port

Manual

PROFINET Device Monitor

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1   Disclaimer

All rights remain with port, the user is allowed to use a copy free-of-charge. Do not dis-assemble or reverse-engineer the software.

This software is intended to be used in a disconnected laboratory environment (stand-alone network). Please back-up all data before employing the software.

It comes AS-IS, no warranty of any kind - not expressed, not implied. Use at your own risk. The software must not be used in any real-life network nor in any production network.

Support will not be provided; however, we appreciate your feedback – sent to support@port.de

2   Functionality

PROFINET Device Monitor is an easy to use tool to support the developer during the development and testing phase of PROFINET capable devices. The tool allows to

- Scan networks for PROFINET capable devices regardless whether master or slave
- Get information about the scanned devices such as station name, IP address aso.
- Set a new temporary or permanent station name
- Set a new temporary or permanent IP address incl. netmask and gateway
- Read a specific record of a device. The slot and module information can be imported from a GSD file.
- Write a specific record of a device. The slot and module information can be imported from a GSD file.
- Establish a cyclic connection. The slot and module information can be imported from a GSD file.

3   Installation and requirements

3.1   System requirements

The PROFINET Device Monitor supports Windows and Linux systems. The following requirements must be met to run the software (important note: your firewall has to allow the UDP ports 49152 and 34964 to receive PROFINET packets).

Windows:
- Windows 7 64Bit or higher
- WinPCAP[1] (already installed when you use Wireshark)
- 64bit JAVA Runtime

Linux:
- Current Ubuntu or Debian system (tested on Ubuntu 14.04 and 16.10)
- Libpcap

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[1] https://www.winpcap.org

- 64bit JAVA Runtime
- Must be executed with root permission

3.2   Installation

3.2.1   Windows

To run it under Windows, double click on the "0213_10_pnio_dm_64_v1.0.5.exe". If everything is unpacked to your favorite directory, the PROFINET Device Monitor can be started by double clicking on "run.bat" or "PROFINETDeviceMonitor.jar".

3.2.2   Linux

Linux users first must make the "run.sh" executable by executing "sudo chmod +x run.sh" on the command line. Please note that the execution of the software requires root permission due to promiscuous access to the Ethernet interface. This can be done by running "sudo ./run.sh" on the command line.

4   Accessing PROFINET devices

4.1   Configuring the network interfaces

The network can be configured after opening the network settings through: "Settings > Network Settings" (Figure 1). You can choose a local IP Address of the host and set up the time for the "Scan network"-Button is waiting for other devices response.
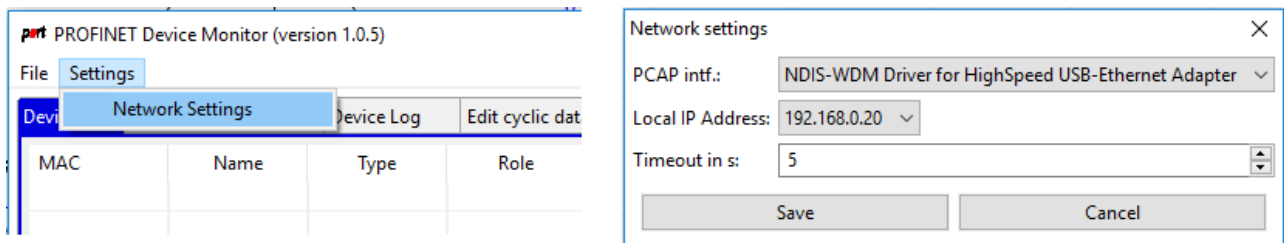

Figure 1: Network settings

4.2   Select and scan a network

After a click on the "Scan network"-Button all relevant information e.g. MAC-Address, Name, Type
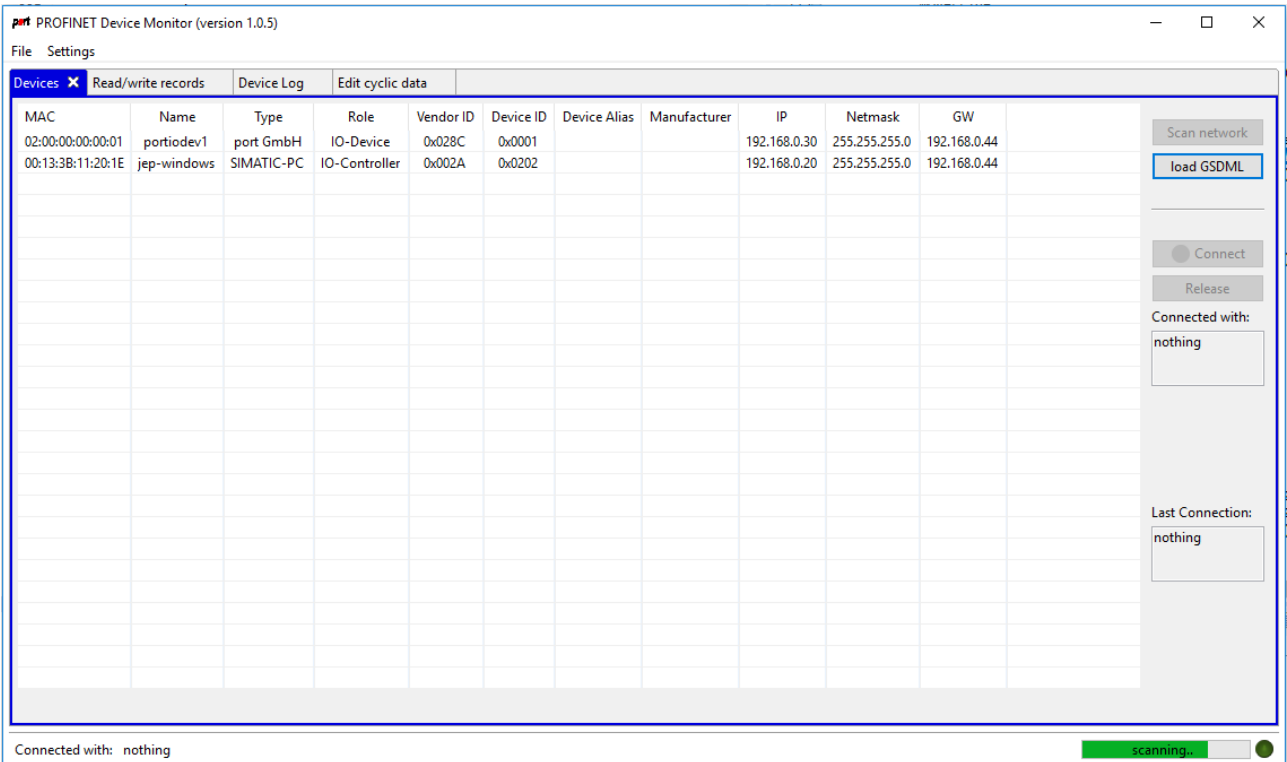
are shown in a table as you can see in Figure 2.

Figure 2: List of identified devices of a PROFINET network

4.3 Set Device Name and IP

The name, netmask, IP- and gateway-address can be changed through a right click on a found device with "Set Device Name" and "Set IP-Settings" as you can see in Figure 3. Name and IP-Address can be set temporary as well as permanent.
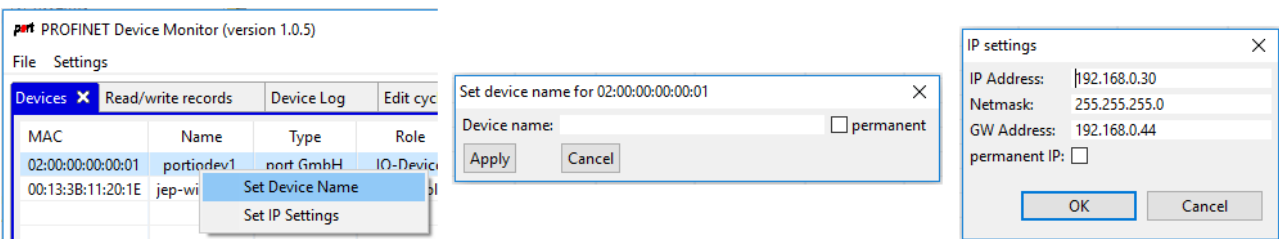

Figure 3: Device name and IP settings dialogues

4.4 Sending a read/write record request

If there is a device selected in the "Devices" tab, the "Read/write records" tab gets enabled. In this

tab, there can be send a record request with the "Send record request" button to the chosen device to read or write a selected record. The index, slot and subslot can be configured for a read implicit request and there is an additional edit-field ("Record Data") for the data to be written if the request type is a write request (Figure 4).
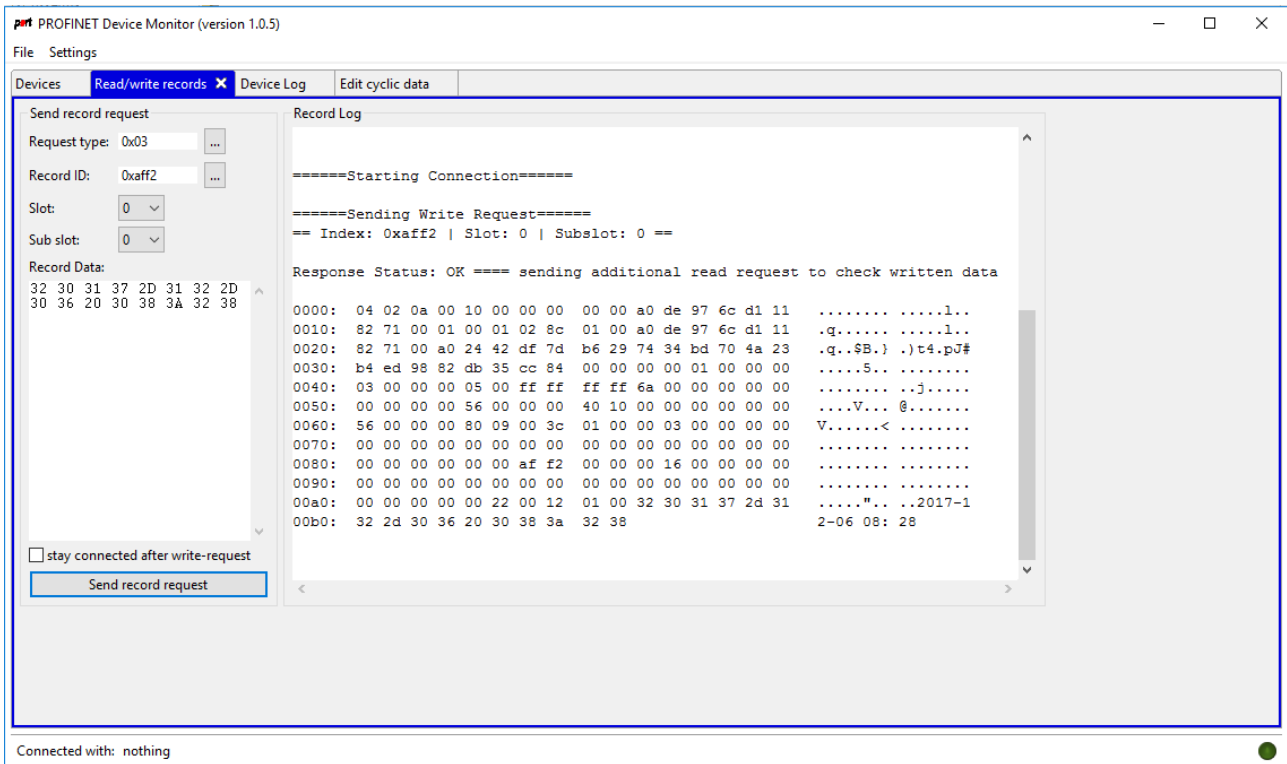

Figure 4: Read/write records tab

To enable a permanent connection after a write-request, the "stay connected after write-request"-checkbox in the tab has to be selected. Additionally, the received information from the device after a read or write request is shown in the "Record Log" as shown in Figure 4. If the "stay connected after write-request" checkbox is unselected and there is a permanent connection, a release request will be sent to the device.

4.5   Set Submodules with GSDML-file

Through the "load GSDML"-Button as shown in Figure 1 the "Expected Submodules" of a connect-request can be configured (Figure 5 and   Figure 6).
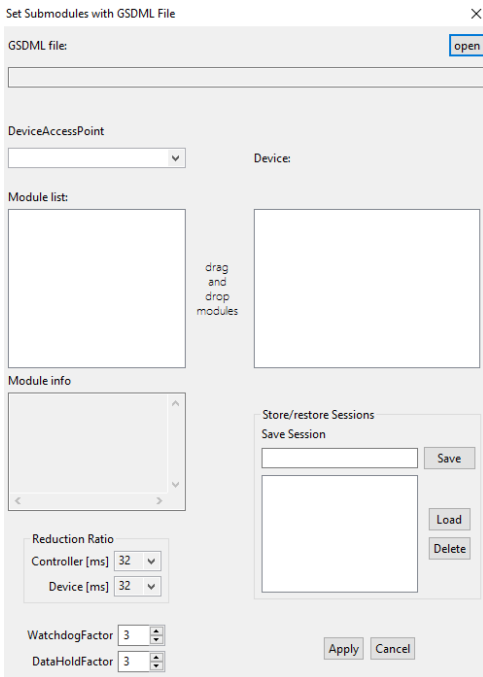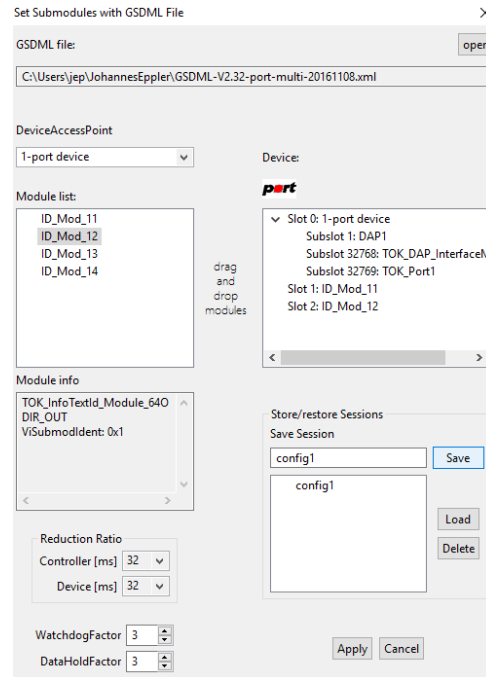

Figure 5: GSDML import dialogue

Figure 6: Selecting modules and slots

First open a GSDML-file through the "open" button. Based on the information loaded from the GSDML file, all Device Access Points (DAPs) and modules defined will be shown (
Figure 6). The appropriate DAP is selected with the drop-down menu "DeviceAccessPoint" and the modules can be configured through drag and drop between the two edit fields under the labels: "Module list" and "Device" (note: only Input and Output-modules with <u>one</u> submodule were supported). Those settings can also be saved which will be stored in the "savedSessions.dat" file. In addition to that the bitmap referenced by the GSDML-file is shown, too (note: only "*.bmp" files located in the "GSDML_Images" directory will be shown). Furthermore, the reduction ratio of controller/device, the WatchdogFactor and DataHoldFactor are configurable.
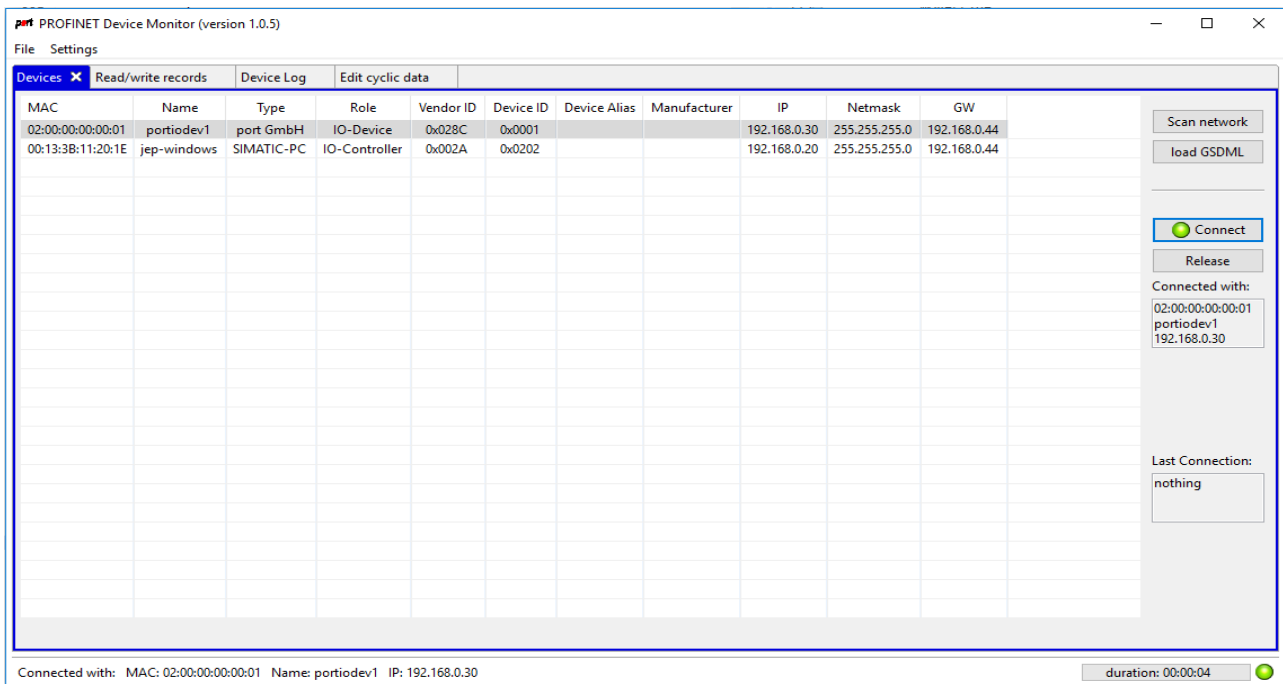
4.6 Initiating an I/O connection

Figure 7: Connect/release buttons

To initiate and stop an I/O connection to the device there are the "Connect" and "Release" buttons in the "Devices" tab (Figure 7). There is also an information which device is currently connected. The buttons which send messages to the device are shown in Table 1.

Table 1: Button description

Buttons	Message Type	Sent Messages
"Scan network"	PN-DCP	1) Release request (if there is a connection to a device) 2) IdentAll request
Set IP-Settings: "OK"	PN-DCP	Set request: IP/IP, Control/End-Trans
Set Device Name: "Apply"	PN-DCP	Set request: Device/Name of Station
"Connect"	PNIO-CM	Establish a connection: 1) Connect request 2) Control request (ParameterEnd) 3) Control response (Application Ready)
"Release"	PNIO-CM	Release request
"Send record request"	PNIO-CM	Request type = 0x05 (read record implicit): read implicit request Request type = 0x03 (write record): 1) Establish a connection (if there is no current connection) 2) Write Request (uses inserted record data) 3) Read Implicit (additional read for checking written data) 4) Release request (if "stay connected after write-request"-checkBox is unselected)

4.7 Edit cyclic data

If you set a GSDML configuration there will be shown the cyclic data byte-wise in the "Edit cyclic data"-tab which will be send to the device (Figure 5). You can edit these bytes even during a permanent connection. If you finished the editing of the data press the "apply"-button to take over the changes (note: the device recognizes these changes after a few seconds). Information about the bytes were shown next to the byte fields. If you clicked a tag the correspond bytes will be highlighted. The data received from the device is shown in the lower left corner of this tab, too. The first 16 bytes ("SrcMac", "DstMac", "Type", "FrameID") are editable but will not be recognized after clicking the "apply"-button, because these values may not be changed by the user.
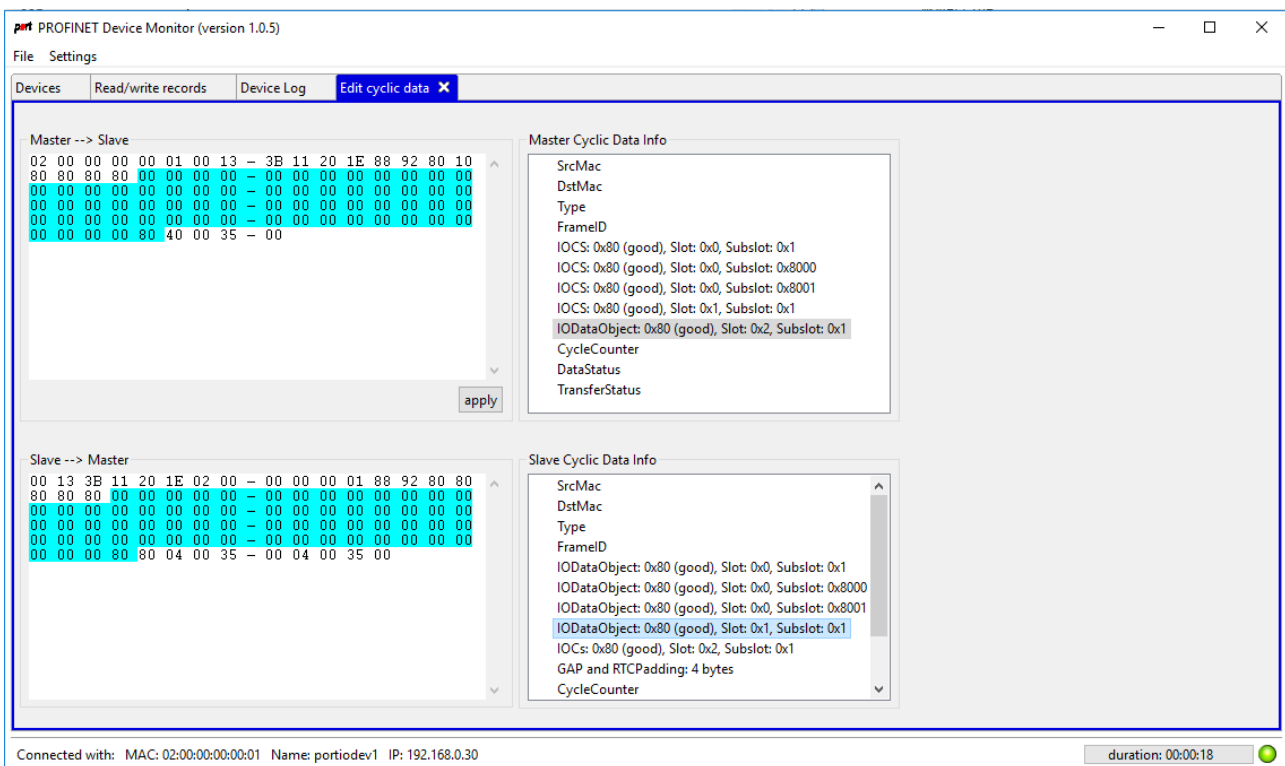

Figure 8: Edit cyclic data