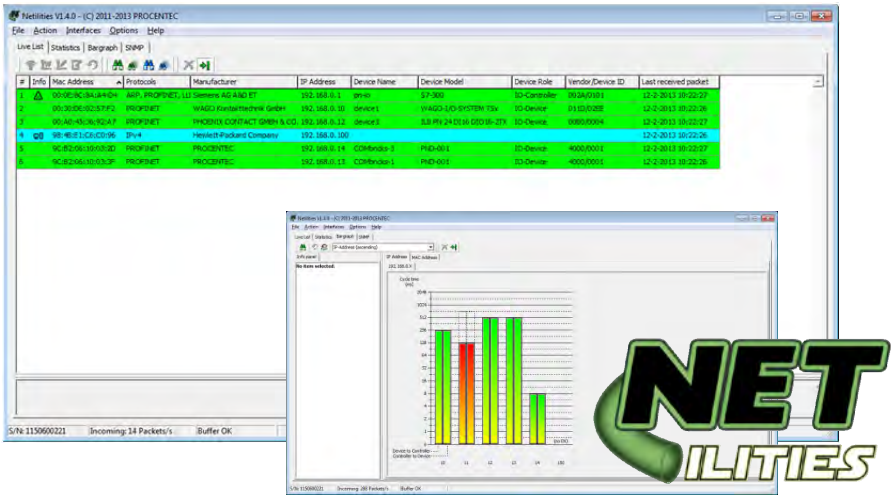
PROCENTEC



User Manual

Netilities 1.5.2

PROFINET-Analyzer

PROFINET analyzer with powerful statistics
Suitable for PROFINET-IO RT & IRT
Livelist
SNMP Information & Topology scan
Reporting
Runs on XP, Vista and Windows 7 platforms

Version 2.2.2 – June 2014

PROCENTEC

Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning sign and are marked as follows according to the level of danger:

 Draws your attention to important information on handling the product, a particular part of the documentation or the correct functioning of the product.

Warranty

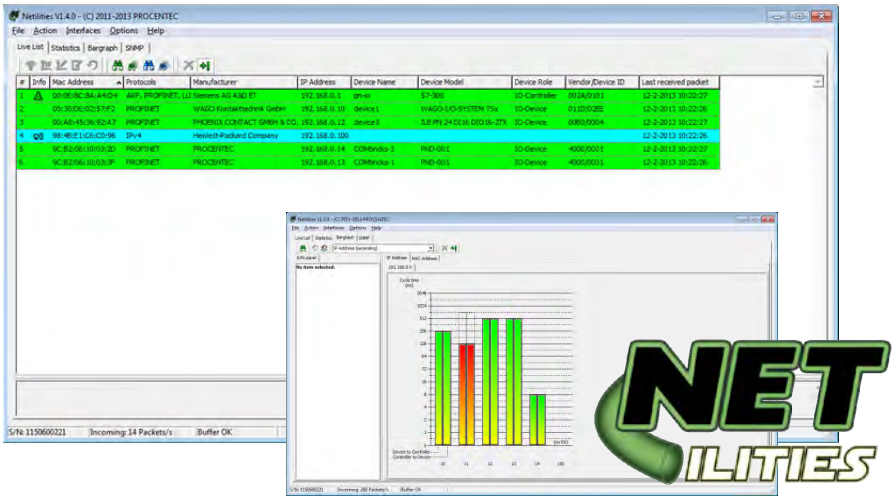
Warranty is void if you open the Netilities Appdongle.

Disclaimer of Liability

We have checked the contents of this manual as much as possible. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the content in this manual is reviewed regularly and necessary corrections will be included in subsequent editions. Suggestions for improvements are welcome.

PROCENTEC
Klopperman 16
2292 JD WATERINGEN
The Netherlands

Tel.: +31-(0)174-671800
Fax: +31-(0)174-671801
Email: info@procentec.com
Web: www.procentec.com



User Manual

Netilities 1.5.2

PROFINET-Analyzer

PROFINET analyzer with powerful statistics
Suitable for PROFINET-IO RT & IRT
Livelist
Reporting
SNMP Information & Topology scan
Runs on XP, Vista and Windows 7 platforms

Safety Guidelines
This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning sign and are marked as follows according to the level of danger:


Draws your attention to important information on handling the product, a particular part of the documentation or the correct functioning of the product.

Warranty
Warranty is void if you open the Netilities Appdongle.

Disclaimer of Liability
We have checked the contents of this manual as much as possible. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the content in this manual is reviewed regularly and necessary corrections will be included in subsequent editions. Suggestions for improvements are welcome.

PROCENTEC
Klopperman 16
2292 JD WATERINGEN
The Netherlands

Tel.: +31-(0)174-671800
Fax: +31-(0)174-671801
Email: info@procentec.com
Web: www.procentec.com

Important Information

Purpose of the Manual
This user manual provides information how to work with Netilities.

Recycling and Disposal
The parts of the Netilities Appdongle can be recycled. For further information about environment-friendly recycling and the procedure for disposing of your old equipment, please contact:

PROCENTEC
Klopperman 16
2292 JD WATERINGEN
The Netherlands

Tel.: +31-(0)174-671800
Fax: +31-(0)174-671801
Email: info@procentec.com

Document Updates
You can obtain constantly updated information on PROCENTEC products on the Internet at www.procentec.com
You can also contact PROCENTEC Customer Support:
• By phone at +31-(0)174-671800
• By fax at +31-(0)174-671801
• By email at support@procentec.com

Contents

1 Product description

1.1 Introduction

Netilities is a compact and efficient tool to support the user with his PROFINET engineering and troubleshooting tasks. It can generate a live list of the PROFINET/Ethernet network and spot the devices which are in Data Exchange. Statistics provide an overview of the network condition. Netilities also makes it easy to check the difference in actual configuration and PLC-configuration. It utilizes the standard Ethernet/WLAN port on the PC or interfaces with a ProfiTap.

Info fields are displayed to inform the user on actual network problems, like: device missing, double device names, double IP addresses, etc. The Statistics provide an overview over the cycle times, corrupted telegrams, data size, etc.

Netilities is also used to set Device Names and IP addresses and export the detected devices to CSV. The LED test feature can identify the targeted PROFINET device. The best performance of Netilities is achieved when the laptop is directly connected to the mirror port of a switch which is installed directly behind the PLC or other controller.

The licensing and software storage is handled by a USB dongle. The dongle can be used on multiple PCs.

1.2 Product features

- ✓ Real time scan / Live List of the complete network
- ✓ Info panel for network problems (device missing, double addresses, etc.)
- ✓ See difference in real and expected configuration of devices
- ✓ Statistics (cycle times, corrupted telegrams, data size, etc.)
- ✓ Import GSDML files to display device specific items and diagnostics
- ✓ Acyclic reading of information of IO-devices (I&M0)
- ✓ Setting Device Names and IP numbers
- ✓ Topology scan based on SNMP and LLDP
- ✓ PROFINET LED test
- ✓ Suitable for other Ethernet systems
- ✓ Save and load all captured information

1.3 Application areas

- ❑ Troubleshooting & maintenance of PROFINET networks
- ❑ Commissioning of PROFINET networks
- ❑ Education

1.4 Detectable faults on PROFINET

- ✓ General communication faults
- ✓ Wrong configuration
- ✓ Diagnostics of devices
- ✓ Lost/missing device
- ✓ Wrong device name
- ✓ Double device names
- ✓ Double IP addresses

1.5 System requirements

In order to use Netilities and all sub programs, your computer system should include the hardware and software listed below. The software has been tested to work on Windows XP and Windows 7.
Minimum requirements:

- ❑ Microsoft Windows XP
- ❑ 600 MHz Intel Pentium III processor or equivalent
- ❑ 512 MB of RAM
- ❑ 1024x768 resolution display
- ❑ 1 free USB 2.0 high-speed interface port (for Appdongle)
- ❑ 1 free USB 2.0 high-speed interface port (when using ProfiTap)
- ❑ 1 free 100Mbit Ethernet port (when connecting directly to a switch)
- ❑ 1 mouse or other pointing device

Recommended (differences from minimum):

- ❑ Dual core 2 GHz processor or equivalent
- ❑ 1024MB of RAM
- ❑ 1280 x 1024 resolution display or better

IMPORTANT NOTE:
The performance also depends on the size of the installation. The more devices in the installation, the more processing power is needed.

2 Software installation instructions

This chapter describes the installation for Netilities and the WinPcap drivers. It is assumed that you have a basic knowledge of Windows operating systems. All examples and dialogs are based on a US/UK based Windows installation and may differ slightly based on upgrades, updates and enhancements. Please use the screenshots in conjunction with the description in order to press the appropriate buttons and other user interface items.

2.1 Installation procedure

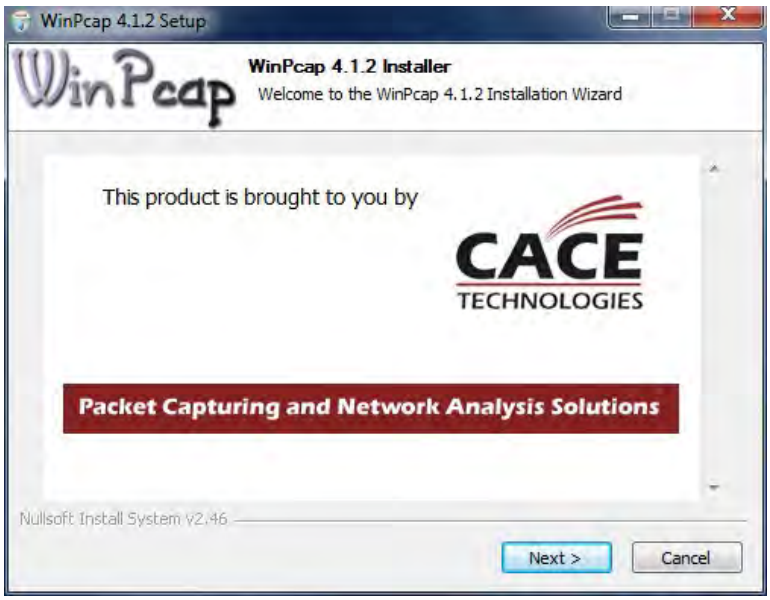
You can run Netilities directly from the USB stick without having to install it on your PC.

2.2 First use

When Netilities is run for the first time, it checks if the required libraries for WinPcap are installed. If these WinPcap libraries are not present the WinPcap installer will be launched.

2.3 Installing WinPcap Driver

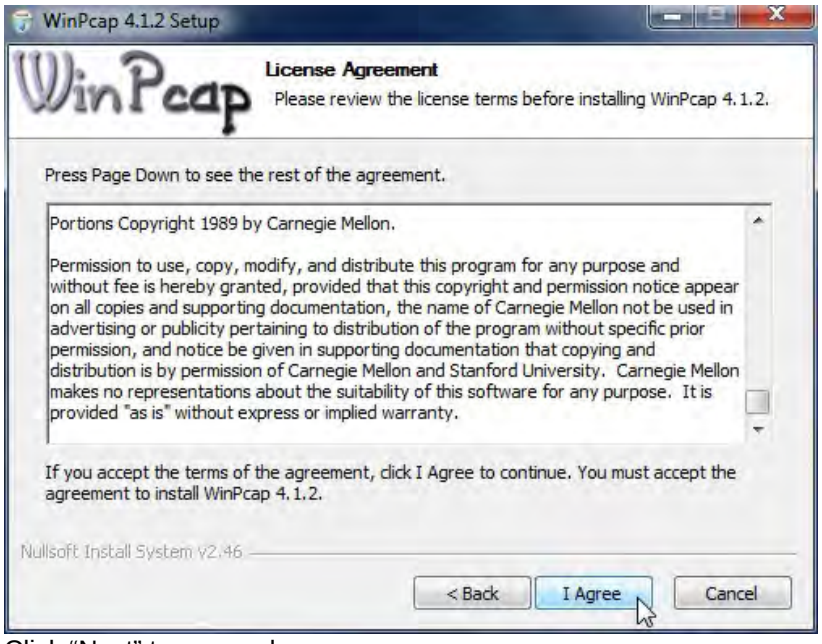
The installation of the WinPcap driver is either started by Netilities when it is launched for the first time or by starting it manually from the USB stick.



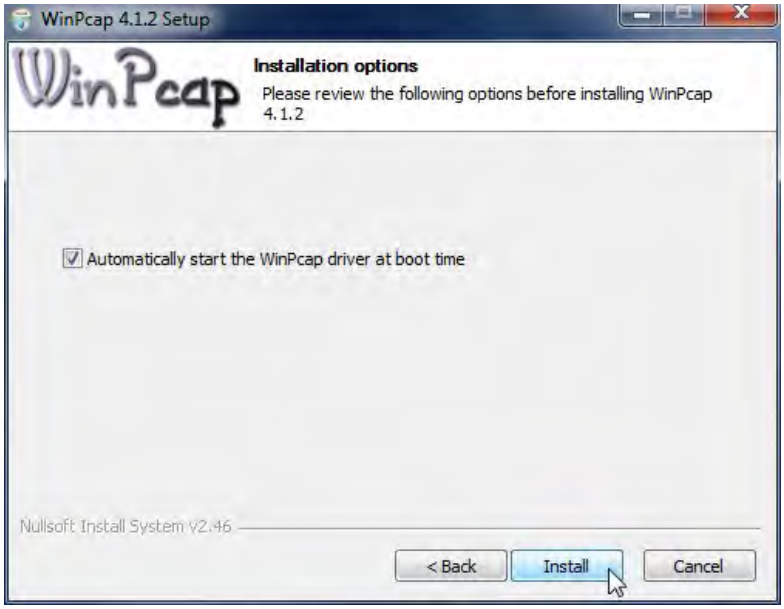
Click “**Next**” to proceed.

Click “Next” to proceed.

You have to accept the terms of the license agreement.



Click “Next” to proceed.

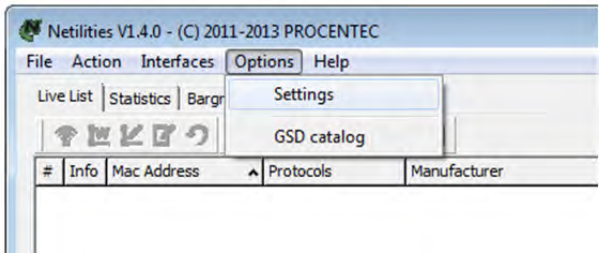


Select “Automatically start the WinPcap driver at boot time.”.
Click “Install” to proceed.

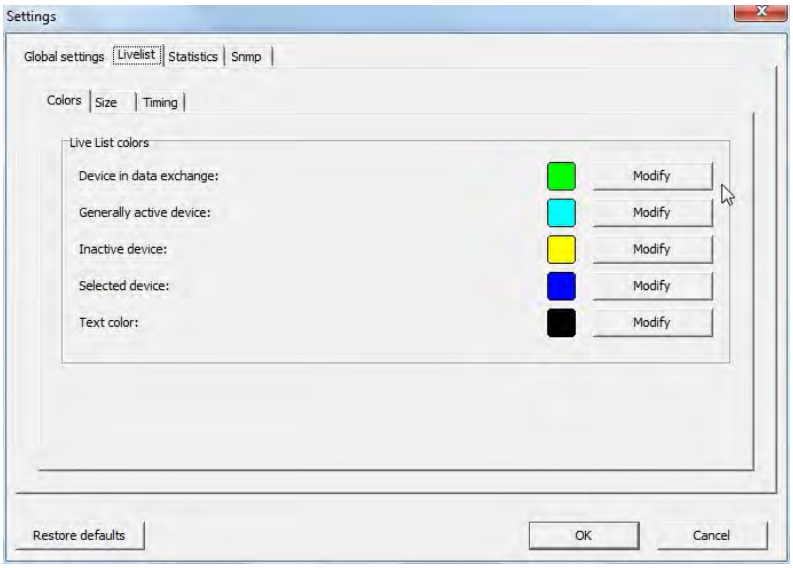
Click “Finish” to close the installer.

2.4 Setting colour preferences

The colours of both the Live List and the Statistics can easily be adjusted in the Options/Settings menu.



Click “Options” followed by “Settings” to proceed.



Click on “Livelist” and “Colors” to set the Live List colours. If you wish to adjust the Statistics colours, click on “Statistics”.

2.5 Updates

It is the policy of PROCENTEC to release periodic updates.

To update your Netilities version, simply download the new ZIP file from our website and copy the contents of the ZIP file to your Netilities Appdongle. This will overwrite your previous version. If you want to keep the previous you can make a backup of it on the USB stick.

3 License system

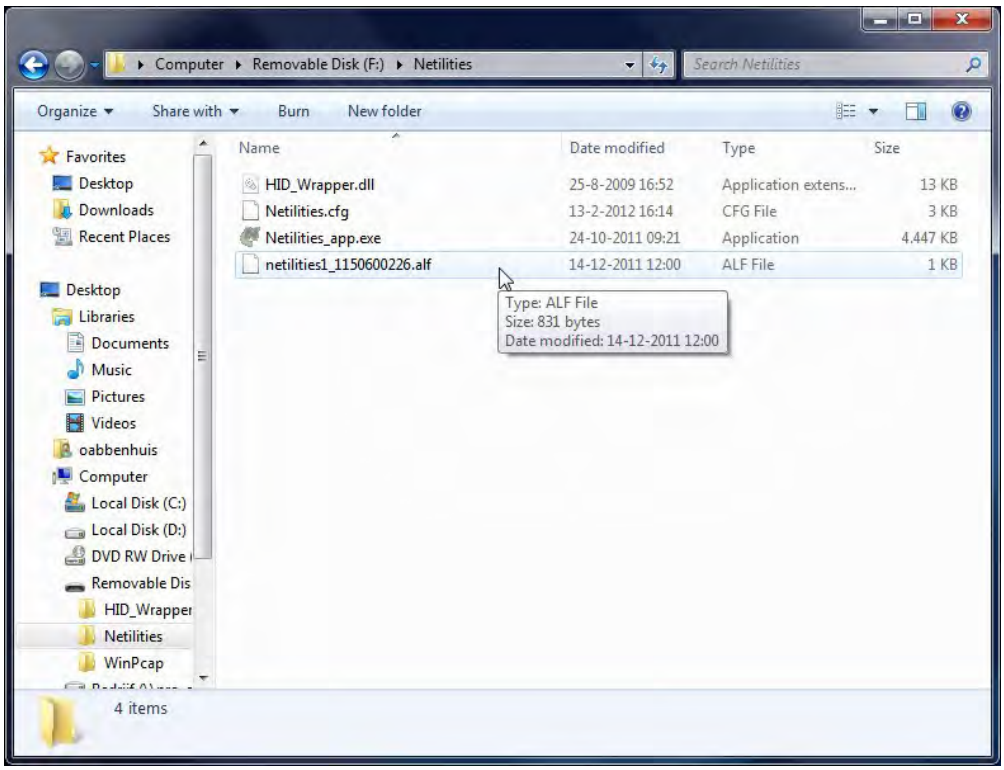
3.1 Introduction

For using Netilities you need the “Appdongle” USB stick, on which Netilities is supplied. The Appdongle also provides your license for Netilities.
You purchase a license for the following combination:

- Netilities (Live List) + Statistics + SNMP

3.2 Storage location of the license file

The license file for Netilities is stored in “\Netilities” directory of the USB stick.



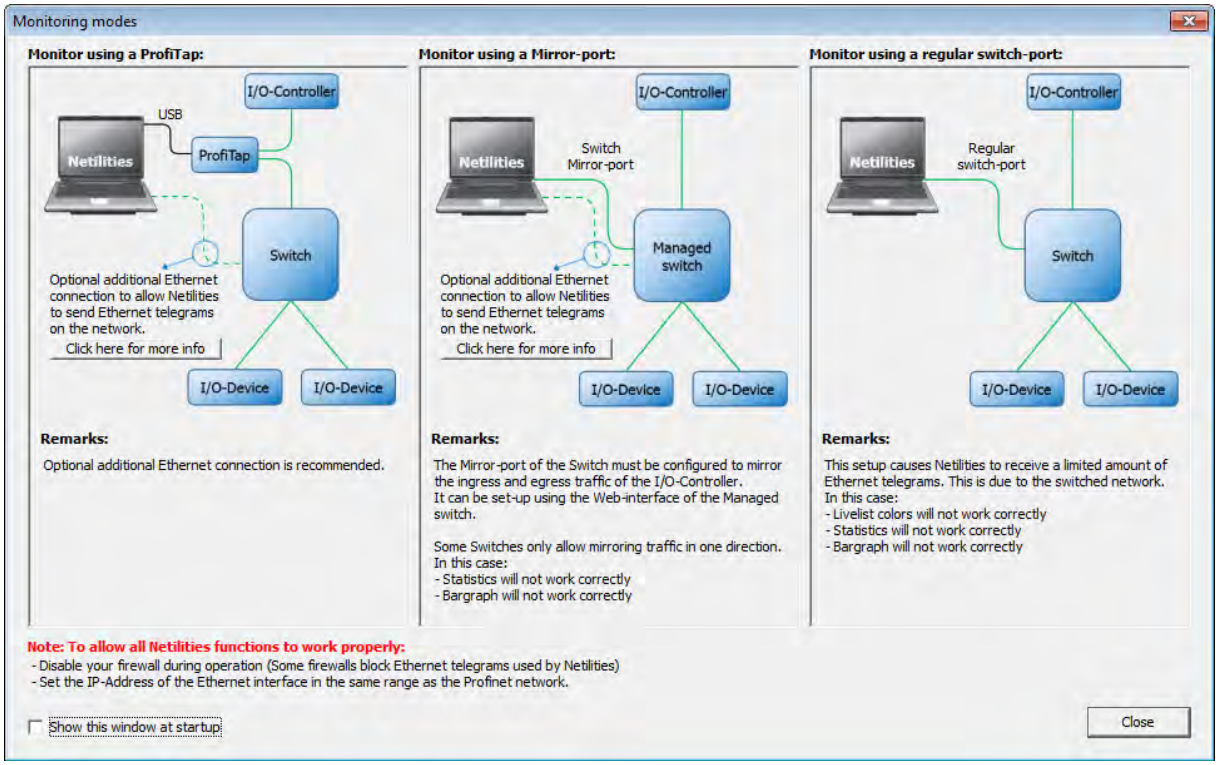
The USB stick can be used on different PCs.

4 Quick start guide

4.1 Adding Netilities to the installation

Attach a network cable to the network port of your laptop/PC. Connect the other end of the network cable to the mirror port on the PROFINET switch. The LED of that port should be ON indicating a working link.

When Netilities starts for the first time, a window is displayed with explanation on the different methods of monitoring. This screen can be disabled by de-selecting the checkbox on the bottom of the window.



The window can later be viewed by choosing ‘Help – Monitoring Modes’ in the main menu, or go to ‘Options - Settings’ and select the checkbox ‘Enable at startup’ under Monitoring Modes pop-up.

4.2 Configuring the PROFINET Switch

In order for Netilities to receive network data, a free switch port should be configured to mirror a port. For best results the port on which the PNIO-Controller is attached should be mirrored to the port your computer is connected to. See **Fig. 1** for an example.

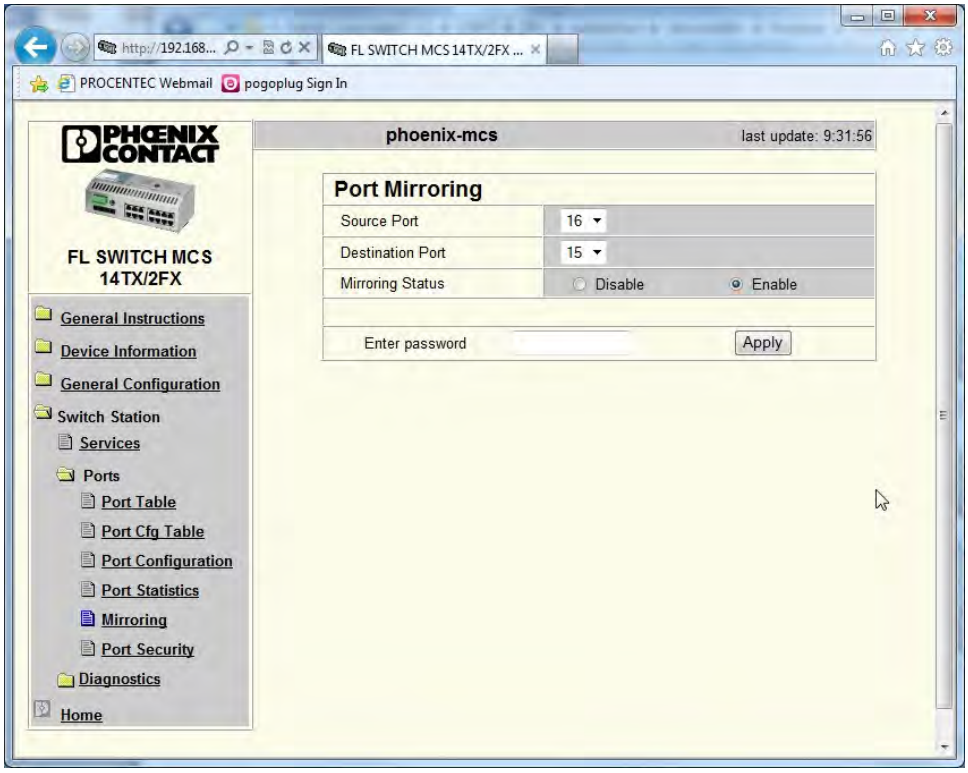


Fig. 1 - Enabling port mirroring on a PROFINET switch

4.3 Starting Netilities

After starting up the Netilities software, the screen as in **Fig. 2** should appear.

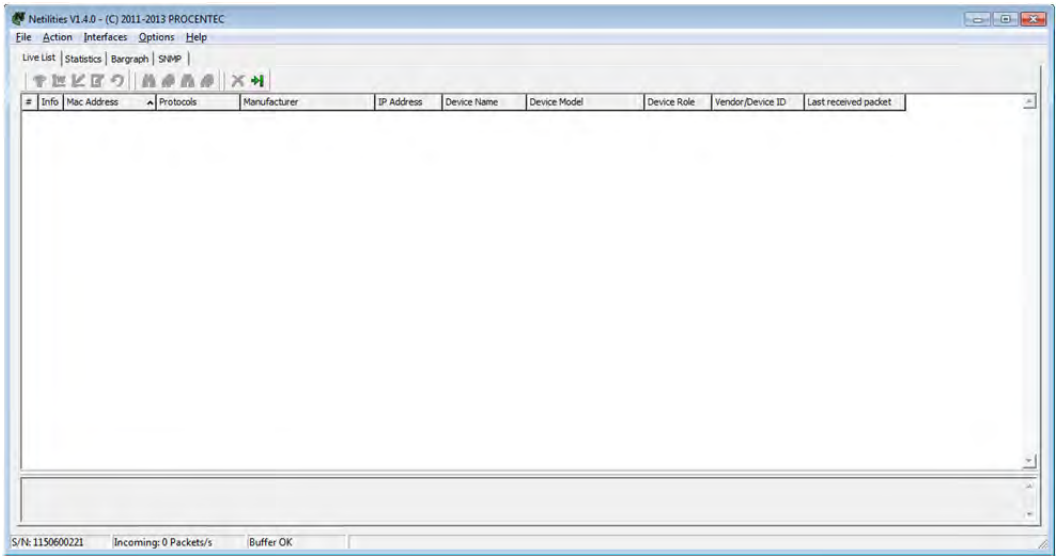
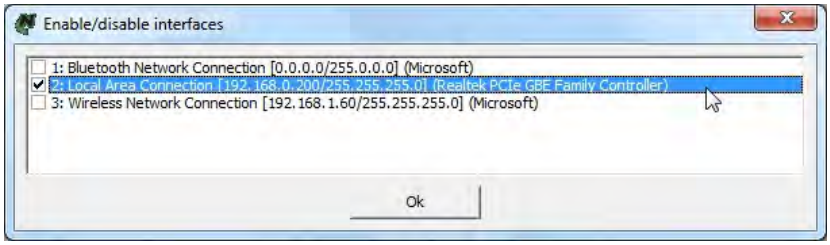


Fig. 2 - Startup screen of Netilities

Click on “Interfaces” and “Enable/disable interfaces” to start the software.



After an interface is enabled, a Live List as in **Fig. 3** should be visible.

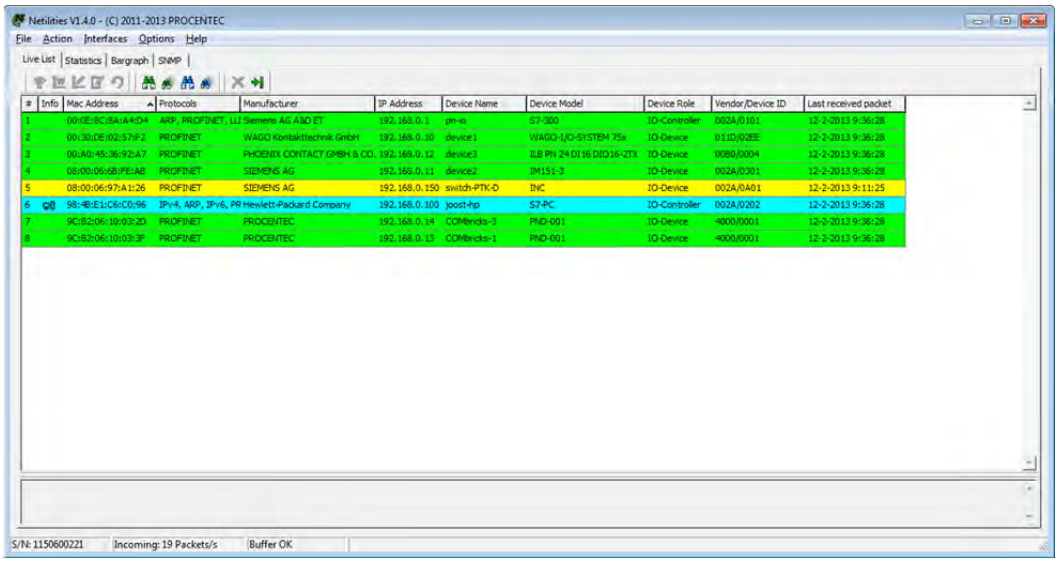


Fig. 3 - Screen of Netilities after correct network has been enabled

4.4 Analyzer

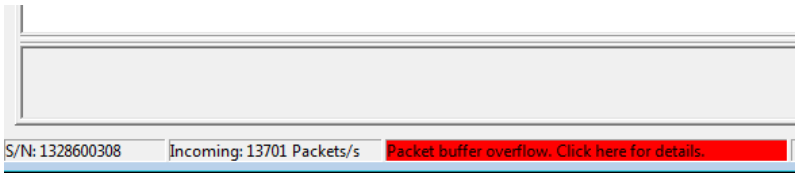
Netilities itself is an analyzer to display a Live List and to view statistics. A quick overview of this is given in the next sections.

4.4.1 Main window notification bar

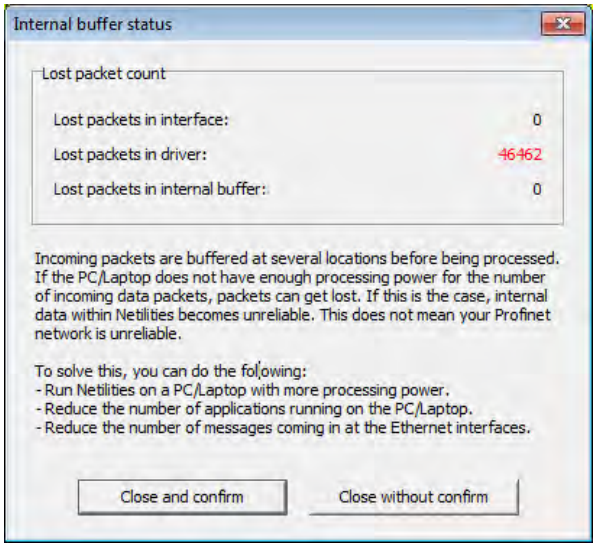
On the bottom of the Netilities window is a notification bar with information about the application and memory status of your laptop/PC. Is displays the following information:

- Serial number of your Appdongle
- Number of incoming packets per second
- Packet buffer state

If you are monitoring a high-speed PROFINET network where the cycle-time of devices is very high, or there are many devices in the network, it can happen that the memory buffer of the computer is flooded with PROFINET packets. This means that not all packets can be processed and data will be lost. If this happens, Netilities will indicate this with a red notification:



Clicking the red warning brings up the following window:



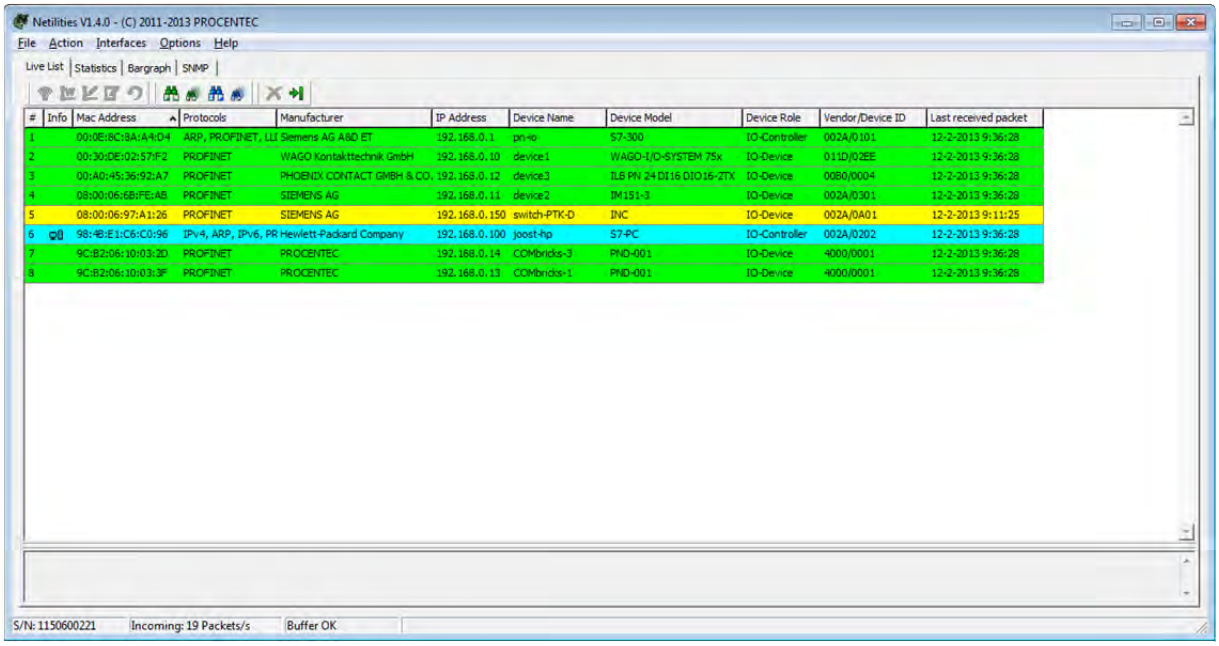
Follow the instructions to reduce the lost packets.

4.4.2 Live List

"Colours make it easy…"

The Live List is a table which continuously lists all the available devices. It is directly visible which devices are active, in data exchange and which devices are inactive. With different background colours, the status of the devices is displayed.

- Yellow: inactive device
- Light blue: Generally active device
- Green: Device in data exchange



4.4.3 Statistics

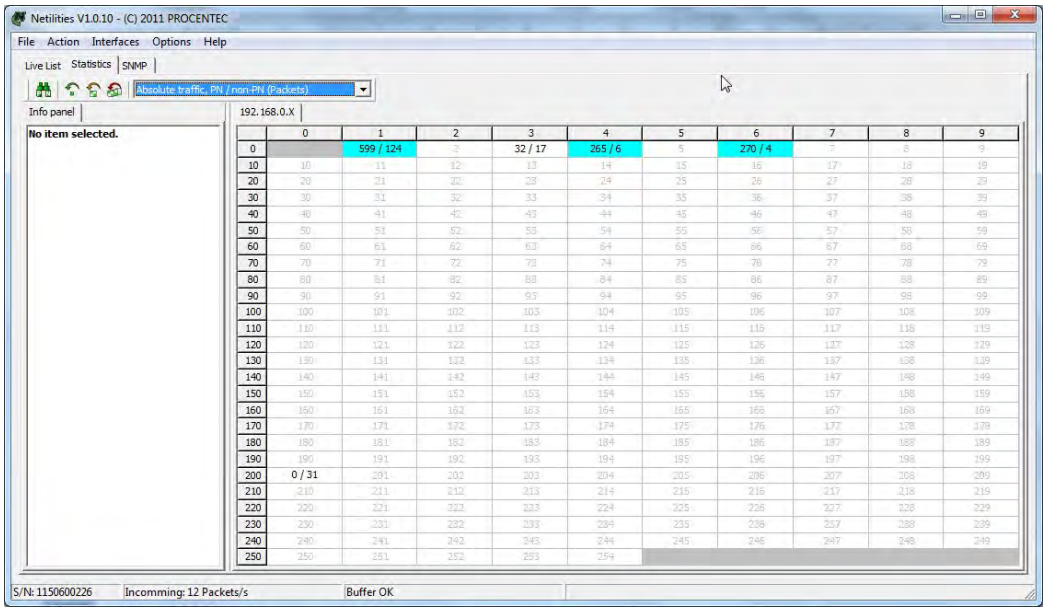
"Click and go…."

The statistics matrix is the most powerful feature of the analyzer. This field can really indicate what the condition of an installation is. It displays the important information that a user, especially a maintenance technician is really interested in:

- Current cycle time
- Minimum cycle time
- Maximum cycle time
- Transfer status error count
- Alarms (device/controller)
- Absolute traffic (PROFINET/Non PROFINET)
- Relative traffic (PROFINET/Non PROFINET)

Because of this feature, the user does not have to inspect messages or do difficult operations to ensure the quality of the installation.

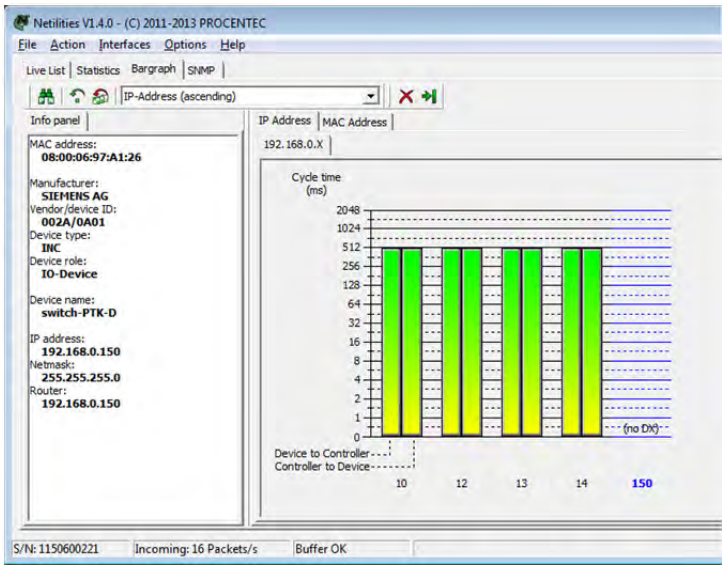
- Light blue: Changed statistic
- Yellow: Device is not active



If the statistics do **NOT** show deviations, the installation is on the 1st degree OK.

4.4.4 Bargraph

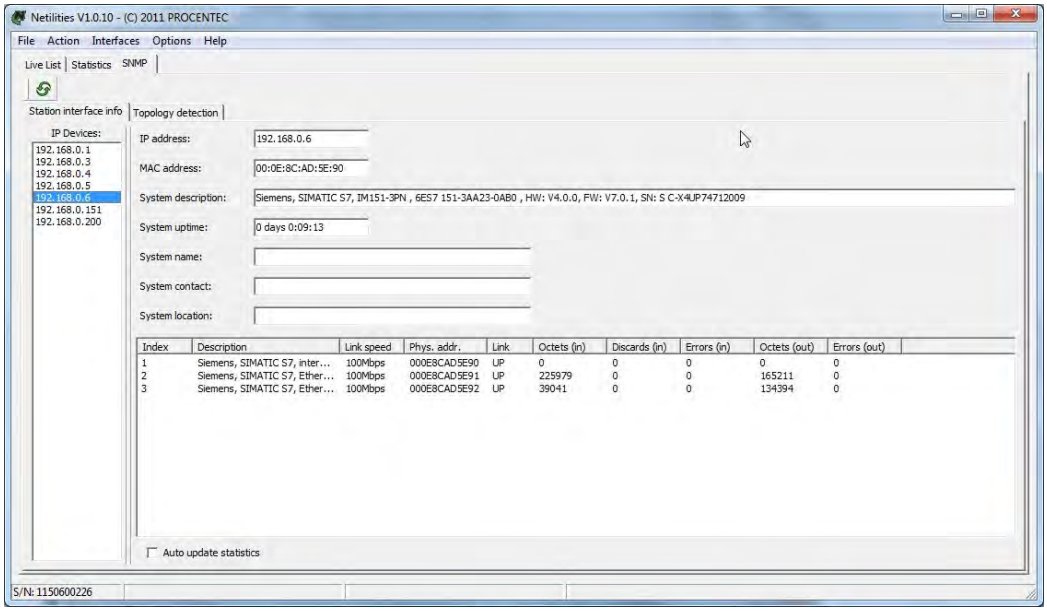
The Bargraph shows the individual cycle times of each device in the network range. This is divided in two bars; one for Controller to Device, and one for Device to Controller. It is also possible to see the cycle time by MAC-address instead of IP-address. When bars have a red colour, this means that at least one cycle has been missed. If the Bargraph do **NOT** show deviations, the installation is on the 1st degree OK.



4.4.5 SNMP

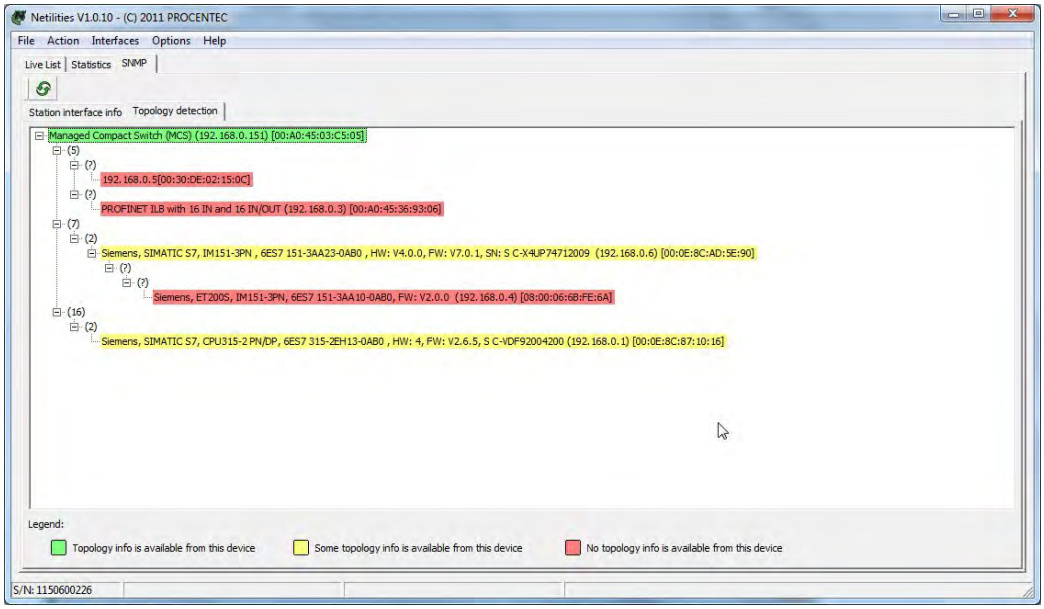
"Management made easy…"

The SNMP functionality can detect the devices in the network. Depending on what a device supports, information like System Uptime, System description, MAC-address, IP-address is displayed.



This information can be updated automatically. It depends on the devices if their information can be updated automatically.
Netilities is also able to detect the topology of the network without shutting down the installation! The Topology detection creates a clear network structure that contains the location of the devices. The result depends on the information supplied by the devices.

- Green: Topology information is available from the device.
- Yellow: Some topology information is available from the device.
- Red: No topology information is available from the device.



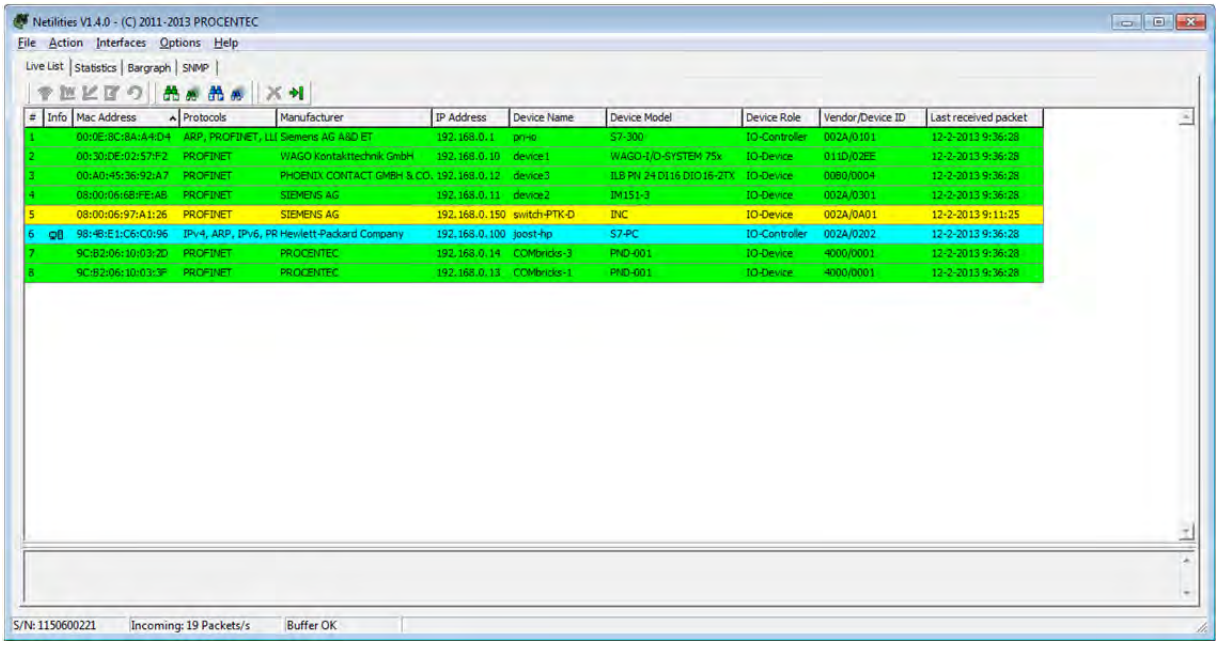
5 Live List

The Live List is a table which continuously lists all the available devices. It is directly visible which devices are active, in data exchange and which devices are inactive. With different background colours, the status of the devices is displayed.

- Yellow: inactive device
  This is because the device is not sending any messages. The problem could be that a device has been lost, or a device has not yet been in data exchange.

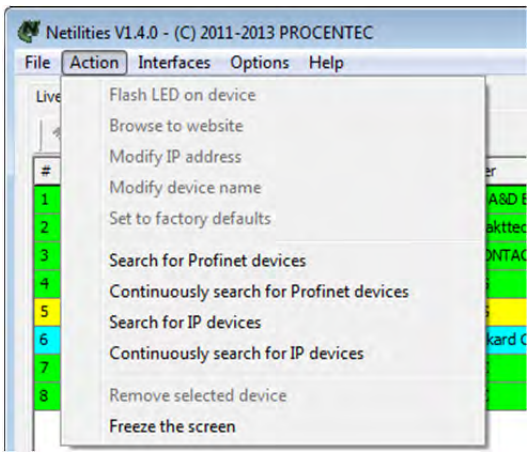
  Another possibility for a yellow live list is that the computer is not fasts enough to process all packages. The Live List will display all devices as yellow for a short time. Refer to paragraph 4.4.1 for more information.

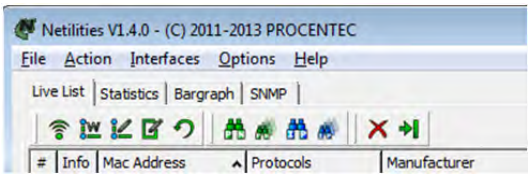
- Light blue: Generally active device
  A device is sending messages, but it is not in data exchange with a PNIO-Controller.
- Green: Device in data exchange
  A device is active and it is in data exchange with a PNIO -Controller.



5.1 Live List Actions

The Live List offers several actions to the user. These actions can be accessed via the Action menu or via the buttons on the Toolbar. The following actions are available:

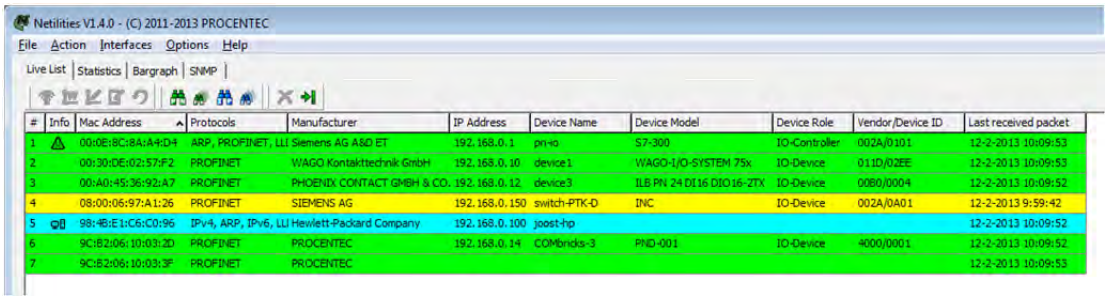




Action	Description
Flash LED on device	Flashes a LED on the selected device. Which LED starts to blink on the device, is dependent on the device. Mostly the Link LED(s) will start blinking.
Browse to website	Opens the default webbrowser and navigates to the IP-address of the selected PROFINET station.
Modify IP-address	Used to modify or clear the IP-address of the selected device. The IP-address can only be changed when the selected device is not in Data Exchange.
Modify device name	Used to modify or clear the device name of the selected device. The device name can only be changed when the selected device is not in Data Exchange.
Set to factory defaults	Resets all settings of the selected PROFINET station to the factory defaults. Name, IP address and other settings will be cleared. ***Note:*** *This can be done while devices are in Data Exchange.*
Search for PROFINET devices	Used to search for PROFINET devices in the network only once.
Continuously search for PROFINET devices	Used to continuously search for PROFINET devices in the network.
Search for IP devices	Used to search for IP devices in the network only once.
Continuously search for IP devices	Used to continuously search for IP devices in the network.
Remove selected device from list	Removes the selected device from the Live List. Used for instance to remove devices from the list that are no longer active in the network.
Freeze the screen	Pauses the information on the screen; no data will be added or removed.

5.2 Live List columns

The Live List shows a number of columns.

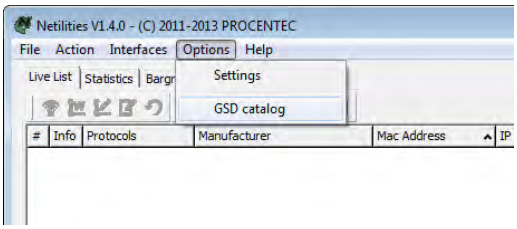


The following table details the information to be found in these columns.

Column	Information
#	The number of a row in the Live List.
Info	In this column icons are used to indicate the type of device, or to warn the user about a problem. The following icons are used: The device in this row encountered a problem. Indicates the device in this row is a network device of the PC on which Netilities is running. Clicking on the row shows a message in the bottom area of the Netilities user interface.
MAC-address	The MAC-address of the device.
Protocols	Displays the protocols used by the device. Commonly used protocols are: • IPv4 Internet Protocol v4 (uses 32-bit addresses) • IPv6 Internet Protocol v6 (uses 128-bit addresses) • LLDP Link Layer Discovery Protocol • ARP Address Resolution Protocol • PROFINET
Manufacturer	Displays the name of the manufacturer of the device.
IP-address	The IP-address in use by the device.
Device name	The configured name of the device.
Device model	The model or type of the device.
Device role	Displays the role of the device. The role can be either PNIO-Controller or PNIO-Device, PNIO-Multidevice or an PNIO-Supervisor.
Vendor/Device ID	Displays both the ID of the vendor and the ID of the device. Both ID are displayed in hexadecimal notation.
Last received packet	Displays the date and time when the last packet was received from the device. When loading from PCAP-file, the date and time of import will be displayed.

5.3 Importing GSD files

Netilities offers the option of importing GSD files. This is very helpful when analysing problems on PROFINET. Device parameters and module names can be interpreted and text from the GSD is displayed.



Open the GSD import window by choosing 'Options – GSD catalog':

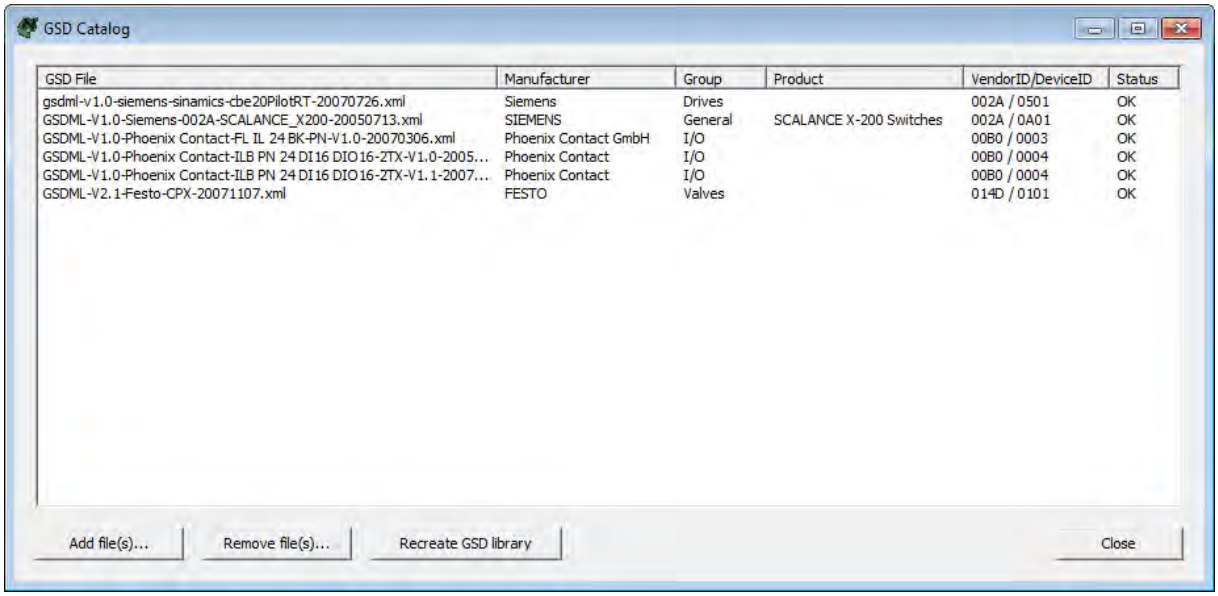


Fig. 4 - GSD Catalog with several GSDs

Next, click 'Add file(s)…'.
A Windows Explorer window appears, and you can select the GSDs you wish to import.

After the GSD files have been imported, the GSD catalog may look like **Fig. 5**: the recently imported GSDs are still unknown. The catalog needs to be recreated, so that all information from the GSDs is read and categorised into Netilities. Press the button 'Recreate GSD library'.

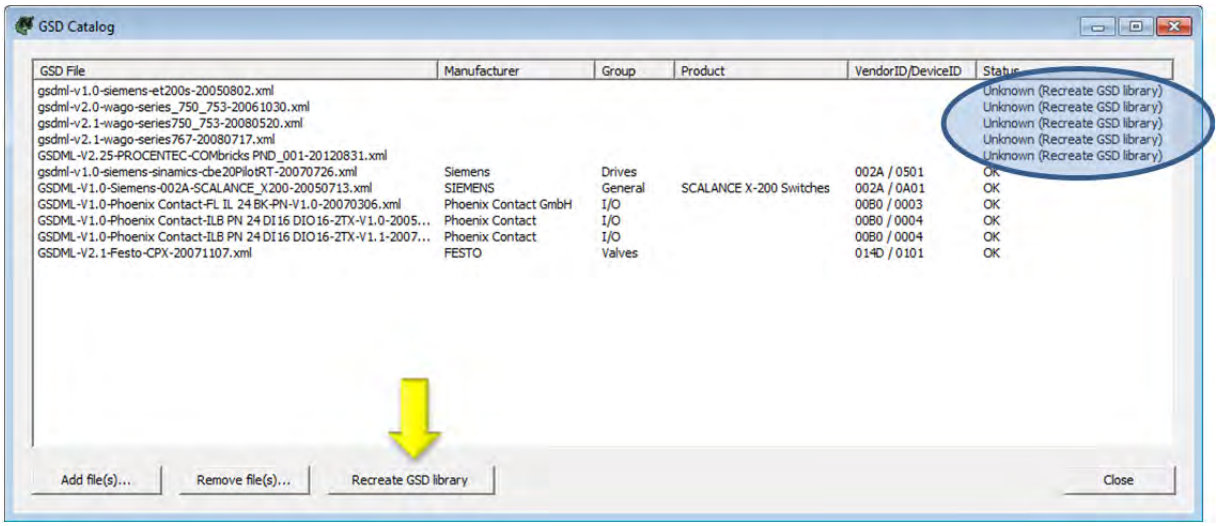
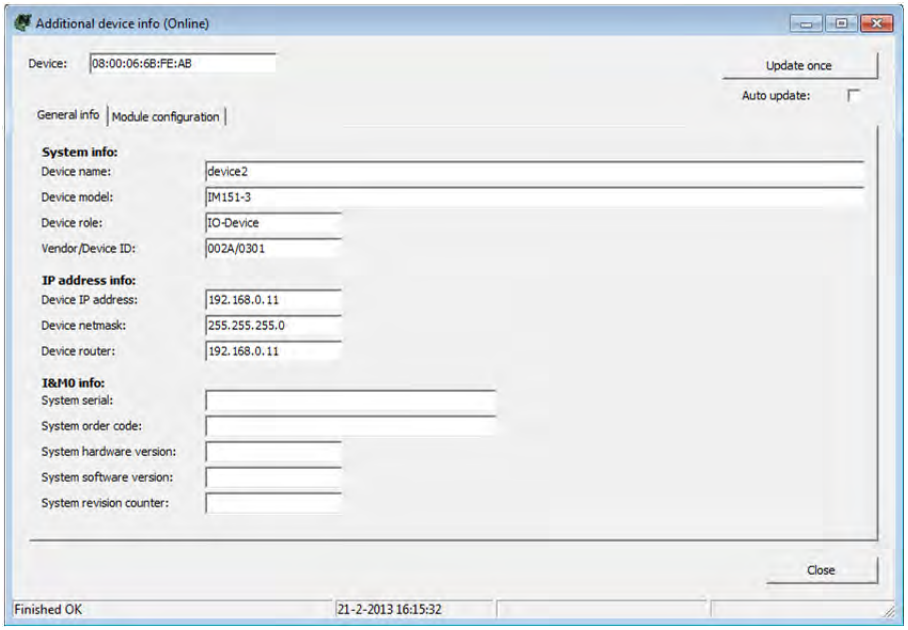


Fig. 5 - Incomplete GSD catalog

5.4 Acyclic information

Clicking the  icon in the menu-bar or double-clicking on a device in the Live List brings up additional device information. The ‘General info’ tab shows general system information such as device name and model, IP address and I&M0 information. The button ‘Update once’ refreshes all the displayed data once. The checkbox ‘Auto update’ continuously updates all the displayed information.



The next tab ‘Module configuration’ is also divided in two tabs: ‘Configuration reported by IO-Device’ and ‘Configuration expected by IO-Controller. This is very useful information during commissioning or troubleshooting because it clearly displays the difference in real and expected configuration of devices.

5.4.1 Configuration reported by IO-device

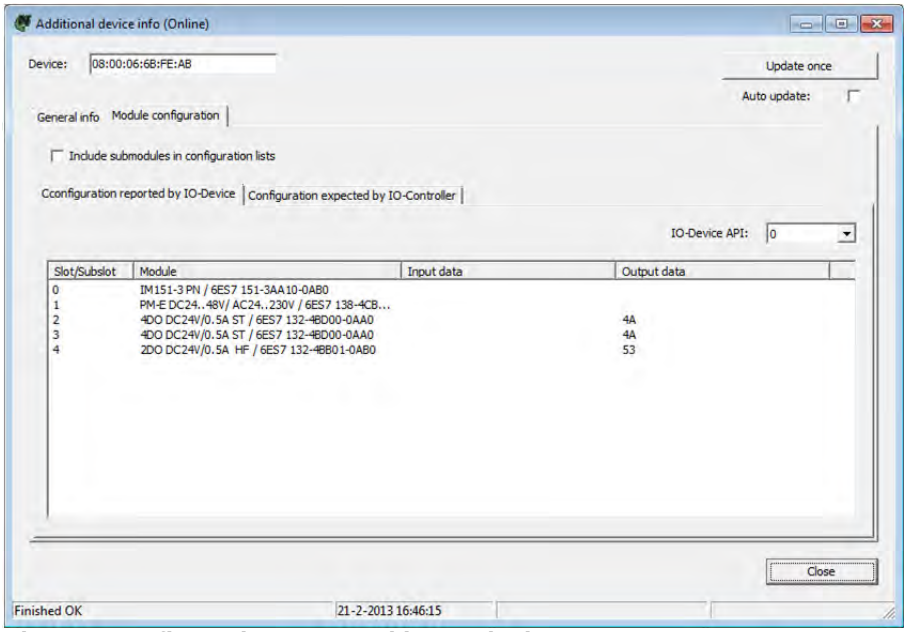


Fig. 6 - Configuration reported by IO-device

The displayed IO-Device has 3 bytes of output data, so only output modules are installed. The module list displays the type numbers of installed modules; this information is read from the imported GSD file (see **paragraph 5.3**). The captured output bytes are also displayed in the 'Output data' column.

The IO-Device API selector can be used for devices which support multiple APIs, but these are very rare.

5.4.2 Configuration expected by IO-Controller

If a controller and device both indicate a problem with the 'SF' LED, there might be a problem with the configuration of the device. In Netilities it is very easy to compare the real configuration (see **Fig. 6**) with the configuration that was entered into the PROFINET Controller. Click on the tab 'Configuration expected by IO-Controller' as shown in **Fig. 7**.

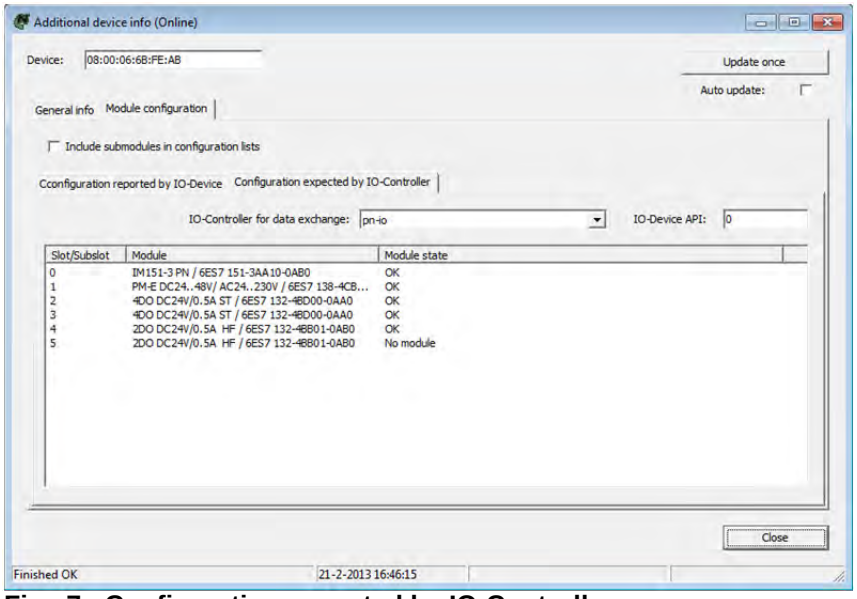


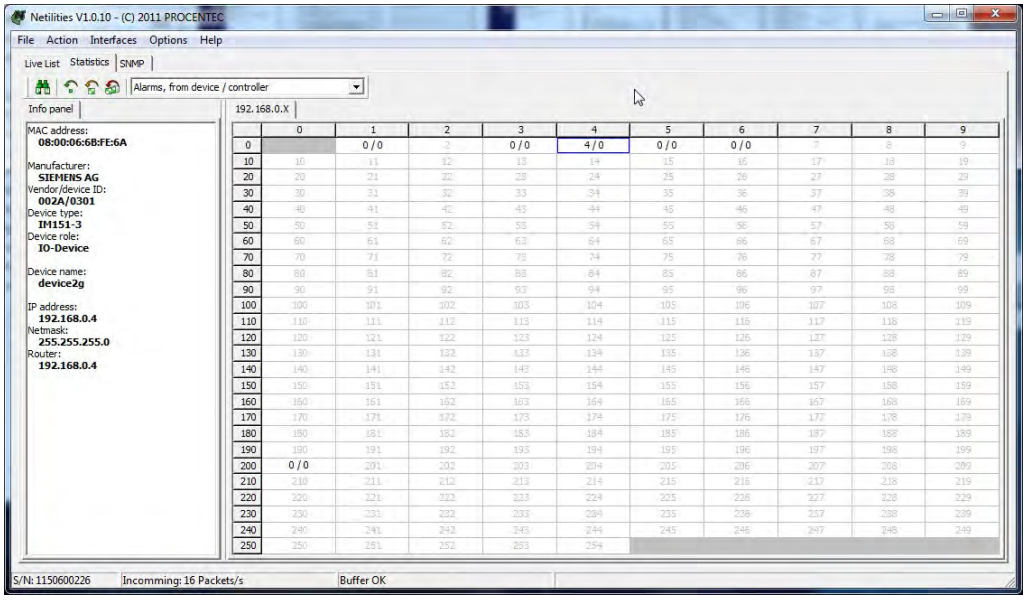
Fig. 7 - Configuration expected by IO-Controller

The controller is expecting a 2DO module in slot 5. It also reads that there is no module available in slot 5. Either the module is missing, or it is not working.

When multiple IO-Controllers exist in one network, you can select the correct IO-Controller in the drop-down list: 'IO-Controller for data exchange:'.

6 Statistics

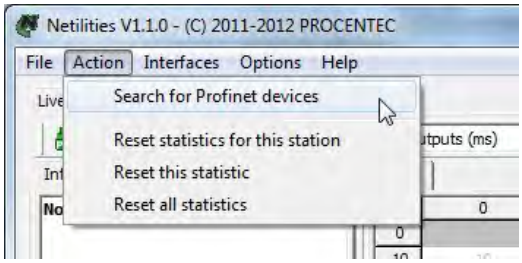
The statistics matrix is the most powerful feature of the analyzer. This field can really indicate what the condition of an installation is. It displays the important information that a user, especially a maintenance technician is really interested in. The different statistics are detailed in the following sections.

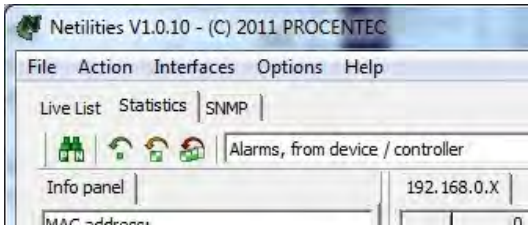


The user interface of the Statistics matrix is split into two parts, a part providing extra information and a part displaying the actual Statistics matrix.
The information part, Info Panel, displays extra information of the selected device in the statistics matrix. The information that is displayed depends on what information is available for the selected device. The MAC-address and IP-address are displayed for both PROFINET and IP devices.
The statistics matrix displays the statistics for each device in a matrix representation. The place of a device in the matrix is based on its address, namely the last byte of its IP address. Therefore the matrix can display 254 devices at once.
When more IP-ranges are used, a new tab will be added to the statistics matrix. Each tab corresponds to a certain address range as indicated by the title of a tab.

6.1 Statistics Actions

The Statistics offer several actions to the user.



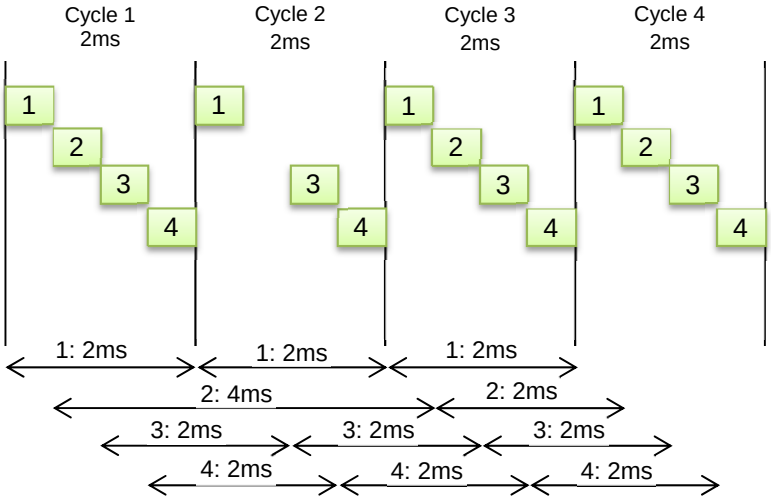


These actions can be accessed via the Action menu or via the buttons on the Toolbar. The following actions are available:

Action	Description
Search for PROFINET devices	Used to search for PROFINET devices in the network only once.
Reset statistics for this station	Used to reset all statistics for the selected device.
Reset this statistic	Used to reset the selected statistic for all devices.
Reset all statistics	Used to reset all statistics for all devices.

6.2 Current Cycle Time

With PROFINET the cycle times can be configured per device. This statistic continuously shows and updates the current cycle time for the inputs and outputs of each single device.
The exact timing of PROFINET messages is difficult to determine because it depends on network load and delays that may be added by switches in the network.
Therefore Netilities bases its Cycle Time calculation on the Cycle Counter value of PROFINET messages. Simplified this means that Netilities calculates the difference of the Cycle Counter between received messages. When a message has been missed, it means the difference between the Cycle Counters of the last received message and the current message increases. In this statistic this is shown in multiples of the configured send cycle for a PNIO-Device.
For instance a PNIO-Device is configured with a send-cycle of 2ms. A message of the PNIO-Device goes missing. The current Cycle Time will then become 4ms instead of 2ms.



In a configuration the following cycle time values are possible:

- 1 ms
- 2 ms
- 4 ms

- 8 ms
- 16 ms
- 32 ms
- 64 ms
- 128 ms
- 256 ms
- 512 ms

6.3 Minimum Cycle Time

This statistic shows the shortest cycle time that has been measured for the inputs and outputs of the device. It is continuously measured and updated when a shorter cycle time has been found.

6.4 Maximum Cycle Time

This statistic shows the longest cycle time that has been measured for the inputs and outputs of the device. It is continuously measured and updated when a longer cycle time has been found.

6.5 Transfer status error count

This statistic shows how many input and output messages have had a CRC error and have been marked by a switch as faulty. The last byte of the PROFINET specific data part on an RT and IRT Data Exchange message contains the Transfer Status.

IMPORTANT NOTE only PROFINET switches (cut-through) will forward faulty messages.

6.6 Alarms

This statistic shows the alarms from a device to the controller and from the controller to the device. The alarms can have a low and a high priority. This statistic does not distinguish between the priorities and counts all alarms and also counts the acknowledge of an alarm. An alarm for instance can be:

- Device lost (controller to device)
- Pull alarm (device to controller)
- Plug alarm (device to controller)
- Plug wrong module alarm (device to controller)
- Diagnosis (generally from device to controller)

An extensive list of alarms can be found in the PROFINET Standard.

6.7 PN Data size

This statistic shows the size of the PROFINET specific data part of Data Exchange messages, for both inputs and outputs.

6.8 Absolute Traffic

This statistic gives an indication of traffic on the network by showing the number of packets for both PROFINET and non-PROFINET traffic.

6.9 Relative Traffic

This statistic gives an indication of the network usage for both PROFINET and non-PROFINET traffic by expressing their share as a percentage of the total traffic.

7 Bargraph

The Bargraph shows a graphical representation of the measured cycle times of individual devices in the network. As described in **paragraph 6.2** the cycle time of each device in a PROFINET network can be configured individually. **Fig. 8** shows an example of four devices with different cycle times.

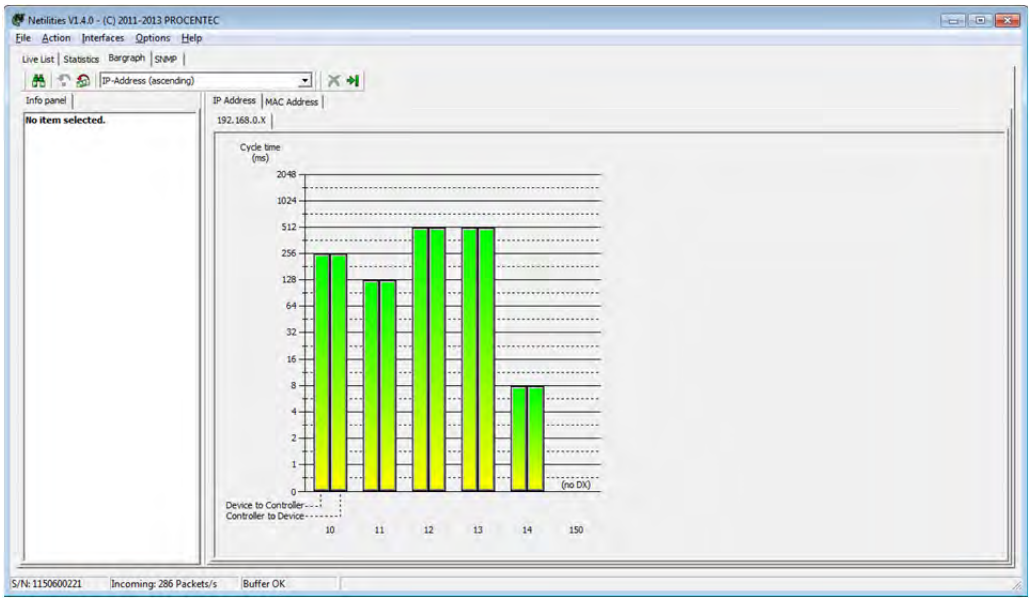


Fig. 8 - Bargraph with different cycle times

The Bargraph displays the current measured cycle times and the largest cycle times. Each device has two bars; one for communication from device to controller, and one from controller to device.

If the Max Cycle Time (see **paragraph 6.4**) has been higher than the current cycle time, the Bargraph will turn red to indicate a problem.

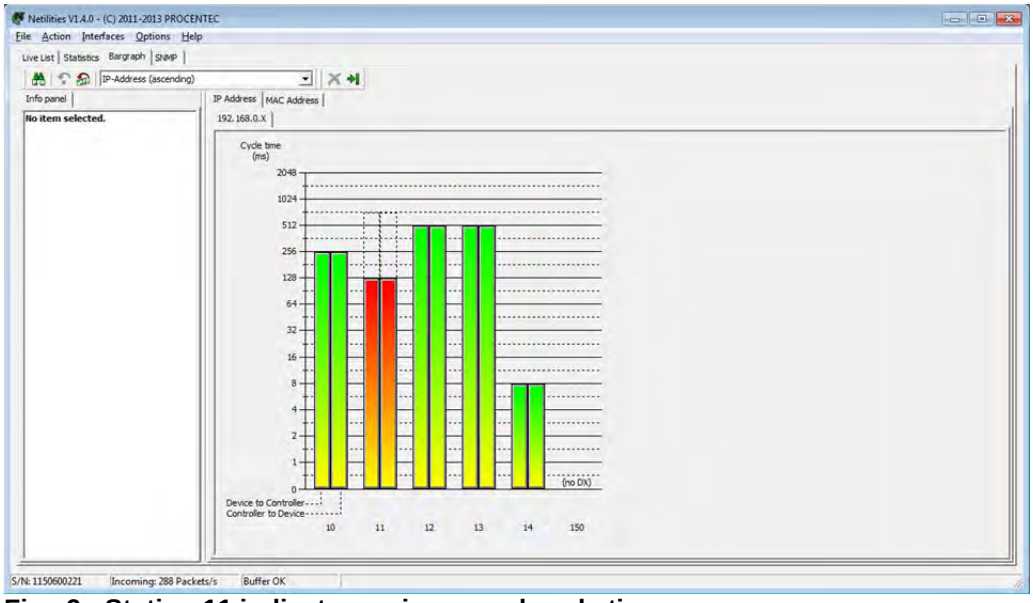


Fig. 9 - Station 11 indicates an increased cycle time

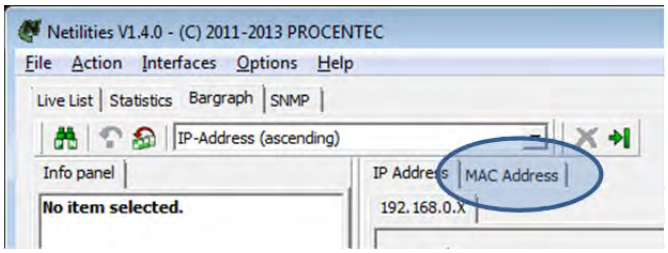
The example in **Fig. 9** shows that the cycle time of station 11 (both directions) is increased, so this indicates that the communication has been disturbed both ways. The cable may have been disconnected, the switch had a problem, or the device was switched off.

7.1 Bargraph options

The following actions can be accessed via the Action menu or via the buttons and drop-down list on the Toolbar:

Action	Description
Search for PROFINET devices	Used to search for PROFINET devices in the network once.
Reset Bargraph for this station	Used to reset all statistics for the selected device.
Reset entire Bargraph	Used to reset the Bargraph for all devices.
Sorting by IP-address (ascending and descending)	Used to sort the Bargraph by IP address from low to high or vice versa.
Sorting by cycle time current (ascending and descending)	Used to sort the Bargraph by current cycle time from low to high or vice versa.
Sorting by cycle time min (ascending and descending)	Used to sort the Bargraph by min cycle time from low to high or vice versa.
Sorting by cycle time max (ascending and descending)	Used to sort the Bargraph by max cycle time from low to high or vice versa.

The Bargraph can also be viewed by MAC-address instead of IP-address by clicking the tab ‘MAC Address’.

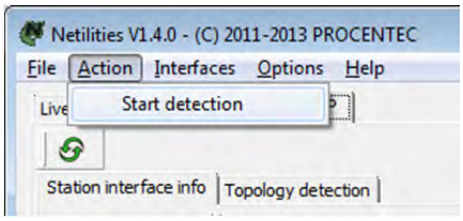


8 SNMP

The SNMP functionality of Netilities allows you to retrieve management information from devices in the network. The information can for instance be the uptime, its MAC- or IP-address of a device. It also enables Netilities to create a topology of the network indicating who is connected to who.
This part of Netilities does not show any data by default. You must start SNMP detection manually in order to see results in Netilities.
The user interface of SNMP consists of two parts, a part providing station information and a part displaying the network topology based on information retrieved through SNMP.
The following sections detail what you can do with SNMP in Netilities.

8.1 SNMP Actions

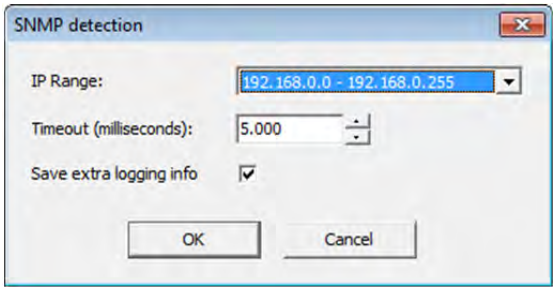
The SNMP action menu offers a single action to the user.



This action can be accessed via the Action menu or via the buttons on the Toolbar. The following action is available:

Action	Description
Start detection	Used to start the detection of devices in the network using SNMP.

The following dialog appears before SNMP detection:

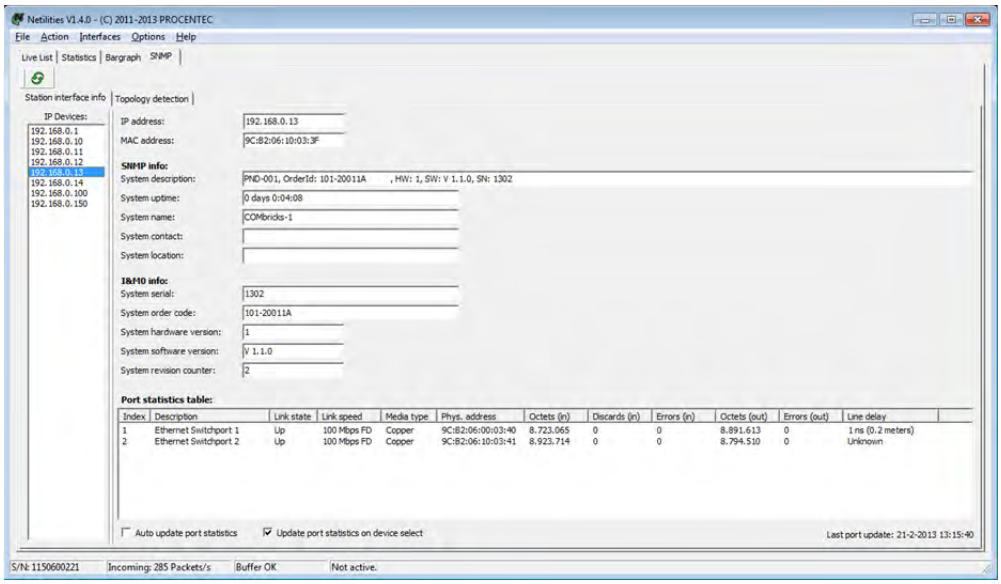


Choose the correct IP range to scan. Next you can select the timeout in milliseconds (default is 5000). As an extra option, extra logging information can be saved for debugging purposes.

The default value for the detection timeout can be changed in the settings menu ‘Options – Settings – SNMP – Default detection timeout’.

8.2 Station interface info

The station interface info shows a list of detected IP devices on the left side of the user interface. The right side of the user interface shows the information of the device selected in the list of detected IP devices. A device can be selected by clicking on it.



Its corresponding information is then displayed in the fields on the right side. Depending on available information from a device, the following information can be displayed:

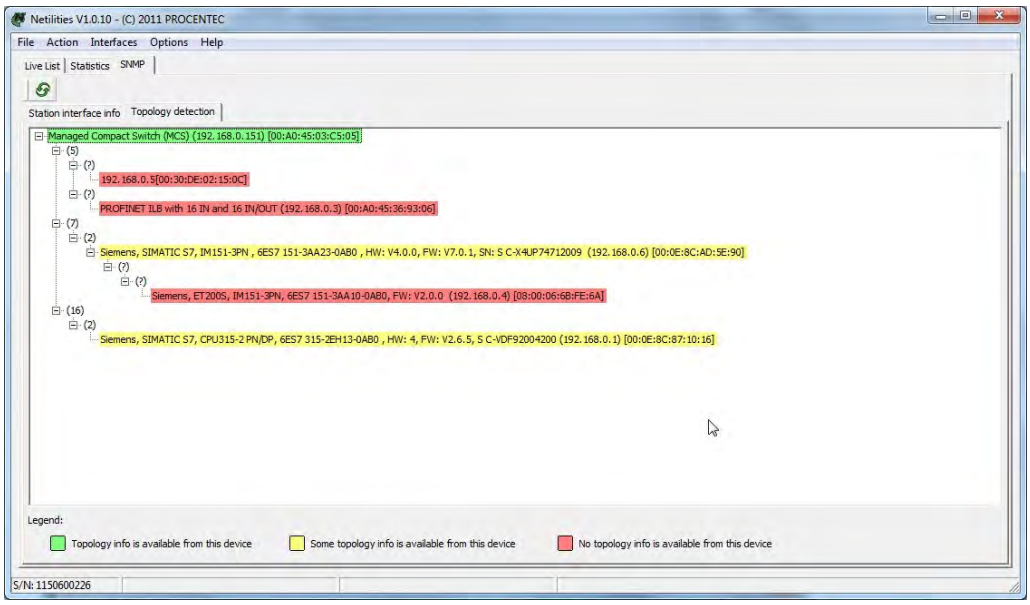
Field	Description
IP address	The IP address of the selected device.
MAC address	The MAC address of the selected device.
System description	A short description of the device.
System uptime	The time the device has been up and running.
System name	The name of the device.
System contact	A name or telephone number of a contact person.
System location	The location of the device.
I&M0 info	
System serial	The serial number of the device
System order code	The order code of the device
System hardware version	The hardware version number of the device
System software version	The software version number of the device
System revision counter	The revision number of the device
Link information	A table displaying information about the link(s) of the device. The following columns are presented: • Index A sequential number. • Description • Link speed • Physical address • Link Status of the link: UP or DOWN • Octets in

- Discards in
- Errors in
- Octets out
- Errors out

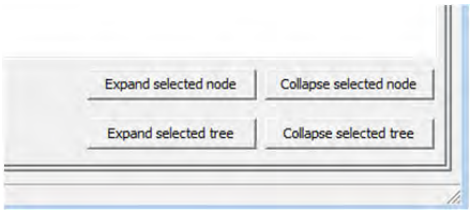
8.3 Topology detection

The Topology detection gives an overview of the topology of your network. It is however dependent on the information provided by the devices in the network. The level of support for topology information is indicated with colours in the topology.

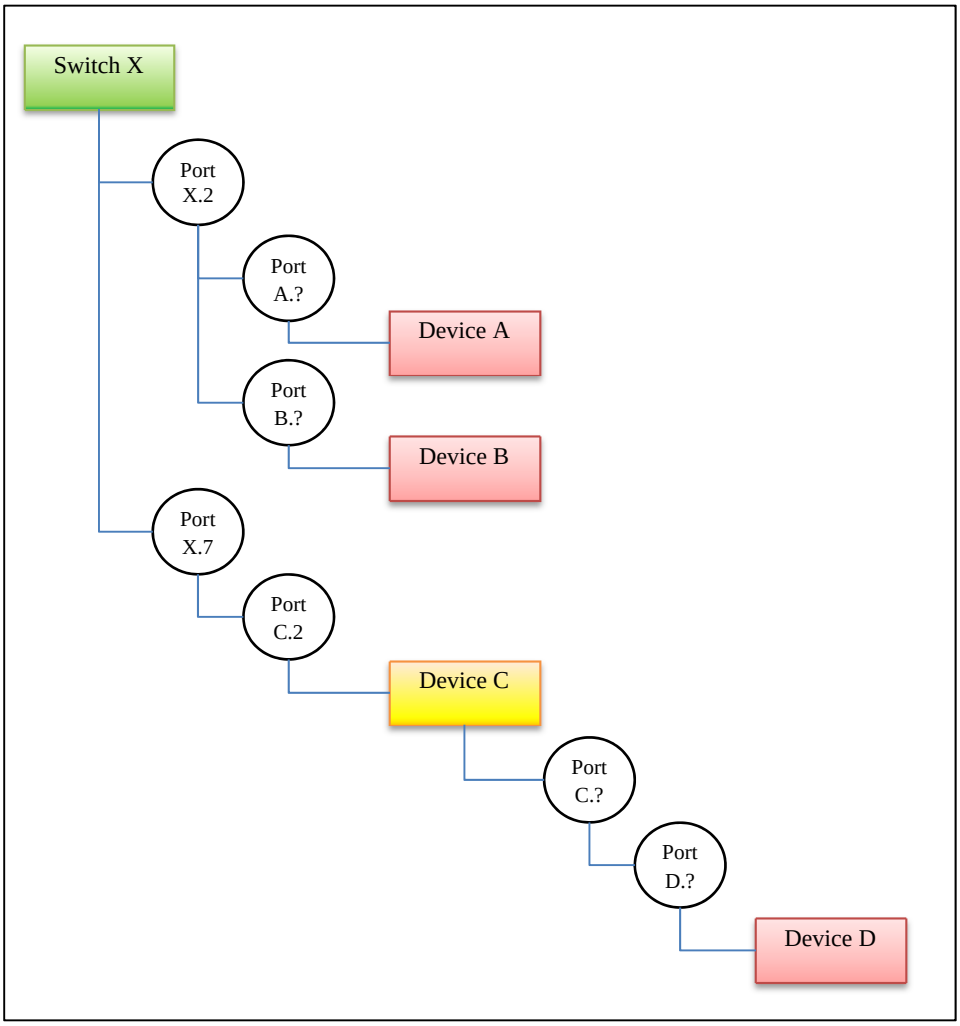
- Green Topology information available.
- Yellow Some topology information available.
- Red No topology information available.



Use the buttons ‘Expand selected node’ and ‘Expand selected tree’ to quickly see all items of the selection:



The presentation of the topology is schematically drawn up in the following figure.



The switch in the figure is a PROFINET switch and provides Netilities with Topology information. Netilities is therefore able to determine which device is connected to which port of the switch. A switch can normally only have one link on a port. However the figure does show a port with two links, to device A and device B. When this is shown in the topology, it means messages from both devices are received through this port of the switch. Probably one of these devices also has a built-in switch, however it does not provide SNMP topology information.
Device C on the other hand is able to provide some SNMP topology information. Therefore Netilities can now distinguish that device D is connected to device C.

IMPORTANT NOTE:
SNMP must be supported by all devices and it must be possible to retrieve a MAC-list and/or LLDP information. If the LLDP protocol is not supported, the topology will be built up starting with devices providing the most information, i.e. having the most connections. They will be presented above other devices.

9 Reporting

The information gathered by Netilities about the PROFINET installation can be saved to PDF with the Reporting tool. This feature creates a detailed report which contains Network Properties, the Live List, Statistics, Bagraph, SNMP and I&M information and device configuration.

No PDF generator is required on the host computer; simply save the report to a PDF.

9.1 Creating a Report

If you are satisfied with the information that Netilities has collected and want to generate a report, click on 'Report' in the upper menu, and then choose 'Generate Report' as shown in **Fig. 10**.

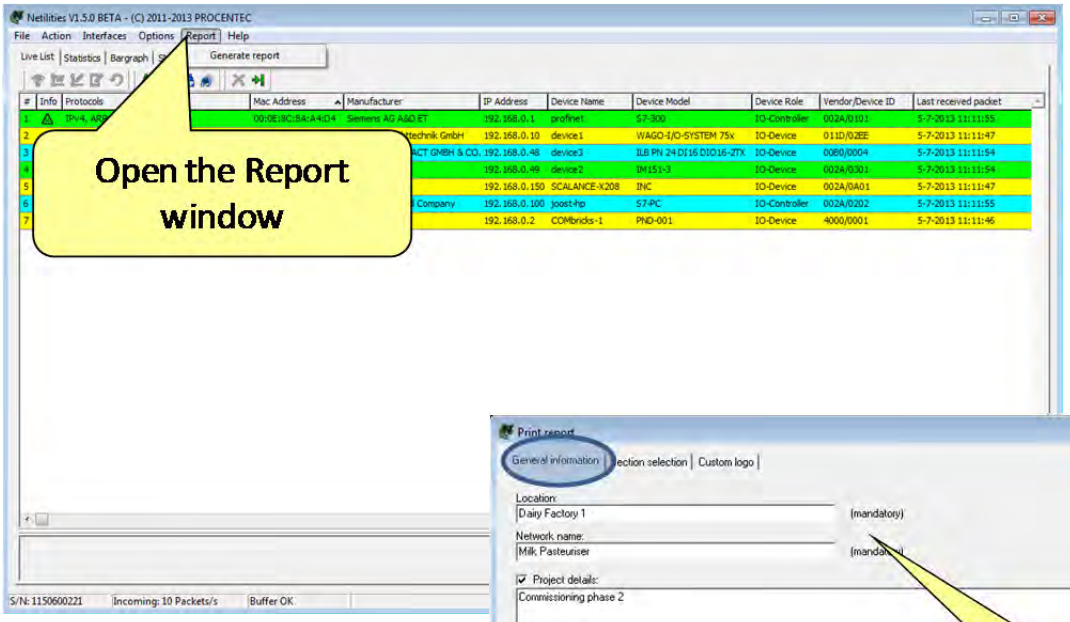


Fig. 10 – Open the Report dialog

Next, a window appears where details can be entered about the site, company and network. Some fields are mandatory.

The entered details can be saved for future use. If you have saved these details before, you can use the 'Load settings' button to easily load them.

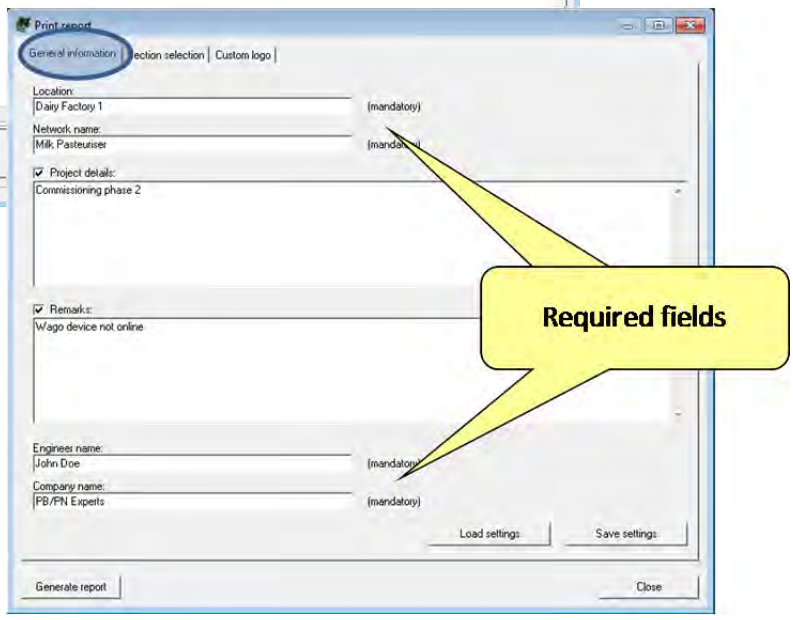


Fig. 11 - Report details

Now you can hit the 'Generate Report' button, or customize the report by clicking on the other tabs described in **paragraph 9.2** and **9.3**.

9.2 (De-)selecting sections

The Report is customizable. You can select or deselect different sections of Netilities. If you wish to leave out the Bargraph for example, simply deselect the corresponding checkbox. See **Fig. 12** for an example.

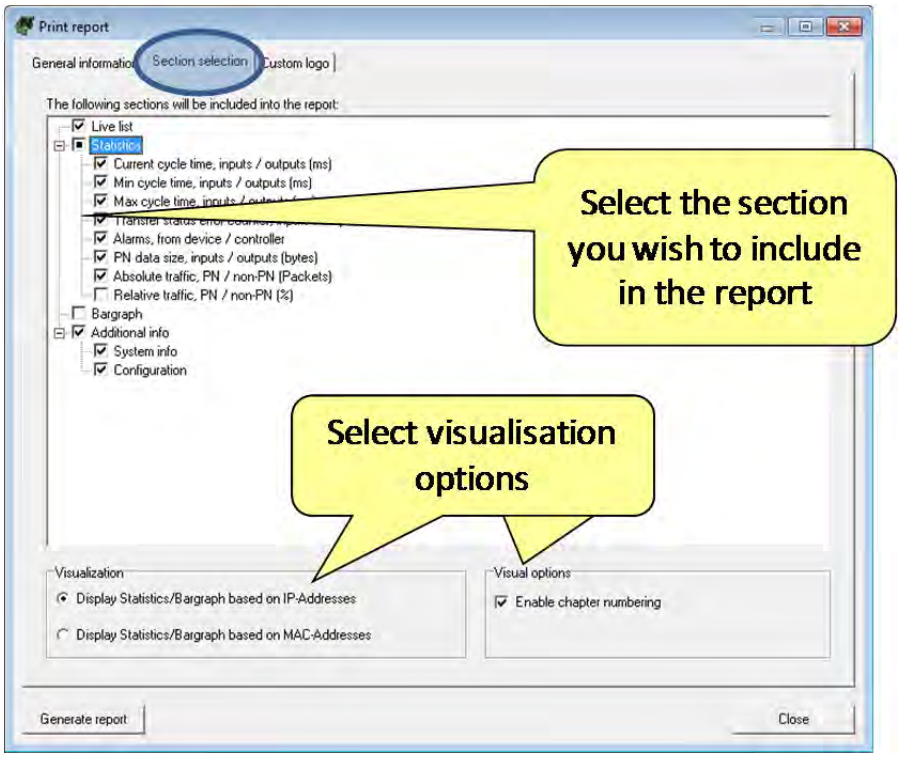


Fig. 12 - Section selection and visualization

This screen also offers the option of reporting station information based on IP-address or on MAC-address. It is also possible to disable chapter numbering, if required.

9.3 Adding company logo

If you want to add a company logo to every page, you can choose a file in one of these formats:

- .GIF (transparent GIFs not supported)
- .JPG, .JPEG, .JPE
- .BMP
- .WMF, .EMF

Choose ‘Load’ to select an image. Next you can select the alignment and scale of the image. Use the ‘Clear’ button to delete it from the report if you do not want to use it.

After you have generated the Report, use the button to save the Report directly to PDF.

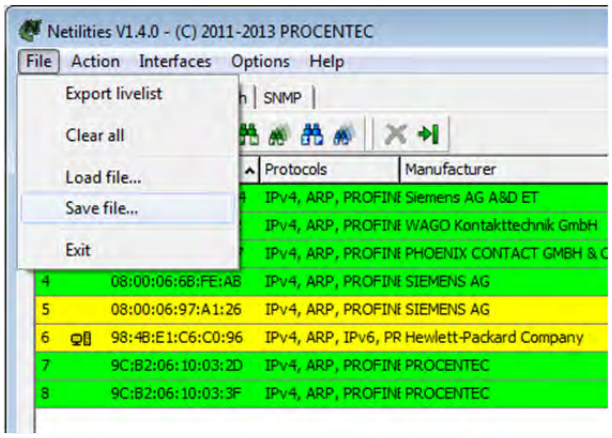
You can also print it using .

10 Saving and loading

Netilities offers the ability to save all recorded network information into a file, and load it for later analysis.

10.1 Saving network information

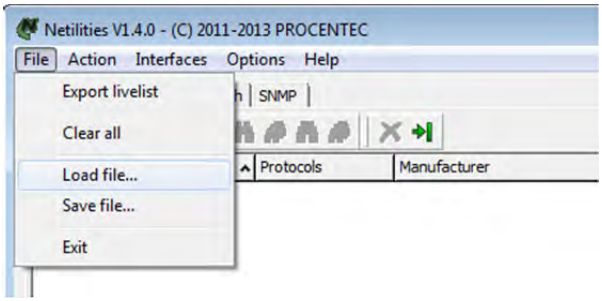
When information has been read into Netilities, all information can be saved by choosing ‘File – Save file…’ and selecting a location. Then enter the filename and choose ‘Save’. The file must have the extension .NDB.



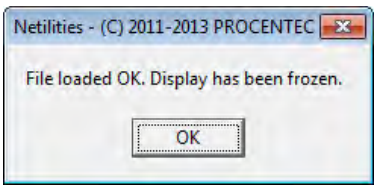
Netilities will also ask to save information before exiting the program, if the information has not been changed or if the information has been changed since the last save.

10.2 Loading network information without active network interface

Loading a saved information file can be done by choosing ‘File – Load file…’ and choosing a saved .NDB file.



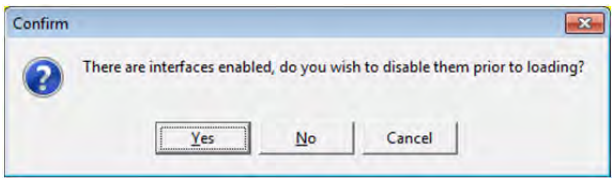
After loading, the following dialog appears to confirm correct loading of the information. The screen is put to ‘Freeze’ so that loaded information will stay on screen as if it was real-time information. If you unfreeze the screen, the live list will turn yellow because the devices have not shown activity.



10.3 Loading network information with active network interface

If a network interface is active when loading a .NDB file (i.e. live list is being updated), you will be prompted to save or discard the information the Netilities has captured so far.

You will also be prompted if you wish to disable the currently active network interface:

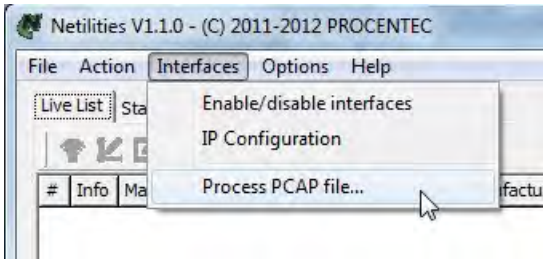


If you choose ‘No’, then all loaded information will be added and merged to the currently captured network information. This may cause information conflicts (IP, device name).

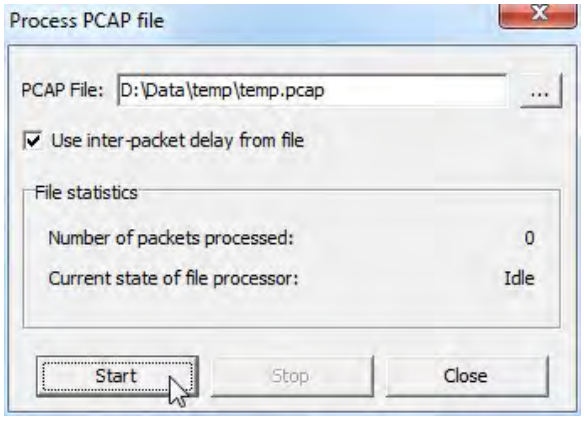
If you choose ‘Yes’, the network interface will be disabled and you will only see the loaded information.

11 Processing a PCAP file

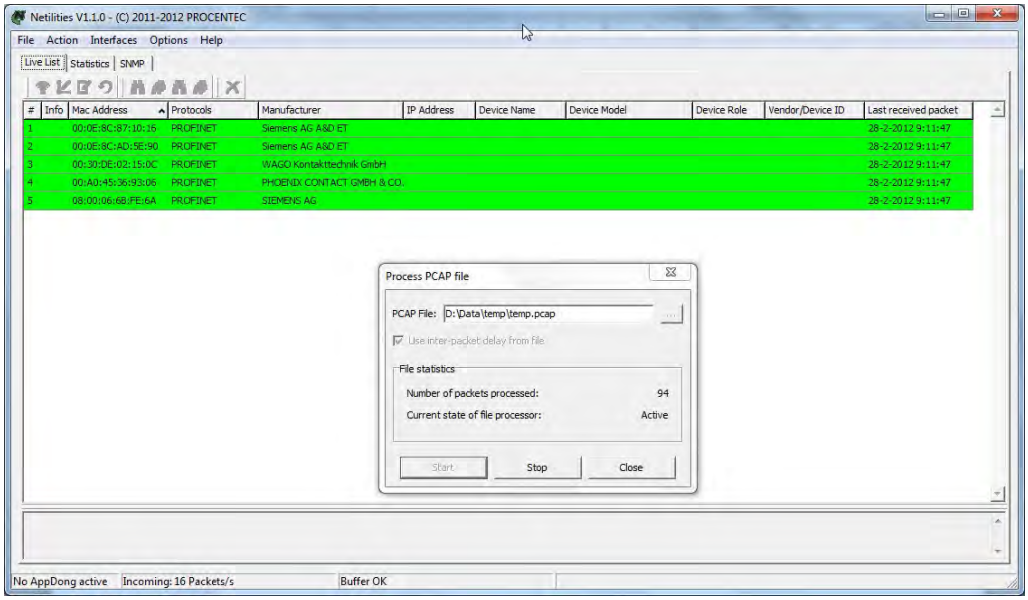
When a packet analyzer like Wireshark is used, you can save the captured packets into a file. This is called a PCAP file. With Netilities you are able to import and process the packets of a PCAP file. The packets are processed in a similar fashion as if they came from a network interface.
Therefore the action can be found in the Interfaces menu.



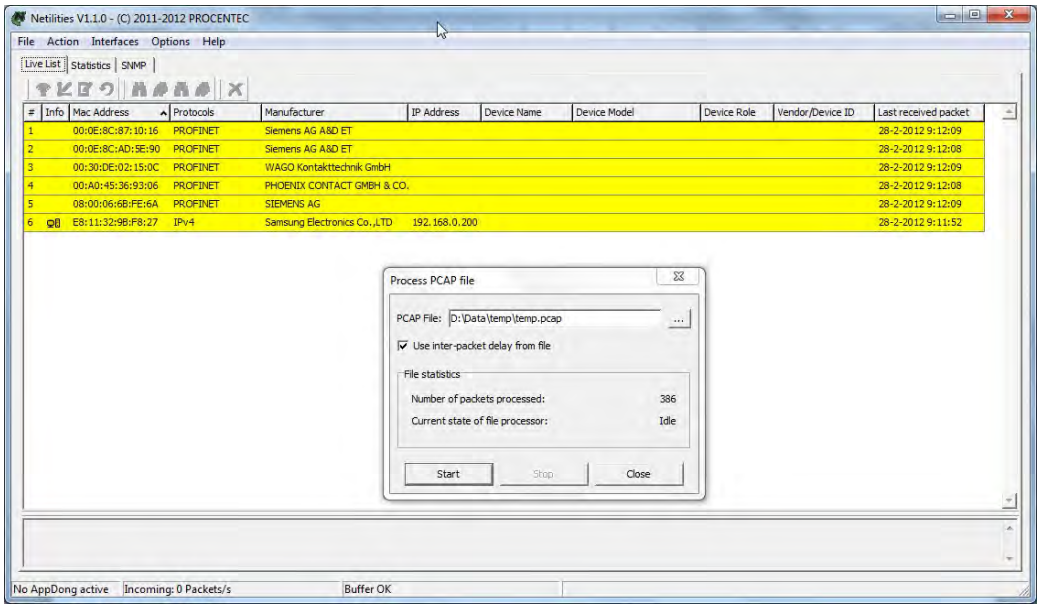
The first step in processing a PCAP file is to select the file to process. Once the file has been selected you can start processing the file by clicking on the “Start” button in the dialog.



The information provided in File statistics is updated during processing. As the packets from the file are processed the Live List and statistics are also updated.



Therefore the Live List shows the devices as if the packets came from a live installation.
When all the packets from the file are processed the file statistics show how many packets have been processed and that the processor is back in its idle state.



12 IP Configuration

To start the IP configuration, go to the menu: Interface -> IP Configuration. When you start the configurator, a popup box will appear, see **Fig. 13** (Windows XP) or **Fig. 14** (Windows 7).

Fig. 13 - Popup in Windows XP

Fig. 14 - Popup in Windows 7

Please make sure the configurator is granted full administrator rights. If you cannot grant administrator rights to the configurator, due to restrictions on your laptop or PC, this function will not work.
When the configurator is started, there will be an icon in your Windows tray ( ).
Netilities will communicate with this application to configure your Ethernet interfaces.

When the configurator has been started, a window will pop up as shown in **Fig. 15**. In this window you can create new and modify existing profiles. You can also activate or deactivate them. When a profile has been activated, the selected Ethernet interface will adapt to the settings of the profile. An Active profile has a green circle in front of it; an inactive profile has a grey circle in front of it.

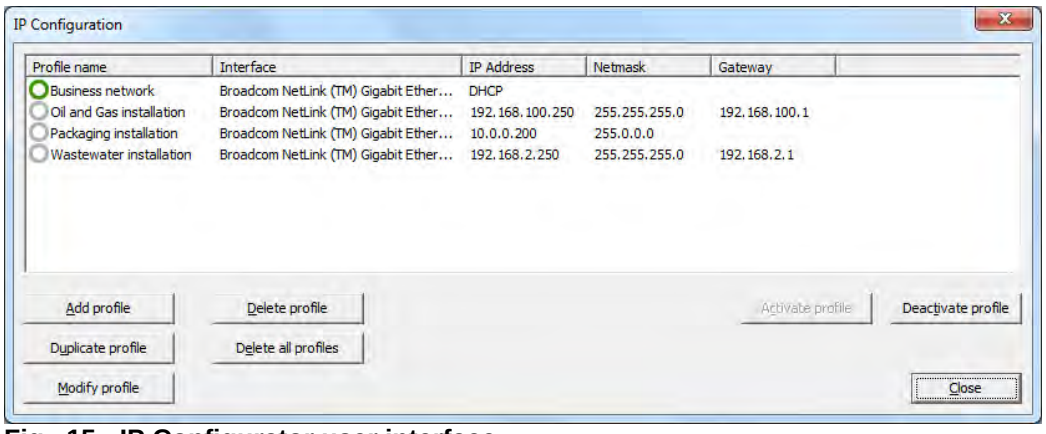


Fig. 15 - IP Configurator user interface

When adding a new profile, you have to enter a profile name and select which interface should be used for it. If you select DHCP, the IP Address, Netmask and Gateway can be left blank. If you don't select DHCP, you have to enter an IP address and Netmask. The Gateway is optional.
If you have created one or more profiles and you run Netilities on another laptop or PC, the profiles interfaces should be altered to the interfaces on the new system. A popup window will appear which allows you to fix the interface of each profile. The popup window is shown in **Fig. 16**.

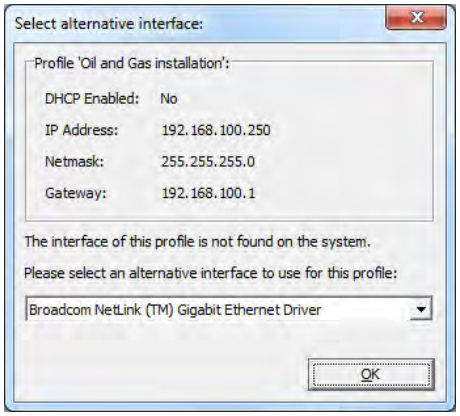


Fig. 16 - Select interface popup

When you close Netilities, all active profiles will be disabled and the original settings of your Ethernet interfaces will be restored.

NOTE: When you change the IP address of an interface, you have to refresh the interfaces' IP addresses in the interfaces window (menu: Interfaces -> Enable/Disable interfaces, then click Refresh).

13 Using ProfiTap

A characteristic of PROFINET is that in the data exchange telegram there is no distinction possible between controller and device telegrams when only sniffing is done using ProfiTap. This makes it impossible to determine certain information.
Normally the "Search for PROFINET devices" button in Netilities can be used to ask all PROFINET devices to identify themselves and to indicate which functionality they have. For this functionality telegrams need to be sent, which is not possible if you only have a ProfiTap.
Therefore it is possible to manually assign functionality to a certain MAC address/device. For the statistics visualization in combination with a ProfiTap, it is necessary to correctly assign the PNIO-Controller. To do this, click on a station in the Live List and then press the right mouse button. A popup will appear in which a functionality can be assigned to the device, see **Fig. 17**. These functionalities can be assigned to a device:

- ❑ Controller
- ❑ Device
- ❑ Multidevice
- ❑ Supervisor

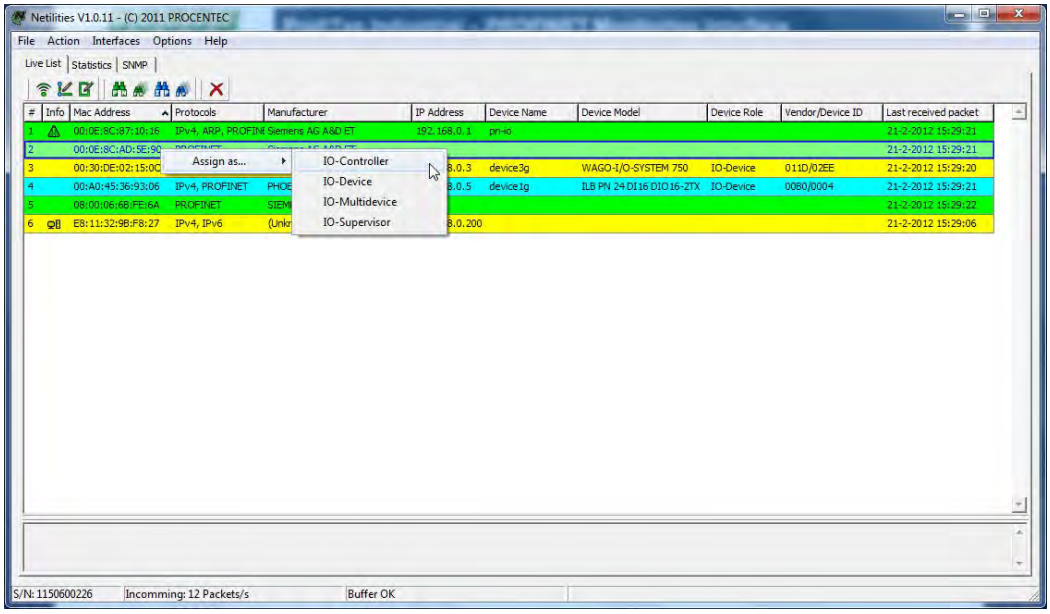


Fig. 17 - Assigning device roles in the Live List

IMPORTANT: There are different modes of operation & situations when doing Ethernet diagnostics, for using ProfiTap this is detailed in the next section.

13.1 Set-up

13.1.1 Only ProfiTap

- All telegrams can be seen, but no telegrams can be sent.
- If the startup procedure of the PNIO-Controller is not captured, the information visible is limited.
- A connection must be broken to insert the ProfiTap cabling

- Basically only a list of devices in data-exchange can be seen.
- Manually assigning functionality is needed.
- SNMP info can NOT be retrieved

Steps:

1. Connect ProfiTap to the USB port.
2. Start Netilities and select the Ethernet interface.
3. Connect the Ethernet cables.
   Preferred location: On PNIO-Controller port.
4. You have to manually assign a MAC address to a functionality:
   Controller, Device, Multidevice, Supervisor in order for the statistics to be visualized correctly.

13.1.2 ProfiTap + PC/Laptop connected to a free port on the PROFINET Switch

- All telegrams can be seen.
- Telegrams can be sent.
  (useful to identify all PROFINET devices & controllers, e.g. DCP functionality)
- A connection must be broken to insert the ProfiTap cabling
- SNMP information can be retrieved.

Steps:

1. Connect ProfiTap to the USB port.
2. Start Netilities and enable both Ethernet interfaces.
3. Connect the Ethernet cables.
   Preferred location: The ProfiTap on the PNIO-Controller port and the PC on a free port of the switch.

14 Tutorial

This chapter contains some exercises to enhance the practical knowledge of Netilities. In order to do these exercises:

- ❑ it is required to connect Netilities, the PC it runs on, to a working installation with a PNIO-Controller that has at least two PNIO-Devices in Data Exchange.
- ❑ to have a tool with which configurations can be created or modified, and uploaded to the PNIO-Controller.

14.1 First steps

14.1.1 Assignment 1: First steps

- ❑ Insert the Netilities dongle in your PC.
- ❑ If Netilities is run for the first time on the PC, or the PC does not have Wireshark installed, install the WinPcap driver supplied with Netilities.
- ❑ Start Netilities from the dongle.
- ❑ Go to menu Interfaces -> Enable/disable interfaces.
- ❑ Select the interface that is connected to the PROFINET installation.

When the software is running, the Live List of the PROFINET installation should be visible.

- ❑ Check the Live List by switching the PLC ON/OFF.
- ❑ Close Netilities when this assignment is ready.

14.1.2 Assignment 2: Create a network drawing

- ❑ Create a drawing of the PROFINET network (finish it within 15 minutes).

Remarks:

- Clearly indicate the location of the devices on the ports of the switch(es). If you want to know which device is on which port, just switch OFF a device and look at the LEDs on the switch.
- Register the MAC addresses of the devices.

14.1.3 Assignment 3: Assessment of the connected devices

- ❑ Start Netilities and enable the network interface.
- ❑ How many IO-Controllers and/or PNIO-Devices does the installation have?
- ❑ Does the Live List correspond with your drawing?

14.2 Netilities Live List

14.2.1 Assignment 4: Interpretation of the Live List colours

Fix each fault after a specific step

- ❑ Switch a PNIO-Device OFF or remove the PROFINET connector and investigate the Live List.
- ❑ Fix all faults after this assignment!

14.2.2 Assignment 5: Changing a device name

- ❑ Change the device name of a PNIO-Device while it is in Data Exchange. *Does this work?*
- ❑ Change the device name of a PNIO-Device in your configuration and use CAPITAL LETTERS and upload the new configuration to the IO-Controller.
- ❑ Investigate the Live List.
- ❑ Change the device name of the PNIO-Device to match the new configuration, but don't use the CAPITAL LETTERS. Investigate the Live List (don't forget to switch the PNIO-Controller OFF/ON).
- ❑ Is the device name case sensitive or not?
- ❑ Change the device name of a PNIO-Device to match another PNIO-Device and investigate the Live List (don't forget to switch the PNIO-Controller OFF/ON).
- ❑ Fix all faults after this assignment!

14.2.3 Assignment 6: Changing an IP-address

- ❑ Change the IP-address of a PNIO-Device while it is in Data Exchange. *Does this work?*
- ❑ Change the IP-address of a PNIO-Device and investigate the Live List (don't forget to switch the PNIO-Controller OFF/ON).
- ❑ Change the IP-address of a PNIO-Device to match another PNIO-Device and investigate the Live List (don't forget to switch the PNIO-Controller OFF/ON).
- ❑ Fix all faults after this assignment!

14.2.4 Assignment 7: Set to factory defaults

- ❑ Reset a device in the Live List. Observe the Live List and see what happens.

14.3 Netilities Statistics

14.3.1 Assignment 8: Current cycle time

- ❑ Investigate the Live List and check if your installation is running according to your configuration.
- ❑ Open the Netilities Statistics.
  When no devices are listed, click on the "Search for PROFINET devices" button.
- ❑ Select "Current cycle time, inputs / outputs (ms)" as the statistic.
- ❑ Investigate the statistics for each device and check whether or not the cycle times correspond with your configuration.

14.3.2 Assignment 9: Alarms

- ❑ Reset all the statistics.
- ❑ Select "Alarms, from device / controller" as the statistic.
- ❑ Investigate the statistics and check they all are 0 / 0.
- ❑ Generate an alarm event (Device lost, Pull/Plug alarm, Plug wrong module) and investigate the statistics.
- ❑ Fix all faults after this assignment and check it with the Live List!

14.4 Netilities SNMP

IMPORTANT NOTE:
SNMP must be supported by all devices and it must be possible to retrieve a MAC-list and/or LLDP information.

14.4.1 Assignment 10: Station interface info

- ❑ Investigate the Live List and check if your installation is running according to your configuration.
- ❑ Open the Netilities SNMP.
- ❑ Start detection.
- ❑ Check if the results of the detection in the Station Interface info correspond with your network drawing.
- ❑ Check the system uptime of your PNIO-Controller.

14.4.2 Assignment 11: Topology detection

- ❑ Open the Topology detection.
- ❑ Expand all nodes.
- ❑ Check if the information displayed at the nodes corresponds with your network drawing.

15 Technical data Netilities Appdongle

To be defined.

16 Frequently asked questions

Why can't Netilities locate any network interfaces?
This probably is because the WinPCap Driver is not started. The easiest way to solve this is to uninstall the WinPCap Driver and to reinstall it again. This time making sure the checkbox "Start WinPCap upon Windows Startup" is checked at the last step before you press Install.

SNMP

SNMP Detecting devices remains at 0%

- This could be because of the TCP/IP settings of your network interface that is used to connect to the PROFINET switch. Check if a correct and free IP-address is configured for the interface, and it is in the same range as the PROFINET installation. An indication for this is the IP-range shown in Netilities is set to 0.0.0.0/255.255.255.0.
- The mirror port of the switch does not have the capability to send telegrams. In this situation Netilities is unable to retrieve SNMP information.
  This can be fixed by using a ProfiTap and connecting your PC to a free port on the PROFINET Switch, see chapter 8 "Using ProfiTap" for more information.

SNMP Topology detection does not show a topology
This could be because of one or more switches that have not been assigned an IP-address. Most probably the PROFINET switch the Netilities PC is attached to. Check if a correct and free IP-address is configured for each switch in the installation, or check if it is a managed switch (a PROFINET switch).

Hardware requirements

Which USB version is supported?
Netilities Appdongle supports high speed USB 2.0.

For the latest FAQ list check out our website!

17 Sales offices and distributors

HEADQUARTERS

PROCENTEC
Klopperman 16
2292 JD WATERINGEN
Netherlands
Tel.: +31-(0)174-671800
Fax: +31-(0)174-671801
Email: info@procentec.com
Internet: www.procentec.com

ARGENTINA

eFALCOM
Alcorta 2411
B1744- Moreno
Buenos Aires
ARGENTINA
Tel.: +54 237 46 31 151
Fax: +54 237 46 31 150
Email: santiago.falcomer@efalcom.com
Internet: www.efalcom.com.ar

AUSTRALIA

IS Systems Pty Limited
14 Laverick Ave., Tomago,
NSW, Australia, 2322
Tel.: +61 2 4964 8548
Fax: +61 2 4964 8877
Email: fritz.woller@issystems.com.au
Internet: www.issystems.com.au

Tyco Flow Control Pacific
1 Percival Road, Smithfield,
NSW, Australia, 2164
Tel.: +61 2 9612 2323
Fax: +61 2 9612 2324
Email: rkoenig@typac.com.au
Internet: www.profibuscentre.com.au

AUSTRIA

Dipl.Ing. Christoph Gudenus
Rotenmuehlgasse 40/5
1120 WIEN
Austria
Tel.: +43 1 812 34 20
Fax: +43 1 812 31 55
Email: office@gudenus.at
Internet: www.gudenus.at

BELGIUM

Bintz Technics N.V.
Brixtonlaan 25,
1930 ZAVENTEM
Belgium
Tel.: +32 2 720 49 16
Fax: +32 2 720 37 50
Email: bloemen@bintz.be
Internet: www.bintz.be

BRAZIL

Westcon Instrument. Indl Ltda
Rual Alvaro Rodrigues, 257
São Paulo – SP
Brazil - CEP 04582-000
Tel.: +55 11 5561-7488
Fax: +55 11 5093-2592
Email: paolo@wii.com.br
Internet: www.wii.com.br

CHILE

RP Ingenieria Limitada
Tucapel 92 oficina 52
Concepción
Chile
Tel.: +56-(0)41-2469350
Fax: +56-(0)41-2522592
Email: rodrigopinto@rpingenieria.cl
Internet: www.rpingenieria.cl

CHINA

PROCENTEC Beijing
Room E-1115 WangJingYuan YouLeHui
ChaoYang
Beijing
CHINA
Tel.: +86(10)84766911 or 84787311
Fax: +86(10)84766722
Email: info@procentec.net
Internet: www.procentec.net

CZECH REPUBLIC

FOXON e-shop
Polní 367
460 01 Liberec 12
Czech Republic
Tel.: +420 484 845 555
Fax: +420 484 845 556
Email: foxon@foxon.cz
Internet: www.foxon.cz

DENMARK

ProSaiCon
Jernbanegade 23B
DK 4000 Roskilde
Denmark
Tel.: +45 70 20 52 01
Fax: +45 70 20 52 02
Email: hfj@prosaicon.dk
Internet: www.prosaicon.dk

FINLAND

Hantekno Oy
Kalliotie 2
FIN-04360 Tuusula
Finland
Tel.: +358 40 8222 014
Email:info@hantekno.com
Internet: www.hantekno.fi

FRANCE

AGILiCOM
Bâtiment B
1, rue de la Briaudière
Z.A. La Châtaigneraie
37510 BALLAN-MIRE
France
Tel.: +33 247 76 10 20
Fax: +33 247 37 95 54
Email: jy.bois@agilicom.fr
Internet: www.agilicom.fr

GERMANY

PROCENTEC GmbH
Benzstrasse 15
D-76185 Karlsruhe
Germany
Tel.: +49-(0)721 831 6630
Fax: +49-(0)721 831 66329
Email: info@procentec.de
Internet: www.procentec.de

INDIA

U L ELECTRODEVICES P LTD
NIRMAN CLASSIC ,
KATRAJ-KONDHWA ROAD,
KATRAJ, PUNE-411046
India
Tel.: +91-202 696 0050
Fax: +91-202 696 2079
Email: dileep.miskin@ulepl.com
Internet: www.ulepl.com

IRELAND

PROFIBUS Ireland
University of Limerick
National Technology Park, Plassey
LIMERICK, Ireland
Tel.: +353-61-202107
Fax: +353-61-202582
Email: info@profibus.ie
Internet: www.profibus.ie

ITALY

C.S.M.T Gestione S.C.A.R.L.
via Branze n. 43/45
25123 BRESCIA
Italy
Tel.: +39 030 6595111
Fax: +39 030 6595000
Email: profibus@csmt.it
Internet: profibus.csmt.it

Genoa FIELDBUS Competence Centre
Via Greto di Cornigliano, 6R/38
16152 GENOVA
Italy
Tel.: +39 010 86 02 580
Fax: +39 010 65 63 233
Email: procentec@gfcc.it
Internet: www.gfcc.it

JAPAN

TJ Group
C/O Japanese PROFIBUS Organisation
West World Building 4F
3-1-6 Higashi-Gotanda,
Shinagawa-ku, TOKYO
Japan
Tel.: +81-3-6450-3739
Fax: +81-3-6450-3739
Email: info@profibus.jp

KOREA

Hi-PRO Tech. Co., Ltd.
#2802, U-Tower, 1029
Youngduk-dong, Giheung-gu
Yongin-Si, Kyunggi-do,
446-908 KOREA
Tel.: +82 82-31-216-2640
Fax: +82 82-31-216-2644
Email: chays@hiprotech.co.kr
Internet: www.profibus.co.kr

LEBANON

Industrial Technologies S.A.L (ITEC)
Point Center, Boulevard Fouad Chehab,
Sin El Fil
BEIRUT
Tel.: +961 1 491161
Fax: +961 1 491162
Email: sales@iteclb.com
Internet: www.iteclb.com

NETHERLANDS

PROCENTEC B.V.
Klopperman 16
2292 JD Wateringen
Tel.: +31-(0)174-671800
Fax: +31-(0)174-671 801
Email: info@procentec.com
Internet: www.procentec.com

POLAND

INTEX Sp. z o.o.
ul. Wincentego Pola 16
44-100 GLIWICE
Poland
Tel.: +48 32 230 75 16
Fax: +48 32 230 75 17
Email: intex@intex.com.pl
Internet: www.intex.com.pl

ROMANIA

S.C. SVT Electronics S.R.L.
Brăila 7
540331 Tg-Mure
Romania
Tel.: +40 365 809 305
Fax: +40 365 809 305
Email: sajgo.tibor@svt.ro
Internet: www.svt.ro

SAUDI ARABIA

asm establishment
Al-Zahra Dist. – Attas st.
cross section with helmy Kutby St.
Villa no.25
JEDDAH-21553
Tel.: +966 2 691 2741
Fax: +966 2 682 8943
Email: info@asmestablishment.com
Internet: www.asmestablishment.com

SINGAPORE

ISEP (S) Pte Ltd
Blk 3015A, #07-12,
Ubi Road 1,
Singapore 408705
Tel.: +65-6356 4237
Fax: +65-6844 4265
Email: stevenkee@ise-p.com
Internet: www.ise-p.com

SLOVAKIA

ControlSystem s.r.o.
Stúrova 4
977 01 BREZNO
Tel.: +421 486115900
Fax: +421 486111891
Email: jan.snopko@controlsystem.sk
Internet: www.controlsystem.sk

SOUTH AFRICA

IDX ONLINE CC
1 Weaver Street, Fourways
JOHANNESBURG
South Africa
Tel.: +27(11) 548-9960
Fax: +27(11) 465-8890
Email: sales@idxonline.com
Internet: www.idxonline.com

ER-SOFT, SA
Av. Constitucion, 4
E-28230 Las Rozas,
MADRID
Tel.: +34 916.408.408
Fax: +34 916.408.409
Email: info@er-soft.com
Internet: www.er-soft.com

SWEDEN

P&L Nordic AB
Box 252,
S-281 23 HÄSSLEHOLM
Sweden
Tel.: +46 451 74 44 00
Fax: +46 451 89 833
Email: hans.maunsbach@pol.se
Internet: www.pol.se/profibus

SWITZERLAND

Hochschule für Technik und Informatik
PROFIBUS Kompetenzzentrum
Jlcoweg 1
CH-3400 BURGDORF
Switzerland
Tel.: +41 (0) 34 426 68 32
Fax: +41 (0) 34 426 68 13
Email: max.felser@bfh.ch
Internet: www.profitrace.ch

Endress+Hauser Process Solutions
Kägenstrasse 2
CH-4153 REINACH / BL1
Switzerland
Tel.: +41 (0) 61 715 73 00
Fax: +41 (0) 61 715 73 01
Email: michael.ulrich@solutions.endress.com
Internet: www.solutions.endress.com

TAIWAN

Full Data Technology
6F., No.200, Gangqian Rd.,
Neihu District, Taipei City
114, Taiwan
Tel.: +886-2-87519941/9097
Fax: +886-2-87519533
Email: sales@fulldata.com.tw
Internet: www.fulldata.com.tw

TURKEY

Emikon Otomasyon
DES Sanayi sitesi 103 sokak B-7 blok No:16
Yukari Dudullu / Umraniye
Istanbul 34776
Turkey
Tel.: +90 216 420 8347
Fax: +90 216 420 8348
Email: tolgaturunz@emikonotomasyon.com
Internet: www.emikonotomasyon.com

NORWAY

AD Elektronikk AS
Boks 641
N-1401 SKI
Norway
Tel.: +47 64 97 60 60
Fax: +47 64 97 60 70
Email: kai@ade.no
Internet: www.ade.no

SPAIN and PORTUGAL

LOGITEK, S.A
Ctra. de Sant Cugat, 63 Esc. B Planta 1ª
Rubí (BARCELONA), 08191
Tel.: +34 93 588 67 67
Email: xavier.cardena@logitek.es
Internet: **www.logitek.es**

UNITED ARAB EMIRATES

Adaptive Technologies LLC
Shed No. 2, Saeed Al Dafoos Building
Al-Quoz, DUBAI
Tel.: +971 4 3386606
Fax: +971 4 3386607
Email: sanu@adaptivellc.com

UNITED KINGDOM

Verwer Training & Consultancy
5 Barclay Road
Poynton, Stockport
Cheshire SK12 1YY
Tel.: +44 (0)1625 871199
Email: andy@verwertraining.com
Internet: www.verwertraining.com

Hi-Port Software Limited
The Hub 2 Martin Close
Lee-on-Solent, Hampshire
PO13 8LG
Tel.: +44 (0)8452 90 20 30
Fax: +44 (0)2392 552880
Email: sales@hiport.co.uk
Internet: www.hiport.co.uk

Saftronics Limited
Pearson Street, Leeds
LS10 1BQ
Tel.: +44 (0)113 245 7170
Fax: +44 (0)113 236 4010
Email: ian.robinson@saftronics.co.uk
Internet: www.saftronics.co.uk

iTech
Unit 1
Dukes Road
Troon, Ayrshire KA10 6QR
Tel.: +44 (0)1292 311 613
Fax: +44 (0)1292 311 578
Email: sales@itech-troon.co.uk
Internet: www.itech-troon.co.uk

UNITED STATES

Grid Connect Inc.
1630 W. Diehl Road
Naperville, Illinois 60563
USA
Tel.: +1 630 245-1445
Fax: +1 630 245-1717
Email: sales@gridconnect.com
Internet: www.gridconnect.com/procentec.html

18 Products and spare parts

Component	Order code	Remarks
Netilities basic	39020	• USB Appdongle containing Netilities and license.
 **ProfiTap**	513-00011A	• ProfiTap • USB cable • Hookup cable • Software and drivers • Manual

19 Glossary

CRC	Cyclic Redundancy Check.
CSV	Comma Separated Values. A file format frequently used for exporting information in an easy to understand format.
Data Exchange	The state of a PNIO-Device after parameterization and configuration has been completed, in which it cyclically exchanges I/O data with an IO-Controller. Normally the PNIO-Device stays forever in Data Exchange until the bus communication or device are stopped.
DIN	German Institute for Standardization (www.din.de).
Electromagnetic Compatibility	See *EMC*.
EMC	The extent to which an electric or electronic device will tolerate electrical interference from other equipment (immunity), and will interfere with other equipment. Within the European Community as well as in other countries it is regulated by law that electric and electronic components and equipment comply with basic standards such as IEC 61000-6-2 or IEC 61326 or corresponding individual product standards.
End Delimiter	This byte identifies the end of a PROFIBUS message and has a fixed value of 16 Hex.
FCS	*See Frame Check Sequence.*
Frame Check Sequence	It is a field in the PROFIBUS message that holds a checksum to check the integrity of the message. It is simply the sum of the bytes. Checksum = (DA + SA + FC + DU) mod 256. This is simply the bytes added together and divided by FF Hex (255). This is an integrated function that is normally performed by the PROFIBUS ASIC.
GSD file	Generic Station Description. It is provided by the device manufacturer and contains a description of the PROFIBUS or PROFINET device. GSD files provide a way for an open configuration tool to automatically get the device characteristics.
GSDML file	A GSD file based on XML. This is always used for PROFINET.
IRT	Isochronous Real Time.

Jitter	The cycle times may differ slightly from one to another. This phenomenon is called **jitter**. For PROFINET Jitter is the unwanted variation in the cycle time that could jeopardize real-time performance. For IRT communication the jitter must be less than 1µs, for all cycle times. For RT communication the jitter must be below 15% of the cycle time.
LAN	Local Area Network.
Live List	The Live List is a matrix that lists all the available devices. It is directly visible which devices are active, in data exchange and which devices are inactive. With different background colours, the status of the devices is displayed.
MAC address	Media Access Control address, a unique identifier assigned to network interfaces for communications on the physical network segment.
PCB	Printed Circuit Board.
PI	PROFIBUS International. The International PROFIBUS Organization based in Karlsruhe.
PNO	PROFIBUS Nutzer Organization. The German PROFIBUS Organization based in Karlsruhe.
ProfiTap	ProfiTap Industrial is an interface to perform monitoring on PROFINET networks.
SNMP	Simple Network Management Protocol (SNMP) is an Internet-standard protocol for managing devices on IP networks.
Switch	A computer networking device that connects network segments.
Topology	In a communications network, the pattern of interconnection between network nodes; e.g. bus, ring, star configuration.
WinPcap	WinPcap is the industry-standard tool for link-layer network access in Windows environments: it allows applications to capture and transmit network packets bypassing the protocol stack, and has additional useful features, including kernel-level packet filtering, a network statistics engine and support for remote packet capture.
WLAN	Wireless LAN.
XML	eXtensible Markup Language.

20 About PROCENTEC

PROCENTEC is an independent company, concentrating all its products and services on PROFIBUS and PROFINET technology. Our main business is the export of in-house developed automation products through our worldwide distributor network. PROCENTEC is also providing vendor independent training and support to end-users.

We are an international PROFIBUS and PROFINET Competence/Training Center with all the required expertise available to realize our projects and services. We have the availability of some real experts whose knowledge makes us unique in the world. Because of our international recognition we are often contracted and offer a wide range of commercial services (consultancy, training, commissioning, maintenance and troubleshooting). PROCENTEC has 2 offices; the headquarters is based in The Netherlands and a sales office is located in Germany.

Testlab
PROCENTEC runs 1 of the 8 accredited test laboratories for the certification of PROFIBUS devices. In our laboratory vendors can have their products tested on PROFIBUS compatibility.

Product development and export
We develop in house PROFIBUS and PROFINET products that are being exported through our worldwide distributor network. Especially in the area of maintenance tools we have gained a unique market position.

Democenter
We have a demonstration facility, which is used for support, training, demonstrations, engineering and trade fairs. It consists of more than 250 devices from more than 40 vendors.

Training and Education
PROCENTEC is very successful with its training program. Up to now, more than 4000 participants have received a certificate. The costs incurred for engineering, assembly, commissioning and maintenance always play a key role when choosing a fieldbus. We train our participants that the implementation of PROFIBUS and PROFINET can help to cut costs in all areas. Our practical experience is the key factor! PROCENTEC offers different types of PROFIBUS and PROFINET training modules which are organised on a regular basis.

PROCENTEC is a professional organisation, which is involved in PROFIBUS and PROFINET technology 24-hours a day. It has the availability of experts who are constantly deployed worldwide. Not only is the tried and tested automation technology ideal for the use in both Factory and Process automation, but support is also ensured through the products and services of PROCENTEC.

www.procentec.com

21 Certificates

QualityMasters
ISO Certificering

certificate

QualityMasters hereby declares that

Procentec B.V.
Wateringen

has a management system that meets the requirements of the standard

NEN-EN-ISO 9001:2008

for the scope

Providing training courses, technical support, product development and the exploitation of the test laboratory.

Date of original approval	10-02-2003
Date of issue	10-04-2013
Valid until	10-02-2016
Certificate number	NL 6313uk

On behalf of Stichting QualityMasters,

CONTROLLED
COMMISSIE WAARBORGING ONAFHANKELIJKHEID

571718

N.B. The failure to meet the conditions as set forth in the certification agreement, or non-compliance with the given standard and/or guidelines, may lead to the suspension or cancellation of the certificate.
This certificate remains the property of Stichting QualityMasters, Nieuwland Parc 157, 3351 LJ Papendrecht.

PI PROFIBUS • PROFINET

Certificate
for a PI Competence Center

PI confirms that

PROCENTEC
Dennis van Booma
Turfschipper 41
2292 JC Wateringen
THE NETHERLANDS

is a fully accredited PI Competence Center for PROFINET basic.

This certificate is granted according to the Quality of Services Agreement for PI Competence Centers and is valid until December 31, 2013.

(Official in Charge)

Chairmen of PI

(Jörg Freitag, Chairman)

(Michael J. Bryant, Deputy Chairman)

PROFINET®

PI PROFIBUS • PROFINET

Certificate
for a PI Training Center

PI confirms that

PROCENTEC
Turfschipper 41
2292 JC Wateringen
THE NETHERLANDS

is a fully accredited PI Training Center for
PROFINET Installers & Engineers.

Instructors:

Dennis van Booma	Elmer Vis	Mark de Brabander
Dave van Cappelle	Fedor Meyer	Paulo Silva
Joost van der Nat	Sander Vermin	Alois Schenkeveld
Edward Dumay	Aad Onderwater	

This certificate is granted according to the Quality of Services Agreement for PI Training Centers and is valid until December 31, 2014.

(Official in Charge)

Chairmen of PI

(Karsten Schneider, Chairman)

(Michael J. Bryant, Deputy Chairman)

PROFINET®

PI
PROFIBUS • PROFINET

Certificate

Authorization as PI Test Laboratory for PROFIBUS

PROFIBUS Nutzerorganisation e.V. accepts
PROCENTEC
Turfschipper 41
2292 JC Wateringen
The Netherlands

as authorized PI Test Laboratory for:

PROFIBUS Slave Devices

PA Profile Devices

The authorization is based on the assessment dated March 20, 2013, and the related assessment report.

The execution of the tests aimed in the PROFIBUS certification shall be conform to the PROFIBUS Standard and the valid guidelines.

This authorization is valid until December 31, 2014.

(Official in Charge)

Board of PROFIBUS Nutzerorganisation e. V.

(K. Schneider) (K.-P. Lindner)

PROFIBUS®

22 Revision History

Version 2.0
- Updated screenshots to the latest version of Netilities
- Added chapter ‘Bargraph’
- Added chapter ‘Saving and Loading’
- Updated chapter ‘Sales offices and Distributors’

Descriptions for new functionality:
> Freeze button
> Buttons in Topology Scan to easily expand and collapse the tree
> MAC-address sorting method for statistics and Bargraph
> Webbrowser-button to easily navigate to the webpage of a device
> Import feature for GSDML-files
> Acyclic reading of info from PN-devices (I&M. configuration etc.)

Version 2.1
- NEW chapter ‘Reporting’.
- Some minor textual changes.
- Changes for Word processor version compatibility issues.

Version 2.2
- New paragraph ‘Main window notification bar’ in paragraph 4.4
- Updated paragraph 4.1 ‘Adding Netilities to the installation’
- Updated paragraph 5.4 ‘Acyclic information’
- Updated paragraph 8.3 ‘Topology detection’
- Updated chapter 21 ‘Certificates’

Version 2.2.1
- Minor textual changes
- Updated chapter ‘Tutorial’
-

23 Next versions

- Detail the SNMP Topology detection chapter with a drawing of an example installation.
- Add a photo of the Netilities Appdongle USB-stick.
- Add technical data of the Netilities Appdongle USB-stick.
- Update all screenshots to the latest version

24 Notes

Other PROCENTEC products

PROFINET Cable Tester

- ✓ Suitable for 4- and 8-wire PROFINET and regular Ethernet cables
- ✓ Suitable for straight and 90°, metal or plastic PROFINET plugs
- ✓ Tests cable shielding
- ✓ Detects short circuits, wire breaks, swaps, miswiring and split pairs
- ✓ Large LCD clearly indicates the test results
- ✓ 150 hours on one 9 V battery
- ✓ Operating temperature: 0 to 50 °C
- ✓ Just 1-key-press to start continuous testing
- ✓ It can also test telephone and coax cable

www.profinetcabletester.com

Compact PROFIBUS Repeater

- ✓ Single channel PROFIBUS repeater
- ✓ ent
- ✓ Increased signal strength
- ✓ 12 Mbps
- ✓ Auto baudrate detection
- ✓ Redundant power supply
- ✓ Digital glitch filtering
- ✓ No limit in cascading
- ✓ Integrated switchable termination
- ✓ Diagnostic LEDs
- ✓ DB9 connector for measurements
- ✓ **IP 20 with DIN-rail mounting**

www.procentec.com/profihub/b1/en

Other PROCENTEC products

ProfiHub B5

- ✓ 5 Isolated channels
- ✓ Transparent
- ✓ Increased signal strength
- ✓ 31 devices per channel
- ✓ 12 Mbps
- ✓ 1200 m spur line length
- ✓ No address required
- ✓ Integrated switchable termination
- ✓ LEDs to indicate termination is ON
- ✓ Screw terminals and DB9 connectors
- ✓ **IP 20 with DIN-rail mounting**

ProfiHub A5

- ✓ 5 Isolated channels
- ✓ Transparent
- ✓ Increased signal strength
- ✓ 31 devices per channel
- ✓ 12 Mbps
- ✓ 1200 m spur line length
- ✓ No address required
- ✓ Integrated switchable termination
- ✓ **IP 65 classification**

www.procentec.com/profihub

PROCENTEC
Klopperman 16
2292 JD WATERINGEN
The Netherlands

Tel.: +31-(0)174-671800
Fax: +31-(0)174-671801
Email: info@procentec.com
Web: www.procentec.com