SIEMENS

Industrial Controls

Function Block Library AS-Interface for SIMATIC PCS 7

AS-Interface PCS 7 Library V7.1+SP1 / AS-Interface PCS 7 Library V7-V8 Migration V8.0+SP1

Programming and Operating Manual

Edition 10/2013

Answers for industry.

SIEMENS

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AS-Interface
AS-Interface PCS 7 Library "V7.1+SP1" / "V7-V8 Migration V8.0+SP1"

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Legal information

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This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

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indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

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indicates that minor personal injury can result if proper precautions are not taken.

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Table of contents

Introduction 1

1.1 General Information

General

The "AS Interface PCS 7 Block Library V7.1 + SP1" Software Package can be used as of PCS 7 V6.1.

The "AS Interface PCS 7 Block Library V7-V8 Migration + SP1" Software Package can be used as of PCS 7 V8.0.

The two software packages contain the following components for integrating the CP 343-2 / CP 343-2P AS-i communication modules and the DP/AS-i LINK Advanced into the driver design of PCS 7:

- Block library with:
  - Diagnostics block for integrating the CP 343-2 and CP 343-2P AS-i communication modules
  - Diagnostics blocks for integrating the DP/AS-i LINK Advanced with one or two AS-i lines
  - Driver blocks for activating digital inputs / outputs for AS-i slaves with standard or A address or with B address that are integrated with CP 343-2 / CP 343-2P
  - Driver blocks for analog AS-i slaves that are integrated with DP/AS-i LINK Advanced
- Symbols for the PCS 7 maintenance station
- Online help in German and English

The processing of digital inputs / outputs for AS-i slaves that are integrated with the DP/AS-i LINK Advanced is made via the standard PCS 7 blocks CH_DI and CH_DO.

1.2 Installing the library

To start the installation, please insert the CD in the CD-ROM drive on your PG/PC and launch the "setup.exe" program. All the other information you need will be provided during the installation process. Please also read the information in the readme file.

1.3 Configuration with CP 343-2 / CP 343-2P

1.3.1 Hardware configuration

AS-Interface communications processors are integrated in HW Config as an S7-slave (via Object Manager).

The following modules and configurations are supported:

CP 343-2	(6ES7343-2AH01-0XA0)
CP 343-2P	(6ES7343-2AH11-0XA0)

1.3.2 Configuration in HW Config

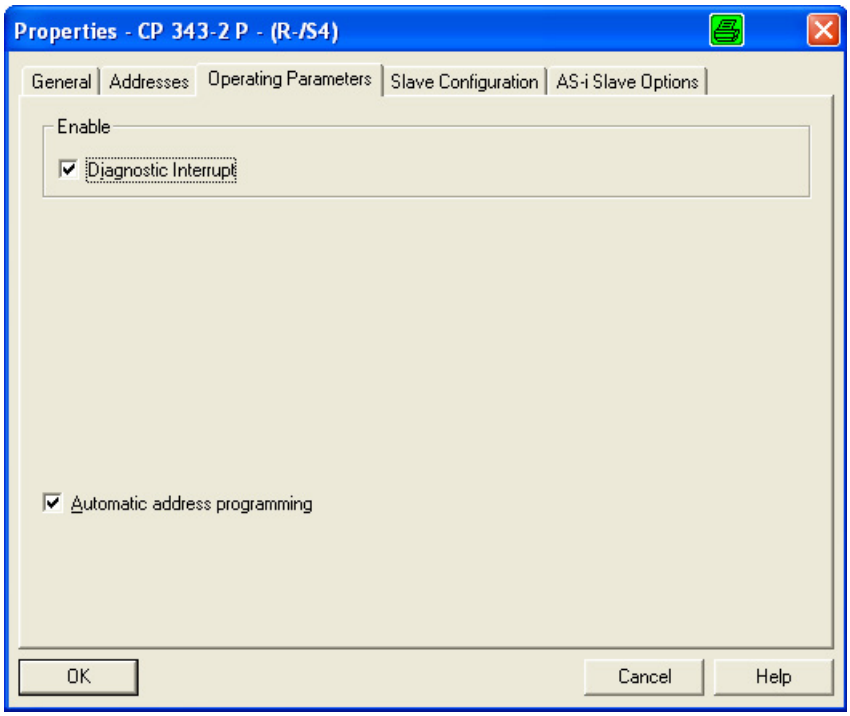
The employed CP 343-2 or CP 343-2P module is installed in HW Config.

The start addresses of inputs and outputs must be located in the process image partition that is assigned to the watchdog interrupt OB in which the driver block is called.

Note

CP 343-2P diagnostics function

Enable the "Diagnostics alarm" option in the operating parameters of the CP 343-2P. This setting is mandatory for the diagnostics function of the AS-i library.



The diagnostic interrupt is required in order to evaluate the current status of the slaves. The diagnostic data contain the current status of each slave, which is passed to the configured channel driver blocks.

If the diagnostic interrupt is not enabled, the inserted driver blocks will signal an invalid value (QBAD = TRUE).

1.3.3 Driver blocks (CP 343-2 / CP 343-2P)

The following table lists the driver blocks that are used in particular applications.

Table 1- 1 Driver blocks for activating digital inputs / outputs for AS-i slaves with standard or A address or with B address.

Application scenario	Blocks
Digital inputs / outputs of AS-i slaves with standard or A address	CHASIDIA / CHASIDOA
Digital inputs / outputs of AS-i slaves with B address	CHASIDIB / CHASIDOB

Analog AS-i slaves on the CP 343-2 / CP 343-2P are not supported by the block library.

1.4 Configuration with DP/AS-i LINK Advanced

1.4.1 Hardware configuration

The DP/AS-i Link Advanced is integrated into HW Config as a DP slave (via Object Manager or GSD file).

Note

Configuration using the Object Manager (OM) means you select the module directly from the hardware catalog in HW Config.

The alternative to configuration via the Object Manager is configuration via GSD.

The following modules are supported.

DP/AS-i Link Advanced with one AS-i line (6GK1 415-2BA10)

DP/AS-i Link Advanced with two AS-i lines (6GK1 415-2BA20)

1.4.2 Configuration in HW Config

In PCS 7 Version 6 and downstream of a Y-link, a GSD file is required to configure DP/AS-i Link Advanced. In PCS 7 Version 7.0 and higher, DP/AS-i Link Advanced should be configured with Object Manager when I/O are connected directly to a DP master system, since this provides a simpler connection of the analog values and better diagnostic options.

Constraints when operating downstream of a Y-Link

The DP/AS-i LINK Advanced can only be operated downstream from a Y-Link in firmware version V2.1.20 or higher. The GSD file must be used for configuring.

The start addresses of inputs and outputs must be identical and must be located in the process image partition that is assigned to the cyclic interrupt OB in which the driver block is called.

Note

Diagnostics function for DP/AS-i LINK Advanced

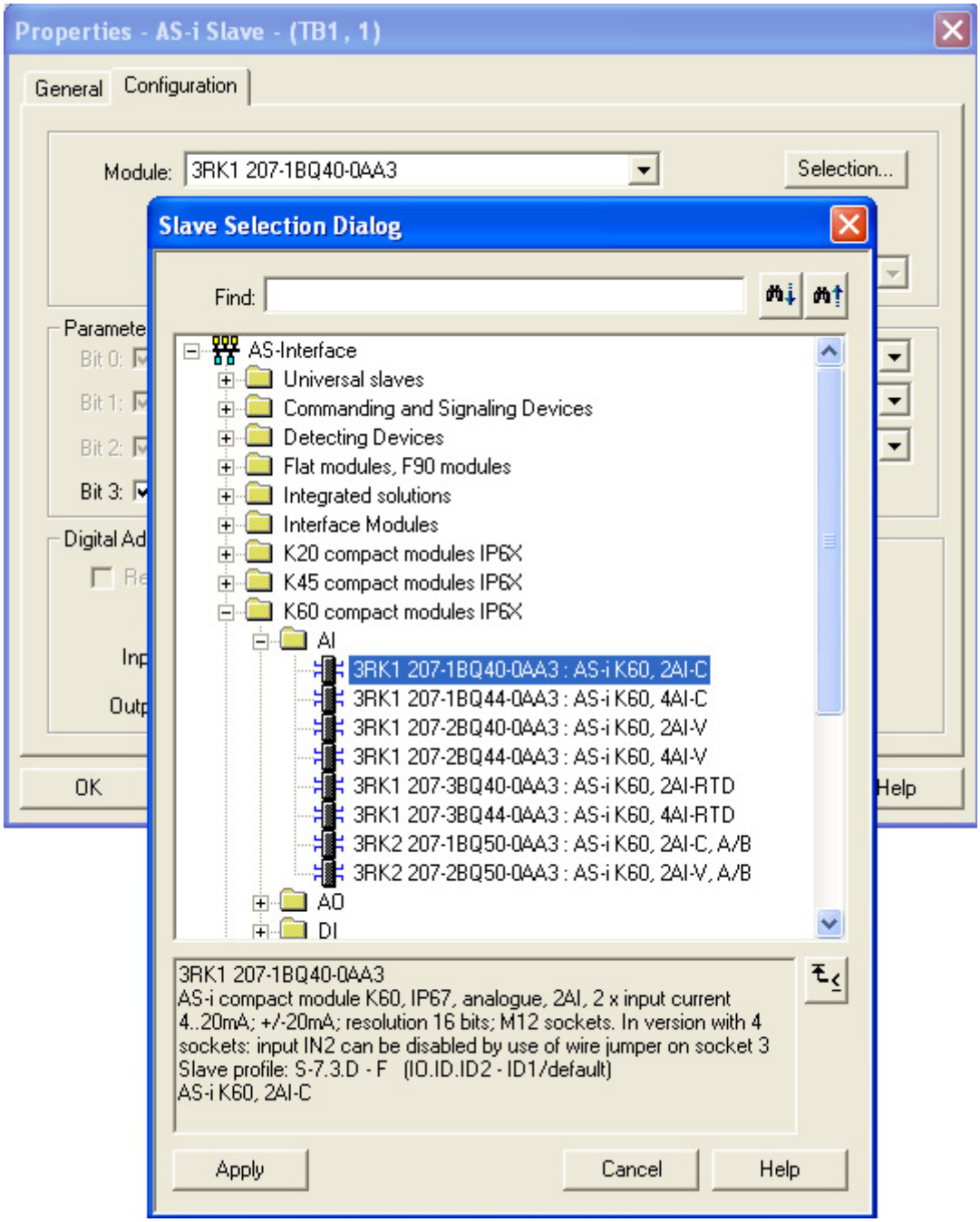
Enable the "Diagnostics alarm" option in the operating parameters of the DP/AS-i LINK Advanced. This setting is mandatory for the diagnostics function of the AS-i library.

1.4.3 Driver blocks (DP/AS-i LINK Advanced)

The following table lists the driver blocks that are used in particular applications. The CH_DI / CH_DO and CH_AI / CH_AO blocks are PCS 7 standard blocks.

Application scenario	Blocks
Digital inputs/outputs	CH_DI / CH_DO
Analog inputs/outputs of analog slaves when configured as Siemens AS-i slave	CH_AI / CH_AO or CHASIAI / CHASIAO *)
Analog inputs/outputs of analog slaves when configured as universal AS-i slave or configured with a GSD file	CHASIAI / CHASIAO

*) The measuring range can only be determined automatically if the Siemens AS-i slaves are configured as such, i.e., via the slave selection dialog in HW Config:



Note

If the PCS 7 driver wizard displays "Hardware for symbol xxxx with address yyyy not found", this may indicate that an incorrect driver block has been configured, e.g., CH_AI instead of CHASIAI.

Information about the library

2

2.1 Overview of the blocks

The library contains the following blocks:

Block type	Functions	Name	Number
Diagnostics block (CP 343-2 / CP 343-2P)	—	MOD_ASI	FB1744
Diagnostics block (DP/AS-i LINK Advanced)	—	SUB_ASI	FB571
Diagnostics block (DP/AS-i LINK Advanced GSD)	—	SUB_ASI_G	FB573
Diagnostics block (DP/AS-i LINK Advanced)	—	SLV_ASI	FB576
Driver block (CP 343-2 / CP 343-2P)	DI (A-slaves)	CHASIDIA	FC308
Driver block (CP 343-2 / CP 343-2P)	DO (A-slaves)	CHASIDOA	FC309
Driver block (CP 343-2 / CP 343-2P)	DI (B-slaves)	CHASIDIB	FB1745
Driver block (CP 343-2 / CP 343-2P)	DO (B-slaves)	CHASIDOB	FB1746
Driver block (DP/AS-i LINK Advanced)	AI	CHASIAI	FB574
Driver block (DP/AS-i LINK Advanced)	AO	CHASIAO	FB640
Communication block	—	AS-i_3422	FC307

Note

Command interface

The ASi_3422 or ASI_CTRL command interface must not be opened in the user program for the same AS-i master at the same time.

Description of blocks

3

3.1 MOD_ASI: Diagnostics block (CP 343-2 / CP 343-2P)

3.1.1 MOD_ASI description

FB1744

Application area

The MOD_ASI block monitors an CP 343-2 or CP 343-2P AS-i master module.

Calling OBs

The block must be inserted in the run sequence in the following OBs (occurs automatically in CFC):

OB 1	Cyclic program
OB 30 to OB 38	Cyclic interrupt OB into which the channel blocks are installed
OB 82	Diagnostic interrupt
OB 83	Insert/remove interrupt
OB 85	Program execution error
OB 100	Warm restart

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- The MOD_ASI block is inserted into the OBs indicated above in its own runtime group downstream of the runtime group of the MOD_1 block.
- Parameters assigned
  - Inputs SUBN1_ID, SUBN2_ID and SUBN_TYP.
  - Logical start address of LADDR module
- Interconnected
  - OUT structures MOD_INF of the MOD_1 block and RAC_DIAG of the RACK block are connected to the INOUT structures of the MOD_ASI of the same name.
  - Input EN is connected to the output of an AND block. Its inputs are connected to outputs EN_SUBx (x = number of the DP master system) of the OB_BEGIN block, EN_Rxxx (xxx = rack/station number) of the SUBNET block, and EN_Mxx (xx = module number) of the RACK block.
  - Input I_MODF is connected to output QMODF of the MOD_1 block.
  - Input I_PERAF is connected to output QPERAF of the MOD_1 block.
  - Input CMD_DONE is connected to output DONE of the AS-i_3422 block.
  - Input CMD_ERR is connected to output ERROR of the AS-i_3422 block.
  - In addition, outputs Q_ACT, Q_STARTUP, LADDR_OUT, SEND_BUF, RECV_BUF, and STATUS are connected to inputs ACT(& EN), STARTUP, LADDR, SEND, RECV, and STATUS of the AS-i_3422 block.

Redundancy

The redundancy of the DP master systems in an H-system is monitored in the higher-level RACK block.

Display of valid channels

The existing slaves of a module are indicated in outputs CH_EXIST and CH_EXISTB, in that a bit is set in the DWORD for each slave, starting with bit 0.
If the bit assigned to a slave has the value "0", the slave is not present.

The valid slaves of a module are indicated in outputs CH_OK and CH_OKB, in that one bit = TRUE is set for each valid slave, where bit 0 is assigned to Slave 0 and so forth.
If the bit assigned to a slave has the value "0", the slave is faulty. In the event of module faults, all slaves are faulty.

Troubleshooting

The input parameters are not checked for plausibility.

Time response

Not implemented.

Message capability

MOD_ASI signals module faults using ALARM_8P.

In addition, the block signals the following statuses for each of the 64 possible slave addresses:

- Unconfigured slave detected
- Slave failure
- Slave has incorrect (unconfigured) slave type

Reading data records

The block reads the information of the B-slaves by means of data records with SFC59 RD_REC.

Writing data records

The block writes the information of the B-slaves by means of data records with SFC58 WR_REC.

Reading diagnostic data

If the module initiates a diagnostic interrupt, system function block RDSYSST (SFB51) will trigger readout of the device-specific diagnostic data.

The information read contains the current status (OK or faulty) of the configured slaves. These data are transferred to the driver blocks and evaluated there.

The diagnostics data can also be displayed on a maintenance station (MS).

Startup characteristics

After a restart or initial run, a check is made to determine whether the module is available under the logical start address.

3.1.2 MOD_ASI block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type	HMI
ACC_Mode	1 = Accept New Mode Settings	BOOL	0	IO	—
CH_EXIST	List of existing A-slaves	DWORD	0	O	+
CH_EXISTB	List of existing B-slaves	DWORD	0	O	+
CH_OK	List of existing A-slaves with status OK	DWORD	0	O	+
CH_OKB	List of existing B-slaves with status OK	DWORD	0	O	+
CMD_DONE	Command finished without errors	BOOL	0	IO	—
CMD_ERR	Error	BOOL	0	IO	—
CONN_TO_CHN	Connection to the driver block	STRUCT	—	O	—
EN_MSG	1 = Enable Alarm	BOOL	1	I	—
EV_IDx 0 < = x < = 9	Event ID x	DWORD	0	I	—
I_MODF	1 = Module removed/defective	BOOL	0	I	—
I_PERAF	1 = I/O access error	BOOL	0	I	—
LADDR	Logical start address of the module	INT	0	I	+
LADDR_OUT	Logical start address of the module	WORD	0	O	—
MOD_INF	Module parameter	STRUCT	—	IO	—
MS	Maintenance State	DWORD	0	I	+
MSG_ACKx 0 < = x < = 9	Message acknowledgment	WORD	0	O	—
MSGSTATx 0 < = x < = 9	Message error information	WORD	0	O	—
Q_ACT	Activate command	BOOL	0	O	—
Q_STARTUP	Startup bit	BOOL	0	O	—
QERR	1 = Runtime Error	BOOL	1	O	—
QMODF	1 = Module removed/defective	BOOL	0	O	+
QPERAF	1 = I/O access error	BOOL	0	O	—
QRACKF	1 = Rack / station failure	BOOL	0	O	—
RAC_DIAG	System structure: RACK diagnostics	STRUCT	—	IO	—
RECV_BUF	Receive buffer	STRUCT	—	O	—
SEND_BUF	Send buffer	STRUCT	—	O	—
STATUS	Reading status LAS;LPS;LDS	DWORD	0	O	—
SUBN_TYP	1 = External DP interface	BOOL	0	I	—
SUBN1_ID	ID of primary subnet	BYTE	—	IO	—
SUBN2_ID	ID of redundant subnet	BYTE	—	IO	—

3.1.3 MOD_ASI block messages

Assignment of message texts

Message block ALARM_8P	Message number	Block parameter	Default message text	Message class
EV_ID1	1	QMODF	QMODF on @1%d@/@2%d@/@3%d@	S
	2	QPERAF	QPERAF on @1%d@/@2%d@/@3%d@	S
	3	QRACKF	QRACKF on @1%d@/@2%d@/@3%d@	S
	4	—	Internal CP error on @1%d@/@2%d@/@3%d@	S
	5	—	External CP error on @1%d@/@2%d@/@3%d@	S
	6	—	At least 1 slave differs on @1%d@/@2%d@/@3%d@ from configuration	S
	7	—	AS-Interface voltage on @1%d@/@2%d@/@3%d@ too low	S
	8	—	CP on @1%d@/@2%d@/@3%d@ is in offline state	S
EV_ID2	1	—	Slave 1 on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 2 on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 3 on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 4 on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 5 on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 6 on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 7 on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	Hardware error on CP on @1%d@/@2%d@/@3%d@	S
EV_ID3	1	—	Slave 8 on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 9 on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 10 on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 11 on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 12 on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 13 on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 14 on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	EPROM on @1%d@/@2%d@/@3%d@ is defective	S

Message block ALARM_8P	Message number	Block parameter	Default message text	Message class
EV_ID4	1	—	Slave 16 on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 17 on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 18 on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 19 on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 20 on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 21 on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 22 on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	Free	S
EV_ID5	1	—	Slave 24 on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 25 on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 26 on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 27 on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 28 on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 29 on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 30 on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	Free	S
EV_ID6	1	—	Slave 1B on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 2B on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 3B on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 4B on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 5B on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 6B on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 7B on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	Free	S

Message block ALARM_8P	Message number	Block parameter	Default message text	Message class
EV_ID7	1	—	Slave 8B on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 9B on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 10B on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 11B on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 12B on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 13B on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 14B on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	Free	S
EV_ID8	1	—	Slave 16B on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 17B on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 18B on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 19B on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 20B on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 21B on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 22B on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	Free	S
EV_ID9	1	—	Slave 24B on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 25B on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 26B on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 27B on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 28B on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 29B on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 30B on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	Free	S

Message block ALARM_8P	Message number	Block parameter	Default message text	Message class
EV_ID10	1	—	Slave 15 on @1%d@/@2%d@/@3%d@ is @4W%t#cp343-2@	S
	2	—	Slave 23 on @1%d@/@2%d@/@3%d@ is @5W%t#cp343-2@	S
	3	—	Slave 31 on @1%d@/@2%d@/@3%d@ is @6W%t#cp343-2@	S
	4	—	Slave 15B on @1%d@/@2%d@/@3%d@ is @7W%t#cp343-2@	S
	5	—	Slave 23B on @1%d@/@2%d@/@3%d@ is @8W%t#cp343-2@	S
	6	—	Slave 31B on @1%d@/@2%d@/@3%d@ is @9W%t#cp343-2@	S
	7	—	Slave 0 on @1%d@/@2%d@/@3%d@ is @10W%t#cp343-2@	S
	8	—	Free	S

The following table presents the message texts and related text numbers of text library "cp343-2" for the MOD_ASI block (FB 1744):

Text no.	Message text
1	not configured
2	broken down
3	wrong type

Assignment of associated values

Message block ALARM_8P	Message number	Block parameter	Meaning
EV_ID1	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
EV_ID2	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 1
	5	—	Text ID from text library "cp343-2" for Slave 2
	6	—	Text ID from text library "cp343-2" for Slave 3
	7	—	Text ID from text library "cp343-2" for Slave 4
	8	—	Text ID from text library "cp343-2" for Slave 5
	9	—	Text ID from text library "cp343-2" for Slave 6
	10	—	Text ID from text library "cp343-2" for Slave 7
EV_ID3	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 8
	5	—	Text ID from text library "cp343-2" for Slave 9
	6	—	Text ID from text library "cp343-2" for Slave 10
	7	—	Text ID from text library "cp343-2" for Slave 11
	8	—	Text ID from text library "cp343-2" for Slave 12
	9	—	Text ID from text library "cp343-2" for Slave 13
	10	—	Text ID from text library "cp343-2" for Slave 14
EV_ID4	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 16
	5	—	Text ID from text library "cp343-2" for Slave 17
	6	—	Text ID from text library "cp343-2" for Slave 18
	7	—	Text ID from text library "cp343-2" for Slave 19
	8	—	Text ID from text library "cp343-2" for Slave 20
	9	—	Text ID from text library "cp343-2" for Slave 21
	10	—	Text ID from text library "cp343-2" for Slave 22
EV_ID5	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 24
	5	—	Text ID from text library "cp343-2" for Slave 25
	6	—	Text ID from text library "cp343-2" for Slave 26

Message block ALARM_8P	Message number	Block parameter	Meaning
EV_ID5	7	—	Text ID from text library "cp343-2" for Slave 27
	8	—	Text ID from text library "cp343-2" for Slave 28
	9	—	Text ID from text library "cp343-2" for Slave 29
	10	—	Text ID from text library "cp343-2" for Slave 30
EV_ID6	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 1B
	5	—	Text ID from text library "cp343-2" for Slave 2B
	6	—	Text ID from text library "cp343-2" for Slave 3B
	7	—	Text ID from text library "cp343-2" for Slave 4B
	8	—	Text ID from text library "cp343-2" for Slave 5B
	9	—	Text ID from text library "cp343-2" for Slave 6B
	10	-	Text ID from text library "cp343-2" for Slave 7B
EV_ID7	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 8B
	5	—	Text ID from text library "cp343-2" for Slave 9B
	6	—	Text ID from text library "cp343-2" for Slave 10B
	7	—	Text ID from text library "cp343-2" for Slave 11B
	8	—	Text ID from text library "cp343-2" for Slave 12B
	9	—	Text ID from text library "cp343-2" for Slave 13B
	10	—	Text ID from text library "cp343-2" for Slave 14B
EV_ID8	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 16B
	5	—	Text ID from text library "cp343-2" for Slave 17B
	6	—	Text ID from text library "cp343-2" for Slave 18B
	7	—	Text ID from text library "cp343-2" for Slave 19B
	8	—	Text ID from text library "cp343-2" for Slave 20B
	9	—	Text ID from text library "cp343-2" for Slave 21B
	10	—	Text ID from text library "cp343-2" for Slave 22B
EV_ID9	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 24B
	5	—	Text ID from text library "cp343-2" for Slave 25B
	6	—	Text ID from text library "cp343-2" for Slave 26B
	7	—	Text ID from text library "cp343-2" for Slave 27B

Message block ALARM_8P	Message number	Block parameter	Meaning
EV_ID9	8	—	Text ID from text library "cp343-2" for Slave 28B
	9	—	Text ID from text library "cp343-2" for Slave 29B
	10	—	Text ID from text library "cp343-2" for Slave 30B
EV_ID10	1	MOD_INF.SUBN_ID	ID of subnet (byte)
	2	MOD_INF.RACK_NO	Rack number (byte)
	3	MOD_INF.SLOT_NO	Slot number (byte)
	4	—	Text ID from text library "cp343-2" for Slave 15
	5	—	Text ID from text library "cp343-2" for Slave 23
	6	—	Text ID from text library "cp343-2" for Slave 31
	7	—	Text ID from text library "cp343-2" for Slave 15B
	8	—	Text ID from text library "cp343-2" for Slave 23B
	9	—	Text ID from text library "cp343-2" for Slave 31B
	10	—	Text ID from text library "cp343-2" for Slave 0

3.2 SUB_ASI: Diagnostics block (DP/AS-i LINK Advanced)

3.2.1 SUB_ASI description

FB571

Application area

The SUB_ASI block monitors an AS-Interface line of a DP/AS-i LINK Advanced (without GSD configuration).

Calling OBs

The block must be inserted in the run sequence in the following OBs (occurs automatically in CFC):

OB 1	Cyclic program
OB 30 to OB 38	Cyclic interrupt OB into which the channel blocks are installed
OB 82	Diagnostic interrupt
OB 83	Insert/remove interrupt
OB 85	Program execution error
OB 86	Rack failure
OB 100	Warm restart

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- The SUB_ASI block is inserted into the OBs indicated above in its own runtime group downstream of the runtime group of the OB_DIAG1 block.
- Parameters assigned
  - Inputs SUBN1_ID, SUBN2_ID, RACK_NO and SLOT_NO.
  - Logical start address of the LADDR module and the DADDR diagnostic address.

    When DP/AS-i Link Advanced is configured with a GSD file:
  - Inputs GSx_SLAVE (always TRUE) and EN_DIAG (only when connected to DP master system after DPV1 = TRUE)
- Interconnected
  - OUT structures MOD_INF of the MOD_1 block and RAC_DIAG of the RACK block are connected to the INOUT structures of the MOD_ASI of the same name.
  - Input RACKF is connected to output QRACKF of the OB_DIAG1 block
  - Output QAISF is connected to inputs AISF of the associated SLV_ASI blocks
  - Outputs SLVxx_OK / SLV_xx_WT are connected to inputs SLV_OK / SLV_WT of the associated SLV_ASI block
  - Input CMD_DONE is connected to output DONE of the AS-i_3422 block.
  - Input CMD_ERR is connected to output ERROR of the AS-i_3422 block.
  - In addition, outputs Q_ACT, Q_STARTUP, LADDR_OUT, SEND_BUF, RECV_BUF, and STATUS are connected to inputs ACT(and EN), STARTUP, LADDR, SEND, RECV, and STATUS of the AS-i_3422 block.

    When DP/AS-i Link Advanced is configured with a GSD file:
  - Output structure CH_STATE is connected to input structure CH_STATE of the associated SUBASI_G block
  - Inputs LADDR / ANY_LADDR and SLOT_NO / ANY_SLOT_NO is connected to outputs QLADDR / QSLOT_NO of the associated SUBASI_G block

Redundancy

The redundancy of the DP master systems in an H-system is monitored in the higher-level OB_DIAG1 block.

Troubleshooting

The input parameters are not checked for plausibility.

Time response

Not implemented.

Message capability

SUB_ASI signals diagnostic events that affect the AS-i line using ALARM_8P.

In addition, the block signals if an unconfigured slave was detected for each of the 64 possible slave addresses.

Reading diagnostic data

If an AS-i line initiates a diagnostic interrupt, system function block RDSYSST (SFC51) will trigger readout of the device-specific diagnostic data and ASI_3422 (FC307) will trigger readout of the Extended_Lists_and_Flags.

The information read contains the current status (OK or faulty) of the configured slaves. On the basis of these data, outputs SLVxx_OK (AS-i slave OK) and SLVxx_WT (AS-i slave is incorrect type) of the AS-i-slave is set.

The diagnostics data can also be displayed on a maintenance station (MS).

Startup characteristics

After a restart or initial run, a check is made to determine whether the module is available under the logical start address.

3.2.2 SUB_ASI block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type	HMI
ACC_Mode	1 = Accept New Mode Settings	BOOL	0	IO	—
ANY_LADDR	Logical Address of Module	ANY	—	I	—
ANY_SLOT_NO	Slot number	—	—	I	—
CH_EXIST	List of existing AS-i slaves	DWORD	0	O	x
CH_EXIST2	List of existing AS-i slaves	DWORD	0	O	x
CH_OK	List of existing AS-i slaves with status OK	DWORD	0	O	x
CH_OK2	List of existing AS-i slaves with status OK	DWORD	0	O	x
CH_STATE	State of channels	STRUCT	—	O	—
CMD_DONE	Command finished without errors	—	0	IO	—
CMD_ERR	Error	BOOL	0	IO	—
DADDR	Diagnostic address of DP-slave	INT	0	I	—
DELAY	Alarm Delay (s)	INT	2	I	—

I/O (parameter)	Meaning	Data type	Default	Type	HMI
EN_DIAG	1 = Enable read diagnostic data 1 = Read diagnosis	BOOL	1	I	—
EN_MAINT	1 = Enable maintenance station	BOOL	1	I	—
EN_MSG	1 = Enable Alarm	BOOL	1	I	—
EV_IDx 0 < = x < = 9	Event ID x	DWORD	0	I	—
GSx_SLAVE	1 = configured with GSx file	BOOL	0	I	—
LADDR	Logical start address of the AS-i slave	INT	0	I	—
LADDR_OUT	Logical start address of the AS-i slave	WORD	0	O	—
MS	Maintenance State	DWORD	0	I	x
MSG_ACKx 0 < = x < = 9	Message acknowledgment	WORD	0	O	—
MSGSTATx 0 < = x < = 9	Message error information	WORD	0	O	—
Q_ACT	Activate command	BOOL	0	O	—
Q_STARTUP	Startup bit	BOOL	0	O	—
QASIF	1 = Rack or AS-i Bus Failure	BOOL	0	O	—
QERR	1 = Runtime Error	BOOL	1	O	—
QRACKF	1 = Rack failure	BOOL	0	O	—
RACK_NO	Rack number	BYTE	—	I	—
RACKF	1 = Rack failure	BOOL	0	I	—
RECV_BUF	Receive buffer	STRUCT	—	O	—
SEND_BUF	Command for reading LAS;LPS;LDS	STRUCT	—	O	—
SLOT_NO	Slot number	BYTE	—	I	—
SLVxx_OK 0 < = xx < = 63	1 = AS-i Slave with address xx OK	BOOL	—	O	—
SLVxx_WT 0 < = xx < = 63	1 = AS-i Slave with address xx wrong type	BOOL	—	O	—
STATUS	Reading status LAS;LPS;LDS	BOOL	—	O	—
SUBN_TYP	1 = External DP interface	BOOL	1	O	—
SUBN1_ID	ID of primary subnet	BYTE	—	I	—
SUBN2_ID	ID of redundant subnet	BYTE	—	I	—

3.2.3 SUB_ASI block messages

Assignment of message texts

Message block ALARM_8P	Message number	Default message text	Message class
EV_ID1	1	AS-i line @3%d@: Internal error on @1%d@/@2%d@	S
	2	AS-i line @3%d@: External error on @1%d@/@2%d@	S
	3	AS-i line @3%d@: At least 1 slave differs on @1%d@/@2%d@ from configuration	S
	4	AS-i line @3%d@: AS-Interface voltage on @1%d@/@2%d@ too low	S
	5	AS-i line @3%d@: Invalid configuration on @1%d@/@2%d@	S
EV_ID2 ... 9	1	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: not configured	S
	2	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: not configured	S
	3	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: not configured	S
	4	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: not configured	S
	5	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: not configured	S
	6	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: not configured	S
	7	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: not configured	S
	8	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: not configured	S

"AS-i Slave xx" stands for "AS-i Slave 1..32" and "AS-i Slave 1B..32B"

Associated values

1. SUBN1_ID
2. RACK_NO
3. ID of AS-i line (1 or 2)

3.3 SUBASI_G: Diagnostics block (DP/AS-i LINK Advanced GSD)

3.3.1 SUBASI_G description

FB576

Application area

The SUBASI_G block is only required when DP/AS-i LINK Advanced was configured with a GSD file. It serves as the interface to the PCS 7 maintenance station for an AS-Interface line and supplies the MODE inputs of the digital driver blocks.

Calling OBs

The block must be inserted in the run sequence in the following OBs (occurs automatically in CFC):

OB 1	Cyclic program
OB 30 to OB 38	Cyclic interrupt OB into which the channel blocks are installed
OB 82	Diagnostic interrupt
OB 85	Program execution error
OB 86	Rack failure
OB 100	Warm restart

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- The SUBASI_ASI block is inserted into the OBs indicated above in its own runtime group downstream of the runtime group of the SUB_ASI block.
- Parameters assigned
  - Inputs SUBN1_ID, SUBN2_ID, and RACK_NO and LADDR.
  - Outputs QLADDR and QSLOT_NO
  - Inputs GSx_SLAVE (always TRUE) and EN_DIAG (only when connected to DP master system after DPV1 = TRUE)
- Interconnected
  - Input RACKF is connected to output QRACKF of the OB_DIAG1 block
  - Input structure CH_STATE is connected to output structure CH_STATE of the associated SUB_ASI block
  - Outputs QLADDR and QSLOT_NO are connected to inputs LADDR/ANY_LADDR und SLOT_NO/ANY_SLOT_NO of the associated SUB_ASI block
  - Outputs OMODE_00 are connected to inputs MODE of the associated SLV_ASI blocks

Troubleshooting

The input parameters are not checked for plausibility.

Time response

Not implemented.

Message capability

SUBASI_G signals diagnostic events that affect the AS-i line using ALARM_8P.

In addition, the block signals if an unconfigured or failed slave or a slave of the wrong type was detected for each of the 64 possible slave addresses.

3.3.2 SUBASI_G block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type	HMI
CH_EXIST	List of existing AS-i slaves	DWORD	0	O	x
CH_EXIST2	List of existing AS-i slaves	DWORD	0	O	x
CH_OK	List of existing AS-i slaves with status OK	DWORD	0	O	x
CH_OK2	List of existing AS-i slaves with status OK	DWORD	0	O	x
CH_STATE	State of channels	STRUCT	—	—	—
EV_IDx 1 < = x < = 9	Event ID x	DWORD	0	I	—
LADDR	Logical start address of the slave	INT	0	I	—
MS	Maintenance State	DWORD	0	I	—
MSG_ACKx 1 < = x < = 9	Message acknowledgment x	WORD	0	O	—
MSGSTATx 1 < = x < = 9	Message error information	WORD	0	O	—
NO_ASI_S	Max. number of AS-i Slaves (16, 32, 64)	INT	0	I	—
OMODE_xx 0 < = x < = 63	Mode Channel (digital input) xx	DWORD	—	O	—
OMODE_xx 64 < = xx < = 127	Mode Channel (digital output) xx	DWORD	—	O	—
QERR	1 = Runtime Error	BOOL	0	O	—
QLADDR	Logical start address of the slave	INT	0	O	—
QRACKF	1 = Rack failure	BOOL	0	O	—
QSLOT_NO	Slot number	BYTE	0	O	—
RACK_NO	Rack number	BYTE	—	I	—
RACKF	1 = Rack failure	BOOL	1	O	—
SLOT_NO	Slot number	BYTE	0	I	—
SUBN1_ID	ID of primary subnet	BYTE	—	I	—
SUBN2_ID	ID of redundant subnet	BYTE	—	I	—

3.3.3 SUBASI_G block messages

Assignment of message texts

Message block ALARM_8P	Message number	Default message text	Message class
EV_ID1	1	AS-i line @3%d@: Internal error on @1%d@/@2%d@	S
	2	AS-i line @3%d@: External error on @1%d@/@2%d@	S
	3	AS-i line @3%d@: At least 1 slave differs on @1%d@/@2%d@ from configuration	S
	4	AS-i line @3%d@: AS-Interface voltage on @1%d@/@2%d@ too low	S
	5	AS-i line @3%d@: Invalid configuration on @1%d@/@2%d@	S
EV_ID2 ... 9	1	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: broken down, wrong type, or not configured	S
	2	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: broken down, wrong type, or not configured	S
	3	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: broken down, wrong type, or not configured	S
	4	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: broken down, wrong type, or not configured	S
	5	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: broken down, wrong type, or not configured	S
	6	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: broken down, wrong type, or not configured	S
	7	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: broken down, wrong type, or not configured	S
	8	AS-i line @3%d@: AS-i Slave xx on @1%d@/@2%d@: broken down, wrong type, or not configured	S

"AS-i Slave xx" stands for "AS-i Slave 1..32" and "AS-i Slave 1B..32B"

Associated values

1. SUBN1_ID
2. RACK_NO
3. ID of AS-i line (1 or 2)

3.4 SLV_ASI: Diagnostics block (DP/AS-i LINK Advanced)

3.4.1 SLV_ASI description

FB573

Application area

The SLV_ASI block monitors an AS-i slave on the DP/AS-i LINK Advanced and supplies the MODE input of the driver blocks.

Calling OBs

The block must be inserted in the run sequence in the following OBs (occurs automatically in CFC):

OB 1	Cyclic program
OB 30 to OB 38	Cyclic interrupt OB into which the channel blocks are installed
OB 82	Diagnostic interrupt
OB 85	Program execution error
OB 86	Rack failure
OB 100	Warm restart

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- The SLV_ASI block is inserted into the OBs indicated above in its own runtime group downstream of the runtime group of the SUB_ASI block.
- Parameters assigned
  - Inputs SUBN1_ID, SUBN2_ID, RACK_NO and SLOT_NO.
  - Start addresses of the AS-i slave LADDR (inputs) and LADDR1 (outputs)
  - Inputs CH_EXIST and CH_EXIST2 corresponding to the existing channels
  - Input GSx_SLAVE (TRUE if configuring uses GSD file, otherwise FALSE)
- Interconnected
  - Input AISF is connected to output AISF of the associated SUB_ASI block
  - Inputs SLV_OK / SLV_WT are connected to outputs SLVxx_OK / SLVxx_WT of the associated SUB_ASI block
  - The OMODEx outputs are connected to the MODE input of the driver blocks

Display of valid channels

The existing channels of the AS-i slave are indicated in inputs CH_EXIST and CH_EXIST2, in that a bit is set in the DWORD for each existing channel, starting with bit 0. If the bit assigned to a channel has the value "0", the channel is not present.

The valid channels of the AS-i slave are indicated in outputs CH_OK and CH_OK2, in that one bit = TRUE is set for each valid channel, where bit 0 is assigned to Channel 0 and so forth. If the bit assigned to a channel has the value "0", the channel is faulty. In the event of higher-level faults, all channels are faulty.

Message capability

SLV_ASI signals the following events using ALARM_8P:

- Slave failure
- Slave has incorrect (unconfigured) slave type
- I/O access error

3.4.2 SLV_ASI block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type	HMI
ASIF	1 = Rack or AS-i Bus Failure	BOOL	0	O	—
CH_EXIST	Channel exist	DWORD	0	I	x
CH_EXIST2	Channel exist 2	DWORD	0	I	x
CH_OK	Channel OK	DWORD	0	O	x
CH_OK2	Channel OK 2	DWORD	0	O	x
DELAY	Alarm Delay (s)	INT	2	I	—
EV_ID	Message number	DWORD	0	I	—
GSx_SLAVE	1 = configured with GSx file	BOOL	0	I	—
LADDR	Logical start address of the AS-i slave (inputs)	INT	-1	I	—
LADDR1	Logical start address of the AS-i slave (outputs)	INT	-1	I	—
MODE_xx 0 < = xx < = 7	Mode Channel xx	WORD	16#00	I	—
MS	Maintenance State	DWORD	0	I	x
MSG_ACK	Message acknowledgment	WORD	0	O	—
MSGSTAT	Message error information	WORD	0	O	—
OMODE_xx 0 < = xx < = 7	Mode Channel xx	DWORD	—	O	—
QPERAF	1 = I/O access error	BOOL	0	O	—
RACK_NO	Rack number	BYTE	—	I	—

I/O (parameter)	Meaning	Data type	Default	Type	HMI
SLAVE_OK	1 = AS-i slave OK (permanent, detected and active)	BOOL	0	I	—
SLAVE_WT	1 = AS-i slave wrong type	BOOL	0	I	—
SLOT_NO	Slot number of the AS-i slave	BYTE	—	I	—
SUBN1_ID	ID of primary subnet	BYTE	—	I	—
SUBN2_ID	ID of redundant subnet	BYTE	—	I	—

3.4.3 SLV_ASI block messages

Assignment of message texts

Message block ALARM_8P	Message number	Default message text	Message class
EV_ID1	1	AS-i Slave @3%s@ on @1%d@/@2%d@ with address @3%s@: broken down	S
	2	AS-i Slave @3%s@ on @1%d@/@2%d@: wrong type	S
	3	AS-i Slave @3%s@ on @1%d@/@2%d@: Access error	S

Associated values

1. SUBN1_ID
2. RACK_NO
3. ID of AS-i slave: 1..32 and 1B..32B

3.5 CHASIDIA: Driver block for the input of a standard / A slave (CP 343-2 / CP 343-2P)

3.5.1 CHASIDIA description

FC308

Application area

The CHASIDIA block is used for signal processing of a digital input value of AS-i slaves with standard or A address on the CP 343-2 or CP 343-2P.

Calling OBs

The calling OB is cyclic interrupt OB 30 to OB 38 into which you insert the block.

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- Input CONN_TO_DRV is connected to the applicable CONN_TO_CHN output of the MOD_ASI block.
- Inputs BINACSEN and SLAVE_NO_ASI_BUS are parameterized.

Functions and principle of operation

The CHASIDIA block cyclically processes all channel-specific signal functions of an AS-i slave with standard or A address. The block reads a digital value of BOOL data type from the process image (partition) of the inputs.

The result generated is a quality code, which can assume the following statuses:

Status	Quality code
Valid value	16#80
Simulation	16#60
Last valid value	16#44
Substitute value	16#48
Invalid value	16#00

Addressing

The VALUE input must be connected to the symbolic or absolute input address of the associated input channel. For information on obtaining the correct address of the input channel, refer to the section "Exchanging AS-i binary values with standard or A-slaves" in the manual for CP 343-2 / CP 343-2P. The input address can optionally be read directly in HW Config with appropriate configuration of the AS-i slaves. The driver wizard requires this interconnection.

Standard value

The digital value of the process image (partition) is output to output parameter Q with quality code QUALITY = 16#80.

Simulation

When input parameter SIM_ON = TRUE, the value of input parameter SIM_I is output to output parameter Q with quality code QUALITY = 16#60. QBAD = TRUE is reset.

The simulation has highest priority. If the block is in simulation mode, QSIM = TRUE is set.

Substitute value

When input parameter SUBS_ON = TRUE, the value of input parameter SUBS_I is output at output parameter Q with quality code QUALITY = 16#48 and QBAD = 1, if the digital value of the process image (partition) is invalid.

Hold last value

When input parameter LAST_ON = TRUE, the last valid value is output at the Q output parameter if the process value is invalid. The quality code is set to QUALITY = 16#44 and QBAD = 1.

The last valid value at the Q output parameter corresponds to Q_LAST.

Output invalid value

If input parameters SUBS_ON and LAST_ON are both = FALSE or both = TRUE and there is an invalid process value, this value is output.

The quality code QUALITY = 16#00 is output and QBAD = 1 is set.

Troubleshooting

The input parameters are not checked for plausibility.

Startup characteristics

Not implemented.

Time response

Not implemented.

Message capability

Not implemented.

Operator control and monitoring

The operator-control block does not have an operating screen (faceplate).

3.5.2 CHASIDIA block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type
BINACSEN	Number of the input channel (0 to 3) on the AS-i slave	INT	0	IO
CONN_TO_DRV	Connection to driver block MOD_ASI	ANY	—	I
LAST_ON	1 = Last valid value Enable injection	BOOL	0	IO
Q	Process value for further processing	BOOL	0	O
QLAST	Last valid process value	BOOL	0	IO
QBAD	1 = Invalid process value	BOOL	0	O
QCONFERR	1 = Configuration error (incorrect slave address or not linked to driver block)	BOOL	0	O
QLAST	1 = Last valid value Injection enabled	BOOL	0	O
QSIM	1 = Simulation enabled	BOOL	0	O
QSUBS	1 = Switch to substitute value enabled	BOOL	0	O
QUALITY	Value status of the process value	BOOL	16#00	O
SIM_I	Simulation value	BOOL	0	IO
SIM_ON	1 = Enable simulation	BOOL	0	IO
SLAVE_NO_ASI_BUS	AS-i address (1 to 31) of the AS-i slave	INT	0	IO
SUBS_I	Switch to substitute value	BOOL	0	IO
SUBS_ON	1 = Switch to substitute value enabled	BOOL	0	IO
VALUE	Process value at the input channel	BOOL	0	IO

3.6 CHASIDOA: Driver block for the digital output of a standard / A slave (CP 343-2 / CP 343-2P)

3.6.1 CHASIDOA description

FC309

Application area

The CHASIDOA block is used for signal processing of a digital output value of AS-i slaves with standard or A address on the CP 343-2 or CP 343-2P.

Calling OBs

The calling OB is cyclic interrupt OB 30 to OB 38 into which you insert the block.

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- Input CONN_TO_DRV is connected to the applicable CONN_TO_CHN output of the MOD_ASI block.
- Inputs BINACSEN and SLAVE_NO_ASI_BUS are parameterized.

Functions and principle of operation

The CHASIDOA block cyclically processes all channel-specific signal functions of an AS-i slave with standard or A address. The block writes a digital value of data type BOOL to the process image (partition) of the outputs.

The result generated is a quality code, which can assume the following statuses:

Status	Quality code
Valid value	16#80
Simulation	16#60
Invalid value	16#00

Addressing

The VALUE output must be connected to the symbolic or absolute output address of the associated output channel. For information on obtaining the correct address of the output channel, refer to the section "Exchanging AS-i binary values with standard or A-slaves" in the manual for CP 343-2 / CP 343-2P. The output address can optionally be read directly in HW Config with appropriate configuration of the AS-i slave. The driver wizard requires this interconnection.

Standard value

The digital value of the process image (partition) is output to output parameter Q with quality code QUALITY = 16#80.

Simulation

When input parameter SIM_ON = TRUE, the value of input parameter SIM_I is output to the process image (partition) with quality code QUALITY = 16#60. QBAD = TRUE is reset.

The simulation has highest priority. If the block is in simulation mode, QSIM = TRUE is set.

Channel fault

In the event of a channel fault, quality code QUALITY = 16#00 is output and QBAD = TRUE is set. The current digital value is always written to the process image (partition).

Troubleshooting

The input parameters are not checked for plausibility.

Startup characteristics

Not implemented.

Time response

Not implemented.

Message capability

Not implemented.

Operator control and monitoring

The operator-control block does not have an operating screen (faceplate).

3.6.2 CHASIDOA block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type
BINACSEN	Number of the output channel (0 to 3) on the AS-i slave	INT	0	IO
CONN_TO_DRV	Connection to driver block MOD_ASI	ANY	—	I
I	Process value from program execution	BOOL	0	IO
QBAD	1 = Invalid output value	BOOL	0	O
QCONFERR	1 = Configuration error (incorrect slave address or not linked to driver block)	BOOL	0	O
QSIM	1 = Simulation enabled	BOOL	0	O
QUALITY	Value status of the output value	BOOL	16#00	O
SIM_I	Simulation value	BOOL	0	IO
SIM_ON	1 = Enable simulation	BOOL	0	IO
SLAVE_NO_ASI_BUS	AS-i address (1 to 31) of the AS-i slave	INT	0	IO
VALUE	Process value to the output channel	BOOL	0	O

3.7 CHASIDIB: Driver block for the digital input of a B slave (CP 343-2 / CP 343-2P)

3.7.1 CHASIDIB description

FB1745

Application area

The CHASIDIB block is used for signal processing of a digital input value of AS-i slaves with B address on the CP 343-2 or CP 343-2P.

Calling OBs

The calling OB is cyclic interrupt OB 30 to OB 38 into which you insert the block.

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- Input CONN_TO_DRV is connected to the applicable CONN_TO_CHN output of the MOD_ASI block.

Functions and principle of operation

The CHASIDIB block cyclically processes all channel-specific signal functions of an AS-i slave with B address. The block reads a digital value of data type Bool from the MOD_ASI block via the structure interconnected at input CONN_TO_DRV. The channel information is read there from the slave using data records.

The result generated is a quality code, which can assume the following statuses:

Status	Quality code
Valid value	16#80
Simulation	16#60
Last valid value	16#44
Substitute value	16#48
Invalid value	16#00

Note

The CP 342-2 / CP 343-2P does not use a cyclical process image (partition) for the I/O data of the AS-i slave with B address. The I/O data are transferred via data records.

Addressing

The module start address of CP 343-2 or CP 343-2P must be configured at the LADDR input. The driver wizard uses this to establish the connection to the module. In addition, the SLAVE_NO_ASI_BUS inputs must be configured with the numerical AS-i address (1 to 31) of the B slave and BINACSEN with the number of the input channel (0 to 3) on the B slave.

Standard value

The digital value of the input channel is output to the Q output parameter with quality code QUALITY = 16#80.

Simulation

When input parameter SIM_ON = TRUE, the value of input parameter SIM_I is output to output parameter Q with quality code QUALITY = 16#60. QBAD = TRUE is reset. The simulation has highest priority. If the block is in simulation mode, QSIM = TRUE is set.

Substitute value

When input parameter SUBS_ON = TRUE, the value of input parameter SUBS_I is output at output parameter Q with quality code QUALITY = 16#48 and QBAD = 1, if the digital value of the sensor is invalid.

Hold last value

When input parameter LAST_ON = TRUE, the last valid output value is output if the count value or measured value is invalid. The quality code is set to QUALITY = 16#44 and QBAD = 1.

The last valid output value corresponds to Q_LAST.

Output invalid value

If input parameters SUBS_ON and LAST_ON are both = FALSE or both = TRUE and there is an invalid process value, this value is output.

The quality code QUALITY = 16#00 is output and QBAD = 1 is set.

Troubleshooting

The input parameters are not checked for plausibility.

Startup characteristics

Not implemented.

Time response

Not implemented.

Message capability

Not implemented.

Operator control and monitoring

The operator-control block does not have an operating screen (faceplate).

3.7.2 CHASIDIB block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type
BINACSEN	Number of the input channel (0 to 3) on the AS-i slave	INT	0	IO
CONN_TO_DRV	Connection to driver block MOD_ASI	ANY	—	I
LADDR	Logical start address of the AS-i master	INT	0	I
LAST_ON	1 = Last valid value Enable injection	BOOL	0	IO
LCOMMERR	Last communication error of former cycle, delivered by Block linked to CONN_TO_DRV	BOOL	0	IO
Q	Process value for further processing	BOOL	0	O
QLAST	Last valid process value	BOOL	0	IO
QBAD	1 = Invalid process value	BOOL	0	O
QCOMFERR	1 = Communication error, delivered by block linked to CONN_TO_DRV	BOOL	0	O
QCONFERR	1 = Configuration error (incorrect slave address or not linked to driver block)	BOOL	0	O
QLAST	1 = Last valid value Injection enabled	BOOL	0	O
QSIM	1 = Simulation enabled	BOOL	0	O
QSUBS	1 = Switch to substitute value enabled	BOOL	0	O
QUALITY	Value status of the process value	BOOL	16#00	O
SIM_I	Simulation value	BOOL	0	IO
SIM_ON	1 = Enable simulation	BOOL	0	IO
SLAVE_NO_ASI_BUS	AS-i address (1 to 31) of the AS-i slave	INT	0	IO
SUBS_I	Substitute value	BOOL	0	IO
SUBS_ON	1 = Enable switch to substitute value	BOOL	0	IO

3.8 CHASIDOB: Driver block for the digital output of a B slave (CP 343-2 / CP 343-2P)

3.8.1 CHASIDOB description

FB1746

Application area

The CHASIDOB block is used for signal processing of a digital output value of AS-i slaves with B address on the CP 343-2 or CP 343-2P.

Calling OBs

The calling OB is cyclic interrupt OB 30 to OB 38 into which you insert the block.

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- Input CONN_TO_DRV is connected to the applicable CONN_TO_CHN output of the MOD_ASI block.

Function and principle of operation

The CHASIDOB block cyclically processes all channel-specific signal functions of an AS-i slave with B address. The block writes a digital value of data type Bool to the MOD_ASI block via the structure interconnected at input CONN_TO_DRV. The channel information is written to the slave using data records.

The result generated is a quality code, which can assume the following statuses:

Status	Quality code
Valid value	16#80
Simulation	16#60
Invalid value	16#00

Note

The CP 342-2 / CP 343-2P does not use a cyclical process image (partition) for the I/O data of the AS-i slave with B address. The I/O data are transferred via data records.

Addressing

The module start address of CP 343-2 or CP 343-2P must be configured at the LADDR input. The driver wizard uses this to establish the connection to the module. In addition, the SLAVE_NO_ASI_BUS inputs must be configured with the numerical AS-i address (1 to 31) of the B slave and BINACSEN with the number of the output channel (0 to 3) on the B slave.

Standard value

The digital value of the output channel is written to the module as a data record. Quality code QUALITY = 16#80 is output at the block.

Simulation

When input parameter SIM_ON = TRUE, the value of input parameter SIM_I is written to the module as a data record. Quality code QUALITY = 16#60 is output at the block.
QBAD = TRUE is reset. The simulation has highest priority. If the block is in simulation mode, QSIM = TRUE is set.

Channel fault

In the event of a channel fault, quality code QUALITY = 16#00 is output and QBAD = TRUE is set. The current digital value is always written to the module as a data record.

Troubleshooting

The input parameters are not checked for plausibility.

Startup characteristics

Not implemented.

Time response

Not implemented.

Message capability

Not implemented.

Operator control and monitoring

The block does not have an operating screen (faceplate).

3.8.2 CHASIDOB block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type
BINACSEN	Number of the output channel (0 to 3) on the AS-i slave	INT	0	IO
CONN_TO_DRV	Connection to driver block MOD_ASI	ANY	—	I
I	Process value from program execution	BOOL	0	IO
LADDR	Logical start address of the AS-i master	INT	0	I
QBAD	1 = Invalid process value	BOOL	0	O
QCOMMERR	1 = Communication error, delivered by block linked to CONN_TO_DRV	BOOL	0	O
QCONFERR	1 = Configuration error (incorrect slave address or not linked to driver block)	BOOL	0	O
QSIM	1 = Simulation enabled	BOOL	0	O
QUALITY	Value status of the process value	BYTE	16#00	O
SIM_I	Simulation value	BOOL	0	IO
SIM_ON	1 = Enable simulation	BOOL	0	IO
SLAVE_NO_ASI_BUS	AS-i address (1 to 31) of the AS-i slave	INT	0	IO

3.9 CHASIAI: Driver block for analog input of an AS-i slave (DP/AS-I LINK Advanced)

3.9.1 CHASIAI description

FB574

Application area

The CHASIAI block is used to process signals of an analog input value from AS-i slaves that are connected to the controller via DP/AS-i LINK Advanced.

The analog slaves must be configured so that the input values are stored in the cyclic process image.

Note

The functionality of the CHASIAI function block is based on that of the standard PCS 7 block CH_AI. Only the measuring range limits have to be specified manually.

Use the CHASIAI block in the following application scenarios:

- When you have configured the analog slave as a universal AS-i slave.
- When you have configured the DP/AS-i LINK Advanced with a GSD file.

Note

CH_AI block

Use the CH_AI block in the following application scenarios:

- When you have configured the analog slave as a Siemens AS-i slave.

Calling OBs

The calling OB is cyclic interrupt OB 30 to OB 38 into which you insert the block and the restart OB 100.

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- Input MODE is connected to the applicable OMODE_xx output of the SLV_ASI block.

Functions and principle of operation

The CHASIAI block cyclically processes all channel-specific signal functions of an analog input module.

The block reads an analog raw value from the process image (partition) and adapts it to its physical quantity or uses it to determines a percentage value. Input MODE Settings_MODE_for_AS_i_SIaves is used to determine the form of the raw value and how it must be processed. If the high byte of input parameter MODE = 16#40 (value status = higher-level error, QMOD_ERR = TRUE), the raw value is treated as invalid.

The result generated is a quality code, which can assume the following statuses:

Status	Quality code
Valid value	16#80
Simulation	16#60
Last valid value	16#44
Substitute value	16#48
Invalid value	16#00

The quality code is formed from a combination of internal events, such as channel faults, higher-level errors, or simulation, and a quality code, which comes directly from the device (QC parameter).

Addressing

Connect the VALUE input to the symbolic or absolute input address of the associated input channel.

Raw value check

Depending on the measurement type and measuring range, there is a nominal range of the analog input module in which the analog signal is converted to a digital value (raw value). In addition, there is an overrange and an underrange in which the analog signal can still be converted. Outside these limits, an overflow or underflow occurs. The block indicates whether the raw value is within the nominal range of the module.

If the value is less than the nominal range, output parameter QCHF_LL = TRUE is set. If the value is greater than the nominal range, output parameter QCHF_HL = TRUE is set. QCHF_LL or QCHF_HL = TRUE remains set if a channel fault has occurred as a result of module diagnosis "Measuring range violation (high or low)".

In the case of overflow or underflow, QBAD = TRUE (channel fault) is also set.

NAMUR limit value check

In the NAMUR Guidelines for analog signal processing, the following limits are defined for Life Zero (4 to 20 mA) analog signals in which a channel fault exists:

3.6 mA ≤ analog signal ≤ 21 mA

The NAMUR limits above are set permanently by default for purposes of the limit value check. If you want to set other limit values, set input parameter CH_F_ON = TRUE and set new limit values, in mA, for input parameters CH_F_HL and CH_F_LL. When the active limit values are violated (high or low), QBAD = TRUE is set in the case of a Life Zero analog signal.

Note

The selectable limit values must be below the upper limit of the overrange and above the lower limit of the underrange of the module. Thus, values outside the NAMUR range are also possible if the module does not automatically limit the measured values to this range.

Standard value

The raw value is adapted to its physical size by means of the input parameters VLRANGE, VHRANGE, and MODE. In order to connect the settings of VLRANGE and VHRANGE to other block parameters, these are written to outputs OVLRANGE and OVHRANGE. The conversion algorithm assumes a linear input signal. When VLRANGE = 0 and VHRANGE = 100, you receive a percentage value.

In contrast to the PCS 7 standard block CH_AI, the CHASIOA does not support output of the physical value (e.g., in mA) when VHRANGE = VLRANGE. If this is desired, inputs VLRANGE and VHRANGE must be configured accordingly, e.g., VLRANGE = 4 and VHRANGE = 20 for 4 to 20 mA.

Note

If the GSD file was used to configure DP/AS-i LINK Advanced or an analog AS-i slave is connected that is not configured as a Siemens slave, the driver wizard cannot determine the measuring range from HW Config and the MODE input has the value 16#xxxxFFFD. The values assigned to the RRLOW and RRHIGH inputs are then used to adapt to the physical quantity. **In this case, the user must configure the RRLOW and RRHIGH inputs with the low and high limits of the nominal range.**

Simulation

When input parameter SIM_ON = TRUE, the value of input parameter SIM_V is output with quality code QUALITY = 16#60. QBAD = TRUE: reset due to a higher-level error. A valid mode must also be set in simulation mode in the low word of input MODESettings_MODE_for_AS_i_Slaves. Otherwise, QBAD = 1 is output. The simulation has highest priority. The simulation value is converted to a raw value based on the mode and input parameters VHRANGE and VLRANGE. This is checked like a raw value from the process image. Thus, the QBAD, QCHF_LL, and QCHF_HL statuses can also be simulated.

If, in the case of a unipolar measuring range a QBAD is to be generated in the negative range, the value must be set to -119%.

If VLRANGE > VHRANGE is set, the status QBAD = TRUE cannot be simulated. Outputs QCHF_LL and QCHF_HL are set according to the value of SIM_V. If the block is in simulation mode, QSIM = TRUE is set.

Note

Note that the simulation value is always output in simulation mode, regardless of whether parameter LAST_ON (last valid value) or SUBS_ON (substitute value) is set.

Substitute value

When input parameter SUBS_ON = TRUE, LAST_ON = FALSE, the value of input parameter SUBS_V is output if the raw value is invalid. The quality code QUALITY = 16#48 is output and QBAD = 1 is set.

Hold last value, parameter V_DELTA

When input parameter LAST_ON = TRUE, SUBS_ON = FALSE, the last or next-to-last valid output value (V_LAST, VLAST1) is output, depending on parameter V_DELTA. A permissible process value change can be specified in the V_DELTA parameter. The function is disabled when V_DELTA ≤ 0 is set. The following conditions apply:

For invalid raw values and V_DELTA > 0, the following applies:

- ABS (V - V_LAST) > V_DELTA: V = V_LAST1 (next-to-last valid output value), DELTA_ON = 1
- ABS (V - V_LAST) ≤ V_DELTA: V = V_LAST (last valid output value), DELTA_ON = 0
- The quality code is set to QUALITY = 16#44 and QBAD = 1.

For valid raw values and V_DELTA > 0, the following applies:

V_DELTA is also used for change limiting of the raw value. If the value change between 2 calls exceeds V_DELTA, the last value (V_LAST) is held at output V for one cycle. The value of V_DELTA should be selected carefully. If it is too small, the quality code can jump back and forth between 16#80 and 16#44, even though the raw value is okay.

- ABS (V - V_LAST) > V_DELTA: for one cycle, V = V_LAST
- The quality code is set to QUALITY = 16#44, DELTA_ON = 1, and QBAD = 0.

Output invalid value

If input parameters SUBS_ON and LAST_ON are both = FALSE or both = TRUE and there is an invalid process value, this value is output and QBAD = 1.

Delay in applying value

Upon restart or if the quality code changes from "BAD" to "GOOD", the quality code and value are not updated until the CNT_LIM cycles have elapsed. If CNT_LIM = 0 (default setting), the function is disabled. During the delay in applying the value, quality code = 16#00 and QBAD = 1. The last value is retained during the delay time.

Troubleshooting

The input parameters are not checked for plausibility. In case of an invalid mode in the low word of the MODE input parameter, an invalid raw value is output.

Startup characteristics

The delay in applying the value is started if CNT_LIM # 0.

Time response

Not implemented.

Message capability

Not implemented.

Operator control and monitoring

The operator-control block does not have an operating screen (faceplate).

3.9.2 CHASIAI block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type
BINACSEN	Number of the input channel (0 to 3) on the AS-i slave (for future development)	INT	0	IO
CH_F_HL	Overshoot high limit of the input value (mA)	REAL	0	IO
CH_F_LL	Overshoot low limit of the input value (mA)	REAL	0	IO
CH_F_ON	1 = Enable limit monitoring	BOOL	0	IO
CNT_LIM	Limits of the startup counter	INT	0	IO
CNT_RES	Startup counter	INT	0	IO
CONN_TO_DRV	Connection to driver block MOD_ASI (for future development)	ANY	—	I
DELTA_ON	Last delta process value exceeded	BOOL	0	IO
LADDR	Logical base address of the AS-i master (for future development)	INT	0	I
LAST_BAD	Last QBAD	BOOL	0	IO
LAST_ON	1 = Last valid value Enable injection	BOOL	0	IO
MODE	Value status and operating mode	DWORD	0	IO
OVHRANGE	High limit of the process value (copy)	REAL	0	O
OVLRANGE	Low limit of the process value (copy)	REAL	0	O
QBAD	1 = Invalid process value	BOOL	0	O
QCHF_HL	1 = Overshoot of process value	BOOL	0	O
QCHF_LL	1 = Undershoot of process value	BOOL	0	O
QLAST	1 = Last valid value Injection enabled	BOOL	0	O
QMOD_ERR	1 = Higher priority error	BOOL	0	O
QSIM	1 = Simulation enabled	BOOL	0	O
QSUBS	1 = Switch to substitute value enabled	BOOL	0	O
QUALITY	Value status of the process value	BYTE	0	O
RRHIGH	Rated range high (raw value)	INT	0	I
RRLOW	Rated range low (raw value)	INT	0	I
SIM_ON	1 = Enable simulation	BOOL	0	IO
SIM_V	Simulation value	REAL	0	IO
SLAVE_NO_ASI	AS-i address (1 to 31) of the AS-i slave (for future development)	INT	0	IO
SUBS_ON	1 = Enable switch to substitute value	BOOL	0	IO
SUBS_V	Substitute value	REAL	0	IO
V	Process value for further processing	REAL	0	O
VALUE	Process value at the input channel	WORD	0	IO
VHRANGE	High limit of the process value	REAL	100	IO
VLRANGE	Low limit of the process value	REAL	0	IO
V_DELTA	Delta of (V - V_LAST) the process value	REAL	0	IO
V_LAST	Last valid process value	REAL	0	IO
V_LAST1	Second to last valid process value	REAL	0	IO

3.10 CHASIAO: Driver block for analog output of an AS-i slave (DP/AS-I LINK Advanced)

3.10.1 CHASIAO description

FB640

Application area

The CHASIAO block is used to process signals of an analog output value from AS-i slaves that are connected to the controller via DP/AS-i LINK Advanced.

The analog slaves must be configured so that the output values are stored in the cyclic process image.

Note

The functionality of the CHASIAO function block is based on that of the standard PCS 7 block CH_AO. Only the measuring range limits have to be specified manually.

Use the CHASIAO block in the following application scenarios:

- When you have configured the analog slave as a universal AS-i slave.
- When you have configured the DP/AS-i LINK Advanced with a GSD file.

Note

CH_AO block

Use the CH_AI block in the following application scenarios:

- When you have configured the analog slave as a Siemens AS-i slave.

Calling OBs

The calling OB is cyclic interrupt OB 30 to OB 38 into which you insert the block and the restart OB 100.

Use in CFC

When the "Generate module driver" CFC function is used, the following is executed automatically:

- Input MODE is connected to the applicable OMODE_xx output of the SLV_ASI block.
- The CHASIAO block is inserted into OB 100 downstream of the SLV_ASI block assigned to it.

Function and principle of operation

The CH_AO block cyclically processes all channel-specific signal functions.

The block writes a process value to a process image (partition) as an analog raw value. Input parameter MODE is used to specify the form in which the raw value is generated. If the high byte of input parameter MODE = 0 (value status), the raw value will continue to be written to the process image (partition), but quality code "invalid value" will be set.

The quality code can assume the following statuses:

Status	Quality code
Valid value	16#80
Upper value limited	16#56
Lower value limited	16#55
Simulation	16#60
Invalid value	16#00

The quality code is formed from internal events, such as a higher-level error or simulation.

Addressing

Connect the VALUE output to the symbolic or absolute output address of the associated output channel.

Standard value

- The ULRANGE and UHRANGE parameters map process value U to raw value VALUE (quantizing level) of the analog output module, depending on MODE. Example: In mode 4 ... 20 mA (16#0203), the raw value for 4 mA is output when U = ULRANGE and the raw value for 20 mA is output when U = UHRANGE.

  Note

  If the GSD file was used to configure DP/AS-i LINK Advanced or an analog AS-i slave is connected that is not configured as a Siemens slave, the driver wizard cannot determine the measuring range from HW Config and the MODE input has the value 16#xxxxFFFD. The values assigned to inputs RRLOW and RRHIGH are then used for mapping the process value U to raw value VALUE. **In this case, the user must configure the RRLOW and RRHIGH inputs with the lower and upper limits of the nominal range.**

- The UHRANGE and ULRANGE parameters are put through to the OVHRANGE and OVLRANGE outputs by the block. You can connect the outputs, e.g., to the CTRL_PID controller using the NM_LMNHR and NM_LMNLR manipulated variable value range limits.
- With PHYS_LIM, the limiting of raw value VALUE can be set. In the default setting (PHYS_LIM = 0), output value VALUE is limited to the standard limiting values of the module. According to the example above, the block calculates the raw value for 20 mA when U > UHRANGE and the raw value for 4 mA when U < ULRANGE. Accordingly, the QUALITY output has quality codes 16#56 (upper value limited) and 16#55 (lower value limited) instead of 16#80 (valid value).
- To output analog values outside the standard limiting values, up to the physical limits of the module, you must set PHYS_LIM = 1. The output values are only limited if you exceed the module limit values, e.g., in the example above when ULRANGE = 0 and UHRANGE = 100 by specifying U = 200 (36 mA) or U = - 50 (- 4 mA). The output values are then limited to the physical limit values listed in the data sheets for the modules, and the corresponding quality codes are output.

  Note

  If the GSD file was used to configure DP/AS-i LINK Advanced or a non-Siemens analog AS-i slave whose PHYS_LIM input has the value "1" is connected, the raw value is limited by the UNDERSR and OVERSR inputs. In this case, the user must configure the UNDERSR and OVERSR inputs with the underrange and overrange.

- Whether or not the output values have been limited can also be determined from the QCHF_HL and QCHF_LL outputs.

Simulation

When input parameter SIM_ON = TRUE, the value of SIM_U is output with quality code (QUALITY) = 16#60. QBAD = TRUE is reset. The simulation has highest priority. If the block is in simulation mode, QSIM = TRUE is set.

I/O fault

If the high byte of input parameter MODE = 0 (value status), the quality code QUALITY = 16#00 is set. The current raw value is always written to the process image (partition).

Value limiting

You can limit very small or very large process values that cause an error (QBAD = TRUE) before entry in the process image (partition).

If the switch LIMIT_ON has the value TRUE, the process values (U) are limited as follows:

- To V_HL, if U > V_HL
- To LL_V, if U < V_LL

Troubleshooting

The input parameters are not checked for plausibility. If the mode in the low word of input MODE is invalid, the digitalized output value is set to 0 and QUALITY = 16#00 is output.

Startup characteristics

The MOD blocks set the LSB in byte 2 of their OMODE_xx output parameters in OB 100. If the block detects this code, it acknowledges it and then reacts as follows:

If START_ON is not set, process value U is processed and transferred to the process image. Otherwise, the raw value corresponding to the START_U process value is written to the process image.

Time response

Not implemented.

Message capability

Not implemented.

Operator control and monitoring

The block has no operating screen.

3.10.2 CHASIAO block parameters

In its as-delivered condition, the block display in CFC is as shown in the "I/O" column:

I/O name in *italics* = I/O is visible; I/O name in normal typeface = I/O is not visible.

I/O (parameter)	Meaning	Data type	Default	Type
BINACSEN	Number of the output channel (0 to 3) on the AS-i slave (for future development)	INT	0	IO
CONN_TO_DRV	Connection to driver block MOD_ASI (for future development)	ANY	—	I
LADDR	Logical base address of the AS-i master (for future development)	INT	0	I
LIMIT_ON	1 = Enable limiting of the process value	BOOL	0	IO
LL_V	Process value, if U < V_LL	REAL	0	IO
MODE	Value status and operating mode	DWORD	0	IO
OVERSR	Overshoot range (raw value)	INT	0	I
OVHRANGE	Output high limit of the process value	REAL	100	O
OVLRANGE	Output low limit of the process value	REAL	0	O
PHYS_LIM	1 = Enable physical limit of the module	BOOL	0	IO
QBAD	1 = Invalid output value	BOOL	0	O
QCHF_HL	1 = Overshoot of process value	BOOL	0	O
QCHF_LL	1 = Overshoot of process value	BOOL	0	O
QMOD_ERR	1 = Higher priority error	BOOL	0	O
QSIM	1 = Simulation enabled	BOOL	0	O
QUALITY	Value status of the output value	BYTE	0	O
RRHIGH	Rated range high	INT	0	I
RRLOW	Rated range low	INT	0	I
SIM_ON	1 = Enable simulation	BOOL	0	IO
SIM_U	Simulation value	REAL	0	IO
START_ON	1 = Switch to substitute value at startup	BOOL	0	IO
START_U	Substitute value at startup	REAL	0	IO
SLAVE_NO_ASI	AS-i address (1 to 31) of the AS-i slave (for future development)	INT	0	IO
U	Process value from program execution	REAL	0	IO
UHRANGE	High limit of the process value	REAL	0	IO
ULRANGE	Low limit of the process value	REAL	0	IO
UNDERSR	Undershoot range (raw value)	INT	0	I
V_HL	High limit	REAL	0	IO
V_LL	Low limit	REAL	0	IO
VALUE	Process value to the output channel	WORD	0	O

Handling of the driver generator

4

4.1 Handling of driver generators (CP 343-2/CP 343-2P)

The Setup program installs XML files for connecting the AS-Interface communication modules to the driver generator.

The following modules and configurations are supported:

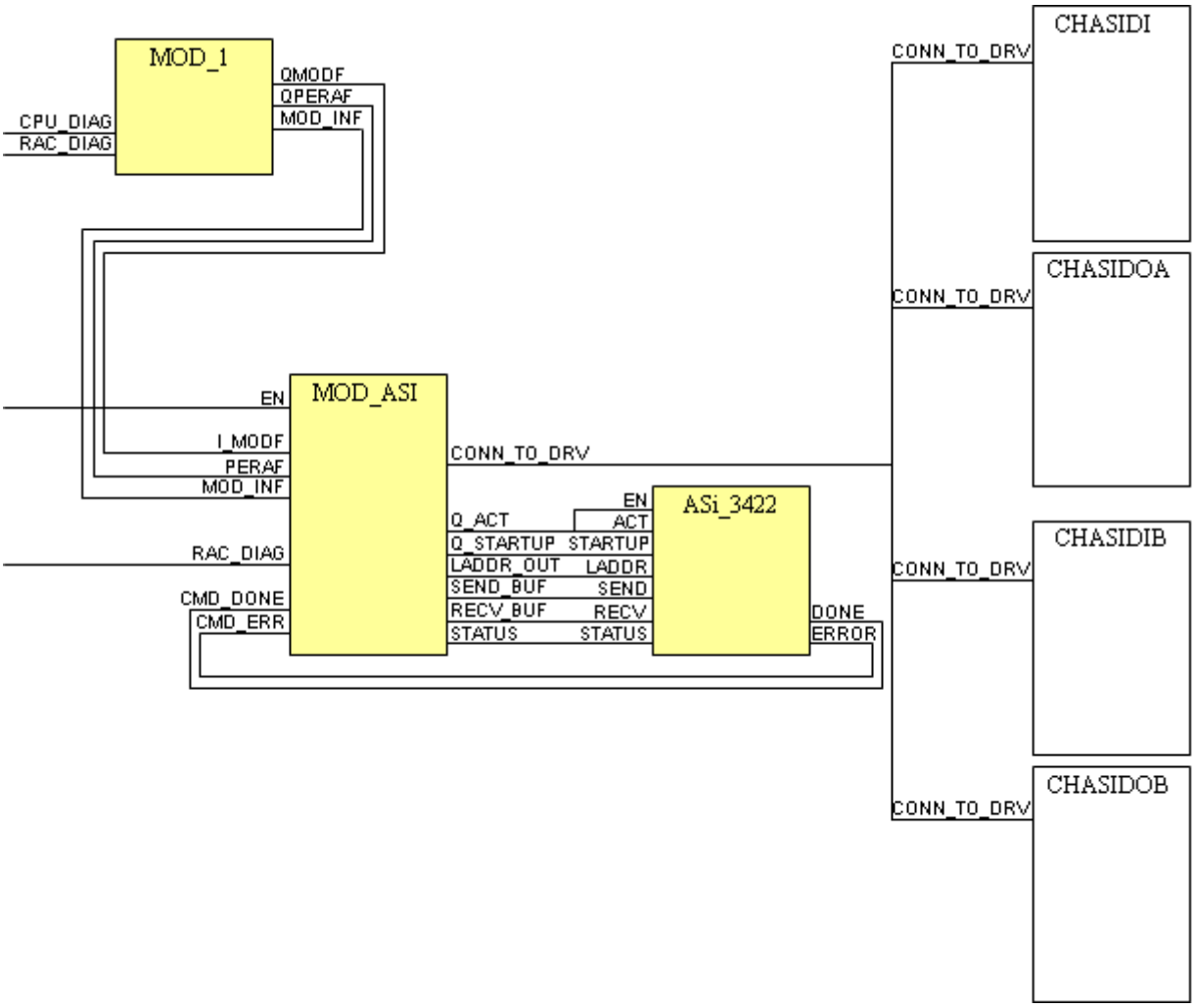
CP 343-2	(6ES7343-2AH01-0XA0)
CP 343-2P	(6ES7343-2AH11-0XA0)

A driver block is inserted in the CFC for each sensor/actuator present, and the connection to the hardware is established using symbolic addressing.

If the "Generate module driver" option is selected when the CFC chart is compiled, all other required blocks are inserted and the corresponding parameters are connected and assigned.

Interconnection diagram of the driver generator

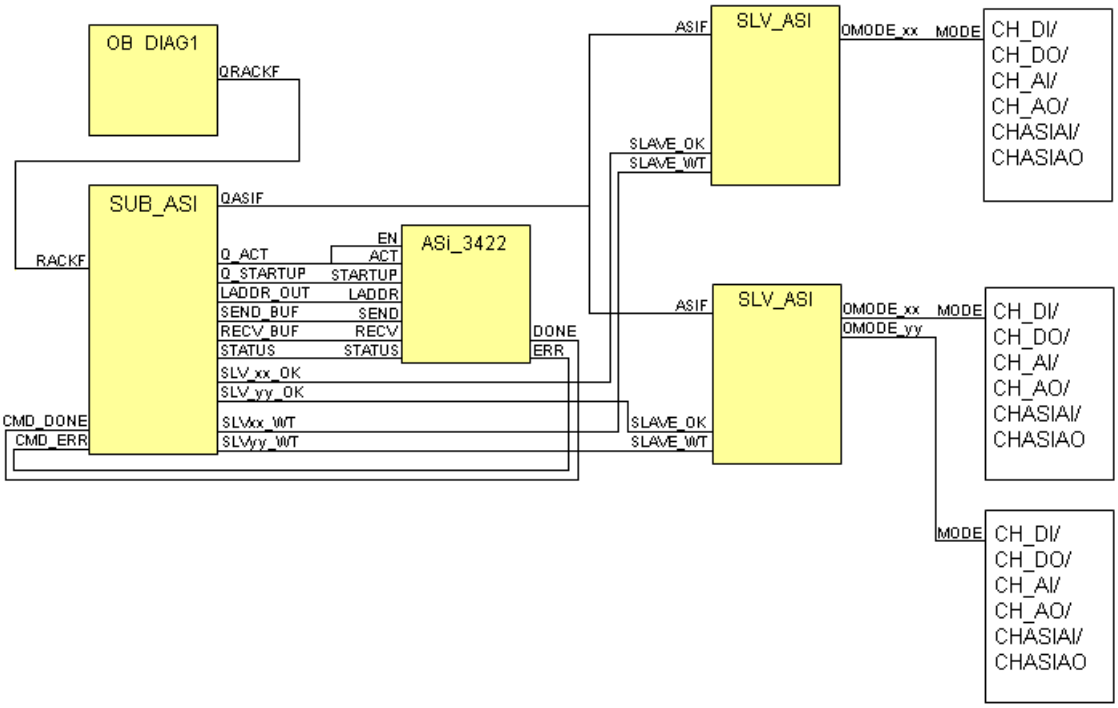
The user must place the blocks with a white background in the CFC. The colored background blocks MOD_1, MOD_ASI, and AS-i_3422 are installed by the driver generator.



4.2 Handling of driver generators (DP AS-i Link Advanced)

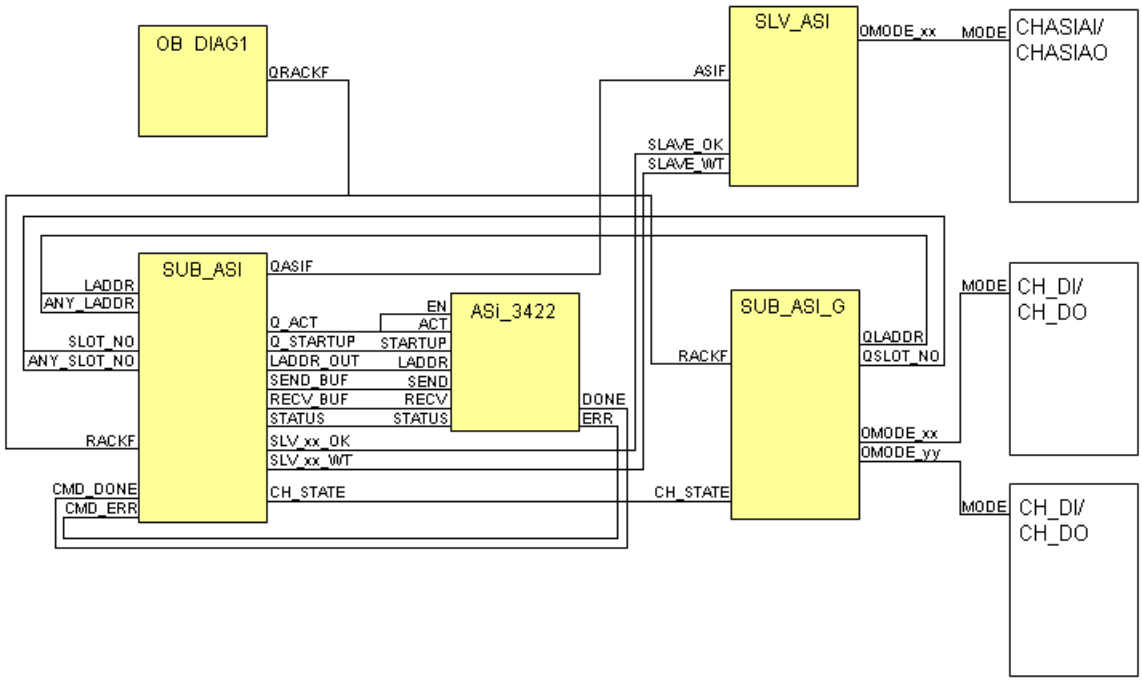
The user must place the blocks with a white background in the CFC. The colored background blocks are installed by the driver generator.

Interconnection diagram of the driver generator (configuring with Object Manager)



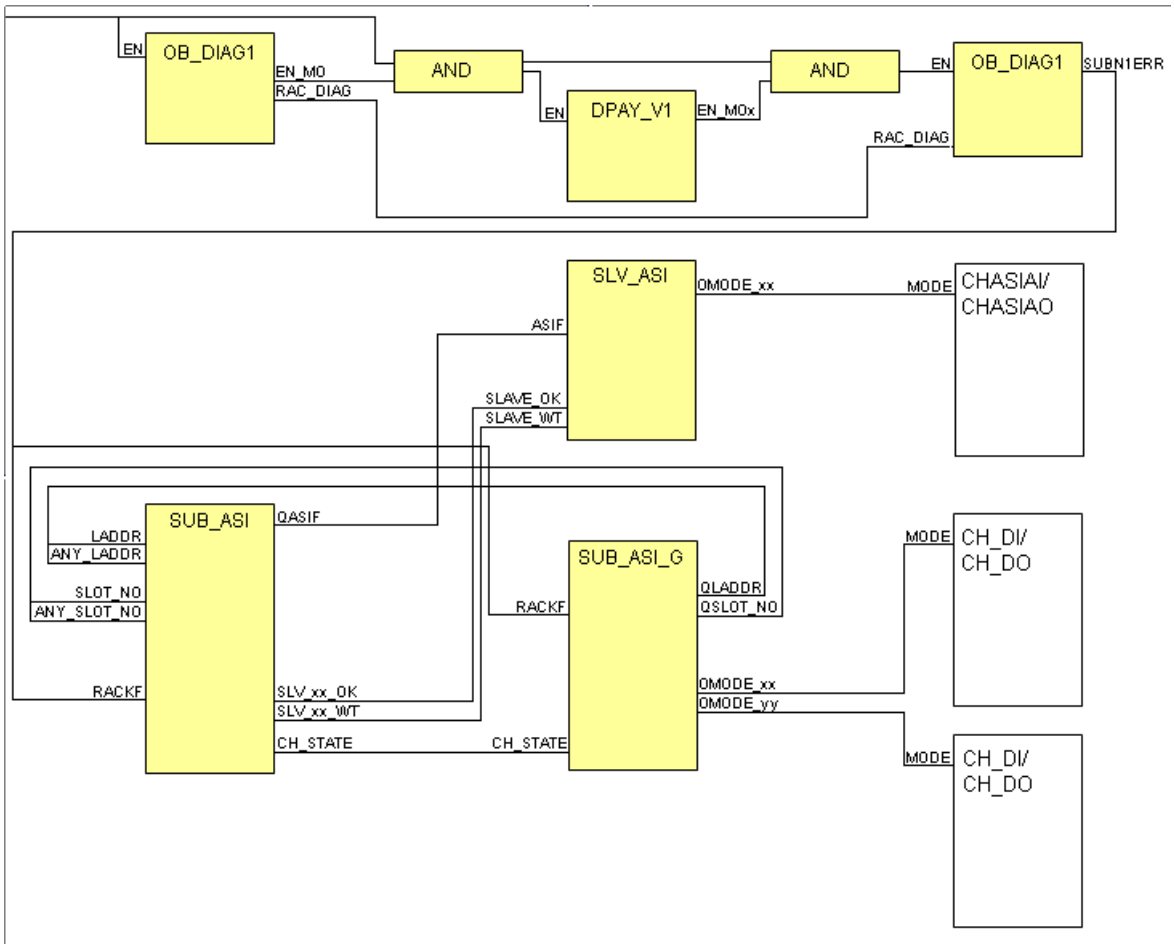
(The AS-i_3422 block is omitted in DPV0 mode)

Interconnection diagram of the driver generator (configuring with GSD file)

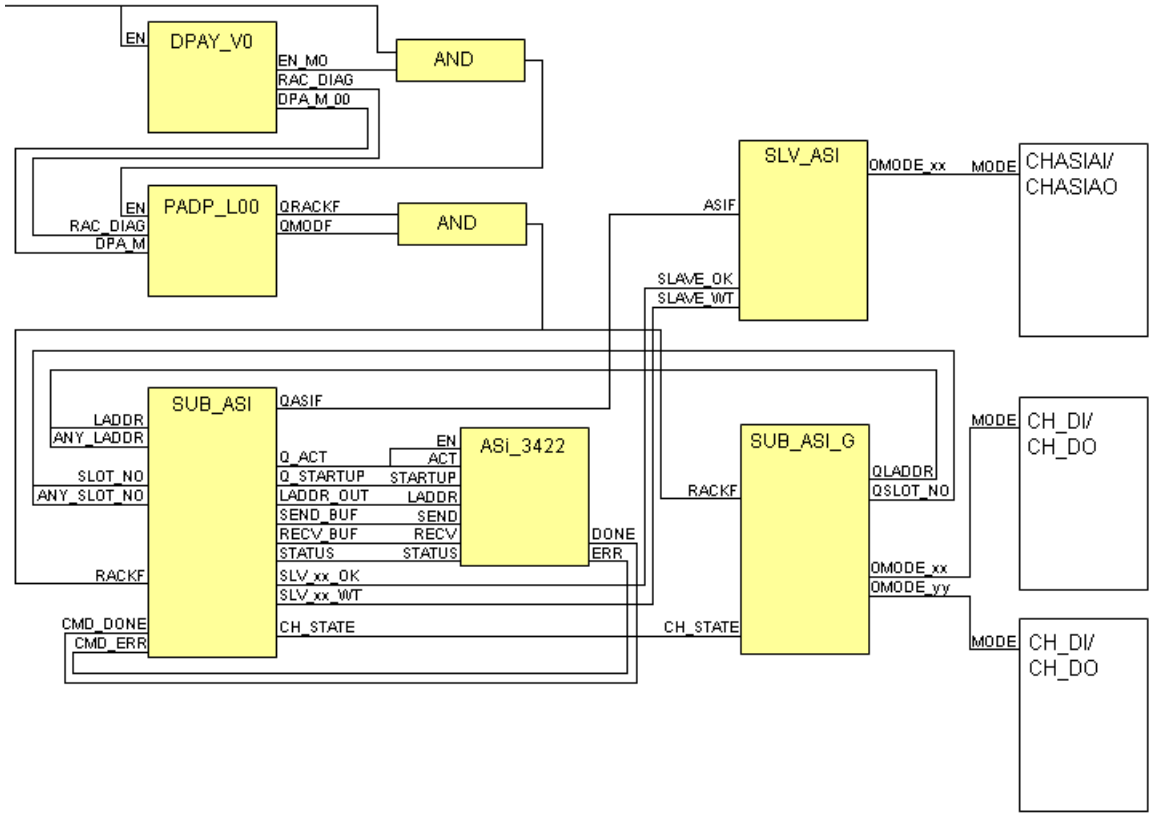


(The AS-i_3422 block is omitted in DPV0 mode)

Interconnection diagram of the driver generator (downstream of Y-Link according to DPV1)



Interconnection diagram of the driver generator (downstream of Y-Link according to DPV0)



Installation in the PCS 7 maintenance station 5

5.1 Installation in the PCS 7 maintenance station

The interface to the PCS 7 maintenance station is integrated into the MOD_ASI, SUB_ASI, SUBASI_G, and SLV_ASI blocks.

The block evaluates the diagnostic data of the module and uses this to define the conditions under which maintenance messages are issued. It issues the following messages or maintenance states to WinCC:

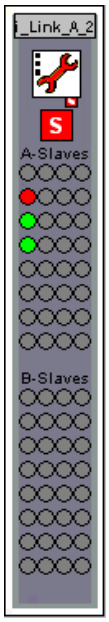
Cause	MS	Message bit	Message text
Rack failure	8 (unsafe)	RACKF / QRACKF	QRACKF
Module removed (MOD_ASI only)	7 (Maintenance: high priority)	MODF / QMODF	QMODF
I/O access error	No effect	PERAF / QPERAF	QPERAF
Internal CP fault (e.g., EEPROM defective)	7 (Maintenance: high priority)	OB82_INT_FAULT	Internal CP fault
External CP fault (e.g., slave failed or APF)	7 (Maintenance: high priority)	OB82_EXT_FAULT	External CP fault
At least one slave does not match the target specification	7 (Maintenance: high priority)	OB82_PNT_INFO or OB82_SUB_MDL_ERR	At least 1 slave does not match the target specification
AS-Interface voltage too low (APF)	7 (Maintenance: high priority)	OB82_EXT_VOLTAGE AS-i	Voltage too low
0: CP 343−2 is in normal state, 1: CP 343−2 is in offline state	7 (Maintenance: high priority)	OB82_MDL_STOP	CP in offline state
Hardware fault (internal watchdog)	7 (Maintenance: high priority)	OB82_WTCH_DOG_FLT	Hardware fault of CP
EEPROM defective	7 (Maintenance: high priority)	OB82_EPROM_FLT	EPROM defective

The CH_OK and CH_OKB or CH_OK2 block outputs contain the status information of the slaves. Information on the slaves present is stored in the CH_EXIST and CH_EXISTB or CH_EXIST2 outputs. This notifies the maintenance station which slave is disrupted.

The WinCC picture @MaintenanceTypicals_ASI_DRV.pdl contains the symbols shown below to display the maintenance state. If the "Create/update diagnostics screens" function is executed in SIMATIC Manager, PCS 7 automatically uses the block icons from this file. The screen is installed when the library is installed.

The symbols indicate the maintenance states "good", "bad", and "undefined" and when clicked open the standard faceplate for the maintenance station.

Installation in the PCS 7 maintenance station SUB_ASI / SUBASI_G and MOD_ASI

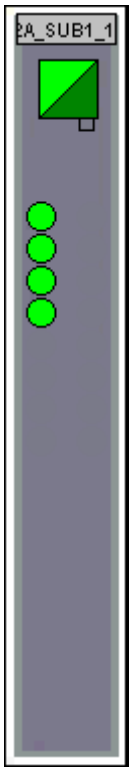


This symbol represents the 32 A-slaves at the top and the 32 B-slaves at the bottom with the following information: "good" (green), "bad" (red), and "not present" (gray). The AS-i slaves are sequentially numbered column-by-column for eight slaves each.

Columns from left to right	Each column from top to bottom
Column 1	Slaves 0 to 7
Column 2	Slaves 8 to 15
Column 3	Slaves 16 to 23
Column 4	Slaves 24 to 31

The element for jumping to the lower-level screen, which contains the symbols of the AS-i slaves, is omitted in the symbol for blocks SUBASI_G (configuring with GSD file or Profibus mode according to DPV0) and MOD_ASI.

Installation in the PCS 7 maintenance station SLV_ASI



The symbol for the AS-i slave indicates the status of its channels: "good" (green) and "bad" (red).

Technical specifications

6

6.1 Technical specifications

The following meanings apply:

Block type name

The symbolic identifier in the symbol table of the library for the respective FB. It must be unique within the project.

Object name

Consists of the type of block (FB/FC) and the number.

Block length in load/work memory

Memory requirement of program code, once per block type.

Length of instance data in load/work memory

Memory requirement of an instance DB.

Temporary memory

The local data memory needed when calling the block in an execution level. This is limited according to the specific CPU. If exceeded, you must check this in the CPU configuration and, if necessary, redistribute to OBs based on the actual requirement.

Called blocks

The blocks stated here are used by the driver block in question and must be located in the user program. They are stored in the same library.

Block (type name)	Number	Block length in load/work memory (bytes)	Length of instance data in load/work memory (bytes)	Temporary memory (bytes)	Called blocks
MOD_ASI	FB1744	10884 / 9222	4146 / 2656	148	SFB35 SFC51 SFC58 SFC59 SFC6
CHASIDIA	FC308	942 / 798	-	30	-
CHASIDOA	FC309	794 / 674	-	28	-
CHASIDIB	FB1745	1446 / 1260	180 / 56	40	-
CHASIDOB	FB1746	1320 / 1152	162 / 56	40	-
SUB_ASI	FB571	23554 / 21868	2978 / 1512	70	SFB35 SFB52 SFC20 SFC21 SFC51 SFC6 SFC64
SUBASI_G	FB576	8264 / 6914	2802 / 1756	88	SFB35 SFC6
SLV_ASI	FB573	2154 / 1798	550 / 278	54	SFB35 SFC6 SFC64
CHASIAI	FB574	6895 / 6014	276 / 126	32	-
CHASIAO	FB640	2014 / 1710	248 / 116	34	-
ASi_3422	FC307	1564 / 1256	-	38	SFC58 SFC59

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