SIEMENS

SINAMICS Line Modules

Drive ES PCS7 block library DRVPCS7 SINA_LM block

Configuration Manual

08/2024
A5E50850487B AB

Legal information

Warning notice system

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.

⚠ **DANGER**
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.

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

NOTICE
indicates that property damage can result if proper precautions are not taken.

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Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Fundamental safety instructions

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1.1 General safety instructions

⚠ WARNING

Danger to life if the safety instructions and residual risks are not observed

If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur.

- Observe the safety instructions given in the hardware documentation.
- Consider the residual risks for the risk evaluation.

⚠ WARNING

Malfunctions of the machine as a result of incorrect or changed parameter settings

As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.

- Protect the parameterization against unauthorized access.
- Handle possible malfunctions by taking suitable measures, e.g. emergency stop or emergency off.

1.2 Warranty and liability for application examples

Application examples are not binding and do not claim to be complete regarding configuration, equipment, or any eventuality which may arise. Application examples do not represent customer-specific solutions, but merely serve to provide assistance with typical tasks.

As the user you yourself are responsible for ensuring that the products described are operated correctly. Application examples do not relieve you of your responsibility for safe handling when using, installing, operating and maintaining the equipment.

1.3 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

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⚠ WARNING

Unsafe operating states resulting from software manipulation

Software manipulations, e.g. viruses, Trojans, or worms, can cause unsafe operating states in your system that may lead to death, serious injury, and property damage.

- Keep the software up to date.
- Incorporate the automation and drive components into a state-of-the-art, integrated industrial cybersecurity concept for the installation or machine.
- Make sure that you include all installed products in the integrated industrial cybersecurity concept.
- Protect files stored on exchangeable storage media from malicious software by with suitable protection measures, e.g. virus scanners.
- Carefully check all cybersecurity-related settings once commissioning has been completed.

Introduction

2

2.1 General

The control blocks and associated faceplates of Drive ES PCS7 integrate the drives specified below into the SIMATIC PCS 7 process control system.

- MASTERDRIVES
- SIMOREG DC-MASTER
- MICROMASTER
- SINAMICS
- Drives that are specified according to VIK/NAMUR

This manual describes the function and handling of the blocks of Drive ES PCS7.

2.2 Requirements

Hardware

The product Drive ES PCS7 is an add-on product for SIMATIC PCS 7

For the prerequisites, refer to the readme file of SIMATIC PCS 7 for which this product has been released.

Software

The product Drive ES PCS7 is an add-on product for SIMATIC PCS 7

For the prerequisites, refer to the readme file of SIMATIC PCS 7 for which this product has been released.

References

Notes on the installation of SIMATIC PCS 7 is available in the product-specific readme file.

2.3 Installing Drive ES PCS 7

Note

Readme file

Also read the information in the readme file.

Procedure

1. Insert the CD Drive ES PCS7 in the CD-ROM drive of your PG/PC.
2. Double-click "Setup.exe".
   All the other information you need will be provided during the installation process.
   - The control blocks of the automation system (AS) are installed in the directory of STEP 7 > "s7libs".
   - The components of the faceplates of the operator station (OS) are installed in the directory of SIMATIC WinCC.
3. You must carry out further steps before working with the faceplates. The detailed procedure for this can be found in the descriptions of the individual blocks.

Note

Execute setup on every computer

Execute the setup on every computer on which the faceplates are used. This means that the components of SIMATIC WinCC must be installed on all OS servers and OS clients. It is not sufficient to simply copy the project from the engineering station to the server/client.

2.4 General Data Protection Regulation

Compliance with the General Data Protection Regulation

Siemens respects the principles of data protection, in particular the data minimization rules (privacy by design).

For this product, this means:
The product does not process neither store any person-related data, only technical function data (e.g. time stamps). If the user links these data with other data (e.g. shift plans) or if he stores person-related data on the same data medium (e.g. hard disk), thus personalizing these data, he has to ensure compliance with the applicable data protection stipulations.

SINA_LM block

3

3.1 Overview

Area of application

The block integrates a device of the SINAMICS Active and Smart Line Module family into the SIMATIC PCS 7 process control system.

The block supports the standard functionality of a SINAMICS with respect to control by a SIMATIC

S7 and operator control and monitoring from an operator station

Communication between the converter and SIMATIC is handled via PROFIBUS DP or PROFINET IO, depending on the device design (DP/PN).

Type/number

FB626

You can change the block number.

Calling OBs

- The cyclic interrupt OB, e.g. OB35.

The block must be installed with the same instance in the following OBs. Installation in the CFC takes place automatically:

- OB100
  For start identification

Function

The SINA_LM block offers the following functionality:

- Alarm indication to SIMATIC WinCC
- Detailed information about drive faults
- Simulation mode with additional inputs and outputs for the connection of an external drive simulation (a simulation block is included in the library).

Boundary condition

- You can use the block with SIMATIC PCS 7 Version 8.2 or higher.
- The block is CIR-capable. It should be noted that when inserting the block in a CFC chart, the input RESTART is set to TRUE. The setting is necessary because the block has startup characteristics, see Chapter: Startup behavior (Page 21)

- The block is integrated into the SIMATIC PCS 7 module driver concept. The functionality of the block is only ensured this way, see Chapter: Module drivers/Maintenance station (Page 57)
- The communication interface between SIMATIC and SINAMICS comprises 1 word in both the send direction and receive direction. The interface contains exclusively process data. You also have the capability of exchanging more data, see Chapter: Adapting the telegram length (Page 65).
- You must configure a SINAMICS with Drive ES/SIMOTION interface in the hardware configuration of STEP 7. Installation of the slave, SIMOTION and device object manager is a prerequisite for this. For this slave, you configure the Siemens telegram 370.
- Make sure that the I addresses and the O addresses begin at the same start address.
- To commission the fieldbus communication, parameter assignments for the bus address and the parameterization enable are required in the drive.
  Further information can be found in the SINAMICS Operating Manual.
- The process data must be "wired" by means of parameter assignment on the basic converter to permit data exchange between the fieldbus interface of the SINAMICS and the basic unit itself. In this context, the first word sent from the SIMATIC to the converter is always connected as control word STW1. The first word sent from the converter to the SIMATIC is always connected as status word ZSW1, see Chapter: Process data interface (Page 29).
- For the assignment of the process data words and their "wiring" in SINAMICS, refer to the following Chapter: Process data interface (Page 29).
- The fault memory of the SINAMICS is read by acyclic access from the SIMATIC master in the case of a fault. The master must thus support the "data record read/write" communication services.
- The block does not provide a freely usable parameter assignment interface between SIMATIC and SINAMICS. If necessary, the interfaces can be implemented using the blocks PDAT_AC2 and PDAT_UD2. The blocks are included in the DRVDPS7 library.
- You can operate a SINAMICS drive in an H system following a Y link. If the drive is integrated in the hardware configuration as DP standard slave (via GSD file) from the "Standard" profile, acyclic communication is not possible. The module driver disables acyclic communication by presetting the block input AC_START = 0. If you enable acyclic communication nevertheless, an error message is output: SFC_ERR = 1.

3.2 Control block

3.2.1 Operating modes

The following operating mode is available:

- Control room mode:
  - Manual/automatic (control word)

In control room mode, you can specify the control word on the operator station (OS) manually or using the automatic program.

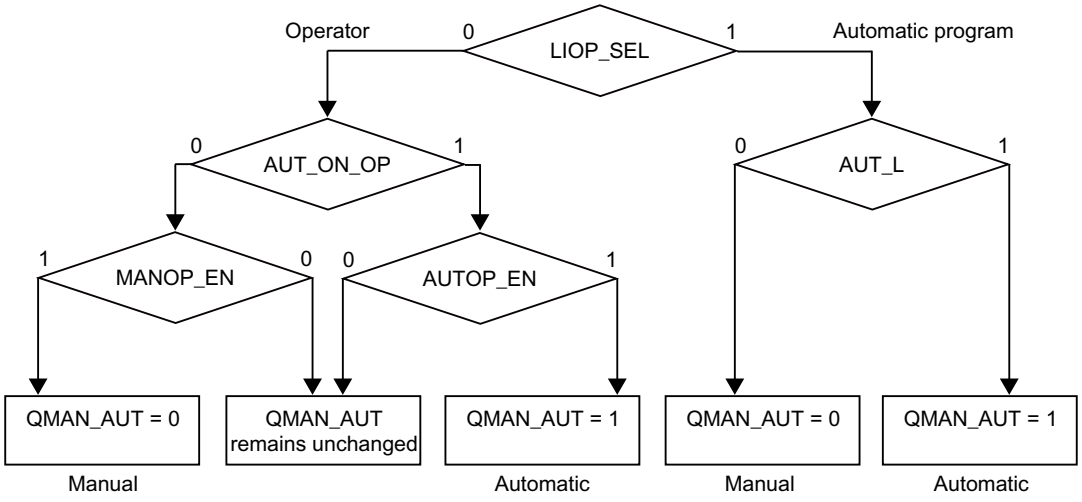
Control room mode: Manual/automatic

You can choose between manual and automatic for operator control and control via CFC/SFC (automatic program).

In operator mode, you switch over via the AUT_ON_OP input. You can additionally lock the switchover between manual and automatic for operator control via the MANOP_EN and AUTOP_EN inputs.

In the automatic program, you select the operating mode via the parameter AUT_L.

Parameter	Data type	Type	Description	
AUT_L	BOOL	IN	Mode selection, linkable input	
			=0:	Manual
			=1:	Automatic
AUT_ON_OP	BOOL	INOUT	Mode selection, operator input	
			=0:	Manual
			=1:	Automatic
AUTOP_EN	BOOL	IN	Release for automatic operation	
LIOP_SEL	BOOL	IN	Mode selection	
			=0:	AUT_ON_OP, operator station
			=1:	AUT_L, automatic program
MANOP_EN	BOOL	IN	Release for manual operation	
QMAN_AUT	BOOL	OUT	Current operating mode	
			=0:	Manual
			=1:	Automatic



Control word automatic

In automatic mode, the interconnected commands are used to control the drive. Operation from the OS side is not possible.

Control word	Parameter/ fixed value	Data type	Type	Description
Bit 0	L_OFF	BOOL	IN	ON/OFF1
Bit 1	LOCK	BOOL	IN	OFF2, electrical OFF
Bit 2	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 3	L_INV_EN	BOOL	IN	Inverter enable
Bit 4	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 5	MOT_LOCK	BOOL	IN	Inhibit motor operation
Bit 6	GEN_LOCK	BOOL	IN	Inhibit regenerative operation
Bit 7	L_RESET	BOOL	IN	Acknowledge
Bit 8	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 9	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 10	TRUE			Hard-coded status, see column "Parameter/ fixed value"
Bit 11	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 12	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 13	FALSE			Hard-coded status, see column "Parameter/ fixed value"

Control word	Parameter/ fixed value	Data type	Type	Description
Bit 14	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 15	FALSE			Hard-coded status, see column "Parameter/ fixed value"

Control word manual

In manual mode, you use the operable commands to control the drive.

Control word	Parameter/ fixed value	Data type	Type	Description
Bit 0	MOT_OFF	BOOL	INOUT	ON/OFF1
Bit 1	LOCK	BOOL	IN	OFF2, electrical OFF The parameters are taken over by the automatic program even in manual mode.
Bit 2	FALSE			
Bit 3	INV_EN	BOOL	INOUT	Inverter enable
Bit 4	TRUE			Hard-coded status, see column "Parameter/ fixed value"
Bit 5	TRUE			Hard-coded status, see column "Parameter/ fixed value"
Bit 6	TRUE			Hard-coded status, see column "Parameter/ fixed value"
Bit 7	RESET	BOOL	INOUT	Acknowledge
Bit 8	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 9	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 10	TRUE			Hard-coded status, see column "Parameter/ fixed value"
Bit 11	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 12	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 13	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 14	FALSE			Hard-coded status, see column "Parameter/ fixed value"
Bit 15	FALSE			Hard-coded status, see column "Parameter/ fixed value"

3.2.2 Data interface status word

The block outputs the status word 1 of the drive at its output interface bit by bit.

Overview

Status word	Parameter/ fixed value	Data type	Type	Description	
Bit 0	QREADYON	BOOL	OUT	=1:	Ready to switch on
Bit 1	QOP	BOOL	OUT	=1:	Ready to operate
Bit 2	QRUN	BOOL	OUT	=1:	Operation released
Bit 3	QGR_ERR	BOOL	OUT	=1:	Group fault drive
Bit 4	QLOCK	BOOL	OUT	=1:	No OFF2
Bit 5				Reserved	
Bit 6	QLOCKOUT	BOOL	OUT	=1:	Power-on inhibit active
Bit 7	QALARM	BOOL	OUT	=1:	Warning
Bit 8					Reserved
Bit 9	QPCD	BOOL	OUT	=1:	PLC control requested
Bit 10				Reserved	
Bit 11	QPCH_END	BOOL	OUT	=1:	Pre-charging completed
Bit 12	QMC_CLS	BOOL	OUT	=1:	Line contactor closed
Bit 13				Reserved	
Bit 14				Reserved	
Bit 15				Reserved	

3.2.3 States

Overview

The following states are defined:

State	Description	Parameter
OFF	Drive is switched off, main contactor off, ON command not present	QOFF
Fault	Group fault drive	QGR_ERR
STOP	Drive ready for operation, main contactor on, inverter locked	QSTOP
Running	Inverter and setpoint are released	QRUNNING
Ready, enable	Drive ready to switch: QREADY = 1	QREADY
Not ready, not enable	Drive not ready to switch: QREADY = 0	
Status transition	Drive changes to other state, switches	QSWITCH
Switching on inhibited	Switching on of drive is inhibited	QLOCKOUT

3.2.4 Error response

Overview

The following errors are signaled by the block:

Parameter	Data type	Type	Description	
AC_ERRNO	WORD	OUT	RET_VAL of SFB52/53, error number	
MODF	BOOL	OUT	=1:	System detected a slave failure
PERAF	BOOL	IN	=1:	System has detected an error while updating the process image
QDAT_ERR	BOOL	OUT	=1:	Group error communication • S_ERR • R_ERR • REQ_ERR • WDOG_ERR • SFC_ERR
QERR	BOOL	OUT	=1:	Group error • QPARF • QRACKF • QTIMEOUT • PERAF
QGR_ERR	BOOL	OUT	=1:	Drive fault
QPARF	BOOL	OUT	=1:	Normalization factors = 0 Or LOCK_MSS parameterized incorrectly
QRACKF	BOOL	OUT	=1:	Rack failure
QTIMEOUT	BOOL	OUT	=1:	Switching time monitoring No positive checkback signal was received after an switching operation within a programmable time SW_CYCLE.
R_ERR	BOOL	OUT	=1:	Cyclic communication error
R_ERRNO	WORD	OUT	Status SFC14: DPRD_DAT	
RACKF	BOOL	OUT	=1:	System has detected a rack failure
REQ_ERR	BOOL	OUT	=1:	Parameter assignment request (DS47) completed with errors: response ID = 0x81 = error during read job Possible cause: e.g. wrong axis ID Further possible causes can be found in the "Function Manual SINAMICS S120 Drive Functions" (FH1), Table 10-57
S_ERR	BOOL	OUT	=1:	Cyclic communication error
S_ERRNO	WORD	OUT	Status SFC15: DPWR_DAT	

Parameter	Data type	Type	Description	
SFB_ERR	BOOL	OUT	=1:	SFB error during data transmission with SFB52/53
WDOG_ERR	BOOL	OUT	=1:	No plausible response data within the monitoring time

If there are the following errors, the drive is no longer accessed:

- QPARF
- QRACKF
- MODF
- PERAF

A restart in the block is only executed when this error has been eliminated.

Drive fault

If the drive reports "Fault" in the status word, QGR_ERR = 1 is set and the fault memory of the drive is read. Thus you receive further information about the drive fault.

See the following Chapter: Coordination of acyclic communication (Page 29)

Data interface fault memory

The following fault information is read by the block and displayed in the "Drive fault" control field:

Parameter	Data type	Type	Description
ERR_NO1	DINT	OUT	Fault number 1
ERR_VAL1	DWORD	OUT	Fault value for fault number 1
ERR_NO2	DINT	OUT	Fault number 2
ERR_VAL2	DWORD	OUT	Fault value for fault number 2
ERR_NO3	DINT	OUT	Fault number 3
ERR_VAL3	DWORD	OUT	Fault value for fault number 3
ERR_NO4	DINT	OUT	Fault number 4
ERR_VAL4	DWORD	OUT	Fault value for fault number 4
ERR_NO5	DINT	OUT	Fault number 5
ERR_VAL5	DWORD	OUT	Fault value for fault number 5
ERR_NO6	DINT	OUT	Fault number 6
ERR_VAL6	DWORD	OUT	Fault value for fault number 6
ERR_NO7	DINT	OUT	Fault number 7
ERR_VAL7	DWORD	OUT	Fault value for fault number 7
ERR_NO8	DINT	OUT	Fault number 8
ERR_VAL8	DWORD	OUT	Fault value for fault number 8

3.2.5 BATCH flexible

Overview

The following inputs on the block are used for connection to the BATCH flexible option of SIMATIC PCS 7:

Parameter	Data type	Type	Description
BA_EN	BOOL	IN	BATCH command enable
BA_ID	STRING[32]	IN	Consecutive batch number
BA_NA	DWORD	IN	BATCH designation
OCCUPIED	BOOL	IN	BATCH occupied identification
STEP_NO	DWORD	IN	BATCH step number

The following inputs are also transferred to the operator station as additional values:

- BA_NA
- BA_ID
- STEP_NO

These inputs are not evaluated by the block algorithm.

3.2.6 Startup behavior

Overview

- Read in the logical base address and the diagnostic address of the slave.
- Read in the value of the input LOCK_MSS for the behavior of the "STOP" button in the faceplate.
  If a value <>0, 2 is entered, the driver sets its output QPARF = 1 and does not carry out any further I/O access.

You can also perform the tasks above by setting the RESTART input. The RESTART input is reset by the block.

After a restart, there is a wait period for a parameterizable number of cycles before you can operate the drive.

3.2.7 Time behavior

The block has no time behavior.

3.2.8 Message behavior

Message generation for SIMATIC WinCC is implemented via SFB 35 (ALARM_8P). This SFB is integrated in the block as instance.

Overview

Message number	Block parameter	Default text	Message class
1	QPARF	Parameter assignment error	F
2	QRACKF Or PERAF Or MODF	External fault	S
3	QGR_ERR	Fault drive no.: @4%d@; @4W%t#TextbibSG@	S
4	QTIMEOUT	Switching time monitoring	S
5	MSG_5		
6	MSG_6		
7	QDAT_ERR	Data error	F
8	QALARM	Warning drive	W

The messages 3 and 8 are triggered by the converter. The other messages are created by the AS block.

Message class	Description
F	AS control system message fault
S	AS control system message failure
A	Alarm message
W	Warning

Assignment of associated values to the block parameters

Associated value	Block parameter
1	BA_NA
2	STEP_NO
3	BA_ID
4	Error number See Chapter: User-specific parameterization of the inputs (Page 23)
5	AUX_PRO6
6	AUX_PRO5
7	AUX_PRO4

Associated value	Block parameter
8	AUX_PRO3
9	AUX_PRO2
10	AUX_PRO1

No technological messages are sent by the block. Users can implement these messages themselves using the status indications (outputs) of the block and a message block from the PCS7 library. (Runtime reasons!)

You parameterize the message texts in the SIMATIC Manager. For each message you can specify which associated values are to be displayed. The message texts are shown in the table above in the "Default text" column.

With the block parameter MSG_LOCK, you can lock messages. If the parameter MSG_LOCK = TRUE, no messages are output from the block.

Further information on message configuration can be found in the online help for SIMATIC PCS 7 under the keyword "Message configuration":

3.2.9 User-specific parameterization of the inputs

Overview

You must parameterize the block inputs listed below application-specifically:

Parameter	Data type	Type	Description
AXIS_ID	BYTE	IN	Module ID of the drive object to be addressed See Chapter: Addressing the drive objects (parameter AXIS_ID) (Page 47)
C_AL_CYC	INT	IN	Number of cycles before an alarm is output when the alarm limits are violated.
DADDR	INT	IN	Diagnostic address of the slave With the use of the module driver, the parameter is automatically provided with the corresponding values. See Chapter: Option for compiling the CFC (Page 38) Module drivers/Maintenance station (Page 57)
FAULT_EN	BOOL	IN	=1: Fault number is read out acyclically and transferred in the message as an associated value. =0: Fault number is not transferred as an associated value.
LADDR	INT	IN	Logical base address of the slave With the use of the module driver, the parameter is automatically provided with the corresponding values. See Chapter: Option for compiling the CFC (Page 38) Module drivers/Maintenance station (Page 57)

Parameter	Data type	Type	Description	
LOCK_MSS	INT	IN	=0:	"STOP" button in faceplate not visible, input STOP in faceplate without effect
			=2:	"STOP" button in faceplate acts on bit 1 in the control word (electrical OFF)
			=3:	"STOP" button in faceplate acts on bit 2 in the control word (fast stop)
MAIN_L	INT	IN	Time until maintenance (M): low requirement See Chapter: Module drivers/Maintenance station (Page 57)	
MAIN_M	INT	IN	Time until maintenance (M): medium requirement See Chapter: Module drivers/Maintenance station (Page 57)	
ME_LE_AV	INT	IN	Telegram length process values See Chapter: Adapting the telegram length (Page 65)	
ME_LE_SP	INT	IN	Telegram length setpoints See Chapter: Adapting the telegram length (Page 65)	
RUNUPCYC	INT	IN	Number of cycles to be waited after a restart before messages are generated and the drive can be started.	
VALUE	WORD	IN	Input value: Start address of the first slot of the drive See Chapter: Module drivers/Maintenance station (Page 57)	

You have to parameterize the following inputs:

- VALUE
- DADDR
- LADDR

The remaining inputs have default values that can be changed specifically for the application.

3.2.10 Application-specific interconnecting of the inputs

Overview

You must interconnect the block inputs listed below application-specifically:

Parameter	Data type	Type	Description	
AC_START	BOOL	IN	Interlock "Read out fault memory"	
			=0:	Acyclic communication channel to the drive is used by another application. Fault memory may not be read out.
			=1:	Acyclic communication channel to drive is free. Fault memory may be read out.

Parameter	Data type	Type	Description
AUT_L	BOOL	IN	Operating mode selection
			=0: Manual
			=1: Automatic
L_INV_EN	BOOL	IN	Inverter enable
MOT_LOCK	BOOL	IN	Inhibit motor operation
GEN_LOCK	BOOL	IN	Inhibit regenerative operation
L_OFF	BOOL	IN	ON/OFF1
L_RES_MA	BOOL	IN	Interconnectable input to reset maintenance requirement. The operating hours counter is reset to 0.
L_RESET	BOOL	IN	Acknowledge
LOCK	BOOL	IN	OFF2: Electrical OFF
LOCK_ON_OP	BOOL	IN	=1: Interlocking: ON See Chapter: Interlocking (Page 26)
LOCK_OP	BOOL	IN	=1: Interlocking: OFF See Chapter: Interlocking (Page 26)
MODF	BOOL	IN	=1: System detected a slave failure. With the use of the module driver, the parameter is automatically interconnected. See Chapter: Option for compiling the CFC (Page 38)
MSS	BOOL	IN	OFF3, fast stop
OFF_EN	BOOL	IN	=0: Drive not ready to switch.
			=1: Drive ready to switch.
PERAF	BOOL	IN	I/O access error when the system updates the process image. With the use of the module driver, the parameter is automatically interconnected. See Chapter: Option for compiling the CFC (Page 38)
RACKF	BOOL	IN	Rack failure With the use of the module driver, the parameter is automatically interconnected. See Chapter: Option for compiling the CFC (Page 38)

If the input OFF_EN = FALSE, an OFF3 command (rapid stop) is sent to the drive.

The "Read fault memory" function can be interlocked via the AC_START input. This interlocking is necessary if several blocks use the acyclic communication channel to the same drive, because otherwise communication errors may occur. An example is the SINAMICS G120 with infeed module and several axes.

If there is no further acyclic communication in the project, set the AC_START input to "1", see Chapter: Coordination of acyclic communication (Page 29).

3.2.11 Interlocking

Overview

You turn on the converter in locked state using the input LOCK_ON_OP if no other conditions are preventing such an operation, e.g. pending OFF2 or OFF3.

You can turn off the converter in locked state using the input LOCK_OP.

Both inputs act on the bit STW1.0 (ON/OFF1). If both inputs are set, the converter will be turned off in locked state.

You must cancel the input LOCK_ON_OP with pending closing lockout, because otherwise you cannot exit the closing lockout status. The closing lockout is pending if SW1.6 = 1. This bit corresponds to the output QLOCKOUT.

If in automatic mode an OFF command is pending, the converter is switched off if LOCK_OP is active. If LOCK_OP is cancelled and the converter is still in automatic mode and the ON command is still pending, then the converter is switched on again.

If in manual mode an OFF1 command is pending, the converter is switched on if LOCK_ON_OP is active.

If LOCK_ON_OP is cancelled and the converter is still in automatic mode and the OFF1 command is still pending, then the converter is switched off again.

In manual mode, the manual command is always updated to the current state. That is to say, after LOCK_ON_OP, the converter remains switched on and after LOCK_OP switched off.

The priority allocation of the individual input variables and events regarding their influence on the control signal is summarized in the table below.

Priority	Event	
High	LOCK: MSS:	OFF2, electrical OFF OFF3, fast stop
⇑	LOCK_OP:	Switched off in locked state
⇓	LOCK_ON_OP:	Switched on in locked state
Low	L_OFF: MOT_OFF:	Automatic mode Manual mode, ON/OFF1

3.2.12 Changing the language for the display device

The block supports the following languages:

- German
- English
- French
- Spanish
- Italian

Before changing the language, open the properties dialog of the control block and switch to the "Connections" tab. Replace the English contents of the columns "Designation", "Unit", "Text0" and "Text1" of the block with the respective German, French, Spanish or Italian texts.

Procedure

1. Select the block.
2. Select "Edit" in the menu bar.
3. Select "Object properties".
4. Open the "Connections" tab and change the descriptions in the "Designation", "Unit", "Text0" and "Text1" columns.
5. Double-click the column borders to automatically increase the width of the column. This will enable the complete headings and contents of the column to be displayed.

Alternatively, you can also change the texts for all of the designators in the columns "Designation", "Unit", "Text0" and "Text1" in the SIMATIC WinCC text library.

Now it is possible to switch between languages as often as desired without having to change the designators in the CFC again.

References

If you switch SIMATIC PCS 7 to a different language, set the language in STEP 7 and in SIMATIC WinCC.

Further information can be found in the configuration manual: Process Control System PCS 7; Engineering System.

German

The following table shows the affected I/O parameters and the translated texts for German.

Parameter	Identifier	Unit	Text0	Text1
AUT_ON_OP	–	–	Hand	Automatik
INV_EN	–	–	Sperren	Freigabe
MAIN_D	Betriebsstunden	d		
MOT_OFF	–	–	Aus	Ein
RES_MAIN			0	Reset
RESET	–	–	0	Reset
STOP	–	–	0	Sperren
SW_CYCLE	Monitor	sec	–	–
SWT_ACT	–	–	SWT deaktiviert	SWT aktiviert

French

The following table shows the affected I/O parameters and the translated texts for French.

Parameter	Identifier	Unit	Text0	Text1
AUT_ON_OP	–	–	Manuel	Automa.
INV_EN	–	–	Blocage	Liber.
MAIN_D	Heures de fonct.	d		
MOT_OFF	–	–	Arrêt	Marche
RES_MAIN			0	Réinit
RESET	–	–	0	Réinit
STOP	–	–	0	Blocage
SW_CYCLE	Moniteur	s	–	–
SWT_ACT	–	–	SWT désactivée	SWT activée

Spanish

The following table shows the affected I/O parameters and the translated texts for Spanish.

Parameter	Identifier	Unit	Text0	Text1
AUT_ON_OP	–	–	Manual	Automático
INV_EN	–	–	Bloqueo	Habilitación
MAIN_D	Horas de funcio-namiento	d		
MOT_OFF	–	–	Des	Con
RES_MAIN			0	Reset
RESET	–	–	0	Reset
STOP	–	–	0	Bloqueo
SW_CYCLE	Monitor	seg	–	–
SWT_ACT	–	–	SWT desactivado	SWT activado

Italian

The following table shows the affected I/O parameters and the translated texts for Italian.

Parameter	Identifier	Unit	Text0	Text1
AUT_ON_OP	–	–	Manuale	Automatico
INV_EN	–	–	Blocco	Abilitazione
MAIN_D	Ore di esercizio	d		
MOT_OFF	–	–	Off	On
RES_MAIN			0	Reset
RESET	–	–	0	Reset
STOP	–	–	0	Blocco
SW_CYCLE	Monitor	sec	–	–
SWT_ACT	–	–	SWT disattivato	SWT attivato

3.2.13 Coordination of acyclic communication

The "Read fault memory" function of this block uses the acyclic communication channel to the drive. This channel must only be used by one application for the same drive at any given time.

Overview

With the input AC_START you enable acyclic communication. If the input is set to "TRUE", the channel for acyclic communication is currently not being used by other applications. The channel can be used by this block. If the block occupies the acyclic channel, the AC_BUSY output is set to TRUE. No other application must use the acyclic channel now.

The QGR_ERR output can be used to give the "Read fault memory" function priority over other applications. This output has the TRUE status as long as an unacknowledged drive fault is pending.

You coordinate the access to this channel with the following parameters:

Parameter	Data type	Type	Description	
AC_START	BOOL	IN	Interlock "Read out fault memory"	
			=0:	Acyclic communication channel to the drive is used by another application. Fault memory may not be read out.
			=1:	Acyclic communication channel to drive is free. Fault memory may be read out.
AC_BUSY	BOOL	OUT	=1:	Fault memory is being read
QGR_ERR	BOOL	OUT	=1:	Drive fault

3.2.14 Process data interface

Parameterize drive

Control room mode (data record 0)

The block transfers 1 process data word (control word) cyclically to the SINAMICS and receives 1 process data word (status word) cyclically from the drive.

See Chapter: Adapting the telegram length (Page 65)

SIMATIC > SINAMICS

Description	Parameter	Data type	Telegram location
Control word	Control word and status word are formed by the block. The required bits are set individually at the I/O bar.	WORD	1st word

SINAMICS > SIMATIC

Description	Parameter	Data type	Telegram location
Status word	Control word and status word are formed by the block. The required bits are set individually at the I/O bar.	WORD	1st word

Procedure for PROFIBUS mode

For PROFIBUS mode, the following parameterization is required:

1. Restore the factory settings:
   The setting is only required to ensure that the correct default is set for CDS1 (local mode). Set the following:
   - For CU3x0: p0009 = 30
   - For CU2x0: p0010 = 30
2. Commission the drive via the AOP30 or the STARTER according to the operating instructions.
3. Set the address using the address switch on the CU:
   p0918 = PROFIBUS address
4. Set p0922 = SIEMENS telegram 370, PZD-1/1 (370).
5. Set p0977 (CU3x0) = 1, fail-safe parameter backup
6. Activate the control via PROFIBUS according to the operating instructions.
7. Switch the circuitry voltage off and back on again.

PROFINET mode

For PROFINET mode, the following parameterization is required:

1. Restore the factory settings:
   The setting is only required to ensure that the correct default is set for CDS1 (local mode). Set the following:
   - For CU3x0: p0009 = 30
   - For CU2x0: p0010 = 30
2. Commission the drive via the STARTER according to the operating instructions.
3. Set p0922 = SIEMENS telegram 370, PZD-1/1 (370).
4. Set p0977 (CU3x0) = 1, fail-safe parameter backup
5. Activate the control via PROFINET according to the operating instructions.
6. Switch the circuitry voltage off and back on again.

3.2.15 I/O bar

The as-supplied state of the block representation in CFC is marked in the "Default" column:

Parameter name **bold** = connection is visible

Parameter name normal = connection is not visible

Connections

Parameter	Type	Type	Default	Comment		S7_m_c:=TRUE X=Parameter can be operated and monitored
AC_BUSY	BOOL	OUT	FALSE	=1:	Upread of fault memory in process	
AC_ERRNO	WORD	OUT	0	SFB52/53 RET_VAL, error number		
AC_START	BOOL	IN	TRUE	=1:	Upread of fault memory enabled	
AUT_L	BOOL	IN	FALSE	Linkable input:		
				=0:	Manual mode	
				=1:	Automatic mode	
AUT_ON_OP	BOOL	INOUT	FALSE	Operator input, operation mode:		X
				=0:	Manual mode	
				=1:	Automatic mode	
AUTOP_EN	BOOL	IN	TRUE	=1:	Automatic operation enable	
AUX_PRO1	ANY	INOUT		Associated value 1		
AUX_PRO2	ANY	INOUT		Associated value 2		
AUX_PRO3	ANY	INOUT		Associated value 3		
AUX_PRO4	ANY	INOUT		Associated value 4		
AUX_PRO5	ANY	INOUT		Associated value 5		
AUX_PRO6	ANY	INOUT		Associated value 6		
AXIS_ID	BYTE	IN	0	Axis addressing for multi-axis drives		
BA_EN	BOOL	IN	TRUE	Batch enable		X
BA_ID	DWORD	IN	0	Batch ID		X
BA_NA	STRING[32]	IN		Batch name		
DADDR	INT	IN	0	Diagnostic address of DP-slave		
DADDR_O	WORD	OUT	0	Diagnostic address of DP-slave		
EN	IN	BOOL	TRUE			
ENO	OUT	BOOL	FALSE			
ERR_NO1	DINT	OUT	0	Error number of error 1		X
ERR_NO2	DINT	OUT	0	Error number of error 2		X
ERR_NO3	DINT	OUT	0	Error number of error 3		X
ERR_NO4	DINT	OUT	0	Error number of error 4		X
ERR_NO5	DINT	OUT	0	Error number of error 5		X
ERR_NO6	DINT	OUT	0	Error number of error 6		X
ERR_NO7	DINT	OUT	0	Error number of error 7		X
ERR_NO8	DINT	OUT	0	Error number of error 8		X
ERR_VAL1	DWORD	OUT	0	Error value of error 1		X
ERR_VAL2	DWORD	OUT	0	Error value of error 2		X

Parameter	Type	Type	Default	Comment		S7_m_c:=TRUE X=Parameter can be operated and monitored
ERR_VAL3	DWORD	OUT	0	Error value of error 3		X
ERR_VAL4	DWORD	OUT	0	Error value of error 4		X
ERR_VAL5	DWORD	OUT	0	Error value of error 5		X
ERR_VAL6	DWORD	OUT	0	Error value of error 6		X
ERR_VAL7	DWORD	OUT	0	Error value of error 7		X
ERR_VAL8	DWORD	OUT	0	Error value of error 8		X
FAULT_EN	BOOL	IN	TRUE	=1:	Drive error is read out acyclically and transferred as an additional value in the message	
				=0:	Drive error is not transferred as an additional value	
GEN_LOCK	BOOL	IN	FALSE	Linkable input: Generator mode disable		
INV_EN	BOOL	INOUT	TRUE	Operator input: Inverter enable		X
L_INV_EN	BOOL	IN	TRUE	Linkable input: Inverter enable		
L_OFF	BOOL	IN	FALSE	Linkable input:		
				=0:	OFF	
				=1:	ON	
L_RES_MA	BOOL	IN	FALSE	Linkable input: Maintenance reset		X
L_RESET	BOOL	IN	FALSE	Linkable input: Error reset		
LADDR	INT	IN	0	Logical address of module		
LADDR_O	WORD	OUT	0	Logical address of module		
LIOP_SEL	BOOL	IN	FALSE	Control word set:		
				=0:	By operator	
				=1:	By linking	
LOCK	BOOL	IN	TRUE	Linkable Input:		
				=0:	OFF2	
				=1:	Operating condition	
LOCK_MSS	INT	IN	2	=0:	STOP Button invisible	
				=2:	STOP Button effects OFF2	
LOCK_ON_OP	BOOL	IN	FALSE	=1:	Lock, ON See Chapter: Interlocking (Page 26)	X
LOCK_OP	BOOL	IN	FALSE	=1:	Lock, OFF See Chapter: Interlocking (Page 26)	X
LR_MAN_AUT	BOOL	IN	FALSE	Switching local to remote:		
				=0:	Reactivate previously selected mode	
				=1:	Activate manual mode	
MAIN_D	INT	IN	0	Backup of days since last maintenance		X
MAIN_L	INT	IN	100	Time interval for maintenance low [day]		
MAIN_M	INT	IN	200	Time interval for maintenance middle [day]		

Parameter	Type	Type	Default	Comment		S7_m_c:=TRUE X=Parameter can be operated and monitored
MANOP_EN	BOOL	IN	TRUE	=1:	Manual operation enable	
ME_LE_AV	INT	IN	1	Message length of actual value See Chapter: Adapting the telegram length (Page 65)		
ME_LE_SP	INT	IN	1	Message length of setpoint See Chapter: Adapting the telegram length (Page 65)		
MODE	DWORD	IN	0	Parameter OMODE of DES_DIAG		
MODF	BOOL	IN	FALSE	=1:	Module failure	
MODF_LOCK	BOOL	IN	FALSE	Linkable input: Generator mode disable		
MOT_OFF	BOOL	INOUT	FALSE	Operator input:		X
				=0:	OFF	
				=1:	ON	
MSG_5	BOOL	IN	FALSE	Free message input 5		
MSG_6	BOOL	IN	FALSE	Free message input 6		
MSG_EVID	DWORD	IN	0	Message ID		
MSG_LOCK	BOOL	IN	FALSE	=0:	Alarming enabled	X
MSGACKEN	BOOL	IN	FALSE	1=:	Evaluate acknowledge state	
MSS	BOOL	IN	TRUE	Linkable input:		
				=0:	OFF3	
				=1:	Operating condition	
OCCUPIED	BOOL	IN	FALSE	Occupied by batch		X
OFF_EN	BOOL	IN	TRUE	=1:	Motor ready to start	
PCD_2	WORD	OUT	0	Optional process value 2 See Chapter: Adapting the telegram length (Page 65)		
PCD_2_IN	WORD	IN	0	Optional setpoint 1 See Chapter: Adapting the telegram length (Page 65)		
PCD_3	WORD	OUT	0	Optional process value 3 See Chapter: Adapting the telegram length (Page 65)		
PCD_3_IN	WORD	IN	0	Optional setpoint 2 See Chapter: Adapting the telegram length (Page 65)		
PCD_4	WORD	OUT	0	Optional process value 4 See Chapter: Adapting the telegram length (Page 65)		
PCD_4_IN	WORD	IN	0	Optional setpoint 3 See Chapter: Adapting the telegram length (Page 65)		

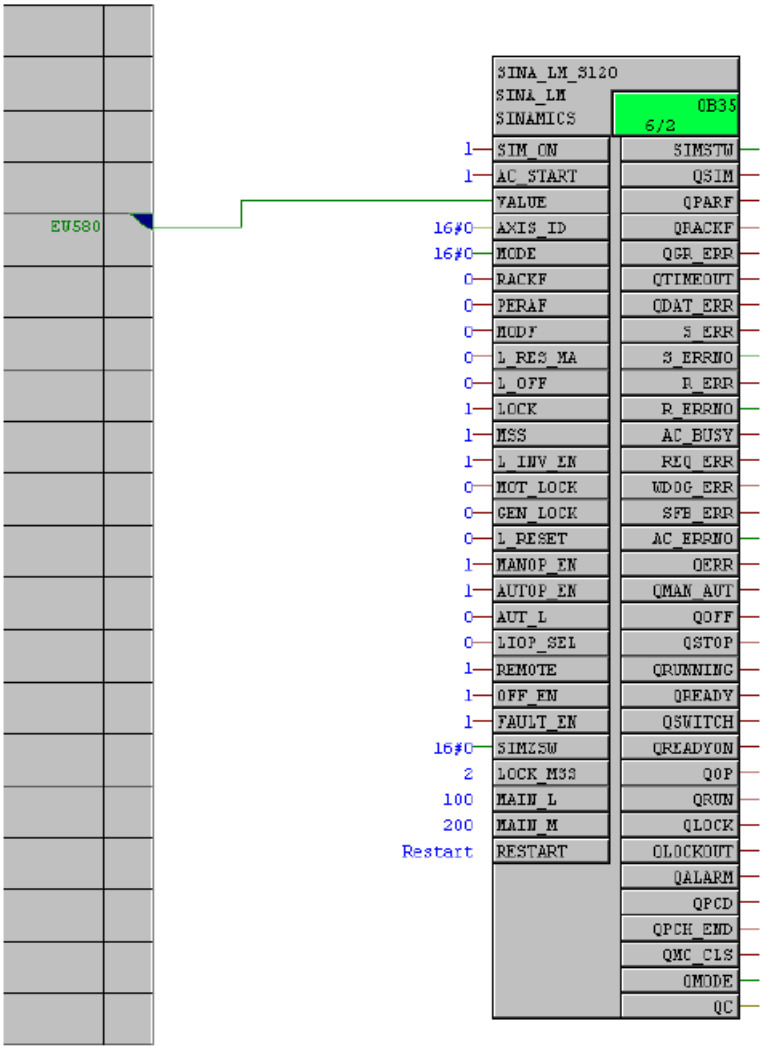
Parameter	Type	Type	Default	Comment		S7_m_c:=TRUE X=Parameter can be operated and monitored
PCD_5	WORD	OUT	0	Optional process value 5 See Chapter: Adapting the telegram length (Page 65)		
PCD_5_IN	WORD	IN	0	Optional setpoint 4 See Chapter: Adapting the telegram length (Page 65)		
PCD_6	WORD	OUT	0	Optional process value 6 See Chapter: Adapting the telegram length (Page 65)		
PCD_7	WORD	OUT	0	Optional process value 7 See Chapter: Adapting the telegram length (Page 65)		
PCD_8	WORD	OUT	0	Optional process value 8 See Chapter: Adapting the telegram length (Page 65)		
PERAF	BOOL	IN	FALSE	Access error		
QALARM	BOOL	OUT	FALSE	=1:	Alarm	
QAUTOP	BOOL	OUT	FALSE	=1:	Automatic operation enabled	
QC	BYTE	OUT	0	Drive state for MS		
QDAT_ERR	BOOL	OUT	FALSE	=1:	Data error appeared	
QERR	BOOL	OUT	FALSE	=1:	Group error	
QGR_ERR	BOOL	OUT	FALSE	=1:	Drive group error	
QLOCK	BOOL	OUT	FALSE	=1:	OFF2	
QLOCKOUT	BOOL	OUT	FALSE	=1:	Lockout function	
QMAN_AUT	BOOL	OUT	FALSE	=0:	Manual mode	
				=1:	Automatic mode	
QMANOP	BOOL	OUT	FALSE	=1:	Manual operation enabled	
QMC_CLS	BOOL	OUT	FALSE	=1:	Percharging completed	
QMODE	DWORD	OUT	0	Status MODE		
QMSG_SUP	BOOL	OUT	FALSE	=1:	Alarming suppressed	
QOFF	BOOL	OUT	FALSE	=1:	Motor OFF	
QOP	BOOL	OUT	FALSE	=1:	Ready	
QPARF	BOOL	OUT	FALSE	=1:	Parameter assignment error	
QPCD	BOOL	OUT	FALSE	=1:	PLC Control requested	
QPCH_END	BOOL	OUT	FALSE	=1:	Mains contactor completed	
QPERF	BOOL	OUT	FALSE	=1:	I/O Access error	
QRACKF	BOOL	OUT	FALSE	=1:	Rack failure	
QREADY	BOOL	OUT	FALSE	=0:	Motor not ready to start	
				=1:	Motor ready to start	
QREADYON	BOOL	OUT	FALSE	=1:	Ready to start	

Parameter	Type	Type	Default	Comment		S7_m_c:=TRUE X=Parameter can be operated and monitored
QREMOTE	BOOL	OUT	FALSE	=0:	Local control selected	
				=1:	Remote control selected	
QRUN	BOOL	OUT	FALSE	=1:	Running	
QRUNNING	BOOL	OUT	FALSE	=1:	Motor running	
QSIM	BOOL	OUT	FALSE	=1:	Simulation active See Chapter: Simulation (Page 69)	
QSTOP	BOOL	OUT	FALSE	=1:	Motor STOP	
QSWITCH	BOOL	OUT	FALSE	=1:	Motor is switching	
QTIMEOUT	BOOL	OUT	FALSE	=1:	Switching timeout	
RACKF	BOOL	IN	FALSE	Rack error		
REMOTE	BOOL	IN	TRUE	Key operated switch:		
				=0:	Local control	
				=1:	Remote control	
REQ_ERR	BOOL	OUT	FALSE	Parameter request error, fault memory		
RES_MAIN	BOOL	INOUT	FALSE	Operator input: Maintenance reset		X
RESET	BOOL	INOUT	FALSE	Operator input: Error reset		X
RESTART	BOOL	INOUT	TRUE	=1:	Manual restart of this block	
RUNUPCYC	INT	IN	3	Lag: Number of run up cycles		
SAMPLE_T	REAL	IN	0.1	Sample time [s], OB Cycle time		
SFB_ERR	BOOL	OUT	FALSE	SFB52/53 error		
SIM_ON	BOOL	IN	FALSE	=1:	Simulation active See Chapter: Simulation (Page 69)	
SIMSTW	WORD	OUT	0	Control word, simulation See Chapter: Simulation (Page 69)		
SIMZSW	WORD	IN	0	Status word, simulation See Chapter: Simulation (Page 69)		
STATUS	WORD	OUT	0	Status word for operation station See Chapter: STATUS (Page 81)		X
STEP_NO	DWORD	IN	0	Batch step number		X
STOP	BOOL	INOUT	FALSE	Stop from faceplate		X
SW_CYCLE	REAL	IN	30.0	Switching timeout [sec]		X
SWT_ACT	BOOL	IN	TRUE	=1:	Switching timeout activated	X
TRACK_CW	BOOL	IN	TRUE	=1:	Track control word to status word	
				=0:	No tracking of control word to status word	
TYPICAL	WORD	OUT	0	Status typical for operator station See Chapter: TYPICAL (Page 83)		X

Parameter	Type	Type	Default	Comment	S7_m_c:=TRUE X=Parameter can be operated and monitored
USTATUS	WORD	IN	0	User STATUS bits The 32-bit status word is used to additionally flag the status in the block symbols and faceplates. The 16 lower bits (bits 0 - 15) are occupied by the block. See Chapter: VSTATUS (Page 84). The 16-bit-wide input USTATUS occupies the upper bits (bit 16 - 31). These bits can be used by the user as required.	
VALUE	WORD	IN	0	Input value	
VSTATUS	DWORD	OUT	0	Status word The 32-bit status word is used to additionally flag the status in the block symbols and faceplates. The 16 lower bits (bits 0 - 15) are occupied by the block. See Chapter: VSTATUS (Page 84). The 16-bit-wide input USTATUS occupies the upper bits (bit 16 - 31). These bits can be used by the user as required.	X
WDOG_ERR	BOOL	OUT	FALSE	Watchdoge error, fault memory	

3.2.16 Block call

Call in the CFC



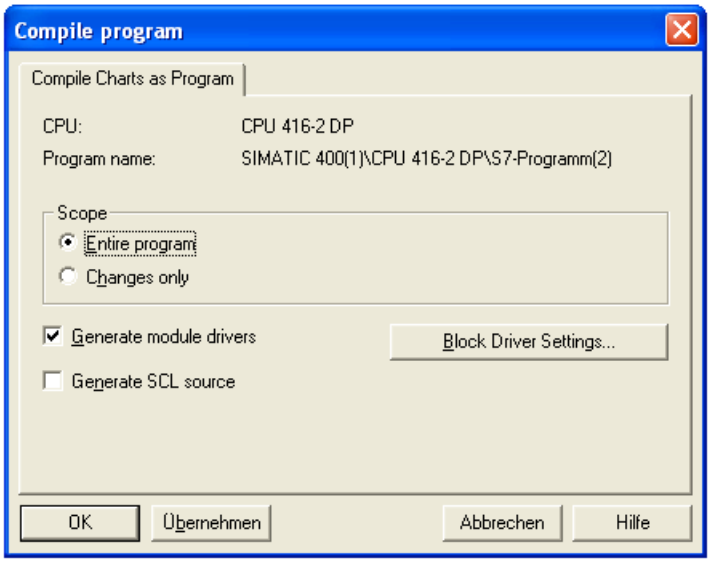
3.2.17 Option for compiling the CFC

Select the checkbox "Generate module drivers" to, prior to compilation from the driver generation, create the module drivers for the existing signal-processing blocks and interconnect them with it.

Note

Set option

Set this option if during initial configuration or since the last compilation the configuration of the signal-processing blocks and the configuration of the associated hardware was changed. For all other changes of the program that require compiling, do not set this option, because the total compilation time is reduced.



3.3 Faceplate

The faceplate supports the following functions:

- Operating and monitoring the drive
- Selecting the operation modes
- Display of detailed fault information for a drive fault
- German, English, French, Spanish, and Italian as display language
- Call of the faceplate via a user object

Prerequisite/boundary condition

- To obtain a full representation of the control fields, select the following:
  - Control Panel > Display > Settings > Advanced > Font size: select small fonts.
- If you use projects of a previous version of SIMATIC PCS 7 in SIMATIC PCS 7 Version 8.2, in the project SIMATIC PCS 7 you must update all images and libraries for all operator stations (OS Server, OS Clients) using the Project Migrator.
- During operation (REMOTE = 0), all operations in the "Standard" and "Drive fault" control fields are blocked.

Overview

The faceplate has several control fields. Each control field shows the AS block on the OS from a specific perspective.

The following control fields are described in the chapters below:

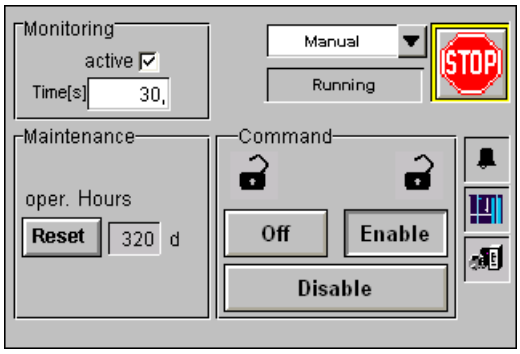
"Standard" control field (Page 39)

"Messages" control field (Page 43)

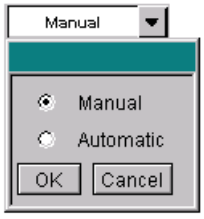
"Drive fault" control field (Page 44)

3.3.1 "Standard" control field

The "Automatic" control field gives you a general overview when operating the drive.



Control world selection



You select the current control word in the drop-down list. The display is controlled via QMAN_AUT.

Activate the option button "Manual" or "Automatic". Depending on this, it is written to the AUT_ON_OP input. You deactivate the selection of the corresponding control word via the outputs QMANOP and QAUTOP. Disabled control words are displayed as grayed out words.

To confirm the entry, click the button "Exec".

To reject the entry, click the button "Canc".

Stop command

Click the "STOP" button to stop the drive without switching to the manual mode level.

The functionality of the STOP command (confirmed command) can be parameterized. This parameter assignment is done via the input LOCK_MSS:

=0: The button is hidden

=2: STOP acts on STW1.1 (OFF2) motor coasts to a standstill

=3: STOP acts on STW1.2 (OFF3) motor brakes at current limit

Operating status

Parameter	Displayed text
QOFF	Off
QSTOP	Stop
QRUNNING	Running
QREADY = 0	Not ready to switch
QLOCKOUT	Switching on inhibited
LOCK_OP	Off (locked)
LOCK_ON_OP	On (locked)
LOCK_ON_OP and QRUNNING	Running (locked)
QGR_ERR QRACKF	Fault

Simulation

If this display is illuminated, the drive is simulated via an external simulation block.

See Chapter: Simulation (Page 69)

Fault status

Drive fault:

Parameter QGR_ERR

Drive without fault

Drive with fault

Fault descriptions can be found in chapter: "Drive fault" control field (Page 44)

Status of the automation system (AS)

The status is determined via the quality code and automatically exchanged between AS and OS.

AS without fault

AS with fault

Status messages

This indicates whether the control module outputs messages (parameter QMSG_SUP).

See Chapter: Message behavior (Page 22)

This is parameterized in the input EN_MSG.

Drive faults are always signaled independently in the "Drive fault" control field.

AS messages are enabled

AS messages are blocked

Control commands

The control commands that can be specified cause the following status transitions.

Command	Status transition
OFF	Ready to run STOP → Ready to start OFF Operation RUNNING → Ready to start OFF
Lock	Operation RUNNING → Ready to start STOP
ON	Ready to start OFF → Ready to run STOP
Enable	Ready to start OFF → Operation RUNNING Ready to run STOP → Operation RUNNING

Interlocking

The symbols indicate whether the drive is switched on or off.

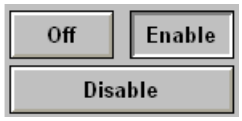
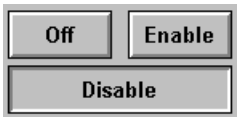
See Chapter: Interlocking (Page 26)

Command is locked

Command is not locked

Representation and command sequences

Below you see the representation in the control command area and the drive status.

Drive status	Representation in the control command area
OFF (QOFF = 1) ON command	
ON (QSTOP = 1) Enable command	
(QRUNNING = 1) Lock command	
STOP (QSTOP = 1) OFF command	
(QOFF = 1)	

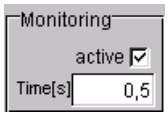
Acknowledging maintenance

If a low or medium maintenance requirement is indicated on the maintenance station (MS), you reset the operating hours counter using the "Reset" button after performing the maintenance work.

The "Reset" button can only be operated if the operator has been assigned the operating level "Higher-level process operation" and at least a "low" maintenance requirement is pending.

The operating hours are displayed in days.

Switching time monitoring



The runtime of the drive is monitored via a parameterizable runtime SW_CYCLE.

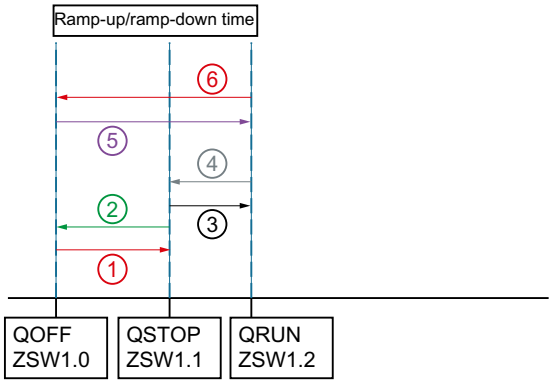
- OFF ↔ ON/STOP: QOFF ↔ QSTOP
- ON/STOP ↔ Running: QSTOP ↔ QRUN
- OFF ↔ Running: QOFF ↔ QRUN

Monitoring of the runtime can be activated and deactivated.

- SWT_ACT = TRUE
- SWT_ACT = FALSE

Only one time can be parameterized for all monitored intervals.

The interval ⑥ is to be used as guide value for parameterization.



① Monitored time for ON command
Transition QOFF "Ready to start" → QSTOP "Ready to run"

② Monitored time for OFF command
Transition QSTOP "Ready to run" → QOFF "Ready to start"

③ Monitored time for START command
Transition QSTOP "Ready to run" → QRUN "Running"

④ Monitored time for STOP command
Transition QRUN "Running" → QSTOP "Ready to run"

⑤ Monitored time for START command
Transition QOFF "Ready to start" → QRUN "Running"

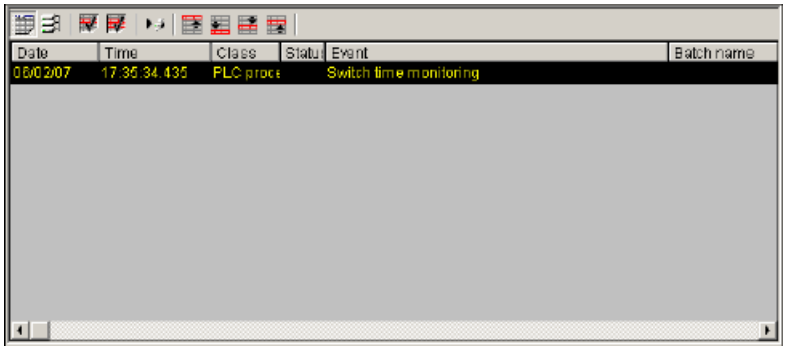
⑥ Monitored time for OFF command
Transition QRUN "Running" → QOFF "Ready to start"

3.3.2 "Messages" control field

In the standard control field "Messages", you see the configured messages of the automation system for the drive with time stamp.

You define the message texts in the "Event" column and the message class in the "Class" column during the configuration of the block.

See Chapter: Message behavior (Page 22)



3.3.3 "Drive fault" control field

In the "Drive fault" control field, you can see up to 8 drive faults of a fault case, with fault number and, if applicable, fault value.

This information is retrieved via corresponding variables from the automation system (AS). The AS reads this data acyclically from the converter:

- P947 fault number
- P949 fault value

The fault text is stored, depending on the language, in the global functions of SIMATIC WinCC:

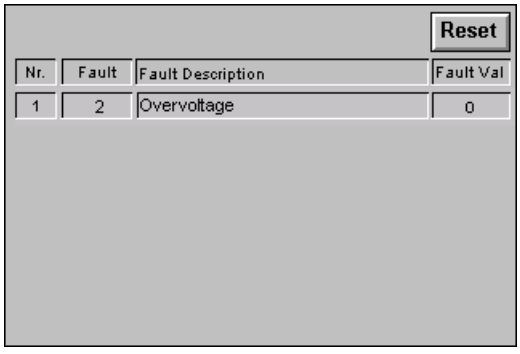
Drvpcs7_Sina_Err_txt_D_1.fct, Drvpcs7_Sina_Err_txt_D_2.fct,

Drvpcs7_Sina_Err_txt_E_1.fct, Drvpcs7_Sina_Err_txt_E_2.fct,

Drvpcs7_Sina_Err_txt_F_1.fct, Drvpcs7_Sina_Err_txt_F_2.fct,

Drvpcs7_Sina_Err_txt_S_1.fct, Drvpcs7_Sina_Err_txt_S_2.fct,

Drvpcs7_Sina_Err_txt_I_1.fct, Drvpcs7_Sina_Err_txt_I_2.fct



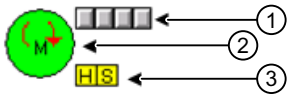
Structure of message line

Click the "Reset" button to acknowledge the fault in the drive.
The acknowledgment does not have to be confirmed.

3.3.4 User object

The user object is connected with the faceplate.

Click on the user object to call the faceplate.



① Group display

② Status display

The arrow in the icon indicates the direction of rotation.

③ Operating mode:

- A: Automatic
- H: Manual
- V: Local mode
- S: Simulation

Drive status

The color of the icon is determined via the status of the drive:

State	Color
OFF	Gray
Fault	Red
Not ready	Violet
STOP	Blue
RUNNING	Green
Switching	Yellow
Switching on inhibited	White

3.3.5 Installing and inserting a faceplate

Requirement

The SIMATIC PCS 7 library is installed.

Procedure

1. Create a project in SIMATIC PCS 7.
2. To insert an operator station, select "Insert" > "SIMATIC PC Station" in the menu bar.
3. Open the configuration and configure the station.

4. To transfer the AS data to SIMATIC WinCC; select "Options" > "OS" > "Compile" in the menu bar.

   Note

   Network connection for operator station (OS)

   In the case of "Network connection for OS", select the AS/OS network connection (CPU-WinCC)!

5. Open the project in SIMATIC WinCC.
6. Start the OS project editor.
7. Create a process image in the Graphics Designer.
   - Insert the user object, see under "Creating a faceplate".
8. Change the operator authorization for controlling the drive and limit value assignment at the objects in the individual faceplates.
9. Save the picture tree manager every time you make a change to a faceplate.

Creating a faceplate

1. Open "@template_DRVPCS7.pdl" and copy the user object into the process picture.
   Or
   Open "@template_DRVPCS7.pdl" and copy the user object into the global library.
   The global library with inserted user objects is available for all projects.
   - To open the library, select the menu "Library" in the "View" menu bar.
   - Insert a new directory in the global library.
   - Assign a name, e.g. Drive ES.
   - Drag and drop the user object from the file into the created directory.
   - Assign a meaningful name, e.g. "SINA_GS".
   - Now insert the user object from the library into the process picture.
2. Select the user object in the process picture
3. Select the tab "Standard dynamics" and run the Dynamic-Wizard "Connect faceplate with process tag".

Automatically inserting the user object in the faceplate

- During the installation, the image "@PCS7Typicals_DRVPCS7.PDL" is also installed.
- If the option "Derive block symbols from the plant hierarchy" is enabled, the user object will be copied to the faceplate during compilation of the OS.

References

Further information can be found in the following manual: Process Control System PCS7 Operator Station.

3.4 Addressing the drive objects (parameter AXIS_ID)

Depending on the drive object to be addressed, specify a different module ID for reading out the fault memory at the AXIS_ID input of the SINA_LM block.

Below it is shown how you can determine the module ID:

3.4.1 SINAMICS S

The module ID of individual drive objects can be found in CU parameter 101 or 978.

3.5 Block data

Block		FB626
Name		SINA_LM
Version		7.6
Programming language		SCL
Length	**Local data**	80
	MC7 code	10720
	Load memory	12338
	Working memory	10756
Length of instance DB	**Load memory**	1628
	Working memory	726
Mapped variables		37
Nesting depth		1
Called blocks		ALARM_8P RD_SINFO DPRD_DAT DPWR_DAT BLKMOV FILL WRREC RDREC

General information on faceplates

4

The faceplates are distinguish by the control field representation and loop representation.

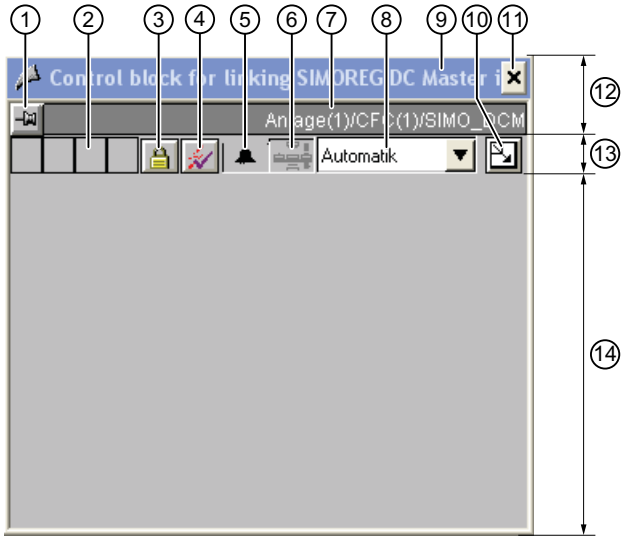
4.1 Control field representation (faceplate)

The following illustration shows an example of the representation of a control field. A control field itself is always comprised of the three standard components:

- Title bar
- Message and navigation bar
- Control field

Description

Function	Description
Title bar	
Measuring point indicator	The measuring point indicator is formed from the configured higher level designation of the plant hierarchy.
Block comment	The block comment line displays the text configured in the CFC call as tooltip text in the comment field.
Menu bar	
Message status display	The message status of the AS block that is assigned to the faceplate is displayed.
Drop-down list	You select the different representations (control fields) of the faceplate in the drop-down list. Next to the drop-down list, there is a button for switching to the loop view.

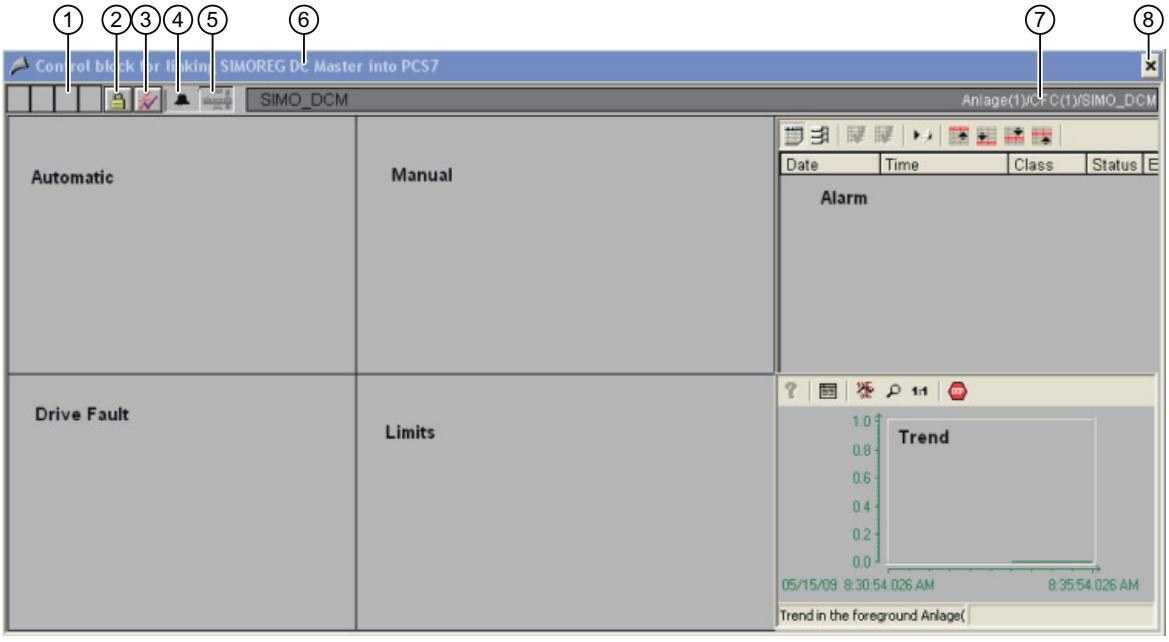


① "Pin faceplate" button
② "Group display" buttons
③ "Enable/disable message" button
④ "Message acknowledgement of this instance" button
⑤ "Message suppression" button
⑥ Batch occupied
⑦ Measuring point indicator
⑧ Drop-down list
⑨ Comment from symbol table
⑩ "Selection of the loop display" button
⑪ "Close" button
⑫ Title bar
⑬ Menu bar
⑭ Block body

4.2 Loop display

The loop display shows all of the control fields of a faceplate in an overall representation.

Depending on the faceplate, another matrix-like display is also possible.

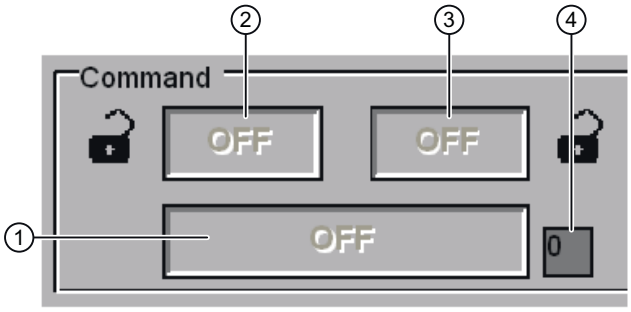


① "Group display" buttons
② "Enable/disable message" button
③ "Message acknowledgement of this instance" button
④ "Message suppression" button
⑤ Batch occupied
⑥ Comment from symbol table
⑦ Measuring point indicator
⑧ "Close" button

4.3 Input interfaces

The standard functions of the Faceplate Designer are used.

Only the buttons for manual operation of the STW1 are operated by their own function.



① ON_OFF
② OFF
③ ON
④ TYPICAL_STATUS

General information on the buttons ON, OFF, and ON_OFF

In contrast to the standard buttons, the ON, OFF and ON_OFF buttons each write two bits simultaneously when operated.

Therefore, the global C script "pcs7_openinputboxbin_2bits_v6.fct" is called, which opens the screen "@pcs7_bedbinaer_2bits.pdl" in the "OperationWindow" of the faceplate.

The "OK" button of this screen writes two bits simultaneously.

Parameter		Description	
Other	DisplayActive	This parameter is not supplied by the button itself but by the user object TYPICAL_STATUS.	
		=FALSE:	Operation possible
		=TRUE:	No operation possible
Left	Write_Variable Write_Variable2	Interconnection with the two variables that are written.	
Left	Display_Variable Display_Variable2	Without function, does not have to be interconnected.	
Parameters	Write_Value Write_Value2	Values that are written to the two variables when confirming with "OK".	
Parameters	ButtonText	The initial value for the text of the button, is not overwritten by the button itself, for ON_OFF from user object TYPICAL_STATUS.	
Parameters	CMD2Steps	=TRUE:	Operation takes place via an extra operating window (@pcs7_bedbinaer_2bits.pdl)

Description: Button/user object

Button/ user object	Description
ON	Motor ON When operated, writes TRUE to the block inputs MOT_OFF and INV_EN. INV_EN#string_1 is displayed as the text.
OFF	Motor OFF When operated, writes FALSE to the block inputs MOT_OFF and INV_EN. MOT_OFF#string_0 is displayed as the text.
ON_OFF	Inverter enable On/Off When operated, write TRUE to the block input MOT_OFF and FALSE to the block input INV_EN. The display text is defined by the values of the parameters STATUS and TYPICAL, which are evaluated by the user object TYPICAL_STATUS. See Chapter: STATUS (Page 81) TYPICAL (Page 83)
TYPICAL_STATUS	The user object TYPICAL_STATUS is interconnected with the parameters TYPICAL and STATUS. When there is a change to the value of TYPICAL and/or STATUS, a C script is called, which evaluates the parameters TYPICAL and STATUS. As a result, the operability of the ON, OFF and ON_OFF buttons is defined via their parameter DisplayActive. In addition, the text of the ON_OFF button is defined.

Description: Global C scripts

The following global C scripts are used to display the associated fault text for each fault number. The setup installs all scripts.

The scripts "Drvpcs7_Sina_Err*" are used by the SINA_GS block and the scripts "Drvpcs7_G120*" are used by the block SINAG120.

pcs7_openinputboxbin_2bits_v6.fct

The function "pcs7_openinputboxbin_2bits_v6.fct" essentially corresponds to the standard function "pcs7_openinputboxbin_v6.fct" of the Faceplate Designer. Only the differences regarding the standard function are described here.

"pcs7_openinputboxbin_v6.fct" opens the image "@pcs7_bedbinaer_2bits.pdl" in the "OperationWindow" of the faceplate. The variable names and the value of two variables that is to be written are transferred to the screen window. The screen window receives the text that is configured on the "ButtonText" property as a caption and text for the operation message.

Calling the function is only permitted with the parameter CallForm = 2.

pcs7_binary_ok_2bits_v6.fct

The function "pcs7_binary_ok_2bits_v6.fct" essentially corresponds to the standard function "pcs7_binary_ok_v6.fct" of the Faceplate Designer. Only the differences regarding the standard function are described here.

Instead of one, two bit variables are written with new values The operation message is always displayed with the values new = 1 and old = 0.

Drvpcs7_Sina_Err_txt_D1.fct / Drvpcs7_Sina_Err_txt_D2.fct / Drvpcs7_Sina_Err_txt_D3.fct

The functions "Drvpcs7_Sina_Err_txt_D1.fct / Drvpcs7_Sina_Err_txt_D2.fct / Drvpcs7_Sina_Err_txt_D3.fct" determine, based on the transferred fault number of the SINAMICS, the German fault text stored in it.

Drvpcs7_Sina_Err_txt_E1.fct / Drvpcs7_Sina_Err_txt_E2.fct / Drvpcs7_Sina_Err_txt_E3.fct

The functions "Drvpcs7_Sina_Err_txt_E1.fct / Drvpcs7_Sina_Err_txt_E2.fct / Drvpcs7_Sina_Err_txt_E3.fct" determine, based on the transferred fault number of the SINAMICS, the English fault text stored in it.

Drvpcs7_Sina_Err_txt_F1.fct / Drvpcs7_Sina_Err_txt_F2.fct / Drvpcs7_Sina_Err_txt_F3.fct

The functions "Drvpcs7_Sina_Err_txt_F1.fct / Drvpcs7_Sina_Err_txt_F2.fct / Drvpcs7_Sina_Err_txt_F3.fct" determine, based on the transferred fault number of the SINAMICS, the French fault text stored in it.

Drvpcs7_Sina_Err_txt_I1.fct / Drvpcs7_Sina_Err_txt_I2.fct / Drvpcs7_Sina_Err_txt_I3.fct

The functions "Drvpcs7_Sina_Err_txt_I1.fct / Drvpcs7_Sina_Err_txt_I2.fct / Drvpcs7_Sina_Err_txt_I3.fct" determine, based on the transferred fault number of the SINAMICS, the Italian fault text stored in it.

Drvpcs7_Sina_Err_txt_S1.fct / Drvpcs7_Sina_Err_txt_S2.fct / Drvpcs7_Sina_Err_txt_S3.fct

The functions "Drvpcs7_Sina_Err_txt_S1.fct / Drvpcs7_Sina_Err_txt_S2.fct / Drvpcs7_Sina_Err_txt_S3.fct" determine, based on the transferred fault number of the SINAMICS, the Spanish fault text stored in it.

Drvpcs7_G120_Err_txt_D.fct

The function "Drvpcs7_G120_Err_txt_D.fct" determines, based on the transferred fault number of the SINAMICS G120, the German fault text stored in it.

Drvpcs7_G120_Err_txt_E.fct

The function "Drvpcs7_G120_Err_txt_E.fct" determines, based on the transferred fault number of the SINAMICS G120, the English fault text stored in it.

Drvpcs7_G120_Err_txt_F.fct

The function "Drvpcs7_G120_Err_txt_F.fct" determines, based on the transferred fault number of the SINAMICS G120, the French fault text stored in it.

Drvpcs7_G120_Err_txt_I.fct

The function "Drvpcs7_G120_Err_txt_I.fct" determines, based on the transferred fault number of the SINAMICS G120, the Italian fault text stored in it.

Drvpcs7_G120_Err_txt_S.fct

The function "Drvpcs7_G120_Err_txt_S.fct" determines, based on the transferred fault number of the SINAMICS G120, the Spanish fault text stored in it.

Module drivers/Maintenance station

5

5.1 Additional parameters at the control blocks

Description

Parameter	Description
VALUE	The VALUE parameter makes the control block recognizable to the module driver. The parameter must be interconnected with the first input word of the drive axis to be addressed.
MAIN_L MAIN_M MAIN_D	The MAIN_L and MAIN_M parameters of the control blocks determine the maintenance alarms for the maintenance station. To deactivate the maintenance alarm, "0" must be set at the corresponding input. The MAIN_D parameter reads back the time until the next maintenance alarm from the automation system to avoid losing this time when a complete download occurs. Also refer to the notes in the online help of the CFC.
RES_MAIN L_RES_MA	The internal counter and the maintenance alarm are reset after completing maintenance work with the RES_MAIN or L_RES_MA parameter.
QC	The QC parameter supplies the field device status to the downstream driver block MOD_PAX0 or MOD_PAL0. This status is used to display symbols on the maintenance station according to the definition.
MODE QMODE	The MODE parameter obtains the module status from the upstream DES_DIAG driver block. This status is forwarded to the QMODE parameter. The QMODE parameter supplies the module status to the downstream driver block MOD_PAX0 or MOD_PAL0. This status is used to display symbols on the maintenance station according to the definition.

Note

Running of operating hours counter

If the MOD_PAX0 or MOD_PAL0 blocks issue the message "Maintenance: medium requirement" or "Maintenance: low requirement" in interaction with a drive, the operating hours counter of the block must be checked for running and reset if necessary. This is done in the faceplate of the Drive ES block (see also "Acknowledging maintenance" in the "Limits" control field in the faceplate (Page 39)). The time until the corresponding message is issued is set via parameters MAIN_L and MAIN_M.

5.2 Symbols and their meaning

The following table shows the meaning of the standardized symbols on the maintenance station in relation to the drives and how they are formed.

Description

Symbol	Meaning	Converter status	Implementation	Message	Priority
	Simulation active	Converter is simulated	Simulation is detected at the set input SIM_ON.	Message	1
	Out of service	Higher-level error (rack failure = FC not on PB)	Status is detected in the controller: Parameter RACKF = 1 or PERAF = 1 or MODF = 1	Message requires acknowledgement	2
	Local operation	Automatic/local control switchover	Parameter at block: QREMOTE = 0	Message	3
	Maintenance: high requirement	Fault in device	ZSW: Error bit = 1 Warning bit = 0 ZSW: Error bit = 1 Warning bit = 1	Message requires acknowledgement	4
	Maintenance: medium requirement	Freely parameterizable time on block (type of operating hours counter)	Additional input at the block, at which the user can specify an appropriate time depending on the application Format: Integer/unit:days Dependency on bit 2 in ZSW 1 (operation enabled): ZSW 1 Bit 2 = TRUE → START operating hours counter ZSW 1 Bit 2 = FALSE → STOP operating hours counter	Message requires acknowledgement	5
	Maintenance: low requirement	Freely parameterizable time on block (type of operating hours counter)	Additional input at the block, at which the user can specify an appropriate time depending on the application Format: Integer/unit: Days Dependency on bit 2 in ZSW 1 (operation enabled): ZSW 1 Bit 2 = TRUE → START operating hours counter ZSW 1 Bit 2 = FALSE → STOP operating hours counter	Message requires acknowledgement	6

	Good	No error, warning is pending	ZSW: Error bit = 0 Warning bit = 1	Message	7
	Good	No error, no warning is pending	ZSW: Error bit = 0 Warning bit = 0	No mes- sage	8

5.3 DES_DIAG block

Area of application

The block is installed automatically by the module driver and appropriately interconnected.

Type/number

FB628

The block number can be changed.

Function

The block evaluates all acyclic events that affect the drive:

- I/O access error
- Rack failure
- Module fault

It reports these to the downstream blocks:

- SIMO_MD
- SIMO_MM3
- SIMO_MM4
- SIMO_DCM
- SINA_GS
- SINAG120
- VIKNAMUR
- SINA_LM

The block also transfers the value status or, if available, the diagnostic information of the field device to the standard blocks MOD_PAX0 (drive behind master system) or MOD_PAL0 (drive behind Y-link).

Calling OBs

The cyclic interrupt OB in which you install the block, e.g. OB32 must be integrated in the run sequence in the following OBs:

1. OB1 cyclic processing
2. OB82 diagnostic interrupt
3. OB83 hot swap interrupt
4. OB85 program execution error
5. OB86 rack failure
6. OB100 restart

Installation in the CFC takes place automatically.

Startup behavior

The block determines the startup and reports it to the OMODE output.

Message behavior

The block does not send any messages.

5.4 I/O bar

Connections

The as-supplied state of the block representation in CFC is marked in the "Default" column:

Parameter name **bold** = connection is visible

Parameter name normal = connection is not visible

Table 5-1 Parameters DES_DIAG

Parameter	Type	Type	Default	Comment		S7_m_c:=TRUE
ACC_ID	BOOL	INOUT	TRUE	=1:	Accept new mode settings	
DADDR	INT	IN	0	Diagnostic address of module		
DELAY	INT	IN	15	Alarm delay (sec)		
EN_DIAG	BOOL	IN	FALSE	=1:	Enable read diagnostic data	
LADDR	INT	IN	0	Logical address of module		
MODE	WORD	IN	0	Parameter OMODE of SMC_DIAG		
OMODE	DWORD	OUT	0	Status MODE		
PA_DIAG	DWORD	OUT	0	Diagnostic information for maintenance		
QEN_RDWR	BOOL	OUT	TRUE	=1:	Enable read / write record	
QERR	BOOL	OUT	FALSE	=1:	Error	
QMODF	BOOL	OUT	FALSE	=1:	Module failure	
QPERAF	BOOL	OUT	FALSE	Access error		
QRACKF	BOOL	OUT	FALSE	=1:	Rack failure	
RACK_NO	BYTE	IN	0	Rack number		
RACK1ERR	BOOL	OUT	FALSE	=1:	DP slave system failure (primary)	
RACK2ERR	BOOL	OUT	FALSE	=1:	DP slave system failure (redundant)	
RACKF	BOOL	IN	FALSE	=1:	Rack failure	
SUBN_TYP	BOOL	IN	FALSE	=1:	External DP-Interface	
SUBN1_ID	BYTE	IN	0	ID of primary subnet		
SUBN1ERR	BOOL	IN	FALSE	=1:	Slave 1 failure	
SUBN2_ID	BYTE	IN	0	ID of redundant subnet		
SUBN2ERR	BOOL	IN	FALSE	=1:	Slave 2 failure	

5.5 Block data

Block		FB628
Name		DES_DIAG
Version		7.1
Programming language		SCL
Length	**Local data**	172
	MC7 code	1552
	Load memory	2156
	Working memory	1588
Length of instance DB	**Load memory**	830
	Working memory	402
Mapped variables		-
Nesting depth		1
Called blocks		RALARM RDREC RD_SINFO RDSYSST TIME_TCK

Adapting the telegram length

6

If the number of PZDs transferred by default is not sufficient, then the blocks provide the option of increasing the number of PZDs. The number of the transferred PZDs can be parameterized differently for setpoints and process values.

The telegram length is parameterized as follows:

- For the setpoint channel via the input ME_LE_SP
- For the process value channel via the input ME_LE_AV

These parameters are only read in and checked during startup. If the parameterized value is less than the minimum value, then the minimum value is used for the telegram length. If the value is too high, then the maximum value for the telegram length is used. No error message will be generated.

In addition, you must parameterize the appropriate telegram length in the hardware configuration and in the converter.

Number of PZDs

The table below shows the minimum/maximum number of PZDs that can be transferred:

Block	Minimum number PZD (setpoints/process values)	Maximum number of PZDs (setpoints/process values)
SINA_LM	1 / 1	5 / 8

WebClient

7

If you use the blocks not only in an environment of SIMATIC WinCC, but also in an environment of WebClient, you must convert the global functions of Drive ES into project functions.

Procedure

1. In SIMATIC WinCC, open the following directory: "<Installation directory>" > "aplib".
2. Select the directory "DriveES".
3. Move the directory "DriveES" into the directory "<Installation directory>" > "wincproj" > "OS-Name" > "library".
4. Open the C-Editor in the "Global Script" directory.
5. Choose "Options" > "Re-generate header" to re-generate the header.

8 Simulation

Function

For the input parameter SIM_ON = TRUE, the value of the following input parameters is used instead of the data received from the drive:

- SIMZSW = Status word 1
- SIMPV = Main process value
- SimCPV = Current process value
- SIMPCD_x = Data that is transferred to PCD4 - PCD6

The above-named inputs are dependent on the actual quantity of data received from the drive. The data which is transferred to the drive during normal operation is output at the outputs SIMSTW (control word 1) and SIMSP (main setpoint). An external simulation block which emulates the State Machine of the drive can be connected via the inputs and outputs referred to above.

The simulation has highest priority. If the block is in simulation mode, QSIM = TRUE is set. There is no longer any communication with the drive. The internal operating hours counter for preventive maintenance is stopped.

In the block library "DRVPCS7", there is a simulation block for each supported drive. This block, which is integrated into a project analog to the following figure, can simulate a drive.

A simple State Machine of the corresponding drive is integrated in the simulation blocks. The block evaluates the bits of the STW 1, which are operated via the faceplate: STW 1 bit 0 - 3 and 7 and the direction of rotation bits.

This allows the simulation block to create the corresponding ZSW 1 so that all displayed statuses are correctly supplied in the faceplate. In addition, the setpoint is directly (without acceleration and deceleration ramp) fed back to the process value. For all other actual process data, only inputs are provided on the simulation block which are written to the corresponding outputs. There is no further processing of these values in the block.

In addition, there are inputs to create faults and warnings with their respective error numbers:

- FAULT
- WARNING
- FAULT_NO
- WARN_NO

The block does not check if the specified error numbers are correct. If the error numbers are supported by the drive blocks, the numbers are transferred to the cyclic data. A pending fault triggers a closing lockout in the operating state "Operation". An error is acknowledged via the faceplate. The error number is not displayed in the "Drive fault" control field.

The following inputs are reset once the error has been acknowledged:

- FAULT
- FAULT_NO

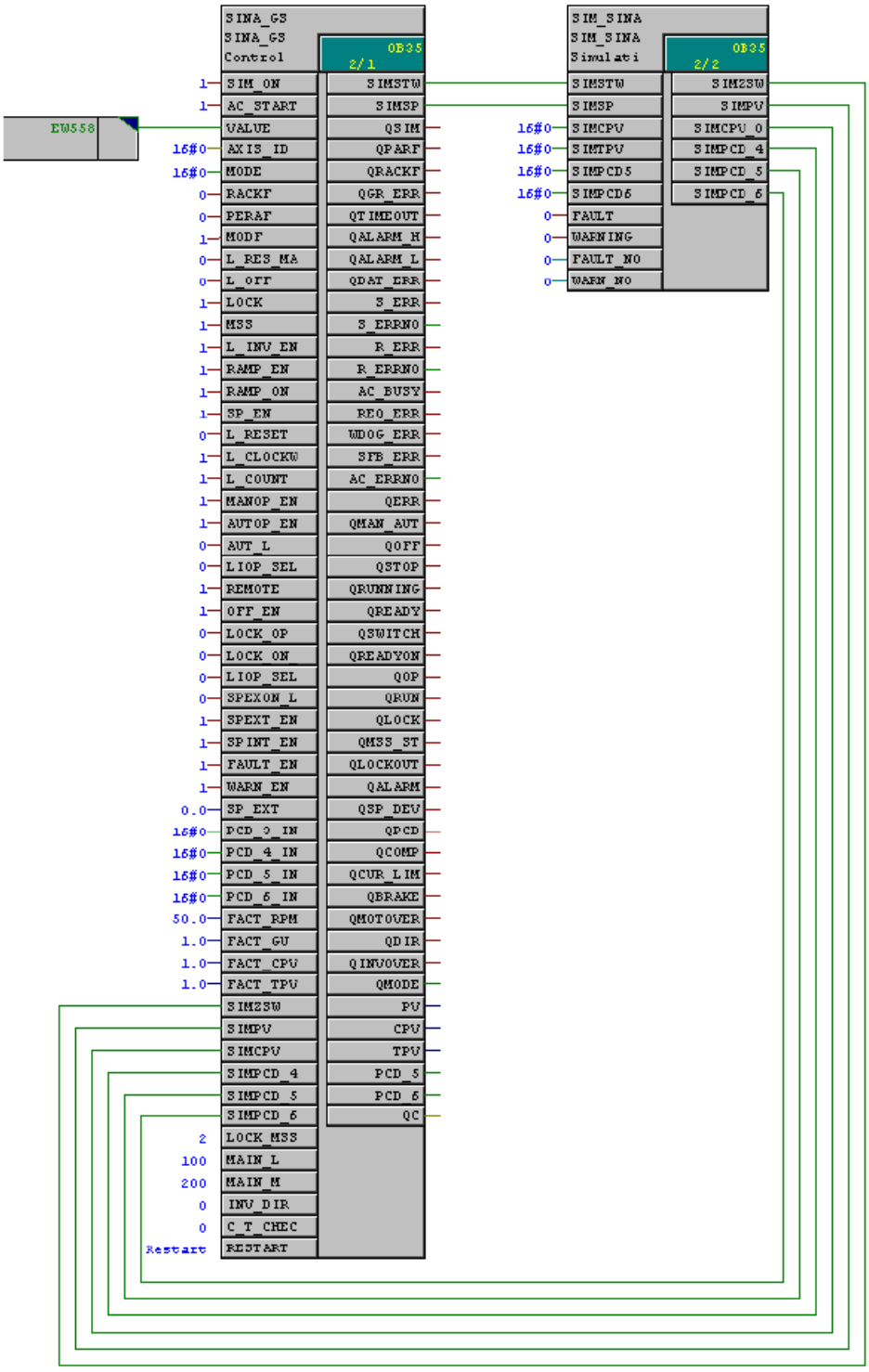
The input "WARNING" is automatically reset as long as the input is WARN_NO = 0.

If the input WARN_NO does not exist on the simulation block (FB1711 (SIM_MM4) and FB1714 (SIM_VIKN)), then you must manually reset the input WARNING.

The block is stored as an SCL source in the source container of the library and can be modified as required.

Interconnection

The following shows an example of how the drive block is interconnected with an external simulation block.



9 Sample project

The setup installs 2 example projects "ZXy51_02_DriveES_PCS7" and "ZXy51_04_DriveES_PCS7" in the installation path of in the directory "Examples".

9.1 Example project "ZXy51_02_DriveES_PCS7" for PROFIBUS

This project contains an S7-400 station in which all drives are configured:

- MASTERDRIVES VC
- SIMOREG DC-MASTER
- SINAMICS G150
- SINAMICS G120
- SINAMICS S120
- SINAMICS S120 with SINAMICS ALM
- MICROMASTER 3rd Gen.
- MICROMASTER 4th Gen.

This station is fully functional. With the corresponding hardware, you can use the station without adaptations. If not all drives are physically available, you can only use the project with the available drives.

However, the blocks of the unavailable drives will then report an error. The trend is configured in such a way that the following values are archived:

- For the MICROMASTER 3rd Gen. and MICROMASTER 4th Gen.:
  - Internal setpoint (SP_INT)
  - Process value (PV)
  - Current process value (CPV)
- For the MASTERDRIVES VC SIMOREG DC-MASTER, SINAMICS G120, SINAMICS G150 and SINAMICS S120:
  - Internal setpoint (SP_INT)
  - Process value (PV)
  - Current process value (CPV)
  - Torque process value (TPV)
- No trend is configured for SINAMICS S120 with SINAMICS ALM.

This project shows how a drive is integrated in SIMATIC WinCC.

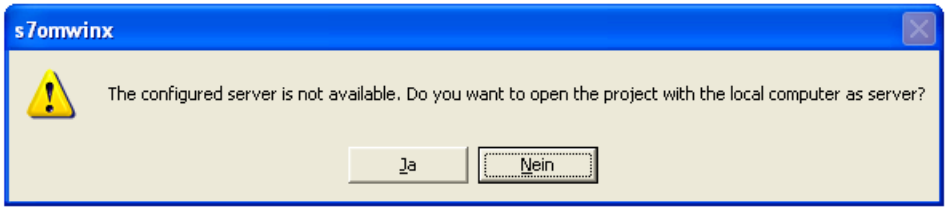
All of the steps that are described in the following chapter have already been executed in this case:

See Chapter: Installing and inserting a faceplate (Page 45)

As a result, you have the capability of working with the automation system and the faceplate without first having to create a new project. The only difference in comparison to the procedure corresponding to the above-mentioned chapter is that the user object is not saved in a global library, but in a project library.

Error message

When you open the operator station (OS) for the first time for this project, you receive an error message.
To open the project in SIMATIC WinCC, click the "Yes" button.



Procedure

The following steps are necessary to stop receiving this error message the next time you open this project.

1. Select the computer.
2. In the "Edit" menu bar, select the menu "Properties".
   The window "Properties, computer list" is opened.
3. Select the computer and the properties.
4. Open the "General" tab and enter the name of the computer on which the example project is installed.

For the MASTERDRIVES VC and for the SIMOREG DC-MASTER, the block PDAT_UD (FB41) is located in the CFC. A download of the configured data block takes place with the block.

The following data blocks are configured:

- DB51 (DL_LOCAL_VC) for MASTERDRIVES VC
- DB55 (DL_LOCAL_DCM) for SIMOREG DC-MASTER

If the drive in the hardware configuration is replaced, you must change the parameters LADDR and DB_NO, if applicable.

- Enter the diagnostic address at the parameter LADDR.
- For the parameter DB_NO, enter the number of the download data block.

Alternative download data blocks are available in the DRVPCS7 library.

Available data blocks for MASTERDRIVES and SIMOREG DC-MASTER are listed in the following Chapter: Process data interface (Page 29).

9.2 Example project "ZXy51_04_DriveES_PCS7" for PROFINET

This project contains an S7-400 station in which all drives are configured:

- SINAMICS G120C
- SINAMICS G150

This station is fully functional. With the corresponding hardware, you can use the station without adaptations. If not all drives are physically available, you can only use the project with the available drives.

However, the blocks of the unavailable drives will then report an error. The trend is configured in such a way that the following values are archived:

- For SINAMICS G120C and SINAMICS G150:
  - Internal setpoint (SP_INT)
  - Process value (PV)
  - Current process value (CPV)
  - Torque process value (TPV)

This project shows how a drive is integrated in SIMATIC WinCC.

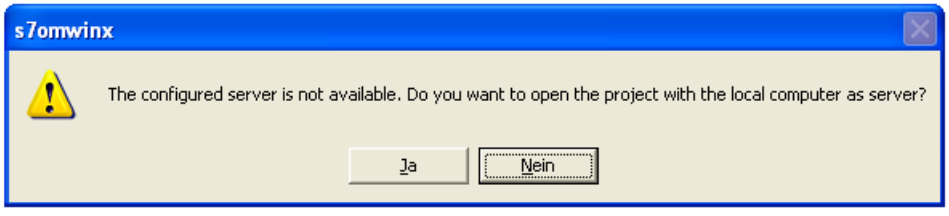
All of the steps that are described in the following chapter have already been executed in this case:

See Chapter: Installing and inserting a faceplate (Page 45)

As a result, you have the capability of working with the automation system and the faceplate without first having to create a new project. The only difference in comparison to the procedure corresponding to the above-mentioned chapter is that the user object is not saved in a global library, but in a project library.

Error message

When you open the operator station (OS) for the first time for this project, you receive an error message.
To open the project in SIMATIC WinCC, click the "Yes" button.



Procedure

The following steps are necessary to stop receiving this error message the next time you open this project.

1. Select the computer.
2. In the "Edit" menu bar, select the menu "Properties".
   The window "Properties, computer list" is opened.
3. Select the computer and the properties.
4. Open the "General" tab and enter the name of the computer on which the example project is installed.

DRVPCS7 and APL

10

The drive blocks of the DRVPCS7 library can also be used together with the blocks of the Advanced Process Library (APL). It is also possible to use the APL faceplates.

The following blocks must be used for the APL block FB1854 (MotSpdCl):

- FB620 (SIMO_MD)
- FB621 (SIMO_MM3)
- FB622 (SIMO_MM4)
- FB623 (SIMO_DCM)
- FB624 (SINA_GS)
- FB625 (VIKNAMUR)
- FB627 (SINAG120)

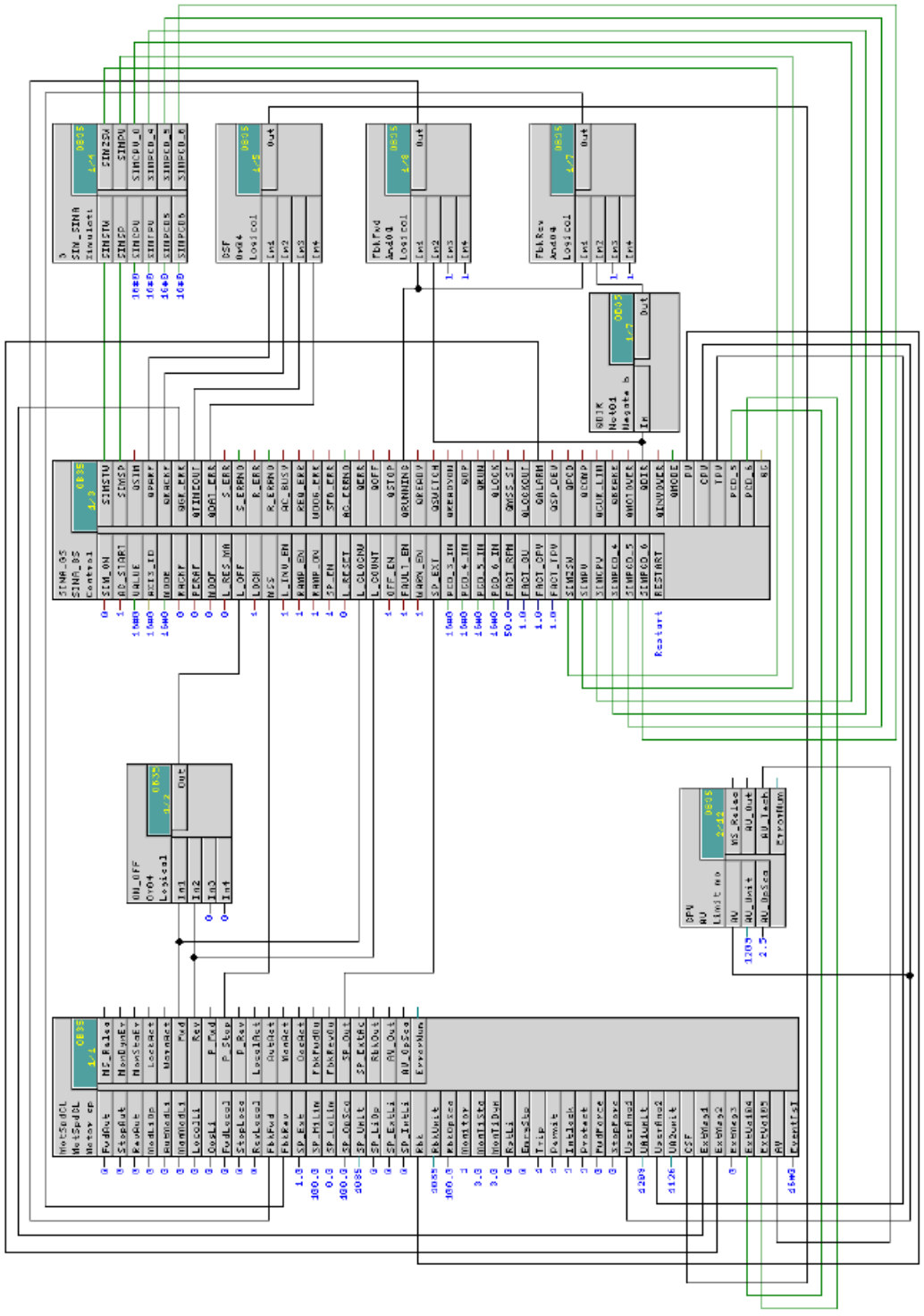
For the block FB626 (SINA_LM), the APL block FB1850 (MotL) must be used.

Interconnecting blocks

To interconnect the blocks, use the so-called conversion blocks. These are used to make the input and output structures of the APL blocks for the DRVPCS7 blocks accessible.

The following figure shows an example of how the interconnection can take place in order to establish a connection to the APL. For reasons of space, the conversion blocks were dispensed with. The DRVPCS7 block must be switched to Automatic mode, because the commands of the APL block are interconnected to the interconnectable inputs.

To reset the operating hours counter for the maintenance alarm or acknowledge the fault in the converter, they must be opened via the user-assignable buttons in the APL faceplates of the DRVPCS7 faceplate of the corresponding block.



References

The operating principle and parameterization of the two blocks mentioned above can be found in the Function Manual or the online help for APL.

Appendix

A

A.1 STATUS

Status word (STATUS)															
.15	.14	.13	.12	.11	.10	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0
		SIM_ON	L_COUNT ②	L_CLOCKW ②	INV_DIR ②	QDIR_OP	C_T_CHECK ①②	QMSG_SUP	QMANOP	QAUTOP	QSPEXTEN ②	QSPINTEN ②	QSPEXTON ②	QMAN_AUT	QREMOTE
						(=1, if not manual and OS mode)	(0: = CPV 1: = TPV)								

① This bit is only used for the following blocks:

- FB620, SIMO_MD
- FB623, SIMO_DCM
- FB624, SINA_GS
- FB627, SINAG120

No torque monitoring is possible for the following blocks:

- FB621, SIMO_MM3
- FB622, SIMO_MM4

② This bit is not used for the following blocks:

- FB626, SINA_LM
- FB625, VIKNAMUR

A.2 STATUS for FB625

Status word (STATUS)															
.15	.14	.13	.12	.11	.10	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0
		SIM_ON	PCD 5 CHECK	PCD 3 CHECK	INV_DIR	QDIR_OP	PCD 4 CHECK	QMSG_SUP	QMANOP	QAUTOP	QSPEXTEN	QSPINTEN	QSPEXTON	QMAN_AUT	QREMOTE
						(=1, if not manual and OS mode)									

A.3 TYPICAL

Status word (TYPICAL)															
.15	.14	.13	.12	.11	.10	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0
	LOCK_ON_OP	LOCK_OP	sb_MAINTENANCE	sb_STOP_INVISIBLE	QPERF ①	QDAT_ERR	QRACKF	QOFF	QSTOP	QRUNNING	QSWITCH	QDIR ②	QLOCKOUT	QREADY	QGR_ERR
			(=1, if maintenance alarm is pending)	(=1, if LOCKMSS =0)											

① This bit is only used in block FB621, SIMO_MM3.

② This bit is not used for the block FB626, SINA_LM.

A.4 VSTATUS

VSTATUS (High-Word)															
.31	.30	.29	.28	.27	.26	.25	.24	.23	.22	.21	.20	.19	.18	.17	.16
USTATUS															

VSTATUS (Low-Word)															
.15	.14	.13	.12	.11	.10	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0
		MODF	PERAF	QRACKF	QOFF	QSTOP	QRUNNING	QSWITCH	QDIR ①	QLOCKOUT	QREADY	QGR_ERR	QSPEXTON ①	QMAN_AUT	QREMOTE

① This bit is not used for the block FB626, SINA_LM.

A.5 Tips and tricks

Reading the fault memory by acyclic communication in the blocks is delayed by an adjustable time. The delay time has a default value of 1 second, which is reduced by the cycle time of the respective cyclic interrupt OB in which the block is called up. The fault memory is only read if this time is ≤ 0. If the time set is too long or too short, it can be changed via "Monitor/control variables".

Procedure

1. Establish the address of the static variables "sr_ERR_TIME_INI" in the instance data block.
2. You assign a symbolic name to the associated instance data block so that not only the address but also the symbolic name of the variables will appear in the variable table.
3. Open the variable table and enter the established address.
4. Enter the desired time as a control value and activate this value.

List of abbreviations

B

ALM	Active Line Module
AOP	Advanced Operator Panel
APL	Advanced Process Library
AS	Automation System (here: SIMATIC S7-400)
BOP	Basic Operator Panel
CBE20	Communication Board PROFINET IO
CBP	COMBOARD PROFIBUS
	PROFIBUS communication module for SIMOVERT MASTERDRIVES and SIMOREG
CDS	Command Data Set
CFC	Control Function Chart:
	tool for the graphical interconnection of blocks in a chart
DCM	SIMOREG DC-MASTER
Drive ES	Drive Engineering Software
ES	Engineering Station
FB	Function Block
MC	SIMOVERT MASTERDRIVES Motion Control
MD	Drive type SIMOVERT MASTERDRIVES
MM	MICROMASTER
MS	Maintenance Station
UL	Measuring range upper limit value
OS	Operator Station
PIV	Parameter Identifier Value
	Protocol for access to drive parameters according to the PROFIBUS profile for variable-speed drives (PNO Order No. 3.071).
PPO	Parameter Process Data Object: combined data object with PIV portion and process data for cyclic transfer to PROFIBUS profile for variable-speed drives (PNO Order No. 3.071).
PROFIBUS DP	Distributed I/O: PROFIBUS DP (according to IEC61158)
PROFINET IO	Industrial Ethernet standard (according to IEC61158)
PV	Process value
SP	Setpoint
STW 1.x	Control word 1 bit x)
LL	Measuring range lower limit value
VC	SIMOVERT MASTERDRIVES Vector Control
WR	Inverter
ZSW 1.x	Control word 1 bit x