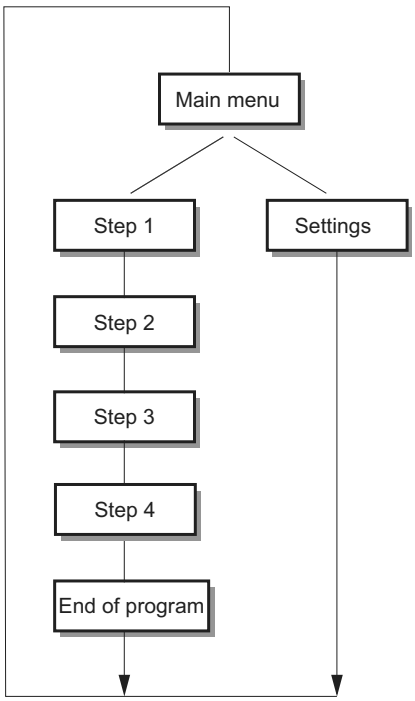
A sequence is also based on a main menu, from which the operator selects a sequence showing the blocks in a predetermined order. The program in the controller is usually used to control the block display.



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The functions of the operator terminals enable the process to be displayed as graphics or as text. There are also functions for

- Alarm handling
- Printing
- Trends
- Recipe management
- Time control

The functions are not only easy to use in the panel, they are also cost-effective in comparison with conventional solutions with buttons, indicator lamps, time relays, preset counters and seven-day clocks. There are also functions to improve the application of the drive electronics.

3.1.1 Programming

You program the operator terminal using a PC and the HMI-Builder software.

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The operator terminal is to a large extent object-oriented, i.e. an object is selected first and the function of the object is then assigned. All types of signals are defined on this principle.

The programmed project is stored in the operator terminal.

3.1.2 Connecting the terminal to SEW frequency inverters

There are many advantages in using a terminal together with the controller system:

- The user does not need to make any changes or additions in the existing controller programs
- and the terminal does not block any of the inputs or outputs in the controller system.
- Overview of controller functions will be optimized, e.g. time control and alarm handling.

3.1.3 Status display and control

The operator is familiar with indicator lamps as well as analog and digital display instruments since these are used in the majority of applications today. The same applies to push buttons and rotary and thumbwheel switches for controlling a system. The terminal enables the operator to have all status displays and controls in one unit.

The operator can easily see and influence information in the controller system. Moreover, it is possible to clearly see and influence all the signals affecting a specific object, e.g. a pump or a drive unit, which further simplifies the work.

This is possible thanks to the fact that the interchange of all information takes place through the so-called blocks in the terminal. Blocks can be text blocks, with only text information, or graphic blocks, with full graphical presentation.

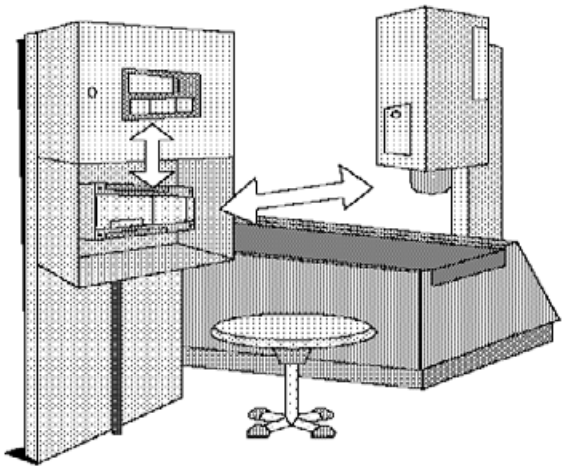
The operator terminals are equipped with function keys for direct control. Maneuvering is controlled by linking different commands to the function keys. This optimizes the control process.

If several blocks are used, the operator can jump between the different blocks by using jump commands. This creates a menu hierarchy, which produces a structured application.

3.1.4 Setting up the operator terminal

The terminal should be placed at the workplace to ensure maximum usability. This will enable the operator to receive all necessary information and work effectively. Set up the terminal at the correct height so that the user can see and operate it without problems. Visibility of the screen is influenced by distance, height, angle, light and color selection.

Monitoring, control and maintenance are remote functions and can be executed, for example, from a different location in the building or a different city. In such instances communication can take place via LAN (Local Area Network), Internet or modem. If there is a long production line with a large number of workplaces several terminals can be connected to one or more controller systems in the network.



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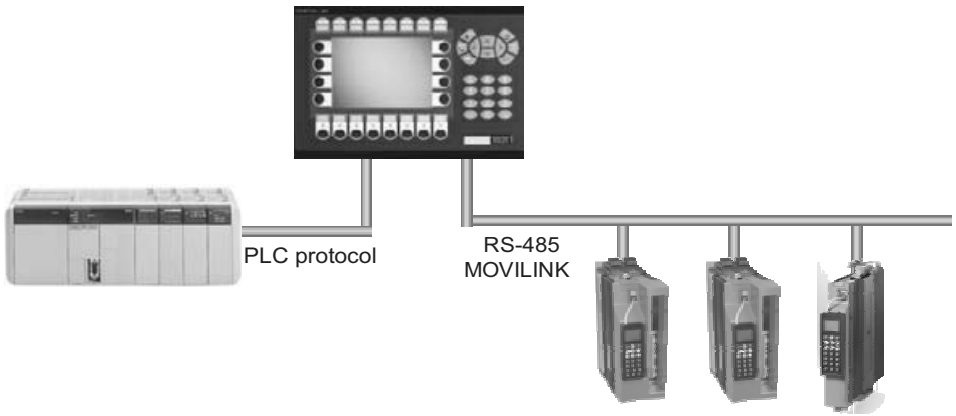
3.1.5 Compact solutions

External units such as barcode scanners, weighing machines, modems, etc. can be connected through the terminal to the controller system. All that is required is for the unit to be connected to an RS-232 interface, and that communication is made through ASCII protocol. Data entering the terminal is written directly to the controller register.

It is also possible to connect a unit working in parallel, such as an additional terminal or a PC with the MOVITOOLS® programming software for the inverter. The terminal then makes it possible to program the controller system while also communicating with the controller system.

When the PLC and the inverter are connected to one terminal (two drivers in the terminal), data can be exchanged between the two units (analog and digital signals).



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3.2 Unit designation, nameplates and scope of delivery

3.2.1 Example unit designation

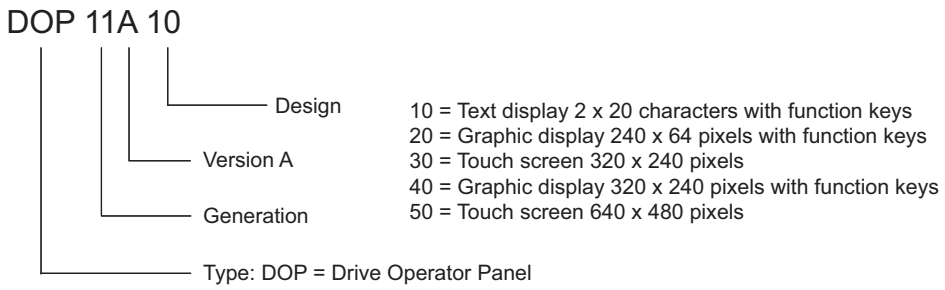

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Figure 1: Unit designation

3.2.2 Example nameplate

The unit nameplate is attached to the side of the unit.

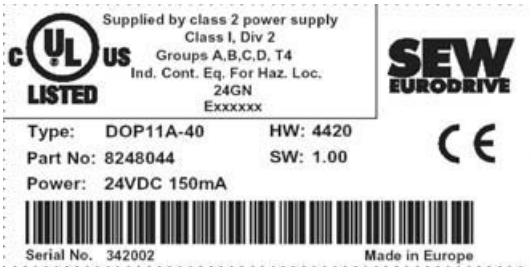

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Figure 2: Unit nameplate

3.2.3 Scope of delivery

Included in the scope of delivery:

- DOP11A operator terminals
- Installation equipment and installation template
- Operating instructions with assembly and installation notes
- Phoenix COMBICON connector for DC 24 V, 5 mm, 3-pin (exception: DOP11A-50)

3.3 DOP11A-10 unit design

Part number: 8248001

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Figure 3: DOP11A-10:

[1] Display
[2] Function keys
[3] Navigation keys
[4] Numerical keys

- 2 x 20 character LCD text display (monochrome) with background illumination
- Voltage supply: DC 24 V, 200 mA
- 3 serial interfaces (RS-232, RS-422 and RS-485); two can be used simultaneously
- IP65 membrane keypad with navigation keys, numeric keypad and 3 function keys
- 64 KByte Flash-EEPROM
- Outer dimensions 142 x 90 x 46.5 mm

3.4 DOP11A-20 unit design

Part number: 8248028

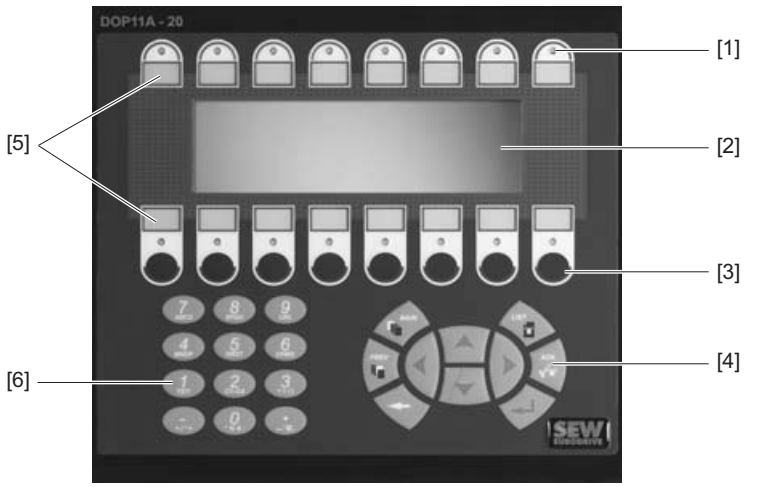

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Figure 4: DOP11A-20

[1] LEDs red / green
[2] Display
[3] Function keys
[4] Navigation keys
[5] Labeling tiles
[6] Numerical keys

- 240 x 64 pixel LCD graphic display (monochrome) with background illumination
- Voltage supply: DC 24 V, 450 mA
- Two serial interfaces (RS-232 and RS-422); two can be used simultaneously
- IP65 membrane keypad with navigation keys, numeric keypad and 8 function keys
- 16 LEDs (two colors red / green)
- 1 expansion slot
- 400 Kbytes Flash EEPROM
- Outer dimensions 214 x 194 x 75 mm

3.5 DOP11A-30 unit design

Part number: 8248036

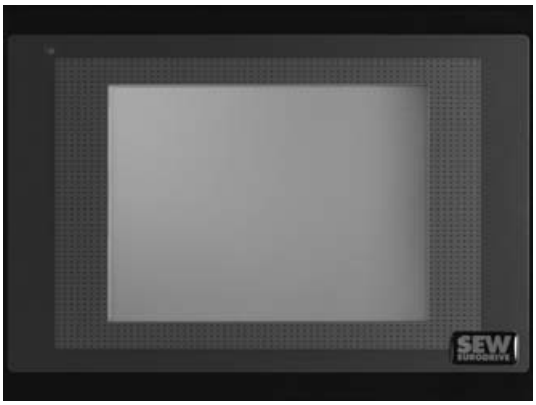

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Figure 5: DOP11A-30

- 320 x 240 pixels, ¼ VGA touch screen (256 colors, STN, 5.7") with background illumination
- Voltage supply: DC 24 V, 450 mA
- Three serial interfaces (RS-232, RS-422 and RS-485); two can be used simultaneously
- IP65
- Horizontal or vertical installation
- 1 expansion slot
- 400Kbyte Flash EEPROM
- Outer dimensions 200 x 150 x 74 mm

3.6 DOP11A-40 unit design

Part number: 8248044

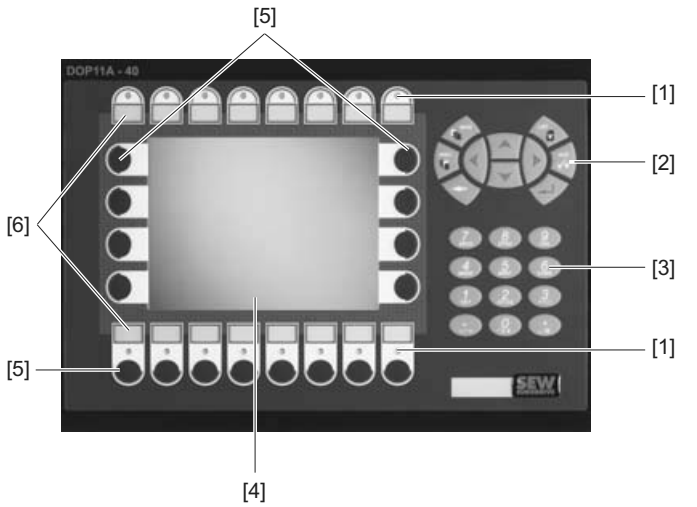

Figure 6: DOP11A-40

[1] LEDs red / green
[2] Navigation keys
[3] Numerical keys
[4] Display
[5] Function keys
[6] Labeling tiles

- 320 x 240 pixels, ¼ VGA graphic display (256 colors, STN, 5.7") with background illumination
- Voltage supply: DC 24 V, 550 mA
- Two serial interfaces (RS-232 and RS-422); two can be used simultaneously
- IP65 membrane keypad with navigation keys, numeric keypad and 16 function keys
- 16 LEDs (two colors red / green)
- 2 expansion slots
- 400 Kbytes Flash EEPROM
- Outer dimensions 276 x 194 x 92.3 mm

3.7 DOP11A-50 unit design

Part number: 8248052

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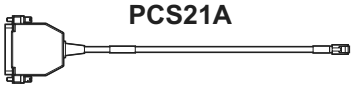
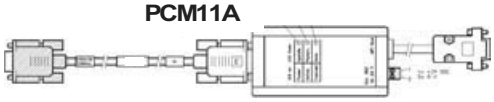
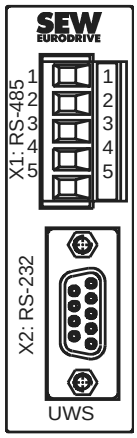
Figure 7: DOP11A-50

- 640 x 480 pixels, VGA touch screen (256 colors, 10.4") with background illumination
- Voltage supply: AC 100 ... 240 V, 350 mA
- 2 serial interfaces (RS-232 and RS-422); two can be used simultaneously
- IP65
- 2 expansion slots
- 1600Kbyte Flash EEPROM
- 290 x 247 x 114 mm

3.8 Accessories and options

Cables for programming of the DOP11A operator terminal and communication between operator terminal and MOVIDRIVE®.

PCS11A (Panel Cable Serial)	Connection cable between operator terminal (RS-232, max. 57.6 Kbit/s) and PC (RS-232) for programming the operator terminal. Set length of 3 m (10ft.). **PCS11A** 	8248087
PCS21A (Panel Cable Serial)	Communication cable between the operator terminal (RS-485, max. 57.6 Kbit/s) and SEW frequency inverters (RS-485, RJ-10). Set length of 5 m (10ft.). **PCS21A** 	18206328
PCM11A (Panel Cable MPI)	Communication cable between the operator terminal (RS-232, max. 57.6 Kbit/s) andSIMATIC S7 via MPI (max. 12 Mbit/s). Set length of 3 m (10ft.). **PCM11A** 	8248303
PCC11A (Panel Cable Converter)	Communication cable between operator terminal (RS-422, max. 57.6 Kbit/s) and UWS11A or USS21A (RS-232) interface converters. For communication with SEW frequency inverters. Set length of 3 m (10ft.). **PCC11A** 	8248095

PFE11A (ETHERNET panel fieldbus)	Option card ETHERNET TCP/IP (10 Mbit/s) To connect the DOP11A operator terminal to the customer's PC network. The following functions become available by using the ETHERNET option: • Operation of the HMI-Builder software for programming the operator terminal via ETHERNET (projects can be uploaded and downloaded more quickly). • Use of the integrated WEB server for operation and control of the operator terminal via Internet Explorer. • For operation of MOVITOOLS® via ETHERNET and using the pass-through function. Additional software is required for rerouting the PC communication port (Com 1 to Com 9) to the ETHERNET IP address of the operator terminal.		8248079
PFP11A (PROFIBUS panel fieldbus)	PROFIBUS DP interface To connect the DOP11A operator terminal to the customer's PROFIBUS fieldbus interface. The operator terminal serves as a slave in PROFIBUS and is linked to the PLC process image. • I/O range: 32 ... 200 bytes • Baud rate: 9.6 Kbit/s ... 12 Mbit/s • Identity code: 1002 PLC-independent option for data exchange between controller and operator terminal. You can communicate with the drive components at the same time via the serial interface.	PROFIBUS DP option card 	8248060
UWS11A	Interface converter for DIN rail mounting RS-232 ↔ RS-485 		822689X

4 Installation

4.1 Installation instructions for the basic unit

It is essential to comply with the safety notes in section 2 during installation.

4.1.1 Separate cable ducts

Route **power cables** and **electronics cables** in **separate cable ducts**.

4.1.2 Cross sections

- Voltage supply: **Cross section according to rated input current**.
- Electronics cables:
  - 1 conductor per terminal 0.20 ... 0.75 mm^2 (AWG 20 ... 17)
  - 2 conductors per terminal 0.20 ... 0.75 mm^2 (AWG 20 ... 17)

4.1.3 Shielding and grounding

- Use **shielded control cables** only.
- Apply the **shield by the shortest possible route and make sure it is grounded over a wide area at both ends**. You can ground one end of the shield via a suppression capacitor (220 nF / 50 V) to avoid ground loops. If using double-shielded cables, ground the outer shield on the controller end and the inner shield on the other end.

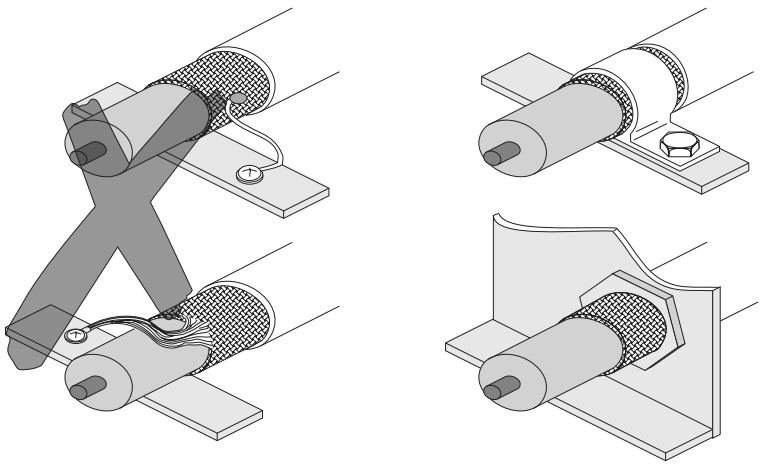


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Figure 8: Example of correct shield connection with metal clamp (shield clamp) or metal cable gland

- **Shielding** can also be achieved by laying the cables in **grounded sheet metal ducts or metal pipes**. In this case, the **power cables and control cables** should be **routed separately**.
- The unit is grounded via the connector for 24 V or 240 V voltage supply.

4.2 UL-compliant installation

Note the following points for UL-compliant installation:

Use only copper conductors with a temperature range of 60 / 75 °C as connection cables.

Electrical connection according to the methods described in class 1, paragraph 2 (article 501-4(b) according to National Electric Code NFPA70).

Only use tested units with a **limited output voltage** (V_{max} = DC 30 V) and **limited output current** (I ≤ 8 A) as an **external DC 24 V** voltage source.

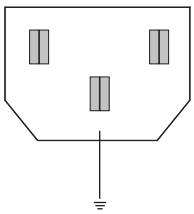
UL certification does not apply to operation in voltage supply systems with a non-grounded star point (IT systems).

4.3 Connecting basic units DOP11A-10 to DOP11A-50

4.3.1 Voltage supply

Ensure correct polarity when connecting the terminal. Incorrect polarity will damage the unit.

Make sure that the operator terminal and the controller system have the same electrical grounding (reference voltage value). Communication errors may occur if this is not the case.

DOP 11A-10, DOP11A-20 & DOP11A-40 DOP 11A-30  	DOP 11A-50 
Voltage supply for DOP11A-10 to DOP11A-40	Voltage supply DOP11A-50 (AC 100 ... 240 V)
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[1] Ground
[2] 0 V
[3] +24 V

4.4 Connection to a PC

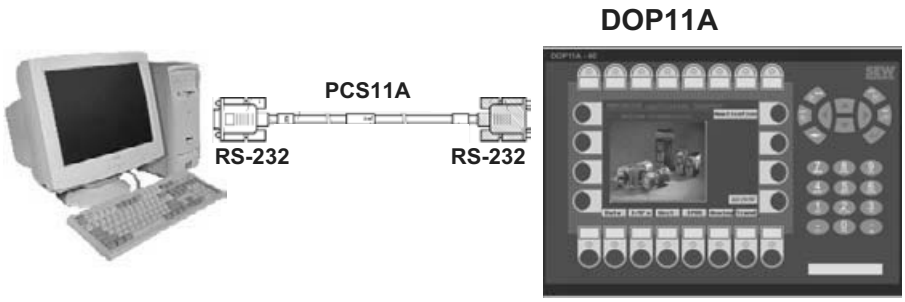

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Figure 9: Connection to a PC

The operator terminal is programmed using the HMI-Builder software.
You need the PCS11A communication cable to program the operator terminal.

The power must be switched off when connecting the units.

4.5 Connecting RS-485 (only for DOP11A-10, DOP11A-20 from HW1.10 and DOP11A-30)

You can connect up to 31 MOVIDRIVE® units to one operator terminal with the RS-485 interface.

Connecting the DOP11A unit to a MOVIDRIVE® frequency inverter directly via RS-485:

- DOP11A-10 via 25-pin Sub-D connector
- DOP11A-20 via 25-pin Sub-D connector (from HW 1.10)
- DOP11A-30 via Phoenix plug-in terminal strip

4.5.1 Wiring diagram: RS-485 interface

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Figure 10: RS-485 connection

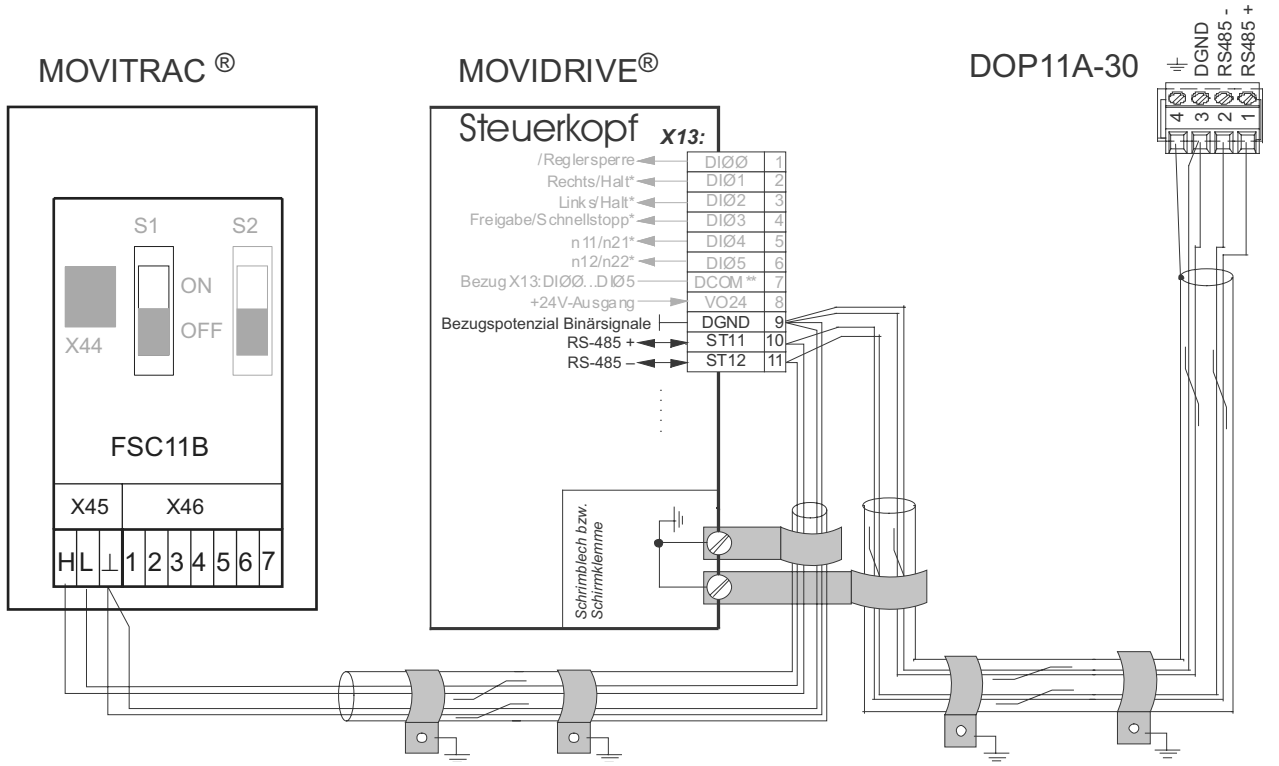

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Figure 11: DOP11A-30 terminal assignments

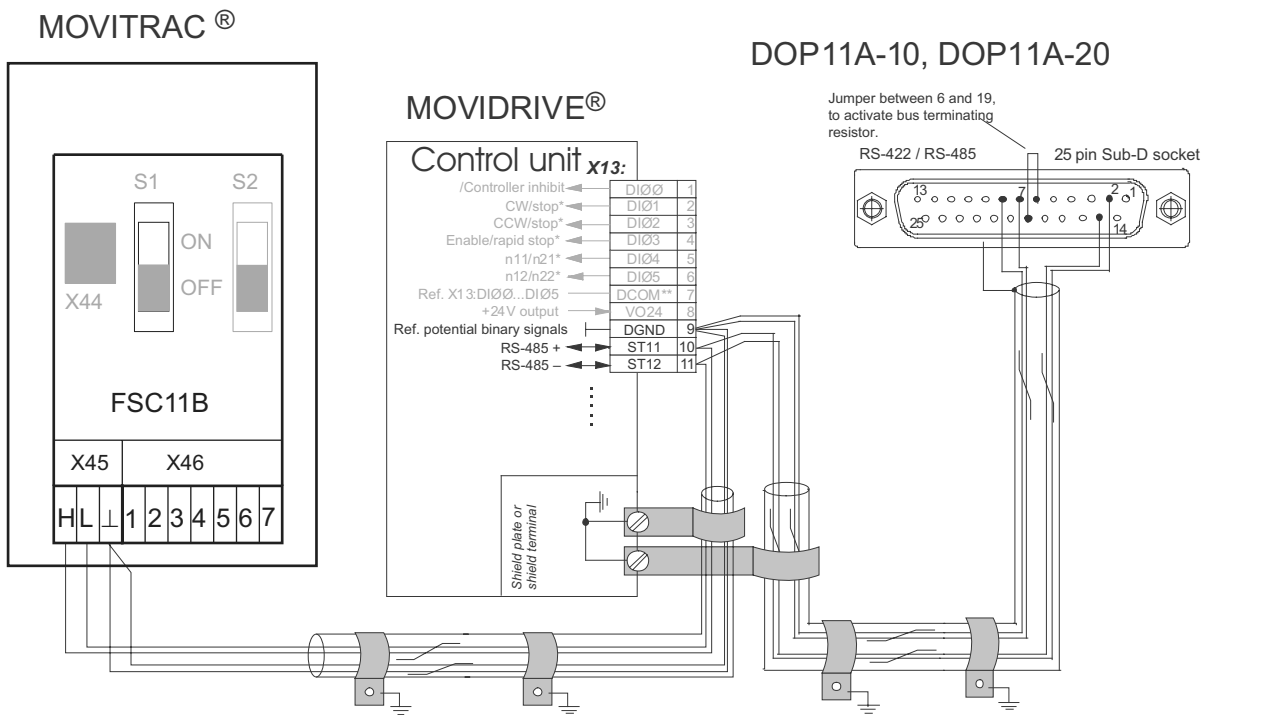

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Figure 12: DOP11A-10 pin assignments

Cable specification

Use a 2x2 core twisted and shielded copper cable (data transmission cable with braided copper shield). The cable must meet the following specifications:

- Core cross section 0.5 ... 0.75 mm^2 (AWG 20 ... 18)
- Cable resistance 100 ... 150 Ω at 1 MHz
- Capacitance per unit length ≤ 40 pF/m (12 pF/ft) at 1 kHz

For example, the following cable is suitable:

- Lappkabel, UNITRONIC® BUS CAN, 2 x 2 x 0.5 mm^2.

Shielding

Apply shield on both ends over large area at the controller electronics shield clamp and in the housing of the 25-pin Sub-D connector of the operator terminal.

Do not connect the shield ends with DGND!

Cable length

The permitted total cable length is 200 m (660 ft).

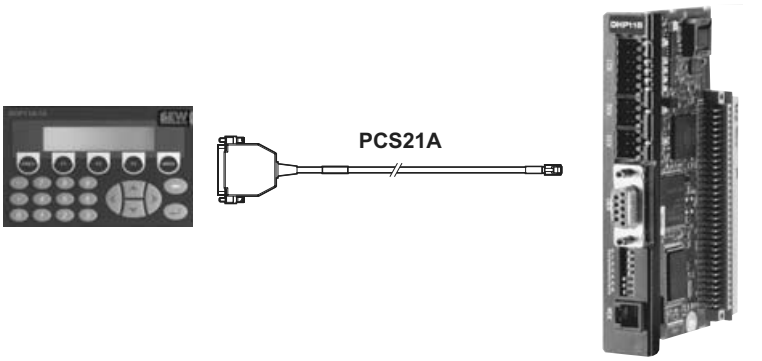
Terminating resistor

The controller and the UWS11A interface converter come equipped with dynamic terminating resistors. Do not connect **any external terminating resistors** in this instance!

If the DOP11A-10 operator terminal is connected to the frequency inverters via RS-485, activate the terminating resistor in the 25-pin Sub-D connector of the DOP11A-10 (jumper between pin 6 and pin 19) if the operator terminal is the first or last station.

There must not be any difference of potential between the units connected using the RS-485. Take suitable measures to avoid a potential displacement, for example, by connecting the unit grounds (GND) with a separate cable, connecting the voltage supply (24 V) etc.

4.6 Connecting RS-485 to PCS21A



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4.6.1 Shielding

Connect the shield to the electronics shield clamp of the controller and make sure it is connected over a wide area. The shielding is already connected in the housing of the 25-pin Sub-D connector of the PCS21A.

STOP

Do not connect the shield ends to DGND!

4.6.2 Terminating resistor

The controller comes equipped with dynamic terminating resistors. Do not connect **any external terminating resistors**!

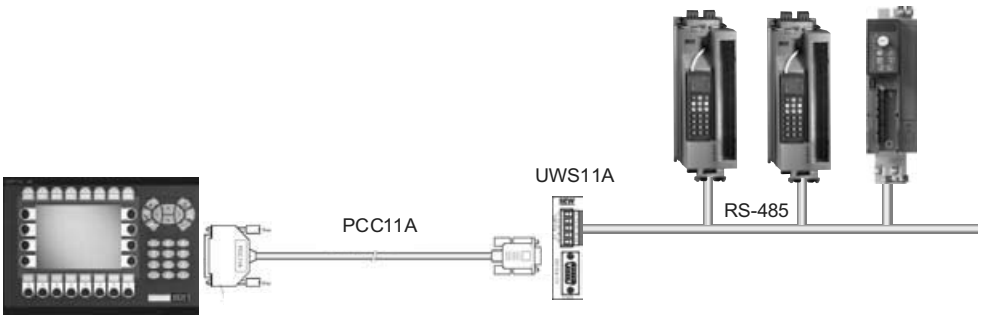
The terminating resistor in the 25-pin sub-D connector of the DOP11A is already activated by a jumper between pin 6 and pin 19.

STOP

There must not be any difference of potential between the units connected using the RS-485. Take suitable measures to avoid a potential displacement, for example, by connecting the unit grounds (GND) with a separate cable, connecting the voltage supply (24 V) etc.

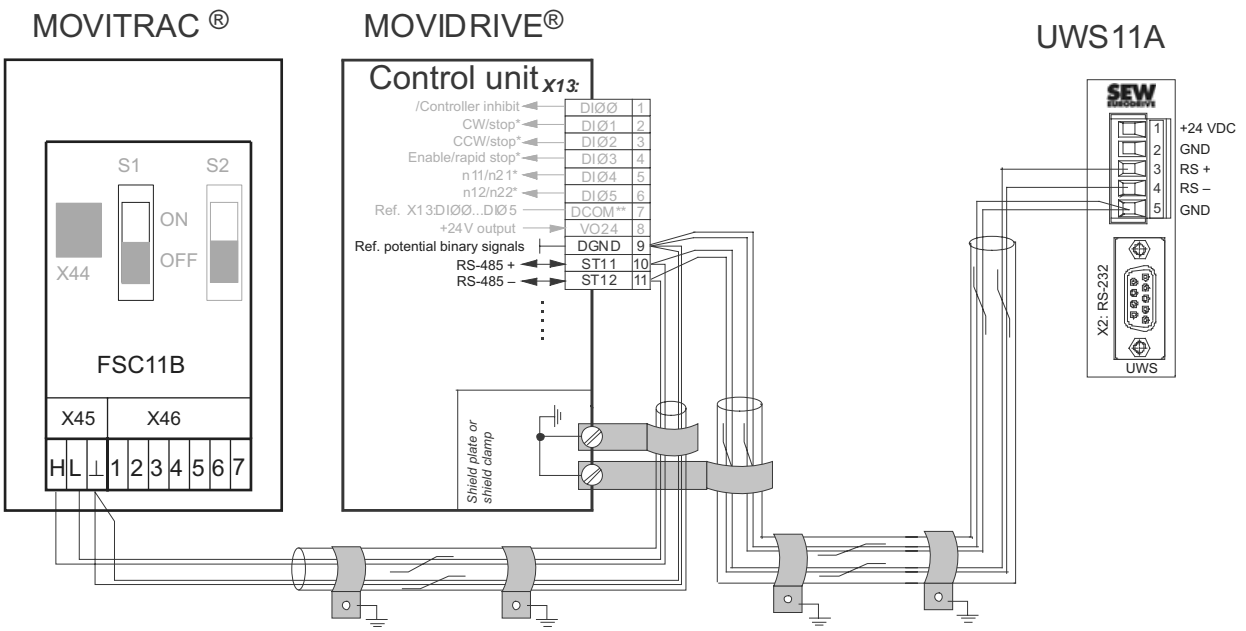
4.7 Connecting RS-422 via UWS11A

Connecting the DOP11A to a MOVIDRIVE® frequency inverter via UWS11A.



58780AXX

Figure 13: Connection via serial connection (UWS11A)



58787AEN

Figure 14: UWS11A terminal assignments

4.7.1 RS-485 connection

See section 4.5, "Connecting RS-485 (only DOP11A-10 and DOP11A-30 from HW 1.10 and DOP11A-30)" for the cable specification.

4.8 Connecting option PFE11A ETHERNET

Connection of DOP11A with PFE11A ETHERNET option card (not available with DOP11A-10) to a PC for programming and remote maintenance via ETHERNET and TCP / IP.

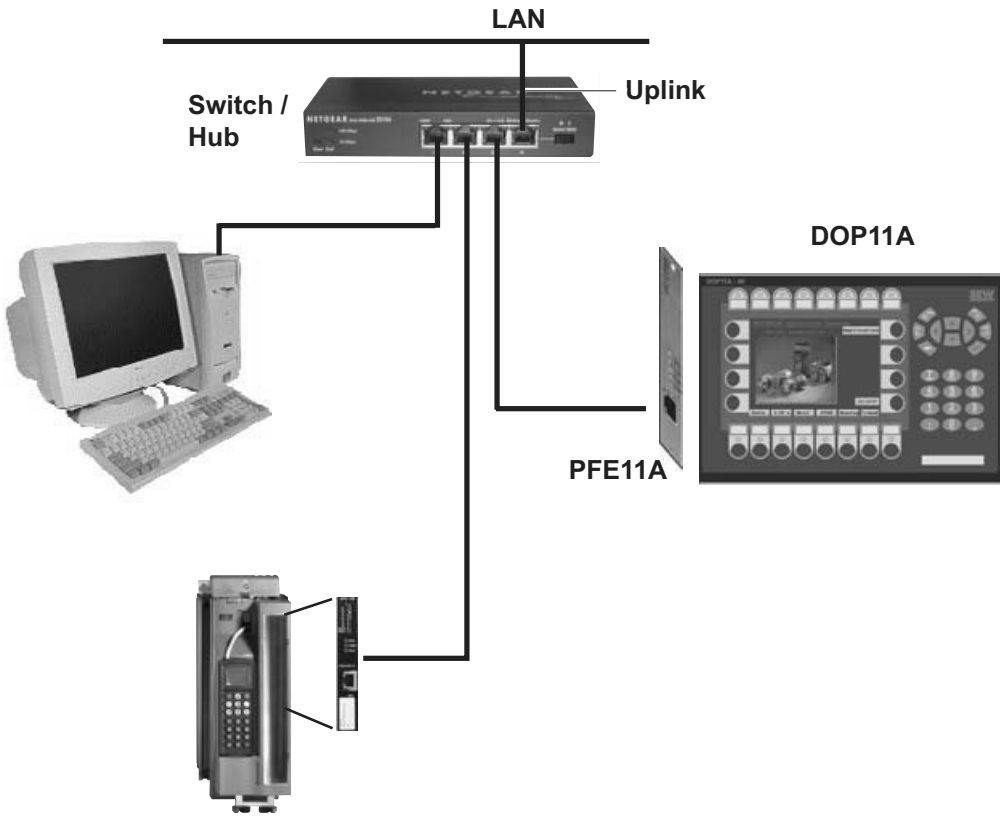


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Figure 15: Connecting the PFE11A ETHERNET option

There are four LEDs on the front of the PFE11A expansion card.

These LEDs have the following functions:

Function	Color	Description
SEL	Yellow	This LED will light up if there is a contact between terminal processor and expansion card connection.
TxD	Yellow	This LED lights up when you send ETHERNET data.
RxD	Yellow	This LED lights up when you receive ETHERNET data.
LINK	green	This LED lights up when the ETHERNET cable (twisted pair cable) has been connected correctly.

4.8.1 Cable specification

Use a shielded standard ETHERNET cable with shielded RJ45 connectors and cables according to specification CAT5. The maximum cable length is 100 m (300ft.).

For example, the following cable is suitable:

– Lappkabel, UNITRONIC® LAN UTP BS flexible 4 x 2 x 26 AWG

For a description of how to determine the Ethernet (MAC) address of the option card, see section 5.2 in the paragraph "Configuration mode (SETUP)".

4.9 Connecting option PFP11A PROFIBUS-DP

Data exchange between a PLC with a DOP11A via PFP11A and PROFIBUS DP. (See section 3.8 "Accessories and options" for a description of the PFP11A.)

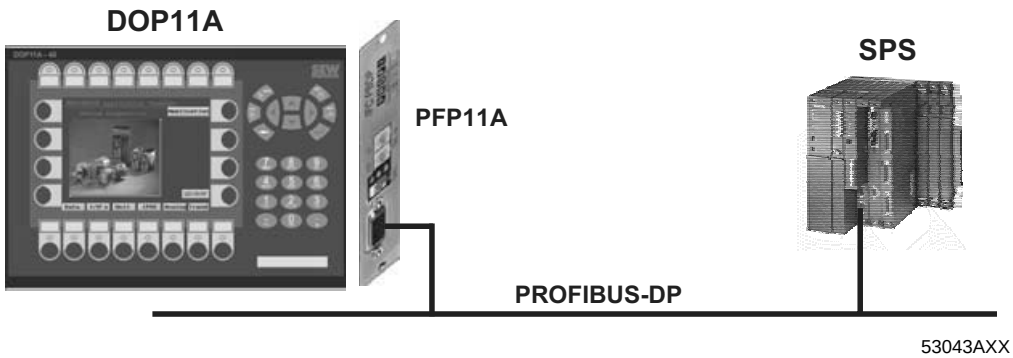

Figure 16: Connecting option PFP11A PROFIBUS

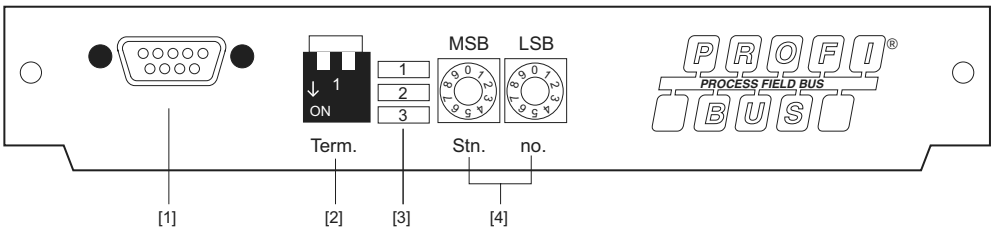

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Figure 17: Connecting option PFP11A PROFIBUS

[1] 9-pin Sub-D socket

[2] **PROFIBUS terminating resistor**
If the terminal is located at the start or end of a PROFIBUS segment and if only one PROFIBUS cable is connected, either activate the terminating resistor in the connector (if present) or set the switch on the PFP11A card to "On."
Never activate both terminating resistors in the connector and card at the same time!

[3] The LEDs on the expansion card have the following functions:

1:ERR	Red	Displays configuration or communication errors. The LED lights up red until the unit is configured and indicates a time violation.
2:PWR	green	Displays a voltage supply with DC 5 V.
3:DIA	green	Displays a diagnostics error in the PROFIBUS network. Is not used by the panel.

[4] The PROFIBUS station address is set using two rotary switches.

The GSD type files required for configuration of the PROFIBUS are available on the HMI-Builder software ROM or at www.sew-eurodrive.de in the Software tab.

4.9.1 Cable specification

Use a two-core, twisted and shielded copper cable to PROFIBUS specification for conductor type A to EN 50170 (V2).

For example, the following cable is suitable:

– Lappkabel, UNITRONIC® BUS L2/F.I.P.

4.10 Connection to a Siemens S7 via MPI and PCM11A

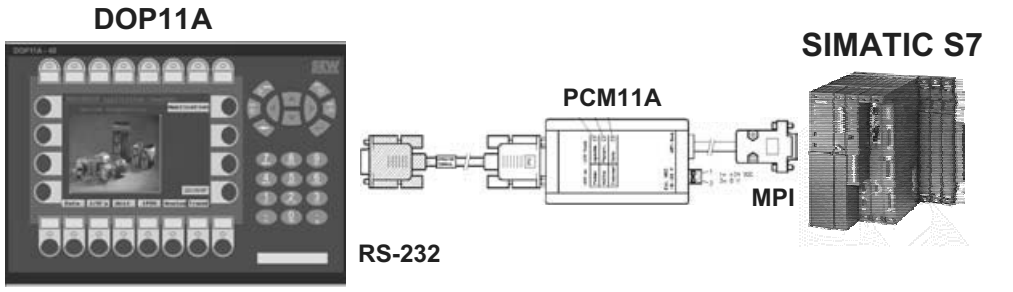

Figure 18: Connection to a Siemens S7 via MPI and PCM11A

5 Startup

It is essential to comply with the safety notes during startup!

5.1 General startup instructions

Requirement for a successful startup is the correct electrical connection of the operator terminal.

The functions described in this section enable users to upload a project to the operator terminal and establish the unit in the necessary communication pathways.

Do not use the DOP11A operator terminals as safety devices for industrial applications. Use monitoring systems or mechanical protection devices as safety equipment to avoid possible damage to property or injury to people.

5.2 Preliminary work and resources

- Check the installation
- Take suitable measures to prevent the motor from starting up unintentionally via the connected frequency inverter.
  - Remove the electronics input X13.0/controller inhibit in MOVIDRIVE® or
  - Disconnect the supply voltage (24 V backup voltage must still be applied)
  - Remove terminals "CW operation" and "Enable" in MOVITRAC® 07

  Furthermore, additional safety precautions must be taken depending on the application to avoid injury to people and damage to machinery.
- Connect the operating terminal to MOVIDRIVE® or MOVITRAC® 07 using an appropriate cable.

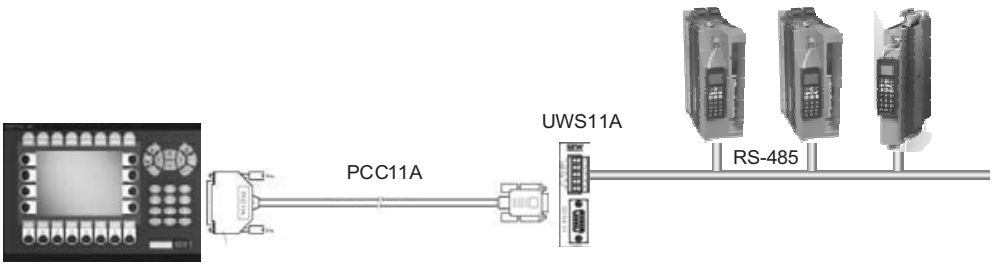

Figure 19: Connection between operator terminal and MOVIDRIVE® MDX60B/61B

- Connect the operator terminal to the PC using the PCS11A (RS-232) programming cable. Operator terminal and PC must be de-energized when you do this, otherwise undefined states may occur. Switch on the PC. If the HMI-Builder project planning software is not already installed on the PC, install it now and then start the software.

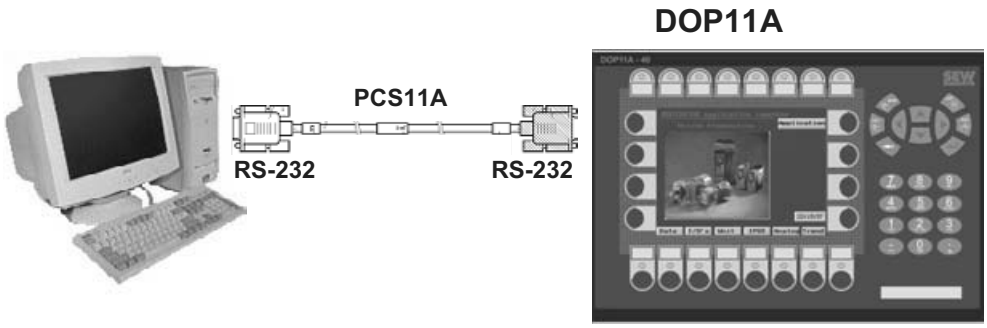

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Figure 20: Connection between PC and operator terminal

- Activate the supply (24 V) for the operator terminal and connected frequency inverters.

5.3 Initial operation

Units are delivered without a loaded project.

Units with a membrane keypad (DOP11A-10, DOP11A-20 and DOP11A-40) will report the following information when they are initially taken into operation:

53253AXX

Figure 21: DOP11A-10 initial screen in delivery state

Units with a membrane keypad (DOP11A-10, DOP11A-20 and DOP11A-40) will remain in [Edit] / [Transfer] mode. The following section describes the individual functions.

The DOP11A-30 and DOP11A-50 touchscreen units indicate that an inverter or PLC communication driver has not been loaded.

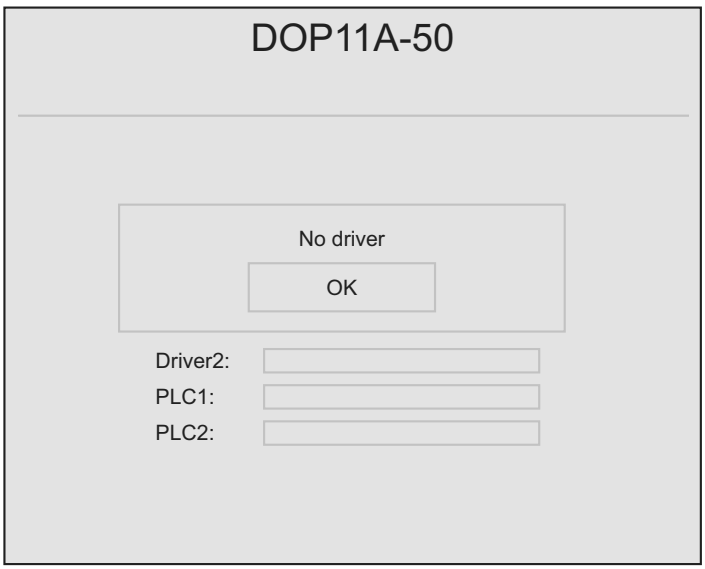

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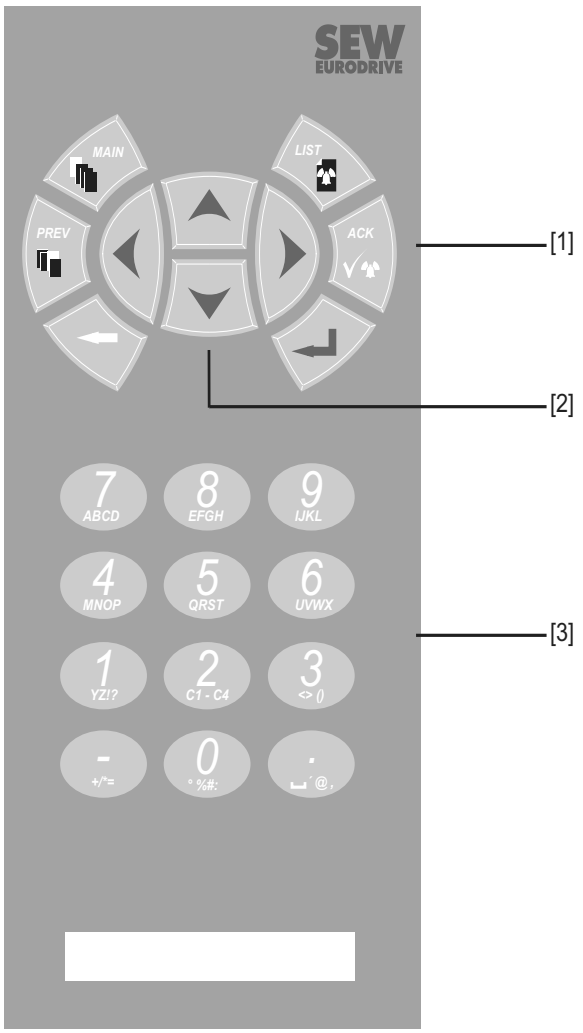
Figure 22: DOP11A-50 initial screen in delivery state

5.4 Terminal functions

This chapter describes the different modes in the operator terminal, the keyboard and the information page in the terminal.

5.4.1 Terminal keypad



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[1] Integrated function keys (not DOP11A-10)
[2] Arrow keys
[3] Alphanumeric keys

Alphanumeric keys

The following characters can be entered in dynamic text and numerical objects during the run mode in the terminal using the alphanumeric keyboard.

0-9

A-Z

a-z

! ? < > ( ) + / * = º % # : ’ @

National characters

You cannot enter characters via the keyboard of the DOP11A-10 terminal because it is not equipped with alphanumeric keys.

Numeric values are entered by pressing the respective key once.

Enter capital letters (A to Z) by pressing the respective key two to five times.

Enter lower case letters (a to z) by pressing the respective key six to nine times.

A time interval between pressing can be set. If the key is not pressed within the specified time interval the cursor moves to the next position.

Enter national characters by pressing key <2> (C1C4) two to nine times. This option offers characters that are not included in the standard character set of the alphanumeric terminal keyboard.

You can use all characters of the selected character set in the HMI-Builder except those characters reserved for static text. Enter the required character by pressing the <ALT>+<0> (zero) key combination on the numeric keyboard of the PC; then enter the character code. You select the used character set in the HMI-Builder.

Reserved characters

The ASCII characters 0-32 (Hex 0-1F) and 127 are reserved for internal terminal functions and must not be used in projects or files in the terminal. The characters are used as control characters.

Arrow keys

Use the arrow keys to move the cursor in a menu or dialog box.

Integrated function keys

Not all the keys are available on all terminals.

Key	Description
Enter key	Use the ENTER key to confirm the setting made and to go to the next line or level.
<PREV>	Use this key to return to the previous block.
<LIST>	Use this key to display the alarm list.
<ACK>	Use this key to acknowledge alarms in the alarm list.
<MAIN>	Use this key to jump to block 0 in run mode.
<←>	Use this key to delete characters to the left of the cursor.

When the main block (block number 0) has been display, the <PREV> key will not work, since the block history is deleted when the main block is shown.

Key combinations

The terminal has key combinations for the following functions:

Key combination	Function
<←> <MAIN>	Switch between SETUP and RUN.
<←> <F1>	Hold this key combination pressed during startup to activate the mode for downloading the system program (see section 4, "Installation").
<←> <PREV>	Open information window.
◀ + ▶	Hold this key combination pressed during start up to activate the self-test function.

Operator terminal	Function			
	Sysload	Self-test	Switch between SETUP and RUN	Diagnostics window
DOP11A-10	<←> + <F1>	◀ + ▶	<←> + <ENTER>	<←> + ▶
DOP11A-20	<←> + <F1>	◀ + ▶	<←> + <MAIN>	<←> + <PREV>
DOP11A-40	<←> + <F1>	◀ + ▶	<←> + <MAIN>	<←> + <PREV>

Switches on DOP11A-30 and DOP11A-50 terminals

Interrupt power supply to the terminal to call up individual modes for DOP11A-30 and DOP11A-50.

Turn the rotary switch on the side or back of the terminal to the position shown in the following table. You can now turn on the power supply again.

Switch position	Function
0	Run mode (RUN, standard operation)
1	Sysload
2	Calibrate touch
3	Cursor
4	Configuration mode (SETUP)
5	Transfer mode, TRANSFER
8	Activates self-test function
9	Erases the clock memory

5.4.2 Operating modes RUN and SETUP

The terminal has two operating modes.

- **Configuration mode (SETUP):** All basic settings are made in this mode, such as selection of controller system and menu language.
- **Run mode (RUN):** This mode is for running the application.

Transfer

Here you manually set the terminal to transfer mode. When the terminal is in transfer mode it is possible to transfer projects between the terminal and the programming software. By using the automatic terminal switching function [RUN] / [TRANSFER] in the programming software, the software automatically sets the terminal to transfer mode.

Switching between operating modes

Switch between RUN and SETUP

Press <←> and <MAIN> simultaneously to enter configuration mode (SETUP). You can now press any key when the start-up menu is shown to enter the configuration mode (SETUP). To return to run mode, press <←> and <MAIN>.

In DOP11A-30 and DOP11A-50 set the switch on the side/back of the terminal in position 4 to access the configuration mode (Setup). The switch should be in position 0 for standard operation.

Configuration mode (SETUP)

This section contains a description of functions that cannot be carried out with the HMI-Builder.

Erasing the memory

The [setup] menu in the terminal includes the function [Erase Memory]. Use this function to erase the application memory of the terminal. All blocks and definitions for alarms, time channels, function keys and system signals are erased.

Parameters	Description
Enter key	Memory is erased. The configuration menu is shown automatically when the erasure is completed.
<PREV>	Return to previous level without erasing the memory.

When the memory is erased all data stored in the terminal will be lost. The language selection parameter is not affected by this function. All other parameters will be erased or reset to their default values.

Contrast setting

Operator terminal	Contrast setting
DOP11A-10	The contrast is set using a rotary regulator on the back of the terminal.
DOP11A-20	Contrast is set in operating mode by jumping to system block 997. You can increase the brightness of the monitor by pressing the <+> function key. You can reduce the brightness by pressing the <-> function key. Press <EXIT> to return to the previous level.
DOP11A-30	
DOP11A-40	
DOP11A-50	The color intensity of the display can be controlled using a data register and the [DIM] command, specified in the command line under [Setup] / [System signals] of the programming software.

The contrast is affected by the ambient temperature. If the terminal is programmed at a room temperature far below the one at the installation site, you will have to adjust the contrast in the actual ambient temperature after 15 - 30 minutes.

Determining the ETHERNET MAC address:

The ETHERNET address of the PFE11A option card is displayed in configuration mode (SETUP). Use the key combination <←> <MAIN> (DOP11A-20 and DOP11A-40) or switch position 4 (DOP11A-30 and DOP11A-50) to enter configuration mode.

The physical ETHERNET address is displayed in the menu item [Expansion Cards - Slot 1 - PFE.]

Run mode (RUN) The application is executed in run mode. Block 0 will automatically be displayed on the screen when changing to run mode.

The integrated keyboard is used to highlight and change values in run mode.

If a communication error occurs between the terminal and the controller system, an error message will be shown on the screen. The terminal starts automatically once communication is reestablished. If you press an I/O key combination while a communication error is active, the combination will be stored in the terminal buffer and transferred to the controller system once communication resumes.

The terminal clock can continuously send data to a register in the controller to activate a monitoring function. The controller can use this monitoring function to detect a communication error. The controller system checks if the register has been updated, if not an alarm indicating a communication error is activated in the controller system.

The functional principle of individual objects and functions in operating mode will be explained in connection with the description of the respective objects and functions.

5.4.3 Setting the real-time clock

The real-time clock of the terminal is set in the [Setup] menu under [Date / Time.].

Select the option [Set terminal clock]. The date and time will now be displayed. Press <SET to change the settings. Enter the required date and time. Move the cursor with the arrow keys in editing mode. Press <NEXT> to return to the previous menu or cancel the setting before you press the <Enter> key.

The real-time clock can also be set in run mode using a maneuverable clock object and when transferring projects from a PC to the terminal.

A digital signal set by a command can let operators know when it is time to change the battery for the real-time clock.

5.4.4 Information page

The terminal contains an information page. The information page is activated by pressing the key combination <←> and <PREV> simultaneously in run mode. A function or touch key can also be used or configured to call up the information page.

The current terminal, system program version and hardware version are shown at the top of the information page.

Parameters	Description
STARTS	Number of terminal starts
RUN	Number of terminal operating hours
CFL	Number of hours the backlighting has been switched on
32°C MIN: 21 MAX: 38 (example)	Current operating temperature, lowest and highest temperature measurement
DYNAMIC MEMORY	Available RAM memory (working memory) in number of bytes.
FLASH MEM PROJ	Available Flash memory (project memory) in number of bytes.
FLASH MEM BACK	Reserved
FLASH CACHEHITS	Percentage of block / allocation cache hits in the file system.
FLASH ALLOCS	Maximum percentage of used or active allocations per block in the file system.
DRIVER 1	Current driver and driver version
DIGITAL I/Os	The number of digital signals linked to controller 1 continuously monitored (STATIC) and the number in the current block (MONITOR)
ANALOG I/Os	The number of analog signals linked to controller 1 continuously monitored (STATIC) and the number in the current block (MONITOR)
I/O POLL	The time in ms between 2 readings of the same signal in controller 1
PKTS	The number of signals in each package transferred between the terminal and controller 1
TOUT1	The number of timeouts in communication with controller 1
CSUM1	The number of checksum errors in communication with controller 1
BYER	The number of byte errors in the communication
DRIVER 2	Current driver and driver version. The parameters for Driver 2 are only shown if controller 2 is defined in the project.
DIGITAL I/Os	The number of digital signals linked to controller 2 continuously monitored (STATIC) and the number in the current block (MONITOR).
ANALOG I/Os	The number of analog signals linked to controller 2 continuously monitored (STATIC) and the number in the current block (MONITOR)
I/O POLL	The time in ms between 2 readings of the same signal in controller 2
PKTS	The number of signals in each package transferred between the terminal and controller 2
TOUT2	The number of timeouts in communication with controller 2
CSUM2	The number of checksum errors in communication with controller 2
1 / 2 / 3	Current port for FRAME, OVERRUN and PARITY. 1 = RS-422 port, 2 = RS-232 port and 3 = RS-485 port.
FRAME	The number of frame errors in each port
OVERRUN	The number of overrun errors in each port
PARITY	The number of parity errors in each port

5.4.5 Joystick functions

Only applies to DOP11A-20 and DOP11A-40.

This function makes it possible to use the arrow keys as function keys. Enter the command "AK" and an address in the command line under [system signals.] Example: "AKM100" (command AK and memory cell M100).

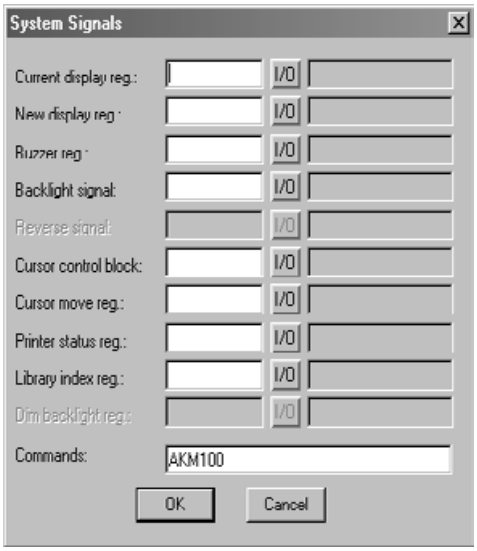

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Figure 23: System signals

Memory cell M100 is the enable signal and the following four memory cells have functions according to the following control block:

Memory cell	Description
Mn0	Active = Joystick function. Disabled = Normal function.
Mn1	LEFT ARROW
Mn2	DOWN ARROW
Mn3	UP ARROW
Mn4	RIGHT ARROW

If you press an arrow when the enable signal is present, the memory cell corresponding to the key you press will be activated. When the enable signal is issued, the arrow keys will not perform their normal functions.

Example

Use the following example to switch between joystick function and normal function.

Perform the following steps:

- Use the DEMO driver.
- Enter the text "AKM1" under [System signals] / [Commands].
- Generate a text block.
- Enter the static text "JOYSTICK."
- Create a digital object with the following settings:
  - Digital signal: M1
  - Text 0: OFF
  - Text 1: ON
  - Activate input: YES
- Create four additional digital objects to monitor the memory contents of M2, M3, M4 and M5.

Display of text block according to sample settings:

JOYSTICK # - - -

M2#

M3 #

M4 #

M5 #

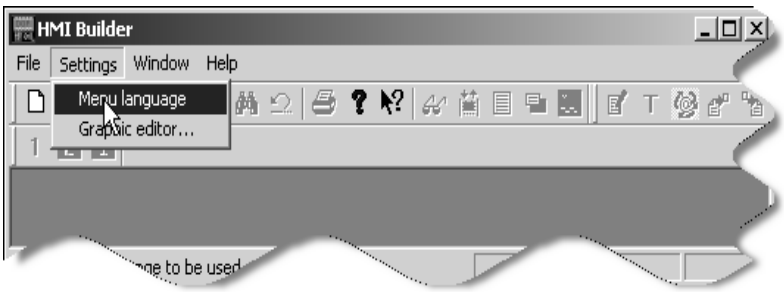
6 Operation and Service

6.1 Transferring projects with PC and HMI-Builder

You need the HMI-Builder software to start up the operator terminal with your PC.

1. Start the HMI-Builder program.

2. Select the language in the [Settings] / [Menu language] selection field.



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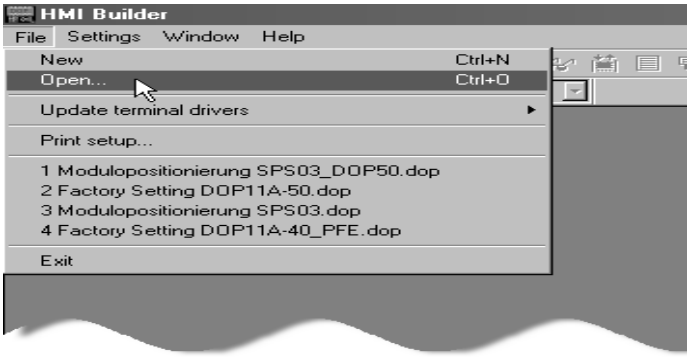
3. Use the [File] / [Open] function to open the project file you would like to transfer to the operator terminal.



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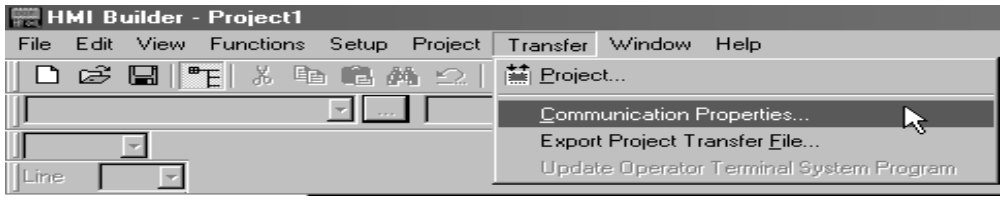
4. In the menu item[Transfer] / [Communication Properties], select the communication connection [Use serial transfer] and enter the necessary parameters:



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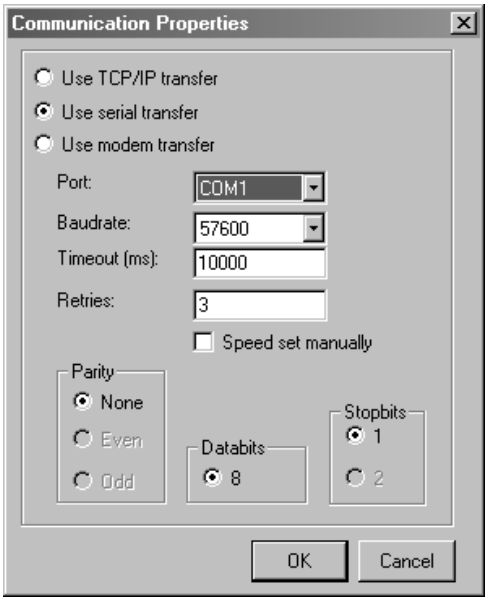
Serial transfer when using the PCS11A programming cable.

Enter the following information:

- Communication port of the PC (e.g. Com1)
- Data transfer rate (default 57600)
- Timeout period (free entry, default 10,000 ms)
- Number of retries in case of communication problems (default 3)

If a project is transferred to the terminal for the first time, the transfer will take place via serial connection and the PCS11A programming cable.



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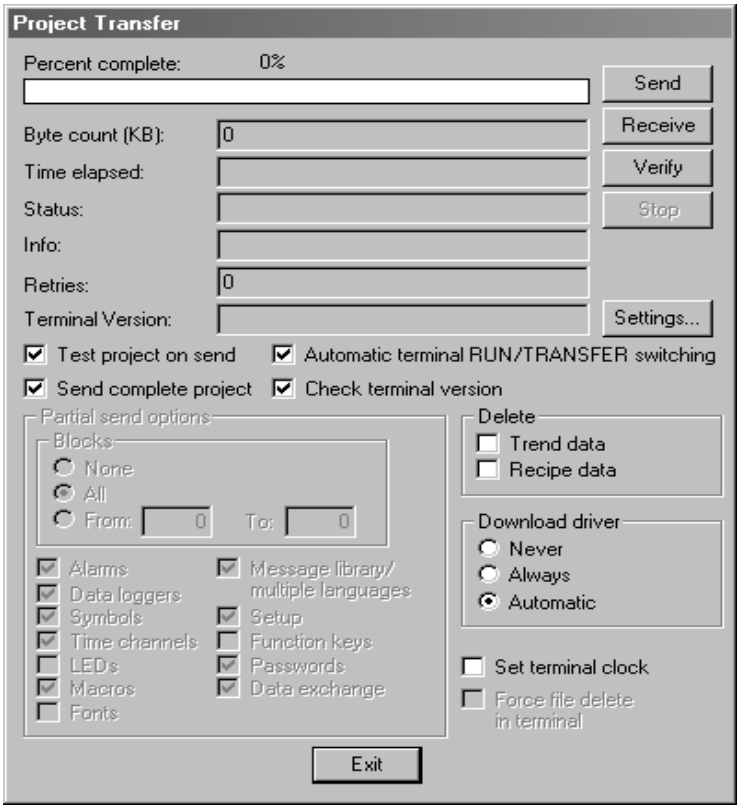
5. The project can now be transferred to the terminal by using the selection field [Transfer] / [Project].

   The following functions are active as standard and must remain in this setting.

   - Test project on send
   - Send complete project
   - Automatic terminal RUN/TRANSFER switching
   - Check terminal version

Press the [Send] button to download the data.



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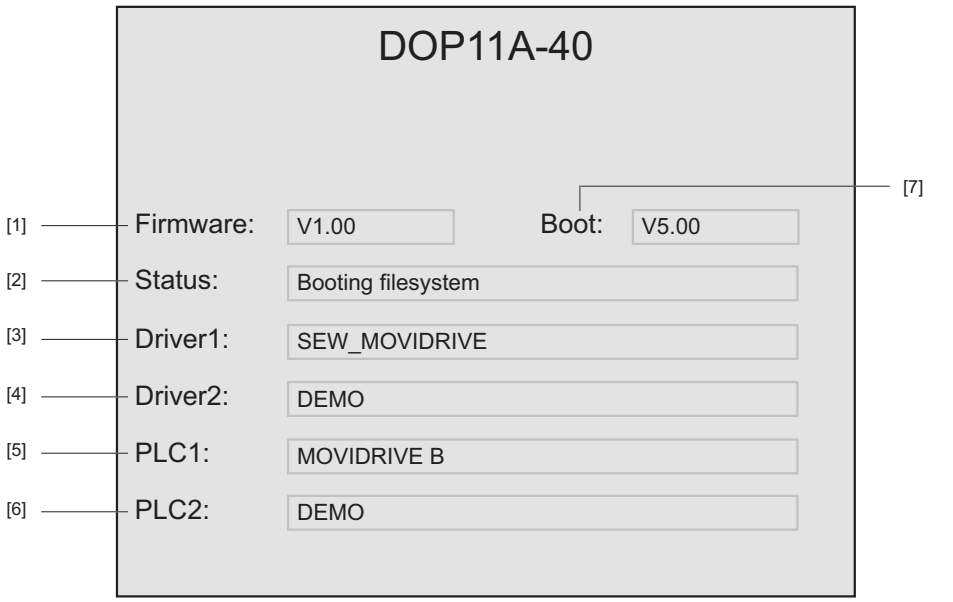
The following steps will be executed one after the other:

- Switch the terminal to transfer mode (TRANSFER)
- Transfer the communication driver for inverter and PLC
- Transfer project data
- Switch the terminal to RUN mode

The individual steps will be displayed during transfer in the terminal display.

After transfer is completed, exit the dialog window using the [Exit] button and close the HMI-Builder.

6.2 Operating display at unit start



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[1] Firmware version of the operator terminal

[2] Status of the boot process
e.g.:
PROJECT STATUS
TCP/IP ADDRESS
CHECKING PLC 1
CHECKING PLC 2
...

[3] Communication driver loaded in Controller 1
e.g.:
DEMO
SEW_MOVIDRIVE
...

[4] Communication driver loaded in Controller 2
e.g.:
DEMO
SEW_MOVIDRIVE
...

[5] Communication status of Controller 1
e.g.:
NO CONNECTION
DEMO
MOVITRAC 07
MOVIDRIVE A
MOVIDRIVE B
...

[6] Communication status of Controller 2
e.g.:
NO CONNECTION
DEMO
MOVITRAC 07
MOVIDRIVE A
MOVIDRIVE B
...

[7] Version of operator terminal boot routine

6.3 Error messages

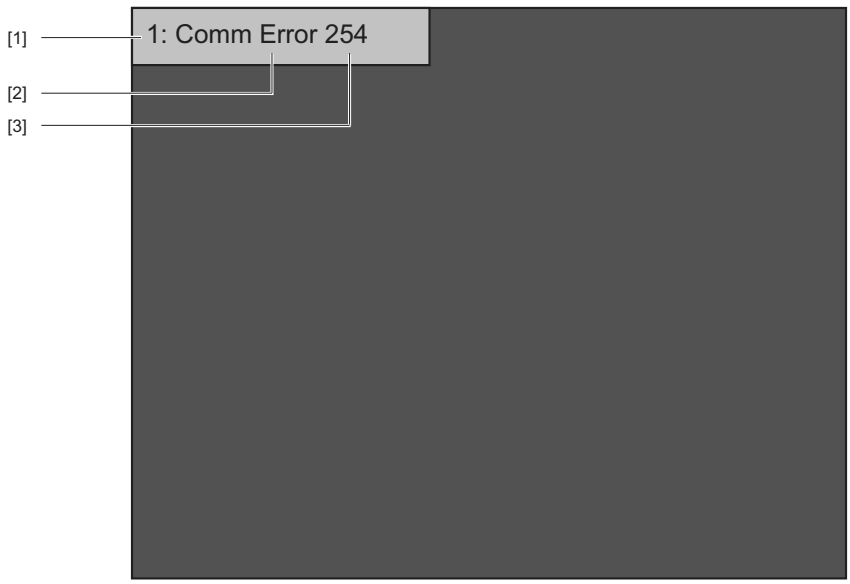
Errors in RUN mode will be displayed in the upper left hand corner of the display as error messages.

They are divided into two groups:

- Boot error (no inverter connected)
- Operation errors - Comm errors (error list)

6.3.1 Boot error (no inverter found)

Boot error "1: Comm Error 254" means: no communication with connected inverters.



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[1] Controller where the communication error occurs.
e.g 1 or 2

[2] Error type
e.g. operation error - Comm Error

[3] With RS-485 address:
e.g.
01 - 99
254 (= point to point!)

6.3.2 Operating errors - Comm errors (error list)

Message from operator terminal	Error code	Description
no error	00 00	No error
invalid parameter	00 10	Illegal parameter index
fct. not implement	00 11	Function / parameter not implemented; • Controller does not know parameter addressed by the operator terminal. Check selection of MOVILINK® driver. Individual parameters of the MOVITRAC® 07, MOVIDRIVE® A and MOVIDRIVE® B controllers are slightly different. • Another reason for this error may be the controller firmware. Recently added parameters may not be included in older versions of the unit firmware.
read only access	00 12	Read access only • No write access to addressed parameter. Deactivate [Activate input] function in project of operator terminal.
param. lock active	00 13	Parameter lock is active • The [Parameter block] function was activated via parameter P803 in the addressed controller. Set parameter P803 to "OFF" by using the controller keypad or the PC software MOVITOOLS® to deactivate the parameter lock.
fact. set active	00 14	Factory setting is active • Controller is performing a factory setting. Parameter change option is locked for a few seconds. Communication will be automatically reactivated once factory setting is complete.
value too large	00 15	Value for parameter too large • Operator terminal is trying to write a value to a parameter that is not within the permitted value range. Adapt the minimum and maximum input values in the [Access] area in the project of the operator terminal. You will find the respective limit values in the parameter list of the controller.
value too small	00 16	Value for parameter too small • Operator terminal is trying to write a value to a parameter that is not within the permitted value range. Adapt the minimum and maximum input values in the [Access] area in the project of the operator terminal. You will find the respective limit values in the parameter list of the controller.
option missing	00 17	Required option card missing for this function / this parameter.
system error	00 18	Error in system software of controller • Contact SEW service.
no RS485 access	00 19	Parameter access via RS-485 process interface on X13 only
no RS485 access	00 1A	Parameter access via RS-485 diagnostic interface only
access protected	00 1B	Parameter is access-protected • No read or write access to this parameter; parameter not suitable for use in operator terminal.
inhibit required	00 1C	Controller inhibit required • The addressed parameter can only be altered with inhibited controller. Activate the controller inhibit status by removing the terminal X13.0 or via fieldbus (control word 1/2 basic block = 01hex).
incorrect value	00 1D	Incorrect value • Some parameters can only be programmed to certain values. You will find the respective limit values in the parameter list of the controller.
fact. set active	00 1E	Factory setting was activated.
not saved in EEPROM	00 1F	Parameter was not saved in EEPROM • Power-failure save failed.
inhibit required	00 20	Parameter cannot be changed with enabled output stage • The addressed parameter can only be altered with inhibited inverter. Activate the controller inhibit status by removing the terminal X13.0 or via fieldbus (control word 1/2 basic block = 01hex).

6.4 SEW Electronics Service

6.4.1 Send in for repair

Please contact the **SEW Electronics Service** if a fault cannot be rectified.

When contacting the SEW electronics service, always quote the digits of the unit designation so that our service personnel can assist you more effectively.

Please provide the following information when sending the unit in for repair:

- Serial number (→ nameplate)
- Unit designation
- Brief description of the application
- Nature of the error
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

7 Programming

7.1 Create a project

7.1.1 Basics

This section describes the system structure of the terminal and its basic functions. There is also an explanation of the general principles, object parameters and joint functions applicable in the terminal.

Procedure for programming a project

The graphical structure of the application in the terminal means that the monitoring tool is easy to use for the operator. It is important to organize the application well and to consider which functions are necessary. Start with the overall view, and then work down to the detailed level. When a project is programmed you start with the functions in your application. Each function corresponds to one or more blocks, depending on the complexity of the function. A project can contain both graphic and text blocks, and each block can contain static and dynamic objects. The blocks should be arranged in hierarchies to achieve a structured application, and to simplify work procedures for the machine operator. The application can also be organized as sequence controls.

The application can be tested in full or in part prior to startup.

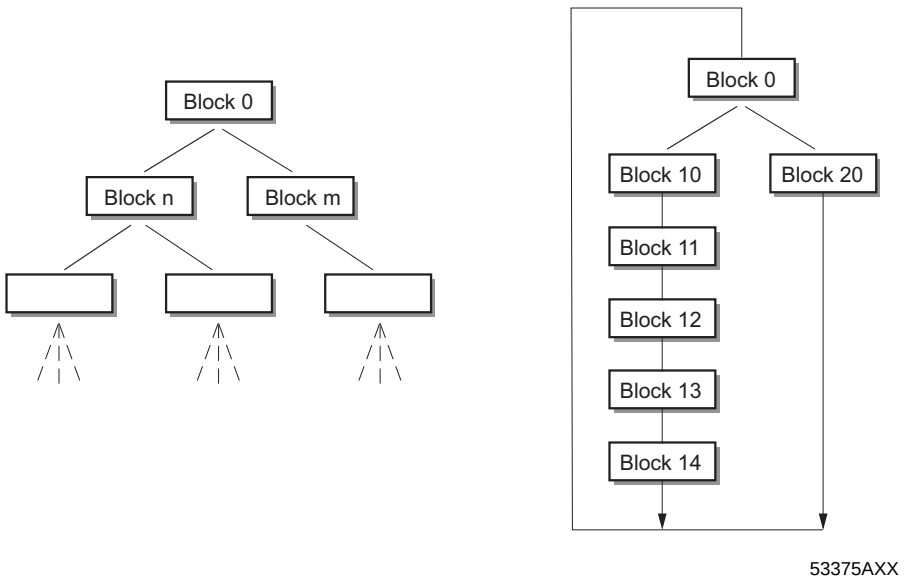


Figure 24: Block structure

Effective communication

Read the following notes on signal transmission and their optimization for fast and effective communication between terminal and controller.

Signals that influence the communication time

Only signals for objects in the current block will be read continuously. These include dynamic object signals. Signals for objects in other blocks will not be read. The number of blocks does not affect the communication time.

In addition to signals for objects in the current block, the terminal continuously receives the following signals from the controller:

- Display signals (block header)
- Block print signals (block header)
- LED register
- Alarm signals
- External confirmation signals for alarms and alarm groups
- Login signal (password)
- Logout signal (password)
- Trend curve register
- Register for column objects when min. / max. indicators are used
- New display register
- Buzzer register
- Background lighting signal
- Cursor control block
- Recipe control block
- Library index register
- Index register
- Register for PLC clock if it was used in terminal
- List erase signal (alarm settings)
- No protocol mode control register
- No protocol signal

Signals that do not influence the communication time

The following signals do not affect the communication time:

- Signals for function keys
- Time channels
- Objects in alarm texts

Optimize communication

Grouping controller signals

The signals from the controller (see list on page 58) will be read fastest if they are bundled in one group, such as: If you have defined 100 signals you will reach the highest reading speed by grouping them (e. g. H0-H99). If the signal transfer takes place in individual steps (e. g. P104, H17, H45, etc.), then the update will take much longer.

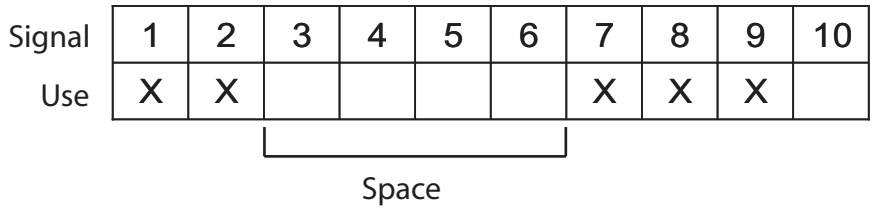
Effective block change

You will reach an optimum block change by using the block jump function of the function keys or via the jump object. The display signal in the block header may only be used if the controller is to enforce the opening of another block. If the controller is to change the display, you can use the new display register. This option affects the communication less then a larger number of display signals.

Signal packages

Transfer of signals between terminal and controller does not take place for all data at the same time. The information is separated into packages that contain several signals each. The number of signals in each package depends on the selected driver.

A minimization of the number of packages is necessary to have the communication take place as quickly as possible. Grouped signals require merely a minimum number of packages. Such programming is not possible in all cases. There may be spaces in between two signals in such cases. A space represents the maximum distance between two signals that are part of the same package. The size of the space depends on the selected driver.



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User interface

Use graphic blocks for the user interface.

Text blocks are mainly for printout of reports. They are slower and require more memory than graphic blocks.

Use 3D effects for an appealing user interface.

You can accomplish a visually impressive design by combining objects with frame and 3D rectangles. Such a design emulates a light incidence from top left. Such an angle creates shadow effects at the lower and right side of raised objects as well as on the upper and left side of lowered objects.

Menu structure

The terminal is divided into two modes: *configuration mode* and *run mode*. In each respective mode there are a number of different levels, depending on the function. Each level consists of a menu where you make a selection or enter parameters before going to the next level (menu).

The application is built up of blocks, graphic blocks and /or text blocks (primarily for report printouts). Values from the controller system are shown and changed in the blocks. Each block has a number between 0 and 989 allocated by the programmer. The blocks 990-999 are reserved for special purposes, so-called system blocks. The terminal is object oriented, which means that a block can contain all the signals linked to an object for the control and monitoring of, for example, a pump.

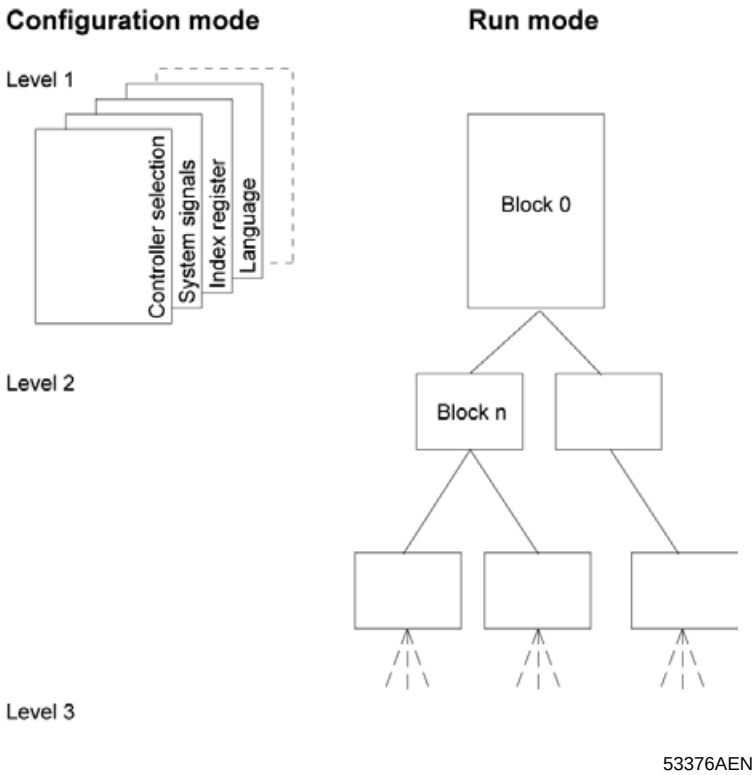

Figure 25: Configuration mode and run mode

Blocks

A block header is defined for each block. The header contains the block number, block type, status word, etc. The following functions can also be invoked as blocks:

- Alarms
- Time channels
- System monitor
- E-mail
- Contrast settings

These are designated system blocks.

150 blocks are permitted for the DOP11A-10. In the other terminals a maximum of 990 blocks can be defined.

The block type cannot be changed for a defined block.

Signal formats

The following signal formats are available in the dialog for each object, on the assumption that the selected driver supports the signal format.

Format type	Range
Signed 16-bit	–32768 ... +32767
Unsigned 16-bit	0 ... +65535
Signed 32-bit	–2147483648 ... +2147483647
Unsigned 32-bit	0 ... +4294967295
Float with exponent, 32-bit	±3.4E38, numbers larger than 1,000,000 are shown with exponent (not with MOVILINK® driver).
Float without exponent, 32-bit	Parameter positions (including decimal point and characters) and decimals indicate the available area. For example, 8 positions and 3 decimals result in ±999.999 (not with MOVILINK® driver).
BCD Float	0 ... 9999.9999 (not with MOVILINK® driver)
BCD 16-bit	0 ... 9999 (not with MOVILINK® driver)
BCD 32-bit	0 ... 99999999 (not with MOVILINK® driver)
HEX 16-bit	0 ... FFFF
HEX 32-bit	0 ... FFFF FFFF
Seconds 16-bit	The object Analog numeric can be displayed in the time format. Syntax: <Hours:Minutes:Seconds> (not with MOVILINK® driver).
Seconds 32-bit	The object Analog numeric can be displayed in the time format. Syntax: <Hours:Minutes:Seconds> (not with MOVILINK® driver).
Character string	Character string which can be used in the dynamic function for graphic objects in DOP11A-20 to DOP11A-50. Example: In the object Static symbol, Digital symbol and Multisymbol, the dynamic property Symbol can be linked to a register with the Character string format.
Array 16-bit	Table format which can be used for an event in the dynamic function for graphic objects in DOP11A-20 to DOP11A-50. Example: A group of registers is to be allocated different values when the value entered is equal to 99. The first value in the field Value will then be entered to register D21 in the field Signal. If the field Value appears as follows <1,2,3,4>, the value 2 will be entered in the next register (D22), etc.

7.1.2 Installing the HMI-Builder

Programming software

The HMI-Builder is a programming software used to develop projects for operator terminals of the DOP11A series. The functions in the HMI-Builder depend on the selected terminal.

We recommend using a mouse as the input device for the programming software. Refer to the Windows Users Guide for information on key combinations.

A project is created with graphic blocks and text blocks in the programming software, which are then transferred to the operator terminal.

An online help is available for all functions. To call up the help text for each function, press the <F1> key. Information on the function is shown by pressing the help button in the toolbox and then clicking on a function.

System prerequisites

The configuration software runs on a PC with a minimum of 100 MB of free memory and Microsoft Windows 2000 / XP Professional. The software can be used with a color or black and white monitor screen. Microsoft Internet Explorer Version 5.0 upwards must be installed.

installing the HMI-Builder

The programming software is supplied on a CD. When you place the CD in your CD ROM drive the installation will start automatically. If not, select [Run] in the Start menu and enter the command `D:/setup.exe` (where D stands for the CD ROM drive). Install the programming software by clicking on the name and following the instructions.

The installation wizard creates an icon for the programming software in the program group of the programming software. To start the programming software, click on [Start] and select [Programs] / [Drive Operator Panels DOP] / [HMI-Builder]. The manual can be read directly from the CD by clicking on [Manuals].

Menu

The menu bar contains a number of drop-down menus.

Menu	Description
File	Contains functions that affect the entire project.
Processing	Contains, among others, the following functions: • Cut • Copy • Paste
View	The following menus can be invoked: • Block manager • Alarm handling • Symbol manager
Functions	In this menu you can configure the function keys, LEDs, passwords and macros. Alarm texts are entered and alarm groups are defined in this menu as well.
Setup	Here you will set the basic configuration for the terminal.
Object	Is available in the managers only and holds all objects. The objects are also included in the toolbox.
Layout	Is available in graphic block manager only and includes functions for positioning of objects in graphic blocks.
Block manager	Settings for visual representation of block manager
Transfer	The functions in the Transfer menu are used to transfer projects between the programming software and the terminal.
Window	Contains all general Windows functions. You can also make grid settings and define the search path to external programs, such as Paintbrush.
Help	Contains the help functions for the program.

Status bar

The status bar is located at the bottom of the HMI-Builder program window. In the [View] menu there is a function to show / hide the status bar.

The left part of the status bar describes the menu function selected in the menu. A short description of the function the cursor points to is shown for the functions in the toolbox.

The right part of the status bar indicates which of the following keys are activated:

OVR Overwrite (Paste key)

CAP Caps Lock

NUM Num Lock

Coordinates, line and column, in the block manager are also shown.

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Figure 26: Status bar

7.2 Communication with MOVIDRIVE® and MOVITRAC®

This section describes the communication between operator terminal and SEW frequency inverters MOVIDRIVE® and MOVITRAC®.

There is also an explanation of how parameters and variables can be addressed and read. Constellations with more than one inverter connected via RS-485 are also described.

7.2.1 Serial connection between operator terminal and inverters

Connect the inverter with the operator terminal as described in section 4.

Use the PCS11A cable for connecting PC and operator terminal. The operator terminal is programmed via this cable.

PCS11A programming cable

Connection cable between operator terminal and PC for programming the operator terminal.

Set length of 3 m (10ft.).

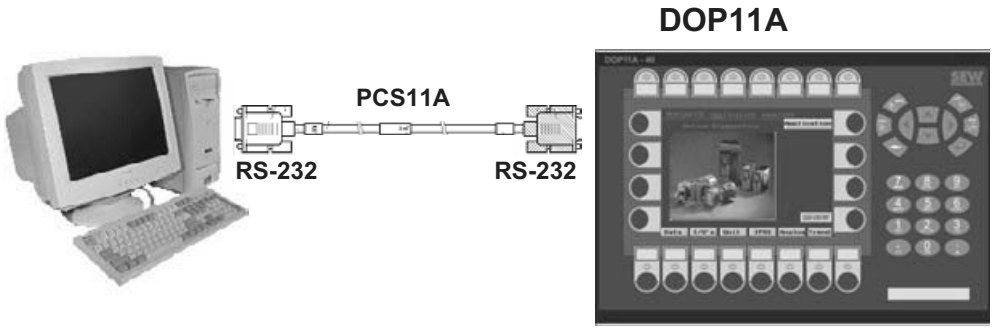

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Figure 27: PCS11A programming cable

7.2.2 Communication settings in the HMI-Builder

Setup of communication between operator terminal and inverter

The settings for communication between operator terminal and inverter are made in the HMI-Builder under [Setup] / [Peripherals].

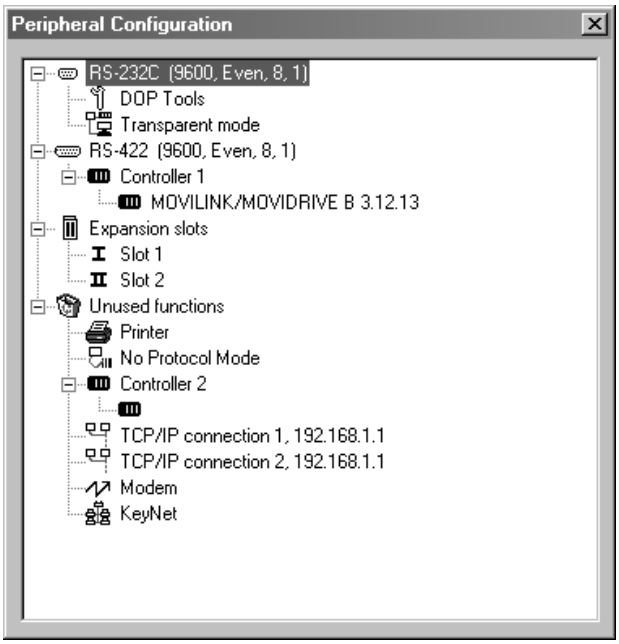

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Figure 28: Communication settings

To change the communication port, select [Controller 1] (or [Controller 2]), hold the left mouse button pressed and drag the controller to the other communication port.

To enter the communication parameter, press the right mouse button.

The settings must correspond with the physical structure.

MOVILINK® SMLP driver (ETHERNET)

Default settings

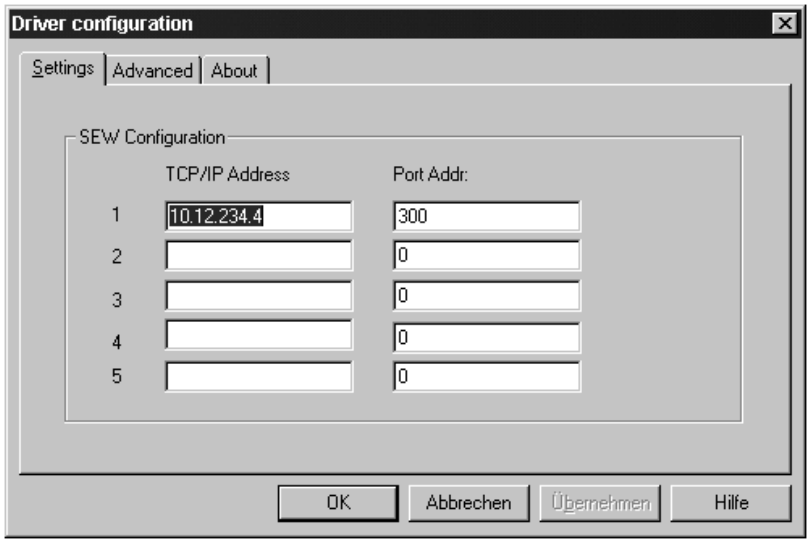

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Figure 29: Driver configuration

Settings

The TCP/IP addresses of the individual addresses are defined under the settings option.

Parameters	Description
TCP/IP address	Communication is established with the inverter addresses entered here during startup of the operator terminal after power on. This inverter address in line 1 will always be used if no other address is specified when defining the communication objects.
Port addr.:	Port number for data access. Always 300 the DFExxB

If several TCP/IP addresses are used, they must be entered in the following lines. Always begin in line 1. If a value should be read from one of the TCP/IP address, the line number must be specified before the variable address: Example:

2:P136 reads parameter P136 from the TCP/IP address from line 2.

3:P136 reads parameter P136 from the TCP/IP address from line 3.

Indexed addressing is also possible here, e.g. I1:P136

If more than 5 TCP/IP addresses are required, you must also use the second controller. Both controllers can be used on the same PFE11A.

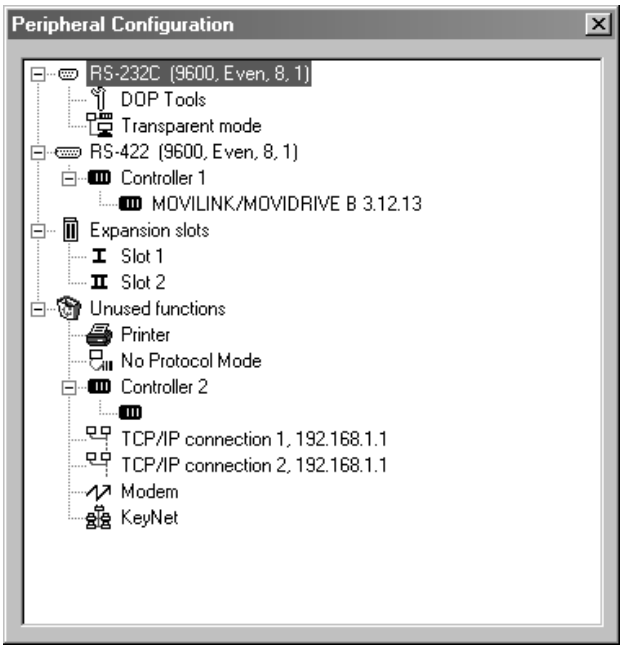

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Figure 30: Peripheral configuration

Advanced settings

Parameters	Description
Interval	Cannot be set in the SMLP® driver.
Timeout	Time in [ms] for repeat transmission.
Retries	Number of repeated transmissions until a communication error is triggered.
Retry time	Timeout for resetting the communication error. Communication will be reestablished after this time has elapsed.

MOVILINK® (serial) driver

Default settings

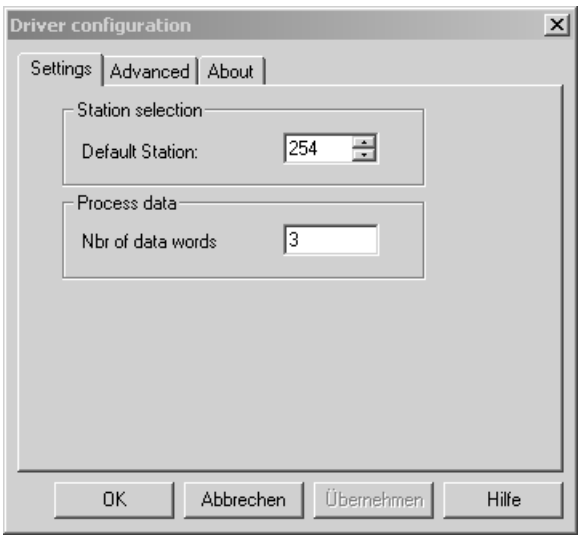

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Figure 31: Default settings

Port	RS-232C or RS-422
Baud rate	9600
Data bits	8
Stop bits	1
Parity	Even

Settings

The RS-485 start address is defined under Settings.

Parameters	Description
Default station	Communication is established with the inverter address entered here during startup of the operator terminal after power on. This inverter address will also be used if no other RS-485 address is specified when defining the communication objects.

You can enter values from 0 to 99, 254 and 255.

Address	Use / description
0 ... 99	Individual inverter address
254	Peer-to-peer communication This address must not be used when several inverters are connected with the operator terminal via RS-485.
255	Broadcast address All inverters connected to the RS-485 bus receive data but do not send a response to the operator terminal.

Advanced settings

Advanced settings	Description
Interval	Cannot be set in the MOVILINK® driver
Timeout	Time in [ms] for repeat transmission.
Retries	Number of repeated transmissions until a communication error is triggered.
Retry time	Timeout for resetting the communication error. Communication will be reestablished after this time has elapsed.

7.2.3 Addressing of parameters and variables

Addressing

The MOVILINK® driver knows the following data formats:

P	For parameters (volatile writing)
NVP	For parameters (non-volatile writing)
X	For index (volatile writing)
NVX	For index (non-volatile writing)
H	For IPOS variables (volatile writing)
NVH	For IPOS variables (non-volatile writing H0 - H127)

Without the suffix NV, the data are written to the RAM of the inverter and are lost when the inverter is switched off.

The suffix NV is required for non-volatile storage. In this case, the data are written to the EEPROM of the inverter. Note that only a limited number of write services can be executed on the EEPROM. Therefore, you should use the suffix NV carefully.

Digital data (bit-wise access)

Device	Minimum address	Maximum address	Comment
P *rr . bb*	P0.0	P963.31	Bit *bb* in register *rr*
NVP *rr . bb*	NVP0.0	NVP963.31	Bit *bb* in register
X *rr . bb*	X8192.0	X24575.31	Bit *bb* in register *rr*
NVX *rr . bb*	NVX8192.0	NVX24575.31	Bit *bb* in register *rr*
H *rr . bb*	H0.0	H511.31 (H1023.31 for MOVIDRIVE® B)	Bit *bb* in register *rr*
NVH *rr . bb*	NVH0.0	NVH511.31 (NVH1023.31 for MOVIDRIVE® B)	Bit *bb* in register *rr*
B *rr*	B0	B63 (local bits, which are stored in the operator terminal)	Bit *bb*

For a number of the inverter parameters, several pieces of information are stored in one parameter. This means parameters P10, P11 and P12 are coded via index 8310. You can use the following notation to partially evaluate these parameters:

- H100. 0-15 Low word of IPOS variable H100
- H100.16-32 High word of IPOS variable H100

Digital data (partial access)

Device	Minimum address	Maximum address	Comment
P *rr . a-b*	P0.0-1	P963.0-31	P *rr . a-b* a = Start bit b = Number of bits to be read **Example** H *100 . 7-8* Data are read from bit 7 to bit 14 inclusively.
NVP *rr . a-b*	NVP0.0-1	NVP963.0-31	
X *rr . a-b*	X8192.0-1	X24575.0-31	
NVX *rr . a-b*	NVX8192.0-1	NVX24575.0-31	
H *rr . a-b*	H0.0-1	H511.0-31 (H1023.0-31 for MOVIDRIVE® B)	
NVH *rr . a-b*	NVH0.0-1	NVH511.0-31 (NVH1023.0-31 for MOVIDRIVE® B)	

Analog signals

Device	Minimum address	Maximum address	Comment
P *rr*	P0	P963	Register *rr*
NVP *rr*	NVP0	NVP963	Register *rr*
X *rr*	X8192	X24575	Register *rr*
NVX *rr*	NVX8192	NVX24575	Register *rr*
H *rr*	H0	H511 (H1023 for MOVIDRIVE® B)	Register *rr*
NVH *rr*	NVH0	NVH511 (NVH1023 for MOVIDRIVE® B)	Register *rr*
R *rr*	R0	R63 (Register, stored in the operator terminal)	Register *rr*

All parameters, variables and indices are 32-bit values.

Communication with inverters connected via RS-485

After power on, the RS-485 address entered as *Default station* in the driver parameters is addressed by the operator terminal.

This address is also used when no other address is specified.

The following notation is used for addressing inverters with a defined RS-485 address:

Example

Default station RS-485 address 254 (peer-to-peer). Only to be used if one single inverter is connected to the operator terminal.

P100	Communication with parameter P100. The address that was entered in the [Default station] input field when configuring the driver is used as communication address.
2:P100	Communication with parameter P100 of the inverter with address 2
4:H102	Communication with IPOS variable H102 of the inverter with address 4

Communication with inverters connected via ETHERNET

When the operator terminal is started up, communication is established with all TCP/IP address entered in the driver configuration.

The address in line 1 is also used when no other address is specified.

The following notation is used for addressing inverters with a defined TCP/IP address:

Example:

TCP/IP address in line 1 is 10.12.234.4, port 300.

TCP/IP address in line 2 is 10.12.234.5, port 300.

TCP/IP address in line 3 is 10.12.234.6, port 300.

TCP/IP address in line 4 is 10.12.234.7, port 300.

P100	Communication with parameter P100. The address that was entered in input field [1] when configuring the driver is used as communication address (10.12.234.4).
2:P100	Communication with parameter P100 of the inverter with address 2 (10.12.234.5).
4:H102	Communication with IPOS variable H102 of the inverter with address 4 (10.12.234.7).

Process data

The MOVILINK® driver can operate one to three process data per inverter depending on the setting.

A distinction is made between process output data (PO data from the PLC to the inverter) and process input data (PI data from the inverter to the PLC).

The number of process data is set in the MOVILINK® driver *Dialog*. The inverter parameter P90 PD configuration must have the same value.

Bit-wise access to process data

Device	Minimum address	Maximum address	Comment
PO *rr* . *bb*	PO1.0	PO3.15	Bit *bb* in register *rr*
PI1 *rr* . *bb*	PI1.0	PI3.15	Bit *bb* in register

Word-by-word access to process data (16-bit)

Device	Minimum address	Maximum address	Comment
PO *rr*	PO1	PO3	Register *rr*
PI *rr*	PI1	PI3	Register *rr*

Indexed communication with inverters connected via RS-485

In addition to directly specifying the RS-485 address, communication can also be performed via index. This means the RS-485 address is stored in a variable of the operator terminal and can be set by the operator.

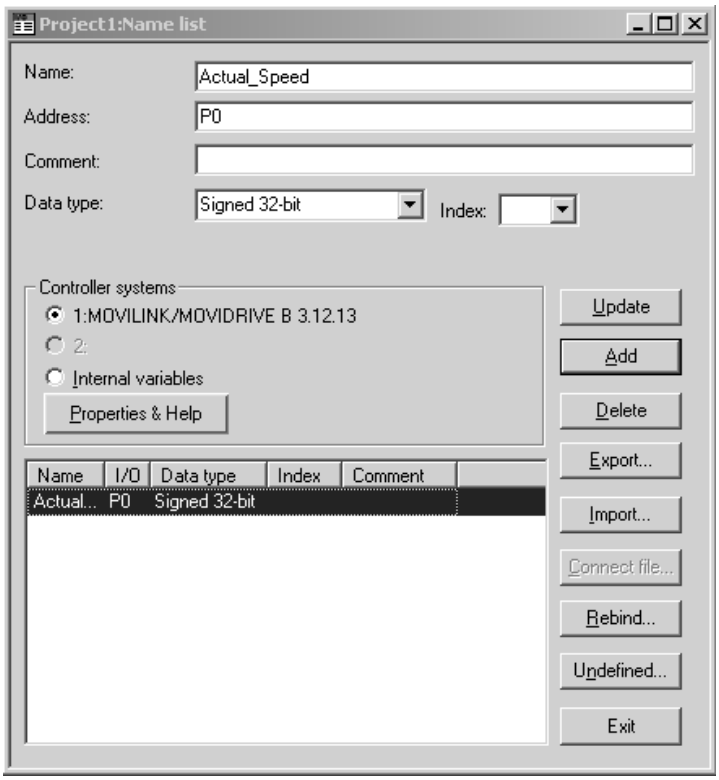
This function is also available with the SMLP driver. The IP station is addressed instead of the RS-485- address.

Example

A project is created in which the operator can enter the RS-485 address of the inverter. This has the advantage that the actual address of the inverter must not be known when creating the DOP project. The operator can enter and specify the address during system operation.

The actual speed of a drive should be indexed. The actual speed is displayed in parameter P000.

1. Define the register R1 to which the RS-485 address of the inverter to be addressed will be stored in the HMI-Builder under [View] / [Name list] and define Parameter P000 as symbolic name for the actual speed:



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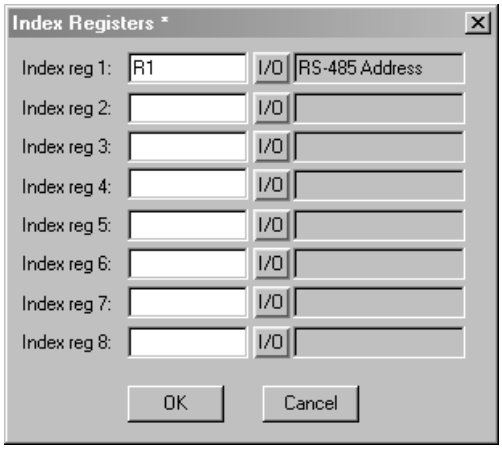
2. Now link index register 1 to terminal register R1 under [Setup] / [Index registers]:



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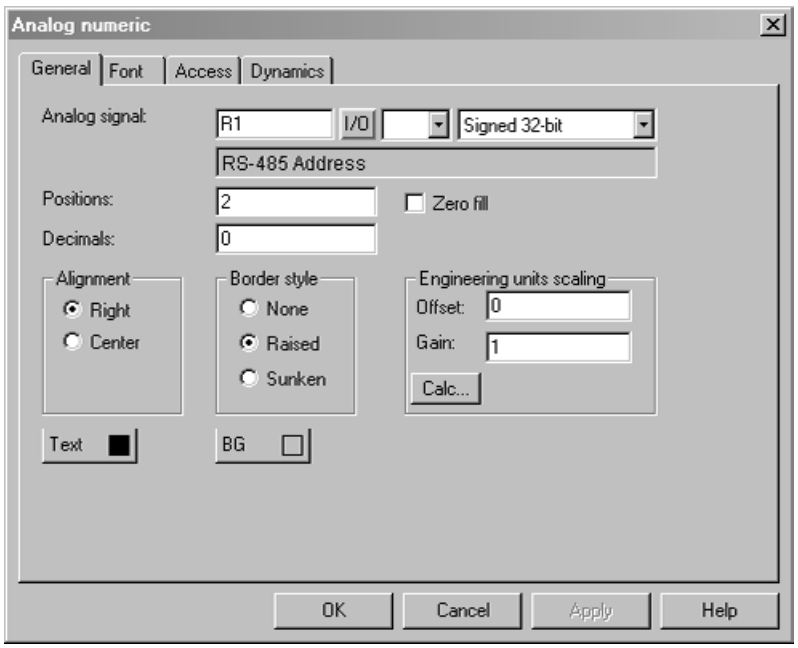
3. Next, define the object Analog numeric  to enable the operator to enter the RS-485 address. Link this object to register R1 and select the Enable operator input checkbox on the [Access] tab page.



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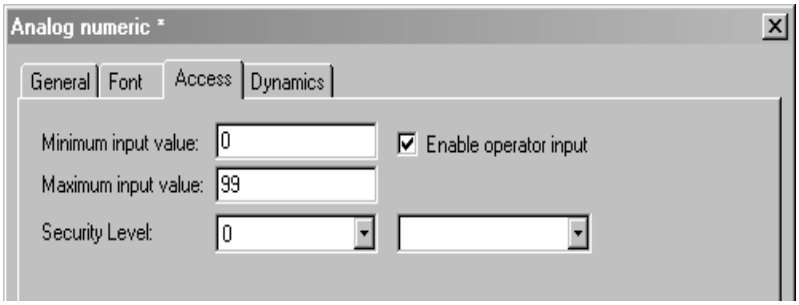

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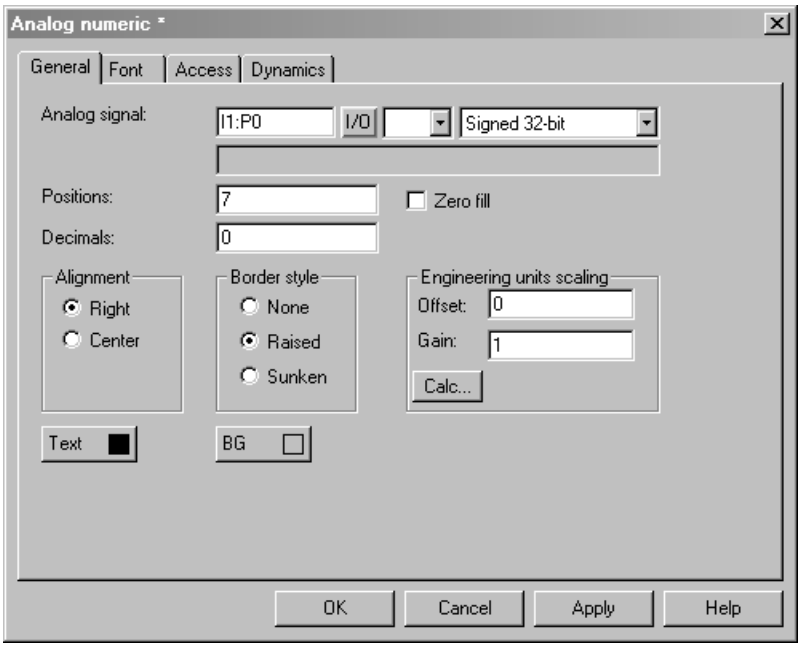
Note the minimum and maximum input values.

4. Now define another Analog numeric object 03 to display the actual speed. Link this object with parameter P000 and enter the necessary scaling (0.001 in the example). Index register I1 is now handled as a preset RS-485 address: I1:P000.

   This means the inverter address that corresponds with the content of index register I1 will be addressed.

   Enter a gain of 0.001 to display the unit of the actual speed in [1/min].



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7.3 Programming with the programming software

7.3.1 Starting the HMI-Builder

Click on [Start] / [Programs] / [Drive Operator Panels DOP] / [HMI-Builder] / [HMI-Builder].

The following menus are available when starting the HMI-Builder without having loaded a project:

- File
- Settings
- Window
- Help

After you have created a project, all menus are available for selection.

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7.3.2 Choosing a language

Choose the language for the user interface (including menu texts, object names, etc. under [Settings] / [Language]. It is assumed in this manual that you have chosen *English*.

7.3.3 Creating projects

To create a new project, select [File] / [New] from the menu. In the [Project settings] dialog, you can select [Terminal], [Controller system] and [Color scheme]. Not all options are available for all terminals. To create a new project, click on [OK].

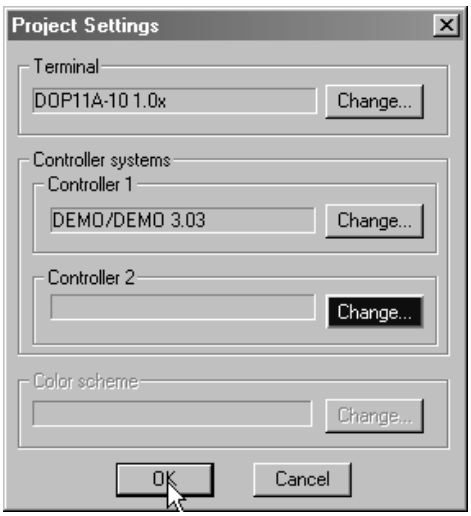

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Figure 32: Project settings

Terminal

Click on [Change].

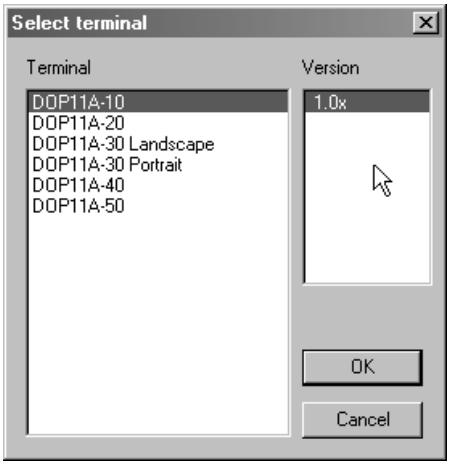

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Figure 33: Select the terminal

Select a terminal and the version (system program) of the selected terminal type.

Controller

Here you define the controller to which the operator terminal will be connected. Clicking on the [Change] button opens the following dialog. The list shows all installed drivers. Select [Brand name], [Protocol] and [Model]. Click [OK] to confirm your selection. To cancel your selection, click [Cancel].

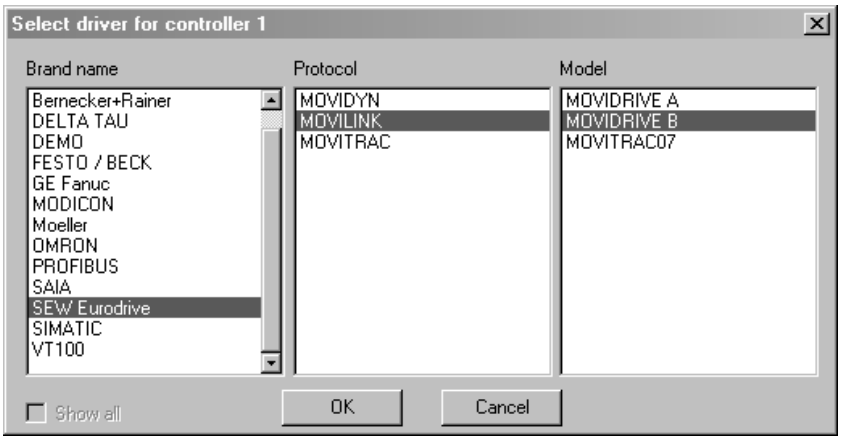

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Figure 34: Controller

Two drivers can be used in a project (terminal). The driver for the second controller is selected like the first one.

For more detailed information on using two drivers in one terminal, refer to section "Communication with two controllers (two drivers)" in chapter 9.1, "Communication."

Color scheme

In this window, you can create an individual color scheme and save it under a different name. You can also define the colors for your background, menus, dialog boxes, objects, etc. When selecting an object from the toolbox or menu, the colors of the object correspond with the colors defined in the color scheme.

Clicking on the [Change] button opens the following dialog. Here you can change an existing color scheme or create a new one.

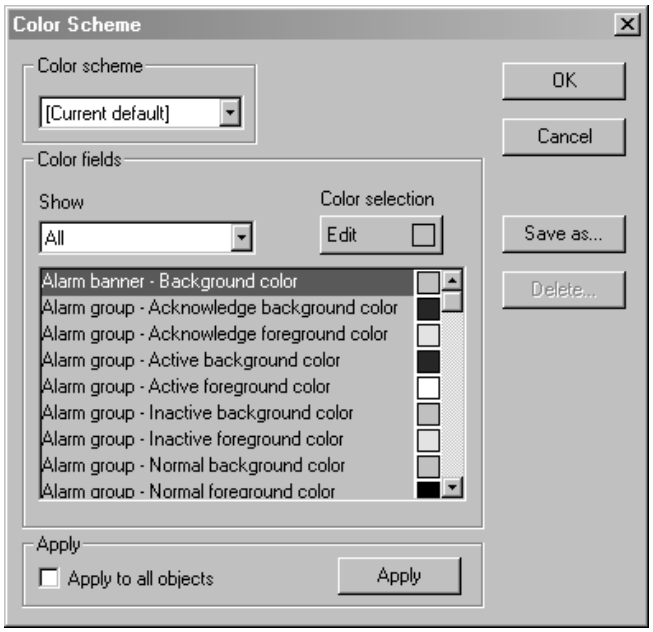

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Figure 35: Color scheme

Clicking the [Apply] button updates all colors in the project except for lines, circles, rectangles and curves.

7.3.4 Updating drivers

From the internet

To update available drivers to the latest version or to install new drivers, use the function [File] / [Update terminal driver] / [Download driver from the Internet].

Close all projects before using this function. The computer must be connected to the Internet. A web browser is not required. After the connection is established, a list with all drivers that can be downloaded from the Internet will be displayed.

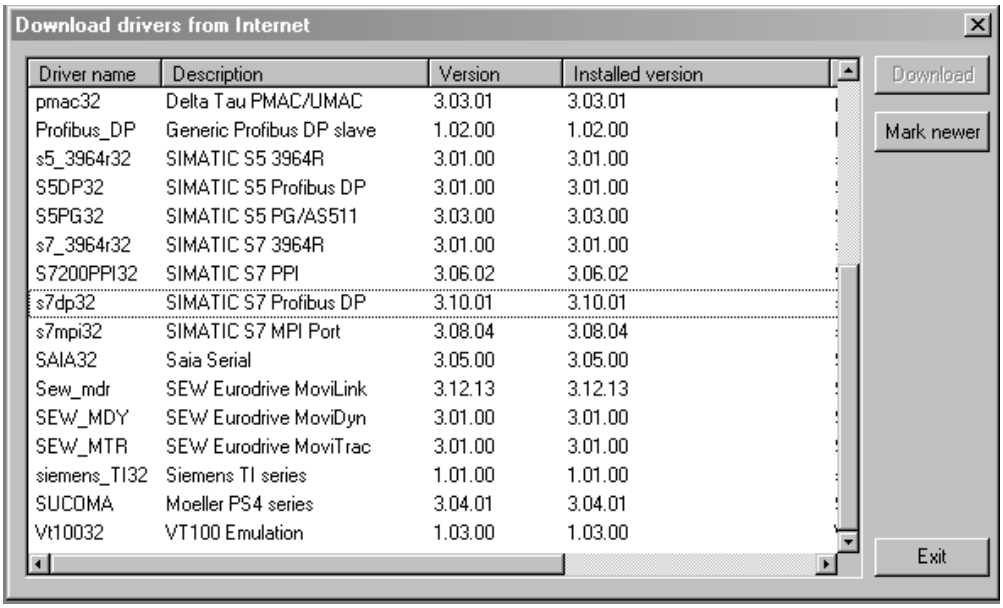

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Figure 36: Downloading a driver from the Internet

The list shows the version numbers of available and already installed drivers. Select the driver(s) to be installed in the HMI-Builder. The function [Mark newer] highlights all drivers of a higher version that are not installed. Next, click [Download]. Each driver file size is about 500 kB and is ready to use directly after download.

From disk

To update existing drives to the most recent version or install a new driver from a file, use the function [File] / [Update terminal driver] / [from disc] in the HMI-Builder. Close all projects before you use this function. low. Open the uncompressed MPD file in the driver directory. A list opens with all drivers that can be installed.

The list shows the version numbers of available and already installed drivers. Select the driver(s) to be installed in the HMI-Builder. Click [Install] to continue.. After the installation has been completed, click on [Close] to return to the HMI-Builder.

7.3.5 Changing project settings

The selected terminal or controller can be changed for a project. To do so, select [File] / [Project settings] from the menu and click [Change] next to the parameter *Terminal* and/or *Controller*.

Changing the operator terminal

When updating the system program in the terminal, the terminal version must be adjusted accordingly in the [Project settings] menu. Else, the scope of functions provided by the new terminal version will not be available.

Changing the controller

If you exchange the controller in a project against another controller with different signal names, then you also have to change these signals. Use the internal name list for this purpose. See the section "Name list" on page 112.

1. Select [View] / [Name list] from the menu.
2. Click the [Undefined] button to add all I/Os used in the project to the name list.
3. Click [Export] to output the name list as text file. Enter a name and click on [Save]. Define a separator for the text file.
4. Open the text file with an editor, such as Wordpad.
5. Change all I/Os into signals that will be used in the new controller. Save the file in a text format.
6. In the [Name list] dialog box, click the [Import] button and answer the question whether you are sure you want to delete all invalid I/Os with [No].
7. Click [Reconnect] to update all new I/Os in the project with the new name.
8. Select [File] / [Project settings] from the menu and click [Change].
9. Select the new controller and double-click [OK].

Project manager As soon as you create a project, the project manager is displayed with all the existing blocks and components. Click on the plus sign in the directory nodes to open the directories.

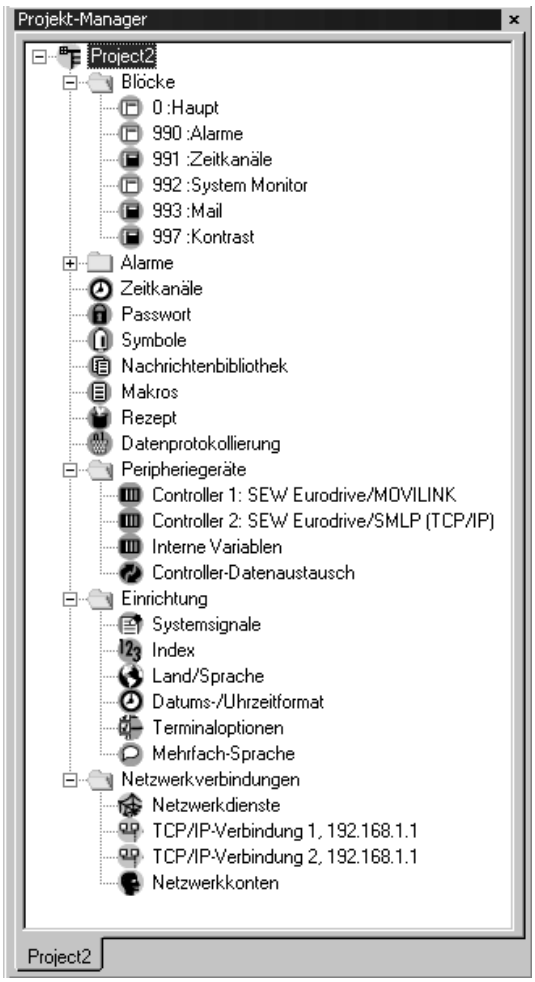

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Figure 37: Project manager

7.3.6 Creating blocks with the block manager

Double-click on the directory [Blocks] to open the block manager. The block manager contains an overview of all the project blocks.

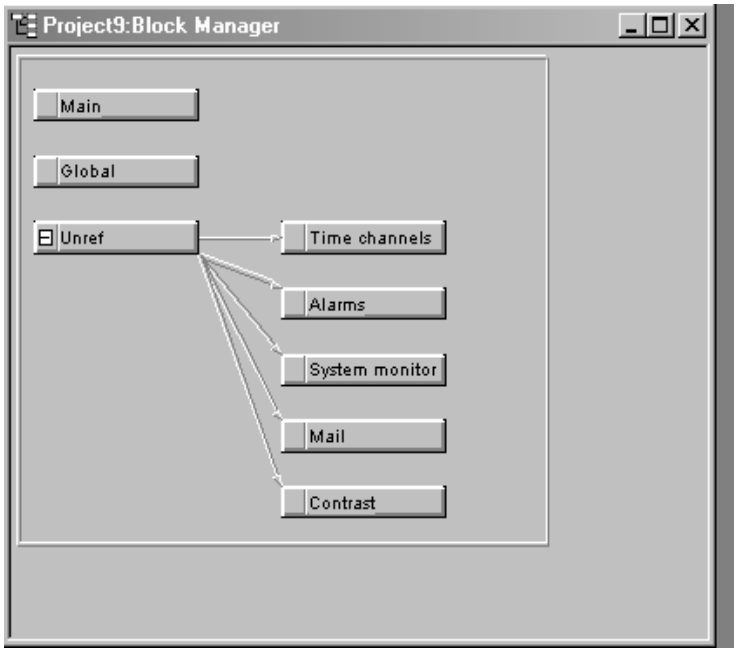

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Figure 38: Creating blocks

When the block manager is displayed, the toolbars of the block manager and the zoom function are marked.

- The DOP11A-10 and DOP11A-50 operator terminal types do not have the [Contrast] block.
- Only the types DOP11A-30, DOP11A-40 and DOP11A-50 have the [System monitor] block.
- The DOP11A-10 type does not have the [Mail] block.

Defining blocks

Adding a block opens the following dialog. The dialog is a simplified representation of the complete block header. Click [OK] to open and display the created block.

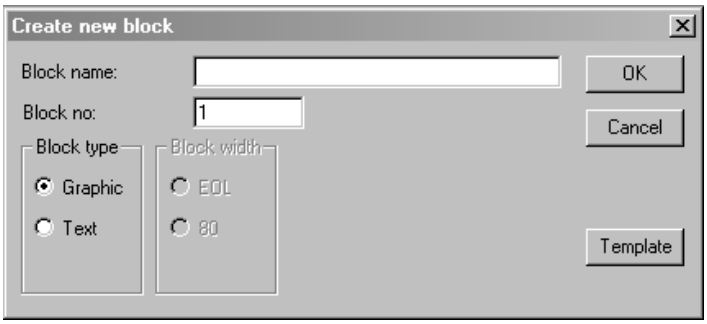

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Figure 39: Creating a new block

Parameters	Description
Block name	You can enter a name for the block in this field. The block name will be displayed in the block manager and in the block list.
Block no.	The block number is specified in this field. If the entered number was already assigned to a block, the defined values will appear automatically. Block 0 is automatically created at the start of the program and must exist in every project.
Block type	Select whether you want the block to be a graphic block or a text block.
Block width	Define the font size for a text block. The font size cannot be changed for a defined block.
Template	Clicking this button inserts a block template or saves the current block as block template.

Block properties

The [Block properties] menu contains basic parameters that apply to each individual block. The appearance of the block header depends on the selected block type. To define a complete block header, click on the block and select [Block manager] / [Block properties] from the menu.

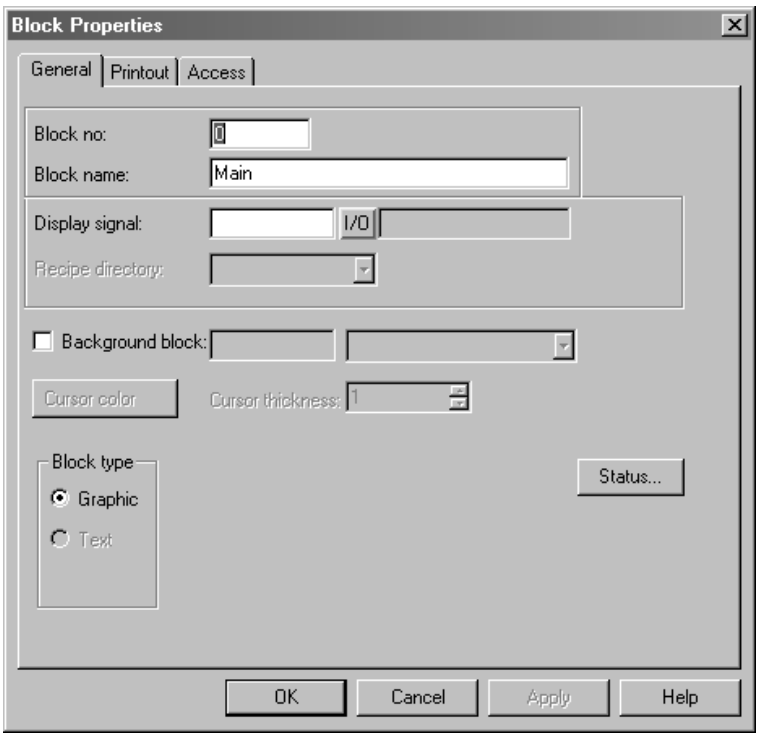

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Figure 40: Block properties

In the project manager or the block manager, click with the right mouse button on a block and choose [Properties] to enter detailed block information.

The terms used for defining the block header are explained below:

Tab page	Name	Description	
General information	Block number	The block number is specified in this field. If the entered number was already assigned to a block, the defined values will appear automatically. Block number 0 is automatically created at the start and must exist in every project.	
	Block name	You can enter a name for the block in this field. The block name will be displayed in the block manager, in the project manager and in the block list.	
	Display signal	Digital signal that displays the selected block on the terminal screen. Use display signals in series to change blocks as quickly as possible. No entry is made in this field if you use another block changing method.	
	Recipe directory	Select a recipe directory where all recipes created in the block will be stored. See chapter 8.3 "Recipe handling".	
	Background block	Applies to graphic blocks only. You can select another block as the background block if, for example, several blocks should be displayed with the same background color. When the graphic block manager is activated, you can define whether the background block is shown when editing the selected block using the [View] / [Options] / [Show background block] function.	
	Cursor color	Applies to graphic blocks only. Determines the color of the cursor in the operator terminal.	
	Cursor thickness	Applies to graphic blocks only. Determines the size of the cursor in the operator terminal.	
	Block type	The block type is defined when the block i s created and cannot be changed here.	
	Status	When you click the [Status] button, the [Block options] dialog box is displayed. It shows the following status characteristics of the operator terminal screen. These characteristics do not affect the system blocks.	
		Parameters	Description
		Cursor off	Applies to text blocks only. Indicates whether the cursor is visible in the block in run mode.
		Place cursor on first maneuverable object	Applies to text blocks only. Defines whether the cursor is to be positioned on the first maneuverable object in the block instead of in the top left hand corner.
		Deactivate <MAIN> key	Deactivates the <MAIN> key when the current block is displayed on the screen.
		Deactivate <LIST> key	Deactivates the <LIST> key when the current block is displayed on the screen.
		Additional notes	Applies to text blocks only. Defines whether the [+] sign is to appear at the bottom and top right corner of the screen if the block contains more characters than can be displayed on the screen.
		Automatic data entry	Moves the cursor to the next maneuverable object after data has been entered. In this mode, the cursor can only point to maneuverable objects.
		Deactivate the <PREV> function key	Deactivates the <PREV> key and the function [Return to previous block] when the current block is displayed on the screen.
		Deactivate the <ENTER> function key	Only applies to digital objects. Deactivates the <ENTER> key when the current block is displayed on the screen.
Appearance	You can change the color and the color shading on the [Appearance] tab page.		
Print	Print signal	Digital signal that sends the block to the connected printer. Display and print signals can be identical. Use print signals in series for fastest possible printing.	
	Conclusion signal	Digital signal that is output by the terminal when the print process has been completed. The signal is enabled by default. Selecting the [Reset] option resets the signal when the print process has been completed.	

Tab page	Name	Description
E-mail	The [E-mail] tab page is only available for text blocks.	
	Send e-mail signal	When the specified digital signal is enabled, the text block will be sent as an e-mail. The block name corresponds to the subject of the e-mail. Only text blocks can be sent as e-mail.
	E-mail conclusion signal	Digital signal that is output by the operator terminal after an e-mail has been sent. The signal is enabled by default. Selecting the [Reset] option resets the signal when the e-mail has been sent.
	Send e-mail to address	The e-mail address of the recipient is entered in this field. Clicking the [...] button enables you to select up to eight recipients from a list. The address list is defined under [Setup] / [Network] / [Services] / [SMTP client]. See section 9.3.2, "STMP client."
	Append file	Enter the name of a trend or recipe file you want to attach to your mail. If a trend file and a recipe file have the same name, the trend file will be attached.
Access	Security level	Define the security level (0-8) for the block. If you enter a security level higher than "0", you will have to logon with a password that corresponds to the defined security level or higher.
Local function keys	You can define local function keys for the block on the [Local function keys] tab page. See section 8.10 "Function keys" for additional information.	

7.3.7 Library

The library includes a series of catalogs with different symbol objects. You can also define catalogs created by the user. To do so, click the right mouse button on the library and choose [Directory] / [New].

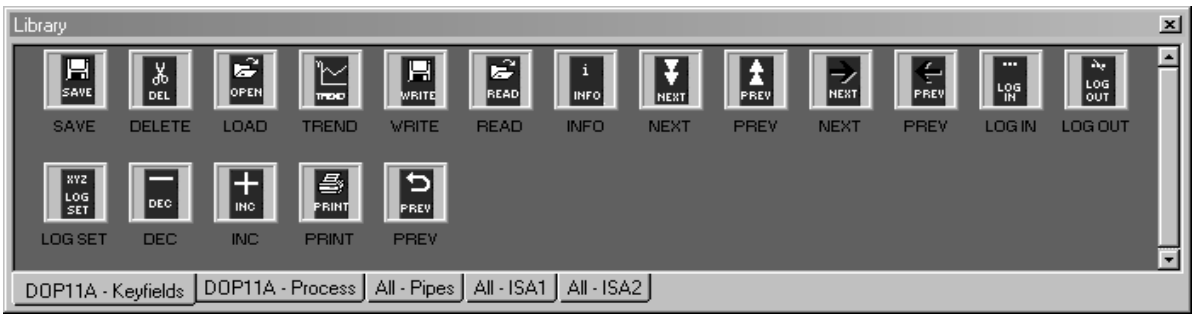

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Figure 41: Library

Grouped objects and symbols can be saved in the library or in other projects. Objects and symbols stored in the library can be used again with other projects. Click with the right mouse button on a grouped object or symbol in the work area, choose [Copy]; click with the right mouse button on the library and choose [Paste]. Library objects can be dragged from the library to the work area.

You can adjust the way the data is displayed by clicking with the right mouse on the library. To close the library catalog, click with the right mouse on the catalog and choose [Directory] / [Close].

You can hide the library by choosing [View] / [Tools] / [Library].

Symbol objects used in a project are stored in the project directory. These symbols can also be defined using the [Select symbol] dialog box. See the section "Symbol manager" on page 101.

Saving symbols in the library

Use the cursor to select one or more objects (grouped or ungrouped) in the work area. Click with the right mouse button on the selection and choose [Copy]. Click the right mouse button in the library and choose [Paste].

7.3.8 Display terminal around the work area

The terminals provide the menu entry [View] / [Options] / [Show terminal]. Selecting this option shows the current terminal around the work area of the active block. You can click on the function keys, LEDs and text fields of the terminal view.

Defining function keys

You can select whether you want to define a local or global function key by double-clicking a function key. The double-click opens the manager for the selected function. For further information on defining function keys, refer to chapter 8.10 "Function keys."

Defining LEDs

Double-click an LED to open the manager for defining LEDs. For further information on defining LEDs, refer to chapter 8.9 "LEDs".

Creating text strips

Double-clicking a text strip field opens a dialog where you can enter a text and define orientation and font of the text. This function enables you to define text strips and print them out.

7.3.9 I/O browser

When creating a local name list in your project, you can select I/O signals from this list when defining objects.

To do so, click on the [I/O] button. The [I/O] button is available in all fields where an address can be entered. The [I/O browser] has an incremental search algorithm. This means a search is initiated by entering characters into the field for a name or signal. The I/O list is sorted by signals or names.

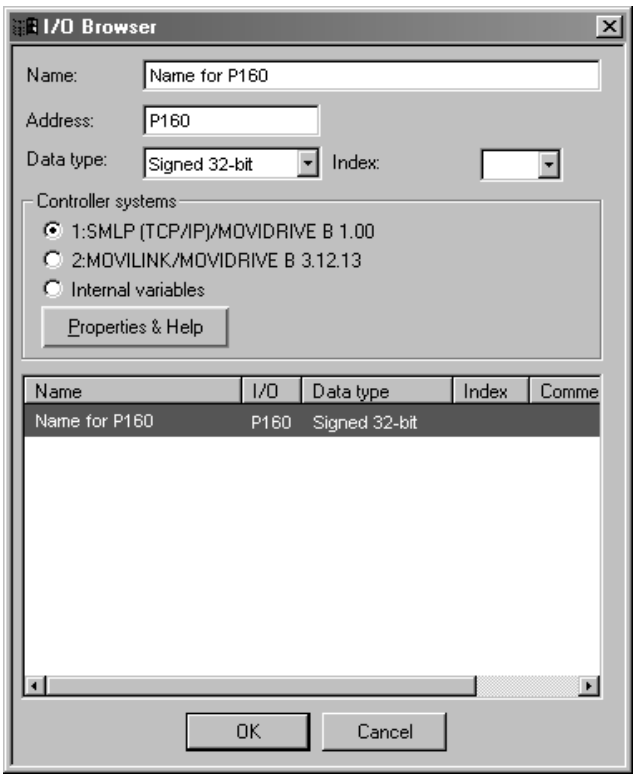

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Figure 42: [I/O browser]

7.3.10 Programming blocks

Double-click the required block in the block manager. The double-click opens the work area for the block and the toolbox. The work area shows the graphic block or text block manager depending on whether you open a graphic block or a text block. The toolbox contains all objects that can be created in the block.

To select an object, click on the object in the toolbox and move the cursor to the position in the work area where you want to place the object. A mouse click activates the dialog box for the selected object. Enter the parameters into the dialog and click [OK]. The object now appears on the work area. Static text or graphics are displayed directly on the work area.

General object parameters are described in "Basics" in section 7.1. Graphic and text objects are explained in sections 7.4 "Graphical display and control" and 7.5 "Text-based display and control."

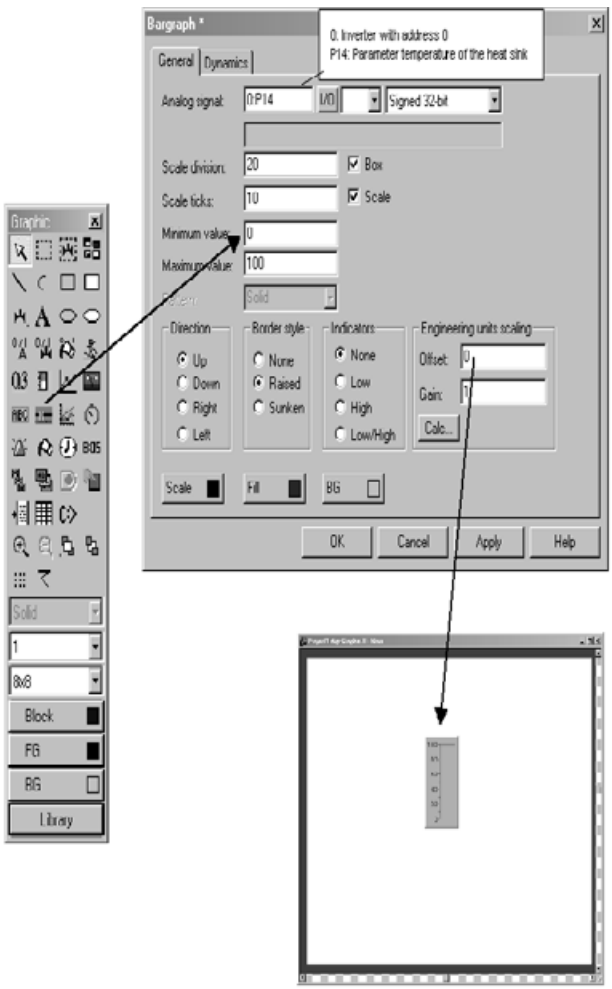

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Figure 43: Programming blocks

7.3.11 Graphic block manager

Not applicable for DOP11A-10.

This section describes the graphic block manager in the HMI-Builder. The method of functioning and appearance are based on the Windows standard.

In the graphic block manager, graphic blocks are created using static and dynamic graphic elements.

Opening the graphic block manager

To open the [Graphic block manager] menu, double-click on a defined graphic block in the [block manager] or in the [Block list].

Mouse, keys and cursor

The following section explains what you can do with the mouse and keys in the graphic block manager and also explains the different cursor shapes.

Use the mouse to perform the following actions:

- Select objects from the toolbox
- Select objects by clicking on them
- Select several objects (by clicking next to the objects, keeping the left mouse button pressed down and drawing a selection rectangle around the required objects.)
- Move objects (by keeping the left mouse button pressed down while the cursor is positioned over an object and moving the mouse.)
- Resize object
- Open the parameter dialog (by double-clicking an object)

The figure below shows what a selected object looks like.

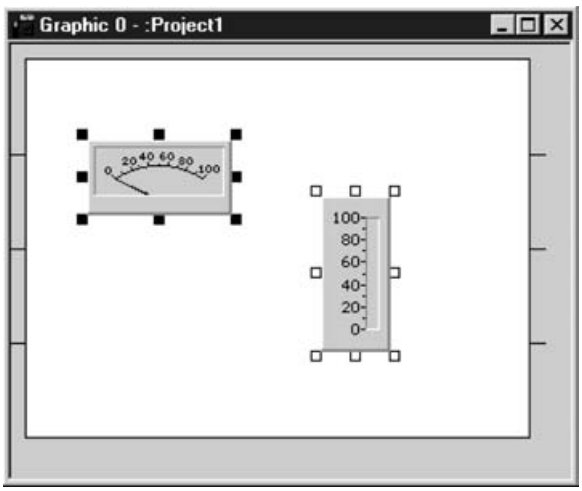

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Figure 44: Selected object

Use the keys to perform the following actions:

- Create objects using the [Object] menu
- Use the arrow keys to move the cursor
- Move the cursor pixel-by-pixel (by pressing the key combination <Ctrl> + arrow key).
- Select or deselect an object (by positioning the cursor over the object and pressing the space bar)
- Select/highlight several objects (by selecting [Object] / [Select block] from the menu and drawing a frame around the objects by pressing the space bar and arrow keys)
- Move an object (by positioning the cursor over the object, keeping the space bar pressed down and pressing the arrow keys)
- Change the size of an object (by positioning the cursor over an object handle, keeping the space bar pressed down and pressing the arrow keys)
- Open the dialog for a selected object (by pressing the Enter key)

Cursor

The cursor can take four different shapes:

	Within an object
	The size of the object can be changed
	In the graphic work area
	When selecting a function from the menu or the toolbox

Creating objects

Click on the required object in the toolbox and move the cursor to the position in the work area where you want to place the object. Make a mouse click to position the object.

Static graphics are displayed when clicking on the work area. For dynamic objects, a dialog opens for the current object. The object is displayed on the screen when clicking [OK] in the object dialog.

Once the object is displayed it has handles and selection mode is active.

Static graphic

Static graphic objects comprise

- Line
- Curve
- Ellipsis
- Rectangle
- Symbol
- Text
- Decorations

They are used to draw background graphics. You can change static graphic objects into dynamic objects by linking them to the objects on the [Dynamic signals] tab page.

Dynamic objects

Dynamic objects are linked with signals to generate control and monitoring functions, among others. For further information on defining objects, refer to section 7.4 "Graphic display and control".

Select several objects

There are two ways of selecting several objects in the graphic block manager.

- Press the left mouse button and keep it pressed down while drawing a selection rectangle around the required objects. The last object you have created will be displayed with filled handles.
- Select the pointer from the toolbox. Hold the shift key pressed while selecting the required objects. The last object you have selected will be displayed with filled handles.

Positioning objects

The [Layout] menu offers several functions for easily positioning objects:

- Align
- Make same size
- Space evenly
- Tile

You can also invoke these functions from a separate toolbox.

This function can only be invoked when at least two objects have been selected. The functions perform their positioning calculations based on one or two reference objects.

The functions [Align], [Make same size] and [Tile] refer to the object that was last selected or created. See the section "Selecting several objects" on page 93.

The function [Space evenly] takes the object furthest down to the bottom/top or left/right as reference object. The functions do not affect the reference object.

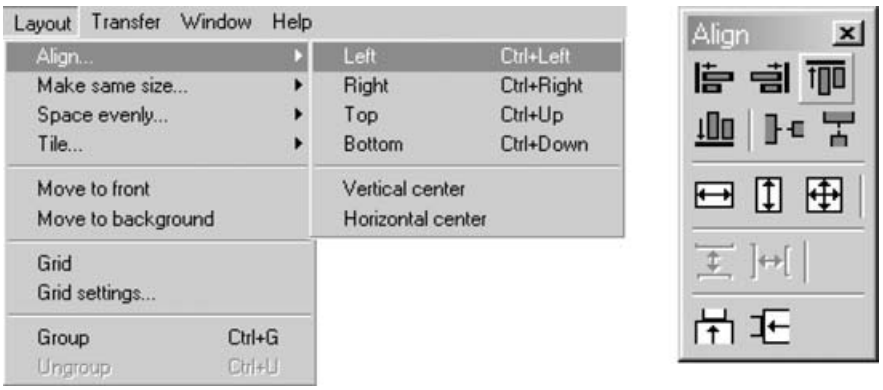

Figure 45: [Layout] menu

Align

The [Align] function offers six menu options for aligning objects vertically or horizontally.

Left	Aligns the selected objects flush left with the reference object.
Right	Aligns the selected objects flush right with the reference object.
Top	Aligns the selected objects flush with the top of the reference object.
Bottom	Aligns the selected objects flush with the bottom of the reference object.
Vertical center	Centers the selected objects vertically based on the reference object.
Horizontal center	Centers the selected objects horizontally based on the reference object.

Make same size

The [Make same size] option offers three functions to make selected objects the same size.

Width	Matches the width of the selected objects to that of the reference object.
Height	Matches the height of the selected objects to that of the reference object.
Both	Matches the size of the selected objects to that of the reference object.

Space evenly

The [Space evenly] option offers two functions to change the distance between two selected objects.

Vertical	Matches the position of the selected objects to have an identical vertical distance. The objects closest to the top and bottom are not moved. At least three objects must have been selected.
Horizontal	Matches the position of the selected objects to have an identical horizontal distance. The objects closest to the left and right side are not moved. At least three objects must have been selected.

Tile

The [Tile] option offers two functions that enable you to position two objects next to each other.

Vertical	Changes the vertical position of the marked objects so that they are aligned with the reference object.
Horizontal	Changes the horizontal position of the marked objects so that they are aligned with the reference object.

Grouping objects

The [Layout] menu offers functions for grouping several objects. Select the required objects and choose [Layout] / [Group] from the menu. The group of objects will now be treated like a single object and you can resize the objects all at once. You can still define the color and font individually for each object in the group. Clicking an object in the group opens the edit dialog for the corresponding object.

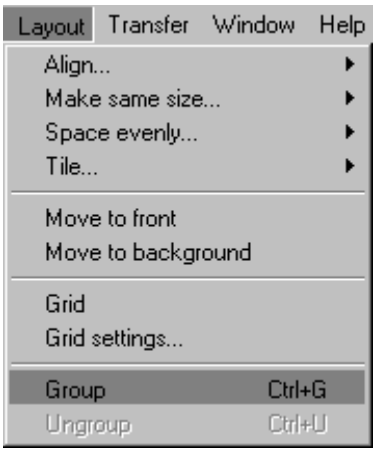

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Figure 46: Grouping objects

The [Layout] / [Ungroup] function allows you to separate a group into individual objects.

Saving and loading grouped objects

You can save or load grouped objects by clicking the [Library] button in the toolbox in the graphic block manager.

Creating tables

Object tables in a graphic block can be created as follows:

1. First, create two rows or columns with the same object.

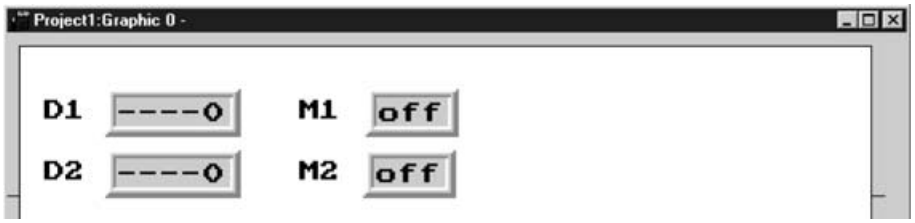

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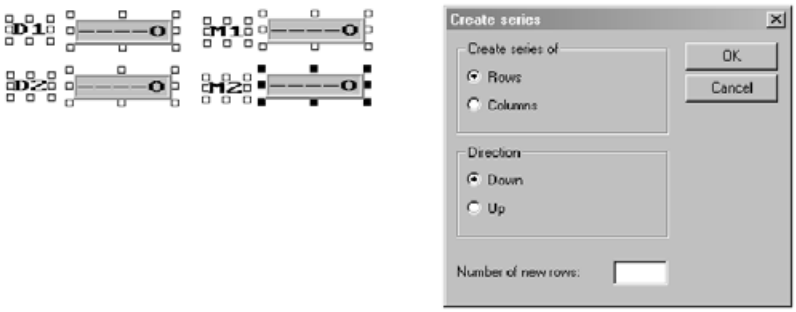
Figure 47: Object tables

2. Select the objects and choose [Object] / [Create series of] from the menu.



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This opens a dialog box.

3. If you want to create a table, define the number of rows and columns and the direction into which you want to expand the table.

   Clicking [OK] has the programming software create a table with the defined number of rows or columns.

The quick info text must end with a number, otherwise the table cannot be created. The object alarm banner cannot be included in a table.

Symbols

There are three ways to create symbols:

- Via the Symbol manager
- Via the function [Create Symbol]
- by inserting a graphic from another Windows application via the clipboard.

See the section "Symbol manager" on page 101.

[Create a Symbol] function

1. Select [Create symbol] from the toolbox.
2. Draw a selection rectangle around the graphic you want to save as symbol.
3. Enter a name for the symbol. The name must not exceed 8 characters.

   The symbol will then be saved in the symbol library under the specified name.

Copy a graphic from another application

1. Copy an object in another application, such as Paint, to the clipboard.
2. Open the graphic block manager in the programming software and select the [Paste] command.
3. Specify a name for the symbol. The name must not exceed 8 characters.

The symbol will then be stored in the system library under the specified name.

Graphics and symbols can be copied from one block to another and from one project to another in the HMI-Builder using the [Copy] and [Paste] functions.

A user defined symbol will be copied from one project to another if it does not yet exist in the target project.

7.3.12 Text block manager

Dialogs and reports are created in the text block manager. A text block can consist of static text and dynamic objects. Static text is not changed during program execution whereas dynamic objects are linked with controller signals.

Seven dynamic object types are available:

- Digital
- analog
- Jump
- Date / time
- Bar
- Multiple selection
- Text object

Opening the text block manager

To open the text block manager, double click on a defined text block in the block manager or in the block list. Select a defined block from the block list or create a new text block.

Mouse and keys

Click on the begin of the text to be selected and drag the mouse pointer over the text. To select text using keys, hold down the shift key and select the text using the arrow keys.

Selected text is deleted using the [Cut] function.

You can insert an end of line using the key combination <Ctrl> + Enter key.

To view an object's properties, double-click an object and press the <F4> key.

Toolbox

The block manager provides a toolbox with the following functions.

- Maximize
- Minimize
- Resizable

All functions are also available from the menus. For further information on defining and using the various objects in text blocks, refer to chapter 7.5 "Text-based display and control".

	Maximize
	Minimize
	ASCII selection list. For selecting characters that cannot be directly entered using the keyboard.

Defining text blocks

Static text

The text block manager is a text manager for entering static text. The Windows functions [Copy] and [Paste] can be used to copy and paste text in a block from one block to another or from one program to another (e. g. Microsoft Word). This function can be used to document applications quickly and easily.

Dynamic objects

Dynamic objects can be defined at any text position. Select the object type from the toolbox or the [Object] menu. This opens a dialog where you can define the object.

The dynamic object is marked with a hash key (#) followed by one or several hyphens (-) depending on the position. For further information on defining dynamic objects, refer to chapter 7.5 "Text-based display and control".

7.3.13 Symbol manager

Not applicable for DOP11A-10.

The symbol manager is opened by selecting [View] / [Symbol manager] from the menu. The symbol manager provides functions for importing and exporting bitmap symbols. You can also add user defined symbols to the symbol library or delete symbols from the library. The symbol list shows all user defined symbols. Predefined symbols are not shown as they cannot be changed.

For information on creating symbols, refer to the paragraph "Graphic block manager" on page 91.

The scope of delivery of the HMI-Builder includes several symbol libraries that contain different symbols, such as predefined pump symbols.

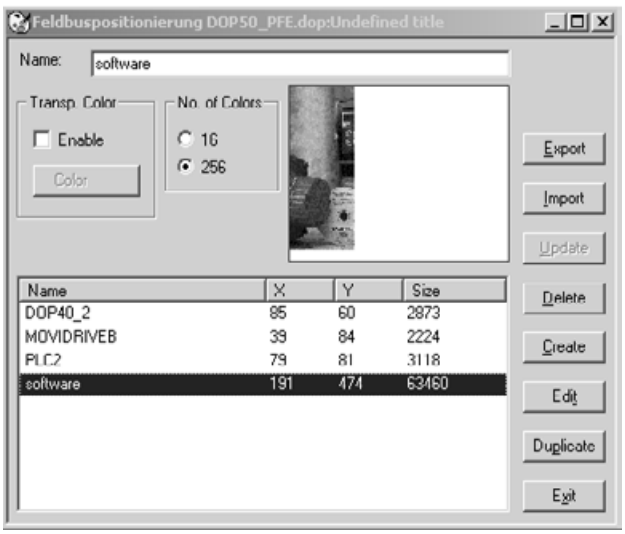

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Figure 48: Symbol manager

Transp. color When importing a symbol you can define a symbol color as transparent.

Number of colors Here you can define the number of colors displayed on a color terminal: 16 or 256.

Exporting symbols You can export symbols in bmp format and use them in other applications.

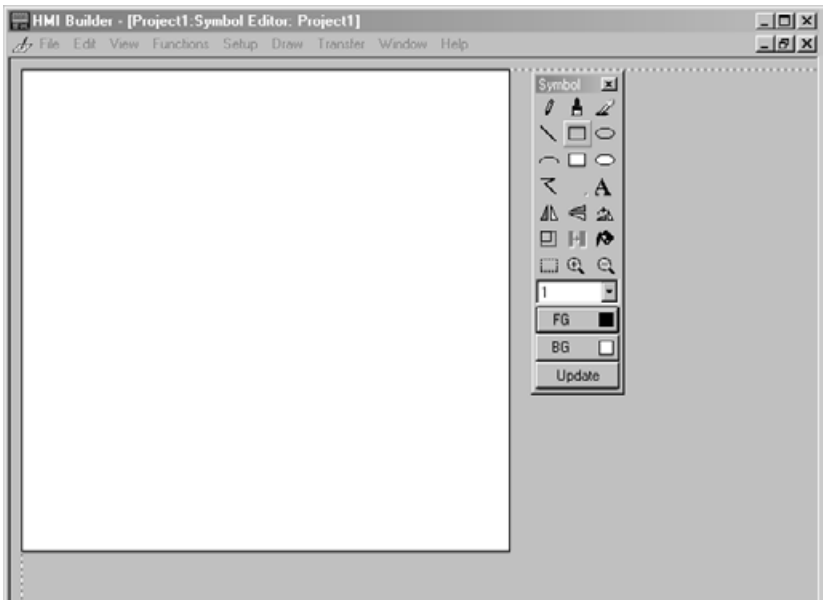
Importing symbols

The import function enables you to reuse symbols from other programs. Image files can be imported from other Windows applications, such as Paint, to the symbol library in the following formats: bmp, cmp, dcx, fpx, jpg, mpt, pcd, png, tga, tif and pcx. For the DOP11A-20, only black and white bmp files can be used.

The scope of delivery of the HMI-Builder includes several symbol libraries that contain different symbols, such as predefined pump symbols. The symbols are saved in the following directory: `C:\Programs\DOP\HMI-Builder\lib\bitmap\`.

Create

You can draw a new symbol using the [Create] function. After clicking the [Create] button, you will be prompted to enter a name for the new symbol. Next, click [OK]. The symbol editor opens. The symbol editor is used like a normal graphic program. There are restrictions depending on the terminal in use.



10420AEN

Figure 49: Bitmap manager

Clicking the right mouse button uses the background color for drawing. If the background color is set to white, you can use it for deletion purposes.

Edit

The [Edit] function opens the bitmap manager for a defined symbol.

Duplicate

Use this function if you want to save the current symbol under a different name.

More Click the [More] button to add more information to a symbol:

Parameters	Description	
File name	Displays the file name for the symbol if it was imported from a file.	
Creation date	Displays the date when the symbol was created.	
Source	Displays information on the source of the symbol.	
	No	Unknown source
	Bitmap file	Imported from a bitmap file
	Clipboard	Inserted via clipboard (using copy & paste)
	Graphic block	Created in a graphic block
Comment	Here you can enter a comment on the symbol.	

Delete Use [Delete] to delete a symbol from a project.

Add a static symbol to a block

Click [Symbol] in the toolbox and move the cursor over the block in the work area where you want to place the symbol. Next, make a mouse click. Clicking on the work area opens the [Static symbol] dialog.

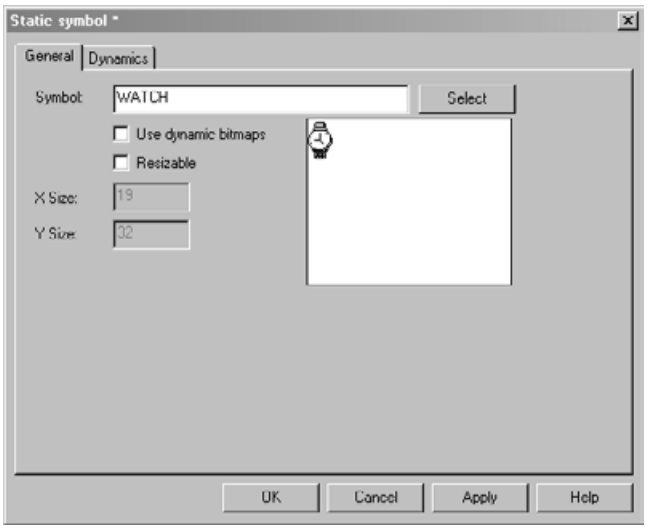


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Figure 50: Static symbol

[General] tab page

Parameters	Description
Symbol	Select the symbol you want to display.
Use dynamic bitmaps	For DOP11A-50 only
Resizable	When this option is enabled, you can change the x or y size of the object.

Other tabs

The functions on the [Dynamics] tab page are described in "General parameters" in section 7.4 "Graphic display and control."

7.3.14 I/O change

The [I/O change] function enables you to change I/Os or move an entire I/O range. I/O changes can be made for the entire project or only for selected objects.

The function can be used in the following areas:

- Blocks in the block list
- Objects in graphic and text blocks
- Lines in the alarm list
- Lines in the function key manager
- Lines in the LED manager
- Lines in the cross reference list

Select [Edit] / [I/O change] from the menu.

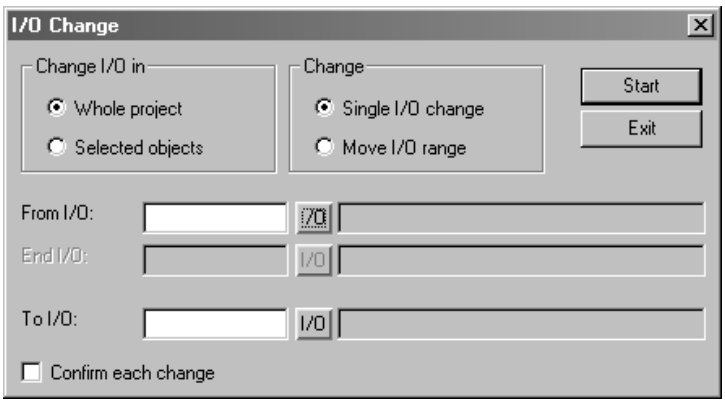

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Figure 51: I/O change

Parameters	Description
Change I/Os in	Define whether I/Os are to be changed in the entire project or for selected objects.
Change	Select whether an individual I/O is to be changed or an entire I/O area is to be moved.
From I/O, End I/O, To I/O	Enter the I/O to be changed and define the area to which you want to move the I/Os.
Confirm each change	Select this checkbox if you want to confirm each I/O change for an object.

7.3.15 BDTP station change

This function enables you to change the index numbering for a BDTP client project in a BDTP network, e. g. from station 1 to station 3. Select [Edit] / [BDTP station change] from the menu.

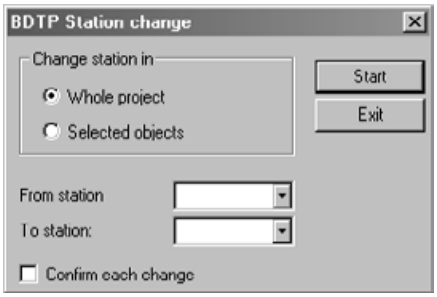

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Figure 52: BDTP station change

Parameters	Description
Change station in	Define whether the index numbering is to be changed in the entire project or for selected objects.
From station, to station	Specify the index number to be changed as well as the BDTP station index number in this field.
Confirm each change	Enable this checkbox if you want to confirm each BDTP station change for an object.

7.3.16 I/O cross reference

The function [I/O cross reference] is used to document I/Os clearly. Select this function via [View] / [I/O cross reference].

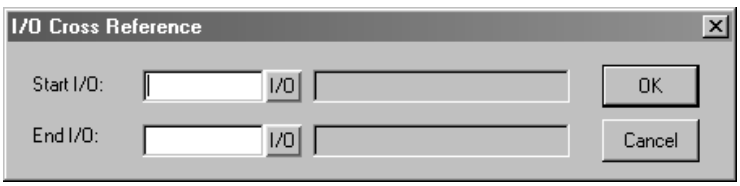

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Figure 53: [I/O cross reference]

Enter [Start I/O] and [End I/O] in the dialog box that opens. If you leave the field [Start I/O] empty, all I/Os up to the value in the field [End I/O] are included. If you leave the field [End I/O] empty, all I/Os up to the value in the field [Start I/O] are included. If you do not enter a value in any field, all I/Os will be included in the list.

Representation

The results output by this function will be displayed in a list with two levels. The first level lists the existing I/Os and the number of objects belonging to the respective IO. To open the second level, click the plus symbol next to I/O. The second level displays all objects in the selected I/O. The plus symbol then changes to a minus symbol.

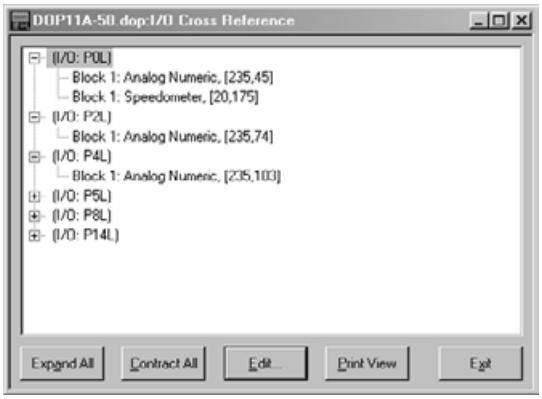

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Figure 54: [I/O cross reference] display

You can select a row in the list and copy it to the clipboard from where you can paste it, for example, into a Microsoft Word document.

7.3.17 Other managers

The HMI-Builder also includes managers for handling:

- Function keys
- LEDs
- Alarms
- Alarm groups
- Passwords
- Time channels
- Message library
- Macros
- Data exchange
- Name list

These managers are called up from the [Functions] menus and used in the same way. The parameters in the respective manager are described in the corresponding sections.

The definitions for function keys, LEDs, alarms, alarm groups, time channels, message library, macros and data exchange are listed in the relevant manager. Insert new definitions using the [Append] or [Insert] functions.

To change a definition, select the definition you want to change, make the change and click [Update]. To easily change several definitions, click [Update] or [Append] only once and then confirm each change with the Enter key.

The [Append] and [Update] functions remain active until another function is called. Use the [Delete] function to delete a selected definition. To close the manager, click [Close]. The following example applies to the alarm manager.

Alarms are numbered automatically. Clicking [Append] adds an alarm definition to the end of the alarm list. Clicking [Insert] inserts the new definition over the selected row in the list. The subsequent alarm definitions will be renumbered. Click [Update] to confirm your changes.

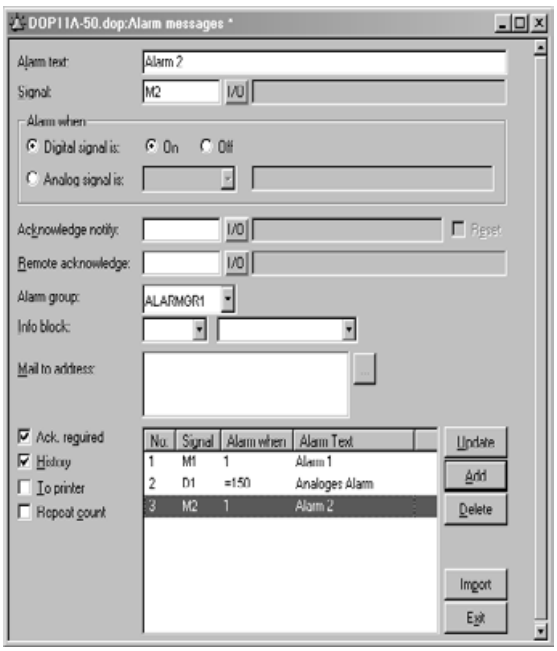

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Figure 55: Alarm manager

7.3.18 Menu [File]

The [File] menu includes functions for creating, opening, saving and closing projects. This menu provides the following options:

- Print setup
- Print preview
- Document header
- Printing

There are also functions to test a project and change project settings.

Using the [Export project transfer file] enables you to transfer a project to a palm pilot for temporary storage. The project cannot be displayed on the palm pilot but can only be exported to another terminal. You can use this function, for example, to copy projects from one terminal to another (e. g. for a project update).

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Figure 56: [File] menu

7.3.19 Menu [Edit]

The [Edit] menu comprises the following functions:

- Cut
- Copy
- Paste
- Undo
- Select all

The [Find] function is available for editing texts in different languages. The function also allows you to access the functions [I/O change], [BDTP station change] and [Default controller].

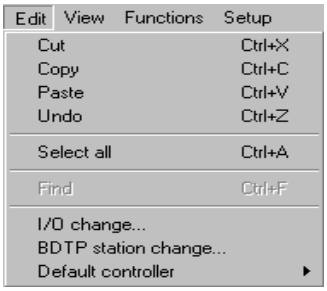

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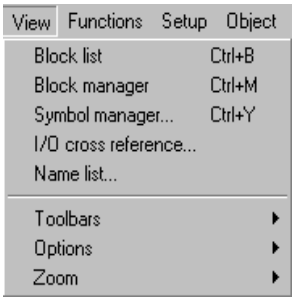
Figure 57: [Edit] menu

7.3.20 Menu [View]

The [View] menu includes

- Block manager
- Symbol manager
- I/O cross reference
- Name list

The menu also provides functions for setting various display modes in the program. Some functions appear in Windows applications as standard, others are HMI-Builder specific. Below a description of HMI-Builder specific functions.



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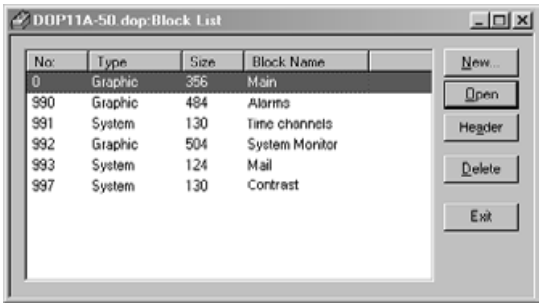
Block list

The [Block list] menu shows the blocks belonging to the application. To create a new block, click on [New] in the block list. To open an already defined block, click on [Open]. Clicking the [New] button opens the [Block header] dialog. Here you can define basic parameters for the block. To open the [Block header] dialog for a selected block in the list, click on the [Block header] button. To delete a selected block, click [Delete].



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Block manager

In the [Block manager] menu, all blocks in an application are presented graphically. Using this menu, you can create new blocks, define the block header and define jumps via toolbox functions.

Symbol manager

This menu option opens the symbol manager where you can create your own symbols or edit existing symbols. You can also create a library with symbols in bmp format. The symbols in the symbol manager will then be available in the symbol list when you create static or dynamic symbol objects.

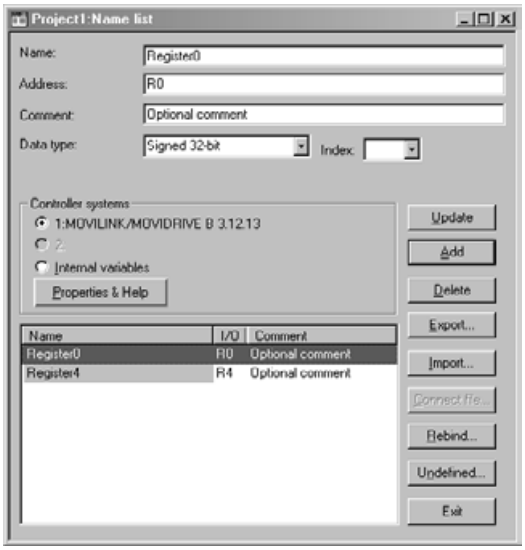
I/O cross reference

The [I/O cross reference] menu item can be used to display a list of the I/Os.

Name list

The [Name list] menu enables you to define a local name list for the signals used. You can add signals in the project that do not have a name to the name list via the [Undefined] function. You can insert new signals or edit and update existing signals. Use the [Update] function to update the project with the changes you have made in the name list.

You can export a name list to a text file. You can also import a text file to a name list. Tab, semicolon, comma or blank can be used as separator for the file contents. You can sort an internal name list. The text file must not contain special national characters, such as B, Ä, Ö and Ü.



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If a driver-specific name list is linked to your project, you can choose the I/O signals from this name list. To do so, click the [Connect file] button.

Tool bar

You can show/hide tool bars using the [Tool bars] menu item.

Parameters	Description
Tool bar	Shows/hides the tool bar.
Controller tool bar	Shows/hides the controller tool bar.
Language tool bar	Shows/hides the language tool bar.
Status bar	Shows/hides the status bar.
Block manager tool box	Shows/hides the block manager tool box.
Toolbox	Shows/hides the toolbox.
Align toolbox	Shows/hides the toolbox for the alignment function.

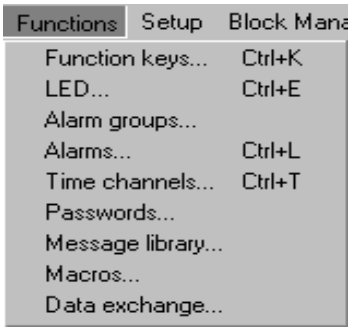
Options

Parameters	Description
Show terminal	Selecting this option displays a terminal around the work area in the graphic manager. You can use the terminal display to call up the managers for LEDs, function keys and text strips. Double-clicking a function (e. g. a function key) opens the corresponding edit dialog.
Show background block	Applies to graphic blocks only. With this option, you can show the background block when working in the graphic block manager.
Show index	For multi-language support only. Shows the index number for the text in the application.
Quick info	A quick info for a function is displayed when the cursor is moved onto the function.
Use block list	Here you can define whether you want the program to open the block list or the block manager when you create a new project.
Use terminal font	Here, you can select whether the text you have entered in the dialog boxes should be displayed by the program in the terminal font.
Choose Unicode font	Select a Unicode font from the dialog. This font will be used in the programming software for multi-language support.

7.3.21 Menu [Functions]

The [Functions] menu includes managers for:

- Function keys
- LEDs
- Alarms
- Time channels
- Passwords
- Message library
- Macros
- Data exchange



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Function	Description
Function keys	Here you can define global and local function keys. See chapter 8.10 "Function keys".
LED	With this option you can define functions for the LEDs. See chapter 8.9 "LEDs."
Alarm groups	With this option, you can group alarms (e. g. by severity levels) to detect and remedy them more efficiently. See chapter 8.2 "Alarm handling".
Alarms	With this option you can define alarm messages and signals that trigger an alarm. See chapter 8.2 "Alarm handling."
Time channels	With this option you can define time channels that control events in processes at a certain time. See chapter 8.6 "Time control."
Passwords	With this option you can define passwords for the various security levels in the application. See chapter 8.4 "Passwords".
Message library	With this option you can create message tables where values between 0 and 65535 are linked with texts. See chapter 8.1 "Message library."
Macros	With this option you can create events that affect all function and touch keys. See chapter 8.12"Macros."
Data exchange	With this option you can define the conditions for data exchange between the selected controllers.

7.3.22 Menu [Setup]

The [Setup] menu includes functions for configuring the terminal.

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System signals With this option you can define handshake signals between terminal and controller.

Current display register

Data register in the controller that contains the number of the block (in run mode) to be displayed on the screen. The data register is automatically updated when the block is changed. This register does not affect block selection.

New display register

Data register in the controller that defines which block will be displayed on the screen.

Buzzer register

Not applicable for DOP11A-10.

The value of this register defines the buzzer tone. Tones and scales are given in the table below. When the value is 0, no sound is issued. All values in the table are given in Hz.

	C	E	E	F	G	A	H
Contra	33	37	41	44	49	55	62
Large	65	73	82	87	98	110	123
Small	131	147	165	175	196	220	247
One	262	294	330	349	392	440	494
Two	523	587	659	698	784	880	988
Three	1046	1174	1318	1397	1568	1760	1975
Four	2093	2348	2636	2794	3136	3520	3950
Five	4186						

Background lighting signal

Digital signal that activates or deactivates background lighting.

Cursor control block

Not applicable for DOP11A-10.

The start register for a control block is specified in the terminal. The start register writes the current cursor position in the graphic block to the data register in the controller.

Register	Description	
0	Current graphic cursor position X (in pixels): 0-239 for DOP11A-20 and 0-319 for DOP11A-40.	
1	Current graphic cursor position Y (in pixels): 0-63 for DOP11A-20 and 0-239 for DOP11A-40.	
2	Status register	
	0	Normal
	1	The user attempts to move the cursor downward but there is no object at the selected position.
	2	The user attempts to move the cursor upward but there is no object at the selected position.
	3	The user attempts to move the cursor to the left but there is no object at the selected position.
	4	The user attempts to move the cursor to the right but there is no object at the selected position.

Start register in a control block in the DOP11A-30 and DOP11A-50 terminals that writes the current cursor position in the graphic block to a controller register.

Register	Description
0	x-coordinate (in pixels): 0-319
1	y-coordinate (in pixels): 0-239
2	Status register: 0 Not pressed, 1 Pressed

Cursor motion register

Not applicable for DOP11A-10.

Cursor positioning in the graphic block can be defined using a register. The register values and their meaning are explained in the table below. Value 0 must be assigned to the register between the same command for the movement. We recommend that you also use the [Cursor control block] function to optimize the function.

Register value	Description
1	Moves the cursor to the first maneuverable object.
2	Moves the cursor to the next maneuverable object.
3	Moves the cursor up one step.
4	Moves the cursor down one step.
5	Moves the cursor left one step.
6	Moves the cursor right one step.

Print status register

The status of the connected printer can be read from a register. The register can have the following values:

Register value	Description
0	OK. The printer works properly.
1	General error. Check the port and printer settings.
2	No paper. Reload printer paper.
3	No memory. The printer memory is full.
4	Not connected. The printer is not connected correctly. Check the port and printer settings as well as the printer cable.

Values 1 to 4 in the register mean that the printer does not work properly. In this case, the terminal will ignore printing until the value in the register is 0 again.

Library index register

This register is used for indexing the message library. The library number from which the texts are to be retrieved is indicated in the message object. When defining an index register, its contents is added to the number specified in the object. This means a register can control from which library the texts are to be retrieved.

Commands

One or more of the following commands can be entered in the command line. Commands are separated by blanks. All commands are capitalized.

Command	Description	Models
Rx	Maximum number of transmission attempts, x = number of attempts. Applies to communication with the controller. Example: R5@2 applies to controller 2.	DOP11A-10 to 50
Tx	Global timeout in x ms. Applies for communication with the controller. Example: T10000@1 applies to the timeout for controller 1.	DOP11A-10 to 50
AKx	Activates the joystick function. See the "Joystick function" section in chapter 5.2 "Terminal functions".	DOP11A-10 to 50
DD	Disable Delete. Deactivates the deletion of alarms from the alarm list. When this command is issued, inactive or acknowledged alarms will not be deleted from the alarm list.	DOP11A-10 to 50
LOBx	Activates the digital signal **x** when the battery of the real-time clock needs to be replaced. Example **LOBM0** activates M0 when the battery needs to be replaced.	DOP11A-10 to 50
MDx	When using two drivers: If communication is interrupted by one controller, the terminal will continue communication with the other controller. The terminal will attempt to reestablish the interrupted communication with the controller every 10 seconds. You can change the interval using the **MDx** command, where **x** indicates the time in ms.	DOP11A-10 to 50
NTx	Timeout in x ms for a message in no protocol mode.	DOP11A-10 to 50
RPD	RUN/PROG Disable. Disables the option to switch between RUN/PROGR using the backspace key and the <MAIN> key. When the **RPD** command is issued, the mode can only be changed via HMI-Builder.	DOP11A-10 to 50
SW	Converts text with Swedish ASCII characters (7-bit) when printing to the expanded IBM PC-ASCII character set (8-bit).	DOP11A-10 to 50
BFF	Block Form Feed. Adds a page break after each block during printing.	DOP11A-20 to 50

Command	Description	Models
BCTO	Displays the error message "BDTG comm. Error" only the first time a BDTP client attempts to reestablish a connection with a BDTP server.	DOP11A-20 to 50
DGP	Removes the alarm group from alarm printouts.	DOP11A-20 to 50
FTNO	Deletes the line with the OFF indicators in trend files when using FTP.	DOP11A-20 to 50
JAAL	Locks keys and touchscreen of the operator terminal as long as a terminal applet is running.	DOP11A-20 to 50
PDxxxxxxxx	Password protecting access to the [Transfer] menu.	DOP11A-20 to 50
PSxxxxxxxx	Password that has priority over all other password levels. Used, for example, for support and maintenance. For further information, refer to section 8.4 "Passwords".	DOP11A-20 to 50
SJAFx	Displays the name of the logged-on user when the Java applet is active. If no name was specified, JAVA will be displayed instead. The name appears in the top right corner. x = represents the character size and can have a value between 1 and 7.	DOP11A-20 to 50
TESOSn	When the *Activate* signal is selected, only a trend template is saved. When **n=***, the setting applies to all trend objects. When **n=T**, the setting only applies to trend objects beginning with T.	DOP11A-20 to 50
TBUP	Is used to create backup copies of trend files on expansion cards.	DOP11A-30 to 50
DBKL	Unlocks keyboard and touchscreen when the background lighting needs to be replaced. The default setting locks keyboard and touchscreen when the background lighting fails.	DOP11A-30 to 50
DNBW	Deactivates the warning "No block x". If this warning is not deactivated, it is issued, for example, when a block jump has not been configured for an existing block number or when the function [New display register] is used in order to use the data registers in the controller to control which block is to be displayed on the screen.	DOP11A-30 to 50
NHD	This command allows for printing graphic blocks without block header (which includes block name, block number, date and time) on a laser printer.	DOP11A-30 to 50
NMAN	Activates the warning "Not maneuverable" for operator terminals with touchscreen.	DOP11A-30 and DOP11A-50 with touchscreen
TCD	The "Touch Calibrate Disable" prevents calibration of the touchscreen.	DOP11A-30 and DOP11A-50 with touchscreen
DIMxxx	Data register xxx that contains a value between -63 and +63 and serves to control the color intensity. -63 represents the darkest and +63 the brightest value. The standard value is 0.	DOP11A-50

Index register Index addressing of dynamic objects. For further information, refer to section 7.8 "Index addressing".

Country settings

Character set

The selected character set determines which character table will be used in the terminal and which national special characters will be available.

Character set	Character table in graphic based terminals
Swedish	437
German	437
French	850
Spanish	850
Norwegian / Danish	850
Russian	866
Slavic	852
Greek	869
Unicode	-

Special character tables are used for the text based terminal (DOP11A-10). The same character table is used regardless of the character set selected. Different national characters are used depending on the selected character set.

	Swedish	German	French	Spanish	Norw. / Danish
C1	Å	Ü	È	Ñ	Å
C2	Ä	Ä	É	É	Æ
C3	Ö	Ö	Ê	Ó	Ö
C4	å	ß	è	Á	Ø
C5	ä	ü	é	ñ	å
C6	ö	ä	ê	é	æ
C7		ö		ó	ö
C8		ß		á	ø

The national characters are not used when Slavic or Russian is selected.

System language

Menu language selection: British English, German, Swedish or American English. By default, the menu texts in the terminal are set to British English.

Multi language

Menu	Description
New language	Starts the wizard for creating multi language applications.
Processing	With this option you can edit or translate texts in the application.
Setup	This function displays the tree structure for the languages in the application. For further information on possible settings, refer to chapter 8.7 "Language handling".
Export	This function exports the languages used for the project application to a text file in ANSI, OEM or Unicode format. Specify whether you want to export languages used for the project application or system languages. Next, the [Multi Language Text-Export] dialog opens. Enter the destination and the format of the file to be saved. Under [Encoding], you can select [ANSI/OEM] (all languages created in ANSI/OEM format will be exported) or [Unicode] (all languages will be exported in one file in Unicode format).
Import	This function imports a language for use in the terminal. Specify whether application or system languages will be imported. Next, the [Multi Language Text-Import] dialog opens. Enter the name of the text file to be imported. If the project language is in ANSI/OEM format and a language is to be imported in Unicode format, the imported language will be converted into ANSI/OEM format. As a result, all characters outside the ANSI/OEM range will be represented as question marks.
Show index	This function displays the index in objects instead of texts. You can also enter test for the index display. In this way, the new text is assigned a new index.
Cross reference	Shows a cross reference with the indices in the application blocks.
Reuse index	If this function is active when copying an object, a new object will be created with the same index.
Choose Unicode font	Choose a Unicode font for use in the programming software.

Date/time format Setting the date and time format.

Menu	Description
Date format	The following date formats are possible: • YY-MM-DD • YYMMDD • DD.MM.YY • DD/MM/YY • DD/MM/YY Y=year, M=month, D=day.
Time format	The following time formats are possible: • HH:MM:SS • HH:MM H=hours, M=minutes, S=seconds.
Activate clock	Select this checkbox to activate the clock in the terminal. When controller 1 or 2 is selected, the clock refers to the clock in controller 1 or 2.
Clock → controller 1/2	Select this option if you want to transfer the data of the terminal clock to a data register in controller 1 or 2. If the controller has an activated real-time clock and the terminal clock sends data to the same data register, the controller clock will have priority.
Update interval	Here you can define how often the terminal sends clock data to the controller. Enter the value in seconds. The recommended value is 60 seconds. Shorter update intervals slow down the communication between terminal and controller.
Controller register	Enter the start address for saving date and time in the controller. For information on saving date and time, refer to the manual of the controller in use. The terminal saves information in the sequence as defined in the basic setting of the controller.
Daylight saving time	Here you can specify dates for start and end of daylight saving time. Enter day of week, week of month, month, hour and setting. You can choose between Europe and US standard time. To deactivate daylight saving time, leave both month fields blank.
Online settings	Allows for changing the selected function in run mode.

Terminal options

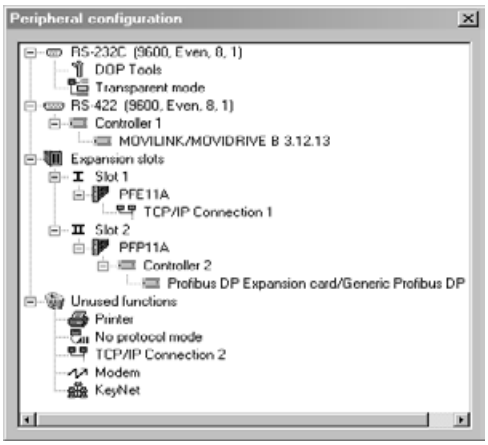
Option	Description
BG	Click on [BG] to define the background color of the terminal.
FG	Click on [FG] to define the foreground color of the terminal.
Window	You can select the window color for the terminal here.
Screen saver time (min)	Enter the screen saver activation time in minutes. The default setting is 0 which means the screen saver is disabled. A screen saver extends the life of your monitor.
Key delay (ms)	Time interval in milliseconds between 2 hits of the same key before the cursor automatically moves to the next position. Is used when ASCII characters (A-Z, etc.) are entered. See the section "Alphanumeric function" in chapter 5.2 "Terminal functions".
Key tone	Define whether the terminal produces a signal tone when a key is pressed.
Key repetition	Specifies whether a function is repeated as long as a key is being pressed. This does not apply to function keys and the entry of alphanumeric characters (A-Z, etc.).
Trend settings	General trend settings are made in this field.
Save modified patterns	Saves all changed patterns in trends even if the value has not changed since the last measurement.
Save all patterns	Saves all patterns in trends even if the value has not changed since the last measurement. These parameters affect all defined trends.
FTP delimiter	The terminal can save the contents of all files that are created in the terminal and that can be accessed via FTP using different separators. The content of recipe or trend files, for example, can be delimited using tab, semicolon or comma. See also section 9.3 "Network functions in the terminal".

Alarm settings

General alarm list settings are made in this field. For further information, refer to chapter 8.2 "Alarm handling".

Peripherals

All communication settings are made under [Setup] / [Peripherals]. Selecting [Peripherals] from the menu opens a list with units defined for the system. You can move the units using drag & drop.



10434AEN

Ports

Clicking on [Ports] opens a dialog with the current configuration. You can change the configuration.

The maximum transfer speed for the model DOP11A-10 is 38400 baud.

RS-232C

Select the [RS-232C] port and click the right mouse button. The following dialog opens.

Assign the following parameters to the port:

- Baud rate
- Parity
- Data bits
- Stop bits

10435AEN

RS-422

Select the [RS-422C] port and click the right mouse button. The following dialog opens.

Assign the following parameters to the port:

- Baud rate
- Parity
- Data bits
- Stop bits

10436AEN

RS-485

Applicable for DOP11A-10, DOP11A-20 from HW1.10 and DOP11A-30 only.

Select the [RS-485] port and click the right mouse button. The following dialog opens.

Assign the following parameters to the port:

- Baud rate
- Parity
- Data bits
- Stop bits

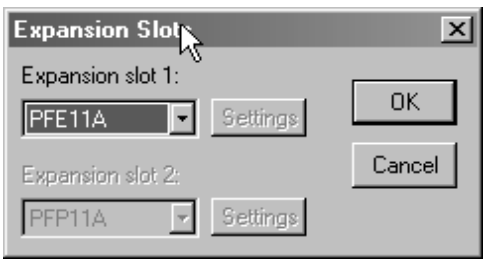
10437AEN

For communication with MOVIDRIVE®, set *9600, even, 8 data bits, 1 stop bit*.

The DOP11A-30 terminal has three physical ports. Only two ports can be used simultaneously. This is why the ports are referred to as "Port 1" and "Port 2" in the [Peripheral configuration] window.

Expansion slots

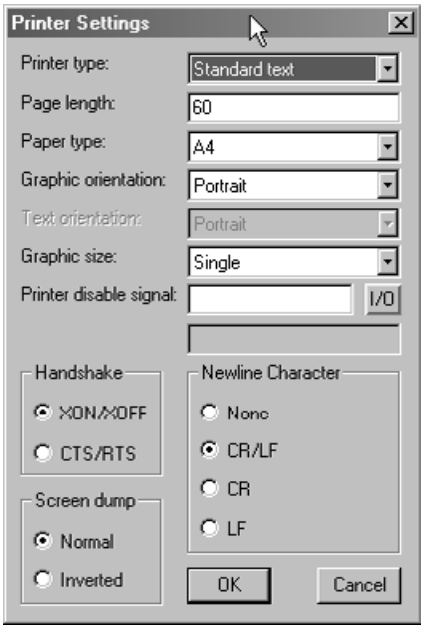
Select [Expansion slots] and press the right mouse button. You can now define the expansion slot you want to use and the settings for the relevant card. You will find detailed information in the manual on the corresponding expansion card.



10438AEN

Printer

Select [Printer] and press the right mouse button to open the printer settings dialog.



10439AEN

Parameters	Description
Printer type	Choose a printer: None, HP PCL5 or standard text.
Page length	Here, you define the number of lines before a page break. No page break is created when the page length is set to 0. The default setting is 60.
Paper type	Select the paper type.
Graphic orientation	Specify whether you want to print the graphic in portrait or landscape format.
Text orientation	Specify whether you want to print text in portrait or landscape format.
Graphic size	Specifiy the size of the graphic print-out.
Printer disable signal	Digital signal which cancels printing if enabled.
Handshake	Specifiy the required handshake type between printer and terminal: XON/XOFF or CTS/RTS. Refer to the printer manual for information on the correct handshake setting.
New line character	Specifiy the end of line character: None, CR/LF, CR, or LF.
Screenshot	Option for screenshots. Select standard or inverted.

The printer settings apply to parameters such as *Character table*, *Font size* and *Margins*.

No protocol mode

Select [No protocol mode] and press the right mouse button. The following dialog opens.

10440AEN

Parameters	Description
No protocol control register	This register is the first control register in no protocol mode. Refer to chapter 9.2 "Communication" for a description of the no protocol mode.
No protocol signal	Digital signal for switching between no protocol mode and transparent mode. This signal is used for switching between the two modes during operation, for example to establish a connection with a computer and to send a message.

Recipe settings

Here you can make the settings for recipe management. See section 8.3 "Recipe handling."

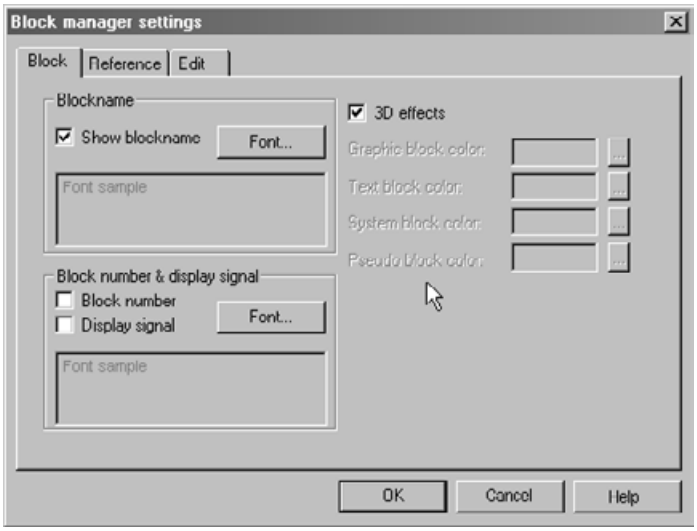
7.3.23 Menu [Block manager]

The [Block manager] menu comprises functions for programming blocks.

10441AEN

Settings for the block manager

The display in the block manager is configured under [Block manager] / [Settings].



10442AEN

Tab page	Description
block	Define the appearance of data for the block and the block in the block manager.
Reference	Here, you can set the block manager view.
Processing	This tab page includes special functions for the display in the block manager.

7.3.24 Menu [Object]

The [Object] menu lists all objects available in the program. The number of objects depends on the terminal type. Refer to chapter 7.4 "Graphic display and control" and chapter 7.5 "Text-based display and control" for a description of the objects.

10443AEN

7.3.25 Menu [Layout]

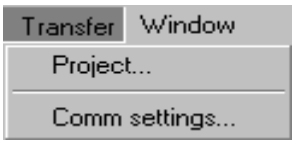
The [Layout] menu offers functions for aligning and sizing several objects. These func-

tions are described in the section "Positioning objects" on page 94 .

10444AEN

7.3.26 Menu [Transfer]

The [Transfer] menu offers functions for transferring projects, selected blocks and communication settings between PC and terminal. See section 7.6 "Project transfer".

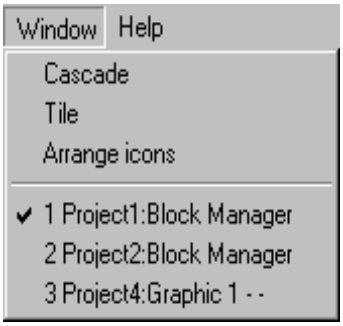


10445AEN

The communication settings for programming software and terminal must be identical.

7.3.27 Menu [Window]

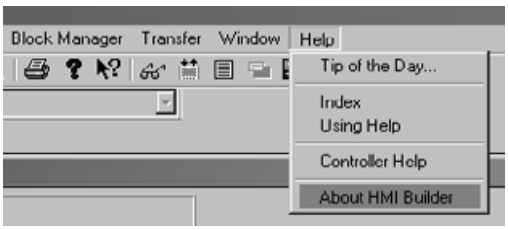
The [Window] menu contains general Windows functions.



10446AEN

7.3.28 Menu [Help]

The [Help] menu contains the help functions and information on the program version.



10447AEN

7.4 Graphical display and control

This section does not apply to DOP11A-10.

This chapter lists all graphic objects in tables and explains each graphic object. This chapter only applies to terminals that support graphic display.

7.4.1 General parameters

Colors

Color terminals can display objects and bitmap graphics with 256 colors.

The use of colors allows for creating more realistic objects with 3D effect and shading. Apart from the background and foreground colors for a block, you can select colors for scales, curves, etc. in graphic objects.

The colors for background, text and windows are defined when configuring the terminal. Colors for axes and curves in graphic objects can also be defined.

Engineering units scaling

The *offset* and *gain* parameters are used to scale the register value to a display value according to the following formula.

Display value = *offset* + *gain* × register value

If you change a value for an object using the terminal, the display value will be scaled according to the following formula:

Register value = (display value – *offset*) / *gain*

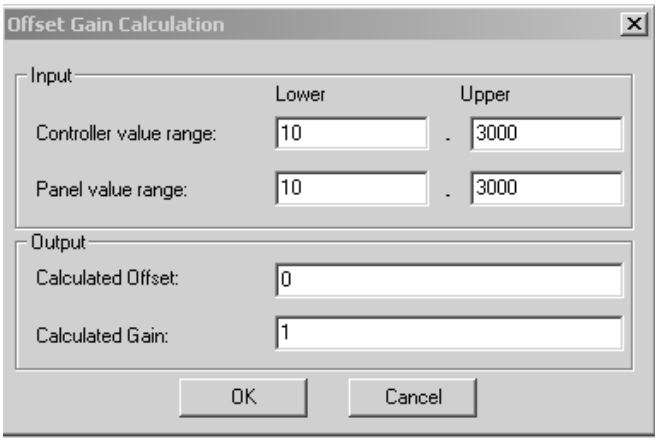
The scaling affects neither the defined maximum/minimum values nor the number of decimal places.

The functions for increasing/decreasing values affect the register value for the maneuverable object but not the display value.

Calculating technical units

The [offset/gain calculation] function serves as tool for calculating the parameters *offset* and *gain*. Enter the value for *offset* and *gain* of the object on the [General] tab page and

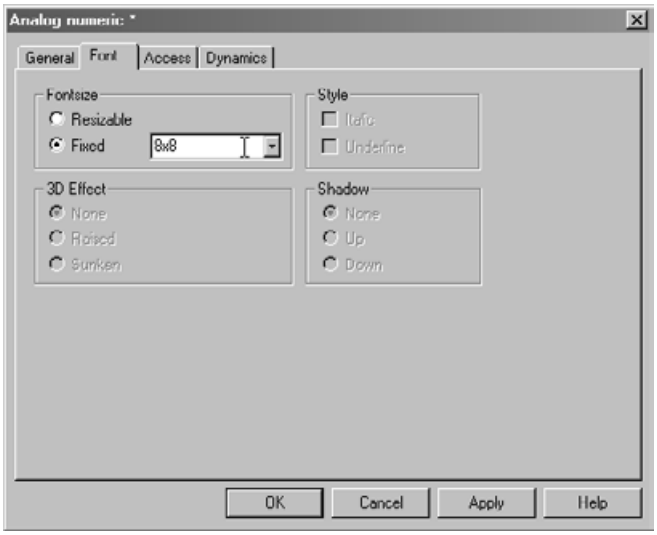
click on [Calculate]. The following dialog box opens:



10591AEN

Enter the range for the controller and terminal values. The function determines the correct values for the *offset* and *gain* parameters.

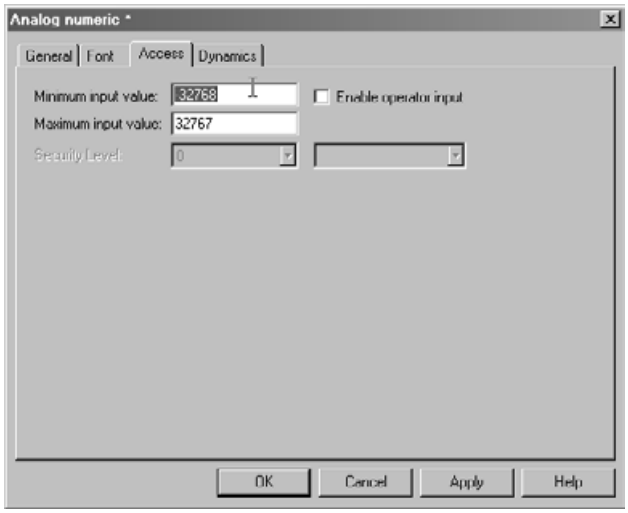
Font



10592AEN

Option	Description
Font size	Selecting the [Resizable] checkbox enables you to change the font by highlighting the required text and sizing it using the handles. Selecting the [Fixed] option enables you to choose a fixed size for the text from the drop-down list. If you choose to use Unicode and the option [Resizable], the graphic display will be slower than usual.
3D effect	Here you can specify a 3D effect for the text.
Style	Select whether you want the text to be displayed in italics or underlined. If you do not select an option, the font will be displayed without any special formatting.
Shadow	Here you can define a shadow for the text.

Access



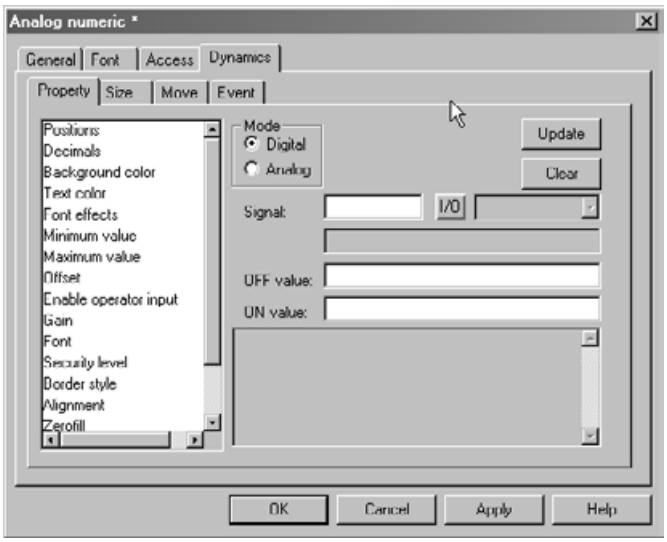
10593AEN

On the [Access] tab page you define whether you want the object to be a maneuverable object. Enter the [Minimum input value] and [Maximum input value] for the object (and the access). You can also specify the security level for the object. You define security levels under [Functions] / [Passwords].

Dynamics

This section describes the functions on the [Dynamics] tab page.

Property



10594AEN

Under [Properties] you can enter a signal that should control a property. You can choose between digital and analog control.

1. Digital
   - Select a property in the list that should be controlled by the controller. The property can only be used once per object / signal. A property being used is marked red. Enter a signal or click on the [I/O] button to select a signal using the I/O browser. You can also specify an [OFF value] and an [ON value]. If you do not specify OFF / ON values, the OFF value is set to 0 and the ON value to 1 by default.

2. analog
   - Select a property in the list that should be controlled by the controller. The property can only be used once per object / signal. A property being used is marked red. Enter a signal or click on the [I/O] button to select a signal using the I/O browser. You can define a length if the format type is “Character string”.

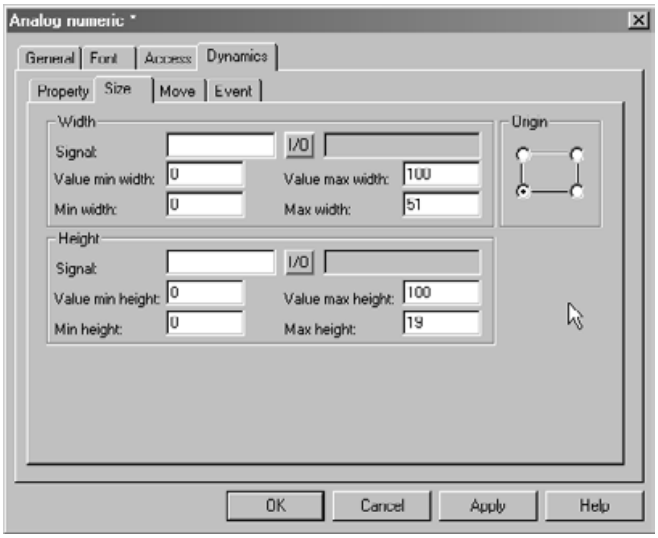
If you select and then deselect analog control for a property that can only accept digital values, the property will remain set as long as the signal has a value unequal 0.

To influence *offset* / *gain* in an object, *offset* / *gain* must be defined other than 0 / 1 in the object right from the beginning.

The *Visible* property must not be used simultaneously with the *Positions* property.

Dynamic texts are not converted into Unicode format. Instead, a question mark will appear.

Size



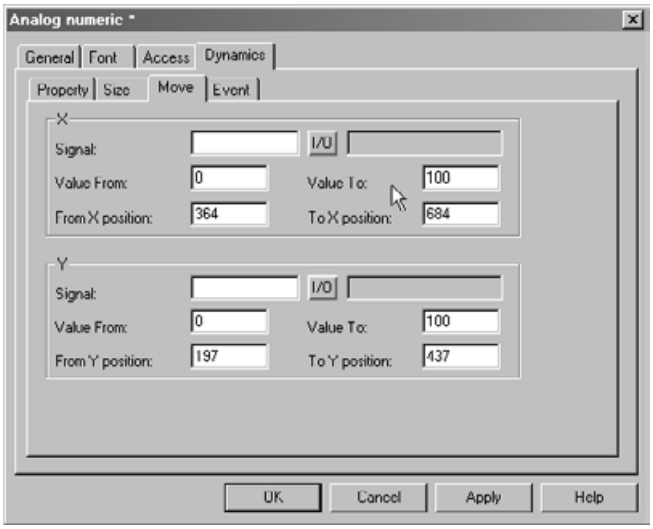
10595AEN

On the [Size] tab page you can define the values for [Width], [Height] and [Source]. Define 2 analog signals for which the signal values determine the size of the object relating to the X axis (width) or the Y axis (height).

If you enter an invalid value, for example a value that does not enable the object to be displayed on the screen, the value will be ignored.

Parameters	Description
Signal	Enter an analog signal.
Value min. width / height	Enter the minimum value of the analog signal.
Value max. width / height	Enter the maximum value of the analog signal.
Min. width / height	Enter the minimum value for the width / height of the object in pixels at which the minimum value corresponds to the defined value.
Max. width / height	Enter the maximum value for the width / height of the object in pixels at which the maximum value corresponds to the defined value.
Origin	Select the original position of the object for display on the screen.

Move



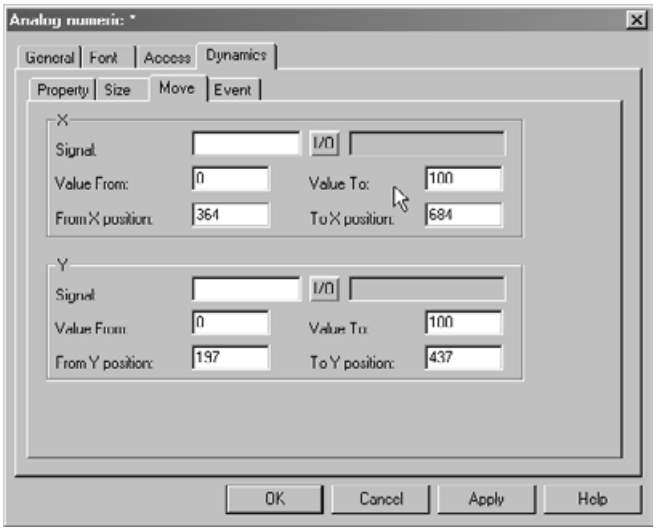
10596AEN

On the [Move] tab page, enter two analog signals the values of which determine the x (width) and y (height) coordinates of the object.

If you enter an invalid value, for example a value that does not enable the object to be displayed on the screen, the value will be ignored.

Signal	Enter an analog signal.
Value from	Enter the minimum value of the analog signal.
Value to	Enter the maximum value of the analog signal.
From X / Y position	Enter the x and y coordinates of the object, i.e. the pixel value on the screen at which the value of the parameter *corresponds with the value of the defined value*.
From X / Y position	Enter the x and y coordinates of the object, i.e. the pixel value on the screen at which the value of the parameter *corresponds with the value of the defined value*.

Event



10597AEN

On the [Event] tab page you can define the parameters described below. You can update existing events, add new events or delete events by clicking the corresponding buttons in the dialog box.

Parameters	Description	
Event name	Enter a name for the event or select an entry from the list.	
Condition	Select a condition from the list. You can choose between four conditions:	
	Equal to	The event will be triggered after the specified signal for which the object value matches the value you have defined in the value check-box. The value has to be entered by the user.
	Not equal to	The event will be triggered after the specified signal for which the object value DOES NOT match the value you have defined in the value checkbox. The value has to be entered by the user.
	Greater than	The event will be triggered after the specified signal where the object value is smaller than the value you have defined in the value checkbox. The value has to be entered by the user.
	Less than	The event will be triggered after the specified signal for which the object value is smaller than the value you have defined in the value checkbox. The value has to be entered by the user.
Action	Select one of the following options: • Digital signal • Analog signal • Macro	
Signal	Select the signal that will be influenced if the condition is fulfilled.	
Value	Enter the value for the affected signal if the condition is fulfilled.	

7.4.2 Graphic objects

Static / dynamic graphic objects

Static graphic objects are used when creating graphics. On the [Dynamics] tab page you can assign dynamic properties to graphic objects.

In the display, static objects are always placed behind dynamic objects.

Symbol	Object
	Line
	Curve
	Rectangle
	Symbol
	Static text
	Ellipsis
	Keypad object
	Polygon line

Dynamic bitmap handling

For DOP11A-50 only.

If you activate the [Use dynamic bitmaps] checkbox for a static symbol object, the terminal will retrieve the specified bitmap file (namn.bmp) from the [IMAGES] library in the terminal file system. The bitmap graphic is displayed on the terminal screen in run mode. The graphic to be displayed must be transferred to the [IMAGES] library in the terminal via ftp. You can add, exchange or delete dynamic bitmap graphics via ftp. You can overwrite, save or delete BMP files in the [IMAGES] library. The image for a dynamic bitmap graphic object is displayed on the terminal in run mode only. The bitmap graphics in the library are not available in the programming software and can therefore not be displayed.

Dynamic digital graphic objects

Digital graphic objects are linked to signals in the controller.

Symbol	Object	Description
	Digital text	Toggles between two texts depending on the state of a digital signal.
	Digital symbol	Changes between two symbols depending on the state of the digital signal.
	Digital fill	Is used for filling a selected area with one of 2 colors. The color depends on the state of the digital signal.

Dynamic analog graphic objects

Analog graphic objects are linked to registers in the controller.

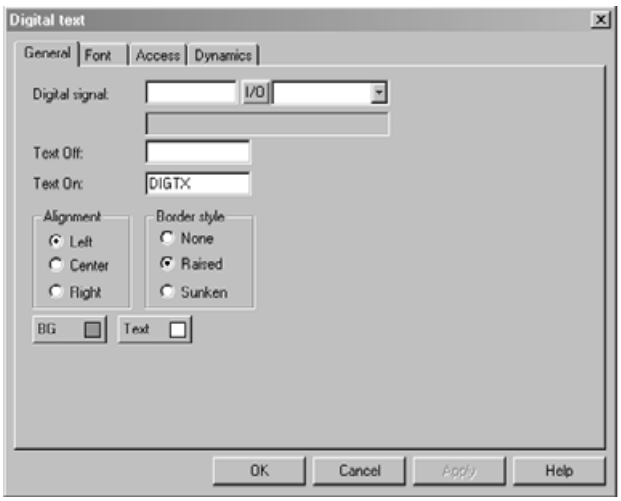
Symbol	Object	Description
	Analog numeric	Entry and display of numerical values.
	Bar	Displays a value in the form of a bar diagram.
	Diagram	Is used for drawing an x / y diagram that corresponds to the data register content.
	VU-meter	Creates a graphic VU-meter on the screen.
	ASCII	Controls ASCII character strings in graphic blocks.
	Slider	Allows for increasing or decreasing the value for an analog signal.
	Trend	Displays the values retrieved from data registers in the form of a curve.
	Speedometer	Creates a graphic speedometer on the screen.
	Analog fill	Is used for filling a selected area with one of 16 colors. The color depends on the register value.
	Multiple symbol	Shows one of up to eight symbols. The symbol depends on the data register value. Allows for moving symbols on the screen.
	Multiple selection	Is linked to a data register that can have up to eight different states. A text with up to 30 characters can be assigned to each state.
	Message	Object that displays texts from a message library.
	Analog numeric table	Creates a table with numeric objects.

Other objects

Symbol	Object	Description
	Jump	Jump to another block.
	Alarm banner	Is used to display a line from the alarm list.
	Analog clock	Object to display an analog clock.
	Digital clock	Object to display a digital clock.
	TCP/IP command entry	Object for transferring a TCP/IP command to other units. Only applies for terminals that are connected to a TCP/IP network.

Digital text

Text object that is used for changing between two entered texts depending on the state of a digital signal. The text can have up to 30 characters.



10632AEN

[General] tab page

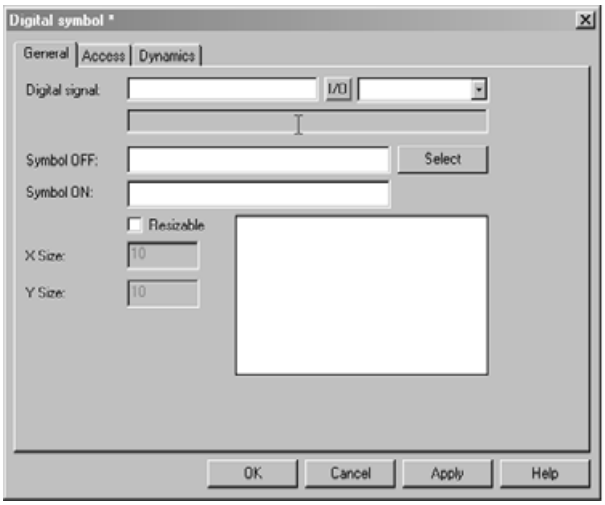
Parameters	Description
Digital signal	Signal of the digital address.
Text Off	Text that is to be displayed when the signal state is 0.
Text On	Text that is to be displayed when the signal state is 1.
Alignment	Specify whether you want the text left-justified or centered.
Border style	Specify whether you want the object to appear with a border.
BG	Define a background color for the object.
Text	Define a color for the text in the object.

Other tabs

The functions on the [Font], [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Digital symbol

Object that is used to change between two selected symbols depending on the state of the digital signal.



10633AEN

[General] tab page

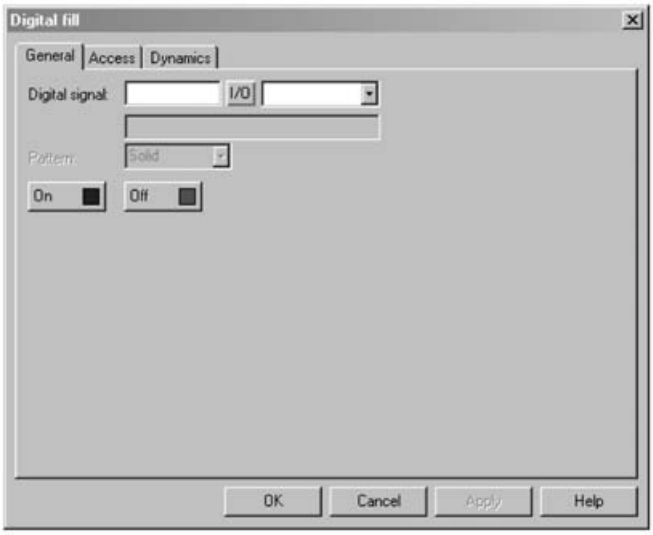
Parameters	Description
Digital signal	Signal address.
Symbol OFF	Select the symbol you want to have displayed when the signal state is 0.
Symbol ON	Select the symbol you want to have displayed when the signal state is 1.
Resizable	When this option is active, you can change the x or y size of the object.

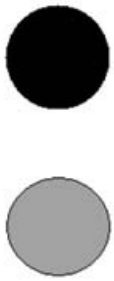
Other tabs

The functions on the [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Digital fill

Object that is used for filling a selected area with any color.





54663AEN

The filling of very irregular areas may lead to system errors during operation. In certain cases, the filling process will slow down the loading time of images.

[General] tab page

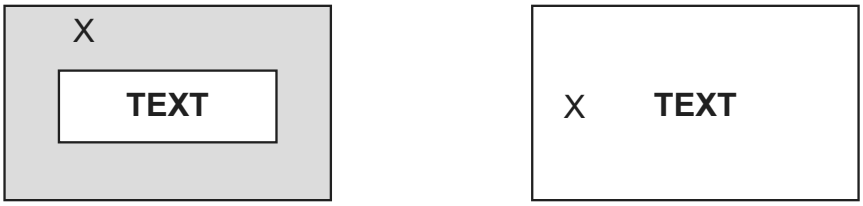
Parameters	Description
Digital signal	Signal of the digital address.
Pattern	Choose whether the framed area should be filled completely or with dots when the signal is issued. Applicable for DOP11A-30 and DOP11A-60 only.
On	Define the object color for signal value 1.
Off	Define the object color for signal value 0.

Other tabs

The functions on the [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Object positioning

The program calculates which area will be filled. The object must therefore be positioned correctly. Incorrectly positioned objects may cause application errors during operation. The area to be filled is only limited by static objects and static parts of dynamic objects. Filled objects can be replaced by digital symbol objects or multiple symbol objects to increase efficiency within a project.



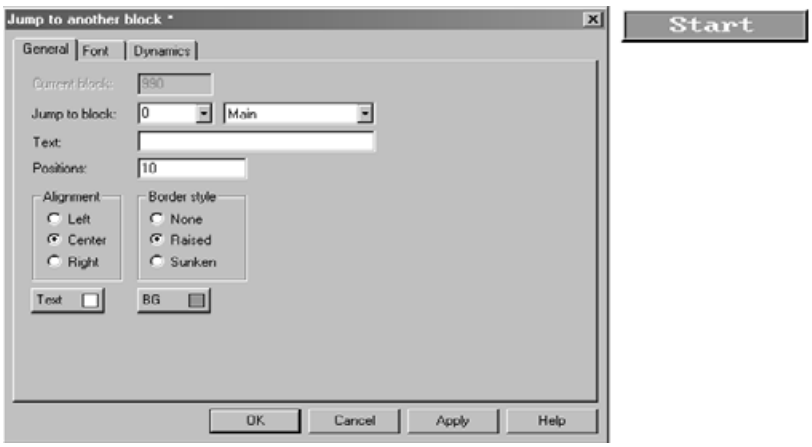
53958AXX

X = Object positioning

Correct: Draw a frame around the text in the area to be filled to speed up image loading.	Incorrect: Image loading is slowed down because the program must perform extensive calculations for filling the area between the letters.

Jump

Object used for jumping to another object. This object allows for creating a menu tree in the project. You can go back to the previous block (up to nine levels back) by pressing the <PREV> button on the terminal. See chapter 8.10 "Function keys".



10635AEN

Figure 58: Jump to another block

[General] tab page

Parameters	Description
Current block	The number of the current block is displayed in this field. This number cannot be changed.
Jump to block	Enter the number or the name of the block to which you want the program to jump to.
Text	Enter any text you want to appear in the object.
Positions	Number of positions for the text
Alignment	Specify whether you want the text left-justified, centered or right-justified.
Border style	Specify whether you want the object to appear with a border.
Text	Define a color for the text in the object.
BG	Define a background color for the object.

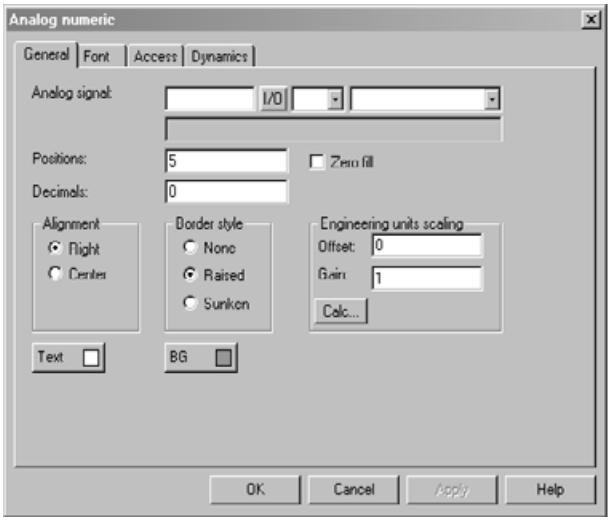
If a jump to a non existing block is initiated during operation, an error message will appear.

Other tabs

The functions on the [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Analog numeric

Object for entering and displaying numerical values. This object is used, for example, for creating input fields.



10636AEN

[General] tab page

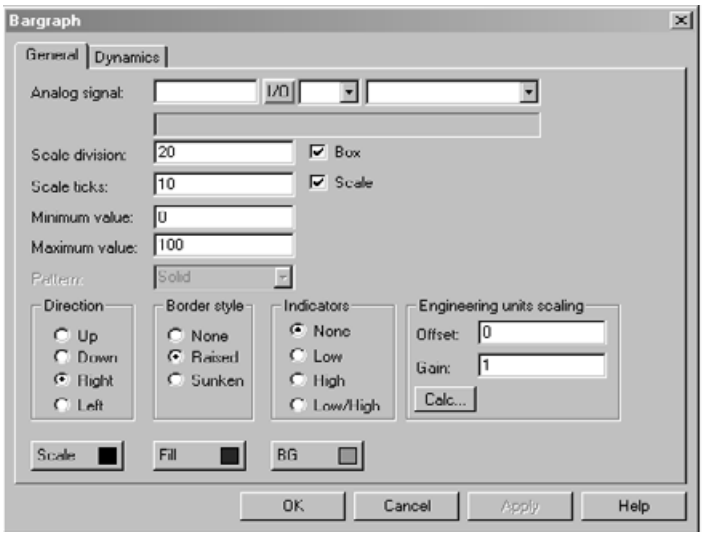
Parameters	Description
Analog signal	Signal address
Positions	Number of positions for displaying the entered value including comma and minus sign.
Zero fill	Specify whether you want empty positions to be filled with zeros.
Decimals	Number of decimal places for displaying the entered value.
Engineering units scaling	These fields are used for scaling the register value. See section "General parameters" on page 130.
Border style	Specify whether you want the object to appear with a border.
Alignment	Specify whether you want the input field to be formatted right-justified or centered.
Text	Define a color for the text in the object.
BG	Define a background color for the object.

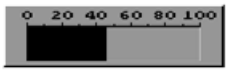
Other tabs

The functions on the [Font], [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Bar diagram

Object that displays integers or floating point numbers in the form of bar graphs.





10637AEN

[General] tab page

Parameters	Description
Analog signal	Signal address
Scale division	Specifies which scale division is used.
Box	Select whether you want to have a box around the bar.
Scale ticks	Specifies the interval between the displayed scale ticks.
Scale	Select whether you want to have a scale displayed at the graph.
Minimum value	Minimum value for the signal.
Maximum value	Maximum value for the signal.
Pattern	Specify whether you want the graph to be filled completely or dot-wise. For DOP11A-20 only.
Direction	Specify whether you want the border to appear on the top, bottom, right, or left.
Border style	Specify whether you want the object to appear with a border.
Indicators	Here you specify whether the highest or lowest value will be indicated for the signal on the axis. The indicators are reset when starting the terminal. This reset can be performed in run mode by selecting the graph with a mouse click and pressing the Enter key. (Point to the graph if your terminal has a touchscreen.) The indicators support 16-bit characters only.
Engineering units scaling	Is used for scaling the register value. See section "General parameters" on page 130.
Scale	Define a color for the scale in the object.
Filling	Choose a filling color.
BG	Define a background color for the object.

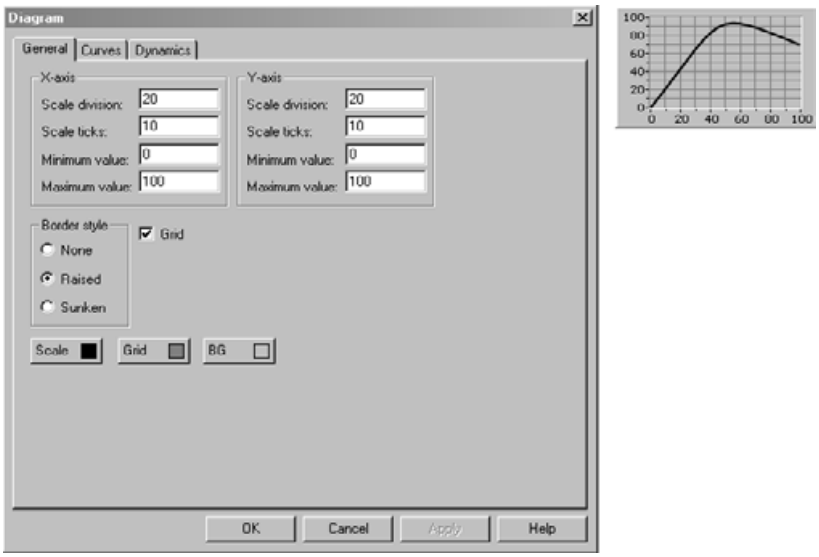
[Dynamics] tab page

The functions on this tab page are explained in section "General parameters" on page 130 .

Diagram

Object used for creating an x / y diagram that corresponds to the register content in the controller. This function is a realtime function. The object is usually used for time-independent displays. A time-dependent display with an update cycle of <1 s is possible if the controller records the data. In the following example, the value in register 0 serves as the first x-coordinate and the value in register 10 as the first y-coordinate. There are 4 register pairs. The table and figure are given to illustrate the example.

x-coordinate	Register	Value	y-coordinate	Register	Value
X0	0	0	Y0	10	11
X1	1	41	Y1	11	40
X2	2	51	Y2	12	85
X3	3	92	Y3	13	62

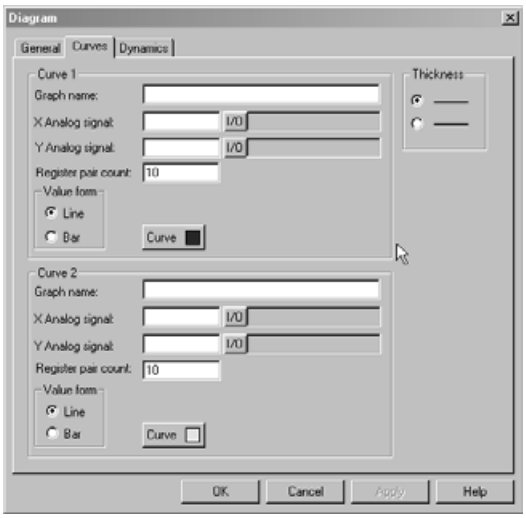


10638AEN

[General] tab page

Parameters	Description
Scale division	Interval between the scale marks on the y or x axis.
Scale ticks	Interval between the displayed scale ticks on the y or x axis.
Minimum value	Minimum value for the y or x coordinate.
Maximum value	Maximum value for the y or x coordinate.
Border style	Specify whether you want the object to appear with a border.
Grid	Select this checkbox to show the grid in the diagram.
BG	Define a background color for the object.
Scale	Define a color for the scale in the diagram.
Grid	Define a color for the grid in the diagram.

[Curves] tab page



10639AEN

Parameters	Description
Graph name	Enter a name for the respective curve in this field.
X analog signal	Data register that contains the first x-coordinate for the corresponding curve.
Y analog signal	Data register that contains the first y-coordinate for the corresponding curve.
Register pair count	Number of register pairs to be drawn (as points or bar).
Value form	Specify whether you want the diagram to appear as bar or line diagram. In a bar diagram, a bar is drawn for each register pair. In a line diagram, the x / y coordinates are displayed as points connected with a line.
Curve	Define a color for the corresponding curve.
Thickness	Specify the line thickness for the curve.

One curve can be defined for DOP11A-20. Two curves can be defined for the DOP11A-30, DOP11A-40 and DOP11A-50 terminals.

[Access] tab page

For DOP11A-50 only.

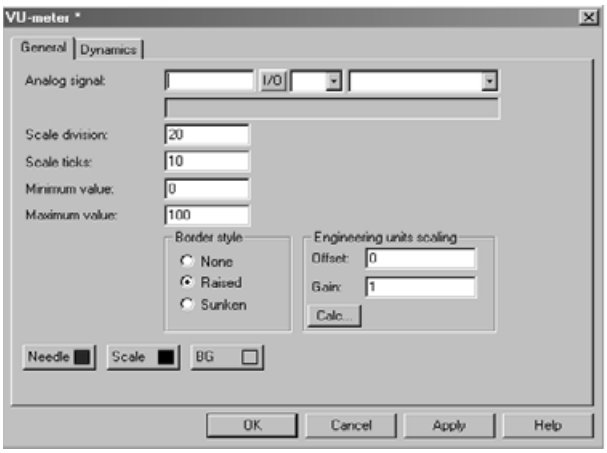
Parameters	Description
Current diagram signal	The register value determines which curve is to be processed in run mode.
Current cursor signal	The register value determines which point on the curve will be processed in run mode.
X processing step	Specifies the interval between the steps in which you activate the arrow keys in run mode.
Y processing step	Specifies the interval between the steps in which you activate the arrow keys in run mode.
Activate operator input curve 1-2	Specifies the curve that can be maneuvered in run mode.

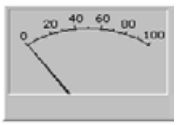
[Dynamics] tab page

The functions on this tab page are explained in section "General parameters" on page 130 .

VU-meter

Object used for creating a graphic VU-meter on the screen.





10640AEN

[General] tab page

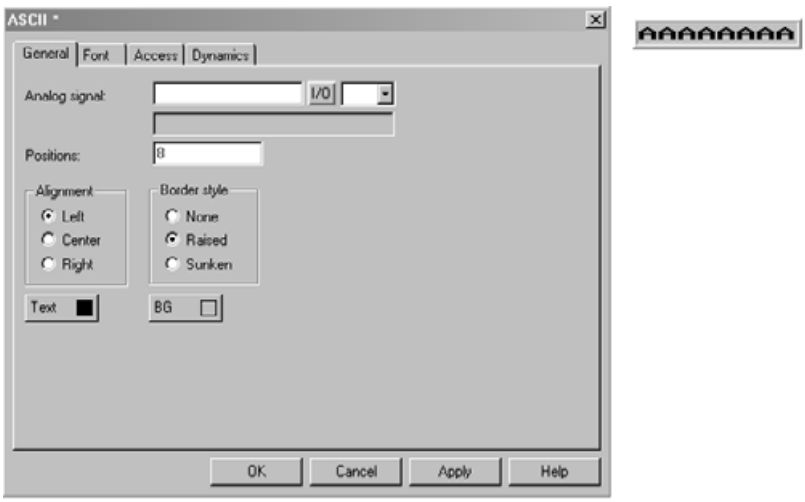
Parameters	Description
Analog signal	Signal address
Scale division	Specifies which scale division is used.
Scale ticks	Specifies the interval between the displayed scale ticks.
Minimum value	Minimum value for the signal.
Maximum value	Maximum value for the signal.
Border style	Specify whether you want the object to appear with a border.
Engineering units scaling	Is used for scaling the register value. See section "General parameters" on page 130.
Needle	Define a color for the pointer needle in the object.
Scale	Define a color for the scale in the object.
BG	Define a background color for the object.

[Dynamics] tab page

The functions on this tab page are explained in section "General parameters" on page 130 .

ASCII

Objects for controlling ASCII character strings in graphic blocks. Texts that are stored in the data register of the CPU can be displayed in ASCII objects. The texts must be available in expanded IBM ASCII format. Entering "SW" in the command line under system signals converts the text from the expanded IBM-ASCII character set (8-bit) into the Swedish ASCII character set (7-bit).



10641AEN

[General] tab page

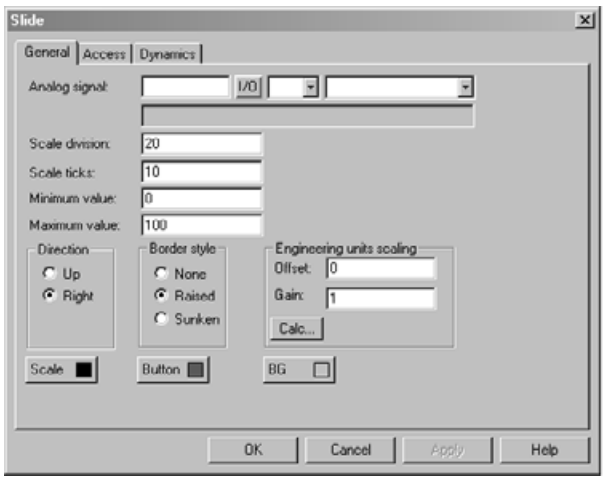
Parameters	Description
Analog signal	Specify the data register where you want to store the text for the first position.
Positions	Specify the number of positions for the text on the screen.
Alignment	Specify whether you want the text left-justified or centered.
Border style	Specify whether you want the object to appear with a border.
Text	Define a color for the text in the object.
BG	Define a background color for the object.

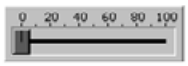
Other tabs

The functions on the [Access], [Font] and [Dynamics] tab pages are described in the section "General parameters" on page 130 .

Slider

Object that displays the value for an analog signal in a slider and enables the value for the analog signal to be increased and decreased.





10642AEN

[General] tab page

Parameters	Description
Analog signal	Signal address
Scale division	Specifies which scale division is used.
Scale ticks	Specifies the interval between the displayed scale ticks.
Minimum value	Minimum value for the object.
Maximum value	Maximum value for the object.
Engineering units scaling	These fields are used for scaling the register value. See section "General parameters" on page 130.
Direction	Specify whether you want the object to appear on the top or left.
Border style	Specify whether you want the object to appear with a border.
Scale	Define a color for the scale in the object.
Button	Define a color for the display button in the object.
BG	Define a background color for the object.

The file format BCD float without exponent cannot be used for SEW communication drivers.

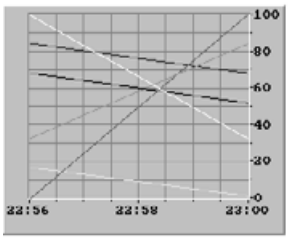
Other tabs

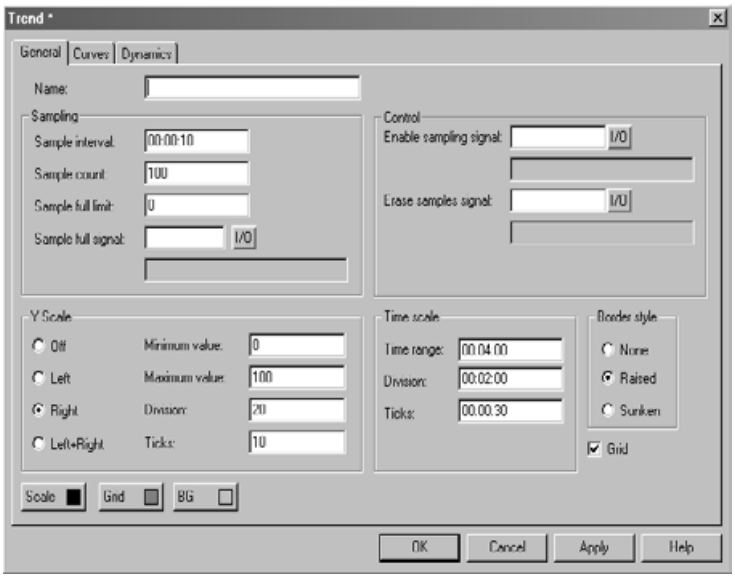
The functions on the [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Trend

Not applicable for DOP11A-10.

Object that displays values sampled by analog signals.



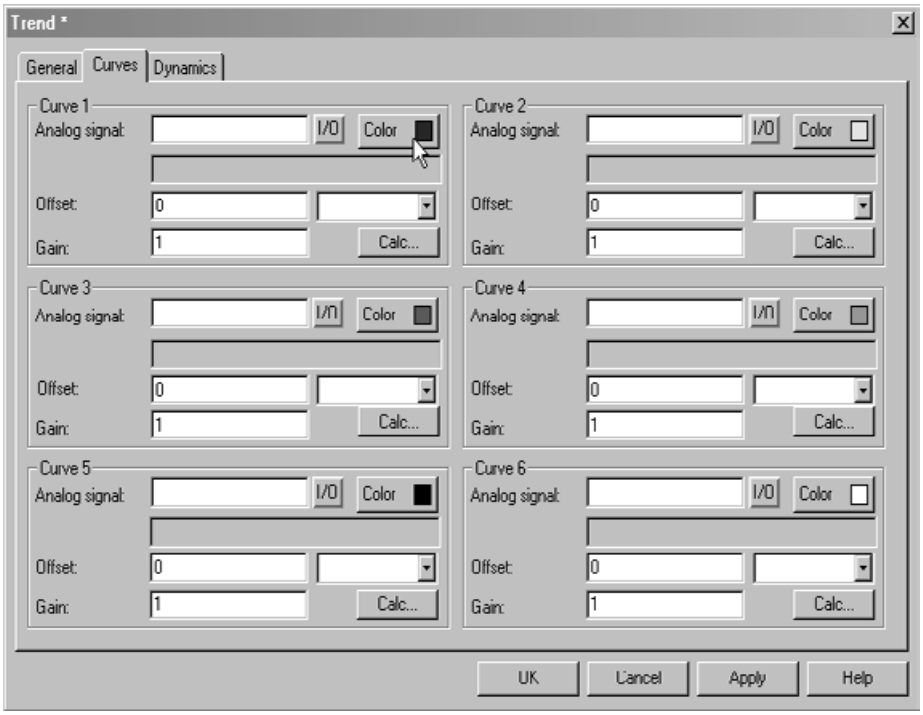


10643AEN

[General] tab page

Parameters	Description
Name	Enter a name for the trend object. Each object must be assigned an unambiguous name. The object name must not exceed eight characters. The parameter is mandatory. Not applicable for DOP11A-20.
Sample interval	Time interval between data acquisition. The minimum value is 1 s.
Sample count	Number of values to be stored. The maximum number of values is 65534. Not applicable for DOP11A-20.
Sample full limit	Enter the number of samples where the Sample full signal is to be enabled. Not applicable for DOP11A-20.
Sample full signal	Specify a digital signal that is to be activated when the number of samples under Sample full limit has been reached. Not applicable for DOP11A-20
Enable sampling signal	Digital signal that, if enabled, starts data acquisition. Acquisition stops when the signal is reset. Parameters need not be specified. Not applicable for DOP11A-20.
Delete trend data	Define a digital signal that, if enabled, deletes all trend data in the history. Not applicable for DOP11A-20.
Y scale	Specify whether you want the y-scale be hidden, appear left, right, or on both sides.
Minimum value	The minimum value on the y-axis is called from the specified register.
Maximum value	Maximum value on the y-axis that is read from the specified controller register.
Division	Specifies which scale division is used on the y-axis.
Scale ticks	Specifies the interval between the displayed scale ticks.
Time range	Time range to be displayed in the trend diagram.
Division	Specifies which scale division is used on the x-axis.
Scale ticks	Specifies the interval between the displayed scale ticks.
Border style	Specify whether you want the object to appear with a border.
Grid	Specify whether you want to display a grid in the object.
Scale	Define a color for the scale in the object.
Grid	Choose an appropriate color for the grid.
BG	Define a background color for the object.

[Curves] tab page



10644AEN

Parameters	Description
Analog signal	Analog signals that the object records and for which the values should be displayed. Only 16-bit numbers must be used.
Color	Choose the color for the corresponding curve.
Offset and gain	Is used for scaling the register value. See section "General parameters" on page 130.

Only two curves can be used with the DOP11A-20 model. The DOP11A-20 only provides realtime trend.

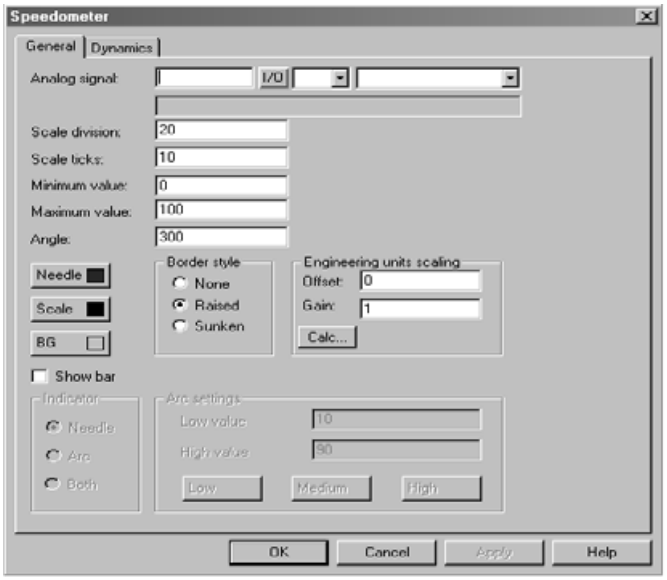
[Dynamics] tab page

The functions on this tab page are explained in section "General parameters" on page 130 .

If you copy a block with trend data, you will have to rename the trend object. Do not use the same name for two trend objects.

Speedometer

Object for creating a graphic speedometer on the screen.



10645AEN

[General] tab page

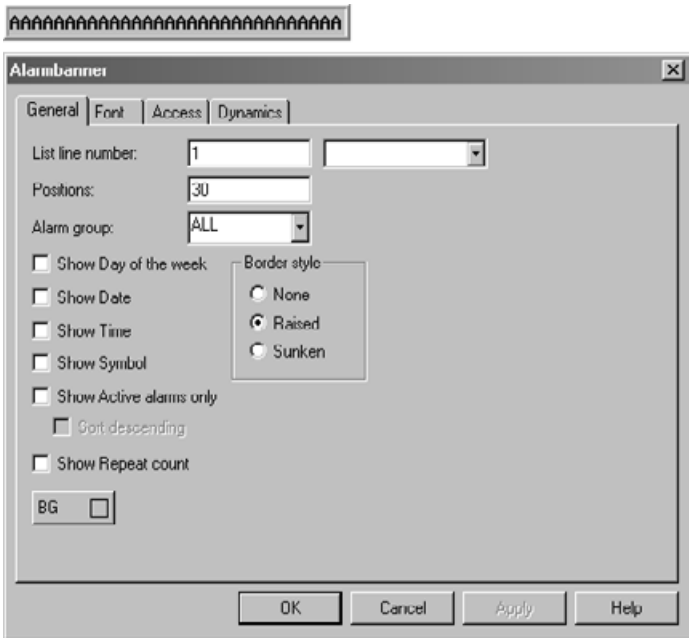
Parameters	Description
Analog signal	Signal address
Scale division	Specifies which scale division is used.
Scale ticks	Specifies the interval between the displayed scale ticks.
Minimum value	Minimum value that the object can display.
Maximum value	Maximum value that the object can display.
Angle	Specifies the angle (work area for the object) within 10-360 degrees.
Engineering units scaling	These fields are used for scaling the register value. See section "General parameters" on page 130.
Border style	Specify whether you want the object to appear with a border.
Needle	Define a color for the pointer needle in the object.
Scale	Define a color for the scale in the object.
BG	Define a background color for the object.
Show bar	Select this checkbox to show a bar for the speedometer. Activating this option means the associated configuration options are available.
Indicator	Choose needle, arc, or both.
Arc settings	Define minimum and maximum values and the colors for the different ranges.

[Dynamics] tab page

The functions on this tab page are explained in section "General parameters" on page 130.

Alarm banner

Object used for displaying a line from the alarm list.



10646AEN

[General] tab page

Parameters	Description
List line number	Enter the line number in the alarm list from which you want to retrieve information (1=first line, 2=second line, etc.) when the specified alarm group is shown in the alarm list.
Positions	Number of positions to be displayed.
Alarm group	Specify the alarm group you want to display. The object is shown in the color defined for the alarm group.
Show week day	Select whether you want the week day to be displayed.
Show date	Select whether you want the date to be displayed.
Show time	Select whether you want the time to be displayed.
Show symbol	Select whether you want alarm symbols to be displayed. See chapter 8.2 Alarm handling".
Show active alarms only	Specify whether only active alarms are to be displayed. The alarm banner object remains empty if no active alarm was triggered.
Show repeat count	Indicates how often the alarm was repeated. See chapter 8.2 "Alarm handling".
Border style	Specify whether you want the object to appear with a border.
BG	Define a background color for the object.

To acknowledge an alarm in the alarm banner, you have to activate the [Enable acknowledge] checkbox on the [Access] tab page.

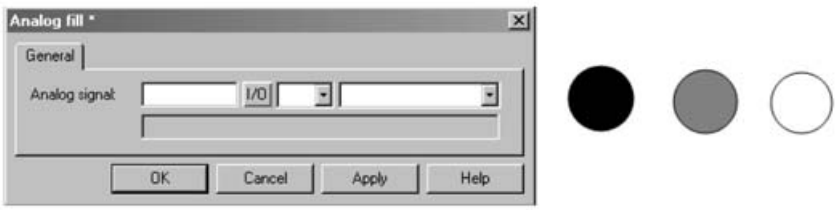
The foreground color for the alarm text is specified by the color defined for the alarm group.

Other tabs

The functions on the [Font], [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130.

See also chapter 8.2 "Alarm handling".

Analog fill



54664AEN

Object used for filling a selected area with one of 256 colors. The color depends on the register value. See the table below for the assignment of color and register content.

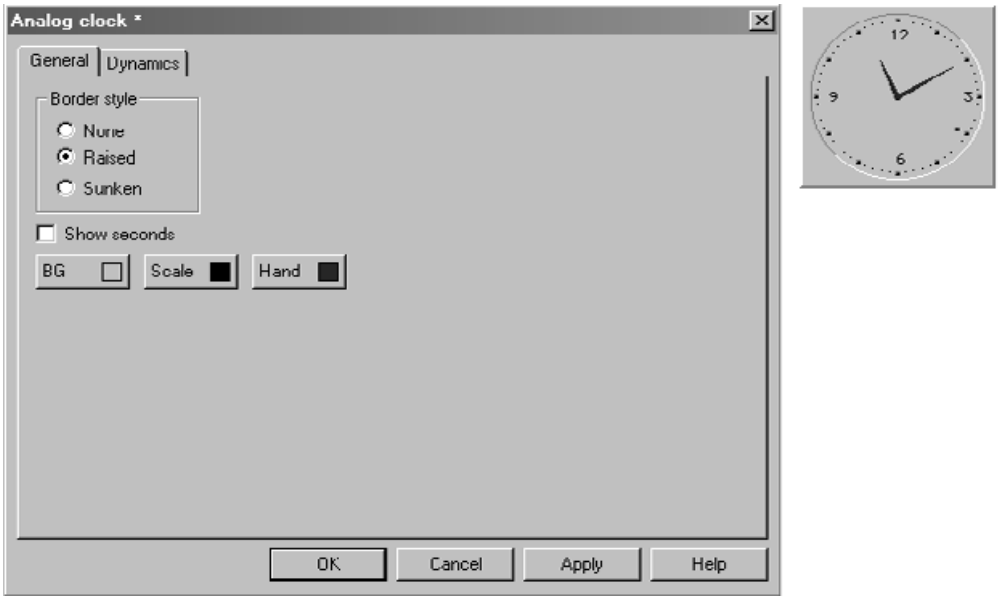
Parameters	Description
Analog signal	Enter the data register the content of which controls the object color. See the following table.

Register content	Color	Register content	Color
0	Black	8	Gray
1	Blue	9	Light blue
2	green	10	Light green
3	Cyan	11	Light cyan
4	Red	12	Bright red
5	Magenta	13	Light magenta
6	Yellow	14	Light yellow
7	Light gray	15	White

For limitations and information on object positioning, refer to section Digital fill" on page 142.

Analog clock

Time object for displaying an analog clock.



10648AEN

[General] tab page

Parameters	Description
Border style	Specify whether you want the clock to appear with a border.
Seconds	Select whether you want a second hand to be displayed.
BG	Define a background color for the object.
Scale	Define a color for the scale in the object.
Hand	Define a color for the hand in the object.

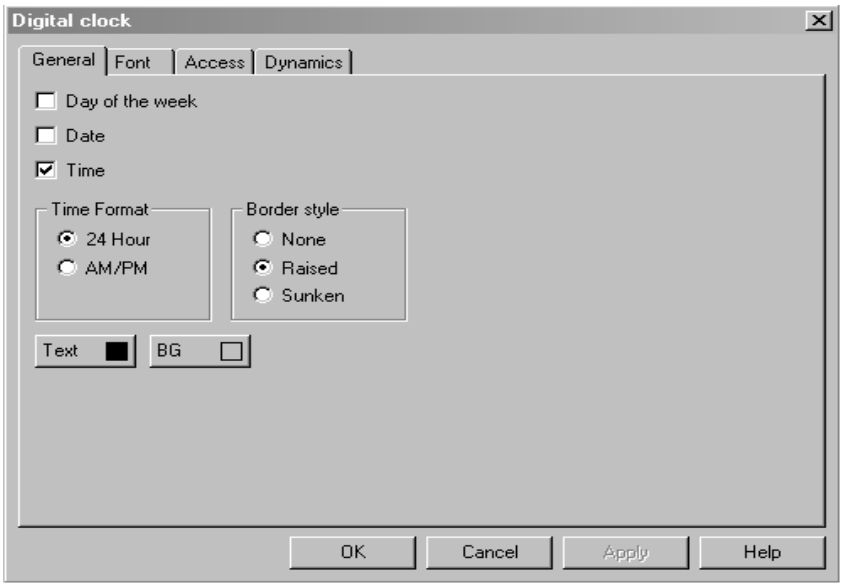
You have to define a maneuverable date / time object (digital clock) to set the clock in run mode.

[Dynamics] tab page

The functions on this tab page are explained in section "General parameters" on page 130 .

Digital clock

Time object for displaying digital clock, week day and date.



10649AEN

[General] tab page

Parameters	Description
Week day	Select whether you want the week day to be displayed.
Date	Select whether you want the date to be displayed.
Time	Select whether you want the time to be displayed.
Time format	The time can be displayed in 12 or 24 hour time mode.
Border style	Specify whether you want the object to appear with a border.
BG	Choose a background color.
Text	Define a color for the text in the object.

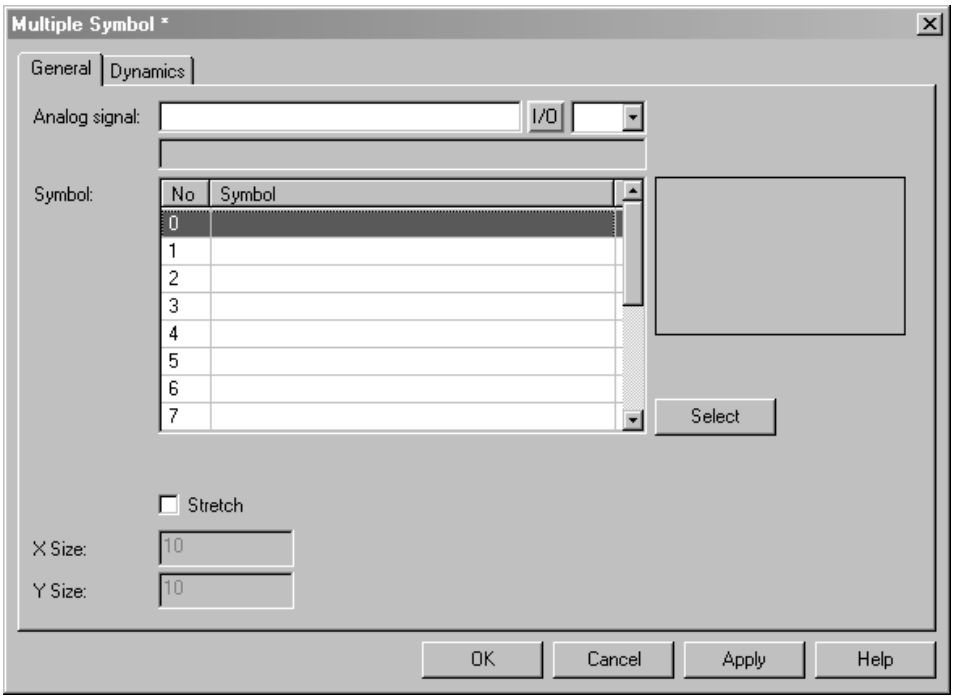
You have to define a maneuverable date / time object (digital clock) to set the clock in run mode.

Other tabs

The functions on the [Font], [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Multiple symbol

Object that can display one of up to 16 symbols. The symbol depends on the data register value.



11321AEN

[General] tab page

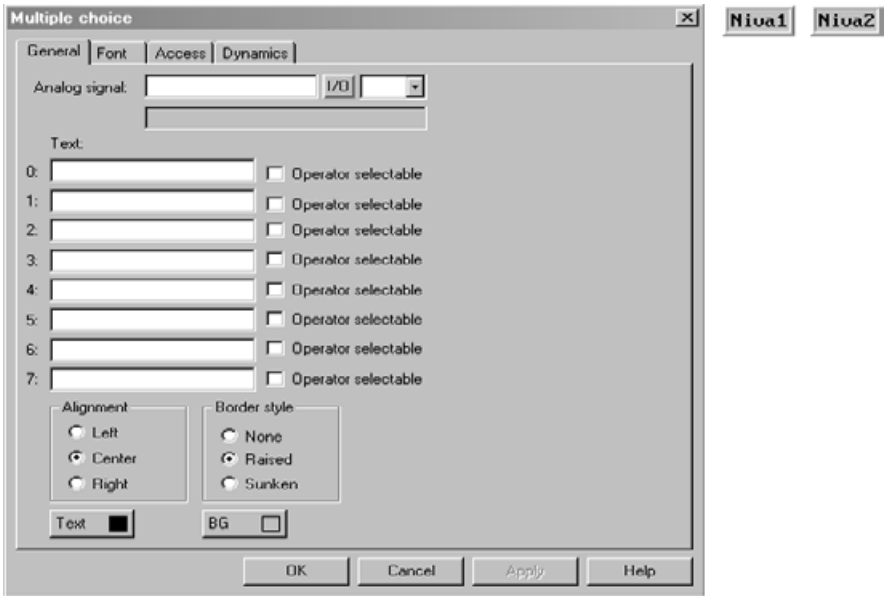
Parameters	Description
Analog signal	Data register that controls the symbol to be displayed. If the register value is 1, symbol 1 will be displayed, etc.
Symbols 0-15	Select the symbol you want to display. If the register value is 0, symbol 0 will be displayed, etc.
Resizable	The x or y size of the symbol can be changed when this checkbox is selected. The permitted x value for DOP11A-20 is between 0 and 239. The value for DOP11A-40 is between 0 and 319, and for DOP11A-50 between 0 and 639. The permitted y value is 0-63 for DOP11A-20, 0-239 for DOP11A-40 and 0-479 for DOP11A-50.

[Dynamics] tab page

The functions on this tab page are explained in section "General parameters" on page 130 .

Multiple selection

Object that can exist in several states. The object is linked to a data register that can have up to eight different states. A text with up to 30 characters can be assigned to each state.



10651AEN

[General] tab page

Parameters	Description
Analog signal	Data register that controls the text to be displayed.
Texts 0-7	Texts to be displayed for the specific object state.
Operator selectable 0-7	Activate the corresponding checkbox to maneuver this object in this status in run mode from the terminal.
Alignment	Specify whether you want the text left-justified, centered or right-justified.
Border style	Specify whether you want the object to appear with a border.
BG	Define a background color for the object.
Text	Define a color for the text in the object.

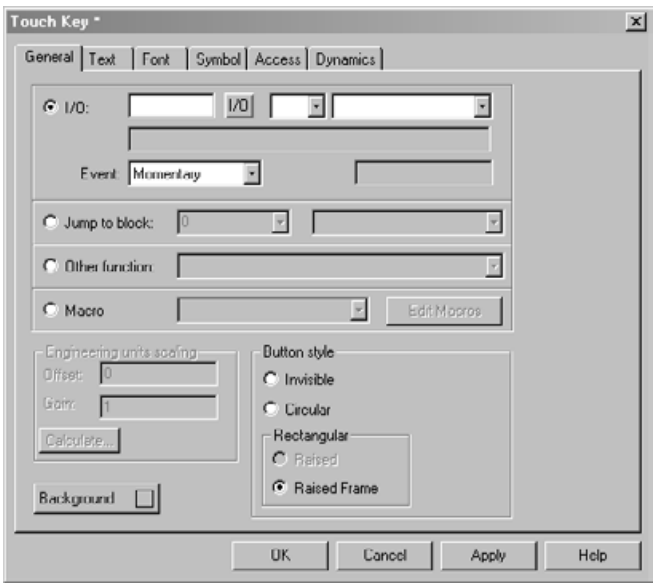
Other tabs

The functions on the [Font], [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Touch key

Only applies to DOP11A-30 and DOP11A-50. See section "Using touchscreen" on page 130 and chapter 8.10 "Function keys".

This object creates a touch-sensitive surface that corresponds to a function key. The object can be used to change the display, control memory cells, etc.



11322AEN

[General] tab page

Parameters	Description	
I/O	Signal type influenced by the object. For a description of predefined functions, refer to chapter 8.10 "Function keys".	
Event	Specifies how the signal is influenced by the object. The signal is activated when the object is triggered using the settings options.	
	Grouped	All signals belonging to a touch key with current group number are reset. The group number is specified under Group no. A group comprises a maximum of eight touch keys.
	Dec. analog	In this field, the analog signal linked to the function key is decreased by the value entered under *value*.
	Volatile	Here, the signal is activated as long as the touch key is being pressed.
	Reset	Here, the signal is reset when the touch key is being pressed.
	Set analog	In this field, the analog signal linked to the function key is assigned the value defined under *value*.
	Toggle	The signal is activated and reset in turns when the touch key is being pressed.
	Inc. analog	In this field, the analog signal linked to the function key is increased by the value defined under *value*.
Jump to block	Jumps to a different block when the object is influenced. Enter the number or the name of the block to which you want the program to jump to.	
Other functions	For a description of the function, refer to chapter 8.10 "Function keys".	
Macro	Refer to chapter 8.12 "Macros" for a description of this function.	
Button style	Choose the required button style: circular, rectangular or invisible.	
BG	Define a background color for the object.	

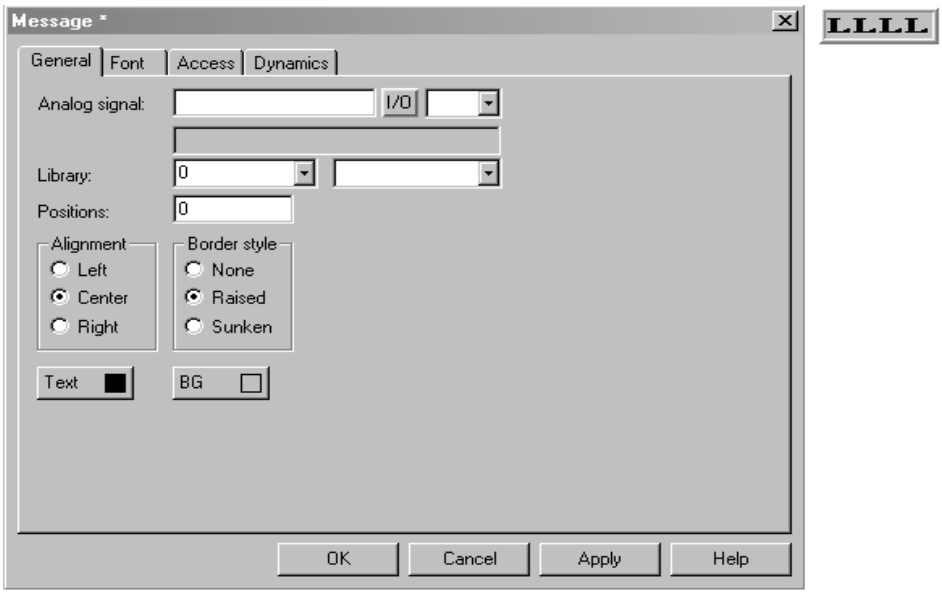
You can use an invisible touch-sensitive area to define areas that enable jumping between blocks in an overall view (e. g. for a machine). The detailed views are linked to invisible touch-sensitive areas that are positioned at certain parts of the machine. Pressing one of these areas will display the corresponding detailed view.

Other tabs

The functions on the [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Message

Object that displays texts from a message library.



10654AEN

[General] tab page

Parameters	Description
Analog signal	Analog signal that controls which text from the selected message library will be displayed.
Library	Select the number of the required message library. You define the number under [Functions] / [Message library].
Positions	Number of places for displaying text; 0=automatic length adjustment.
Alignment	Specify whether you want the text left-justified or centered.
Border style	Specify whether you want the object to appear with a border.
Text	Define a color for the text.
BG	Define a background color for the object.

When using the function for an indexed message library, the number of positions must not be 0, else automatic length adjustment will not work.

For further information, refer to chapter 8.1 "Message library".

Other tabs

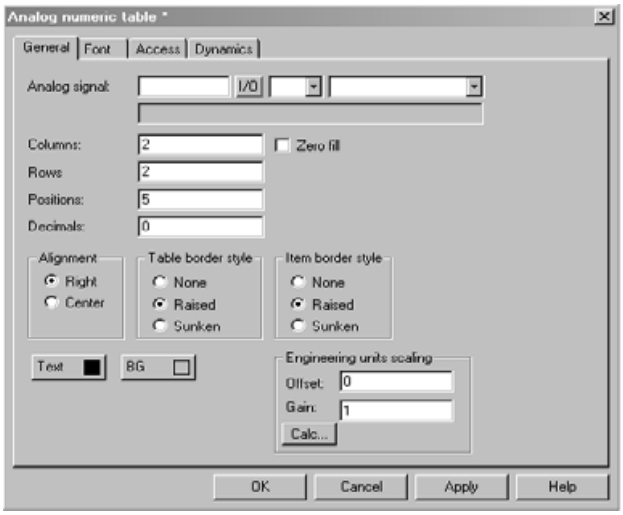
The required maneuvering range is set on the [Access] tab page. An area with a maximum of 64 texts can be maneuvered in run mode. Enter the number for the first and last text in the area.

The functions on the [Font], [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Analog numeric table

Not applicable for DOP11A-20.

Object used for creating a table with analog numeric objects.



10655AEN

[General] tab page

Parameters	Description
Analog signal	The first signal that appears in the table.
X size	Number of table columns
Zero fill	Specify whether you want empty positions to be filled with zeros.
Y size	Number of table rows
Positions	Number of positions for displaying the entered value.
Decimals	Number of decimal places for displaying the entered value.
Alignment	Specify whether you want the input field to be formatted left-justified or centered.
Table border style	Specify whether you want the table to appear with a border.
Item border style	Specify whether you want each table cell to appear with a border.
Text	Define a color for the text in the object.
BG	Define a background color for the object.
Engineering units scaling	These fields are used for scaling the register value. See section "General parameters" on page 130.

Other tabs

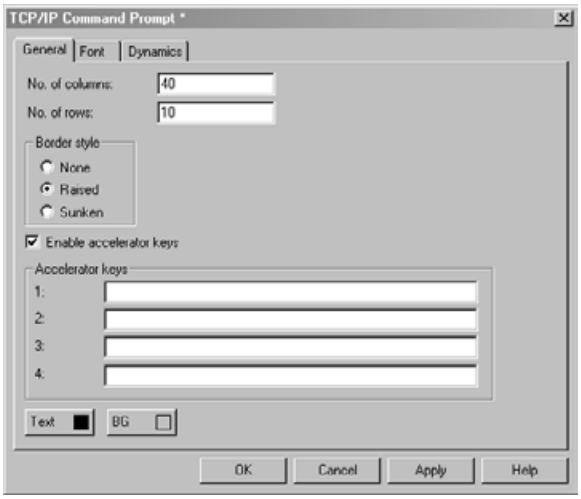
The table orientation is specified on the [Access] tab page: "horizontal" or "vertical". The table signals are calculated according to the direction specified.

The functions on the [Font], [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Minimum and maximum values are only used when the object is a maneuverable object.

TCP/IP command prompt

Window where you can enter a TCP/IP command and send it to terminals and PCs within a TCP/IP network. You can call the previous command during operation by using the up and down arrow keys.



10656AEN

[General] tab page

Parameters	Description
No. of columns	Window width
No. of rows	Window height
Border style	Specify the border type to be drawn around the window.
Enable accelera-tor keys	Specify whether you want to enter predefined commands in the window using F1-F4 function keys or 1-4 touch keys.
Accelerator keys	Enter any command you want to appear at the prompt when hitting the corre-sponding key.
BG	Define a background color for the window.
Text	Define a color for the text in the window.

Other tabs

The functions on the [Access] and [Dynamics] tabs are explained in section "General parameters" on page 130 .

Commands for TCP/IP command prompt

Command	Description
IPCONFIG	Retrieves and displays the current IP address for the terminal.
PING	Checks whether a value is available.
ROUTE	Serves to display, add and delete routes.
ARP	Serves to display, add and delete IP hardware addresses.

For further information on TCP/IP networks, refer to chapter 9.2 "Network communication".

7.4.3 Operate graphic blocks

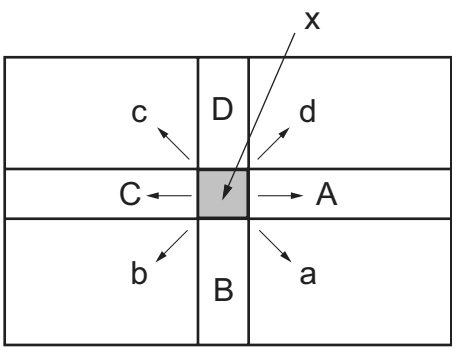
Not applicable for DOP11A-30 and DOP11A-50.

Press the arrow keys to change between maneuverable objects. A selected object is identified by a blinking border.

Select maneuverable objects

Press the arrow keys to change between maneuverable objects. The objects are selected according to the following principle:

The cursor is positioned in the middle of a cross. Pressing the right arrow key selects the first object located in area "A" (see figure). if the system cannot find an object in the narrow strip on the right, it searches area "a". Pressing the down arrow key searches for objects in areas "B" and "b". Press the left arrow key to search in areas "C" and "c". Press the up arrow key to search objects in areas "D" and "d".



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x = cursor position

Digital objects

Digital objects, text objects, symbol objects and filled objects change their state when pressing the Enter key. If the functions for incrementing and decrementing are linked to function keys, the signal linked to the object of these keys will be enabled or reset.

Analog objects

ASCII objects

Move the cursor over the object and press the Enter key. Enter the required text and confirm the entry by pressing the Enter key.

Message objects

Move the cursor over the object and press the Enter key. A selection list with all available states opens. Select the required state and press the Enter key. This way, you define the analog signal linked to the object.

Multiple selection objects

Move the cursor over the object and press the Enter key. A selection list with all available states opens. Select the required state and press the Enter key. This way, you define the analog signal linked to the object.

Numeric objects

To control a numeric object, enter a value and press the Enter key. If the entered value is too high or too low, the possible minimum or maximum value for the object will be displayed. This information will also be issued if you press the Enter key while the object is maneuverable.

Numeric table objects

If a table object is highlighted, press the Enter key to select the first table row. You can now move the cursor over the cells using the arrow keys. Change the value of a selected cell and press the Enter key.

Slider objects

You control the object using the arrow keys by moving the cursor over the object and pressing the Enter key. You can now increase or decrease the value using the arrow keys. Confirm your entry by pressing the Enter key. The value increases or decreases by the number that corresponds to the object setting under scale ticks. Complete the process by pressing the Enter key.

This object can also be increased and decreased using the functions. The object must be linked to function keys for this purpose. See section 8.10 Function keys".

Bar objects

To change (reset) the minimum and maximum indicators for a specific value in bar objects, place the cursor on the object and press the Enter key.

In terminals with touchscreen, you reset the minimum and maximum indicators by pointing on the bar.

Trend objects

Not applicable for DOP11A-20.

In run mode, trend curves can display continuously measured values. Select the required trend object and press the Enter key. This opens a dialog box. Select a time interval and date for the data to be displayed. “History” is displayed at the bottom of the dialog box. To go back to real-time display, press the Enter key again. The trend data are stored in files. You specify the name when defining the trend object.

10657AXX

Other objects

Digital clock

The digital clock (real-time clock) is set by selecting the object and entering the required time. To complete the process, press the Enter key.

If you use the controller clock, you have to set the time in run mode.

Jump objects

Select the required object and press the Enter key.

TCP/IP command prompt

TCP/IP commands can be entered in a selected line. To call up the previous command, press the up and down arrow keys.

7.4.4 Using the touchscreen

This paragraph refers only to DOP11A-30 and DOP11A-50.

Terminals with touchscreen do not have a built-in keyboard. The system is controlled using the touchscreen functions only. You should always touch only one spot on the touch-sensitive screen. If you touch two spots at the same time, the spot between the two spots you have touched will be chosen.

When using terminals with touchscreen, objects CANNOT be controlled in the text block.

If you touch a non-maneuverable object, the message "Not maneuverable" will appear. If you touch a password protected object, the message "Access denied" will appear.

Digital objects

Digital objects, text objects, symbol objects and filled objects change their state when you touch them with your finger.

Analog objects

ASCII objects

Touch the object with your finger. This displays an alphanumeric keyboard on the screen. Enter the required text by touching the keyboard. Complete your entry by pressing the Enter key.

Multiple selection objects

Touch the object with your finger. to open a selection list. To select an object on the screen, touch it with your finger.

Numeric objects

Touch the object with your finger. The numeric keyboard will be displayed. Enter the required value by touching the keyboard. Complete your entry by pressing the Enter key.

Numeric table objects

Touch a cell in the table object with your finger. The numeric keyboard will be displayed. Enter the required value by touching the keyboard. Complete your entry by pressing the Enter key.

Slider objects

Control the object by touching and then dragging the buttons.

Bar graph objects

Press the bars to reset the minimum/maximum indicators.

Trend objects

In run mode, trend curves can display continuously measured values. Touch the object with your finger. A button toolbar is shown under the trend.

Double arrows	Scroll the trend horizontally by one screen
Single arrows	Scroll the trend horizontally by half a screen
–	Maximizes the trend display
+	Minimizes the trend display
^	Returns to the basic setting

To go back to real-time display, click on the object again.

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Other objects

Digital clock

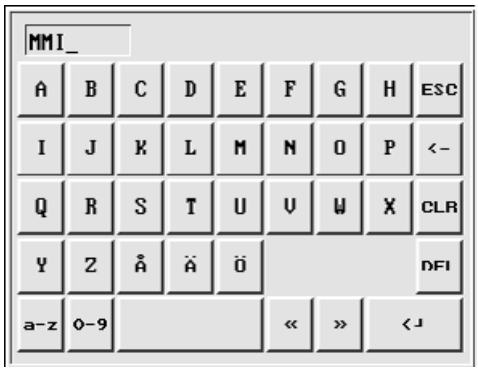
Touch the object with your finger. The numeric keyboard will be displayed. Enter the required time by touching the keyboard. Complete your entry by pressing the Enter key.

Jump objects

Touch the object with your finger to perform a jump.

Alphanumeric keypad

The alphanumeric keypad appears, for example, when controlling an ASCII object.



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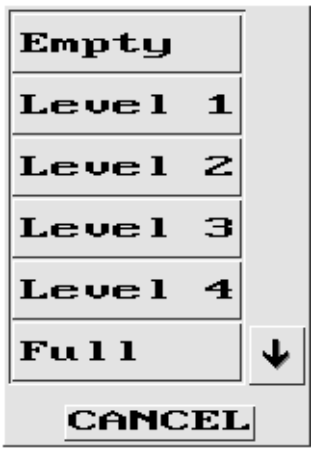
Key	Description
A-Z	These keys are used for entering the required text.
ESC	Hides the keyboard and returns to the previous menu.
←	Deletes one character left to the current position.
CLR	Clears all characters you entered.
DEL	Deletes the character where the cursor is currently positioned.
↵	Confirms the setting made and hides the keyboard.
@	Is used to type the @ character.
>>	Moves the cursor to the right.
<<	Moves the cursor to the left.
a-z	Toggles between upper and lower case.
0-9	Toggles between letters, numbers, and special characters.
SPC	Opens a selection list with special characters.
MAIL	Opens a list with e-mail addresses.

Selection lists

Selection lists are displayed in addition to alphanumeric and numeric keyboards.

In certain cases you can use the <LIST> accelerator key for displaying selection lists.

Use the arrows in the selection list to view the top or bottom list entry. To close the list without selecting any entry, press [CANCEL].



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Calibrating the touchscreen

The touchscreen must be calibrated once a year. To do so, disconnect the power supply to the terminal. Move the switch on the side or back of the terminal to position 2 and then reconnect the power supply.

7.5 Text-based display and control

Text-based display and control are suited for creating different report printouts, such as daily reports, status reports, etc. A report consist of text blocks, which may comprise both static and dynamic text. Refer to section 8.5, "Printing reports" for more information on the structure of a report.

This section gives an overview of text objects in tables followed by a description of each object.

Text-based printouts are not supported when using Unicode.

7.5.1 General parameters

Engineering units scaling

The *offset* and *gain* parameters are used to scale the register value to a display value according to the following formula.

Display value = *offset* + *gain* × register value

If you alter the value for an object via the terminal in run mode, the display value will be scaled according to the following formula.

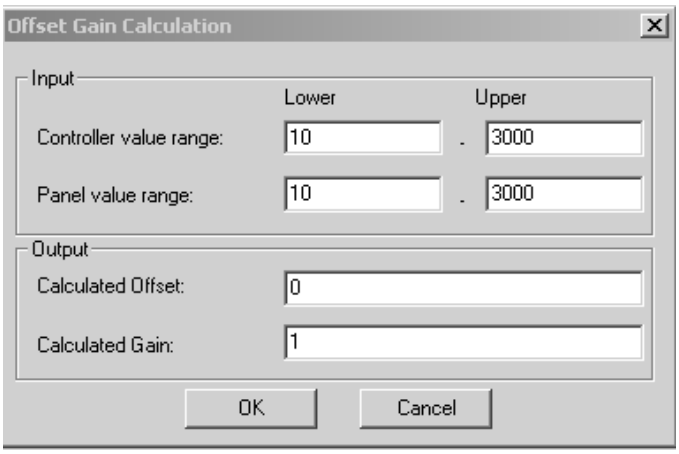
Register value = (display value – *offset*) / *gain*

The scaling neither affects the defined maximum/minimum values nor the number of decimal places.

The functions for increasing/decreasing values affect the register value for the maneuverable object but not the display value.

Calculating technical units

The [offset/gain calculation] function serves as tool for calculating the parameters *offset* and *gain*. Enter the value for *offset* and *gain* of the object on the [General] tab page and click on [Calculate]. The following dialog opens.



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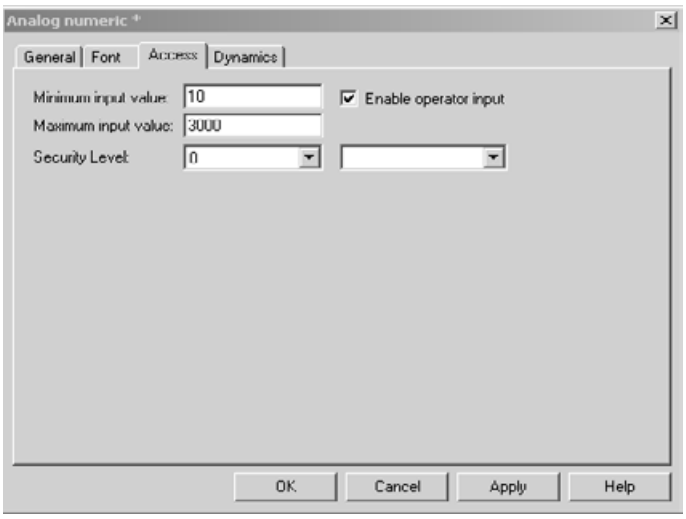
Enter the range for the controller and terminal values. The function determines the correct values for the *offset* and *gain* parameters.

Access



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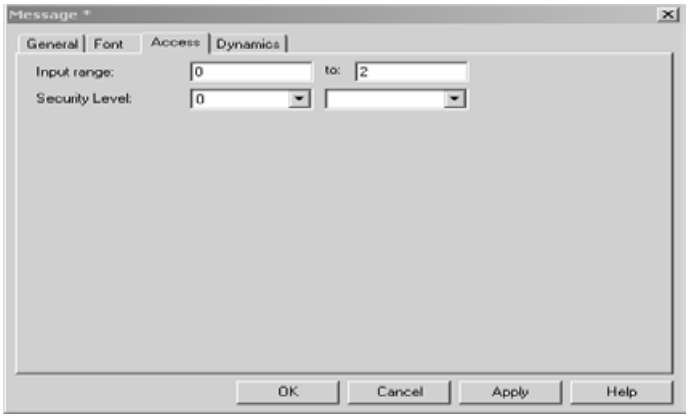
Under [Access], define whether the object should be maneuverable. Also enter the minimum and maximum input values. You can also specify the security level for the object. You define security levels under [Functions] / [Passwords]. See section 8.4 "Passwords".

The [Message] dialog looks as follows:



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Enter the [Input range] for the first and last text in the area. An area with a maximum of 64 texts can be maneuvered in run mode.

7.5.2 Text objects

Dynamic text objects

Symbol	Object	Description
	Analog numeric	Displays the value in numerical form.
	Date / time	Set date and time.
	Digital text	Toggles between two texts depending on the state of a digital signal.
	Multiple selection	Is linked to a data register that can have up to eight different states. A text with up to 30 characters can be assigned to each state.
	Jump	Jump to another block.
	Bar diagram	Displays the value in the form of a bar diagram.
	Text	Controls ASCII character strings.
	Message	Object that displays text from a message library.

7.5.3 Operate text blocks

A text block consists of rows of text with static and dynamic objects. The dynamic objects indicate the current state of signals to which the objects are linked. Certain dynamic objects can be maneuvered. Their status can be changed in run mode.

To change a maneuverable object, use the arrow keys and move the cursor over the object you want to change. Text blocks can be scrolled vertically but not horizontally.

Objects in text blocks cannot be controlled when using terminals with touchscreen.

Digital objects

Digital objects are operated by selecting the required object. Press the Enter key to change the object status.

Analog objects

Analog objects and date / time objects

To operate these objects, move the cursor over the required object. Enter the new value. Complete your entry by pressing the Enter key. You can reject any changes you make before you press the Enter key. To do so, exit the field using the [↑] or [↓]key. The original value will be retained.

Text objects

To operate a text object, select it and press the Enter key. This opens an input field. The input field will appear in the first or last line depending on the position of the object on the screen. If the text is longer than the width of your screen, the input field will be scrolled. Press the Enter key to confirm your entry.

Message objects

To operate a message object, move the cursor with the arrow keys to the required object and press the Enter key. A selection list with all available states will appear on the screen. Select the required state and press the Enter key. The analog signal linked to the object will be changed.

Multiple selection objects

To operate a multiple selection object, move the cursor with the arrow keys to the required object and press the Enter key. A selection list with all available states will appear on the screen. Select the required state and press the Enter key. The analog signal linked to the object will be changed.

Jump objects

Select the required object and press the Enter key.

Bar objects

You can set the indicators for the minimum and maximum values to the current value for the bar object. To do so, select the object and press the Enter key.

7.6 Transferring projects

To make the project available to the terminal, you have to transfer the project from the PC (where it was programmed) to the terminal.

Connect the PC on which the HMI-Builder is installed to the terminal using the PCS11A cable.

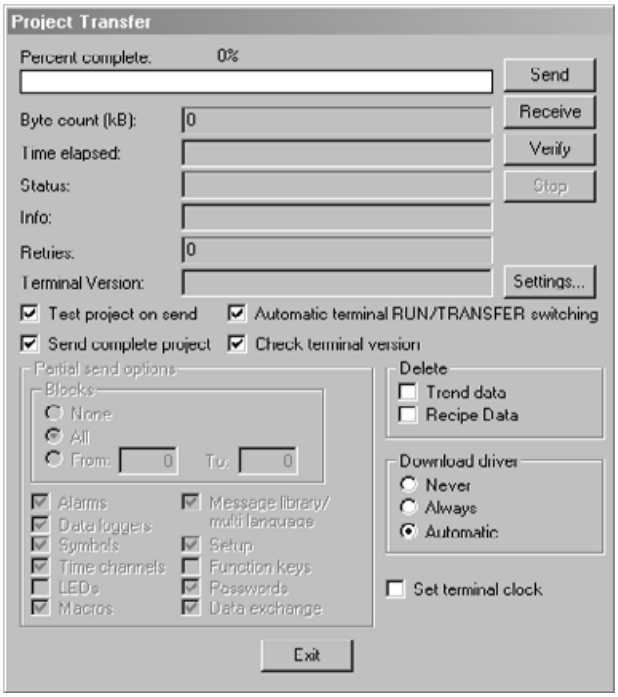
7.6.1 Setting up your terminal

You do not usually have to make any settings in the terminal. The project transfer process is controlled by the HMI-Builder. If required, you can set the transfer parameters in the terminal in configuration mode under [Setup] / [Port parameters] / [HMI-Builder].

The communication settings for HMI-Builder and terminal must be identical.

7.6.2 Transfer settings

The transfer is controlled by the HMI-Builder. In the HMI-Builder, you can set transfer parameters under [Transfer] / [Project].



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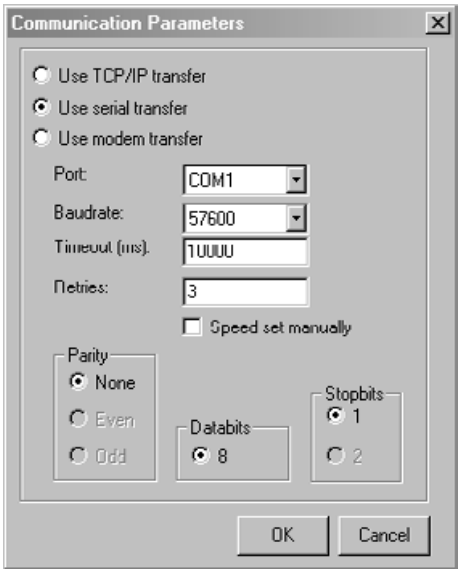
Parameters	Description
Percent complete	Progress indicator that displays the upload status in percentage completed.
Byte count (kB)	Indicates how many kB have already been uploaded.
Time elapsed	Indicates how much time has elapsed since the send, receive, or verify functions have been performed.
Status	Indicates the transfer status and the project section that is currently being uploaded, such as settings, individual blocks, alarm groups, individual symbols and function keys.
Information	Displays the specified driver that is loaded to the terminal.
Retries	If problems occur during the upload, the HMI-Builder will retry the upload several times before aborting the process.
Terminal version	Displays the current terminal type and version number of the system program after the connection with the terminal is reestablished.
Test project on send	Using this option automatically verifies the project before it will be transferred.
Automatic terminal RUN/TRANSFER switching	If this checkbox is enabled, the terminal will automatically switch to transfer mode. The terminal will return to the previous state after completed transfer.
Check terminal version	If this option is enabled, the system program version of the terminal will be compared with the project version set in the HMI-Builder.
Send complete project	Specify whether you want to send the complete project.

Parameters	Description	
Partial send options	block	
	All	All blocks will be transferred to the terminal.
	No	No blocks will be transferred to the terminal.
	From To	Specify the block sequence to be transferred to the terminal.
	Alarms	Alarms will be transferred to the terminal.
	Symbols	Symbols will be transferred to the terminal.
	Time channels	Time channels will be transferred to the terminal.
	LEDs	LEDs will be transferred to the terminal.
	Message library	The message library will be transferred to the terminal.
	Setup	The configuration under Setup will be transferred to the terminal.
	Function keys	The function keys will be transferred to the terminal.
	Passwords	The passwords will be transferred to the terminal.
	Data exchange	The data exchange will be transferred to the terminal.
Delete	Trend data	All trend data stored in the terminal will be deleted.
	Recipe data	All recipe data stored in the terminal will be deleted.
Download driver	No	The driver is never downloaded.
	Always	The driver is always downloaded.
	Automatic	The driver is transferred to the terminal when the drivers in the terminal and the current project are not the same or if they do not have the same version.
Set terminal clock	The PC clock will be transferred to the terminal.	
Send	Sends the project to the terminal using the defined settings.	
Receive	HMI-Builder loads the project in the terminal. This means the active project in the HMI-Builder will be overwritten. There must be an active project in the HMI-Builder to be able to load a project from the terminal.	
Verify	Verifies whether the active project in the HMI-Builder is identical with that in the terminal.	
Stop	Clicking this button stops the ongoing loading process.	
Settings	Clicking this button enables you to configure transfer parameters. The transfer values must correspond with the values in the terminal.	

You can call up the communication parameters under [Transfer] / [Comm. settings[or by clicking the [Settings] button in the [Project Transfer] dialog box.



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Settings in the communication parameters dialog box.

Parameters	Description
Use TCP/IP transfer	Specify whether you want to transfer the project using TCP/IP. See section "TCP/IP transfer" on page 180.
Use serial transfer	Specify whether you want to transfer the project using serial transfer. See section "Serial transfer" on page 180.
Use modem transfer	Specify whether you want to transfer the project using the modem. See section "Modem transfer" on page 180.
Port	Select a communication port for the PC.
Baud rate	Specify the baud rate.
Timeout (ms)	Specify the number of milliseconds between two transfer attempts.
Quantity	Enter the number of transfer attempts after interrupted transfer.
Speed set manually	Only required for older terminal versions with modem communication. The transfer speed must be set manually to the same value in the terminal and the HMI-Builder. The terminal must be switched to transfer mode manually.
Parity	Select a parity check type.
Data bits	Number of data bits for the transfer. The value must be 8.
Stop bits	Select the number of stop bits used for transfer.

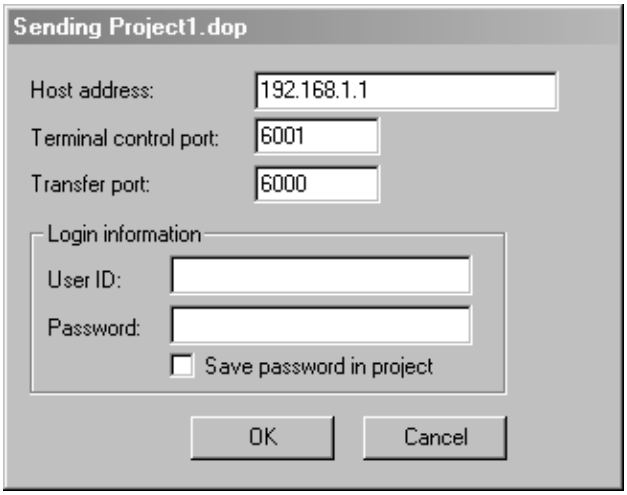
Communication errors may occur if other Windows applications are being run during project transfer. Close all other programs to eliminate this error source.

Existing links to symbols are taken account of when blocks are being transferred.

7.6.3 TCP/IP transfer

Not applicable for DOP11A-10.

To transfer a project via TCP/IP, select the [Use TCP/IP transfer] option from the [Transfer] / [Communication settings] menu. Clicking the [Send] button in the [Project Transfer] dialog box opens the following window:



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Parameters	Description
Host address	The IP address for the target terminal is entered in this field.
Terminal control port	Specifies the TCP/IP port number for the changeover from RUN to transfer mode. This value usually need not be changed. The default setting is 6001.
Transfer port	Specifies the TCP/IP port number for the transfer (project transfer server). This value usually need not be changed. The default setting is 6000.
User ID	Type the user name that is used when checking the changeover from RUN to transfer mode. The password is not required when the terminal is already in transfer mode.
Password	Type the password that is used when checking the changeover from RUN to transfer mode. The password is not required when the terminal is already in transfer mode. You only have to make this setting when the authorization check under [Setup] / [Network] / [Services] / [Terminal controller] is activated and the users are defined under [Setup] / [Network] / [Accounts].
Save password in project	Select this checkbox if you want to save your password and user ID. You will then not be prompted for them anymore.

7.6.4 Serial transfer

For serial transfer, select the [Use serial transfer] option under [Transfer] / [Comm. settings]. To transfer the project to the terminal, click the [Send] button in the [Project Transfer] dialog box.

7.6.5 Modem transfer

For transfer via modem, select the [Use modem transfer] option under [Transfer] /]Comm. settings]. To transfer the project to the terminal, click the [Send] button in the [Project Transfer] dialog box.

Modem settings

Use the following settings for the modem connected to the operator terminal:

AT &F E0 Q1 &D0 &K0 &W

Use the following settings for the modem connected to the PC:

AT &F &D0 &K0 &W

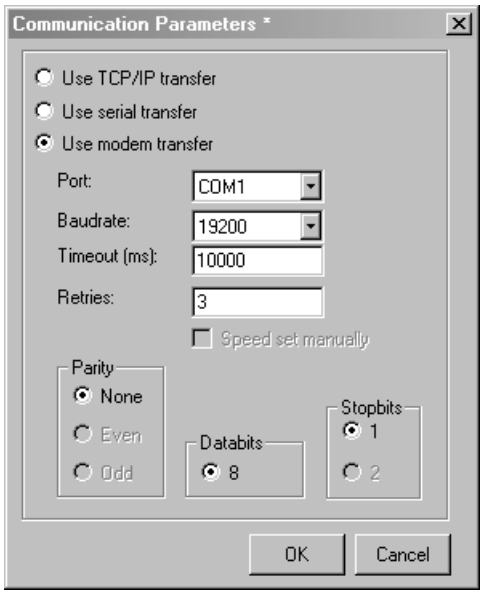
The modem commands are described in the following table.

Command	Description
AT	Tells the modem that it will receive commands. AT precedes all commands.
&F	Resets the modem to factory defaults.
&E0	Deactivates echo.
Q1	Result codes are not returned.
&D0	Modem ignores DTR.
&K0	No flow control.
&W	Saves settings.

The modem must be set to "autoanswer" to enable transfer.

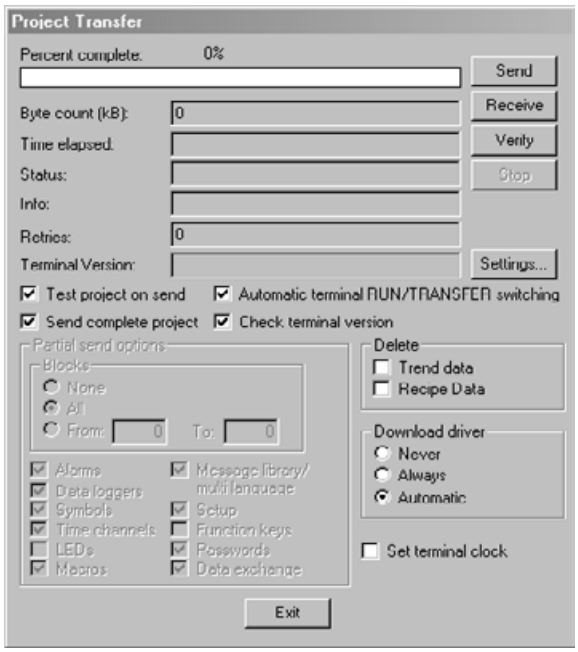
Communication settings

1. Configure the modem.
2. Make the communication settings in the HMI-Builder under [Transfer] / [Comm. settings]. Select [Use modem transfer].



10706AEN

3. Specify a port and set [Baud rate], [Parity] and [Stop bits].
4. Use the program [DOP Tools] / [DOP Modem Connect] to establish the connection.
5. Next, select [Transfer] from the HMI-Builder menu.



10707AEN

6. Select [Automatic RUN/TRANSFER switching].

7.7 Expansion cards for ETHERNET and PROFIBUS-DP

This section does not apply to DOP11A-10.

Operator terminals DOP11A-20 to DOP11A-50 can be equipped with various expansion cards to increase communication options.

PFE11A and PFP11A expansion cards are used for integrating the operator terminals in an ETHERNET network with TCP/IP communication or in a PROFIBUS-DP network. PROFIBUS-DP is an open, industrial fieldbus standard that varies according to the supplier. It can be used for numerous applications.

PROFIBUS-DP enables units from different suppliers interconnected in a network to efficiently communicate with each other.

The PFP11A expansion card for PROFIBUS-DP is supplied with a disk (GSD file), which includes the device information on the PROFIBUS configuration of the operator terminal.

7.7.1 Settings in the programming software

The DOP series operator terminals from SEW-EURODRIVE come equipped with integrated option card. This means the required settings in the HMI-Builder are factory-set as the corresponding project is already loaded at the factory.

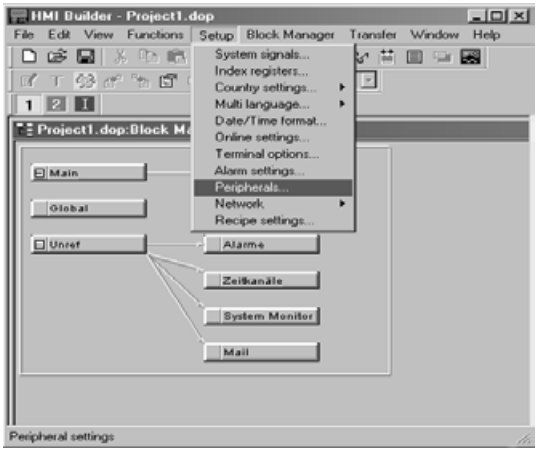
Nevertheless, the required settings in the programming software are described in the following section.

7.7.2 Expansion cards:PFE11A for ETHERNET TCP/IP

Settings in the programming software

Specifying the option slot

1. Choose [Setup] / [Peripherals] from the menu.



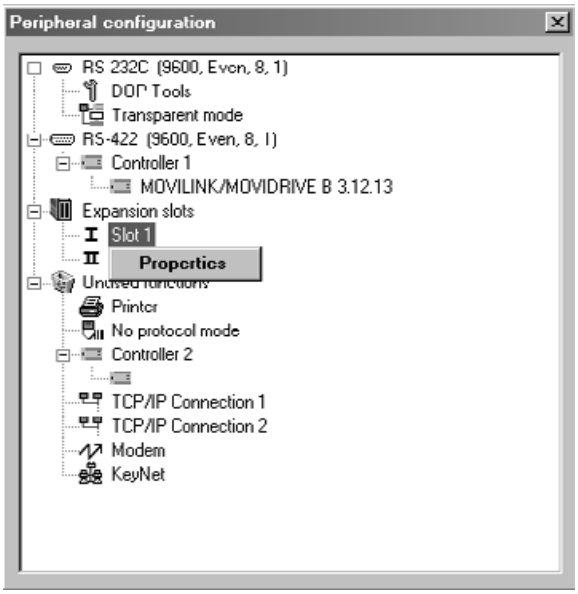
10774AEN

2. Assign the matching option slot to the option card.

   Use the following assignment:

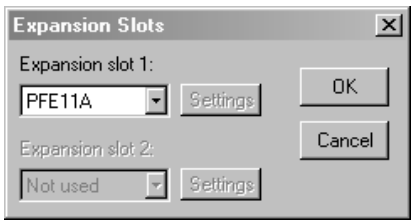
Operator terminal	Option card	Option slot
DOP11A-10	Option not possible	
DOP11A-20	PFE11A	1
DOP11A-20	PFP11A	1
DOP11A-30	PFE11A	1
DOP11A-30	PFP11A	1
DOP11A-40	PFE11A	1
DOP11A-40	PFP11A	1
DOP11A-40	PFE11A and PFP11A	1 (PFE11A)
		2 (PFP11A)
DOP11A-50	PFE11A	1
DOP11A-50	PFP11A	1
DOP11A-50	PFE11A and PFP11A	1 (PFE11A)
		2 (PFP11A)

3. Right-click on the corresponding option slot and select [Properties].



10775AEN

4. Choose the expansion card type, in this case PFE11A.

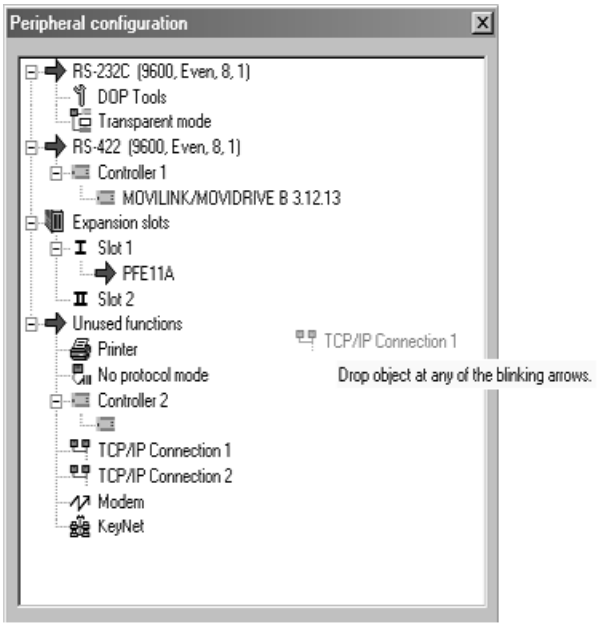


10776AEN

5. Next, click [OK].

TCP/IP settings

The TCP/IP settings are made under [Peripheral configuration].



10777AEN

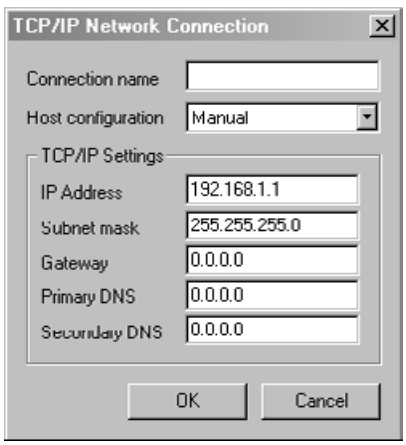
Figure 59: Peripheral configuration

1. Drag [TCP/IP Connection 1] with the mouse from [Unused functions] to [PFE11A] under [Slot].

   The blinking arrows indicate the positions where you can drop the dragged item.

   You have to select [TCP/IP Connection 1] before [TCP/IP connection 2] will be available.

2. Select [TCP/IP Connection 1]. Right-click and select [Properties] to open the dialog box for making the TCP/IP network settings.



10778AEN

In the dialog box, type the connection and define IP address and subnet mask.

Parameters	Description
Connection name	Enter a name for the connection. This parameter is optional.
Host configuration	If [Manual] is selected, the settings specified in the TCP/IP setting dialog box will be used. All other options are used when a server assigns one or several TCP/IP parameters to the terminal.
IP address and subnet mask	Enter the network ID for the node. The network connection takes place according to ETHERNET standard. IP addresses in the range of 192.168.1.1 and 192.168.1.254 are recommended for a local network that only consists of terminals.
Gateway	Enter the network unit in the local network that is capable of identifying the other networks in the Internet.
Primary DNS and secondary DNS	Enter the server(s) that contain information on part of the DNS database.

3. Finally, click [OK] to confirm your settings.

ETHERNET connections

The following section gives an example for ETHERNET connections.

Connection between several terminals.

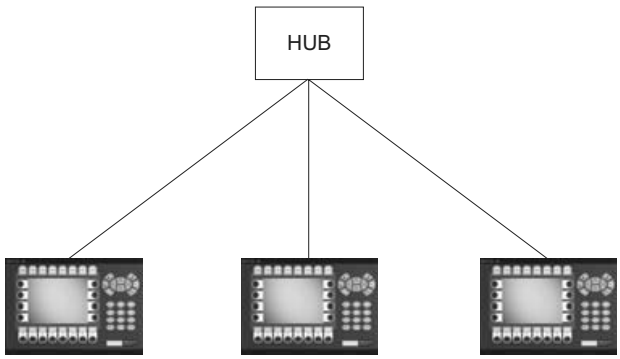
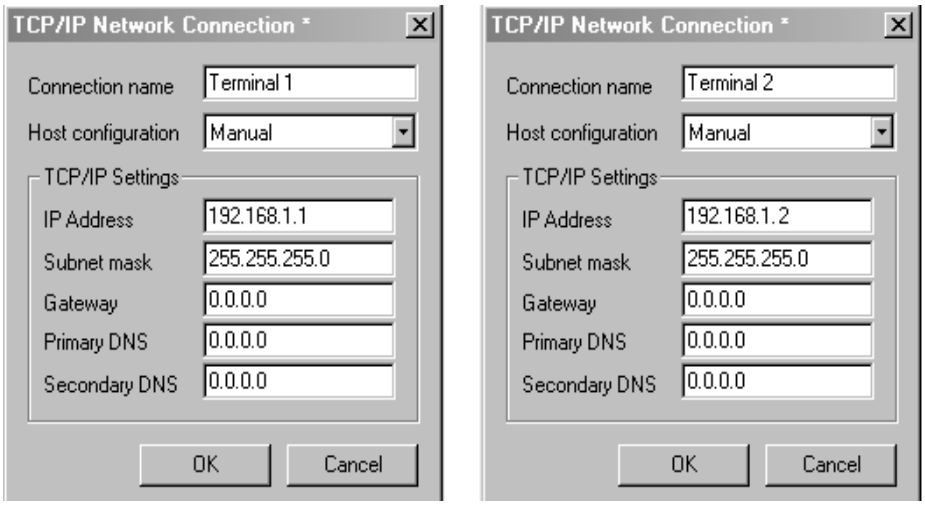


Figure 60: Connection between several terminals.

- The maximum distance between terminal and hub is 100 m.
- The maximum number of terminal per hub depends on the number of ports available on the hub.
- The cable is a shielded twisted pair CAT7 cable with RJ45 connectors.

TCP/IP settings in the nodes



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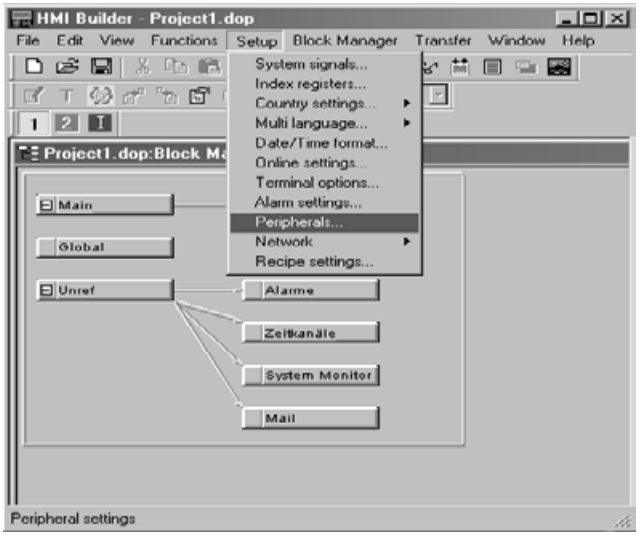
7.7.3 Expansion card PFP11A for PROFIBUS-DP

Settings in the programming software

Specifying the option slot

1. Choose [Setup] / [Peripherals] from the menu.



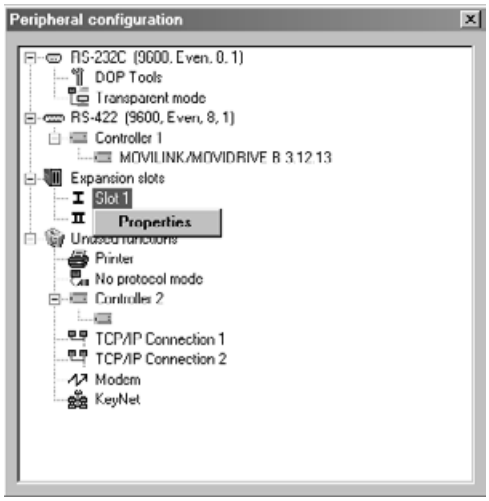
10774AEN

2. Assign the matching option slot to the option card.

   Use the following assignment:

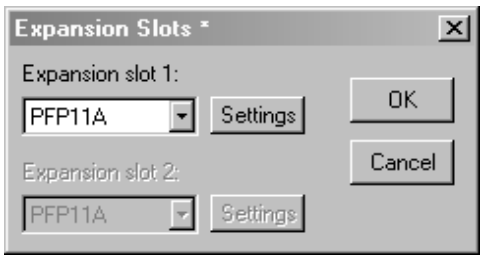
Operator terminal	Option card	Option slot
DOP11A-10	Option not possible	
DOP11A-20	PFE11A	1
DOP11A-20	PFP11A	1
DOP11A-30	PFE11A	1
DOP11A-30	PFP11A	1
DOP11A-40	PFE11A	1
DOP11A-40	PFP11A	1
DOP11A-40	PFE11A and PFP11A	1 (PFE11A)
		2 (PFP11A)
DOP11A-50	PFE11A	1
DOP11A-50	PFP11A	1
DOP11A-50	PFE11A and PFP11A	1 (PFE11A)
		2 (PFP11A)

3. Right-click on the corresponding option slot and select [Properties].



10775AEN

4. Choose the expansion card type, in this case PFP11A.
   Next, click [OK].



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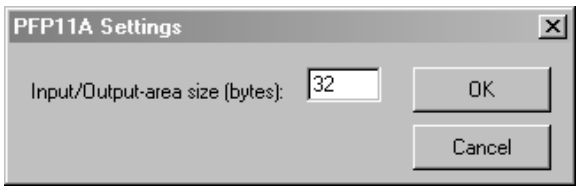
5. Open the [Settings] dialog box to define the [Input/Output area size] for the PROFIBUS-DP configuration.

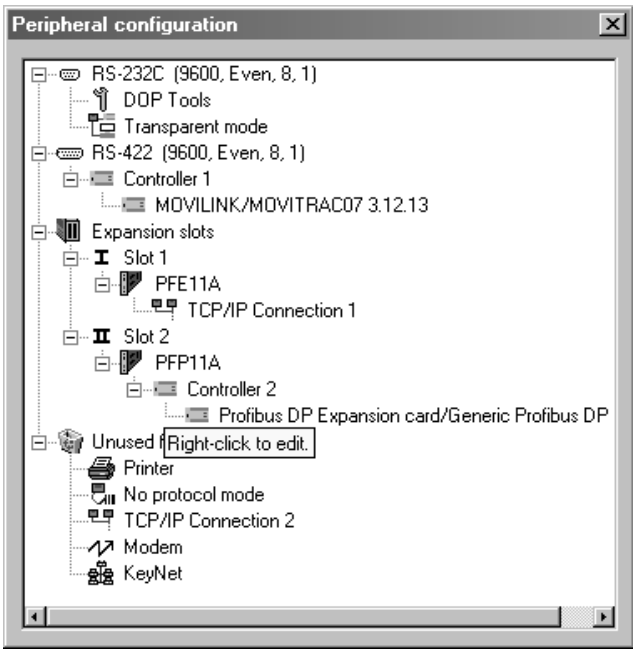


10782AEN

   The default value is 32 bytes. If you change the setting, you have to restart the terminal after completed transfer of the project. Briefly disconnect the power supply to the terminal for this purpose. The new setting will now become effective.

6. Click [OK] to confirm your settings.

7. Drag the controller that acts as PROFIBUS-DP master (controller 1 or controller 2) from [Unused functions] to the option slot with the installed expansion card.



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8. Complete the configuration of the [PFP11A] expansion card by closing the [Peripheral configuration] window.

7.8 Index addressing

Without index addressing, an object is always linked to the same register (IPOS variable or parameter number). Consequently, only the value of this register can be displayed in the object.

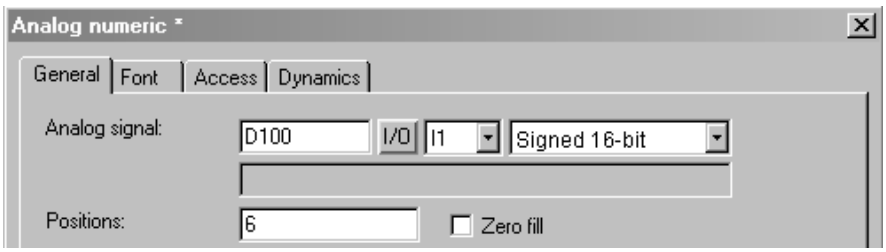
Index addressing enables you to choose in run mode from which register you want the object to read the display value. For this purpose, the value in the index register can be added to the address for the register that displays an analog signal in the object. The following basically applies:

Display value = content in register (object address + content in index register)

If the index register content is 2 and the address of the register specified in the object is 100, the value displayed in the object will be retrieved from register 102. If the value in the index register is changed to 3, the value for the object will be retrieved from register 103 instead.

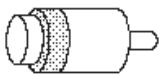
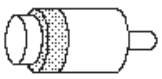
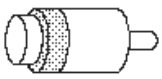
The index register is defined in the individual projects. Make this setting under [Setup] / [Index registers]. Up to eight index registers can be used in each project. Each index register can be used for more than one object.

The objects used in the project specify whether index addressing is used and which register acts as index register. To do so, select I1 to I8 in the dialog box for the object to the right of the specified analog signal.

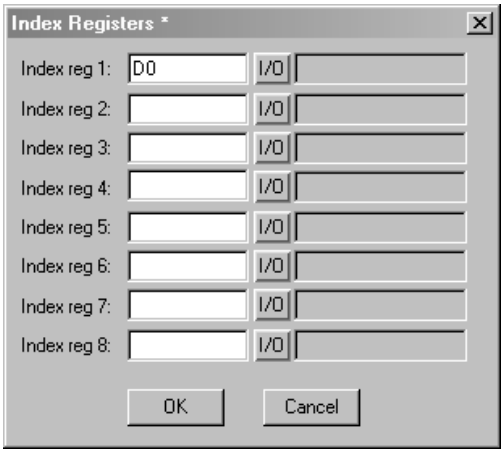


10448AEN

The following example shows how to control three motors from one block. The motor parameters for torque and speed are stored in six different registers. One of the motors is selected in a block. The current torque and speed for the selected motor are displayed in the block. When selecting another motor, the current torque and speed of the other motor should be displayed instead. Index addressing is used for this purpose.

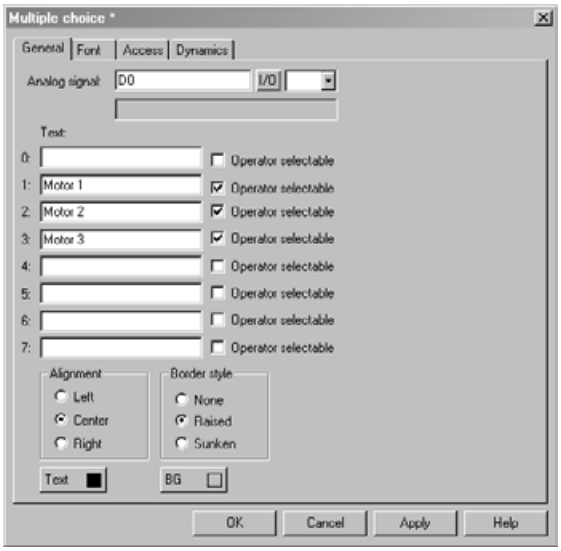
Motor 1	Motor 2	Motor 3
		
Torque in register D101 Speed in register D201	Torque in register D102 Speed in register D202	Torque in register D103 Speed in register D203

Register D0 is defined as [Index register 1] under[Setup] / [Index register]. The value in the register is used to determine the motor for which the torque and speed are to be displayed.



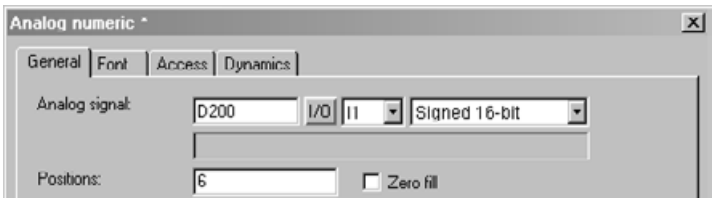
10449AEN

If the value in D0 is 1, then torque and speed of motor 1 are to be displayed. If the value is 2 or 3, then the parameters for motor 2 or 3 are to be displayed. The value in register D0 is controlled by a multiple selection object in which the texts motor 1, motor 2, and motor 3 appear. In addition, these three options are created as being maneuverable.



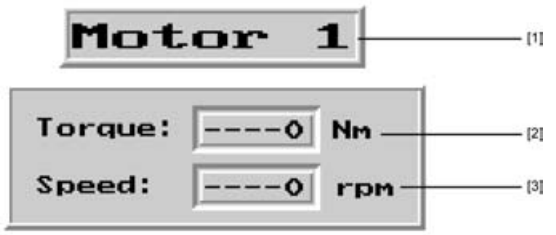
10450AEN

Torque and speed and displayed in the form of two numeric objects. In the object for the torque, "D100" is defined as analog signal and "I1" as index register.



10451AEN

In the object for the speed, D200 is defined as analog signal and I1 as index register. The maneuverable multiple selection object allows for calling up the motor 1, motor 2, and motor options in run mode. Depending on the selection, one of the values 1, 2 or 3 is stored in register D0. The value in register D0 is added to the addresses of the objects that display torque and speed. Consequently, the object can display the values of register D101, D102 or D103, or register D201, D202 or D203.



10452AEN

[1] Multiple selection objects - analog signal D0
[2] Numeric object - analog signal D100, index register D0
[3] Numeric object - analog signal D200, index register D0

Other suffixes can be specified in addition to index registers. The index register is not counted twice when using 32-bit registers.

If you connect the terminal to a BDTP network, you have to specify the same index register both in the server and the client because indexing takes place in the server driver.

8 Unit Functions

8.1 Message library

The [Message library] function enables you to create text tables where values between 0 and 65535 are linked with texts. One of the uses of the [Message library] function is to display each sequence step in a sequence control. The function can also be used to display error codes. An analog signal creates error codes that are linked with texts in a text block. The function is also used for assigning specific values to analog signals depending on the selected text.

The message library consists of one or several text tables with up to 512 text character strings. Each text string can have up to 40 characters. Activate this option under [Functions] / [Message library].

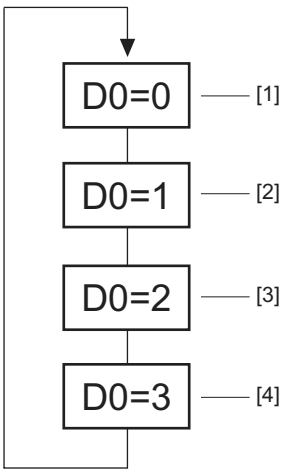
Parameters	Description
library	Specify a number for the message library.
Name	Define a name for the message library.

You can edit a message library by selecting the library and clicking [Edit]. Several edit windows can be opened at the same time.

Parameters	Description
Text no.	Enter a number for the text (0 - 65535).
Text	Any text that is called once the current signal shows the text number for the text.

Example

Below a simple example to explain the function. Each sequence step in our sequence control is displayed by a text.



54131AXX

[1] The object is placed onto the conveyor belt.

[2] Mount tool X

[3] Mount tool Y

[4] Remove object from the conveyor belt

Begin by creating a message library with the name "Maskin2."

1. Select [Functions] / [Message library] from the menu.

2. Assign a number (in this case "2") and a name ("Maskin2") to the library.

3. Click on [Add].

   You have now created a message library with the name "Maskin2." Next, you have to define the various texts in the library.

4. Select the library and click [Edit].

   Define the text number and text in this dialog box. The text number represents the value for the analog signal linked to the message object. The [Text] button can be used to display the text in the message object.

   After having completed the message library, you have to create a message object in the application. You can create the message library in the text block or in the graphic block.

5. To do so, select the [Message] object from the toolbox. Move the pointer to the position where you want to place the object and make a mouse click.

6. Define the analog signal that controls the text display.

7. In the [Library] field, you can select the message library from which the text is to be retrieved.

8. Select whether the object should be maneuverable and choose the different texts it should be able to display during operation.

8.2 Alarm handling

This chapter is not applicable to DOP11A-10.

The [alarm handling] function alerts the operator to incidents in the process that require immediate action.

Function	Description
Alarm groups	Alarms can be divided into groups, for example to categorize them according to their severity levels.
Alarm message	This function defines which signal will trigger an alarm and which text will be displayed when the signal is activated.
Alarm list	Lists alarms that occurred during operation.

Text-based printouts are not supported when using Unicode.

8.2.1 Alarm grouping

Alarms can be divided into several groups in the terminal depending on the terminal type used.

You can assign different color attributes to each group (DOP11A-30 to DOP11A-50). Alarms can be sorted by groups in the alarm block. Alarm groups need not be defined.

Terminal	Number of alarm groups
DOP11A-20	4
DOP11A-30	3 ... 5 (depending on the selected font size)
DOP11A-40	16
DOP11A-50	7 ... 11 (depending on the selected font size)

Defining alarm groups

You define alarm groups under [Functions] / [Alarm groups]. The properties of the alarm group are defined in following dialog box.

Parameters	Description	
Group name	User defined name for the alarm group	
Summary notification	Active	Digital signal that is output by the terminal when the print process has been completed.
	Unacknowledged	Digital signal that is activated if alarms in the group have not been acknowledged.
	Remote acknowledge	Digital signal that, if enabled, acknowledges all alarms in the group at the same time.
Colors	Define the colors for active, acknowledged and inactive alarms as well as for alarms in normal state. For DOP11A-30 to DOP11A-50 only.	

8.2.2 Alarm message

Alarm messages are defined under [Functions] / [Alarms]. Enter your alarm message in this dialog.

Maximum length of the alarm message

Terminal	Maximum length of the alarm message
DOP11A-20	38 characters
DOP11A-30	38 characters
DOP11A-40	38 characters
DOP11A-50	78 characters

The smaller you choose the font in the alarm list the more characters will be displayed. The message may contain digital or analog dynamic data (like a text block). The alarm text can display data from analog numerical objects and digital text. If you move the cursor to the alarm text input field, the toolbox will appear and you can add an object.

You can define 300 alarms depending on the application.

Parameters	Description	
Alarm text	Any alarm text (may also include certain dynamic objects).	
Signal	Specifies the signal (digital or analog) that triggers the alarm when it changes to the defined state.	
Alarm if	Digital signal is	
	On/Off	Select [On] if an alarm is to be issued when the signal is enabled. Select [Off] if an alarm is to be issued when the signal is disabled.
	Analog signal is	
	Equal to	An alarm will be issued if the value of the specified analog signal equals the value entered in the following field.
	Not equal to	An alarm will be issued if the value of the specified analog signal does not equal the value entered in the following field.
	Less than	An alarm will be issued if the value of the specified analog signal is smaller than the value entered in the following field.
	Greater than	An alarm will be issued if the value of the specified analog signal is greater than the value entered in the following field.
Acknowledgement message	Digital signal that is influenced when acknowledging the alarm. The signal is enabled by default.	
Reset	Selecting the [Reset] checkbox disables above mentioned signal when acknowledging an alarm.	
Remote acknowledge	Digital signal which acknowledges the alarm if enabled.	
Alarm group	Specifies the alarm group for the definition (alarm).	
Info block	A block number or a block name for a text or graphic block is entered in this field. This way, the operator is provided with help information with details on the alarm and possible remedial measures. If no entries are made in the field, no block will be linked with an alarm. If the info block is a text block it will be sent as attachment when the alarm is sent as e-mail. See section "Alarms in run mode" on page 201.	
Mail to address	Alarms can be sent as e-mail to a predefined recipient. This mail contains the alarm text. See section "Alarm settings" on page 201.	
Ack. required	Indicates whether the alarm needs to be acknowledged or not. The alarm must be acknowledged when the checkbox is activated. If the checkbox is deactivated, the alarm will only serve as event alarm which means as information.	

Parameters	Description
History	Indicates when the alarm should be deleted from the alarm list. An activated checkbox means the alarm remains in the alarm list until the list is full. A deactivated checkbox indicates that the alarm will be deleted from the alarm list once it has been acknowledged. The alarm will then no longer be active. If the *Acknowledgment required* parameter is not selected, the alarm will be deleted from the list once it is no longer active.
To printer	This parameter defines whether the alarm message will be output directly to the printer when the alarm status changes.
Repeat count	If the checkbox is activated, a counter for the alarm in the alarm list will be displayed. The counter is incremented each time an alarm is triggered. The alarm must be acknowledged to enable the alarm to appear in the list as new alarm message.
Import	See section "Alarm import" on page 201.

The value defined for an analog alarm signal cannot be controlled via register. Hysteresis is not supported. Only 16-bit values are supported.

8.2.3 Alarm settings

General settings for alarms and the alarm list are made under the menu item [Setup] / [Alarm settings]. The space required by alarms in the alarm lists depends on the length of the alarm text and the number of objects. The space required by an alarm can be calculated using the following formula.

S= 42 + NC

S = Number of bytes

NC = Number of characters in the alarm text

The alarm list will be rewritten when it is full. 25% are deleted from the list when it is rewritten. This means 75% of the previous content will be retained.

Example:

The length of the alarm text is 38 characters. This means each alarm requires 80 bytes in the alarm list. The result is 1024 (list size = 1 kB) / 80 = maximal 12 alarms in the alarm list. When the 13th alarm is issued, the alarm list will be rewritten and only includes the last nine alarms.

Parameters	Description	
Active signal	Indicates the digital signal that will be issued by the terminal if the alarm is active.	
Unack. signal	Indicates the digital signal that will be issued by the terminal when the alarm is not acknowledged.	
List erase signal	Indicates the activated digital signal that deletes deactivated alarms from the alarm list.	
Reset	Means that the list erase signal is deactivated when the alarm list is cleared.	
List size (kilobytes)	Provides the list size in kB for DOP11A-20 to DOP11A-50 Note: If the system assigns the same amount of memory as is indicated for the list size, the list size will double. If the list size exceeds 10 kB, the performance of the project will be influenced negatively.	
Enable alarm signal	Digital signal that, if enabled, invokes alarm handling in the terminal. This parameter allows to activate or deactivate alarm handling in the terminal. Do not use this parameter if you want alarm handling to be active permanently.	
Default font size	Specifies the preset font size for the alarm list. The standard font size in the alarm list is always displayed after a start or restart and when switching between operating modes.	
Alarm symbol	Specifies when the alarm symbol is to be displayed. In the text block, "ALARM" will be displayed and in the graphic block a clock in the top right corner of the screen.	
	No	The alarm symbol is never displayed.
	Unacknowledged	The alarm symbol is displayed when the alarm list includes unacknowledged alarms.
	Active	The alarm symbol is displayed when the alarm list includes active alarms.
	All	The alarm symbol is displayed when the alarm list includes active or unacknowledged alarms.
Send e-mail	Specifies when alarms are to be sent as e-mail.	
	Always	An alarm is always sent as e-mail when its status changes.
	Active	An alarm is sent as e-mail when it is activated.
	Inactive	An alarm is sent as e-mail when it is deactivated.
	Acknowledge	An alarm is sent as e-mail when it is acknowledged.
Backlight	Specifies whether the backlighting should be switched on when an alarm is activated.	
	On	Means that the lighting is to be switched on when the alarm symbol is displayed (default setting).
	Off	The background lighting is not affected by the alarm.
	Timer	The lighting is switched on when a new alarm is activated. The lighting is switched off when the screen saver time has elapsed.
Alarm cursor	DOP11A-30 to DOP11A-50 terminals allow for changing the cursor color in the alarm list.	

8.2.4 Alarm import

Alarm texts can be imported from name lists created with the programming tools for the controller. Before importing alarms, the project in HMI-Builder must be linked to a name list. Select the corresponding name file under [View] / [Name list]. Next, call [Functions] / [Alarms] and click on the Import button to define the settings.

Start I/O Enter the address for the start I/O when importing alarms from the name file. The signal can be an analog or digital signal.

End I/O Enter the address for the end I/O when importing alarms from the name file. The signal can be analog or digital. However, the signal type must be identical with that for the start I/O.

Alarm settings All alarms (start I/O to end I/O) that are imported by clicking the Import button will have the settings you have specified under Alarm settings in the Alarm import dialog box. For a description of the individual parameters, see section "Alarm message" on page 198.

You have to specify the parameters, signal type, analog or digital, and the alarm group before importing the alarm.

8.2.5 Alarms in run mode

In the text block, an alarm is signaled when the text "ALARM" appears in the top right corner of the screen. In the graphic block, an alarm is indicated by a blinking clock in the top right corner of the screen. You can disable alarm signaling in configuration mode or in the programming software under [Setup] / [Alarm settings].

Alarms are displayed in an alarm list with predefined alarm texts. The alarm list includes the last triggered alarms and is sorted by the defined alarm groups. The alarm triggered last is displayed first in the list. You can define the alarm list size in kB in configuration mode under [Setup] / [Alarm settings] in HMI-Builder. Jumping to the alarm block (system block no. 990) will display the alarm list.

The following information is displayed in the selected display format for each alarm:

- Number of times the alarms were triggered (if selected)
- Alarm status
- Time when the alarm was triggered
- Deactivation
- Acknowledgement

The repeat counter in the alarm list (if enabled) is displayed as follows:

Display format	Description
(12)	Means the alarm was issued twelve times. The alarm must be acknowledged to enable the alarm to appear in the list as new alarm message.
>999)	Means the alarm was issued more than 999 times without having been acknowledged. The counter counts up to maximum 999 values.

An alarm can have one of the following states:

Symbol	Status
*	Active, not acknowledged
$	Not active, not acknowledged
–	Active, acknowledged
<empty>	Not active, acknowledged

Alarm times can be displayed in the following formats:

Display format	Description
S	Time when the alarm was activated. If alarms occur repeatedly, the time when the alarm was activated first will be displayed.
E	Time when the alarm became inactive. If alarms occur repeatedly, the time when the alarm was deactivated last will be displayed.
A	Time when the alarm was acknowledged.

To go to the alarm block, either define a jump to system block 990 in a block, press <LIST> or have the controller retrieve the list for block 990 via the display signal.

To acknowledge an alarm, move the cursor over the corresponding line in the list and press <ACK>, point to the symbol ✓ or confirm with a function key.

When a printer is connected, the alarm can be output directly according to the order or status change. This setting can be specified in the alarm definition.

The alarm is printed with the following information:

- Frequency of occurrence
- Date
- Time
- Status
- Alarm text

To return to the previous block, press <PREV> on the terminal or <ESC> on the touchscreen.

When the print signal is output for block 990, the respective alarm list contents can be printed.

Linking blocks with alarms

Text or graphic blocks can be linked with alarms. Choose <INFO> for an alarm in the alarm list to display the block with which the alarm is linked. This block can contain information on the alarm and the corresponding handling recommendations. The <INFO> button is only available when the relevant alarm is linked with a block. To return to the alarm list, press <PREV>.

8.2.6 Graphic alarm page in run mode

The page is displayed graphically and can be edited by the user. You can assign functions to function keys or touch keys to maximize or minimize alarm page text and to browse through the pages. You can also select date and time as function. Alarms can be sorted by groups and the required group can be displayed.

The status is indicated by different colors that are defined when setting the alarm group. With models DOP11A-20 and DOP11A-40, you select the alarm group using the left and right arrow keys.

The graphic alarm page (alarm list) is printed in text form.

8.3 Recipe handling

The [Recipe management] function allows for saving all dynamic data of one or several blocks (i.e. signals and their values) in a file in run mode.

The operator can transfer the file to the controller where the load values are further processed. You can reuse comprehensive parameter configurations with the help of the recipe management function. Users can set up a recipe directory with files offering different parameter settings. This function makes for an efficient design of production runs with tight schedules that require a fast product change, such as in the production of identical products in different colors.

The recipe files can be created on a terminal, controller or PC using the DOP tools software.

The recipe files are stored in the terminal. To use the recipe management function, the functions for saving, loading, deleting and adding recipes have to be linked with function or touch keys. See chapter 8.10 "Function keys".

You can send recipe files as attachments from terminals with e-mail function.

8.3.1 Calculating the recipe size

The following formula is used for determining the recipe size in the project memory. (The formula does not always provide exact results due to the complexity of the file system).

$S = 90 + \Sigma (IOW + 28)$

S = Number of bytes. If the calculated value S is less than 360, the value 360 must be set for S.

Σ = Number of I/O series

IOW = Number of words in each I/O series. For values less than 16 bit, a word memory is calculated nevertheless.

Example

Our recipe consists of 3 I/O series H0-H109 (=110 double words) and H200-H299 (=100 double words) and H600.0 to H609.0 (=10 words).

The resulting calculation is as follows:

$S = 90 + [(2 \times (110 \times 2) + 28) + (2 \times (100 \times 2) + 28) + (2 \times 10 + 28)]$

$S = 90 + 944$

S = 1034 bytes (per recipe)

8.3.2 Recipe settings and recipe directories

Under [Setup] / [Recipe settings], you define the settings for recipe management and create, edit and delete recipe directories.

Recipe control block

Control block for saving, reading, and deleting recipes via controller.

See section "Creating and transferring recipes using the controller program" on page 208.

Current recipe register

Enter the first of four 16-bit registers where the terminal stores the name of the recipe that was last loaded to the controller. This name can then be represented as ASCII object. The function occupies all four registers (8 characters) disregarding the length of the recipe name.

Enable directories

Selecting this option enables you to create recipe directories in the terminal.

See section "Recipe directory" on page 205.

Current directory register

Enter the first of four 16-bit registers where the terminal stores the name of the recipe directory that was specified for the block. This name can then be represented as ASCII object. The function occupies all four registers (8 characters) disregarding the length of the recipe directory.

Recipe directory

Recipes created in the terminal can be stored in various recipe directories (folders) in the terminal memory.

Using recipe directories allows for a clear structure and easier recipe management in applications with many recipes.

You can create 32 different recipe directories (or eight with DOP11A-10) in one level. Recipe directories are created in the recipe library [RECIPE] in the root library of the terminal memory. A recipe directory is linked with one or several blocks in the block header of a block. All recipes created in a block are stored in the selected recipe directory.

You can create, edit, and delete a recipe directory in HMI-Builder under [Setup] / [Recipe settings]. Defined recipe directories are displayed in a list that corresponds to the library structure. You can add a new recipe directory by clicking the [Add directory] button. The name of a recipe directory can have up to eight characters. The first character must be a letter or a number. Permitted characters for the name are A-Z, 0-9 and _ (underscore). The same file name conventions apply as for MS-DOS.

To make modifications to a recipe directory, select it and click [Edit]. Clicking [Delete] deletes the selected recipe directory.

Recipe directory in run mode

You can create and delete recipe directories in run mode using the [Create recipe directory] and [Delete recipe directory] functions. The functions are linked with function keys or touch keys.

You can modify and select recipe directories for the current block in run mode using the [Change recipe settings] function for function keys or touch keys. Pressing the function key or touch key for [Change recipe directory] opens a pick-list with available recipe directories. Select a file and press the Enter key. The recipes in the block are then stored in the selected recipe directory. See chapter 8.10 Function keys".

Recipe directories created in HMI-Builder cannot be deleted using the function or touch key linked with the [Delete recipe directory] function. Recipe directories created in the terminal are not included in the terminal project when a project is transferred from the terminal to HMI-Builder (via receive function in the [Project transfer] dialog box).

Recipe management between terminal and PC takes place using the applications [DOP Tools] / [DOP File Transfer] and [DOP Tools] / [DOP FTP Transfer]. See section "Using recipes in the PC" on page 207.

8.3.3 Creating recipes on the terminal

When programming the application, you can specify which block(s) can be used to save the recipe. The [Append recipe] function is also available in run mode. All signals to be included in the recipe are defined in the recipe block. All dynamic values of the block are saved in a recipe file. Apart from trend objects, you can use all digital and analog objects as recipe parameters.

In run mode, a jump is performed to the block containing the recipe parameters. Enter the required values in the dynamic objects and press the function or touch key that is linked with [Save recipe]. The name can have up to eight characters. The first character must be a letter or a number. Permitted characters for the name are A-Z, 0-9 and _ (underscore). The same file name conventions apply as for MS-DOS.

The recipe file is stored in the terminal; either in the recipe directory specified for the block or in the same recipe directory unless you have created specific recipe directories under [Setup] / [Recipe settings].

8.3.4 Appending recipes

You can link the [Append recipe] function to function or touch keys. This function allows for adding signals and the associated values of the current block to an existing recipe in run mode. This way, you can store signals and the associated values of different blocks in a common recipe. New signals are appended in this process. Already existing signals are updated when the function is executed.

When pressing the function or touch key for [Append recipe], you have to specify the name of the recipe to which you want to add the current block signals and the associated values. If no recipe is stored in the terminal when the function is executed, a new recipe will be created in the terminal. A new recipe will also be created if you do not have specified the same recipe directory for the blocks.

The same or no recipe directory must be specified to add signals from another block to a recipe.

If a new character string is added to an already existing recipe with character strings, you have to separate the character strings using address separators. Otherwise, the already existing character string will be expanded by the new one.

8.3.5 Transferring recipes to the controller

In run mode, the recipe is transferred to the controller using the [Load recipe] function. This function transfers the signals and values saved in the files to the controller. Pressing the function or touch key for [Load recipe] opens a pick-list with available recipe files. Select a file and press the Enter key. The controller now runs with the loaded values.

8.3.6 Deleting recipes

In run mode, the specified recipe can be deleted from the terminal memory using the [Delete recipe] function. Press the function or touch key linked with [Delete recipe]. Doing so opens a pick-list with available recipe files. Select the file you want to delete and press the Enter key. To confirm that you want to delete the file, press Enter. To cancel the action, press <PREV>.

8.3.7 Using recipes in the PC

The [DOP Tools File Transfer] program (icon in the DOP Tools program group) installed on your PC allows for addressing the terminal like a PC drive. This means the PC can be used to create backup copies of terminal files (e.g. recipe files). This way, new recipes can be created in the PC and transferred to the terminal.

The recipe file is saved in SKV format on the PC and can be called up in Excel. The files can be edited in Excel and then used again. Complete the file with the "END" command.

Example

P100;3

P102;0

H50;12

END

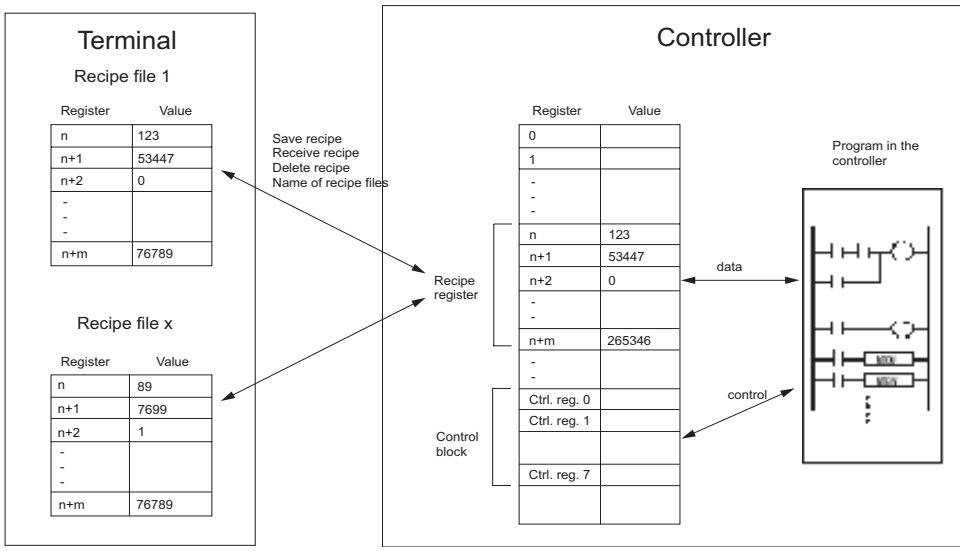
You can also transfer recipe files between terminal and PC via FTP. Use the [DOP Tools] / [DOP FTP Transfer] (Standard FTP Client) program for this purpose.

There are restrictions for recipes in SKV format when using Unicode. For further information, refer to chapter 8.8 "Unicode".

8.3.8 Creating and transferring recipes using the controller program

Recipe data can be created, transferred and deleted via a control block in the controller. The files created with the controller program are compatible with the recipe files of the terminal. Consequently, the terminal can receive files created by the controller program and vice versa.

The control block looks as follows:



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You can define the first register in the control block under [Setup] / [Recipe settings]. This register as well as the seven subsequent registers are used as control registers. The control block is described in the following table.

Register	Contents	Description
Ctrl. reg. 0	Command	The command register is defined by the controller. Available commands: 0. No command 1. Save recipe in the terminal 2. Recipe received by terminal 3. Delete recipe in the terminal 4. Create recipe directory 5. Change recipe directory 6. Delete recipe directory
Ctrl. reg. 1	Result code	Handshake register defined by the terminal 0. Ready for new command 1. OK 2. Write error in the recipe file 3. Recipe file does not exist.
Ctrl. reg. 2	File name characters 1-2	Name of the recipe file or recipe directory in the terminal.
Ctrl. reg. 3	File name characters 3-4	
Ctrl. reg. 4	File name characters 5-7	
Ctrl. reg. 5	File name characters 7-8	
Ctrl. reg. 6	Start data register	First data register that is loaded from the recipe file or is to be saved in the recipe file.
Ctrl. reg. 7	Number of registers	Number of registers to be loaded from the recipe file or to be saved in the recipe file.

Management takes place as follows:

1. The result code register must be 0. If not, check whether the command register is set to 0.
2. Save the command in the command register.
3. Wait for the ready signal or the error code in the result code register.
4. Set the command register to 0. The terminal will then set the result register to 0.

Recipe directories that were created in the HMI-Builder programming software cannot be deleted in run mode.

Limitations

Recipes created in the controller can contain a maximum of 1000 registers.

Only data registers can be used.

The following characters are not permitted in recipe names:

! ? < > ( ) + / * = ° % # : . [spaces], and -

8.4 Passwords

This function can be used to create a security system for the machine. Operators can be assigned user-specific authorizations for the system.

A security level can be assigned to the following objects:

- Blocks
- Function keys
- Touch keys
- Maneuverable objects

Each security level is protected by a password. To gain access to the individual levels, the user must register with a password for the current level or a higher security level. This function is optional.

8.4.1 Defining security levels

In the dialog box for the object called up from the [Access] tab page, specify a security level (0-8) when the input is active. Security level 0 means all users can access the object. In this case, you will not be prompted for a password.

8.4.2 Defining passwords

The passwords for security levels 1-8 are defined under [Functions] / [Passwords].

Parameters	Description
Password 1-8	Enter the password for security levels 1-8.
Confirm question 1-8	Enter a security question with a maximum of 20 characters that is to be answered by the user before being able to access an object with a certain security level. This function is not available if you have defined a security level for a function or touch key.
Comment 1-8	Enter a comment or description for the password or security level. This parameter is optional.
Login signal	This parameter specifies the digital signal that creates an input field for login when enabled. You can also link the login input field with a function or touch key.
Logout signal	This parameter specifies a digital signal that logs out the current user when enabled. This function can also be linked with a function or touch key. See chapter 8.10 "Function keys".
Login level reg.	Here, users can specify a register in the controller that executes the control of the security level. The register controls the security level for all objects to which a security level (password) has been assigned. The register value determines the current security level: Value 0 = no security level, 1 = security level 1, etc.
Current level reg.	This parameter specifies a register from which the terminal can retrieve data for displaying the corresponding security level (0-8).
Login timeout	This parameter specifies the amount of idle time for a terminal in minutes after which a user is automatically logged out. If the value 0 is entered, the user will not be logged off automatically.
Password RUN / PROG.	Here you can enter a password that is mandatory when changing manually from RUN to PROG mode. This function does not apply to the transition from PROG to RUN or when an automatic terminal switchover RUN/TRANSFER is used in the HMI-Builder.
Automatic login	This parameter specifies whether the login screen opens automatically when password-protected blocks, objects or keys are accessed. This function only applies to terminals with touchscreen as well as to function keys on all other terminals because the cursor cannot be positioned on password-protected objects without already being logged in with security level access corresponding to the object.

8.4.3 Login

If the [Automatic login] checkbox under [Functions] / [Passwords] has not been activated, log in takes place either via function or touch key, or via a digital signal from the controller (login signal). The login input field opens when pressing the function key that is linked with the [Login] function on the defined security level, or by activating the digital signal. Enter the password here. The password is linked to a security level. See section "Defining security levels" on page 210.

8.4.4 Passwords for transferring projects

In the command line under [Setup] / [System signals], you can enter the command "PDxxxxxxxx". This command prompts for a password (xxxxxxxx) to allow the user gain access to the functions in the terminal menu [Transfer]. This password must be entered in the terminal when transferring a project from HMI-Builder to the terminal.

8.4.5 Multi-access passwords

In the command line under [Setup] / [System signals], you can enter the command "PSxxxxxxxx". This password (xxxxxxxx) grants access to all terminal functions. This command is used, for example, for support and maintenance. Only capital letters can be entered in the command line.

8.4.6 Changing passwords during operation

The [Change login password] function allows users to change passwords for function or touch keys during operation. Pressing the function or touch key linked with [Change login password] opens a dialog box where you can change the password for the relevant security level. See chapter 8.10 "Function keys".

No security level can be entered for block [0].

After logoff, the <PREV> key and the [Return to previous block] function are disabled for function and touch keys to prevent unauthorized users from accessing password-protected blocks.

8.5 Printing reports

Various reports (such as daily reports or event reports) can be easily created for tracking the production process. The diagram below shows the principle for creating daily reports.

8.5.1 Printer connection

The printer must have a serial interface and an IBM character set (850).

The printer settings are made in the dialog box under [Setup] / [Peripherals]. For information on the printer configuration, refer to the printer manual.

Example for possible printers:

Serial printer = Panasonic KX-P1092

8.5.2 Printing projects

To print a project, select [File] / [Print] from the menu. Select the corresponding checkboxes to define which parts of the project will be printed. Click [Setup] to configure the printer. Click [Preview] to open a print preview.

8.5.3 Printing text blocks

Reports are created as text block with static and dynamic text. The maximum width of the report is 150 characters. You can enter any text in the text block, e.g. the table header or another static text that should always be printed out. To output process values, dynamic objects have to be defined that represent the value for the signal to which the object is linked.

The time when the report is to be printed can be defined, for example, via time channels.

Text blocks cannot be printed with Unicode.

8.5.4 Printing graphic blocks

With DOP11A-20, DOP11A-30, DOP11A-40 and DOP11A-50, graphic blocks can be output on a printer that is compatible with Epson FX-80.

Graphic blocks can only be printed when they are displayed on the screen. Only black and white graphic display is supported.

Entering the command "NHD" in the command line under [Setup] / [System signals] has the laser printer print the graphic block without block header (contains the normal block name, block number, date and time).

Epson FX-80 graphic does not support grayscale.

The printer buffer must have a size of at least 5 MB to print graphic blocks.

The alarm block, i.e. the graphic block with the alarm list, is printed in text form.

Pressing the <PREV> key on the terminal when a graphic block is being printed cancels printing.

8.5.5 Defining printouts

Printouts are defined in the block header. You access the block header via the block manager or the block list. The *Print signal* parameter in the block header specifies the digital signal that triggers printing for the block when activated. This parameter also specifies the digital end signal that is activated by the terminal when printing is finished. Selecting the [Reset] option resets the signal.

8.5.6 Printer settings

You make the printer settings under [Setup] / [Peripherals] / [Printer] / [Edit]. You will find detailed information in the manual on the corresponding printer. The printer must support the expanded IMB-ASCII character set.

When printing the graphic block, the printer must support graphics for Epson FX-80, HP PCL5 or HP PCL6.

Parameters	Description
Printer type	Select the printer, none, normal text or the installed printer, e.g. Epson FX-80
Page length	Here, you define the number of lines before a page break. No page break is created when the page length is set to 0.
Paper type	Choose the paper type matching the installed printer.
Graphic orientation	This parameter specifies whether the graphic is printed in portrait or landscape format.
Text orientation	Specify whether you want to print the report in portrait or landscape format using an FX80 compatible printer.
Printer disable signal	Digital signal that cancels printing when enabled. The port to which the printer is connected can be used for another communication (e.g. for transparent mode).
New line character	Character for the end of line: CR/LF, CR, LF or none.
Handshake	Specify whether the handshake between printer and terminal takes place via XON/OFF or CTS/RTS.
Screenshot	Allows for printing a screenshot: normal or inverted.

8.5.7 Setting up a communication port

The settings for the communication port are made under [Setup] [[Peripherals]. Select [RS-232] or [RS-422] and make a right mouse click. For information on how to correctly set up the connected printer, refer to the printer manual.

Parameters	Description
Baud rate	Define the communication speed (in baud). The speed must correspond with the baud rate of the external units.
Parity	Specify the parity. The parity must correspond with the parity of the external units.
Data bits	Specify the number of data bits. The number of data bits must correspond with that of the external units.
Stop bits	Specify the number of stop bits. The number of stop bits must correspond with that of the external units.

8.5.8 Control codes for the printer

Not applicable for DOP11A-10.

Enter the control codes for the printer in a text block. Type "%%" and add a number between 1 and 31. The numbers 1 to 31 represent the control codes for the printer. Type "%%12" for example. This entry refers to the page break. For a description of the control code, refer to the printer manual. A command must be followed by a blank. The page break ("%%12") must be entered at the end of the line. The "%%" character is not permitted in the text. Several commands are permitted in a line.

8.5.9 Printer status

The status of the connected printer can be read using a printer register. This register is specified under [Setup] / [System signals].

8.6 Time control

The [Time control] function allows for enabling and disabling digital signals depending on the realtime clock. You can use this function for controlling events in the process via the terminal at specified times (e.g. switching motors on and off). Time channels replace time relays and 7-day time switches.

8.6.1 Defining time channels

Time channels are defined under [Functions] / [Time channels].

Parameters	Description
Interval text	Enter any text for the time channel.
Signal	Define a digital signal that will be activated at the specified time intervals.
Interval	Specify days and times for the interval. You can define four different intervals for each time channel.

8.6.2 Display in run mode

The page with the time channels is displayed when system block 991 is activated. The system block is either activated by a jump object or a digital signal that is linked with the block. The time channel values can read and modified. The [Time channels] option under [Setup] / [Online settings] must be selected to modify time channel values in run mode.

To read or modify the values for a time channel, move the cursor to the required line and press the Enter key. You can also touch the required line if the terminal has a touchscreen. Press [OK] to confirm the time channel definition. Close the time channel menu with <PREV> or press <CANCEL> if the terminal has a touchscreen. Doing so displays the block from which the time channel block was activated.

8.7 Language handling

The programming software supports multi language applications for DOP series operator terminals. We recommend to create the entire application in one language using the programming software. Multi language support enables you to translate all texts of the application into other languages. The translation can be carried out directly in the programming software. You can also export all texts in the form of a text file and do the translation in another software. The translated file will then be reimported into the programming software. A maximum of 10 languages can be created per application.

A user defined index is assigned to each text in the application. To optimize the function and minimize the amount of text, you can copy and paste text that is frequently used in the application. Copied texts are linked with the same index.

The application language also contains user texts and is linked with a system language that contains system texts. User texts are texts that are entered when programming the project. System texts are texts that already exist when a new project is created as well as texts in the system program of the terminal.

8.7.1 Creating several application languages

Select [Setup] / [Multi Language] / [New Language]. This function calls up a wizard for creating several application languages. Follow the instructions of the wizard and select the required parameter values or names, or enter them.

Specify whether you want to have all texts copied from an existing language (which means an already created language). Language 1 is the language in which the application was created (basic language).

The software suggests language names. You can change these names.

Select the character set for use in the terminal as well as national special characters under [Character table]. See section "Country settings" in chapter 7.3 "Programming with the programming software".

Under [System language], you can choose between [Built in] or [User defined]. Selecting [Built in] will display the system texts in the terminal in the selected language. Selecting [User defined] enables you to translate an integrated system language and link it with the system language for the application language (terminal needs to be connected with a PC).

The data register whose value (0-9) controls which application language (0-9) the terminal should use in the run mode is entered in the controller.

Click [End] to quit the function. This opens a directory tree with all languages you have created.

8.7.2 Translating and editing texts in the programming software

Select [Setup] / [Multi Language] / [Edit].

Enter the translation for the respective language in a table cell. Use the arrow keys to move the cursor through rows and columns. Browse the text list via [Edit] / [Find].

You can also export application languages as text files and translate them in another program (e.g. Excel or Notepad). The text file will then be reimported into the application. See sections "Export" and "Import" on page 220.

8.7.3 Settings for the application language

Select [Setup] / [Multi Language] / [Setup].

Right click on [User language] to change the registers for controlling the language.

You can make the following settings by right clicking the language name:

Parameters	Description
Make copy	Make copy of the current language
Character set	Select / change character set
System language	Select / change system language
Delete language	Delete current language
Change name	Change name of the current language
More	Define the data registers that determine the value for the language display

To change the character set for the language (also Unicode), right click [Character set].

To change the system language or create a new one, right click [System language].

8.7.4 User-defined system language

To create a user defined system language, select [User defined], choose the source language and click [Receive]. The [Language transfer] dialog box opens. Click [Load] to load the integrated system languages from the terminal. Under [Setup] / [Multi Language] / [Edit], you can also edit system texts. You can also export texts as text file and edit the text in another program.

All system texts in the terminal (passwords, time channels, etc.) support multi language applications. You can either use the predefined system languages or own (new) languages. All characters in the selected character set are available for the application languages. A text character sequence can be linked with several objects. The maximum number of text character sequences for each language depends on the available project memory in the terminal.

The following memory space is available for each language:

Operator terminal	Hard disk space
DOP11A-10	16 kB / language
DOP11A-20	64 kB / language
DOP11A-30	64 kB / language
DOP11A-40	128 kB / language
DOP11A-50	128 kB / language

The left bottom area of the application language dialog box shows information on the memory size for the selected language (language file). The information is displayed in X/Y format where X stands for the occupied memory and Y for the free memory available for each language, e. g. size 7/128.

8.7.5 Export

Languages can be exported, e. g. to Excel, where they can be translated and then be reimported to the programming software.

Select [Setup] / [Multi Language] / [Export]. Choose user texts (or system texts). Enter the name of the export file in the dialog box that opens and select ANSI, OEM or Unicode as format.

Selecting ANSI/OEM means that all languages created in ANSI/OEM format will be exported. Selecting Unicode means that all languages are exported to a file in Unicode format. To edit a file in Unicode format in another program, a Unicode font must be selected in the relevant software.

8.7.6 Import

Select [Setup] / [Multi Language] / [Import]. Next, select [User texts] (or [System texts]). The [Import multi language texts] dialog box opens. Enter the name of the text file to be imported. If the project language is in ANSI/OEM format and a language is to be imported in Unicode format, the imported language will be converted into ANSI/OEM format. All characters outside the ANSI/OEM range will be represented as question marks.

When opening a project with several application languages in an older programming software version, all objects with several application language texts will be replaced by the @ character followed by an index number, e. g. "@55".

8.7.7 Show index

Each object, which represents text in an application with multi language support, is linked with an index. An index can be linked with various objects containing the same text. To display the index numbers for the object texts, select [Setup] / [Multi Language] / [Show index].

8.7.8 Cross reference

Select [Setup] / [Multi Language] / [Cross reference]. In the cross reference list that opens, you can edit objects by right-clicking them. The cross reference list supports the incremental search algorithm when entering index numbers.

8.7.9 Copying objects

If the [Copy cross reference index] function is active while copying an object, the same index will be assigned to the copy. This way, objects with the same index need only be translated once. Changes made to a text affect all texts with the same index number.

If you delete an object that has copies with the same index number, only the selected object will be deleted.

8.7.10 Choose Unicode font

Here you choose a Unicode font if an expanded character set is required for creating the application language.

8.7.11 Application languages in run mode

The application language can be changed in the terminal in run mode. To do so, change the value (0-9) in the specified language selection register. Note that the terminal updates the entire displayed block when a new language is selected in run mode. If the terminal has a cursor, it will be positioned on the first maneuverable object in the current block after having performed the change.

8.8 Unicode

8.8.1 Introduction

Unicode is a global character coding standard that uses 16-bit values for displaying the characters of almost any language. Earlier character coding standards (e. g. the Microsoft Windows ANSI character set) use 8-bit values or combinations of 8-bit values to represent the characters used in a certain language or region.

Microsoft Windows 2000 and Windows XP have input locales installed. This enables the computer user to enter complex characters and symbols (e.g. Chinese characters) using a normal keyboard. The character sets installed in the computer are used. You can select input locales for various languages via the Control Panel. When installing new character sets, all required characters will be added to the system.

8.8.2 Unicode in the programming software

The DOP11A-20 to DOP11A-50 operator terminals support Unicode if the latest system program version (firmware) is installed. Unicode characters can be used in projects and/or system texts.

The Microsoft Windows XP and Windows 2000 operating systems support Unicode.

The programming software uses a Unicode character set to display Unicode characters in the dialog boxes on the computer. Only the Unicode characters used in the project are downloaded when transferring a project.

8.8.3 Terminal font

The operator terminal uses a terminal character set to display Unicode characters. The character set in the terminal comprises approximately 35 000 characters but is not complete according to Unicode standard. When transferring a project to the terminal, only the characters used in the terminal will be downloaded. If a character is used that is not available, a black rectangle will appear instead in the programming software and in the operator terminal. The project test, which can be carried out when transferring a project, checks whether all characters used are included in the terminal character set.

Font size for user texts and system texts

Unicode characters are processed as bitmaps (point matrix). The predefined font size is 8 x 16 pixels. This value can be changed. Certain complex characters (e. g. Chinese characters) require a font size of 16 x 16 characters to ensure that all pixels are displayed and misunderstandings avoided. When selecting a large font size on small terminals, the screen may not be large enough to display the entire menu.

8.8.4 Multi language functions

Switching between object text and index number

When you click the [T] button in the [Language] tool bar, the programming software shows the index number (@number) instead of the object text. New text (in ANSI format, not in Unicode) can also be entered in @ mode to link the object with a new index and to delete the link to other objects with the original index. You can link an object with a new index by specifying @number.

Exporting and importing files in Unicode format

System and user texts can be exported and imported under [Setup] / [Multi Language]. You can edit an exported file in Unicode format in a text editor, such as Notepad. Select a Unicode font in the text editor for this purpose.

When exporting files, you can choose between ANSI, OEM or Unicode format. If you select ANSI/OEM, only languages in ANSI/OEM format will be exported to a file with ANSI/OEM format. When selecting Unicode, all languages will be exported to a file in Unicode format.

When importing a file in ANSI/OEM format, you can define whether an existing language is to be updated or a new language to be added.

When importing a file in Unicode format, you can define whether an existing language is to be updated or a new language to be added. If the existing language is in ANSI/OEM format and you want to import a language in Unicode format, the imported language will be converted into ANSI/OEM format. Characters not included in the ANSI/OEM character set are replaced by a question mark.

Memory requirements

If you use Unicode, a memory is assigned according to the following formulas:

Language size	Each character string requires 22 bytes + amount of characters in the character string x 4 bytes.
Character set size	The transferred character set requires the amount of unambiguous characters x 34 bytes. The transfer of 1000 characters consequently requires 34 kB.
Unicode	The memory requirements for a Unicode language corresponds to the language size + character set size.

Power

Unicode characters are loaded a little slower than ANSI/OEM characters because Unicode characters contain a larger amount of pixels.

The Unicode character set is read to the memory when starting the operator terminal. This process may take some time if the character set is large.

8.8.5 Limitations of Unicode

Text blocks

Unicode does not support text blocks.

Saving recipe and alarm history

The [DOP Tools] \ [DOP File Transfer] program and the DOP FTP client do not support Unicode characters. Using Unicode means that the SKV file, which can be used for editing recipes or for the alarm history on a PC, will contain index numbers (@xxx) instead of block texts. You can search for the terminal text in the project. If you want text to appear in the SKV file, you have to change the terminal character set to ANSI format.

Dynamic texts

Text in objects can be controlled by system signals. To do so, select [Dynamics] / [Properties] for the selected object.

Dynamic texts are not converted into Unicode format. Questions marks will appear instead.

Time channel block

The standard block time channels, which can be configured in RUN mode, must use the specified font size 8 x 16 in the DOP11A-20 operator terminal. Otherwise, the input window will be too large for the screen so you cannot configure the block.

8.9 LEDs

Only applies to operator terminals with LEDs.

The operator terminal has integrated LEDs that are linked with a register. The LEDs are defined under [Functions] / [LED]. The register content determines the color and, if required, the flashing frequency of the LED as shown in the following table.

Register value (Hex)	Register value (Dec)	Flashing frequency (Hz)	Color
00	0	-	None
01	1	-	green
02	2	-	Red
11	17	5	green
12	18	5	Red
21	33	2,5	green
22	34	2,5	Red
31	49	1,2	green
32	50	1,2	Red
41	65	0,6	green
42	66	0,6	Red

8.10 Function keys

You link a function key to a signal by entering the signal's address according to the relevant key or by choosing the corresponding function from the selection list. The function key linked to a signal will be activated according to the function you have specified when defining the function key.

Only two function keys linked to signals can be activated at the same time. If more than two function keys are pressed simultaneously, only the two signals that were triggered first will be activated.

The number of function keys depends on the terminal type.

8.10.1 Defining function keys

You can define function keys in two ways:

- Globally
- Local

Global definition

- Global function keys are defined and used in the entire application and apply to all blocks.
- A global definition is always available in run mode, as long as the block displayed on the screen does not have any local definitions for the current function key.
- Global definitions are made under [Functions] / [Function keys].

Local definition

- Local function keys are defined and used for a block.
- Local definitions have a higher priority than global definitions.
- Local definitions are made under [F keys] in the block header of the current block.

Function	Description	
IO	Signal that is activated by the function key. (The subsequent field is used for specifying possible index registers and signal formats.)	
Event	The IO event function serves for defining the effect of the function key on the specified signal. The Event function provides the following options:	
	Volatile	The signal is output as long as the key is active.
	Toggle	The signal is output and reset alternately as long as the key is active.
	Set	The signal is activated when the key is pressed and remains in this state.
	Reset	The signal is reset when the key is pressed and remains in this state.
	Grouped	All signals are reset that are linked to a function key with the current group number. The group number is entered in the [Group no.] field. A group comprises a maximum of eight functions. In the option [Set analog], the analog signal linked to the function key is assigned the value defined in the [Value] field.
	Inc. analog	The analog signal linked to the function key is incremented by the value defined in the [value] field.
	Dec. analog	The analog signal linked to the function key is decremented by the value defined in the [value] field.
Set analog object to	Assigns the entered value to the maneuverable analog object selected with the cursor.	
Increment analog object with or set digital object	Increments the value of the selected maneuverable analog object by the entered value or activates a selected maneuverable digital object.	
Decrement analog object with or reset digital object	Decrements the value of a maneuverable analog object by the entered value or resets a selected maneuverable digital object.	
Set digital object momentarily	Activates a selected digital object as long as the key is being pressed.	
Jump to block	Jumps to the block with the specified name or number.	
Security level	You can define security levels for function keys. The operator must login with a password for this or another security level to being able to use the function key.	
Other functions	Function or touch keys are linked to the functions in the selection list. See the separate table "Other functions of function keys and touch keys" on page 228.	
Macro	The selected macro is executed. You can change the name of the selected macro or change the macro event for the selected event by clicking the [Edit] button.	

Other functions of function keys and touch keys

Function	Description
Load recipe	Load recipe from the terminal memory.
Save recipe	Save recipe in the terminal.
Delete recipe	Delete recipe in the terminal memory.
Append recipe	Appends signals and their values of the current block to an existing recipe. See chapter 8.3 "Recipe handling".
Login to specified security level	Login. See chapter 8.4 "Passwords".
Logoff	Logoff
Change login password	Change password
Scroll up one page	Scroll text pages in the text block and in the alarm list.
Scroll down one page	Scroll text pages in the text block and in the alarm list.
Zoom up text size	Maximize text size in the alarm list.
Zoom down text size	Minimize text size in the alarm list.
Save recipe on memory card	Save the recipe on the memory card defined as backup medium.
Load recipe from memory card	Load the recipe from the memory card defined as backup medium.
Erase recipe on memory card	Erase the recipe from the memory card defined as backup medium.
Save project on memory card	Save the project on the memory card defined as backup medium.
Load project from memory card	Load the project from the memory card defined as backup medium.
Erase project on memory card	Erase the project from the memory card defined as backup medium.
Acknowledge alarm	Acknowledge alarm in the alarm list.
Show alarm list	Show alarm list (block 990).
Jump to info block connected with the alarm	Jump to the block linked to the alarm. Applies to selected alarm banners or alarms in the alarm list.
List alarm groups	Specify the alarm group from which the alarm is to be displayed in the alarm list.
Return to previous block	Shows the previous block. You can go back up to nine levels. When block 0 is displayed, this function will not execute a jump to the previous block. If logging in in run mode on a higher security level than the current one, this function will not execute a jump.
Jump to main block (block 0)	Shows the start block, block number 0.
Show object info	Shows the minimum and maximum values for the analog objects in the text block in run mode.
Enter	Corresponds to pressing the Enter key.
Show diagnostics page	Shows the diagnostics page.
Connect TCP/IP	Initiates the connection for serial TCP/IP connection.
Disconnect TCP/IP connection	Disconnects the serial TCP/IP connection.
Change recipe directory	Edit recipe directory in the terminal.
Create recipe directory	Create recipe directory in the terminal.
Delete recipe directory	Delete recipe directory in the terminal.

8.10.2 Using function keys to jump to block

This function allows the user to jump to blocks using function keys without using the display signal. Choose [Jump to block] from the selection list when defining the keys (locally or globally).

Changing to a block can be performed easiest using function keys. A digital signal is not assigned in the controller.

8.11 Trends

This chapter does not apply to DOP11A-10.

8.11.1 Development trend

Does not apply to DOP11A-10 and DOP11A-20.

With this function, the controller constantly acquires analog values and displays them in a trend object during operation. The values are displayed in curves. The recorded values are stored in the operator terminal's project memory.

Several independent trend curves can either be displayed in the same block or in different blocks. The number of curves is restricted by the size and capacity of the project memory.

The trend object displays, for example, the time interval between the data recordings and the number of values.

Calculating the trend data size

Use the following formula to calculate the trend data size in the project memory:

S = TOG + AK (28 + (645 x ((AM / 100) + 1))

TOG	Trend object size (If all the parameters are changed for a trend object, the value of the TOG = 320 Bytes.)
AK	Number of curves defined in the trend object
AS	Number of samples that are rounded off to the next hundredth
S	Number of bytes

The RAM memory can also limit the number of trends in an object. This limitation depends on other objects and functions used in the project.

Display in run mode

In run mode, trend curves can display continuously measured values. Select the required trend object and press the Enter key. This opens a dialog box. Select a time interval and date for the data to be displayed. "History" is displayed at the bottom of the dialog box. To go back to real-time display, press the Enter key again. The trend data are stored in files. You specify the name when defining the trend object.

8.11.2 Real-time trend

Only applies to DOP11A-20.

The real-time trend displays analog values from the controller in a trend object during run time. The values are displayed in curves. No values are stored in the project memory of the terminal. No continuously measured data are displayed.

Several independent trend curves can either be displayed in the same block or in different blocks. A maximum of 10 trends can be used per application.

8.11.3 Defining trend objects

You can define trend objects in a block exactly like other dynamic objects. You can link the object with up to six analog signals (maximum 10 trends per projects with DOP11A-20).

Unlike other objects, the trend object name must be specified using 1-8 characters. The first character must either be a letter or a number. A-Z, 0-9 are permitted characters for the trend name. The same file name conventions apply as for MS-DOS.

You can define the following parameters for the trend object. Under [Setup] / [Terminal options], you can define if you want to save changed trends or all samples.

[General] tab page

Parameters	Description
Name	Enter a name for the trend object. Each object must be assigned an unambiguous name. The object name must not exceed eight characters. The parameter is mandatory. Not applicable for DOP11A-20.
Sample interval	Time interval between data acquisition. The minimum value is 1 s.
Sample count	Number of values to be stored. The maximum number of values is 65534. Not applicable for DOP11A-20.
Sample full limit	Enter the number of samples where the Sample full signal is to be enabled. Not applicable for DOP11A-20.
Sample full signal	Specify a signal that is to be activated once the number of samples under Sample full limit is reached. Not applicable for DOP11A-20.
Enable sampling signal	Digital signal that, if enabled, starts data acquisition. Acquisiton stops when the signal is reset. Parameters need not be specified. Not applicable for DOP11A-20.
Delete trend data	Define a digital signal that, if enabled, deletes all trend data in the history. Not applicable for DOP11A-20.
Y scale	Specify whether you want the y-scale be hidden, appear left, right, or on both sides.
Minimum value	The minimum value on the y-axis is called from the specified register.
Maximum value	Maximum value on the y-axis that is read from the specified controller register.
Scale division	Specifies which scale division is used on the y-axis.
Scale ticks	Specifies the interval between the displayed scale ticks.
Border style	Specify whether you want the object to appear with a border.
Grid	Specify whether you want to display a grid in the object.
Scale	Define a color for the scale in the object.
Grid	Choose an appropriate color for the grid.
BG	Define a background color for the object.

[Curves] tab page

Parameters	Description
Analog signal	Analog signals that the object records and for which the values should be displayed. Only signed 16-bit numbers can be used.
Color	Choose the color for the corresponding curve.
Offset and gain	Is used for scaling the register value.

Only two curves can be used with the DOP11A-20 model.

The DOP11A-20 only provides realtime trend.

[Dynamics] tab page

The functions on this tab are explained in section "General parameters" in chapter 7.4 "Graphic display".

If you copy a block with trend data, you will have to rename the trend object.

Two trend objects must not have the same name.

8.11.4 Transferring trend data

Not applicable for DOP11A-20.

If the [DOP Tools] \ [DOP File Transfer] program is installed on your PC, you will be able to transfer trend data, recipes and alarm lists to and from the PC for statistical calculations, display or for storage purposes.

You can also transfer the following data between PC and terminal using FTP:

- Trend data
- Recipes
- Alarm lists
- HTML files
- Terminal applets
- Bitmap graphics

An FTP client must be installed on the PC for this purpose. The DOP Tools program group provides the DOP FTP Transfer application that acts as standard FTP.

You can directly open trend files for statistical calculations, e. g. in Excel.

Trend files

The name for each trend file is specified when defining the trend object. The suffix SKV is assigned to the file.

Line format of the trend file:

DDDD;TTTT;AAAA;BBBB;CCCC;DDDD;EEEE;FFFF:

Format	Description
DDDD	Date format defined under Setup.
TTTT	Time format defined under Setup.
AAAA	Trend curve 1
BBBB	Trend curve 2 (if defined)
CCCC	Trend curve 3 (if defined)
DDDD	Trend curve 4 (if defined)
EEEE	Trend curve 5 (if defined)
FFFF	Trend curve 6 (if defined)

The oldest value is displayed in the first file line, the newest in the last line. The SKV format can be directly exported to Microsoft Excel. The diagram wizard in Excel is used for creating statistical diagrams. You cannot change files and send them to the terminal.

8.12 Macros

A macro combines several events in the terminal into a single command. If you frequently call up certain commands or settings in the terminal, you can automate these processes by creating a macro. A macro is triggered via local or global function keys or touch keys. You call up the [Macros] function under [Functions] / [Macros].

8.12.1 Adding macros

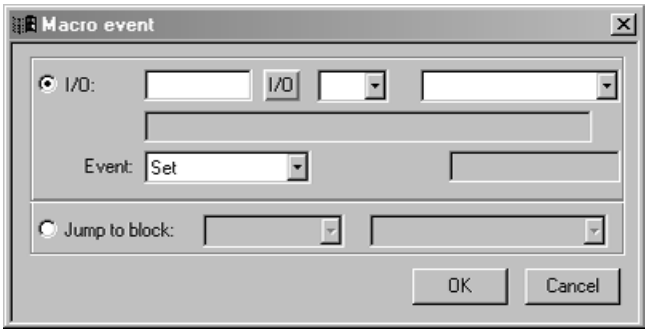
Clicking on the [Add macro] button opens the selection dialog.

Enter a name for the macro in the dialog. The name must be unambiguous. Clicking [OK] displays the macro in the list under the name you have defined.

The number of user-definable macros is unlimited.

8.12.2 Insert event / Add event

Clicking on the [Insert event/Add event] button opens the following selection dialog box:



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Each macro can include a maximum of eight different events (lines).

Parameters	Description	
I/O	With this parameter you define the signal to be linked with an event in the macro. In the [Choose event], field you select the event to be linked with the signal in the macro. You can choose from the following events:	
	Set	The digital signal is activated when the macro key is pressed and remains in this state.
	Grouped	Signals that are linked to a function key with the current group number are reset. The group number is entered in the [Group no.] field. A group comprises a maximum of eight functions.
	Dec. analog	Activating the macro by pressing a key will decrease the analog signal by the value defined in the [value] field.
	Reset	The digital signal is deactivated when the macro key is pressed and remains in this state.
	Set analog	Activating the macro by pressing a key will assign the value defined in the [value] field to the analog signal.
	Toggle	The digital signal is activated and deactivated alternately when pressing the macro key.
	Inc. analog	Activating the macro by pressing a key will increment the analog signal by the value defined in the [value] field.
Jump to block	Enter the number or name of the block you want to jump to when pressing the macro key. A block jump can only be the last event in a macro because it completes the macro.	

8.12.3 Editing

You can change the name of the selected macro or change the macro event for the selected event by clicking the [Edit] button. Instead, you can also double-click [Macro] or [Macro event].

8.12.4 Activating macros

You activate a macro using function or touch keys. Each key (global or local) can be linked to a macro. You select the macro for the corresponding key in the dialog boxes for local and global function keys and touch keys.

9 Network Functions and Communication

9.1 Communication

9.1.1 Communication with two controllers (two drivers)

You can activate two different drivers in the terminal. This means the terminal is capable of simultaneously communicating with two different controllers.

You can connect the controllers to the serial terminal interface, or to the PFE11A expansion card via ETHERNET connection.

Signal addressing to the controller takes place according to the usual procedure for the respective controller (see driver documentation for more details).

- Call up [File] / [Project settings] from the menu in HMI-Builder.
- Select the controller by clicking [Change] for system 1 or system 2. If the driver selected for system 1 does not support two drivers, then you cannot select a driver for system 2.
- Click [OK].
- Call up [Setup] / [Peripherals].
- Drag [Controller 1] and [Controller 2] to the connection ports to which the respective controller is connected. Available interfaces are RS-232C, RS-422, RS-485 (DOP11A-30) as well as the PFP11A and PFE11A expansion cards.

Refer to the driver documentation for more details on how to connect controller and terminal.

Addressing

Signal addressing to the controller takes place according to the usual procedure for the respective controller (see driver documentation for more details). To define the controller to which a created object should be linked, click the button for the required controller ([1] or [2]) in the tool bar in HMI-Builder.

Controller 1 is set by default when you create or open a project.

Clicking the [1] button links the signal of an object to be created with controller 1. Clicking the [2] button links the signal of an object to be created with controller 2.

Alternatively, you can also click the [I/O] button in the object to be created and select the object to be linked to the controller using the I/O browser.

To address a signal in controller 2 when controller 1 is preset, add "@2" to the signal (or vice versa "@1" for controller 1 if controller 2 is preset).

Example

Controller 1 is preset. Register D0 in controller 2 is to be linked to a slider. Enter "D0@2" under analog signal in the slider dialog box.

I/O cross reference

The [I/O cross reference] function for displaying an overview of I/Os can be used both for controller 1 and controller 2. The cross reference indicates the preset controller.

Name list

Controller 1 and controller 2 support the name list with all associated functions.

If communication is interrupted by one controller, the terminal will continue communication with the other controller. The terminal will attempt to reestablish the interrupted communication with the controller every 10 seconds. This process can impair communication with the connected system. The interval can be changed using a command. See section "Commands" in section 7.3.

9.1.2 Controller data exchange

When the terminal is connected to two controllers (two drivers in the terminal), data can be exchanged between the two controllers (analog and digital signals). You can also connect two controllers via separate terminals in a BDTP network.

The signal type need not be identical in the two controllers. Data are exchanged via a virtual data channel between controller 1 and controller 2. You can define eight different data channels. Data exchange can be time controlled or based on events. You define the conditions for the exchange of data as well as for the signal intervals for each data channel under [Functions/ [Data exchange].

Parameters	Description		
Range	Start I/O 1	Start address for the data channel for controller 1. (The subsequent field is used for specifying possible index registers and signal formats.)	
	Start I/O 2	Start address for the data channel for controller 2. (The subsequent field is used for specifying possible index registers and signal formats.)	
Mode	Specify whether the signals for the data channel are analog or digital signals.		
Size	Specify the number of signals to be transferred in the data channel (start address + subsequent). The maximum number of signals for a data channel is 255.		
Flow 1 → 2	Trigger signal	Digital trigger signal that controls the data exchange for the data channel from controller 1 to controller 2. Meaning of the signal status:	
		0	Inactive
		1	Transfer The terminal deactivates the signal after successful transfer.
	Interval	Indicates the time in seconds that elapses between cyclic transfers in the data channel. Set the interval parameter to zero if there is no cyclic transfer. When the value is higher than zero (1), the parameter has priority over the trigger signal. In this case, a trigger signal will not be able to initiate a transfer. The maximum number of seconds is 65535.	

Parameters	Description		
Flow 2 → 1	Trigger signal	Digital trigger signal that controls the data exchange for the data channel from controller 2 to controller 1. Meaning of the signal status:	
		0	Inactive
		1	Transfer The terminal deactivates the signal after successful transfer.
	Interval	Indicates the time in seconds that elapses between cyclic transfers in the data channel. Set the interval parameter to zero if there is no cyclic transfer. When the value is higher than zero (1), the parameter has priority over the trigger signal. In this case, a trigger signal will not be able to initiate a transfer. The maximum number of seconds is 65535.	

When you have completed your data channel settings, click [Add].

The [Data exchange] function has the same priority as all other terminal functions. Example: If the terminal is working at full capacity (because other functions are being executed) when you request a data exchange, the data transfer time between the controllers will increase.

9.1.3 Transparent mode

In transparent mode, you can use a communication port (programming / printer port) on the terminal that is not connected with the controller to connect other parallel units to the controller. Such units can be terminals, a PC with programming tools for the controller or a higher-level operator system.

Refer to the driver manual for information whether the connected controller supports transparent mode.

Connecting PCs or other computer systems

PCs with a programming tool or another computer system are directly connected with a communication port (in this case programming/ printer port) of the terminal.

Terminal and PC settings

Make the following PC and terminal settings to enable transparent mode.

Make the communication settings in the terminal project in HMI-Builder under [Setup] / [Peripherals].

- Drag the [Transparent mode] element to the required communication port (i.e. the port to which the PC is connected with the terminal).
- Right-click the element to configure transparent mode (if supported by the driver, see the driver manual for details).

The settings for the port to which the PC is connected must be identical with the settings in the PC program (programming software for the controller).

Parameters	Description
IP settings	This parameter is only used for communication in transparent / pass-through mode via ETHERNET. The transparent mode unit must be connected with a TCP/IP port for this purpose. Port number 6004 usually need not be changed. Select the required protocol: UDP or TCP.
Controller systems	This parameter is only used for communication in transparent / pass-through mode via ETHERNET. The transparent mode unit must be connected with a TCP/IP port for this purpose. Define whether you want the transparent / pass-through mode to apply to controller 1 or 2.
Mode	Select transparent or pass-through mode as communication type. Timeout – Enter a time interval in seconds after which the terminal will change from pass-through mode back to run mode if no pass-through communication has taken place.

Connecting two terminals in pass-through mode

You can connect several terminals to the same computer in transparent mode. The following section explains how to connect two terminals. Several terminals can be connected in the same way.

SEW communication drivers do not support the transparent mode.

Cable connections

When connecting two terminals to one controller, the first terminal is connected as described in the installation manual. The two terminals are connected with a cable. The cable connects to the free port of the first terminal and the corresponding port of the second terminal. If the communication distance via RS-232 ports exceeds 15 m, you will require a signal amplifier.

Setting up the first terminal

Make the communication settings in HMI-Builder under [Setup] / [Peripherals]. Make the settings for the port connected to the controller as usual. The settings for the port connected to the second terminal can be defined by the user.

Setting up the second terminal

Make the communication settings in HMI-Builder under [Setup] / [Peripherals]. The controller must be connected to the port provided for connecting the second terminal to the first terminal. The settings on this port correspond to those of the port of the first terminal to which the second terminal is connected.

Baud rate

The baud rate is between 600 and 75 600 baud. We recommend you use the highest baud rate between the terminals for optimum performance. The communication speed decreases with increasing number of connected terminals (see the following table).

Access time to the controller

Terminals	Terminal 1	Terminal 2	Terminal 3	Terminal 4
1	100 %	–	–	–
2	50 %	50 %	–	–
3	50 %	25 %	25 %	–
4	50 %	25 %	12,5 %	12,5 %

Connecting three terminals in pass-through mode

You can connect a third terminal to terminal two in the network using a cable. Setup is the same as for the second terminal.

9.1.4 Pass-through mode

The [pass-through mode] function allows for setting the terminal in such a way that communication can take place between the PC programming software (in this case MOVITOOLS®) for the connected controller and the controller itself (MOVIDRIVE® or MOVITRAC® 07) via operator terminal.

The function is analog to the transparent mode function and also only supports one controller. Consequently, transparent or pass-through mode can only be performed on one communication port of the terminal.

If pass-through mode is active and the PC communicates with the controller via terminal, the communication between terminal and connected controller will be interrupted. This is the difference between pass-through mode and transparent mode. A terminal on which a communication in pass-through mode takes place will be locked for the operator and only show an empty screen with a reference made to the pass-through mode.

Pass-through mode for one of the connected controllers is activated or deactivated using the [DOP Tools] / [DOP Modem Connect] program. You find the program as an icon in the [DOP Tools] program group.

The MOVILINK® driver for MOVIDRIVE® and MOVITRAC® 07 units only supports pass-through mode. Transparent mode is not supported.

Terminal and PC settings

The following PC and terminal settings are required to enable pass-through mode:

Make the communication setting in the terminal project in HMI-Builder under [Setup] / [Peripherals]. Drag the [Transparent mode] element to the required communication port (i.e. the port to which the PC is connected with the terminal).

To configure pass-through mode, right-click the element. The settings for the port to which the PC is connected must be identical with the settings in the PC program (programming software for the controller).

Parameters	Description
IP settings	This parameter is only used for communication in transparent / pass-through mode via ETHERNET. The transparent mode unit must be connected with a TCP/IP port for this purpose. Port number 6004 usually need not be changed. Select the required protocol: UDP or TCP.
Controller systems	This parameter is only used for communication in transparent / pass-through mode via ETHERNET. The transparent mode unit must be connected with a TCP/IP port for this purpose. Define whether you want the transparent / pass-through mode to apply to controller 1 or 2.
Mode	Select transparent or pass-through mode as communication type. Refer to the relevant section for further information on pass-through mode. Timeout – Enter a time interval in seconds after which the terminal will change from pass-through mode back to run mode if no pass-through communication has taken place.

You can use pass-through mode for serial communication as well as for connection via ETHERNET.

9.1.5 Using the terminal as communication interface (no protocol mode)

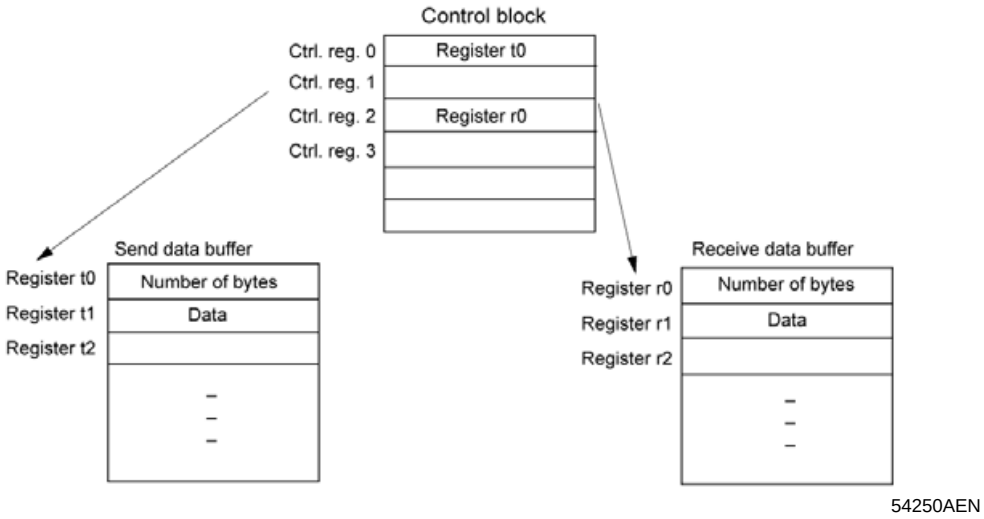
The no protocol mode is used for connecting different controllers or for connecting external devices (e. g. barcode scanners or weighing machines) to the controller. The controller monitors data transfer to the communication port. The data arriving at the communication port are stored in registers. Communication takes place by transferring the data register range that corresponds to the following control block.

Make a right mouse click on [No protocol mode] under [Setup] / [Peripherals].

Register	Description
Ctrl. reg. 0	Start register for transfer data buffer • The first register in the buffer area contains the total number of bytes to be transferred. • The subsequent registers contain the transfer data. • The maximum buffer size is 127 registers = 254 bytes.
Ctrl. reg. 1	Command register for transfer • Is set to 1 by the controller if transfer is requested. • Is set to 0 by the terminal after successful transfer.
Ctrl. reg. 2	Start register for receive data buffer • The first register in the buffer area contains the total number of bytes received. • The subsequent register contains the received data. The maximum buffer size is 127 registers = 254 bytes.
Ctrl. reg. 3	Command register for reception • Is set to 0 by the controller if controller is ready to receive data. • Is set to 1 by the terminal when the message is available. • Will be set to -1 (FFFF), if the message is missing (e. g. too short). • Is set to 2 by the controller when the port buffer is to be deleted. • Is set to 3 by the controller when the port buffer was cleared. The port buffer is automatically cleared when starting the unit and when changing between transparent mode and no protocol mode. The register is assigned the value 3.
Ctrl. reg. 4	End code (1 or 2 bytes) in the received message.
Ctrl. reg. 5	Length of the received message. The end code will be used if the register content is 0.

Drag the element to the required communication port under [Setup] / [Peripherals]. Make a right mouse click to define the register that should be listed as first control register in the transfer area. This register as well as the five subsequent registers will be used as control registers.

In run mode, the inverter/PLC can change between no protocol mode and transparent mode/printer mode. To do so, enter a digital signal in the dialog box under the 'No protocol signal' parameter.

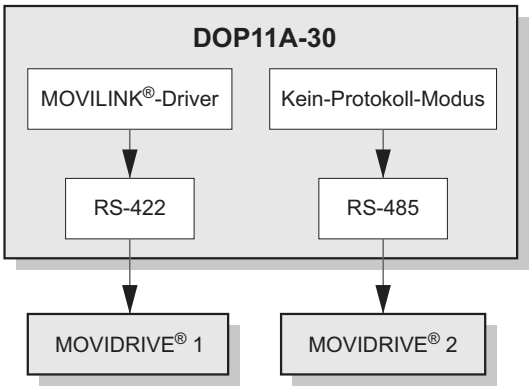


Example of using no protocol mode

The following example describes the use of the no protocol mode using a MOVILINK® read command.

A MOVIDRIVE® unit is connected to RS-422 and RS-485 respectively on the DOP11A-30. The MOVIDRIVE® unit connected to the RS-485 interface is controlled as usual using the MOVILINK® driver.

The MOVIDRIVE® unit connected to the RS-422 interface should, for example, simulate a barcode scanner. It has the RS-485 address 2. In this case, the terminal acts as the master for the MOVIDRIVE® unit.



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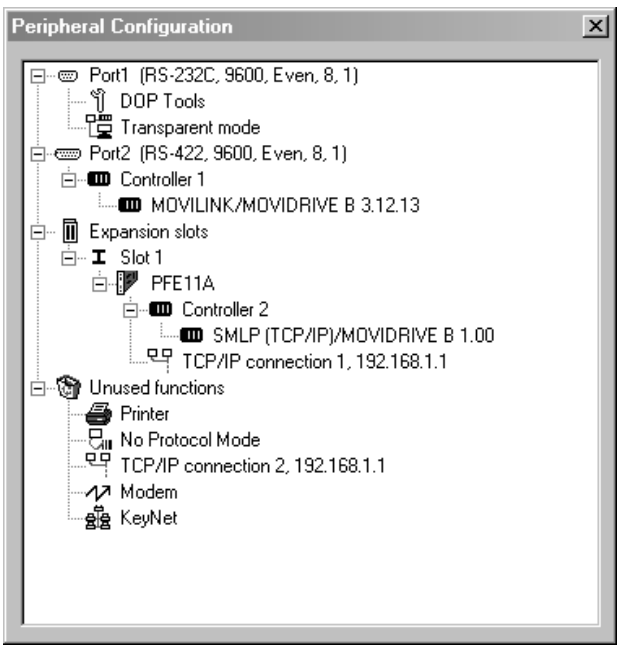
Make the following settings:

1. Under [Set up] / [Peripheral units], pull the [No protocol mode] unit to the required communication port.

   Example:



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2. Click the right mouse button on [No protocol mode] / [Properties] to define the first control register.

   Example:

   – No protocol control register:H50(controller 1)
   – No protocol signal:H56.0(controller 1)

Index 8489 from RS-485 address 2 should be read. The relevant telegram is given as follows in hexadecimal code:

02 02 86 31 00 21 29 00 00 00 00 BF

The control block is defined as H50 to H55 (s.a.).

At bit H56.0, the program changes to no protocol mode (s.a.).

The transfer data buffer should be H60 to H66.

The receive data buffer should be H80 to H86.

Make the following settings in HEX:

H50:00 3C

H51:00 00

H52:00 50

H53:00 00

H54:00 00

H55:00 0C

H60:00 0C

H61:02 02

H62:86 31

H63:00 21

H64:29 00

H65:00 00

H66:00 BF

Set H56.0 = 1 to activate the no protocol mode.

When H51 = 00 01, the telegram defined from H60 is sent.

H53 is set to 3 by the terminal. When it is reset to 0, the sent telegram is only written from H80 for a parity check, if applicable. H53 is then set to 1 automatically by the terminal.

When H53 is set to 00 00 again, the received response is stored from H80. For confirmation, H53 is reset to 1.

The response should look as follows or similar:

H80:00 0C
H81:1D 02
H82:86 31
H83:00 21
H84:29 00
H85:02 49
H86:F0 1B= 1D 02 86 31 00 21 29 00 02 49 F0 1B

In this process, index 8489 was read once. It can be started again by setting H51 = 00 01.

Connecting a modem

A modem is used for establishing a connection with a PC. You make the connection settings under [Setup] / [Peripherals]. Call up the dialog box by selecting the [Modem] entry and use the right mouse button to click on the selection.

Communication is established using three control registers in a control block. The first register in the control block is defined next to the control block register in the dialog box. The table below describes the control register functions.

Register	Description	
Ctrl. reg. 0	Contains the command that describes how the controller establishes a connection and communication.	
	0	Wait for command
	1 ... 10	Establish a connection using the phone number entered in the [Phone no.] field. Maximum 40 characters.
	11	Establish a connection using a phone number stored in the controller. The phone number is stored as ASCII character string that begins in the third control register and in the subsequent register. The character string must not exceed 40 characters, i.e. 20 registers are permitted. Not all registers must be used. The last register to be read must contain the ASCII code 0.
	101 ... 110	An initialization character string is transferred to the modem. Enter the Hayes modem command in the [Phone no.] (1 ... 10) field. The command 101 sends the character field entered in the [Phone no. 1] etc.
	111	An initialization character string stored in the controller is sent to the modem. Enter the Hayes modem command that begins in the third control register. See command 11 for more details.
	255	End command

Register	Description	
Ctrl. reg. 1	The other control register is used as status register. The register contains the result of the modem commands. The register can have one of the following states:	
	Status codes	
	0	Command was executed correctly
	1	A connection is being established
	2	Modem has established a connection
	3	Modem has received a ring signal.
	Error codes	
	101	No connection
	102	Modem recognizes lost carrier wave
	103	Unknown modem fault
	104	Modem does not receive a dial tone
	105	Busy while establishing a connection
	106	No response while establishing a connection
	107	No response from the modem
	255	Unknown fault / status
Ctrl. reg. 2	The terminal can establish a connection using a phone number stored in the controller. The phone number is stored as ASCII character string that begins in the third control register and in the subsequent register. The character string must not exceed 40 characters, i.e. 20 registers are permitted. Not all registers must be used. The last register to be read must contain the ASCII code 0.	

Init

Modem setup string

Timeout (ms)

Number of seconds after which an inactive line is interrupted. The predefined value is 30 s. You can enter a time between 5 and 600 s.

Dial method

Pulse or touch-tone dialing.

Phone no. 1-10

Complete phone number for establishing a connection.

9.2 Network communication

Not applicable for DOP11A-10.

Network communication takes place using TCP/IP (Transmission Control Protocol / Internet Protocol). TCP/IP is a standard protocol that enables communication with other systems and devices.

Operator terminals can be integrated in the network in different ways: via ETHERNET or serial. When connecting operator terminals via ETHERNET, all terminals must be equipped with PFE11A expansion cards.

The terminal network is a client / server network. Only clients can access data in the network. Servers only make data available to the clients. A terminal can be client and server at the same time. This way, it provides data and can also access the data of other terminals. Up to 20 different clients can retrieve data from the same server. One client can access the data of up to 16 different servers.

Each terminal must have an IP address. IP addresses in the range from 192.168.0.0 to 192.168.254.254 are recommended for internal networks.

Standard Internet tools, such as web browser, mail server and FTP client, can be used for working on the terminal. You can create a web page on the PC that can be called up from the terminal. This web page can contain real-time data from the controller or terminal. You can then change values, set signals, acknowledge alarms, etc. via Internet and web browser using a script.

The terminal can also send e-mails, such as alarms and status reports, when certain events have occurred.

9.2.1 Network communication via ETHERNET

The terminals must be equipped with PFE11A expansion cards if you want to connect them to a TCP/IP network via ETHERNET.

Making the connection

Call up [Setup] / [Peripherals] in HMI-Builder. Select the required expansion card slot and make a right mouse click on the selection. Select the network card. Select [TCP/IP connection] and keep the left mouse key pressed while moving the mouse to the selected expansion card. Now release the mouse key.

Settings

Select [TCP/IP connection 1] and make a right mouse click to make the settings for the TCP/IP network.

Connection name

Enter a name for the connection. Parameters need not be specified.

Host configuration

If [Manual] is selected, the parameter settings specified in the TCP/IP setting dialog box will be used. If you select one of the other options, a network server will assign one or several TCP/IP parameters.

IP address and subnet mask

Enter the network ID for the node (terminal). The network connection takes place according to ETHERNET standard. IP addresses in the range of 192.168.0.0 and 192.168.254.254 are recommended for a local network that only consists of terminals.

Gateway

Enter the network unit in the local network that is capable of identifying the other networks in the Internet.

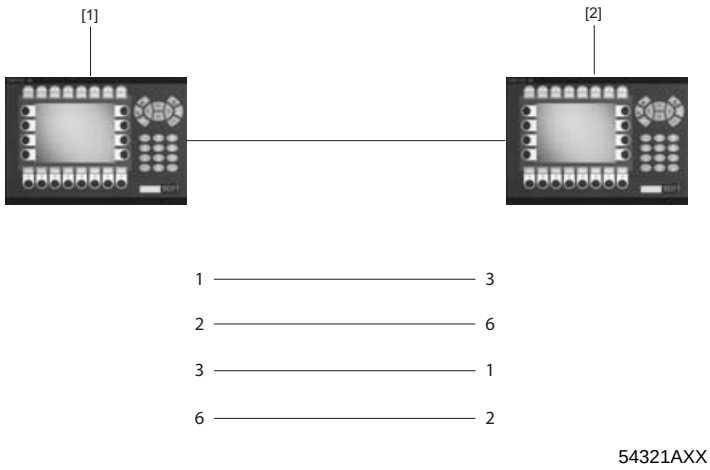
Primary DNS and secondary DNS

Enter the server(s) that contain information on part of the DNS database.

Finally, click [OK] to confirm your settings.

ETHERNET connections

The following section gives three examples for ETHERNET connections.



[1] Node 1

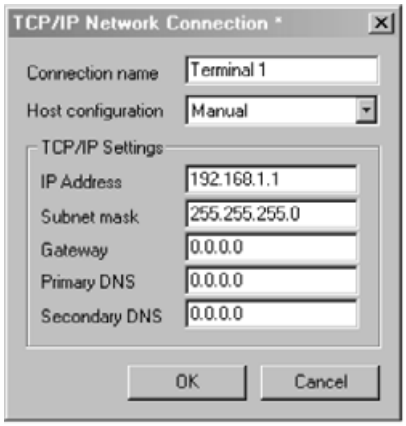
[2] Node 2

Connection between two operator terminals with twisted-pair cable (TP)

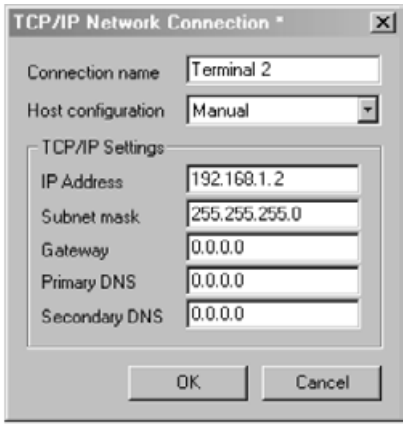
The cables have RJ45 connectors. The cable is a shielded or unshielded twisted pair (crossed) CAT5 cable.

If communication does not function correctly and the "Link" LED on the IFC ETTP card does not light up, connections 3 and 6 have probably been mixed up.

TCP/IP settings in the nodes



[Setup] / [Network] / [TCP/IP-Connections]



[Setup] / [Network] / [TCP/IP-Connections]

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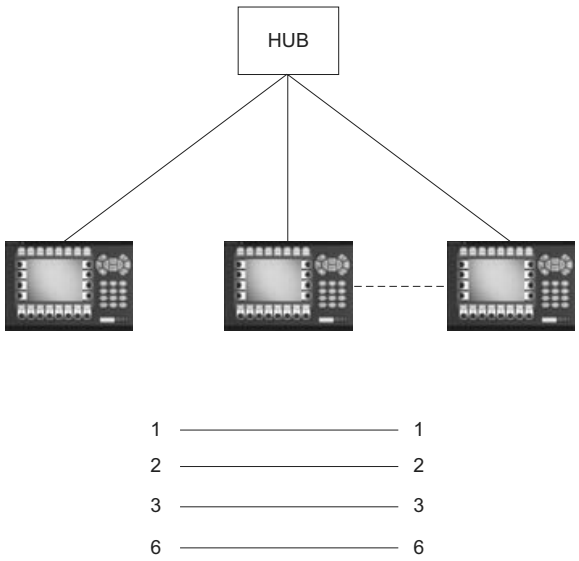
Connection between more than two operator terminals with twisted-pair cable (TP)



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The maximum length between operator terminal and hub is 100 m. The maximum number of nodes per hub depends on the number of connections on the hub. The cables have RJ45 connectors. The cable is a shielded or unshielded twisted pair CAT5 cable.

9.2.2 Serial network communication

Making the connection

Choose [Setup] / [Peripherals] from the menu. In the [Peripheral configuration] dialog box, select a TCP/IP connection and keep the left mouse button pressed while moving the mouse to the [RS-232C] or [RS-422] entry. Now release the mouse key. TCP/IP connection 2 will only be available when TCP/IP connection 1 has been used.

The parity on the port for the TCP/IP connection must be set to "None."

Settings

Select [TCP/IP connection 1] and make a right mouse click to make the settings for the TCP/IP network.

Connection name

Enter a name for the connection. Parameters need not be specified.

Serial protocol

The PPP protocol is used for serial communication.

User Name

Enter the user name used for login.

Password

Enter the password used for login.

Connect signal

Digital signal that establishes the connection when enabled and disconnects the connection when disabled.

Connected register

Analog register that can have one of the following states:

Register	Description
0	Disconnected (PPP client)
1	Waiting for a connection (PPP server)
2	Connected as a PPP client
3	Connected as a PPP server
7	Connection error

Use logon script

This function is used to automate the establishment of a serial connection. The script may differ depending on the connected server and modem.

The terminal supports the following commands:

Parameters		Description
1	`WAIT: Text, x`	Waits x seconds for text. x need not be specified.
2	`SEND: Text`	Sends text.
3	`LABEL: Label`	The label marks a reference point in a script.
4	`ONERR: Label`	Jumps to label if an error occurs in the previous command.
5	`MESSAGE: Message`	Opens a message window.
6	`END`	Ends the script.
7	`SLEEP: x`	Interrupts the process for x seconds.
8	`COUNTER: y`	Counts the pulses each time COUNTER is activated. If the value is reached, an error will be output that is processed by ONERR.

Variables	Description
% USER NAME	Comparison with the user names defined for existing accounts.
% PASSWORD	Comparison with the passwords defined for existing accounts.

Example 1:

```
WAIT: login:, 10
SEND: KALLE
WAIT: password:, 10
SEND: HELLO
```

Example 2:

The following script will send the text "CLIENT". If the sending process fails, a Send Failed" message will appear. If sending was successful, wait for the text "CLIENTSERV-ER". If this text does not appear within 10 seconds, a "Receive Failed" message will be displayed.

```
SEND: CLIENT
ONERR: Send Failure
WAIT: CLIENT SERVER, 10
ONERR: Receive Failure
END:
LABEL: Send Failure
MESSAGE: Send Failed
END:
LABEL: Receive Failure
MESSAGE: Receive Failed
END:
```

Example 3:

The following script will send the text "login". It waits for the remote end to send a user name. The name is then verified whether it corresponds with one of the user names for defined accounts. After verification, the script continues to run and sends the "password". It waits for the remote end to send a password. The received value is compared with the password in the account for which the user name has already been verified.

Usually, no script needs to be executed. Use the following script if your terminal is connected to a Windows NT server:

```
SEND: login:
WAIT: % USER NAME
SEND: password:
WAIT:%PASSWORD
```

PPP login validation method

Choose a method for validating the user ID. This value usually need not be changed. The parameter is only used with PPP connections.

Act as client / server

When the connection is a PPP connection, you have to define whether the terminal should act as PPP client and/or PPP server, or whether the terminal establishes the connection or acts as remote end.

Connect at boot

With a PPP connection, the terminal can be automatically connected at startup with another terminal or PC.

Advanced

Choosing Advance enables you to define more parameters.

Use VJ compressing of IP headers

The IP header is compressed. This value usually need not be changed. The parameter is only used with PPP connections.

Request / provide remote address

The IP address for the remote node is requested and provided. Should be set to 0.0.0.0 if the IP address is to be assigned by the remote node. The parameter is only used with PPP connections.

Use remote address as gateway

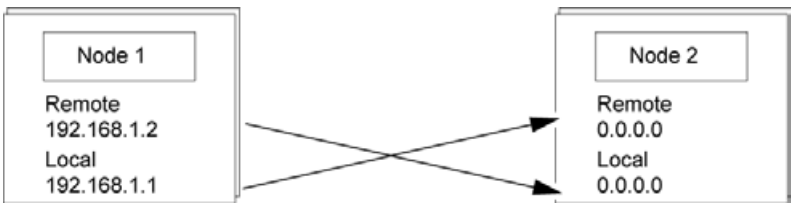
Activate this option if you want to use the IP address of the remote node as gateway (connection port to another network). The option is disabled by default. The parameter is only used with PPP connections.

Network communication is not possible if the [Use remote address as gateway] checkbox is disabled when you use a subnetwork. In this case, you can send e-mails from the terminal but external login on the terminal is not possible (e. g. via FTP client or web browser).

Request / provide local address

The local IP address is requested and provided. Should be set to 0.0.0.0 if the IP address is to be assigned by the remote node. The parameter is only used with PPP connections.

If the terminal acts as server or as server and client, and you change the addresses under [Request local address], the new addresses will be saved. If the terminal acts as client, the addresses are set to 0.0.0.0. If you change the terminal status to server or server and client, the stored addresses will be used.



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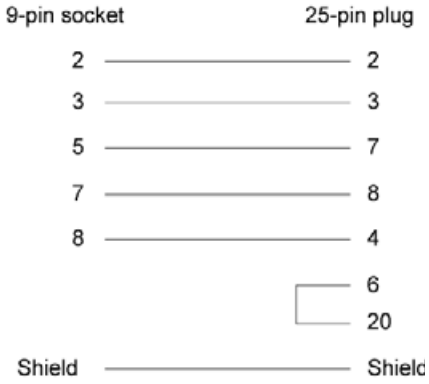
Modem

You will have to configure the parameters in the [Modem] window if you want to establish a connection using the modem. A special cable is required for this purpose.

[Setup] / [Peripherals]



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- Select [Setup] / [Peripherals] from the menu.
- Select the TCP/IP connection on the serial port and click on [Edit].
- Next, click the [Modem] button.

Parameters	Description
Enable modem	Check the modem checkbox if you use a modem.
Disconnect if idle (min)	Interrupts the connection if it has been idle for the specified number of seconds. Entering 0 means the connection will never be interrupted.
Phone number	Enter the phone number to be dialed.
Modem setup string	Character string for modem initialization. Refer to the modem manual for more information.
TCP/IP	TCP/IP connection parameters.
Host configuration	If Manual is selected, the TCP/IP parameter settings specified in the dialog box will be used. If you select one of the other options, a network server will assign one or several TCP/IP parameters to the terminal.
IP address and subnet mask	Enter the network ID for the node (terminal). The network connection takes place according to ETHERNET standard. IP addresses in the range of 192.168.0.0 and 192.168.254.254 are recommended for a local network that only consists of terminals.
Gateway	Enter the network unit in the local network that is capable of identifying the other networks in the Internet.
Primary DNS and secondary DNS	Enter the server(s) that contain information on part of the DNS database.

9.3 Network functions in the terminal

This section does not apply to DOP11A-10.

9.3.1 FTP server

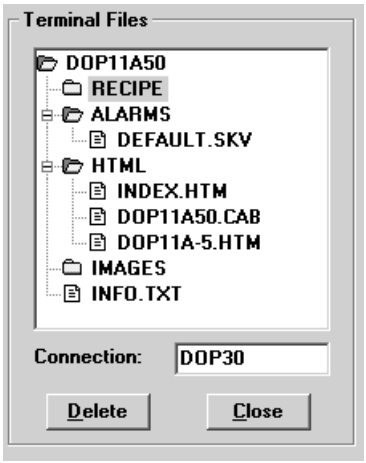
FTP (File Transport Protocol) is a standard Internet protocol and the easiest way of exchanging files between computers in the Internet. FTP is an application protocol using the TCP/IP Internet protocol. FTP is usually used to transfer web sites from the computer where they were created to a server connected to the Internet. FTP can also be used for downloading programs and other files from another server (terminal) to your computer. Files can be transferred from or to the terminal when the terminal acts as FTP server. An FTP client must be installed on the PC for file transfer, such as DOP Tools, Internet Explorer, Windows Commander or another FTP standard software.

Files with a length of 0 are displayed in certain libraries. The reason for this is that these files contain dynamic data, which means that their size changes. This means a file of the length 0 is not necessarily empty. The terminal does not work with the file date. Therefore, the date values displayed are not relevant. The terminal can save the contents of all files that can be accessed via FTP using various separators. You can use the following characters as separator for the file contents: Tabulator (→), semicolon (;) or colon (:).

Make the FTP separator setting in HMI-Builder under [Setup] / [Terminal options]. The file name must not contain national special characters, such as B, Ä, Ö and Ü. The FTP server of the terminal can process up to three connected clients simultaneously.

The files in the individual libraries increase the project memory load. For information on the available project memory, see the file `info.txt` in the root library [ROOT].

Root library



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The root library (current terminal name) comprises the following libraries:

- ALARMS
- HTML
- RECIPE
- TRENDS

The DOP11A-50 type has the [IMAGES] file available in addition. See section "Library [IMAGES]" on page 260.

Only libraries for which the user has access rights (per account) are shown. The `info.txt` file, containing information on the terminal, is also stored here.

info.txt file

The `info.txt` file contains the following information on the terminal:

DOP11A-40

Boot version: 4.07

Firmware version: V4.00

Build number: 320

Driver1: MOVILINK V3.11.1

Driver2: MODBUS Master V3.00.4

Dynamic memory: 304237 bytes free

Project memory: 184700 bytes free

IP address: 192.168.98.1

No files can be deleted from the root library even if the user has write access. Deleting the [HTML], [RECIPE] or [IMAGES] libraries (DOP11A-50) deletes the contents of the respective library. The library itself will not be deleted.

Alarm library [ALARMS]

This library is only shown if alarms have been defined in the terminal and the terminal is in run mode. In this library, the alarm groups are displayed as SKV files with a length of 0. This does not necessarily mean that there are no alarms. They are read-only files.

Each alarm is stored in a line ending with a carriage return and a line feed: [carriage return][line feed].

Syntax (DOP11A-40 and DOP11A-50)

A semicolon (;) is used as separator.

Status;Activation date;Activation time;Deactivation date;Deactivation time;Acknowledgement date;Acknowledgement time;Alarm text

All fields are always available. The date and time fields of unacknowledged alarms are empty.

Syntax (other terminals):

Status;Activation date;Activation time;Alarm text

The file is completed with "END" [carriage return] [line feed].

HTML library [HTML]

This library contains files that are managed by the web server. You can create sub-libraries. The start file (HTML page shown as start page in the web browser) must always have the name `index.htm`.

The file name depends on the file type. Standard file formats such as HTML are used.

Recipe library [RECIPE]

The individual recipes in the respective recipe libraries are displayed as SKV files with a length of 0. This does not mean the recipe is empty. Read and write access is possible on files in this library.

Each recipe value is stored in a line ending with a carriage return and a line feed: [carriage return][line feed].

Syntax

A semicolon (;) is used as separator.

e g. unit;value;file type;length

The file is completed with

"END" [carriage return][line feed].

If the file is of the "Array" (AR) type, each line contains a value. The first line looks as described above. All subsequent lines only have the following entry:

;value

Data types for analog signals

Type	Description
Unas-signed	16-bit character
+	No 16-bit character
L	32-bit character
L+	No 32-bit character
RB	BCD float format
RF	Float with exponent
SB	16-bit BCD format
LB	32-bit BCD format
SH	16-bit hexadecimal
LH	32-bit hexadecimal
RD	Floating point number
AR	Array 16-bit
ST	Character string
BI	Bit 0 or 1

Trend library [TRENDS]

This library is only available if trends have been defined in the terminal and the terminal is in run mode. In this library, the various trend objects are displayed as SKV files with a length of 0. They are read-only files. Curve 1 must be used to make sure a trend is valid,

Each measured value is stored in a line ending with a carriage return and a line feed: [carriage return][line feed].

Syntax

A semicolon (;) is used as separator.

The file is completed with

"END" [carriage return] [line feed].

Only the number of curves available in the trend (no empty fields) will be transferred.

In the following cases, "OFF" is included in the measured values and indicates an interruption in the acquisition process.

- When the terminal changes to run mode, a copy of the latest sample will be saved. The copy is marked with "OFF". As soon as the terminal has received the valid value, the new values will be saved without the "OFF" mark.
- When the signal for trend activation is output, a copy is marked with "OFF." When the signal is output, a new value is saved without the "OFF" mark.
- When the stored value is transferred using FTP or HMI-Tools, a sample will be saved marked with "OFF". After the transfer is complete, a new value will be saved without the "OFF" mark.

Library [IMAGES] For DOP11A-50 only.

The DOP11A-50 terminal also includes an [IMAGES] library. You can save graphics in BMP format in the library. Bitmap graphics can be displayed in static symbol objects when the terminal is in run mode.

Files in this library can be written, overwritten and deleted. It is not possible to create new sub-libraries. If you activate the [Use dynamic bitmaps] checkbox for a static symbol object, the terminal will call up the specified bitmap file (`namn.bmp`) from the [IMAGES] library in the terminal file system. In run mode, the bitmap graphic will be displayed on the terminal screen.

The graphic to be displayed must be transferred to the library via FTP. You can add, exchange or delete dynamic bitmap graphics via FTP by overwriting, saving or deleting BMP files in the [IMAGES] library. The image for a dynamic bitmap graphic object is only displayed on the terminal in run mode.

The bitmap graphics are not available in HMI-Builder and can therefore not be displayed.

Use the same X and Y size for the BMP graphic in the library and for the symbol object defined in HMI-Builder.

Files cannot be accessed from the [IMAGES] library.

When a BMP file is sent to the [IMAGES] library, transfer is stopped briefly for the duration of time the terminal converts the standard BMP format into the special BMP format of the terminal.

9.3.2 STMP client

SMTP (Simple Mail Transfer Protocol) is a TCP/IP protocol used for sending and receiving e-mails. SMTP is usually used together with one or two other protocols (POP3 or IMAP) as SMTP only provides limited functions for saving received messages. These protocols allow the user to save messages in a server mailbox and retrieve them later. This means SMTP is used for sending e-mails and POP3 or IMAP are used for retrieving e-mails from the local server.

The terminals can act as SMTP client (send e-mails). A mail server is required for using the SMTP client function.

You can use the mail server of your Internet service provider for this purpose. You can also use a local mail server.

9.3.3 Terminal mirroring - terminal applet

Where the object-oriented programming language Java is used in the Internet, an applet is a small application sent to the user together with the data of a web site. Terminal applets can execute interactive animations, direct computations or other simple tasks without sending a request back to the server.

You can mirror the terminal in a web browser (e. g. Microsoft Internet Explorer) on a PC. This means the applet represents a terminal on the screen. The mirrored image is updated at specified regular intervals. The mirrored terminal fulfills the same function as the actual terminal. You can control the terminal by pressing the buttons on the terminal user interface using the mouse or keyboard. Or you directly touch the screen if your terminal has a touchscreen. Text strips for the terminal are not represented in the applet.

The applet is compressed in a CAB file. This file installs in the browser the first time the applet is loaded. You can load the file either via the terminal file system or the local hard disk of your PC. Do not extract a CAB file manually. The file will be extracted by the browser.

You need to transfer the CAB file to the HTML library via FTP to allow the applet to be installed and executed by the terminal. A web site (HTML file) containing the HTML code for loading and executing the applet must also be transferred to the HTML library in the terminal. The web server must be activated in the web server.

Enter the host name or IP address of the terminal as well as the file name of the web page in the web browser (e. g. "terminal1.domain.com/terminal1.htm" or "192.168.98.75/terminal1.htm") to establish a connection to the web server of the terminal. The terminal icon [Terminal Interaction] will appear once the web page has loaded. Click this symbol to start the applet. The applet will then establish a connection to the terminal controller network service (port number 6001 is preset). You can configure the port number in HTML code via an applet parameter. The relevant dialog box will appear if a login was defined for the terminal controller function. The user data entered in the dialog are compared with the entries made under [Setup] / [Network] / [Accounts].

If you execute the applet locally, you can store the CAB and HTML files anywhere on your hard disk. You have to enter the host name of the terminal in the HTML code (e. g. "terminal1.domain.com" or "192.168.98.75"). In this case, the CAB file is directly loaded from the hard disk and the web server is bypassed. Apart from this, the procedure for executing the applet is the same as described above (loading the HTML file).

The CAB file is only loaded to the browser the first time or when the applet is reinstalled.

Signed applet

Signing the applet with a software certificate allows for installing it in the browser. A security dialog pops up when you call up the certificate the first time (i.e. the first time a signed applet is loaded).

The dialog informs you that the applet was signed with a certificate from SEW-EURODRIVE. To install the applet, answer the security dialog with [Yes]. In the dialog box, you can define whether you always want to trust the contents signed with this certificate. Any signed applet that is signed using the same certificate will be trusted automatically in the future. The certificate will be added to your browser and no security dialog will pop up again.

To see which applets are installed in your browser, select [Extras] / [Internet options] / [Contents] / [Certificates] from the Internet Explorer menu. The tab shows the applet version and time of installation. You can deinstall applets if you do not need them. You can influence the setting and appearance of the applet via the following parameters in the HTML code:

Parameters	Description	Default value
TermCtrlPort	Port number for the network service	6001
Background	Background color for the terminal mirror image on the web page in RRGGBB format (hexadecimal 00-FF)	B7F58D (light green)
Title	Title in the applet window	Terminal view
HostNameInTitle	Specifies whether the host name should be included in the title e. g. "Terminal view - 192.168.98.1" or "Terminal view - Terminal1.domain.com".	YES
ScrUpdInterval	Start value for the update interval in seconds	10
Label	Heading in the applet view	Terminal Interaction
LabelFontSize	Font size for the heading	12
LabelBoldStyle	Specifies whether the heading should appear in bold text.	NO
LabelColor	Foreground color for the heading in RRGGBB format (hexadecimal 00-FF)	000000 black
LabelXPos	X position of the heading in the applet view	5
LabelYPos	Y position of the heading in the applet view	15
Icon	Specifies whether the terminal icon should appear in the browser.	YES
IconXPos	X position of the icon in the applet view	5
IconYPos	Y position of the icon in the applet view	17
MouseInputFeedback	Mouse feedback	YES
KeyboardInputFeedback	Keyboard feedback	NO
AppletHostname	Host name of the terminal e. g. "192.168.92.1" or "terminal1.domain.com"	" " (the local address is used)
ForcePacking	Specifies whether screen data should be compressed. No compressing will take place with ETHERNET if this parameter is not active. Compressing will take place when using PPP.	NO

Example

```
<HTML>
<head>
<title>Untitled Document</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-
1">
</head>
<body bgcolor="#FFFFFF">
<div align="center">
<p><b><font size="+7">Example of HTML page with Terminal Ap-
plet</font></b></p>
<hr>
<p><font size="+7">DOP11A-30</font></p>
<p> </p>
<p>
<APPLET code=COM.sew.hmi.terminalapplet.DOP11A30.TERMAPPL width=117
height=101>
<PARAM NAME=useslibrary VALUE="Terminal Applet DOP11A-30">
<PARAM NAME=useslibrarycodebase VALUE="DOP11A30.cab">
<PARAM NAME=useslibraryversion VALUE="0,1,20,6">
<param name=TermCtrlPort value="6001"><!-- The Terminal Controller Port
number. Does not normally need to be changed. -->
<param name=Background value="FF1111"><!-- The color for the background
frame around the terminal picture on this page in format: "RRGGBB"
(hexadecimal) -->
<param name=Title value="Terminal view"><!-- The title for the applet
window, e.g. Terminal view -->
<param name=HostNameInTitle value="YES"><!-- States if the host name is
to be included in the appletwindow title, e.g. "Terminal view -
192.168.98.1" -->
<param name=ScrUpdInterval value="5"><!-- Start value in seconds for the
screen (applet window) update interval -->
<param name=Icon value="YES"><!-- States if the terminal picture on this
page is to be shown -->
<param name=IconXPos value="28"><!-- The terminal pictures' X position
in the framearound the terminal picture on this page -->
<param name=IconYPos value="20"><!-- The terminal pictures' Y position
in the framearound the terminal picture on this page -->
<param name=Label value="Terminal Interaction"> <!-- The title in the
frame (around the terminalpicture) on this page, e.g "Terminal Interac-
tion" -->
<param name=LabelFontSize value="15"><!-- Font size for "Label" -->
<param name=LabelBoldStyle value="NO"><!-- States if the font for "La-
bel" is to be bold -->
<param name=LabelColor value="000000"><!-- The fore color for "Label" in
format: "RRGGBB" (hexadecimal) -->
<param name=LabelXPos value="5"><!-- The X position for "Label" in the
frame around the terminal picture and "Label" on this page -->
<param name=LabelYPos value="15"> <!-- The Y position for "Label" in the
frame around the terminal picture and "Label" on this page -->
<param name=MouseInputFeedback value="YES"> <!-- States if feedback on
mouse inputs is to be shown (and saved in a queue) -->
<param name=KeyboardInputFeedback value="NO"> <!-- States if feedback on
keyboard (PC) inputs isto be shown (and saved in a queue) -->
</APPLET>
</HTML>
```

Input feedback and wait cursor

Input feedback and wait cursor are controlled via the applet parameters *MouseInputFeedback* or *KeyboardInputFeedback*. These parameters prevent that mouse or keyboard input are handled using a queue with the applet being updated with each input.

The presettings are YES for *MouseInputFeedback* (no queue for mouse input) and NO for *KeyboardInputFeedback* (queue for keyboard input).

The wait cursor is activated for mouse input feedback. Disabling the keyboard input feedback allows for a more efficient keyboard input. If the parameters are not set in HTML code, the above values apply. To increase the security for keyboard input, the parameter *KeyboardInputFeedback* is set to YES.

To deactivate the wait cursor, both parameters must be set to NO. This means *MouseInputFeedback* is also set to NO. This way, any input will be added to the queue and can take effect without the applet being updated between each input.

If you use the *Background* parameter, you have to enter a value that corresponds to an RGB color code. Do not leave the field empty.

An object cannot be activated temporarily for function and touch keys in terminal mirroring using the function [Set digital object momentarily].

Activating the Java console

In the Microsoft Internet Explorer, it is recommended to activate the Java console for troubleshooting.

1. Select [Extras] / [Internet options] from the menu.
2. Change to the [Expanded] tab.
3. Select the [Java console active] option (restart required).
4. Restart the browser.

Make sure you have the latest version of Microsoft Virtual Machine installed on your PC. You can download the latest version from www.microsoft.com

9.3.4 WWW server

A web server (www server) is a program using the client / server model and the Hypertext Transfer Protocol (HTTP) to transfer files that form web sites of Internet users (with computers with HTTP clients). A web server program must also be installed on all PCs or terminals in the Internet that contain a web site.

SSI script

An SSI (Server-Side Include) is a variable value (e. g. a file) that a server can add to an HTML file before sending it to a user. Do the following to insert an SSI into an HTML file when creating a web site:

```
<!--#echo var="LAST_MODIFIED"-->
```

The following SSI scripts are supported to display terminal values in HTML pages:

Name	Parameters	Description	Example
get_ipaddr.fn	None	Indicates the IP address of the web server. Is used in the CGI script.	`<!--#exec cgi="get_ipaddr.fn"-->`
get_domainname.fn	None	Indicates the domain name of the web server.	`<!--#exe cgi="get_domainname.fn"-->`
get_date.fn	Date format e.g. MM/DD/YY or YY-MM-DD. If not specified, the terminal settings will be used.	Indicates the terminal date.	`<!--#exec cgi="/get_date.fn MM/DD/YY"-->`
get_time.fn	Time format e.g. HH:MM:SS or HH:MM. If not specified, the terminal settings will be used.	Indicates the terminal time.	`<!--#exec cgi="/get_time.fn HH:MM"-->`

get_device.fn	X, Y, Z
	X = device
	Y = display format (see separate table)
	Z = length (see following table)
		Indicates the device value (signal value) of the controller.	`<!--#exec cgi="/get_device.fn D5"-->`
			`<!--#exec cgi="/get_device.fn D5LH"-->`
			`<!--#exec cgi="/get_device.fn M7"-->`
			`<!--#exec cgi="/get_device.fn D9ST,30"-->`
			`<!--#exec cgi="/get_device.fn D0AR,10"-->`

get_diag.fn	None	Indicates the diagnostics window of the terminal.	`<!--#exec cgi="/get_diag.fn"-->`
get_mode.fn	None	Indicates the operating mode of the terminal: [RUN] / [PROG] / [SETUP] / [TRANSFER]	`<!--#exec cgi="/get_mode.fn"-->`

Display format for get_device.fn

Name	Length	Description	Example
None	None	Indicates the value in signed 16-bit format.	`<!--#exec cgi=/get_device.fn D1"-->`
+	None	Indicates the value in unsigned 16-bit format.	`<!--#exec cgi=/get_device.fn D3+"-->`
L	None	Indicates the value in signed 32-bit format.	`<!--#exec cgi=/get_device.fn D7L"-->`
L+	None	Indicates the value in unsigned 32-bit format.	`<!--#exec cgi=/get_device.fn D2L+"-->`
RB	None	Indicates the value as 32-bit BCD float (SIMATIC).	`<!--#exec cgi=/get_device.fn D10RB"-->`
RF	None	Indicates the value as 32-bit IEEE float.	`<!--#exec cgi=/get_device.fn D8RF"-->`
RD	None	Indicates the value as 32-bit IEEE float without exponent.	`<!--#exec cgi=/get_device.fn D1RD"-->`
SB	None	Indicates the value in 16-bit BCD format.	`<!--#exec cgi=/get_device.fn D3SB"-->`
LB	None	Indicates the value in 32-bit BCD format.	`<!--#exec cgi=/get_device.fn D7LB"-->`
SH	None	Indicates the value in 16-bit HEX format.	`<!--#exec cgi=/get_device.fn D2SH"-->`
LH	None	Indicates the value in 32-bit HEX format.	`<!--#exec cgi=/get_device.fn D1LH"-->`
AR	None	Indicates the number of values in signed 16-bit format.	`<!--#exec cgi=/get_device.fn D5AR,10"-->`
ST	None	Indicates the number of registers as character string.	`<!--#exec cgi=/get_device.fn D9ST,30"-->`

Automatic refresh

The HTML page is usually not automatically refreshed. Adding the following code to the HTML page will enable automatic refresh.

```
<meta http-equiv="Refresh"CONTENT="5">
```

CONTENT specifies how often the page should be refreshed (in seconds).

Example of an HTML page with SSI script

```
<HTML>
<HEAD>
<meta http-equiv="Refresh"CONTENT="5">
</HEAD>
<!--#exec cgi="/get_ipaddr.fn"--><BR>
<!--#exec cgi="/get_domainname.fn"--><BR>
<BR>
One IO:<BR>
<!--#exec cgi="/get_date.fn MM/DD/YY"--><BR>
<!--#exec cgi="/get_time.fn HH:MM"--><BR>
D5 = <!--#exec cgi="/get_device.fn D5"--><BR>
M7=<!--#exec cgi="/get_device.fn M7"--><BR>
D9 (string) = <!--#exec cgi="/get_device.fn D9ST,30"--><BR>
D0-D9 =<!--#exec cgi="/get_device.fn D0AR, 10"--><BR>
D8013 = <!--#exec cgi="/get_device.fn D8013"--><BR>
</HTML>
```

CGI script

The CGI (Common Gateway Interface) is a standard method for a web server to administer data for and from the user. When the user opens a web site (by clicking a link or entering an address in the web browser) the server sends back the required page. If you fill in and send a form on a website, it is usually received by an application program. The server will return a confirmation. The procedure for data transfer between server and application is referred to as CGI and belongs to the HTTP protocol.

The following CGI scripts are supported to allow for changing values in the terminal:

Name	Parameters	Description	Example
set_date.fn	Date format, e. g. MM/DD/YY or YY-MM-DD. If not specified, the terminal settings will be used.	Is used with FORM to set the date in the terminal.	`<FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/ set_date.fn" METHOD="POST"> <INPUT SIZE=10 MAXLENGTH=10 NAME="YY:MM:DD"> <INPUT TYPE="submit" VALUE="Submit"> </FORM>`
set_time.fn	Time format, e. g. HH:MM:SS or HH:MM. If not specified, the terminal settings will be used.	Is used with FORM to set the time in the terminal.	`<FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/ set_time.fn" METHOD="POST"> <INPUT SIZE=10 MAXLENGTH=10 NAME="HH:MM:SS"> <INPUT TYPE="submit" VALUE="Submit"> </FORM>`
set_device.fn	XY X = device Y= display format (see separate table) e. g. D0L + D5SH	Is used with FORM to set a device (signal) in the controller.	`<FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/ set_device.fn" METHOD="POST"> <INPUT SIZE=10 MAXLENGTH=10 NAME="D0L"> <INPUT TYPE="submit" VALUE="Submit"> </FORM>`
set_mode.fn	RUN PROG SETUP TRANSFER	Is used with FORM to change the operating mode of the terminal.	`<FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/ set_mode.fn" METHOD="POST"> <SELECT NAME="MODE"> <OPTION VALUE="RUN">Run <OPTION VALUE="PROG">Prog <OPTION VALUE="SETUP">Setup <OPTION VALUE="TRANSFER">Transfer </SELECT> <INPUT TYPE="submit" VALUE="Submit"> </FORM>`
push_key.fn	(see separate table)	Used with FORM to simulate an activated terminal key.	`<FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/ push_key.fn" METHOD="POST"> <SELECT NAME="F2"> <OPTION VALUE="SET">Set <OPTION VALUE="RESET">Reset <OPTION VALUE="TOGGLE">Toggle </SELECT> <INPUT TYPE="submit" VALUE="Submit"> </FORM> <FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/ push_key.fn" METHOD="POST"> <INPUT SIZE=1 MAXLENGTH=1 NAME="Key"> <INPUT TYPE="submit" VALUE="Submit"> </FORM>`

Display format for set_device.fn

Name	Description
None	Indicates the value in signed 16-bit format.
+	Indicates the value in unsigned 16-bit format.
L	Indicates the value in signed 32-bit format.
L+	Indicates the value in unsigned 32-bit format.
RB	Indicates the value as 32-bit BCD float (SIMATIC).
RF	Indicates the value as 32-bit IEEE float.
RD	Indicates the value as 32-bit IEEE float without exponent.
SB	Indicates the value in 16-bit BCD format.
LB	Indicates the value in 32-bit BCD format.
SH	Indicates the value in 16-bit HEX format.
LH	Indicates the value in 32-bit HEX format.
ST	Indicates the number of registers as character string.

Parameters for push_key.fn

Parameters	Description	Example
KEY	Can assume the following values: A-Z 0-9 ACK LIST MAIN PREV BACKSPACE ENTER UP DOWN LEFT RIGHT	<FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/push_key.fn" METHOD="POST"> Key = <SELECT NAME="Key"> <OPTION VALUE="ENTER">Enter <OPTION VALUE="A">A <OPTION VALUE="B">B <OPTION VALUE="1">1 <OPTION VALUE="2">2 <OPTION VALUE="3">3 <OPTION VALUE="UP">Up <OPTION VALUE="DOWN">Down <OPTION VALUE="LEFT">Left <OPTION VALUE="RIGHT">Right <OPTION VALUE="PREV">Prev </SELECT> <INPUT TYPE="submit" VALUE="Submit"> <P> </FORM>
F1-F22	Can assume the following values: SET RESET TOGGLE	<FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/push_key.fn" METHOD="POST"> <SELECT NAME="F2"> <OPTION VALUE="SET">Set <OPTION VALUE="RESET">Reset <OPTION VALUE="TOGGLE">Toggle </SELECT> <INPUT TYPE="submit" VALUE="Submit"> </FORM>

Example of an HTML page with SSI and CGI script

```
<HTML>
<FORM  ACTION="http://<!--#exec  cgi="/get_ipaddr.fn"-->/  set_date.fn"
METHOD="POST">
Set date here (YY:MM:DD):
<INPUT SIZE=10
        MAXLENGTH=10
        NAME="YY:MM:DD"
        VALUE="<!--#exec cgi="/get_date.fn"-->">
<INPUT TYPE="submit" VALUE="Submit"> <P>
</FORM>
<FORM  ACTION="http://<!--#exec  cgi="/get_ipaddr.fn"-->/  set_time.fn"
METHOD="POST">
Set time here (HH:MM:SS):
<INPUT  SIZE=10
        MAXLENGTH=10
        NAME="HH:MM:SS"
        VALUE="<!--#exec cgi="/get_time.fn"-->">
<INPUT TYPE="submit" VALUE="Submit"> <P>
</FORM>
<FORM ACTION="http://<!--#exec cgi="/get_ipaddr.fn"-->/ set_device.fn"
METHOD="POST">
D0 =
<INPUT  SIZE=10
        MAXLENGTH=10
        NAME="D0"
        VALUE="<!--#exec cgi="/get_device.fn D0"-->">
<INPUT TYPE="submit" VALUE="Submit">
</FORM>
</HTML>
```

Saving HTML files via FTP

An FTP standard client, such as [DOP Tools] \ [DOP FTP Client], is used for transferring and saving HTML files to and on the terminal.

See section "FTP server" on page 256.

The files are stored in (transferred to) the HTML library in the terminal file system.

File names must be assigned in DOS format (8.3). The length of the file name is limited to eight characters. HTM is used as suffix.

You must have the file `INDEX.HTM`.

9.3.5 Recommendations and restrictions for network communication

Optimal signal transfer is required for fast and efficient communication between terminals and controller in a terminal network (BDTP network). Read the section "Efficient communication" in section 7.1 and observe the requirements for optimizing the network function in the terminals. A maximum of 3000 signals can be transferred in a terminal network.

Example 1

A terminal network consists of three clients and a server. Each client can access 1000 signals. This means the server has to transfer 3000 signals to the individual clients. This is also the case if the address ranges for the signals in the clients are identical. This way the signal transfer capacity in the network is utilized optimally.

Example 2

The server should retrieve the addresses that were required by the clients. The server then requests the controller status and sends it to the relevant client.

Example

A terminal network (BDTP network) consists of a server and five clients. Each terminal contains 50 alarms with the same address. For the server, this means that 50 addresses must be queried by the controller. In addition, the server must send 50 alarms to the respective client (5 x 50). Consequently, the server must distribute 250 alarms in the network.

Transparent mode via ETHERNET

The following prerequisites must be fulfilled before the [Transparent mode] via ETHERNET communication (TCP/IP protocol) function can be used:

- Driver and programming tools must support communication in transparent mode. (For more information, refer to the driver or controller manual.)
- You will have to use a program for conversion from COM port to TCP/IP if the programming software for the controller supports project transfer via TCP/IP. This program communicates with the controller in transparent mode via TCP/IP network.

Pass-through mode via ETHERNET

Communication in pass-through mode is only possible if the drivers support this mode. See section 9.1 "Communication".

The following prerequisite must be fulfilled before pass-through mode via ETHERNET communication (TCP/IP protocol) can be used:

- You will have to use a program for conversion from COM port to TCP/IP if the programming software for the controller does not support project transfer via TCP/IP. This program communicates with the controller in transparent mode via the TCP/IP network. (For more detailed information, refer to the driver or controller manual.)

No protocol mode

The [No protocol mode] function, which is used when one or more terminals act as the communication interface (see also section 9.1 "Communication"), is not recommended for large terminal networks (BDTP networks).

A large network is a BDTP network with a large amount of signals between server and clients. Control registers and control signals are transferred when the terminal acts as communication interface. Registers and signals negatively influence communication speed and reduce network performance. See section "Efficient communication" in section 7.1.

Signal packages

Optimal signal transfer is of great importance for fast and efficient communication between terminals and controller (e. g. in a network). Read the section "Efficient communication" in section 7.1 and observe the requirements for optimizing the network function in the terminals. These requirements apply to all stations in the terminal network. The refresh duration may increase if signals are not transferred in packages.

Alarm handling

The terminal network is a client / server network. The server contains data (e. g. alarm signals) that are requested by clients. A great number of different signals negatively influence the duration of communication between terminals and controllers in the network. The number of signals should therefore be limited. For further information, refer to "Efficient communication" in section 7.1.

The number of alarm signals in the network must not exceed the number of signals the server is capable of processing in the entire network. A server can process between 100 and 300 alarms depending on the application and the terminal. Consequently, a network must not comprise more than a total number of 100 and 300 alarms.

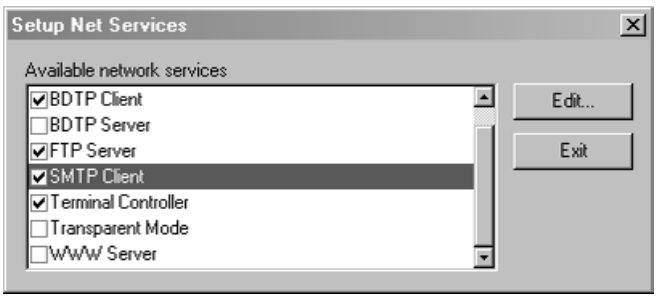
Index in the network client

In run mode, index addressing helps to specify the register from which an object should retrieve the displayed value. Index addressing cannot be used in terminals that act as BDTP clients. BDTP clients exclusively use the index register of the BDTP server.

However, if a terminal that acts as a BDTP client also has a local controller, the normal regulations apply when using index addressing.

9.4 Network services

You select the available services for the terminal in the network under [Setup] / [Network] / [Services]. Select the relevant function and click [Edit].



10805AEN

9.4.1 Project transfer server

Transfer of projects using TCP/IP. Click on Edit and enter the port number to be specified for a transfer. This value usually need not be changed.

9.4.2 BDTP

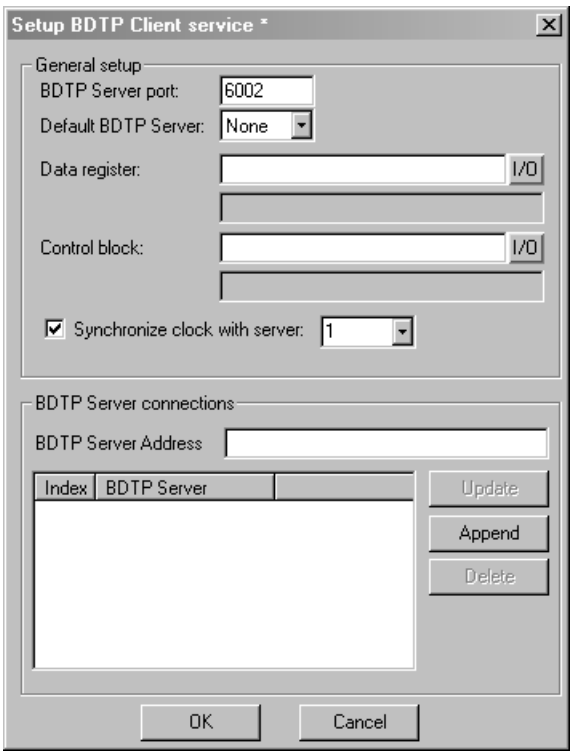
BDTP is a protocol that uses client/server communication. A client requests information and obtains this information from the server. The BDTP server can receive I/O requests from the BDTP clients. The terminal can be a server, a client, or both at the same time. A client can request data from maximal 16 servers. The IP addresses of the server are specified in the BDTP client. Each server can supply up to 20 clients with information.

Network communication via BDTP is used to connect two or more terminals with one or two controllers, or several terminals with two or more controllers at the same performance level. An example of network communication via BDTP is for production lines with one terminal at each work station.

If the BDTP server fails, the client will continue to use the physically existing system connection. The client does not perform a restart for establishing a connection to the server. When the server is active, BDTP communication takes place as before.

9.4.3 BDTP client

For the BDTP client network service, IP addresses are defined for the BDTP server in the network from which the client will request information. Clicking on [Edit] opens the following dialog box.



10986AEN

BDTP server port Enter the communication port to which the BDTP server or the network is connected. This value usually need not be changed.

Standard BDTP server You can specify a standard server which will be used by default. If no other entry is made for I/O, the signals will be requested from this server.

Data register The values in the data register can be transferred between a client and various servers in the network. The first register in the register block of the client that is to be transferred to or from the specified server is defined under Data register. The register type must be the same for client and server.

54652AEN

Control block

Control block specifies the first register in the control block of the client, which occupies a total of five registers.

Register	Contents	Description	
Ctrl. reg. 1	Command	Command register defined in the client.	
		Available commands:	
		0	No command
		1	Transfers the register values from the client to the server specified in control register 3.
		2	Transfers the register values from the server, which is specified in control register 3, to the client.
Ctrl. reg. 2	Result code	Result code register defined in the client.	
		Available commands:	
		0	Ready for new command
		1	OK
		2	Transfer error
Ctrl. reg. 3	Server index	Number of the server in the network with which the data is exchanged.	
Ctrl. reg. 4	Index register	The value in the index register is added to the address of the register specified under Data register. When a zero is entered, the register block starts for the address specified in the data register.	
Ctrl. reg. 5	Number of registers	Number of registers whose values are to be transferred from or to the specified server.	

The following procedure must be followed for transfer:

1. The result code register must be 0. If not, check whether the command register is set to 0.
2. Enter the command in the command register.
3. Wait for the ready signal or the error code in the result code register.
4. Set the command register to 0. The terminal will then set the result code register to 0.

Synchronize clock with server

Specify whether you want the clock in the client to be synchronized with a certain server (terminal). Enter the number of the required server in the selection field for this purpose. If the clock in the client is changed locally, the new data will also be transferred to the server.

BDTP server address

Enter the IP address for the server from which the client is to request data. The addresses are indexed in the order they are entered.

When programming the project, it is essential to specify the server from which the address is to be requested. In the address field of the object dialog boxes, enter the text "Index>server signal."

For example, if you enter "2>D15" in the address field, the value for the object from register D15 on the server will be retrieved using index 2.

You can change the server index in a client project using the [BDTP station change function.

If no controller is connected to the BDTP client (terminal), the inverter/PLC 1 and inverter/PLC 2 units must be dragged from the RS-232C / RS-422 / RS-485 interfaces to "Unused functions" in the [Peripheral configuration] dialog box. Call up this dialog box from [Setup] / [Peripherals] from the dialog.

9.4.4 BDTP server

The BDTP server handles queries from clients and supplies clients (terminals) with information after a request from a client (terminal). Click on Edit and enter the port. This value usually need not be changed.

Parameters	Description
Server port	Communication port for the BDTP server. Usually need not be changed.
Max. clients	Maximum number of BDTP clients (terminals) in the network.
Data register	The values in the data register can be transferred between a server and various clients in a network. The first register in the register block of the server that is to be transferred to or from the specified client is defined under Data register. The register type must be the same for client and server. Data transfer can only be controlled from the clients. For further information on data transfer, refer to section "BDTP client" on page 273.
Clock server	Specify whether you want all other clients in the network to be synchronized to the current server clock. See also section "BDTP client" on page 273.

9.4.5 FTP server

This function allows for transferring data from a PC to and from the terminal. The FTP server in the terminal supports data transfer in passive mode (PASV). The passive mode should be used if the terminal is not connected using PPP connection. This is necessary because it is not possible to determine in advance which components are connected between client and server, e. g. router based firewalls or gateways.

Using passive mode eliminates several errors. Web browsers use this mode as standard. Passive mode can also be used with PPP connections. National special characters in file names are not supported. The terminals use files without dates.

For more information on the FTP server in the terminal, see section 9.3 "Network functions in the terminal".

To make the settings for this function, select the entry [FTP server] from [Setup] / [Network] / [Services] and click [Edit].

Parameters	Description
Control port number	The standard value is 21 and should not be changed.
Data port number	The standard value is 21 and should not be changed.
Request login	Here you specify whether the user requires to log in to be granted access to the FTP server (terminal). Make the user definition under [Setup] / [Network] / [Accounts]. See section 9.5 "Network accounts". If you do not activate this option, all users will have unlimited access right to the FTP server.
Pre login text	Text that appears after the login prompt: e. g. "The terminal requires login. Enter the login data."
Post login text	Text that appears after the login prompt: e. g. "You are logged in."
Connection timeout (min)	Permitted idle time for the FTP connection before the FTP server (terminal) will disconnect the connection. The standard value is 10 minutes.

9.4.6 STMP client

This function allows for sending e-mails from the terminal. For using the SMTP client function, a mail server is required to which the message can be sent from the terminal. The receiver retrieves the mail message from the mail server. You can use the mail server of your Internet service provider or a local mail server. You can attach trend and recipe files to an e-mail. The attached files can only be read using DOP Tools. Up to a maximum of 20 messages can be sent simultaneously.

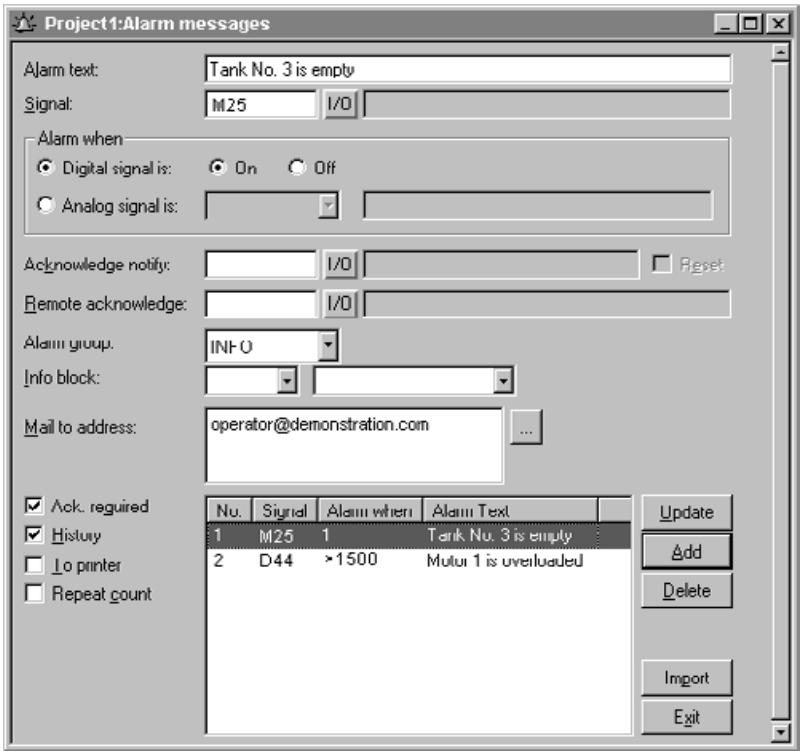
Under [Setup] / [Network] / [Services], select the entry [SMTP server], click [Edit] and make the following settings:

Parameters	Description
Server port	Connection port 25. Usually need not be changed.
Mail server	IP address for the mail server or alias name (DNS server) for the SMTP mail server. If you enter an alias name, you have to enter the IP address for the DNS server under [Setup] / [Network] / [TCP/IP connections].
My domain name	Name of the terminal or another domain (e-mail address) used for logging on to the SMTP server: e. g. the domain name in "mail@master.com" is "master.com".
My e-mail address	Enter your e-mail address. The recipient will see this name as sender. If possible, enter an e-mail address to which the mail server can send back error messages in case of an error.
Send via connection	Specify the TCP/IP connection to be used for sending the e-mail. Note that TCP/IP connection 1 must be used before TCP/IP connection 2 is available.
Predefined recipients	Predefined list with maximal 16 recipients, e-mail addresses, to which the terminal will send messages. The maximum length for a recipient address is 60 characters.

Sending alarms by e-mail

Alarms can not only be printed but can also be sent by e-mail. You can transfer the entire alarm list by sending block 990 (see section "Sending reports by e-mail").

Each alarm can be linked to one or several e-mail addresses in the configuration of the STMP client. You can make a general setting for the status of alarms for being sent by e-mail under [Setup] / [Alarm settings]. See section "Alarm handling" on page 272.



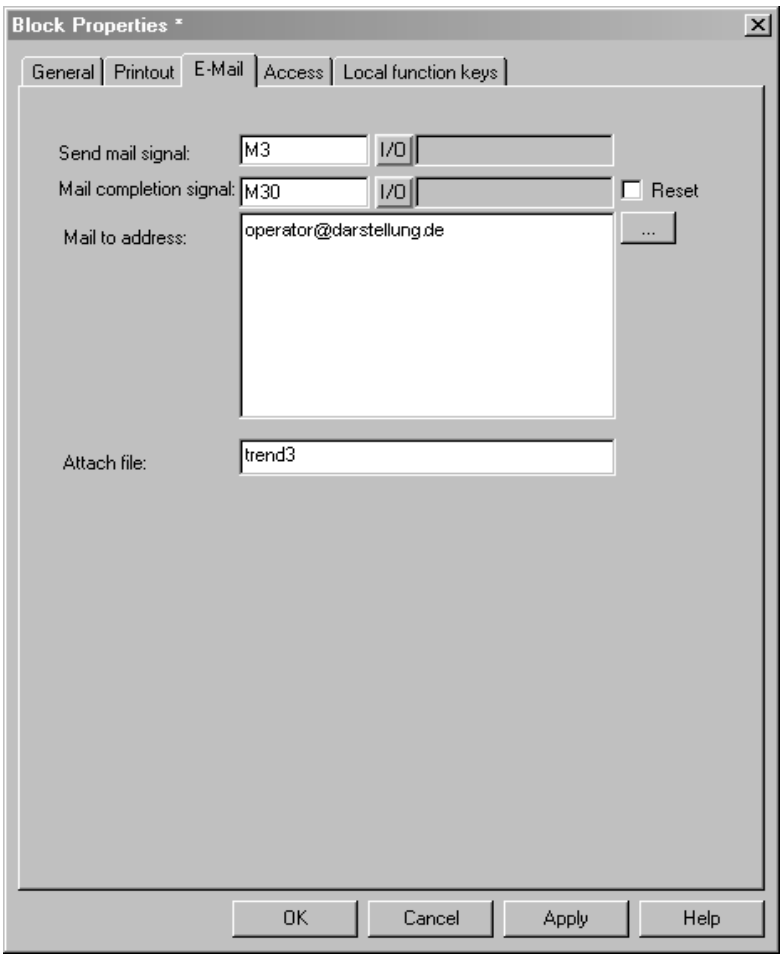
10806AEN

Parameters	Description
Info block	If an info block is specified that is a text block, the info block will be included in the e-mail. See section "Alarm handling" on page 272.
Mail to address	Define the mail recipient. You can choose up to eight recipients from the predefined list in the [Setup STMP Client Service] dialog box.

Sending reports by e-mail

Text blocks can not only be printed but can also be sent by e-mail. Alarm block 990 can also be sent as e-mail.

Only text blocks can be sent. Alarm block 990 is the only system block that can be sent as e-mail. Trend and recipe files can be sent as attachment to the e-mail message. There are restrictions when using Unicode. For further information, refer to section 8.8 "Unicode".

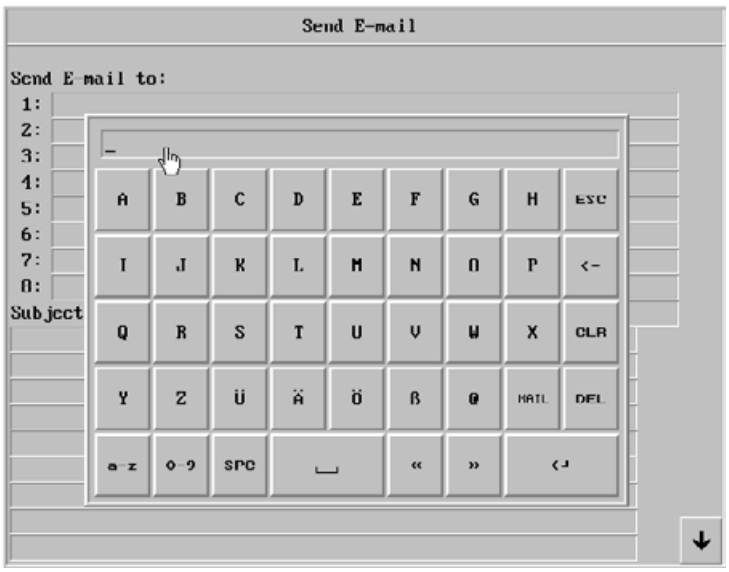


11284AEN

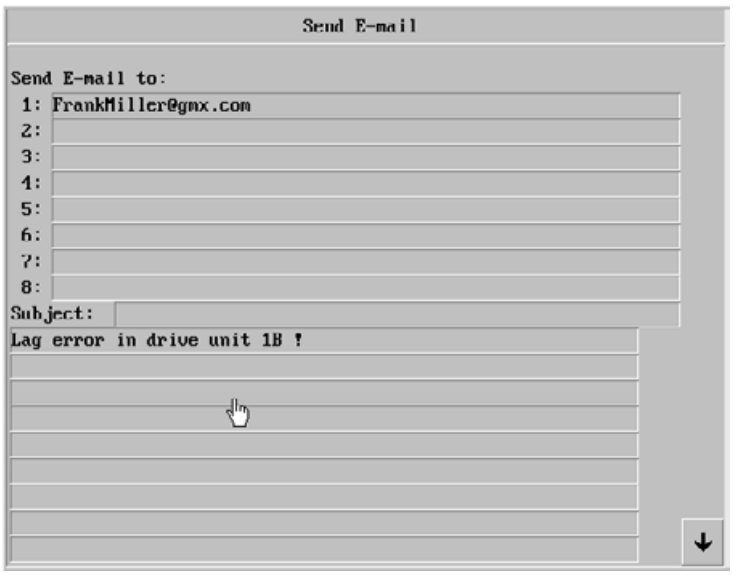
Parameters	Description
Block name	The name of the text block will be sent as subject if you enter the name of a text block in this field.
Send mail signal	An e-mail will be sent when the specified digital signal is activated.
Completion signal	Digital signal that is output by the terminal after an e-mail has been sent. The signal is usually activated by the terminal. Selecting the [Reset] option will reset the signal when the e-mail was sent.
Mail to address	The e-mail address of the recipient is entered in this field. Clicking the [...] button enables you to select up to eight recipients from a list. The list with e-mail addresses is created under [Setup] / [Network] / [Services] in the [Create SMTP Client Service] dialog box.
Append file	Enter the name of a trend or recipe file you want to attach to your mail. If a trend file and a recipe file have the same name, the trend file will be attached. The file name must not contain national special characters, such as B, Ä, Ö and Ü.

Sending e-mails via system block

A block jump to the [E-mail] system block (993) enables you to print and send messages in run mode.



10810AEN



10811AEN

Parameters	Description
Send e-mail to	Enter the recipient. You can type an address or select an entry from the global list. To display the global list, press the <LIST> key on terminals with keyboard, or the <MAIL> key on terminals with touchscreen.
Topic	Enter the subject of your message. The subject length is limited to 50 characters. The message text is limited to 10 lines with 50 characters each.

9.4.7 Terminal controller

Is used for changing from RUN to TRANSFER via TCP/IP. Click on [Edit] and enter the port number to be specified for a transfer. The port number usually need not be changed. Activate the [Requirement authorization check] option if user and password should be specified prior to transfer. Users are defined under [Setup] / [Network] / [Accounts].

9.4.8 Transparent mode

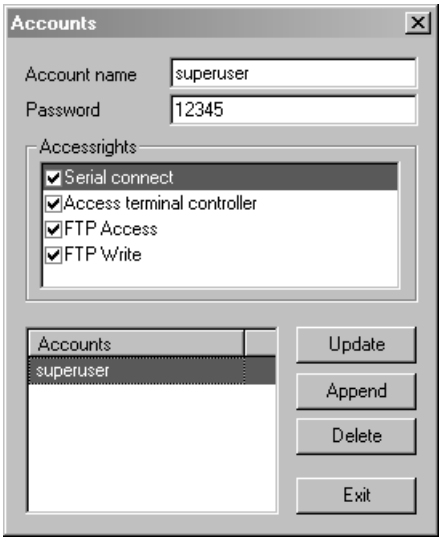
Is used for communication in transparent/pass-through mode in the terminal network via ETHERNET (see also sections 9.1 "Communication" and 9.3 "Network functions"). Click on [Configure transparent mode]. In this case, the unit must be connected via TCP/IP.

Parameters	Description
IP settings	Port number 6004 usually need not be changed. Select the required protocol: UDP or TCP.
Inverter / PLC-systems	Define whether you want the transparent / pass-through mode to apply to controller 1 or 2.
Mode	Select transparent or pass-through mode as communication type. Enter a time interval in seconds under [Timeout] after which the terminal will change from pass-through mode back to run mode if no pass-through communication took place.

9.4.9 WWW server

You can configure the web server in the terminal with this function. A www server is a program that uses client / server models and the Hypertext Transfer Protocol (HTTP) to transfer files that form web sites of Internet users (with computers with HTTP clients).

See also section 9.3 "Network functions in the terminal".



10809AEN

Parameters	Description
Account name	Defining an account name protects HTML pages in the terminal with passwords. Accounts are defined under [Setup] / [Network] / [Accounts].

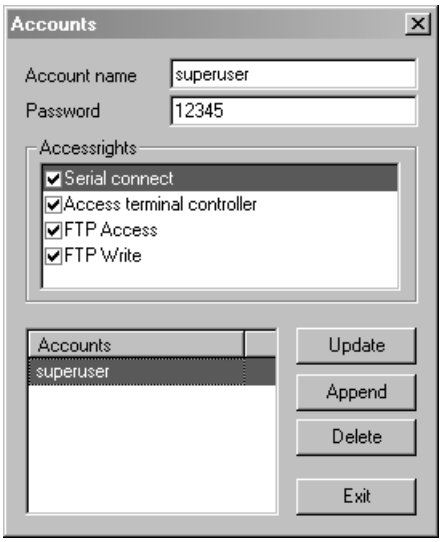
Password	Enter a password. All HTML pages are protected with this account name and password.
	To protect an individual page with another account name and password, add the following code to the HTML header:
	`<HTML>`
	`  <HEAD>`
	`  <META name="superuser"`[1)] `content="12345">`
	`  </HEAD>`
	Contains the remaining HTML code.
	`</HTML>`

1) "superuser" stands for the account name and "12345" for the password.

The header must contain the above mentioned code. The *Name* and *Content* parameters must have an account name and a password.

9.5 Network accounts

Under [Setup] / [Network] / [Accounts], you can define who may access terminal services that require login. This function creates an authorization check. This means a user name and password are created for various users with access to different services in the network. National special characters are not permitted in account names and passwords.



10809AEN

According to the figure, the account with the name "Superuser" is authorized to access all network functions requiring login. The buttons enable you to update, append and delete accounts in the list.

Parameters	Description
Account name	Enter an account name.
Password	Enter a password for the account.

9.5.1 Access rights

Parameters	Description
Serial connection	The user can establish a serial connection (PPP). This option should be activated.
Access terminal controller	Is used for changing from RUN to TRANSFER via TCP/IP. This option should be activated.
FTP Access	The user has read access on the FTP server (terminal).
FTP Write	The user has write access on the FTP server. This also requires FTP access.

10 Technical Data and Dimension Drawings

10.1 General technical data

10.1.1 Display

	DOP11A-10	DOP11A-20	DOP11A-30	DOP11A-40	DOP11A-50
Graphics resolution (pixels)	No graphics	240 x 64	320 x 240	320 x 240	640 x 480
Line x characters text	2 x 20	Graphic			
Active screen size, W x H	73.5 x 11.5 mm	127.2 x 33.9 mm	115.2 x 86.4 mm	115.2 x 86.4 mm	211.2 x 158.4 mm
Backlight	50,000 h at an ambient temperature of +25 °C. LED.		50,000 h at an ambient temperature of +25 °C. Touchscreen. CFL	50,000 h at an ambient temperature of +25 °C. CFL.	50,000 h at an ambient temperature of +25 °C. Touchscreen.
Contrast setting	Via slide rule; position: Upper right hand corner on terminal back.	Via system block			
Screen	LCD screen (liquid cristal), monochrome, 2 lines with 20 characters each, 5 mm character size	LCD screen (liquid cristal), 240 x 64 pixels, monochrome, 4 lines with 20 characters each or 8 lines with 40 characters each.	LCD screen (liquid crystal), 320 x 240 pixels, 256 colors (graphics and text)	LCD screen (liquid crystal), 320 x 240 pixels, 256 colors (graphics and text)	TFT screen, 640 x 480 pixels, 256 colors (graphics and text)

10.1.2 Technical data

	DOP11A-10	DOP11A-20	DOP11A-30	DOP11A-40	DOP11A-50
Keyboard	• Numeric keypad • Navigation keypad • Three function keys • No LEDs	• Numeric keypad • Navigation keypad • Eight function keys • 16 LEDs (red / green)	Touch resistive	• Numeric keypad • Navigation keypad • 16 function keys • 16 LEDs (red / green)	Touch resistive
Keyboard material / Material for unit face	Membrane keypad with polyester caps Overlay autotex F207 with back print 1 million operations	Membrane keypad with polyester caps Overlay autotex F207 with back print 1 million operations	Touchscreen Polyester on glass 1 million operations	Membrane keypad with polyester caps Overlay autotex F207 with back print 1 million operations	Touchscreen Polyester on glass 1 million operations
Graphical objects	No	Yes			
Real-time clock	±10 PPM + error display through ambient temperature and supply voltage. Max. total error display: 1 minute/month = 12 minutes/year. The real-time clock battery has a rating life of ten years.				
Supply voltage	DC 24 V (DC 20 ... 30 V), 3-pin terminal contact CE				AC 100 ... 240 V, 50/60 Hz, 3-pin terminal contact CE
	The voltage supply has to meet requirements for SELV according to IEC 950 or IEC 742. UL: Supply voltage according to guidelines for voltage supply class 2.				
Current consumption at operating voltage	Max. 200 mA	Without load: 300 mA Max. load: 450 mA	Max. 400 mA	Without load: 300 mA Max. load with expansion card: 550 mA	Max. 0,17 ... 0.35A (AC 240 ... 100 V)
Ambient temperature	0 to +50°C				
Storage temperature	-20 to +70°C				
Humidity	Max. 85 % (non-condensed)				
Dimensions W x H x D	142 x 90 x 3.5 mm	214 x 194 x 6 mm	200 x 150 x 5 mm	276 x 198 x 5.7 mm	290 x 247 x 6 mm
Installation depth	29 mm without sub D connector and 96.5 mm with sub D connector	69 mm without sub D connector and 110 mm with sub D connector	70 mm without sub D connector and 70 mm with sub D connector	87 mm without sub D connector and 110 mm with sub D connector	109 mm without sub D connector and 130 mm with sub D connector
Enclosure front	IP65, NEMA 4, NEMA 4X (indoor use only)				IP65, NEMA 4
Enclosure back	IP20				
Protection material back	Galvalume	Yellow-chromatized sheet metal			
Weight	Without sub D connector: 0.5 kg	Without sub D connector: 1.5 kg	Without sub D connector: 1.5 kg	Without sub D connector: 1.7 kg	Without sub D connector: 3.3 kg
Memory	Flash memory: 64 kB for application	Flash memory: 400 kB for application			Flash memory: 1600 kB for application
EMC tests on terminal	The terminal conforms with the essential protection requirements in article 4 of the EMC directive 89/336/EEC. Tested according to: EN 50081-1 (emission) and EN 50082-2 (interference immunity).				
UL approval	UL 508, UL 1604 (class I div 2)				
DNV approval	Approval by Det Norske Veritas Typgodkännande in classes temperature A, relative humidity B, vibration A, protection cover C (front cover only).				
Expansion slots	None	1 expansion slot	1 expansion slot	2 expansion slots	2 expansion slots

10.1.3 Functions

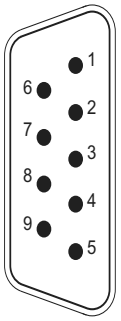
	DOP11A-10	DOP11A-20	DOP11A-30	DOP11A-40	DOP11A-50
Alarm handling	No	Yes			
Intervals per time channel	4				
Recipe management	Yes				
Passthrough mode	Yes				
Dual protocol	Yes				
Web server	No	Yes, with ETHERNET option			
Printer function	Yes				

10.1.4 Communication

	DOP11A-10	DOP11A-20	DOP11A-30	DOP11A-40	DOP11A-50
Serial interfaces	Separate interface for programming and inverter communication. • RS-232 • RS-485/ RS-422 Two interfaces can be used at the same time.	Separate interface for programming and inverter communication. • RS-232 • RS-422 • RS-485 from HW1.10 Two interfaces can be used at the same time.	Separate interface for programming and inverter communication. • RS-232 • RS-422 • RS-485 Two interfaces can be used at the same time.	Separate interface for programming and inverter communication. • RS-232 • RS-422 Two interfaces can be used at the same time.	Separate interface for programming and inverter communication. • RS-232 • RS-422 Two interfaces can be used at the same time.
Fieldbus via option slot	No options	PROFIBUS DP or ETHERNET		• PROFIBUS DP and / or • ETHERNET	• PROFIBUS DP and / or • ETHERNET
Serial port RS-422	25-pin sub D connector, installed socket with standard retaining screws 4-40 UNC.				
Serial port RS-232	9-pin sub D connector, installed plug with standard retaining screws 4-40 UNC.				
Serial port RS-485	RS-422 and RS-485 are combined in 25-pin sub-D connector. Installed socket with standard retaining screws 4-40 UNC.		4-pin contact, installed plug		

10.2 Pin assignment

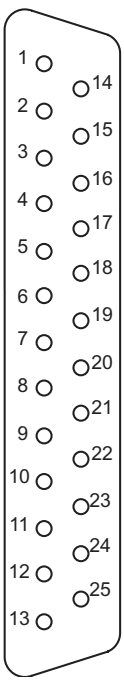
10.2.1 RS-232

D-sub 9-pin connector	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	1	+5 V >200 mA [1]	←
	2	TxD	→
	3	RxD	←
	5	0V	
	7	CTS	←
	8	RTS	→
	9		

1) not connected

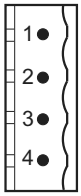
10.2.2 RS-485

Applicable for DOP11A-10 and DOP11A-20 from HW 1.10 only.

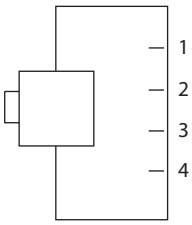
D-sub 25-pin socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	2	Tx/Rx+	↔
	15	Tx/Rx-	↔
	6	Tx/Rx -/ 120 Ω [1]	
	19	Tx/Rx+ [1]	
	7,8	0V	

1) Jumper between 6 and 19 active 120 Ω terminating resistor of RS-485 bus.

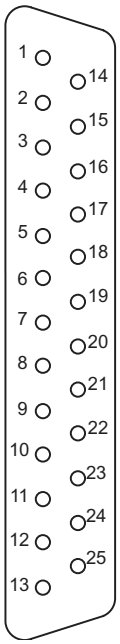
For DOP11A-30 only.

COMBICON 4-pin socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	1	Tx/Rx+	↔
	2	Tx/Rx-	↔
	3	0V	
	4	⏚	

Only applies to PCS21A.

RJ10 4-pin connector	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	1	Do not assign	Reserved
	2	Tx/Rx+	↔
	3	Tx/Rx-	↔
	4	⏚	

10.2.3 RS-422

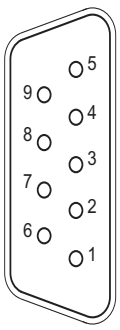
D-sub 25-pin socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	2	+TxD	→
	15	-TxD	
	3	+RxD	←
	16	-RxD	
	4	+RTS	→
	17	-RTS	
	5	+CTS	←
	18	-CTS	
	20	1)	
	21	1)	
	7,8	0V	
	14	+5 V <50 mA	→
	12,13, 24,25	2) +5 V >200 mA	←
	9	3) TxD	→
	10	3) RxD	←
	22	3) CTS	←
	23	3) RTS	→

1) Terminal no. 20 connected internally to terminal no. 21

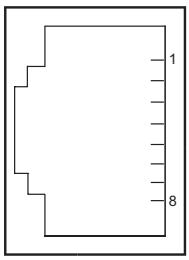
2) For DOP11A-10 only:

3) Rerserved

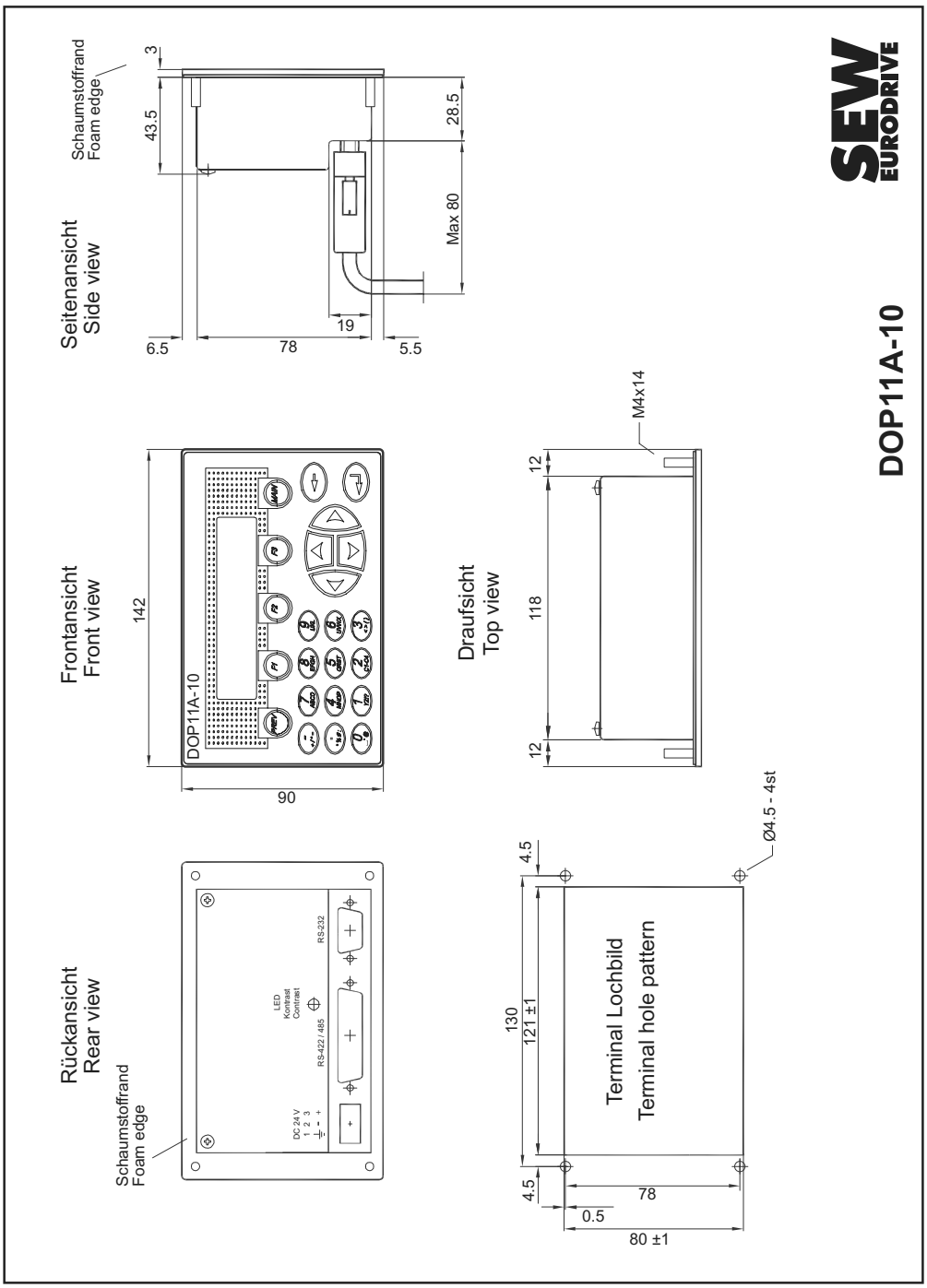
10.2.4 PROFIBUS-DP (option card)

D-sub 9-pin socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	1		
	2		
	3	RxD / TxD-P	↔
	5	DGND	
	7		
	8	RxD/TxD-NS	↔
	9		

10.2.5 ETHERNET 10 Base T (option card)

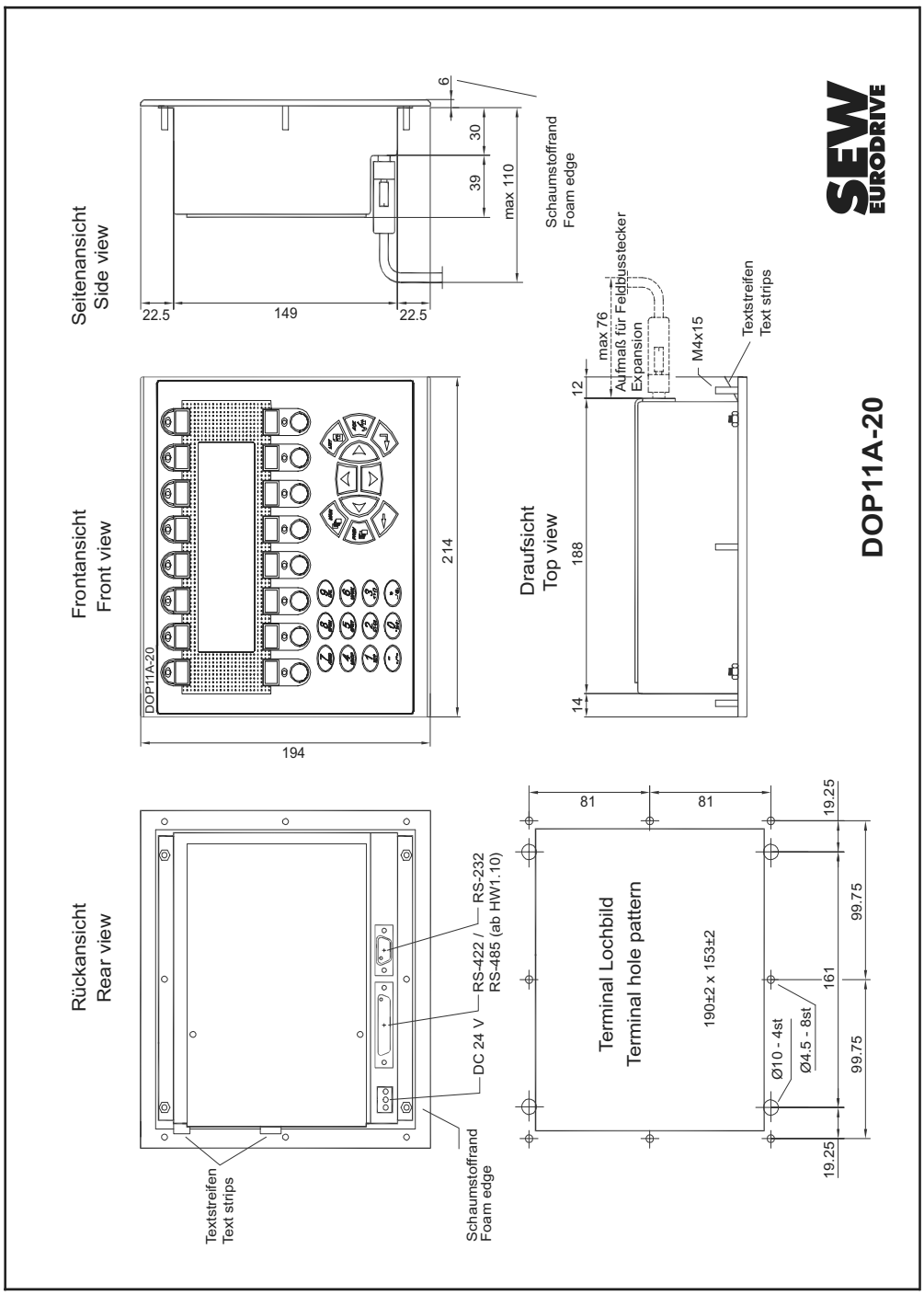
RJ45 socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	1	Tx+	→
	2	Tx-	→
	3	Rx+	←
	6	Rx-	←

10.3 DOP11A-10



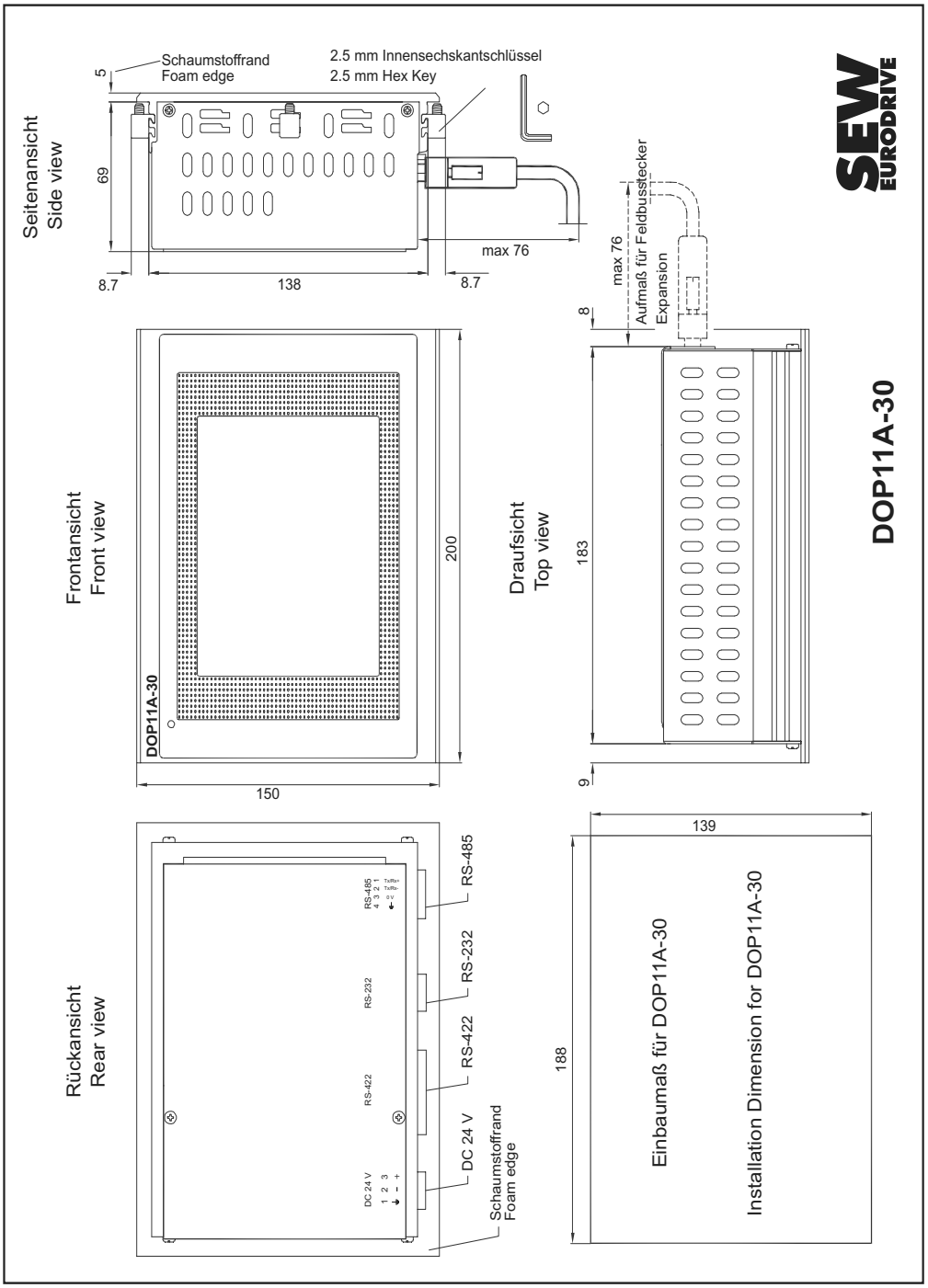
53454AXX

10.4 DOP11A-20



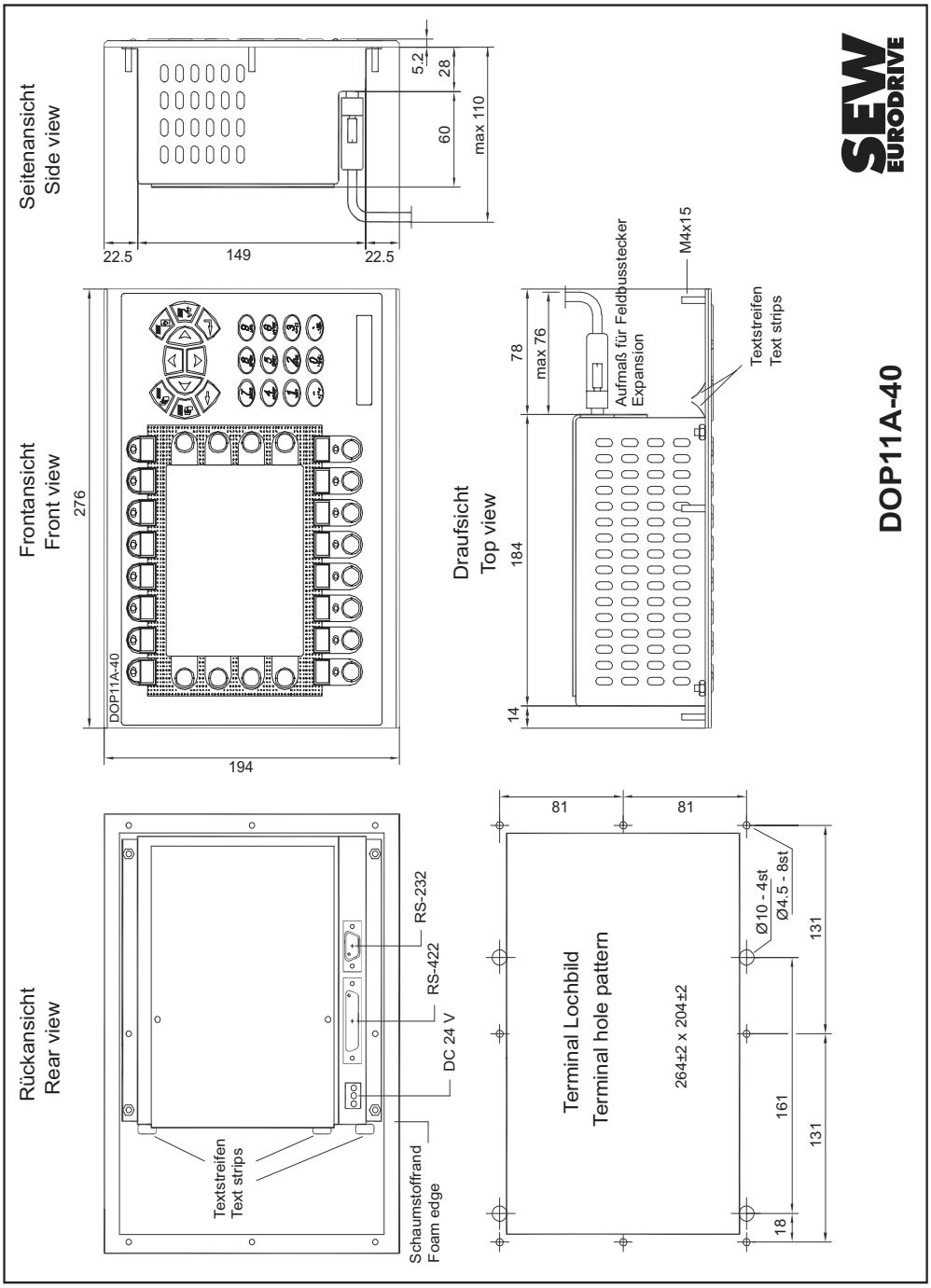
53455AXX

10.5 DOP11A-30



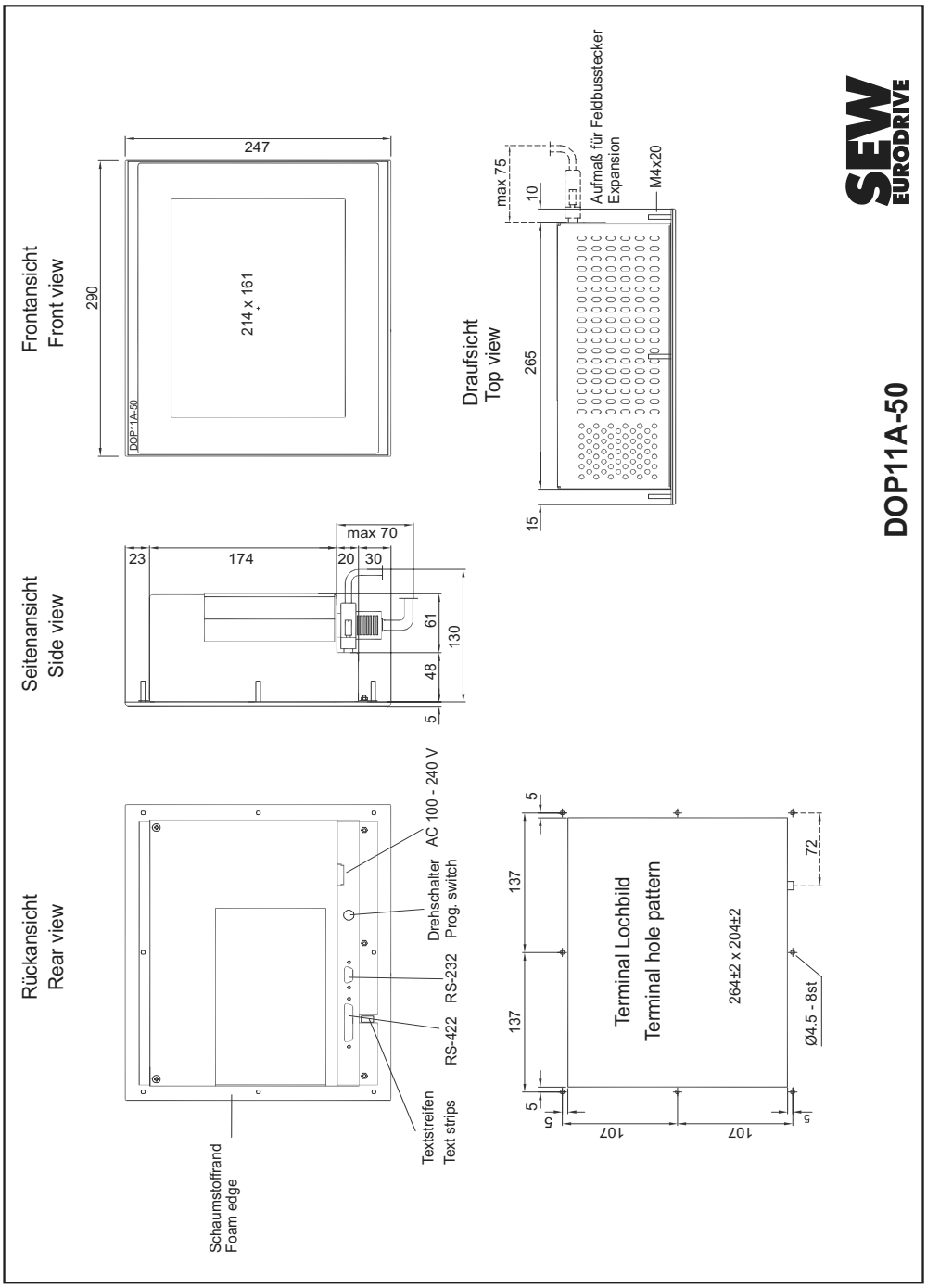
53458AXX

10.6 DOP11A-40



53459AXX

10.7 DOP11A-50



53459AXX

11 Appendix

11.1 Membrane keypad

11.1.1 Resistance to solvents for Autotex 2

Acceptable substances

The Autotex 2 material of the operator terminal can be exposed to the following substances according to DIN 42 115 part 2 for more than 24 hours without showing any noticeable changes:

- Ethanol
- Cyclohexanol
- Diacetone alcohol
- Glycol
- Isopropanol
- Glycerine
- Methanol
- Triacetin
- Dowanol DRM/PM
- Acetone
- Methyl ethyl ketone
- Dioxan
- Cyclohexanone
- Methylisobutylcetone
- Isophorone
- Ammonia <40%
- Caustic soda <40%
- Caustic potash <30%
- Alkaline carbonate
- Bicarbonate
- Potassium ferricyanide
- Acetonitrile
- Sodium bisulphate
- 1.1.1 Trichloroethane
- Ethyl acetate
- Diethyl ether
- n-butyl acetate
- Amyl acetate
- Ethylene glycol monobutyl ether
- Ether
- Sodium hypochloride <20%
- Hydrogen peroxide <25%
- Potassium carbonate
- Gasolin
- Formaldehyde 37% - 42%
- Ethanal
- Aliphatics
- Toluene
- Xylene
- Mineral spirit
- Formic acid <50%
- Acetic acid <50%
- Phosphoric acid <30%
- Hydrochloric acid <36%
- Nitric acid <10%
- Trichloracetic acid <50%
- Sulfuric acid <10%
- Cutting oil
- Diesel oil
- Linseed oil
- Parrafin oil
- Blown castor oil
- Silicone oil
- White spirit
- Universal brake oil
- Decon
- Aviation gasoline
- Laundry detergent
- Fabric softener
- Ferrous (III) chloride
- Ferrous (II) chloride
- Dibutyl phthalate
- Diethyl phthalate
- Soda
- Fresh water
- Salt water
- Teepol

Autotex did not show any signs after being exposed to pure acetic acid for less than one hour according to DIN 42 115 part 2.

Harmful substances

The operator terminal may not get in contact with the following substances.

- Strong mineral acids
- Strong caustic solutions
- High pressure vapor with a temperature of more than 100°C
- Benzyl alcohol
- Dichloromethane

Substances that do not change colors

Autotext will not change colors when being exposed to the following substances for 24 hours at a temperature of 50°C:

- Top Job
- Ajax
- Persil (laundry detergent)
- Coffee
- Fantastic
- Formula 409
- Grape juice
- Jet Dry
- Vim (cleansing agent)
- Wisk
- Lenor
- Downey
- Ariel (laundry detergent)
- Milk
- Gumption
- Domestos
- Vortex
- Windex

Substances that may change colors

Closer examination showed slight discolorations due to contact with the following substances:

- Tomato juice
- Ketchup
- Lemon juice
- Mustard

11.2 Downloading the system program

The operator terminal is delivered with a system program (operating system) stored in the terminal memory. You can replace the system program, e. g. to update it to a newer version. The following equipment is required to load the system program into the terminal:

- PC
- Connection cable between PC and operator terminal (PCS11A)
- PC program SYSLOAD.EXE (system loader, icon in the DOP Tools program group)
- File with new system program

Proceed as follows to download the system program:

1. Connect PC and operator terminal using the connection cable.
2. Start the PC program by selecting [Programs] / [Drive Operator Panels DOP] / [DOP Tools] / [DOP System Loader] from the startup menu.

No settings are required in the operator terminal.

You can define the communication port and the transfer speed under [Options] / [Comm Settings] in [DOP Tools] /DOP System Loader[.

The checkbox for overwriting the controller driver must be activated when replacing the system program with an elder version.

If the download process fails when downloading a new system program (*.bin file) after you have clicked on [Send] in [DOP Tools] / [DOP System Loader], the terminal will automatically enter sysload mode. You can try to download the system program again once the terminal has entered sysload mode.

12 Index of Changes

12.1 Changes compared to the previous version

The following section lists the changes made to the individual sections from edition 09/2004, publication number 11276916.

Important Notes

- The following subsections have been added to this section:
  - "Liability for defects"
  - "Product names and trademarks"

Safety Notes

- The following subsections have been added to this section:
  - "Transportation/storage"

Unit Information, Installation and Hardware

- Cable PCS21A has been added to the subsection "Accessories and options."

Installation

- The subsection "Connecting RS-485 to PCS21A" has been added.

Operation and Service

- The subsection "Transferring projects with PC and HMI-Builder" has been revised.

Programming

- The subsection "System prerequisites" has been revised.
- The subsection "Programming with the programming software" has been revised.

Network functions and communication

- The subsection "Communication" has been revised.

Technical Data and Dimension Drawings

- The subsection "Pin assignment" has been revised.

13 Index

Address List

Germany			
Headquarters **Production** **Sales**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Service **Competence Center**	**Central** Gear units / Motors	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte-gm@sew-eurodrive.de
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France			
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	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
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Algeria			
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Argentina			
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Australia			
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	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
	Townsville	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at

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Cameroon			
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Canada			
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Denmark			
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Lebanon			
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Luxembourg			
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Netherlands			
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New Zealand			
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	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
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Portugal			
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	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk

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South Africa			
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	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za

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Switzerland			
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Tunisia			
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Turkey			
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USA			
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	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
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	Additional addresses for service in the USA provided on request!		

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Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve sewventas@cantv.net sewfinanzas@cantv.net

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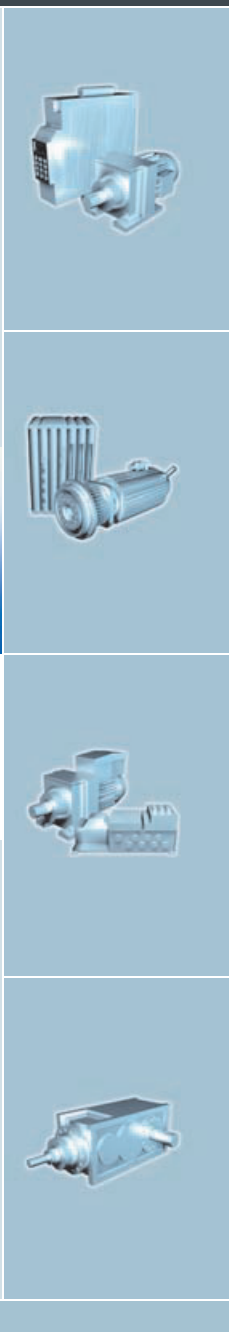

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