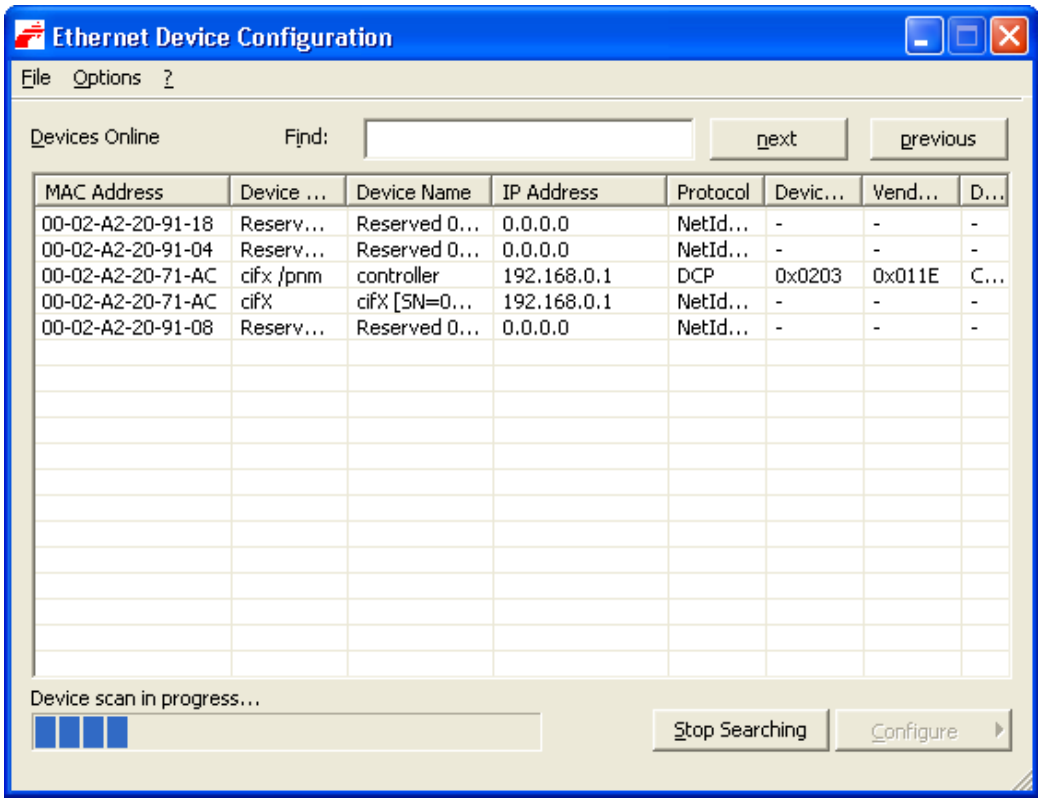
Operating Instruction Manual

Ethernet Device Configuration

Address Setting for Ethernet capable Hilscher Devices



Hilscher Gesellschaft für Systemautomation mbH

www.hilscher.com

DOC050402OI05EN | Revision 5 | English | 2010-12 | Release | Public

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1 Introduction

1.1 About this Manual

This manual describes the program **Ethernet Device Configuration**, by the use of which the IP address as well as a device name (or station name) at Ethernet-capable devices can be adjusted using an Ethernet connection.

These adjustments are necessary to configure a device using the configuration software SYCON.net via the Ethernet connection of the device. For further information refer to section *About Ethernet Device Configuration* on page 9.

1.1.1 Online Help

Ethernet Device Configuration contains an integrated online help.

- In order to invoke the online help, click **Help** or press the **F1** key.

1.1.2 List of Revisions

Index	Date	Version	Component	Chapter	Revisions
1	29.04.05	V1.000, V1.000	ENDevCfgApp.exe, ENDevCfg.ocxx	all	created
2	04.07.06	V1.103.0, V1.1.0.1	ENDevCfgApp.exe, ENDevCfg.ocxx		DCP added
3	12.08.10	V1.1.x.x	ENDevCfgApp.exe	all	Adaption to new document layout and new GUI of program.
4	28.10.10	V1.1.x.x	ENDevCfgApp.exe	all	Final corrections
5	07.12.10	V1.1.x.x	ENDevCfgApp.exe	1.3, 2, 2.2.3, 3, 4	Section *About Ethernet Device Configuration*: Note added, revised, Chapter *How to start* revised, Section *Select Network Devices for Scan*: Note added, revised, Chapter *Searching Devices* and *Adjusting Addresses*: Descriptions completed for the columns **Device ID**, **Vendor ID** and **Device role** newly added in the **Ethernet Device Configuration** window, revised.

Table 1: List of Revisions

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1.1.3 Conventions in this Manual

Operation instructions, a result of an operation step or notes are marked as follows:

Operation Instructions:

➢ <instruction>

Or

1. <instruction>
2. <instruction>

Results:

<result>

Notes:

Important: <important note>

Note: <note>

<note, were to find further information>

Positions in Figures

The *Positions* ①, ②, ③ **...** or ⓐ, ⓑ, ⓒ **...** or Ⓐ, Ⓑ, Ⓒ **...** refer to the figure used in that section. If the numbers reference to a section outside the current section then a cross reference to that section and figure is indicated.

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1.3 About Ethernet Device Configuration

Using **Ethernet Device Configuration** the IP address or the device name (or station name) at Ethernet-capable Hilscher devices can be adjusted. The identification of devices is done via the *NetIdent protocol* or the *DCP protocol*.

Note:
The *NetIdent protocol* is only supported by Hilscher devices. It is used to identify TCP/IP devices and to set IP addresses.
The *DCP protocol* is supported by PROFINET compatible devices. It is used to identify PROFINET compatible devices and to set the station name and the IP address of this devices.

1.4 Requirements

System Requirements

- Windows® 2000/ Windows® XP
- DVD ROM drive
- Free memory on hard disk: 2 MByte
- Graphic resolution: min. 1024 x 768 pixel
- Keyboard and Mouse

Prerequirement for the used Devices

The used Ethernet device must support the Hilscher *NetIdent protocoll* or the DCP *protocol* and it must be connected to the PC network.

1.5 Installation

Ethernet Device Configuration is delivered and installed with the configuration software SYCON.net.

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2 How to start

Start **Ethernet Device Configuration** using one of the three possibilities described hereafter:

- Use the commands.

➢ Threfore select **Start > All programs > SYCON.net system configurator >Ethernet device setup**.

- Or invoke **Ethernet Device Configuration** directly.

➢ Therefore invoke in the installation directory „*ENDevCfgApp.exe*“, e. g. *C:\programs\Hilscher GmbH\SYCONnet\EthernetDeviceConfig\ ENDevCfgApp.exe*

- Or use the DOS Box:

➢ Therefore first select **Start > Programs > Accessories > Command Prompt**.

➢ Then enter the path: `C:\Programs\Hilscher GmbH\SYCONnet\EthernetDeviceConfig`

➢ For the language selection *Englisch* enter only the application name without a parameter: `ENDevCfgApp.exe`

➢ Or for the language selection *German* enter the application name and pass a parameter:
`ENDevCfgApp.exe /i1031`

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2.1 Initial Screen

Ethernet Device Configuration starts with the following dialog window:

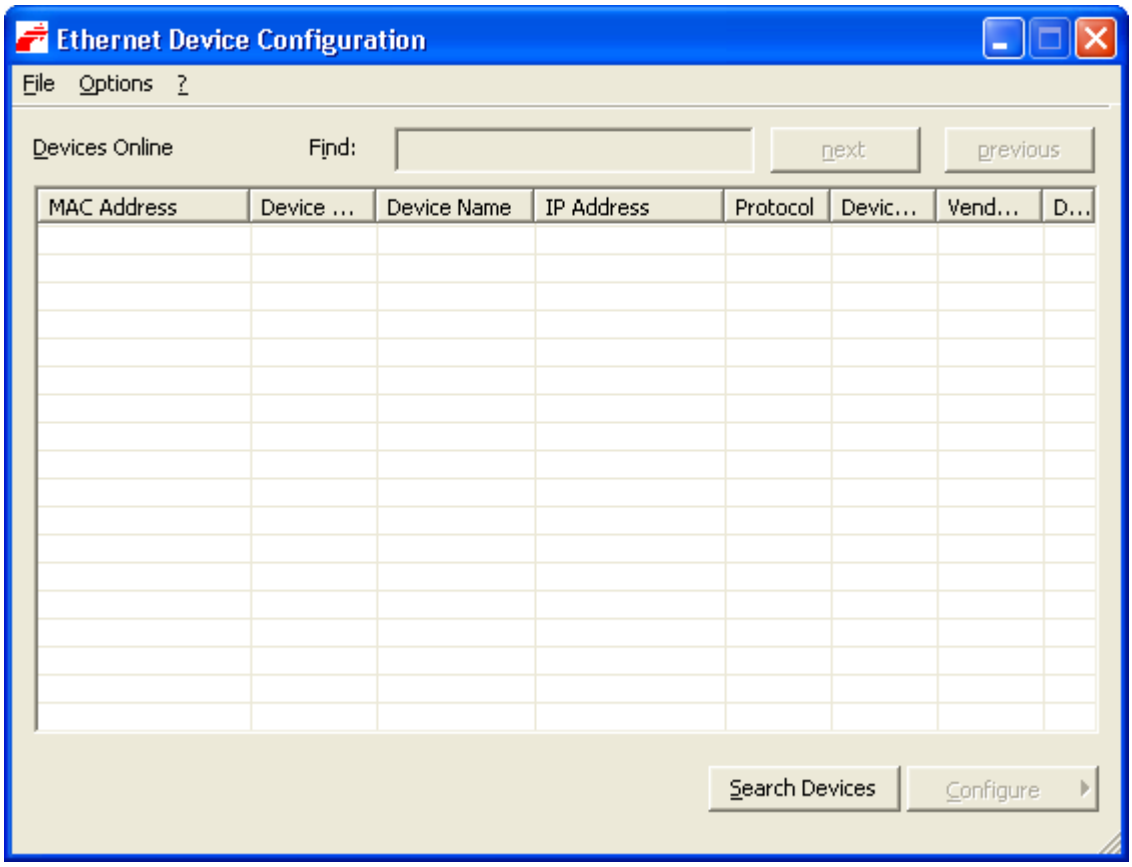

Figure 1: Initial Screen Ethernet Device Configuration

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2.2 Settings

Note: The settings which you adjust for the **Language**, the **Protocols** and the **DCP Configuration** will also be valid when invoking the program again.

2.2.1 Select Language

You can select the language **English** or **German** for the graphical user interface. Select the language as follows:

1. Select under **Options > Language**.

Figure 2: Language Selection

- The current language is marked with a hook (*see position* ① *in the figure above*).

2. To change the language, select the alternative language entry ②.

2.2.2 Select Protocol

Select the protocols to be used for searching for Ethernet-capable devices and for configuring those devices.

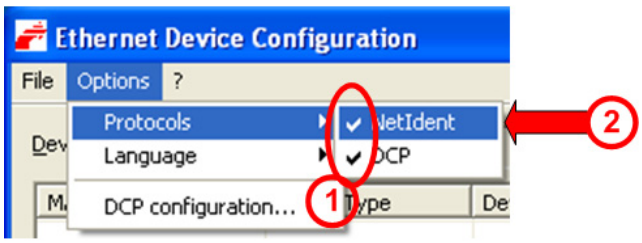

Figure 3: Protocol Selection

- The activated protocol is marked with a hook.
- In the figure above both protocol types are activated ①.

➢ Select under **Options > Protocols >** [*Protocol name*] ②.

Note: If you do not know, to which protocol the devices will react, simply select both protocols.

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2.2.3 Select Network Devices for Scan

Note: Using the *DCP protocol* to scan for devices, the network devices to be used for the scan must be selected manually. When using the *NetIdent protocol*, by default all network devices in the PC are used to scan for devices.

Here you can adjust for the *DCP protocol* which network devices of the PC shall be used for the Scan.

Figure 4: Open DCP Configuration

1. Select **Options > DCP configuration...**.

➘ The following dialog window opens:

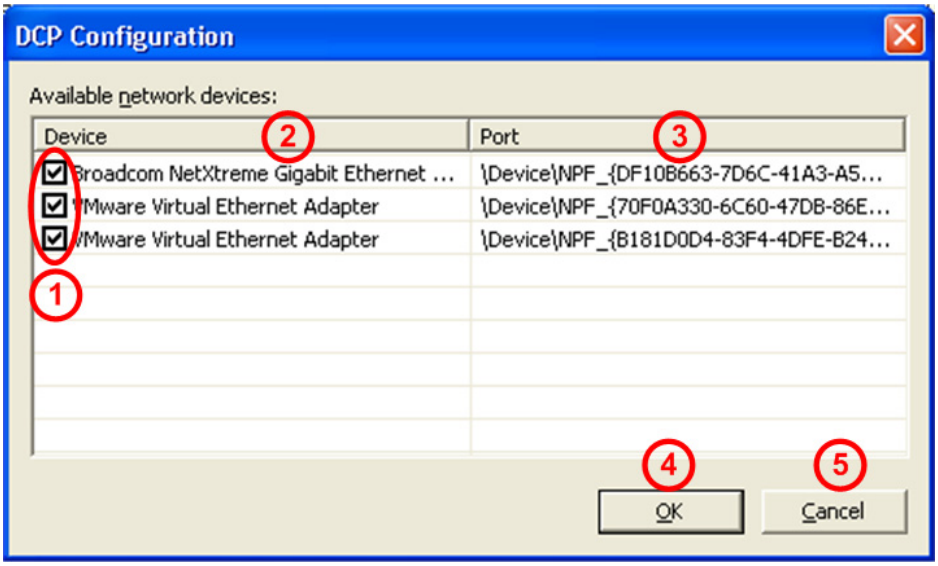

Figure 5: DCP Configuration, Selection of Ethernet Connection (Network Device)

In the dialog **DCP Configuration**:

2. Under **Device** ① check the network devices to be used with the *DCP protocol* at the scan.

➘ Under **Device** ② the *name* and under **Port** ③ the *port number* of the network devices of your PC are displayed.

3. Leave the dialog via **OK** ④ with taking over of all settings you made.

4. Or leave the dialog with **Abort** ⑤ without taking over any settings you made.

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3 Searching Devices

➢ In order to search for devices, click at **Search Devices** (*see position* 12 *in the following figure*) in the initial screen **Ethernet Device Configuration**.

↬ The Ethernet network connected to the PC is searched for devices reacting to the *DCP protocoll* or to the *NetIdent protocol*. If devices are found, they are listed in the following manner.

Stop Searching stops the search.

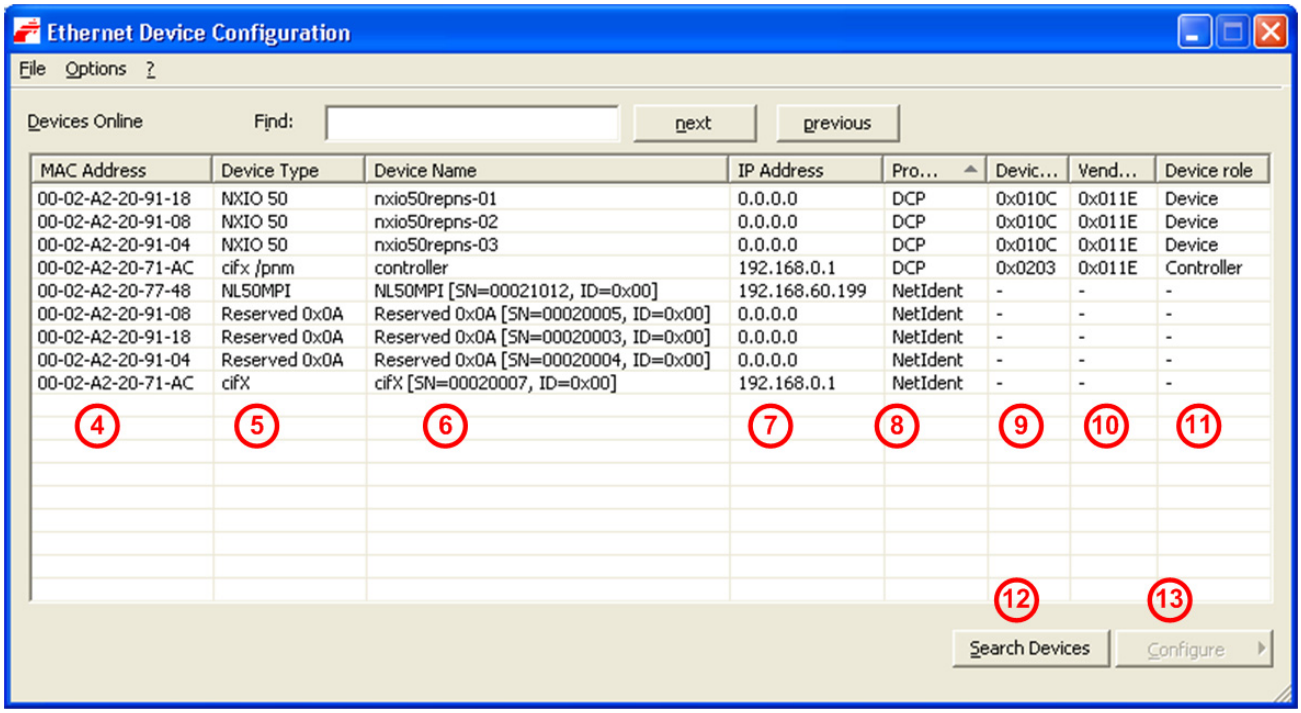

Figure 6: Found Devices

In the table in the figure above you can find the following information:

Item	**Position**	**Meaning**	*Display DCP*	*Display NetIdent*	**Value / Range of Value**
MAC Address	4	The MAC Address (=MAC-ID) is on delivery the unique (physical) Ethernet address of the device fixed by the manufacturer of the device.	*MAC Address*	*MAC Address*	
Device type	5	Name for the device that is stored non-volatile on the device.	*Device type*	*Device type*	
Device name	6	Device name that can be set via **Configure** 13. The device name must match to the PROFINET specification [3] for the “Name of Station”.	*Device name (=station name)*	*Device name, serial number, or ID*	Character string, 1 ... 240 characters

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Item	Position	Meaning	*Display DCP*	*Display NetIdent*	**Value / Range of Value**
IP-Address	(7)	IP-Address of the device that can be set via **Configure** (13). The IP address must be unique and must fit to the used network. The IP address 0.0.0.0 indicates that no IP address has been adjusted yet.	*IP-Address*	*IP-Address*	valid IP-Address
Protocol	(8)	Protocol by which the device has been found.	*DCP*	*NetIdent*	DCP, NetIdent
Device ID	(9)	Identification number of the device, is fixed by the manufacturer for every device.	*Device ID*	-	0x00000000 ... 0xFFFFFFFF (hex)
Vendor ID	(10)	Identification number of the vendor, assigned by PROFIBUS Nutzerorganisation e. V.	*Vendor ID*	-	0x00000000 ... 0xFFFFFFFF (hex)
Device Role	(11)	Textual description on the function the device has on the network.			"Device", "Controller", "Multidevice", "Supervisor"

Table 2: Parameters of found Devices

First select a line. Then via **Configure** (13) you get to the configuration dialog.

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3.1 Search Device within Table

In order to search the device, proceed as follows:

➢ Put in the string to be searched at **Find** ①.

If the table is large, you can search within the table for any sequence of characters appearing within one single column.

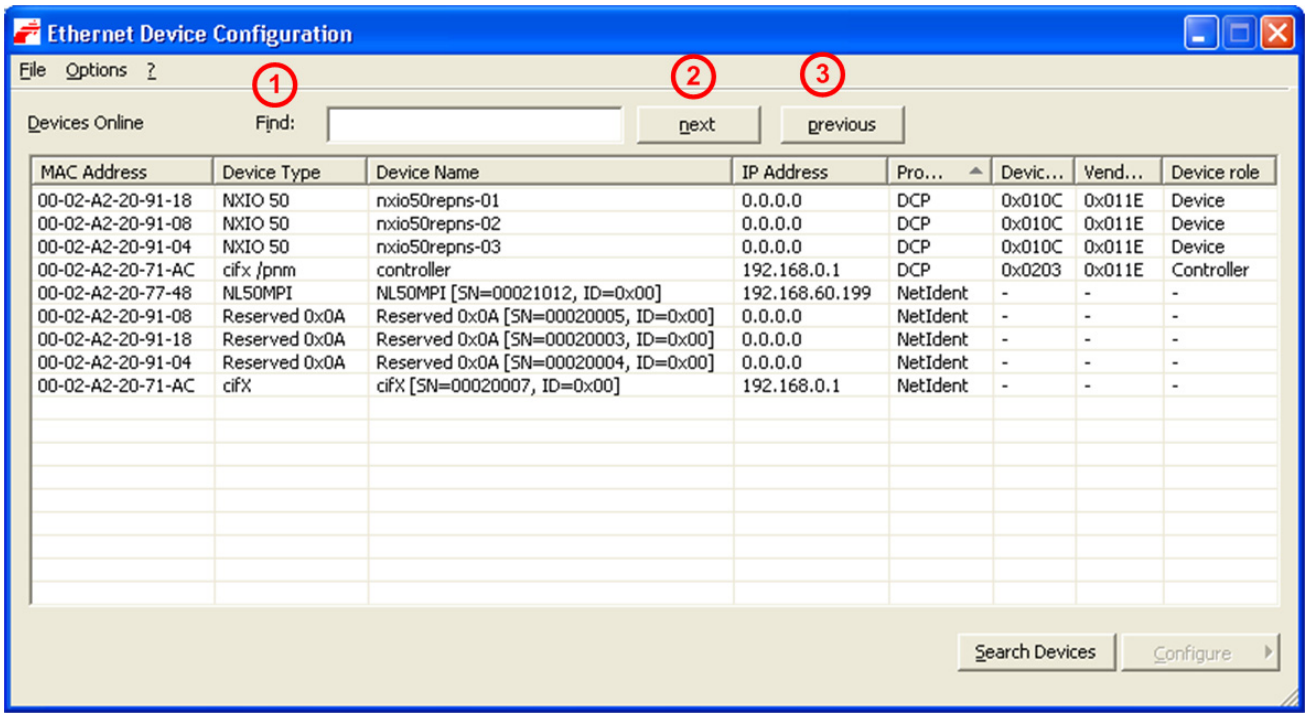

Figure 7: Found Devices

- Using **next** ② you can find the next entry in the table matching the search string (Direction of search: downwards).
- Using **previous** ③ you can find the next entry in the table matching the search criteria (Direction of search: upwards).

Sorting the Table

By a mouse click at a field at the head line of the table, you can force sorting the lines in alphanumerically ascending or descending order according to the entries of the selected column .

➢ To sort the entries within a column, click on the respective column header.

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4 Adjusting Addresses

4.1 Adjust Device Name (Station Name) and IP Address by DCP Protocol

Note: The *DCP protocol* is supported by PROFINET compatible devices. It is used to identify PROFINET compatible devices and to read out or to change the station name and the IP address of this devices.

Using the *DCP protocol* you can newly assign the **IP Address** or the **Station Name** of a device or you can change an already configured IP address or station name. Therefore:

1. Open the initial screen as described in section *How to start* on page 10.
2. Select for the concerned device within the table **Devices Online** the line with the entry "*DCP*" in the **Protocol** column (8).

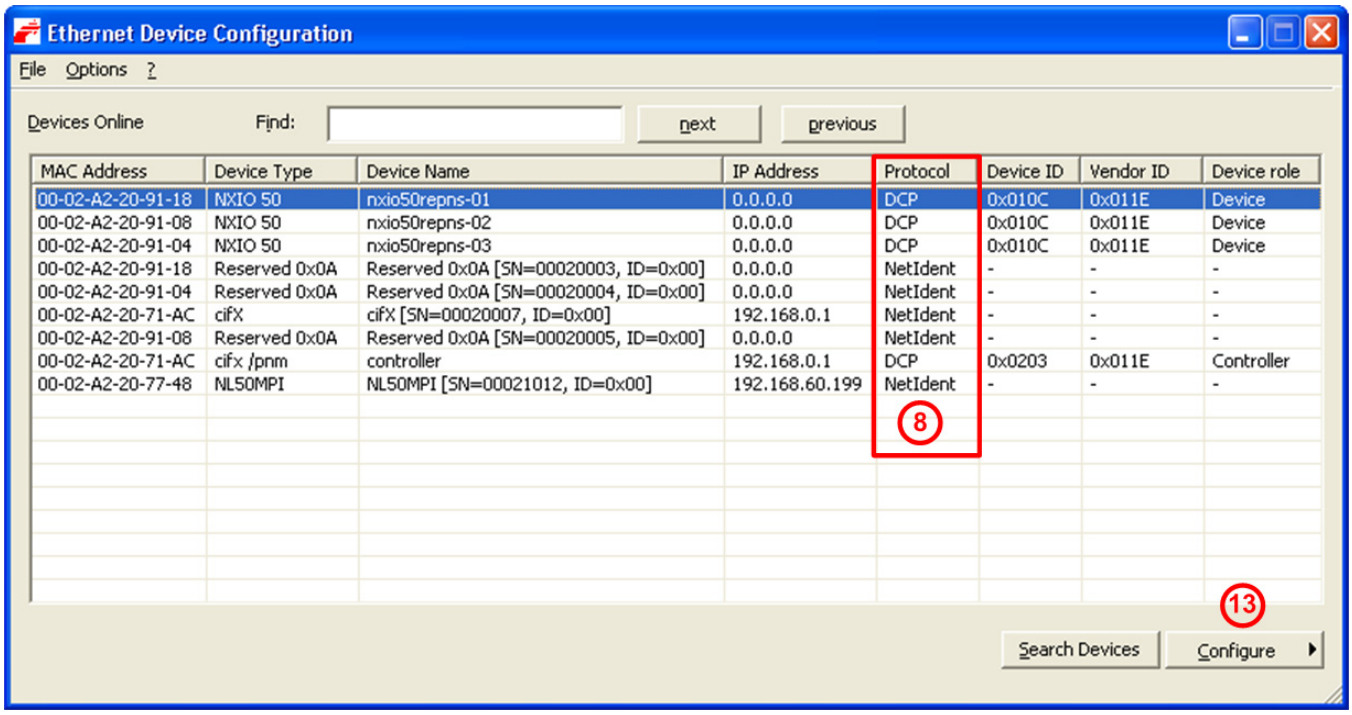

Figure 8: Found Devices, DCP protocol

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3. Open the configuration dialog:

➢ Click **Configure** (13).

➢ Or open the context menu via right click on the table line of the found device.

➢ You have the following **DCP configuration possibilities**:

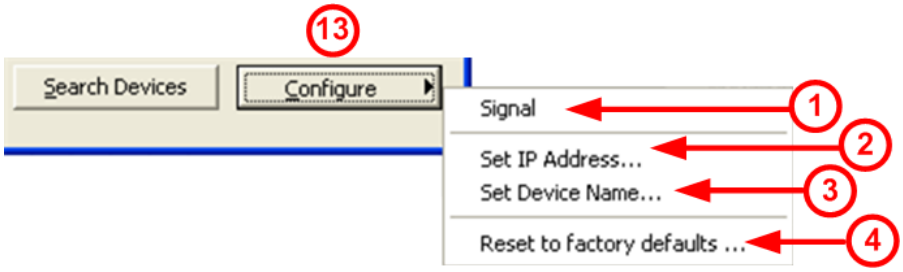

Figure 9: DCP Configuration Possibilities

- **Signal** (1)

  The LED on the selected device blinks. This allows to clearly identifying the device among others.

- **Set IP Address...** (2)

  The dialog window **IP Configuration for …** is displayed, see section *Set IP Address* on page 21.

- **Set Device Name...** (=station name) (3)

  The dialog window **Name Configuration for…** is displayed, see section *Set Device Name* (Station Name) on page 19.

- **Reset to factory defaults...** (4)

  Adjustments made at the device are reset to the factory defaults.

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4.1.1 Set Device Name (Station Name)

Note: The station name must comply with the PROFINET specification [1]. Forbidden signs (e. g. blanks) must not be used in the name.

To set the device name for a device via the *DCP protocol* either for the first time or to change an already present name, proceed as described hereafter:

1. Click **Configure > Set Device Name...** (see figure *DCP Configuration Possibilities* on page 18).

↪ The following dialog window will open:

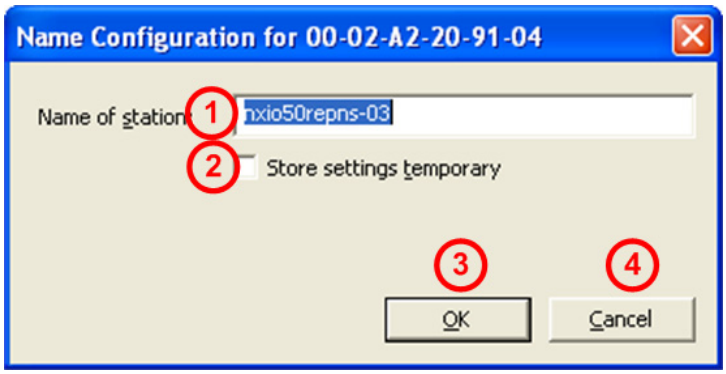

Figure 10: DCP Set Device Name

2. Under **Name of station** ① you can specify the device name according to the PROFINET specification [1].
3. Check **Store settings temporary** ② if the station name should only be stored temporarily (if the used device supports that functionality).
4.

➢ Click **OK** ③, to transmit the settings into the device and to close the **Name Configuration for…** dialog window.

➢ Or click **Cancel** ④ to close the **Name Configuration for…** dialog window without transmitting any settings into the device.

Note: For PROFINET IO Controller devices a change of the device name can be rejected. Then an error message is displayed.

Figure 11: Error when setting Name of Station

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4.1.1.1 Device Name according to PROFINET „Name of Station“ Specification

The device name must comply with the coding rules following excerpt from the PROFINET specification [1] for the „Name of Station“.

A Name of Station:

- has a **length** of *1 ... 240 characters*.
- may consist of one or more **labels**, which are *1 ... 63 characters* long and which are separated by dots.

The point is the separator between labels).

- must contain only **valid characters**:
  a – **z** *lower case letters*,
  0 – **9** *digits*,
  - *Minus sign*,
  . *Point*.
  The *point* is the separator between labels.
  The *minus sign* must not be used as the start or end character.
  The *minus sign* must not be used before or after a dot.
  The *Name of Station* must not begin or end with a point.
  Invalid characters are, for example, capital letters and spaces.

Source [1] (see section *References* on page 29): *PNO document 2722*, section *4.3.1.4.15.1*, on page 10073f.

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4.1.2 Set IP Address

Usually the IP address is statically during the configuration. Later on, the PROFINET IO Controller will assign an IP address via the station name. If the used device supports the IP address assignment via a DHCP server, you can choose between static IP address assignment and taking over the IP address from a DHCP server.

➢ Click **Configure > Set IP Address...** (see figure *DCP Configuration Possibilities* on page 18).

↬ The following dialog window is displayed:

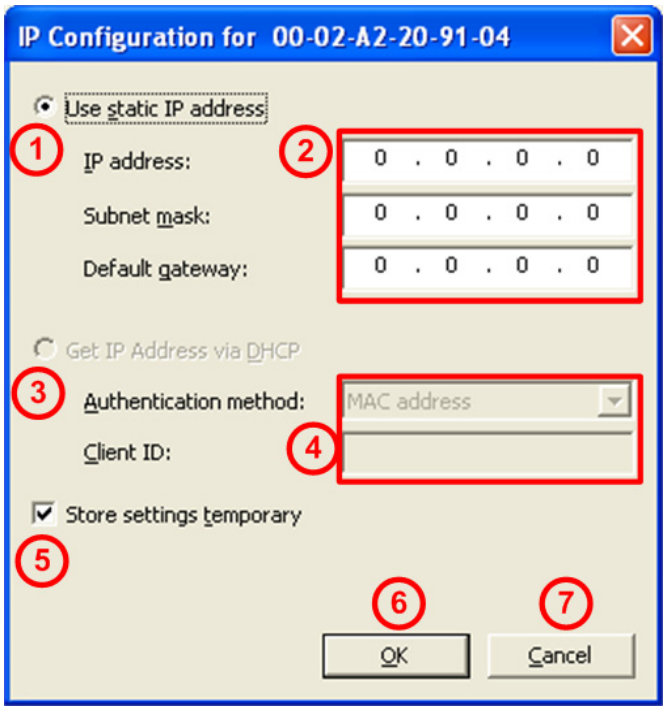

Figure 12: IP Configuration for …

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4.1.2.1 Use static IP address

1. Select **Use static IP address** ①, to adjust the static IP address (see figure *IP Configuration for …* on page 21).

   For the selected device set under ②:

➢ Under **IP address** set the IP address.

➢ Under **Subnet mask** set the Subnet mask.

➢ Under **Default gateway** set the Default gateway.

2.

➢ Check **Store settings temporary** ⑤ to specify whether these settings should be applied to the device temporarily.

Note: If the IP address, subnet mask and gateway address are set "only temporarily", after a device reset the settings are no longer stored in the device.

➢ Or uncheck **Store settings temporary** ⑤ to specify whether these settings should be applied to the device permanently (if the used device supports this).

Note: The PROFINET IO-Controller can assign a new IP address to the PROFINET IO-Device during the start of the PROFINET network.

3.

➢ Click **OK** ⑥, to load the settings into the device and to close the **IP Configuration for…** dialog.

Note: Depending on the device the transfer of the IP address may take some time. During this time the dialog **IP Configuration for…** remains open. Canceling an active transmission via **Cancel** does not guarantee the new IP address setting is being discarded by the device.

➢ Or Click **Cancel** ⑦ to close the **IP Configuration for…** dialog window without loading any settings into the device.

Note: For PROFINET IO Controller devices a change of the IP address can be rejected. Then an error message is displayed.

Figure 13: Error when setting IP Address

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4.1.2.2 Get IP Address via DHCP (for future Applications)

1. Select **Get IP Address via DHCP** ③ (see figure *IP Configuration for …* on page 21).

↬ The area to specify the static IP address is grayed out.

2. Under ④ select how to identify the device, via **MAC Address**, **Device Name** or by **Client ID**.

3.

➢ Check **Store settings temporary** ⑤ to specify whether these settings should be applied to the device temporarily.

➢ Or uncheck **Store settings temporary** ⑤ to specify whether these settings should be applied to the device permanently (if the used device supports this).

Note: The PROFINET IO-Controller can assign a new IP address to the PROFINET IO-Device during the start of the PROFINET network.

4.

➢ Click **OK** ⑥, to load the settings into the device and to close the **IP Configuration for…** dialog.

Note: Depending on the device the transfer of the IP address may take some time. During this time the dialog **IP Configuration for…** remains open. Canceling an active transmission via **Cancel** does not guarantee the new IP address setting is being discarded by the device.

➢ Or click **Cancel** ⑦ to close the **IP Configuration for…** dialog window without loading any settings into the device.

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4.2 Adjust IP Address by NetIdent Protocol

Note: The **NetIdent** protocol is only supported by Hilscher devices. It is used to identify TCP/IP devices and to set IP addresses.

Using the *NetIdent protocol* you can read out the **IP address** from a device or change the IP address. Therefore proceed as follows:

1. Open the initial screen as described in section *How to start* on page 10.
2. Select for the concerned device within the table **Devices Online** the line with the entry "*NetIdent*" in the **Protocol** column (8).

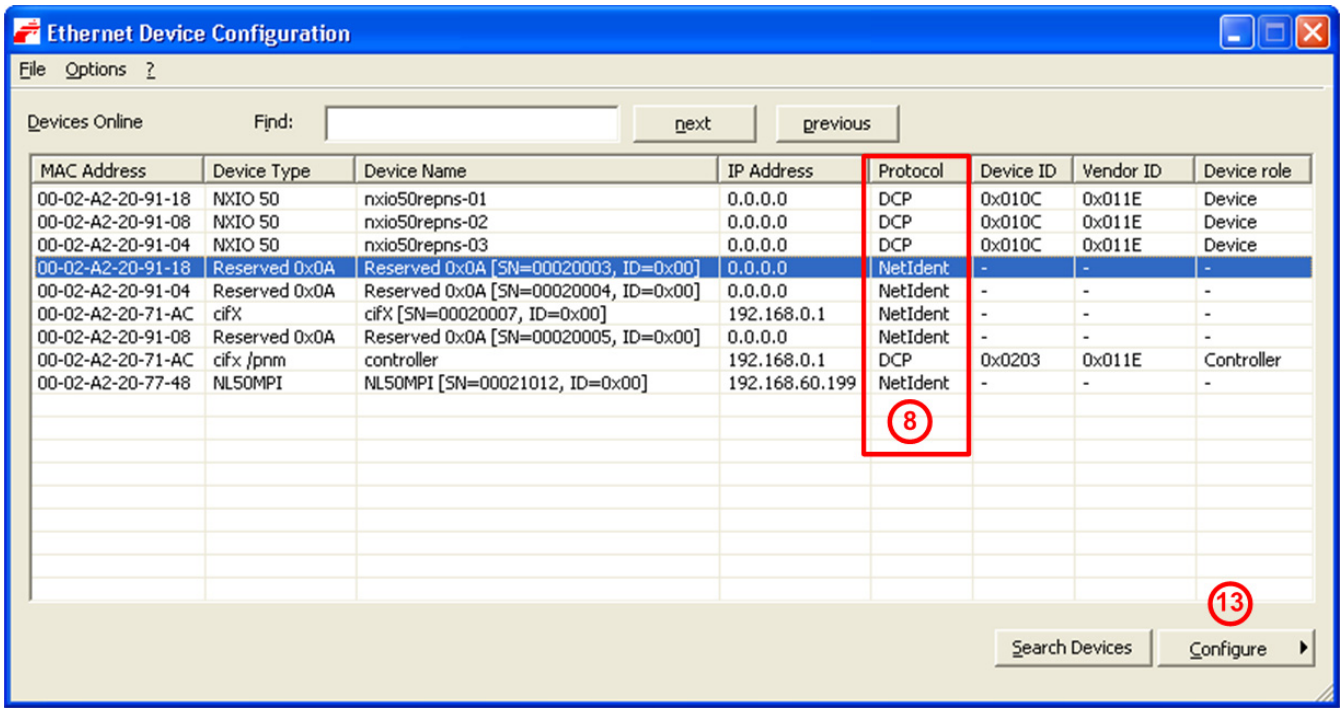

Figure 14: Found Devices, using NetIdent Protocol

3. Click **Configure** (13) **> Set IP address**

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➮ The following dialog window is displayed:

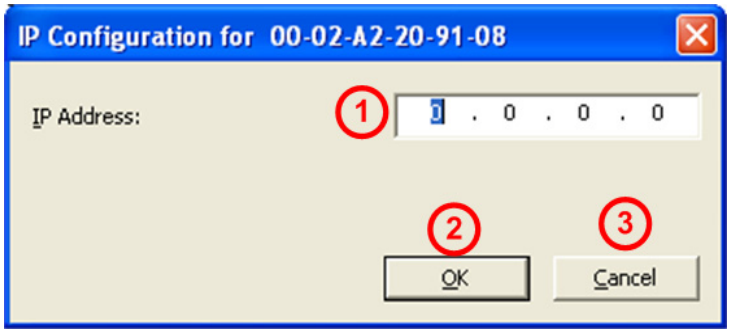

Figure 15: Set NetIdent IP Address.

4. Specify the **IP Address** (1) to be assigned to the device.
5. Click at **OK** (2).

➮ The IP address is transferred to the device.

Note: The IP address is only temporarily adjusted. To save the IP address permanently a configuration must be downloaded. For further information to the configuration download refer to the *SYCONnet_netDevice_en.pdf* user manual.

6. Alternatively, you can leave the dialog by clicking at **Cancel** (3) without any transfer of the data.

Note: Depending on the device the transfer of the IP address can take up to 40 seconds. During this time the dialog remains open. Canceling an active transmission via **Cancel** does not guarantee the new IP address setting is being discarded by the device.

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5 Lists

5.1 List of Figures

5.2 List of Tables

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6 Glossary of Terms

DCP

Discovery and basic Configuration Protocol

The Discovery and basic Configuration Protocol (DCP) is a protocol for identifying and configuring devices which is defined within the PROFINET specification.

Ethernet

A networking technology used both for office and industrial communication via electrical or optical connections. It has been developed and specified by the Intel, DEC and XEROX. It provides data transmission with collision control and allows various protocols. As Ethernet is not necessarily capable for real-time application, various real-time extensions have been developed (Industrial Ethernet, Real-Time Ethernet).

IP

Internet Protocol.

IP belongs to the TCP/IP family of protocols and is defined in RFC791. It is based on layer 3 of the ISO/OSI 7 layer model of networking.

It is a connectionless protocol, i.e. you do not need to open a connection to a computer before sending an IP data packet to it. Therefore IP is not able to guarantee that the IP data packets really arrive at the recipient. On IP level neither the correctness of data nor the consistence and completeness are checked.

IP defines special addressing mechanisms, see IP Address.

IP Address

An IP address is an address identifying a device or a computer within a network using the IP protocol. IP addresses are defined as a 32 bit number. Usually, for ease of notation the IP address is divided into four 8 bit numbers which are represented in decimal notation and separated by points:

a.b.c.d

where a.b.c.d are each integer values between 0 and 255.

Example: 192.168.30.15

However, not all combinations are allowed, some are reserved for special purposes.

The IP address 0.0.0.0 is defined as invalid.

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MAC-ID

MAC = Media Access Control

A MAC-ID is on delivery a unique (physical) Ethernet address of the device.

MAC-IDs are defined as a 48 bit number. Usually, for ease of notation the IP address is divided into six 8 bit numbers which are represented in hexadecimal notation and separated by “minus”-signs (-):

A-B-C-D-E-F

where A-B-C-D-E-F are each integer values between 0 and 255.

Example: 00-02-A2-20-91-18

NetIdent

A protocol for identifying and configuring devices which has been developed by Hilscher and used in several Hilscher products.

PROFINET

A communication system for Industrial Ethernet designed and developed by PROFIBUS International. It uses some mechanisms similar to those of the PROFIBUS field bus.

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7 Appendix

7.1 References

[1] Application Layer protocol for decentralized periphery and distributed automation, Specification for PROFINET, Version 2.2, October 2007, Order No: 2.722, PROFIBUS Nutzerorganisation e.V., Karlsruhe

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