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APPLICATION EXAMPLE

Redundant process data transmission with the SIMATIC PN/PN Coupler, driver library, and SIMATIC PCS 7

PCS 7 V9.1

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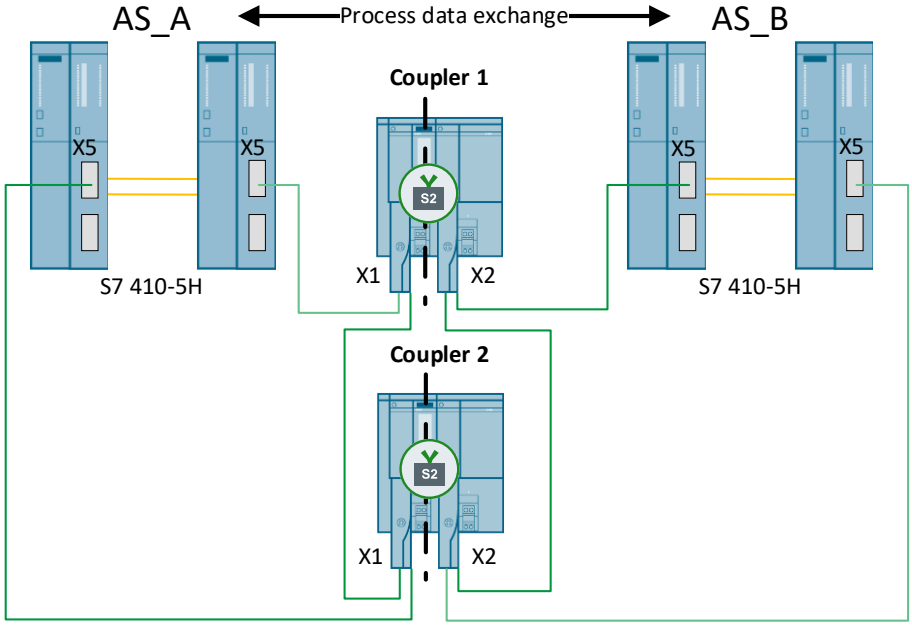
1 Introduction

1.1 Overview

Since the PCS 7 Version 9.0 SP2 Update Collection 1, the SIMATIC PN/PN Coupler can be used to exchange process data between two automation systems. The PCS 7 library "PCS 7 PN/PN PN/MF Coupler Software" (9LA1110-6CG20-0AA0) which is used in this application example can be used for PCS 7 V9.3 or higher.

Given two fault-tolerant programmable controllers, a singular SIMATIC PN/PN Coupler represents a single point of failure. In this case it is recommended to redundantly design the SIMATIC PN/PN Coupler as shown in Figure 1-1 to ensure fault-tolerant exchange of process data.

Figure 1-1



In this application example you will learn how process data are exchanged redundantly via two separate SIMATIC PN/PN Couplers, and which technical specifications must be considered.

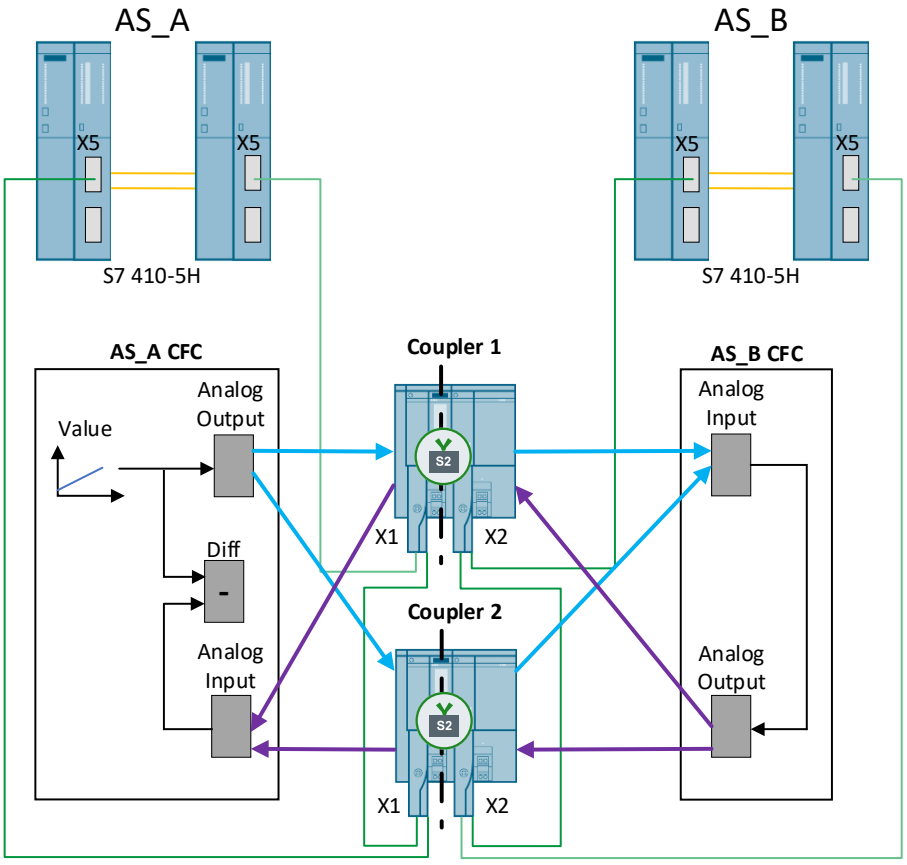
1.2 Principle of operation

The PN/PN Coupler is one way of exchanging data over the fieldbus. One advantage is the galvanic isolation between the X1 and X2 interfaces. The isolation is required to guarantee I-Device functionalities. A PN/PN Coupler is the only approved method of communicating between two CPUs with the fieldbus The X1 and X2 ports represent two separate PROFINET devices, each of which can be connected with S2 system redundancy (possible with firmware version V4.2 onward).

A PN/PN Coupler maintains constant communication with the connected IO controllers. If data has already been made available for reading on one side of the interfaces, the data will be deleted at the start of the cycle. Transmission only occurs when both sides of the Coupler communicate with the IO controllers.

With S2 system redundancy, 988 BYTE input data and 988 BYTE output data can be communicated. It is not possible to saturate the complete address range of 1000 BYTES, since 12 BYTES are required for internal communication between the X1 and X2 ports. Accordingly, the configuration used in this application example allows for 196 analog data records to be transmitted.

Figure 1-2



To safeguard the single point of failure in redundant process data exchange between the two fault-tolerant controllers "AS_A" and "AS_B", two separate SIMATIC PN/PN Couplers, "Coupler 1" and "Coupler 2", are utilized (Figure 1-2). The analog value signal generated in "AS_A" is sent to both Couplers by an output module in the "AS_A" CFC. The Couplers send the signals to a CFC chart in "AS_B". This is accomplished through processing of the redundant values, whereby the signal with the signal status "Good" / the defined master signal is always the signal that is used. The light blue arrows in Figure 1-2 show data value transmission via both Couplers from "AS_A" to "AS_B". The purple arrows show how data are sent from "AS_B" to "AS_A" according to the same principle. IO data are continuously updated via the process image of the inputs and outputs.

1.3 Used components

The following hardware and software components were used to create this application example:

Table 1-1

Components	Quantity	Item number	Note
SIMATIC PN/PN Coupler	2	6ES7158-3AD10-0XA0	Firmware version 4.2.1
SIMATIC PCS 7 CPU410-5H	4	6ES7410-5HX08-0AB0	Firmware version 8.2.2
PCS 7 PN/PN PN/MF Coupler Software	1	9LA1110-6CG20-0AA0	Lib_PCS7_PNPN_Coupler_V11

Document creation

Screenshots were taken with PCS 7 V9.1.

Applicability

This document is valid for SIMATIC PCS 7 V9.1.

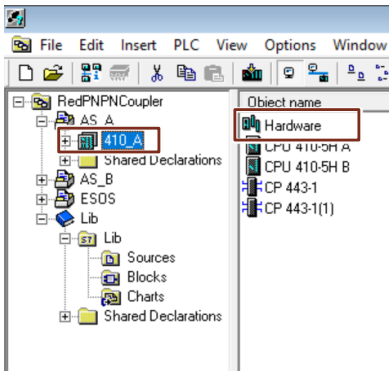
2 Hardware integration and symbol table

2.1 Hardware integration of the PN/PN Coupler

2.1.1 Hardware configuration of the PN/PN Coupler in AS_A

1. Open the hardware configuration of PC station A in the component view.

   Figure 2-1

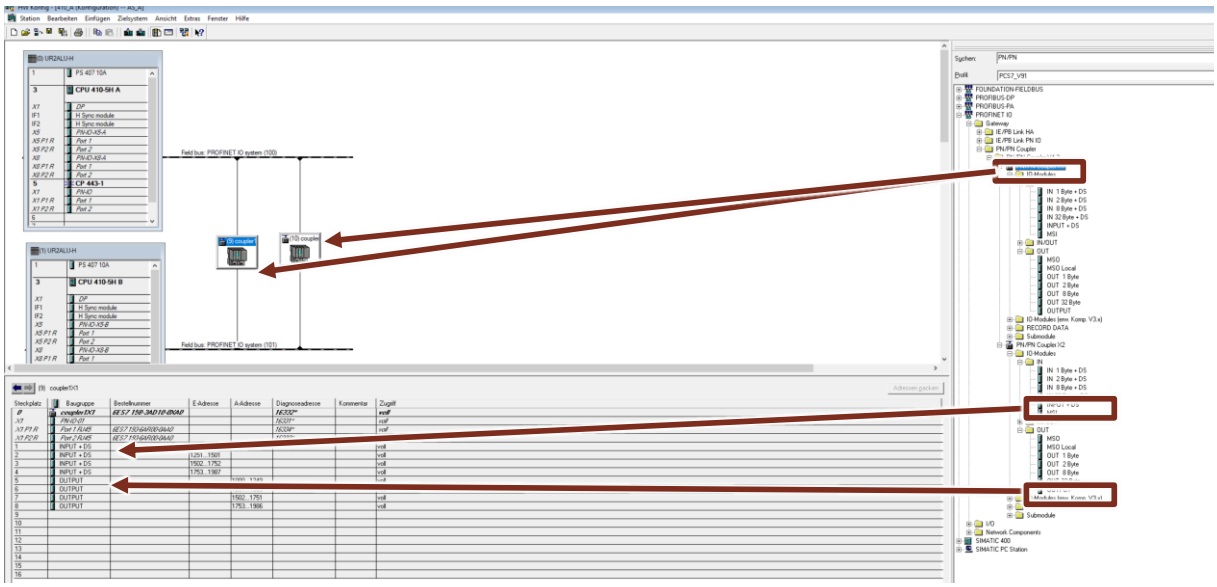


2. Integrate two X1 PN/PN Couplers into your PROFINET system from the side navigation pane. To do this, drag and drop a PN/PN Coupler to a "PN-IO-X8" interface. Since both interfaces need to be in the same network, a connection is automatically created between the interfaces and the Couplers.

Note

It is important that the hardware is based on the correct GSDML file. In case of the wrong GSDML file, the driver wizard does not proceed with the call up of the diagnostic blocks and interconnections of the parameter. The supported GSDML files can be found in the manual of “PCS 7 PN/PN PN/MF Coupler Software” Library.

Figure 2-2



3. To transmit 196 data records, 8 modules must be added to the configuration of the PN/PN Couplers from the navigation pane. Integrate them into the modules listed.

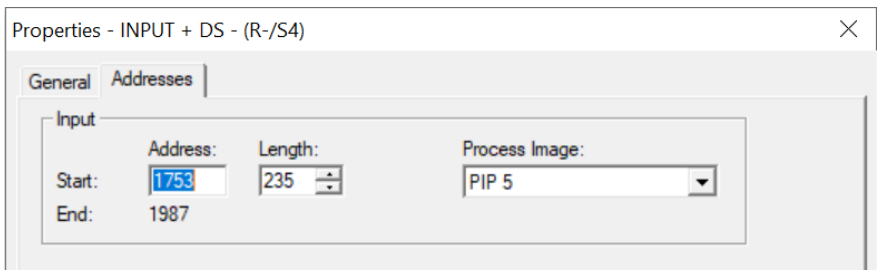
Figure 2-3 "Coupler1X1" hardware configuration

(9) coupler1X1

Steckplatz	Baugruppe	Bestellnummer	E-Adresse	A-Adresse	Diagnoseadresse	Kommentar	Zugriff
0	*coupler1X1*	*6ES7 158-3AD10-0XA0*			*16332**		*voll*
X1	*PN-IO-01*				*16331**		*voll*
X1 P1 R	*Port 1 RJ45*	*6ES7 193-6AR00-0AA0*			*16334**		*voll*
X1 P2 R	*Port 2 RJ45*	*6ES7 193-6AR00-0AA0*			*16333**		*voll*
1	INPUT + DS		1000...1250				voll
2	INPUT + DS		1251...1501				voll
3	INPUT + DS		1502...1752				voll
4	INPUT + DS		1753...1987				voll
5	OUTPUT			1000...1249			voll
6	OUTPUT			1251...1500			voll
7	OUTPUT			1502...1751			voll
8	OUTPUT			1753...1986			voll
9							
10							
11							
12							
13							
14							
15							
16							

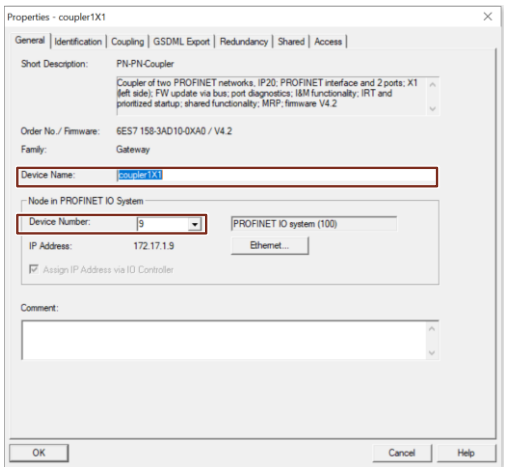
4. Adapt the input and output addresses to match the modules you inserted. To do this, double-click on the modules and change to the "Addresses" tab. The corresponding addresses can be found in Figure 2-3.

Figure 2-4



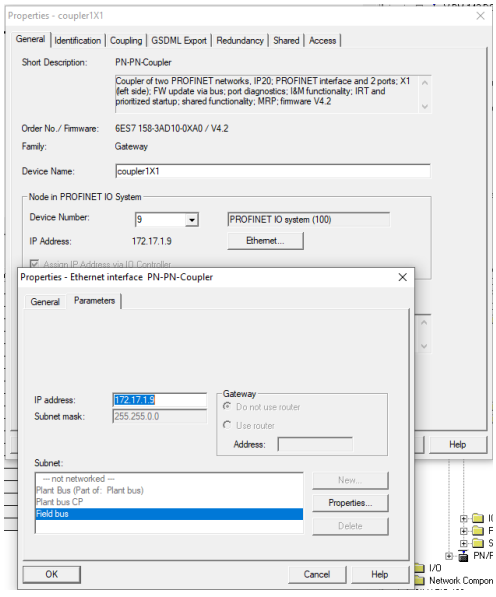
5. Open the device settings of the Coupler and enter the desired device names in the "General" tab. Here we enter the name "Coupler1X1".

Figure 2-5



6. In the "General" tab, modify the PROFINET device address of the X1 Coupler. It must be the same between the hardware configuration of AS_A and the configuration of AS_B, the X2 Coupler.
7. Open the "Ethernet..." sub-tab in the "General" tab, then modify the IP address of the Coupler. This view also allows you to change the network assignment.

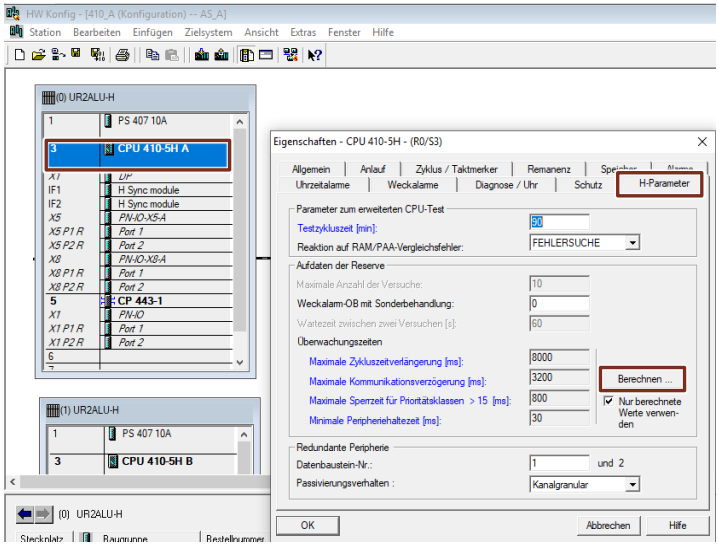
Figure 2-6



8. Close the tab by clicking "OK" when you are done.
9. Click "OK" to close the object properties.

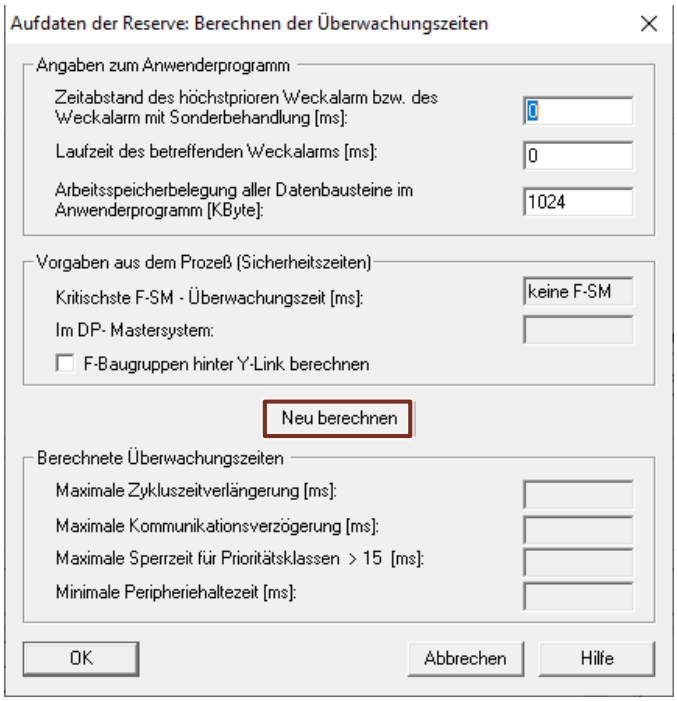
10. In order to compile the hardware configuration, the H parameters of the CPU must be recalculated. Open the object properties of the master CPU and change to the "H parameters" tab. Open the "Calculate..." sub-tab.

Figure 2-7



11. Change the figures to fit your user program. Recalculate the parameters. Click the "Recalculate" button. Then click on "OK" to close the sub-menu.

Figure 2-8



12. Click "OK" to close the object properties.

13. Perform Steps 3 through 12 again for your redundant Coupler. Refer to Figure 2-9 for the appropriate modules, input and output addresses, and the device name "Coupler2X1".

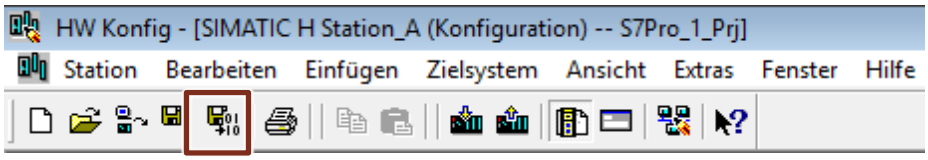
Figure 2-9 "Coupler2X1" hardware configuration

(10) coupler2X1

Slot	Module	Order Number	I Address	Q Address	Diagnostic Address	Comment	Access
0	*coupler2X1*	*6ES7 158-3AD10-0XA0*			*16328**		*Full*
X1	*PN-IO-01*				*16327**		*Full*
X1 P1 R	*Port 1 RJ45*	*6ES7 193-6AR00-0AA0*			*16330**		*Full*
X1 P2 R	*Port 2 RJ45*	*6ES7 193-6AR00-0AA0*			*16329**		*Full*
1	INPUT + DS		2000...2250				Full
2	INPUT + DS		2251...2501				Full
3	INPUT + DS		2502...2752				Full
4	INPUT + DS		2753...2987				Full
5	OUTPUT			2000...2249			Full
6	OUTPUT			2251...2500			Full
7	OUTPUT			2502...2751			Full
8	OUTPUT			2753...2986			Full
9							
10							
11							
12							
13							
14							
15							
16							

14. Save and compile the hardware configuration.

Figure 2-10

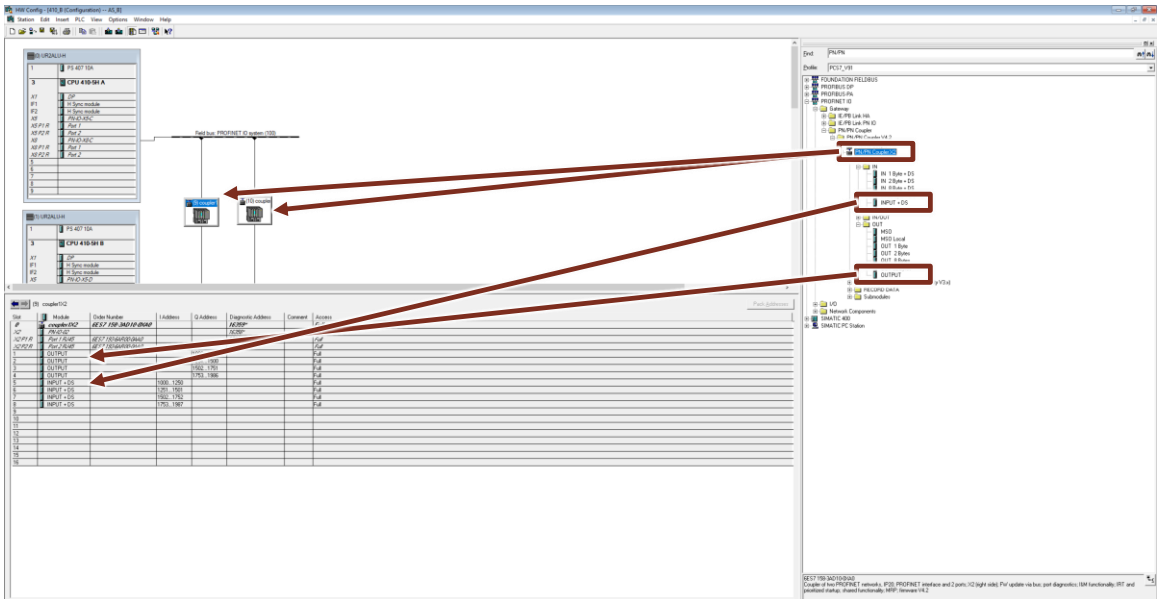


2.1.2 Hardware integration of the PN/PN Coupler in AS_B

Integration of the PN/PN Coupler into the hardware configuration of AS_B works in much the same way as the integration into the HW Config of AS_A (see 2.1.1 Hardware configuration of the PN/PN Coupler in AS_A). This chapter describes the points where the configuration differs.

1. Integrate two PN/PN Couplers as described in Steps 1 and 2 in chapter 2.1.1 Hardware configuration of the PN/PN Coupler in AS_A. Drag and drop 2 X2 PN/PN Couplers (instead of X1) into your PROFINET system.

Figure 2-11



2. Parameterize the Couplers as described in Steps 3 through 14 in chapter 2.1.1 Hardware configuration of the PN/PN Coupler in AS_A. Refer to the Figure 2-12 and Figure 2-13 for the correct modules and input and output addresses of the Couplers.

Note

It is important that the hardware is based on the correct GSDML file. In case of the wrong GSDML file, the driver wizard does not proceed with the call up of the diagnostic blocks and interconnections of the parameter. The supported GSDML files can be found in the manual of "PCS 7 PN/PN PN/MF Coupler Software" Library.

Figure 2-12 "Coupler1X2" hardware configuration

(9) coupler1X2

Slot	Module	Order Number	I Address	Q Address	Diagnostic Address	Comment	Access
0	*coupler1X2*	*6ES7 158-3AD10-0XA0*			*16359*		*Full*
X2	*PN-IO-02*				*16358*		*Full*
X2 P1 R	*Port 1 RJ45*	*6ES7 193-6AR00-0AA0*			*16361*		*Full*
X2 P2 R	*Port 2 RJ45*	*6ES7 193-6AR00-0AA0*			*16360*		*Full*
1	OUTPUT			1000...1249			Full
2	OUTPUT			1251...1500			Full
3	OUTPUT			1502...1751			Full
4	OUTPUT			1753...1986			Full
5	INPUT + DS		1000...1250				Full
6	INPUT + DS		1251...1501				Full
7	INPUT + DS		1502...1752				Full
8	INPUT + DS		1753...1987				Full
9							
10							
11							
12							
13							
14							
15							
16							

Note

Slot allocation from one IO device to the other IO device (coupling partner) must be done on a 1-to-1 basis (e.g. slot 3 left bus side = slot 3 right bus side).

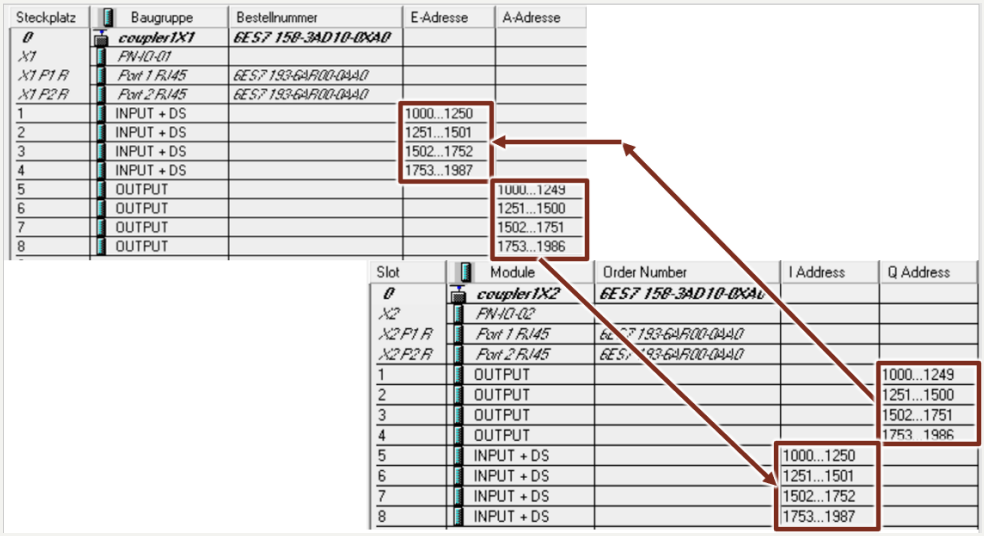


Figure 2-13 "Coupler2X2" hardware configuration

(10) coupler2X2

Slot	Module	Order Number	I Address	Q Address	Diagnostic Address	Comment	Access
0	coupler2X2	6ES7 158-3AD10-0XA0			16355*		Full
X2	PN-IO-02				16354*		Full
X2 P1 R	Port 1 RJ45	6ES7 193-6AR00-0AA0			16357*		Full
X2 P2 R	Port 2 RJ45	6ES7 193-6AR00-0AA0			16356*		Full
1	OUTPUT			2000...2249			Full
2	OUTPUT			2251...2500			Full
3	OUTPUT			2502...2751			Full
4	OUTPUT			2753...2986			Full
5	INPUT + DS		2000...2250				Full
6	INPUT + DS		2251...2501				Full
7	INPUT + DS		2502...2752				Full
8	INPUT + DS		2753...2987				Full
9							
10							
11							
12							
13							
14							
15							
16							

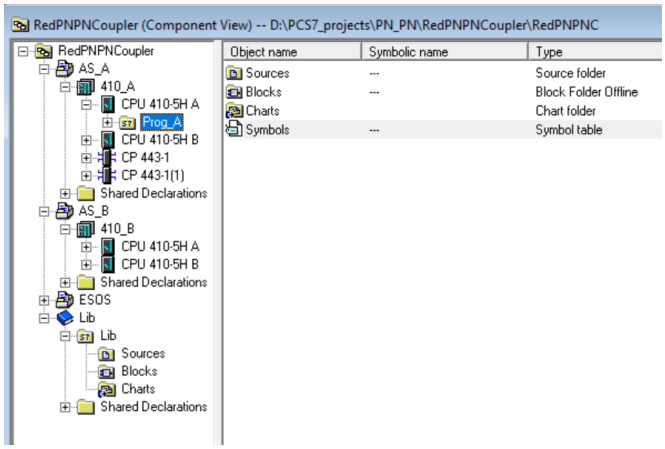
2.2 Symbol table

The symbol table contains symbols for communicating with the hardware. The input and output addresses listed for the Coupler modules in chapter 2.1 must be in the symbol table. These addresses are necessary for communication between the CPUs via the Coupler. They contain all transmitted signals. The symbol table must have the same input and output addresses on the PLCs that are communicating. The symbol table should be configured in the same manner as with an ordinary distributed I/O system.

2.2.1 Configure the symbol table

1. Open the symbol table for AS_A in the component view.

Figure 2-14



2. Instance the input and output addresses of the redundant Couplers (see Table 2-1).

Table 2-1

Symbol	Data type	Address range	Steps	Comment
PVIn_xxx	REAL	ID 1000...1978	1000; 1005...1978	Process value input (Coupler 1)
PVInSL_xxx	REAL	ID 2000...2978	2000; 2005...1978	Process value input (Coupler 2)
STIn_xxx	BYTE	IB 1000...1982	1004; 1009...1982	Status byte of the input data records - Last BYTE of a PVIn_xxx (REAL) -> 5. BYTE
STInSL_xxx	BYTE	IB 2000...2982	2004;2009...2982	Status byte of the input data records (device) - Last BYTE of a PVInSl_xxx (REAL) -> 5. BYTE
STSLx_X1	BYTE	IB 1250;1501; 1752;1987	-	Status bytes of the Coupler modules (INPUT + **DR**) - Last byte of the respective address range
STSLx_X2	BYTE	IB 2250;2501; 2752;2987	-	Status bytes of the Coupler modules (INPUT + **DR**) (device) - Last byte of the respective address range
PVOut_xxx	REAL	QD 1000...1978	1000; 1005...1978	Process value output
PVOutSL_xxx	REAL	QD 2000...2978	2000; 2005...1978	Process value output (device)
STOut_xxx	BYTE	QB 1000...1982	1004; 1009...1982	Status byte of the output data records - Last BYTE of a PVOut_xxx (REAL) -> 5. BYTE
STOutSL_xxx	BYTE	QB 2000...2982	2004; 2009...2982	Status byte of the output data records (device) - Last BYTE of a PVOutSl_xxx (REAL) -> 5. BYTE

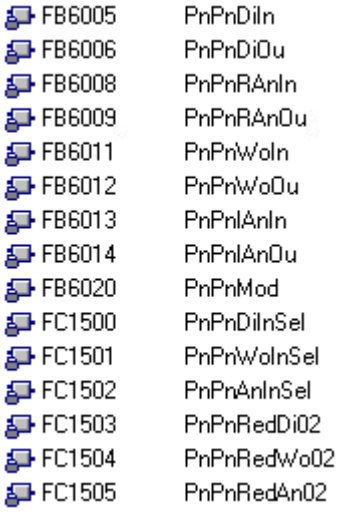
3. Copy the inserted input and output addresses into the symbol table of AS_B.

3 Library

This chapter explains the templates of the “PCS 7 PN/PN PN/MF Coupler Software” Library (9LA1110-6CG20-0AA0) which are used in this application example. The Diagnostic blocks

Figure 3-1

Figure 3-2



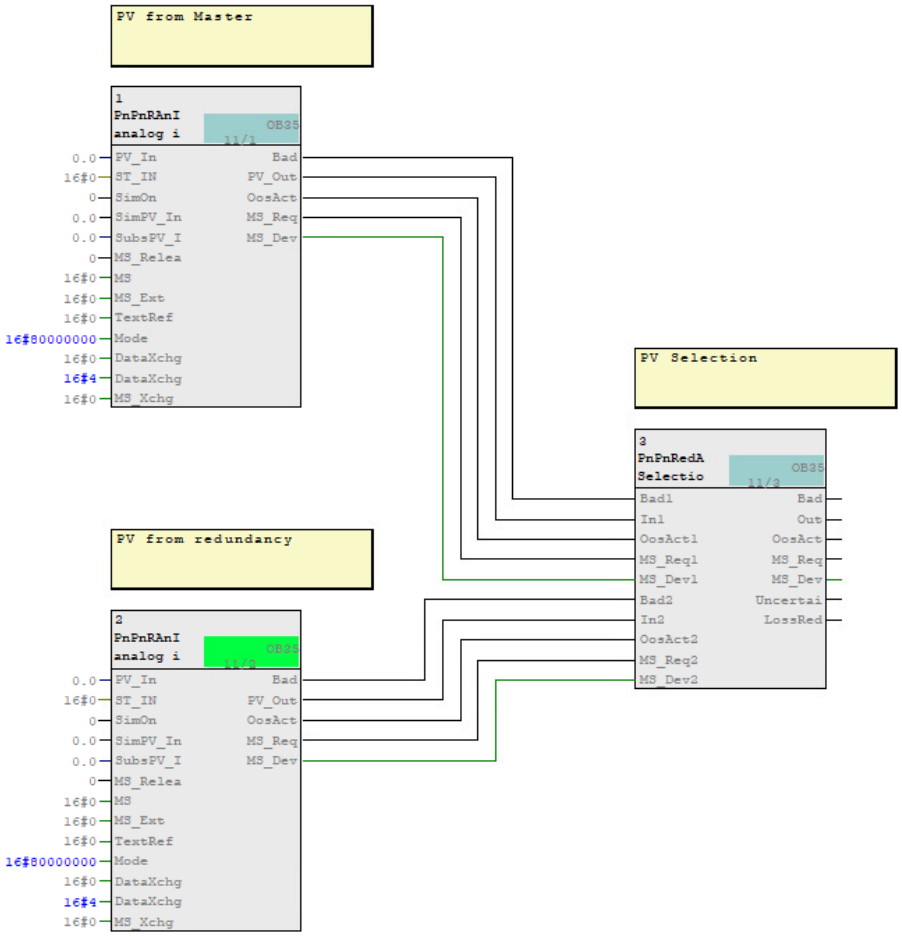
As shown in Figure 3-1 and Figure 3-2, the library contains many other blocks and templates. For other applications there are also blocks for the data type Integer and Word and Templates which handles the quality information with a bit instead of a byte. General the Status information via process image is an option that can be used or not used to save data space at the Coupler.

Note More information can be found in the manual of “PCS 7 PN/PN PN/MF Coupler Software” Library.

3.1 Tmpl_PnPnRAnIn_red_ST

The "Tmpl_PnPnRAnIn_red_ST" template describes the redundant data transmission of analog input values in “REAL” format with the “PnPnRAnIn” and the “PnPnRedAn02” block. All necessary diagnostic blocks are automatically called up and interconnected at the Charts beginning with “@”.

Figure 3-3



The “PV_In” of the two "PnPnRAnIn" blocks (analog input driver real) process the redundantly transmitted analog values of the Couplers. The "ST_In" of the two "PnPnRAnIn" blocks read the corresponding signal status. The “PnPnRedAn02” (Selection of two redundant analog values) block evaluates the best of the two redundant signals based on “In1.ST” resp. “In2.ST”. The best signal with the corresponding signals “Bad”, “OosAct”, “MS_Req” MS_dev” is given out at the output parameters of the “PnPnRedAn02”.

Figure 3-4

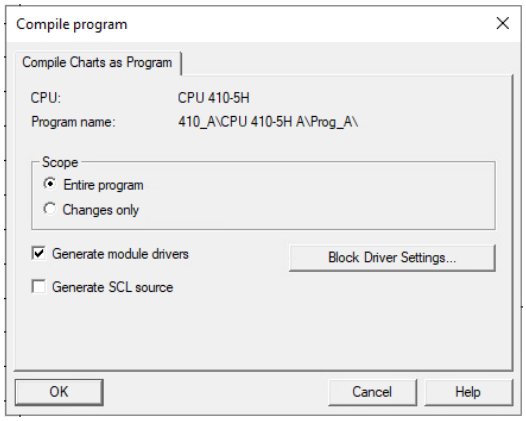
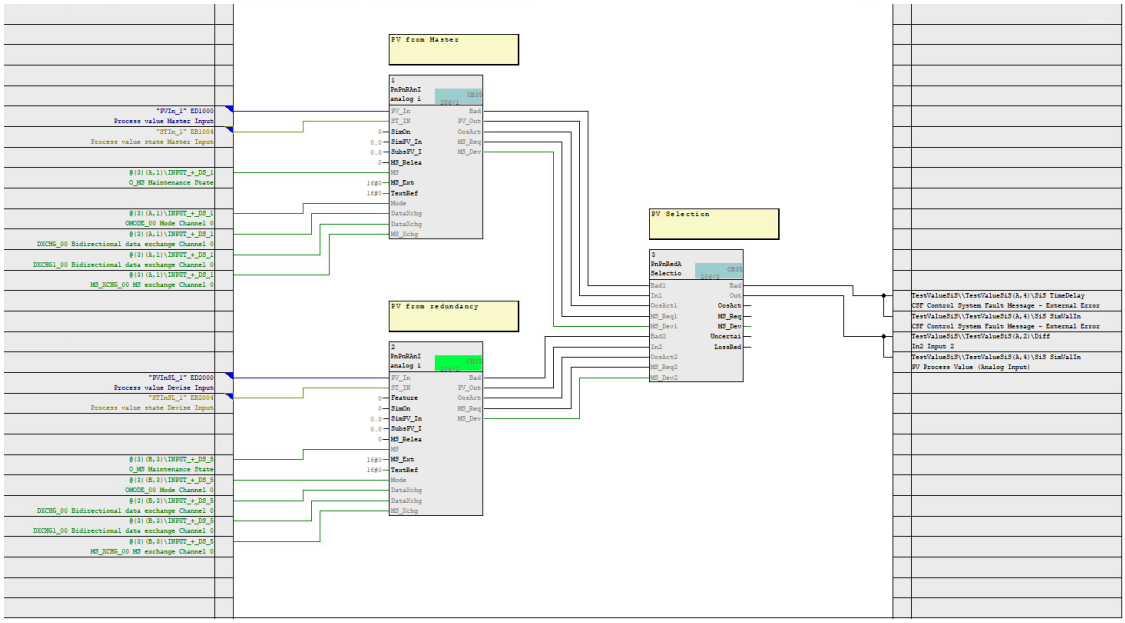


Figure 3-5



Thanks to the "Generate module drivers" functionality, as is customary in PCS 7, all necessary diagnostic blocks are automatically called up and interconnected. At the “PnPnRAnIn” block, the input parameter “ST_In”, “MS”, “Mode”, “DataXchg”, “DataXchg1”, and” MS_Xchg” will be interconnected with the corresponding module diagnostic block resp. address of the process image.

Parameters of “PnPnRAnIn”

“SelQB” ist set to 0 and “SelST” is set to 1 because the evaluation of the signals status is done by the input parameter “ST_IN”

“Feature.Bit25” and “Feature.Bit26” are set to 0. These Bits can be used for “Bit Swap” and “Byte swap” if the coupled PLC have different data formats, like little Endian and Big Endian. The "Feature.Bit27" is set to 0. "Feature.Bit28" allows for evaluation of the signal status at the output "Bad"."Feature.Bit29" and "Feature.Bit30" is set to 0.

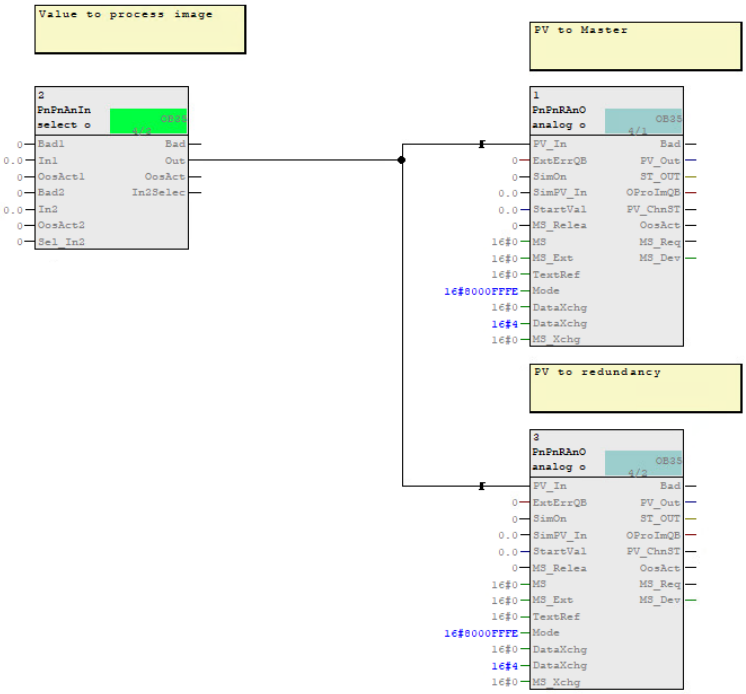
Note

A detailed description for the blocks "PnPnRAnIn" and “PnPnRedAn02” can be found in the manual of “PCS 7 PN/PN PN/MF Coupler Software” Library.

3.2 Tmpl_PnPnRAnOu_red_ST

The "Tmpl_PnPnRAnOu_red_ST" template describes the redundant data transmission of analog output values in “REAL” format with the “PnPnRAnOu” block.

Figure 3-6



The “PV_Out” of the two "PnPnRAnOu" blocks (analog output driver real) process the analog value which must be transmitted redundantly by the Couplers. The "ST_Out" of the two "PnPnRAnOu" blocks write the corresponding signal status to the process image. The “PnPnAnInSel” (select one out of two analog values real) block is a placeholder for a block that gives out an analog value.

Figure 3-7

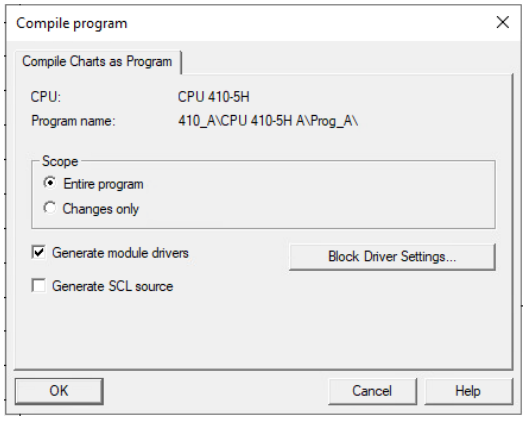
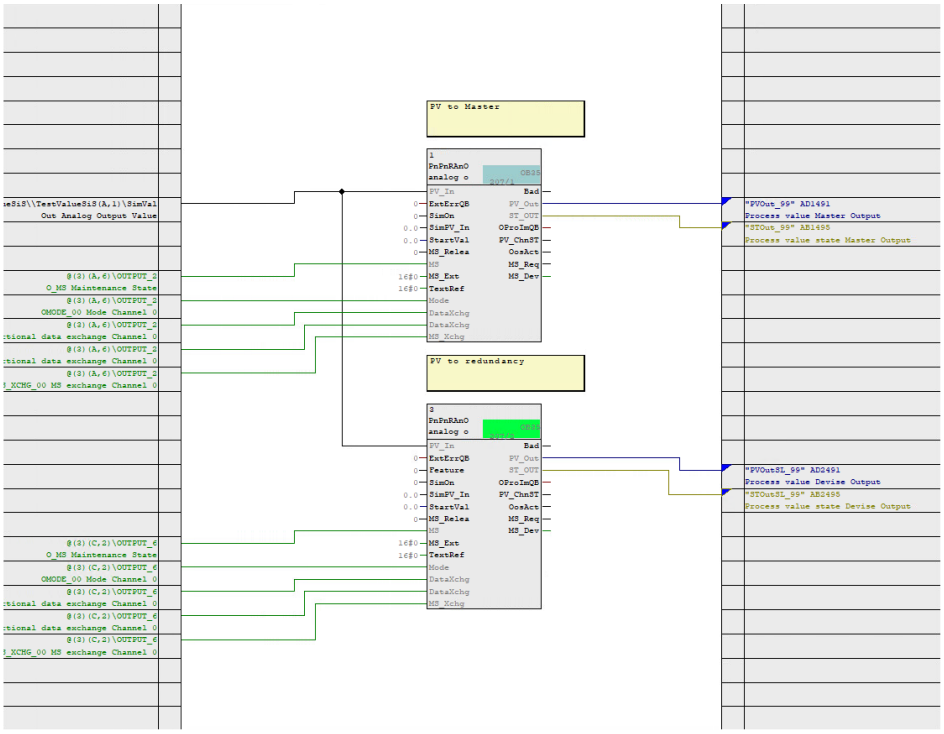


Figure 3-8



Thanks to the "Generate module drivers" functionality, as is customary in PCS 7, all necessary diagnostic blocks are automatically called up and interconnected. At the “PnPnRAnOu” block, the output parameter “ST_Out” and the input parameter “MS”, “Mode”, “DataXchg”, “DataXchg1”, and “MS_Xchg” will be interconnected with the corresponding module diagnostic block resp. address of the process image.

Parameters of “PnPnRAnOu”

“Feature.Bit25” and “Feature.Bit26” are set to 0. These Bits can be used for “Bit Swap” and “Byte swap” if the coupled PLC have different data formats like little Endian and Big Endian. The standard Feature Bits "Feature.Bit27", "Feature.Bit31" are set to 0 and "Feature.Bit30" is set to 1.

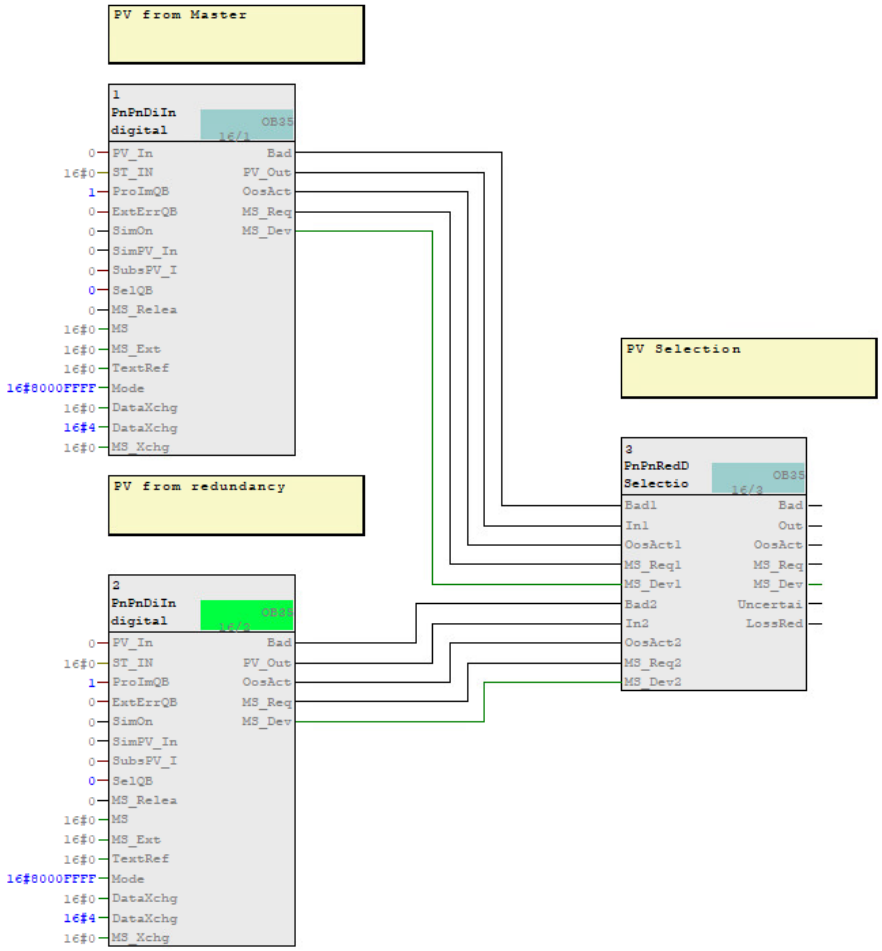
Note

A detailed description for the blocks "PnPnRAnOu" and “PnPnAnInSel” can be found in the manual of “PCS 7 PN/PN PN/MF Coupler Software” Library.

3.3 Tmpl_PnPnDiIn_red_ST

The "Tmpl_PnPnRDiIn_red_ST" template describes the redundant data transmission of digital input values with the “PnPnDiIn” and the “PnPnRedDi02” block.

Figure 3-9



The “PV_In” of the two "PnPnRDiIn" blocks (digital input driver bit) process the redundantly transmitted digital values of the Couplers. The "ST_In" of the two "PnPnRDiIn" blocks read the corresponding signal status. The “PnPnRedDi02” block (selection of two redundant digital values) evaluates the best of the two redundant signals based on In1.ST resp. In2.ST. The best signal with the corresponding signals “Bad”,”OosAct”, “MS_Req” and “MS_dev” is given out at the output parameters of the “PnPnRedDi02”.

Figure 3-10

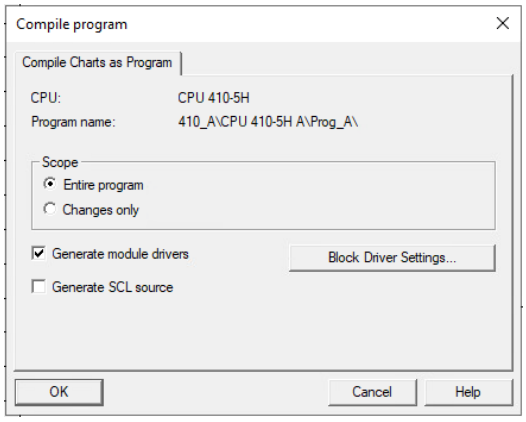
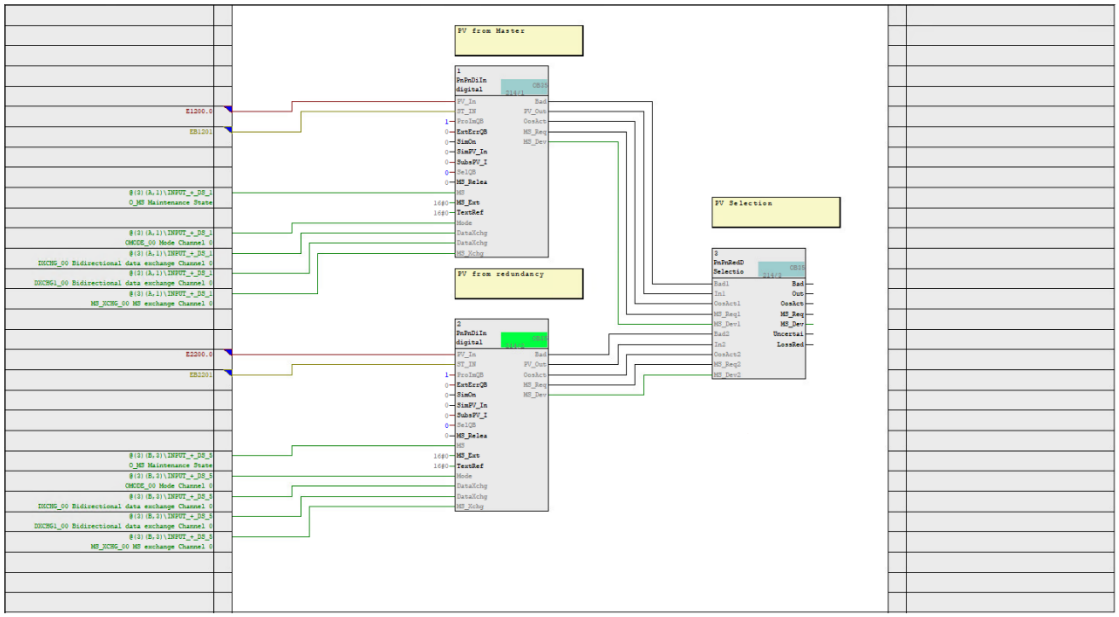


Figure 3-11



Thanks to the "Generate module drivers" functionality, as is customary in PCS 7, all necessary diagnostic blocks are automatically called up and interconnected. At the “PnPnDiIn” block, the input parameter “ST_In”, “MS”, “Mode”, “DataXchg”, “DataXchg1”, and “MS_Xchg” will be interconnected with the corresponding module diagnostic block resp. address of the process image.

Parameters of “PnPnDiIn”

“SelQB” is set to 0 and “SelST” is set to 1 because the evaluation of the signals status is done by the input parameter “ST_IN”

"Feature.Bit27" is set to 0. "Feature.Bit28" allows for evaluation of the signal status at the output "Bad". "Feature.Bit29" and "Feature.Bit30" is set to 0.

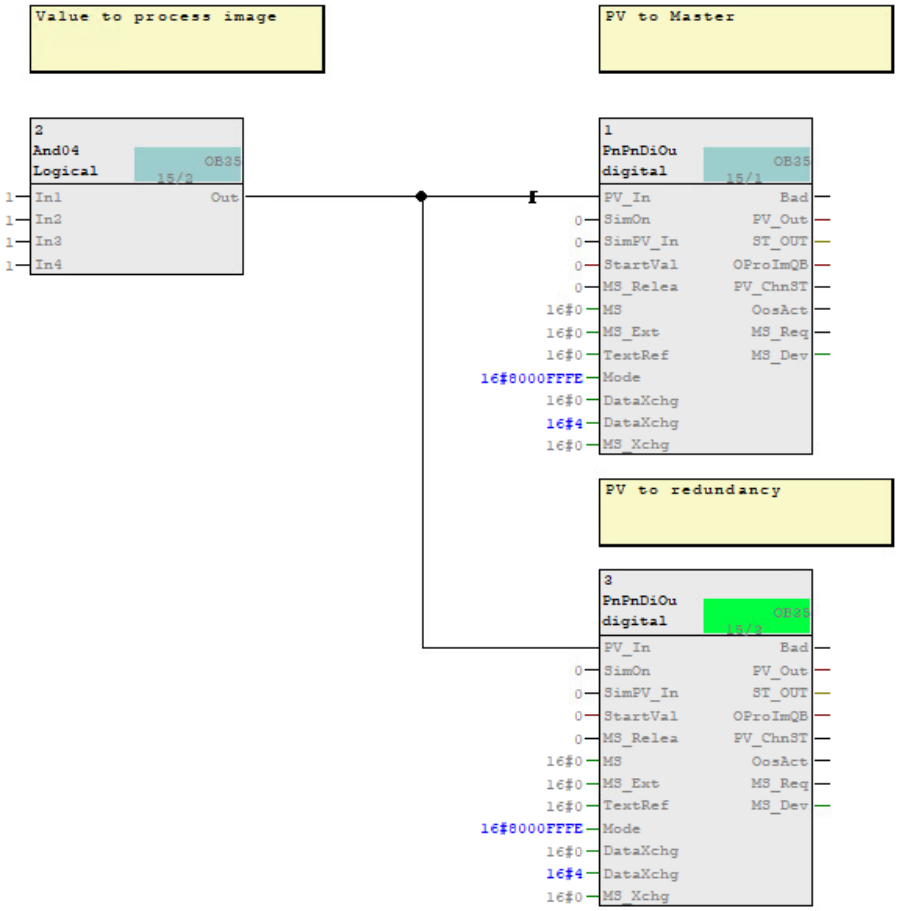
Note

A detailed description for the blocks "PnPnDiIn" and “PnPnRedDi02” can be found in the manual of “PCS 7 PN/PN PN/MF Coupler Software” Library.

3.4 Tmpl_PnPnDiOu_red_ST

The "Tmpl_PnPnRDiOu_red_ST" template describes the redundant data transmission of digital output values with the "PnPnDiOu" block.

Figure 3-12



The "PV_Out" of the two "PnPnDiOu" blocks (digital output driver bit) process the ditial value which must be transmitted redundantly by the Couplers. The "ST_Out" of the two "PnPnDiOu" blocks write the corresponding signal status to the process image. The "And04" block (Logical AND with 4 inputs) is a placeholder for a block that gives out a digital value.

Figure 3-13

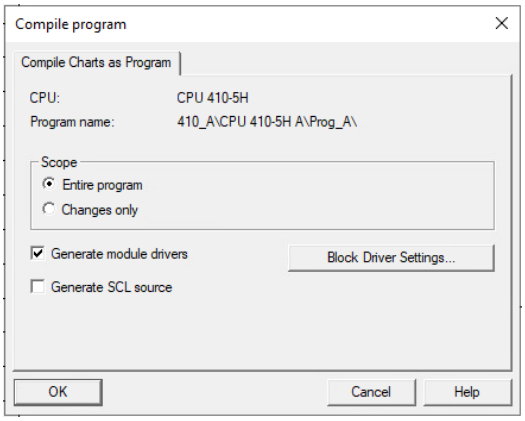
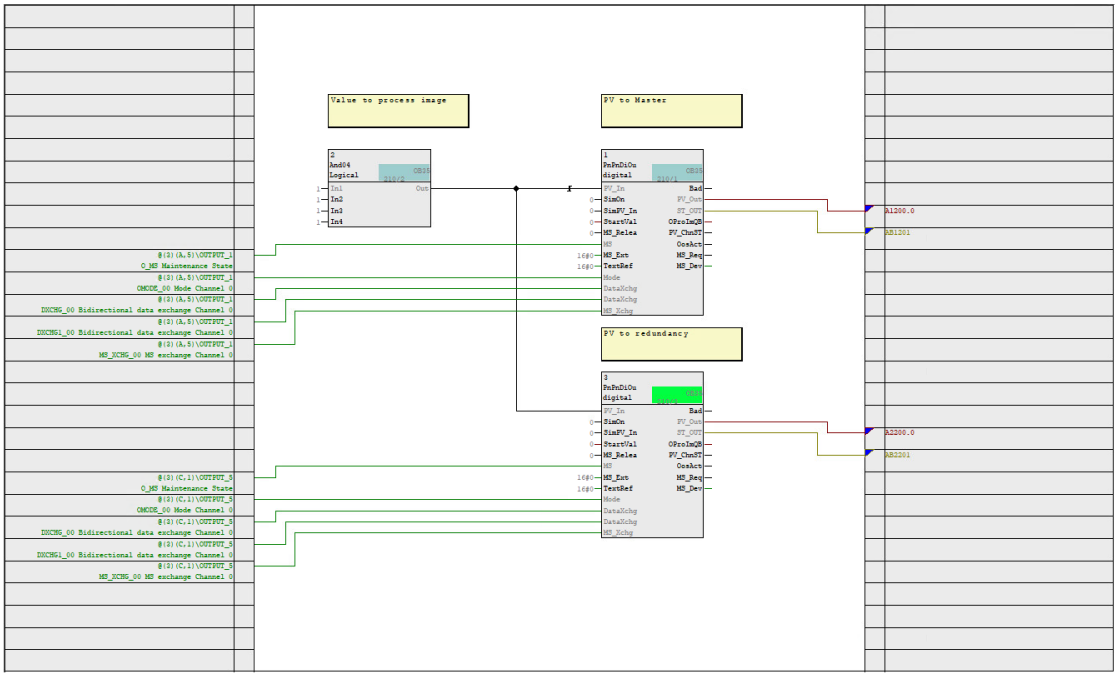


Figure 3-14



Thanks to the "Generate module drivers" functionality, as is customary in PCS 7, all necessary diagnostic blocks are automatically called up and interconnected. At the “PnPnDiOu” block, the output parameters “ST_Out” and the input parameter “MS”, “Mode”, “DataXchg”, “DataXchg1”, and “MS_Xchg” will be interconnected with the corresponding module diagnostic block resp. address of the process image.

Parameters of “PnPnRAnOu”

The standard Feature Bits "Feature.Bit27", "Feature.Bit31" are set to 0 and "Feature.Bit30" is set to 1.

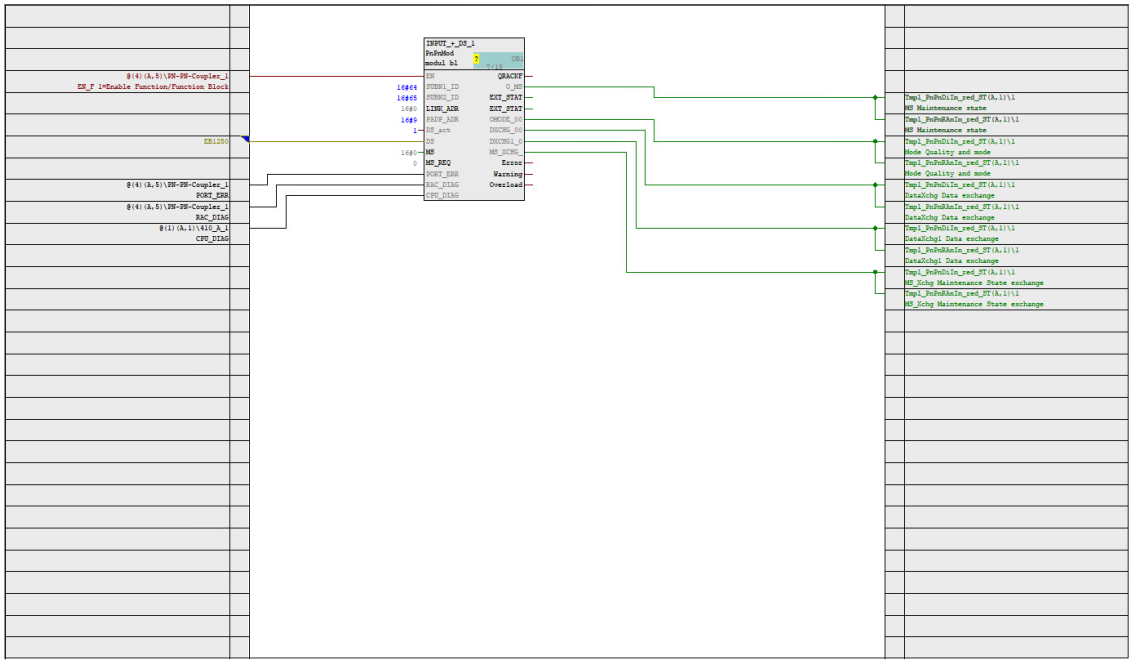
Note

A detailed description for the blocks "PnPnRAnOu" and “PnPnAnInSel” can be found in the manual of “PCS 7 PN/PN PN/MF Coupler Software” Library.

3.5 Diagnostic in the @-Charts

In the charts beginning with “@” all necessary diagnostic blocks are automatically called up and interconnected. This happens by compiling the program with the option "Generate module drivers".

Figure 3-15

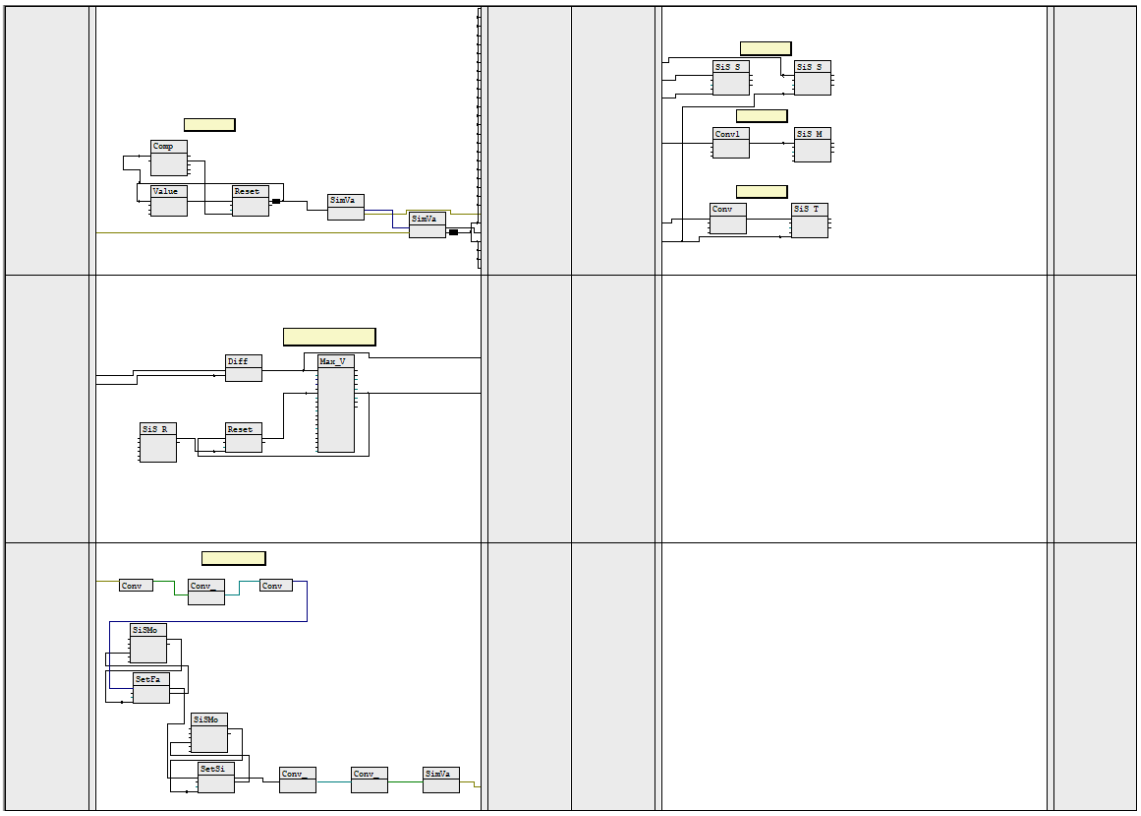


The “PnPNMod” handles the proceeds of the diagnostic for each module of the PN/PN. The interconnection on the left-hand side guides to higher level diagnostic blocks e.g., “OB_DIAG1_PN”, “SUBNET_PN” and “OB_BEGIN_HPN”. The dialog status at the input parameter “DS” taken from the input byte “DS” of the Coupler. The interconnections on the right-hand side guide to the channel blocks e.g., “PnPnRAnIn”, “PnPnRAnOu”, “PnPnDiIn” and “PnPnDiOu”.

4 Test charts

4.1 TestValueSiS

Figure 4-1

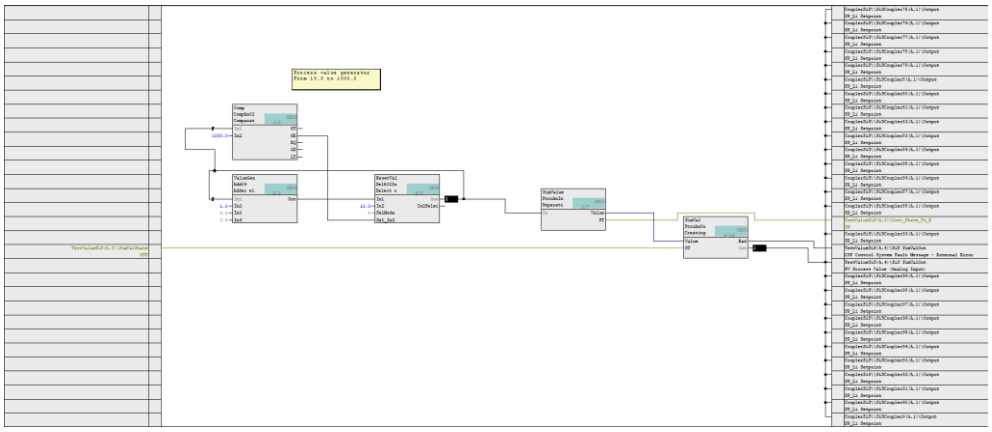


The CFC "TestValueSiS" is employed for the following applications:

- Generating a process value
- Comparing a sent and received process value
- Simulating process values
- Process value monitoring
- Monitoring of transmission speed
- Displaying the maximum transmission time
- Simulating signal states

4.1.1 CFC Chart Partition A/Sheet 1

Figure 4-2

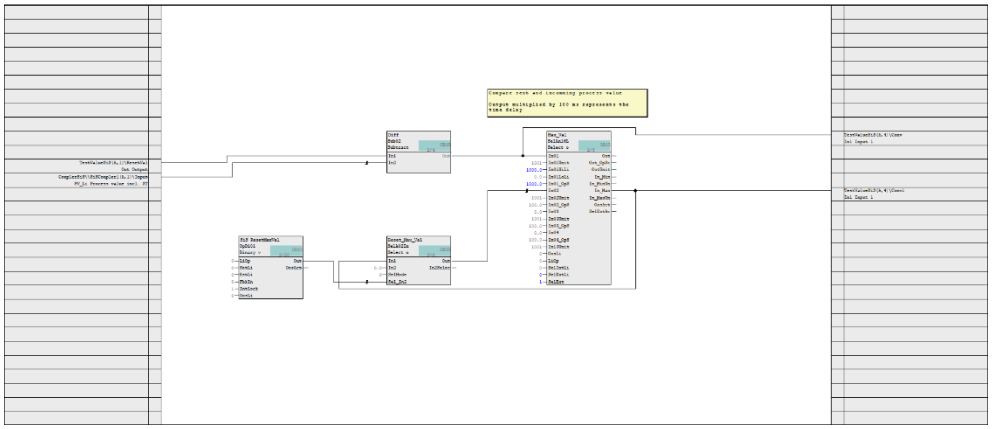


In CFC Chart Partition A/Sheet 1, a process value is generated which increments cyclically from 10 to 1000 in increments of one. Once 1000 is reached, the process value automatically resets to 10. APL standard blocks are used (CompAn02, Add04, SelA02In). The process value is combined with a generated signal status using a "StruAnOu" APL block (see

CFC Chart Partition A/Sheet 3).
The "Out" output of the "SimVal" is connected to the "PV_In" input of the two "PnPnRAnOu" blocks (Logical AND with 4 inputs) in Tmpl_PnPnRAnOu_red_ST 3.2 in order to use the generated process value.

4.1.2 CFC Chart Partition A/Sheet 2

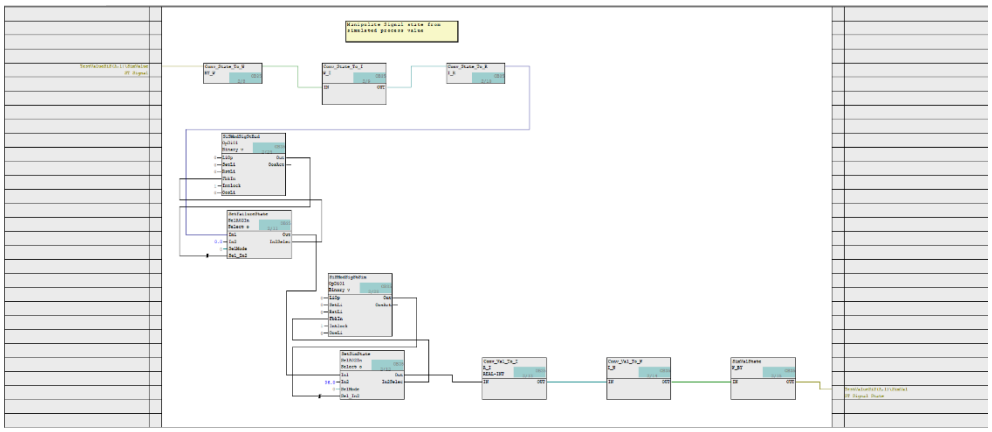
Figure 4-3



In CFC Chart Partition A/Sheet 2, the received process value (sent via the Coupler) from Tmpl_PnPnRAnIn_red_ST 0 is compared to the generated process value. The value calculated from this operation is used on CFC Chart Partition A/Sheet 4 to compute the transmission speed (multiplication by 100 ms). The maximum transmission speed is set using a selector block, "Max_Val", and likewise computed with a factor of 100 ms on CFC Chart Partition A/Sheet 4. It is possible to reset this value in the OS with an "OpDi01" control block ("SiS ResetMaxVal").

4.1.3 CFC Chart Partition A/Sheet 3

Figure 4-4

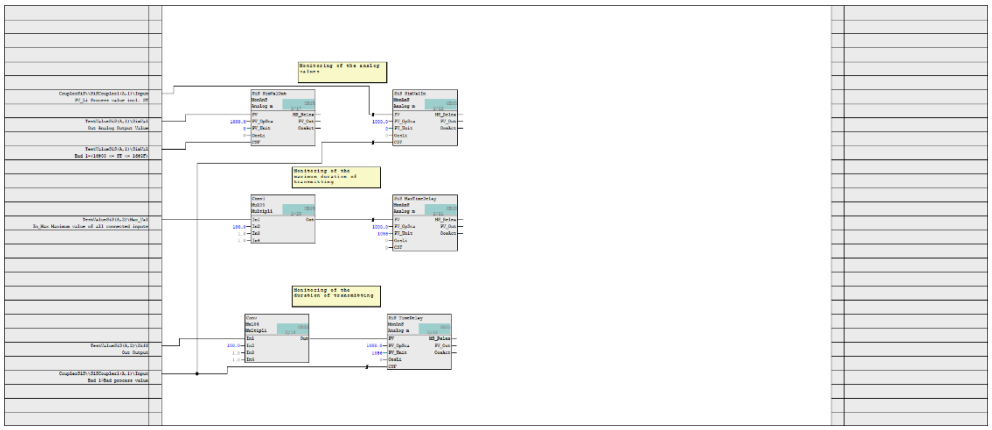


In CFC Chart Partition A/Sheet 3, it is possible to change the signal status of the generated process value. The signal status of the process value generated in CFC Chart Partition A/Sheet 1 is converted to a REAL with the help of APL standard blocks. It can be modified on the OS by "OpDi01" blocks ("SiSModSigStBad", "SiSModSigStSim"). The status can be simulated for three states:

- 16#80 > Good
- 16#00 > "Bad" Signal
- 16#60 > Simulation
- The simulated signal status is converted to a Word.

4.1.4 CFC Chart Partition A/Sheet 4

Figure 4-5

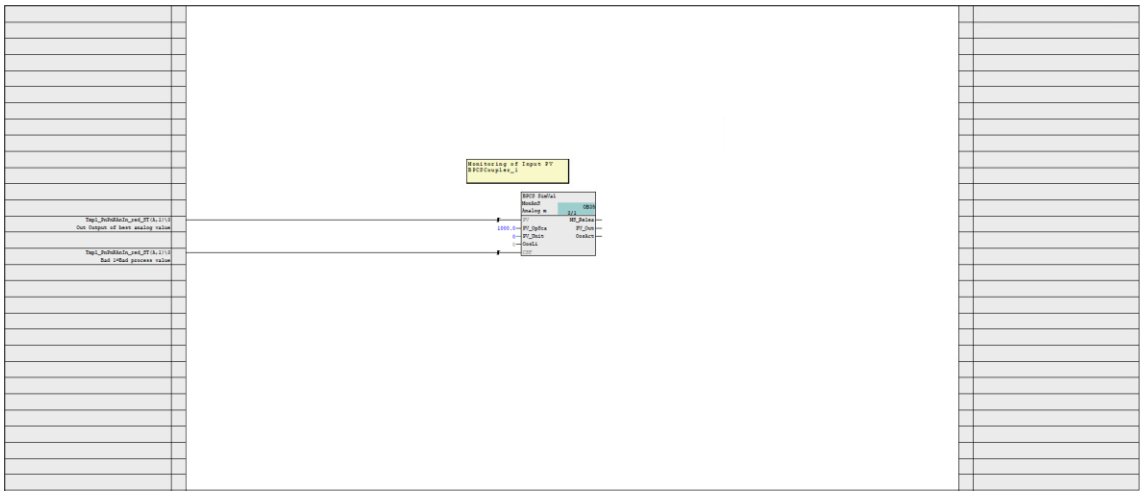


In CFC Chart Partition A/Sheet 4, the process value is displayed on the OS using monitoring blocks ("MonAnS").

- "SiS SimValIn" > current generated process value
  (see CFC Chart Partition A/Sheet 1)
- "SiS MaxTimeDelay" > maximum transmission time
  (see CFC Chart Partition A/Sheet 2)
- "SiS TimeDelay" > transmission time (see CFC Chart Partition A/Sheet 2)

4.2 TestValueBPCS

Figure 4-6

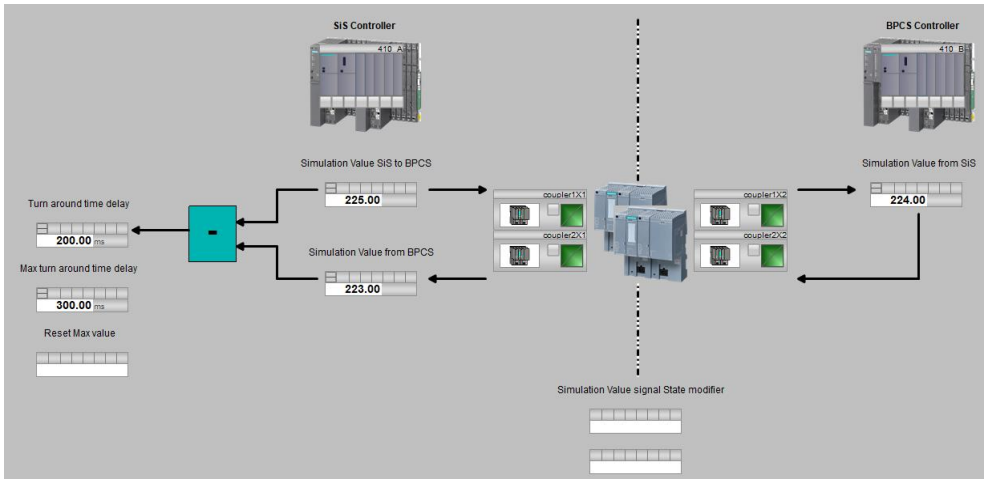


In the CFC "TestValueBPCS", the current process value being sent is displayed on the OS with a monitoring block. The "Out" output of the "PnPnRedAn02" ("Input") block of a BPCSCoupler is interconnected with the "PV" input of the monitoring block. The "CSF" input is interconnected with the "Bad" output of the " PnPnRedAn02" block to display an external error.

4.3 OS display

In the OS, the test charts "TestValueSiS" and "TestValueBPCS" are shown on a screen.

Figure 4-7



5 Appendix

5.1 Service and support

Industry Customer Support for PCS 7 PN/PN PN/MF Coupler Software

Do you have any questions or need assistance regarding the driver library?

Please contact:

function.blocks.industry@siemens.com

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers
– ranging from basic support to individual support contracts. Please send queries to Technical Support via Web form:

siemens.com/SupportRequest

SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

siemens.com/sitrain

Service offer

Our range of services includes the following:

- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in SiePortal: https://sieportal.siemens.com/en-ww/home

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android:

support.industry.siemens.com/cs/ww/en/sc/2067

5.2 Industry Mall

The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location:
mall.industry.siemens.com

5.3 Links and literature

Table 5-1

Nr.	Thema
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to this entry page of this application example https://support.industry.siemens.com/cs/ww/de/view/109824283
\3\	

5.4 Change documentation

Table 5-2

Version	Date	Modifications
V1.0	09/2023	First version