<table>
<thead>
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<th>Page</th>
</tr>
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<td>6</td>
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**Industrial Controls**

PCS 7 Library Soft Starter 3RW44
"V6.2" / "V7.1" / "V8 Migration V8.0+SP2

Getting Started
Legal information

Warning notice system

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="DANGER" /></td>
<td>indicates that death or severe personal injury <strong>will</strong> result if proper precautions are not taken.</td>
</tr>
<tr>
<td><img src="image" alt="WARNING" /></td>
<td>indicates that death or severe personal injury <strong>may</strong> result if proper precautions are not taken.</td>
</tr>
<tr>
<td><img src="image" alt="CAUTION" /></td>
<td>indicates that minor personal injury can result if proper precautions are not taken.</td>
</tr>
<tr>
<td><img src="image" alt="NOTICE" /></td>
<td>indicates that property damage can result if proper precautions are not taken.</td>
</tr>
</tbody>
</table>

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

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

Proper use of Siemens products

Note the following:

| ![WARNING](image) | Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed. |

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Disclaimer of Liability

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

The Getting Started of the PCS 7 library for SIRIUS soft starter uses a simple example project to show you the basic procedures:

- Basic configuration steps
- Handling and monitoring different signal blocks
- Parameterization

This Getting Started serves as an introduction and largely dispenses with detailed information and background information.

Requirements

Basic knowledge of how to create a PCS 7 project. You can find information on creating a project in the following documents:

- For PCS 7 V6.1:
  "SIMATIC PCS 7 Process Control System V6.0 Getting Started - First Steps Documentation"

- For PCS 7 V7.0:
  "SIMATIC PCS 7 Process Control System V7.0 Getting Started - First Steps Documentation"

- For PCS 7 V7.1:
  "Process Control System PCS 7 Getting Started Part 1 (V7.1)"
  "Process Control System PCS 7 Getting Started Part 2 (V7.1)"

- For PCS 7 V8.0:
  "Process Control System PCS 7 Getting Started Part 1 (V8.0)"
  "Process Control System PCS 7 Getting Started Part 2 (V8.0)".

Conventions

This documentation contains designations of the software interface elements. If you have installed a multi-language package for the operating system, some of the designations will be displayed in the base language of the operating system after a language switch and will, therefore, differ from the designations used in this documentation.
Software required for the Getting Started of the PCS 7 block library for soft starters

- You can execute the example project on any PC or programming device on which the following software is installed:
  - Windows operating system
  - Internet Explorer
  - Message Queuing service
  - SQL server

**Note**

The versions required conform to the version of PCS 7 installed.

You can find further relevant details in the following manuals:

- "SIMATIC Process Control System PCS 7 PC Configuration and Authorization"
- "SIMATIC Process Control System PCS 7 V7.0 Released Modules"
- "SIMATIC Process Control System PCS 7 V6.1 Released Modules"
- SIMATIC Process Control System PCS 7 Released Modules (V7.1)
- SIMATIC Process Control System PCS 7 Released modules (V8.0)

- You create the PCS 7 project with the SIMATIC Manager.
  To create a project in PCS 7, follow the instructions in the documentation "Process Control System SIMATIC PCS 7 V6.0 Getting Started - First Steps Documentation" or "Process Control System SIMATIC PCS 7 V7.0 Getting Started - First Steps Documentation".
  For PCS 7 V7.1:
  "Process Control System PCS 7 Getting Started (V7.1)"
  For PCS 7 V8.0:
  "Process Control System PCS 7 Getting Started (V8.0)".

You can find these documents under Start > SIMATIC > Documentation > English.
## Hardware required for creating an example project

### Table 1-1 Soft Starter hardware

<table>
<thead>
<tr>
<th>Order number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3RW4422-1BC44</td>
<td>SIRIUS Soft Starter, values with 400 V, 40 DEG., Standard: 29 A, 15 KW, inside-delta circuit: 50 A, 22 KW, 200 ... 460 V AC, 230 V AC, screw terminals</td>
</tr>
<tr>
<td>3RW4900-0KC00</td>
<td>Communication board PROFIBUS for SIRIUS Soft Starter 3RW44 Note on the firmware version If the soft starter is operated as a DP slave following a Y link with a firmware version &lt;=”E03”, no DPV1 functionality is available. Firmware version &lt;=”E04” is required for DPV1 functionality following a Y link.</td>
</tr>
</tbody>
</table>

### Table 1-2 Hardware - Automation station 1: Configuration direct on the master system

<table>
<thead>
<tr>
<th>Order number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6ES7416-3XL04-0AB0</td>
<td>SIMATIC S7-400, CPU 416-3 central processing unit, e.g. with PROFIBUS DP interface</td>
</tr>
<tr>
<td>6ES7407-0KA01-0AA0</td>
<td>SIMATIC S7-400, Power Supply PS 407-10 A, UC 120 / 230 V, DC 5 V / 10 A</td>
</tr>
</tbody>
</table>

### Note

Creating a PCS 7 project

Create the PCS 7 project with the automation station (AS) hardware listed in the table above this note.

### Table 1-3 Hardware - Automation station 2: Configuration following a Y-link

<table>
<thead>
<tr>
<th>Order number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6ES7654-2PG67-0XC0</td>
<td>SIMATIC PCS 7 AS417-4-2H for H systems</td>
</tr>
<tr>
<td>6ES7407-0KR00-0AA0</td>
<td>SIMATIC S7-400, Power Supply PS 407, 10 A for redundant use</td>
</tr>
<tr>
<td>6ES7153-2BA82-0XB0</td>
<td>SIMATIC DP, INTERFACE DP/PA LINK and ET 200M IM153-2 HIGH FEATURE for H systems</td>
</tr>
<tr>
<td>6ES7197-1LB00-0XA0</td>
<td>SIMATIC S7, Y-coupler for building up a Y-link for redundant controllers</td>
</tr>
</tbody>
</table>
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. For more information, visit http://support.automation.siemens.com.
3.1 Introduction

This document explains the basic principles of using the Library Soft Starter 3RW44. The library contains a CFC template to fulfill the control function of a Soft Starter device.

For reducing configuration time on site, a module driver generator is included in this library. By using this driver generator, it is ensured that all necessary interconnections will be handled automatically by the system and the device is ready to operate in PCS 7 environment.

Custom configuration can be done by the user as well. User manual and online help will give detailed information about the blocks and their input and output pins.

Any manual changes done in the interconnections between the blocks can be reverted by running the driver generator again. This will reset all interconnections to initial state.

This document will guide you through the necessary steps for using the template and the module driver generator in a PCS 7 environment using a sample project. This example uses minimum hardware, single station, one PLC connected to one Soft Starter via PROFIBUS.
Getting Started

4.1 Installation

Setup program will guide you through the required steps. Use "< Back" and "Next >" buttons to navigate through the screens during the installation process. The installation program supports German and English. Please choose your language at the initial screen.

The Library Soft Starter 3RW44 has two components:

- **AS** = Components for Automation System
- **OS** = Components for Operator Station.

For example, this library has:

- 3RW44 Soft Starter PCS 7 Library V8 (AS) Migration V8.0 + SP2
- 3RW44 Soft Starter PCS 7 Library V8 (OS) Migration V8.0 + SP2.

Installation program will ask you to decide, which product you want to install. Please take a look at the decision matrix:

<table>
<thead>
<tr>
<th></th>
<th>AS</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Station</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Distributed System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering Station</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Operator Station</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

"X" – required, "." – not required.
Open HW-Config to retrieve the input and output addresses of the Soft Starter device.

Note down the addresses or enter them in symbol table for later usage.
4.3 CFC

Master data library

For using the library in a plant, it is recommended to store the Soft Starter template in the Master data library. Since this would be beyond the scope of this document, we recommend you to take a look at the "Process Control System PCS 7 CFC for SIMATIC S7 – Function manual".

With the template stored in the Master data library, proceed with the following steps.

CFC Template

1. Open CFC-Editor by double clicking on the desired CFC-Object.

2. Select the Libraries tab, located underneath the Catalog view. If the Soft Starter template is placed in the Master data library, you will find it in the project library folder (Notation: "Project Name"+_Lib" e.g.: GS_SoSt_Lib). Otherwise you will find the Soft Starter Template in the Soft Starter Library (e.g.: PCS7_SS_Lib_V8_Mig_SP2).
3. Expand the Master data library node GS_SoSt_Lib. You will find two nodes:
   - Blocks
   - Charts

4. Expand the Charts node. The SoftStarter template is present.

5. Drag the SoftStarter object by pressing left mouse button and drop the object in the Chart view. SoftStarter template is now instantiated.
Open the Template

1. Right click on the instantiated SoftStarter template in the chart view and select Open. The template opens in a new chart view.
Set I/O

Input

1. Scroll to the left, till you see the sheet bar. There you will find a textual interconnection named "Input WORD address of Soft Starter Module (IW x)".

Now you have two options:

– Setting the HW input address manually, as seen in HW-Config
– Use symbol table for selecting the input address.

Since this is a short example, we will just hand over the device input address as it is displayed in HW-Config. We recommend using the symbol table for large projects. Please refer to “SIMATIC Process Control System PCS 7 Engineering System”.

2. Right click on "Input WORD address of Soft Starter Module (IW x)" and select Interconnection to Address. A symbol table like dialog opens.
3. Enter input address, in this case: IW0.

4. Confirm input value by pressing enter. Now the blocks input address is connected to the devices input address.

Output

1. Please note the following label in the CFC-Template. This is a reminder that you need to wire the output address of the Soft Starter device manually.

   Wire OUT_01 parameter to Output WORD address of Soft starter (QW x)

2. Right click on output pin OUT_01 of block SS_DIR and select “Interconnection to Address...”
3. A dialog similar ri the input address opens. Enter output address, in this case: QW0.

4. Confirm value by pressing enter. Now the blocks output address is connected to the devices output address.

   Block set up is now complete.

**Generate module drivers**

1. Go to Chart > Compile > Chart as Program or hit Ctrl+B or click in the toolbar. Compile dialog opens.

2. Ensure that the option Generate module drivers is checked in. Confirm dialog with the OK-Button.

3. After compilation has finished, Logs dialog will be displayed. Confirm this dialog by the Close button.

4. Now hit F5 in the chart view. The view will be updated and all textual interconnections are replaced by the according block interconnection.
Note

Manual changes in the interconnections are reverted by generating the module drivers after the changes took place. Deactivate Generate module drivers if you want to keep your changes.

Download

The CFC-Template is now ready for download.
Go to CPU > Download or hit CTRL+L or use in the toolbar.
Template set up is now complete and ready to use.
4.4 Operator Station

Operator Station

Block icons and faceplates are inserted in the project while compiling the Operator Station (OS). Ensure OS is compiled.

Refer the "SIMATIC Process Control System PCS 7 Operator Station" manual for working on Operator Station.

Block Icons

After activating WinCC you will find three block icons for the Soft Starter device:

The block icons in detail are:

<table>
<thead>
<tr>
<th>SSDIR</th>
<th>SSMEAS</th>
<th>SSSTAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Soft Starter</td>
<td>Measurement values</td>
<td>Statistic values</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The block icons give a general feedback of the current device status to the user. You can find the detailed information about the device in the faceplate.
Faceplates

Faceplates of the block icons:

SSDIR:

SSMEAS:
SSSTAT:

Faceplate-Views

Each faceplate provides multiple views:

<table>
<thead>
<tr>
<th>SS DIR</th>
<th>SS MEAS</th>
<th>SS STAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td>Limits</td>
<td>Standard 2</td>
<td>Max Pointer</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Protection diag</td>
<td></td>
</tr>
<tr>
<td>Process image</td>
<td>Alarm</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Trend</td>
<td></td>
</tr>
<tr>
<td>Parameter set1</td>
<td>Batch</td>
<td></td>
</tr>
<tr>
<td>Parameter set2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter set3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Station diag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control diag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Device diag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter diag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logbook</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Batch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trend</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
You can switch between the single views by using the view selector dropdown menu.

![View selector dropdown menu](image)

Button **Open loop** (located next to the view selector dropdown menu) opens all views of the block within one faceplate.

![Faceplates](image)

Faceplates may be pinned or unpinned to the screen according to the demands of the user. Further information on how to use the faceplates can be found in the online help or the user manual provided for this library.

**Deactivate block icons**

If you do not need a block icon for every block, you can deactivate it.

1. Open CFC-Editor.
2. Select the desired block.
3. Right click and select Object properties in the context menu.

4. Uncheck the check box for Create block icon.
5. Confirm the Properties dialog by clicking OK.

6. Compile and download the CFC, if not yet done.

7. Compile the OS and activate WinCC. The block icon (e.g.: SSMEAS) is not visible anymore.
Getting Started

4.4 Operator Station
More information

Additional information can be found as follows:

- For PCS 7 V6.1:
  "SIMATIC PCS 7 Process Control System V6.0 Getting Started - First Steps Documentation"

- For PCS 7 V7.0:
  "SIMATIC PCS 7 Process Control System V7.0 Getting Started - First Steps Documentation"

- For PCS 7 V7.1:
  "Process Control System PCS 7 Getting Started Part 1 (V7.1)"
  "Process Control System PCS 7 Getting Started Part 2 (V7.1)"

- Programming and Operating Manual: "PCS 7 Library Soft Starter 3RW44 "V6.2" / "V7.1"/ "V8 Migration V8.0+SP2."

List of Abbreviations

6.1 Abbreviations

Overview

Table 6-1 Meaning of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>Automation station</td>
</tr>
<tr>
<td>CFC</td>
<td>Continuous Function Chart</td>
</tr>
<tr>
<td>GSD</td>
<td>Generic Station Description</td>
</tr>
<tr>
<td>HMI</td>
<td>Human machine interface</td>
</tr>
<tr>
<td>HW Config</td>
<td>&quot;Hardware configuration&quot; module in the SIMATIC Manager</td>
</tr>
<tr>
<td>OS</td>
<td>Operator station</td>
</tr>
<tr>
<td>PCS 7</td>
<td>Process Control System 7</td>
</tr>
<tr>
<td>CPU</td>
<td>Central Processing Unit</td>
</tr>
<tr>
<td>SS</td>
<td>Soft starter</td>
</tr>
</tbody>
</table>
6.1 Abbreviations