SIEMENS

Industrial Controls

Soft starter
SIRIUS Soft Starter 3RW44 PCS 7 Library V8.3

Programming and Operating Manual

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Legal information

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⚠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.

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Introduction

1

1.1 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

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To stay informed about product updates as they occur, sign up for a product-specific newsletter. You can find additional information on this at: http://support.automation.siemens.com.

1.2 Product specific security information

Product specific security information

This library is designed to run under the PCS 7 environment. Therefore, it is recommended to follow the security principles for PCS 7 to support a secure operation, such as:

- User rights
- Password protection of
  - WinCC

For more information, click here (https://support.industry.siemens.com/cs/document/60119725).

1.3 Components of the software package

The Soft Starter 3RW44 PCS 7 Library V8.3 integrates PROFIBUS and PROFINET 3RW44 Soft Starters into the PCS 7 environment.

The software package includes the following components:

No.	Functions	Name	FB no.
1	Diagnostics function	SSDiag (Page 64)	FB1325
2	Driver block for operating 3RW44 Soft Starters	SSOprtn (Page 95)	FB1326
2	Measured value function	SSMeas (Page 74)	FB1327
3	Statistics function	SSStat (Page 84)	FB1328
5	Channel block for 3RW44 Soft Starters	SSChn (Page 117)	FB1329

- Block library (function blocks and faceplates):
  - SSDiag diagnostics block
  - SSMeas, SSStat blocks
  - SSOprtn driver block
  - SSChn channel block
- Online help in German and English
- Installation program
- Readme file for installation

1.4 Installing the library

Starting the installation

For more information on installation, refer section Installation in "Getting Started (https://support.industry.siemens.com/cs/ww/en/view/109482393)". Please find other documentation regarding this library at this link (https://support.industry.siemens.com/cs/products).

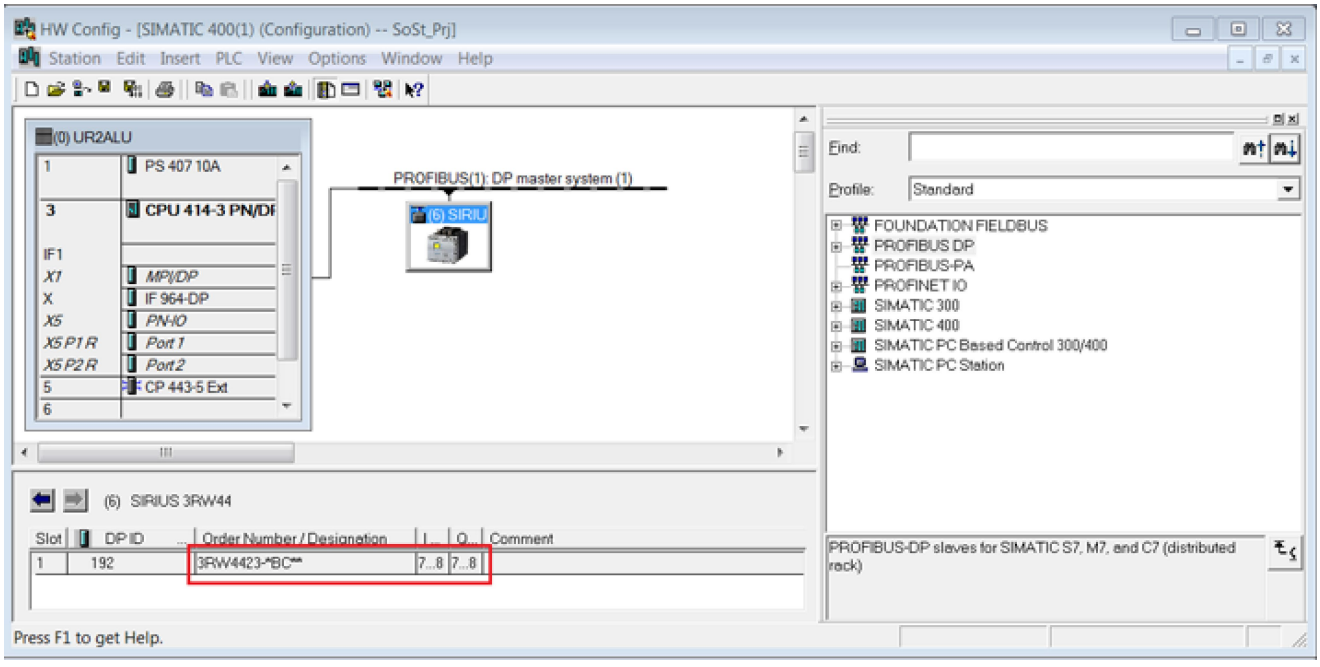
1.5 Configuration steps

1.5.1 Configuring in HW Config

The two bytes of the process image inputs (PII) are transferred from the Soft Starter 3RW44 device based on the logical address configured for the module. This is a manual configuration that a user has to configure for both the inputs and outputs.

3RW44 Soft Starter on the master system (PROFIBUS)

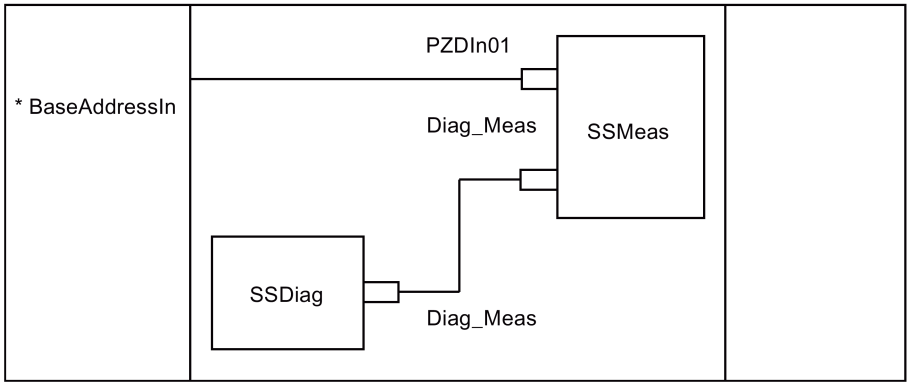
- Drag and drop the desired Soft Starter 3RW44 object (OM, PDM or GSD) out of the HW Catalog into the "Station" window of HW Config and connect it to the desired field bus (PROFIBUS).
- HW Config assigns the logical address to the object which will be used for setting up of the CFC template.



Symbolic name in HW Config

The `PZDIn01` input parameter of the block is interconnected with the corresponding input of the logical address of the device (`LAddr`).

The logical word address can be assigned to a symbolic name (*).



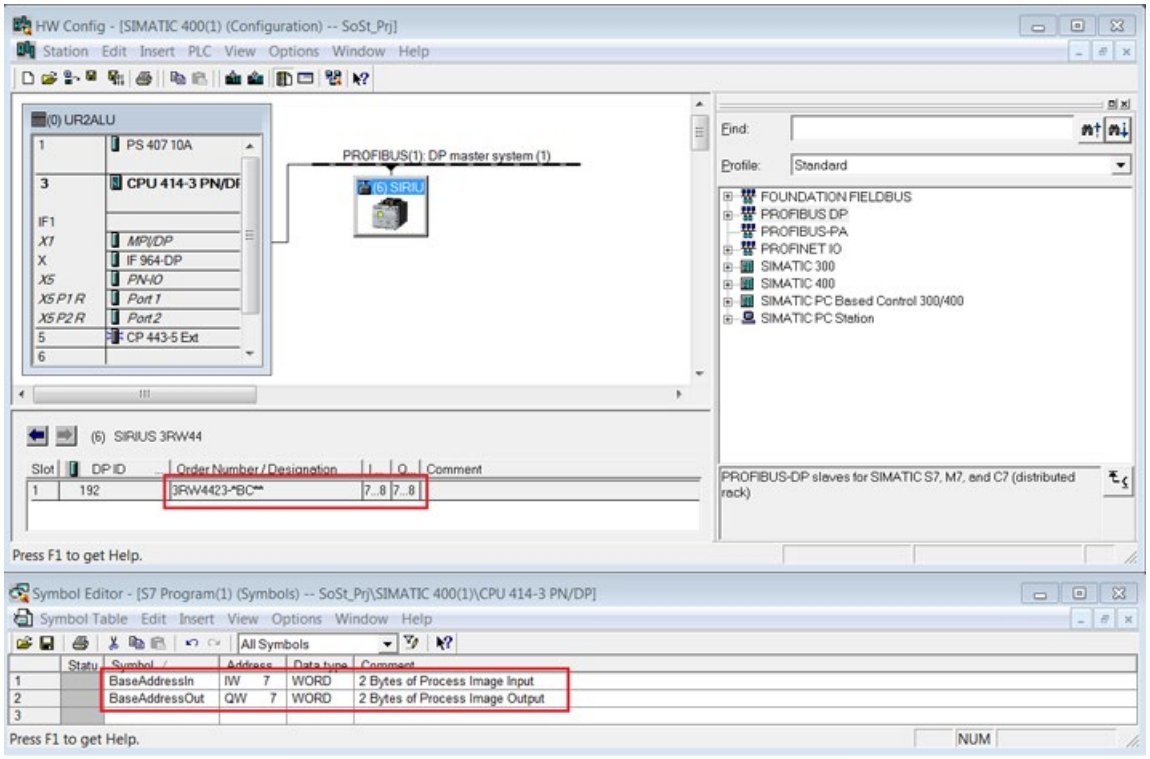


Figure 1-1 Symbolic name in HW Config

1.5.2 Configuring in CFC

The two bytes of the process image inputs (PII) are transferred from the Soft Starter device based on the logical address configured for the module. This is a manual configuration that a user has to configure.

Procedure

1. Configure the Soft Starter 3RW44 at HW config.
2. Open CFC-Editor.
3. If not yet done, instantiate an appropriate template and open it.
4. Refer to the input address of the Soft Starter 3RW44 device at HW Config and assign this address to the textual interconnection "Input WORD address of Soft Starter Module (IW x)".

Compile the CFC chart using the "Generate Module Driver" function.

Reference

Additional information is available in the "Process Control System PCS 7 Compendium Part A - Configuration Guidelines" Operating Manual on the Internet (https://support.industry.siemens.com/cs/document/63187279).

1.6 Driver generator

The "Generate Module Driver" function is available for signal processing in PCS 7. Once the hardware has been configured in HW Config and the technological functions have been configured in the CFC, this function automatically generates, interconnects, and parameterizes the required module drivers. These module drivers are responsible for diagnosing and reporting errors during signal processing.

The Setup program installs XML files for the connection between the 3RW44 Soft Starter and the installed driver generator.

Supported modules and configurations

The driver concept for the 3RW44 Soft Starter includes operation of Soft Starter 3RW44 control function:

- as a DP slave direct on the DP master system (connection via GSD, PDM object or S7 module via OM)
- As a DP slave behind a Y-link (connection via GSD or PDM object)
- As a PROFINET I/O system on Single PLC (connection via GSD, PDM object or S7 module via OM).

More information

The GSD files for the 3RW44 Soft Starter PROFIBUS (https://support.industry.siemens.com/cs/document/113630) and PROFINET (https://support.industry.siemens.com/cs/document/38702563) are available for download on the Internet. (http://support.industry.siemens.com)

Purpose of the driver generator

The signal-processing blocks, the diagnostics blocks, and the channel block are inserted in the CFC for each Soft Starter, and the connection to the hardware is established using symbolic addressing.

The "Generate Module Driver" option inserts the additionally required blocks, and then connects and assigns the corresponding parameters.

See also

Overview of the templates, control functions and blocks (Page 27)

Object lists and action lists (Page 126)

1.7 Example Configurations

In HW Config, the 3RW44 Soft Starter is inserted and configured with the associated components (GSD, OM or EDD files).

Note

The following diagrams show example configurations to illustrate configuring in HW Config.

3RW44 Soft Starter on the master system (PROFIBUS)

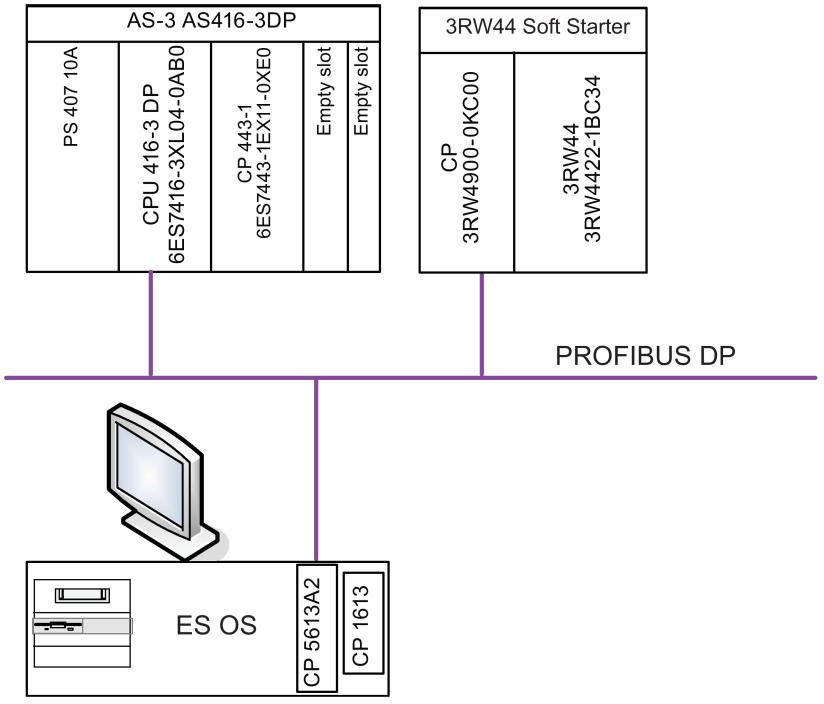


Figure 1-2 3RW44 Soft Starter on the master system (PROFIBUS)

3RW44 Soft Starter on the master system (PROFINET)

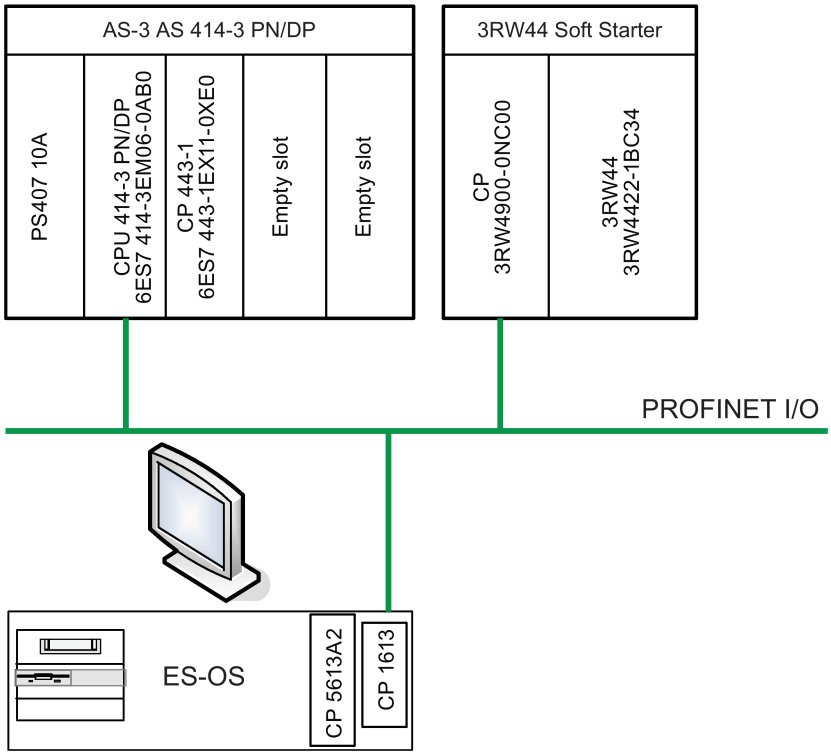


Figure 1-3 3RW44 Soft Starter on the master system (PROFINET)

3RW44 Soft Starter on PROFIBUS DP behind a Y-link

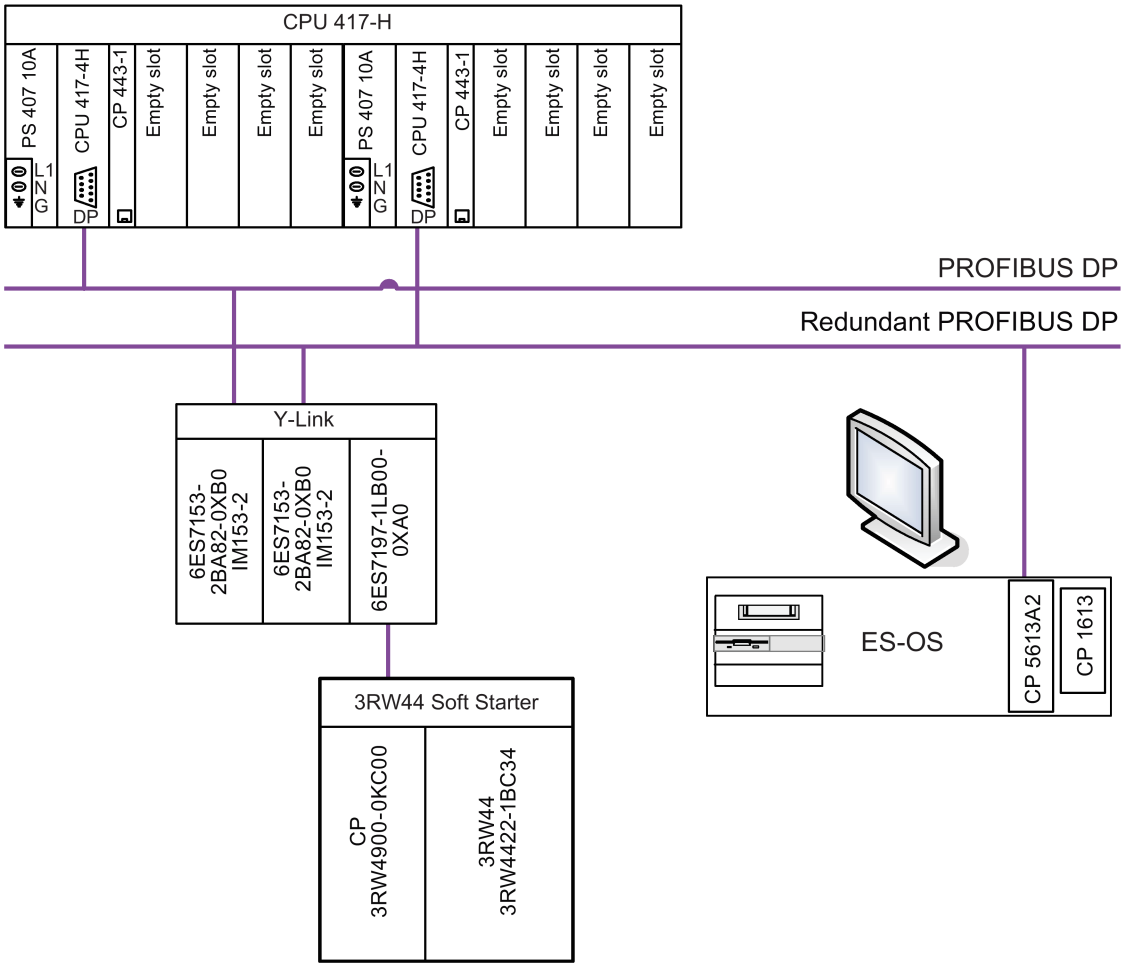


Figure 1-4 3RW44 Soft Starter on PROFIBUS DP behind a Y-link

1.8 Parameterization softwares

1.8.1 Parameterization softwares

Parameterization Softwares

For parametrizing the device following softwares are available:

- Soft Starter ES (with OM intergration)
- SIMATIC PDM (with EDD)
- GSD

1.8.2 Configuring in Soft Starter ES

Soft Starter ES is used for parameterizing 3RW44 Soft Starters, diagnosing their status, and controlling them, where applicable.

You can connect Soft Starter ES to the Soft Starter for PC/PG communication in the following ways:

- Via the COM interface with PC cable (Article No. 3UF7940-0AA00-0)
- Via the USB interface with USB PC cable (Article No. 3UF7941-0AA00-0)
- Via the PROFIBUS interface with PROFIBUS DP cable for 3RW44 Soft Starter PROFIBUS device
- Via the PROFINET interface (SIMATIC network) with Ethernet cable for 3RW44 Soft Starter PROFINET device.

1.8.3 Configuration with SIMATIC PDM

Configuration with SIMATIC PDM

You can use the SIMATIC PDM software to configure the Soft Starter devices. The devices are accessed via the PROFIBUS and PROFINET interface.

You can find information on configuration using the SIMATIC PDM software in the documentation for SIMATIC PDM and Soft Starter EDD.

Note

Transmission of modified device parameters is possible under the following conditions:

- The device is not in the Soft Starter "remote" mode.
- No ON control command is active.
- No motor current is flowing.

1.8.4 Device type selection in HW Config

Device type selection in HW Config

You can select the device type in the HW Config as follows:

1. Start the SIMATIC Manager.
2. Open the "Settings" menu via "Options → SIMATIC PDM → Settings".
   The dialog box opens.
3. Enable "Select type when device is inserted in HW Config".
4. Confirm by clicking OK and close the dialog box.
5. Close SIMATIC Manager and integrate EDD using the SIMATIC PDM "Device Integration Manager".

Note

3RW44 Soft Starter PN

PCS 7 V8.1 and above support integration of 3RW44 Soft Starter PN devices using SIMATIC PDM.

1.9 Update an existing PCS 7 project

Performing a project update

Please refer "ReadMe" provided with the library.

1.10 Further documentation

Overview

You can find more information here:

- Online help for PCS 7 Advanced Process Library.
- Online help for SIMATIC PCS 7 Process Control System
- Function manuals for SIMATIC PCS 7 Process Control System on the Internet (https://support.industry.siemens.com/cs/ww/en/view/109482346)
- System Manual Soft Starter PROFIBUS on the Internet (https://support.industry.siemens.com/cs/document/23831273)
- Manual for PROFINET Communication Module for SIRIUS Soft Starter 3RW44 on the Internet (https://support.industry.siemens.com/cs/document/85225796)
- Getting Started on the Internet (https://support.industry.siemens.com/cs/ww/en/view/109482393).

Information about the library 2

2.1 Blocks - overview

The following blocks can be used with the 3RW44 Soft Starters:

Table 2- 1 Soft starter blocks

Name	FB no.	Description
SSDiag (Page 64)	FB1325	Diagnostic functions
SSOprtn (Page 95)	FB1326	Control function that supports specific functions for operating the Soft Starter
SSMeas (Page 74)	FB1327	Measurement functions
SSStat (Page 84)	FB1328	Statistical functions
SSChn (Page 117)	FB1329	Channel block for 3RW44 Soft Starters

2.2 Faceplates

A faceplate displays all elements of a block graphically. The faceplate is displayed in a separate window on the Operator Station (OS). You can call the faceplate:

- Using picture selection keys
- From the process tag list
- By clicking the specific block icon

Typical structure of a faceplate

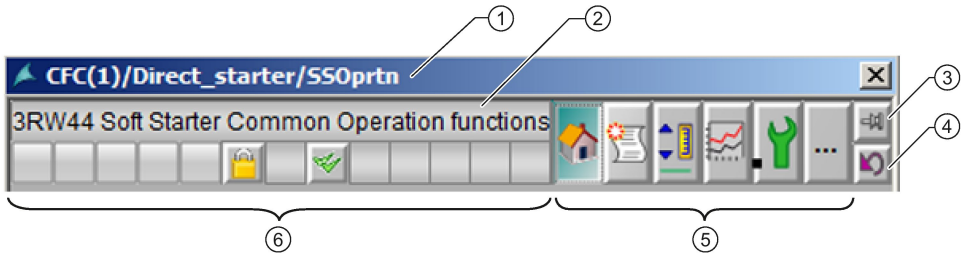
The file name of the faceplate is structured as follows:

"@<PG>_<XXX>_<YYY>.pdl"

Table 2- 2 Meaning of tags

Tag	Replaced with
<PG>	• PG for block-specific elements • PCS7 for elements provided by PCS 7
<XXX>	Name of the block, e.g. SSOprtn
<YYY>	Name of view

Example: "@PG_SSOprtn.pdl"

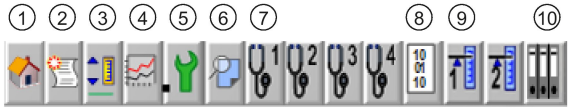


① Name of block
② Comment, e.g., name of starter
③ "Pin faceplate" button:
You can use this button to secure the faceplate when switching the range.
④ "Back to Process Picture" button:
You can use this button to return to the original process picture.
⑤ Toolbar for selecting the view
⑥ Overview window

Figure 2-1 Example of the header structure of a faceplate

Toolbar

Every button in the toolbar represents a view. Click on the appropriate button to open the view. Right-click on the name of the view in the toolbar to open the view in a separate window.



① Standard	④ Trend	⑦ Diagnostics	⑩ Logbook
② Alarm	⑤ Maintenance	⑧ Process image	
③ Limits	⑥ Preview	⑨ Maximum pointers	

Figure 2-2 Icons for views

Overview window

The overview window shows the overall status of the block:

① Group display:
Indicates whether unacknowledged alarms and warnings are pending.
② Status LOCK for messages, authorization level 5 and higher
③ Message suppression
④ Message acknowledgement, authorization level 5 and higher
⑤ Signal status of the block
⑥ Occupied – Batch:
This function indicates whether the block instance of SIMATIC BATCH is occupied.
⑦ Maintenance state

Figure 2-3 Overview window

Expanded command area

For inputs in the dialog window that require confirmation by the operator, the command area is expanded in the faceplate. The corresponding options are then available, depending on the selection.

Figure 2-4 Example of expanded command area

The expanded command area can be programmed with a 2- or 3-level access concept for the operator. The access can be changed in the WinCC Explorer using the internal @APLCommandExecutionSteps variable.
Level 2: The operator only needs to press the command to execute.
Level 3: The operator must also press the OK button to execute the command.

Authorization levels

Some commands are subject to permission with authorization levels via WinCC. The authorization levels are updated when a view is opened. The user can only execute the commands that are enabled for him.

The authorization levels are created for the project by means of a user ID.

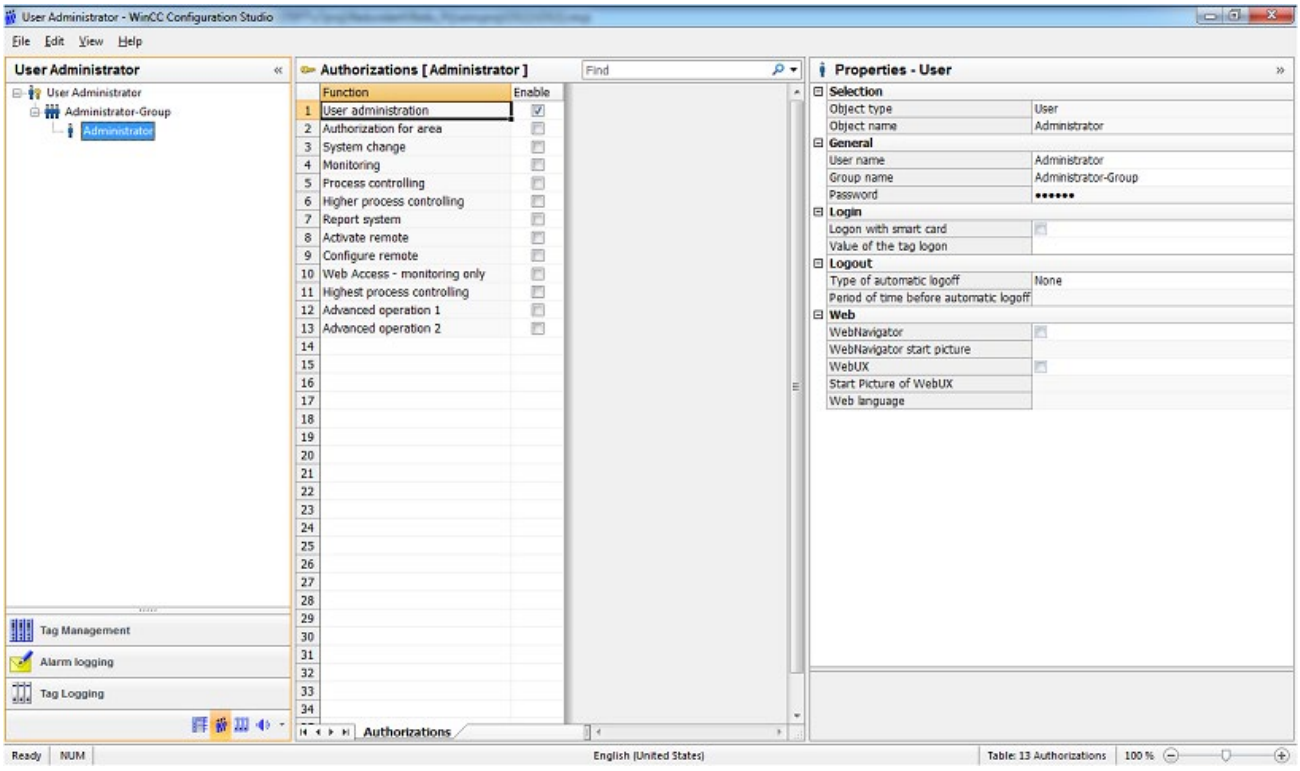


Figure 2-5 Assigning authorization levels in WinCC

Configuration aids

The following software and templates are available for configuring the faceplates:

- In WinCC Explorer: the Graphics Designer
- Templates available from the Faceplate Designer
- PCS 7-specific standard views
  - Trend
  - Alarms
- Additionally required views, user objects, and functions

More information

The faceplates described are available as functional, tested components. Along with the faceplates, you receive a description that enables you to adapt the faceplates:

- Description of the interface to the blocks
- Description of the operator input functions and the display functions.

2.3 Block icons

The block symbols are contained in the following file: "@PCS7TypicalsSSV8.pdl"

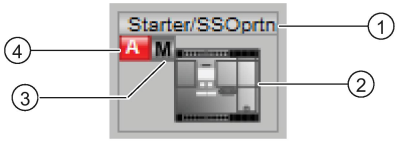
The SSOprtn block can be displayed by a block icon. There are no block icons available for SSDiag, SSMeas and SSStat blocks.

The block icons of the SSOprtn block are displayed as follows:

Figure 2-6 Block icons, example SSOprtn

Structure

Structure of a block icon:



① Process type
② Motor status display
③ Operating mode
④ Error messages

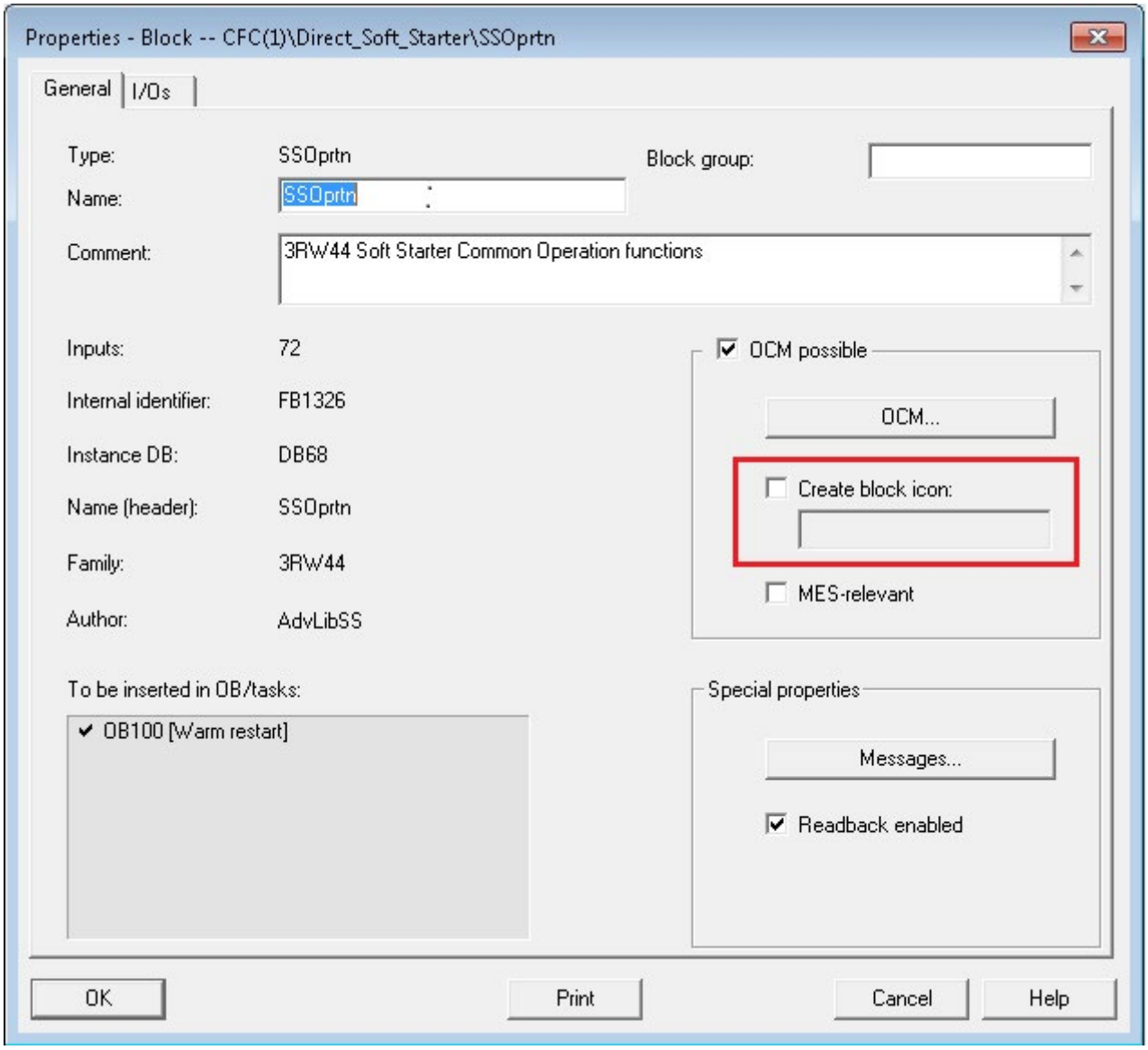
Figure 2-7 Structure of a block icon, example SSOprtn

Creating block icons in CFC

To create a block icon, select the number for the appropriate block icon in the object properties of the block.

During the AS-OS compilation, the block icons are extracted from the file @PCS7TypicalsSSV8.pdl to the picture file of the current project.

Clicking on the block icon opens the corresponding faceplate and the block icon remains highlighted as long as this faceplate is opened.


Properties - Block -- CFC(1)\Direct_Soft_Starter\SSOprtn
General
I/Os
Type:
SSOprtn
Block group:
Name:
SSOprtn
Comment:
3RW44 Soft Starter Common Operation functions
Inputs:
72
OCM possible
Internal identifier:
FB1326
OCM...
Instance DB:
DB68
Create block icon:
Name (header):
SSOprtn
MES-relevant
Family:
3RW44
Author:
AdvLibSS
To be inserted in OB/tasks:
Special properties
OB100 [Warm restart]
Messages...
Readback enabled
OK
Print
Cancel
Help

2.4 Supported functions

2.4.1 Central color management

Central color management

The central color palette from the APL Library underlies the "3RW44 Soft Starter PCS 7 Library V8.3".

The colors in the faceplates and block icons can be changed via this central color palette in WinCC. The color palette is located on the "User interface and design" tab of the project properties.

For more information about the parameterizable functions, refer to the Function Manual "Process Control System PCS 7, PCS 7 Advanced Process Library" on the Internet (https://support.industry.siemens.com/cs/ww/en/view/109482346).

2.4.2 Web Navigator

The Soft Starter 3RW44 PCS 7 Library V8.3 supports the Web Navigator functions.

You can find additional information on configuring the Web Navigator functions in the manual "PCS 7 - OS Web Option" under C:\Program Files\SIEMENS\Documentation\English.

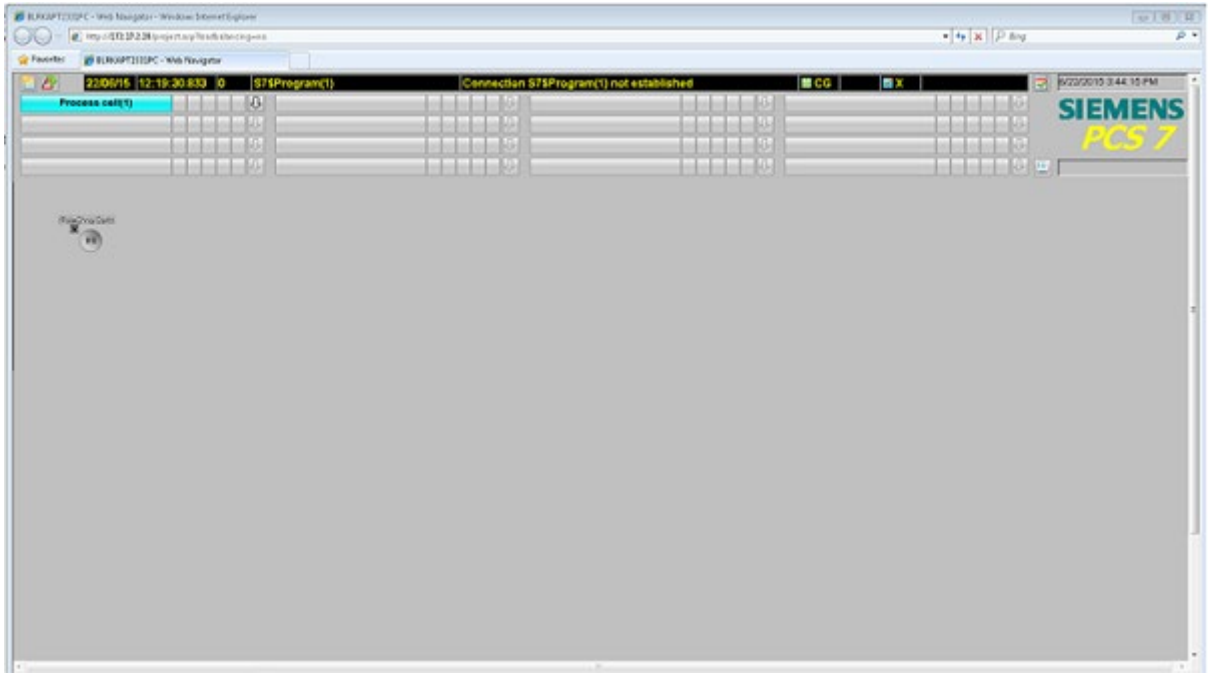


Figure 2-8 Web Navigator

Templates

3

3.1 Overview of the templates, control functions and blocks

Templates from the SIRIUS Soft Starter 3RW44 PCS 7 Library V8.3 are templates that you can use to implement control functions in your project. Templates thus simplify the engineering for configuring the blocks, and they support their problem-free functioning.

You can also modify the templates or create completely new ones. The interconnections that must then be created manually can be found in the available templates.

Note

The templates of SIRIUS Soft Starter 3RW44 PCS 7 Library V8.3 have been built using the function blocks of PCS7 APL. However, when the SIRIUS Soft Starter 3RW44 PCS 7 Library V8.3 is installed on PCS7 V8.1 and above, the respective Drive block(MotRevL) of PCS7 APL would need to be imported by the user at the templates.

To update the existing project, please refer the respective readme version under the topic "Steps to be done for updating existing PCS 7 projects" for detailed information.

Template for the control function Direct Soft-Starter

Control function	Template	APL blocks	Soft Starter blocks
Direct starter and Reverse starter	Direct_Soft_Starter (Page 30)	MotRevL EventTs Or04	SSOprtn[1] SSMeas SSStat SSChn

[1] Block icon available

For more information about the APL blocks, refer to the Function Manual "PCS7 Process Control System, PCS7 Advanced Process Library" on the Internet (https://support.industry.siemens.com/cs/ww/en/view/109482346).

3.2 Using templates

The template for the control function Direct starter is located in the 3RW44 Soft Starter Library under:
SS_PCS7_LibV83 > Blocks+Templates\Templates >

Select the template *Direct_Soft_Starter* and drag-and-drop onto the CFC. Alternatively, you can also copy the template direct to the chart container or to the required location in the technological hierarchy view.

To edit the template, right-click on the template and select "Open" from the shortcut menu. The template is opened as a CFC.

Manual interconnections

In the CFC, connect "Input Word Address of Soft Starter Module" in the left-hand sheet bar with the logical address of the basic unit.

There are two ways of doing this:

- Via the already created symbolic name
- Via direct input of the calculated address

Repeat the procedure on CFC sheet 2. To do so, change the view in CFC with the selection list Sheet / Overview in the symbol bar.

Automatic interconnections

If the option "Generate Block Driver“ is activated in the "Compile Program" dialog, interconnections that are not yet available but that are necessary will be automatically executed.

In addition to the interconnections, the driver generator automatically generates the following blocks and connects them with the template:

- SUBNET DP
- OB_DIAG1/OB_DIAG1_PN
- RACK
- SSDiag
- MOD_SWT

The textual interconnections supplied in the template can be deleted individually or entirely. The driver generator replaces the textual interconnections automatically.

You control deletion of the textual interconnections using the menu command Options → Delete Textual Interconnections.

Note

To view generated interconnections after executing the driver generator, hit F5 to refresh or close the CFC and open it again.

Remove unused blocks

The following blocks (CFC Sheet 2) are not absolutely necessary for operating 3RW44 Soft Starters:

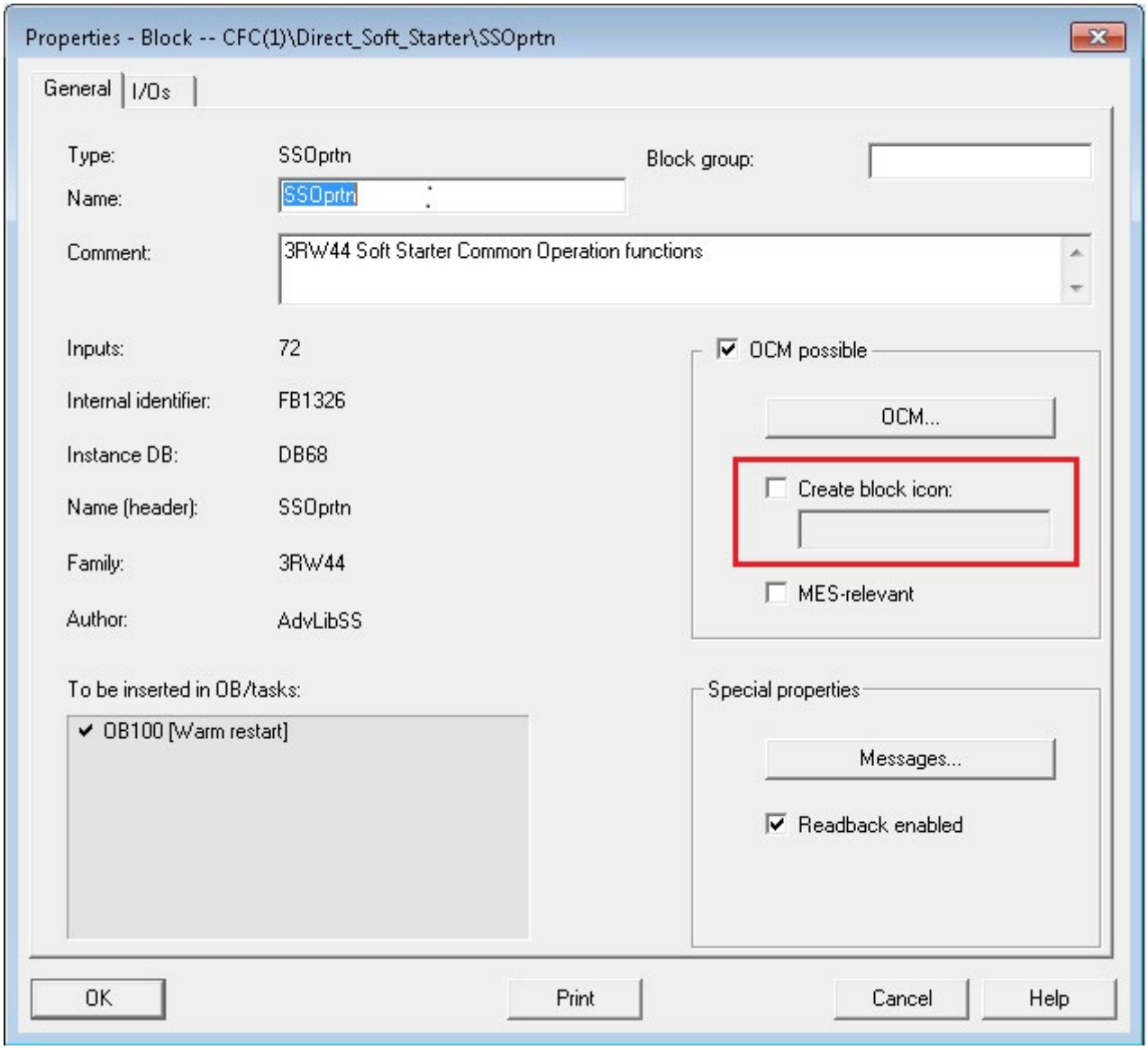
- SSMeas
- SSStat

They provide further functions such as measured values (e.g. temperature) and statistical data.

These blocks can be deleted (right mouse key → delete or select block → Del). After renewed compiling and downloading to the PLC, these functionalities are no longer available for the user program.

Note

Once the OS compilation is also done, there will be only one block icon created for each template. The block icon will be that of the respective APL block. However, if the user desires to have a block icon for the SSOprtn block, it can be enabled manually by the user before OS compilation. Pls refer to the screenshot below.



3.3 Direct Soft Starter template

This template supports the control function **Direct starter and Reverse starter**.

It contains one instance each of the following blocks:

- MotRevL
- EventTs
- Or04
- And04
- SSOprtn
- SSMeas
- SSStat
- SSChn

Interconnections

1. Instantiate the template from the 3RW44 Library.
2. Interconnect the following parameters with the logical input address of the Soft Starter:

- `PZDIn1` (SSChn)
- `PZDIn01` (SSOprtn)
- `PZDIn01` (SSMeas)
- `PZDIn01` (SSStat)

Starting the motor in the opposite direction

In the template *Direct_Soft_Starter*, the button for starting the motor in the opposite direction is deactivated in the faceplate MotRevL. Bit6 in the parameter `OS_Perm` was set to "0" for this purpose.

Note

Starting the motor in the opposite direction is only possible if slow speed is active.

Slow speed is activated using the "Slow speed" button in the SSOprtn faceplate. In this faceplate, you can start the motor in the opposite direction using the "Slow speed Reverse" button.

The "Slow speed Reverse" command of the faceplate SSOprtn always takes priority over the command of the faceplate MotRevL.

See also

SSOprtn - Standard (Page 47)

Slow speed (Page 104)

Emergency start (Page 102)

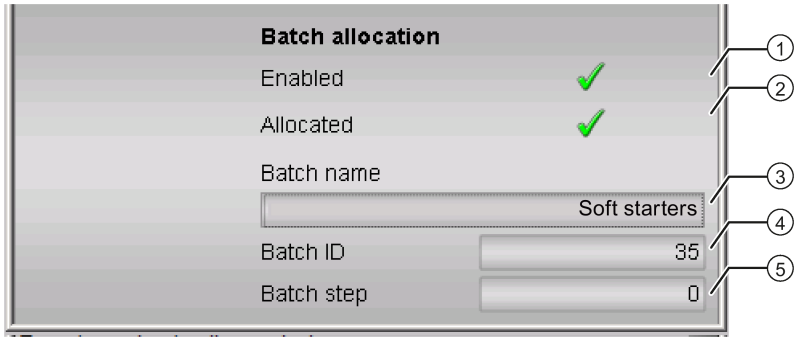
Faceplate - Views

4

4.1 Batch view @PG_APL_Batch.pdl

The "Batch" view is available for all signal blocks.

Batch view



①	Enabled `(BatchEn)`	This area shows you if the block is enabled for operation via SIMATIC BATCH (Status1.Bit1)
②	Allocated `(Occupied)`	This area shows if the block is currently in use by SIMATIC BATCH (Status1.Bit0)
③	Batch name `(BatchName)`	This area shows the name of the batch that is currently running
④	Batch ID `(BatchID)`	This area shows the identification number of the batch that is currently running `(BatchID)`. The batch view is disabled if `BatchID` = 16#00000000.
⑤	Batch step `(StepNo)`	This area shows the step number of the batch that is currently running.

Figure 4-1 Batch view

4.2 Trend view @PG_APL_Trend.pdl

The "Trend" view is available in blocks in which curves are generated online from measured values, for example, the motor current.

Trend view

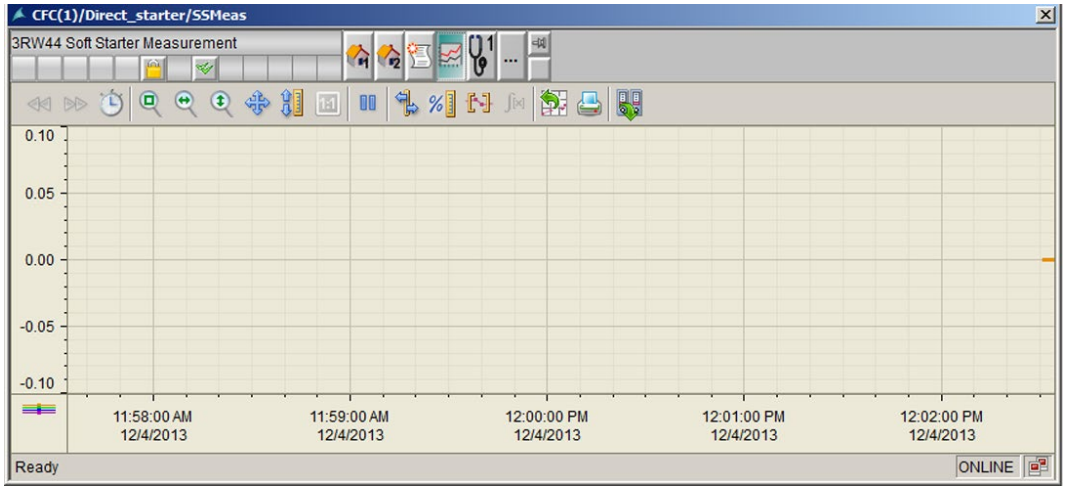


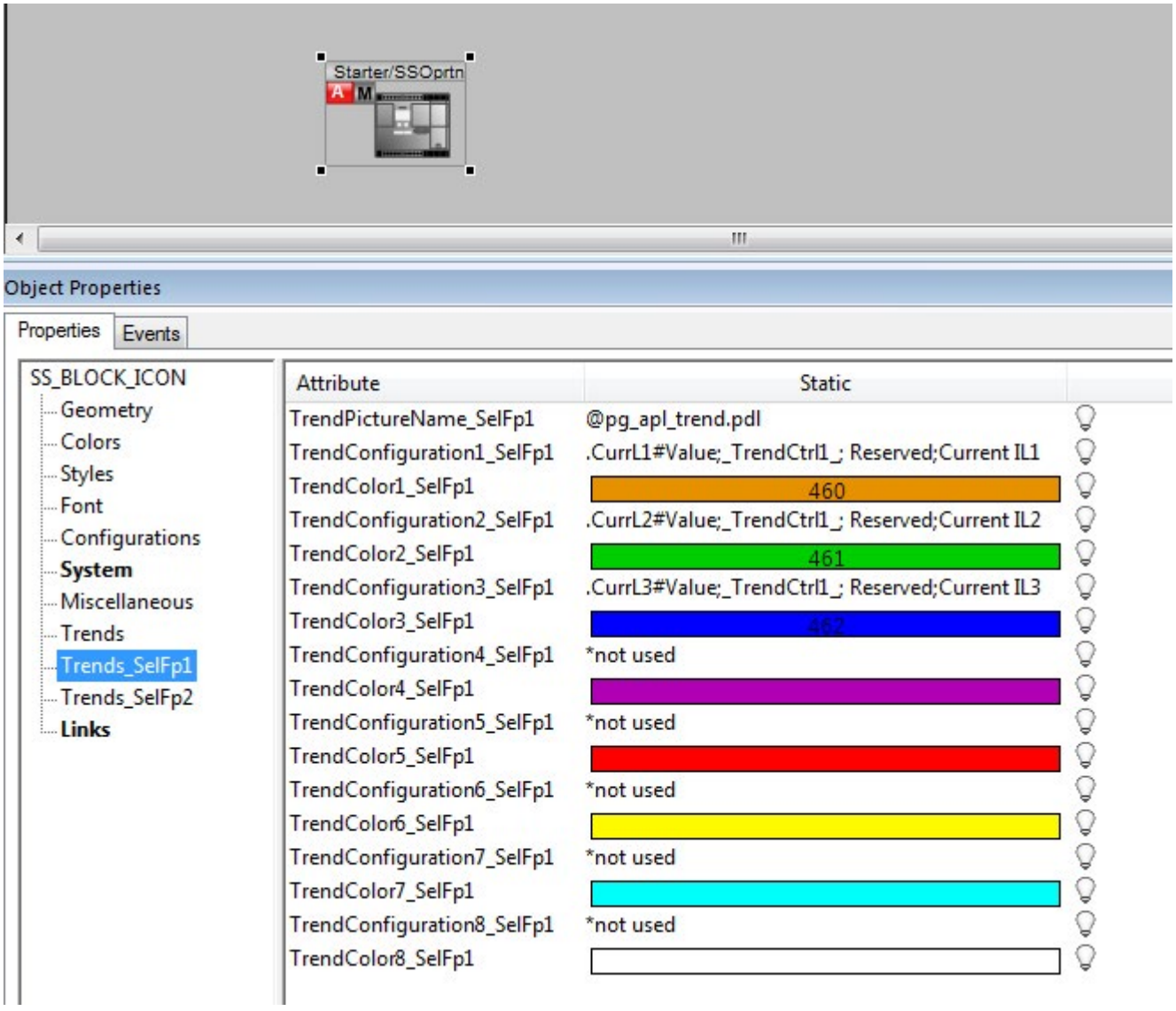
Figure 4-2 Trend view, SSMeas example

Configuring the view

The block parameters that are evaluated for the trend are configured in the block icon of the block.
To configure the view, use the properties TrendPictureName, TrendConfiguration and Trend color. Up to 10 parameters can be used for the view

1. The file name TrendPictureName is identical for all the blocks in the library: "@PCS7_APL_Trend.PDL".
2. TrendConfiguration is entered in the following format:
   <ParameterName>;<TrendControl>;<Reserved>;<Name of the Curve>
   For example, MotCurr#Value;_TrendCtrl1_;Reserved;MotorCurrent
3. Trend color determines the color of the curve.

Object properties TrendConfiguration



Trends	Trend curves configuration for the SSOprtn block
Trends_SelFp1	Trend curves configuration for the block connected via the parameter Trends_SelFp1 (e.g. SSMeas).
Trends_SelFp2	Trend curves configuration for the block connected via the parameter Trends_SelFp2.

Figure 4-3 Object properties TrendConfiguration

4.3 Alarm view (@PG_APL_Message.pdl)

The "Alarm" view is available for all signal blocks.

Alarm view

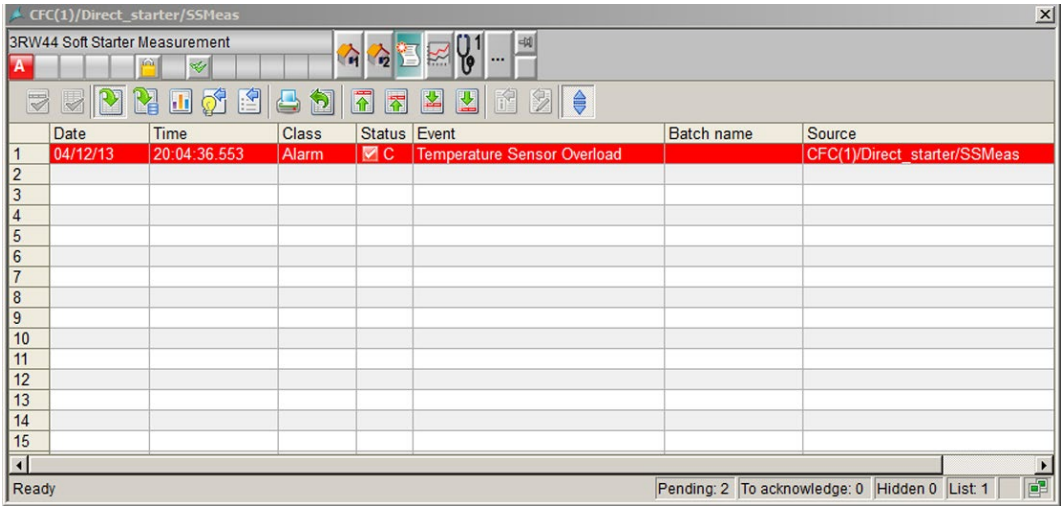


Figure 4-4 Alarm view, SSMeas example

4.4 Preview view

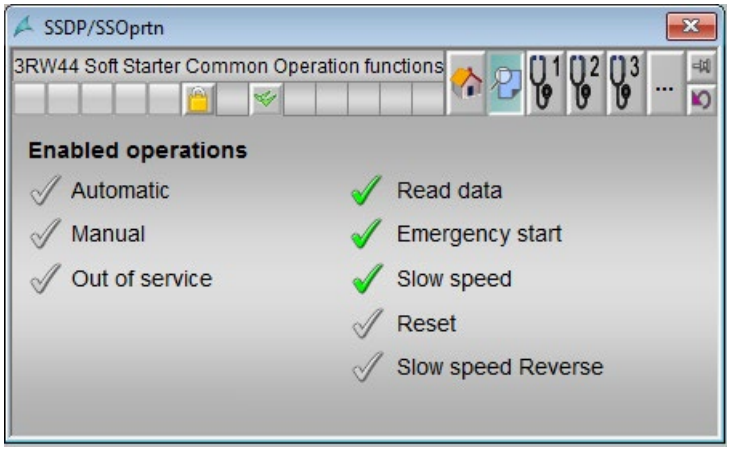
The preview shows the enabled operations for each signal block.

The operator may execute the command.

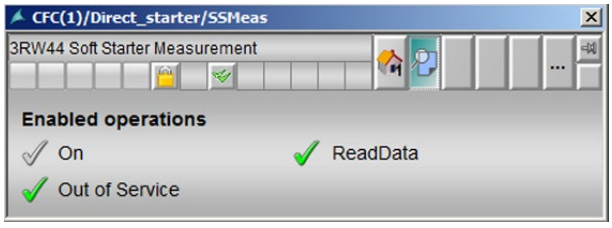
The operator may execute the command. The command is currently blocked by a process in the block.

The operator is not permitted to execute the command.

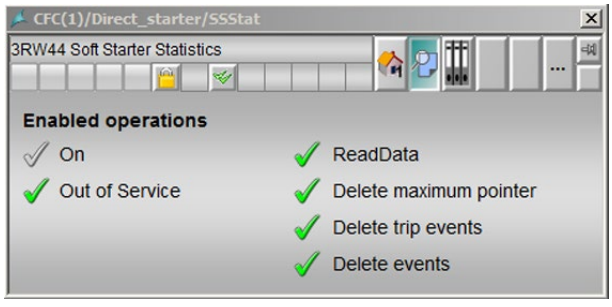
Preview – SSOprtn



Preview – SSMeas



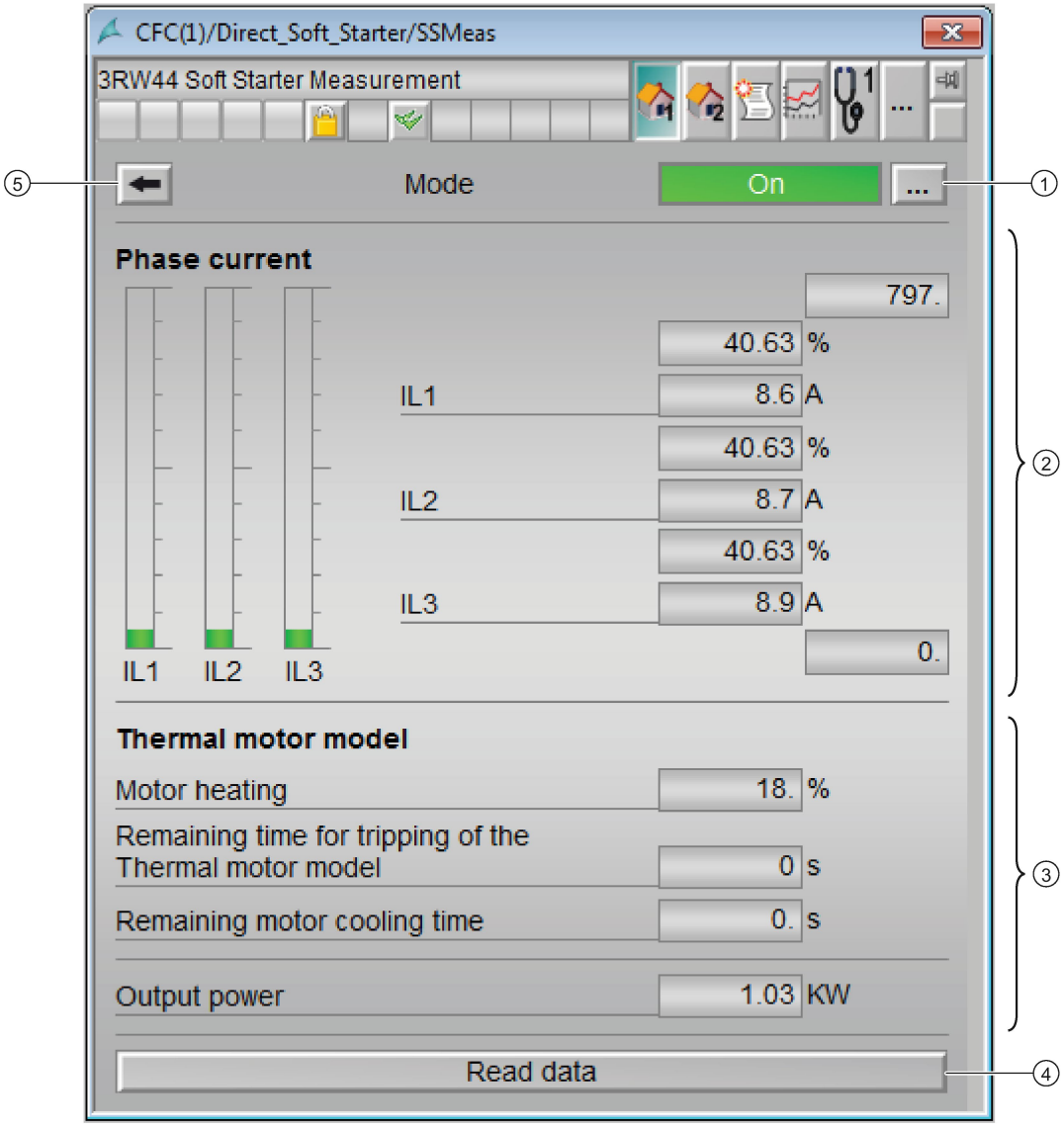
Preview – SSStat



4.5 SSMeas - Views

4.5.1 SSMeas - Standard

Standard 1 View



① Display of the operating mode

② **Phase current**

Current values as bars (Curr_OpScale high value, low value)

Phase current in % and amperes (CurrL1, CurrL2, CurrL3, CurrL1E, CurrL2E, CurrL3E)

③ **Thermal motor model**

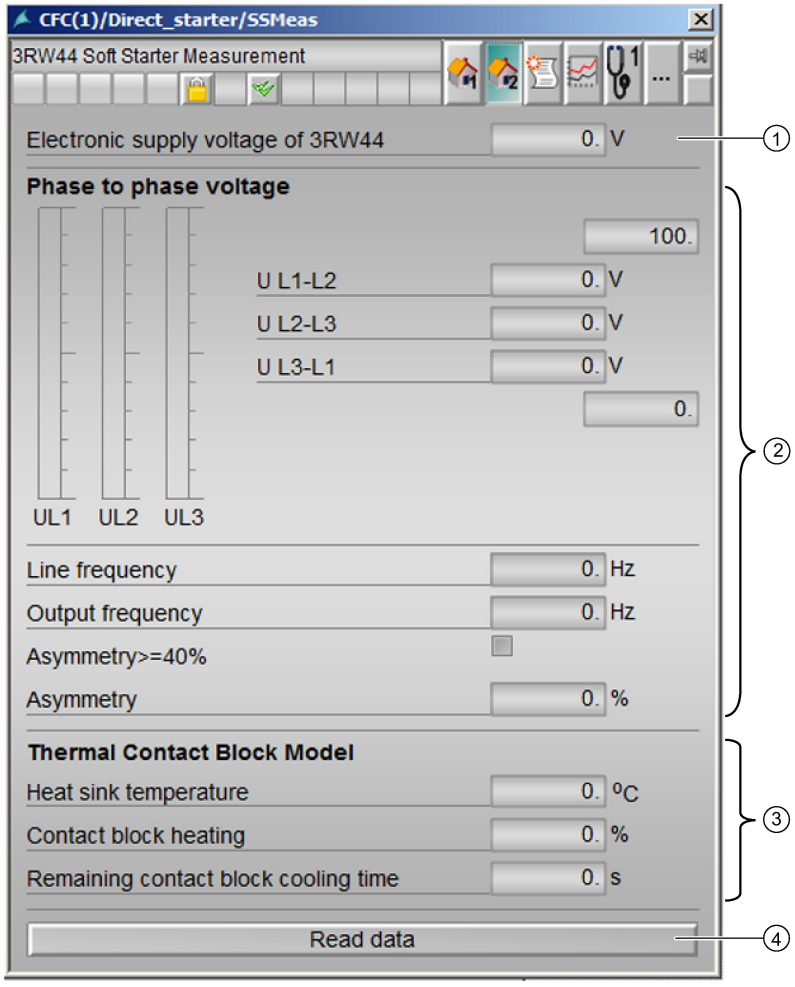
Motor heating in % (MotHtBld)
Remaining time for tripping the thermal motor model (TrpTm)
Remaining motor cooling time (MotcolTm)
Output power (OutPwr)

④ Button for updating the data (`RdDataOp`).
Button is deactivated if `RackFAct = 1`.
User authorizaton level 5.

⑤ **Navigation button**

Navigation to the connected SS Operation block.

Standard 2 View



① Supply voltage of the Soft Starter (SupVol)

② **Phase-to-phase voltage**

Voltage values as bars (Volt_OpScale high value, low value)
Voltage values in volts (VolL1L2, VolL2L3, VolL3L1)
Line frequency (LineFreq)
Activate / deactivate Asymmetry >= 40% (AsymtryEn)
Asymmetry (Asymtry)

③ **Thermal contact block model**

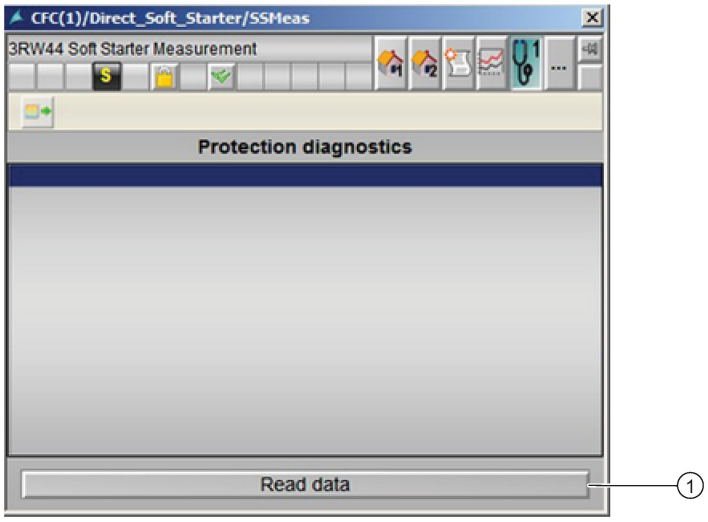
Heat sink temperature (HtSnkTmp)
Contact block heating (CntBlkHeat)
Remaining contact block cooling time (CntBlkColTm)

④ Button for updating the data (`RdDataOp`).
Button is deactivated if `RackFAct = 1`.
User authorizaton level 5.

4.5.2 SSMeas - Diagnostics

Protection diagnostics view (DiagMeas)

All the available diagnostics messages are displayed in this view.

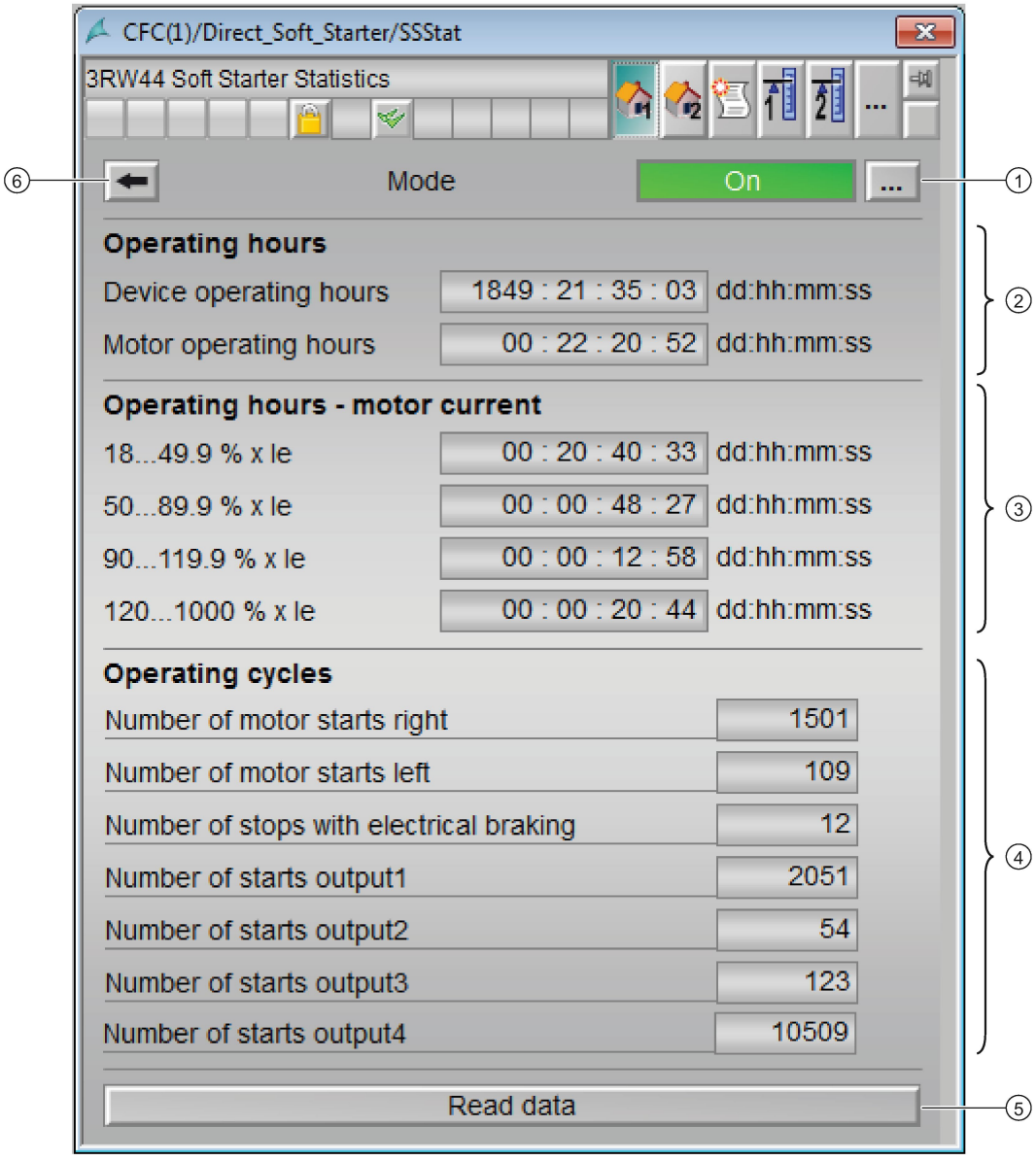


① Button for updating the data (RdDataOp). Button is deactivated if RackFAct = 1. User authorization level 5.

4.6 SSStat - Views

4.6.1 SSStat - Standard

Standard 1 View



① Operating mode
② **Operating hours**
Device (D_OpH), motor (M_OpH)

③ **Operating hours**

Motor current (OphIl18, OphIl50, OphIl90, OphIl120)

④ **Operating cycles**

Number of motor starts CW / CCW (N_StCw, N_StCcw)
Number of stops with electrical braking (N_BrkStp)
Number of starts output 1–4 (Output1, Output2, Output3, Output4)

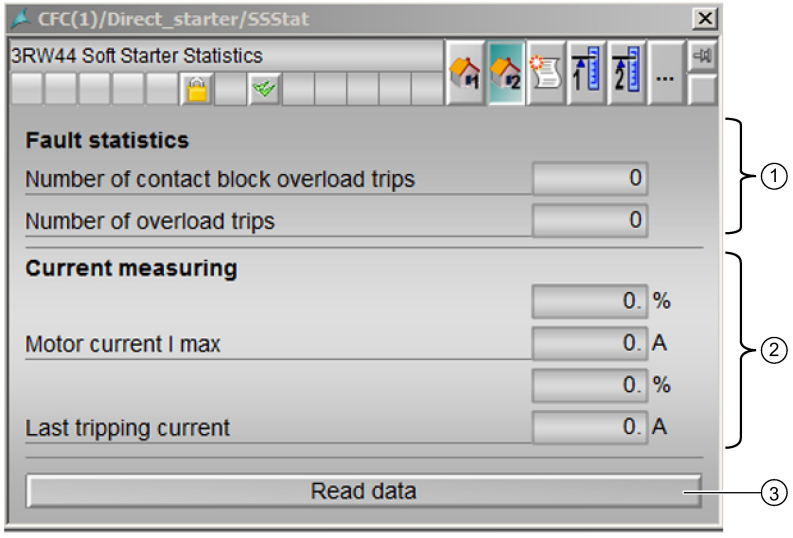
⑤ Button for updating the data (`RdDataOp`).
Button is deactivated if `RackFAct = 1`.

User authorizaton level 5.

⑥ **Navigation button**

Navigation to the connected SS Operation block.

Standard 2 View



① **Fault statistics**

Number of contact block overload trips (N_CntTrp)
Number of overload trips (N_OvlTrp)

② **Current measuring**

Maximum motor current Imax in % and amperes (ImMax, ImMaxE)
Last tripping current in % and amperes (Trg_I, Trg_IE)

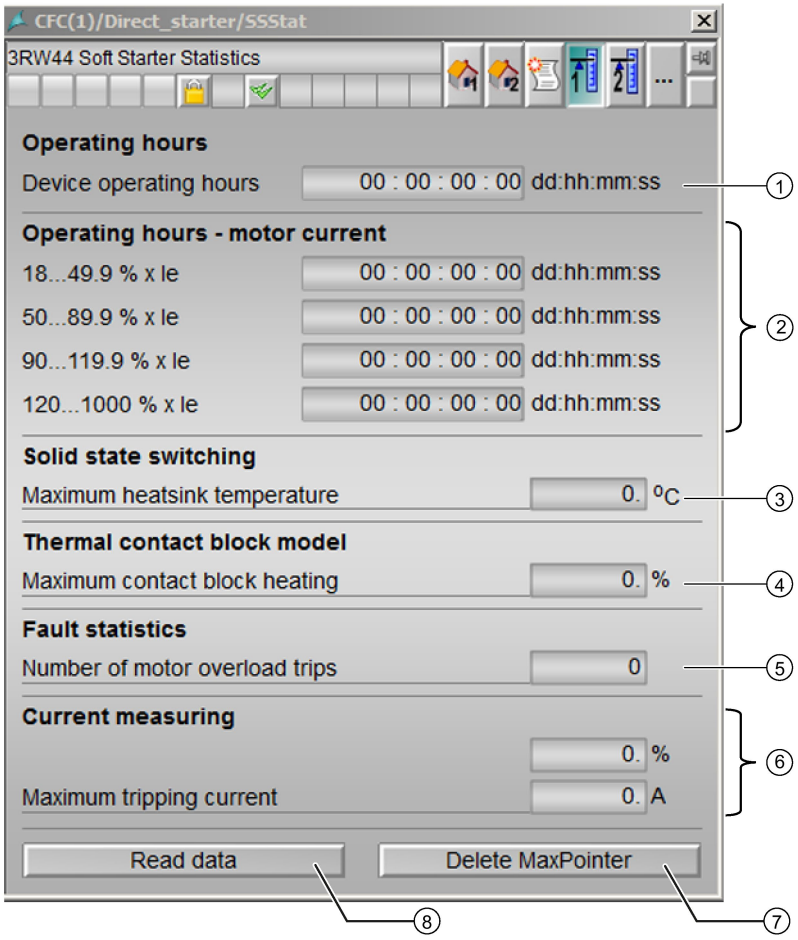
③ Button for updating the data (`RdDataOp`).
Button is deactivated if `RackFAct = 1`.

User authorizaton level 5.

4.6.2 SSStat - Maximum pointer

Maximum pointer 1

This Maximum pointer 1 view displays statistical data of the SSStat block.



① **Operating hours** Device (D_OpH)

② **Operating hours** Motor current (OhIl18Mp, OhIl50Mp, OhIl90Mp, OhIl120Mp)

③ **Solid-state switching**
Maximum heat sink temperature (HtSkTmpMax)

④ **Thermal contact block model**
Maximum contact block heating (CntBlkMp)

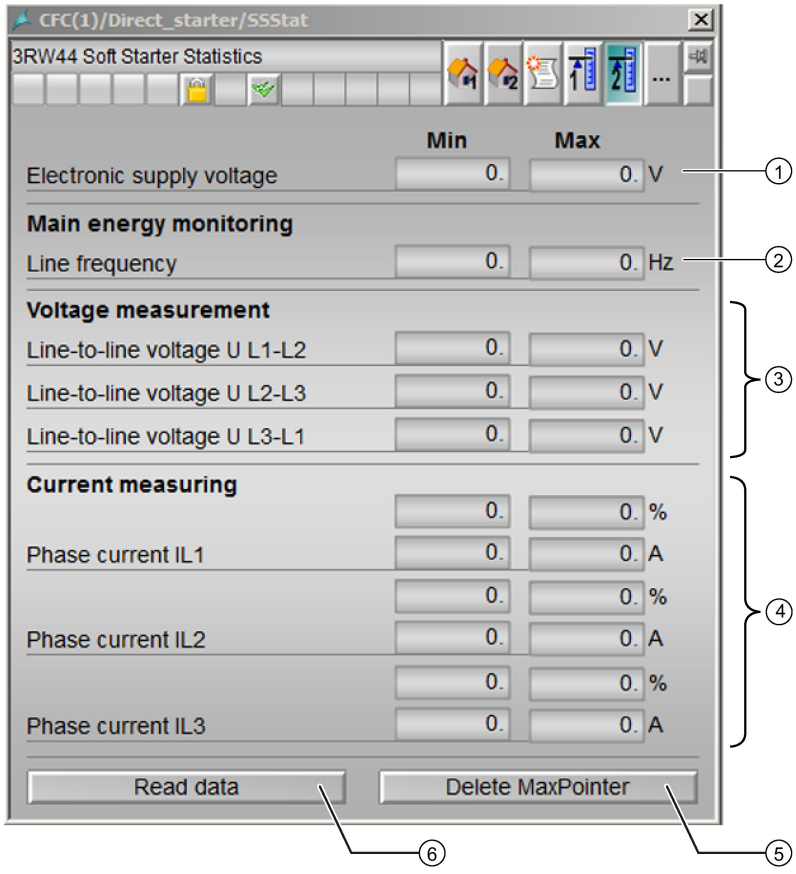
⑤ **Error statistics** Number of motor overload trips (N_OvlTrpMp)

⑥ **Current measuring**
Maximum tripping current in % and amperes (I1TrpMx, I1TrpMxE)

⑦ Button for deleting the maximum pointer, authorization level 6.

⑧ Button for updating the data, button is deactivated, if `RackFAct = 1`.
User authorizaton level 5.

Maximum pointer 2



① Electronics supply voltage (VoltMin, VoltMax)

② **Main energy monitoring**

Line frequency (LFreqMin, LFreqMax)

③ **Voltage measurement**

Line-to-line voltage in volts (Ul1l2Min, Ul1l2Max, Ul2l3Min, Ul2l3Max, Ul3l1Min, Ul3l1Max)

④ **Current measuring**

Phase current IL1, IL2, IL3 in amperes and %

(CurrL1MinE, CurrL1MaxE, CurrL1Min, CurrL1Max, CurrL2MinE, CurrL2MaxE, CurrL2Min, CurrL2Max, CurrL3MinE, CurrL3MaxE, CurrL3Min, CurrL3Max)

⑤ Button for deleting the maximum pointer, only in REMOTE mode, authorization level 6.

⑥ Button for updating the data (`RdDataOp`), authorization level 5 and higher.

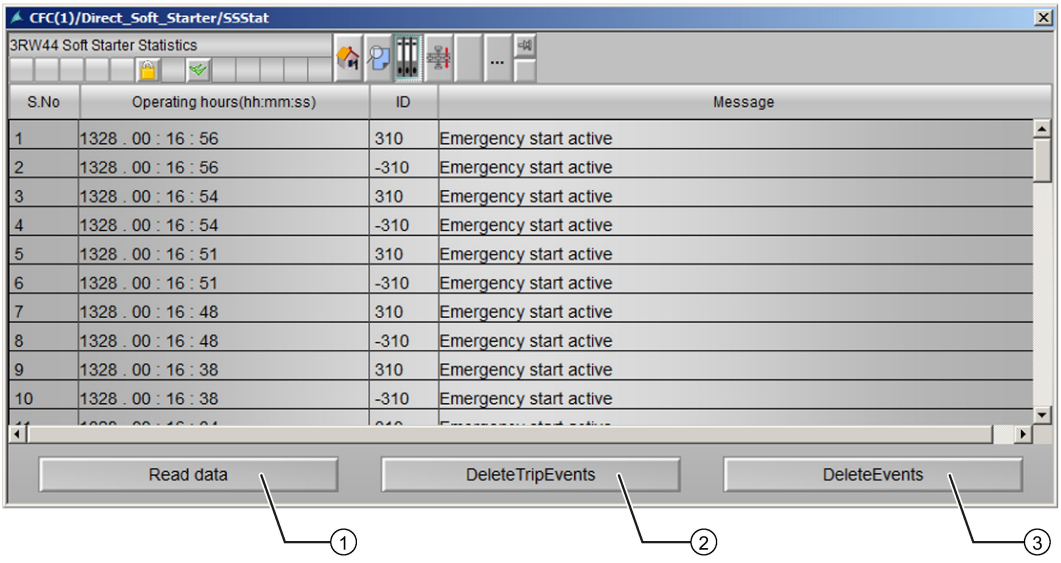
Button is deactivated if `RackFAct = 1`.

User authorizaton level 5.

4.6.3 SSStat - Logbook

Logbook view

The logbook contains device faults, trip faults and events with the corresponding fault numbers.

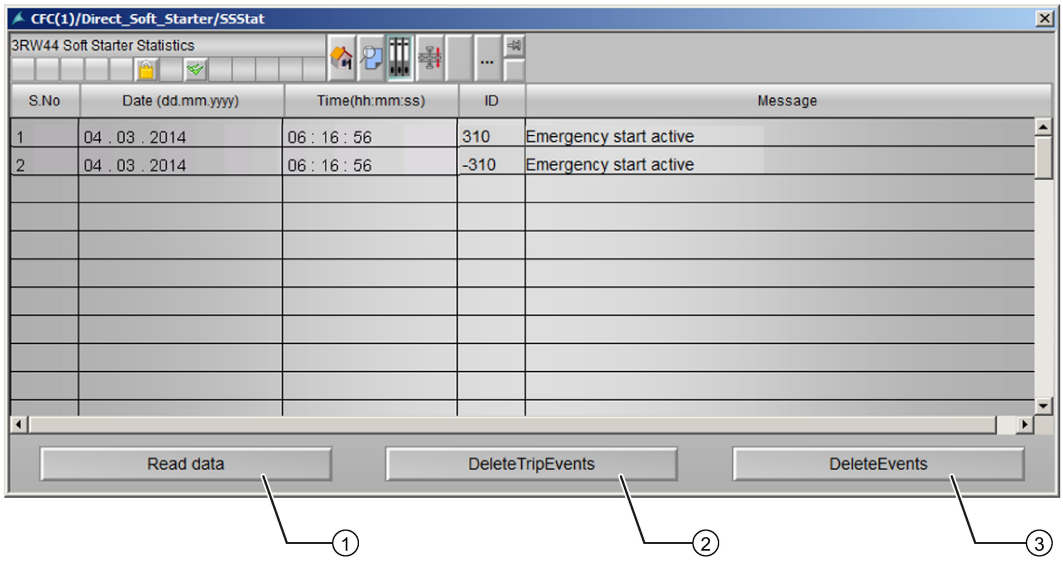


① Button for updating the data (`RdDataOp`), authorization level 5.
Button is deactivated if `RackFAct = 1`.

② Button for deleting logbook trips, only in REMOTE mode.
User authorization level 6.

③ Button for deleting logbook events, only in REMOTE mode.
User authorization level 6.

Figure 4-5 Logbook view for PROFIBUS



① Button for updating the data (`RdDataOp`), authorization level 5.
Button is deactivated if `RackFAct = 1`.

② Button for deleting logbook trips, only in REMOTE mode.
User authorization level 6.

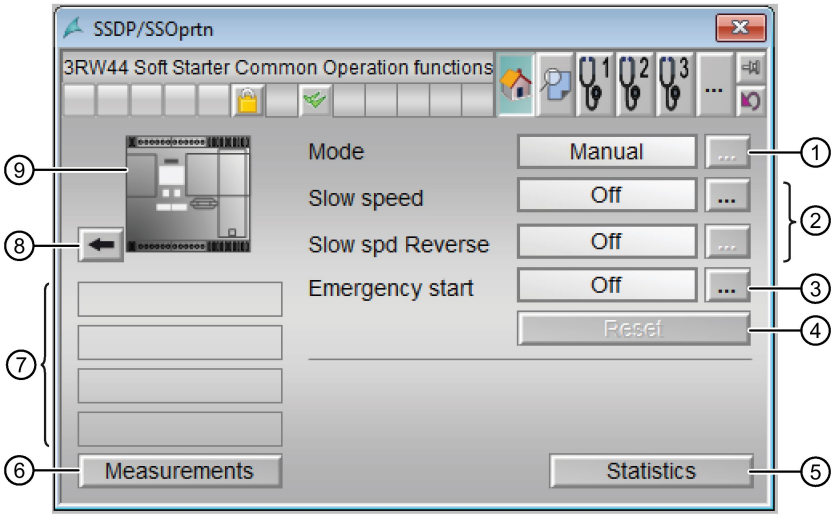
③ Button for deleting logbook events, only in REMOTE mode.
User authorization level 6.

Figure 4-6 Logbook view for PROFINET

4.7 SSOprtn - Views

4.7.1 SSOprtn - Standard

Standard view



① Button for changing the operating mode (`AutoModOp`, `ManModOp`, `OosOp`)
opens the expanded command area; authorization level 5 and higher, authorization level 6 for OosOp.

② Button for activating Slow speed (Page 104) (`SlSpdMan`); authorization level 5.
Only this faceplate shows whether or not slow speed is active!

To start the motor with slow speed in the forward direction, you use the "Forward" button in the faceplate MotRevL (see the chapter Templates (Page 30)).

The "Slow speed Reverse" button for starting the motor with slow speed in the reverse direction. This button is only active if slow speed has been activated previously.

③ Emergency start (Page 102) button; opens the expanded command area; authorization level 6.

④ Button for resetting the trip (`TrpRstOp`)

opens the expanded command area; authorization level 5.

⑤ Button for switching to the Standard view of Statistics faceplate; visible if the `Selfp2` input parameter of the SSOprtn block is configured

⑥ Button for switching to the Standard view of Measurement faceplate; visible if the `Selfp1` input parameter of the SSOprtn block is configured.

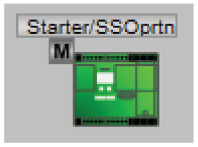
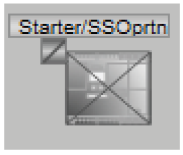
⑦ Status display of the block, e.g. monitoring, maintenance, group errors.

⑧ **Navigation button**

The button to navigate to the connected motor block.

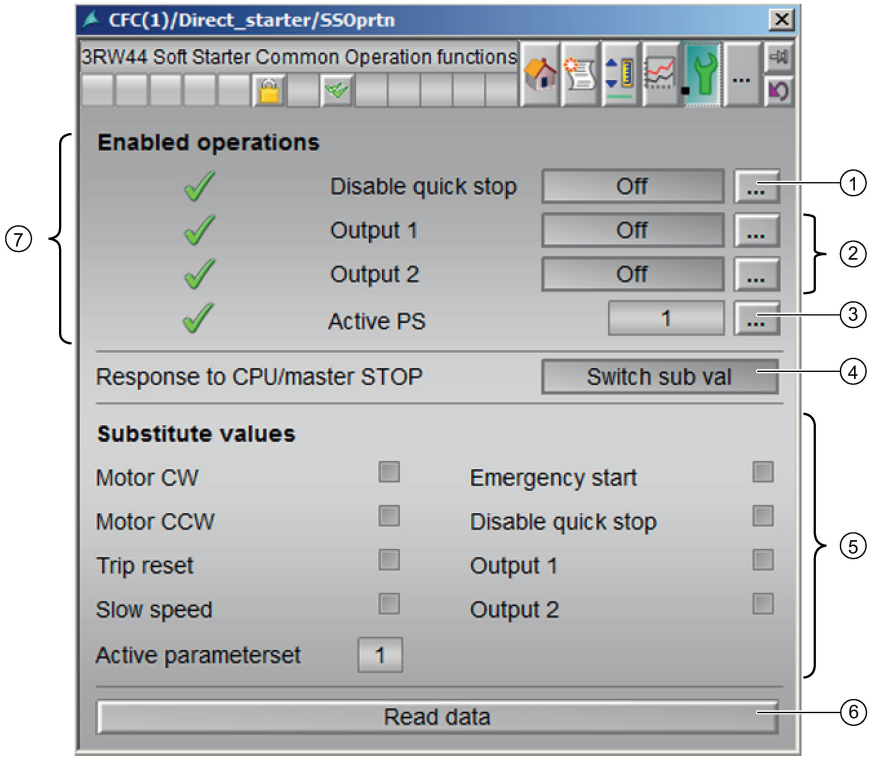
⑨ **Motor status** (see table)

Icons for motor status ⑧

Status	Symbol
Motor ON	
Motor OFF	
Error	
OoS	

4.7.2 SSOprtn - Maintenance

Maintenance view



① Button for activating Disable quick stop (`DsQkSpMan`),
opens the expanded command area; authorization level 6.

② Output 1, Output 2

③ Active parameter set

④ Response to CPU / master STOP (Feature Bit 0).

⑤ Substitute values that can be activated

⑥ Button for updating the data (`RdDataOp`).
Button is deactivated if `RackFAct = 1`.
User authorizaton level 5.

⑦ **Operator control enable**

- The operator may execute the command.

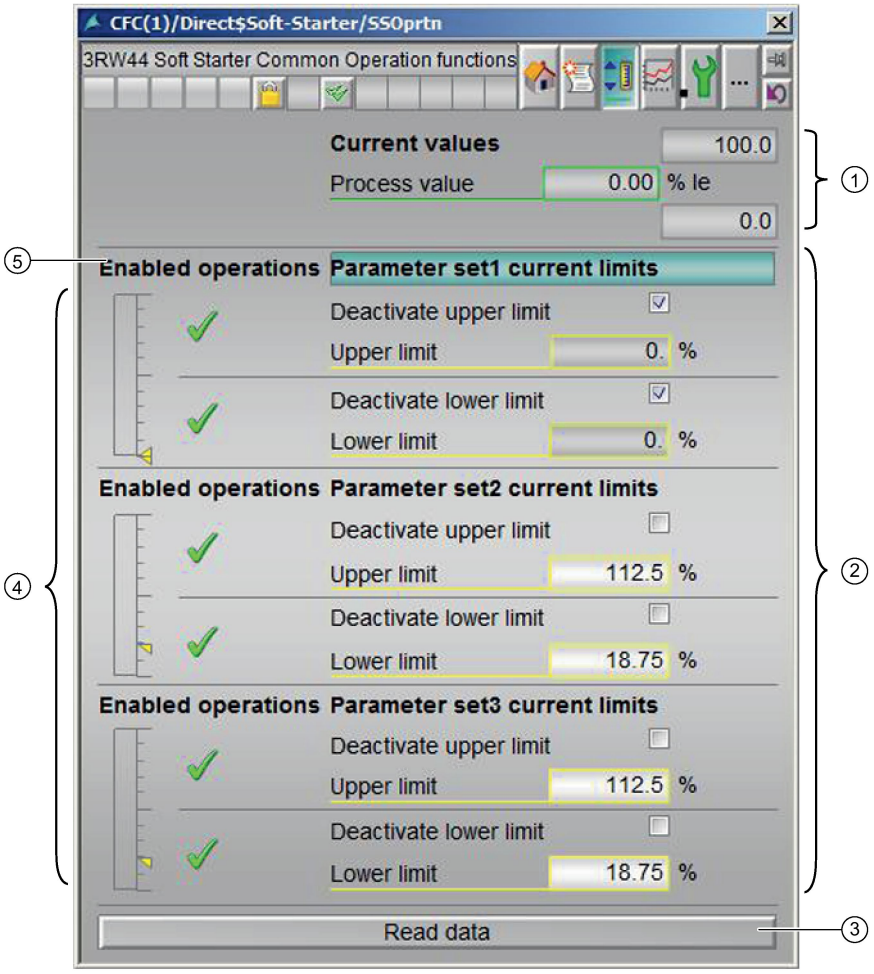
- The operator cannot execute the command because the command is currently blocked by a process.

- The operator is not permitted to execute the command (`OS_Perm`).

The displays are dependent on the bit values in the `OS_PermOut` and `OS_PermLog` parameters.

4.7.3 SSOprtn - Limits

Limits view



① **Current values**

Display of the drawn motor current under the selected parameter set (shown in blue) and its limit values (`MotCurr`).

Upper and lower limits for motor current (`PS1_OpScale`, `PS2_OpScale`, `PS3_OpScale`).

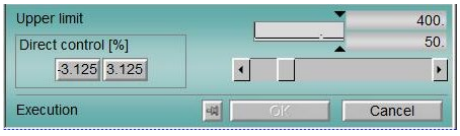
The values show the display range of the process value. The scale range is defined in the Engineering Station.

② **Parameter set 1–3 - Current limits**

- Deactivate upper / lower limit
- Upper limit (`PS1CurHi`, `PS2CurHi`, `PS3CurHi`)
- Lower limit (`PS1CurLo`, `PS2CurLo`, `PS3CurLo`)

If the background color of the field is white, you can change the value in the expanded operating area in 3 ways (authorization level 6):

- Entry in the input box
- Setting using the slider
- Entry by direct operation



③ Button for updating the data (`RdDataOp`);
opens the expanded command range; authorization level 5.

Button is deactivated if `RackFAct = 1`.

④ **Bar graph for current - Parameter set 1–3**

The visible range in the bar graph depends on the configuration in the Engineering Station.

The colored triangles show the specified limits:

- Red: Alarm
- Yellow: Warning

⑤ **Operator control enable**

- The operator may execute the command.

- The operator cannot execute the command because the command is currently blocked by a process.

- The operator is not permitted to execute the command (`OS_Perm`).

The displays are dependent on the bit values in the `OS_PermOut` and `OS_PermLog` parameters.

4.7.4 SSOprtn - Diagnostics

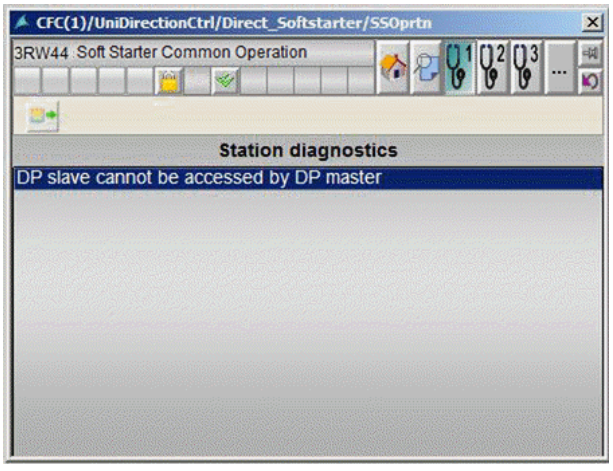
For the SSOprtn block there are diagnostics views for station, control, device and parameters.

All the available diagnostics messages are displayed in the Diagnostics view.

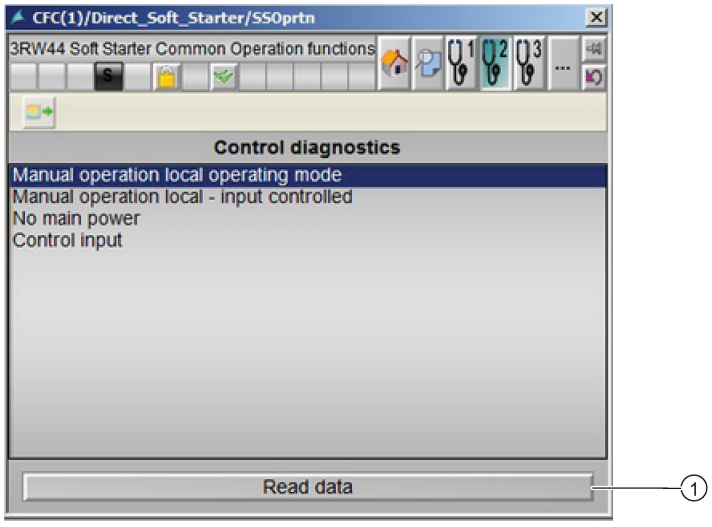
Note

In case of Rack fault/ Module fault of the device, all of the diagnostic messages will be suppressed except the station diagnostics messages.

Station diagnostics (DiagStn)



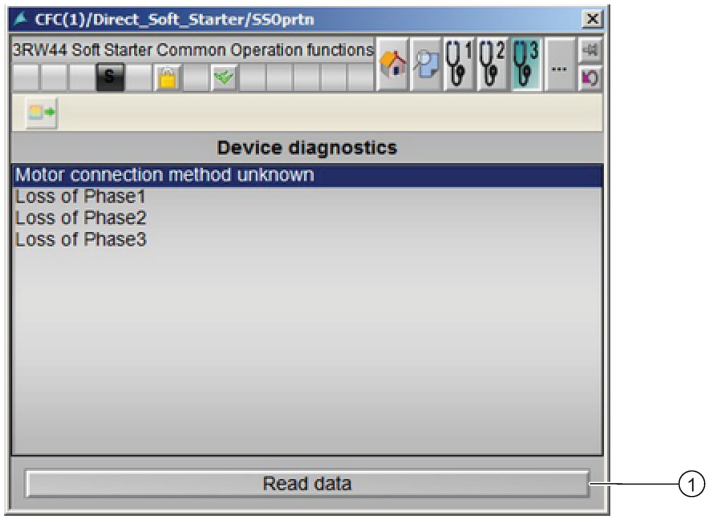
Control diagnostics (DiagCom)



① Button for updating the data (`RdDataOp`);opens the expanded command range; authorization level 5.

Button is deactivated if `RackFAct = 1`.

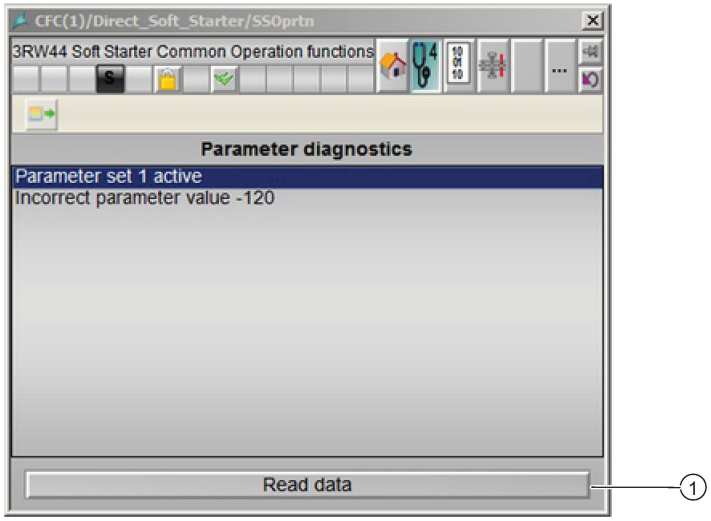
Device diagnostics (DiagPar)



① Button for updating the data (`RdDataOp`);opens the expanded command range; authorization level 5.

Button is deactivated if `RackFAct = 1`.

Parameter diagnostics (DiagPar)



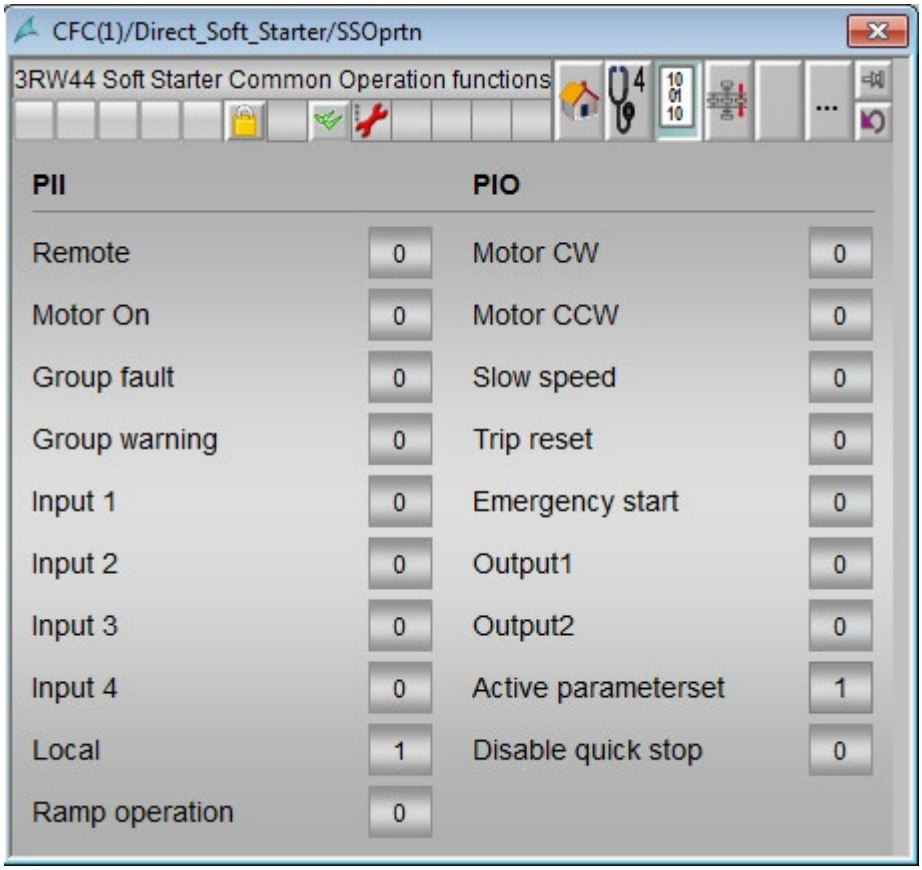
① Button for updating the data (`RdDataOp`);opens the expanded command range; authorization level 5.

Button is deactivated if `RackFAct = 1`.

4.7.5 SSOprtn - Process image

The Process image view displays the values for the process image inputs (PII) and the process image outputs (PIO).

Process image – Soft Starter



Description of the blocks

5

5.1 Functions for all blocks

5.1.1 Calling OBs

The "Generate Module Driver" function automatically inserts the Soft Starter blocks into the following organization blocks within the run sequence of the CFC:

Table 5- 1 Organization blocks

OB	Description	SSDiag	SSMeas	SSStat	SSOprtn	SSChn
OB1	Cyclic program	X	X	X	X	X
OB30...OB38[1]	Cyclic alarms	X	X	X	X	X
OB82	Diagnostics alarm	X	–	–	–	–
OB83	Insert/remove interrupt	X	–	–	–	–
OB85	Program execution error	X	–	–	–	–
OB86	Rack fault	X	–	–	–	–
OB100	Restart (warm restart)	X	X	X	X	X

[1] Insert the block into the OB32, if read/write access is slow.

"X" = OB calls the block, "—" = OB calls does not call the block.

Reference

You can obtain further information on the organization blocks in the "Process Control System PCS 7 System Functions" manual and in the system and standard functions reference manual for S7-300/400 on the Internet (https://support.industry.siemens.com/cs/document/44240604).

5.1.2 Called blocks

The Soft Starter blocks call the following blocks:

Table 5- 2 Called blocks

Block		Description	SSDiag	SSMeas	SSStat	SSOprtn
SFB35	ALARM_8P	Generates block-specific messages with values for eight signals	X	X	X	X
SFB52	RDREC	Read data set	X	X	X	X
SFB53	WRREC	Writes a data record	–	–	X	X
SFB54	RALRM	Receives alarm	X	–	–	X
SFC6	RD_SINFO	Reading of OB start information	X	X	X	X
SFC13	DPNRM_DG	Reads the diagnostic data of the DP slave	X	–	–	–
SFC51	RDSYSST	Reads the system status list or the sublist	X	–	–	–
SFC64	TIME_TCK	Reads the system time	X	X	X	X
FC369	SelST16	Output of the best or worst signal status	X	X	X	X

"X" = The block calls this block, "—" = The block does not call this block.

5.1.3 Worst signal status

Worst Signal Status `ST_Worst` is formed from the following parameters:

Block	Parameter

SSOprtn	`ModFAct.ST`
	`RackFAct.ST`
	`GrpFlt.ST`
	`GrpWarn.ST`
	`EmrgStAut.ST`
	`DsQkSpAut.ST`
	`Out1Aut.ST`
	`Out2Aut.ST`
	`SlSpdAut.ST`
	`TrpRstLi.ST`
	`RdDataLi.ST`
	`GrpErr.ST`
	`RdErr.ST`
	`WrErr.ST`

SSMeas	`RackFAct.ST`
	`ModFAct.ST`
	`GrpErr.ST`
	`RdErr.ST`
	`RdDataLi.ST`

SSStat	`RackFAct.ST`
	`ModFAct.ST`
	`GrpErr.ST`
	`RdErr.ST`
	`WrErr.ST`
	`RdDataLi.ST`

SSDiag	`ModFAct.ST`
	`RackFAct.ST`
	`GrpErr.ST`
	`RdErr.ST`
	`Rack1Err.ST`
	`Rack2Err.ST`

5.1.4 Quality code

The status and quality of a rack is checked by means of the quality code.

Table 5- 3 Quality code

Quality code	Priority [1]	Occurs when...	Meaning	SSDiag	SSMeas	SSStat	SSOprtn
16#80	6	No error	Good	X	X	X	X
16#60	–	`SimOn`	Simulated value	–	–	–	–
16#00	0	• `RackFAct` • `ModFAct` • `BusFlt`	Bad, device related, value not valid	X			
	1				X	X	X
16#28	1	• Subnet error `Rack1Err` or `Rack2Err` • OB not loaded.	Bad, device related	X	–	–	–
16#28	2	From preceding blocks	Bad, process-specific	–	X	X	X
16#68	3	Group warning	Bad	X			
		From preceding blocks	Uncertain, device related		X	X	X
16#FF	–	Default setting	–	–	X	X	X

[1] 0 = high; > 0 = low

[2] X = The quality code occurs in this block, – = The quality code does not occur in this block.

Icons

The icons for the quality code are displayed in the block icon and in the overview window of the faceplates.

Table 5- 4 Icons for quality code display

Quality code	Symbol	Meaning
16#80		Good
16#60		Local function check / simulation
16#00 [1]		Bad, device related, value not valid
16#28 [1]		Bad, process-specific
16#68		Uncertain, device related
16#A4		Maintenance demand

[1] Active Quality Codes for the `Trip`, `Intlock`, `Permit`, and `Protect` parameters in the interlock status.

Reference

You can find more information on quality code display in the Programming Manual PCS 7 Libraries APL Styleguide on the Internet (https://support.industry.siemens.com/cs/document/59062870).

5.1.5 Error numbers

Table 5- 5 Error numbers per block

Error number	Error type	Description	SSDiag	SSMeas	SSStat	SSOprtn	SSChn
-1	–	Predefined value when inserting the block; the block is not processed.	X	X	X	X	X
0	–	No error	X	X	X	X	X
1	System error	Rack failure	X	X	X	X	–
3	System error	The module does not respond.	X	X	X	X	–
4	System error	Subnet 1 or subnet 2 error	X	–	–	–	–

"X" = Error occurs in this block, "–" = Error does not occur in this block.

See also

Failure of the DP master/DP slave/PROFINET IO station (Page 68)

Fault handling (Page 111)

5.1.6 Overview of the measuring point browser window

For more information on measuring point browser, refer SIMATIC PCS 7 APL Function Manual (https://support.industry.siemens.com/cs/ww/en/view/109754967).

5.1.7 Parameterizable functions via the Feature connection

The modules of the library have an input named `Feature`. You can influence various responses of the block via this input.

The Feature Bits are assigned in the following order:

Table 5- 6 Meaning of the Feature.Bits

Feature.Bit	Meaning[1]	SSMeas	SSStat	SSOprtn	SSChn
Feature.Bit0	Set startup characteristics 0 = Switch substitute value (OB100) 1 = Retain last value	–	X	X	–
Feature.Bit1	1 = Input "OosLi" can be used to switch to the "Out of Service" mode.	X	X	X	–
Feature.Bit2	1 = Reset commands for switching the operating mode	–	–	X	–
Feature.Bit4	Set switch mode or pushbutton mode 0 = Pushbutton mode 1 = Switch mode	–	–	X	–
Feature.Bit7	Status handling for values 0 = BAD value (ST:=16#00) 1 = Last valid value (ST:=16#68)	–	–	–	X
Feature.Bit10	Exit local mode 1 = When Manual LOCAL mode is exited, switch to the last setting of AUTO / MANUAL mode.	–	–	X	–
Feature.Bit10	Condition Monitoring, status transfer to maintenance station 0 = No Condition Monitoring 1 = Condition Monitoring	–	–	–	X
Feature.Bit22	1 = Update acknowledgment and error status of the message call	X	X	X	–
Feature.Bit23	0 = Messages are forwarded via an EventTS block to the APL motor block (e.g. MotL) and displayed there; 1 = Messages are displayed on the SSOprtn block	–	–	X	–
Feature.Bit24	1 = "Local operator authorization" function is activated	X	X	X	–
Feature.Bit25	1 = Suppression of all messages is activated if `MsgLock` = 1	X	X	X	–
Feature.Bit26	1 = Suppress reading of logbook data for SSStat	–	X	–	–
Feature.Bit28	1 = Motor starter is operated without the "Slow speed" command	–	–	–	X
Feature.Bit29	1 = DataXchg is updated with the status information (Motor ready, Motor on, Group fault and Group warning)	–	–	–	X
Feature.Bit30	1 = De-energized (lowest) value is output in the case of block-external simulation (standard setting = 1)	–	–	–	X

[1] The standard setting is 0 if no other value is specified.

For more information about the parameterizable functions, refer to the function manual "Process Control System PCS 7, PCS 7 Advanced Process Library" in the Internet (https://support.industry.siemens.com/cs/ww/en/view/109482346).

5.2 SSDiag diagnostics block

5.2.1 SSDiag description

Purpose of the block

The SSDiag block handles the diagnostics of the 3RW44 direct-on-line Soft Starters.

- It evaluates the acyclic events:
  - Start
  - DP station failure
  - Module fault
- It signals module failure on the DP master system (`RackF`) and behind the Y-link (`ModF`).
- It generates the associated Quality Codes.
- It reads the messages of the station diagnostics and channel diagnostics.
- It transmits the status information to the signal processing block via the `RackFAct` and `ModFAct` parameter outputs.

Views

The SSDiag block does not support views.

5.2.2 Message characteristics

SSDiag signals the following errors:

- DP station fault (`Rack1Err`, `Rack2Err`)
- Rack failure (`RackFAct`)
- Module fault (`ModFAct`)
- Connection fault (`BusFlt`)

An error generates a group error in output parameter `GrpErr`.

The `Subn1_Id` and `Subn2_Id` parameters of the SUBNET function block (FB106) are combined with the `Subn1Id` and `Subn2Id` parameters of the SSDiag block. These parameters forward the error information of the primary and redundant master system. This information is provided to output parameters `Rack1Err` and `Rack2Err` of the SSDiag block.

Message block MsgEvId1

Table 5- 7 Output SSDiag messages

Message block	Message No.	Block parameters	Message text	Message class *
`MsgEvId1`	1	`Rack1Err`	$$BlockComment$$ Subnet1@1%d@: Fault	S
	2	`Rack2Err`	$$BlockComment$$ Subnet2@2%d@: Fault	S
	3	`RackFAct`	$$BlockComment$$ Device @1%d@/@5%d@/@3%d@: Failure	S
	4	`ModFAct`	$$BlockComment$$ Device @1%d@/@5%d@/@3%d@: Module error	S
	5	`BusFlt`	$$BlockComment$$ Device @1%d@/@5%d@/@3%d@: Not reachable	S
	6	`ExtMsg1` **	$$BlockComment$$ External message 1	S
	7	`ExtMsg2` **	$$BlockComment$$ External message 2	S
	8	`ExtMsg3` **	$$BlockComment$$ External message 3	S

* S = AS, OS process control fault; A = Alarm

** User-definable message

Auxiliary values

Table 5- 8 Structure of the auxiliary values ALARM_8P

Message No.	Auxiliary value	Block parameters	Meaning
1	1	Subn1Id	ID of the primary DP master system
2	2	Subn2Id	ID of the redundant DP master system
3	3	RackNo	Field device address
4	4	SlotNo	Slot number
5	5	ExtVa105	Auxiliary value 5, user-definable
6	6	ExtVa106	Auxiliary value 6, user-definable
7	7	ExtVa107	Auxiliary value 7, user-definable
8	8	ExtVa108	Auxiliary value 8, user-definable
9	9	ExtVa109	Auxiliary value 9, user-definable
10	10	ExtVa110	Auxiliary value 10, user-definable

The MsgStat1, MsgAckn1, and MsgErr1 parameters transfer the following information:

- Message status
- Message error
- Message acknowledgment status

5.2.3 Driver generator

The "Generate Module Driver" function automatically inserts the SSDiag block into the following organization blocks within the run sequence:

- OB1 (cyclic program)
- OB82 (diagnostics alarm)
- OB83 (pull/plug alarm)
- OB85 (program execution error)
- OB86 (rack failure)
- OB100 (warm restart)

The block is inserted behind the OB_DIAG1/OB_DIAG1_PN block in the CFC chart.

The RackNo, SlotNo, SubSlotNo, SubAddr, DAddr, LAddr, Subn1Id, Subn2Id and SubNTyp inputs are configured using the information from HW Config.

5.2.4 Start-up characteristics

In OB100, the identifier for "Start up" is entered in output `OMODE` (`OMODE = 16#xx01xxxx`).

The messages are suppressed in OB100 for the number of cycles that have been programmed for runup in parameter `RunUpCyc`.

Acknowledge the errors `GrpErr`, `RackFAct`, `ModFAct`, `Rack1Err`, and `Rack2Err`.

5.2.5 Module error

Following a restart and when `AccId = TRUE` , a check of the module addressed with `LAddr` is carried out. The SZL ID xC91 is read for this purpose. If the module addressed with `LAddr` is missing, the `ModFAct` output is set and the identifier for "higher-level fault" is entered for the `OMODE` output `(OMODE = 16#40xxxxxx)`.

The module fault is detected by the event number 16#61 for PROFIBUS for event class 16#39.

The module fault is detected while the Soft Starter is configured behind a Y-link.

The logical address of the module (`LAddr`) is derived from the geographical address of the module, e.g. from `SubN1Id`, `RackNo`, `SlotNo`, `SubSlotNo` and `SubAddr`.

Note

The "module rack fault" takes precedence over the module fault.

5.2.6 Failure of the DP master/DP slave/PROFINET IO station

The OB_DIAG1 block detects the failure of DP master and DP slave, OB_DIAG1_PN detects the failure of PROFINET IO station and evaluates it via the inputs `RackF`, `Subn1Id` and `Subn2Id`.

In the case of an error, the identifier for "Higher-level fault" (`OMODE` = 16#40xxxxxx) is entered for in the `OMODE` output.

Fault	Event number	Event class
Distributed I/O devices: Failure of the DP master system (`RackFAct`)	16#C3	16#39
PROFIBUS DP station failure (`RackFAct`)	16#C4	16#39
PROFIBUS DP station return	16#C4	16#38
PROFIBUS DP station fault	16#C5	16#39
Reset PROFIBUS DP station fault	16#C5	16#38
PROFIBUS DP station return, but error in assignment of the module parameters	16#C6, 16#C7	16#38
PROFINET IO system failure	16#CA	16#39
PROFINET IO system failure	16#CA	16#38
PROFINET IO system failure	16#CB	16#39
PROFINET IO system failure	16#CB	16#38
PROFINET IO station return	16#CC	16#38
PROFINET IO station operational again, but expected configuration does not match actual	16#CD	16#39
PROFINET IO station operational again, but error(s) in module parameter assignment	16#CE	16#39

If the "Rack failure" error (`RackFAct = 1`) occurs, the PROFIBUS connection to the device is lost (`BusFlt = 1`).

See also

Error numbers (Page 62)

5.2.7 PROFIBUS connection error

Failure of the PROFIBUS connection to the DP slave (3RW44 device) is detected by reading out the diagnostics information of the device. The information is saved in bit 0 of byte 0 of the device.

The diagnostics information is read from SFC13 (DPNRM_DG) and saved in a temporary buffer.

The PROFIBUS connection error is reported at the `BusFlt` output of the SSDiag block and as an alarm in WinCC.

Table 5- 9 Possible reasons for the connection error

Byte 0	Meaning	Reason or remedy
Bit 0	1: DP slave cannot be accessed by the DP master.	• DP slave cannot be accessed by the DP master. • Is the station address of the DP slave set correctly? • Is the bus connection plug connected? • Is voltage applied to the DP slave? • Is the RS 485 Repeater secured correctly? • Has a reset been performed on the DP slave?

5.2.8 Slave diagnostics of the 3RW44

The following system function and diagnostic interrupt calls read the diagnostic information of the 3RW44 slave.

Block	Description	
SFC 13	DPNRM_DG	Reads the diagnostic data of the PROFIBUS DP slave
SFB 52	RDREC	If diagnostic interrupt 82 occurs, this block reads a process data set.
SFC 64	TIME_TCK	Reads the system time

Diagnostic messages that relate to communication and operation are read:

- Cyclically every 5 seconds.
- If interrupt OB 82 occurs.

This diagnostic information is mapped onto the `DiagOprtn` and `DiagMeas` output parameters. These parameters are interconnected with the SSOprtn and SSMeas blocks.

The information from the station diagnostics of the PROFIBUS DP slave is read out using SFC 13 DPNRM_DG.

Table 5- 10 Status of the station

Number of the bus node	Byte containing the diagnostic information
1	Byte 0
2	Byte 1
3	Byte 2

DiagOprtn

DiagOprtn transfers the following information:

Table 5- 11 Diagnostic information in DiagOprtn.DIAG for each bit

DiagOprtn.DIAG Bit	Diagnostic message
0	DP slave cannot be accessed by DP master. [1]
1	DP slave is not yet ready for data exchange.
2	Config data to DP slave from DP master does not match.
3	External diagnostics pending (Group diagnostics display)
4	The function is not supported by the DP slave, e.g. node address change by the software.
5	DP master cannot interpret DP slave response.
6	DP slave type does not match the software configuration.
7	DP slave parameterized by a different DP master
8	DP slave parameters must be reassigned.
9	Static diagnostic message: A diagnostics message is pending. DP slave will not function until the error is corrected.
10	Bit is set to "1" as long as DP slave address exists.
11	Watchdog function activated for DP slave
12	DP slave has received "FREEZE" command.
13	DP slave has received "SYNC" command.
14	The DP slave has been deactivated, e.g. it is not included in the current processing.
15	More diagnostic messages than DP slave can store. The DP master cannot write all diagnostic messages to its diagnostic buffer that were sent by the DP slave.
16…31	Not used

[1] The lost connection is signaled with `BusFlt` and as an alarm in WinCC.

5.2.9 Malfunction when loading the OB

Interrupt OB85 sets or resets the priority class error `GrpErr` (malfunction when loading OBs).

Table 5- 12 Events during which OB 85 `GrpErr` is reset

Fault	Event number	Event class
Error when creating a start event for an OB. This is not loaded to the CPU.	16#A1, 16#A2 or 16#A3	16#35
Error when the operating system accesses a module.	16#B1, 16#B2	16#39
	16#B3	16#39 or 16#38
PROFINET Interface DB cannot be addressed	16#A4	16#35
PROFINET Interface DB can be addressed again	16#A4	16#34

`GrpErr` is only triggered once for one execution cycle of the block.

5.2.10 Interconnections of the SSDiag block

The Generate module driver function generates the driver blocks and creates all the required interconnections between the driver blocks automatically.

Use the templates supplied. These contain all the necessary blocks for operating the Soft Starter.

For additional information, refer to the section Templates (Page 27).

Diagnostic information

The SSDiag block reads the diagnostic information and transfers it to the SSOprtn block using the `DiagOprtn` output parameter.

5.2.11 Reading the device diagnosis

Reading the device diagnosis

The SSDiag block reads diagnostic data via data set DS92.

Principle

Table 5- 13 Data set table

No.	Data set number	Read access/write access	Number of bytes	Description
1	DS92	R	37	Read diagnostic data

The values are read from the Soft Starter with the RDREC function. This information is written to the output parameters.

5.3 Block for SSMeas measured value function

5.3.1 SSMeas description

Purpose of the block

The SSMeas block provides the following measurement information:

- Current values
- Voltage values
- Output frequency
- Line frequency
- Output power
- Thermal motor model
- Temperature
- Asymmetry

The block receives the information from the SSDiag block.

Views

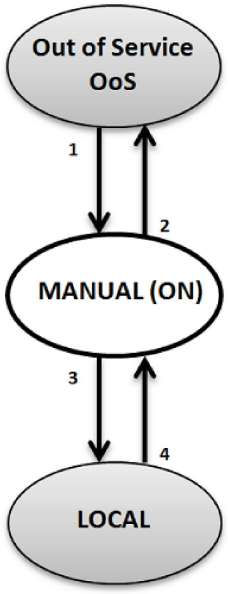
The SSMeas block supports the following views:

- Trend (Page 32)
- Alarm (Page 34)
- Preview (Page 34)
- Standard (Page 36)
- Diagnostics (Page 39)
- Batch (Page 31)

5.3.2 Operating modes

The following modes are available for the block:

- Local
- ON
- Out of service(OoS)



Local mode

The process image input bit 1.6 indicates whether the mode is local or remote.

- DP bit 1.6 = 1: Ready (automatic) or PLC operation or Remote.
  The PLC controls all operations of the Soft Starter.
- DP bit 1.6 = 0: Local (`LocalAct = 1`).
  The Soft Starter ES Premium application (PC software) controls all operations of the Soft Starter.

ON mode

The ON mode tells you that the block algorithm is being processed (output parameter `OnAct = 1`).

The ON mode can only be activated via a control on the faceplate (input parameter `OnOp = 1`). The block must be in the Out of service operating mode for this to be possible.

Out of service mode

The mode is intended for maintenance and servicing purposes (replacing the device, for example). All of the block's functions are disabled. No incoming or outgoing messages are generated. The only function still possible is an operating mode switchover.

It is only possible to switch to this operating mode if the block is in "Manual mode" or ON mode.

The mode can only be switched on by using the faceplate when it is in the standard block view (parameter `OosOp = 1`). The block must be in ON mode.

The mode is activated via the interconnectable parameter `OosLi = 1`.

From this mode (depending on the value of the PIO to `PZDIn01`), a block can be switched to the MANUAL or Local modes only by operator input to the faceplate. The block must be in ON mode.

Reference

You will find more information in the Function Manual "Process Control System PCS7, PCS7 Advanced Process Library" on the Internet (https://support.industry.siemens.com/cs/ww/en/view/109482346).

5.3.3 Measured values

The SSMeas block reads measured values via data set DS94.

Table 5- 14 DS94

No.	Data set number	Read access/write access	Number of bytes	Description
1	DS94	R	52	Read measured values

The values are read from the Soft Starter with the RDREC function. This information is written to the output parameters.

5.3.4 Reading and writing data records

The RDREC function is used to read the data sets, and the WRREC function is used to write commands and values to the Soft Starter.

The "Read Data" button in the faceplates is used to update the displayed values.

Parameter Read data set

Reading data sets is performed irrespective of the current mode.

Reading is performed with the following parameters:

Table 5- 15 Parameter Read data set

Parameter	Value	Meaning
RdDataOp [1]	1	Read data from data set
RdDataLi [1]	0 → 1	Read data set via link or SFC
RdWrEn	1	Enable read/ write record
RdErr	1	Error when reading
WrErr	1	Error when writing
RdWrAct	1	Reading/writing data set ended

[1] not in Out of service mode and in case of rack failure

Errors when reading/writing data set

The following errors can occur when reading/writing the data set:

Table 5- 16 Errors when reading/writing data set

Error code (W#16#...)	Description
8085	Due to a problem in the system, information is not currently available (for example, due to a lack of resources).
80A2	DP protocol error at layer 2
80A3	PROFIBUS DP: DP protocol error with Direct-Data-Link-Mapper or user interface / user
80A4	Bus communication disrupted
80C0	The module has not yet read the data.
80C2	The module currently processes the maximum possible jobs for a CPU.
80C3	The required operating resources (memory, etc.) are currently occupied.
80C4	Internal temporary error. Job could not be carried out. Repeat the job. If this error occurs often, check your installation for sources of electrical interference.
80C6	Data set transfer was canceled due to priority class cancellation.
80C7	Job cancelled due to restart (warm restart) or cold restart of DP master.

If any of these errors are detected, the function call to read or write data set is executed again. The maximum count of these repetitive calls is set to 300 beyond which an error is reported as a read error or write error at the `RdErr` or `WrErr` output parameter respectively.

5.3.5 Message characteristics

SSMeas reports the following errors at the block output:

- Rack failure (`RackFAct`)
- Module fault (`ModFAct`)

An error generates a group error in output parameter `GrpErr`.

These errors are not signaled as alarms as they are already part of the SSDiag block (both on the DP master system and behind the Y-link). The alarms are output using the ALARM_8P function.

The messages can be enabled or disabled using the `MsgLock` input.
The alarms are suppressed when the block is in Out of service mode.

Message block MsgEvId1

Table 5- 17 Output messages

Message block	Message No.	Block parameters	Message text	Message class *
`MsgEvId1`	1	DiagMeas.TMPSNSOVLD	$$BlockComment$$ Temperature sensor overload	A
	2	DiagMeas.TMMOVLD	$$BlockComment$$ Thermal motor model overload	A
	3	DiagMeas.CURHI	$$BlockComment$$ Current limit overshot	A
	4	DiagMeas.CURLO	$$BlockComment$$ Current limit undershot	A
	5	ExtMsg1 **	$$BlockComment$$ External message 1	S
	6	ExtMsg2 **	$$BlockComment$$ External message 2	S
	7	ExtMsg3 **	$$BlockComment$$ External message 3	S
	8	ExtMsg4 **	$$BlockComment$$ External message 4	S

* S = AS, OS process control fault; A = Alarm

** User-definable message

Auxiliary values

The block supports 10 programmable auxiliary values.

Table 5- 18 Structure of the auxiliary values ALARM_8P

Message No.	Auxiliary value	Block parameter	Meaning
1	1	SarBatchName	Batch name
2	2	SdwStepNoLoc	Batch step
3	3	SdwBatchId	Batch ID
4	4	ExtVal04	External value 4, user-definable
5	5	ExtVal05	External value 5, user-definable
6	6	ExtVal06	External value 6, user-definable
7	7	ExtVal07	External value 7, user-definable
8	8	ExtVal08	External value 8, user-definable
9	9	ExtVal09	External value 9, user-definable
10	10	ExtVal10	External value 10, user-definable

The MsgStat1, MsgAckn1, and MsgErr1 parameters transfer the following information:

- Message status
- Message error
- Message acknowledgment status

5.3.6 Start-up characteristics

The alarm messages are suppressed in the OB100 for the RunUpCyc no. of times.

5.3.7 Status information

Status information SSMeas

The status information is passed to WinCC for display in the faceplates.

Table 5- 19 Status information – SSMeas

Status1 Bit	Description
0	Occupied
1	BatchEn
2	Slave Type; 0 = PROFIBUS 1 = PROFINET
3	OosAct.Value
4	OosLi active
5	Reserved
6	LocalAct.Value
7...27	Reserved
28	GrpErr.Value
29	MsgLock
30	NOT RackF.Value
31	Reserved

5.3.8 Enabled operations

Operator permissions

The operator permissions for control commands are configured in the `OS_Perm` structured parameters. These are transferred to WinCC via the `OS_PermOut` and `OS_PermLog` parameters.

The operator permissions control operation only in the faceplate.

Table 5- 20 Operator permissions – SSMeas

OS_Perm Bit	OS_PermOut Bit	OS_PermLog Bit	Description
0	0	0	Reserved
1	1	1	1 = Operator is permitted to change to ON mode.
2	2	2	Reserved
3	3	3	1 = Operator is permitted to change to "Out of service" (OoS) mode.
4...20	4...20	4...20	Reserved
21	21	21	1 = Operator is permitted to read data from the device.
22…31	22…31	22…31	Reserved

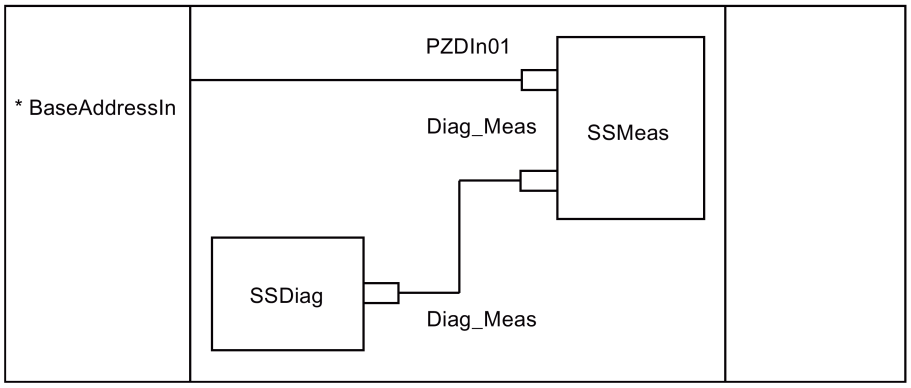
`OS_PermOut` contains the release information of all parameters.
`OS_PermLog` contains the release based on the current modes.

5.3.9 Assigning addresses in HW Config

The 2 bytes of the process image inputs (PII) are transferred by the Soft Starter based on the logical address of the device. The user has to configure the inputs.

Symbolic name in HW Config

The `PZDIn01` input parameter of the block is interconnected with the corresponding input of the logical address of the device (`LAddr`). The logical word address can be assigned to a symbolic name (*).



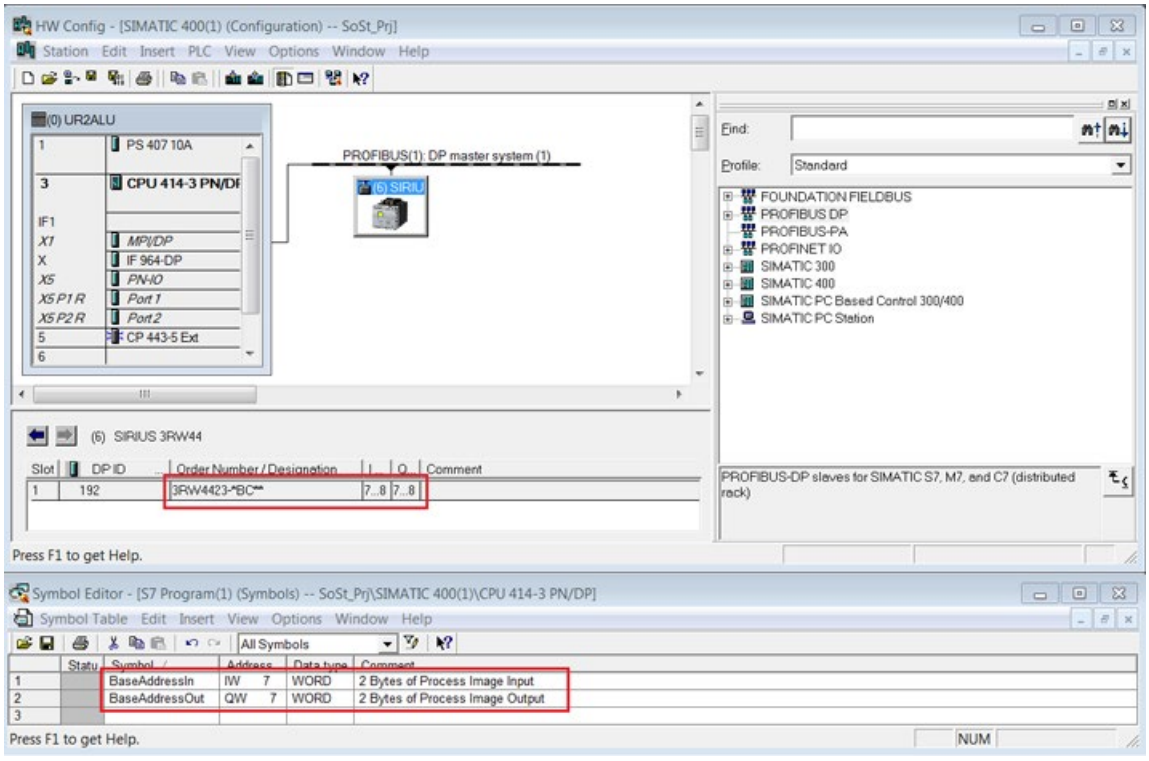


Figure 5-1 Symbolic name in HW Config

5.4 Block for SSStat statistical function

5.4.1 SSStat description

Purpose of the block

The SSStat block gathers statistical data from data set 95. It receives diagnostic data from the SSDiag block.

For Soft Starters, the SSStat block provides information about the following topics:

- Device operating hours
- Motor hours run
- Operating cycles
- Fault statistics
- Current measuring

Views

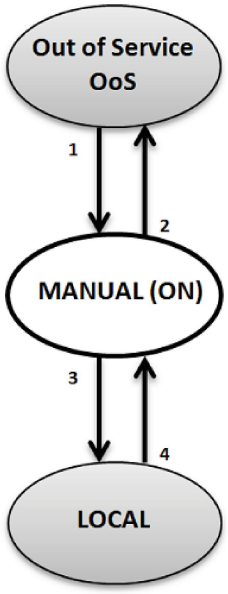
The SSStat block supports the following views:

- Alarm (Page 34)
- Preview (Page 34)
- Standard (Page 40)
- Maximum pointer (Page 43)
- Logbook (Page 45)
- Batch (Page 31)

5.4.2 Operating modes

The following modes are available for the block:

- Local
- ON
- Out of service(OoS)



Local mode

The process image input bit 1.6 indicates whether the mode is local or remote.

- DP bit 1.6 = 1: Ready (automatic) or PLC operation or Remote.
  The PLC controls all operations of the Soft Starter.
- DP bit 1.6 = 0: Local (`LocalAct = 1`).
  The Soft Starter ES Premium application (PC software) controls all operations of the Soft Starter.

ON mode

The ON mode tells you that the block algorithm is being processed (output parameter `OnAct = 1`).

The ON mode can only be activated via a control on the faceplate (input parameter `OnOp = 1`). The block must be in the Out of service operating mode for this to be possible.

Out of service mode

The mode is intended for maintenance and servicing purposes (replacing the device, for example). All of the block's functions are disabled. No incoming or outgoing messages are generated. The only function still possible is an operating mode switchover.

It is only possible to switch to this operating mode if the block is in "Manual mode" or ON mode.

The mode can only be switched on by using the faceplate when it is in the standard block view (parameter `OosOp = 1`). The block must be in ON mode.

The mode is activated via the interconnectable parameter `OosLi = 1`.

From this mode (depending on the value of the PIO to `PZDIn01`), a block can be switched to the MANUAL or Local modes only by operator input to the faceplate. The block must be in ON mode.

Reference

You will find more information in the Function Manual "Process Control System PCS7, PCS7 Advanced Process Library" on the Internet (https://support.industry.siemens.com/cs/ww/en/view/109482346).

5.4.3 Statistical values

The DS93 Data set has write capability. The necessary function to Write (Wr_Rec) is executed to write the command (Delete Maximum Pointer) to the Soft Starter Device. Data set 95 reads statistical information, and data set 96 reads the maximum pointer. The values are read from the Soft Starter with the RDREC function. This information is written to the output parameters.

Table 5- 21 Data set table

No.	Data set number	Read access/write access	Number of bytes	Description
1	DS93	W	6	Write command
2	DS95	R	80	Read statistics data
3	DS96	R	84	Read maximum pointer
4	DS72	R	126	Read logbook - Device errors
5	DS73	R	126	Read logbook - Trips
6	DS75	R	126	Read logbook - Events
7	DS203	R	154	Read time shift for logbook - PROFINET
8	DS204	R	168	Read logbook - Device errors time stamp - PROFINET
9	DS205	R	168	Read logbook - Trip time stamp - PROFINET
10	DS206	R	168	Read logbook - Events time stamp - PROFINET

Note

The user can suppress the reading of Logbook datarecords by selecting the Feature.Bit26 = 1.

In that case, the data is not read from the device. Also the Logbook view button will be disabled at the Faceplates.

5.4.4 Reading and writing data records

The RDREC function is used to read the data sets, and the WRREC function is used to write commands and values to the Soft Starter.

The "Read Data" button in the faceplates is used to update the displayed values.

Parameter Read data set

Reading data sets is performed irrespective of the current mode.

Reading is performed with the following parameters:

Table 5- 22 Parameter Read data set

Parameter	Value	Meaning
RdDataOp [1]	1	Read data from data set
RdDataLi [1]	0 → 1	Read data set via link or SFC
RdWrEn	1	Enable read/ write record
RdErr	1	Error when reading
WrErr	1	Error when writing
RdWrAct	1	Reading/writing data set ended

[1] not in Out of service mode and in case of rack failure

Errors when reading/writing data set

The following errors can occur when reading/writing the data set:

Table 5- 23 Errors when reading/writing data set

Error code (W#16#...)	Description
8085	Due to a problem in the system, information is not currently available (for example, due to a lack of resources).
80A2	DP protocol error at layer 2
80A3	PROFIBUS DP: DP protocol error with Direct-Data-Link-Mapper or user interface / user
80A4	Bus communication disrupted
80C0	The module has not yet read the data.
80C2	The module currently processes the maximum possible jobs for a CPU.
80C3	The required operating resources (memory, etc.) are currently occupied.
80C4	Internal temporary error. Job could not be carried out. Repeat the job. If this error occurs often, check your installation for sources of electrical interference.
80C6	Data set transfer was canceled due to priority class cancellation.
80C7	Job cancelled due to restart (warm restart) or cold restart of DP master.

If any of these errors are detected, the function call to read or write data set is executed again. The maximum count of these repetitive calls is set to 300 beyond which an error is reported as a read error or write error at the `RdErr` or `WrErr` output parameter respectively.

5.4.5 Message characteristics

SSStat reports the following errors at the block output:

- Rack failure (`RackFAct`)
- Module fault (`ModFAct`)

An error generates a group error in output parameter `GrpErr`.

These errors are not signaled as alarms as they are already part of the SSDiag block (both on the DP master system and behind the Y-link). The alarms are output using the ALARM_8P function.

The messages can be enabled or disabled using the `MsgLock` input.
The alarms are suppressed when the block is in Out of service mode.

Message block MsgEvId1

Table 5- 24 Output messages

Message block	Message No.	Block parameter	Message text	Message class *
`MsgEvId1`	1	`ExtMsg1` **	$$BlockComment$$External Message 1	S
	2	`ExtMsg2` **	$$BlockComment$$External Message 2	S
	3	`ExtMsg3` **	$$BlockComment$$External Message 3	S
	4	`ExtMsg4` **	$$BlockComment$$External Message 4	S
	5	`ExtMsg5` **	$$BlockComment$$External Message 5	S
	6	`ExtMsg6` **	$$BlockComment$$External Message 6	S
	7	`ExtMsg7` **	$$BlockComment$$External Message 7	S
	8	`ExtMsg8` **	$$BlockComment$$External Message 8	S

* S = AS, OS process control fault

** User-definable message

Auxiliary values

The block supports 10 programmable auxiliary values.

Table 5- 25 Structure of the auxiliary values ALARM_8P

Message No.	Auxiliary value	Block parameter	Meaning
1	1	SarBatchName	Batch name
2	2	SdwStepNoLoc	Batch step
3	3	SdwBatchId	Batch ID
4	4	ExtVa104	External value 4, user-definable
5	5	ExtVa105	External value 5, user-definable
6	6	ExtVa106	External value 6, user-definable
7	7	ExtVa107	External value 7, user-definable
8	8	ExtVa108	External value 8, user-definable
9	9	ExtVa109	External value 9, user-definable
10	10	ExtVa110	External value 10, user-definable

The `MsgStat1`, `MsgAckn1`, and `MsgErr1` parameters transfer the following information:

- Message status
- Message error
- Message acknowledgment status

5.4.6 Start-up characteristics

The alarm messages are suppressed in the OB100 for the `RunUpCyc` no. of times.

5.4.7 Status information

Status information SSStat

The status information is passed to WinCC for display in the faceplates.

Table 5- 26 Status information – SSStat

Status1 Bit	Description
0	Occupied
1	BatchEn
2	Slave Type 0 = PROFIBUS 1 = PROFINET
3	OosAct.Value
4	OosLi active
5	1 = Suppress Logbook 0 = Default Read Logbook
6	LocalAct.Value
7...27	Reserved
28	1 = Group fault
29	MsgLock activated
30	1 = Rack failure
31	Logbook update

5.4.8 Enabled operations

Operator permissions

The operator permissions for control commands are configured in the `OS_Perm` structured parameters. These are transferred to WinCC via the `OS_PermOut` and `OS_PermLog` parameters.

The operator permissions control operation only in the faceplate.

Table 5- 27 Operator permissions – SSStat

OS_Perm Bit	OS_PermOut Bit	OS_PermLog Bit	Description
0	0	0	Reserved
1	1	1	1 = Operator is permitted to change to ON mode.
2	2	2	Reserved
3	3	3	1 = Operator is permitted to change to "Out of service" (OoS) mode.
4...16	4...16	4...16	Reserved
17	17	17	1 = Operator is permitted to delete trips in the logbook.
18	18	18	1 = Operator is permitted to delete events in the logbook.
19	19	19	Reserved
20	20	20	1 = Operator is permitted to delete the maximum pointer.
21	21	21	1 = Operator is permitted to read data from the device.
22…31	22…31	22…31	Reserved

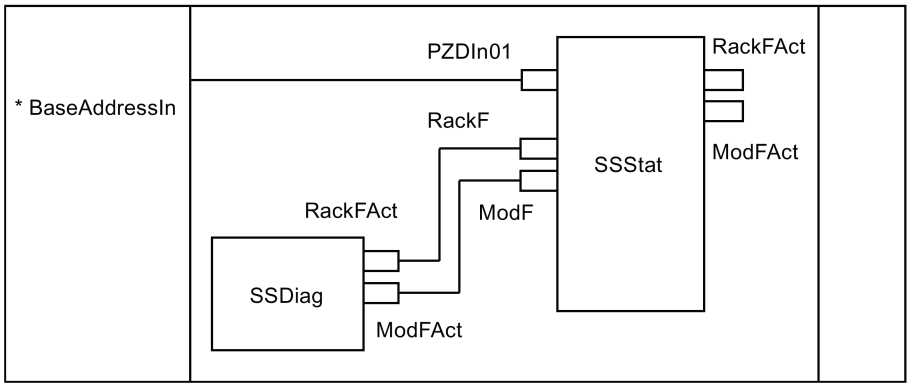
`OS_PermOut` contains the permission information of all the parameters.
`OS_PermLog` contains the permission evaluated based on the current operating states.

5.4.9 Assigning addresses in HW Config

The 2 bytes of the process image inputs (PII) are transferred by the Soft Starter based on the logical address of the device. The user has to configure the inputs.

Symbolic name in HW Config

The `PZDIn01` input parameter of the block is interconnected with the corresponding input of the logical address of the device (`LAddr`). The logical word address can be assigned to a symbolic name (*).



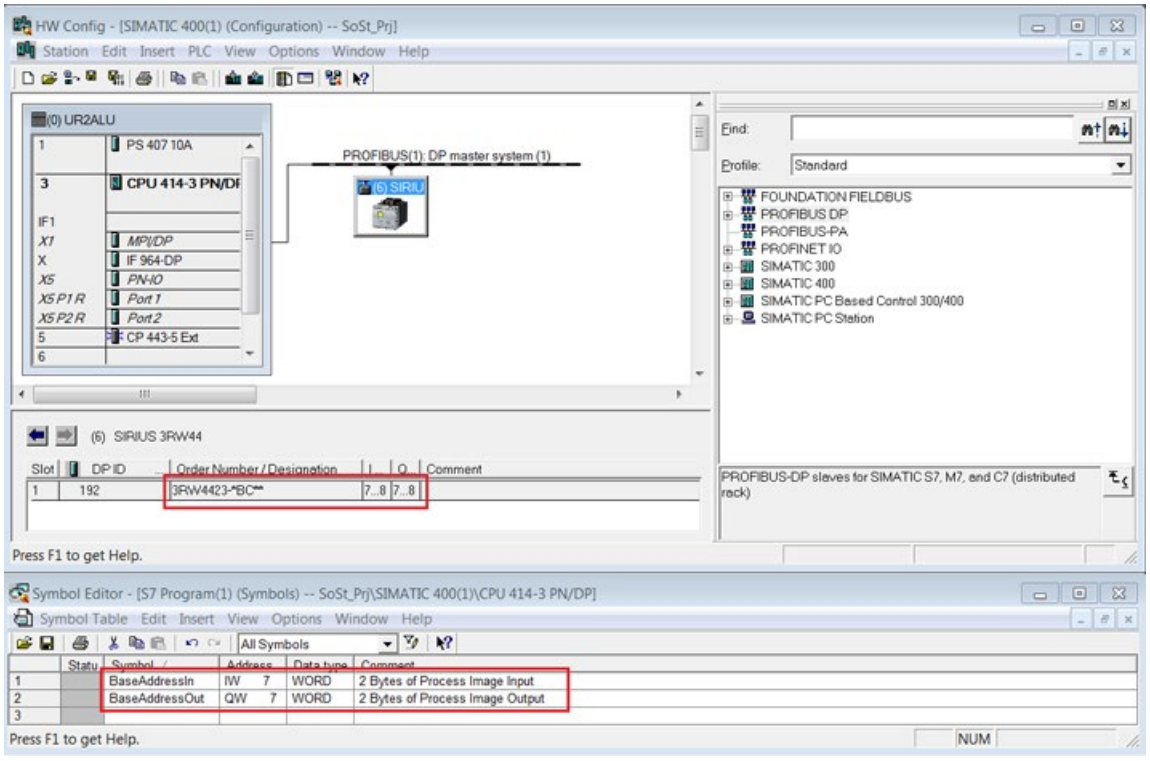


Figure 5-2 Symbolic name in HW Config

5.5 SSOprtn driver block

5.5.1 Description of SSOprtn

Purpose of the block

The Advanced Process Library (APL) offers fundamental control functionality that can be expanded by the SSOprtn block.

- Via the block, commands such as emergency start, test, trip reset are started because these functions are not supported by the APL themselves.
- The block reads data sets.
- Soft Starter data sets are configured via the block.
- The SSOprtn block faceplates can be displayed via the "Operation" button on the standard view of the respectie APL block used in the template.

  The block icon for the SSOprtn block can also be enabled at the CFC as described in section 2.2.

Views

The SSOprtn block supports the following views:

- Trend (Page 32)
- Alarm (Page 34)
- Preview (Page 34)
- Standard (Page 47)
- Maintenance (Page 49)
- Limits (Page 50)
- Diagnostics (Page 52)
- Process image (Page 55)
- Batch (Page 31)

See also

Block icons (Page 23)

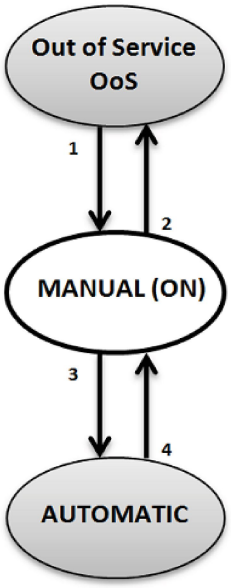
5.5.2 Operating modes

The following modes are available for the SSOprtn block:

- Local
- Automatic
- Manual
- Out of service

In conjunction with APL blocks, the block is used, for example, for the emergency start and test modes.

An APL block is interconnected with SSOprtn to control the Local / Remote (automatic / MANUAL) mode.
Dependent on the value of the process image input at `PZDIn01`, the block is switched to Local mode. The command for switching modes changes the process input image `PZDIn01`.



Conditions for changing the mode

Table 5- 28 Conditions for changing the mode

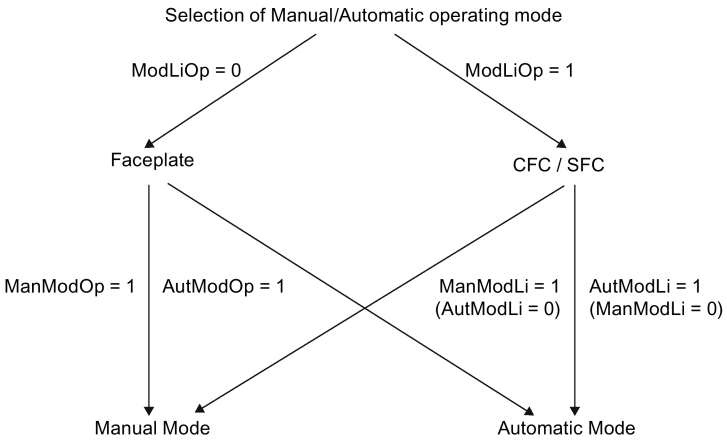
No.	Conditions
①	MANUAL (ON) → Out of service (OoS) • Via faceplate `(OosOp = 1)` if `ModLiOp = 0` or • on an edge transition 0 → 1 from `OosLi`, if `Feature.Bit1 = 1` (response for Out of service mode)
②	Out of service (OoS) → MANUAL (ON) • Via faceplate `(ManModOp = 1)`
③	AUTOMATIC → MANUAL • Via faceplate `(ManModOp = 1)` if `ModLiOp = 0` or • via `ManModLi = 1` if `ModLiOp = 1` and `Feature.Bit4 = 0` (pushbutton mode) or • via `AutModLi = 0` if `ModLiOp = 1` and `Feature.Bit4 = 1` (switch mode)
④	MANUAL → AUTOMATIC • Via faceplate `(AutModOp = 1)` if `ModLiOp = 0` or • via `AutModLi = 1` if `ModLiOp = 1`

If `ModLiOp = 1`, the enabled operations for all mode changes will be deactivated.

If the block is in local mode, no other mode can be activated for it.

Switching between the operating modes

The switchover between "Manual and Automatic mode" takes place as shown in the following schematic:



Reference

You will find more information in the function manual "Process Control System PCS7, PCS7 Advanced Process Library" on the Internet (https://support.industry.siemens.com/cs/ww/en/view/109482346).

5.5.3 Process image input and output

Bit assignment

Table 5- 29 Process image input and output: Bit assignment of byte 0 and byte 1

Byte.Bit	PII meaning	Byte.Bit	PIO meaning
0.0	Ready to start (automatic)	0.0	Motor CW
0.1	Motor ON	0.1	Motor CCW
0.2	Group error	0.2	Brake
0.3	Group warning	0.3	Trip reset
0.4	Input 1	0.4	Emergency start
0.5	Input 2	0.5	Self-test
0.6	Input 3	0.6	Slow speed
0.7	Input 4	0.7	Reserved
1.0	Motor current (Page 107)	1.0	Output 1
1.1		1.1	Output 2
1.2		1.2	Active parameter sets 1, 2, 3
1.3		1.3	
1.4		1.4	Reduction factor
1.5		1.5	
1.6	Manual Local mode	1.6	
1.7	Ramp mode	1.7	Disable quick stop

Note

Process image output data will not be updated in the Local operating mode.

5.5.4 Diagnostics information

The diagnostic information is communicated to WinCC for display in the faceplates.

The following diagnostic information is available for Soft Starters:

- 3RW44 Soft Starters PROFIBUS DP slave diagnostics, output via the parameter output `DiagStn`
- Diagnostics communication, switching and controlling, output via parameter output `DiagCom`
- Diagnostics parameter and device function, output via the parameter output `DiagPar`
- Diagnostics error parameter number, output via parameter output `FltPar`

Bit assignment DiagStn

Table 5- 30 Bit assignment DiagStn

Output parameter	Auxiliary variable	DiagStn Bit	Message
DiagStn 3RW44 PROFIBUS DP slave diagnostics	DiagStn	0	DP slave cannot be accessed by DP master. [1]
	DiagStn	1	DP slave is not yet ready for data exchange.
	DiagStn	2	Config data to DP slave from DP master does not match.
	DiagStn	3	External diagnostics pending (Group diagnostics display)
	DiagStn	4	The function is not supported by DP slave, e.g. node address change by the software
	DiagStn	5	DP master cannot interpret DP slave response.
	DiagStn	6	DP slave type does not match the software configuration.
	DiagStn	7	DP slave parameterized by a different DP master
	DiagStn	8	DP slave parameters must be reassigned.
	DiagStn	9	Static diagnostic message: A diagnostics message is pending. DP slave will not function until the error is corrected.
	DiagStn	10	Bit is set to "1" as long as DP slave address exists.
	DiagStn	11	Watchdog function activated for DP slave
	DiagStn	12	DP slave has received "FREEZE" command.
	DiagStn	13	DP slave has received "SYNC" command.
	DiagStn	14	The DP slave has been deactivated, e.g. it is not included in the current processing.
	DiagStn	15	More diagnostic messages than DP slave can store. The DP master cannot write all diagnostic messages to its diagnostic buffer that were sent by the DP slave.
		15...31	Not used

5.5.5 Group error

The output parameter `GrpErr` is set when one of the errors listed below is detected. The Standard view displays these errors as a group error in plain text.

- Group error: Process image bit 0.2
- Module failure
- Rack failure

5.5.6 Trip reset

Soft Starters can be reset with the trip reset command in the following situations:

- No contact block supply voltage.
- Motor overload.
- `RdytoReset` generated in the previous APL.

A trip resets the process image output PIO DP 0.3.

Reset trip

A trip can be reset as follows:

Table 5- 31 Trip reset

Operating mode	Parameter	Value	Meaning	Assigned PIO bits
AUTO	`TrpRstLi`	0 → 1	Trip reset active, trip is reset.	DP 0.3 = 1
MANUAL	`TrpRstOp` [1, 2]	1	Trip reset active, trip is reset.	DP 0.3 = 1

1 The command is reset at the end of the execution cycle of the block.

2 In the Standard view if the operation has been enabled (`OS_Perm = 1`).

5.5.7 Emergency start

Purpose of emergency start

The emergency start function sets the process image output DP 0.4, that issues the emergency start command to the Soft Starter.

The following parameters are active in the various operating modes of the block:

Table 5- 32 Emergency start

Operating mode	Parameter	Value	Meaning	Assigned PIO bits
AUTO	EmrgStAut	0 → 1 1 → 0	Enable emergency start Disable emergency start	DP 0.4 = 1
MANUAL	EmrgStMan [1, 2]	0 → 1 1 → 0	Enable emergency start Disable emergency start	DP 0.4 = 1

[1] In the Standard view if the operator control enable exists (OS_Perm).

[2] The emergency start command of MANUAL mode monitors the respective command in AUTO mode to guarantee bumpless transfer of the command state during mode switchover from AUTO to MANUAL.

Status displays with activated Emergency start function

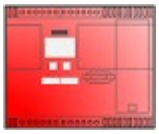
Note

The *Direct Soft-Starter* template prevents forwarding of a group error to the MotRevL block when the Emergency start function is activated. Only in this way is it possible to still send start and stop commands to the Soft Starter via MotRevL while a group error is active.

However, this has the result that different motor states can be displayed in the faceplates of SSOprtn and MotRevL while the Emergency start function is active.

While the SSOprtn icon displays an active group error, the MotRevL icon shows the current operating state of the motor when the Emergency start function is active, e.g.:

Table 5- 33 Example: Status displays with activated Emergency start function

SSOprtn faceplate		**MotRevL faceplate**	
Status display	**Symbol**	**Status display**	**Symbol**
Group error		Motor is running	
		Motor stationary	

Note

Emergency start status is not updated in the Local operating mode.

See also

Direct Soft Starter template (Page 30)

5.5.8 Slow speed

The Slow speed function allows you to temporarily operate an induction motor in both directions of rotation at a speed that is less than the rated speed.

The following parameters are active in the various operating modes of the block:

Table 5- 34 Slow speed

Operating mode	Input parameter	Assigned PIO bits	Control via
Manual Local	—	PIO 0.6	Soft Starter ES
Auto	SlSpdAut = 1	PIO 0.6	Automation system
Manual	SlSpdMan = 1	PIO 0.6	Automation system

`SlSpdOn` = 1 indicates that slow speed is activated.

Start motor in slow speed

1. Activate the Slow speed function in the SSOprtn faceplate.

2. Start the motor at the slower speed using the corresponding forward command in the MotRevL faceplate and slow speed reverse command in the SSOprtn faceplate.

Note

Slow speed status is not updated in the Local operating mode.

See also

Direct Soft Starter template (Page 30)

SSOprtn - Standard (Page 47)

5.5.9 Output 1 and output 2

The following parameters are active in the various operating modes of the block:

Table 5- 35 Output 1, output 2

Operating mode Manual Input parameter	Operating mode Auto Input parameter	Value	Output parameter	Process image output Bits
Out1Man	Out1Aut	0 → 1	Out1On	PIO 1.0
Out2Man	Out2Aut	0 → 1	Out2On	PIO 1.1

Note

Output 1 and Output 2 status is not updated in the Local operating mode.

5.5.10 Active parameter sets

The process images of the outputs bit PIO 1.2 and PIO 1.3 correspond to the settings that the operator makes for the active parameter sets. For this purpose, parameter sets 1, 2 and 3 are assigned via the parameter `ParaSet` = 1, 2 or 3.

`ParaSet` = 1 (Standard)

PIO 1.2 = FALSE
PIO 1.3 = FALSE

`ParaSet` = 2

PIO 1.2 = TRUE
PIO 1.3 = FALSE

`ParaSet` = 3

PIO 1.2 = FALSE
PIO 1.3 = TRUE

Note

Active parameter set status is not updated in the Local operating mode.

5.5.11 Status of the Forward / Reverse command in Local mode

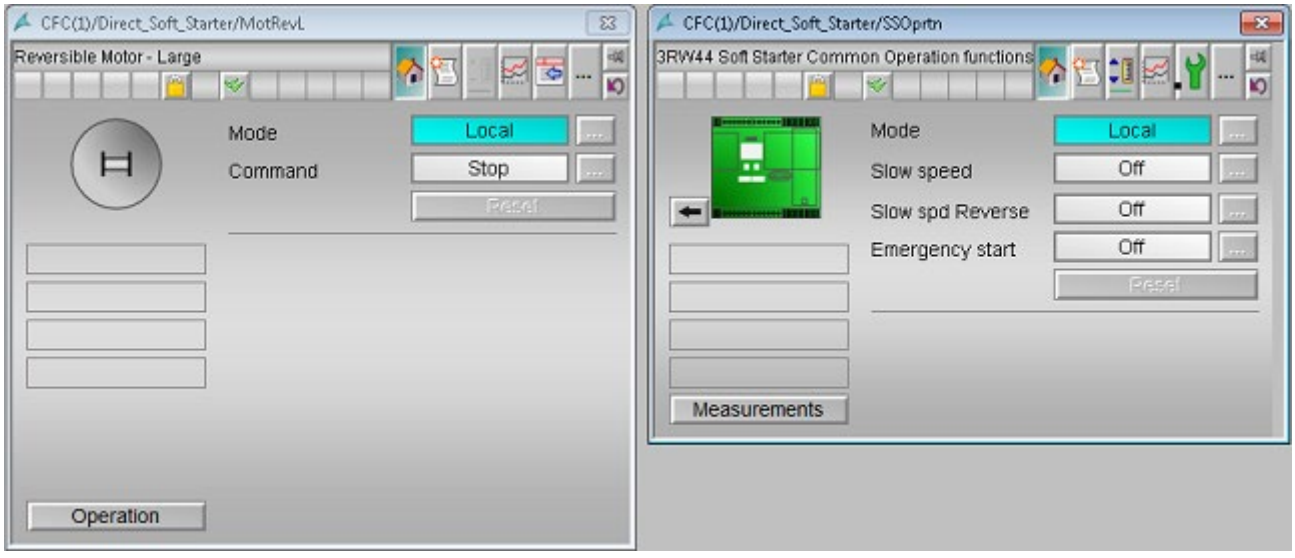
If the Soft Starter is in the Local operation mode, then there is no information available in the cyclic data (process input image) in what direction the motor is running.

It was possible to get this information by triggering read data command and this information was reflected on output parameters (Fwd, Rev) of the SSOprtn block, but this possibility could lead to misinformation because the status change of the motor was not reflected automatically on the output parameters.

Because of this the output parameters (Fwd, Rev) that reflected the direction of the motor have been removed and a new output parameter “MotorOn” has been implemented.

The motor running status is shown with a plain green color symbol as shown below at SSOprtn blockicon and SSOprtn Standard view faceplate. Whereas MotRevL displays grey color symbol in Local operating mode even if the motor running in the Local operating mode.

It is suggested to use Local controls (For E.g. Soft starter ES/ EDD) for checking the direction of motor running.



5.5.12 Disable Quick Stop

The Quick Stop function enables the motor and switches off the brake output without a group error. This function can be disabled.

The following parameters are active in the various operating modes of the block:

Table 5- 36 Disable quick stop

Operating mode Manual Input parameter	Operating mode Auto Input parameter	Value	Meaning	Process image output Bit
DsQkSpMan	DsQkSpAut	0 1	Deactivate Disable quick stop Activate Disable quick stop	PIO 1.7

Note

Disable quick stop status is not updated in the Local operating mode.

5.5.13 Motor current display

Display for motor current

The PROFIBUS DP Bits 1.0 to 1.5 of the process image input describe the current consumption when the motor is connected. The current value is displayed in the Limits view as a percentage via the `MotCurr` output parameter.

Note

Soft Starter DPV0

If the Soft Starter is configured in the DPV0 Interrupt mode, the values are not transferred to the device.

To transfer the values, parameterize the rated current of the device in HW Config as follows: **Device Properties > Device-specific Parameters > "Rated operating current"**.

Calculation of the motor current

Table 5- 37 Calculation of the motor current

PII						
DP 1.5	**DP 1.4**	**DP 1.3**	**DP 1.2**	**DP 1.1**	**DP 1.0**	**Max.**
2^0	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	
1	0,5	0,25	0,125	0,0625	0,03125	**1,96875**
Example						
0	1	0	1	0	1	**0,65625 ***

* The sum of the values is the motor current:

Ratio = 0.5 + 0.125 + 0.03125 = 0.65625

`MotCurr` = 0.65625 * 100 (current in %)

5.5.14 Substitute value

The operator parameterizes the substitute value. The `SubValue` parameter is 2 bytes long. The data contained are written to the Soft Starter via data set 131. If the Response to CPU/master stop event occurs, the Soft Starter is switched to the substitute value parameterized in `SubValue` or it retains the last value.

5.5.15 Message characteristics

SSOprtn reports the following errors at the block output:

- Rack failure (`RackFAct`)
- Module fault (`ModFAct`)

An error generates a group error in output parameter `GrpErr`.

These errors are not signaled as alarms as they are already part of the SSDiag block (both on the DP master system and behind the Y-link).

The alarms are output using the ALARM_8P function.

The messages can be enabled or disabled using the `MsgLock` input. The alarms are suppressed when the block is in Out of service mode.

Message block MsgEvId1

Table 5- 38 Output messages

Message block	Message No.	Block parameter	Message text	Message class *
MsgEvId1	1	PZDIn01.GrpWarn	$$BlockComment$$Group Warning	W
	2	PZDIn01.GrpFlt	$$BlockComment$$Group Fault	S
	3	CSF	$$BlockComment$$Control System Fault	S
	4	ExtMsg1	$$BlockComment$$External message 1	S
	5	ExtMsg2	$$BlockComment$$External message 2	S
	6	ExtMsg3	$$BlockComment$$External message 3	S
	7	ExtMsg4	$$BlockComment$$External message 4	S
	8	ExtMsg5	$$BlockComment$$External message 5	S

* W = Warning;S = AS, OS process control fault;A = Alarm

Auxiliary values

The block supports 10 programmable auxiliary values.

Table 5- 39 Structure of the auxiliary values ALARM_8P

Message No.	Auxiliary value	Block parameter	Meaning
1	1	SarBatchName	Batch name
2	2	SdwStepNoLoc	Batch step
3	3	SdwBatchId	Batch ID
4	4	ExtVal04	External value 4, user-definable
5	5	ExtVal05	External value 5, user-definable
6	6	ExtVal06	External value 6, user-definable
7	7	ExtVal07	External value 7, user-definable
8	8	ExtVal08	External value 8, user-definable
9	9	ExtVal09	External value 9, user-definable
10	10	ExtVal10	External value 10, user-definable

The MsgStat1, MsgAckn1, and MsgErr1 parameters transfer the following information:

- Message status
- Message error
- Message acknowledgment status

5.5.16 Reading and writing data records

Read function

The RDREC function is used to read the data sets, and the WRREC function is used to write commands and values to the Soft Starter.

The "Read Data" button in the faceplates is used to update the displayed values.

Reading can only be performed successfully if the function Write to data sets (WRREC) is not executed at the same time.

Table 5- 40 Parameter Read/write data set

Parameter	Value	Meaning
RdDataOp [1]	1	Read data from data set
RdDataLi [1]	0 → 1	Read data set via link or SFC
EnRdWr	1	Enable reading/writing data set
RdErr	1	Error when reading
WrErr	1	Error when writing
RdWrAct	1	Reading/writing data set ended

[1] not in Out of service mode and in case of rack failure

Data set table

Table 5- 41 Data set table

No.	Data set number	Read access/write access	Number of bytes	Description
1	DS68	W	6	Writing the process image of the outputs
2	DS131	R/W	138	Technology parameter 2 set 1
3	DS141	R/W	138	Technology parameter 2 set 2
4	DS151	R/W	138	Technology parameter 2 set 3

Write function

Writing of data sets is only possible when the block is in REMOTE mode.

Note

1. If the Soft Starter is in the “Local”operation mode, then there is no information available in the cyclic data (process input image) in what direction the motor is running. It was possible to get this information by triggering read data command and this information was reflected on output parameters (Fwd, Rev) of the SSOprtn block, but this possibility could lead to misinformation because the status change of the motor was not reflected automatically on the output parameters.

   Because of this reading of Process image output (DS 68) has been disabled and the output parameters that reflected the direction of the motor have been removed and a new output parameter “MotorOn” has been implemented. The below listed parameters also do not update the status in Local mode:
   - Trip reset
   - Emergency start
   - Slow speed
   - Output 1
   - Output 2
   - Active parameter set
   - Disable quick stop
2. After complete download of CFC, the read data command has to be executed at least once (e.g. by pushing “Read data” button at SSOprtn faceplate or by giving a value “1” at “RdDataOp” input parameter at SSOprtn block) before writing current limit values at SSOprtn.

See also

Enable for measurement and statistics (Page 114)

5.5.17 Fault handling

The following errors can be displayed for this block:

- Error numbers (Page 62)
- Mode changeover error
- Invalid input signals

5.5.18 Invalid input signals

The "Invalid input signals" error is output if there are inconsistencies between associated inputs and outputs. For example, you cannot issue start commands and stop commands to the motor simultaneously.

If the block algorithm detects an invalid combination of input signals, it will issue an error number at the `ErrorNum` output, depending on the block.

The STANDARD view displays this error in plain text.

5.5.19 Operator permissions

Operator permissions SSOprtn

The operator permissions for control commands are configured in the `OS_Perm` structured parameters. These are transferred to WinCC via the `OS_PermOut` and `OS_PermLog` parameters.

The operator permissions control operation only in the faceplate.

Table 5- 42 Operator permissions – SSOprtn

OS_Perm Bit	OS_PermOut Bit	OS_PermLog Bit	Description
0	0	0	1 = Operator can switch to automatic mode
1	1	1	1 = Operator can switch to manual mode
2	2	2	Reserved
3	3	3	1 = Operator can switch to OoS
4...7	4...7	4...7	Reserved
8	8	8	1 = Operator enabled to trip reset
9	9	9	1 = Operator enabled to activate Slow Speed
10	10	10	1 = Operator enabled for Output1
11	11	11	1 = Operator enabled for Output2
12	12	12	1 = Operator enabled to change Parameter set
13	13	13	1 = Operator enabled for Disable Quick stop
14	14	14	1 = Operator enabled to emergency start the motor
15	15	15	1 = Operator enabled to start the motor in Slow speed reverse
16...20	16...20	16...20	Reserved
21	21	21	1 = Operator enabled to read data
22	22	22	1 = Operator can alter the Maximum current limit of PS1
23	23	23	1 = Operator can alter the Minimum current limit of PS1
24	24	24	1 = Operator can alter the Maximum current limit of PS2
25	25	25	1 = Operator can alter the Minimum current limit of PS2
26	26	26	1 = Operator can alter the Maximum current limit of PS3
27	27	27	1 = Operator can alter the Minimum current limit of PS3
28...31	28...31	28...31	Reserved

`OS_PermOut` contains the permission information of all the parameters.
`OS_PermLog` contains the permission evaluated based on the current operating states.

5.5.20 Enable for measurement and statistics

You can open the Standard view of the SSMeas and SSStat blocks using buttons in the Standard view and Maintenance view of the SSOprtn block.

To display buttons in the faceplate, connect the `SelFp1` and `SelFp2` input parameters to an output parameter of the SSMeas and SSStat blocks in the CFC chart.

See also

Reading and writing data records (Page 110)

5.5.21 Status information

Status information SSOprtn

Table 5- 43 Status1 – SSOprtn

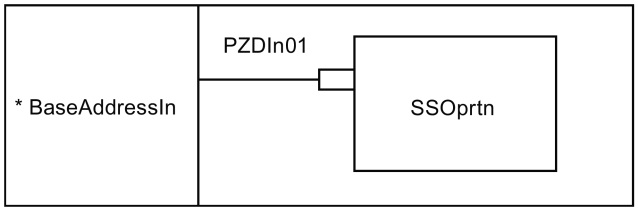
Status1 Bit	Description
0	Occupied
1	BatchEn
2	Slave Type 0 = PROFIBUS 1 = PROFINET
3	1 = Out of service
4	1 = Out of service via interconnection
5	1 = AUTO mode active 0 = MANUAL mode active
6	1 = Local active
7	1 = Forward command (PIO)
8	1 = Disable Quick stop (PIO)
9	1 = Reverse command (PIO)
10	1 = Slow speed (PIO)
11	1 = Output 1 (PIO)
12	1 = Output 2 (PIO)
13	1 = Emergency start active, 0 = Emergency start inactive (PIO)
14	1 = Parameter set bit0 (PIO)
15	1 = Parameter set bit1 (PIO)
16	1 = Trip reset active; 0 = Trip reset inactive (PIO)
17	1 = Motor ON feedback
18	1 = Input 1 (PII)
19	1 = Input 2 (PII)
20	1 = Input 3 (PII)
21	1 = Input 4 (PII)
22	1 = Ramp mode (PII)
23	1 = Status – Group fault (PII)
24	1 = Status – Group warning (PII)
25	1 = Current limit trip 0 = Current limit warning
26	Reserved
27	Startup with OB100
28	1 = Group fault 0 = No error
29	MsgLock activated
30	1 = Rack failure
31	Invalid signal status

5.5.22 Assigning addresses in HW Config

The 2 bytes of the process image inputs (PII) are transferred by the Soft Starter based on the logical address of the device. The user has to configure the inputs.

Symbolic name in HW Config

The `PZDIn01` input parameter of the block is interconnected with the corresponding input of the logical address of the device (`LAddr`). The logical word address can be assigned to a symbolic name (*).



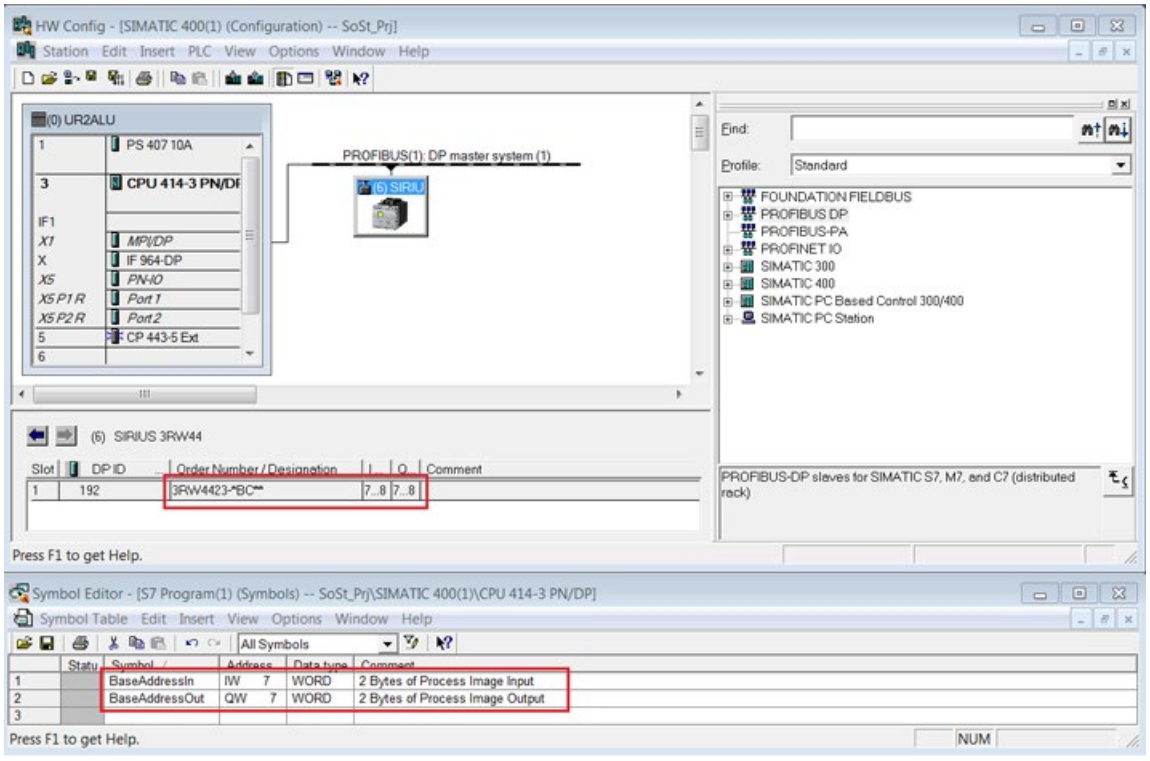


Figure 5-3 Symbolic name in HW Config

5.6 SSChn channel block

5.6.1 SSChn description

Purpose of the block

The SSChn channel block is used for processing 3RW44 Soft Starter signals.

The block has no operating modes.

Views

The SSChn block does not support faceplate views.

5.6.2 Configuration

Interconnection of the SSChn channel block

The interconnection is made symbolically to the first input word or output word. The input word and output word must have the same start in HW Config.

Use the CFC editor to install the block in a cyclic interrupt OB (OB30 to OB38).

The block is automatically installed in the startup OB (OB100).

Use the templates supplied. These contain all the necessary interconnections between the blocks.

Note

Please observe the information in Chapter Templates (Page 27).

5.6.3 Control word

If the control word STW1 is formed and the signal status Stw1ST is good (16#80), the control inputs listed in the table are ineffective. The control word STW1 is set at process value output PZDOUT1.

If the signal status Stw1ST has a bad value, the data of the control inputs are used.

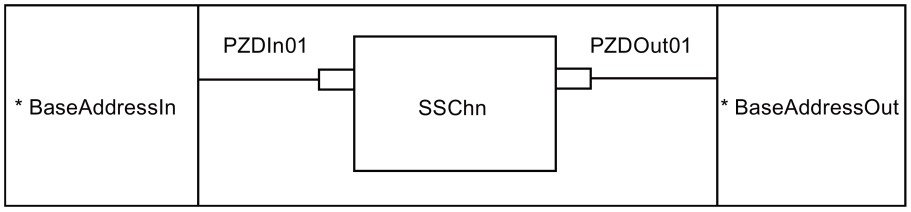
Signal status Stw1ST	Control inputs
Fwd	Control word 1, bit 0
Rev	Control word 1, bit 1
BrakeRel	Control word 1, bit 2
ResetTrip	Control word 1 bit 3 or (STW1ST = 16#80 AND STW1 control word bit 3)
StartEmerg	Control word 1, bit 4
StartTest	Control word 1, bit 5
LowSpeed	Control word 1, bit 6
Ctrl7	Control word 1, bit 7
Out1	Control word 1, bit 8
Out2	Control word 1, bit 9
ManSpec1	Control word 1, bit 10
ManSpec2	Control word 1, bit 11
ManSpec3	Control word 1, bit 12
ManSpec4	Control word 1, bit 13
ManSpec5	Control word 1, bit 14
ManSpec6	Control word 1, bit 15

5.6.4 Assigning addresses in HW Config

The 2 bytes of the process image inputs (PII) are transferred by the Soft Starter based on the logical address of the device. The user has to configure the inputs.

Symbolic name in HW Config

The `PZDIn01` input parameter of the block is interconnected with the corresponding input of the logical address of the device (`LAddr`). The logical word address can be assigned to a symbolic name (*).



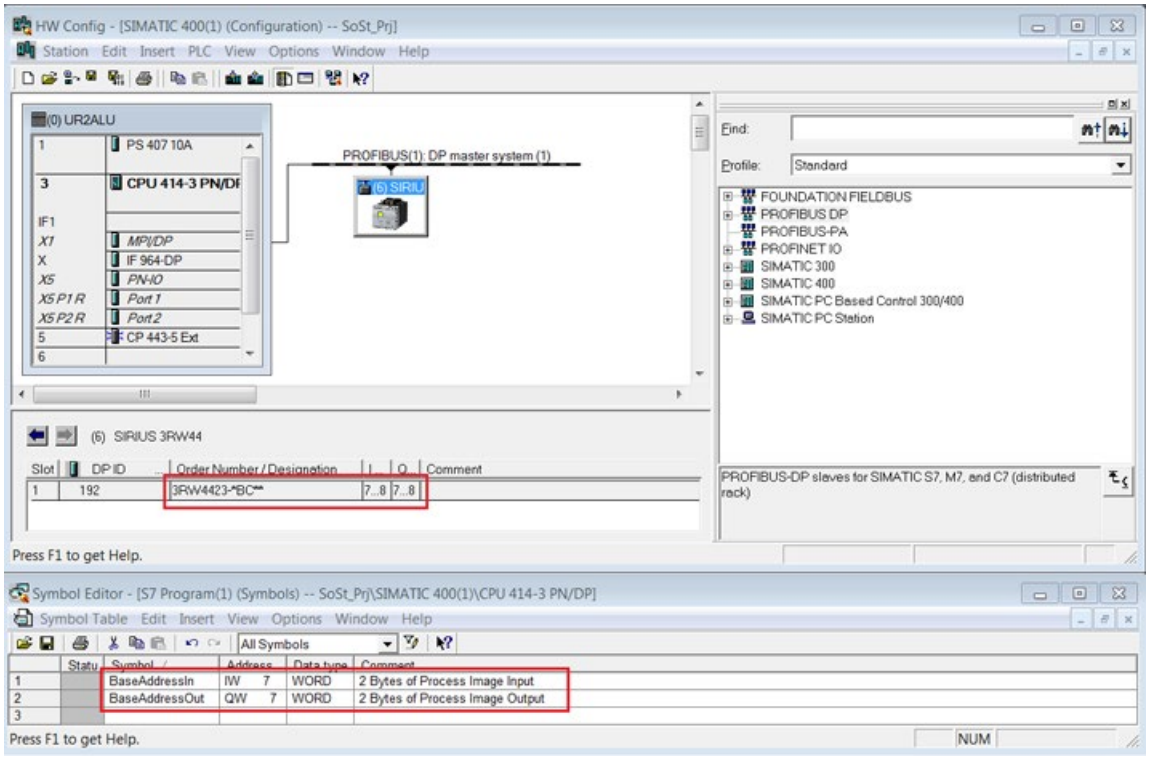


Figure 5-4 Symbolic name in HW Config

Maintenance station

6

6.1 Maintenance Station

The 3RW44 Soft Starter Library PCS 7 V8.3 supports the function of the Maintenance Station, via GSD, via PDM object, and via OM Soft Starter.

Soft Starter PROFIBUS – Maintenance Station

Display	Remark	Message	Caused by
	Unknown/untested	-	PLC in Standby
	Trip	Device [Subnet No.]/[Address]: Bad, maintenance alarm	Tripping *) • General Fault • Controller Fault • Protection has tripped • Level monitoring low/high • Miscellaneous
	Failure	Device [Subnet No.]/[Address]: Failure	Failure of PROFIBUS connection or Rack Fault or Module Fault
	Warning	Device [Subnet No.]/[Address]: Uncertain, maintenance demanded	Warnings *) • Protection has tripped • Level monitoring low/high • Miscellaneous
	Signaling	Device [Subnet No.]/[Address]: Good, maintenance required	Status signaling *) • Signaling by controller • Protection has tripped • Signaling caused by parameterization
	Good	-	-
	Message is locked	-	-

Soft Starter PROFINET – Maintenance Station

Display	Remark	Message	Caused by
	Unknown/untested	-	PLC in Standby
	Trip	Device [Subnet No.]/[Device No.]: Bad, maintenance alarm	Tripping *) • General Fault • Controller Fault • Protection has tripped • Level monitoring low/high • Miscellaneous • Protection extended (TM2) has tripped • Level monitoring extended (AM2) low/high • Miscellaneous extended (AM2) • Event – DM-FP F-Prm error
	Failure	Device [Subnet No.]/[Device No.]: Failure	Failure of PROFINET connection or Rack Fault or Module Fault
	Warning	Device [Subnet No.]/[Device No.]: Uncertain, maintenance demanded	Warnings *) • Protection has tripped • Level monitoring low/high • Miscellaneous • Protection extended (TM2) has tripped • Level monitoring extended (AM2) low/high • Miscellaneous extended (AM2)
	Signaling	Device [Subnet No.]/[Device No.]: Good, maintenance required	Status signaling *) • Signaling by controller • Protection has tripped • Signaling caused by parameterization

Display	Remark	Message	Caused by
	Good	-	-
	Message is locked	-	-

*) Please find detailed information on Signaling, Warning and Tripping described for Dataset DS 92 – Device diagnostic in system manual of Soft Starter PROFINET.

Messages

Messages for an incoming Signaling, Warning and Tripping event can be found using:

Tool	Dialog/Alarm logging
For WinCC	Alarm logging or at the faceplates diagnosis view of the device
For PDM-Menu	Device > Faults / Warnings / Status Information - You will find following tabs according to the event: • Faults • Warnings • Status Information
For Soft Starter ES-Menu	Target System > Faults / Warnings / Status Information - You will find following tabs according to the event: • Faults • Warnings • Status Information

Further status information according to control and protection can be found:

Tool	Dialog
For PDM-Menu	Device > Control/ Status Information - Following group boxes will display status information: • Control • Protection
For Soft Starter ES-Menu	Target System > Control/ Status Information - Following group boxes will display status information: • Control • Protection

Correlation Maintenance Status and Maintenance Job

The following table provides an overview:

Meaning	Maintenance job	Status maintenance job
Maintenance required has been requested, maintenance engineer has not yet created a maintenance job		
Maintenance demanded has been requested, maintenance engineer has not yet created a maintenance job		
Maintenance alarm has been requested, maintenance engineer has not yet created a maintenance job		
Maintenance required has been requested, maintenance job was set to status "In progress"		
Maintenance demanded has been requested, maintenance job was set to status "In progress"		
Maintenance alarm has been requested Maintenance job was set to status "In progress"		
Maintenance job canceled Maintenance engineer has canceled the maintenance job	Maintenance status see table above	
Maintenance job completed	Maintenance status see table above	

Module drivers of the Soft Starter

7

7.1 Released modules

The following Soft Starters are available for the PCS 7 Library V8.3:

Article number	Compatible modules
3RW4422-*BC** 3RW4423-*BC** 3RW4424-*BC** 3RW4425-*BC** 3RW4426-*BC** 3RW4427-*BC** 3RW4434-*BC** 3RW4435-*BC** 3RW4436-*BC** 3RW4443-*BC** 3RW4444-*BC** 3RW4445-*BC** 3RW4446-*BC** 3RW4447-*BC** 3RW4453-*BC** 3RW4454-*BC** 3RW4455-*BC** 3RW4456-*BC** 3RW4457-*BC** 3RW4458-*BC** 3RW4465-*BC** 3RW4466-*BC**	Yes

7.2 Object lists and action lists

Hardware modules, among other things, are configured in HW Config.

Description

The object lists and the action lists are used to generate the module drivers for these hardware modules.

The object list contains a unique object identification number for each of these hardware modules. Each object list is assigned to a particular hardware configuration.

The action list contains a list of actions. These actions must be executed for the object identification numbers that appear in the object list. Examples of such actions include:

- Assigning the device address
- Interconnecting the input and output parameters of the driver block

The "Generate Module Driver" function generates the module drivers when the CFC is compiled.

7.3 Driver blocks

3RW44 Soft Starter PROFINET directly on the PROFINET IO master system - Configuration using the hardware catalog or a GSD / EDD file

The following driver blocks are generated when the CFC is compiled:

- SSDiag diagnostics for the SIRIUS 3RW44 Soft Starter
- OB_DIAG1_PN - OB diagnostics function
- OB_BEGIN - CPU function block
- MOD_SWT - Message diagnostics for PA slave DPV0 connected to the DP master system

3RW44 Soft Starter directly on the DP master system - Configuration using the hardware catalog or a GSD / EDD file

The following driver blocks are generated when the CFC is compiled:

- SSDiag diagnostics for the SIRIUS 3RW44 Soft Starter
- OB_DIAG1 - OB diagnostics function
- OB_BEGIN - CPU function block
- MOD_SWT - Message diagnostics for PA slave DPV0 connected to the DP master system

3RW44 Soft Starter behind a Y-link - Configuration using the Object Manager

This configuration cannot be applied.

3RW44 Soft Starter following a Y-link - Configuration using GSD file or PDM object

The following driver blocks are generated when the CFC is compiled:

- SSDiag diagnostics for the SIRIUS 3RW44 Soft Starter
- OB_DIAG1 - OB diagnostics function
- OB_BEGIN - CPU function block
- MOD_SWT - Message diagnostics for PA slave DPV0 connected to the DP master system

Note

3RW44 Soft Starter following a Y link - Configuration using GSD file

If you are using the communication module with firmware version < E*04, a DPV1 following the Y link is not possible.

3RW44 Soft Starter behind a IE/PB-link - Configuration using the Object Manager

This configuration cannot be applied.

3RW44 Soft Starter behind a IE/PB-link - Configuration using GSD file or PDM object

The following driver blocks are generated when the CFC is compiled:

- SSDiag diagnostics for the SIRIUS 3RW44 Soft Starter
- OB_DIAG1_PN - OB diagnostics function
- OB_BEGIN - CPU function block
- MOD_SWT - Message diagnostics for PA slave DPV0 connected to the DP master system.

More information

Additional information regarding GSD files is available in the "SIRIUS 3RW44 Soft Starter" System Manual > section "Configuration with the GSD File".

Additional information here (https://support.industry.siemens.com/cs/document/35202974) or on:
DPV1 functionality for SIRIUS 3RW44 Soft Starter following a Y link

1. Enter the following search term in the "Product Name or Part Number" field: **y link 3rw44**
2. Select the entry.

See also

Driver generator (Page 12)

Parameter

A

A.1 SSDiag block parameters

Input parameters

Table A- 1 SSDiag input parameters

Parameter	Data format	Default setting	Meaning
EnDiag	BOOL	TRUE	1 = Enable reading of diagnostic data
Mode	DWORD	16#00	OMODE from MOD_SWT
DAddr	INT	0	Diagnostic address of module
RdData	BOOL	0	1 = Read diagnostic data
DPALink	BOOL	FALSE	Device connection: 0= DP-MASTER 1 = DP-LINK
SubnTyp	BOOL	FALSE	1 = External DP-Interface
Sl_Typ	BOOL	FALSE	0 = PROFIBUS 1 = PROFINET
Subn1Id	BYTE	16#FF	ID of Primary Subnet
Subn2Id	BYTE	16#FF	ID of Redundant Subnet
RackNo	BYTE	16#FF	Rack number
SlotNo	BYTE	16#FF	Slot number
LAddr	WORD	16#0000	Logical address of the starter module
RackF	BOOL	FALSE	1 = Rack failure
Subn1Err	BOOL	FALSE	1 = Subnet 1 error
Subn2Err	BOOL	FALSE	1 = Subnet 2 error
RunUpCyc	INT	3	Number of cycles for which all messages are suppressed
MsgEvId1	DWORD	16#FF	Message Event ID
AccId	BOOL	TRUE	1 = Accept new Mode settings
ExtMsg1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 1
ExtMsg2	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 2
ExtMsg3	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 3

Parameter	Data format	Default setting	Meaning
ExtVal05	ANY	–	External Value 5
ExtVal06	ANY	–	External Value 6
ExtVal07	ANY	–	External Value 7
ExtVal08	ANY	–	External Value 8
ExtVal09	ANY	–	External Value 9
ExtVal10	ANY	–	External Value 10
ReserveIn	WORD	–	Reserved

Output parameters

Table A- 2 SSDiag output parameters

Parameter	Data format	Default setting	Meaning
GrpErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Group error is active
RackFAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Rack Failure
ModFAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Module Failure
Rack1Err	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = DP slave / IO system failure (primary)
Rack2Err	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = DP slave/IO system failure (redundant)
Slv_Typ	BOOL	FALSE	0 = PROFIBUS 1 = PROFINET
BusFlt	BOOL	FALSE	1 = Connection Fault
RdEn	BOOL	FALSE	1 = Enable read record
RdErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Error read record
RdErrStat	WORD	16#00	Status of Read record error
PA_Diag	DWORD	0	Diagnostic information for maintenance
DiagOprtn	SSDIAGOPRTN (Page 132)	–	Diagnostic information for SSOprtn
DiagMeas	SSDIAGMEAS	–	Diagnostic information for SSMeas

Parameter	Data format	Default setting	Meaning
ST_Worst	BYTE	16#80	Worst Signal Status
OMode	DWORD	16#00	Status MODE
ErrorNum	INT	-1	Error Number
MsgErr1	BOOL	FALSE	1 = Messaging Error Occurs
MsgStat1	WORD	16#00	ALARM_8P: Status Output
MsgAckn1	WORD	16#00	Message acknowledgment status 1 (output STATUS of first ALARM_8P)
ReserveOut	WORD	–	Reserved

Structure of OMODE

Table A- 3 Structure of OMODE – SSDiag

Byte	Value		Meaning
Byte 1; 0	16#0000	–	Irrelevant
Byte 2	16#01:	Warm restart (OB100)	–
Byte 3	16#80: 16#40: 16#20:	Valid data Invalid data Redundancy error	–

A.2 Structure of UDTs for SSDiag

UDTs for diagnostic information

The following diagnostic information is available for 3RW44 Soft Starters:

- SSDIAGOPRTN – Status, output via the `DiagOprtn` parameter output
- SSDIAGMEAS – Status, output via the `DiagMeas` parameter output

SSDIAGOPRTN and SSDIAGMEAS are structured parameters for diagnostic information. They are composed of a number of elements.

SSDIAGOPRTN

Table A- 4 Diagnostic information

Element	Data format	Message	Diagnostic type
DIAG[1]	DWORD	3RW44 PROFIBUS DP Slave diagnostics (Page 70)	Station diagnostics
BUSERR	BOOL	Bus error	Communication
CPUMSTRSTOP	BOOL	CPU / master Stop	
AUTOPLCCNTRL	BOOL	Automatic mode (PLC controlled)	
MANBUSCNTRL	BOOL	Manual mode via field bus (O&M controlled)	
MANLOCCNTRL	BOOL	Manual operation local operating mode	
CONNBRK	BOOL	Connection break in manual operation local operating mode	
PIERROR	BOOL	Process image error	
NOEXTSTPAR	BOOL	No external start-up parameters received	
MANBUSPCCNT	BOOL	Manual bus - PC controlled	
MANLOCINCNT	BOOL	Manual operation local - input controlled	
MANLOCOMCNT	BOOL	Manual operation local - O&M controlled	
MANLOCPCNT	BOOL	Manual operation local - PC controlled	

Element	Data format	Message	Diagnostic type
READY	BOOL	Ready (automatic)	Switching and controlling
MOTCW	BOOL	Motor clockwise (right)	
MOTCCW	BOOL	Motor counter-clockwise (left)	
CNTOVLD	BOOL	Contact block overload	
CNTDMAG	BOOL	Contact block damaged	
EMGSTART	BOOL	Emergency start is active	
GRPERR	BOOL	Group error	
GRPWARN	BOOL	Group warning	
NOMAINPWR	BOOL	No main power	
STRTMODACT	BOOL	Start mode active	
STPMODACT	BOOL	Stopping mode active	
ELEBRKACT	BOOL	Electrical braking procedure is active	
SLWSPDACT	BOOL	Slow speed active	
CTRLINPUT	BOOL	Control input	
QCKSTPACT	BOOL	Quick stop active	
ELEVLTHI	BOOL	Electronics supply voltage too high	
ELEVLTLO	BOOL	Electronics supply voltage too low	
RDYMOTON	BOOL	Ready for motor ON	
CNTSHRT	BOOL	Contact block short-circuited	
BYPPRTFLT	BOOL	Bypass part fault	
BYPPRTTRP	BOOL	Bypass element protective tripping	
SWELE1FAIL	BOOL	Switching element 1 failed	
SWELE2FAIL	BOOL	Switching element 2 failed	
SWELE3FAIL	BOOL	Switching element 3 failed	

Element	Data format	Message	Diagnostic type
FACTSETRSTR	BOOL	Factory settings restored	Parameter
FWUPDTACT	BOOL	FW update active	
FWUPDTSCFL	BOOL	FW update successful	
FWUPDTUNSCFL	BOOL	FW update unsuccessful	
FWUPDTREJ	BOOL	FW update rejected	
FLTPARLB	BYTE	Faulty parameter number (low byte)	
FLTPARHB	BYTE	Faulty parameter number (high byte)	
IMPERCLASS	BOOL	Impermissible Ie / CLASS settings	
PSACTIVE	BOOL	Parameterization active	
PS1ACTIVE	BOOL	Parameter set 1 active	
PS2ACTIVE	BOOL	Parameter set 2 active	
PS3ACTIVE	BOOL	Parameter set 3 active	
IMPCHNGPS	BOOL	Impermissible change of the parameter set	
INCORPSVAL	BOOL	Incorrect parameter value	
PSPERMIT	BOOL	Parameter changes not permissible when ON	
PSDISCPUACT	BOOL	Parameterization disable CPU/master active	
MOTHEATACT	BOOL	Motor heating active	
DCBRKACT	BOOL	DC braking active	
DYNDCBRK	BOOL	Dynamic DC braking active	
CONSTDELT	BOOL	Motor connection method star/delta	
CONINSDDELT	BOOL	Motor connection method inside delta	
CONUNKWN	BOOL	Motor connection method unknown	
NOLOAD	BOOL	No load	
PHS1LOSS	BOOL	Loss of Phase1	
PHS2LOSS	BOOL	Loss of Phase2	
PHS3LOSS	BOOL	Loss of Phase3	
LIPHDIR	BOOL	Line phase direction right	
LIPHREV	BOOL	Line phase direction left	
OUT1ACT	BOOL	Output 1 active	
OUT2ACT	BOOL	Output 2 active	
OUT3ACT	BOOL	Output 3 active	
OUT4ACT	BOOL	Output 4 active	
TRPRSTCARID	BOOL	Trip reset carried out	
TRPRSTNOTPOS	BOOL	Trip reset not possible	
MAXPNTRDEL	BOOL	Maximum pointer deleted	

[1] The information of the station diagnostics is mapped to the DiagOprtn.DIAG parameter.

SSDIAGMEAS

Table A- 5 Diagnostic information

Element	Data format	Meaning	Diagnostic type
TMPSNSOVLD	BOOL	Temperature sensor overload	Protective function motor/cable/short-circuited
TMPSNSOPEN	BOOL	Temperature sensor open	
TMPSNSSHORT	BOOL	Temperature sensor short	
TMMOVLD	BOOL	Thermal motor model overload	
OVLDSWOFF	BOOL	Overload switch off	
IDLETMACT	BOOL	Idle time active	
COOLDNTMACT	BOOL	Cool down time active	
ASYMREC	BOOL	Asymmetry recognized	
ASYMSWOFF	BOOL	Asymmetry switch-off	
CURLMACT	BOOL	Current limiting active	
CURHI	BOOL	Current limit exceeded	
CURLO	BOOL	Current limit undershot	
CURLMSWOFF	BOOL	Current limit switch-off	
MOTSTLSWOFF	BOOL	Motor stalled - switched off	
INPUT1	BOOL	Input 1 active	
INPUT2	BOOL	Input 2 active	
INPUT3	BOOL	Input 3 active	
INPUT4	BOOL	Input 4 active	
GNDFLT	BOOL	Ground fault	
GNDFLTSWOFF	BOOL	Ground fault switch off	
TMMDEACT	BOOL	Thermal motor model deactivated	
PHANGCTRFLT	BOOL	Phase angle control failure	
COOLCNTACT	BOOL	Cool down time contact block active	
CTNHOTSTART	BOOL	Contact element too hot for starting	
CUROVERFLOW	BOOL	Current range overflow	
PREWRNUNDSHT	BOOL	Prewarning limit - prewarning time undershot	
PREWRNHTEXED	BOOL	Prewarning limit - motor heat build-up exceeded	
CMDSTRPAUACT	BOOL	Command Start_Pause active	
ENRGSAVMACT	BOOL	Energy saving mode active	

A.3 SSMeas block parameters

Input parameters

Table A- 6 SSMeas input parameters

Parameter	Data format	Default setting	Meaning
Mode	DWORD	16#8000FFFF	OMODE information from MOD_SWT block
DAddr	INT	0	Diagnostic address of Soft Starter
LAddr	INT	0	Logical address of the Soft Starter
Slv_Typ	BOOL	0	0 = PROFIBUS 1 = PROFINET
RackF	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Rack Failure information from SSDiag block
ModF	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Module Failure information from SSDiag block
RdEn	BOOL	TRUE	1 = Enable read record
RdDataLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Input 0 → 1: Read data set via link or SFC
RdDataOp	BOOL	FALSE	1 = Read data from datasets
DiagMeas	SSDIAGMEAS (Page 132)	–	Diagnostic information from SSDiag block
PZDIn01	WORD	16#00	Process value DP 0.0-1.7
OnOp	BOOL	FALSE	1 = ON mode: ON mode by Operator
OosOp	BOOL	FALSE	1 = Out of Service mode: Oos Mode by Operator
OosLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Out of Service mode: Oos Mode by Field Signal
Curr_OpScale	STRUCT • High: REAL • Low: REAL	– • 797.0 • 0.0	Current Bar Display Limits for OS
Volt_OpScale	STRUCT • High: REAL • Low: REAL	– • 1500.0 • 0.0	Voltage Bar Display Limits for OS
RunUpCyc	INT	3	Number of cycles for which all messages are suppressed

Parameter	Data format	Default setting	Meaning
BatchEn	BOOL	FALSE	Enable Remote Operation of Controller by Batch Recipe
BatchID	DWORD	16#00	Current Batch ID (number)
BatchName	STRING[32]	–	Current Batch Name
StepNo	DWORD	16#00	Batch Step Number
Occupied	BOOL	FALSE	1 = Occupied by Batch
MsgEvId1	DWORD	16#FF	Message Event ID
MsgLock	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Inhibit process message
ExtMsg1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 1
ExtMsg2	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 2
ExtMsg3	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 3
ExtMsg4	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 4
ExtVal04	ANY	–	External Value 4
ExtVal05	ANY	–	External Value 5
ExtVal06	ANY	–	External Value 6
ExtVal07	ANY	–	External Value 7
ExtVal08	ANY	–	External Value 8
ExtVal09	ANY	–	External Value 9
ExtVal10	ANY	–	External Value 10
OS_Perm	STRUCT • Bit 0: BOOL • ... • Bit 31: BOOL	– • 1 • 1 • 1	Operator Permissions
OpSt_In	DWORD	16#0	Enabled operator stations
Feature	STRUCT • Bit 0: BOOL • ... • Bit 31: BOOL	– • 0 • 0 • 0	Status of various features
ReserveIn	WORD	–	Reserved

Output parameters

Table A- 7 SSMeas output parameters

Parameter	Data format	Default setting	Meaning
RackFAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Rack Failure
ModFAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Module Failure
GrpErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Group error is active
RdErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Error read record
RdAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Enable read record
RdDataOut	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Triggers Read operation of DS92 at SSDiag
RdErrStat	WORD	16#00	Status of read record error
LocalAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Motor in Local Operation Mode: Local Mode Indicator
OnAct	STRUCT	–	On Mode is active
OosAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Out of service is active
DiagProt	DWORD	16#00	Current and thermal diagnostics
CurrL1	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Phase current IL1 in %/Is
CurrL2	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Phase current IL2 in %/Is
CurrL3	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Phase current IL3 in %/Is

Parameter	Data format	Default setting	Meaning
CurrL1E	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective phase current IL1 in Amps
CurrL2E	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective phase current IL2 in Amps
CurrL3E	STRUCT • Value: BOOL • ST: BYTE	– • 0.0 • 16#80	Effective phase current IL3 in Amps
VolL1L2	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective phase-to-phase voltage UL1L2 in Volts
VolL2L3	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective phase-to-phase voltage UL2L3 in Volts
VolL3L1	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective phase-to-phase voltage UL3L1 in Volts
SupVol	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Electronics supply voltage
OutPwr	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Output Power in kW
LineFreq	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Line Frequency
OutFreq	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Output Frequency
MotHtBld	STRUCT • Value: INT • ST: BYTE	– • 0 • 16#80	Motor heat build-up
Asymtry	STRUCT • Value: INT • ST: BYTE	– • 0 • 16#80	Asymmetry

Parameter	Data format	Default setting	Meaning
AsymtryEn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	0 = No asymmetry 1 = Asymmetry >= 40%
HtSnkTmp	STRUCT • Value: INT • ST: BYTE	– • 0 • 16#80	Heat sink temperature
CntBlkHeat	STRUCT • Value: INT • ST: BYTE	– • 0 • 16#80	Contact block heating
CntBlkColTm	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Remaining cool down time of contact block
TrpTm	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Remaining time for tripping of the thermal motor Model
MotcolTm	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Remaining cool down time of the motor
CurrHi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Current limit exceeded
CurrLo	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Current limit undershot
OS_PermOut	DWORD	16#FFFFFFFF	Operator Permission: Output for OS
OS_PermLog	DWORD	16#FFFFFFFF	Operator Permission: Output for OS
OpSt_Out	DWORD	16#00	Enabled operator stations
ST_Worst	BYTE	16#80	Worst signal status
Status1	DWORD	16#00000000	Status 1 information
ErrorNum	INT	-1	Error Number
MsgErr1	BOOL	FALSE	1 = Messaging Error Occurs
MsgStat1	WORD	16#00	ALARM_8P: Status Output
MsgAckn1	WORD	16#00	ALARM_8P: ACK_STATE Output
ReserveOut	WORD	–	Reserved

A.4 SSStat block parameters

Input parameters

Table A- 8 SSStat input parameters

Block parameters	Data format	Default setting	Meaning
Mode	DWORD	16#8000FFFF	OMODE information from MOD_SWT block
DAddr	INT	0	Diagnostic address of Soft Starter
LAddr	INT	0	Logical address of Soft Starter
Slv_Typ	BOOL	0	0 = PROFIBUS 1 = PROFINET
RackF	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Rack failure information from SSDiag block
ModF	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Module Failure information from SSDiag block
RdWrEn	BOOL	TRUE	1 = Enable read / write record
RdDataLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Input 0->1: Read record via Link or SFC
RdDataOp	BOOL	FALSE	1 = Read data from datasets
PZDIn01	WORD	16#00	Process value DP 0.0-1.7
MotCurrE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective Motor Current in Amp from SSOprtn Block
VoltE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective Voltage of the motor
Eff	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Motor efficiency
MotCosPhi	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Motor Power Factor in %
RstTlErg	BOOL	FALSE	Reset total energy
OnOp	BOOL	FALSE	1 = ON mode: ON Mode by Operator
OosOp	BOOL	FALSE	1 = OoS mode: OoS Mode by Operator

Block parameters	Data format	Default setting	Meaning
OosLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = OoS Mode: OoS Mode by Field Signal
RunUpCyc	INT	3	Number of cycles for which all messages are suppressed
MsgEvId1	DWORD	16#FF	Message Event ID 1
MsgLock	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Inhibit process message
BatchEn	BOOL	FALSE	Enable Remote Operation of Controller by Batch Recipe
BatchID	DWORD	16#00	Current Batch ID (number)
BatchName	STRING	–	Current Batch Name
StepNo	DWORD	16#00	Batch Step Number
Occupied	BOOL	FALSE	Occupied by Batch
ExtMsg1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 1
ExtMsg2	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 2
ExtMsg3	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 3
ExtMsg4	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 4
ExtMsg5	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 5
ExtMsg6	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 6
ExtMsg7	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 7
ExtMsg8	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 8

Block parameters	Data format	Default setting	Meaning
ExtVa104	ANY	–	External Value 4
ExtVa105	ANY	–	External Value 5
ExtVa106	ANY	–	External Value 6
ExtVa107	ANY	–	External Value 7
ExtVa108	ANY	–	External Value 8
ExtVa109	ANY	–	External Value 9
ExtVa110	ANY	–	External Value 10
OS_Perm	STRUCT • Bit 0: BOOL • ... • Bit 31: BOOL	– • 1 • 1 • 1	Operator Permissions
OpSt_In	DWORD	–	Enabled operator stations
Feature	STRUCT • Bit 0: BOOL • ... • Bit 31: BOOL	– • 0 • 0 • 0	Status of various features
DelMaxPtr	BOOL	FALSE	Delete maximum pointer
DelLogTrp	BOOL	FALSE	Delete trips in Log list
DelLogEvnt	BOOL	FALSE	Delete events in Log list
ReserveIn	WORD	–	Reserved

Output parameters

Table A- 9 SSStat output parameters

Parameter	Data format	Default setting	Meaning
RackFAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Rack Failure
ModFAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Module Failure
GrpErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Group error is active
RdErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Error read record
WrErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Error write record
RdWrAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Enable read / write record
RdErrStat	WORD	16#00	Status of read record error
WrErrStat	WORD	16#00	Status of write record
LocalAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Motor in Local Operation Mode: Local Mode Indicator
OnAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	On Mode is active
OosAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Out of service is active
EffPwr	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective calculated power in KW
TotlEnrg	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Total energy consumed in KWh

Parameter	Data format	Default setting	Meaning
InstEnrg	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Instant energy consumed in KWh
D_OpH	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Device operating hours
M_OpH	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Motor operating hours
N_OvlTrp	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	Number of overload trips
N_CntTrp	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	Number of contact block overload trips
N_StCw	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	Number of motor starts CW
N_StCcw	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	Number of motor starts CCW
N_BrkStp	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	No. of braking Stops
Output1	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	Number of starts – output1
Output2	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	Number of starts – output2
Output3	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	Number of starts – output3
Output4	STRUCT • Value: DINT • ST: BYTE	– • 0 • 16#80	Number of starts – output4

Parameter	Data format	Default setting	Meaning
ImMax	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Motor current Imax in %
ImMaxE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective motor current Imax
Trg_I	STRUCT • Value:REAL • ST: BYTE	– • 0.0 • 16#80	Last trigger current IA in %
Trg_IE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective last trigger current IA
OphIl18	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Operating hours motor current = 18...49.9% x Ie (max.)
OphIl50	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Operating hours motor current = 50...89.9% x Ie (max.)
OphIl90	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Operating hours motor current = 90...1199.9% x Ie (max.)
OphIl120	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Operating hours motor current = 120...1000% x Ie (max.)
S_OpHMp	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Device operating hours: Maximum Pointer
HtSkTmpMax	STRUCT • Value: INT • ST: BYTE	– • 0 • 16#80	Max. heat sink temperature
CntBlkMp	STRUCT • Value: INT • ST: BYTE	– • 0 • 16#80	Max. contact block heating
N_OvlTrpMp	STRUCT • Value: INT • ST: BYTE	– • 0 • 16#80	Number of motor overload trips (motor protection, temperature sensor, blocking)

Parameter	Data format	Default setting	Meaning
VoltMin	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Minimum electronic supply voltage
VoltMax	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum electronic supply voltage
LFreqMin	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Minimum line frequency
LFreqMax	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum Line frequency
Ul1l2Min	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Min. effective phase-to-phase voltage UL1-L2
Ul2l3Min	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Min. effective phase-to-phase voltage UL2-L3
Ul3l1Min	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Min. effective phase-to-phase voltage UL3-L1
Ul1l2Max	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Max. effective phase-to-phase voltage UL1-L2
Ul2l3Max	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Max. effective phase-to-phase voltage UL2-L3
Ul3l1Max	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Max. effective phase-to-phase voltage UL3-L1
CurrL1Min	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Minimum phase current IL1 in %
CurrL2Min	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Minimum phase current IL2 in %

Parameter	Data format	Default setting	Meaning
CurrL3Min	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Minimum phase current IL3 in %
CurrL1Max	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum phase current IL1 in %
CurrL2Max	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum phase current IL2 in %
CurrL3Max	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum Phase current IL3 in %
CurrL1MinE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Minimum effective phase current IL1
CurrL2MinE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Minimum effective phase current IL2
CurrL3MinE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Minimum effective phase current IL3
CurrL1MaxE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum effective phase current IL1
CurrL2MaxE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum effective phase current IL2
CurrL3MaxE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum effective phase current IL3
IlTrpMx	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Maximum tripping current in %
IlTrpMxE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Effective maximum tripping current

Parameter	Data format	Default setting	Meaning
OhIl18Mp	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Maximum pointer: Operating hours motor current = 18...49.9% x Ie (max.)
OhIl50Mp	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Maximum pointer: Operating hours motor current = 50...89.9% x Ie (max.)
OhIl90Mp	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Maximum pointer: Operating hours motor current = 90...119.9% x Ie (max.)
OhIl120Mp	STRUCT • Value: DWORD • ST: BYTE	– • 16#00 • 16#80	Maximum pointer: Operating hours motor current = 120...1000% x Ie (max.)
OS_PermOut	DWORD	16#FFFFFFFF	Operator Permission: Output for OS
OS_PermLog	DWORD	16#FFFFFFFF	Operator Permission: Output for OS
OpSt_Out	DWORD	16#00	Enabled operator stations
ST_Worst	BYTE	16#80	Worst Signal Status
Status1	DWORD	16#00000000	Status 1 information
ErrorNum	INT	-1	Error Number
MsgErr1	BOOL	FALSE	1 = Messaging Error Occurs
MsgStat1	WORD	16#00	ALARM_8P: Status Output
MsgAckn1	WORD	16#00	ALARM_8P: ACK_STATE Output
LogId1 ... LogId21	INT	–	Message ID number 1 to 21
LogTm1 ... LogTm21	DWORD	16#00	Time stamp 1 to 21
LogDs	INT	–	Logging set
ReserveOut	WORD	–	Reserved

A.5 SSOprtn block parameters

Input parameters

Table A- 10 SSOprtn input parameters

Parameter	Data format	Default setting	Meaning
Mode	DWORD	16#8000FFFF	OMODE information from MOD_SWT block
DAddr	INT	0	Diagnostic address of Soft Starter module
LAddr	INT	0	Logical address of Soft Starter module
Slv_Typ	BOOL	0	0 = PROFIBUS 1 = PROFINET
RackF	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Rack failure information from SSDiag block
ModF	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Module failure information from SSDiag block
RdWrEn	BOOL	TRUE	1 = Enable read / write record
RdDataLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Input 0->1: Read record via Link or SFC
RdDataOp	BOOL	FALSE	1 = Read data from datasets
DiagOprtn	SSDIAGOPRTN (Page 132)		Diagnostic information from SSDiag block
PZDIn01	WORD	16#00	Process value DP 0.0-1.7
PZDOut01	WORD	16#00	Process image output
ModLiOp	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Input to Auto/Manual commands: 0 = Manual 1 = Link/Auto
AutModOp	BOOL	FALSE	1 = Auto Mode: Auto Mode by Operator
ManModOp	BOOL	TRUE	1 = Manual Mode: Manual Mode by Operator
AutModLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Auto Mode: Auto Mode by Linked or SFC
ManModLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Manual Mode: Manual Mode by Linked or SFC
OosOp	BOOL	FALSE	1 = Oos Mode: Oos Mode by Operator

Parameter	Data format	Default setting	Meaning
OosLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Oos Mode: Oos Mode by Field Signal
TrpRstLi	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Trip Reset Active, by Linked or SFC
TrpRstOp	BOOL	FALSE	1 = Trip Reset Active, Manual Mode Command
RdyToRst	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Ready to trip reset active
EmrgStMan	BOOL	FALSE	1 = Emergency Start Active, Manual Mode Command
EmrgStAut	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Emergency Start Active, Auto Mode Command
SlSpdMan	BOOL	FALSE	1 = Slow speed Active, Manual Mode Command
SlSpdAut	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Slow speed Active, Auto Mode Command
RevMan	BOOL	FALSE	1 = Reverse command to MotRevL block, Manual Mode Command
Out1Man	BOOL	FALSE	1 = Output1 Active, Manual Mode Command
Out1Aut	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Output1 Active, Auto Mode Command
Out2Man	BOOL	FALSE	1 = Output2 Active, Manual Mode Command
Out2Aut	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Output2 Active, Auto Mode Command
DsQkSpMan	BOOL	FALSE	1 = Disable quick stop Active, Manual Mode Command
DsQkSpAut	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Disable quick stop Active, Auto Mode Command
ParaSet	INT	1	Parameter Set Active
PS1CurHi	STRUCT • Value: REAL • ST: BYTE	– • 112.50 • 16#80	Para. Set1: Current: H limit (warning/tripping)

Parameter	Data format	Default setting	Meaning
PS1CurLo	STRUCT • Value: REAL • ST: BYTE	– • 18.75 • 16#80	Para. Set1: Current: L limit (warning/tripping)
PS2CurHi	STRUCT • Value: REAL • ST: BYTE	– • 112.50 • 16#80	Para. Set2: Current: H limit (warning/tripping)
PS2CurLo	STRUCT • Value: REAL • ST: BYTE	– • 18.75 • 16#80	Para. Set2: Current: L limit (warning/tripping)
PS3CurHi	STRUCT • Value: REAL • ST: BYTE	– • 112.50 • 16#80	Para. Set3: Current: H limit (warning/tripping)
PS3CurLo	STRUCT • Value: REAL • ST: BYTE	– • 18.75 • 16#80	Para. Set3: Current: L limit (warning/tripping)
SubValue	WORD	16#00	Substitute Value on Response to CPU/master stop
CSF	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Control System Fault Message - External Fault
BatchEn	BOOL	FALSE	Enable Remote Operation of Controller by Batch Recipe
BatchID	DWORD	16#00	Current Batch ID (number)
BatchName	STRING[32]	–	Current Batch Name
StepNo	DWORD	16#00	Batch Step Number
Occupied	BOOL	FALSE	Occupied by Batch
MsgLock	STRUCT • Value: BOOL • ST: BYTE	FALSE	Inhibit process message
RunUpCyc	INT	3	Number of cycles for which all messages are suppressed
PS1_OpScale	STRUCT • High: REAL • Low: REAL	– • 400.0 • 18.75	Parameter set 1 Op_scale
PS2_OpScale	STRUCT • High: REAL • Low: REAL	– • 400.0 • 18.75	Parameter set 2 Op_scale
PS3_OpScale	STRUCT • High: REAL • Low: REAL	– • 400.0 • 18.75	Parameter set 3 Op_scale

Parameter	Data format	Default setting	Meaning
MsgEvId	DWORD	16#00	Message Event ID
ExtMsg1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 1
ExtMsg2	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 2
ExtMsg3	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 3
ExtMsg4	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 4
ExtMsg5	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 5
ExtVal04	ANY	–	External Value 4
ExtVal05	ANY	–	External Value 5
ExtVa106	ANY	–	External Value 6
ExtVal07	ANY	–	External Value 7
ExtVal08	ANY	–	External Value 8
ExtVal09	ANY	–	External Value 9
ExtVal10	ANY	–	External Value 10
SelFp1	ANY	–	Select Faceplate 1
SelFp2	ANY	–	Select Faceplate 2
OS_Perm	STRUCT • Bit 0: BOOL • ... • Bit 31: BOOL	– • 1 • 1 • 1	Operator Permissions
OpSt_In	DWORD	16#0	Enabled operator stations
Feature	STRUCT • Bit 0: BOOL • ... • Bit 31: BOOL	– • 0 • 0 • 0	Status of various features
ReserveIn	WORD	–	Reserved

Output parameters

Table A- 11 SSOprtn output parameters

Parameter	Data format	Default setting	Meaning
RackFAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Rack Failure
ModFAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Module Failure
GrpErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Group error is active
RdErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Error read record
WrErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Error write record
RdWrAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Operator enabled for read / write record
RdDataOut	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Triggers Read operation of diagnostic data at SSDiag
RdErrStat	WORD	16#00	Status of read record error
WrErrStat	WORD	16#00	Status of write record error
LocalAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Local mode on
AutAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Auto: Automatic Mode Indicator
ManAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Manual Mode is active
OutIn01	WORD	16#00	Process Image Input `PZDIn01`
OosAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Out of service is active

Parameter	Data format	Default setting	Meaning
SubAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value is active
SubFwd	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Motor CW active
SubRev	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Motor CCW active
SubTrpRt	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Trip Reset
SubEmgSt	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Emergency start
SubSlSpd	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Slow speed
SubOut1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Output 1 active
SubOut2	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Output 2 active
SubPBit0	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Parameter set bit 0
SubPBit1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Parameter set bit 1
SubDQkSp	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Substitute value Disable quick stop
MotorOn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Motor running status active (PII Bit 0.1 status)

Parameter	Data format	Default setting	Meaning
TrpRstOn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Trip Reset
EmrgStOn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Emergency start
SlwSpdOn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Slow speed
RevManOn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Slow speed Reverse
Out1On	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Output 1 active
Out2On	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Output 2 active
PSBit0	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Parameter set bit 0
PSBit1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Parameter set bit 1
DsQkSpOn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Disable quick stop
DiagStn	DWORD	16#00	3RW44 PROFIBUS DP slave diagnostics
DiagCom1	DWORD	16#00	Communication and switching and controlling diagnostics
DiagCom2	DWORD	16#00	Communication and switching and controlling diagnostics
DiagPar	DWORD	16#00	Parameter diagnostics
DiagDev	DWORD	16#00	Device function diagnostics
FltPar	WORD	16#00	Diagnostic of faulty parameter number
RampOn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Ramp Operation Active

Parameter	Data format	Default setting	Meaning
GrpFlt	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Group fault
CSFlt	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Control system fault active
GrpWarn	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Group warning
OosAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Block is out of service
MotCurr	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Actual motor current (%)
MotCurrE	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Actual motor current in Amps
OS_PermOut	DWORD	16#FFFFFFFF	Operator Permission: Output for OS
OS_PermLog	DWORD	16#FFFFFFFF	Operator Permission: Output for OS
OpSt_Out	DWORD	16#0	Enabled operator stations
ST_Worst	BYTE	16#80	Worst Signal Status
Status1	DWORD	16#00000000	Status 1 Word
ErrorNum	INT	-1	Error Number
MsgErr1	BOOL	FALSE	1 = Messaging Error Occurs
MsgStat1	WORD	16#00	ALARM_8P: Status Output
MsgAckn1	WORD	16#00	ALARM_8P: ACK_STATE Output
ExtMsg1Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 1 Active
ExtMsg2Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 2 Active
ExtMsg3Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 3 Active
ExtMsg4Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 4 Active

Parameter	Data format	Default setting	Meaning
ExtMsg5Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	External Message 5 aAtive
ReserveOut	WORD	–	Reserved

Note

Note the following rules when assigning parameters:

- Maximum current limit > minimum current limit
- Maximum starting time ≥ starting time
- Limiting torque > start torque
- To select "DC braking", the "DC braking" function must be assigned to an output.
- Enter the parameter values of the parameter sets as multiples.

A.6 SSChn block parameters

Input parameters

Table A- 12 SSChn input parameters

Parameter	Data format	Default setting	Meaning
PZDIn1	WORD	16#00	Input word 1
MS_Release	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Maintenance release
MS	DWORD	0	Maintenance State
MS_Ext	DWORD	–	External Maintenance state
TextRef	WORD	0	Text reference external messages
FlutEn	BOOL	0	1 = Fluttersupress active
FlutTmIn	INT	0	Fluttersupress time
Stw1	WORD	16#00	Control word
Stw1ST	BYTE	16#00	Control word status
Fwd	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Run Forward
Rev	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Run Reverse
BrakeRel	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Brake Release
ResetTrip	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Clear last trip
StartEmrg	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Emergency start
StartTest	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Self test
LowSpeed	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Low speed

Parameter	Data format	Default setting	Meaning
Ctrl7	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Control Input 7
Out1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Output 1
Out2	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Output 2
ManSpec1	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Manufacturer specific command 1
ManSpec2	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Manufacturer specific command 2
ManSpec3	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Manufacturer specific command 3
ManSpec4	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Manufacturer specific command 4
ManSpec5	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Manufacturer specific command 5
ManSpec6	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Manufacturer specific command 6
IScale	STRUCT • High: REAL • Low: REAL	– • 100.0 • 0.0	Measurement End
IUnit	INT	1342	unit for the line measured current
Feature	STRUCT • Bit 0: BOOL • .... • Bit 31: BOOL	– • 0 • 0 • 0	Status of various features
ReserveIn	WORD	–	Reserved

Output parameters

Table A- 13 SSChn output parameters

Parameter	Data format	Default setting	Meaning
PZDOut1	WORD	16#00	Output word 1
Bad	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Invalid Process values
ErrorNum	INT	-1	Error number
ModErr	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Drive out of order
OosAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Out of service is active
OMS_Ext	DWORD	–	Reserved
Zsw1	WORD	–	Status word
FdkRdy	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Feedback Ready
FdkFwd	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Feedback of Control Forward
FdkRev	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Feedback of Control Reverse
ErrAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Internal device error
WarnAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	1 = Internal warning activated
In1Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Input 1 activated
In2Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Input 2 activated

Parameter	Data format	Default setting	Meaning
In3Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Input 3 activated
In4Act	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Input 4 activated
Imax	STRUCT • Value: REAL • ST: BYTE	– • 0.0 • 16#80	Actual current in %
FdkLocal	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Feedback Local Control
RampAct	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Ramping Activated
IScaleOut	STRUCT • High: REAL • Low: REAL	– • 100.0 • 0.0	Measurement End
IUnitOut	INT	0	unit for the line measured current
MS_Req	STRUCT • Value: BOOL • ST: BYTE	– • 0 • 16#80	Maintenance request
MS_Dev	DWORD	16#00	Maintenance State
ReserveOut	WORD	–	Reserved

Input and output parameters

Table A- 14 SSChn input and output parameters

Parameter	Data format	Default setting	Meaning
Mode	DWORD	16#00000030	Quality and Mode
DataXchg	DWORD	0	Data exchange

Technical data

B

B.1 Technical data

Table B- 1 Memory requirement, FB number, and called blocks, per block type

Name of block [1]	FB no. [2]	Length of block in the load memory, in bytes [3]	Length of block in the work memory, in bytes [3]	Length of instance data in the load memory, in bytes [4]	Length of instance data in the work memory, in bytes [4]	Temporary memory, in bytes [5]	Blocks called [6]
SSDiag	FB 1325	6840	5742	1296	430	442	SFB 35 SFB 52 SFB 54 FC 369 SFC 13 SFC 51 SFC 6 SFC 64
SSOprtn	FB 1326	17110	14584	3160	1150	232	SFB 35 SFB 52 SFB 53 SFB 54 FC 369 SFC 6 SFC 64
SSMeas	FB 1327	5416	4272	1664	672	84	SFB 35 SFB 52 FC 369 SFC 6
SSStat	FB 1328	25628	23398	3924	2308	94	SFB 35 SFB 52 SFB 53 FC 369 SFC 6 SFC 64
SSChn	FB 1329	3746	3088	756	208	74	SFC 6

1) The symbolic designator in the symbol table of the library for the respective function block (FB). It must be unique within the project.

2) Composed of the block type, e.g., FB for function block and the number.

3) Memory requirement of program code, once per block type

4) Memory requirement for an instance data block.

5) The memory required for the local data when the block is called in an execution level. This is limited according to the specific CPU. If this amount is exceeded, you must check the setting in the CPU configuration and redistribute it among the organization blocks based on the actual requirement.

6) The relevant driver block uses these blocks. They are now located in the user program. They are stored in the same library.

Abbreviations

C

C.1 Abbreviations

Table C- 1 Meaning of abbreviations

Abbreviation	Meaning
AS	Automation station
CFC	Continuous Function Chart
CCW	Counter-clockwise
CW	Clockwise
CSF	Control System Fault
DC	Direct-current voltage
DP	Distributed Peripherals
ES	Engineering system
FB	Function block
GSD	Generic Station Description
HW Config	"Hardware configuration" module in SIMATIC Manager
HMI	Human Machine Interface
ID	Identification number
OB	Organization block
OM	Object Manager
OoS	Out of Service
OS	Operator station
PCS 7	Process Control System 7
PIO	Process image output
PII	Process image input
PDM	Process Device Manager
PG	Programming device
PS	Parameter set
SFB	System function block
SFC	Sequential function chart
SS	Soft Starter
SSL	System status list
TIA	Totally Integrated Automation