



Manual

PROFINET Device Monitor –

Command Line Tool

© 2018 port
GmbH
Regensburger Straße 7b
D-06132 Halle
Tel. +49 345 - 777 55 0
Fax. +49 345 - 777 55 20
E-Mail: service@port.de
Internet: <http://www.port.de>

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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 – Command Line Tool 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 permanent station name
- Set a new 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 – Command Line Tool 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
- WinPCAP¹ (already installed when you use Wireshark)
- 64bit JAVA Runtime

¹ <https://www.winpcap.org>

Linux:

- Current Ubuntu or Debian system (tested on Ubuntu 14.04 and 16.10)
- Libpcap
- 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 “0214_10_pnio_dm_cmd_64_v*.exe”. If everything is unpacked to your favorite directory, this tool can be started by running “pnioCmd <param1> <param2> ...” on the command line.

3.2.2 Linux

Linux users first must make the “pnioCmd.sh” executable by executing “sudo chmod +x pnioCmd.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 ./pnioCmd.sh <param1> <param2> ...” on the command line.

4 Accessing PROFINET devices

4.1 Configuring the network settings

To configure network settings, you have several “get” and “set” commands:

```
pnioCmd --localIp set
pnioCmd --localIp set 192.168.0.20
pnioCmd --localIp get

pnioCmd --timeout set
pnioCmd --timeout set 5
pnioCmd --timeout get
```

The “set”-commands without a following parameter will show all valid values which you can choose through inserting a number and press enter. If you know these valid values already you can even run this commands without interaction through an additional parameter after the “set” parameter. In addition to that the “get”-commands will show the current value of the specified parameter.

4.2 Scan a network

To scan a network, execute the following command:

```
pnioCmd --network eth0 --test dcp_scan
```

The network parameter: “eth0” is the name of the network. If you don’t know the name correctly execute “pnioCmd --listIf”. This command shows all relevant networks which can be selected as you can see in Figure 1.

Insert one of these names after the “--network” parameter to select your favorite network (Important note: if there are any whitespaces in the network name put the whole name in quotation marks). An example output if there are devices found is shown in Figure 2.

```
-----Network List from Host-----
[0]: HighSpeed USB-Ethernet Adapter
    possible addresses:
        addr[0]: 192.168.0.20
[1]: Oracle
    possible addresses:
        addr[0]: 192.168.56.1
[2]: Realtek PCIe GBE Family Controller
    possible addresses:
        addr[0]: 172.16.10.194
-----
```

Figure 1: Network interface list

```
12:31:24.369 [main] INFO PNIogui - Binding syslog to any address at port 12346
12:31:24.370 [main] INFO PNIogui - Network interface initialized and started.
12:31:24.370 [SyslogNetworkThread] INFO PNIogui - Waiting for next syslog
12:31:24.372 [main] INFO PNIogui - Running ident all
Device [0]: 02:00:00:00:00:01
Device [1]: 00:13:3B:11:20:1E
12:31:29.426 [Timer-1] INFO PNIogui - End of device search

-----Devices Found-----

(0) MAC | (1) Name | (2) Type | (3) Role | (4) Vendor ID | (5) Device ID | (6) Device Alias
| (7) Manufacturer | (8) IP | (9) Netmask | (10) GW |

[0]: (0) 02:00:00:00:00:01 | (1) testdevice1 | (2) port GmbH | (3) IO-Device | (4) 0x028C |
(5) 0x0001 | (6) | (7) | (8) 192.168.0.30 | (9) 255.255.255.0 | (10) 192.168.0.44 |
[1]: (0) 00:13:3B:11:20:1E | (1) jep-windows | (2) SIMATIC-PC | (3) IO-Controller | (4) 0x00
2A | (5) 0x0202 | (6) | (7) | (8) 0.0.0.0 | (9) 0.0.0.0 | (10) 0.0.0.0 |
Figure 2: Example of identified PROFINET devices
```

4.3 Set device name and IP

The name, netmask, IP- and gateway-address of a device can be changed through the following commands:

```
pnioCmd --network eth0 --dstMac 02:00:00:00:00:01 --test
dcp_set_name --name testdevice1
```

```
pnioCmd --network eth0 --dstMac 02:00:00:00:00:01 --test
dcp_set_ip --ip 192.168.0.30 --netmask 255.255.255.0 --gateway
192.168.0.44
```

(Note: Name and IP configurations will always be set as a permanent value).

Furthermore the parameter after “--dstMac” specifies the MAC-Address of the target PROFINET device and the parameter after “--name” has to be without any whitespaces or special characters.

4.4 Sending a read/write record request

The user is able to send an implicit read request or a write request to a PROFINET device with the specified IP-address through the following commands:

```
pnioCmd --network eth0 --dstIp 192.168.0.30 --test record_read  
--api 0 --slot 1 --subslot 1 --index 0xaff2
```

```
pnioCmd --network eth0 --dstIp 192.168.0.30 --test  
record_write --api 0 --slot 1 --subslot 1 --index 0xaff2 --  
value 0x1234567890
```

You have to enter the api, slot, subslot and index for a read request and in addition for a write request the value which has to be written.

4.5 Set Submodules with GSDML-file

The configuration of the submodules through a GSDML-file can be done with following commands:

```
pnioCmd --gsdmlConfig new  
pnioCmd --gsdmlConfig get  
pnioCmd --gsdmlConfig del  
pnioCmd --gsdmlConfig set  
pnioCmd --gsdmlConfig set 0
```

You can add a new configuration of submodules with the “new”-command. This is done through a step-by-step interaction where you choose the GSDML-file, DAP, number of modules and type of modules to plug respectively reduction ratios, WatchdogFactor, DataholdFactor and the name of the configuration (Important note: GSDML-files you want to use have to be located in the “gsdmlFiles”-directory; only Input and Output-modules were supported). Moreover the “get”-command will show all configurations which are stored in the “savedSessions.dat”-file and the “del”-command asks for a configuration that you want to remove (Note: If you cannot interact with the command line and you want to setup a new configuration you can even copy the “savedSessions.dat”-file from the “PnioConfigTool” where you can add a new configuration with a GUI).

The “set”-command modifies the default configuration which will be used for read/write requests and initiating I/O connections. If you do not want interaction with the command line and you know the correct number of the configuration you want, you can set it directly with an additional parameter after “set”.

4.6 Initiating an I/O connection

There can be initiate a time-limited or permanent connection with a device through the following command:

```
pnioCmd --network eth0 --dstIp 192.168.0.30 --test cyclic --  
duration 10
```

The parameter after "--duration" specifies the period of time in seconds the host holds up the connection to the target IP-address of a device (Note: "--duration 0" will start a permanent connection).