



TCP/IP Enhancements

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0.1 Document History

| Version | Date | Changes | Remarks |
|---------|------------|---------------------------|-------------------------------------------------------------------------------------|
| pEN01 | 2009-03-17 | - | New Edition |
| pEN01 | 2010-01-15 | - | Major changes |
| pEN01 | 2010-03-31 | - | Changes |
| EN01 | 2010-08-23 | Chapt. 2 Chapt. 8.1 | - Reworked chapter 2 - Extended chapter 8.1 |
| EN02 | 2011-08-26 | Cover Chapt. 4.4.4 | Modified the cover picture: removed PCD2.M480 and PCS1 New warning in Ch4.4.4 |
| EN03 | 2012-11-21 | Chapt. 1 & 4 | Modification in chapter 1 and 4 |
| EN04 | 2013-11-08 | - | New logo and new company name |
| ENG05 | 2019-02-12 | Chaot. A | New phone number, valid from 15th February 2015 |

0.2 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.

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1 Introduction

This manual deals with the supported IP protocols of Saia PCD® systems. Each protocol will be explained and then the use will be explained through an exemplary configuration.

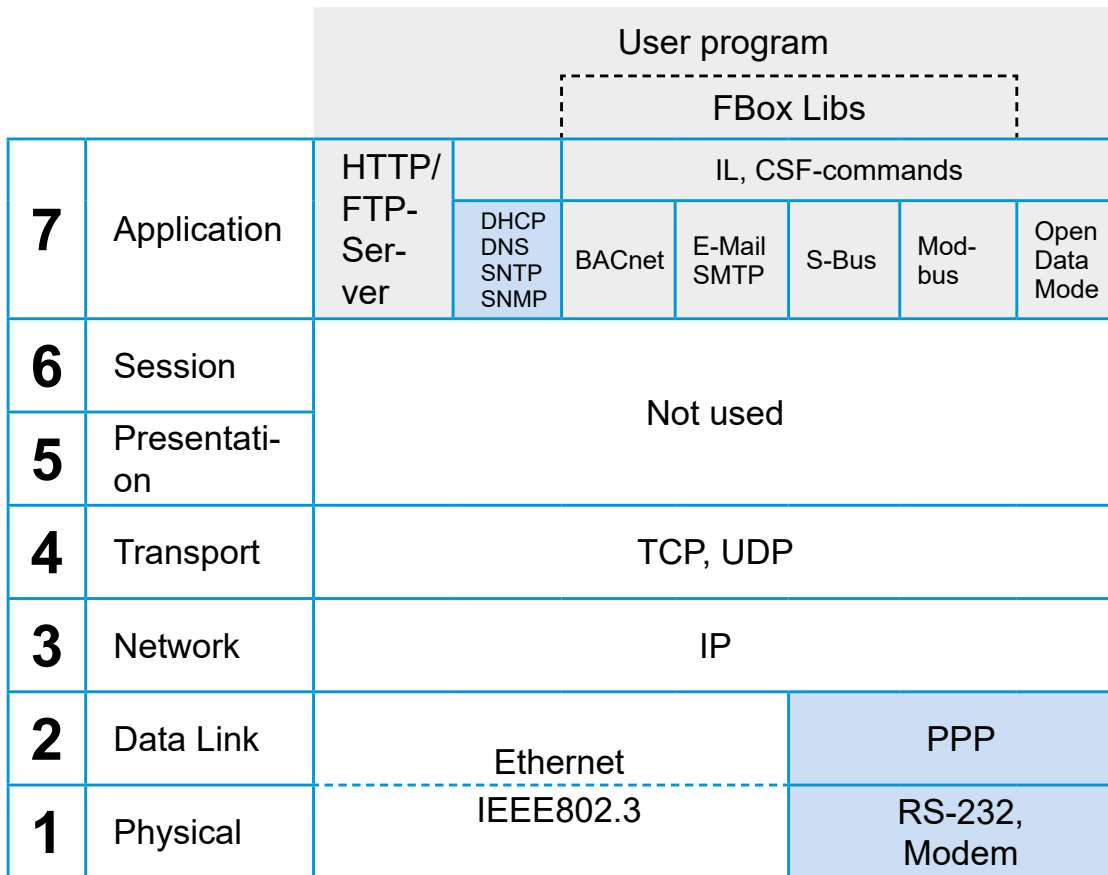


In addition to the protocols discussed in this guide, Ethernet-S-Bus as well as other additional IP-protocols of the automationserver for the Saia PCD® are supported at firmware level:

| | | |
|-----------------|--------|--------|
| HTTP | Manual | 26/790 |
| FTP | Manual | 26/855 |
| Modbus TCP, UDP | Manual | 26/866 |
| BACnet / IP | Manual | 26/849 |
| LON / IP | Manual | 26/883 |

1.1 OSI Referenz Model

The following ISO/OSI layer model represents the IP protocols supported by Saia PCD® controllers. Protocols highlighted in colour are new and will be supported by the current firmware versions of PCD3 and PCD2.M5 CPUs.



1.2 Minimum requirements

| Saia PCD® Type | HW version | Firmware Version |
|---------------------------|--------------------|------------------|
| PCD3.Mxxx0 | ≥D | 1.14.23 |
| PCD3.M3120, M3020 | ≥E48 | 1.14.23 |
| PCD2.M5xx0 | A (no restriction) | 1.14.23 |
| PCD1.M2120 | A (no restriction) | 1.14.23 |
| PCD2.M480 | not supported | |
| PCD3.M2x30 (WAC, Compact) | A (no restriction) | |

1

Saia PG5® version 2.0 with Device Configurator

1.3 Abbreviations

TCP: Transfer Control Protocol

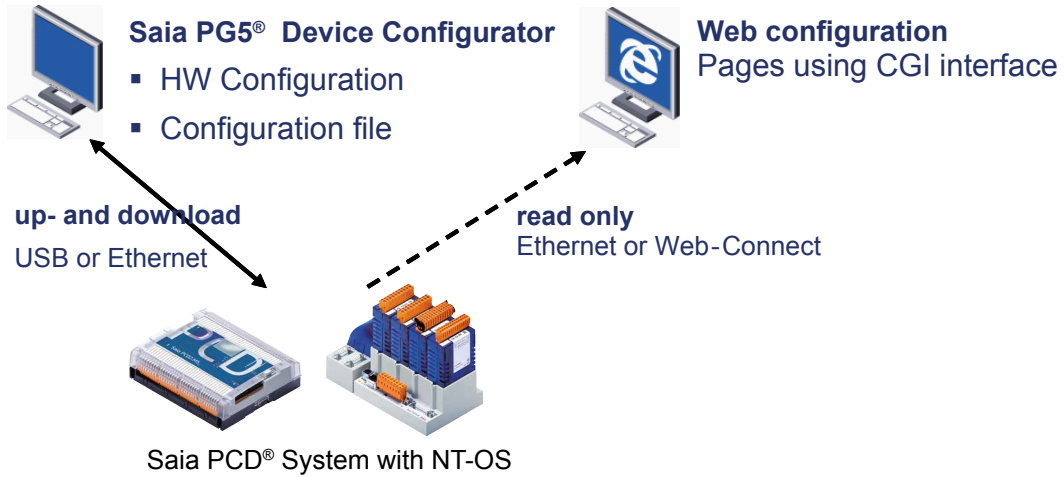
IP: Internet Protocol

UDP: User Datagramm Protocol

2 Using configuration files

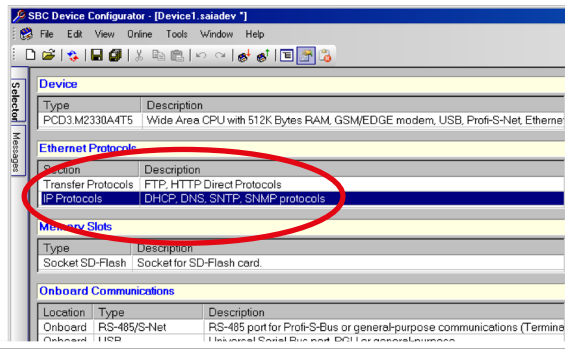
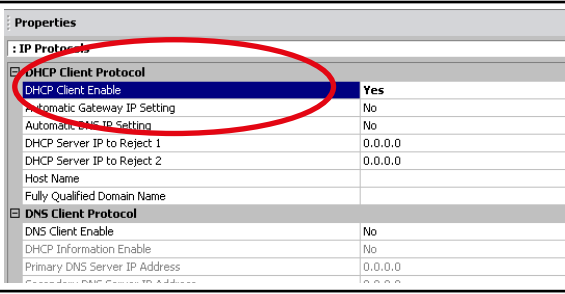


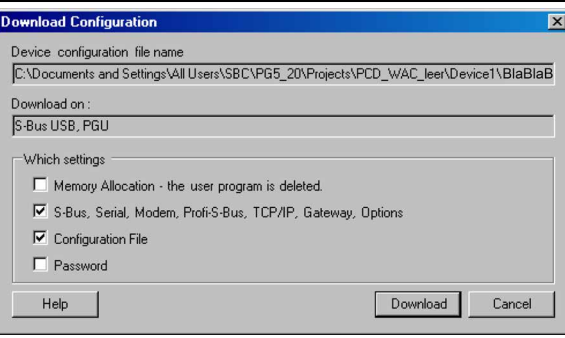

2.1 General

The configuration of all TCP/IP protocols is done with the Device Configurator of Saia PG5® 2.0. All configuration parameters are stored in one configuration file PCD.SCFG which is stored in the Saia PG5® project folder. The download with the Device Configurator includes the HW configuration and the download of the configuration file to the PLC system.



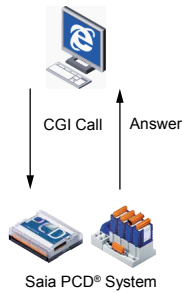
2.2 Device Configurator for SNTP, SNMP, DHCP and DNS

| | | |
|---|-------------------------------------------------------------------------------------|--|
| ① | Start Device Configurator | |
| ② | Choose CPU type | |
| ③ | Select FW version To use new IP enhancements you need at least a FW version 1.14.xx | |

| | | |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p>④</p> | <p>Select IP protocol</p> |  |
| <p>⑤</p> | <p>Each IP protocol can be enabled separately.</p> |  |
|  | <p>Save: Saves the configuration PCD.SCFCG in the project CPU folder.</p> | |
|  | <p>Download: Downloads hardware configuration and IP protocol configuration file (optional PCD.SCFCG) to the Saia PCD® system. By default the downloading of the device configuration includes:</p> <ul style="list-style-type: none"> - Hardware configuration - Configuration file PCD.SCFCG (optional) |  |
| | <p>On the Saia PCD® the file will be stored in the Config folder (PLC_SYS)</p> | <p>Please note; this folder is not accessible for the user</p> |
|  | <p>Upload: Downloads hardware configuration and IP protocol configuration file (PCD.SCFCG) from the Saia PCD® system.</p> | |

2.3 Web diagnostic over CGI interface

Most of the configuration parameters can be visualised by using the CGI interface.



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2.4 Advanced programming

For advanced programming using CSF commands please refer to the system function library and help documents you find in Saia PG5® 2.0 version.

3 PPP (Point to Point Protocol)

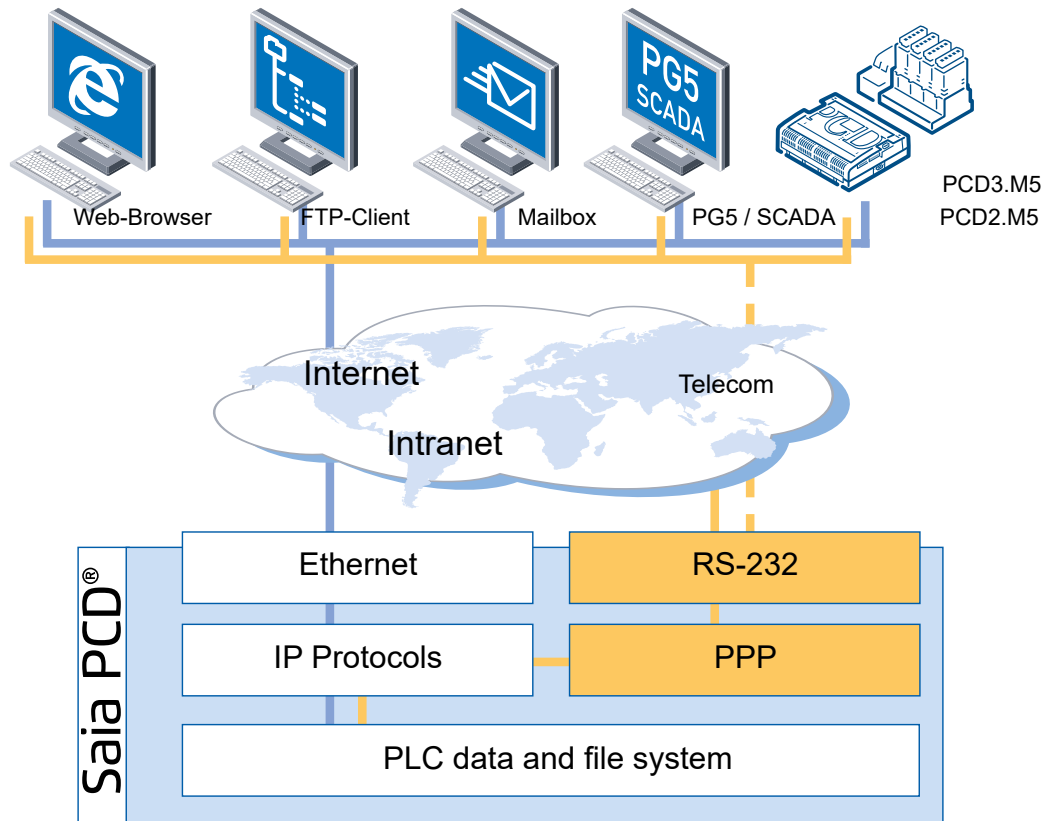
3.1 Introduction

This is a protocol that establishes communication between one point (location) and another. PPP is mainly used to transport the TCP/IP protocol across a serial line or modem connection.

PPP operates at the bottom 2 layers of the ISO/OSI model and allows the same functions as an Ethernet connection.

To fulfil the greater safety needs defined for dialling in company networks or in installations with critical tasks, the CHAP protocol (Challenge Handshake Authentication Protocol) has been introduced. Unlike PAP (Password Authentication Protocol) the password transmitted here is encrypted.

Web and FTP servers can be accessed, even with the cheaper devices that have no Ethernet connection. They can be integrated into IP environments via serial ports. Modems connected to the serial port of a such devices can directly be used to connect the devices to internet or intranet. Standard web browsers can be utilized without additional software with all Saia PCD® controllers Saia PCD® controllers can now also be connected directly using modern communications methods, like GPRS and UMTS networks.



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By creating a PPP connection, the default gateway will be defined as PPP. Thus, for calls outside the local network only considered PPP will be taken (and it is no longer possible to communicate via the default gateway of the Ethernet interface, while PPP is active).



When using DHCP on the Ethernet interface in parallel with a PPP configuration, the DHCP configuration «Automatic Gateway IP Setting» in the Device Configurator must be set to «No». In this constellation (while operating without the PPP) can be communicated only on the local network.

3.2 Enable PPP

| <p>PPP can be activated on all RS-232 Interfaces able to run full RS-232 with handshaking.</p> | <table border="1"> <thead> <tr> <th colspan="2">Onboard Communications</th> </tr> <tr> <th>Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>RS-485/S-Net</td> <td>RS-485 port for Profi-S-Bus or general-purpose communications (D-Sub #2).</td> </tr> <tr> <td>USB</td> <td>Universal Serial Bus port, PGU or general-purpose.</td> </tr> <tr> <td>RS-232/PGU</td> <td>RS-232, PGU or general-purpose serial port (D-Sub #1).</td> </tr> <tr> <td>RS-485</td> <td>RS-485 port for general-purpose communications (Terminal block).</td> </tr> <tr> <td>Ethernet</td> <td>Ethernet port.</td> </tr> </tbody> </table> | Onboard Communications | | Type | Description | RS-485/S-Net | RS-485 port for Profi-S-Bus or general-purpose communications (D-Sub #2). | USB | Universal Serial Bus port, PGU or general-purpose. | RS-232/PGU | RS-232, PGU or general-purpose serial port (D-Sub #1). | RS-485 | RS-485 port for general-purpose communications (Terminal block). | Ethernet | Ethernet port. | | | | | | | | | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|---------|-------------|--------------|---------------------------------------------------------------------------|-----------------|----------------------------------------------------|---------------|--------------------------------------------------------|----------------|------------------------------------------------------------------|--------------------------------|----------------|------------------------|----|-----------|----|--------------------|-----|----------------------|--|----------------------|--|----------------------|----|
| Onboard Communications | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | Description | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RS-485/S-Net | RS-485 port for Profi-S-Bus or general-purpose communications (D-Sub #2). | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USB | Universal Serial Bus port, PGU or general-purpose. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RS-232/PGU | RS-232, PGU or general-purpose serial port (D-Sub #1). | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RS-485 | RS-485 port for general-purpose communications (Terminal block). | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ethernet | Ethernet port. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Switch PPP Enable to Yes</p> <p>With "Immediate start" after download PPP starts immediately. PPP can be controlled with Saia PG5® FBoxes or CSF commands.</p> | <table border="1"> <thead> <tr> <th colspan="2">PPP Protocol</th> </tr> </thead> <tbody> <tr> <td>Port ID</td> <td>0</td> </tr> <tr> <td>PPP Enable</td> <td>Yes</td> </tr> <tr> <td>Connection Type</td> <td>Server</td> </tr> <tr> <td>Local Address</td> <td>0.0.0.0</td> </tr> <tr> <td>Remote Address</td> <td>0.0.0.0</td> </tr> <tr> <td>PPP Restarted on Disconnection</td> <td>No</td> </tr> <tr> <td>Immediate Start Enable</td> <td>No</td> </tr> <tr> <td>Use Modem</td> <td>No</td> </tr> <tr> <td>Use Default Script</td> <td>Yes</td> </tr> <tr> <td>Script Modem, Line 1</td> <td></td> </tr> <tr> <td>Script Modem, Line 2</td> <td></td> </tr> <tr> <td>+ Advanced Parameter</td> <td>No</td> </tr> </tbody> </table> | PPP Protocol | | Port ID | 0 | PPP Enable | Yes | Connection Type | Server | Local Address | 0.0.0.0 | Remote Address | 0.0.0.0 | PPP Restarted on Disconnection | No | Immediate Start Enable | No | Use Modem | No | Use Default Script | Yes | Script Modem, Line 1 | | Script Modem, Line 2 | | + Advanced Parameter | No |
| PPP Protocol | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port ID | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PPP Enable | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Connection Type | Server | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Local Address | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Remote Address | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PPP Restarted on Disconnection | No | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Immediate Start Enable | No | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Use Modem | No | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Use Default Script | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Script Modem, Line 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Script Modem, Line 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + Advanced Parameter | No | | | | | | | | | | | | | | | | | | | | | | | | | | |



Start and stop PPP

The state of PPP can on every time be controlled by the user program either by using Saia PG5® FBoxes or CSF commands.

All PPP CSF libraries are described in PG5 2.0.

3.3 Connection types and related parameters



Please read the TCP/IP enhancements application note for further details. The application can be found as download on the PCD support site.

3.3.1 Direct cable connection

The most important parameters for such a connection are:

- Defines which device is client / server. The server shall define the IP addresses (local and remote), the client can leave the fields unspecified.
- The UseModem parameter shall be set to 0.
- Any script can be defined. If one of the devices is a PC running over Windows®, the default script can be used on the Saia PCD® side.
- The CheckDCD, DTRPulse and DCDTimeout shall be set to 0 for these parameters.
- For connection keep-alive checks, the EnaEReq parameter shall be set, together with the ERTInterval and ERNumber. In case of connection problems, the PPP connection will be closed and restarted according to given parameters.

3.3.2 Modem connection

The most important parameters for such a connection are:

- Defines which device is client / server. The server shall define the IP addresses (local and remote), the client can leave the fields unspecified.
- The UseModem parameter shall be set to 1. This enables the checking of the DSR/DCD signals as soon as the connection is established. As soon as one of these signals is down, the connection is closed and restarted according to given parameters.
- The modem script lines shall define de AT* commands to setup the modem and to initiate the modem connection. Modem can be set in auto-answer mode (in-definite time until connection is established) or can initiate the dialing sequence.
- The CheckDCD parameter shall be set to 1 together with the DCDDTimeout parameter. This allows checking the DCD signal after the modem script has been played.
- The DTRPulse shall be set to 1. If correctly initialized, the modem will be reset when the DTR is kept low for a defined period. The modem will also raise the DSR as soon as the DTR signal is high again.
- It is not useful to set the EnaEReq, ERTInterval and the ERNumber parameter.

3.3.3 Wireless connection with PPP as server

The most important parameters for this type of connection, e.g. PPP over Bluetooth, are identical to the modem connection parameters.

The exception is the DTRpulse parameter which shall be set to 0. The Bluetooth device is automatically reset during its start-up sequence.

Any script can be defined as for the direct connection settings.

It has to be noted that the Bluetooth device shall be configured separately in its own configuration file. The End Point mode shall be selected. Secure connection (PIN enabled) or defining the remote partner Bluetooth address can be defined.

3.3.4 Wireless connection with PPP as client

The most important parameters for this type of connection, e.g. PPP over Bluetooth, are identical to the modem connection parameters.

One exception is the DTRpulse parameter which shall be set to 0. The Bluetooth device is automatically reset during its start-up sequence.

The second exception is the CheckDCD parameter. It has to be set to 2, allowing the PPP script to be played when the device is really connected to the remote partner.

Any script can be defined as for the direct connection settings.

It has to be noted that the Bluetooth device shall be configured separately in its own configuration file. The connecting mode shall be selected, together with the remote partner Bluetooth address. Other security connection (e.g. PIN enabled) can be set.

3.3.5 Authentication processing

PPP is defining two ways of authentication. The first is the peer authentication; the second is the local authentication. Both can be active at the same time, or only one, or none of them.

4 DHCP and DNS

4.1 DHCP - Dynamic Host Configuration Protocol

This is a protocol for the automatic configuration of IP communication settings. Lengthy manual entry of communications parameters is no longer necessary; instead they are assigned directly from a central server. After a request, a DHCP client receives the parameter IP address, subnet mask, gateway and DNS address automatically.

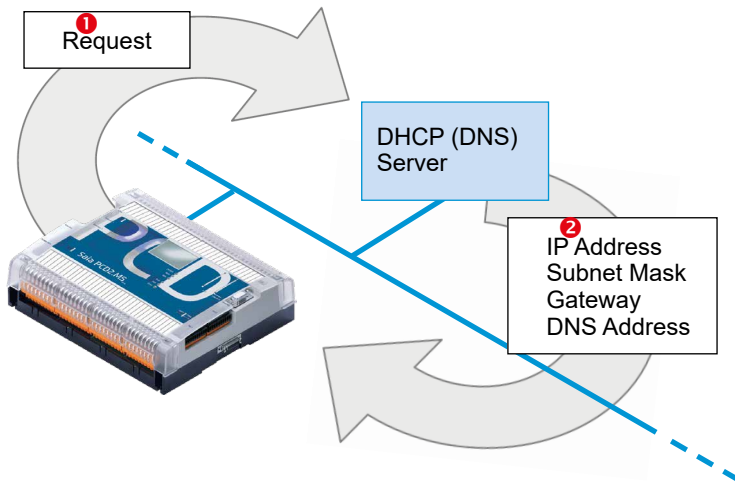
The integration of devices in existing networks takes place automatically. The only manual setting on the client device is the one that tells it to take its configuration automatically from a DHCP server.

Without knowing the network parameters, devices can be integrated into existing networks. This also makes it easier to increase the availability of devices and simplify the management of addresses used. Even service personnel with no technical background or knowledge of the precise data can exchange devices.

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Larger networks become child's play. Networks of any size can be created through optimum assignment of IP addresses. It is possible, without major clarification, to connect devices directly even to networks that are constantly expanding.



The IP configuration received from the DHCP server will be used while a time specified by the DHCP server (lease time). After the lease time has elapsed, a new address is requested from the server (usually the server will provide the same address again).

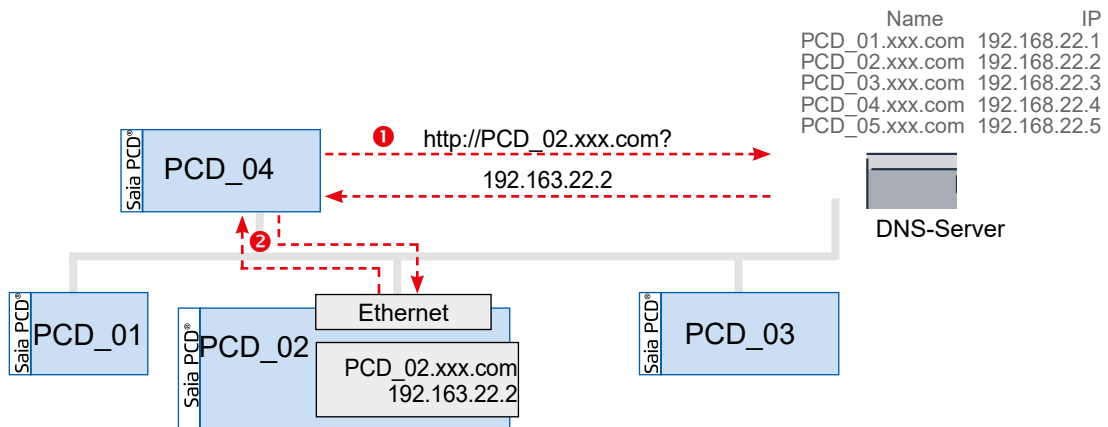
4.2 DNS - Domain Name System

Access to controllers through the assignment of fixed hostnames. To establish communication between two controllers, it is not necessary to know the IP address of the target controller, only its hostname. Using this name, the IP address can be requested from a DNS server.

Devices no longer use anonymous IP addresses that contain little information. The structure and availability of individual networks are defined once, and do not need to be adapted to changes in the available IP addresses. Controllers are supplied pre-configured and programmed. The IP addresses are only transferred on-site and are generally not known.

On-site users only need to know the user-friendly device names. Systems therefore become easier and their operation more intuitive. The hostnames can contain relevant and useful information, such as the location or function of the device, making it much more intelligible than IP addresses. Documentation of networks with multiple stations can be displayed more clearly.

It is possible to create relatively large or small networks that are regularly accessed from different locations. The topologies of these networks can be adapted to circumstances, without restricting station availability. To the outside world, station names can still be used.



4.3 Enable DHCP

4.3.1 Activating S-Bus Support



To use any IP functionality on a Saia PCD® the S-Bus support needs to be active

| Properties | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Device : PCD1.M2120 | |
| <input type="checkbox"/> Firmware Firmware version From V1.14.00 or more recent and compatible | |
| <input type="checkbox"/> Memory Code/Text Memory 512K Bytes Extension Memory 128K Bytes RAM Backup For User Memory On File System File System Size (Flash) 16M Bytes | |
| <input type="checkbox"/> Options Reset Output Enable No XOB 1 Enable No Run/Stop Switch Enable Yes Time Zone | |
| <input type="checkbox"/> Password Password Enabled No Password Inactivity Timeout [minutes] 1 | |
| <input type="checkbox"/> S-Bus S-Bus Support Yes Station Number 0 | |



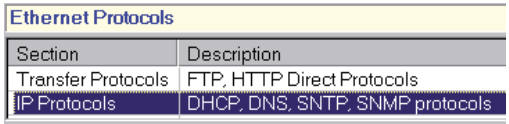
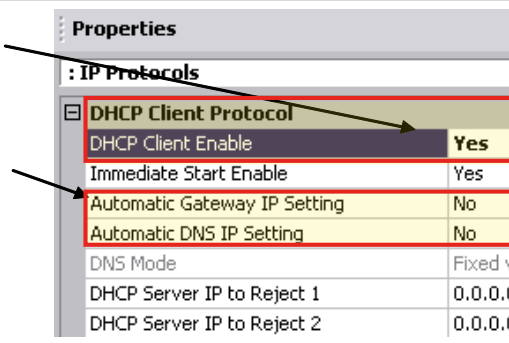
4.3.2 Using fix IP addresses

To activate the use of fix IP address it is necessary to enable TCP/IP on the onboard Ethernet communication settings:

| | <table border="1"> <thead> <tr> <th colspan="3">Onboard Communications</th> </tr> <tr> <th>Location</th> <th>Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Onboard</td> <td>RS-485/S-Net</td> <td>RS-485 port for Profi-S-Bu</td> </tr> <tr> <td>Onboard</td> <td>USB</td> <td>Universal Serial Bus port</td> </tr> <tr> <td>Onboard</td> <td>Modem GSM/GPRS</td> <td>Internal GSM/GPRS Mod</td> </tr> <tr> <td>Onboard</td> <td>Ethernet</td> <td>Ethernet port.</td> </tr> <tr> <td>Socket A</td> <td></td> <td></td> </tr> </tbody> </table> | Onboard Communications | | | Location | Type | Description | Onboard | RS-485/S-Net | RS-485 port for Profi-S-Bu | Onboard | USB | Universal Serial Bus port | Onboard | Modem GSM/GPRS | Internal GSM/GPRS Mod | Onboard | Ethernet | Ethernet port. | Socket A | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--|--------------------|----------|----------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------|---------|-----|---------------------------|---------|----------------|-----------------------|---------|----------|----------------|----------|--|--|
| Onboard Communications | | | | | | | | | | | | | | | | | | | | | | |
| Location | Type | Description | | | | | | | | | | | | | | | | | | | | |
| Onboard | RS-485/S-Net | RS-485 port for Profi-S-Bu | | | | | | | | | | | | | | | | | | | | |
| Onboard | USB | Universal Serial Bus port | | | | | | | | | | | | | | | | | | | | |
| Onboard | Modem GSM/GPRS | Internal GSM/GPRS Mod | | | | | | | | | | | | | | | | | | | | |
| Onboard | Ethernet | Ethernet port. | | | | | | | | | | | | | | | | | | | | |
| Socket A | | | | | | | | | | | | | | | | | | | | | | |
| <p>Change TCP/IP Enabled to Yes</p> <p>Master Gateway is only available when using fix IP addresses.</p> <p>When DHCP is activated the fix IP address configuration is set to 0.0.0.0 by the Device Configurator from PG5 2.0 SP2 and later. In case a new address is written in runtime (with an FBox), this written IP will be used, if the FW 1.16.27 and newer is used re-use DHCP, the IP must be re-written to 0.0.0.0 by the user program or the Device Configurator.</p> | <table border="1"> <thead> <tr> <th colspan="2">Properties</th> </tr> </thead> <tbody> <tr> <td colspan="2">Onboard : Ethernet</td> </tr> <tr> <td colspan="2"> <input type="checkbox"/> General MAC Address Not available </td> </tr> <tr> <td colspan="2"> <input type="checkbox"/> TCP/IP Channel Number 0 TCP/IP Enabled Yes IP Node 0 IP Address 192.168.1.4 Subnet Mask 255.255.255.0 Default Router 0.0.0.0 Ethernet R/I/O Network No PGU Port Yes Slave Yes Network groups (Default) Initialize Open Data Mode No Telegram Reading Timeout 1000 </td> </tr> </tbody> </table> | Properties | | Onboard : Ethernet | | <input type="checkbox"/> General MAC Address Not available | | <input type="checkbox"/> TCP/IP Channel Number 0 TCP/IP Enabled Yes IP Node 0 IP Address 192.168.1.4 Subnet Mask 255.255.255.0 Default Router 0.0.0.0 Ethernet R/I/O Network No PGU Port Yes Slave Yes Network groups (Default) Initialize Open Data Mode No Telegram Reading Timeout 1000 | | | | | | | | | | | | | | |
| Properties | | | | | | | | | | | | | | | | | | | | | | |
| Onboard : Ethernet | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> General MAC Address Not available | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> TCP/IP Channel Number 0 TCP/IP Enabled Yes IP Node 0 IP Address 192.168.1.4 Subnet Mask 255.255.255.0 Default Router 0.0.0.0 Ethernet R/I/O Network No PGU Port Yes Slave Yes Network groups (Default) Initialize Open Data Mode No Telegram Reading Timeout 1000 | | | | | | | | | | | | | | | | | | | | | | |

4.3.3 Dynamic IP addressing

Set "TCP/IP Enabled" to No

| Set "TCP/IP Enabled" to No | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|--------------------|----------------------------|----------------------|---------------------------------|--------------------|-----|------------------------|-----|------------------------------|----|--------------------------|----|----------|---------|----------------------------|---------|----------------------------|---------|
| To use dynamic IP addressing you need to activate DHCP |  <table border="1"> <thead> <tr> <th>Section</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Transfer Protocols</td> <td>FTP, HTTP Direct Protocols</td> </tr> <tr> <td>IP Protocols</td> <td>DHCP, DNS, Sntp, Snmp protocols</td> </tr> </tbody> </table> | Section | Description | Transfer Protocols | FTP, HTTP Direct Protocols | IP Protocols | DHCP, DNS, Sntp, Snmp protocols | | | | | | | | | | | | | | |
| Section | Description | | | | | | | | | | | | | | | | | | | | |
| Transfer Protocols | FTP, HTTP Direct Protocols | | | | | | | | | | | | | | | | | | | | |
| IP Protocols | DHCP, DNS, Sntp, Snmp protocols | | | | | | | | | | | | | | | | | | | | |
| <p>At start up the Saia PCD® will look for DHCP server settings using broadcast commands.</p> <p>Using network with routers it could be helpful to activate automatic Gateway and DNS setting.</p> |  <table border="1"> <thead> <tr> <th colspan="2">Properties</th> </tr> <tr> <th colspan="2">: IP Protocols</th> </tr> <tr> <th colspan="2">DHCP Client Protocol</th> </tr> </thead> <tbody> <tr> <td>DHCP Client Enable</td> <td>Yes</td> </tr> <tr> <td>Immediate Start Enable</td> <td>Yes</td> </tr> <tr> <td>Automatic Gateway IP Setting</td> <td>No</td> </tr> <tr> <td>Automatic DNS IP Setting</td> <td>No</td> </tr> <tr> <td>DNS Mode</td> <td>Fixed v</td> </tr> <tr> <td>DHCP Server IP to Reject 1</td> <td>0.0.0.0</td> </tr> <tr> <td>DHCP Server IP to Reject 2</td> <td>0.0.0.0</td> </tr> </tbody> </table> | Properties | | : IP Protocols | | DHCP Client Protocol | | DHCP Client Enable | Yes | Immediate Start Enable | Yes | Automatic Gateway IP Setting | No | Automatic DNS IP Setting | No | DNS Mode | Fixed v | DHCP Server IP to Reject 1 | 0.0.0.0 | DHCP Server IP to Reject 2 | 0.0.0.0 |
| Properties | | | | | | | | | | | | | | | | | | | | | |
| : IP Protocols | | | | | | | | | | | | | | | | | | | | | |
| DHCP Client Protocol | | | | | | | | | | | | | | | | | | | | | |
| DHCP Client Enable | Yes | | | | | | | | | | | | | | | | | | | | |
| Immediate Start Enable | Yes | | | | | | | | | | | | | | | | | | | | |
| Automatic Gateway IP Setting | No | | | | | | | | | | | | | | | | | | | | |
| Automatic DNS IP Setting | No | | | | | | | | | | | | | | | | | | | | |
| DNS Mode | Fixed v | | | | | | | | | | | | | | | | | | | | |
| DHCP Server IP to Reject 1 | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | |
| DHCP Server IP to Reject 2 | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | |

4

4.3.4 Checking IP configuration with Web-Connect

How can I check the received IP configuration? One possibility is to use Web-Connect and the Web diagnostic command over the CGI interface:

| | |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Open USB station (eg. Station_USB) with Web-Connect (Refer to Web-Connect manual) |
| 2. | Connect Saia PCD® to PC by using USB cable |
| 3. | Open Internet Explorer and type the following command: http://localhost/station_USB/cgi-bin/readVal.exe?SYS-DHCP.AssignedIPAddr |
| 4. | The returned value will show the IP address received by the DHCP server |

4.4 Using host names and enable DNS

4.4.1 Assigning host name to the Saia PCD®

| <p>To access Saia PCD® by its name you need to define a host name.</p> | <table border="1"> <tr> <th colspan="2">Properties</th> </tr> <tr> <th colspan="2">: IP Protocols</th> </tr> <tr> <th colspan="2">DHCP Client Protocol</th> </tr> <tr> <td>DHCP Client Enable</td> <td>Yes</td> </tr> <tr> <td>Immediate Start Enable</td> <td>Yes</td> </tr> <tr> <td>Automatic Gateway IP Setting</td> <td>No</td> </tr> <tr> <td>Automatic DNS IP Setting</td> <td>No</td> </tr> <tr> <td>DNS Mode</td> <td>Fixed value</td> </tr> <tr> <td>DHCP Server IP to Reject 1</td> <td>0.0.0.0</td> </tr> <tr> <td>DHCP Server IP to Reject 2</td> <td>0.0.0.0</td> </tr> <tr> <td>Host Name</td> <td>PCD_Station</td> </tr> <tr> <td>Fully Qualified Domain Name</td> <td></td> </tr> </table> | Properties | | : IP Protocols | | DHCP Client Protocol | | DHCP Client Enable | Yes | Immediate Start Enable | Yes | Automatic Gateway IP Setting | No | Automatic DNS IP Setting | No | DNS Mode | Fixed value | DHCP Server IP to Reject 1 | 0.0.0.0 | DHCP Server IP to Reject 2 | 0.0.0.0 | Host Name | PCD_Station | Fully Qualified Domain Name | |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--|----------------|--|----------------------|--|--------------------|-----|------------------------|-----|------------------------------|----|--------------------------|----|----------|-------------|----------------------------|---------|----------------------------|---------|-----------|-------------|-----------------------------|--|
| Properties | | | | | | | | | | | | | | | | | | | | | | | | | |
| : IP Protocols | | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Client Protocol | | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Client Enable | Yes | | | | | | | | | | | | | | | | | | | | | | | | |
| Immediate Start Enable | Yes | | | | | | | | | | | | | | | | | | | | | | | | |
| Automatic Gateway IP Setting | No | | | | | | | | | | | | | | | | | | | | | | | | |
| Automatic DNS IP Setting | No | | | | | | | | | | | | | | | | | | | | | | | | |
| DNS Mode | Fixed value | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Server IP to Reject 1 | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Server IP to Reject 2 | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| Host Name | PCD_Station | | | | | | | | | | | | | | | | | | | | | | | | |
| Fully Qualified Domain Name | | | | | | | | | | | | | | | | | | | | | | | | | |



4.4.2 Using DNS name resolution

Communication by host name

| <p>Enable DNS</p> <p>Set IP address of DNS server</p> | <table border="1"> <tr> <th colspan="2">Properties</th> </tr> <tr> <th colspan="2">: IP Protocols</th> </tr> <tr> <th colspan="2">DHCP Client Protocol</th> </tr> <tr> <td>DHCP Client Enable</td> <td>Yes</td> </tr> <tr> <td>Immediate Start Enable</td> <td>Yes</td> </tr> <tr> <td>Automatic Gateway IP Setting</td> <td>No</td> </tr> <tr> <td>Automatic DNS IP Setting</td> <td>No</td> </tr> <tr> <td>DNS Mode</td> <td>Fixed value</td> </tr> <tr> <td>DHCP Server IP to Reject 1</td> <td>0.0.0.0</td> </tr> <tr> <td>DHCP Server IP to Reject 2</td> <td>0.0.0.0</td> </tr> <tr> <td>Host Name</td> <td>PCD_Station</td> </tr> <tr> <td>Fully Qualified Domain Name</td> <td></td> </tr> <tr> <th colspan="2">DNS Client Protocol</th> </tr> <tr> <td>DNS Client Enable</td> <td>Yes</td> </tr> <tr> <td>DHCP Information Enable</td> <td>No</td> </tr> <tr> <td>Primary DNS Server IP Address</td> <td>0.0.0.0</td> </tr> <tr> <td>Secondary DNS Server IP Address</td> <td>0.0.0.0</td> </tr> </table> | Properties | | : IP Protocols | | DHCP Client Protocol | | DHCP Client Enable | Yes | Immediate Start Enable | Yes | Automatic Gateway IP Setting | No | Automatic DNS IP Setting | No | DNS Mode | Fixed value | DHCP Server IP to Reject 1 | 0.0.0.0 | DHCP Server IP to Reject 2 | 0.0.0.0 | Host Name | PCD_Station | Fully Qualified Domain Name | | DNS Client Protocol | | DNS Client Enable | Yes | DHCP Information Enable | No | Primary DNS Server IP Address | 0.0.0.0 | Secondary DNS Server IP Address | 0.0.0.0 |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--|----------------|--|----------------------|--|--------------------|-----|------------------------|-----|------------------------------|----|--------------------------|----|----------|-------------|----------------------------|---------|----------------------------|---------|-----------|-------------|-----------------------------|--|---------------------|--|-------------------|-----|-------------------------|----|-------------------------------|---------|---------------------------------|---------|
| Properties | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| : IP Protocols | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Client Protocol | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Client Enable | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Immediate Start Enable | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Automatic Gateway IP Setting | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Automatic DNS IP Setting | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DNS Mode | Fixed value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Server IP to Reject 1 | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Server IP to Reject 2 | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Host Name | PCD_Station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fully Qualified Domain Name | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DNS Client Protocol | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DNS Client Enable | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DHCP Information Enable | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Primary DNS Server IP Address | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Secondary DNS Server IP Address | 0.0.0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

4.4.3 Using name resolution with Saia PG5® FBoxes

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Communication FBox library</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Communication <input type="checkbox"/> Broadcast Clock <input type="checkbox"/> Lifelist Profi-S-Net <input checked="" type="checkbox"/> Lifelist Profi-S-Net Extended <input type="checkbox"/> Query IP Name <input checked="" type="checkbox"/> Receive Binary |
| <p>This FBox issues a DNS query to retrieve an IP address according to a given host name.</p> <p>To use Query IP Name FBox DNS needs to be active.</p> | |

4



The execution of this FBox is done by a positive transient on the input. The returned IP address can be used for other FBoxes using IP addresses.



Calling multiple «query F-Boxes» at the same time, works only if all F-Boxes are in the same Fupla-File.

4.4.4 Using name resolution with router

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>To use DNS name resolution passing through router, the Saia PCD® controller configuration needs the routers IP address or DNS server address</p> | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|

4.5 Using CSF commands

| | |
|-------------------|--------------------------------------------------------------------------------------|
| S.DNS.QueryByName | This CSF issues a DNS query to retrieve an IP address according to a given host name |
| S.DNS.QueryByAddr | This CSF issues a DNS query to retrieve a hostname according to a given IP address |



The details are described in the online help of PG5 2.0 libraries.

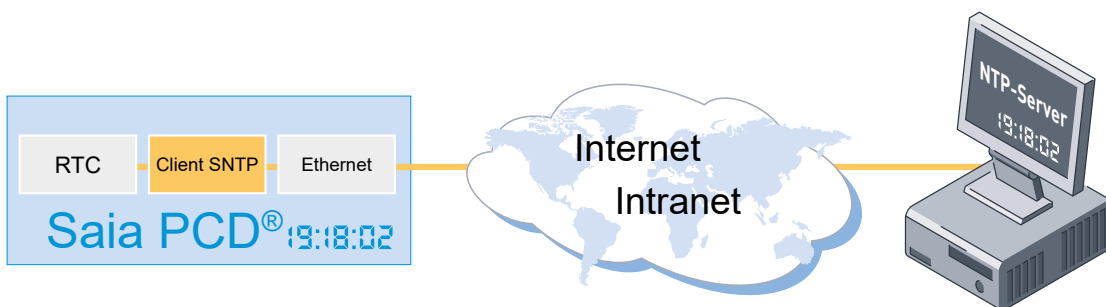
5 SNTP – Simple Network Time Protocol

5.1 Introduction

The Simple Network Time Protocol is a standard for synchronizing multiple devices in IP networks. This protocol allows the transmission of actual time by servers located on internet or intranet. Two modes are available: unicast point-to-point (the SNTP client initiates a time request) or broadcast point-to-multipoint (time information sent by NTP server to all clients simultaneously). The time accuracy achieved with unicast is around 500 ms and with broadcast it is 1 s. Clever algorithms ensure that the different running times are compensated by a network.

Synchronisation occurs for several network stations at a time. The internal clocks of individual network stations are synchronized centrally from a time server. A single time source in the network is enough for everything else to proceed automatically. Since the protocol is a fixed element of Saia PCD® firmware, it can be used quickly and easily.

Maintaining the internal clocks is child's play. On-site staffs do not have to concern themselves with each network station individually. Events like the changeover between summer and winter time happen automatically for all network stations at once. The protocol can be used in large networks to synchronize several stations, so that events registered can also be stored in the correct chronological order.



5.2 Enable SNTP

To use SNTP change SNTP Enable to Yes. The SNTP (or NTP) Server can be specified by its IP address or host name.

| SNTP Protocol | |
|------------------------|-----------------------------------|
| SNTP Enable | Yes |
| SNTP Mode | Use NTP server list |
| Immediate Start Enable | Yes |
| Start Delay | 0 |
| Maximum Delta Clock | 2000 |
| Server NTP 1 | 0.0.0.0 |
| Server NTP 2 | 0.0.0.0 |
| Time Zone | CET-01,CEST-02,M3.5.0/2,M10.5.0/2 |

5

If Enable = 1, by default approximately every 10 (+/- 0.5) seconds a query with the SNTP protocol takes place. The query interval can be changed.

The SNTP protocol only functions via the Ethernet interface. The query via the PPP interface is not yet supported.

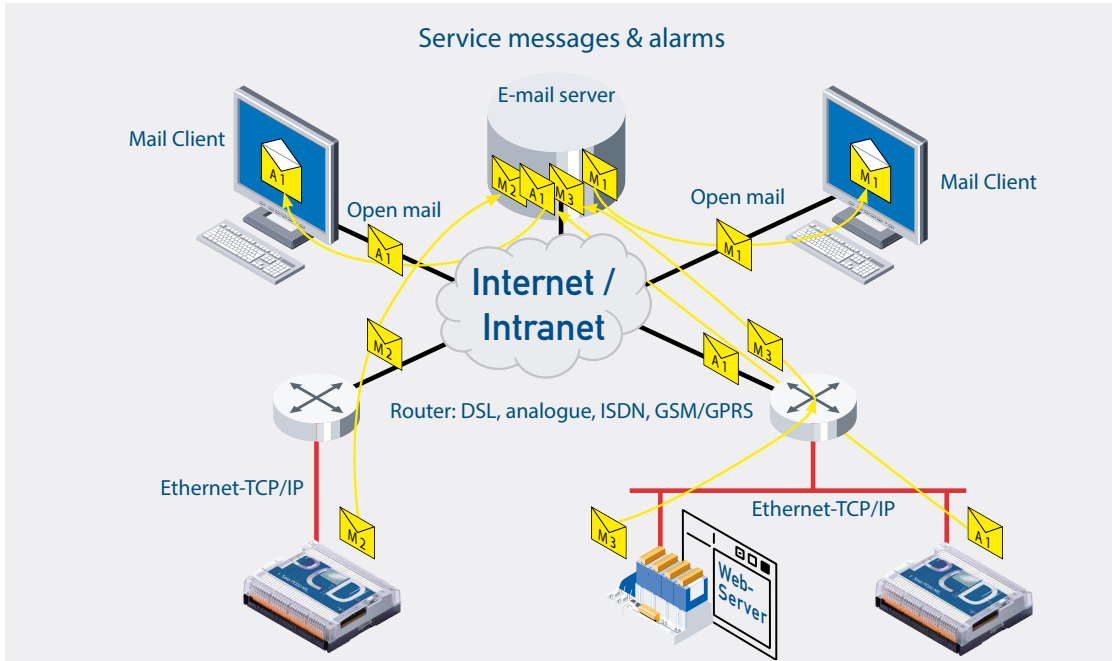


If an URL hostname is defined then the DNS Client Protocol has to be activated.

6 Email

6.1 SMTP – Simple Mail Transfer Protocol

With the Email function and integral SMTP client (simple mail transfer protocol) PCD controllers can forward process and system information via the Ethernet interface to a mail server. In this way, alarms, service messages, error messages or any selected process information can be sent via Email to a control centre and/or service personnel. For the simple integration of Email functions within PCD programs, FBox and IL libraries are available.



6.2 Using Email functionality with Saia PG5® FBoxes

TCP/IP has to be configured in the Device Configurator. A default router is needed to send Emails. Your IT support will be able to tell you the default router address if you don't know it. The configuration can also be done by DHCD (Or you can use DHCP configuration).

The screenshot shows the Device Configurator interface. On the left, the 'Device' section shows 'PCD3.M5540' with a description of 'CPU with 256/512/1024K Bytes RAM, 4 I/O slots (expandable), USB, Pr'. Below this are sections for 'Memory Slots', 'Onboard Communications', and 'Onboard I/O Slots'. The 'Onboard Communications' table lists various ports like RS-485/S-Net, USB, RS-232/PGU, and Ethernet. On the right, the 'Properties' panel is open to 'Onboard : Ethernet'. Under 'General', the MAC Address is 'Not available'. Under 'TCP/IP', 'TCP/IP Enabled' is checked, and the IP Address is '172.16.1.69'. Under 'TCP/IP 5-Bus Master Gateway', 'Use TCP/IP For Gateway' is unchecked.



| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>To use Email functionality on your PCD use the "Communication Email" FBox library.</p> | |
| <p>First place the Init FBox to enable Email functionality:</p> <p>SMTP Server is defined by its IP address. To use name resolution please refer to DNS chapter.</p> <p>In case of using fix IP addressing please verify that it is a static address.</p> | <p>The 'AMail Init' FBox has an 'Enable_Mail' input connected to the 'En' pin. It has three outputs: 'Busy', 'Err', and 'ErrNum'. The configuration table shows: SMTP Server, Name: User_Name, Pwd: Password, Sender: Sender, To1: Destination_1, To2: Destination_2, To3: Destination_3, To4: Destination_4, To5: Destination_5.</p> |
| <p>Send Email with attachment to destination addresses on positive edge.</p> | <p>The 'AMail Send' FBox has a 'Send_Email' input connected to the 'Send' pin. It has a 'Busy' output. The configuration table shows: SubjectLine, Text: Content, File: Attachment.</p> |

By using the special characters \$ and @ it is possible to create dynamic text structures.

For more details please refer to IL manual.

6.3 Supported Saia PCD® systems

PCD systems with SMTP client: All PCDs with NT-OS Firmware and PCD1.M135F655, PCD2.M150F655, PCD2.M170 with PCD7.F655, PCD2.M480 with PCD7.F655

Please note that all TCP/IP enhancements like DNS for name resolution are only supported by PCDs with NT-OS firmware.

6.4 Mail account checklist

To following checklist help to check if your mail account is compatible to the PCD Email functionality. Our experiences have shown that sending Emails does not only depend from this feature, but also from the ISP (Internet Service Provider) rules. In order to figure out whether it will be possible sending Emails already before the PCD is placed, the following points need to be verified:

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| MSA (Mail Submission Agent) | | |
| Is there a MSA () available? | This is the „SMTP Server“ or „Email Server“ which will receive the message sent by the PCD (which acts as MUA, „Mail User Agent“) | <input type="checkbox"/> yes <input type="checkbox"/> no |
| SMTP Simple Mail Transfer Protocol | | |
| Does this MSA support SMTP? | Not all MSA do support SMTP (there are other protocols to deliver Emails), | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Is either the Authentication method „AUTH LOGIN“ or „AUTH PLAIN“ accepted? | | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Account | | |
| Do I have an account on the according MSA? | In general it is only possible sending Emails if an according account is available. | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Reachable from Saia PCD® | | |
| Can I reach this server from my PCD? | As SMTP is based on TCP/IP, an according connection to the server is required. In case there are Firewalls between the PCD and the MSA, there must be a rule which allows the connection from the PCD to the MSA. Depending on the rules of the SMTP server, it may be that this server only accepts mails from a local network. Some ISP do only accept mails which are delivered from their own modems/internet connections (e.g. the Swiss provider Bluewin). | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Mail Server address | | |
| What is the host name or IP address of the server? | Server Host Name: IP address: | <input type="checkbox"/> not known |
| The IP address is required for that the PCD knows where to connect for sending Emails. This IP address must be written into the text provided to the „SMTP“ field of the FBox „AMail Init“ In case of using name resolution please refer to chapter DNS protocol. | | |
| TCP port known | | |
| On which TCP port does the MSA accept SMTP messages? | Port: | <input type="checkbox"/> not known |
| In general the port 25 is used for the submission of Emails, but never servers do sometimes use port 587 (generally used for authenticated users). Please configure the port in the FBox adjust parameter „SMTP server port“ | | |
| Username, password | | |

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------|
| What is the user name and the password for the mail submission? | user: password: | <input type="checkbox"/> not known |
| Enter your user name in the text which is provided to the „Name“ field of the FBox. The password is to be written in the text provided to the field „Pwd“. | | |
| Sender address valid | | |
| Please also make sure that the text provided to the „Sender“ field of the FBox is an EMail address with correct domain name (which exists). sender: | | <input type="checkbox"/> not known |
| The „To1“..„To5“ inputs of the FBox correspond to the destinations of the mails. Add here a text which contains the Email addresses of the recipients of the E-mails to be sent. | | <input type="checkbox"/> not known |

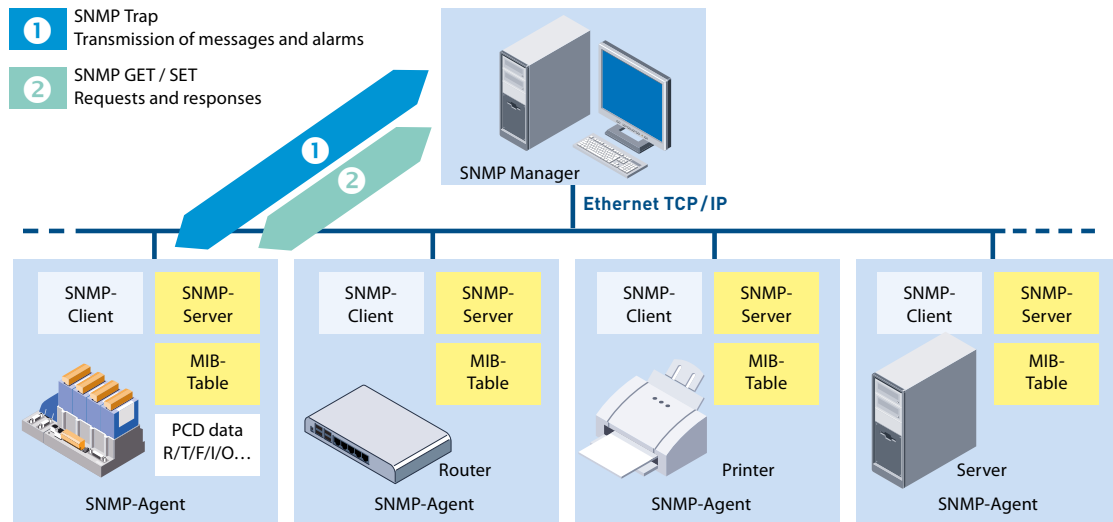
If all this points are answered positive, Email sending is possible.

7 SNMP-Simple Network Management Protocol

7.1 Introduction

The SNMP manager software usually runs on a server. It monitors and controls SNMP agents. The SNMP manager reads and sends data from the agent using SET and GET commands. The SNMP agent can also sent unrequested so-called ‘trap’ messages to the SNMP manager. This allows, for example, the direct reporting of faults.

Saia PCD® MIB has been defined for Saia PCD® with SNMP support. Within it are re-presented all the resources that can be queried and modified with SNMP. Basically, all PCD media can be accessed (inputs/outputs, registers, flags, DBs, etc.). In the MIB file, the programmer can restrict access to selected areas only.



The simple network management protocol (SNMP) was developed to allow network elements like routers, servers and switches to be monitored and controlled from a central station. The SNMP manager usually runs as software on a server. It monitors and controls SNMP agents. These may be any chosen devices accessible via the network and support SNMP. With the new firmware, Saia PCD® supports SNMP agent functionality.

The following SNMP versions are available: v1, v2c, v3 (security mechanism with MD5 authentication, encryption with DES 56 Bit). The v3 standard has not yet achieved very wide distribution. Version v2c is still, in principle, the current standard. Saia PCD® supports Version v2c.

8 Advanced Web diagnostic

8.1 Introduction

Most of the TCP/IP enhancement configured items or tags can be accessed through the Web CGI interface.

Please refer to the access syntax of each protocol, to read the diagnostic values.

The access through the CGI interface is to be used as a read-only access. When using the write access it must be taken into consideration that powering off and on the Saia PCD® will lead to a loss of the configuration written over the CGI interface. Therefore the write access should only be used for test purposes. The correct configuration for continuous operation is only guaranteed when configured with the Saia PG5® Device Configurator.

Please note that the CGI tags definition can be changed in a later firmware version.

8.2 PPP Configuration using Web CGI

8.2.1 Generic access syntax

All PPP configuration items or tags can be accessed through the Web CGI. The access is done with the following syntax:

Read values:

`http://hostname/cgi-bin/readVal.exe?<ConfigRegistry>,<TagName>`

| | |
|----------------|--------------------------------------------------------|
| ConfigRegistry | CFG-PPP, SYS-PPP |
| TagName | Corresponds to the configuration tag in the tag table. |

8.2.2 Special tags

The following tags have dedicated processing:

UpdateConfig: (CFG-PPP,UpdateConfig+1): Setting this variable to one (only once), allows to make the current configuration as valid, if and only if the PPP is in IDLE state. When marked as valid, the configuration will be executed as if loaded from a configuration file. If an immediate start is required, the PPP protocol will be started as configured after the defined timeout. PPP protocol starts with executing the PPP script lines as defined in 2.2 above.

Save: (CFG-PPP,Save+1): Setting this variable to one (only once) allows to write the current configuration into a file. The configuration is also updated (like writing Update-Config tag). By default, the file "PPPConfig.txt" will be written, with an additional entry in the "Config.txt" file. If the saved configuration is requested to be saved in a flat structure, the current configuration will be saved in directly in the "Config.txt" file.

Start: (CFG-PPP,Start+1): Setting this variable to one (only once), allows to start immediately PPP according to the loaded configuration. The start delay is not taken into account. The status of the PPP connection can be retrieved with the different PPP status tags.

Stop: (CFG-PPP,Stop+1): Setting this variable to one (only once), allows to stop immediately PPP. If the restart flag is set, the PPP will be automatically restarted after the given timeout delay. The status of the PPP connection can be retrieved with the different PPP status tags.

8.2.3 PPP TAG list

This paragraph presents the list of tags used by the PPP module. The table contains the following information

Name;

Related ID (used in CSF call) (none implies that the tag is not accessible through CSF);

Configuration tag or not (a configuration tag is saved in the related configuration file);

Access type for the tag (read/write, read only or write only);

Its default value;

Eventually its minimum value and/or maximum value;

Definition and tag usage.

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|--------------|--------|------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| Enable | RW | CFG | 0 | NA | Enable (1) or disable (0) PPP functionalities |
| DefaultRoute | RW | CFG | 0 | NA | Enable (1) or disable (0) PPP interface to be the default IP route when an unreachable IP address is provided. |
| PeerAuth | RW | CFG | 0 | NA | Enable (1) or disable (0) the peer authentication. Enabling it implies that the user / password shall be provided by the peer when the connection is established. See also §2.3 for authentication process. |
| Restart | RW | CFG | 0 | NA | Enable (1) or disable (0) the PPP functionality when the connection is closed, either locally or by the host. Disable it means that the PPP link establishment functionality is not restarted when the connection is closed. |
| ImmStart | RW | CFG | 0 | NA | Enable (1) or disable (1) the automatic start of the PPP according to the given parameters. The automatic start occurs after the PPPStart-Delay time is elapsed. This parameter can only be set in the configuration file and not via the CSF call. |
| PortID | RW | CFG | 1 | NA | This parameter allows defining on which serial line the PPP connection shall be established. Possible values are: 0, 1, 2, 3, 100, 101, 110, 111, 120, 121, 130, 131 |
| SerialPort | RO | SYS | NA | NA | This parameter owns the internal ID of the serial port, after the conversion of the user provided PortID. |
| Baudrate | RW | CFG | 115200 | NA | This parameter allows defining the baud rate to be used for PPP communication. Possible values are: 2400, 4800, 9600, 19200, 38400, 57600, 115200 |

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|--------------------|--------|------|---------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| Mode | RW | CFG | 1 | 1 (SVR) 2 (CLI) | <p>This parameter defines which type of connection will be established between the two peers.</p> <p>Specifying a server connection means that the PPP will wait for the partner to establish a connection.</p> <p>Specifying a client connection means that the PPP will initiate the connection with the peer.</p> |
| StartDelay | RW | CFG | 5 | 0 / 60 | <p>This parameter defines the number of seconds to wait until the PPP is started. This parameter can only be set in the configuration file and not via the CSF call.</p> |
| LocalAddress | RW | CFG | 0 | NA | <p>This parameter defines the IP address to be proposed during the IPCP negotiation between the two peers for the local address. If 0 is specified, the local address shall be provided by the peer.</p> <p>Normally, an IP address shall be specified when working in server mode, whereas it is not necessary to specify a local address when working in client mode. However, this is not always the case.</p> <p>The given address may not be the one used after successful IPCP negotiation.</p> |
| RemoteAddress | RW | CFG | 0 | NA | <p>This parameter defines the IP address to be proposed during the IPCP negotiation between the two peers for the partner address. If 0 is specified, the partner address shall be provided by the peer.</p> <p>Normally, an IP address shall be specified when working in server mode, whereas it is not necessary to specify a partner address when working in client mode. However, this is not always the case.</p> <p>The given address may not be the one used after successful IPCP negotiation.</p> |
| RemoteAuthUsername | RW | CFG | "" | NA | <p>This parameter contains the user name that will be used to authenticate the Saia PCD® to the remote host. Refer to §2.3 for authentication description. The maximum length of the user name is 31 characters.</p> |
| RemoteAuthPasswd | RW | CFG | "" | NA | <p>This parameter contains the password that will be used to authenticate the Saia PCD® to the remote host. Refer to §2.3 for authentication description. The maximum length of the password is 31 characters.</p> |

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|-------------|--------|------|---------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| PPPState | RO | SYS | | NA | <p>This value provides the current status of the PPP:</p> <ul style="list-style-type: none"> 0: No PPP device has been configured on this system. 1: PPP is in Idle mode. 2: PPP is currently playing startup script. 3: Script has been executed, waiting for connection to complete. 4: PPP is up and running <p>Remark: When used as WEB CGI tag, the value is directly converted to a meaningful string.</p> <p>Remark: The current PPPState can be accessed through the S.PPP.State CSF call (4th parameter).</p> <p>Remark: The current values are also described in the PG5 related INC file, e.g. S.PPP.PPPState.STATE_SCRIPTING</p> |
| PPPLink | RO | SYS | - | NA | <p>Provides the current state of the PPP link. The following values are provided:</p> <ul style="list-style-type: none"> 1: Physical link layer not ready 2: Link establishment phase 3: Network layer protocol phase. 4: Authentication phase. 5: Something happens that imply a disconnection. 6: Negotiation is successful. <p>Remark: When used as WEB CGI tag, the value is directly converted to a meaning full string.</p> <p>Remark: The current PPPLink can be accessed through the S.PPP.State CSF call (1st parameter).</p> <p>Remark: The current values are also described in the PG5 related INC file, e.g. S.PPP.LNKValue.LINK_DOWN</p> |

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|-------------|--------|------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| PPPEvt | RO | SYS | - | NA | <p>Provides events occurring on the PPP link. The following values are provided:</p> <ol style="list-style-type: none"> 1: The LCP negotiation is starting. 2: The LCP negotiation is successful. 3: The authentication is successful. 4: The LCP negotiation or authentication has failed. 5: The LCP layer is closing the connection. 6: The link is terminated. 7: The IPCP negotiation is starting. 8: The IPCP layer is configured and the interface is up. 9: The IPCP layer configuration has failed. 10:PAP authentication status report. 11:CHAP (MD5 and MS) authentication status. 12:MSCHAP authentication status <p>Remark: When used as WEB CGI tag, the value is directly converted to a meaning full string.</p> <p>Remark: The current PPPEvt can be accessed through the S.PPP.State CSF call (2nd parameter).</p> <p>Remark: The current values are also described in the PG5 related INC file, e.g. S.PPP.PPPEvt.EVT_LCP_SUCCESS</p> |

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|-------------------|--------|------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| PPPSubEvent | RO | SYS | - | NA | <p>For the PPPEvt values 4, 5 and 6 this parameter provides some more information, describing the cause of the failure:</p> <ul style="list-style-type: none"> 1: The authentication has failed. 2: Termination request has been received from the peer. 3: The maximum number of echo requests has been sent without reply from the peer. 4: The physical link is disconnected. 5: The application has called xxx. 6: Protocol reject has been received. 7: The maximum number of configuration requests has been sent. Either the negotiation is not converging or the peer is not responding. 8: The IPCP layer configuration has failed. 9: The magic number option is activated and a looped-back line has been detected. <p>For the PPPEvt 10 or 11, this parameter provides some more information:</p> <ul style="list-style-type: none"> 10:Local host authentication has failed. 11:Local host authentication successful. 12:Peer authentication has failed. 13:Peer authentication successful. 14:No answer from the peer. <p>Remark: The current LinkSubEvent can be accessed through the S.PPP.State CSF call (3rd parameter).</p> |
| UseDefault-Script | RW | CFG | 1 | NA | <p>Two startup scripts are available for client or server connection when a direct connection between a Saia PCD® and PC (running Win XP). By enabling it, the default script corresponding to the connection type is selected and played over the interface.</p> <p>By disabling it, no script is provided. Script lines (if required) shall be entered (see §2.2.4 below).</p> |

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|-------------|--------|------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| UseModem | RW | CFG | 0 | NA | Setting this variable to 1 enables the checking of the modem signals on the serial line, especially the DCD and DSR used for modem disconnection checks. When a modem is used, it is required to enable these checks. Setting this variable to 0 disables the checking of the modem lines, e.g. when a direct connection is used. |
| MSLa | RW | CFG | - | NA | See §2.2 below |
| MSLb | RW | CFG | - | NA | See §2.2 below |
| MSLc | RW | CFG | - | NA | See §2.2 below |
| MSLd | RW | CFG | - | NA | See §2.2 below |
| MSLe | RW | CFG | - | NA | See §2.2 below |
| MSLf | RW | CFG | - | NA | See §2.2 below |
| MSLg | RW | CFG | - | NA | See §2.2 below |
| MSLh | RW | CFG | - | NA | See §2.2 below |
| MSLi | RW | CFG | - | NA | See §2.2 below |
| MSLj | RW | CFG | - | NA | See §2.2 below |
| MSLj | RW | CFG | - | NA | See §2.2 below |
| EnaIPFW | RW | CFG | 0 | - | Setting this variable to 1 enables the internal forwarding of IP message from one interface (e.g. PPP) to another interface (e.g. eth0). Such configuration requires a good knowledge of routing between different equipments. IP forwarding mechanism is disabled by default. |
| EnaEReq | RW | CFG | 0 | - | Setting this variable to 1 enables the sending of echo request message over PPP. This can be used if an interface does not support DSR / DCD signals, but the line shall still be checked if partner is present or not. Echo requests are sent every 10 seconds and if no response is received after 5 retries, the PPP interface is shut down (about 50 seconds). Sending of echo request is disabled by default. |
| CheckDCD | RW | CFG | 0 | - | Setting this variable to 1 enables the DCD checking before the PPP protocol is started, but after the modem scripts have been played. Using the DCDTimeout parameter (see below), the time used before the DCD comes can be configured. CheckDCD parameter is disabled by default. Remark: The DCD/DSR signals are checked when the UseModem parameter is checked. If one of the signal goes down, the PPP connection is stopped. |

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|-------------|--------|------|---------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| DTRPulse | RW | CFG | 0 | - | <p>Setting this variable to 1 enables the DTR signal to be cleared during 1 second before the PPP script is played. After the DTR is high again, the DSR signal is checked. If DSR is still low after 5 seconds, the PPP connection is aborted. This option is only taken into account if the UseModem is TRUE.</p> <p>If the UseModem parameter is set, and the DTRPulse is not set, the DTR signal is set high, a small wait loop is executed and the DSR signal is checked. If low, then the PPP connection is aborted.</p> <p>If the UseModem parameter is low, the DTR is set high but the DSR signal is not checked.</p> |
| LastError | RO | SYS | - | NA | The last error occurred while processing PPP is stored in that variable. |
| ERTInterval | RW | CFG | 5 | 1..3600 | This allows setting the time interval between 2 echo requests (when the EnaEReq variable has been set to 1). Default is 5 seconds, maximum is 1 hour |
| ERNumber | RW | CFG | 6 | 1..100 | <p>This allows setting the number of echo requests to be sent and not answered before closing the connection (when the EnaEReq variable has been set to 1). Default is 6 requests, maximum is 100.</p> <p>The interval multiplied by the number gives the total time before the disconnection is effective.</p> |
| DCDTimeout | RW | CFG | 1000 | 0 .. 1hr | <p>When the CheckDCD parameter is set to 1, the DCD signal is checked before starting the PPP protocol. This parameter defines the time during which it is checked before returning an error.</p> <p>When the parameter value is 0, the check is performed infinitely.</p> <p>Maximum time is 1 hour, expressed in milliseconds.</p> |
| ALAddress | RO | SYS | - | NA | This parameter is the real IP address assigned to the PPP connection. It can be different from the one specified or if none has been specified (LocalAddress parameter) |
| ARAddress | RO | SYS | - | NA | This parameter is the real IP address of the partner of the PPP connection. |

8.3 DHCP diagnose through Web CGI

8.3.1 Access syntax

All DHCP and DNS configuration tags can be accessed through the Web CGI interface.

The access has the following syntax:

Read values:

`http://hostname/cgi-bin/readVal.exe?<ConfigRegistry>,<TagName>`

| | |
|----------------|--------------------------------------------------------|
| ConfigRegistry | CFG-DHCP, SYS-DHCP CFG-DNS, SYS-DNS |
| TagName | Corresponds to the configuration tag in the tag table. |

8.3.2 Special tags

8

The following tags have dedicated processing:

UpdateConfig: [CFG-DHCP,UpdateConfig+1] [CFG-DNS,UpdateConfig+1]: Setting this variable to one (only once), allows making the current configuration valid. When marked as valid, the configuration will be executed as if loaded from a configuration file.

Save: [CFG-DHCP,Save,1], [CFG-DNS,Save,1]: Setting this variable to one (only once) allows to write the current configuration into a file. The configuration is also updated (like writing UpdateConfig tag).

Start: [CFG-DHCP,Start+1]: Setting this variable to one (only once), allows to start immediately DHCP according to the loaded configuration. The status of the DHCP can be retrieved with the different DHCP status tags.

Stop: (CFG-DHCP,Stop+1): Setting this variable to one (only once), allows to stop immediately DHCP. The status of the DHCP can be retrieved with the different DHCP status tags.

Please note that stopping DHCP un-configure the IP interface and does NOT allow to access it through the Ethernet network.

8.3.3 DHCP and DNS Tag list

This paragraph presents the list of tags used by the DHCP and DNS modules. The table contains the following information

- Name;
- Configuration tag or not
(a configuration tag is saved in the related configuration file);
- Access type for the tag (read/write, read only or write only);
- Its default value;
- Eventually its minimum value and/or maximum value;
- Definition and tag usage.

First table contains the information for DHCP, whereas the second table contains the information for DNS.

8.3.4 DHCP Tag table

| Web CGI-Bin | | | | | |
|-------------|--------|------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | Type | Default | Min/Max | Description |
| Enable | RW | CFG | 0 | NA | Enable (1) or disable (0) DHCP functionalities. |
| Enabled | RO | SYS | - | - | Display if the DHCP is enabled (1) or disabled (0) |
| ImmStart | RW | CFG | 0 | NA | Enable (1) or disable (0) the DHCP immediate starting when Saia PCD® is powered ON. |
| SetGateway | RW | CFG | 0 | NA | Enable (1) or disable (0) the automatic setting of the gateway IP address, if this information is received from the DHCP server. |
| SetDNSInfo | RW | CFG | 0 | NA | Enable (1) or disable (0) the automatic setting of the DNS information if this information is received from the DHCP server. Using this option allows to avoid configuring the DNS manually as presented in the next tag table. |
| Mode | RW | CFG | 0 | 0 | Reserved for future extension, shall be set to 0. |

DHCP diagnose access through Web CGI

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|------------------------------------------|--------|------|------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| CurState | RO | SYS | - | - | <p>This parameter returns the current state of the DHCP binding.</p> <p>0: (INIT): DHCP is not yet started</p> <p>1: (SELECTING): DHCP is selecting the DHCP server</p> <p>2: (REQUESTING): DHCP is requesting the DHCP server information</p> <p>3: (BOUND): DHCP has received all information.</p> <p>4: (RENEWING): DHCP is renewing the DHCP server information.</p> <p>5: (REBINDING): DHCP is rebinding to a DHCP server.</p> <p>6: (INIT_REBOOT): DHCP is restarting its init sequence.</p> <p>7: (REBOOTING): DHCP is rebooting for new DHCP server information.</p> <p>Using the WEB interface, the text is directly written in the page.</p> |
| RejSVRa RejSVRb RejSVRc RejSVRd | RW | CFG | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | NA | A list of DHCP server to be rejected can be given with these 4 parameters. If none is set, the first DHCP server answering will be used for the IP configuration. |
| AssignedIPAddr | RO | SYS | - | - | This parameter displays the assigned IP address received from the DHCP server. |
| AssignedSvrAddr | RO | SYS | - | - | This parameter displays the IP address of the selected DHCP server |
| AssignedDNS-SVRa | RO | SYS | - | - | This parameter displays the IP address of the primary DNS server as received by the DHCP server. If the SetDNSInfo tag is set, this information will be used for the DNS requests. |
| AssignedDNS-SVRb | RO | SYS | - | - | This parameter displays the IP address of the secondary DNS server as received by the DHCP server. If the SetDNSInfo tag is set, this information will be used for the DNS requests. |
| AssignedGatewayAddr | RO | SYS | - | - | This parameter displays the IP address of the gateway as received by the DHCP server. This address will be used as default gateway if the SetGateway tag is set. |
| Assigned-SNTPAddr | RO | SYS | - | - | This parameter displays the IP address of the SNTP as received by the DHCP server. It can be used to configure the SNTP server, but this is not done automatically (SNTP shall be configured separately.) |

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|--------------------|--------|------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| AssignedIP-Mask | RO | SYS | - | - | This parameter displays the IP network mask as received by the DHCP server. It is immediately set and used. |
| Hostname | RW | CFG | "" | NA | This parameter provides the name of the host to be configured. The information is passed to the DHCP server and eventually to the related DNS server. Then it can be used for direct connection between Saia PCD® or between a PC and a PCD. |
| AssignedDomainName | RO | SYS | "" | NA | This parameter displays the domain name as received by the DHCP server. |
| FQDN | RW | CFG | "" | NA | This parameter can be set to specify the "Fully Qualified Domain Name", which will be attached to the hostname. Normally, this tag can be kept empty. |
| UpdateConfig | WO | SYS | NA | NA | Writing a "1" to this tag through the CGI WEB interface allows making the current configuration valid. As consequence of setting this value, the DHCP may be immediately started according to defined configuration tags. |
| Start | WO | SYS | NA | NA | Writing a "1" to this tag through the CGI WEB interface allows initiating a DHCP server connection with the current parameter set. |
| Stop | WO | SYS | NA | NA | Writing a "1" to this tag through the CGI WEB interface allows stopping the current DHCP processing. Stopping it unconfigure the IP address of the Saia PCD®. After, it can not be reached over the Ethernet network. |
| Save | WO | SYS | NA | NA | Writing a "1" to this tag through the CGI WEB interface allows writing the current configuration parameters in the DHCP dedicated file. Refer to chapter 4 for details on the configuration file(s). |

8.3.5 DNS Tag table

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|--------------|--------|------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| Enable | RW | CFG | 0 | NA | Enable (1) or disable (0) DNS resolver functionality. |
| UseDHCPInfo | RW | CFG | 0 | NA | Enable (1) or Disable (0) the use of the DHCP received information for DNS functionalities. |
| State | RO | SYS | 0 | NA | Set to 1 if the DNS functionalities have been enabled. Set to 0 if NOT. |
| SVRa | RW | CFG | 0.0.0.0 | NA | This parameter sets the IP address of the primary DNS server to be used when trying to resolve an IP address |
| SVRb | RW | CFG | 0.0.0.0 | NA | This parameter sets the IP address of the secondary DNS server to be used when trying to resolve an IP address |
| UpdateConfig | WO | SYS | NA | NA | Writing a "1" to this tag through the CGI WEB interface allows making the current configuration valid. |
| Save | WO | SYS | NA | NA | Writing a "1" to this tag through the CGI WEB interface allows writing the current configuration parameters in the DNS dedicated file. Refer to chapter 4 for details on the configuration file(s). |

8.4 SNTP diagnose through Web CGI

8.4.1 Access syntax

All SNTP configuration tags can be accessed through the Web CGI interface. The access has the following syntax

Read values:

`http://hostname/cgi-bin/readVal.exe?<ConfigRegistry>,<TagName>`

| | |
|----------------|--------------------------------------------------------|
| ConfigRegistry | CFG-SNTP, SYS-SNTP |
| TagName | Corresponds to the configuration tag in the tag table. |

8.4.2 Special tags

The following tags have dedicated processing:

UpdateConfig (CFG-SNTP,UpdateConfig+1): Setting this variable to one (only once), allows to make the current configuration as valid, if and only if the SNTP is in IDLE state. When marked as valid, the configuration will be executed as if loaded from a configuration file. If an immediate start is required, the SNTP protocol will be started as configured after the defined timeout.

Save (CFG-SNTP,Save+1): Setting this variable to one (only once) allows to write the current configuration into a file. The configuration is also updated (like writing UpdateConfig tag). By default, the file "SNTPConfig.txt" will be written, with an additional entry in the "Config.txt" file. If the saved configuration is requested to be saved in a flat structure, the current configuration will be saved in directly in the "Config.txt" file.

Start: (CFG-SNTP,Start+1): Setting this variable to one (only once), allows to start immediately SNTP according to the loaded configuration. The start delay is not taken into account. The status of the SNTP processing can be retrieved with the SNTP status tag.

Stop: (CFG-SNTP,Stop+1): Setting this variable to one (only once), allows to stop immediately SNTP. The status of the SNTP processing can be retrieved with the SNTP status tag.

8.4.3 SNTP TAG list

This paragraph presents the list of tags used by the SNTP module. The table contains the following information:

- Name;
- Configuration tag or not
(a configuration tag is saved in the related configuration file);
- Access type for the tag (read/write, read only or write only);
- Its default value;
- Eventually its minimum value and/or maximum value;
- • Definition and tag usage.

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|----------------------------------------------|--------|------|------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | Type | Default | Min/Max | Description |
| Enable | RW | CFG | 0 | NA | Enable (1) or disable (0) SNTP functionalities |
| Enabled | RO | SYS | - | - | Display current status of SNTP. |
| ImmStart | RW | CFG | 0 | NA | Enable (1) or disable (0) SNTP functionality to be started immediately (after a defined time) after the configuration has been parsed. |
| Mode | RW | CFG | 0 | 0 / 1 | Specifying a 0 means that the SNTP will use the list of specified NTP server and send a NTP request to receive the time. The first server answering to this request will be used for synchronization purposes. Specifying a 1 means that the SNTP will listen to broadcast messages from any NTP server. The first NTP server sending broadcast request will be used for synchronization purposes. |
| StartDelay | RW | CFG | 0 | NA | This parameter defines the number of seconds to wait until the SNTP is started. |
| ClockDelta | RW | CFG | 2000 ms) | 100 (ms) 3600(sec) | This parameter defines the maximum delta between the internal clock and the received time. As soon as the delta is over passed, the internal clock is updated. |
| SVRa SVRb SVRc SVRd | RO | CFG | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | NA | Provides the IP addresses of the named servers (see below). |
| SVRNamea SVRNameb SVRNamec SVRNamed | RW | CFG | 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 | NA | Provides the list of named server used with Mode 0. Up to 4 servers can be specified. If a SVRName is specified, the corresponding SVR value will be updated. The SVRName _x can specify either an IP address (expressed as string, e.g. 182.75.22.198) or a hostname. If a hostname, e.g hostname:www.ntp.srv.ch is specified, a DNS configuration is also specified. |
| UsedServer | RO | SYS | - | NA | Provides the actually used NTP server when synchronization has been initialized. |

SNTP diagnose through Web CGI

| Web CGI-Bin | | Type | Default | Min/Max | Description |
|--------------|--------|------|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag name | Access | | | | |
| TimeZone | YES | | RW | NA | <p>A time zone can be specified within the SNTP definition. The received SNTP time is always provided in UTC. In order to display correctly the time, the local time zone can be provided.</p> <p>The format of the time zone is defined as follows:</p> <p><TZName> [+ -] HH [:MM] e.g CET-01:00 or CET-1</p> <p>winter time can be specified, specifying the second timezone, and the dates where the time shall be changed,</p> <p><TZName2> [+ -] HH [:MM] e.g. CCET-2:00 or CCET-2</p> <p>M<month>.<weekofmonth>.<dayofweek>/HH [:MM] e.g. M3.5.0/02:00</p> <p>The 4 fields definitions shall be specified in one string, each field being separated by a “,”</p> <p>Example</p> <p>CET-01,CEST-02,M3.5.0/2,M10.5.0/2</p> <p>Specifying a 5 as week in month specifies the last week of the month.</p> <p>Specifying a 0 as day of week specifies it is Sunday.</p> <p>The minutes can be omitted.</p> <p>Specifying a second time zone requires that the 2 dates for time change shall be specified.</p> <p>It is not required to specify a second time zone.</p> <p>The default is the one defined in the example (Central European Time with summer time (last week - Sunday in March at 2 am (forwarded to 3 pm) and last week – Sunday in October at 3 am (back to 2 am)</p> |
| UpdateConfig | WO | SYS | - | NA | Writing once this tag to 1 allows writing the given configuration as the valid one (if SNTP is in IDLE mode) and to test the current configuration. |
| Start | WO | SYS | - | NA | Writing a 1 allows to manually start the SNTP synchronization. |
| Stop | WO | SYS | - | NA | Writing a 1 allows to manually stop the SNTP synchronization |
| Save | WO | SYS | - | NA | Writing once this tag to 1 allows saving the configuration in a file on the FLASH. |
| Status | RO | SYS | - | - | This variable provides the status of the SNTP processing (started, stopped) |

8.5 SNMP diagnose through Web CGI

8.5.1 Access syntax

All SNMP configuration tags can be accessed through the Web CGI interface. The access has the following syntax

Read values:

`http://hostname/cgi-bin/readVal.exe?<ConfigRegistry>,<TagName>`

| | |
|----------------|--------------------------------------------------------|
| ConfigRegistry | CFG-SNMP, SYS-SNMP |
| TagName | Corresponds to the configuration tag in the tag table. |

8.5.2 SNMP Tag list

| Web CGI Bin | | Type | Default | Min/Max | Description |
|----------------|--------|------|---------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag Name | Access | | | | |
| Enable | RW | CFG | 0 | NA | Enable (1) or disable (0) SNMP functionalities |
| UseV3 | RW | CFG | 0 | NA | Enable (1) or disable (0) SNMP V3 functionality. Actually, only V2 is supported. Setting this flag has no influence. |
| StartDelay | RW | CFG | 5 | 0/60 | Defines the time when the SNMP agent is started at power ON. Time is required in order to allow the Saia PCD® to set the IP configuration before the SNMP agent is started. If the start delay is too short, it is possible that the cold start trap event can not be sent. Setting it to 0 allows starting SNMP immediately when the IP configuration has been parsed. |
| IOReadFirst | RW | CFG | 0 | 2 ³¹ - 1 | Defines the first input/output address that can be accessed with a SNMP GET/GETNEXT request. Below the given value, the request returns with an error. |
| IOReadLast | RW | CFG | 1024 | 2 ³¹ - 1 | Defines the first input/output address that can NOT be accessed with a SNMP GET/GETNEXT request. Below the given value, but higher or equal to the IOReadFirst, requests will be answered without error. If Last and First are equal, no access is granted. |
| IOWriteFirst | RW | CFG | 0 | 2 ³¹ - 1 | Defines the first input/output address that can be accessed with a SNMP SET/CHECK request. Below the given value, the request returns with an error. |
| IOWriteLast | RW | CFG | 0 | 2 ³¹ - 1 | Defines the first input/output address that can NOT be accessed with a SNMP SET/CHECK request. Below the given value, but higher or equal to the IOWriteFirst, requests will be answered without error. If Last and First are equal, no access is granted. |
| FlagRead-First | RW | CFG | 0 | 2 ³¹ - 1 | Defines the first flag address that can be accessed with a SNMP GET/GETNEXT request. Below the given value, the request returns with an error. |

| Web CGI Bin | | Type | Default | Min/Max | Description |
|-------------------|--------|------|---------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag Name | Access | | | | |
| FlagRead-Last | RW | CFG | 8192 | $2^{31} - 1$ | Defines the first flag address that can NOT be accessed with a SNMP GET/GETNEXT request. Below the given value, but higher or equal to the <code>FlagReadFirst</code> , requests will be answered without error. If Last and First are equal, no access is granted. |
| FlagWrite-First | RW | CFG | 0 | $2^{31} - 1$ | Defines the first flag address that can be accessed with a SNMP SET/CHECK request. Below the given value, the request returns with an error. |
| FlagWrite-Last | RW | CFG | 0 | $2^{31} - 1$ | Defines the first flag address that can NOT be accessed with a SNMP SET/CHECK request. Below the given value, but higher or equal to the <code>FlagWriteFirst</code> , requests will be answered without error. If Last and First are equal, no access is granted. |
| RegRead-First | RW | CFG | 0 | $2^{31} - 1$ | Defines the first register address that can be accessed with a SNMP GET/GETNEXT request. Below the given value, the request returns with an error. |
| RegRead-Last | RW | CFG | 16364 | $2^{31} - 1$ | Defines the first register address that can NOT be accessed with a SNMP GET/GETNEXT request. Below the given value, but higher or equal to the <code>RegReadFirst</code> , requests will be answered without error. If Last and First are equal, no access is granted. |
| RegWrite-First | RW | CFG | 0 | $2^{31} - 1$ | Defines the first register address that can be accessed with a SNMP SET/CHECK request. Below the given value, the request returns with an error. |
| RegWrite-Last | RW | CFG | 0 | $2^{31} - 1$ | Defines the first register address that can NOT be accessed with a SNMP SET/CHECK request. Below the given value, but higher or equal to the <code>RegWriteFirst</code> , requests will be answered without error. If Last and First are equal, no access is granted. |
| TimerRead-First | RW | CFG | 0 | $2^{31} - 1$ | Defines the first timer address that can be accessed with a SNMP GET/GETNEXT request. Below the given value, the request returns with an error. |
| TimerRead-Last | RW | CFG | 32 | $2^{31} - 1$ | Defines the first timer address that can NOT be accessed with a SNMP GET/GETNEXT request. Below the given value, but higher or equal to the <code>TimerReadFirst</code> , requests will be answered without error. If Last and First are equal, no access is granted. |
| TimerWrite-First | RW | CFG | 0 | $2^{31} - 1$ | Defines the first timer address that can be accessed with a SNMP SET/CHECK request. Below the given value, the request returns with an error. |
| TimerWrite-Last | RW | CFG | 0 | $2^{31} - 1$ | Defines the first timer address that can NOT be accessed with a SNMP SET/CHECK request. Below the given value, but higher or equal to the <code>TimerWriteFirst</code> , requests will be answered without error. If Last and First are equal, no access is granted. |
| Counter-ReadFirst | RW | CFG | 32 | $2^{31} - 1$ | Defines the first counter address that can be accessed with a SNMP GET/GETNEXT request. Below the given value, the request returns with an error. |

| Web CGI Bin | | Type | Default | Min/Max | Description |
|--------------------|--------|------|----------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag Name | Access | | | | |
| Counter-ReadLast | RW | CFG | 1600 | $2^{31} - 1$ | Defines the first counter address that can NOT be accessed with a SNMP GET/GETNEXT request. Below the given value, but higher or equal to the CounterReadFirst, requests will be answered without error. If Last and First are equal, no access is granted. |
| Counter-WriteFirst | RW | CFG | 0 | $2^{31} - 1$ | Defines the first counter address that can be accessed with a SNMP SET/CHECK request. Below the given value, the request returns with an error. |
| Counter-WriteLast | RW | CFG | 0 | $2^{31} - 1$ | Defines the first counter address that can NOT be accessed with a SNMP SET/CHECK request. Below the given value, but higher or equal to the CounterWriteFirst, requests will be answered without error. If Last and First are equal, no access is granted. |
| DBReadFirst | RW | CFG | 0 | $2^{31} - 1$ | Defines the first DB number that can be accessed with a SNMP GET/GETNEXT request. Below the given value, the request returns with an error. When a DB is accessible, all elements within the DB can be accessed. |
| DBReadLast | RW | CFG | 8192 | $2^{31} - 1$ | Defines the first DB number that can NOT be accessed with a SNMP GET/GETNEXT request. Below the given value, but higher or equal to the DBReadFirst, requests will be answered without error. If Last and First are equal, no access is granted. Once a DB has been defined for read access, the complete DB can be read. |
| DBWriteFirst | RW | CFG | 0 | $2^{31} - 1$ | Defines the first DB number that can be accessed with a SNMP SET/CHECK request. Below the given value, the request returns with an error. When a DB is accessible, all elements within the DB can be accessed. |
| DBWriteLast | RW | CFG | 0 | $2^{31} - 1$ | Defines the first DB number that can NOT be accessed with a SNMP SET/CHECK request. Below the given value, but higher or equal to the DBWriteFirst, requests will be answered without error. If Last and First are equal, no access is granted. Once a DB has been defined for write access, the complete DB can be written. |
| ReadCommunity | RW | CFG | „public“ | Max. 24 char. | Defines the string used in SNMP V2 to access (read commands e.g. GET/GETNEXT) on board objects. |
| WriteCommunity | RW | CFG | „private“ | Max. 24 char. | Defines the string used in SNMP V2 to access (write commands e.g. SET) on board objects. |
| TrapCommunity | RW | CFG | „public“ | Max. 24 char. | Defines the string used when Trap is sent to the SNMP Manager by the agent. |
| sysContact | RW | CFG | „Saia-Burgess Controls AG“ | Max. 100 char. | Defines the string displayed when accessing the default SNMP object sysContact (defined in SNMPv2-MIB) |
| sysLocation | RW | CFG | „CH-3280 Murten“ | Max. 100 char. | Defines the string displayed when accessing the default SNMP object sysLocation (defined in SNMPv1-MIB) |

| Web CGI Bin | | Type | Default | Min/Max | Description |
|-------------|--------|------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tag Name | Access | | | | |
| TrapxPort | RW | CFG | 0 | 65535 | Up to three SNMP trap receiver can be defined. The x shall be replaced with a, b or c. The port defines the IP port defines by the receiver. Setting 0 implies the use of the default port, normally 162. |
| TrapIPAddr | RW | CFG | 0.0.0.0 | NA | Up to three SNMP trap receiver can be defined. The x shall be replaced with a, b or c. The IP address defines the IP address of the receiver. Setting 0 implies that no receiver is defined for this trap entry. |
| LifeTimeout | RW | CFG | 0 | 1 hrs | Expressed in millisecond value, it defines the time between two "Life Trap" send to the configured managers. Setting this variable to 0 disables the sending of "life trap" message. |

A Appendix

A.1 Icons



This symbol refers to additional information, which is available in this or another manual or in technical documentation on this subject. There are not direct references to such documents.



This symbol designates instructions, which need to be strictly followed.



This symbol warns the reader that components may be damaged as a result of electrostatic discharge when touched.

Recommendation: as a minimum touch the negative terminal of the system (PGU connector housing) before coming into contact with the electronic components. Better still is to wear an earthed strap on your wrist, which is connected with the negative terminal of the system.



Explanations next to this symbol are only valid for the Saia PCD® Classic series.



Explanations next to this symbol are only valid for the Saia PCD® xx7 series.

A.2 Technical overview

| | |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Supported systems | New systems with NT-OS operating system PCD1.M2xxx, PCD2.M5xx and PCD3 systems |
| Configuration | Configuration file with tags created with device configurator. (Accessible with CSF command or Web CGI) |
| PPP | |
| Standard | RFC-1661 |
| Authentication | PAP, CHAP and MS-CHAP |
| PPP connections at the same time | Per Saia PCD® controller only one 1 PPP-connection is possible (Client or Server) |
| PPP over Ethernet | No |
| IP address | Client: address from server. |
| Baud rate | Depending on serial interface. Up to 115'200 Baud |
| IP protocols | HTTP, FTP, Open data mode for free programming. Ether-S-Bus. SMTP Email, and other. |
| S-Bus-Gateway | Serial-S-Bus auf RS-485/422 <u>yes</u> Ether-S-Bus <u>no</u> |
| DHCP | |
| Standard | RFC-2131 |
| UDP Port | 67 for Server, 68 for Client |
| Parameters | IP address Subnet Mask Standard Gateway (optional) DNS Adresse (optional) |
| DNS | |
| Standard | RFC 1035 |
| Port | UDP 53 |
| SNTP | |
| Standard | RFC-2030 |
| Port | UDP 123 |
| SNTP Mode | Unicast Point to Point (SNTP Client starts request) Broadcast Point to Multipoint (Time is send out to all clients by a NTP-Server) |
| Possible SNTP Server | See application notes |
| Time format | UTC (Greenwich Mean Time) Time zone can be changed |
| Time precision | 500 ms for Unicast Point to Point 1 s for Broadcast Point to Multipoint |
| Requests | 10 s |
| Interface | Ethernet Serial RS-232 over PPP |
| SMTP (Send Email) | |
| Standard | RFC 821 |
| Port | 25 |
| Authentication method | AUTH LOGIN AUTH PLAIN |
| Encryption | None |
| SNMP (Agent) | |
| Standard | RFC 1157 |
| Port | UDP 161 (commands) UDP 162 (traps) |
| Traps format | V1, V2C |

A.3 Configuration file

In the project:

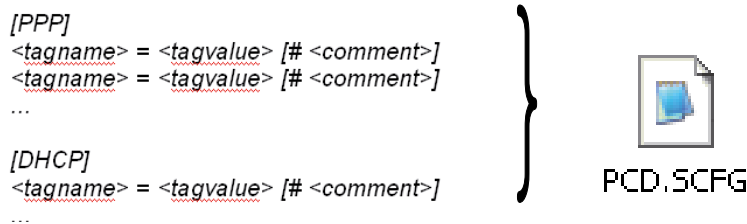
All TCP/IP protocols are configured by using a configuration file. Its name is PCD.SCFG:

```
...\project_name\device_name\PCD.SCFG
```

This configuration file contains one section per protocol and each configuration parameter is defined by a configuration tag:

```
[PPP]
<tagname> = <tagvalue> [# <comment>]
<tagname> = <tagvalue> [# <comment>]
...

[DHCP]
<tagname> = <tagvalue> [# <comment>]
...
```



The comment is optional. Only configuration tags will be taken as configuration parameters.

On the Saia PCD®:

On the Saia PCD® the file will be stored in the system folder.

If there are more than one config file the priority is as follow:

INTFLASH

M1 Flash

M2 Flash

SL0 Flash

If the configuration file is not present on the Saia PCD® file system, the firmware will start with default parameters.

IP extension will be disabled.

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A.3.1 Editing configuration file with text editor

The configuration file can be edited with any text editor. This allows the user to change parameters without installing Saia PG5®.

After editing, the file is transferred by FTP to the controller.

Recommendation:

Do only adapt complete files created by the device configurator of Saia PG5®.

A.4 Contact**Contact****Saia-Burgess Controls AG**

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International representations &

SBC sales companies: www.saia-pcd.com/contact**Repair****Postal address for customers to return products in Switzerland:****Saia-Burgess Controls AG**

After sales service

Bahnhofstrasse 18

3280 Murten, Switzerland

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