



Operating instruction manual
DTM for EtherNet/IP Scanner devices
Configuration of EtherNet/IP Scanner devices
V1.1100

Hilscher Gesellschaft für Systemautomation mbH
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Table of contents

1	Introduction	5
1.1	About this manual	5
1.1.1	Online help	5
1.1.2	List of revisions	5
1.2	Overview use cases	6
1.3	System requirements	7
1.4	About the EtherNet/IP Scanner DTM	8
1.5	Requirements EtherNet/IP Scanner DTM	8
1.6	DTM dialog structure	9
1.6.1	General device information	9
1.6.2	Navigation area	10
1.6.3	Dialog panes	10
1.6.4	OK, Cancel, Apply, Help,	10
1.6.5	Status bar	11
2	Safety	12
2.1	General note	12
2.2	Intended use	12
2.3	Personnel qualification	12
2.4	Safety messages	13
2.4.1	Communication stop caused by firmware or configuration download	13
2.4.2	Mismatching system configuration	13
2.5	Property damage	14
2.5.1	Power disconnect during firmware or configuration download	14
2.5.2	Invalid firmware	14
2.6	Safety messages on firmware or configuration download	15
3	Device start up	16
3.1	Configuration steps	16
3.2	Create project configuration	19
3.3	Start/stop communication	20
4	Settings	21
4.1	Overview settings for driver and device assignment	21
4.2	Verifying or adapting driver settings	24
4.3	Configuring drivers	26
4.3.1	cifX device driver	26
4.3.2	netX driver	26
4.3.3	Configuring netX driver	27
4.3.4	netX driver - USB/RS232 connection	28
4.3.5	netX driver - TCP/IP connection	30
4.4	Assigning device (with or without firmware)	33
4.4.1	Scanning for devices	33
4.4.2	Selecting the device (with or without firmware)	36
4.4.3	Selecting the device once more (with firmware)	36
4.5	Selecting and downloading firmware	38
4.6	Licensing	44

5	Licensing	45
5.1	Opening license dialog	45
5.2	License dialog	46
5.3	Which licenses are present in the device?	47
5.3.1	License for master protocols	48
5.3.2	Licenses for utilities	48
5.4	How to order a license?	49
5.5	Selecting license(s)	49
5.6	Ordering data	50
5.6.1	Device information (ordering data read from the device)	50
5.6.2	Data to manage the order (license information)	51
5.7	Ordering the license	52
5.7.1	Ordering the license by e-mail	53
5.7.2	Ordering the license by fax or by telephone	54
5.7.3	Exporting license request to a file	55
5.8	How to get the license and transfer it to the device	56
6	Configuration	57
6.1	Overview configuring device parameters	57
6.2	Network settings	59
6.3	Scan list	61
6.3.1	Set the IP address for the EtherNet/IP Adapter station	62
6.4	Process data	63
6.5	Address table	64
6.6	Quick connect table	65
6.7	Scanner settings	67
6.7.1	Start of bus communication	67
6.7.2	Application monitoring	68
6.7.3	Module alignment	68
6.8	Connecting/disconnecting device	69
6.9	Download configuration	71
7	Diagnosis	73
7.1	Overview diagnosis	73
7.2	General diagnosis	74
7.3	Master diagnosis	76
7.4	Station diagnosis	77
7.5	Firmware diagnosis	78
8	Extended Diagnosis	79
8.1	Overview extended diagnosis	79
8.2	Task information:	80
8.3	IniBatch status	80
8.4	ENCAP_TASK	81
8.4.1	Encap command counter	81
8.4.2	Packet counter	82
8.4.3	Code diagnosis	83

8.5	OBJECT_TASK.....	84
8.5.1	Object request counter.....	84
8.5.2	Output connection.....	85
8.5.3	Input connection.....	85
8.5.4	Code diagnosis.....	86
8.6	TCPUDP.....	87
8.6.1	IP information.....	87
8.6.2	IP packet counter.....	88
8.6.3	IP code diagnosis.....	88
8.6.4	TCP_UDP information.....	89
8.6.5	TCP_UDP code diagnosis.....	89
8.7	AP_TASK.....	90
8.7.1	Common Diagnosis.....	90
8.7.2	General status.....	90
8.7.3	Code diagnosis.....	91
8.8	EIS_DLR_TASK.....	92
8.8.1	DLR object diagnosis.....	92
8.8.2	DLR object counter.....	94
9	Tools.....	95
9.1	Overview tools.....	95
9.2	Packet monitor.....	96
9.2.1	Sending packet.....	97
9.2.2	Receiving packet.....	98
9.3	I/O monitor.....	99
9.4	Process image monitor.....	100
10	Appendix.....	102
10.1	References.....	102
10.2	User rights.....	103
10.2.1	Settings.....	103
10.2.2	Configuration.....	103
10.3	Conventions in this document.....	104
10.4	Legal notes.....	105
10.5	Registered trademarks.....	108
	Glossary.....	113
	Contacts.....	115

1 Introduction

1.1 About this manual

This manual provides information on how to set and configure the device parameters of a netX based EtherNet/IP Scanner device using the EtherNet/IP Scanner DTM, and what can be read from the diagnosis panes.



Refer to the operator manual, 'netDevice and netProject', how to create a network configuration, or in the user manual for the generic DTM, for EtherNet/IP Adapter devices, how to configure the EtherNet/IP Adapter device.

Error codes



All status and error codes you find in the API manual "Hilscher status and error codes".

1.1.1 Online help

The EtherNet/IP Scanner DTM contains an integrated online help.

- To open the online help, click on **Help** or press **F1**.

1.1.2 List of revisions

Index	Date	Version	Component	Changes
11	2022-05-16	1.1100	ENIPScannerDTM.dll, ENIPScannerGUI.ocx	Document revised. Chapter Error codes removed. See API Manual "Hilscher status and error codes" instead.
12	2022-06-13	1.1100	ENIPScannerDTM.dll, ENIPScannerGUI.ocx	Corrections.
13	2022-06-21	1.1100	ENIPScannerDTM.dll, ENIPScannerGUI.ocx	Additional corrections.

Table 1: List of revisions

1.2 Overview use cases

In the table below you find an overview of the applicable use cases.

Use case	Description	Chapter, section
Device start up	<ul style="list-style-type: none"> • Creating project configuration • Start/stop communication 	<i>Device start up</i> [▶ page 16] <i>Create project configuration</i> [▶ page 19] <i>Start/stop communication</i> [▶ page 20]
Driver and device assignment settings	<ul style="list-style-type: none"> • Verifying or adapting driver settings • Configuring drivers • Assigning device (with or without firmware) • Selecting and downloading firmware 	<i>Overview settings for driver and device assignment</i> [▶ page 21] <i>Verifying or adapting driver settings</i> [▶ page 24] <i>Configuring drivers</i> [▶ page 26] <i>Assigning device (with or without firmware)</i> [▶ page 33] <i>Selecting and downloading firmware</i> [▶ page 38]
Licensing	(licenses for master protocols)	<i>Licensing</i> [▶ page 45]
Configuring device parameters	<ul style="list-style-type: none"> • Network Settings • Scanlist • Process Data • Address Table • Quick Connect Table • Scanner Settings 	<i>Overview configuring device parameters</i> [▶ page 57] <i>Network settings</i> [▶ page 59] <i>Scan list</i> [▶ page 61] <i>Process data</i> [▶ page 63] <i>Address table</i> [▶ page 64] <i>Quick connect table</i> [▶ page 65] Master settings
Connecting/disconnecting device	Establishing online connection	<i>Connecting/disconnecting device</i> [▶ page 69]
Downloading configuration	Download to the device	<i>Download configuration</i> [▶ page 71]
Diagnosis	<ul style="list-style-type: none"> • General diagnosis • Master diagnosis • Firmware diagnosis 	<i>Overview diagnosis</i> [▶ page 73] <i>General diagnosis</i> [▶ page 74] <i>Master diagnosis</i> [▶ page 76] <i>Firmware diagnosis</i> [▶ page 78]
Extended diagnosis	Finding communication/configuration errors.	<i>Overview extended diagnosis</i> [▶ page 79]
Packet Monitor	Test of send and receive data.	<i>Packet monitor</i> [▶ page 96]
IO Monitor	Test of communication.	<i>I/O monitor</i> [▶ page 99]
Process Image Monitor	Display fieldbus structure and data structure of the input and output data of the devices transmitted on the bus.	<i>Process image monitor</i> [▶ page 100]
User rights	Definition of access rights	<i>User rights</i> [▶ page 103]

Table 2: Overview use cases

1.3 System requirements

- PC with 1 GHz processor or higher
- Windows® XP SP3,
Windows® Vista (32-Bit) SP2,
Windows® 7 (32-Bit and 64-Bit) SP1,
Windows® 8 (32-Bit and 64-Bit),
Windows® 8.1 (32-Bit and 64-Bit),
Windows® 10 (32-Bit and 64-Bit)
- Administrator privilege required for installation
- Internet Explorer 5.5 or higher
- RAM: min. 512 MByte, recommended 1024 MByte
- Graphic resolution: min. 1024 x 768 pixel
- Keyboard and Mouse
- Restriction: Touch screen is not supported.

**Note:**

If the project file is used on a further PC,
- this PC must also comply with the above system requirements,
- the device description files of the devices used in the project must be imported into the configuration software SYCON.net on the new PC,
- and the DTMs of the devices used in the project must also be installed on that further PC.

1.4 About the EtherNet/IP Scanner DTM

The EtherNet/IP Scanner DTM is used to configure an EtherNet/IP Scanner device. The configuration is done using the FDT frame application SYCON.net, which serves as configuration software.

1.5 Requirements EtherNet/IP Scanner DTM

To configure the an EtherNet/IP Scanner device with the EtherNet/IP Scanner DTM the following requirements have to be accomplished:

- Completed hardware installation of a netX based DTM-compatible EtherNet/IP Scanner device, including loaded firmware, license and loaded cifX configuration file,
- Installed FDT/DTM V 1.2 compliant frame application,
- Loaded DTM in the Device Catalog of the FDT Framework.

**Note:**

If the EtherNet/IP Scanner DTM and the EtherNet/IP Scanner device are installed on the same PC, the **cifX device driver** must be installed on that PC, as you can connect the DTM to the device.



For more information to the hardware installation, please refer to the corresponding User Manual of your device. Information on how to order and to download the license to the device, you will find in this manual in the sections about the use case "Licensing".

1.6 DTM dialog structure

The graphical user interface of the DTM is composed of different areas and elements listed hereafter:

1. A header area containing the **General device information**,
2. the **Navigation area** (area on the left side),
3. The **Dialog pane** (main area on the right side),
4. **OK, Cancel, Apply, Help**,
5. The **Status line** containing information e. g. the online-state of the DTM.

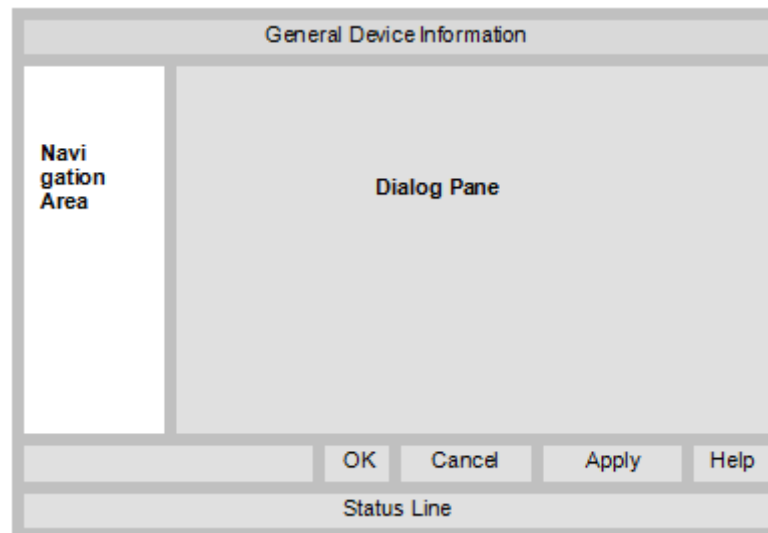


Figure 1: Dialog structure EtherNet/IP Scanner DTM

1.6.1 General device information

Parameter	Description
IO device	Device name
Vendor	Vendor name of the device
Device ID	Identification number of the device
Vendor ID	Identification number of the vendor

Table 3: General device information

1.6.2 Navigation area

In the navigation area, you can select the individual dialog panes via the folder structure of the DTM.

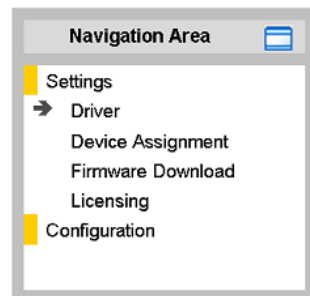



Figure 2: Navigation area

- Select the required folder and subfolder.
- ⇒ The corresponding dialog pane appears.
- Click , to hide or to open the navigation area.

1.6.3 Dialog panes

At the dialog pane the Settings, Configuration, Diagnosis/Extended Diagnosis or the Tools panes are opened via the corresponding folder in the navigation area.

1.6.4 OK, Cancel, Apply, Help,

In the configuration software SYCON.net the following is valid:

	Description
OK	To confirm your latest settings, click OK . All changed values will be applied on the frame application database. The dialog then closes.
Cancel	To cancel your latest changes, click Cancel . Answer to the safety query "Configuration data has been changed. Do you want to save the data?" by Yes, No or Cancel . <ul style="list-style-type: none"> • Yes: The changes are saved or the changed values are applied on the frame application database. The dialog then closes. • No: The changes are <i>not</i> saved or the changed values are <i>not</i> applied on the frame application database. The dialog then closes. • Cancel: Back to the DTM.
Apply	To confirm your latest settings, click Apply . All changed values will be applied on the frame application database. The dialog remains opened.
Help	To open the DTM online help, click Help .

Table 4: OK, Cancel, Apply, Help

1.6.5 Status bar

The status bar displays information about the current state of the DTM. The current activity, e.g. download, is signaled graphically via icons in the status bar.

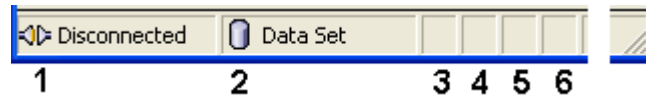
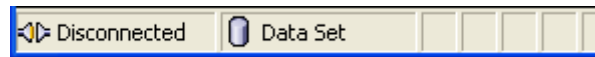


Figure 3: Status bar – status fields 1 to 6

Status field	Icon / description
1	DTM connection states
	Connected: Icon closed = Device is online Disconnected: Icon opened = Device is offline
2	Data source states
	Data set: The displayed data is read out from the instance data set (database). Device: The displayed data is read out from the device.
3	States of the instance date set
	Valid Modified: Parameter is changed (not equal to data source).
4	Changes directly made on the Device
	Load/configure diagnosis parameters: Diagnosis is activated.
6	Device diagnosis status
	Save operation succeeded: The save operation has been successful. Further messages due to successful handling of device data.
	Firmware Download: Firmware download is running
	Save operation failed: The save operation has failed. Further fail operation messages due to incorrect communication due to malfunction in the field device or its peripherals.

Table 5: Status bar icons [1]

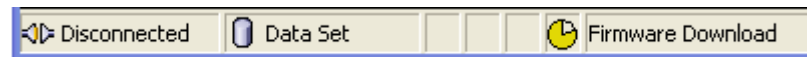
Offline state



Save operation succeeded



Firmware download



Firmware download successful



Online state and diagnosis

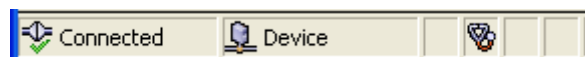


Table 6: Status bar display examples

2 Safety

2.1 General note

The documentation in the form of a user manual, an operating instruction manual or other manual types, as well as the accompanying texts, have been created for the use of the products by qualified personnel. When using the products, all Safety Messages, Integrated Safety Messages, Property Damage Messages and all valid legal regulations must be obeyed. Technical knowledge is presumed. The user has to assure that all legal regulations are obeyed.

2.2 Intended use

The EtherNet/IP Scanner DTM serves for configuration and diagnosis of EtherNet/IP Scanner devices.

2.3 Personnel qualification

Personnel responsible for the application of the network system shall be aware of the system behavior and shall be trained in using the system.

2.4 Safety messages

2.4.1 Communication stop caused by firmware or configuration download

If you want to perform either a firmware update (as a download) or a configuration download, both via the EtherNet/IP Scanner DTM, please be aware of the following:

- Together with the firmware download, an automated reset to the device is performed that will interrupt all network communication and all established connections will drop.
- If you download the configuration during bus operation, the communication between master and slaves stops.

Possible faulty system operation

- An unpredictable and unexpected behavior of machines and plant components may cause personal injury and property damage.
 - Stop the application program, before starting the firmware update or before downloading the configuration.
 - Make sure that your equipment operates under conditions that prevent personal injury or property damage. All network devices should be placed in a fail-safe mode, before starting the firmware update or before downloading a configuration.

Loss of device parameters, overwriting of firmware

- Both the firmware download and the configuration download erase the configuration database. The firmware download overwrites the existing firmware in the network device.
 - To complete the firmware update and to make the device operable again, re-load the configuration after the firmware update has been finished.

Device parameters that have been saved volatile, e. g. as the temporarily set IP address parameters, are getting lost during the reset.

- In order to prevent loss of configuration data, make sure that your project configuration data are saved non-volatile, before you initiate a firmware update or download the configuration.
 - In order to prevent loss of configuration data, before you initiate a firmware update or download the configuration, make sure that your project configuration data are saved non-volatile.

2.4.2 Mismatching system configuration

Mismatching system configuration loaded into the device may result in faulty data mapping in the application program. Thus, unexpected equipment operation may cause personal injury or damage to equipment.

- In the device, use only a configuration suitable for the system.

2.5 Property damage

2.5.1 Power disconnect during firmware or configuration download

If during the process of downloading a firmware or configuration,

- the power supply to a PC with the software application is interrupted,
- or the power supply to the EtherNet/IP Scanner device is interrupted,
- or a reset to the device is done.

This may lead to the following consequences:

Loss of device parameters, firmware corruption

- The firmware download or the configuration download is interrupted and remains incomplete.
- The firmware or the configuration database will be corrupted and device parameters will be lost.
- Damage to the device may occur, as the device cannot be rebooted.

Whether these consequences occur depends on when the power disconnect occurs during the download.

- During configuration download process, do not interrupt the power supply to the PC or to the device, and do not perform a reset!

Otherwise, you might be forced to send in your device for repair.

Power drop during write and delete accesses in the file system

The FAT file system in the netX firmware is subject to certain limitations in its operation. Write and delete accesses in the file system (firmware update, configuration download etc.) can destroy the FAT (File Allocation Table) if the accesses cannot be completed if the power drops. Without a proper FAT, a firmware may not be found and cannot be started.

Make sure that the power supply to the device is not interrupted during write and delete accesses in the file system (firmware update, configuration download, etc.).

2.5.2 Invalid firmware

Loading invalid firmware files could render your module unusable.

- Only load firmware files to the device that are valid for this device.

Otherwise, you might be forced to send in your device for repair.

2.6 Safety messages on firmware or configuration download

If you perform a firmware download or a configuration download via the EtherNet/IP Scanner DTM, adhere to the following warnings:

WARNING

Communication stop caused by firmware or configuration download

Initiating a firmware or configuration download process during bus operation will stop the communication and a subsequent plant stop may cause unpredictable and unexpected behavior of machines and plant components, possibly resulting in personal injury and damage to your equipment.

The firmware download overwrites the existing firmware. The communication stop may cause loss of device parameters and the device may be damaged.

- Stop the application program, before you start the firmware or configuration download.
 - Make sure that all network devices are in a fail-safe condition.
-

WARNING

Mismatching system configuration

Mismatching system configuration loaded into the device may result in faulty data mapping in the application program. Thus, unexpected equipment operation may cause personal injury or damage to equipment.

- In the device, use only a configuration suitable for the system.
-

NOTICE

Power disconnect while downloading firmware or configuration

If the power supply to the PC or device is interrupted while the firmware or configuration is being downloaded, the download will be aborted, the firmware may be corrupted, the device parameters may be lost, and the device may be damaged.

- During firmware or configuration download process, do not interrupt the power supply to the PC or to the device, and do not perform a reset to the device!
-

NOTICE

Invalid firmware

Loading invalid firmware files could render your device unusable.


- Only proceed with a firmware version valid for your device.
-

3 Device start up

3.1 Configuration steps

The following overview provides to you the step sequence on how to configure a netX based EtherNet/IP Scanner device with EtherNet/IP Scanner DTM as it is typical for many cases. It is assumed at this point that the hardware installation has been completed.

Step	Brief description	Further information
Add EtherNet/IP Adapter in the device catalog	Open configuration software SYCON.net. Add device by importing the device description file to the Device Catalog. - Network > Import device descriptions.	Section <i>Create project configuration</i> [▶ page 19], or Operating instruction manual "SYCON.net" and Operating instruction manual "netDevice and netProject"
Load device catalog	- Select Network > Device catalog, - Reload catalog.	
Create new project / Open existing project	- Select File > New or File > Open.	
Insert the master device and the adapter device and into configuration	- In the Device catalog , select the master device and insert the device via drag & drop to the line in the network view. - In the Device catalog , select the adapter device and insert the device via drag and drop to the master bus line in the network view.* <i>*This step will not be necessary if the network structure is scanned automatically.</i> Important! In order to select the desired device in the device catalog, note the details about the DTM and the device at the bottom of the window. When sorting by fieldbus, display of multiple devices with identical names by different vendors is possible.	
Open scanner DTM configuration dialog	Open the scanner DTM configuration dialog. - Double click to the device icon of the scanner. - The scanner DTM configuration dialog is displayed.	-
Verify or adapt driver settings	In the scanner DTM configuration dialog: - select Settings > Driver. Note! For PC cards cifX the cifX device driver is preset as a default driver. For all the other Hilscher devices, the netX driver is preset as a default driver. <ul style="list-style-type: none"> • Use the cifX device driver if the EtherNet/IP Scanner DTM is installed on the same PC as the EtherNet/IP Scanner device. • Use the netX driver to establish a USB, Serial (RS232) or TCP/IP connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device. • The 3Sgateway driver for netX (V3.x) is used only in relationship with CODESYS. To search for devices you can check one or multiple drivers simultaneously. - Verify that the default driver is checked. - If necessary, check another driver or multiple drivers.	Section <i>Overview settings for driver and device assignment</i> [▶ page 21] or <i>Verifying or adapting driver settings</i> [▶ page 24]

Step	Brief description	Further information
Configure driver	<p>If you use the netX driver, you respectively must configure it.</p> <p>For netX Driver and communication via TCP/IP set the IP address of the device.</p> <ul style="list-style-type: none"> - Select Settings > Driver > netX driver > TCP connection. - Via  add an IP range. - Under IP address enter the IP Address of the device or an IP range. - Click Save. <p>Adjust the driver parameters netX driver USB/RS232 only if they differ from the default settings.</p> <p>Note!</p> <ul style="list-style-type: none"> • The cifX device driver requires no configuration. • The configuration of the 3Sgateway driver for netX (V3.x) is carried out via the CODESYS user interface. 	<p><i>Configuring netX driver</i> [▶ page 27]</p>
Assign master device (with or without firmware)	<p>Assign the master device to this driver.</p> <p>In the scanner DTM configuration dialog:</p> <ul style="list-style-type: none"> - Select Settings > Device assignment, - select a master device (with or without firmware), - therefore check the appropriate checkbox. - Click Apply. 	<p><i>Assigning device (with or without firmware)</i> [▶ page 33]</p>
Select and download firmware	<p>If not yet a firmware was loaded to the device:</p> <ul style="list-style-type: none"> - Adhere to the necessary safety precautions to prevent personnel injury and property damage. <p>In the scanner DTM configuration dialog:</p> <ul style="list-style-type: none"> - Select Settings > Firmware download, - click Browse..., - select a firmware file, - click Open. - Click Download and Yes. 	<p><i>Safety messages on firmware or configuration download</i> [▶ page 15]</p> <p><i>Selecting and downloading firmware</i> [▶ page 38]</p>
Assign master device once more (with firmware and system channel) <i>For repeated download this step is omitted.</i>	<p>In the scanner DTM configuration dialog:</p> <ul style="list-style-type: none"> - Select Settings > Device assignment, - click Scan, - select the master device (with loaded and defined system channel), - therefore check the appropriate checkbox. - Click Apply. - Close the scanner DTM configuration dialog via OK. 	<p><i>Selecting the device once more (with firmware)</i> [▶ page 36]</p>
Configure adapter device	<p>Configure the adapter device.</p> <ul style="list-style-type: none"> - Double click to the device icon of the adapter. - The adapter DTM configuration dialog is displayed. <p>In the adapter DTM configuration dialog:</p> <ul style="list-style-type: none"> - Select Configuration > Modules (for modular DTM only), - configure the modules of the modular EtherNet/IP Adapter, - select Configuration > Electronic keying, - select the keying method and configure it if necessary, - select Configuration > Connection, - configure the connection points, - select Configuration > Assembly, - configure Instance ID and Data length, - configure a modular device according to the description <i>Configuring a modular EtherNet/IP Adapter</i>. - Close the adapter DTM configuration dialog via OK. 	<p>(See <i>“Operating instruction manual Generic EtherNet/IP Adapter DTM for EtherNet/IP Adapter Devices and Modular Generic EtherNet/IP Adapter DTM for modular EtherNet/IP Adapter Devices</i>)</p>

Step	Brief description	Further information
Configure master device	<p>Configure the scanner device.</p> <ul style="list-style-type: none"> - Double-click to the device icon of the scanner. - The scanner DTM configuration dialog is displayed. <p>In the scanner DTM configuration dialog:</p> <ul style="list-style-type: none"> - Select Configuration > Network settings. <p>For 'Quick Connect' the adapter devices must be configured as MDI or MDIX.</p> <ul style="list-style-type: none"> - Set the network settings, - select Configuration > Scan list, - select the required connection or set the IP address of the adapter. - Select Configuration > Process data, - assign symbolic names to the configured modules or measurement signals, - select Configuration > Address table, - Set the device address if necessary, - select Configuration > Quick connect table, - check Quick connect for each adapter device that is to operate as a "Quick Connect" adapter, - select Configuration > Scanner settings, - set the scanner settings. - Close the scanner DTM configuration dialog via OK. 	<p>Sections <i>Overview configuring device parameters</i> [▶ page 57]</p> <p><i>Network settings</i> [▶ page 59]</p> <p><i>Scan list</i> [▶ page 61]</p> <p><i>Process data</i> [▶ page 63]</p> <p><i>Address table</i> [▶ page 64]</p> <p><i>Quick connect table</i> [▶ page 65]</p> <p>Master settings</p>
Save project	<ul style="list-style-type: none"> - Select File > Save. 	Operating instruction manual "SYCON.net"
Connect master device	<ul style="list-style-type: none"> - Right click to the device icon of the scanner, - select Connect. 	Section <i>Connecting/disconnecting device</i> [▶ page 69]
Download configuration	<ul style="list-style-type: none"> - Adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop or in consequence of a mismatching system configuration. - Right click to the device icon of the scanner, - select Download. 	Section <i>Safety messages on firmware or configuration download</i> [▶ page 15] or <i>Download configuration</i> [▶ page 71]
Live list	Via the context menu Additional functions > Live list you can display the devices present at the bus.	Section Live List
I/O monitor	<ul style="list-style-type: none"> - Right click to the device icon of the master, - select Diagnosis, - select Tools > I/O monitor, - check the input or output data. - Close the I/O monitor dialog via OK. 	Section <i>I/O monitor</i> [▶ page 99]
Disconnect	<ul style="list-style-type: none"> - Right click to the device icon of the Master, - select Disconnect. 	Section <i>Connecting/disconnecting device</i> [▶ page 69]
Diagnosis	<ul style="list-style-type: none"> - Right click to the device icon of the master. - Select Diagnosis. - The master DTM diagnosis dialog is displayed. (1.) Check whether the communication is OK: Diagnosis > General diagnosis > Device status "Communication" must be green! (2.) "Communication" is green: Open the IO monitor and test the input or output data. (3.) "Communication" is not green: Use diagnosis and extended diagnosis for troubleshooting. - Close the master DTM diagnosis dialog via OK. 	<p>Section <i>Diagnosis</i> [▶ page 73]</p> <p>Section <i>Extended Diagnosis</i> [▶ page 79]</p>

Table 7: Getting started – Configuration steps

3.2 Create project configuration

1. Complete the slave device in the device catalog.
 - Open configuration software SYCON.net.
 - Add the slaves in the device catalog by importing the device description file.
 - Select **Network > Import device descriptions**.
2. Load device catalog
 - - Select **Network > Device catalog**.
 - - Select **Reload catalog**.
3. Create or open a project
 - Create new project / open existing project:
 - - Select **File > New** or **File > Open**.
4. Insert master or slave device in configuration.
 - In the device catalog click to the master device and insert the device via drag and drop **to the line** in the network view.
 - In the Device Catalog click to the slave device* and insert the device via drag and drop **to the master bus line** in the network view.*

**This step will not be necessary if the network structure is scanned automatically.*



Important:

In order to select the desired device in the device catalog, note the details about the DTM and the device at the bottom of the device catalog window. When sorting by fieldbus, several devices with the same name from different vendors can be displayed.



For further information, see operating instruction manual "SYCON.net" or "netDevice and netProject".

3.3 Start/stop communication

You can manually start or stop the communication between an EtherNet/IP Scanner device and EtherNet/IP Adapter devices.

- **Start communication** can be enabled if the communication was stopped before or if the configuration requires this (controlled release of communication).
- **Stop communication** can be enabled if the communication was started.

To start or to stop the communication, proceed as follows:

Start communication

- Connecting device:



Note:

To manually start the communication of the device at the bus, an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device is required. Further information can be found in the section *Connecting/disconnecting device* [▶ page 69].

- Select **Additional functions** > **Service** > **Start communication** from the context menu (right mouse click).
- ⇒ The device communicates at the bus.

Stop communication

⚠ WARNING Faulty system operation possible, overwriting of firmware or loss of device parameters

Before stopping the communication:

- Stop the application program.
- Make sure that all network devices are in a fail-safe condition.

After carrying out the security measures:

- Select **Additional functions** > **Service** > **Stop communication** from the context menu (right mouse click).
- ⇒ The communication of the device at the bus is stopped.

4 Settings

4.1 Overview settings for driver and device assignment

Under "Settings" you can make different basic settings for your device:

- To establish a connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device, check whether the default driver is hooked up in the dialog box **Driver** and if necessary, check another or several drivers.
- In the **Device assignment** pane, select the device and assign it to the driver.
- The dialog in the **Firmware download** pane is used to load a new firmware into the device.
- The dialog in the **Licensing** or **License** pane allows you to order licenses for master protocols and utilities and transfer them to your device.

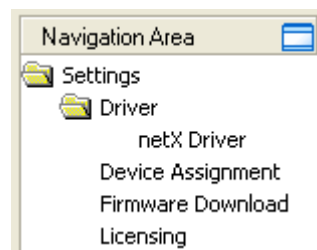


Figure 4: Navigation area - Settings (example)

There may be more drivers.



Note:

To edit the dialog boxes under **Settings**, you need the user rights for "Maintenance".

Overview on steps

To establish a connection between the EtherNet/IP Scanner DTM and the EtherNet/IP Scanner device, the following steps are required:

1. Verifying or adapting driver settings
 - In the FDT container, **netDevice** double-click on the EtherNet/IP Scanner icon.
 - The DTM configuration dialog opens.
 - Check whether the default driver is checked and if necessary, tick another or several drivers.
 - Select **Settings > Driver**.



Note:

For PC cards cifX the **cifX device driver** is preset as a default driver. For all the other Hilscher devices, the **netX driver** is preset as a default driver.

- Use the **cifX device driver** if the EtherNet/IP Scanner DTM is installed on the same PC as the EtherNet/IP Scanner device.
- Use the **netX driver** to establish an USB, Serial (RS232) or TCP/IP connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device.
- The **3Sgateway driver for netX (V3.x)** is used only in relationship with CODESYS. The version V3.x refers to the driver version defined by 3S-Smart Software Solutions GmbH.

To search for devices on the network, you can check one or more drivers at the same time.

- Check if the default driver for your device is checked.
- Respectively check another driver or multiple drivers.

2. Configuring drivers

- If you use the **netX driver**, you respectively must configure it.



Note:

The **cifX device driver** requires no configuration.

The configuration of the **3Sgateway driver for netX (V3.x)** is carried out via the CODESYS surface.

- Go to **Settings > Driver > netX driver** to open the driver dialog box for the **netX driver** and if necessary, press **F1**, so that the separate help for the **netX driver** appears.
- For **netX Driver** and communication via TCP/IP set the IP address of the device.

Adjust the driver parameters **netX driver USB/RS232** only if they differ from the default settings.

3. Assigning the master device to the DTM

- First, you scan for the device (with or without firmware) and select the device.
- Select **Settings > Device assignment**.
- Under **Device selection**, select *suitable only* or *all* and click **Scan**.
- In the table, check the required devices.
- Select **Apply**.

4. Selecting and downloading the firmware
 - If not yet a firmware was loaded to the device, select and download the firmware.
 - Select **Settings > Firmware download**.
 - Select and download the firmware via **Download**.
 - Click **Apply**.
 - Scan for and select the devices (with firmware and defined system channel) once more. *For repeated download this step is omitted.*
 - Select **Settings > Device assignment**.
 - Select **Scan**.
 - In the table, check the required device.
 - Close the DTM configuration dialog via **OK**.
5. Connecting the device
 - In **netDevice** put a right-click on the EtherNet/IP Scanner icon.
 - Select the **Connect** command from the context menu.
 - ⇒ In the network view, the device description at the device icon of the scanner is displayed with a green colored background. The EtherNet/IP Scanner device now is connected to the EtherNet/IP Scanner DTM via an online connection.

For more information on the required settings, see sections *Verifying or adapting driver settings* [▶ page 24], *Assigning device (with or without firmware)* [▶ page 33], *Selecting and downloading firmware* [▶ page 38] or *Licensing* [▶ page 44].



Descriptions of the netX Driver are available in the DTM user interface as online help:

- Therefore, click **Settings > Driver > netX driver** and press the **F1** key.
-

4.2 Verifying or adapting driver settings

The **Driver** dialog pane displays the drivers available to establish a connection from the EtherNet/IP Scanner DTM to the device.



Note:

A default driver is set in the configuration software.

Proceed as follows:

1. Select driver.
 - Select **Settings > Driver** in the navigation area.
 - ⇒ The **Driver** dialog pane is displayed. This shows the available drivers and the pre-setting of the default driver.

Driver			
	Driver	Version	ID
<input checked="" type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A68EA91}
<input type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 5: Default driver ,cifX Device Driver' for PC cards cifX (example)

Driver			
	Driver	Version	ID
<input type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A68EA91}
<input checked="" type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 6: Default driver ,netX Driver' for Hilscher devices except for PC cards cifX (example)

Parameter	Description
Driver	Name of the driver. (For further details, see the descriptions of the action steps.) Default driver (Pre-settings in the configuration software): For PC cards cifX the cifX device driver is preset as a default driver. For all the other Hilscher devices the netX driver is preset as a default driver. To search for devices you can check multiple drivers simultaneously.
Version	ODMV3 version of the respective driver
ID	ID of the driver (driver identification)

Table 8: Parameters of the driver selection list

2. Verify whether the default driver is checked.
 - To establish a connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device, check whether the default driver is hooked up in the dialog box Driver and if necessary, check another or several drivers.
3. Respectively check another driver or multiple drivers.
 - Check the checkbox for the driver in the selection list.



Note:

The driver used for the connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device must be supported by the device and must be available for the device.

- Use the **cifX device driver** if the EtherNet/IP Scanner DTM is installed on the same PC as the EtherNet/IP Scanner device.
- Use the **netX driver** to establish an USB, Serial (RS232) or TCP/IP connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device.
- The **3Sgateway driver for netX (V3.x)** is used only in relationship with CODESYS. The version V3.x refers to the driver version defined by 3S-Smart Software Solutions GmbH.

To search for devices on the network you can check multiple drivers simultaneously.

Driver			
	Driver	Version	ID
<input checked="" type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A68EA91}
<input checked="" type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 7: Manual selection of multiple drivers (example)

4.3 Configuring drivers

4.3.1 cifX device driver

In the EtherNet/IP Scanner DTM for the **cifX device driver** no driver dialog pane is available, since for the cifX device driver no driver settings are required.

The cifX device driver will be used if the EtherNet/IP Scanner DTM is installed in the same PC as the EtherNet/IP Scanner device.

**Note:**

To establish a connection from a DTM to a master device via the **cifX device driver**, the cifX device driver must be installed and the driver must have access to the master device.

4.3.2 netX driver

The **netX driver** is used to connect the DTM to the device via different connection types. The DTM communicates with the device via an USB connection, a serial (RS232) connection or a TCP/IP connection. The netX Driver establishes

- via the USB interface of the device and the USB port of the PC an USB connection to the device,
- via the RS232 interface of the device and the COM port of the PC a serial connection (RS232) to the device
- and via Ethernet a TCP/IP connection to the device.

To connect the DTM to the physical layer of the device the netX driver software works in combination with the software components:

- “USB/COM connector” for the USB connection and for the serial connection (RS232) and
- “TCP/IP connector” for the Ethernet connection.

4.3.3 Configuring netX driver

The following steps are required to configure the netX driver:

USB/RS232 Connection

To set the driver parameters for an USB/RS232 connection note:



Note:


Adjust the driver parameters netX driver USB/RS232 only if they differ from the default settings. After saving the changed driver parameters, these parameters are used for the device assignment when scanning devices.

For setting the driver parameters for an USB connection or a serial connection:

1. Set the driver netX driver USB/RS232 parameters.
 - Open the driver dialog via **Settings > Driver > netX driver > USB/RS232 connection**.

TCP/IP connection

For setting the driver parameters for a TCP/IP connection:

2. Set IP address of the device.
 - Select **Settings > Driver > netX driver > TCP connection**.
 - Add an IP range via **Select IP range** .
 - Under **IP range configuration > IP address** enter the IP address of the device (**Use IP range** is unchecked).
3. Or set IP range:
 - Check **Use IP range**.
 - Under **IP range configuration > IP address** enter the start address (left side) and the ending address of the IP scanning range (right side).
4. Save the IP address or the IP search range.
 - Click on **Save**.
 - ⇒ After saving the changed driver parameters, these parameters are used for the device assignment when scanning devices.

4.3.4 netX driver - USB/RS232 connection

The communication from the DTM to the device via an USB/RS232 connection is used when the DTM is installed on a PC and between the PC and the device

- an USB connection,
- or a serial connection (RS232) exists.

The DTM accesses the device via the USB interface or via the RS232 interface. This requires either to connect an USB port of the PC to the USB interface of the device using an USB cable or to connect a physical COM port of the PC to the RS232 interface of the device via a serial cable.

The **netX driver / USB/RS232 connection** supports all physical and virtual COM ports available on the PC.

Via the RS232 interface or USB interface, the device is configured or diagnosis is performed.

4.3.4.1 Driver parameters for netX driver - USB/RS232 connection

The settings of the driver parameters for the USB/RS232 connection are made via the **netX driver / USB/RS232 connection** configuration dialog.

- Open the **USB/RS232 connection** dialog via navigation area **Settings > Driver > netX driver**.

➤ The **USB/RS232 connection** dialog is displayed:

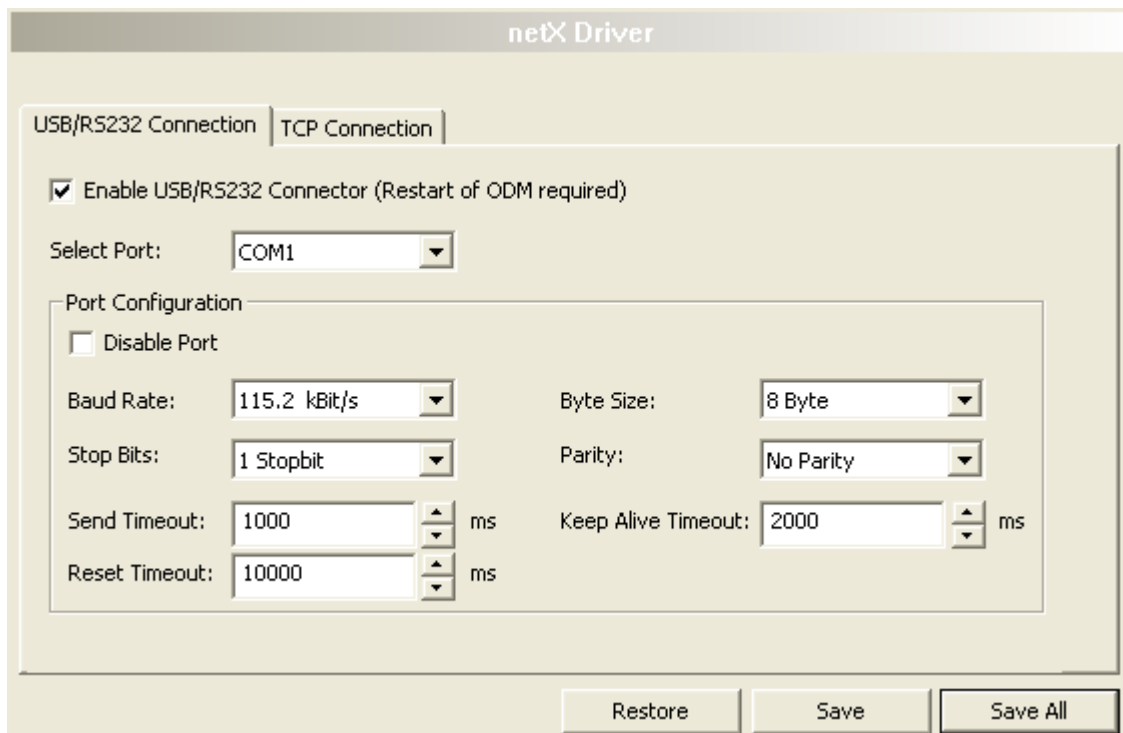


Figure 8: cifX driver > USB/RS232 connection


Parameter	Description	Range of value / value
Enable USB/RS232 connector (restart of ODM required)	<p>checked: The cifX driver can communicate via the USB/RS232 interface.</p> <p>unchecked: The cifX driver cannot communicate via the USB/RS232 interface.</p> <p>If the check mark for Enable USB/RS232 connector is set or removed, then the ODM server must be restarted¹, to make the new setting valid.</p> <p>_____</p> <p>¹ Restart the ODM server via the ODMV3 tray application:</p> <ul style="list-style-type: none"> - In the foot line click on  using the right mouse key. - In the context menu select Service > Start. 	checked, unchecked; Default: unchecked
Select port	Depending on the COM ports (interfaces) available on the PC, they will be listed under Select port .	COM 1 to COM N
Port configuration		
Disable port	<p>checked: No connection.</p> <p>unchecked: The cifX driver tries to establish a connection using the configured USB/RS232 interface.</p>	checked, unchecked (Default)
Baud rate	<p>Transfer rate: Number of bits per second.</p> <p>The device must support the baud rate.</p>	9.6, 19.2, 38.4, 57.6 bzw. 115.2 [kBit/s]; Default (RS232): 115.2 [kBit/s]
Stop bits	Number of stop bits sent after the transfer of the send data for synchronization purposes to the receiver.	Stop-Bit: 1, 1.5, 2; Default (RS232): 1
Send timeout	Maximum time before the transfer of the transmission data is canceled, when the send process fails, for example, because of the transfer buffer is full.	100 ... 60.000 [ms]; Default (RS232 and USB): 1000 ms
Reset timeout	Maximum time for a device reset, including the re-initialization of the physical interface used for the communication.	100 ... 60.000 [ms]; Default (RS232 und USB): 5000 ms
Byte size	Number of bits per byte by byte specification	7 Bit, 8 Bit; Default (RS232): 8 Bit
Parity	<p>In the error detection in data transmission using parity bits, "parity" describes the number of bits occupied with 1 in the transmitted information word.</p> <p>No Parity: no parity bit</p> <p>Odd Parity: The parity is "odd" if the number of bits occupied with 1 in the transmitted information word will be odd.</p> <p>Even parity: The parity is "even" if the number of bits occupied with 1 in the transmitted information word will be even.</p> <p>Mark Parity: if the parity bit is always 1, this will be named mark-parity (the bit does not contain any information).</p> <p>Space Parity: if the parity bit always 0, this will be named space-parity (the bit represents an empty space).</p>	No Parity, Odd Parity, Even Parity, Mark Parity, Space Parity; Default (RS232): No Parity
Keep alive timeout	The "Keep Alive" mechanism is used to monitor whether the connection to the device is active. connection errors are detected using a periodic heartbeat mechanism. The heartbeat mechanism will be initiated after the set time has elapsed if the communication has failed.	100 ... 60.000 [ms]; Default (RS232 und USB): 2000 ms
Restore	Resets all settings in the configuration dialog to the default values.	
Save	Saving all settings made in the configuration dialog cifX driver > USB/RS232 connection , i. e. only for the selected connection type.	
Save all	Saving all settings made in the configuration dialog cifX driver , i. e. for all connection types.	

Table 9: Parameters cifX driver > USB/RS232 connection

4.3.5 netX driver - TCP/IP connection

The communication from the DTM to the device via a **TCP/IP connection** is used in the following two typical applications:

Application 1: The device has its own Ethernet interface. The DTM is installed on a PC and the TCP/IP connection is established from this PC to the stand-alone device. The IP address of the device is used.

Application 2: The device is installed in a remote PC. The DTM is installed on an additional PC and the TCP/IP connection is established from this PC to the remote PC. The IP address of the remote PC is used. For the TCP/IP connection is made, on the remote PC the cifX TCP/IP server must be started. The cifX TCP/IP server allows the remote access to the device via a TCP/IP connection.

**Note:**

An exe file for the cifXTCP/IP server is provided on the product CD in the Tools directory.

Via the TCP/IP interface of the device or of the remote PC, the device is configured or diagnosis is performed.

4.3.5.1 Driver parameters for cifX driver - TCP/IP connection

The settings for the driver parameters for the TCP/IP connection are made via the **netX driver / TCP connection** configuration dialog.

- Open the **TCP connection** dialog via navigation area **Settings > Driver > netX driver**.
- The dialog **netX driver** is displayed:
- Select **TCP connection**.

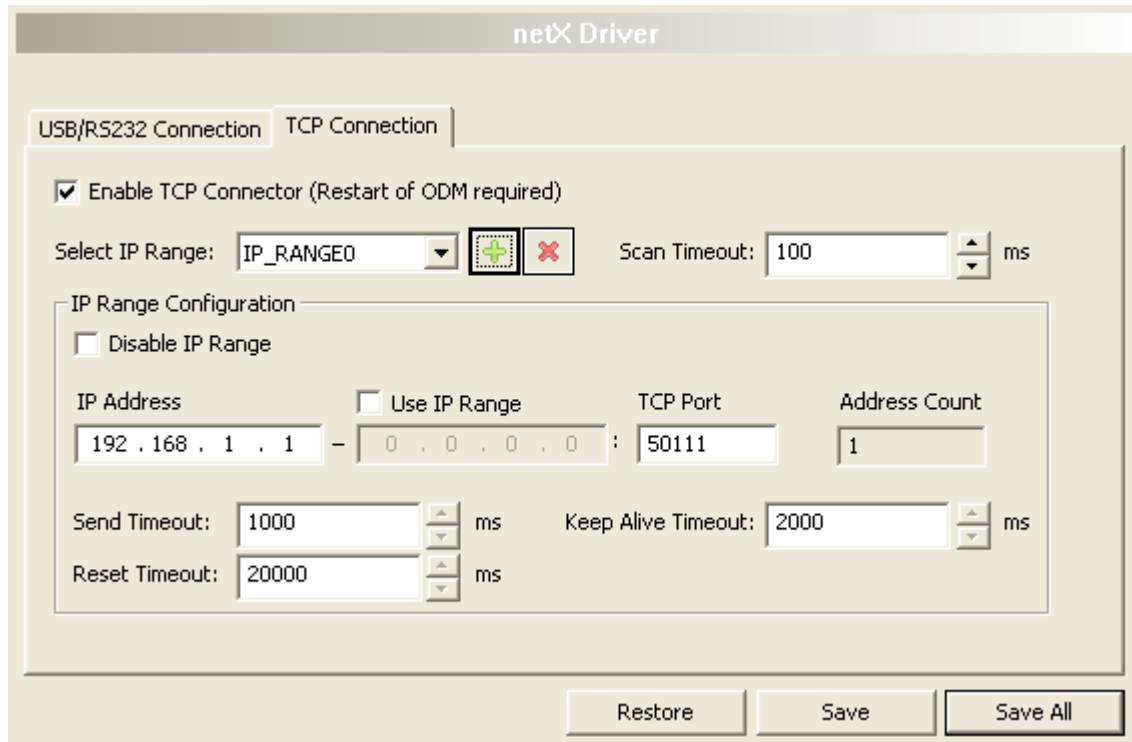





Figure 9: netX driver > TCP connection

Parameter	Description	Range of value / value
Enable TCP connector (restart of ODM required)	checked: The cifX driver can communicate via the TCP/IP interface. unchecked: The cifX driver cannot communicate via the TCP/IP interface. If the check mark for Enable TCP connector is set or removed, then the ODM server must be restarted ¹ , to make the new setting valid. ¹ Restart the ODM server via the ODMV3 tray application : - In the foot line click on  using the right mouse key. - In the context menu select Service > Start .	checked, unchecked; Default: unchecked
Select IP range	Via Select IP range already created IP ranges can be selected. Via  an additional IP range can be added. Via  an IP range can be deleted.	
Scan timeout [ms]	With Scan timeout can be set, how long to wait for a response while a connection is established.	10 ... 10.000 [ms]; Default: 100 ms
IP range configuration		
Disable IP range	checked: No connection. unchecked: The cifX driver tries to establish a connection using the configured TCP/IP interface.	checked, unchecked (Default)

Parameter	Description	Range of value / value
IP address (links)	Enter the IP address of the device, (if Use IP range is not checked). Enter the IP address of the device, (if Use IP range is not checked).	valid IP address; Default: 192.168.1.1
Use IP range	checked: An IP address range is used. unchecked: Only one IP address is used.	checked, unchecked; Default: unchecked
IP address (right)	Enter the end address of the IP scanning range, (only if Use IP range is checked).	valid IP address; Default: 0.0.0.0
Address count	Displays the scanning range address count, depending on the selected IP-start or IP-end address. (For this read the note given below.)	recommended: 10
TCP Port	Identifies the endpoint of a logical connection or addresses a specific endpoint on the device or PC.	0 – 65535; Default Hilscher device: 50111
Send timeout	Maximum time before the transfer of the transmission data is canceled if the send process fails, for example, because of the transfer buffer is full.	100 ... 60.000 [ms]; Default (TCP/IP): 1000 ms
Reset timeout	Maximum time for a device reset, including the re-initialization of the physical interface used for the communication.	100 ... 99.999 [ms]; Default (TCP/IP): 20.000 ms
Keep alive timeout	The "Keep Alive" mechanism is used to monitor whether the connection to the device is active. Connection errors are detected using a periodic heartbeat mechanism. The heartbeat mechanism will be initiated after the set time has elapsed if the communication has failed.	100 ... 60.000 [ms]; Default (TCP/IP): 2000 ms
Restore	Resets all settings in the configuration dialog to the default values.	
Save	Saving all settings made in the configuration dialog cifX driver > TCP/IP connection , i. e. only for the selected connection type.	
Save all	Saving all settings made in the configuration dialog cifX driver , i. e. for all connection types.	

Table 10: Parameters netX driver > TCP connection



Note:

Do not use large IP ranges in combination with a low scan timeout. Microsoft introduced in Windows® XP SP2 a limit of concurrent half-open outbound TCP/IP connections (connection attempts), to slow the spread of virus and malware from system to system. This limit makes it impossible to have more than 10 concurrent half-open outbound connections. Every further connection attempt is put in a queue and forced to wait. Due to this limitation, a large IP range used in combination with a low scan timeout could prevent the connection establishment to a device.

4.4 Assigning device (with or without firmware)



Note:

In the **Device assignment** dialog pane, you first must assign the EtherNet/IP Scanner device to the EtherNet/IP Scanner DTM by checking the check box. This is essential to establish an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device later, as described in section *Connecting/disconnecting device* [▶ page 69].

Therefore, in the **Device assignment** dialog pane you scan for the EtherNet/IP Scanner device and select it.

If the device did not get a firmware or shall get a new firmware:

1. First you scan for the device (with or without firmware) and select the device,
2. then you download a firmware to the device, and
3. subsequently you scan for the device (with firmware) once more and select the device again.
 - Proceed in the order mentioned.

4.4.1 Scanning for devices

- Select **Settings > Device assignment** in the navigation area.
- ⇒ The dialog pane Device assignment is displayed.
- Under **Device selection**, select *suitable only*.
- Select **Scan**, to start the scanning process.
- ⇒ In the table all devices are displayed, which can be connected to the EtherNet/IP Scanner DTM via the preselected driver.

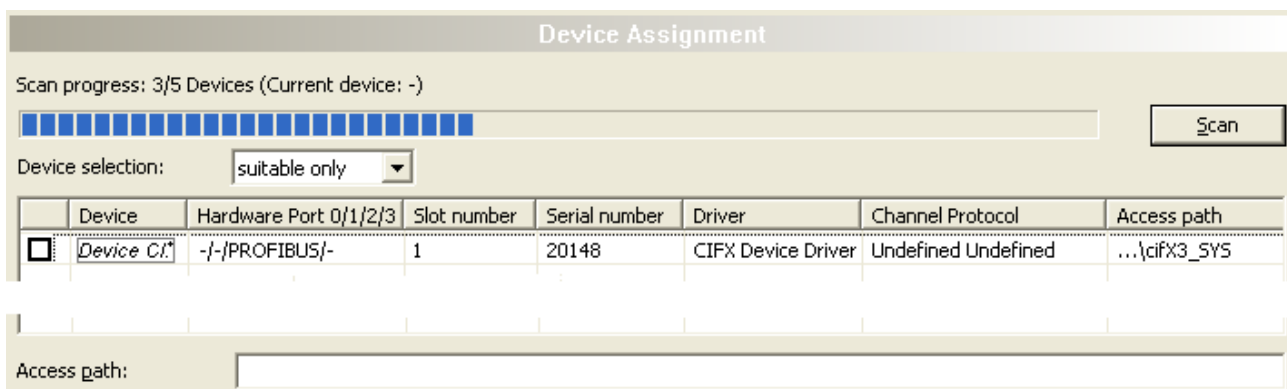


Figure 10: Device Assignment - detected devices (example: device without firmware)



Note:

For devices, which have been found via the **cifX device driver** in the column **Access path** the indication ...\\cifX[0toN]_SYS is displayed. This is correct, as long as a device did not get a firmware. After the firmware download has been completed, in the column Access path the indication ...\\cifX[0toN]_Ch[0to3] is displayed.

Parameter	Description	Range of value / value
Device selection	Selecting <i>suitable only</i> or <i>all</i> devices.	suitable only, all
Device	*The device name (= name of the device class) of the EtherNet/IP Scanner device appears.	
Hardware Port 0/1/2/3	Shows, which hardware is assigned to which communication interface.	
Slot number	Shows the Slot number (card ID) , preset at the PC card cifX via the Rotary switch slot number (card ID) . The indication <i>n/a</i> means, that no Slot number (card ID) exists. This will occur if the PC card cifX is not equipped with a Rotary switch slot number (card ID) or for PC cards cifX equipped with a Rotary switch slot number (card ID) if the rotary switch is set to the value 0 (zero).	1 to 9, n/a
Serial number	Serial number of the device	
Driver	Name of the driver.	
Channel Protocol	Shows, which firmware is loaded to which device channel. The data for the used channel consists of the protocol class and the communication class. a.) For devices without firmware: Undefined Undefined, b.) For devices with firmware: Protocol name corresponding to the used Firmware	
Access path (last column on the right)	Depending on the used driver in the column Access path different data to the device is displayed. For the cifX device driver the following data is displayed: a.) For devices without firmware: ...\ <code>cifX[0toN]_SYS</code> , b.) For devices with firmware: ...\ <code>cifX[0toN]_Ch[0to3]</code> . <code>cifX[0toN]</code> = Board number 0 to N <code>Ch[0to3]</code> = Channel number 0 to 3	Depending on the device and on the driver: board or channel number, IP address or COM interface
Access path (at the lower side of the dialog pane)	If in the table a device is checked, under Access path (at the lower side of the dialog pane) the driver identification or depending on the used driver additional data to the device will be displayed. For the cifX device driver the following data is displayed: a.) For devices without firmware: ...\ <code>cifX[0toN]_SYS</code> , b.) For devices with firmware: ...\ <code>cifX[0toN]_Ch[0to3]</code> . <code>cifX[0toN]</code> = Board number 0 to N <code>Ch[0to3]</code> = Channel number 0 to 3	Driver identification (ID) Depending on the device and on the driver: board or channel number, IP address or COM interface

Table 11: Parameters of the Device Assignment

4.4.1.1 Selecting suitable only or all devices

All

- Under **Device selection** select *all*.
- Select **Scan**.

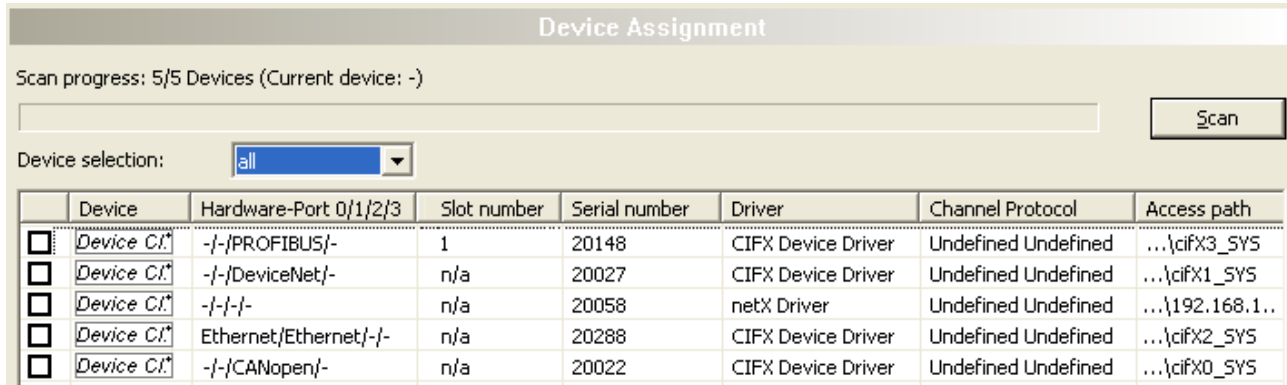


Figure 11: Device Assignment - detected devices (example: device without firmware)

- In the table all devices are displayed, which are attainable in the network and which can be connected to a single DTM each via the preselected drivers.



Note:

During a subsequent firmware download in the selection window **Select firmware file** all files from the selected folder are displayed, under **Files of type** „All Files (*.*)“ is displayed and the check box **Validate the selected firmware file.** is unchecked.

suitable only

- Under **Device selection** select suitable only.
- Select **Scan**.
- In the table all devices are displayed, which can be connected to the EtherNet/IP Scanner DTM via the preselected driver.



Note:

During a subsequent firmware download in the selection window **Select firmware file** only firmware files from the selected folder are displayed, under **Files of type** „Firmware Files (*.nxm)“ or „Firmware Files (*.nxf)“ is displayed and the check box **Validate the selected firmware file.** is checked.

4.4.2 Selecting the device (with or without firmware)



Note:

A connection with the EtherNet/IP Scanner DTM can only be established with *one* EtherNet/IP Scanner device.

To select the physical EtherNet/IP Scanner device (with or without firmware):

- Check the appropriate device.
- Under **Access path** (below in the dialog pane) the access path to the device, e. g. the driver identification, or depending on the used driver additional access data of the device is displayed.
- Select **Apply**, to apply the selection.

Device	Hardware Port 0/1/2/3	Slot number	Serial number	Driver	Channel Protocol	Access path
<input checked="" type="checkbox"/> Device Cl.	-/-/PROFIBUS/-	1	20148	CIFX Device Driver	PROFIBUS Master	... \cifX3_SYS

Figure 12: Device Assignment - selecting device (example: device without firmware / one device selected)



Note:

Before an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device can be established, a firmware must be loaded to the device and the device must be selected once more.

For further information refer to section *Selecting and downloading firmware* [▶ page 38] or to section *Selecting the device once more (with firmware)* [▶ page 36].

4.4.3 Selecting the device once more (with firmware)



Note:

For repeated download this step is omitted.

To select the EtherNet/IP Scanner device (with firmware and defined system channel) once more, proceed as described hereafter:

- Under **Device selection** select *all* or *suitable only*.
- Select **Scan**.
- For selection *All*: The table shows all devices which can be reached in the network and which can be connected to a DTM via the preselected drivers.

- For selection *suitable only*: In the table all devices are displayed, which can be connected to the EtherNet/IP Scanner DTM via the preselected drivers.
- Check the appropriate device.
- Select **Apply**, to apply the selection.
- Or select **OK**, to apply the selection and to close the DTM interface dialog.
- Connect the DTM to the device using the context menu (right mouse click).

Device Assignment

Scan progress: 5/5 Devices (Current device: -)

Device selection: all

	Device	Hardware-Port 0/1/2/3	Slot number	Serial number	Driver	Channel Protocol	Access path
<input checked="" type="checkbox"/>	Device Ci.*	-/-/PROFIBUS/-	1	20148	CIFX Device Driver	PROFIBUS-DP Master	...\cifX3_Ch0
<input type="checkbox"/>	Device Ci.*	-/-/DeviceNet/-	n/a	20027	CIFX Device Driver	DeviceNet Master	...\cifX1_Ch0
<input type="checkbox"/>	Device Ci.*	-/-/-/-	n/a	20058	netX Driver	Undefined Undefined	...\192.168....
<input type="checkbox"/>	Device Ci.*	Ethernet/Ethernet/-/-	n/a	20288	CIFX Device Driver	PROFINET IO Device	...\cifX2_Ch0
<input type="checkbox"/>	Device Ci.*	-/-/CANopen/-	n/a	20022	CIFX Device Driver	Undefined Undefined	...\cifX0_SYS

Access path: {368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}\cifX3_Ch0

Figure 13: Device Assignment - selecting device (example: devices with and without firmware / one device selected)



Note:

After the firmware download has been completed, for the devices which have been detected via the cifX Device Driver the following data is displayed:

In the column **Channel protocol**: The data for the firmware for the used channel

In the column **Access path** or under **Access path** (below in the dialog pane): The data: ... \cifX[0toN]_Ch[0to3].

cifX[0toN] = board number 0 to N

Ch[0to3] = channel number 0 to 3

For further information how to establish an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device, refer to section *Connecting/disconnecting device* [▶ page 69].

4.5 Selecting and downloading firmware

Requirements



Note:

Before downloading the firmware, you must select the driver and the Master device (with or without firmware) and assign the hardware to the device. For more information, see section *Overview settings for driver and device assignment* [▶ page 21].

How to proceed

You can use the dialog **Firmware download** to transfer a firmware to the device. Load the firmware into the device as described below:

1. Select the firmware file.
 - In the navigation area, select **Settings > Firmware download**
 - The dialog pane **Firmware download** is displayed.

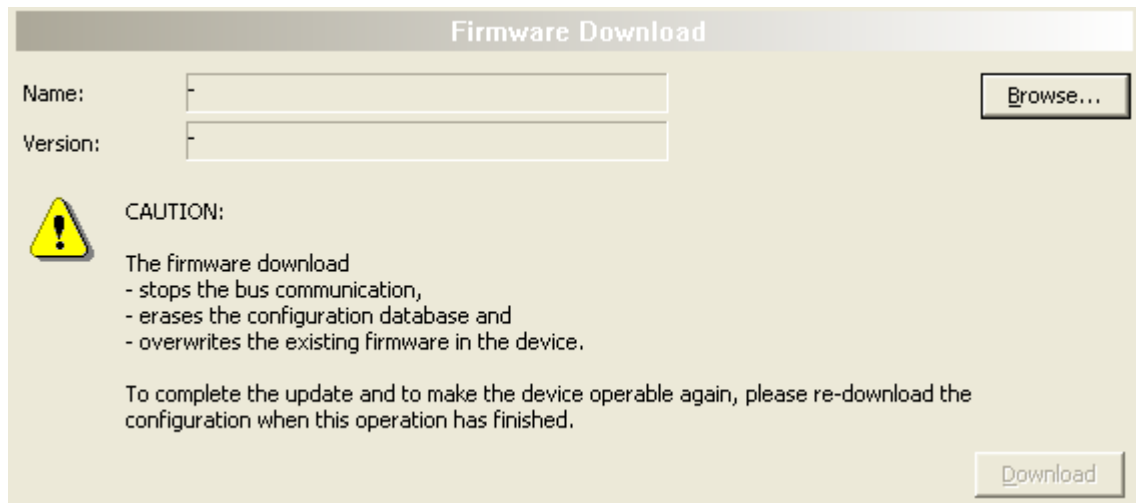


Figure 14: Firmware download

Element	Description
Name	The path and name of the selected firmware file are displayed.
Version	The version and build version of the selected firmware file are displayed.
Browse...	Via "Browse..." you can select the firmware file to download. Note! If the device is not assigned to the hardware, the error message "The device is not assigned to the hardware!" is displayed.
Download	Via "Download" you can download the firmware to the device.

Table 12: Firmware download parameters

- Select **Browse....**
- If the device is not assigned to the hardware, the error message "The device is not assigned to the hardware!" is displayed.

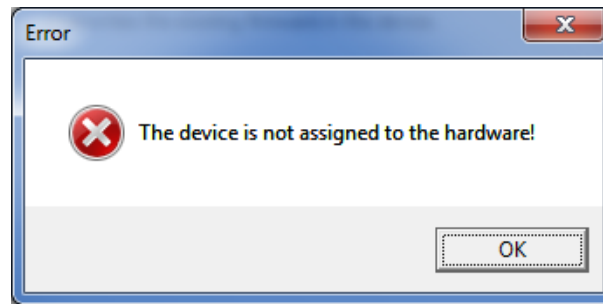


Figure 15: Error Message "The device is not assigned to the hardware!"

- Click **OK** and select and assign the master device as described in section *Assigning device (with or without firmware)* [▶ page 33].
- If a hardware has been assigned to the device, the selection window **Select firmware file** opens.
- Enlarge the selection window to view the columns **Hardware** and **Version**.

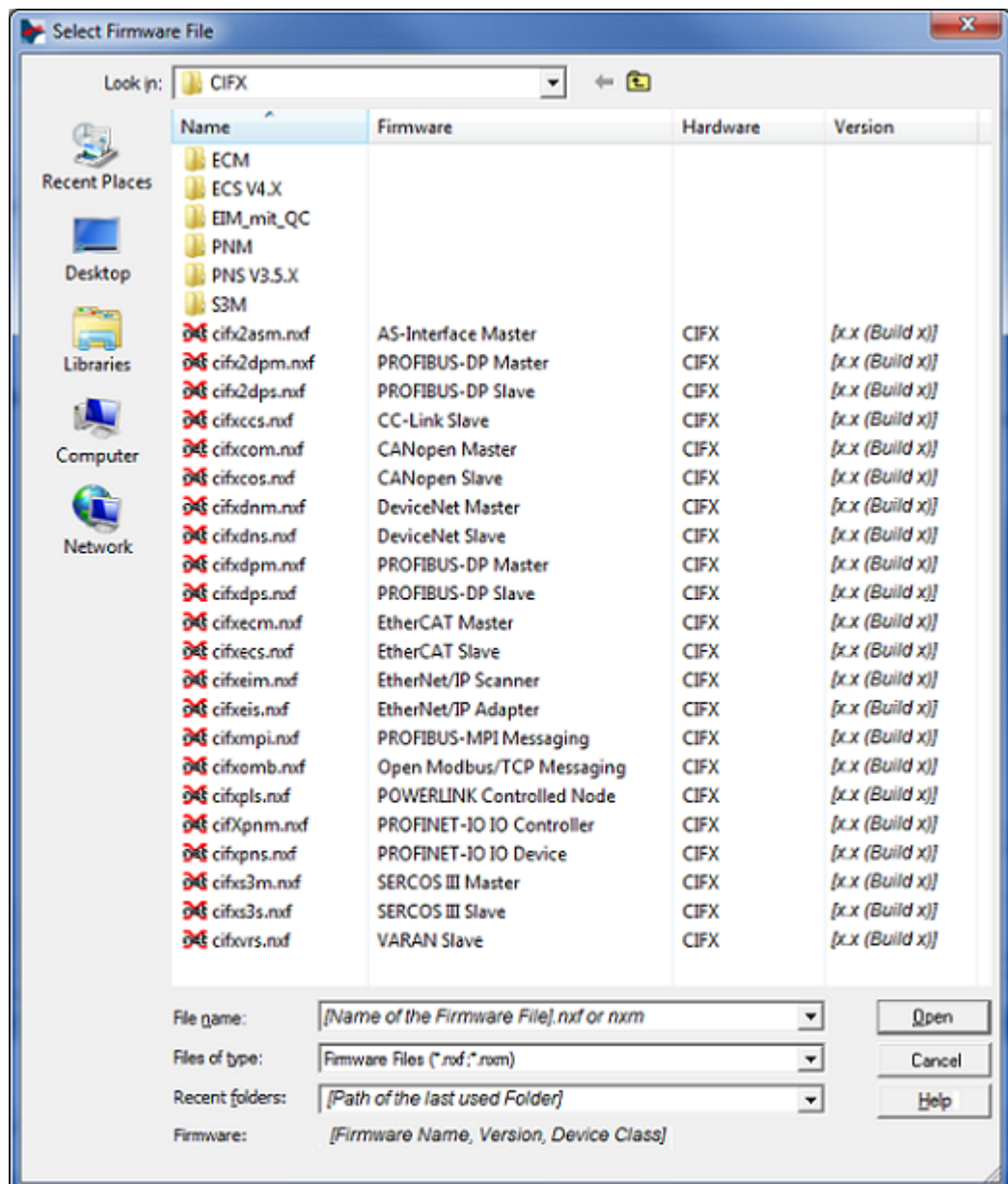


Figure 16: "Select firmware file" selection window (example CIFX)

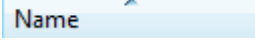
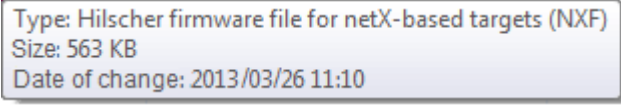
Parameter	Description	Range of value / value
Column Name	File name of the firmware file To sort the entries of the window Select firmware file by name click to the column head 	nxf, nxm
Column Firmware	Name of the firmware (consisting of the protocol name and the protocol class)	
Column Hardware	Device class of the assigned hardware	e. g. CIFX, COMX, COMX 51, NETJACK 10, NETJACK 50, NETJACK 51, NETJACK 100, NETTAP 50 (Gateway), NETTAP 100 (Gateway), NETBRICK 100 (Gateway)
Column Version	Firmware version	x.x (build x)
Tooltip	To view the tooltip display, move the mouse pointer over the selected firmware line. 	
File of Type	"All Files (*.*)" if before in the Device assignment pane the list entry all was selected. "Firmware Files (*.nxm)" or "Firmware Files (*.nxf)" if before in the Device assignment pane under Device selection - suitable only was selected.	All Files (*.*), Firmware Files (*.nxm), Firmware Files (*.nxf)
Recent folders	Path of the recently opened folder	
Firmware	As soon as the firmware file has been selected, under Firmware the name, the version and the build version as well as the device class for the selected firmware is displayed.	Name, Version, Build Version, Device Class for the selected firmware
Help	Button to open the online help of the DTM.	

Table 13: Parameters "Select firmware file"



Further descriptions to the selection window **Select firmware file** are included in the context sensitive help (**F1** key) of the Microsoft Corporation.

**Note:**

After in the **Device assignment** pane under **Device selection - all** or **suitable only** has been set, during a subsequent firmware download in the selection window **Select firmware file** the following data is displayed or set:

(for the list box entry ->)	all	suitable only
In the selection window Select firmware file :	all files from the selected folder	only firmware files from the selected folder
Under File of type* :	"All Files (*.*)"	"Firmware files (*.nxm)", "Firmware Files (*.nxf)"

(for the list box entry ->)	all	suitable only
Validation:	A restricted validation will be performed if the selected firmware is applied for the download.	A validation is made whether the firmware file is suitable for the EtherNet/IP Scanner DTM.
These settings in the selection window Select firmware file can also be changed manually.		

Table 14: In the selection window "Select firmware file"

- In the selection window mark the firmware file to be loaded using the mouse.
- In the selection window under **Firmware** the name and the version of the firmware are displayed.
- In the selection window select the **Open** button.
- A validation is made, whether the selected firmware file is suitable for the EtherNet/IP Scanner device.
- If a firmware file has been selected that is valid for the selected device, the selection window closes immediately (without dialog).
- If a firmware file has been selected that is not valid for the selected device, the query **Select firmware file** appears:
 "Invalid firmware for assigned device!
 [detailed explanation]
 Should the firmware file nevertheless be applied for the download?"



Figure 17: Request Select firmware file - Example Invalid Firmware

NOTICE Invalid firmware

Loading invalid firmware files could render your device unusable.

- Only proceed with a firmware version valid for your device.
 - Answer to the request with **No** and select a valid firmware.
 - The selection window closes.
2. Transmit firmware to the device.
- Note the following safety information:

WARNING Communication stop caused by firmware update, faulty system operation possible, overwriting of firmware or loss of device parameters

Before you initiate a firmware download process, while the bus is still in operation status:

- Stop the application program.
- Make sure that all network devices are in a fail-safe condition.

NOTICE Firmware corruption or loss of parameters caused by power disconnect during firmware download

- During firmware download process, do not interrupt the power supply to the PC or to the device, and do not perform a reset to the device!
- In the dialog pane **Firmware download** click to the **Download** button, to download the firmware.
- The request **Do you really want to download the firmware?** is displayed.

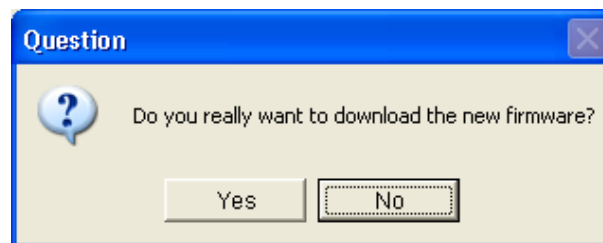


Figure 18: Request - Do you really want to download the firmware?

- Click **Yes**.
- If you are sure, that you have selected the appropriate firmware file answer to the request with **Yes** otherwise with **No**.
- During the download, a progress bar is displayed ("Download active, device performs initialization..."), in the status line a clock / green hook symbol is displayed and in the dialog pane **Firmware download** the button **Download** is grayed out.
- In the **Firmware download** dialog pane the path and name as well as the version of the selected firmware file are displayed.

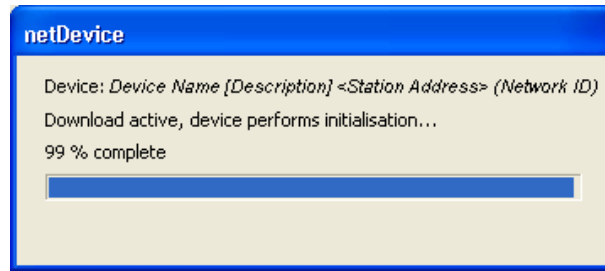


Figure 19: Firmware download - progress bar

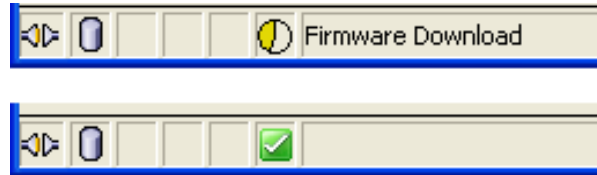


Figure 20: Clock symbol and hook symbol green

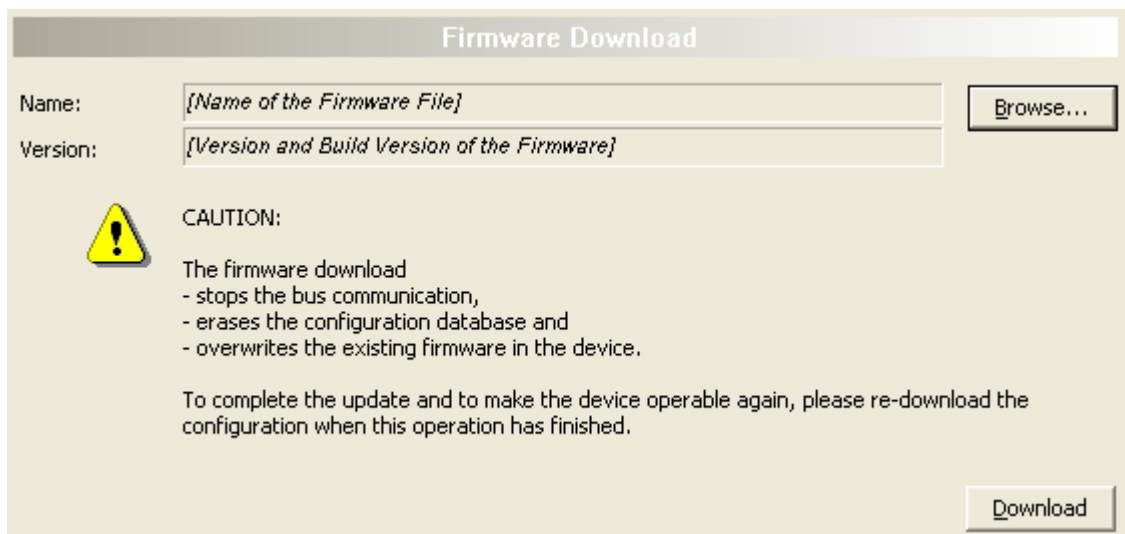


Figure 21: Firmware download - download

4.6 Licensing

To open the Licensing pane:

- In the navigation area select **Settings > Licensing**.
- The dialog pane **Licensing** is displayed.

Licensing

License Type

	Existing	Order
Master protocols		
One General Master License	NO	<input type="checkbox"/>
Two General Master Licenses	NO	<input type="checkbox"/>
PROFIBUS Master	YES	<input type="checkbox"/>
CANopen Master	YES	<input type="checkbox"/>
DeviceNet Master	YES	<input type="checkbox"/>
AS-Interface Master	YES	<input type="checkbox"/>
PROFINET IO RT Controller	YES	<input type="checkbox"/>

Request Form, please fill out

Name	Value
License type	User Single Device License
Manufacturer*	00000001
Article number*	01250510
Serial number*	00020086
Chiptype*	00000002
Step*	00000000
Romcode revision*	00000002

Fields marked with * are mandatory.

Hilscher Germany

E-mail... license@hilscher.com

Print Fax Form... +49 6190 9907-50

Telephone... +49 6190 9907-0

Export License Request...

Download License

Figure 22: Licensing

Using the license dialog, you can order licenses for **Master protocols** and **Utilities** and transfer them to your device. Further information on the license dialog is described in the section *Licensing* [▶ page 45].

5 Licensing

Using the license dialog, you can order licenses for **Master protocols** and **Utilities** and transfer them to your device.

5.1 Opening license dialog

You first open the **License** window.



Note:

You first need to assign the master device to the DTM. Only then the device data and the licenses already present in the device are displayed in the **License** dialog.

How to proceed:

1. Assign the master device to the DTM.
 - In the FDT container **netDevice**, double click to the device icon.
 - Select **Settings > Driver**.
 - Select one or several drivers (checking).
 - **Select Settings > Driver > [Name of the assigned driver]**.
 - Configure the driver settings if necessary.
 - Select **Settings > Device assignment**.
 - Under **Device selection**, select *suitable only* or *all* and click **Scan**.
 - In the table, check the required device.
 - Click **Apply**.
 - Close the DTM configuration dialog via **OK**.

For details to the device assignment, refer to section *Settings* [▶ page 21].

2. Open the **License** pane.
 - Right-click on the device icon in the FDT container **netDevice**.
 - From the context menu, select **Additional functions > License**.
 - ⇒ The **License** window opens.
 - ⇒ The title bar contains the notation of the device description: *Symbolic Name [Device Description] <Station Address > (#Network ID)*.

5.2 License dialog

In the **License** pane, you can:

- check, which licenses for Master protocols or Utilities are present in the device (Position (1) in the figure below),
- order licenses (Positions (2) to (11)),
- transfer license to the device (12),

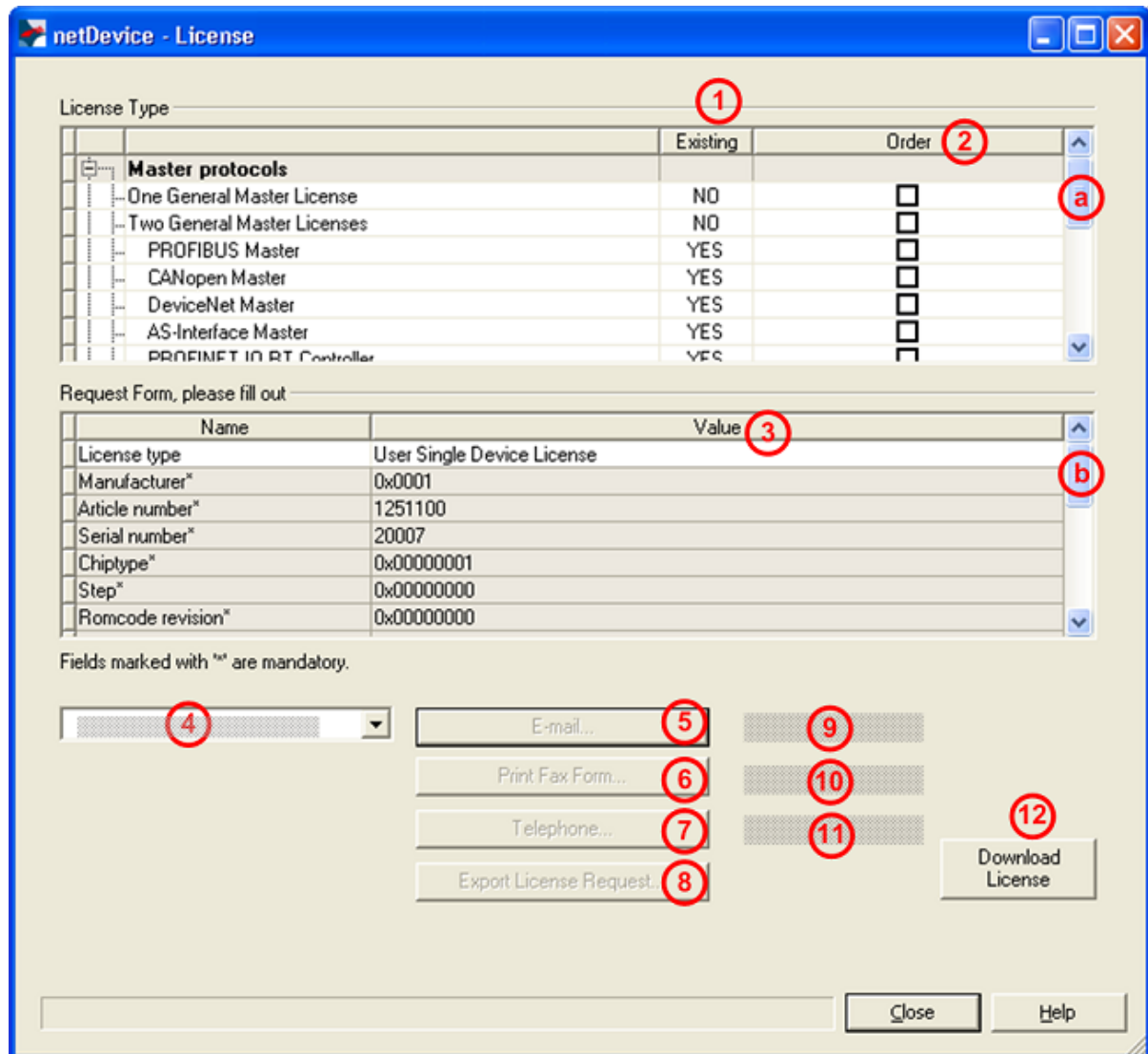


Figure 23: License pane



Note:

To display further entries under License Type, move the scroll box (a) downwards or upwards. To display further entries under **Request form, please fill out**, move the scroll box (b) downwards or upwards.

5.3 Which licenses are present in the device?

Check, which licenses are present in the device.

How to proceed:

- Open the **License** pane as described under section *Opening license dialog* [▶ page 45].

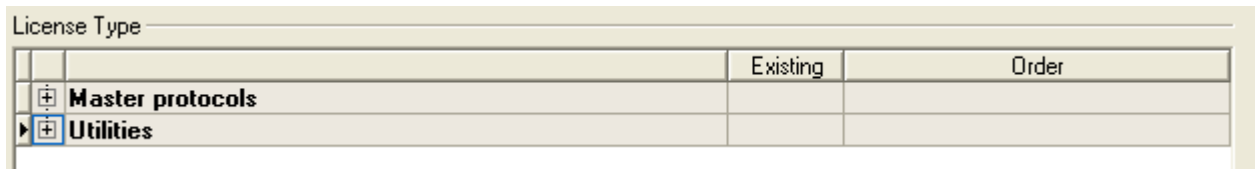


Figure 24: License pane - License Type

- Under **License type** click **+** at **Master protocols**.
- The **Master protocols** overview opens:

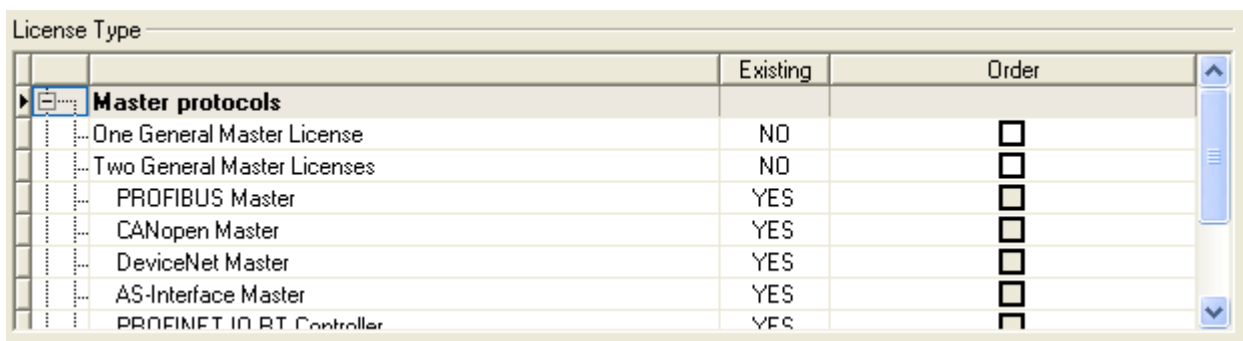


Figure 25: License pane – License Type / Master protocols

- Or click **+** at **Utilities**.
- The **Utilities** overview opens:

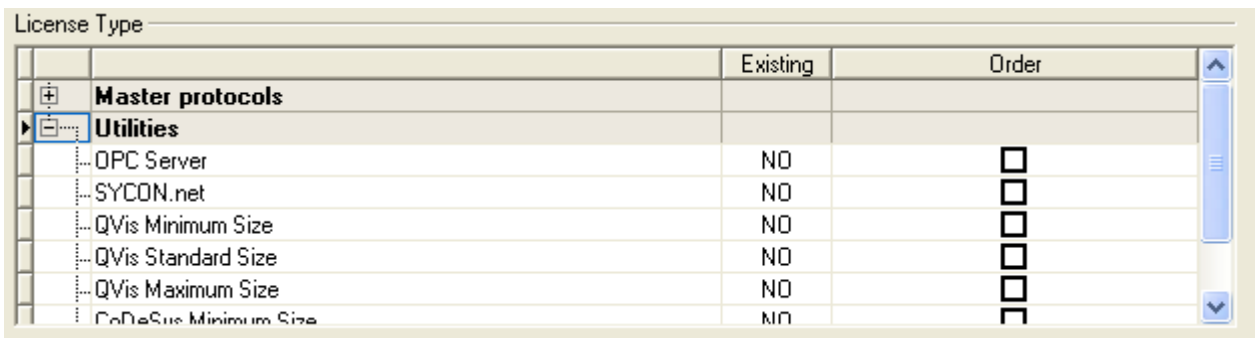


Figure 26: License pane – License Type / Utilities

➤ The column **Existing** indicates which licenses are present in the device.

Yes = License is present in the device.

No = License is not present in the device.



Note:

In newer versions of the present configuration software, under **License type** may be displayed additional licenses or other protocols that can be ordered later.

5.3.1 License for master protocols

One General Master License:

On the device maximally 1 communication protocol with master function can be implemented.

Two General Master Licenses:

On the device maximally 2 communication protocols with master function can be implemented.

The license includes the following master protocols:

- AS-Interface Master
- CANopen Master
- DeviceNet Master
- EtherCat Master
- EtherNet/IP Scanner
- PROFIBUS Master
- PROFINET IO RT Controller
- Sercos Master

5.3.2 Licenses for utilities

SYCON.net

OPC Server

QVis Minimum Size

- QVis Standard Size
- QVis Maximum Size
- CoDeSys Minimum Size
- CoDeSys Standard Size
- CoDeSys Maximum Size

For the Utilities QVis and CoDeSys only one license can be selected alternatively:

- *Minimum Size,*
- *Standard Size* or
- *Maximum Size.*

5.4 How to order a license?

To order a license, proceed as follows:

1. Open the license dialog.
 - Refer to Section *Opening license dialog* [▶ page 45].
2. Select the required licenses.
 - Refer to Section *Selecting license(s)* [▶ page 49].
3. Enter the ordering data.
 - Refer to Section *Ordering data* [▶ page 50].
4. Place your order.
 - Refer to Section *Ordering the license* [▶ page 52].

5.5 Selecting license(s)

You can select licenses for Master protocols and / or Utilities.

1. Selecting license(s) for Master protocol(s):
 - In the **License** pane under **License type** click **+** at **Master protocols**.
 - Under **Order** check as many licenses must run simultaneously on your device:
One General Master License or
Two General Master Licenses.
2. And/or select license(s) for utility(utilities):
 - In the **License** pane under **License type** click **+** at **Utilities**.
 - Under **Order** check the required utility(utilities)
(*single or several*):
 - SYCON.net
 - OPC Server
 - QVis Minimum Size*
 - QVis Standard Size*
 - QVis Maximum Size*
 - CoDeSys Minimum Size**
 - CoDeSys Standard Size**
 - CoDeSys Maximum Size**

For *) and **) minimum size, standard size or maximum size can be selected only as an alternative.

5.6 Ordering data

- Device information

The "Device Information" required for the order are read from the device and automatically filled in the order.

- Ordering Data

➤ Enter the Ordering Data into the **License** pane.

➤ Enter the **Data to manage the Order** (therefore refer to section *Data to manage the order (license information)* [▶ page 51]).

5.6.1 Device information (ordering data read from the device)

The following ordering data is read from the device and displayed in the **License** pane:

- Manufacturer
- Article number
- Serial number
- Chip type
- Step (chip revision)
- Romcode revision
- Checksum (checksum of the device data)

The gray fields under **Request Form, please fill out > Value** contain the ordering data read from the device:

Request Form, please fill out	
Name	Value
Manufacturer*	0x0001
Article number*	1251100
Serial number*	20007
Chiptype*	0x00000001
Step*	0x00000000
Romcode revision*	0x00000000
Checksum*	G

Fields marked with "*" are mandatory.

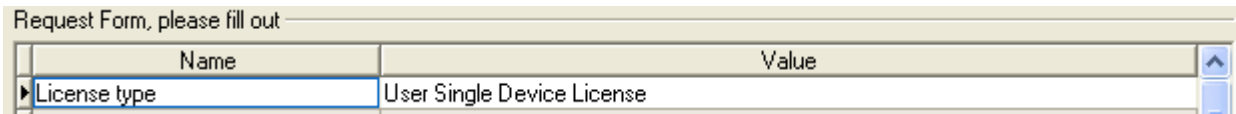
Figure 27: License pane - request form, please fill out / device information

These ordering data read out from the device are displayed automatically from the device.

5.6.2 Data to manage the order (license information)

For your order, you must enter the following data to the **License** pane:

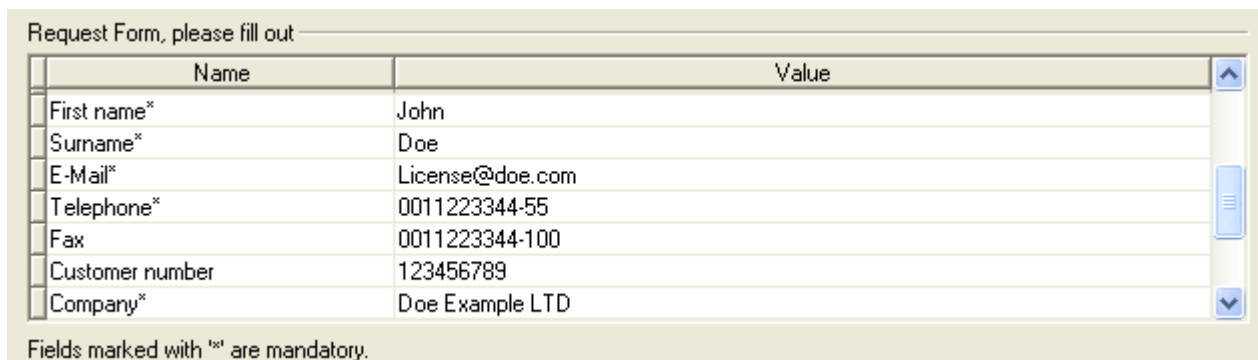
- License type (User Single Device License).



Name	Value
License type	User Single Device License

Figure 28: License pane - Request form, please fill out / License type

- Select the license type under **Request form, please fill out > Value**, (for future application, currently only *User Single Device License* can be selected).
- Mandatory data to the order request (editable fields):
 - First name
 - Surname
 - E Mail (address, to which the license download link shall be send.)
 - Telephone
 - Company
 - Address
 - Country
 - City, State, Zip



Name	Value
First name*	John
Surname*	Doe
E-Mail*	License@doe.com
Telephone*	0011223344-55
Fax	0011223344-100
Customer number	123456789
Company*	Doe Example LTD

Fields marked with '*' are mandatory.

Figure 29: License pane - request form, please fill out / mandatory data

- Enter all mandatory fields under **Request form, please fill out > Value** (marked with*).
- Additional order data, not mandatory (editable fields):
 - Fax
 - Customer number
 - Order number
 - Value added tax identification number
- Under **Request form, please fill out > Value** enter all fields for the additional data, which is not mandatory.

5.7 Ordering the license

Place your order in the **License** pane. Therefore:



Figure 30: License pane – selecting the subsidiary / ordering / contacts

- Select the subsidiary (4), to which the order shall be send.
- Place the order:
 - by **E-Mail** (5),
 - or by **Fax** (6) or by **Telephone** (7),
 - or in a **file** (8).

The **Contact data** of the selected subsidiary is displayed under the positions (9), (10) and (11).

5.7.1 Ordering the license by e-mail

You can place your order by e-mail.

- In the **License** pane, click **e-mail...** (5).
- ⇒ The order e-mail **License request** opens:

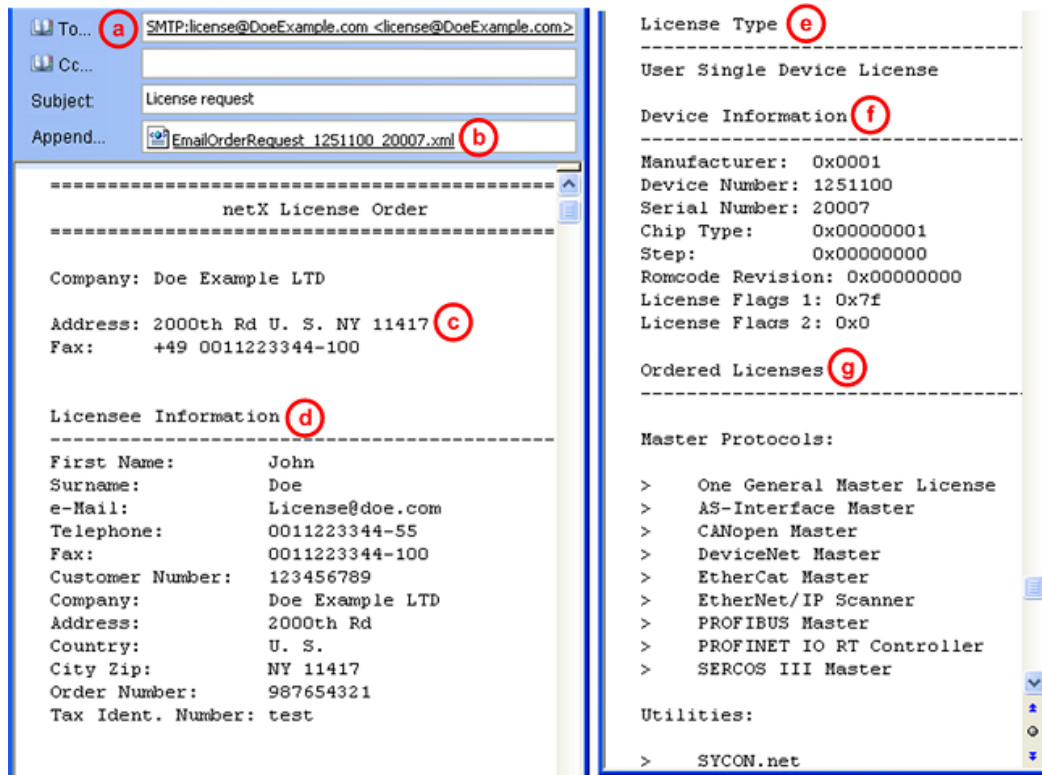


Figure 31: Example: Order e-mail License request

The order e-mail **License request** contains:

- the **E-mail...** of the selected subsidiary (a),
 - the automatically generated **XML file** (b) *EmailOrderRequest_- [Devicenumber]_[Serialnumber].xml* with a summary info of the **order information**,
 - the **Order address** (c),
 - the **License information** (d),
 - the **License type** (e),
 - the **Device information** (f),
 - the **ordered licenses** (g).
- Send the order e-mail **License request**.
 - ⇒ The order process is complete.

5.7.2 Ordering the license by fax or by telephone

You can place your order by fax or by telephone.

- In the **License** pane, click **Print fax form (6)** or **Telephone... (7)**.
- The summary of the ordering data *PrintOrderRequest_[Devicenum-ber]_[Serialnumber].html* is opened in a browser window.



Note:

If your browser does not display the order data or the window **Move element** or **Copy element** is displayed, check the safety settings of your system.

netX License Order Form

Doe Example LTD
2000th Rd
NY 11417
U. S.
fax: +11223344-100



Licensee Information



First Name: John
Surname: Doe
e-Mail: License@doe.com
Telephone: 0011223344-55
Fax: 0011223344-100
Customer No: 123456789
Company: Doe Example LTD
Address: 2000th Rd
Country: U. S.
City Zip: NY 11417
Order Number: 987654321
Tax Ident. Number: test

License Type



User Single Device License

Device Information



Manufacturer: 0x0001
Device Number: 1251100
Serial Number: 20007
Chip Type: 0x00000001
Step: 0x00000000
Romcode Revision: 0x00000000
License Flags 1: 0x7f
License Flags 2: 0x0

Ordered Licenses



Master Protocols

- One General Master License
- AS-Interface Master
- CANopen Master
- DeviceNet Master
- EtherCat Master
- EtherNet/IP Scanner
- PROFIBUS Master
- PROFINET IO RT Controller
- SERCOS III Master
- Sercos III Master

Utilities

- SYCON.net

Date: _____

Signature: _____

Figure 32: Example: Order data form *PrintOrderRequest*

The order data form contains:

- the **Order address (c)** ,
 - the **License information (c)**,
 - the **License type (e)**,
 - the **Device information (f)**,
 - the **ordered Licenses (g)**.
- Print the order data form, sign it and send it by fax.
- In the **License** pane, use the Fax number **(10)**, which is displayed after the subsidiary, was selected.

Or:

- Keep ready the data form and communicate the order data via telephone.
- In the **License** pane, use the telephone number **(11)**, which is displayed after the subsidiary, was selected.
- ⇒ The order process is complete.

5.7.3 Exporting license request to a file

If you are working on a process computer without an e-mail client, you can export your order information to a file, save the file to a removable disk and place your order manually via e-mail from a different PC.

- In the **License** pane, click **Export license request... (8)**.
- ⇒ The window **Browse for folder** is displayed.
- Choose for or create a new folder on a removable disk.
- Save the automatically generated **XML file** *EmailOrderRequest_- [Devicenumbr]_[Serialnumbr].xml* with a summary info of the **order information** to this folder.
- Send this file from a PC with an e-mail client manually via e-mail.
- Therefore use an e-mail address, which is displayed after the subsidiary was selected in the **License** pane (see Position **(9)**, figure *License pane* [▶ page 46]).
- ⇒ The order process is complete.

5.8 How to get the license and transfer it to the device

**Note:**

License files can only be delivered via e-mail. The e-mail contains a link to download the license file.

According to the license you ordered, you will receive an e-mail containing a **Link to download the license file**. This leads to a server PC on which the license file is provided. Using the received link you will have to save the license file on your PC and then transfer the license to your device. If your e-mail client is on another PC as your device, you must save your license file e. g. to an USB stick.

Steps on how to proceed

1. Save the license file to a PC or a disk.
 - Click to the **Link to download the license file** in the e-mail.
 - Save the license file **.nxl* to a PC or a removable disk.
2. Download the license file to the device.
 - Respectively connect the removable disk with the license file to the PC, which is connected to your device.
 - In the **License** pane, click **Download license (12)** in the **License** pane in the configuration software.
 - ↻ The file selection window **Open** is displayed.
 - Therein select the license file *netX License Files (*.nxl)*.
 - Click **Open**.
 - ↻ The license file is transferred to the device.
 - ↻ After this the license is present in the device and is activated with the next device reset.

**Note:**

To activate the license in the device for the first time, a device reset is required.

3. Activate device reset
 - To check whether the license has been activated, follow the steps in section *Which licenses are present in the device?* [▶ page 47].

6 Configuration

6.1 Overview configuring device parameters

Under "Configuration", you can configure your device.

- The **Network settings** include the description of the EtherNet/IP Scanner station and the IP settings.
- The **Scan list** dialog pane shows all defined connections to EtherNet/IP Adapter devices configured in the EtherNet/IP Scanner configuration.
- The **Process data** dialog pane serves as an external process data interface for the EtherNet/IP Scanner DTM.
- The **Address table** shows a list of all addresses used in the process data image.
- In the **Quick connect table**, you can configure the accelerated reattach option for the Adapter devices on an EtherNet/IP network.
- Device-specific settings can be made in the **Scanner settings** dialog pane.

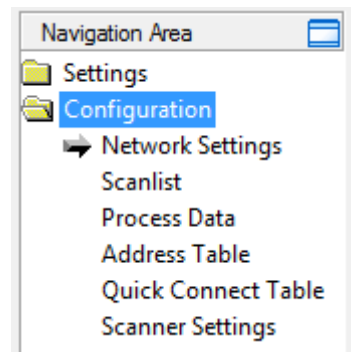


Figure 33: Navigation area - Configuration

Configuring device parameters

The following steps are required to configure the parameters of the EtherNet/IP Scanner device using the EtherNet/IP Scanner DTM:

1. Set the Scanner settings.
 - In the navigation area, select **Configuration > Network settings**.
 - Set the network settings.
 - Apply all settings.

For 'Quick Connect' the Adapter devices must be configured as MDI or MDIX.

2. Configure Scan list.
 - In the navigation area, select **Configuration > Scan list**.
 - Select the required connection or set the IP address of the Adapter.
 - Apply all settings.
3. Setting process data
 - In the navigation area, select **Configuration > Process data**.
 - Set symbolic names for the configured modules or measuring signals.

- Apply all settings.
4. If necessary, set the device address.
 - In the navigation area, select **Configuration > Address table**.
5. Adjust the Scanner settings.
 - In the navigation area, select **Configuration > Scanner settings**.
 - Under **Start-up of bus communication** select **Automatic by the device** or **Controlled by application**.
 - Under **Application monitoring**, set the **Watchdog time**.
 - Under **Module alignment**, set **Byte boundaries** or **2 Byte boundaries**.
6. Close the master DTM configuration dialog.
 - Click **OK** to close the master DTM configuration dialog and save the configuration.
7. Download configuration parameters to the EtherNet/IP Scanner device.
 - Adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop or in consequence of a mismatching system configuration. You find the corresponding safety information in section *Safety messages on firmware or configuration download* [▶ page 15].

**Note:**

To transfer the configuration to the EtherNet/IP Scanner device, download the data of the configuration parameters into the EtherNet/IP Scanner device. See also section *Download configuration* [▶ page 71].

For further information about configuration, see the sections

- *Network settings* [▶ page 59]
- *Scan list* [▶ page 61]
- *Process data* [▶ page 63]
- *Address table* [▶ page 64]
- *Quick connect table* [▶ page 65]
- *Scanner settings* [▶ page 67]

6.2 Network settings

The **Network settings** dialog pane displays the description and IP settings of the EtherNet/IP Scanner. To view the current network settings:

- In the navigation area, select **Configuration > Network settings**.

Figure 34: Configuration > Network settings

Parameters	Description	Range of value / value
Description	Symbolic name of the EtherNet/IP Scanner DTM.	
IP settings of the EtherNet/IP Scanner		
DHCP	To set the IP address, enable/disable DHCP protocol.	
BootP	To set the IP address, enable/disable BootP protocol.	
Fixed addresses	Enable/disable fixed IP settings.	
IP address	IP address of the EtherNet/IP Scanner station	
Network mask	Network mask of the EtherNet/IP Scanner station	
Gateway address	Gateway address of the EtherNet/IP Scanner station	
Port 1 / Port 2		
Operating mode	Operating mode of the EtherNet/IP Scanner for port 1 or port 2	Speed/Duplex mode/ Auto negotiation

Parameters	Description	Range of value / value
MDI mode	<p>MDI mode of the EtherNet/IP Scanner for port 1 or port 2</p> <p>In accordance with the EtherNet/IP specification [4], the following rules apply: If a port is configured for 'forced speed' and 'duplex mode' in the Quick-Connect mode, the Quick-Connect device must not use Auto-MDIX (detection of the required cable connection type) under any circumstances. This detection may take longer than the system connection time allocated for Quick Connect allows. To enable the use of straight-thru cables when Auto-MIDX is disabled, the following rules must be followed:</p> <ol style="list-style-type: none"> 1. For a single-port device, the port must be configured as an MDI. 2. For devices with 2 external Ethernet ports: <ol style="list-style-type: none"> a. The names for the 2 external ports must contain a serial number (number or letter) (for example, port 1 and port 2, or A and B). b. The port with the lower serial number must be configured as MDI. c. The port with the higher serial number must be configured as MDIX. <p>Note: For DLR-capable devices, these requirements are more important than the requirement that DLR-capable devices use "forced Auto-MDIX" when speed and duplex are fixed.[4]</p> <p>Selection for MDI mode:</p> <p>'Auto MDI-X': 'Auto negotiation' mode does not allow 'MDI mode' to be selected. In this case, 'Auto MDI-X' automatically applies.</p> <p>'MDI' and 'MDI-X': The assignment of the RX or TX data direction to the cable ends is statically defined. As a result, the IO connection is established more quickly. A static definition is only used with Quick Connect (see also section <i>Quick connect table</i> [▶ page 65].</p>	'Auto MDI-X', 'MDI' 'MDI-X'

Table 15: Parameters of the Scanner network settings dialog pane

6.3 Scan list

The **Scan list** dialog pane shows all defined connections to EtherNet/IP Adapter devices that are configured in the EtherNet/IP Scanner configuration.

The IP addresses of the EtherNet/IP Adapter stations can be edited or set here.

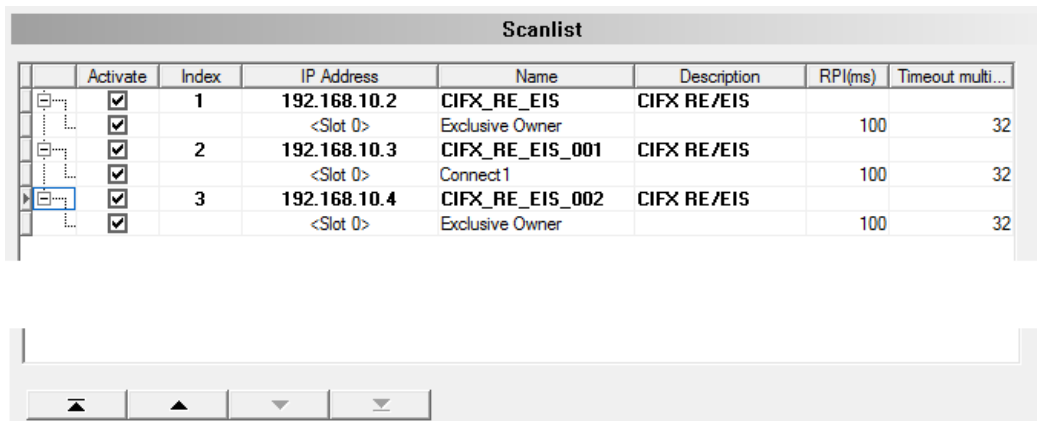


Figure 35: Configuration > Scan list (example)

Parameters	Description	Range of value / value
Enable	Checkbox to activate/deactivate a connection. If the Activate checkbox is checked, the scanner uses up process memory capacity for this connection and the scanner maintains a data exchange with the corresponding device/module on the bus. If the Activate checkbox is not checked, the scanner occupies memory space in the process data image for this connection, but no data exchange with the corresponding device/module takes place on the bus.	checked (default), not checked
Index	Sequential numbering of EtherNet/IP Adapter stations (devices) in the Scan list.	
IP address (editable)	IP address of the EtherNet/IP Adapter station. The IP address of the EtherNet/IP Adapter station can be set in the Scan List here and is only displayed in the EtherNet/IP Adapter DTM. The EtherNet/IP Scanner device transmits the IP address of the EtherNet/IP Adapter station to the EtherNet/IP Adapter device during startup via the EtherNet/IP network and configures the EtherNet/IP Adapter device with it.	Valid IP address
Name	Text name of the EtherNet/IP Adapter station (editable)	
Description	Symbolic name of the EtherNet/IP Adapter device from the EDS file (cannot be edited)	
Slot	Slot number in the chassis, for modular adapters	
RPI(ms)	Requested packet rate in ms for a connection For values in the microsecond range, the fixed-point format can be used, e.g. 0.2 for 200 microseconds.	0,001 – 4294967 Default: 100

Parameters	Description	Range of value / value
Timeout multiplier	The connection timeout multiplier specifies the multiplication factor applied to the Expected Packet Rate to obtain the Connection timeout value. Whenever the connection times out, devices/modules should stop transmission over a connection, even if the pending close signal has been sent.	Value / multiplier 0 / x4 (default), 1 / x8, 2 / x16, 3 / x32, 4 / x64, 5 / x128, 6 / x256, 7 / x512, 8 – 255 / Reserved

Table 16: Parameters of the Scan list dialog pane





	Description
	Click First row to select the first row of a table.
	Click Previous row to select the previous row of a table.
	Click Next row to select the next row in a table.
	Click Last row to select the last row of a table.

Table 17: Select table rows

6.3.1 Set the IP address for the EtherNet/IP Adapter station

To select the required connection or to set the IP address of the adapter:

1. In the navigation area, select **Configuration > Scan list**.
2. Check the **Activate** checkbox for the required connections.
3. In the **IP Address** column, set the **IP address** for the EtherNet/IP Adapter station.

6.4 Process data

For the EtherNet/IP Scanner DTM the **Process data** pane serves as an external process data interface, e. g. for data transfer to a PLC unit. The process data pane lists the slave devices connected to the master, as well as the configured modules or input or output signals of the devices. This makes the fieldbus structure visible.

For the configured modules, submodules or measuring signals names (tags) can be set (column "Tag").

In addition, it can be specified which signal data is to be made available on the OPC server (column SCADA).

Process Data			
	Type	Tag	SCADA
	CIFX RE/EIS V1.1 <192.168.10.2>	CIFX_RE_EIS	<input checked="" type="checkbox"/>
	Exclusive Owner<Slot 0>	Module 0	<input checked="" type="checkbox"/>
	Input Assembly (Instance ID 101)	Input	<input type="checkbox"/>
	Output Assembly (Instance ID 100)	Output	<input checked="" type="checkbox"/>

Figure 36: Process data (example adapter device)

Column	Symbol	Description
Type	Device	Device labeling* provided by the hardware followed by the device's name of station in pointy brackets
	module, submodule	Description of the modules, submodules or input or output signals configured on the device (not editable)
	I/O signal	
Tag	Device	Symbolic name* of the device
	module, submodule	Symbolic name for the modules, submodules or input or output signals configured on the device (editable)
	I/O signal	
	warning	Duplicate Tag at the same level can cause errors by use of OPC!
SCADA	Selection option which module, submodule or signal data should be made available on the OPC server. „SCADA“ (= Supervisory Control and Data Acquisition), here used with the meaning „to provide for visualizing purposes“.	
*Depending on the protocol, either the device name or the symbolic name can be edited via the device symbol context menu.		

Table 18: Process data

6.5 Address table

The **Address table** dialog pane shows a list of all addresses used in the process data image. The displayed addresses refer to the used EtherNet/IP Scanner.

To configure the address data:

- Select **Configuration > Address table** in the navigation area.

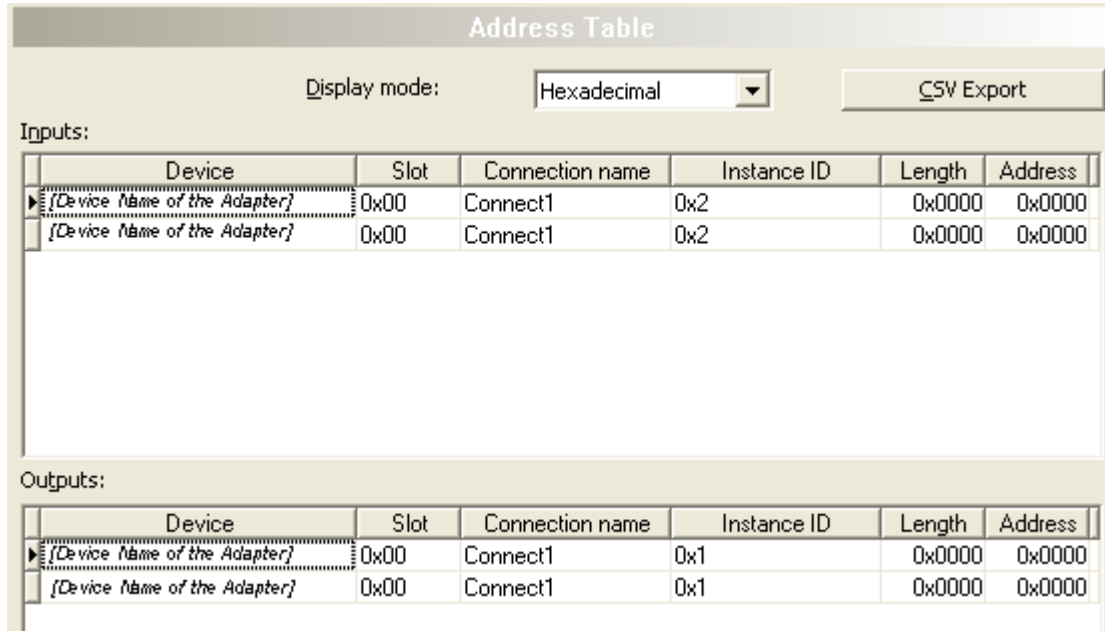


Figure 37: Configuration > Address Table

Parameter	Description
Device	Device name of the adapter
Slot	Slot in chassis, for modular adapters
Connection name	Textual connection name
Instance ID	Assembly instance ID
Length	Byte length of the instance
Address	DPM data offset address of the instance

Table 19: Address table pane parameters - inputs / outputs

Use **Display mode** to select data display mode decimal or hexadecimal.

The **CSV export** option allows to export input- and output addresses as CSV file (CSV = comma separated value). Therefore:

- Click to the **CSV export** button.
- A file saving dialog opens.
- Save the data as *.CSV file.

You can open the generated data by means of a spreadsheet application.

Sort addresses

- To sort the address data, click on the respective column header.

6.6 Quick connect table

"Quick connect" enables an adapter device to start up faster when reconnected in an EtherNet/IP network (e.g. after a tool change). For class A EtherNet/IP Adapter devices, the connection is established within 500 ms.

Requirements

- The scanner device and the adapter device must support "Quick connect" in order to use "Quick connect" to the full.
- The hardware installation must allow the transmission of the electrical lock signal to the EtherNet/IP Scanner device. A permanent I/O connection can be used for this purpose.
- The customer application must send the package EIP_OBJECT_CC_SLAVE_ACTIVATE_REQ (0x1A48) triggered by the electrical lock signal to the scanner stack to open the connection to the EtherNet/IP Scanner device.

Configuration steps

- Select **Configuration > Quick connect table**.

Quick Connect Table						
	Support Quick Connect	Ready for Connection Time(ms)	CIP Connection Time(ms)	IP Address	Name	Description
	<input checked="" type="checkbox"/>	300	50	192.168.10.4	CIFX_RE_EIS_002	CIFX RE/EIS
	<input checked="" type="checkbox"/>	300	50	192.168.10.3	CIFX_RE_EIS_001	CIFX RE/EIS
	<input checked="" type="checkbox"/>	300	50	192.168.10.2	CIFX_RE_EIS	CIFX RE/EIS

Figure 38: Configuration > Quick connect table

- Check if **Support quick connect** is checked.
- ⇒ If **Support quick connect** is checked, the time displayed under **Ready to connect time** is always written to the configuration software database. This time comes directly from the EDS file of the adapter device.

For more information about the **Quick connect table**, see the table below:

Parameters	Description	Range of value / value
Support quick connect	If Support quick connect for an adapter device is checked, the time displayed under Ready for connection time is always written to the database of the configuration software. If Support quick connect for an adapter device is not checked, no time is written to the configuration software database for Ready for connection time . In this case, the time for Ready for connection time must be given to the scanner stack via the packet.	checked (default), not checked
Ready for connection time (ms)	The EDS file of the adapter contains the time that the Quick connect adapter device needs to be ready for connection. The time is measured from the moment the adapter device is connected to the power supply until the time the adapter device is ready to accept an incoming TCP connection. This time is called "Ready for connection time" (ENetQCTN).	Adapter class A: 0 ... 350 ms, Adapter class B: 0 ... 2000 ms, default: Value from the EDS file
CIP connection time (ms)	Time required by the EtherNet/IP Adapter to establish the connection to the EtherNet/IP Scanner. During this time, the adapter must process several frames.	

Parameters	Description	Range of value / value
IP Address (editable)	IP address of the EtherNet/IP Adapter station as set in the Scan list table (see section <i>Scan list</i> [▶ page 61]). This parameter defines the IP address of the EtherNet/IP Adapter device within the EtherNet/IP network.	Valid IP address
Name	Text name of the EtherNet/IP Adapter station (can be edited in the Scan list pane)	
Description	Symbolic name of the EtherNet/IP Adapter device from the EDS file (cannot be edited)	

Table 20: Parameters of the Quick connect table

6.7 Scanner settings

Device-specific settings can be made in the **Scanner settings** dialog pane. These settings only take effect after the configuration has been downloaded to the device. For download information, see *Download configuration* [▶ page 71].

➤ Go to **Configuration > Scanner settings**.

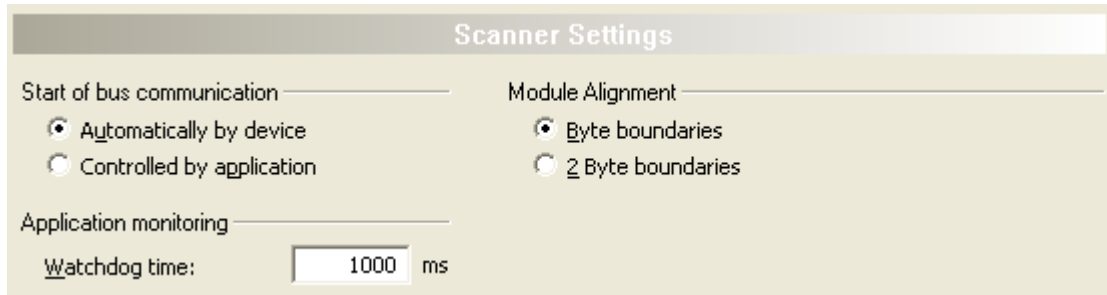


Figure 39: Configuration > Scanner settings



Note:

The setting options in the **Scanner settings** dialog pane shown here may differ from the settings for customer-specific versions of the configuration software.

6.7.1 Start of bus communication

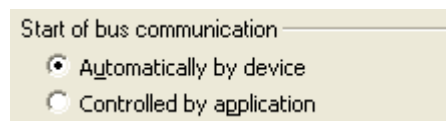


Figure 40: EtherNet/IP Scanner settings > Start of bus communication

If **Automatically by device** is selected, the EtherNet/IP Scanner device will start with the data exchange on the bus after the initialization has been finished.

When **Controlled by application** is selected, the application program must activate the data exchange on the bus.

6.7.2 Application monitoring

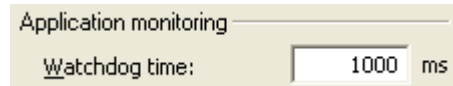


Figure 41: EtherNet/IP Scanner settings > Application monitoring

The **Watchdog time** determines the time within which the device watchdog must be re-triggered from the application program while the application program monitoring is activated. When the watchdog time value is equal to 0 the watchdog is deactivated and the application program monitoring is deactivated too.

The permissible range of values of the watchdog time is 20 to 65535. By default the watchdog time value equals to 1000 ms.

Watchdog time	Range of value / value
Permissible range of values	20 ... 65535 ms
Default	1000 ms
The software watchdog is deactivated.	0 ms

Table 21: Range of value / Value for the watchdog time

6.7.3 Module alignment

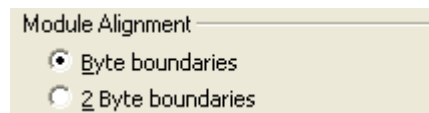


Figure 42: EtherNet/IP Scanner settings > Module alignment

The **Module alignment** defines the addressing mode of the process data image. The addresses (offsets) of the process data are always interpreted as byte addresses. The **Module alignment** then defines the addressing mode, **Byte boundaries** or **2 Byte boundaries**.

Parameter	Description
Byte boundaries	The module address can start at any byte offset.
2 Byte boundaries	The module address can only start at even byte offsets.

Table 22: Parameters EtherNet/IP Scanner Settings > Module Alignment

6.8 Connecting/disconnecting device

**Note:**

Several EtherNet/IP Scanner DTM functions, e. g. diagnosis or the configuration download in SYCON.net, require an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device.

Connecting device

To establish an online connection from the EtherNet/IP Scanner device to the EtherNet/IP Scanner DTM, take the following steps:

Under **Settings** in the **Driver** pane:

- Verify that the default driver is checked and respectively check another or multiple drivers.
- Configure the driver if necessary.

Under **Settings** in the **Device assignment** pane:

- Scan for the devices (with or without firmware).
- Select the device (with or without firmware) and apply the selection.

Before you download the firmware, adhere to the necessary safety precautions to prevent personnel injury and property damage that may occur in consequence of a communication stop. For details, refer to section *Safety messages on firmware or configuration download* [▶ page 15].

Under **Settings** in the **Firmware download** pane, if not yet a firmware was loaded to the device:

- Selecting and downloading the firmware.

Under **Settings** in the **Device assignment** pane, if not yet a firmware was loaded to the device:

- Scan for the device (with firmware) once more.
- Select the device (with firmware) once more.

An overview of the descriptions for these steps you find in the section *Overview settings for driver and device assignment* [▶ page 21].

- In the DTM interface dialog, select the **OK** button, to apply the selection and to close the DTM interface dialog.
- Right-click on the EtherNet/IP Scanner icon.
- Select the **Connect** command from the context menu.
- The EtherNet/IP Scanner device now is connected to the EtherNet/IP Scanner DTM via an online connection. In the network view, the device description at the device icon of the master is displayed with a green colored background.

Disconnecting device

To disconnect an online connection from the EtherNet/IP Scanner device to the EtherNet/IP Scanner DTM, take the following steps:

- In the DTM interface dialog, select the **OK** button, to close the DTM interface dialog.
- Right-click on the EtherNet/IP Scanner icon.
- Select the **Disconnect** command from the context menu.
- ⇒ In the network view, the device description is not any more displayed with a green colored background. Now the online connection from EtherNet/IP Scanner device to the EtherNet/IP Scanner DTM.

6.9 Download configuration

The device configuration is created "offline" in the DTM (application program). A download to the device is required, to transfer the configuration with the parameter data to the device.

**Note:**

To download configuration parameter data to the EtherNet/IP Scanner device an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device is required. Further information can be found in *Connecting/disconnecting device* [▶ page 69].

**WARNING Communication stop caused by configuration download, faulty system operation possible or loss of device parameters**

Before you initiate a configuration download process, while the bus is still in operation status:

- Stop the application program.
- Make sure that all network devices are in a fail-safe condition.

**WARNING Mismatching system configuration, faulty system or device operation possible**

- In the device, use only a configuration suitable for the system.

**NOTICE Loss of device parameters caused by power disconnect during configuration download**

- During configuration download process, do not interrupt the power supply to the PC or to the device, and do not perform a reset to the device!

Download steps

In order to transfer the configuration with the corresponding data of the configuration parameters to the EtherNet/IP Scanner device, download the data using the frame application netFrame in SYCON.net via **Device > Download** or context menu **Download**.

- Select **Download** in the context menu of the device.
- If the download is started as long as the slave devices are connected to the master device, the following message is displayed: "If you attempt to download during bus operation, communication between master and slaves is stopped. Do you really want to download?"

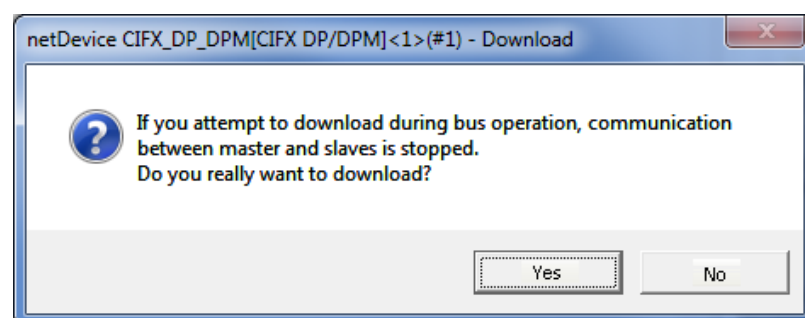


Figure 43: netDevice Message: Download

**Important:**

If the communication between the master device and the adapter devices is stopped, the data exchange between the master device and the adapter devices is stopped.

- Click **Yes** if you intend to download the configuration.
- Then the current configuration in the application program is downloaded to the device.
- Otherwise click to **No**.

7 Diagnosis

7.1 Overview diagnosis

Under "Diagnosis", you can can diagnose your device. The dialog Diagnosis serves to diagnose the device behavior and communication errors. For diagnosis, the device must be in online state.

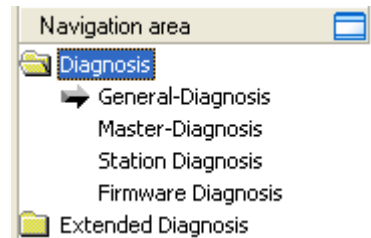


Figure 44: Navigation area - Diagnosis EtherNet/IP Scanner DTM

Online connection to the device



Note:

Accessing the **Diagnosis** panes of the EtherNet/IP Scanner DTM requires an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device. For further information refer to section *Connecting/disconnecting device* [▶ page 69].

How to proceed

- In the scanner DTM diagnosis dialog, check whether the communication is OK: **Diagnosis > General diagnosis > Device status**
"Communication" must be green!
- **"Communication"** is green: Open the **IO monitor** and test the input or output data.
- **"Communication"** is not green: Use **Diagnosis** and **Extended diagnosis** for troubleshooting.

Extended diagnosis

The **Extended diagnosis** helps to find communication and configuration errors, when default diagnosis fails.

For further information, refer to chapter *Extended Diagnosis* [▶ page 79].

7.2 General diagnosis

Information regarding the Device State and other general diagnosis parameters are displayed in the **General Diagnosis** dialog.

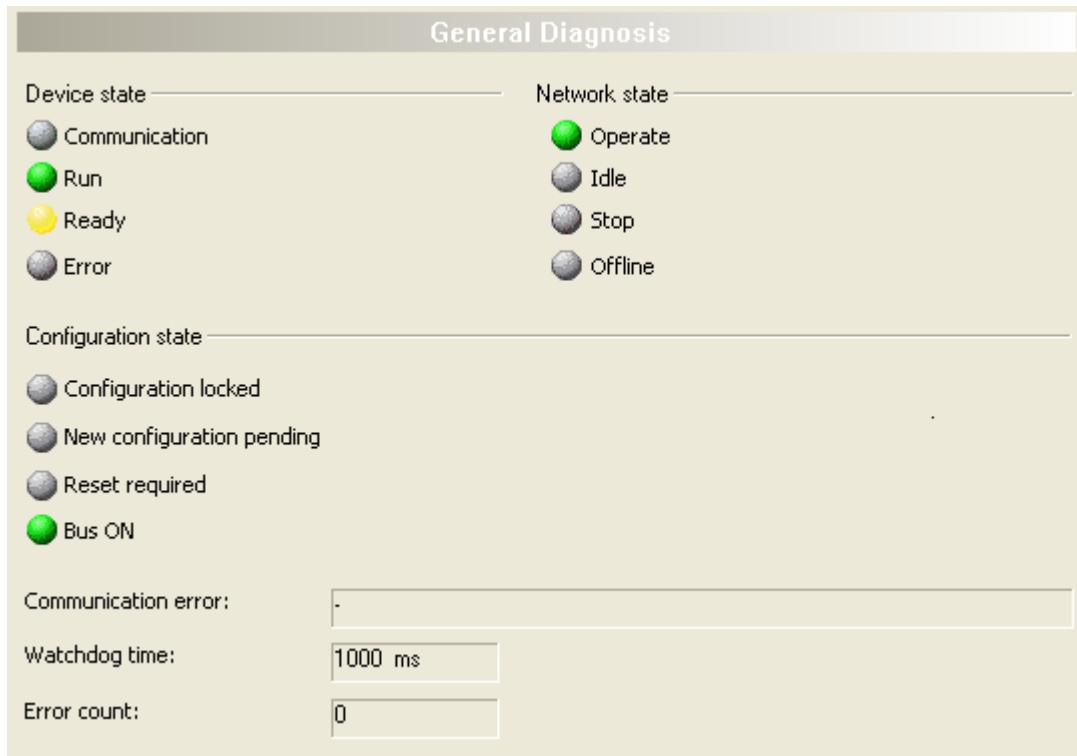


Figure 45: General diagnosis

LED	Description	Color	State
Device state			
Communication	Shows whether the EtherNet/IP device executes the network communication.	(green)	In COMMUNICATION state
		(gray)	Not in COMMUNICATION state
Run	Shows whether the EtherNet/IP device has been configured correctly.	(green)	Configuration OK
		(gray)	Configuration not OK
Ready	Shows whether the EtherNet/IP device has been started correctly. The EtherNet/IP device waits for a configuration.	yellow	Device READY
		(gray)	Device not READY
Error	Shows whether the EtherNet/IP device records a device status error. For further information about the error characteristics and the number of counted errors refer to the extended diagnosis.	(red)	ERROR
		(gray)	No ERROR
Network state			
Operate	Shows whether the EtherNet/IP device is in data exchange. In a cyclic data exchange the input data or the output data of the EtherNet/IP Scanner is transmitted to the EtherNet/IP Adapter.	(green)	In OPERATION state
		(gray)	Not in OPERATION state
Idle	Shows whether the EtherNet/IP device is in data exchange.	(yellow)	In IDLE state
		(gray)	Not in IDLE state
Stop	Shows whether the EtherNet/IP device is in Stop state: There is no cyclic data exchange at the EtherNet/IP network. The EtherNet/IP device was stopped by the application program or it changed to the Stop state because of a bus error.	(red)	In STOP state
		(gray)	Not in STOP state









LED	Description	Color	State
Offline	The EtherNet/IP Scanner is offline as long as it does not have a valid configuration.	 (yellow)	In OFFLINE state
		 (gray)	Not in OFFLINE state
Configuration state			
Configuration locked	Shows whether the EtherNet/IP device configuration is locked, to avoid the configuration data is typed over.	 (yellow)	Configuration not LOCKED
		 (gray)	Configuration not LOCKED
New Configuration pending	Shows whether a new EtherNet/IP device configuration is available.	yellow	New configuration pending
		 (gray)	No new Configuration pending
Reset required	Shows whether a firmware reset is required as a new EtherNet/IP device configuration has been loaded into the device.	yellow	RESET required
		 (gray)	No RESET required
Bus ON	Shows whether the bus communication was started or stopped. I. e., whether the device is active on the bus or no bus communication to the device is possible and no response telegrams are sent.	 (green)	Bus ON
		 (gray)	Bus OFF

Table 23: Indication general diagnosis

Parameter	Description
Communication error	Shows the name of the communication error. If the cause of error is resolved, the value will be set to zero again.
Watchdog time	Shows the watchdog time in ms.
Error count	This field holds the total number of errors detected since power-up, respectively after reset. The protocol stack counts all sorts of errors in this field no matter whether they were network related or caused internally.

Table 24: Indication general diagnosis

7.3 Master diagnosis

Information regarding the slave state, slave errors and slaves configured, active or in diagnostic is displayed in the **Master Diagnosis** dialog.

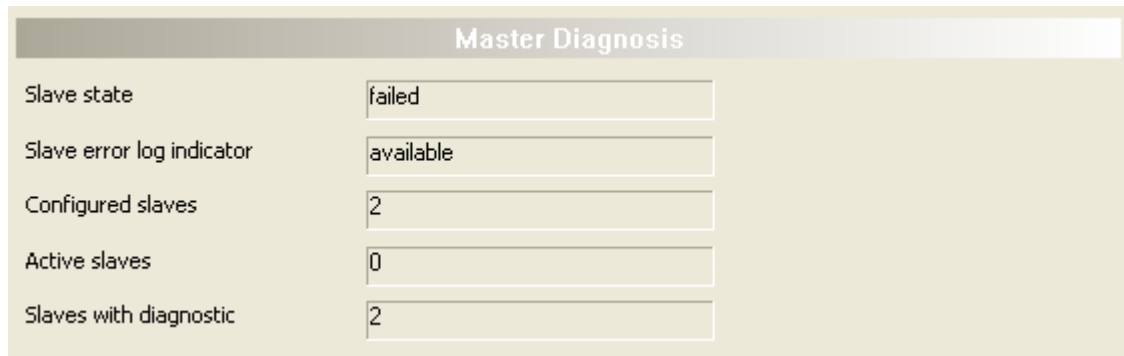
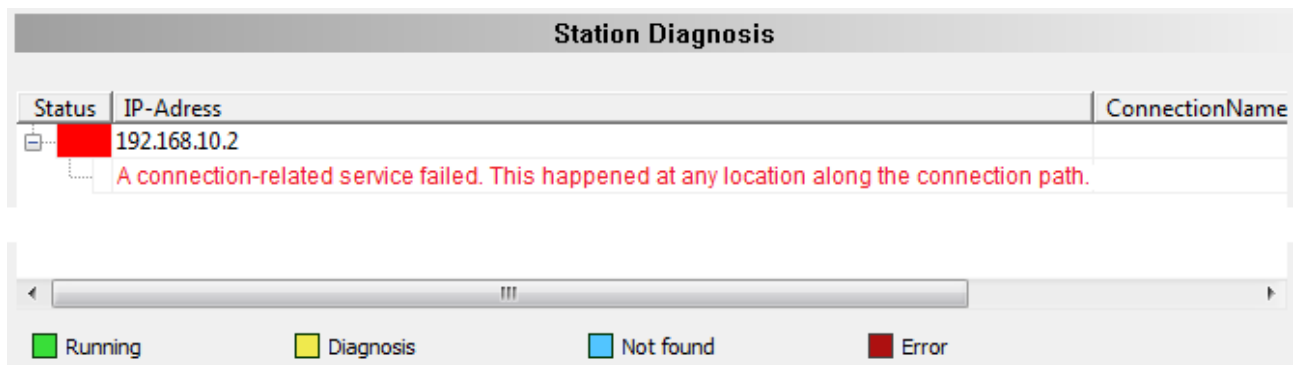


Figure 46: Master diagnosis

Parameter	Description	Range of value / value
Slave state	Shows whether slave state is ok or not. The slave state field for master diagnosis shows whether the master is in cyclic data exchange to all configured slaves. In case there is at least one slave missing or if the slave has a diagnostic request pending, the status will be set to FAILED. For protocols that support non-cyclic communication only, the slave state is set to OK as soon as a valid configuration is found.	UNDEFINED, OK, FAILED
Slave error log indicator	Shows whether the slave error log indicator is available. The error log indicator field holds the number of entries in the internal error log. If all entries are read from the log, the field will be set to zero.	EMPTY, AVAILABLE
Configured slaves	Shows the number of configured slaves. Number of configured slaves in the network according to the slave list derived from the configuration database created by the configuration software. The list includes the slaves to which the master has to open a connection.	
Active slaves	Shows number of active slaves. Number of slaves in data exchange mode. The list includes the slaves to which the Master has successfully opened a connection	
Slaves with diagnostic	Shows number of slaves with diagnostic. Number of slaves with diagnosis or error slaves.	

Table 25: Parameters Master diagnosis

7.4 Station diagnosis



Station diagnosis

The Station diagnosis shows the status of the devices, which are connected to the EtherNet/IP Scanner DTM online. The DTM updates this display cyclically.

Column	Description
Status	The current status of the device associated to the IP address displayed.
IP-Address	IP address, to which the device is assigned.
ConnectionName	The name of the connection from the EtherNet/IP Scanner DTM to the device.

Table 26: Columns of table 'Station Diagnosis'

The legend below describes the possible values for the state of a device, which is assigned to a station address.

Color	Name	Description
green	Running	The device associated with this station address is running.
yellow	Diagnosis	Diagnosis is available for the device associated with this station address.
blue	Not found	The device associated with this station address was parameterized, but not found.
red	Error	An error message is available for the device associated with this station address.

Table 27: Possible values for the status

7.5 Firmware diagnosis

In the dialog **Firmware Diagnosis**, the current task information of the firmware is displayed.

Under **Firmware** or **Version** the name of the firmware and version (including the date) are indicated.

Firmware Diagnosis					
Firmware:	EtherNet/IP Scanner				
Version:	2.6.0 (Build 6)				
Date:	22.3.2013				
Task information:					
Task	Name of task	Version	Priority	Description	State
0	RX_IDLE	1.0	63	RX IDLE Task.	Task Status ok. (0x00000000)
1	RX_TIMER	1.0	1	rcX Timer.	Task Status ok. (0x00000000)
2	DLR_IRQ_TSK	0.0	11	The task identifier is unknown.	Task Status ok. (0x00000000)
3	RX_SYSTEM	1.16	8	Middleware System Task.	Task Status ok. (0x00000000)
4	DPM_COMO_SMBX	1.0	50	TLR-Router DPM.	Task Status ok. (0x00000000)
5	DPM_COMO_RMBX	1.0	51	TLR-Router DPM.	Task Status ok. (0x00000000)
6	TLR_TIMER	1.0	17	TLR Timer Task.	Task Status ok. (0x00000000)
7	EIM_CL1_TASK	1.1	19	EthernetIP Encapsulation Task Class 1 services.	Task Status ok. (0x00000000)
8	EIM_ENCAP_TASK	1.10	37	EthernetIP Encapsulation Task.	Task Status ok. (0x00000000)
9	EIM_OBJECT_T...	1.22	38	EthernetIP Object Task.	Task Status ok. (0x00000000)
10	EIM_TCPUDP	2.23	22	TCPUDP task (TCP/IP stack).	Task Status ok. (0x00000000)
11	EIM_AP_TASK	1.15	47	EtherNet/Ip Scanner Application-Task.	Task is not communicating. (0x...
12	EIP_DLR_TASK	1.4	18	EthernetIP DLR task.	Task Status ok. (0x00000000)
13	MARSHALLER	2.0	56	Marshaller: Main Task.	Task Status ok. (0x00000000)
14	ETH_INTF	5.0	48	Ethernet Interface Task.	Task Status ok. (0x00000000)
15	PACKET_ROUTER	2.0	57	Marshaller: Packet Router Task.	Task Status ok. (0x00000000)

Figure 47: Firmware Diagnosis

Task information:

The table **Task Information** is listing the task information of the single firmware tasks.

Task	Description
Task	Name of task
Name of task	Name of the task
Version	Version number of the task
Prio	Priority of the task
Description	Description of the task
Status	Current status of the task

Table 28: Description table task information

8 Extended Diagnosis

8.1 Overview extended diagnosis

The "Extended Diagnosis" of the EtherNet/IP Scanner DTM helps to find communication and configuration errors, when default diagnosis fails. Therefore, it contains a list of diagnosis structures as online counter, states and parameters.

The table below gives an overview for the extended diagnosis dialog panes descriptions of the EtherNet/IP Scanner DTM:

Folder name / section	Subsection
Various folders	<i>Task information</i> : [▶ page 80]
RX SYSTEM	<i>IniBatch status</i> [▶ page 80]
ENCAP_TASK	<i>Encap command counter</i> [▶ page 81]
	<i>Packet counter</i> [▶ page 82]
	<i>Code diagnosis</i> [▶ page 83]
OBJECT_TASK	<i>Object request counter</i> [▶ page 84]
	<i>Output connection</i> [▶ page 85]
	<i>Input connection</i> [▶ page 85]
	<i>Code diagnosis</i> [▶ page 86]
TCPUDP	<i>IP information</i> [▶ page 87]
	<i>IP packet counter</i> [▶ page 88]
	<i>IP code diagnosis</i> [▶ page 88]
	<i>TCP_UDP information</i> [▶ page 89]
	<i>TCP_UDP code diagnosis</i> [▶ page 89]
AP_TASK	<i>Common Diagnosis</i> [▶ page 90]
	<i>General status</i> [▶ page 90]
	<i>Code diagnosis</i> [▶ page 91]
EIS_DLR_TASK	<i>DLR object diagnosis</i> [▶ page 92]
	<i>DLR object counter</i> [▶ page 94]

Table 29: Descriptions of the Extended dialog panes



Note:

Accessing the **Extended Diagnosis** dialog panes of the EtherNet/IP Scanner DTM requires an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device. For further information refer to section *Connecting/disconnecting device* [▶ page 69].

8.2 Task information:

Task Information	
Task states	
Name	Value
Identifier	
Major version	[The displayed values depend from the corresponding task]
Minor version	
Maximum Packet size	
Default Que	
Unique identifier	
Init result	

Figure 48: Extended Diagnosis > [Folder Name] > Task Information Example Display

Name	Description
Identifier	Identification number of the task
Major version	Task version, contains incompatible changes
Minor version	Task version, contains compatible changes
Maximum packet size	Maximum packet size, which the task sends
Default Queue	Queue handle, which is accessible via DPM by mailbox.
UUID	Unique user ID, 16 Byte indicator used for task identification and its affiliation e. g. to a stack (therein different identification data is coded in).
Init result	Error Code, 0= no Error The description of the error codes can be found in this manual or in the corresponding software reference manuals.

Table 30: Extended Diagnosis > [Folder Name] > Task Information

8.3 IniBatch status

IniBatch-Status	
Task states	
Name	Value
Communication Channel	0
Current State	Error
IniBatch Result	No DBM file
OpenDbm Result	24975
SendPacket Result	0
Confirmation Result	0
Last Packet Number	0
Last Packet Command	0
Last Packet Length	0
Last Packet Destination	0

Figure 49: Extended Diagnosis > [Folder name] > IniBatch Status example display

Name	Description
Communication Channel	Number of the communication channel used by the device.
Current State	Idle; IniBatch packets in progress; Retrying to send last packet; Error

Name	Description
IniBatch Result	Ok; No DBM file; No Packet table; No data set available; Data set is shorter than packet length; Packet Buffer is shorter than Packet length; Invalid packet destination; Logical queue not defined Send packet failed; Too many retries; Error in confirmation packet status
OpenDbm Result	Error when opening the IniBatch database Under "OpenDbm Result" the error code is typed in, when "IniBatch Result" == "No DBM file" (1) is.
SendPacket Result	Error when sending a packet Under "SendPacket Result" the error code is typed in, when "IniBatch Result" == "send packet failed" (8) is.
Confirmation Result	Confirmation error when sending packets Under "Confirmation Result" the packet specific error code from the ulSta is typed in, when "IniBatch Result" == "Error in confirmation packet status" (10) is.
Last Packet Number	Value depends by the communication system.
Last Packet Command	Value depends by the communication system.
Last Packet Length	Value depends by the communication system.
Last Packet Destination	Value depends by the communication system.

Table 31: Extended Diagnosis > [Folder name] > IniBatch Status

The task status "Confirmation Result" is bus specific. The other task status are rcx-related error codes.

8.4 ENCAP_TASK

8.4.1 Encap command counter

Encap Command Counter	
Task states	
Name	Value
NOP	0
List Target	0
List Identity	0
List Services	0
List Interfaces	0
Register session	0
Unregister session	0
Send process data	0
Unknown Command	0
Good Reply	0
Error Reply	0

Figure 50: Extended Diagnosis > EIM_ENCAP_TASK > Encap command counter

Name	Description
NOP	Counter of incoming encapsulation telegrams
List Target	Counter of incoming encapsulation telegrams
List Identity	Counter of incoming encapsulation telegrams
List Services	Counter of incoming encapsulation telegrams

Name	Description
List Interfaces	Counter of incoming encapsulation telegrams
Register Session	Counter of incoming encapsulation telegrams
Unregister Session	Counter of incoming encapsulation telegrams
Process data	Unit-Date RR data telegrams
Unknown command	Counter of incoming encapsulation telegrams
Good Reply	Counter of incoming encapsulation telegrams
Error Reply	Counter of incoming encapsulation telegrams

Table 32: Extended Diagnosis > EIM_ENCAP_TASK > Encap command counter

8.4.2 Packet counter

Task states	
Name	Wert
ulOpenCnf	12
ulWaitConnCnf	0
ulConnectCnf	0
ulUdpSendCnf	0
ulTcpSendCnf	0
ulCloseCnf	0
ulSetSockOptionCnf	0
ulReceiveInd	0
ulStopInd	0
ulGetCfgCnf	521
ulShutdownInd	0
ulSetCfgCnf	0
ulSetCloseAllCnf	0
ulResetReq	3
ulRespRRReq	0
ulSendRRReq	0
ulSendCl3Req	0
ulCreateTranspReq	0
ulDelTranspReq	0
ulStartTranspReq	0
ulLIdnetityReq	0
ulLInterfaceReq	0
ulLServiceReq	0

Figure 51: Extended Diagnosis > EIM_ENCAP_TASK > Packet Counter

Name	Description
[Service]	Diagnosis counter of the encapsulation layer. Indicates the services processed. (The services of the single packets are described in the API manual.)

Table 33: Extended Diagnosis > EIM_ENCAP_TASK > Packet Counter

8.4.3 Code diagnosis

Code Diagnosis	
Task states	
Name	Value
Info counter	0
Warning counter	0
Error counter	0
Error level	0
Error code	0x0
Parameter	0x0
Line number	0
Module	

Figure 52: Extended Diagnosis > EIM_ENCAP_TASK > Code

Name	Description
Info counter	Counter for information messages
Warnings	Counters for warning messages
Error counter	Counter for errors that have occurred
Error level	Class of the last error that occurred
Error code	Code of the last error
Parameters	Additional information about the error
Line number	Line number within the software module
Module	Software module

Table 34: Extended Diagnosis > EIM_ENCAP_TASK > Code

8.5 OBJECT_TASK

8.5.1 Object request counter

Object Request Counter	
Task states	
Name	Value
Identity Get Attribute Single	0
Identity Get Attribute All	0
Identity Reset	0
Identity unknown command	0
Assembly Get Attribute Single	0
Assembly Set Attribute Single	0
Assembly unknown command	0
Connection Manager Get Attribute Single	0
Connection Manager Forward Open	0
Connection Manager Forward Close	0
Connection Manager unknown command	0
CoCo Get Attribute Single	0
CoCo Get Attribute All	0
CoCo Set Attribute Single	0
CoCo Set Attribute All	0
CoCo Create	0
CoCo Delete	0
CoCo Restore	0
CoCo Change Start	0
CoCo Audit Change	0
CoCo Change Complete	0
CoCo Kick Timer	0

Figure 53: Extended Diagnosis > EIM_OBJECT_TASK > Object Request Counter

The object request counter table shows the number of services sent to different objects.

Name	Description
Identity Get Attribute Single	Counter for the Get Attribute Single Services to the Identity object
Identity Get Attribute All	Counter for the Get-Attribute-AllServices to the Identity object
Identity Reset	Counter for the reset services to the identity object
Identity unknown command	Counter for the unknown command services to the identity object
Assembly Get Attribute Single	Counter for the Get Attribute Single services to the Assembly object
[Object] [Service]	Counter for the [service] services to the [object] object

Table 35: Extended Diagnosis > EIM_OBJECT_TASK > Object Request Counter

8.5.2 Output connection

Outgoing Connection	
Task states	
Name	Value
Issue Open	2832
Issue Close	0
Open Connections	0x00000000
Last error instance	1
Last GRC	0x1
Last ERC	0x204

Figure 54: Extended Diagnosis > EIM_OBJECT_TASK > Output connection

Name	Description
Issue open	Counter for open commands
Issue close	Counter for closed commands
Open connections	Currently open connections
Last instance with error	Last instance of error
Last GRC	Last General Status Code
Last ERC	Last Extended Status Code

Table 36: Extended Diagnosis > EIM_OBJECT_TASK > Output connection

8.5.3 Input connection

Ingoing Connection	
Task states	
Name	Value
Last Error Address	0x00000000
Last GRC	0x0
Last ERC	0x0
Current Connection	0

Figure 55: Extended Diagnosis > EIM_OBJECT_TASK > Input connection

Name	Description
Last bad address	IP adresse
Last GRC	Last General Status Code
Last ERC	Last Extended Status Code
Current connections	Currently open connections

Table 37: Extended Diagnosis > EIM_OBJECT_TASK > Input connection

8.5.4 Code diagnosis

Code Diagnosis	
Task states	
Name	Value
Info counter	0
Warning counter	2862
Error counter	2862
Error level	2
Error code	0xC01F0024
Parameter	0x0
Line number	2590
Module	ConnConfig

Figure 56: Extended > OBJECT_TASK > Code

Name	Description
Info counter	Counter for information messages
Warnings	Counters for warning messages
Error counter	Counter for errors that have occurred
Error level	Class of the last error that occurred
Error code	Code of the last error
Parameters	Additional information about the error
Line number	Line number within the software module
Module	Software module

Table 38: Extended > OBJECT_TASK > Code

8.6 TCPUDP

8.6.1 IP information

IP Information	
Task states	
Name	Value
Task State	1
Error Count	7
Last Error	0xC0070150
IP Address	192.168.10.1
Net Mask	255.255.255.0
Gateway	0.0.0.0
IP Config source	Database, Warmstart packet

Figure 57: Extended Diagnosis > EIM_TCPUDP > IP Information

Name	Description
Task status	Current status of log processing: 0 = Task not initialized 1 = Task running 2 = Task initialized 3 = Initialization error
Error counter	Counter for errors that have occurred
Last error	Last occurred error (description see corresponding Application Programming Manual)
IP adresse	IP address of the Adapter station.
Network Mask	Network mask of the Adapter station.
Gateway	Gateway address of the Adapter station.
IP configuration source (IP config source)	IP configuration was performed from the following source: None (no configuration received), DHCP server, BOOTP server, database, warm boot packet, ICMP (ping) (not supported), Hilscher NetIdent protocol

Table 39: Extended Diagnosis > EIM_TCPUDP > IP Information

8.6.2 IP packet counter

IP Packet Counter	
Task states	
Name	Value
Packet Recv TCP	0
Packet Recv UDP	0
Packet Recv ICMP	0
Packet Recv IP Header Err	0
Packet Recv ARP	0
Packet Recv Unknown	0

Figure 58: Extended Diagnosis > EIM_TCPUDP > IP Packet Counter

Name	Description
Received TCP packets	Counter for incoming TCP packets
Received UDP packets	Counter for received UDP packets
Received ICMP packets	Counter for incoming ICMP packets
Received IP packets with a faulty IP header	Counter for incoming IP packets with errors
Received ARP packets	Counter for received ARP packets
Unknown received packets	Counter for incoming packets of unknown type

Table 40: Extended Diagnosis > EIM_TCPUDP > IP Packet Counter

8.6.3 IP code diagnosis

IP Code Diagnosis	
Task states	
Name	Value
Information Counter	1
Warning Counter	0
Error Counter	0
Severity Level	Information
Code	0
Parameter	691
Module	TcpTaskF
Line Number	691

Figure 59: Extended > EIM_TCPUDP > IP Code

Name	Description
Note counter	Counter for information messages
Warning counter	Counters for warning messages
Error counter	Counter for errors
Severity of the error (severity level)	Class of the last error that occurred
Code	Code of the last error
Parameters	Additional information about the error
Module	Software module
Line number	Line number within the software module

Table 41: Extended > EIM_TCPUDP > IP Code

8.6.4 TCP_UDP information

TCP_UDP Information	
Task states	
Name	Value
Task State	1
Error Counter	7
Last Error	0xC0080032

Figure 60: Extended Diagnosis > EIM_TCPUDP > TCP_UDP Information

Name	Description
Task status	Current status of log processing: 0 = Task not initialized 1 = Task running 2 = Task initialized 3 = Initialization error
Error counter	Counter for errors that have occurred
Last error	Last occurred error (description see corresponding Application Programming Manual)

Table 42: Extended Diagnosis > EIM_TCPUDP > TCP_UDP Information

8.6.5 TCP_UDP code diagnosis

TCP_UDP Code Diagnosis	
Task states	
Name	Value
Information Counter	0
Warning Counter	3240
Error Counter	0
Severity Level	Warning
Code	36
Parameter	2
Module	Arp
Line Number	1883

Figure 61: Extended Diagnosis > EIM_TCPUDP > TCP_UDP Code Diagnosis

Name	Description
Notes Counter	Counter for information messages
Warnings Counter	Counters for warning messages
Error counter	Counter for errors
Severity of the entry (severity level)	Class of the last error that occurred
Code	Code of the last error
Parameters	Additional information about the error
Module	Software module
Line number	Line number within the software module

Table 43: Extended Diagnosis > EIM_TCPUDP > TCP_UDP Code Diagnosis

8.7 AP_TASK

8.7.1 Common Diagnosis

Common Diagnosis	
Task states	
Name	Value
State field	7
Bus state	4
Communication error	0
Version	1
Watchdog time	1000
Protocol class	0:4 1:2
Error counter	0

Figure 62: Extended Diagnosis > EIM_AP_TASK > Common Diagnosis

Name	Description
Status field	Communication change of state
Bus state	Communication status
Communication error	Unique error number according to protocol stack (not supported)
Version	Version number of this diagnosis structure
Watchdog time	Configured watchdog time
Protocol Class	Protocol class: MASTER, SLAVE, CLIENT, SERVER, GATEWAY
Error Counter	Total number of detected errors since device start or reset

Table 44: Extended Diagnosis > EIM_AP_TASK > Common Diagnosis

8.7.2 General status

General State	
Task states	
Name	Value
Error code	0

Figure 63: Extended Diagnosis > EIM_AP_TASK > General Status

Name	Description
Error Code	Code of the last error

Table 45: Extended Diagnosis > EIM_AP_TASK > General Status

8.7.3 Code diagnosis

Code Diagnosis	
Task states	
Name	Value
Info counter	0
Warning counter	0
Error counter	0
Error level	0
Error code	0x0
Parameter	0x0
Line number	0
Module	

Figure 64: Extended > AP_TASK > Code

Name	Description
Info counter	Counter for information messages
Warnings	Counters for warning messages
Error counter	Counter for errors that have occurred
Error level	Class of the last error that occurred
Error code	Code of the last error
Parameters	Additional information about the error
Line number	Line number within the software module
Module	Software module

Table 46: Extended > AP_TASK > Code

8.8 EIS_DLR_TASK

8.8.1 DLR object diagnosis

DLR Object Diagnosis	
Task states	
Name	Value
Network Topology	Linear
Network Status	Normal
Ring supervisor status	Normal ring node
Ring supervisor mode	Deactivated
Ring supervisor precedence	0
Beacon interval	0 micro sec
Beacon timeout	0 micro sec
VLAN ID	0
Ring faults count	0
MAC of last active node port 1	00-00-00-00-00-00
IP of last active node port 1	0.0.0.0
MAC of last active node port 2	00-00-00-00-00-00
IP of last active node port 2	0.0.0.0
Ring participants count	0
MAC of active ring supervisor	00-00-00-00-00-00
IP of active ring supervisor	0.0.0.0
Precedence of active ring super...	0
Capability Flags	0x00000022
MAC node 1	00-00-00-00-00-00
IP node 1	0.0.0.0
MAC node 2	00-00-00-00-00-00
IP node 2	0.0.0.0
MAC node 3	00-00-00-00-00-00
IP node 3	0.0.0.0
MAC node 4	00-00-00-00-00-00
IP node 4	0.0.0.0
MAC node 5	00-00-00-00-00-00
IP node 5	0.0.0.0
MAC node 5	00-00-00-00-00-00
IP node 5	0.0.0.0
MAC node 5	00-00-00-00-00-00
IP node 5	0.0.0.0
MAC node 5	00-00-00-00-00-00
IP node 5	0.0.0.0
MAC node 5	00-00-00-00-00-00
IP node 5	0.0.0.0

Figure 65: Extended > EIS_DLR_TASK > DLR Object

Name	Description
Network topology	Possible values are Linear or Ring
Network status	Possible values: Normal, Ring Error, Unexpected Loop Detected, Partial Ring Error, Error Series Detected
Ring supervisor status	Possible values: Backup, Active Ring Supervisor, Normal Ring Node, DLR not supported, Current Supervisor parameters are not supported
Ring supervisor mode	Possible values are Disabled, Enabled
Ring Supervisor Precedence	A priority assigned to a ring supervisor for transmitting beacon frames (see www.odva.org)
Beacon Interval (micro-sec)	Ring interval within which the supervisor sends beacon frames (see www.odva.org)

Name	Description
Beacon timeout (micro-sec)	Timeout for nodes until beacon frames are received and appropriate actions are taken to trigger them (depending on whether the node is a supervisor or a normal ring node). (See www.odva.org)
VLAN ID	VLAN ID when sending DLR protocol frames.
Ring error counter	Counts errors in the ring
MAC of last active node port 1	MAC address of the last active node on port 1
IP of last active node port 1	IP address of the last active node on port 1
MAC of last active node port 2	MAC address of the last active node on port 2
IP of the last active node port 2	IP address of the last active node on port 2
Ring participants	Number of participants in the ring
MAC of the active ring supervisor	MAC address of the active ring supervisor
IP of the active ring supervisor	IP address of the active ring supervisor
Priority of the active supervisor	Priority with which the supervisor participates in the ring.
Capability flags	Show what the supervisor has.
MAC node 1	MAC address node 1
IP node 1	IP address node 1
to	
MAC node 10	Node 2 MAC address
IP node 10	Node 2 IP address

Table 47: Extended > EIS_DLR_TASK > DLR Object

8.8.2 DLR object counter

DLR Objekt Zähler	
Task-Status	
Name	Wert
Beacon Precedence Higher	0
Beacon Rx Port Neq Last	0
Ring State Changed To Normal	0
Ring State Changed To Fault	0
Rcvd Beacon From Self on Port 1	0
Rcvd Beacon From Self on Port 2	0
Rcvd Neighbor Check Req on Port 1	0
Rcvd Neighbor Check Req on Port 2	0
Rcvd Neighbor Check Res on Port 1	0
Rcvd Neighbor Check Res on Port 2	0
Rcvd Neighbor/Link Status	0
Rcvd Locate Fault Frame	0
Rcvd Announce Frame	0
Rcvd Sign On Frame	0
Rcvd Sign On Frame As Unicast	0
Beacon Timeout Port 1	0
Beacon Timeout Port 2	0
Sent Neighbor Check Req	0
Sent Neighbor Check Res	0
Sent Announce Frame	0
Sent Neighbor/Link Status Frame	0
Forward Sign On Frame	0
Sent Sign On Frame	0
Sent Locate Fault Frame	0
Sent Sign On Frame To Active SV	0
Neighbor Check Timeout Port 1	0
Neighbor Check Timeout Port 2	0
Announce Interval Timeout	0
Sign On Timeout	0
Link Up Port 1	0
Link Down Port 1	0
Link Up Port 2	0
Link Down Port 2	0
Set Beacon Ind Self	0
Reset Beacon Ind Self	0

Figure 66: Extended Diagnosis > EIS_DLR_TASK > DLR Object Counter

Name	Description
[Service]	Diagnostic counter of the DLR object layer. Indicates the services processed. (The services of the single packets are described in the API manual.)

Table 48: Extended Diagnosis > EIS_DLR_TASK > DLR Object Counter

9 Tools

9.1 Overview tools

Under "Tools", the Packet monitor and the IO monitor are provided for test and diagnosis purposes.

- In the "Packet Monitor", data packets are used to communicate with the firmware and are exchanged between the application (configuration software) and the firmware in the device.
- The "I/O Monitor" offers an easy way to display data of the process image and to change the output data.

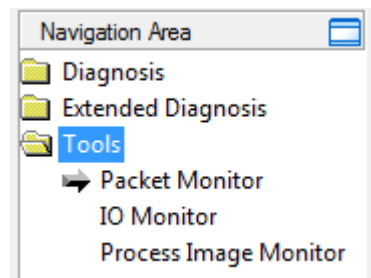


Figure 67: Navigation area - Tools (example)

Online connection to the device



Note:

Accessing the **Tools** dialog panes of the EtherNet/IP Scanner DTM requires an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device. For further information refer to section *Connecting/disconnecting device* [▶ page 69].

9.2 Packet monitor

The Packet monitor serves for test and diagnosis purposes.

Data packets, i. e. messages are self-contained blocks of defined data length. The packets are used to communicate with the firmware and they are exchanged between the application (configuration software) and the firmware in the device. Packets can be sent once or cyclically to the connected device controlled by the user and packets received can be displayed.

Data packets comprise from a **Packet header** and the **Send data** or from a **Packet header** and the **Receive data**. The packet header can be evaluated by the receiver of the packet and contain the sender and receiver address, the data length, an ID number, status and error messages and the command or response code. The minimum packet size amounts 40 Byte for the packet header. The sending and receiving data is added.



For further information to the packet description, refer to the Protocol API Manual.

➤ Open the **Packet monitor** via **Tools > Packet monitor**.

The screenshot shows the 'Packet Monitor' window. It is divided into 'Send' and 'Receive' sections. The 'Send' section has a 'Display mode' dropdown set to 'Hexadecimal' and a 'Reset counter' button. Below this are fields for 'Packet header' (Dest, Src, Dest ID, Src ID, Len, ID) and 'Send data' (State, Cmd, Ext, Rout, Autg Increment ID). The 'Send data' grid shows a counter at 0 and a list of data values: 0000, 000A, 0014, 001E, 0028, 0032, 003C. The 'Receive' section has similar fields for 'Packet header' and 'Receive data' grid, also with a counter at 0 and the same data values.

Figure 68: Packet monitor

Display mode switches the representation of the send and reception data between decimal and hexadecimal.

➤ Select **Reset counter** to reset the packet counter.

9.2.1 Sending packet

The screenshot shows a software interface for sending packets. It is divided into two main sections: 'Packet header' and 'Send data'.

Packet header section:

- Dest:** 00000001 (dropdown menu)
- Src:** 00000000
- State:** 00000000
- Dest ID:** 00000000
- Cmd:** 00002F00
- Src ID:** 00000000
- Ext:** 00000000
- Len:** 00000012
- Rout:** 00000000
- ID:** 00000001
- Auto Increment ID:**

Send data section:

- Send data:** A grid with columns 0-9 and rows 0-60. A cursor is positioned at row 0, column 0.
- Counter:** 0
- Buttons:** 'Put cyclic' and 'Put packet'.

Figure 69: Send > Packet header and Send data

Packet header

Under **Send > Packet header** the elements of the packet header of the sending packet are displayed, which is transmitted from the application (configuration software) to the device. The packet header of the sending packets contain the elements described in the following table.

Element		Description
Dest	Destination Queue Handle	Contains the identifier of the receiver for the packet (<i>destination task queue</i> of the firmware).
Src	Source Queue Handle	Contains the identifier of the sender of the packet (sending task).
Dest ID	Destination Queue Reference	Contains an identifier for the receiver of unsolicited sent packets from the firmware to the application (configuration software).
Src ID	Source Queue Reference	Contains an identifier of the sender.
Len	Packet Data Length (in bytes)	Length of the send respectively receive data.
ID	Packet Identification As Unique Number	Identifies identical data packets among each other.
State	Status / Error Code	Transmits status or error codes to the packet sender.
Cmd	Command / Response Code	Command or respond code.
Ext	Extension	Field for extensions (reserved).
Rout	Routing Information	Internal value of the firmware.

Table 49: Descriptions Packet header

- Under **Dest** select the receiver (destination task queue).
- Under **Cmd** select the command identification (Request).

Auto Increment ID is an increment for the identifier of the data packets and increments the ID by 1 for each newly sent packet.

Send data

- Under **Send > Send data** enter the send data of the packet, which shall be transmitted from the application (configuration software) to the mailbox of the device. The meaning of the transmitted data depends on the command or response code.

Sending packets once or cyclic

- To send packet "once", select **Put packet**.
- To send packet "cyclic", select **Put cyclic**.

9.2.2 Receiving packet

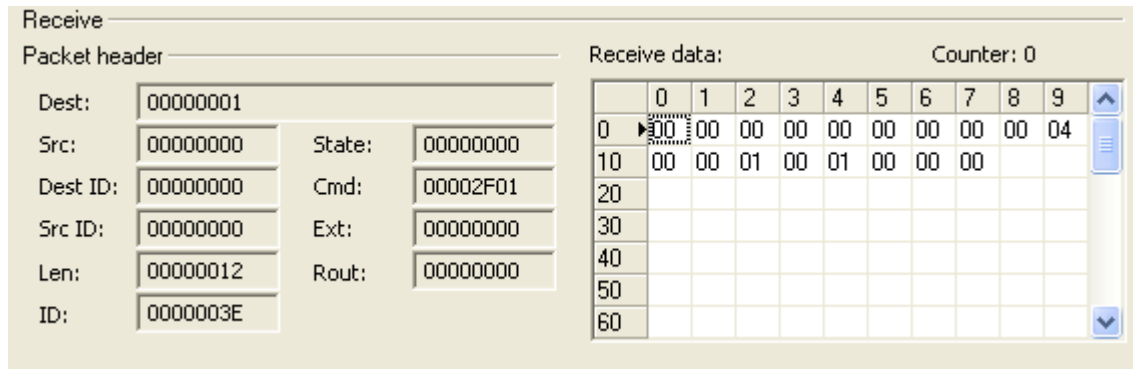


Figure 70: Packet header and Receive data

Packet header

Under **Receive > Packet header** the elements of the packet header of the receiving packet are displayed, which are transmitted back from the device to the application (configuration software). The packet header of the receiving packets contain the elements described in the following table.

Element	Description	
Dest	Destination Queue Handle	Contains the identifier of the receiver for the packet (<i>destination task queue</i> of the firmware).
Src	Source Queue Handle	Contains the identifier of the sender of the packet (sending task).
Dest ID	Destination Queue Reference	Contains an identifier for the receiver of unsolicited sent packets from the firmware to the application (configuration software).
Src ID	Source Queue Reference	Contains an identifier of the sender.
Len	Packet Data Length (in bytes)	Length of the send respectively receive data.
ID	Packet Identification As Unique Number	Identifies identical data packets among each other.
State	Status / Error Code	Transmits status or error codes to the packet sender.
Cmd	Command / Response Code	Command or respond code.
Ext	Extension	Field for extensions (reserved).
Rout	Routing Information	Internal value of the firmware.

Table 50: Descriptions Packet header

Receive data

Under **Receive > Receive data** the receiving data of the packet, which is transmitted back from the device to the application (configuration software) is displayed.

9.3 I/O monitor

The IO monitor serves for test and diagnosis purposes. It provides to view data of the process data image and to change output data easily. The display is always in a Byte manner.



Note:

Only change and write output data if you know that no plant disturbances are caused by this. All output data written by the IO monitor is transmitted at the bus and have effect on subordinate drives, IO etc.

IO Monitor

Columns: 10 Display mode: Decimal

Input data

Offset: 0 Go

	0	1	2	3	4	5	6	7	8	9
0	227	207	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0

Output data

Offset: 0 Go

	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0

Update

Figure 71: IO monitor

Columns switches the number of columns.

Display mode switches the representation of the input and output data between decimal and hexadecimal.

Offset / Go moves the indication of the data to the entered offset value.

- Enter the output value and select **Update**.
- ⇒ The data of the process image are always displayed, even if these bytes are not reserved by the configuration.

9.4 Process image monitor

The window **Process image monitor** lists the adapter devices connected to the scanner, as well as the configured modules or input or output signals of the devices. This makes visible the fieldbus structure and the data structure of the device's input and output data transmitted at the bus. Furthermore, the values of the signal data provided to the OPC server are displayed here.

➤ Open **Tools > Process image monitor**.

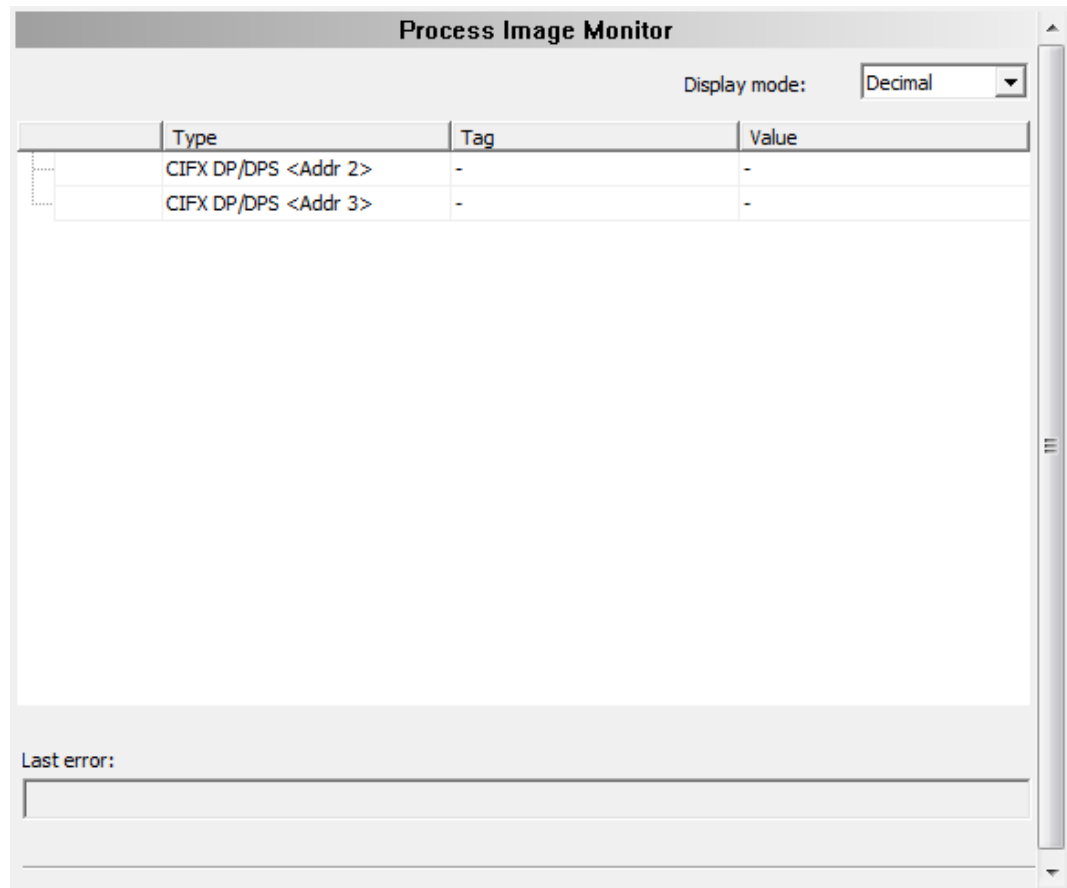
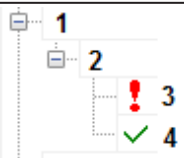





Figure 72: Window "Process image monitor"

Parameter	Description	Range of value/ value
Display mode	Display of the values in the column Value in decimal or hexadecimal mode.	Decimal (Default), Hexadecimal
	The tree shows the structure of the devices (1), modules (2) and the input data (3) and output data (4).	
	Display when the input and output data is not completely read and analyzed.	
	Display when the input and output data is not valid.	
	Display when the input and output data is valid.	
Type	Device labeling provided by the hardware: Also description of the modules or input or output signals configured to the device.	

Parameter	Description	Range of value/ value
TAG	Device name provided by the hardware (not changeable in the FDT container) or symbolic name for the modules configured to the device or for the input or output signals (changeable in the window Configuration > Process data).	
Value	Display of the valid input and output data values.	
Last error	Last occurred error (Description see appropriate Application Programming Manual)	

Table 51: Notes to the "Process image monitor" window

10 Appendix

10.1 References

[1] FDT Joint Interest Group (www.fdt-jig.org, FDT-JIG Working Group): Device Type Manager (DTM) Style Guide, Version 1.0; FDT-JIG - Order No. <0001-0008-000>, English, 2005.

[2] Hilscher Gesellschaft für Systemautomation mbH: Protocol API, EtherNet/IP Scanner, V 2.12.0, Protocol API Manual, Revision 16, DOC050702API16EN, English, 2022-04.

[3] ODVA Inc.: THE CIP NETWORKS LIBRARY, Volume 2, EtherNet/IP Adaptation of CIP, Edition 1.19, English, 2015-04.

[4] Hilscher Gesellschaft für Systemautomation mbH: API, Hilscher status and error codes, Firmware and driver, Revision 5, DOC100802API05EN, English, 2019-11.

Safety standard

American National Standards Institute, Inc.: American National Standard, Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials, ANSI Z535.6-2016, English, 2016.

10.2 User rights

User-rights are set within the FDT-container. Depending on the level, the configuration is accessible by the user or read-only.

To access the **Settings**, **Configuration** and **Diagnosis** panes of the EtherNet/IP Scanner DTM you do not need special user rights. Also all users can select the decimal or hexadecimal Display mode or sort table entries.



Note:

To edit, set or configure the parameters of the **Settings** and **Configuration** panes, you need user rights for "Maintenance", for "Planning Engineer" or for "Administrator".

The following tables give an overview of the user right groups and which user rights you need to configure the single parameters.

10.2.1 Settings

Settings		Observer	Operator	Maintenance	Planning engineer	Administrator
Driver	Verifying or adapting driver settings [▶ page 24]	D	D	X	X	X
	Configuring netX driver [▶ page 27]	D	D	X	X	X
Device Assignment	Scanning for devices [▶ page 33]	D	D	X	X	X
	Selecting the device (with or without firmware) [▶ page 36]	D	D	X	X	X
	Selecting the device once more (with firmware) [▶ page 36]	D	D	X	X	X
	Selecting and downloading firmware [▶ page 38]	D	D	X	X	X
Licensing	Licensing [▶ page 44]	D	D	X	X	X

Table 52: User rights settings (D = displaying, X = editing, configuring)

10.2.2 Configuration

	Observer	Operator	Maintenance	Planning engineer	Administrator
Network settings [▶ page 59]	A	A	X	X	X
Scan list [▶ page 61]	A	A	X	X	X
Process data [▶ page 63]	A	A	X	X	X
Address table [▶ page 64]	A	A	X	X	X
Quick connect table [▶ page 65]	A	A	X	X	X
Master settings	A	A	X	X	X

Table 53: User rights configuration (D = displaying, X = editing, configuring)

10.3 Conventions in this document

Instructions

1. Operation purpose
2. Operation purpose
 - Instruction

Results

- ↻ Intermediate result
- ⇒ Final result

Signs




Sign	Note
	General note
	Important note that must be followed to prevent malfunctions.
	Reference to further information

Table 54: Signs

Signal words





Signal word	Description
	Indicates a hazardous situation, which if not avoided, will result in death or serious injury.
	Indicates a hazardous situation, which if not avoided, could result in death or serious injury.
	Indicates a hazardous situation, which if not avoided, may result in minor or moderate Injury.
	Indicates a property damage message.

Table 55: Signal words

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List of figures

Figure 1:	Dialog structure EtherNet/IP Scanner DTM.....	9
Figure 2:	Navigation area	10
Figure 3:	Status bar – status fields 1 to 6	11
Figure 4:	Navigation area - Settings (example)	21
Figure 5:	Default driver ‚cifX Device Driver’ for PC cards cifX (example)	24
Figure 6:	Default driver ‚netX Driver’ for Hilscher devices except for PC cards cifX (example).....	24
Figure 7:	Manual selection of multiple drivers (example)	25
Figure 8:	cifX driver > USB/RS232 connection.....	28
Figure 9:	netX driver > TCP connection.....	31
Figure 10:	Device Assignment - detected devices (example: device without firmware)	33
Figure 11:	Device Assignment - detected devices (example: device without firmware)	35
Figure 12:	Device Assignment - selecting device (example: device without firmware / one device selected).....	36
Figure 13:	Device Assignment - selecting device (example: devices with and without firmware / one device selected).....	37
Figure 14:	Firmware download	38
Figure 15:	Error Message "The device is not assigned to the hardware!"	39
Figure 16:	"Select firmware file" selection window (example CIFX)	39
Figure 17:	Request Select firmware file - Example Invalid Firmware	41
Figure 18:	Request - Do you really want to download the firmware?	42
Figure 19:	Firmware download - progress bar.....	43
Figure 20:	Clock symbol and hook symbol green.....	43
Figure 21:	Firmware download - download.....	43
Figure 22:	Licensing	44
Figure 23:	License pane	46
Figure 24:	License pane - License Type.....	47
Figure 25:	License pane – License Type / Master protocols	47
Figure 26:	License pane – License Type / Utilities	47
Figure 27:	License pane - request form, please fill out / device information.....	50
Figure 28:	License pane - Request form, please fill out / License type	51
Figure 29:	License pane - request form, please fill out / mandatory data.....	51
Figure 30:	License pane – selecting the subsidiary / ordering / contacts	52
Figure 31:	Example: Order e-mail License request	53
Figure 32:	Example: Order data form PrintOrderRequest	54
Figure 33:	Navigation area - Configuration.....	57
Figure 34:	Configuration > Network settings	59
Figure 35:	Configuration > Scan list (example)	61
Figure 36:	Process data (example adapter device).....	63
Figure 37:	Configuration > Address Table.....	64

Figure 38:	Configuration > Quick connect table	65
Figure 39:	Configuration > Scanner settings	67
Figure 40:	EtherNet/IP Scanner settings > Start of bus communication	67
Figure 41:	EtherNet/IP Scanner settings > Application monitoring.....	68
Figure 42:	EtherNet/IP Scanner settings > Module alignment.....	68
Figure 43:	netDevice Message: Download	71
Figure 44:	Navigation area - Diagnosis EtherNet/IP Scanner DTM.....	73
Figure 45:	General diagnosis.....	74
Figure 46:	Master diagnosis	76
Figure 47:	Firmware Diagnosis.....	78
Figure 48:	Extended Diagnosis > [Folder Name] > Task Information Example Display	80
Figure 49:	Extended Diagnosis > [Folder name] > IniBatch Status example display	80
Figure 50:	Extended Diagnosis > EIM_ENCAP_TASK > Encap command counter	81
Figure 51:	Extended Diagnosis > EIM_ENCAP_TASK > Packet Counter	82
Figure 52:	Extended Diagnosis > EIM_ENCAP_TASK > Code	83
Figure 53:	Extended Diagnosis > EIM_OBJECT_TASK > Object Request Counter.....	84
Figure 54:	Extended Diagnosis > EIM_OBJECT_TASK > Output connection	85
Figure 55:	Extended Diagnosis > EIM_OBJECT_TASK > Input connection	85
Figure 56:	Extended > OBJECT_TASK > Code	86
Figure 57:	Extended Diagnosis > EIM_TCPUDP > IP Information.....	87
Figure 58:	Extended Diagnosis > EIM_TCPUDP > IP Packet Counter	88
Figure 59:	Extended > EIM_TCPUDP > IP Code	88
Figure 60:	Extended Diagnosis > EIM_TCPUDP > TCP_UDP Information	89
Figure 61:	Extended Diagnosis > EIM_TCPUDP > TCP_UDP Code Diagnosis	89
Figure 62:	Extended Diagnosis > EIM_AP_TASK > Common Diagnosis	90
Figure 63:	Extended Diagnosis > EIM_AP_TASK > General Status.....	90
Figure 64:	Extended > AP_TASK > Code	91
Figure 65:	Extended > EIS_DLR_TASK > DLR Object	92
Figure 66:	Extended Diagnosis > EIS_DLR_TASK > DLR Object Counter.....	94
Figure 67:	Navigation area - Tools (example)	95
Figure 68:	Packet monitor.....	96
Figure 69:	Send > Packet header and Send data	97
Figure 70:	Packet header and Receive data	98
Figure 71:	IO monitor.....	99
Figure 72:	Window "Process image monitor"	100

List of tables

Table 1:	List of revisions	5
Table 2:	Overview use cases.....	6
Table 3:	General device information.....	9
Table 4:	OK, Cancel, Apply, Help	10
Table 5:	Status bar icons [1].....	11
Table 6:	Status bar display examples.....	11
Table 7:	Getting started – Configuration steps	16
Table 8:	Parameters of the driver selection list.....	24
Table 9:	Parameters cifX driver > USB/RS232 connection	29
Table 10:	Parameters netX driver > TCP connection	31
Table 11:	Parameters of the Device Assignment	34
Table 12:	Firmware download parameters	38
Table 13:	Parameters “Select firmware file”	40
Table 14:	In the selection window "Select firmware file".....	40
Table 15:	Parameters of the Scanner network settings dialog pane	59
Table 16:	Parameters of the Scan list dialog pane	61
Table 17:	Select table rows	62
Table 18:	Process data.....	63
Table 19:	Address table pane parameters - inputs / outputs	64
Table 20:	Parameters of the Quick connect table.....	65
Table 21:	Range of value / Value for the watchdog time	68
Table 22:	Parameters EtherNet/IP Scanner Settings > Module Alignment	68
Table 23:	Indication general diagnosis	74
Table 24:	Indication general diagnosis	75
Table 25:	Parameters Master diagnosis	76
Table 26:	Columns of table ‘Station Diagnosis’	77
Table 27:	Possible values for the status	77
Table 28:	Description table task information.....	78
Table 29:	Descriptions of the Extended dialog panes	79
Table 30:	Extended Diagnosis > [Folder Name] > Task Information	80
Table 31:	Extended Diagnosis > [Folder name] > IniBatch Status	80
Table 32:	Extended Diagnosis > EIM_ENCAP_TASK > Encap command counter	81
Table 33:	Extended Diagnosis > EIM_ENCAP_TASK > Packet Counter.....	82
Table 34:	Extended Diagnosis > EIM_ENCAP_TASK > Code	83
Table 35:	Extended Diagnosis > EIM_OBJECT_TASK > Object Request Counter	84
Table 36:	Extended Diagnosis > EIM_OBJECT_TASK > Output connection	85
Table 37:	Extended Diagnosis > EIM_OBJECT_TASK > Input connection	85
Table 38:	Extended > OBJECT_TASK > Code	86
Table 39:	Extended Diagnosis > EIM_TCPUDP > IP Information	87
Table 40:	Extended Diagnosis > EIM_TCPUDP > IP Packet Counter	88

Table 41:	Extended > EIM_TCPUDP > IP Code	88
Table 42:	Extended Diagnosis > EIM_TCPUDP > TCP_UDP Information.....	89
Table 43:	Extended Diagnosis > EIM_TCPUDP > TCP_UDP Code Diagnosis	89
Table 44:	Extended Diagnosis > EIM_AP_TASK > Common Diagnosis.....	90
Table 45:	Extended Diagnosis > EIM_AP_TASK > General Status	90
Table 46:	Extended > AP_TASK > Code	91
Table 47:	Extended > EIS_DLR_TASK > DLR Object	92
Table 48:	Extended Diagnosis > EIS_DLR_TASK > DLR Object Counter	94
Table 49:	Descriptions Packet header	97
Table 50:	Descriptions Packet header	98
Table 51:	Notes to the "Process image monitor" window	100
Table 52:	User rights settings (D = displaying, X = editing, configuring)	103
Table 53:	User rights configuration (D = displaying, X = editing, configuring)	103
Table 54:	Signs	104
Table 55:	Signal words	104

Glossary

Adapter	Type of device that is configured by the Scanner (Master) and which then performs the communication
CODESYS	COntroller DEvelopment SYStem: Development environment for programming controller applications (PLC) according to the international industrial standard IEC 61131-3
Data packet	Data packets, i. e. messages are self-contained blocks of defined data length. The packets are used to communicate with the firmware and they are exchanged between the application (configuration software) and the firmware in the device.
DTM	Device Type Manager: Software module with graphical user interface for the configuration and/or for diagnosis of devices
Ethernet	Network 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, 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).
EtherNet/IP	Communication system for industrial Ethernet designed and developed by Rockwell that uses the CIP (common industrial protocol)
EtherNet/IP Adapter	Exchanges real-time I/O data with a Scanner Class product and does not initiate connections on its own
EtherNet/IP Scanner	Exchanges real-time I/O data with adapters and scanners, can respond to connection requests and also initiate connections on its own
FDT	Field Device Tool: FDT specifies an interface, in order to be able to use DTM (Device Type Manager) in different applications of different manufacturers
IP	Internet Protocol: Belongs to the TCP/IP family of protocols and is defined in RFC791 (available on http://www.ietf.org/rfc/rfc791.txt). It is based on layer 3 of the ISO/OSI 7 layer model of networking and 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	Identifies a device or a computer within an IP-based network and is defined in the Internet Protocol Version 4 (IPv4) as a 32-bit number. For ease of notation, the address is usually divided into four 8-bit numbers represented in decimal notation and separated by points: a.b.c.d. Each letter stands for an integer value between 0 and 255, e.g. 192.168.30.16. However, not all combinations are allowed, some are reserved for special purposes. The IP address 0.0.0.0 is defined as invalid.

Module	Hardware or logical component of a physical device
ODMV3	Online-Data-Manager Version 3: Application interface, respectively works as a server, which can be run as an out-proc server or system service. Its task is to provide different applications (e. g. SYCON.net), access to multiple devices and even share one device amongst several applications.
SCADA	Supervisory Control and Data Acquisition: A concept for the control and data acquisition of technical processes
Scanner	Type of device that initiates and controls the communication on the bus
Submodule	Hardware or logical component of a physical device.
SYCON.net	multiprotocol-capable Hilscher configuration and diagnosis software (FDT frame application), that can be used to configure communication-capable fieldbus devices of different manufacturers in one project

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