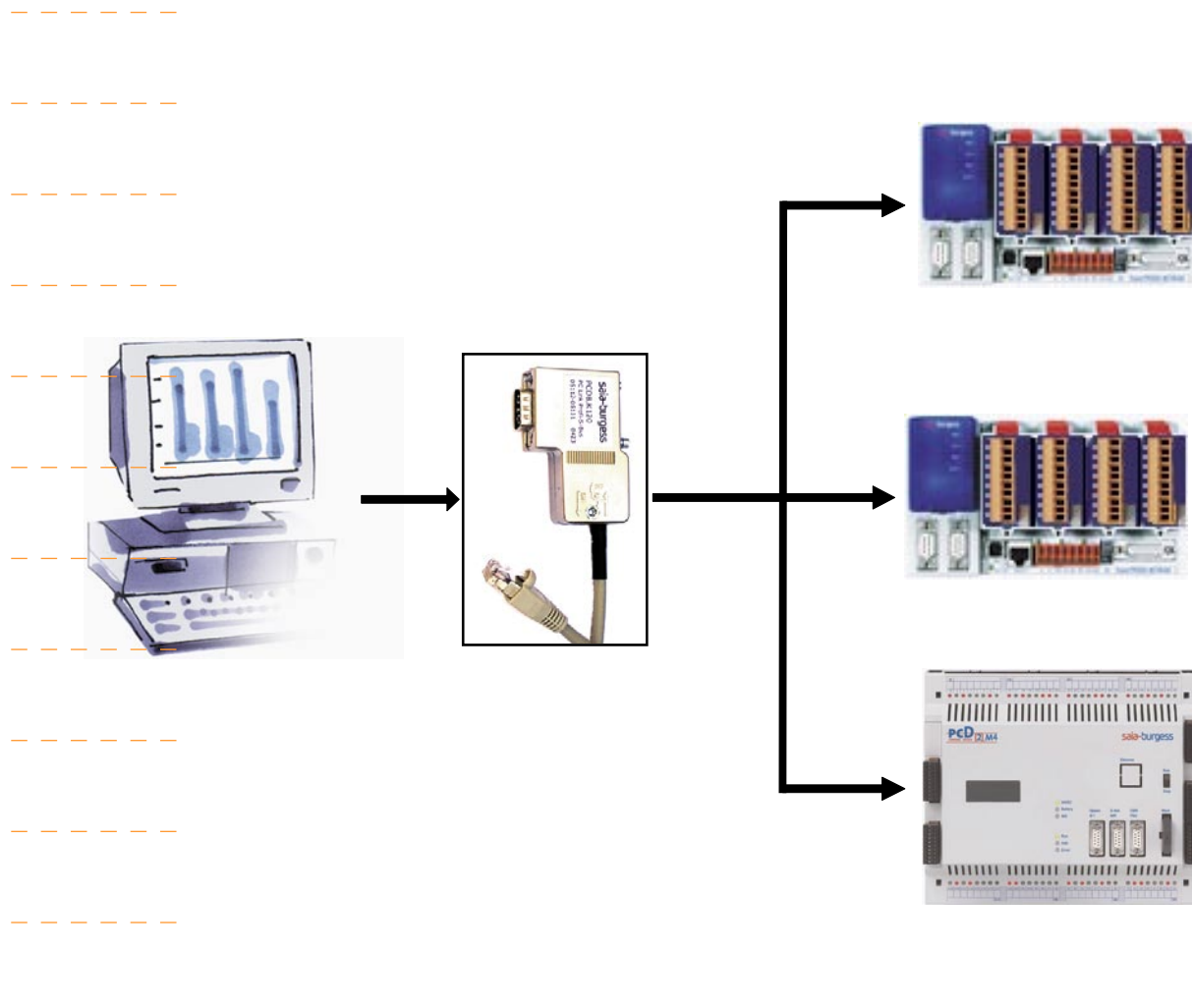


Manual Profi-S-Link



0	Content	
0.1	Document-History	0-2
0.2	Trademarks	0-2
1	Quickstart	
1.1	Summary	1-1
1.2	Communication network	1-1
1.3	PG5 Hardware settings of the stations connected to Profi-S-Bus	1-2
1.4	Online settings	1-3
1.4.1	Configuration of the Profi-S-Link	1-3
1.4.2	Configuration of the online settings of the CPU's	1-5
2	Technical characteristics	
2.1	General	2-1
2.2	Profi-S-Bus interface	2-1
2.3	Ethernet interface	2-2
2.4	Standard Ethernet accessories	2-3
2.5	LED's	2-3
2.6	Default parameters	2-3
3	Networking possibilities	
4	Troubleshooting	
5	Appendix	
5.1	Icons	5-1
5.2	Product and documentation concept	5-1
5.3	Technical support	5-2
5.4	Workshops, training literature	5-3
5.5	Reliability and safety of electronic controllers	5-3
5.6	About ourselves	5-4
	Addresses of SAIA-Burgess companies	5-5

0.1 Document-History

Document-No.	Edition	Modification	Publication	Remarks
26/834	PE1	15.05.2004	31.05.2004	Preliminary Edition
	E1		01.07.2004	Published Edition

0.2 Trademarks

- Saia[®] and Saia[®] PCD are registered trademarks of Saia-Burgess Controls AG

Technical modifications and changes depending on state of the art.

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Published in Switzerland

1 Quickstart

1.1 Summary

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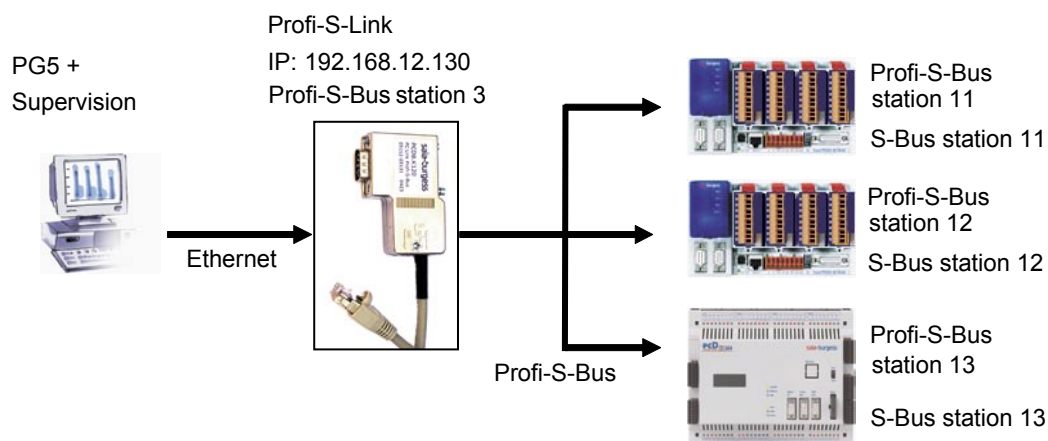
Profi-S-Link is an Ethernet to Profibus Gateway that supports programming and supervision of the new generation of PCD-CPU's with Profi-S-Bus protocol, like the PCD2.M480 or the PCD3.Mxxxx.

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



The Minimum 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

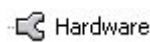
- directly connect it to a hub/switch which is closed to the Profi-S-Link
- or use a male/male adaptor and a straight (non-crossed) cable to create a longer connection to a hub/switch
- or use a male/male adaptor and a crossed cable (see chapter 2.4) to create a point to point connection

For all methods: use a category 5 twisted pair cables.

Profi-S-Bus network

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

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



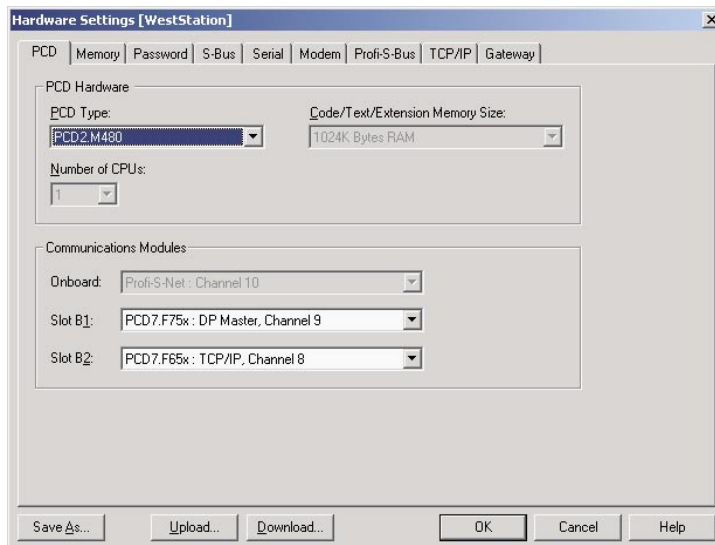
Hardware settings allow to define the parameters of the Profi-S-Bus port for each connected station.

1



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 PCD-CPU. Only the latest 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.

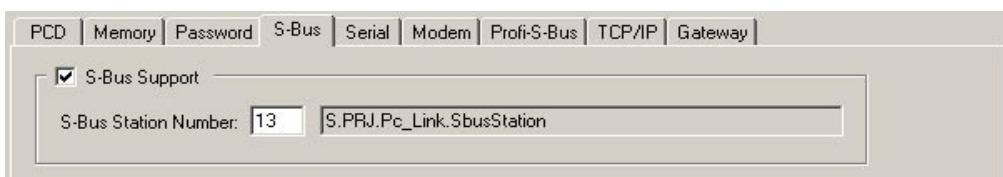


When using PCD7.F750 modules on slot B1 or B2 (ports 8 and 9 respectively), choose the module in the “Communication Modules” section and don't forget to insert the module in the slot.

Define the S-Bus address of the PCD:

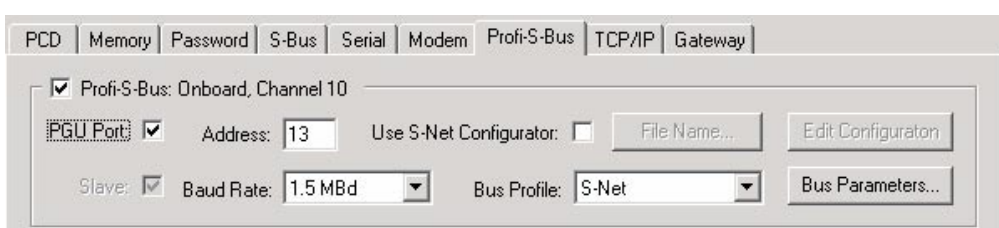


The PCD's have a Profi-S-Bus **and** a S-Bus address. To avoid confusion we recommend to use the same address for both, even though they are independent.



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 programming of the PCD with 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 PCD's and the Profi-S-Link.





After defining the hardware settings, download them into the PCD memory with the button Download. If the download was not successful, 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 PCD independent of its hardware settings.

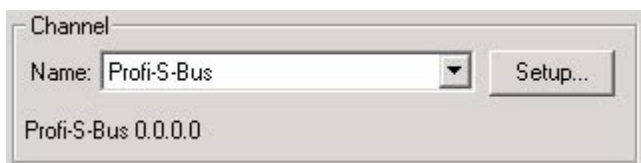
1

1.4 Online settings



The online settings allow to define the communication parameters for:

- the software tool 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.



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* 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.

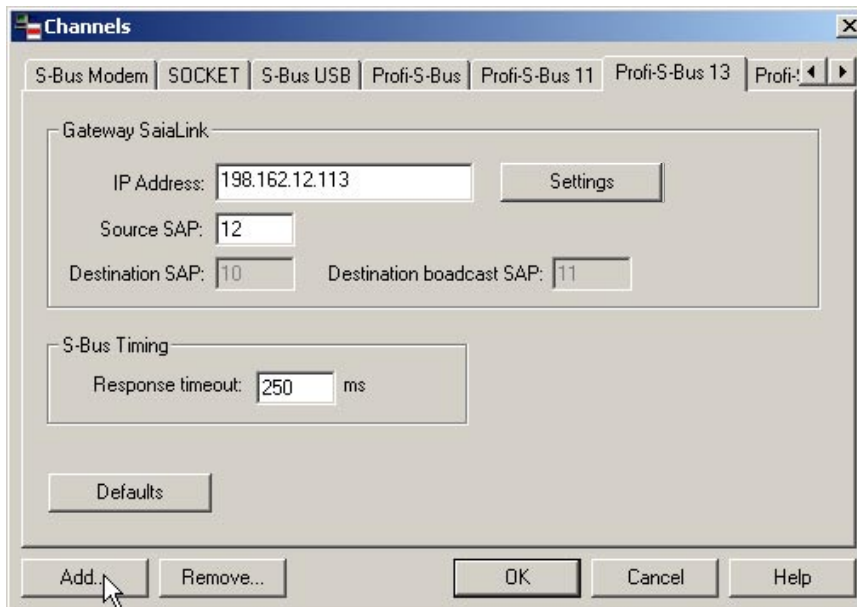




The buttons Download and Save store the parameters of Profi-S-Link in a file which belongs to the common files of the project. This file has the name of the channel.

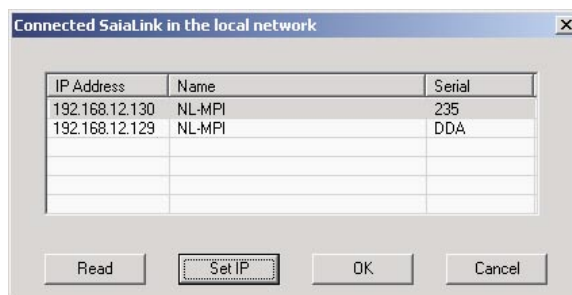
If several Profi-S-Links are present in the same PG5 project, we recommend to define a new channel for each Profi-S-Link using the menu Tools, Channels of the PG5 Project Manager.

1



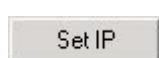
Download the selected settings into the Flash memory of Profi-S-Link with the button Download.

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.

PC Link settings for 192.168.12.128



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.

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 configuration. After this the Profi-S-Link is restarting with the IP settings according to the new configuration.



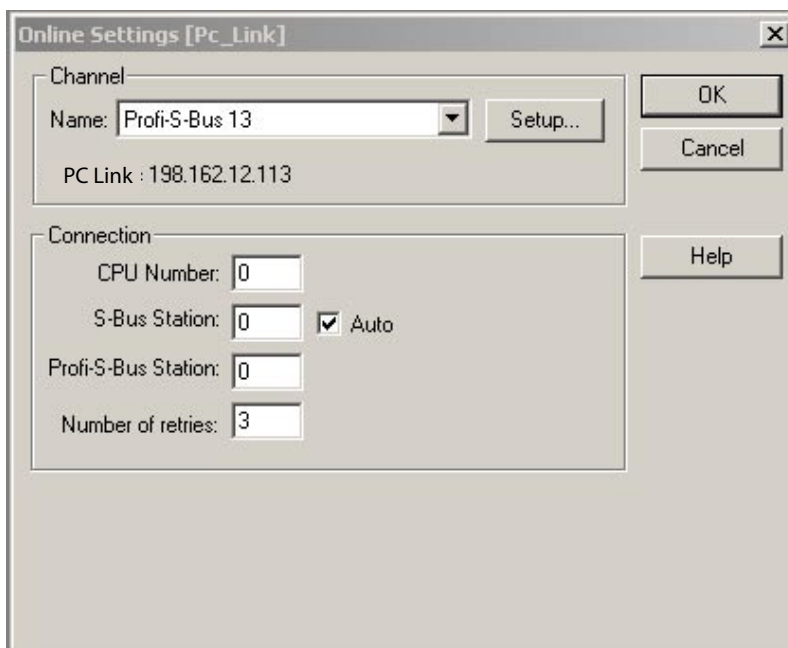
1



1.4.2 Configuration of the online settings of the CPU's

For each CPU in the 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

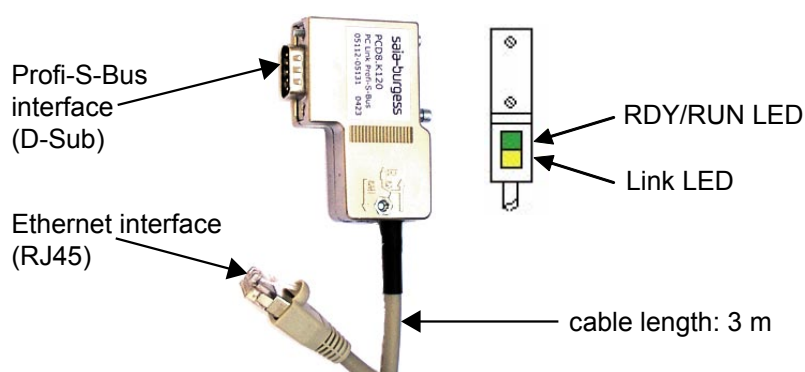


2 Technical characteristics

2.1 General

Profi-S-Link is an Ethernet to Profibus Gateway built into a D-Sub connector. It is connected to the PC via Ethernet, often using a Hub or Switch. A point to point connection 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 PCD. The configuration is downloaded via Ethernet and stored in Flash EPROM.



General data	
Operating temperature	0 °C...+50 °C
Degree of protection	IP 20
Dimensions (LxWxH)	65x48x16 mm
Weight	approx. 140 g with cable
Minimum 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 PCD)
8	RxD/TxD-N	Receive / transmit data-N
9	Shield-	Housing / shield



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.

Default parameters at delivery:

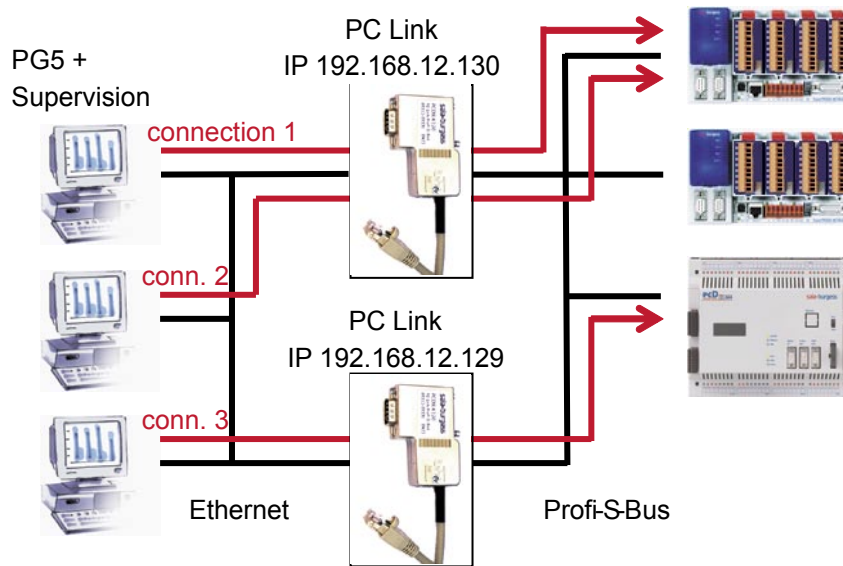
IP Address	0.0.0.0
IP Baudrate	auto negotiation
Profi-S-Bus Baudrate	1.5 MBaud,
Profi-S-Bus Station number	0
Profile	SNet
Highest station address	126
Slot time	3000 bits
Min Tsdr	150 bits
Max Tsdr	980 bits
Quiet time	0 bit
Setup time	240 bits
Gap update factor	50
Max retry limit	1
Target rotation time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



3

In an Ethernet network it is possible to have several clients that communicate simultaneously with different 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 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 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 PG5 it is possible to go online with the 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 indicate 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).

5 Appendix

5.1 Icons

	<p>In manuals, this symbol refers the reader to further information in this manual or other manuals or technical information documents.</p> <p>As a rule there is no direct link to such documents.</p>
	<p>This symbol warns the reader of the risk to components from electrostatic discharges caused by touch. This could happen, if cassettes have to be opened for changing jumpers like described for such cassettes in chapter 2.8 and 2.9.</p> <p>Recommendation: at least touch the Minus of the system (cabinet of PGU connector) before coming in contact with the electronic parts. Better is to use a grounding wrist strap with its cable attached to the Minus of the system.</p>
	<p>This sign accompanies instructions that must always be followed.</p>
	<p>Explanations beside this sign are valid only for the Saia-Burgess PCD Classic serie.</p>
	<p>Explanations beside this sign are valid only for the Saia-Burgess PCD xx7 serie.</p>

5.2 Product and documentation concept

The **Saia® PCD product range** is rigorously modular in structure. It demonstrates a clear hierarchy of systems, sub-systems, functions and diverse accessories. Fully developed software tools allow the efficient creation of user programs.

All Saia® PCD systems (up to PCD6) work with the same operating system. The PCD systems communicate easily with each other and PCD user programs run on all systems.

PCDn xx7 series controllers have a special operating system. This enables them to be programmed with Siemens® STEP®7 and to communicate readily with the corresponding systems of other manufacturers.

Saia® PCD customer documentation comprises pre-sales and after-sales documents that complement each other. As a rule, they are published in three language versions (German, English, French).



Technical information

Manuals

References

Technical Information (TI) documents offer overviews of a system (e.g. the Saia® PCD operating system OS), sub-system (e.g. PCD2) or product family with common features (e.g. digital I/O modules, etc.). TI's have been designed as pre-sales documents. They describe the system or product features and contain all the selection criteria necessary for a preliminary project. They offer the prospective customer more information than a normal brochure. TIs are available free-of-charge as brochures or in electronic form (on CD for a token fee or free of charge via Internet <http://www.sbc-support.ch>).

Manuals are after-sales documents. They contain all the detailed information and application examples necessary for the efficient realization of a project. Manuals are available to the Saia® PCD customer in electronic form on CD (for a token fee) and free of charge via Internet <http://www.sbc-support.ch>.

References describe projects that have been successfully realized with Saia® PCD's (after-sales). The solutions outlined in them will provide many ideas for the use of Saia® PCD's in similar projects (pre-sales, closing the loop with the TI). References are available free-of-charge as brochures or in electronic form (on CD or via Internet <http://www.sbc-support.ch>). Please read also our Controls News published on internet side: <http://www.controls-news.ch>.

P documentation (P = preliminary) describes new or extensively redeveloped products. After extensive internal testing of function and integration, these products are supplied to external commercial partners for field trials under more difficult conditions. P documentation is provided for these field trials. Improvements suggested by these external partners influence the definitive documentation. P documents can be requested as PDF files and some are available free-of-charge via Internet <http://www.sbc-support.ch>.

5.3 Technical support

Any questions that you cannot answer by referring to the documentation will be dealt with promptly and reliably for you by the Saia® PCD Support Team. The team is based in Switzerland and can be reached by

phone: **+41 26 672 71 11** or by

E-Mail: **pcdsupport@saia-burgess.com**

The addresses of Saia-Burgess sales companies and agents for other sales areas can be found under <http://www.saia-burgess.com>

5.4 Workshops, training literature

Interesting, informative SAIA®PCD workshops offer technically qualified people the opportunity to make valuable contacts and extend their technical knowledge of the PCD, taking home with them both the training literature and the solutions produced collaboratively during the workshop. Workshops are your route to joining the large group of enthusiastic SAIA®PCD users. Current workshop programs are among a wealth of other useful information to be found under <http://www.sbc-support.ch>

5.5 Reliability and safety of electronic controllers

5

Saia-Burgess Controls Ltd. is a company which devotes the greatest care to the design, development and manufacture of its products:

- state-of-the-art technology
- compliance with standards
- ISO 9001 certification
- international approvals: e.g. Germanischer Lloyd, United Laboratories (UL), Det Norske Veritas, CE mark...
- choice of high-quality componentry
- quality control checks at various stages of production
- in-circuit tests
- run-in (burn-in at 85°C for 48h)

Despite every care, the excellent quality which results from this does have its limits. It is therefore necessary, for example, to reckon with the natural failure of components. For this reason Saia-Burgess Controls Ltd. provides a guarantee according to the „General terms and conditions of supply“.

The plant engineer must in turn also contribute his share to the reliable operation of an installation. He is therefore responsible for ensuring that controller use conforms to the technical data and that no excessive stresses are placed on it, e.g. with regard to temperature ranges, overvoltages and noise fields or mechanical stresses.

In addition, the plant engineer is also responsible for ensuring that a faulty product in no case leads to personal injury or even death, nor to the damage or destruction of property. The relevant safety regulations should always be observed. Dangerous faults must be recognized by additional measures and any consequences prevented. For example, outputs which are important for safety should lead back to inputs and be monitored from software. Consistent use should be made of the diagnostic elements of the PCD, such as the watchdog, exception organization blocks (XOB) and test or diagnostic instructions.

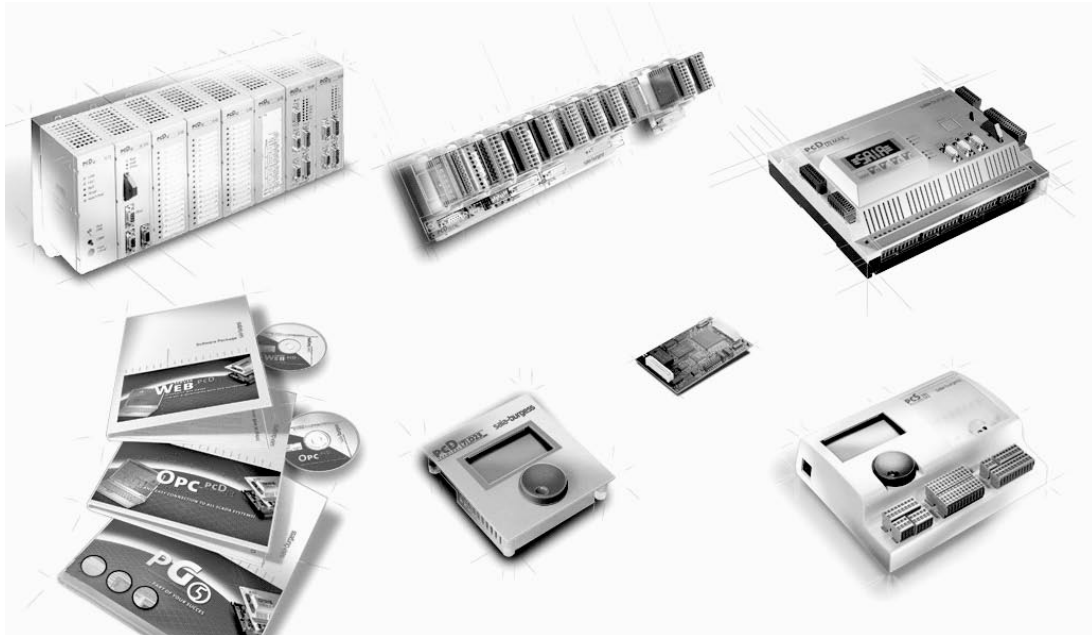
tion with reliability for many years.

If all these points are taken into consideration, the SAIA PCD will provide you with a modern, safe programmable controller to control, regulate and monitor your installation with reliability for many years.

5.6 About ourselves

Saia-Burgess Controls Ltd (SBC) is a medium-sized European controls technology company. SBC is committed to the values, standards and culture of PLC engineering.

All hardware, operating systems, software tools, CPUs, interfaces, etc. have been developed by SBC itself and are marketed as embedded controls.



5

With full technical knowledge of all system elements and with quality-oriented business processes, SBC is equipped to provide unique, custom solutions regarding range of use, functionality, openness, flexibility, reliability and price.

These core competencies, combined with innovative strength, a broad product range and a readiness to implement special customer requests rapidly, have made SBC the attractive, competitive partner of choice for a large number of international customers.

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