

MANUAL

PROFIBUS Configurator

Configuration Tool for PROFIBUS DP



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We have checked the contents of the document for conformity with the hardware and software described. Nevertheless, we are unable to preclude the possibility of deviations so that we are unable to assume warranty for full compliance. The information given in the publication is, however, reviewed regularly. Necessary amendments are incorporated in the following editions.

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Important notes

Read the manual before the start. For damages due to improper connection, implementation or operation Softing refuses any liability according to our existing guarantee obligations.

The recent version of this manual is available in the Download Area of Softing at: http://industrial.softing.com.



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Chapter 1

Overview



1 Overview

PROFIBUS Configurator is a versatile configuration tool. It allows the user to define PROFIBUS networks from a master's point of view. PROFIBUS Configurator can be used in various application scenarios to configure Softing PROFIBUS DP masters.

Depending on the use case the functionality reaches from defining the network structure with its connected devices and their individual device parameters over interactive online tests of particular inputs and outputs up to the definition of tag names and data types for all available process data as they are used by Softing's PROFIBUS OPC server.

1.1 Use Cases

• Offline configuration

The goal of an offline configuration is to prepare a binary configuration file for a controller that uses a Softing PROFIBUS DP master.

The PROFIBUS DP master may either be based on a PC interface board or implemented as an embedded solution using Softing's protocol stacks and IP cores.

• Online configuration

Online configuration makes use of a PROFIBUS interface boards installed on the PC where the PROFIBUS Configurator is used.

This allows for scanning the network for connected devices and for interactive communication with these devices.

A network configuration can be activated using the interface board as the active master for the devices connected to it.

• Defining tag names for process variables

For each configured device it is possible to assign named process variables to its inputs and output. These variable are also assigned a data type (e.g. Boolean for single bits or Signed Byte for an analog input).

These variables may subsequently be used inside the PROFIBUS Configurator for purposes like commisioning the network. For that purpose variables can be read and written as soon as the current configuration is activated.

Furthermore, the named variables serve as so-called "OPC items" if such a configuration is used by a Softing PROFIBUS OPC server.

1.2 How to get started

The remainder of this manual focuses on how to get started with offline configuration. Online configuration, OPC operation and a more detailed description of all configuration parameters are covered by the online help.



Chapter 2

Installation



2 Installation

2.1 System requirements

To run the PROFIBUS Configurator, the PC must meet the following requirements:

- Windows7 (32 or 64 bit version), Windows 8, Windows Vista or Windows XP installed
- Free USB 2.0 port for the USB hardlock

2.2 Software installation

Please insert the product CD-ROM in your PC's CD drive.

If the CD does not start automatically double-click on index.htm. The following screen opens in your web browser. All subsequent screen shots are taken from Internet Explorer. Other web browsers may show a slightly different behaviour.



Please click on your preferred installation language.



| Softing CD-ROM - PROFIBUS Configurator - Windo | ws Internet Explorer |
|--|--|
| CO V F:\install\PROFIBUS_Configurator_e. | html 🔹 47 🗙 🖸 Bing 👂 |
| 🖌 Favorites 🏾 🏉 Softing CD-ROM - PROFIBUS Cor | nfigurator 🛛 🛉 🛪 🔊 🛪 🖃 🖷 🖛 🔻 <u>P</u> age 🔻 Safety 🕶 Tools 🕶 🔞 🖲 |
| | PROFILE Configurator |
| | Installation of PROFIBUS |
| | Configurator |
| | Installation 32-Bit-Version |
| Home Installation Support | Installation 64-Bit-Version |
| Contact | |
| http://industrial.softing.com | >>>Manual |
| Done | 📜 Computer Protected Mode: Off 🛛 🖓 🔻 🍕 100% 🔻 |

On the following screen please select the installation package that suits your operating system.

When you are prompted with the following screen please choose "Run" in order to start the installation process.

| Do you | want to run or save this file? |
|--------|--|
| | Name: PBConfigurator64Setup.exe Type: Application, 31,3MB From: F:\software <u>Run Save</u> Cancel |
| | While files from the Internet can be useful, this file type can botentially harm your computer. If you do not trust the source, do not un or save this software. <u>What's the risk?</u> |

Please choose "Run" if the following security warning is shown.

| Internet E | xplorer - Security Warning | | × |
|------------|---|--|--|
| Do you | ı want to run this software? | | |
| | Name: PBConfigurator64Setup | | |
| | Publisher: Softing AG | | |
| Mo | ore <u>o</u> ptions | Run | Don't Run |
| ۲ | While files from the Internet can be use your computer. Only run software from | ful, this file type o publishers you tr | can potentially harm ust. <u>What's the risk?</u> |

The installation wizard appears.



Click on "Next"



and accept the terms of the license agreement.

| Softing Profibus Configurator (64Bit) - Installation Wizard | × |
|---|--|
| License Agreement Please read the following license agreement carefully. | your connection to excellence |
| LICENSE AGREEMENT FOR SOFTWARE PRODUCTS | <u>^</u> |
| 1 SUBJECT MATTER OF AGREEMENT | and the second |
| SUBJECT MATTER OF AGREEMENT between you ("LICENSEE") and S Automation GmbH, Haar ("SOFTING") is the computer program stored on the corresponding program documentation. (Hereinafter referred to as "SO | OFTING Industrial a data carrier and FTWARE [®] .) |
| SOFTING points out that it is not possible, at the state of the art, to programs with high complexity which work free of errors in all applications and | produce computer nd combinations. |
| 2 PROPERTY RIGHTS, RIGHTS OF USE | - |
| • I accept the terms in the license agreement | Print |
| I do not accept the terms in the license agreement | |
| | |
| InstallShield | |
| < <u>B</u> ack <u>N</u> ext > | Cancel |
| | |

Click on "Next".

Here you may change the installation directory. Otherwise just stay with the proposed default destination folder.

| B Softing F | Profibus Configurator (64Bit) - Installation Wizard | |
|------------------------|--|---|
| Destinati Click Nex | ion Folder xt to install to this folder, or click Change to install to a different folder. your connection to excellen | |
| Ø | Install Softing Profibus Configurator (64Bit) to: C:\Program Files (x86)\Softing\Profibus\configurator\ Change |] |
| | | |
| InstallShield . | | |
| | < <u>B</u> ack <u>Next</u> Cancel |] |

Click on "Next" once more.



| Bofting Profibus Configurator (64Bit) - Installation | Wizard |
|---|--|
| The wizard is ready to begin installation. | your connection to excellence |
| Click Install to begin the installation of | |
| Softing Profibus Configurator | |
| If you want to review or change any of your installation exit the wizard. | on settings, click Back. Click Cancel to |
| InstallShield | Install Cancel |

When you click on "Install" software installation begins. This process may take some time.

| B Softing P | Profibus Configurator (64Bit) - Installation Wizard |
|------------------------|---|
| Installing The prog | softing Profibus Configurator (64Bit) gram features you selected are being installed. |
| P | Please wait while the Installation Wizard installs Softing Profibus Configurator (64Bit). This may take several minutes. |
| | Status: |
| | Install drivers |
| | |
| | |
| | |
| | |
| | |
| InstallShield | |
| | < <u>B</u> ack <u>N</u> ext > Cancel |

Finally, the installation will terminate.





Please confirm this final step by clicking on "Finish".



2.3 Hardlock installation

Insert the supplied blue USB hardlock in a free USB port of your PC. After a short while the hardlock will be recognized.

If it is the first time the hardlock is installed on your PC you typically get a success message from Windows.



Successful installation and operation of the hardlock is signalled by switching on a red LED indicator inside the translucent housing of the hardlock.



Chapter 3

Working with PROFIBUS Configurator



3 Working with PROFIBUS Configurator

The following simple example shows how to create a binary configuration file for a PROFIBUS DP master based on Softing's protocol stacks.

3.1 First start

Click on the Windows start button and select "all programs" - "Softing PROFIBUS"

| Softing PROFIBUS Configurator | | Default Programs |
|----------------------------------|---|------------------|
| Documentation Back | Ŧ | Help and Support |
| Search programs and files |] | Shut down D |

There you can launch the "Configurator".

When you start it the first time there is no recent project file. In this case an empty configuration project opens.

| <u>File E</u> dit <u>V</u> iew <u>O</u> ptions <u>H</u> elp | | | | |
|---|---|------|------|--------------|
|) 🚅 🖬 % 🖻 🛍 😰 🕨 🔳 | | | | |
| Computer | 🖳 Computer | | 1 | |
| | | Name | Туре | Network Type |
| | Select an item to view its description. | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

3.2 Adding a network and a segment

The configuration tool follows a structured approach for the modeling of automation systems. All master and slave devices are connected to network segments.

First we need to create a network.



ROFIBUS Configurator [C: Wocuments and Settings VAII Users Vapplication Data Vsofting VBOPCServer Configuration.xml] [ile Edit ⊻iew Options ∐elp D 😅 🖬 | X 🖻 🖻 📄 📕 Computer 📕 Computer Сору Туре Network Type Name Paste Cut Select an item to view its description. Delete Del Renar F2 Activate F5 Deactivate Shift+F5 Alt+Enter Properties Scan Objects... F6 New network Ctrl+I

Right-click on the computer symbol and select "New network".

Then right-click on the new network and select "Insert Segment".

| <u>File Edit View O</u> pti | ions <u>H</u> elp | | |
|-----------------------------|-------------------|-----------|------------|
| 🗅 🚅 🔛 🕺 🛍 I | 8 🕑 🕨 🗖 | ļ | |
| Computer | | | -fi |
| Profibus Networki | Сору | Ctrl+C | |
| | Paste | Ctrl+V | |
| | Cut | Ctrl+X | Sel its |
| | Delete | Del | |
| | Rename | F2 | |
| | Activate | F5 | |
| | Deactivate | Shift+F5 | |
| | Properties | Alt+Enter | |
| | Insert Segment | Ctrl+I | |

3.3 Adding a master

We need to add a PROFIBUS master device. This master represents the target device for our binary configuration file.

A configuration project may have more than one master, each with its own binary configuration. In our example we stay with only one master.



Right-click on the new segment and select "Master...".

| PROFIBUS Configurato | r [C:\Documents | and Settin | igs\All |
|------------------------------|---|----------------------------|------------|
| Eile Edit View Options | Help | | |
| 0 🗃 🖬 👗 🖻 🖻 | 8 🕨 🔳 | | |
| Computer Computer Computer | | | ±γ Ρ |
| 한 삭 Profibus Segment 1 | Copy Paste Cut | Ctrl+C Ctrl+V Ctrl+X | ele s d |
| | Delete Rename | Del F2 | |
| | Activate Deactivate | F5 Shift+F5 | |
| | Properties Calculate/Check Scan Nodes | Alt+Enter Ctrl+A F6 | |
| | Master | Ctrl+M | |
| | Slave Coupler | Ctrl+K Ctrl+O | |

The following dialog will open.

| ofting | Name | Ident |
|--------|---|----------------------|
| | PBpro Master PB Master PROFIcard2 PB Master PCI or PC/104 | 08AA 8204 8203 |
| | | |

It does not matter which master type we select. The master entry only acts as a placeholder for our target controller to be configured. In our example we select PBpro Master an click on "Next".



In the following dialog we may adjust our master's station address and click on "Finish".

| | J.C. Martine and | |
|----------------|------------------|--|
| ation Address: | 1 🔅 | Unique station address on the bus. |
| Local Master | | |
| oardname: | Node0 | <u></u> |
| utoClear | Γ | In case of an error, the master automatically switches to operation mode 'Clear' |

We also want to define the baud rate setting for our master. This is a segment parameter. Right-click on the segment and select "Properties...".

| | Bulaton Teranoa | uments and Setti | ngs va |
|-----------------------|-----------------|------------------|--------|
| <u>File Edit Yiew</u> | Options Help | | |
| 0 🗃 🖬 🖌 🛛 | à 🖪 📴 🕨 | | |
| 🗐 Computer | 164 W C | | 4.7 |
| Profibus Netwo | rk1 | | |
| | Сору | Ctrl+C | 10000 |
| E Man M | Paste | Ctrl+V | Sel |
| | Cut | Ctrl+X | ics i |
| | Delete | Del | |
| | Rename | F2 | |
| - | Activate | F5 | |
| | Deactivate | Shift+F5 | |
| | Properties | Alt+Enter | |
| | Calculate/Check | Ctrl+A | |
| | Scan Nodes | F6 | |
| | Master | Ctrl+M | |
| | Slave | Ctrl+K | |
| | Coupler | Ctrl+O | |



Here we choose the desired baud rate from the select box and click on the "Standard" button. This adjusts the bus parameters to typical values for the selected baud rate which we confirm by clicking on "OK".

| Properties of Profibus Segment General Standard Properties Project Comment Advanced Advanced Properties | 1 <u>Name:</u> <u>Baud Rate:</u> <u>I</u> arget Rotation Time: <u>Watchdog Time:</u> Watchdog/TT <u>B</u> Ratio: <u>H</u> ighest Station Address: | Profibus Segment1 12MBit/s 2400000 140 700 126 | (Bit Time) *) (ms) (%) |
|--|---|--|--------------------------------------|
| | *) Bit Time is the transmiss OK | ion time in bits, for example | e 1/12 MBaud = 83,3 ns Apply Help |

3.4 Adding a slave

Slave devices represent the peripherals connected to a master via the PROFIBUS network. The characteristics of such slave devices are modeled in a so-called "GSD file" that is available from the vendor of the slave device.

Please make sure you have all GSD files at hand for your specific devices.

| <u>File Edit View Options</u> | Help | |
|-------------------------------|-----------------|-----------|
| 0 🚅 🖬 👗 🛍 🛍 | 😰 🕨 🔳 | |
| Computer | ana kao ara | |
| جلہ 🖻 🖓 Profibus Network1 | | |
| 🖻 📶 001_PBpro Mas | Сору | Ctrl+C |
| 🛨 📶 MasterData | Paste | Ctrl+V |
| | Cut | Ctrl+X |
| | Delete | Del |
| | Rename | F2 |
| | Activate | F5 |
| | Deactivate | Shift+F5 |
| | Properties | Alt+Enter |
| | Calculate/Check | Ctrl+A |
| | Scan Nodes | F6 |
| | Master | Ctrl+M |
| | Slave | Ctrl+K |
| | Coupler | Chil+O |

Right-click on the segment again and select "Slave...".



This opens the following dialog:

| Endress + Hauser | Name | Ident |
|---|---------------------------------------|--------------|
| Phoenix Contact SIEMENS SIEMENS_AG Softing | PBpro Slave PB Slave PCI or PC/104 | 0835 8205 |
| | | |

Here you can select from already available GSD files. For any other slave device click on "Import..." and browse the fitting GSD file.

When the correct slave is selected continue with "Next".

In the following dialog we may adjust the slave's station address and click on "Finish".

| Insert new slave | ? 🛛 |
|--------------------------|---|
| Standard Propertie | 2 |
| | |
| <u>N</u> ame: | 002_PBpro Slave |
| Station Address: | 2 Unique station address on the bus. |
| Assigned <u>M</u> aster: | 001_PBpro Maste Cyclic Master of the device. |
| | |
| | |
| | |
| < Back | Next > Finish Cancel Help |



Now we need to define some slave parameters. Right-click on "CyclicData" of the slave and select "Properties...".



In the following dialog we may adjust some general characteristics:





Now we need to define the i/o data of the slave. Click on "Modules".

| General Standard Properties Project Comment | - Max. number of modules: 100 Number of used modules: List of <u>a</u> vailable | 2 |
|---|--|----------------|
| Advanced Modules User Parameter Data | 0 Byte Out, 8 Byte In 1 Byte Out, 0 Byte In 2 Byte Out, 0 Byte In 3 Byte Out, 0 Byte In 4 Byte Out, 0 Byte In 5 Byte Out, 0 Byte In | |
| | Down Up Insert List of used modules: | <u>D</u> elete |
| | 0 Byte Out, 2 Byte In 2 Byte Out, 0 Byte In | |
| | | |

Here we can select and "Insert" the modules that we want to add to the master's process image. Some slaves have user parameters that may be adjusted by clicking on "User Parameter Data". Finally click on "OK".

Further slaves may be added in the same way.

3.5 Saving the project

Finally we save the project. Selecting "Save As..." allows us to choose the name and location of the project individually.

| Eil | e <u>E</u> dit <u>V</u> iew <u>O</u> pt | ions <u>H</u> elp |
|-----|--|-------------------|
| | New Ctrl+N Open Ctrl+O Save Ctrl+S | |
| | Save <u>A</u> s | 1 ster |
| | Print Ctrl+P Print Preyjew Print Setup | ta ave a |
| | Recent <u>F</u> iles | |
| | E <u>x</u> it | - |



PROFIBUS configurator stores two types of files. The project information is contained in an XML file. In addition to that BIN files are created for each PROFIBUS master that is contained in the project. These files contain the configuration information for a particular master device. Transfer this BIN file to the corresponding target master device.

| 😂 PROFIBUS | | | |
|--|---|--|--------------------------------|
| <u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> oc | ls <u>H</u> elp | | 1 |
| 🕝 Back 🔹 🕥 - 🏂 🔎 | Search 🎼 Folders 🛄 🗸 | | |
| Address 🗁 C:\Documents and Settin | gs\Administrator\My Documents\PROFIBUS | | 🖌 🄁 Go |
| | Name 🔺 | Size Type Date | • Modified |
| File and Folder Tasks Image: Constraint of the state of the sta | my_configuration.bin my_configuration.xml | 1 KB BIN File 4/12, 4 KB XML Document 4/12, | /2013 3:21 PM /2013 3:21 PM |
| Other Places (*) My Documents My Computer My Network Places Details (*) | | | |
| | < | 101 |) > |

There are two types of PROFIBUS DP master stacks available from Softing that use different BIN file formats.

By default the PROFIBUS Configurator uses the "Version 5" format. This typically fits controllers based on Softing's PC interface boards.

Controllers using Softing's IP Core solutions use "Version 6" format.

Please ask the vendor of your PROFIBUS master controller about the appropriate format.

The format to be generated by PROFIBUS Configurator may be changed by clicking on "Settings..." in the "Options" menu.





Choose the desired format on the "Binary Format" tab and click on "OK".

| Properties | $\mathbf{\times}$ |
|---|-------------------|
| Choose GSD OPC Server OPC Properties Binary Format Binary configuration file File format Version 5 File format Version 6 | |
| OK Cancel Apply | |

3.6 Further information

For further information on the features of PROFIBUS Configurator please use the online help (F1).