PROFINET Master Simulator

Overview

This application assists you in the following tasks:

Configuration and commissioning of Profinet slaves without a Profinet master being present.

Configuration of the IO data using the GSD of the Profinet slave and start of IO data exchange

View of the input data and setting of the output data either consistently or in single bit mode (push-to-set mode)

Alarms are listed and, if supported by the GSD, displayed as text.

Notes on installation

During installation, you can select the language to be used.

The progress of installation may not change for a long time toward the end of the installation procedure. At this point, all components undergo optimization for use in the target system. This can (depending on the system) take several minutes.

The application is available in two variants: 024710 | PROFINET Master Simulator and 024720 | PROFINET Master Simulator Plus. If you have licensed the 024710 you may update the existing application by adding a valid 024720 license without the need of re-installation. You can do this with use of the license manager application which can be found in the startup menu of the application.

The currently used license of the simulator can be found in the 'info' dialog. There you find the order number und the license information.

Menu elements of main window

Button	Description	Reference
	Used to set the used network interface (if more than one is present)	Device selection
	Opens the dialog for finding/configuring the desired Profinet slave	Device selection
	Opens the dialog for loading a GSD of the desired Profinet slave or a previously created configuration	Data selection
	Opens the dialog for compiling the modules for data exchange	Data selection
	Save the configuration to disk	
	Starts data exchange between the master simulator and the slave using the configured data	IO data exchange
	Shows / hides tool windows	
	Controls the layout of the tool windows	
	Shows information on the program version and provides the possibility of checking for updates	
	Opens this file	
	Used to change the program language	

Use of the Profinet Master Simulator generally includes the following steps:

- Selection of the desired Profinet slave in the network. This is done in the "Device management" dialog. All of the Profinet devices detected in the network are listed here. If required, the IP address and the Profinet device name can be assigned

If yet no network interface was selected you will be automatically prompted to select one. The selection will be stored as default for further usage.

- Selection of the GSD XML file belonging to the device

- Compilation of the desired IO data (modules) and the required parameter values based on the GSD

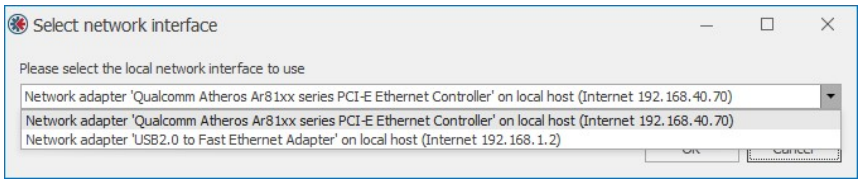
- Start of Profinet communication for exchanging the configured IO data.

- If the connection is set up successfully, the input data can be viewed and the output data can be set in the "Profinet IO data" dialog.

- Alarms are listed in the alarm list. Pending channel diagnosis alarms are listed in the window of the IO data.

Note: Please repect that this is a simulation application which is NOT a realtime enviroment!
This means the the quality of connection is strongly dependent to the work load of the pc and the network.

Note: If the PC has more than one network card, a dialog first appears in which the used network card is selected.



Note:
This dialog lists all available network adapter. In order to use one of those, following requirements have to fullfill:

- the interface must support IPv4

- the interface has to be activated and connected (network cabel plugged)

- the interface has to have a valid IPv4 configuration

If you connect your pc exclusively to the profinet device (directly, just using a network cable), you will have to set a matching IP configuration to your pc network interface. This is done in the properties of the used network adapter in the IPv4 settings tab.

Once, a network card was selected to use, it will be set as default for further device selections. No need to configure the network card at any startup

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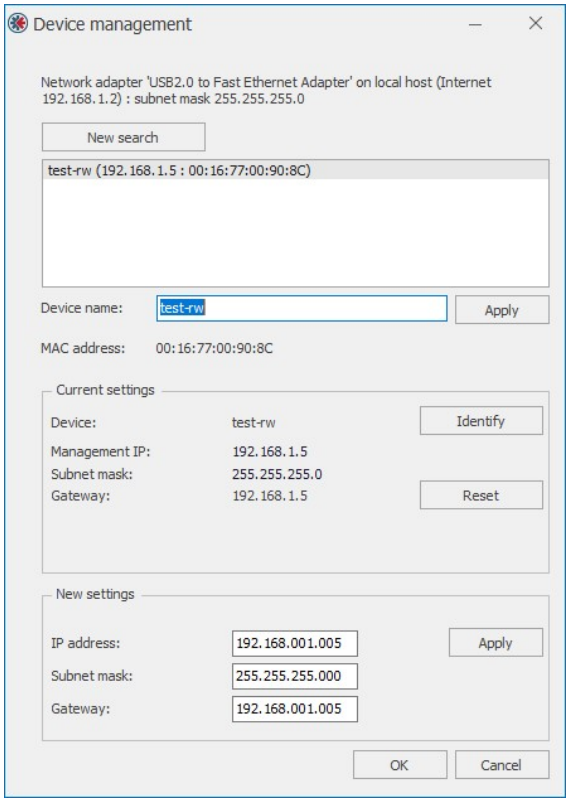
The selection of the desired Profinet Slave is done by Device Selection Dialog



All detected Profinet devices are shown in the selection list. The search starts automatically once, the dialog shows up. If no device (or not the desired one) is listed, the search may be repeated at any time with the button 'new scan'

A selected device can be requested to identify itself which it normally does by flashing its bus LED or similar. The request is done with the button 'identify'.

The 'reset' button resets the selected device to factory settings.

Note:
This will also reset the IP configuration and the device name.

After a device has been selected from this list, the name of the device and/or the IP configuration can be changed. When you change those attributes, a new scan will be started to detect the changes. If the device doesn't report the new settings, you may redo the scan manually

General guidelines for those settings (name / ip configuration):

The name of the device must not contain special signs / characters or white spaces.
The ip settings must not contain empty fields, they have to be filled up with zeros (e.g.: 192.168.002.001 instead of 192.168.2.1)
key inputs may appear delayed

Make sure that the IP configuration of the slave matches the configuration of the network because Profinet communication is initiated via UDP. The ip configuration of the chosen network adapter is shown in the upper of the dialog for better overview

Note: When you change the name or the ip configuration, the device may reboot to apply the changes (device specific). For that case, it may take some time until it appears in the list of found devices

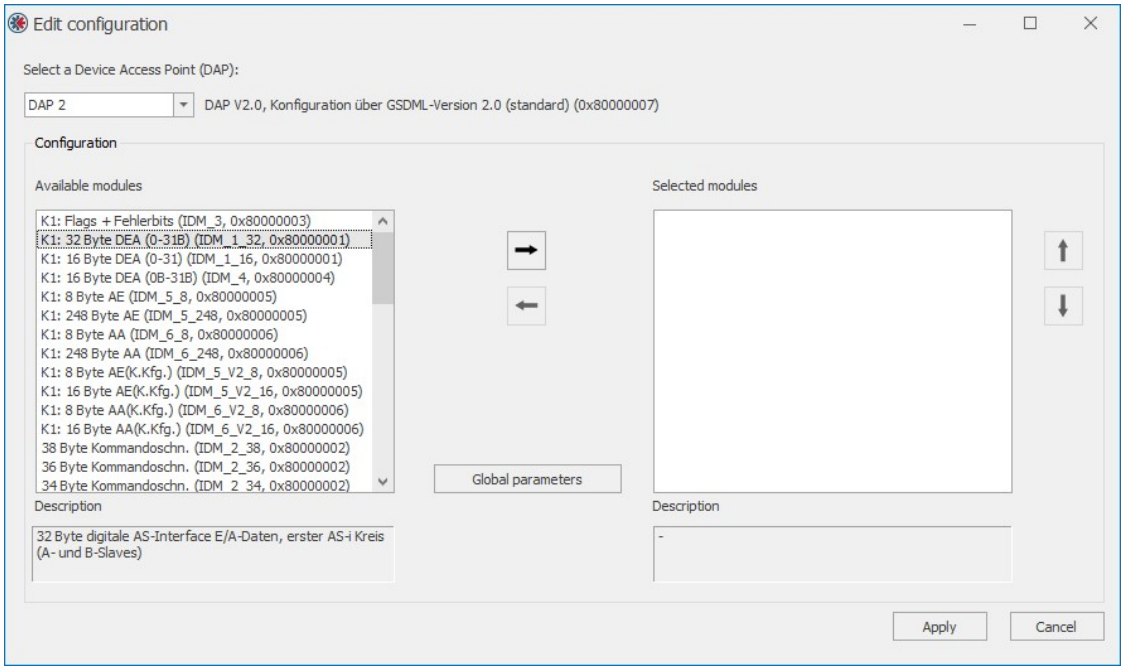
Some hints on problems with the connection setup (error message 'timeout' on connect)

- be sure that the subnet masks of both (pc and device) match and both ip addresses are reachable with those masks

- If pc and device are connected directly, the subnet masks must match. Also the the option DHCP must not be set
- If the new settings are not applied by the device you may try again. Sometimes the devices perform a reboot to apply a setting which takes some time.

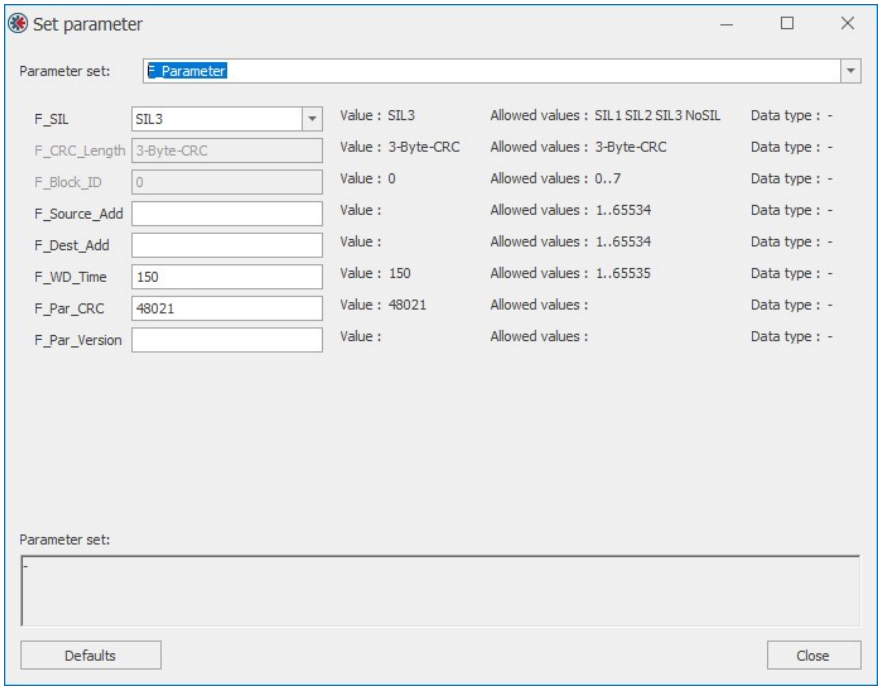
The desired modules for data exchange can be selected from the selected GSD file in the "Edit configuration" dialog. One of the available Device Access Points (DAP) must be selected first. The available modules can then be added to the selection (and also removed again) using the arrow buttons.

The sequence of the modules to use may be changed with the buttons showing the vertical arrows (up/down). The currently selected module is moved up/down accordingly. The sequence of the modules in the selection list dictates the order of the io data as well as the profinet slot number of each module. The slot number will be assigned consecutively during connection setup, starting with 1. (Slot 0 is used for the DAP).
Please follow the guidelines of the device manufactor for which DAPs and modules to select for the given device. Further, some devices have restrictions for the sequence of the modules (the slots, in which modules are expected)



The "General parameters" button at the center is used to set the parameter data of the selected DAP.

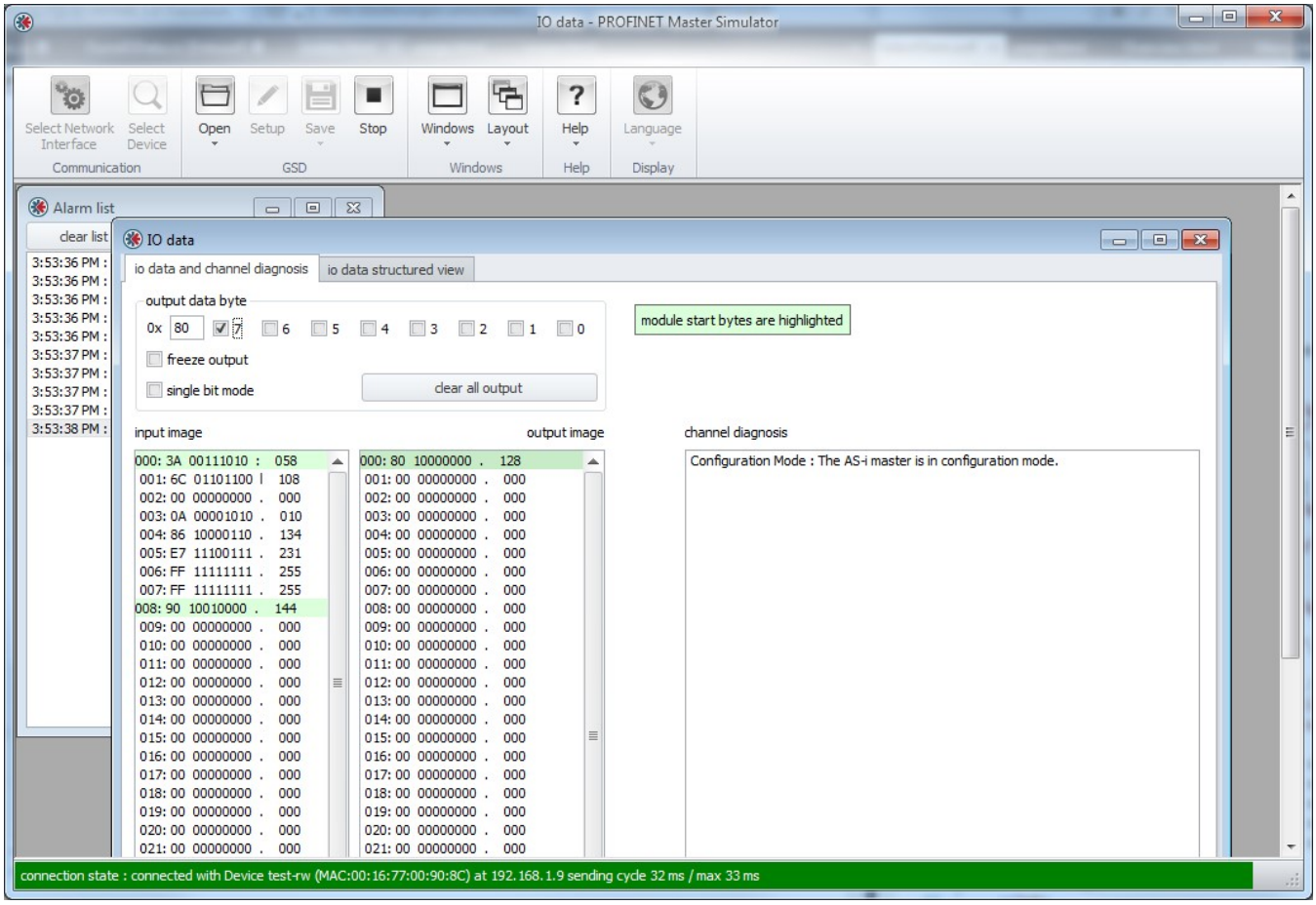
Double-clicking a selected module (in the list on the right) opens the dialog for entering the parameter data for this module. A module may require special parameters that are passed from the master to the slave when the connection is being set up. The settings to use shall be found in the documentation of the device.
The start parameter for Bihl+Wiedmann profisafe modules are as follow:
The source address is free to choose (as long as not the same as the destination address)
the destination address must be the one that is set in the device
Wathdog timout may be increased if you encounter problems during connection (in that case you will receive profinet alrams refering to watchdog timeouts)



The configuration may be saved to disk with the "Save" button.

Note:
Saving the configuration will produce two files with the desired name but those file extensions:
One file has the extension ".pngsdml". This is basically the underlaying device description file.
The other file with extension ".pncfg" contains the configured modules...
If the configuration is moved to another storage location, ensure to move both of those files together !

When Profinet communication between the Profinet Master Simulator and the slave is active, the cyclic input and output data can be observed and changed in the "IO data" window.



The widow offers two depictions of the data - on two tabs:

(1) Sequential list of all IOs as byte lists and the display of the channel diagnoses

(2) Structured view of the IOs based on the data types described in the GSD.

(1) IO data and channel diagnosis

The input data (to the master simulator) is shown in bytes in the list on the left. The output data (to the device) is shown in the list in the middle. In both lists, the first bytes of each module are highlighted in green in order to show the structure more clearly.

The output data can be changed by first marking the desired byte in the list and then either entering a numerical value (hex) in the upper "Output data byte" mask or setting the check marks for the corresponding bits.

Note:

The changes made to the selected output byte are always adopted (and transmitted) immediately. If at first you want to set a certain value or want to change several bytes consistently, set the check mark for the "Freeze outputs" option. No changes will then be made in the transmit buffer until the check mark is removed again.

Additionally, push-to-set mode can be activated for the selected output data byte (set the check mark for the "Single bit mode" option). Now an individual bit in the byte can be set for exactly as long as you press the corresponding switch using the mouse.

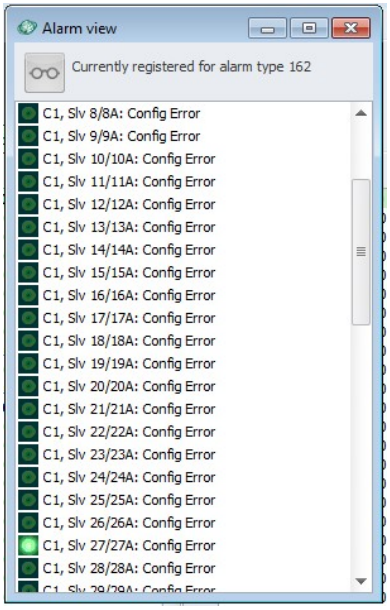
Note:

When push-to-set mode is started, the output value of the selected byte is set to 0. When push-to-set mode is ended, the output byte reassumes the value that was set previously.

The list on the right shows channel diagnosis events that may be pending.

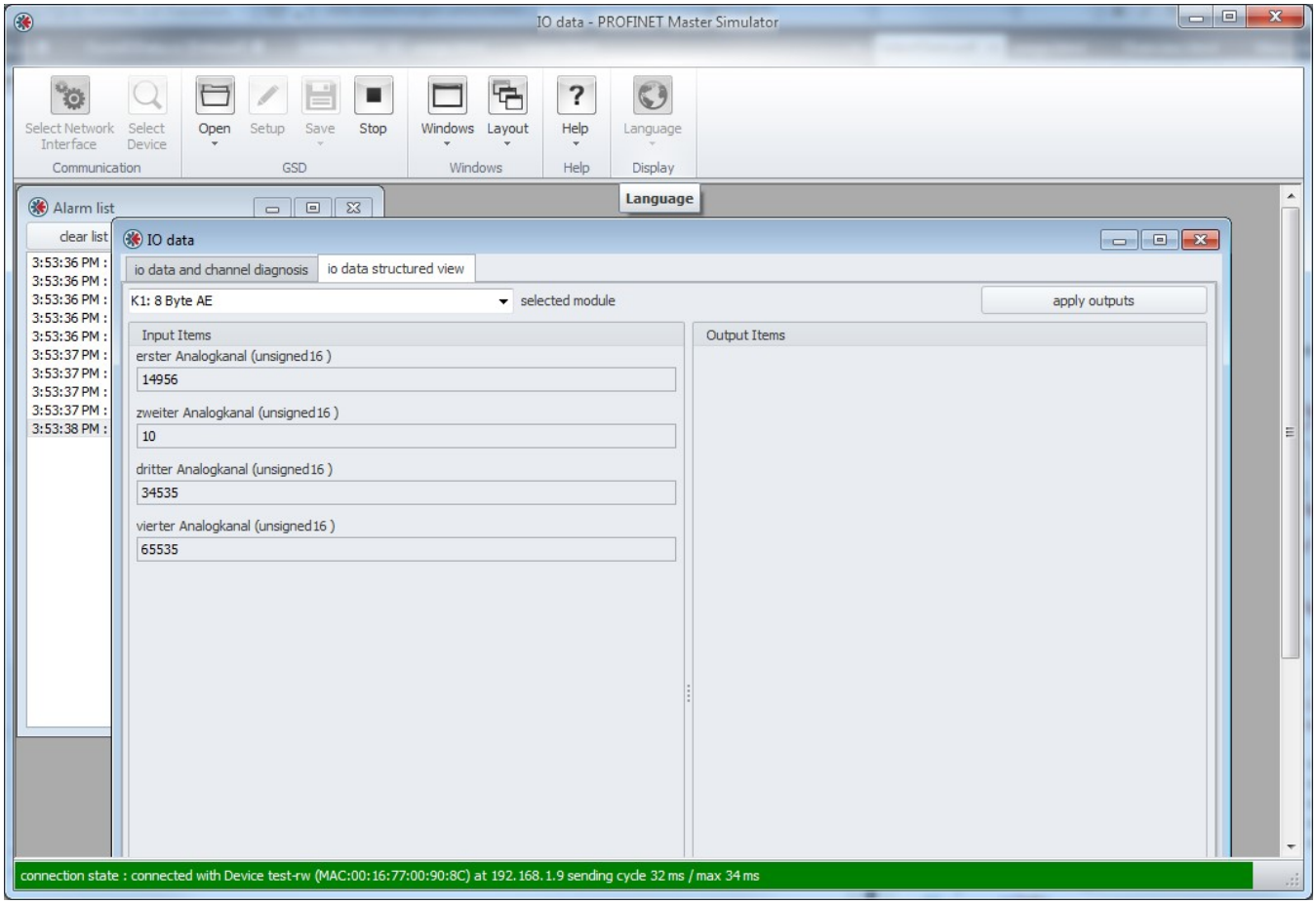
All received Profinet alarms are shown in a list in the "Alarm list" tool window. Double-clicking one of these entries opens a separate window in which a more detailed description of the alarm is shown (if a corresponding description for the alarm ID is found in the used GSD).

For user-specific alarms, it is possible to register yourself as an observer for this particular alarm by clicking the "glasses" button in the detail window. This window is then always updated with the data of the alarm if a further alarm with this ID occurs.



Notice: Also included in the alarm list are Profinet alarms that are not described in the GSD. In this case, only the four-byte status code can be displayed. Indication of the cause of the alarm can then be found in either the Profinet specification or the device description.

(2) IO data in structured view



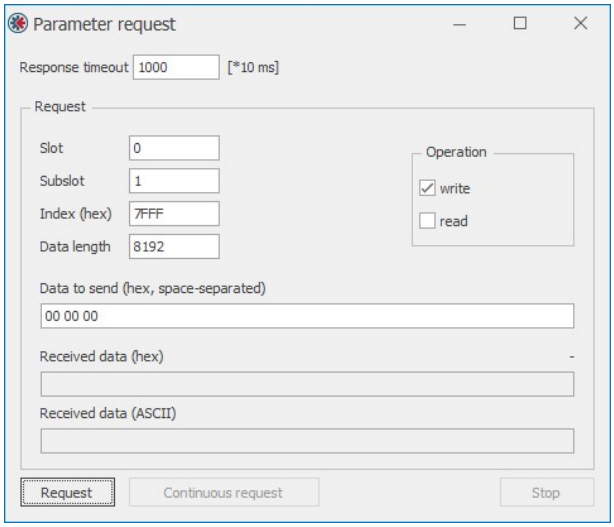
In this view, appropriate input and output elements are displayed for the most common data types and filled with the values from the data stream. Use the selection box in the upper edge to select the desired module. The output values are not accepted in the data stream until the “apply outputs” button is pressed.

Notice: The OctetString data type is specified as a list of the hexadecimal values of the individual octets and is expected accordingly for the use of the output values. The UnsignedXX and IntegerXX data types can be entered either as hexadecimal number with prefixed “0x” or as a natural number.

If a Profinet connection has been established, acyclic parameters can be exchanged with the device (RecordData CR)

Refer to the corresponding device documentation for the type and form of the data.

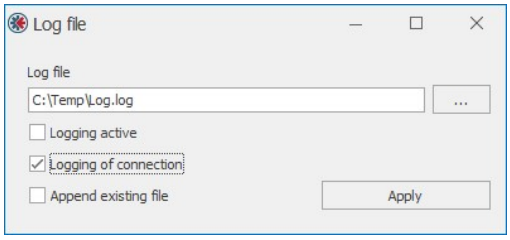
In general, parameter requests require the slot, subslot and index in order to identify the parameter. Parameter requests are either a read or write operation. For write operations, the bits to be sent can be specified as a list of hex values in the form "00 00 00 ...", each separated with a blank space.



The operation can be performed with the ‘Request’ button. Any response bytes are output as a byte list and, where possible, as text. With the ‘request continuously’ button, the set operation is executed cyclically. This cyclical request is not to be confused with cyclic data exchange! The application only submits a new request if the previous request has been completed.

Note:
The function of the acyclic exchange of parameter data is only available in the released version of the PROFINET Master Simulator (024720).

With the tool window 'Logging' you can set a log file which will store the io data of the cyclic data exchange.



When logging is active, the io data will be written to the file. If the file already exists the data will be appended. In addition to the cyclic data you can also select the logging of connection setup and parameter data exchange. The log-settings will also stored for next application startups.

Note: The entries in the log file are done on very low application level. Input data is written to file directly after receiption. Output data is written to file close before sending. Thus, in the log file appear all data bytes of the cyclic data exchange. Those also contain the IOCS and IOPS bytes as well as any SPDU overhead for ProfiSafe if used.

Note: The functionality of logging is only available in the full version of PROFINET Master Simulator (024720).

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