Profi-S-Link

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0.1   Document History

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Date	Version	Changes	Remarks
2004-05-31	pEN1	-	Preliminary Edition
2004-07-01	EN01	-	Published Edition
2004-08-15	EN02	-	New pictures
2013-10-17	EN03	-	New logo and new company name

0.2   About this manual

See the section in the appendix in relation to some of the terms, abbreviations and the references used in this manual.

0.3   Brands and trademarks

Saia PCD® and Saia PG5®
are registered trademarks of Saia-Burgess Controls AG.

Technical modifications are based on the current state-of-the-art technology.

Published in Switzerland

1   Quickstart

1.1   Summary

Profi-S-Link is an Ethernet to Profibus Gateway that supports programmation and supervision of the new generation of Saia PCD® CPU's with Profi-S-Bus protocol, like the PCD2.M480 or the PCD3.Mxxxx.

This manual describes how to establish communication between the software tool Saia PG5® and the Saia PCD® CPU's that are connected via Profi-S-Bus.

> The Minimum Saia PG5® Version, which has to be used is 1.3.100

1.2   Communication network
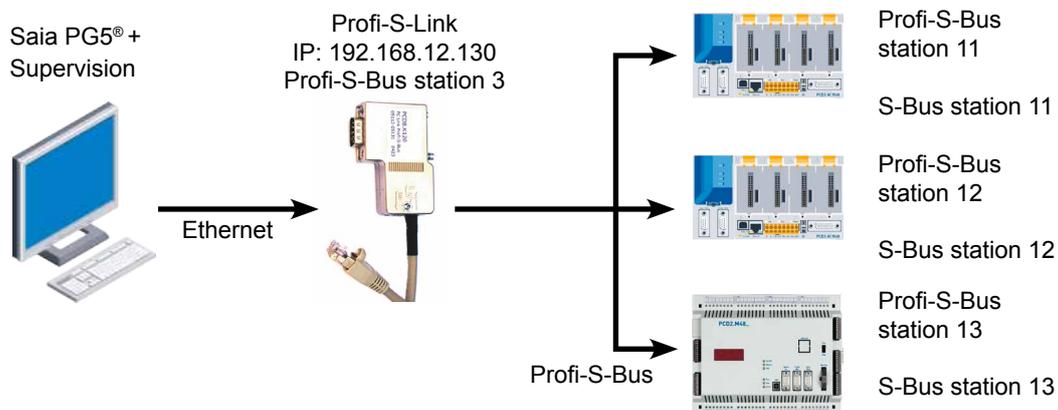
Ethernet network

Profi-S-Link is connected to the PC via Ethernet. It is possible to have several Profi-S-Links in the same Ethernet network.

> Profi-S-Link is delivered with 3 meters of cable, it is not suitable to be directly connected to a PC or other participant, you must either
>
> ● directly connect it to a hub/switch which is closed to the Profi-S-Link
> ● or use a male/male adaptor and a straight (non-crossed) cable to create a longer connection to a hub/switch
> ● or use a male/male adaptor and a crossed cable (see chapter 2.4) to create ad point to point connection
>
> For all methods: use a category 5 twisted pair cables.

Profi-S-Bus network

Connect Profi-S-Link and the Saia PCD® CPU's according the specifications of Profi-S-Bus (which are identical to the Profibus specifications).

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1.3   Saia PG5® Hardware settings of the stations connected to Profi-S-Bus

Hardware   Hardware settings allow to define the parameters of the Profi-S-Bus port for each connected station.

! Without the following configuration the Profi-S-Link will not be powered by the 24 V supply from the Profi-S-Bus port, so the Profi-S-Link will not work.

Select the hardware type of the Saia PCD® CPU. Only the latest Saia PCD® CPU's (PCD2.M480 and PCD3.Mxxxx) support Profi-S-Bus. The PCD2.M480 for instance supports up to 3 Profi-S-Bus ports.
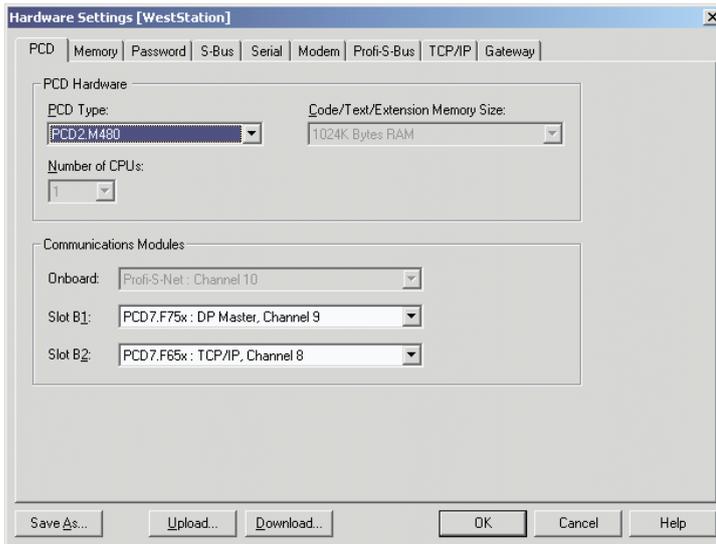
When using PCD7.F750 modules on slot B1 or B2 (ports 8 and 9 respectively), choose the module in the "Communication Modules" section and don't forget to insert the module in the slot.

! Define the S-Bus address of the Saia PCD®:
The Saia PCD®'s have a Profi-S-Bus **and** a S-Bus address. To avoid confusion we recommend to use the same address for both, even though they are independent.
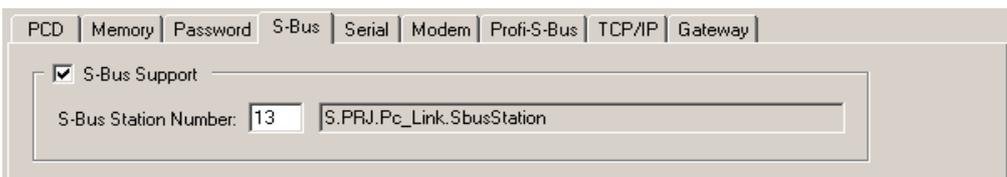
After the choice of the communication channel define:
● the Profi-S-Bus address: *Address*
● the speed of the communication: *Baud Rate*
● the option *PGU Port* supports the programmation of the Saia PCD® with Saia PG5®. If the PGU port is used for supervision only, select *Slave* here
● *Bus Profile* defines the timing for the communication. You must select the same profile for the Saia PCD®'s and the Profi-S-Link.
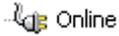
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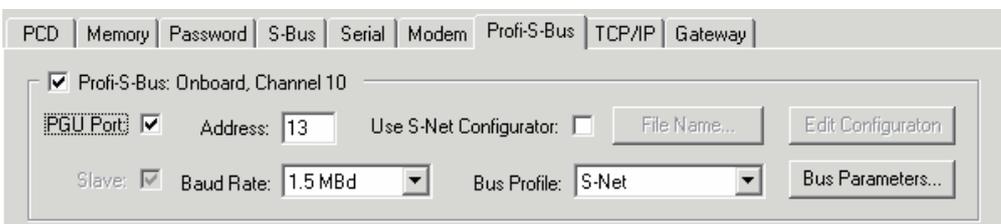
Download...   After defining the hardware settings, download them into the Saia PCD®
memory with the button Download. If the download was not success-
full, a dialogue window appears with the message: No response. Verify the online
settings. Only the PGU on S-Bus, USB channels allow to communicate with a Saia
PCD® independent of its harware settings.

1.4 Online settings

Online

The online settings allow to define the communication parameters for:
- the software tool Saia PG5®
- the Profi-S-Link

Only the Profi-S-Bus channels support the Profi-S-Link adapter.

1.4.1 Configuration of the Profi-S-Link

In the online settings select the button Setup, then Profi-S-Link settings.

Settings

Now the parameters of Profi-S-Link have to be defined:
- Ethernet address: *IP Address*
- The Profi-S-Bus communication speed: *Baudrate*
- *Profi-S-Bus Station* address. The Profi-S-Link is an active station in the Profi-S-
  Bus network!
- The *Highest Station address* in the network (leave the default value for this
  example)
- The *Profile* is defines the timing of the bus and must be identical for all stations
  on the bus. The parameters can be displayed with the button *Bus Parameters*.
  For most profiles the parameters are read only, only the "User" profile can be
 modified if necessary.

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> The buttons Download and Save store the parameters of Profi-S-Link in a file which belongs to the common files of the project. This file has the name of the channel.

If several Profi-S-Links are present in the same Saia PG5® project, we recommend to define a new channel for each Profi-S-Link using the menu Tools, Channels of the Saia PG5® Project Manager.
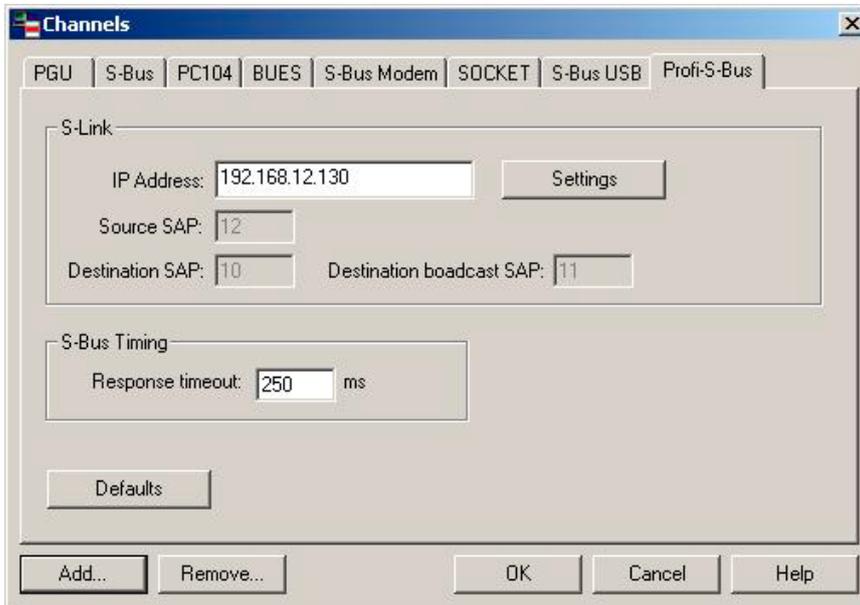
Download the selected settings into the Flash memory of Profi-S-Link with the button Download.

A dialogue window shows the list of the Profi-S-Link hardware available only on the **local** Ethernet subnet. For configuration select the desired Profi-S-Link with the mouse and press OK.
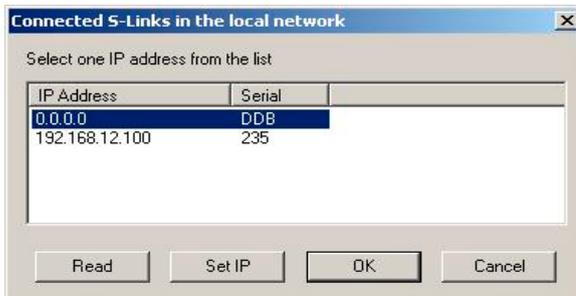
The active Profi-S-Link is shown in the header of the following window. The next selection of one of the buttons Download, Upload and Firmware does not show this list, these commands use the last selected (active) Profi-S-Link. To change the active Profi-S-Link, call the stations list with the button Life List.

If the Profi-S-Link is brand new (Address 0.0.0.0 per default) or is not located in the local subnet, you can temporarily define an IP address to communicate with the Profi-S-Link for the download and the upload of the settings.

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The temporary modification of the IP address is subject to certain conditions:

- This function is sending broadcast telegrams and searches all Profi-S-Links in the **local** network
- The Profi-S-Link do only accept a temporary IP Address the first three minutes after startup. Make sure, that only the Profi-S-Link you want to configure is within these 3 minutes, or you will have several Profi-S-Links with the same address
- The most safe way for this step is to use the crossed cable and male/male adaptor provided with each Profi-S-Link (point to point connection)
- The temporary address is only valid until the next download of the configurtion. After this the Profi-S-Link is restarting with the IP settings according to the new configuration.
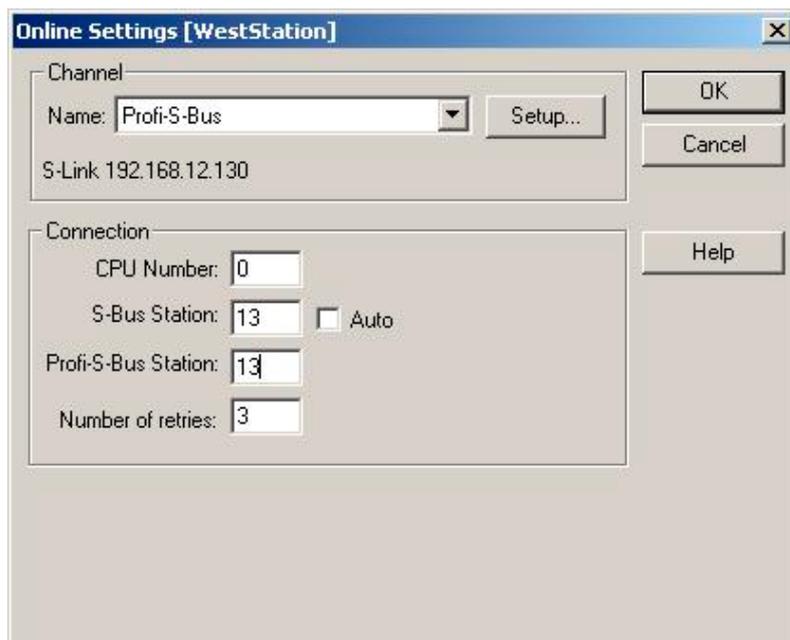

1.4.2   Configuration of the online settings of the CPU's

For each CPU in the Saia PG5® project verify the parameters of the Profi-S-Bus channel:

- Ethernet address of the Profi-S-Link adapter, if necessary correct the address using the button Setup
- Profi-S-Bus station number
- S-Bus station number

2   Technical characteristics

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2.1   General

Profi-S-Link is an Ethernet to Profibus Gateway built into a D-Sub connector. It is con-
nected to the PC via Ethernet, often using a Hub or Switch. A point to point connec-
tion is possible using the crossed cable and male/male adaptor provided with each
Profi-S-Link.

The Profi-S-Link is supplied from the Profi-S-Bus port of the Saia PCD®. The configu-
ration is downloaded via Ethernet and stored in Flash EPROM.

Profi-S-Bus
interface
(D-Sub)

RDY/RUN LED

Link LED

Ethernet interface
(RJ45)

cable length: 3 m
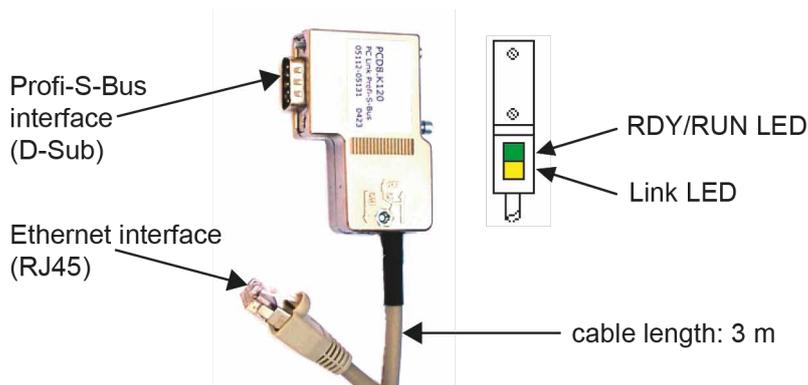
General data	
Operating temperature	0 °C...+50 °C
Degree of protection	IP 20
Dimensions (LxWxH)	65x48x16 mm
Weight	approx. 140 g with cable
Minimum Saia PG5® Version	1.3.100

2.2   Profi-S-Bus interface

PROFIBUS interface data	
Interface	RS-485, max. 12 Mbps, without galvanical separation
Supported standard	according to EN 50170
Operating voltage	+24 V / 50 mA, taken from the Profi-S-Bus port

Profi-S-Bus connector		
Pin	Signal	Meaning
1	-	not used
2	DGND	Data and supply voltage reference
3	RxD/Txd-P	Receive / transmit data-P
4	-	not used
5	DGND	Data and supply voltage reference
6	-	not used
7	VP	24 V power supply (coming from the Saia PCD®)
8	Rxd/TxD-N	Receive / transmit data-N
9	Shield-	Housing / shield

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> Due to its compact dimensions, the Profi-S-Link is not protected against supply voltages with inverse polarity.

2.3   Ethernet interface

Ethernet interface data	
Transmission rate	10/100 MBaud, auto negotiation
Interface	10/100 Base-TX, RJ45, galvanical separation connector

RJ45 connector		
Pin	**Signal**	**Meaning**
1	TX+	Transmit data
2	TX-	Transmit data
3	RX+	Receive data
4	-	not used
5	-	not used
6	RX-	Receive data
7	-	not used
8	-	not used

> Profi-S-Link is delivered with 3 meters of cable, it is not suitable to be directly connected to a PC or other participant, you must either
>
> - directly connect it to a hub/switch which is closed to the Profi-S-Link
> - or use a male/male adaptor and a straight (non-crossed) cable to create a longer connection to a hub/switch
> - or use a male/male adaptor and a crossed cable (see chapter 2.4) to create a point to point connection
>
> For all methods: use a category 5 twisted pair cable.

2.4   Standard Ethernet accessories

For configuration purposes we recommend a point to point connection. For this reason you get with every Profi-S-Link the following accessories:

Male/Male Adaptor and crossed cable category 5

2.5   LED's

LED	Colour	State	Meaning
RDY / RUN	**Red**	Flashing (1 Hz)	Boot loader active
		Flashing fast (10 Hz)	Booting, Firmware being initialized
RDY / RUN	**Green**	On	Ready, IP address set
		Flashing non-cyclically	Still no IP address or double addresses in the network
		Flashing fast (10 Hz)	Firmware being updated
Link LED		On	There is a connection with the Ethernet
		Off	No connection with the Ethernet

2.6   Default parameters

> To prevent communication conflicts, Profi-S-Link is delivered with a predefined IP address 0.0.0.0. Without configuration, the Profi-S-Link will not answer to telegrams, but it is possible to assign a temporary IP Address for the configuration process. This address is saved in the RAM and is lost after the download of a configuration or an interruption of the supply voltage (when disconnected from the PCD). Refer to chapter 1 for more details about the configuration of the Profi-S-Link.

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Default parameters at delivery:

IP Address	0.0.0.0
IP Baudrate	auto negotiation
Profi-S-Bus Baudrate	1.5 MBaud,
Profi-S-Bus Station number	0
Profile	SNet
Highest station address	126
Slot time	3000 bits
Min Tsdr	150 bits
Max Tsdr	980 bits
Quiet time	0 bit
Setup time	240 bits
Gap update factor	50
Max retry limit	1
Target rotation time	2021 bits

> We recommend to use the DP profile, it allows to change data faster than with Snet profile. The SNet profile is necessary to support the PCD3 RIO's, this is why it is the default setting.

> Remember that all participants on a Profibus network (and therefore as well on Profi-S-Bus networks) must contain identical timing settings.

3 Networking possibilities
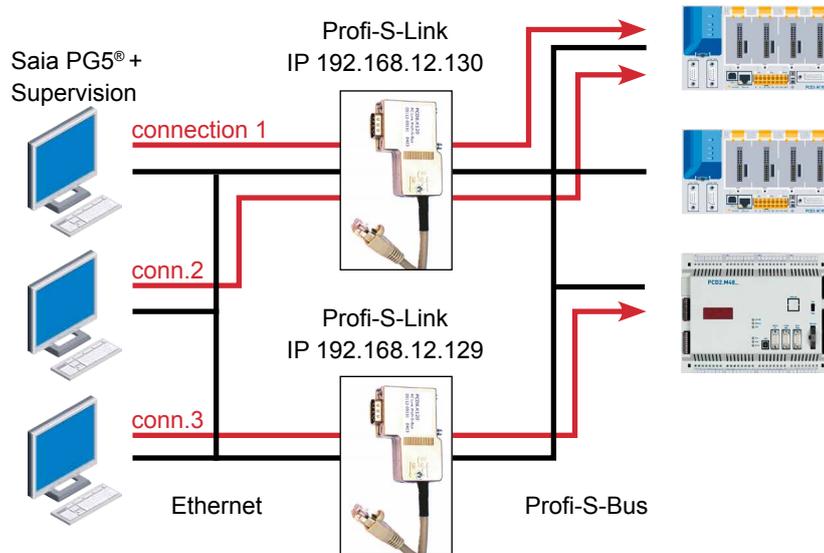
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In an Ethernet network it is possible to have several clients that communicate simultaneously with different Saia PCD®'s. At the same time it is possible to have several Profi-S-Links in the network that are Gateway to one or several Profi-S-Bus networks.

The Profi-S-Link hardware supports in **maximum two simultaneous Ethernet connections**. If a third client wants to get a connection through the same Profi-S-Link at the same time, the connection will be refused (no response). This means that you have to introduce a Profi-S-Link for each pair of connections.

The number of Profi-S-Links in an Ethernet network is not limited. We recommend to define a new channel for each Profi-S-Link with the menu Tools, Channels of the Saia PG5® Project Manager. To get a connection, you have to define the IP address of the Profi-S-Link which is used for the relevant connection in the channel settings.

Remember that Saia PCD®'s can only have one full protocol communication at a time (for programming and debugging).

4   Troubleshooting

Problem:

The Life List shows no Profi-S-Link but with Saia PG5® it is possible to go online with the Saia PCD®.

Possible reason:

The Profi-S-Link is probably not in the same local Ethernet subnet. The Life List does only display the Profi-S-Links in the local subnet.

4

Problem:

The Profi-S-Link doesn't communicate after loading the settings or being put to the supply voltage.

Possible reason:

About 15 seconds are required to (re) initialize the Profi-S-Link.

Problem:

The Profi-S-Link LED's do not idicate anything.

Possible reason:

24 V supply is missing, because Profi-S-Link is not configured to the Profi-S-Bus port (see chapter 1.3).

A   Appendix

A.1   Icons

i	In manuals, this symbol refers the reader to further information in this manual or other manuals or technical information documents. As a rule there is no direct link to such documents.
	This symbol warns the reader of the risk to components from electrostatic discharges caused by touch. **Recommendation:** Before coming into contact with electrical components, you should at least touch the Minus of the system (cabinet of PGU connector). It is better to use a grounding wrist strap with its cable permanently attached to the Minus of the system.
!	This sign accompanies instructions that must always be followed.
Classic	Explanations beside this sign are valid only for the Saia PCD® Classic series.
xx7	Explanations beside this sign are valid only for the Saia PCD® xx7 series.

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A.2   Contact

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