

PSS 4000 OPC Server with PMI 4



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We are grateful for any feedback on the contents.

September 2012

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You can reach our international hotline on:

+49 711 3409-444 or [**mailto:support@pilz.com**](mailto:support@pilz.com)

Pilz GmbH & Co. KG
Safe Automation
Felix-Wankel-Straße 2
73760 Ostfildern, Germany

Telephone: +49 711 3409-0
Telefax: +49 711 3409-133
E-Mail: pilz.gmbh@pilz.de
Internet: www.pilz.com

Contents

1. Useful documentation	5
1.1. Documentation from Pilz GmbH & Co. KG	5
1.2. Documentation from other sources of information	5
2. Hardware configuration.....	6
2.1. Pilz products.....	6
2.2. List of actual PMI series v4xx	6
2.3. Hardware configuration	7
3. Application Task	8
3.1. PSS 4000 Configuration.....	8
3.1.1. Installation of used Pilz software	8
3.1.2. PSS 4000 OPC Server settings.....	9
3.2. PMI program configuration.....	11
3.2.1. Basic Variables	11
3.2.2. Status of the LEDs	17
4. Table of figures	19

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 PSS4000 Diag Control	1001687-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	OPC Foundation	www.opcfoundation.org
2		

2. Hardware configuration

2.1. Pilz products

No.	Description	Order number	Version	Number
1	PSSu H PLC 1 FS SN SD Link: Firmware for PSSu H PLC1 FS SN SD v1.6.0	312 700	HW 2, FW 1.6.0	1
2	PSSu E S 4 DI	312 400		1
3	PSSu E S 4 DO 0.5	312 405		1
4	PSSu E F 4 DI	312 300		1
5	PSSu E F 4DO 0.5	312 210		1
6	PSSu BP 1/8 C	312 600		4
7	PAS 4000 Link: Software PAS4000 1.6.0		V1.6.0	1
8	PMI v416 with MS Windows CE.Net 4.2 and Kernel/Loader Pilz-1.73 Notice: complete PMI series 4xx can be used (Ch. 2.2)		1.4	1
9	PMI-PRO Link: PMI-PRO Editor full licence (D,GB,F,E,I)	310400	V5.50 SP7 / 08-2004 + Fix30	1
10	OPC Server and Diag Control for PMI series Link: Software PSS 4000 PMI 1.6.0		V1.6.0	1
11	OPC Server for PC (without Diag Control) Link: Software PSS 4000 PC 1.6.0		V1.6.0	1
12	Diag Control for PC and PMI series (only PMI Client) Link: Software PSS 4000 Diag Control 1.6.0		V1.6.0	1

2.2. List of actual PMI series v4xx

- ▶ "v"-Version of PMI4 series
 - » Diag Control must be integrated into the visualization (PMI-PRO)
 - 263080 PMI v416 basic
 - 263082 PMI v416 MPI
 - 263083 PMI v416 Profibus DP-Slave
 - 263085 PMI v416 CANopen
 - 263100 PMI v426 basic
 - 263102 PMI v426 MPI
 - 263103 PMI v426 Profibus DP-Slave
 - 263105 PMI v426 CANopen
 - 263180 PMI v431 basic
 - 263182 PMI v431 MPI
 - 263183 PMI v431 Profibus DP-Slave
 - 263185 PMI v431 CANopen
 - 263260 PMI v438 basic
 - 263262 PMI v438 MPI
 - 263263 PMI v438 Profibus DP-Slave
 - 263265 PMI v438 CANopen

► “o”-Version of PMI4 series

» Realization through Internet Explorer with an HTML container (not described in this AN)

- 264080 PMI o416 basic
- 264100 PMI o426 basic
- 264180 PMI o431 basic
- 264260 PMI o438 basic

2.3. Hardware configuration

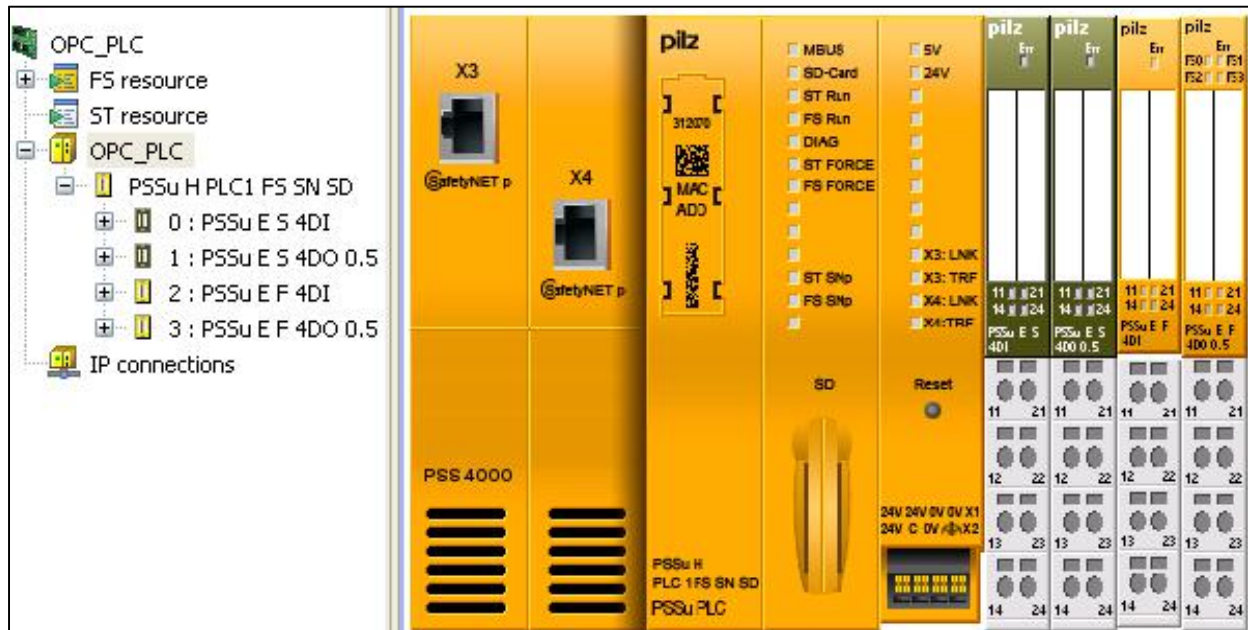


Fig. 1: PAS4000 Hardware Configuration – PSS 4000 system “OPC_PLC”

3. Application Task

3.1. PSS 4000 Configuration

3.1.1. Installation of used Pilz software

► General:

- Install software “PAS4000” on PC in actual version (Ch. 2.1; No. 7)
- Update PSS 4000 head with actual “Firmware for PLC” (Ch. 2.1; No. 1)
- Install software “PMI-PRO” on PC in actual version (Ch. 2.1; No. 9)
- Install software “PSS 4000 PC” on PC in actual version (Ch. 2.1; No. 11)

\PSS_4000_PC_1_6_0_3000763B09.zip\	
Name	
	PSS_4000_PC_1_6_0_Installer.exe

- Install software “PSS 4000 Diag Control” on PC in actual version (Ch. 2.1; No. 12)

\PSS_4000_Diag_Control_1_6_0_3000829A03.zip\PSS_4000_Diag_Control_1_6_0\PC\	
Name	Größe
	PSS_4000_Diag_Control_1_6_0.exe
	1 231 115

► [A] PMI is server:

- Install software “PSS 4000 PMI” on PMI in actual version (Ch. 2.1; No. 10)

\PSS_4000_PMI_1_6_0_3000838A03.zip\PSS_4000_PMI_1_6_0_Installer\PMI4\	
Name	Größe
	PSS_4000_PMI_4_Data_1_6_0.CAB
	11 864 535
	PSS_4000_PMI_4_Installer_1_6_0.exe
	21 504

► [B] PMI is client:

- Install software “PSS 4000 Diag Control” on PMI in actual version (Ch. 2.1; No. 12)

\PSS_4000_Diag_Control_1_6_0_3000829A03.zip\PSS_4000_Diag_Control_1_6_0\PMI4\	
Name	Größe
	PSS_4000_Diag_Control_1_6_0.CAB
	1 490 295

3.1.2. PSS 4000 OPC Server settings

- After creating the PSS 4000 project, add the device that is to run the OPC Server to the PAS4000 project. Add a PSS4000-PC for the device type.

The name of the PMI is set in the Control Panel under “System” and then on the “Network” tab:

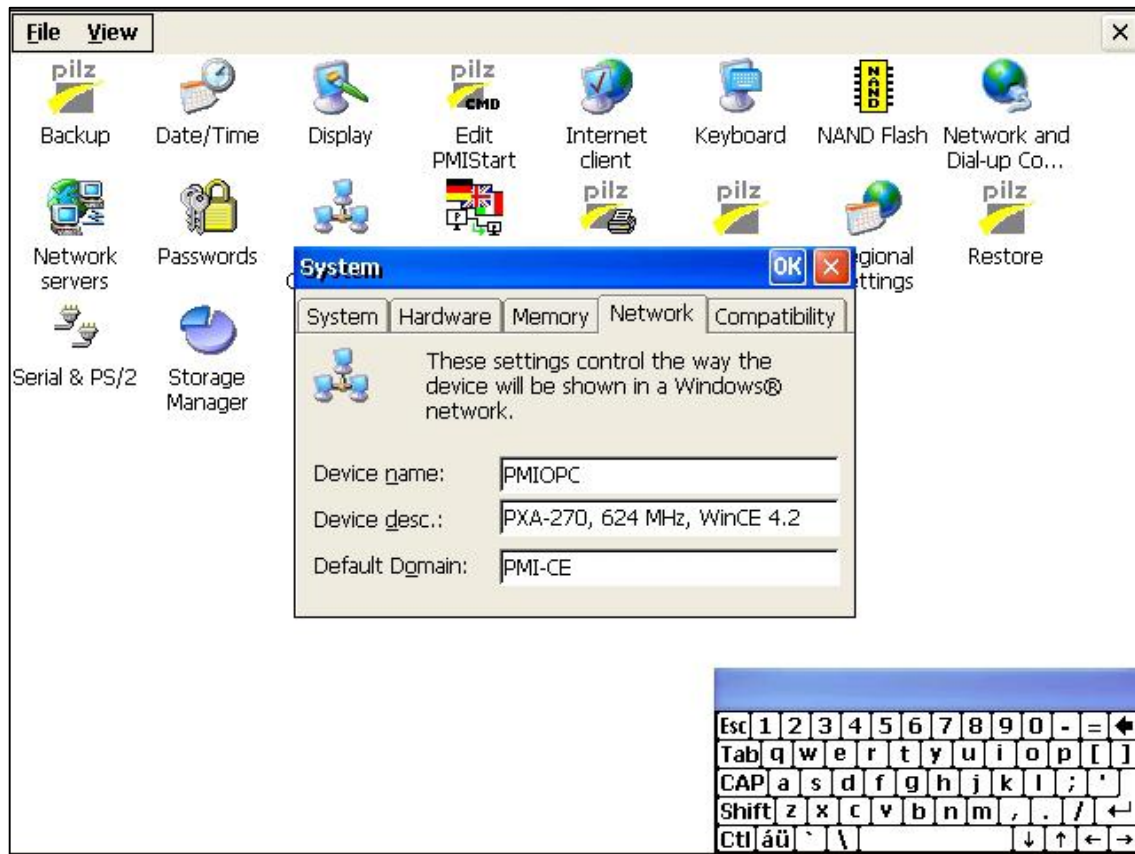


Fig. 2: PMI-PRO – Device Name “PMIOPC” of used PMI416

- **Notice:** By using the local PC as the OPC server initially, all variables can be accessed within PMI-PRO automatically, rather than typing in the path of the variable.
If the OPC Server is to run on the PMI, just change the OPC Server to be the PMI after adding all the required variables.

- Add new device as OPC Server:

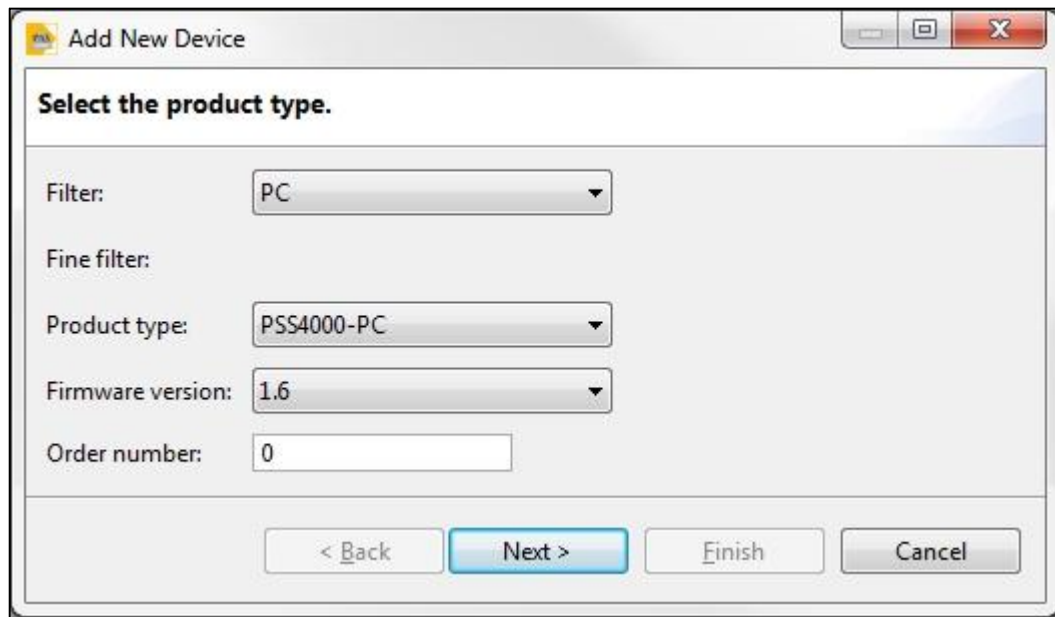


Fig. 3: PAS4000 Hardware Configuration – Add OPC Server

The name of the PC will be added automatically - for a PMI you must enter the Device Name “PMIOPC” as per Fig. 2, page 9.

You must then configure the OPC Server within PAS4000. Go to the “Tools” menu and select “Configure Server - > OPC Server”.

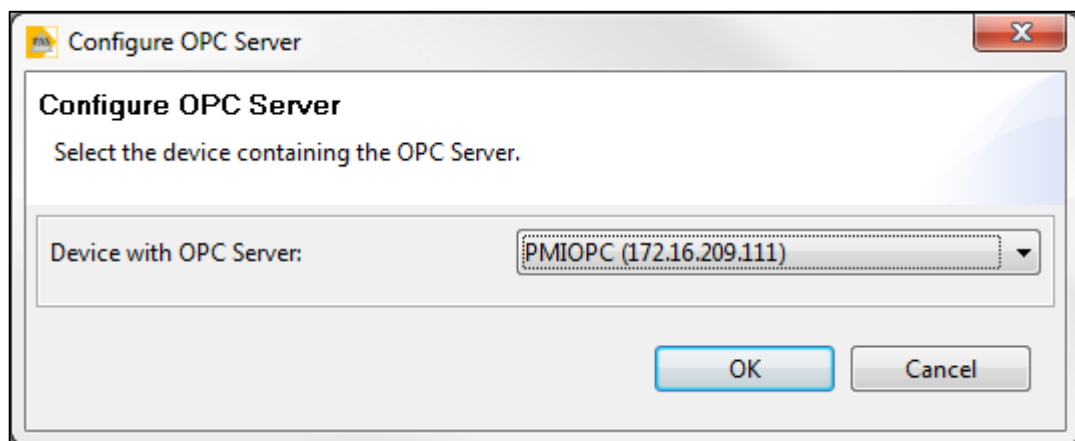


Fig. 4: PAS4000 Hardware Configuration – Configure device as OPC Server

- Once the OPC Server is added, build and download your project.

3.2. PMI program configuration

3.2.1. Basic Variables

- In PMI-PRO add the OPC Client driver to your project.

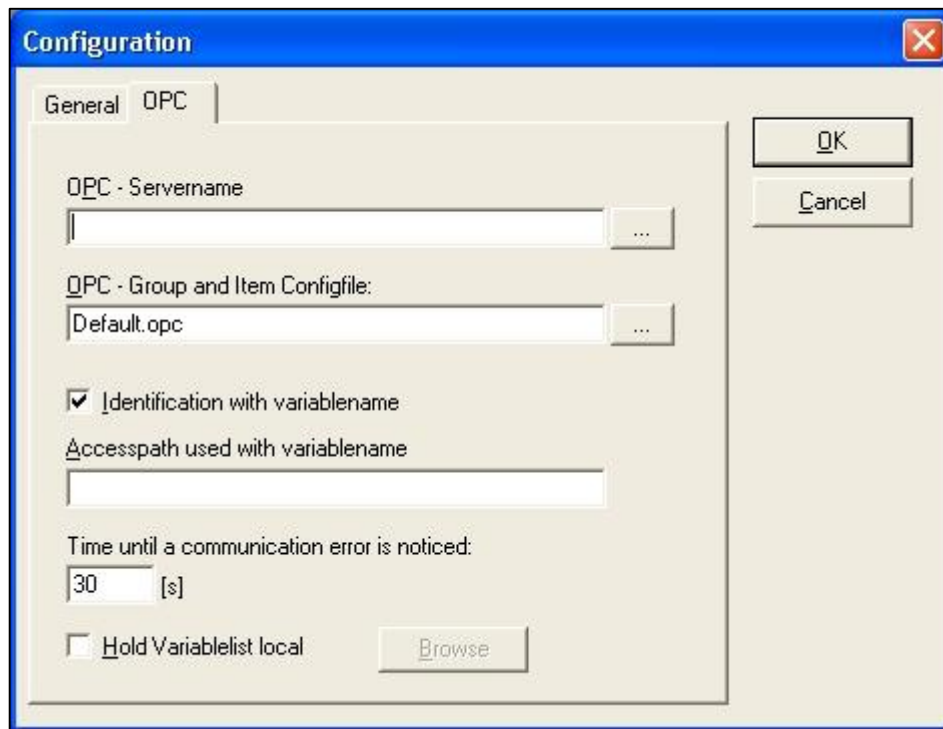


Fig. 5: PMI-PRO – Configuration window for OPC Client driver

- Click on the box next to the OPC-Servername entry, and
- in the next box while on “Lokal” select the **PilzPSS4000_OPCServer** entry and then click on OK.

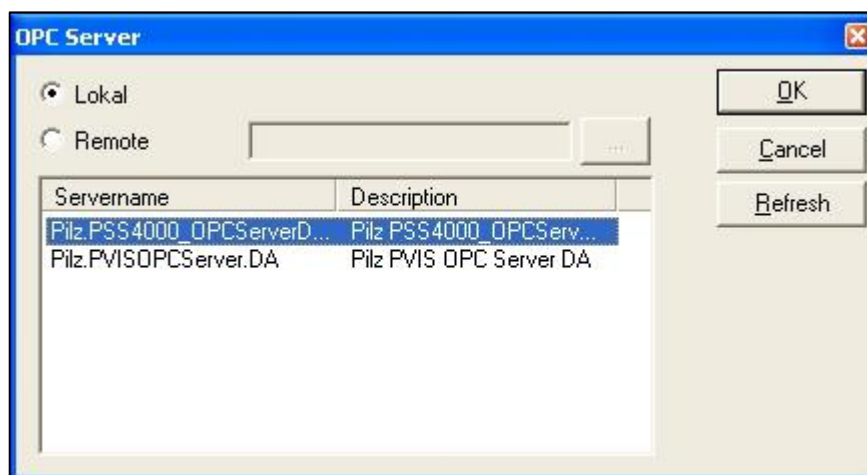


Fig. 6: PMI-PRO – Select PilzPSS4000_OPCServer

- ▶ Select the “Hold Variablelist local” checklist to be able to see all the variables on the PC.
The Configuration should then look like that shown in Fig. 7, page 12.
- ▶ Click on OK once finished.

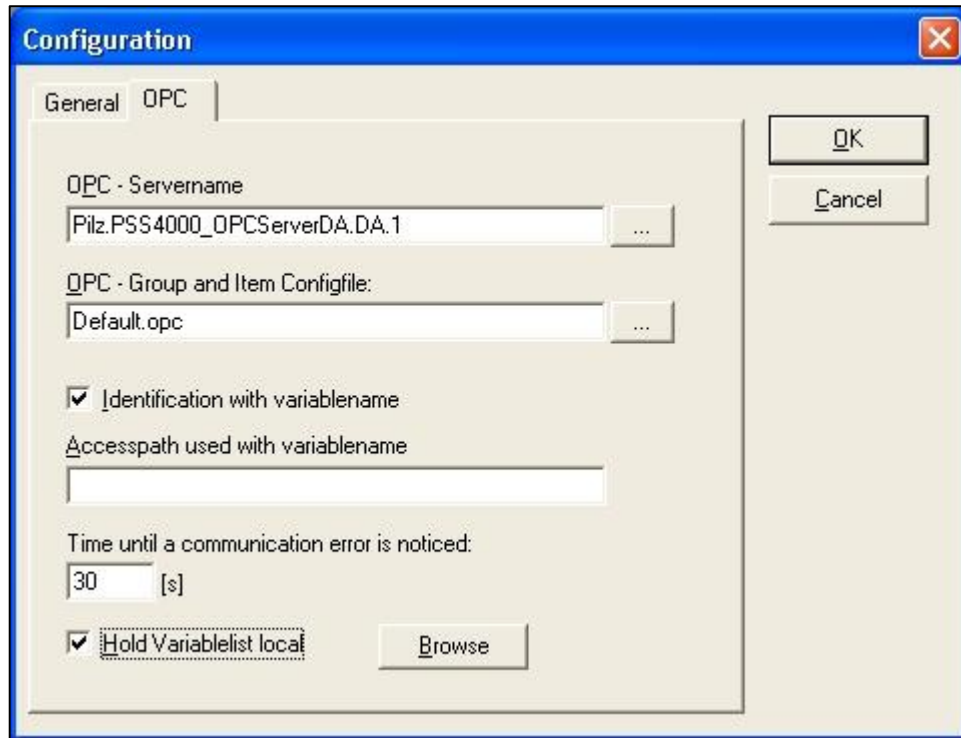


Fig. 7: PMI-PRO – Final OPC Client driver configuration

Now add variables to the project.

- ▶ Go to the **Tools** menu and select **Variables List**.
- ▶ Click on “New...”.

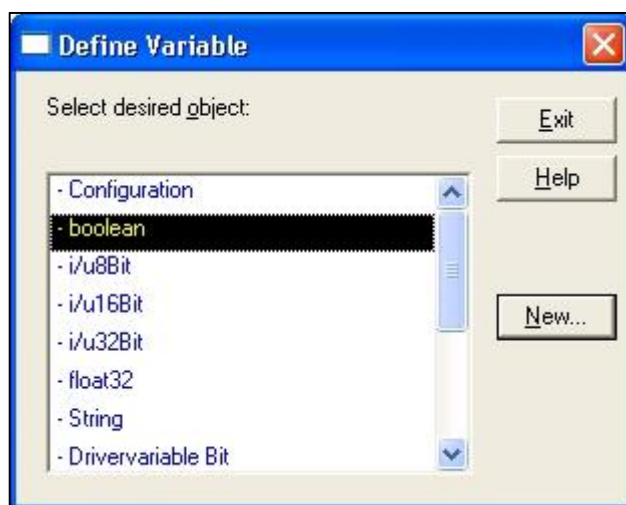
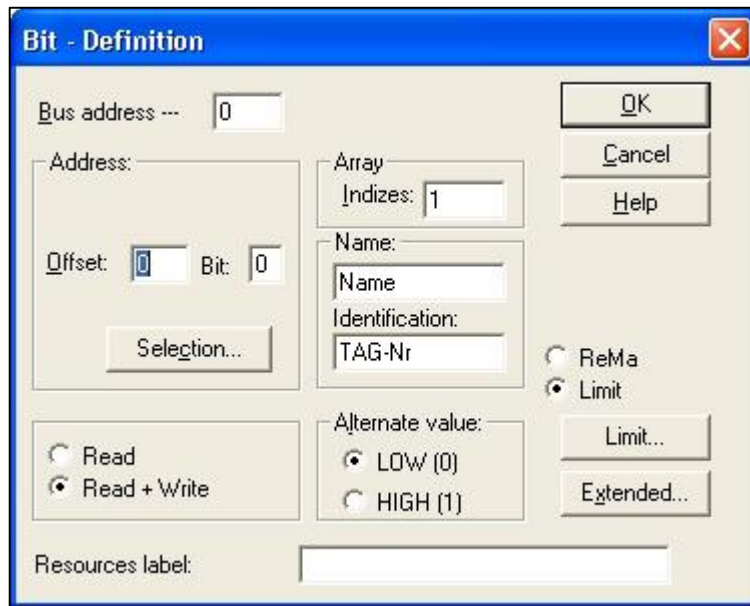


Fig. 8: PMI-PRO – Define Variable

- ▶ Select the type of variable to be accessed - e.g. boolean – and
- ▶ select “New...”. This brings up the definition window.

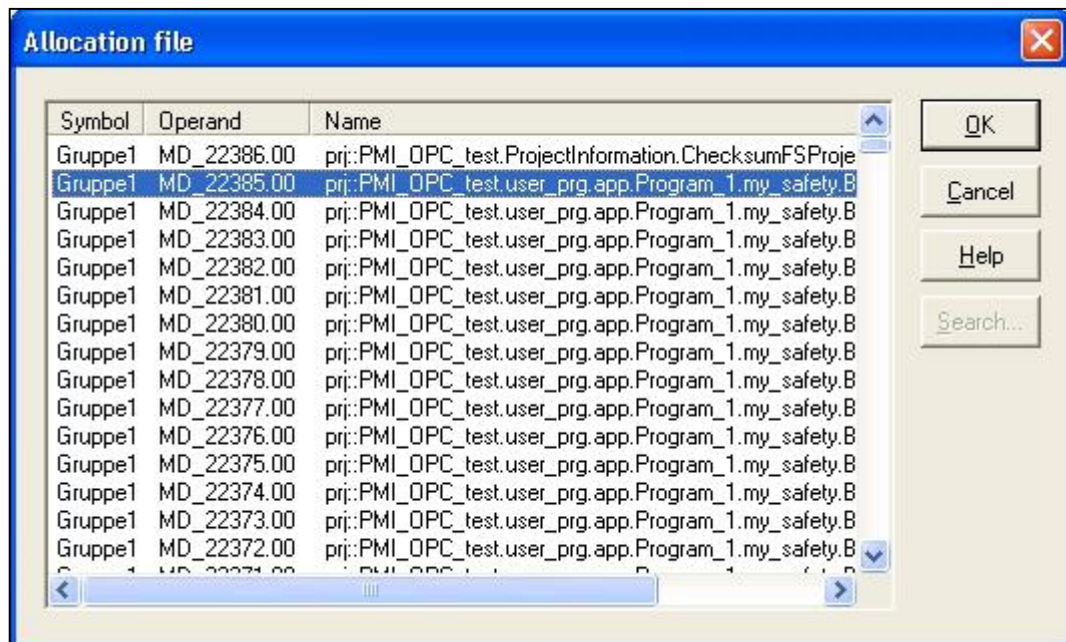


The "Bit - Definition" dialog box is shown. It has a title bar with a close button. The main area contains several fields and controls:

- Bus address ---**: A text box containing the value "0".
- Address:**: A section with **Offset:** (text box with "0") and **Bit:** (text box with "0"). Below it is a **Selection...** button.
- Array**: A section with **Indices:** (text box with "1").
- Name:**: A section with **Name** (text box) and **Identification:** (text box with "TAG-Nr").
- Read/Write**: Radio buttons for **Read** and **Read + Write** (selected).
- Alternate value:**: Radio buttons for **LOW (0)** (selected) and **HIGH (1)**.
- Limit/Extended**: Radio buttons for **ReMa** and **Limit** (selected). Below them are **Limit...** and **Extended...** buttons.
- Resources label:**: A text box at the bottom.
- Buttons**: **OK**, **Cancel**, and **Help** buttons are on the right side.

Fig. 9: PMI-PRO – Bit Definition

- ▶ Click on “Selection...” to bring up a list of the available variables.



The "Allocation file" dialog box is shown. It has a title bar with a close button. The main area contains a table with three columns: **Symbol**, **Operand**, and **Name**. The table is populated with data, and the second row is selected. To the right of the table are **OK**, **Cancel**, **Help**, and **Search...** buttons.

Symbol	Operand	Name
Gruppe1	MD_22386.00	prj::PMI_OPC_test.ProjectInformation.ChecksumFSProje
Gruppe1	MD_22385.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22384.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22383.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22382.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22381.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22380.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22379.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22378.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22377.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22376.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22375.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22374.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22373.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22372.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B
Gruppe1	MD_22371.00	prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.B

Fig. 10: PMI-PRO – Allocation file > Select the variable required

If the PC was selected as the OPC Server and the “Hold Variablelist local” option as per Fig. 7, page 12, was selected, the list of variables is automatically populated.

The path of the variable is defined by:

prj::PMI_OPC_test.user_prg.app.Program_1.my_safety.Block_1.Enable

prj:: = start of tag

PMI_OPC_test = name of PSS 4000 project

user_prg.app. = common

Program_1 = name of PAsmulti program or POU

my_safety. = name of component block

.Block_1.Enable = function block name and variable

Once the variable is selected, click on "OK". The name of the variable is the path, so this cannot be modified, but it's possible to change the Identification field.

Once all the details are entered, click on OK again to get back to the "Define Variable" window. You can add more variables, or click "Exit" to finish.

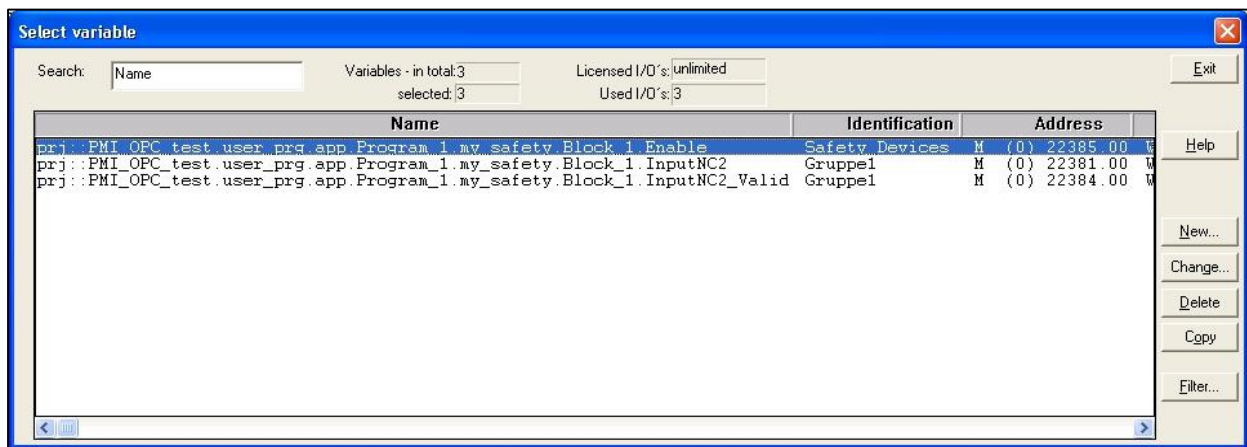


Fig. 11: PMI-PRO – Select variable > Variable list

Notice: The variables can now be used with any of the functions in the PMI program.

For example, to display the status of an Emergency Stop button, a graphic of an Emergency Stop button can be applied to a "Multibin" (multiple link) element using the enable output of the Emergency Stop block in the PASMULTI program.

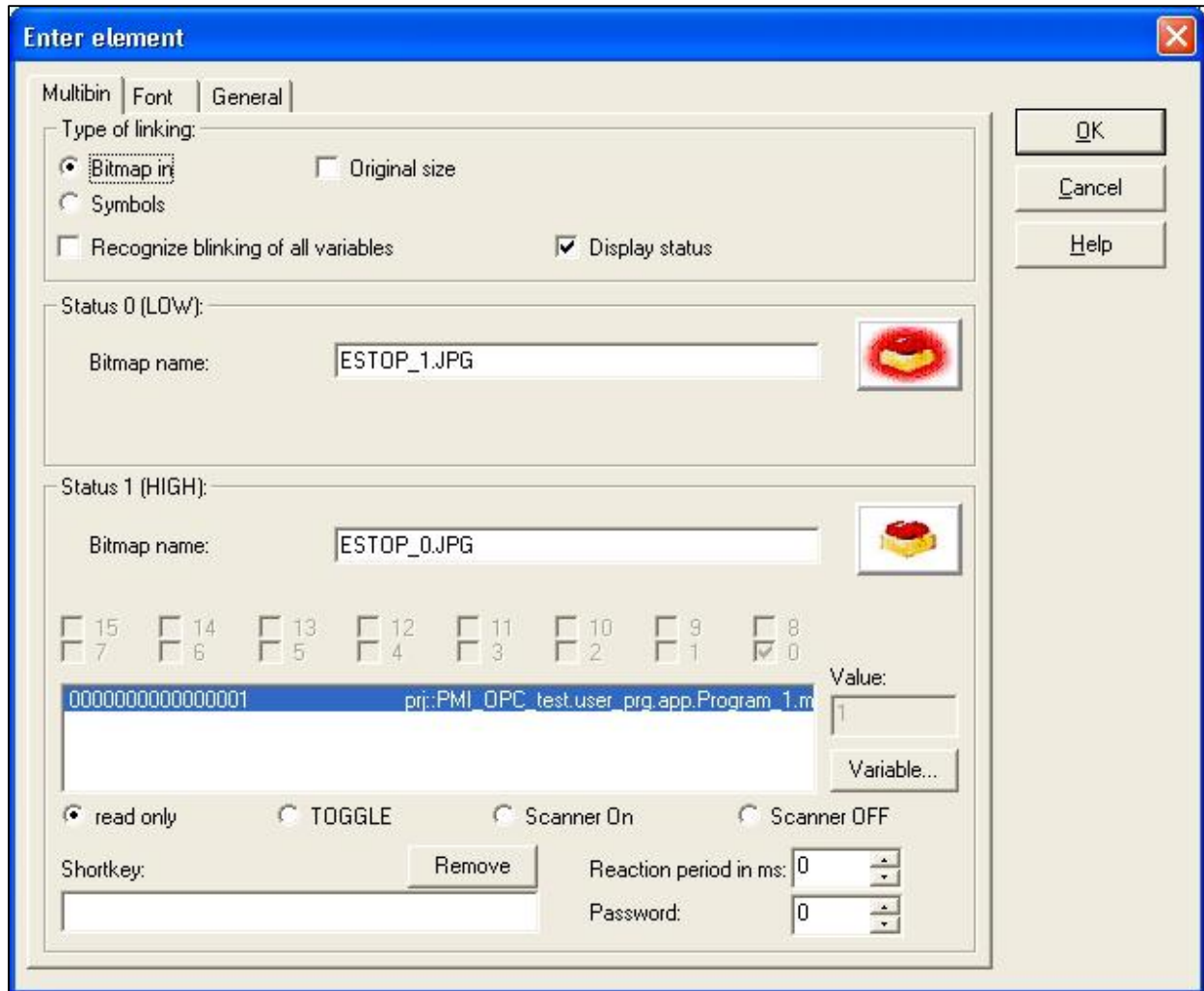


Fig. 12: PMI-PRO – Select variable > Variable list

Once you have finished adding all the variables to the PMI project go back to the PAS4000 project and change the OPC Server to be the PMI, and then build and download the project. Then download your PMI project.

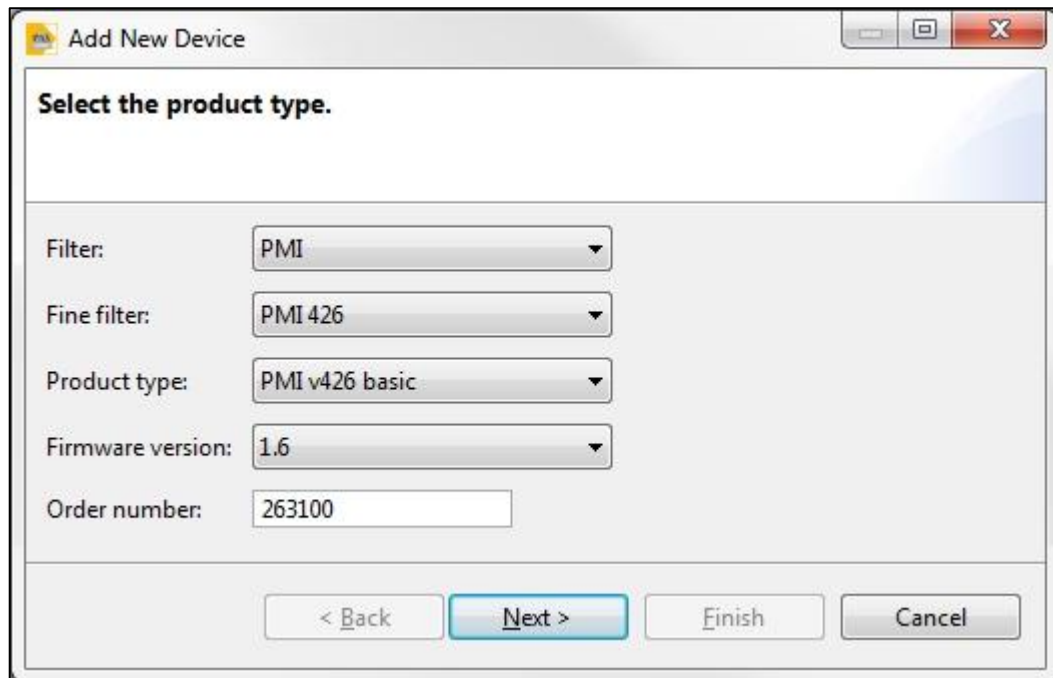


Fig. 13: PAS4000 Hardware Configuration – Add PMI4 for OPC Server

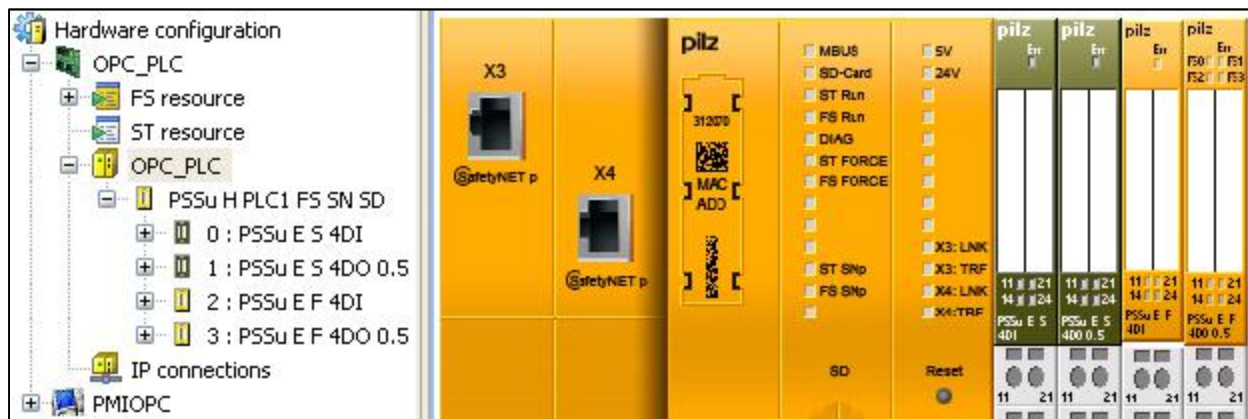
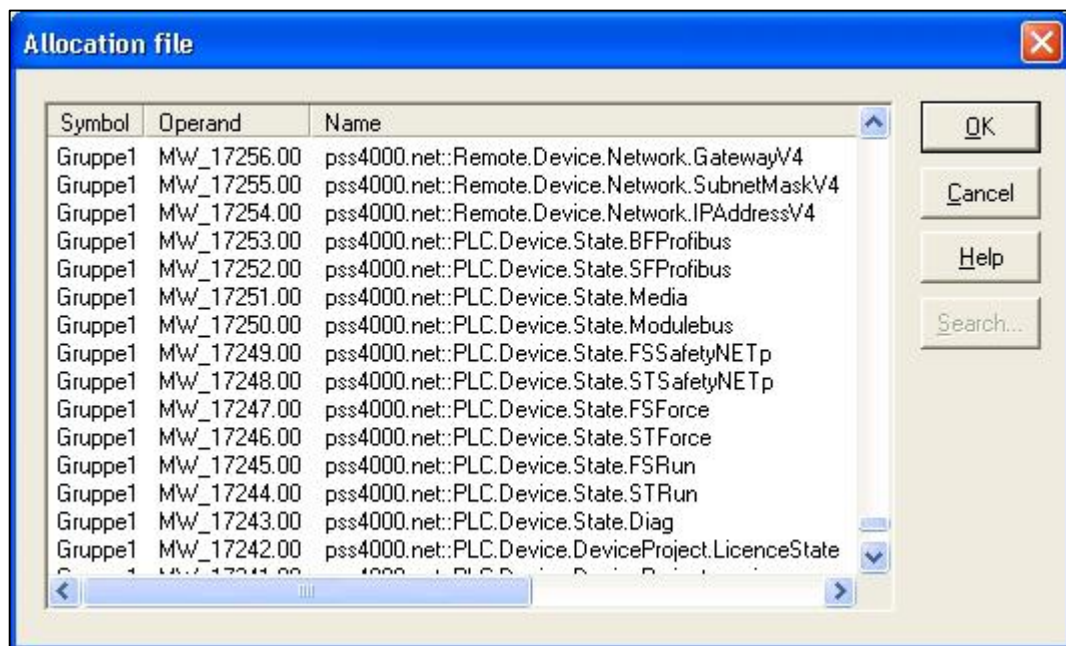


Fig. 14: PAS4000 Hardware Configuration – PSS 4000 system with PMI4

3.2.2. Status of the LEDs

To display the status of the LEDs on the PLC or IO head units some can be accessed in bit (Boolean) format and some must be accessed in Word (i/u16Bit) format.

- For example:
 - **MBUS** - access in WORD format. Green = 2 (bit 1)
 - **SD-Card** - access in WORD format. Green = 4 (bit 2)
 - **ST Run** - access in BIT format
 - **FS Run** - access in BIT format
 - **DIAG** - access in WORD format. Green = 5 (bits 0 and 2)
 - **ST SNp** - access in BIT format
 - **FS SNp** - access in BIT format



Symbol	Operand	Name
Gruppe1	MW_17256.00	pss4000.net::Remote.Device.Network.GatewayV4
Gruppe1	MW_17255.00	pss4000.net::Remote.Device.Network.SubnetMaskV4
Gruppe1	MW_17254.00	pss4000.net::Remote.Device.Network.IPAddressV4
Gruppe1	MW_17253.00	pss4000.net::PLC.Device.State.BFProfibus
Gruppe1	MW_17252.00	pss4000.net::PLC.Device.State.SFProfibus
Gruppe1	MW_17251.00	pss4000.net::PLC.Device.State.Media
Gruppe1	MW_17250.00	pss4000.net::PLC.Device.State.Modulebus
Gruppe1	MW_17249.00	pss4000.net::PLC.Device.State.FSSafetyNETp
Gruppe1	MW_17248.00	pss4000.net::PLC.Device.State.STSafetyNETp
Gruppe1	MW_17247.00	pss4000.net::PLC.Device.State.FSForce
Gruppe1	MW_17246.00	pss4000.net::PLC.Device.State.STForce
Gruppe1	MW_17245.00	pss4000.net::PLC.Device.State.FSRun
Gruppe1	MW_17244.00	pss4000.net::PLC.Device.State.STRun
Gruppe1	MW_17243.00	pss4000.net::PLC.Device.State.Diag
Gruppe1	MW_17242.00	pss4000.net::PLC.Device.DeviceProject.LicenceState

Fig. 15: PMI-PRO – Status LED variables in Word format

- For example, to display the status of the MBUS LED, a Multibin element can be used:

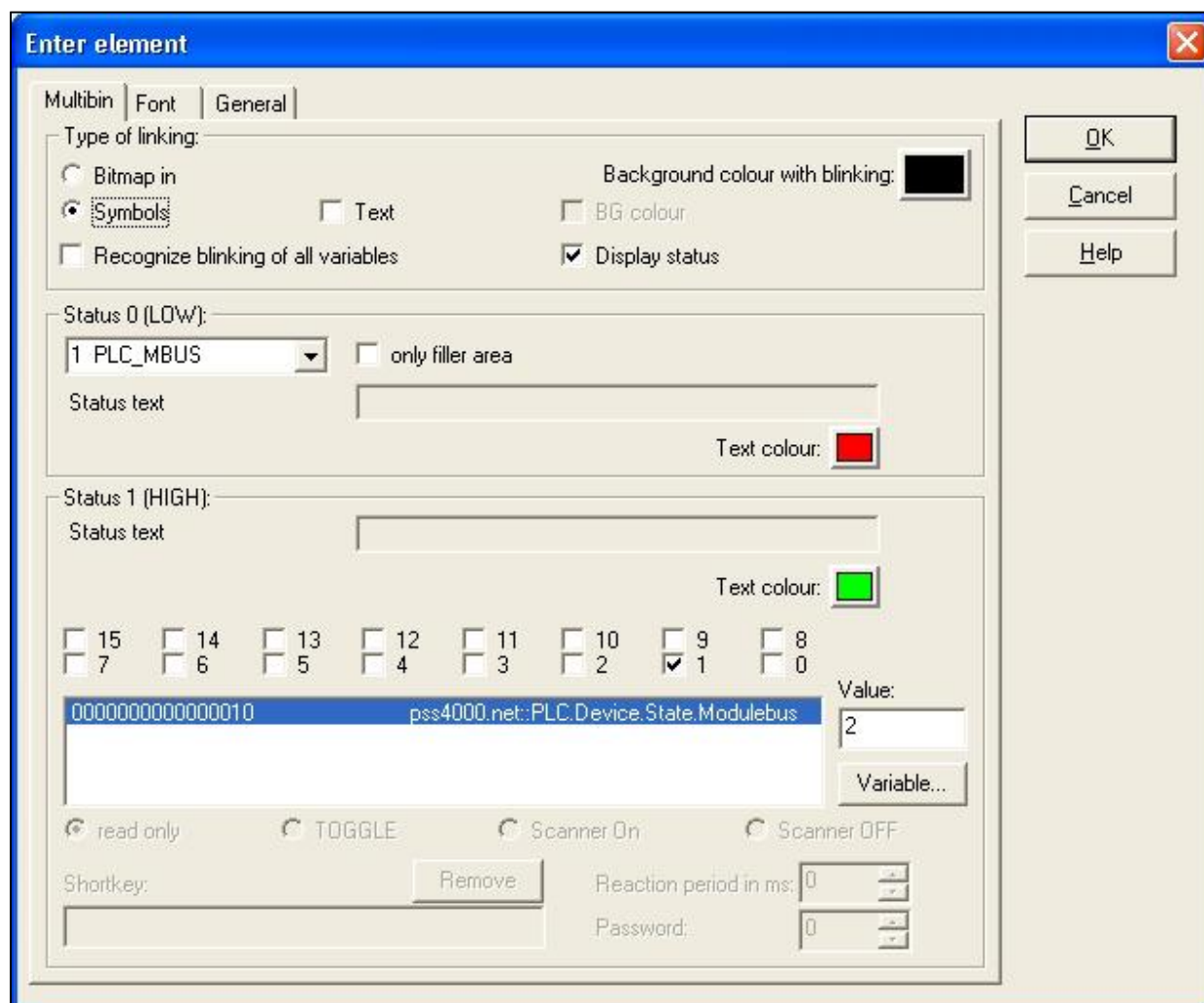


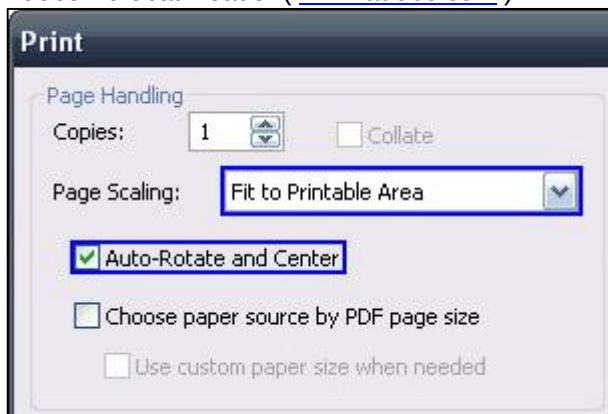
Fig. 16: PMI-PRO – Multibin element for MBUS LED

4. Table of figures

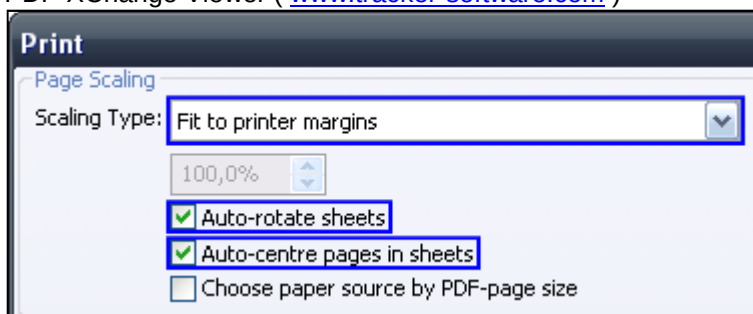
Fig. 1: PAS4000 Hardware Configuration – PSS 4000 system “OPC_PLC”	7
Fig. 2: PMI-PRO – Device Name “PMIOPC” of used PMI416	9
Fig. 3: PAS4000 Hardware Configuration – Add OPC Server	10
Fig. 4: PAS4000 Hardware Configuration – Configure device as OPC Server	10
Fig. 5: PMI-PRO – Configuration window for OPC Client driver	11
Fig. 6: PMI-PRO – Select PilzPSS4000_OPCTServer	11
Fig. 7: PMI-PRO – Final OPC Client driver configuration	12
Fig. 8: PMI-PRO – Define Variable	12
Fig. 9: PMI-PRO – Bit Definition	13
Fig. 10: PMI-PRO – Allocation file > Select the variable required	13
Fig. 11: PMI-PRO – Select variable > Variable list	14
Fig. 12: PMI-PRO – Select variable > Variable list	15
Fig. 13: PAS4000 Hardware Configuration – Add PMI4 for OPC Server	16
Fig. 14: PAS4000 Hardware Configuration – PSS 4000 system with PMI4	16
Fig. 15: PMI-PRO – Status LED variables in Word format	17
Fig. 16: PMI-PRO – Multibin element for MBUS LED	18

Recommended printer settings

Adobe Acrobat Reader (www.adobe.com)



PDF-XChange Viewer (www.tracker-software.com)





Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern, Germany
Telephone: +49 711 3409-0
Telefax: +49 711 3409-133
E-Mail: pilz.gmbh@pilz.de
Internet: www.pilz.com

In many countries we are
represented by our subsidiaries
and sales partners.

Please refer to our homepage
for further details or contact our
headquarters.

► Technical support

+49 711 3409-444
support@pilz.com

pilz