

PSS 4000 Modbus TCP configuration



Product

Type: Modbus TCP
Name: PSS 4000, PAS4000
Manufacturer: Pilz GmbH & Co. KG, Safe Automation

Document

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02	2010-08-23	Adjustments for publication on Pilz website	only editorial
03	2010-11-24	Adjustments for publication on Pilz website	only editorial

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We are grateful for any feedback on the contents.

November 2010

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1. Useful documentation

Reading the documentation listed below is necessary for understanding this application note.
The availability of the indicated tools and safe handling are also presupposed with the user.

1.1. Documentation from Pilz GmbH & Co. KG

No.	Description	Item No.
1	Pilz international homepage, download section	www.pilz.com
2	Operating Manual PSSu H PLC1 FS SN SD	21939-EN-xx
3	System Description Programmable safety and control system PSS 4000	1001467-EN-xx
4		
5		
6		

1.2. Documentation from other sources of information

No.	Description	Item No.
1	Modbus-IDA Independent User Organization	www.modbus.org
2		

2. Hardware configuration

2.1. Pilz products

No.	Description	Order number	Version	Number
1	PSSu H PLC1 FS SN SD	312 070	001	1
2	PSSu E F 4DI	312 200		2
3	PSSu E F DI OZ 2	312 220		1
4	PSSu E F 4DO 0.5	312 210		2
5	PSSu BP 1/8 C	312 601		5
6	PAS4000	-- --	v1.1.0 Build 28	1
7	PMI 326 (Series 3xx) with MS Windows CE.Net 4.2 and Kernel/Loader Pilz-1.54	261 100	Hardware- Revision 1.3	

3. Application Task

3.1. PSS4000 - PMI - Modbus TCP example: 0x CoilBit

3.1.1. PMI Settings

- [Step 1] Include in the Project Configuration in the Remote Transport folder the Default.iso

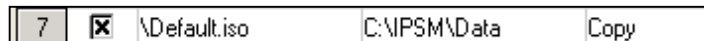


Fig. 1: PMI-Setting: copy 'Default.iso'

- [Step 2] Driver configuration for ModRTU-32 Modbus RTU Master

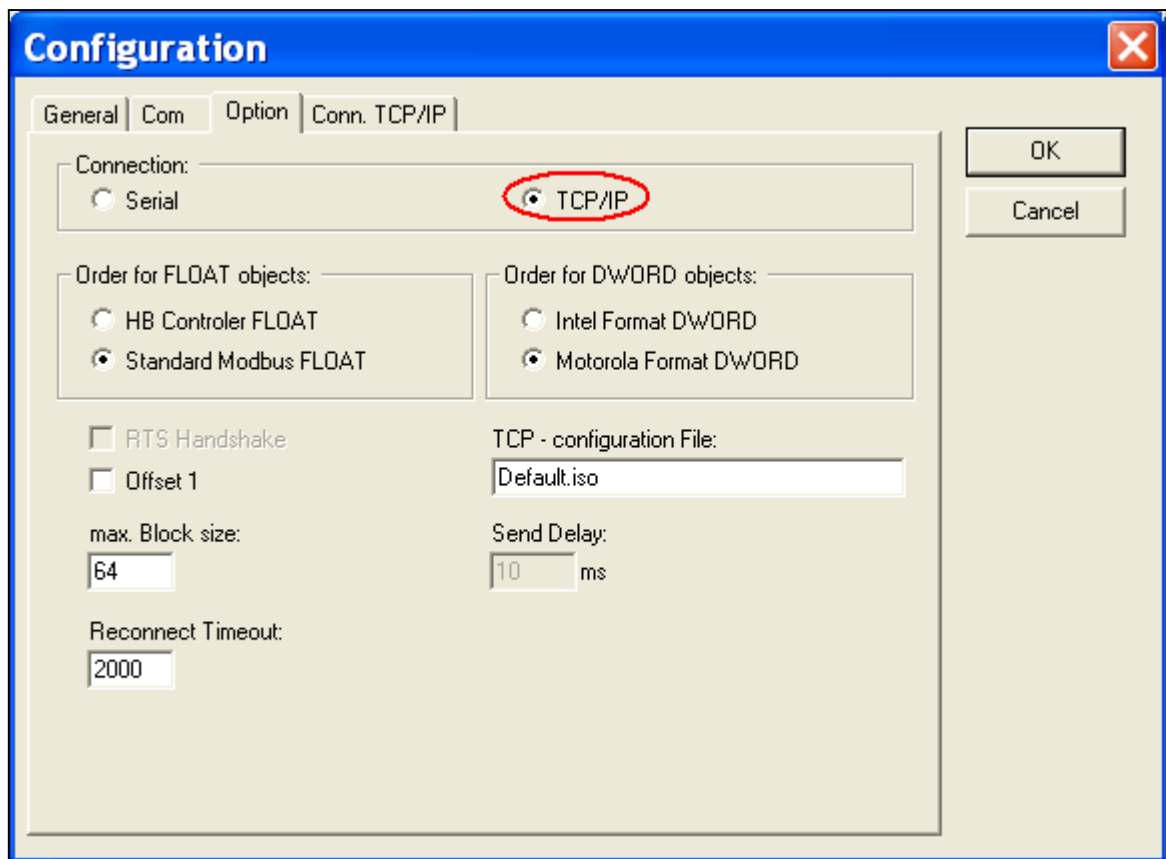


Fig. 2: PMI-Setting: configuration of Modbus driver (Part 1/2)

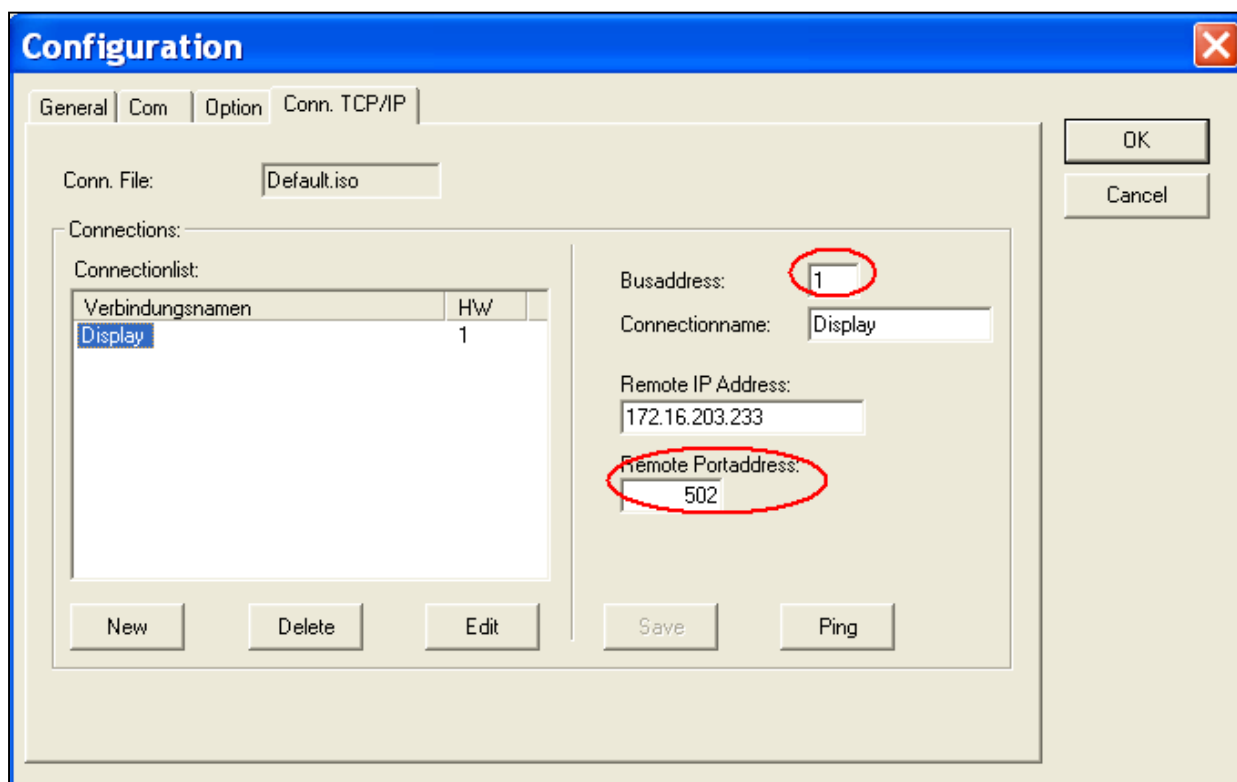


Fig. 3: PMI-Setting: configuration of Modbus driver (Part 2/2)

► [Step 3] Variable choice

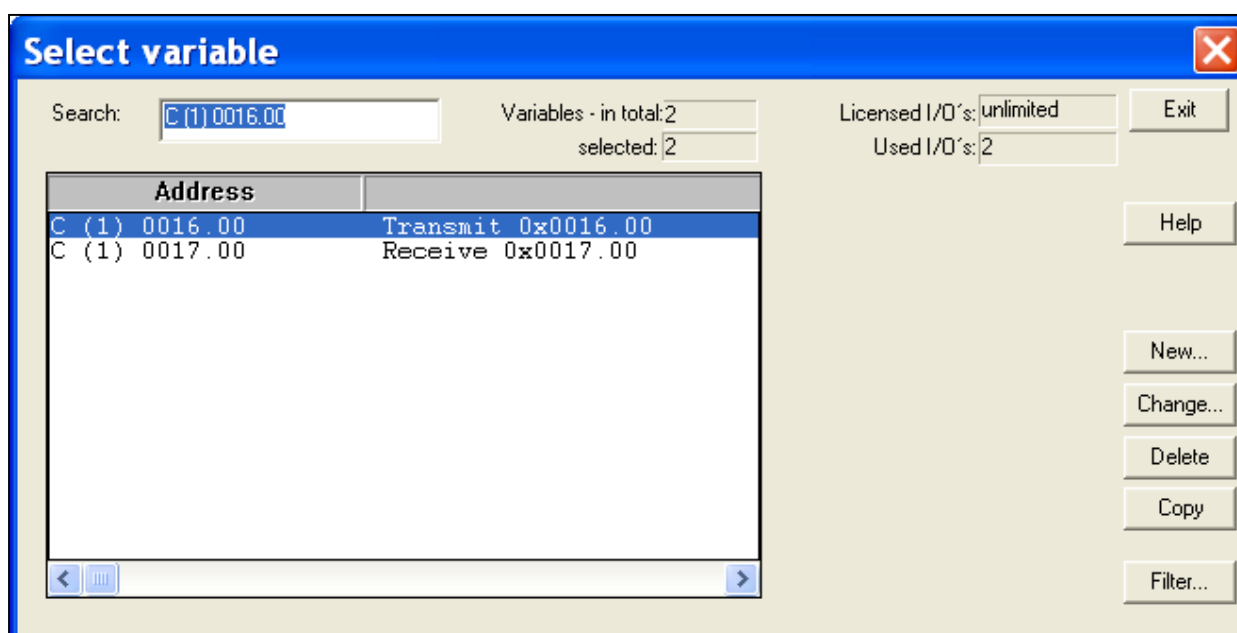
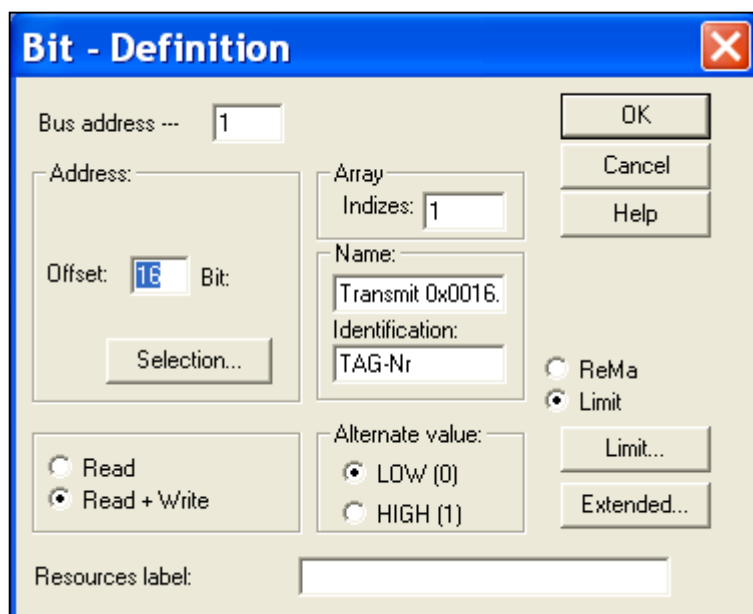


Fig. 4: PMI-Setting: variable choice (Part 1/2)



The image shows a 'Bit - Definition' dialog box with a blue title bar and a red close button. The dialog is divided into several sections. At the top left, 'Bus address ---' is set to '1'. Below it, 'Address:' is empty. To the right, 'Array' is set to '1'. Further right are 'OK', 'Cancel', and 'Help' buttons. In the middle left, 'Offset:' is set to '16' and 'Bit:' is empty, with a 'Selection...' button below. To the right, 'Name:' is 'Transmit 0x0016', and 'Identification:' is 'TAG-Nr'. Below these are radio buttons for 'ReMa' and 'Limit', with 'Limit' selected. At the bottom left, radio buttons for 'Read' and 'Read + Write' are shown, with 'Read + Write' selected. To the right, 'Alternate value:' has radio buttons for 'LOW (0)' and 'HIGH (1)', with 'LOW (0)' selected. Below these are 'Limit...' and 'Extended...' buttons. At the bottom, 'Resources label:' is followed by an empty text field.

Bus address --- 1

OK
Cancel
Help

Address:

Array
Indizes: 1

Offset: 16 Bit:

Selection...

Name:
Transmit 0x0016
Identification:
TAG-Nr

☐ ReMa
☒ Limit

☐ Read
☒ Read + Write

Alternate value:
☒ LOW (0)
☐ HIGH (1)

Limit...
Extended...

Resources label:

Fig. 5: PMI-Setting: variable choice (Part 2/2)

3.1.2. PMI function

- ▶ Send a Coilbit 0x0016 to the PSSu H PLC1 !
- ▶ Receive a Coilbit 0x0017 from the PSSu H PLC1 !

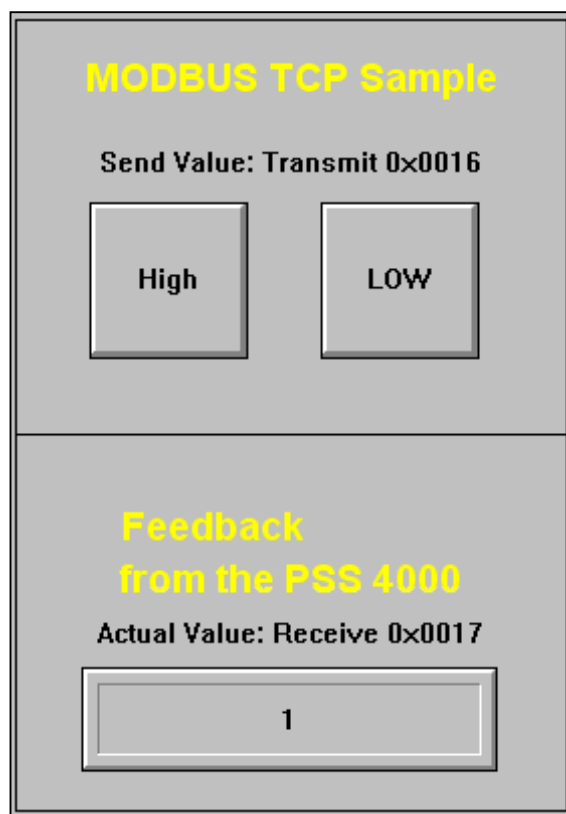


Fig. 6: PMI-function

3.1.3. PLC Settings

- [Step 1] Create a new Modbus TCP connection

IP Connections (Device: JV4000)

Configured Connections

Protocol	Connection Name	Role	Remote IP Address	Remote Port Number
Modbus/TCP	Display	Server	0.0.0.0	0

Network settings

Connection Name:

Unit ID:

Local port number:

Remote IP Address:

Remote Port Number:

Keep alive settings

☒ Enable keep alive

Keep alive time [ms]:

Keep alive interval [ms]:

Connection timeout

☐ Enable Connection Timeout

Connection timeout:

Fig. 7: PLC-Setting: create a new Modbus TCP connection

- ▶ [Step 2] Configuration of Modbus Table
 - Take Care about the direction of the Data!
 - The Table has the point of few of the external Device!
 - READ: The external device PMI READ from the PSSu H PLC1
 - WRITE: The external device PMI WRITE to the PSSu H PLC1

Server mapping table for Modbus/TCP (device: JV4000)

Data Range	Start Address	Data Length
0xRead	17	1
0xWrite	16	1
1xRead	0	0
3xRead	0	0
4xRead	0	0
4xWrite	0	0

Data update cycle time

☒ Calculate automatically
 Data update cycle time [ms]

100

Data range setting

Start address

17

Data length

1

Fig. 8: PLC-Setting: configuration of Modbus table

- [Step 3] simple project for PLC
 - Input variable "W_ModbusEmpf_16" copy it to the Output variable "W_ModbusSend_17"

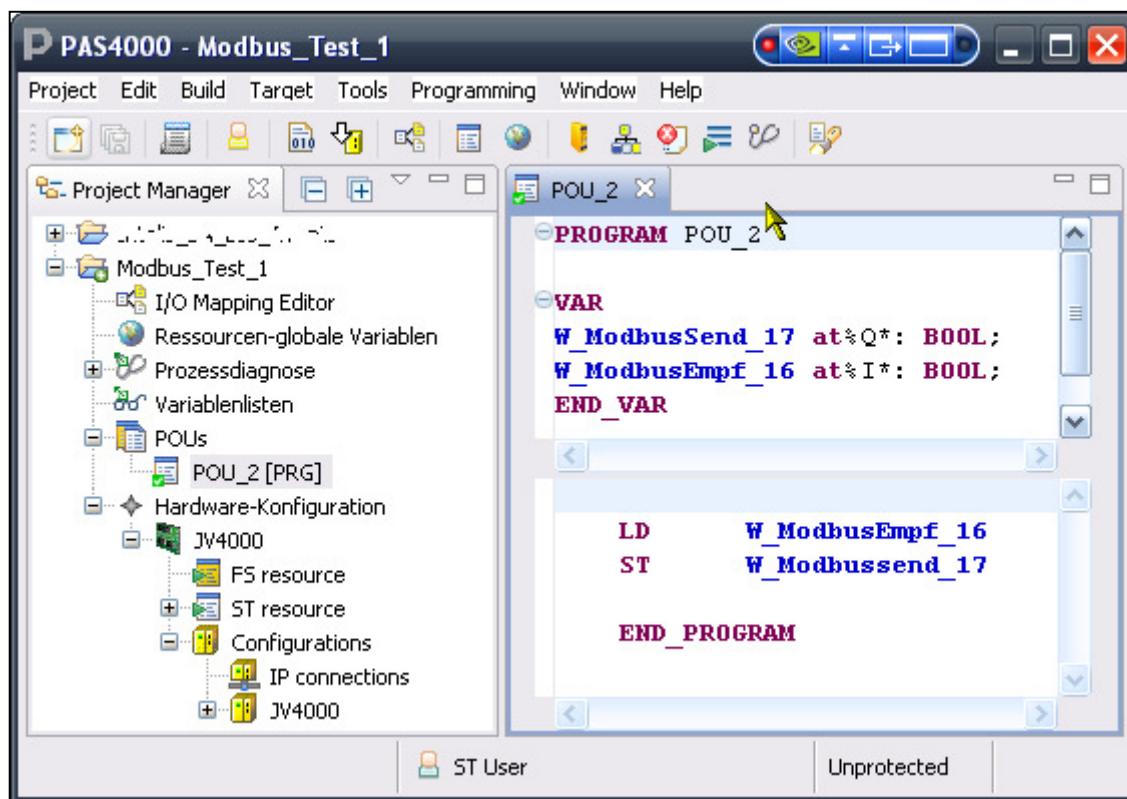


Fig. 9: PLC-Program: simple example

- [Step 4] Input/Output mapping for PLC
 - The Input variable from the external device on 0x0016 is linked the internal variable "W_ModbusEmpf_16"

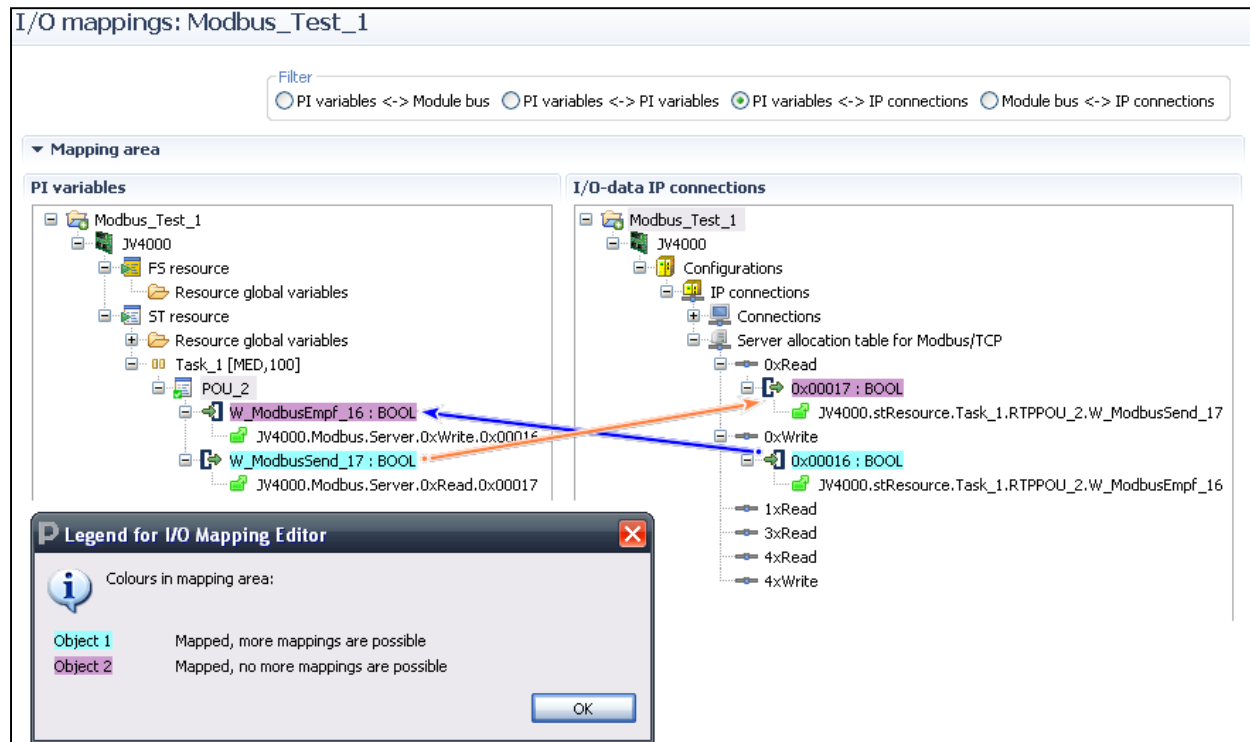


Fig. 10: PLC-Program: I/O mapping

► Description of symbols

Symbol	Description
	This is the PSSu H PLC1 system
	This is an Input Value to the system
	This is an Output Value from the system
W_Modbus	This color shows the base of the data
W_Modbus	This color shows the target of the data

3.2. PSS4000 - PMI - Modbus TCP example: 4x Holding Register

3.2.1. Differences of PLC Settings compared with Chapter 3.1.3

 **Server mapping table for Modbus/TCP (device: JV4000)**

Data ranges

Data Range	Start Address	Data Length
0xRead	0	0
0xWrite	0	0
1xRead	0	0
3xRead	0	0
4xRead	0	20
4xWrite	0	20

Data update cycle time

☒ Calculate automatically

Data update cycle time [ms]

100

Data range setting

Start address

Data length

Fig. 11: PLC-Setting: changes with configuration of Modbus table

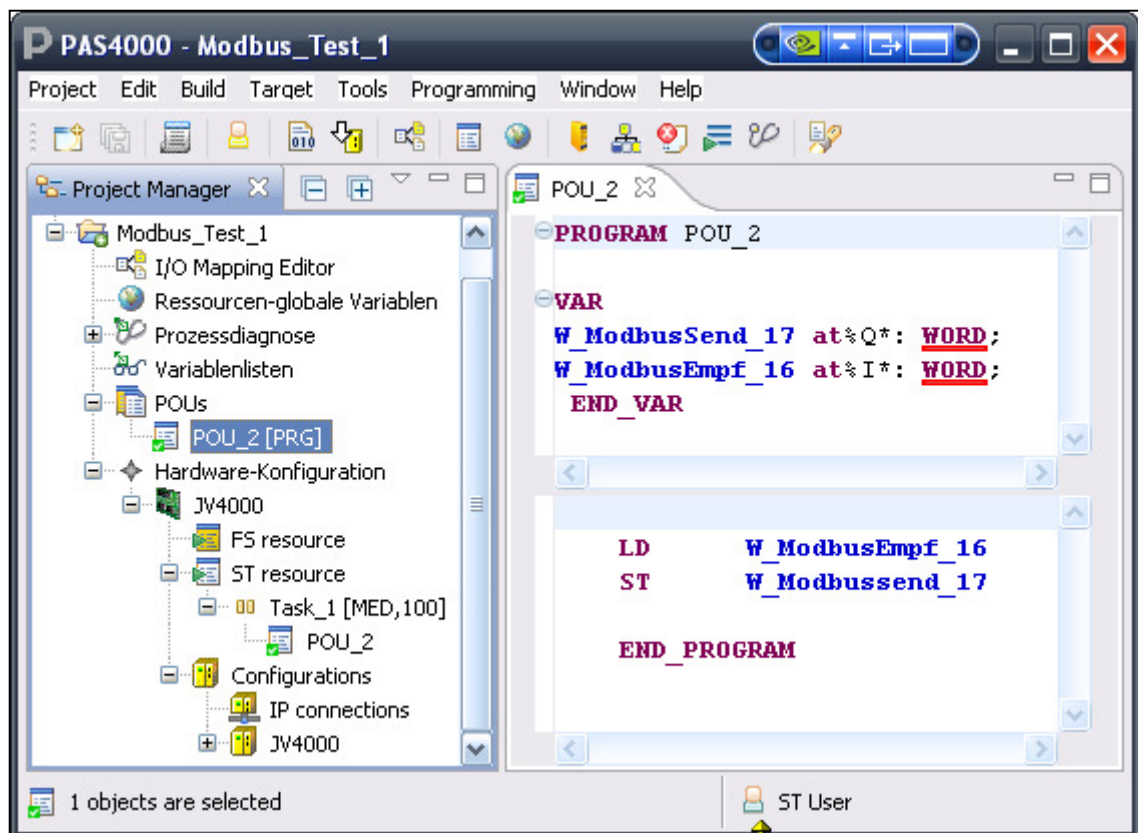


Fig. 12: PLC-Program: changes with the simple example

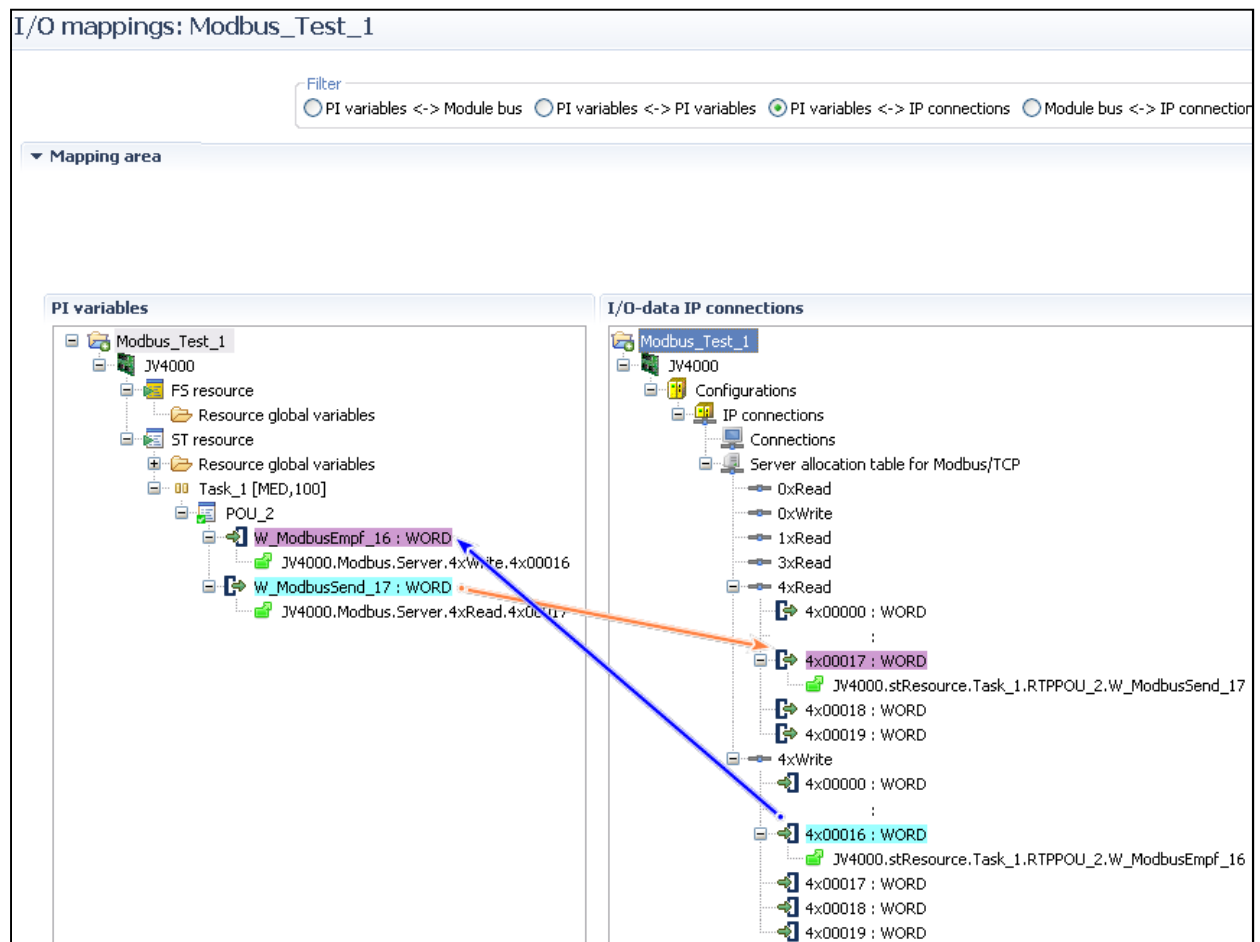


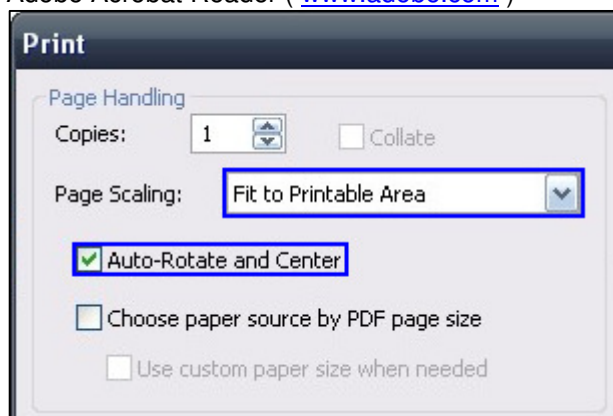
Fig. 13: PLC-Program: changes with I/O mapping

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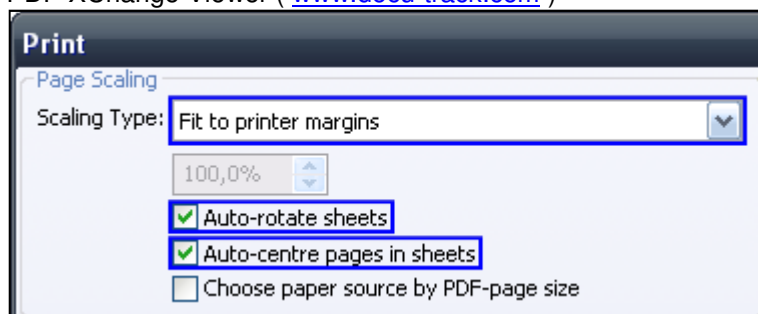
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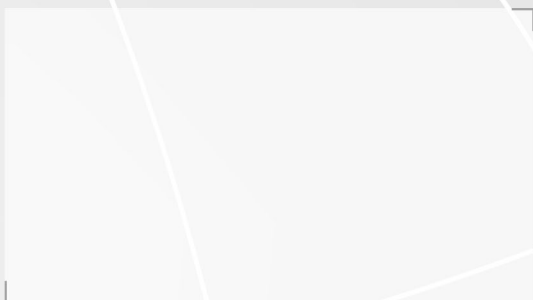
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Adobe Acrobat Reader (www.adobe.com)



PDF-XChange Viewer (www.docu-track.com)





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