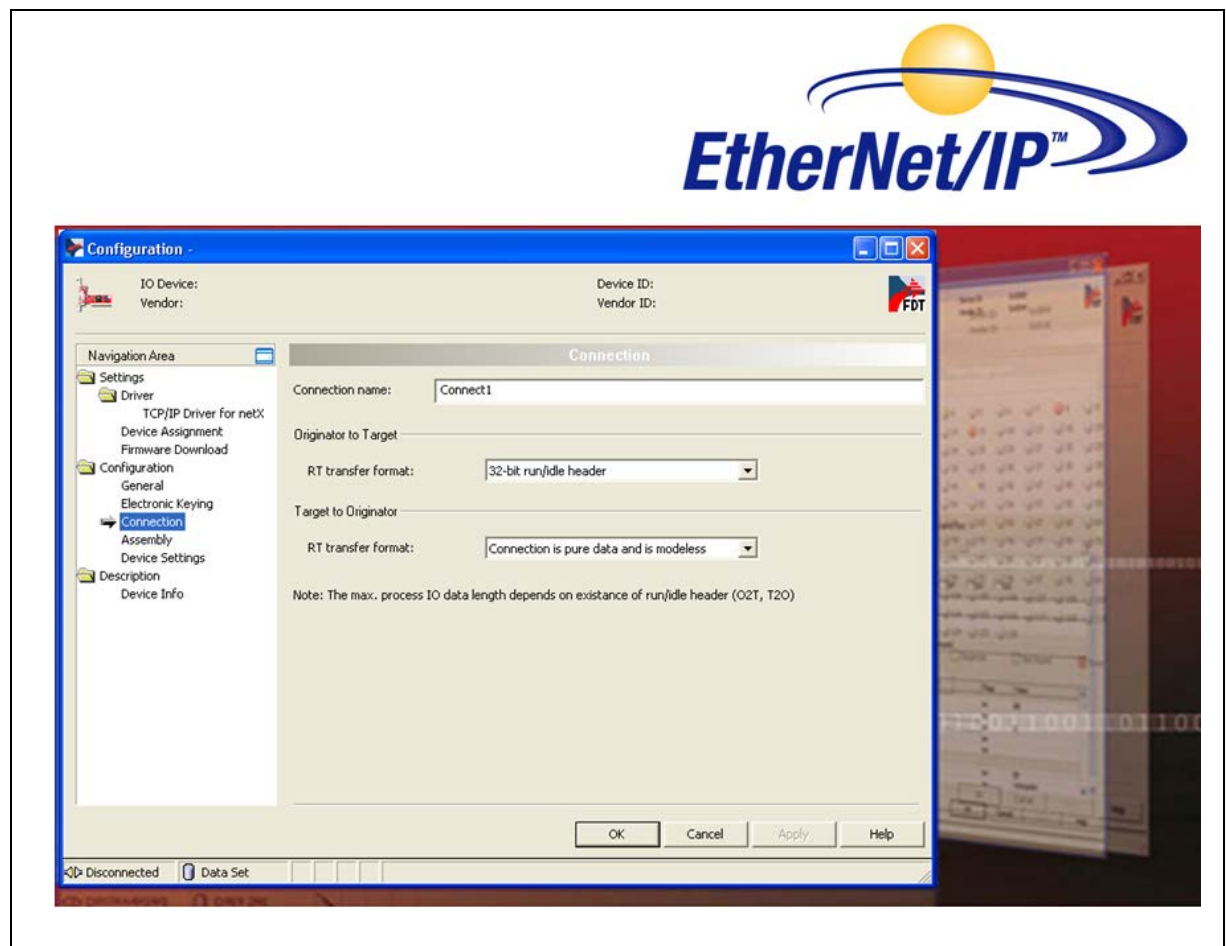


Operating Instruction Manual
DTM for EtherNet/IP Adapter Devices
Configuration of EtherNet/IP Adapter Devices
V1.1100



Hilscher Gesellschaft für Systemautomation mbH

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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 Adapter device within a FDT Framework using the EtherNet/IP Adapter DTM, and what can be read from the diagnosis panes.

In a network project the EtherNet/IP Adapter DTM can be dropped:

- to the root line (Stand-Alone Slave),
- or to the Master busline of a EtherNet/IP Scanner DTM.



Note: This manual edition first provides information for the case if the EtherNet/IP Adapter DTM is dropped to the root line (Stand-Alone Slave) and in addition important information for the case if the EtherNet/IP Adapter DTM is dropped to the Master busline of a EtherNet/IP Scanner DTM.

1.1.1 Descriptions of the Dialog Panes

The table below gives an overview for the individual dialog panes descriptions:

Section	Subsection	Manual Page
<i>Settings</i>	<i>Overview Settings</i>	32
	<i>Driver</i>	35
	<i>Device Assignment</i>	45
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Table 1: Descriptions Dialog Panes

1.1.2 Online Help

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

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

1.1.3 List of Revisions

Index	Date	Version	Chapter	Revision
13	20-01-28	1.1100	5.7	Section <i>Signal Configuration</i> added.

Table 2: List of Revisions

1.1.4 Conventions in this Manual

Notes, operation instructions and results of operation steps are marked as follows:

Notes



Important: <important note you must follow to avoid malfunction>



Note: <general note>



<note, where to find further information>

Operation Instructions

1. <instruction>

2. <instruction>

or

➤ <instruction>

Results

↪ <result>

Language Convention for EtherNet/IP

The EtherNet/IP specification defines the term "Scanner" instead of "Master" and "Adapters" instead of "Slave".

1.2 Legal Notes

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1.4 About EtherNet/IP Adapter DTM

You can use the EtherNet/IP Adapter DTM to configure EtherNet/IP Adapter devices within a FDT Framework and to view the device diagnosis.

In a network project the EtherNet/IP Adapter DTM can be dropped:

- to the root line (Stand-Alone Slave),
- or to the Master busline of a EtherNet/IP Scanner DTM.

Adapter DTM at the Root-Line (Stand-Alone Slave)

Insert the EtherNet/IP Adapter DTM to the root busline if you intend to configure only one single EtherNet/IP Adapter device.

Adapter DTM at the Master Busline

Insert the EtherNet/IP Adapter DTM to the Scanner busline of the EtherNet/IP Scanner DTM if within the network project the Adapter device and the Scanner device are used, i. e. if you intend to configure the Adapter device and the Scanner device.

1.4.1 Requirements

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.

Requirements EtherNet/IP Adapter DTM

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

- Completed hardware installation of a netX based DTM-compatible EtherNet/IP Adapter device, inclusive loaded firmware and loaded configuration file
- Installed FDT/DTM V 1.2 compliant frame application
- Installed EtherNet/IP Scanner DTM (If Adapter DTM is dropped to the Master busline.)
- Loaded DTM in the Device Catalog of the FTD Framework



Note: If the EtherNet/IP Adapter DTM and the EtherNet/IP Adapter 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.

1.5 Dialog Structure of the EtherNet/IP Adapter DTM

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.

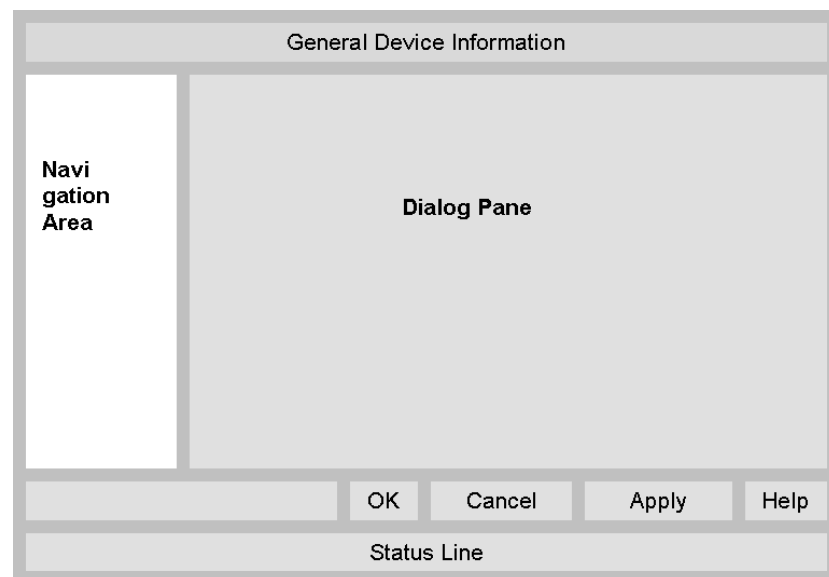


Figure 1: Dialog Structure of the EtherNet/IP Adapter DTM

1.5.1 General Device Information

Parameter	Meaning
IO Device	Name of the device
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

1.5.2 Navigation Area

The **Navigation Area** contains folders and subfolders to open the dialog panes of the DTM.

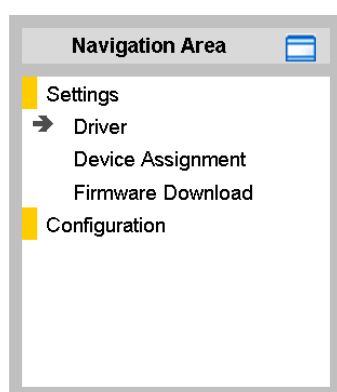


Figure 2: Navigation Area

- Select the required folder and subfolder.
- The corresponding Dialog pane is displayed.

Hide / display Navigation

	Hiding the navigation area (above right side).
Show navigation area	Opening the navigation area (below left side).

1.5.3 Dialog Panes

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

Settings	
Driver	To establish a connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device, on the pane Driver you can verify if the default driver is checked and respectively check another driver or multiple drivers. For further information, refer to section <i>Driver</i> on page 35.
Device Assignment	On the pane Device Assignment you select the device and assign the device to the driver. For further information, refer to section <i>Device Assignment</i> on page 45.
Firmware Download	The dialog on the pane Firmware Download is used to load a new firmware into the device. A detailed description can be found in section <i>Firmware Download</i> on page 51.
Configuration	
General	On the pane General EtherNet/IP Adapter information is displayed. For 'Quick Connect' the Adapter devices must be configured as MDI oder MDIX. For further information, refer to section <i>General</i> on page 61.
Electronic Keying	At the Electronic Keying pane for online validation of adapters an electronic keying method can be selected and the keying can be configured. For further information, refer to section <i>Electronic Keying</i> on page 64.
Connection	At the Connection pane the connection can be parameterized. For further information, refer to section <i>Connection</i> on page 65.
Assembly	At the Assembly pane the configured input / output connections of the EtherNet/IP adapter are displayed. For further information, refer to section <i>Assembly</i> on page 66.
Signal Configuration	In the Signal Configuration pane the data structure of the input and output data for the signal assignment is determined. For further information, refer to section <i>Signal Configuration</i> on page 67.
Device Settings	At the Device Settings pane device related settings can be made. For further information, refer to section <i>Device Settings</i> on page 73.
Description	
Device Info	The Device Info pane contains the manufacturer information about the device. For further information, refer to section <i>Overview Description</i> on page 75.
Diagnosis	
Diagnosis/ Extended Diagnosis	At the Diagnosis panes information can be read for troubleshooting. For further information, refer to section <i>Overview Diagnosis</i> on page 82 or section <i>Overview Extended Diagnosis</i> on page 86.
Tools	
Packet Monitor/ IO Monitor	Under Tools the Packet Monitor and the IO Monitor are provided for test and diagnosis purposes. For further information, refer to section <i>Packet Monitor</i> on page 103 or section <i>IO Monitor</i> on page 106.

Table 4: Overview Dialog Panes



Note: Accessing the **Diagnosis** panes of the EtherNet/IP Adapter DTM requires an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter DTM.



For further information, refer to section *Connecting/Disconnecting Device* on page 77.

1.5.4 OK, Cancel, Apply and Help

OK, Cancel, Apply and Help you can use as described hereafter.

	Meaning
OK	To confirm your latest settings, click OK . All changed values will be applied on the frame application database. <i>The dialog then closes.</i>
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 . Yes: The changes are saved or the changed values are applied on the frame application database. <i>The dialog then closes.</i> No: The changes are <u>not</u> saved or the changed values are not applied on the frame application database. <i>The dialog then closes.</i> Cancel: <i>Back to the DTM.</i>
Apply	To confirm your latest settings, click Apply . All changed values will be applied on the frame application database. <i>The dialog remains opened.</i>
Help	To open the DTM online help, click Help .

Table 5: OK, Cancel, Apply and Help

1.5.5 Table Lines

In the DTM dialog pane table lines can be selected, inserted or deleted.

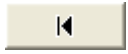


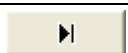

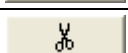
	Meaning
	To select the first line of a table use First Line .
	To select the previous line of a table use Previous Line .
	To select the next line of a table use Next Line .
	To select the last line of a table use Last Line .
	Create a new Line inserts new lines into the table.
	Delete selected Line deletes the selected line from the table.

Table 6: Selecting, inserting, deleting Table Line

1.5.6 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.

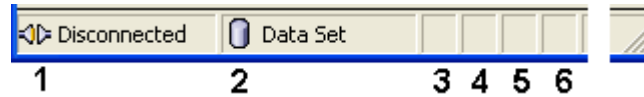
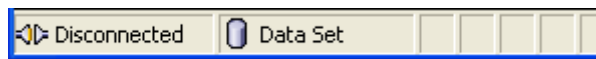


Figure 3: Status Bar – Status Fields 1 to 6

Status Field	Icon / Meaning	
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 are read out from the instance data set (database).
		Device: The displayed data are 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 7: Status Bar Icons [1]

Offline State



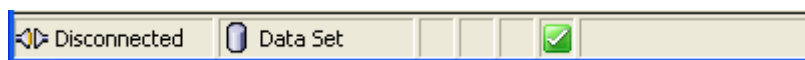
Save operation succeeded



Firmware Download



Firmware Download successful



Online State and Diagnosis

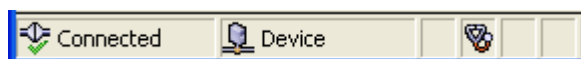


Figure 4: Status Bar Display Examples

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 educated 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 Instructions

To ensure your own personal safety and to avoid personal injury, you necessarily must read, understand, and comply with the safety instructions and safety messages in this manual before you install and operate your system.

For cases if both, personal injury as well as property damage (damage of equipment or device) may occur together, you find the safety instructions in this section.

2.4.1 Communication Stop during 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 Adapter DTM, 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 is stopped.

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 data base. 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.

2.4.2 Mismatching System Configuration

Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury or damage of equipment.

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

2.5 Property Damage

To avoid property damage and damage to your system or to your equipment, you necessarily must read, understand, and comply with the safety instructions and safety messages in this manual before you configure your system.

2.5.1 Power Disconnect while downloading Firmware or Configuration

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 Adapter device is interrupted,
- or a reset to the device is performed,

this may lead to the following consequences:

Loss of Device Parameters, Firmware Corruption

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

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

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 device unusable.

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

Otherwise you might be forced to return your device for repair.

2.6 Labeling of Safety Messages

- The **Section Safety Messages** at the beginning of a chapter are pinpointed particularly and highlighted by a signal word according to the degree of endangerment. The type of danger is specified by the safety message text
- The **Integrated Safety Messages** within an instruction description are highlighted with a signal word according to the degree of endangerment. The kind of danger is specified exactly by the safety message text.





Signal Word	Meaning (International)	Meaning (USA)
 DANGER	Indicates a direct hazard with high risk, which will have a consequence of death or grievous bodily harm if it is not avoided.	Indicates a hazardous situation which if not avoided, will result in death or serious injury.
 WARNING	Indicates a possible hazard with medium risk, which will have a consequence of death or (grievous) bodily harm if it is not avoided.	Indicates a hazardous situation which if not avoided, could result in death or serious injury.
 CAUTION	Indicates a minor hazard with medium risk, which could have a consequence of minor or moderate bodily harm if it is not avoided.	Indicates a hazardous situation which if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a property damage message.	Indicates a property damage message.

Table 8: Signal Words



Note: The ANSI Z535.6 standard specifies in section 4.8: "Messages about hazards that could result in both, physical injury and property damage are considered safety messages, not property damage messages." Thus depending of the type of danger and its consequences, warning messages marked by a signal word DANGER, WARNING or CAUTION may include both, messages on physical injury and property damage.

In this document all Safety Instructions and Safety Messages are designed according both to the international used safety conventions as well as to the ANSI Z535.6 standard, refer to safety reference [S1].

In this document the signal words 'WARNING', 'CAUTION' and 'NOTICE' are used according to ANSI Z535.6 standard. The meaning given in ISO/IEC 26514 [S4] section '11.11 Contents of warnings and cautions' is not relevant in this manual.

2.7 References Safety

- [S1] ANSI Z535.6-2011 American National Standard for Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials
- [S4] 26514-2010 - IEEE Standard for Adoption of ISO/IEC 26514:2008 Systems and Software Engineering--Requirements for Designers and Developers of User Documentation

3 Getting started

3.1 Configuration Steps

The following overview provides to you the step sequence on how to configure a netX based EtherNet/IP Adapter device with EtherNet/IP Adapter DTM as it is typical for many cases. At this time it is presupposed that the hardware installation was done.




The overview lists all the steps in a compressed form. For detailed descriptions of each step refer to the sections noted in the column *For detailed information see section*.

The following two cases are considered:

- Adapter DTM at the Root-Line (Stand-Alone Slave)
- and Adapter DTM at the Scanner busline.

3.1.1 Adapter DTM at the Root-Line (Stand-Alone Slave)

#	Step	Short Description	For detailed information see section	Page
1	Load device catalog	Depending of the FDT Container: For netDevice: - select Network > Device Catalog , - select Reload Catalog .	(See <i>Operating Instruction Manual netDevice and netProject</i>)	-
2	Create new project / Open existing project	Depending of the frame application. For the configuration software: - select File > New or File > Open .	(See <i>Operating Instruction Manual of the Frame Application</i>)	-
3	Insert Adapter into configuration	Depending of the FDT Container: For netDevice: - in the Device Catalog under Gateway / Stand-Alone Slave click to the Adapter, - and insert the Adapter via drag and drop to the root line in the network view.	(See <i>Operating Instruction Manual netDevice and netProject</i>)	-
4	Open the Adapter DTM configuration dialog	Open the Adapter DTM configuration dialog. - Double click to the device icon of the Adapter. - The Adapter DTM configuration dialog is displayed.	-	-

#	Step	Short Description	For detailed information see section	Page
5	Verify or adapt Driver Settings	In the Slave DTM configuration dialog: - select Settings > Driver .	<i>Settings for Driver and Device Assignment and Driver</i>	33
		 <ul style="list-style-type: none">• 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 Adapter DTM is installed on the same PC as the EtherNet/IP Adapter device.• Use the netX Driver to establish a USB, Serial (RS232) or TCP/IP connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device.• The 3SGateway Driver for netX (V3.x) is used only in relationship with CODESYS. <p>To search for devices you can check one or multiple drivers simultaneously.</p> <p>- Verify that the default driver is checked. - If necessary, check another driver or multiple drivers.</p>		35
6	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> <p>- Select Settings > Driver > netX Driver > TCP Connection.</p> <p>- Via  add an IP range.</p> <p>- Under IP Address enter the IP Address of the device or an IP range.</p> <p>- Click Save.</p> <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 surface.	<i>Configuring netX Driver</i>	38
7	Assign Adapter device (with or without firmware)	Assign the device to this driver. In the Adapter DTM configuration dialog: - select Settings > Device Assignment , - select a Adapter device (with or without firmware), - therefore check the appropriate checkbox, - select Apply .	<i>Selecting the Device (with or without firmware)</i>	48
8	Select and download firmware	<p>If not yet a firmware was loaded to the device:</p> <p>- Adhere to the necessary safety precautions to prevent personnel injury and property damage</p> <p>In the Adapter DTM configuration dialog: - select Settings > Firmware Download, - select Browse..., - select a firmware file, - select Open, - select Download and Yes.</p>	<i>Safety Messages on Firmware or Configuration Download</i>	31
			<i>Firmware Download</i>	51




#	Step	Short Description	For detailed information see section	Page
9	Assign Adapter device once more (with firmware and system channel) <i>For repeated download this step is omitted.</i>	In the Adapter DTM configuration dialog: - select Settings > Device Assignment , - select Scan , - select the Adapter device (with loaded firmware and defined system channel), - therefore check the appropriate checkbox, - select Apply , - close the Adapter DTM configuration dialog via OK .	<i>Selecting the Device once more (with Firmware)</i>	49
10	Configure Adapter device	Configure the Adapter device. - Double click to the device icon of the Adapter. - The Adapter DTM configuration dialog is displayed. In the Adapter DTM configuration dialog: - select Configuration > General (for configuration without scanner only). For 'Quick Connect' the Adapter devices must be configured as MDI oder MDIX. - Set the IP settings for the adapter device, - 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, - select Configuration > Signal Configuration , - proceed the signal configuration, - Select Configuration > Device Settings , - set the Device Settings , - configure the device settings, - close the Adapter DTM configuration dialog via OK .	<i>Configuring Adapter Parameters</i> <i>General</i> <i>Electronic Keying</i> <i>Connection</i> <i>Assembly</i> <i>Signal Configuration</i> <i>Device Settings</i>	58 61 64 65 66 67 73
11	Save project	Depending of the frame application. For the configuration software: - select File > Save .	<i>(See Operating Instruction Manual of the Frame Application)</i>	-
12	Connect Adapter device	Depending of the FDT Container. For netDevice: - right click to the device icon of the Adapter, - select Connect .	<i>Connecting/Disconnecting Device</i>	77
13	Download Configuration	- Adhere to the necessary safety precautions to prevent personnel injury and property damagen. Depending of the FDT Container. For netDevice: - right click to the device icon of the Adapter, - select Download .	<i>Safety Messages on Firmware or Configuration Download</i> <i>Download Configuration</i>	31 79
14	Diagnosis	Depending of the FDT Container. For netDevice: - right click to the device icon of the Adapter, - select Diagnosis . - The Adapter 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 Adapter DTM diagnosis dialog via OK .	<i>Overview Diagnosis</i>	82

#	Step	Short Description	For detailed information see section	Page
15	IO Monitor	Depending of the FDT Container: For netDevice: - right click to the device icon of the Adapter, - select Diagnosis , - select Tools > IO Monitor . - Check the input or output data, - close the IO Monitor dialog via OK .	<i>IO Monitor</i>	106
16	Disconnect	Depending of the FDT Container. For netDevice: - right click to the device icon of the Adapter, - select Disconnect .	<i>Connecting/Disconnecting Device</i>	77

Table 9: Getting started - Configuration Steps (Adapter DTM at the Root-Line (Stand-Alone Slave))

3.1.2 Adapter DTM at the Master busline

#	Step	Short Description	For detailed information see section	Page
1	Load device catalog	Depending of the FDT Container: For netDevice: - select Network > Device Catalog , - select Reload Catalog .	<i>(See Operating Instruction Manual netDevice and netProject)</i>	-
2	Create new project / Open existing project	Depending of the frame application. For the configuration software: - select File > New or File > Open .	<i>(See Operating Instruction Manual of the Frame Application)</i>	-
3	Insert Scanner or Adapter into configuration	For netDevice: - in the Device Catalog click to the Scanner, - and insert the device via drag and drop to the root line in the network view, - in the Device Catalog click to the Adapter, - and insert the device via drag and drop to the Master bus line in the network view.	<i>(See Operating Instruction Manual netDevice and netProject)</i>	-
4	Open the Adapter DTM configuration dialog	Open the Adapter DTM configuration dialog. - Double click to the device icon of the Adapter. - The Adapter DTM configuration dialog is displayed.	-	-

#	Step	Short Description	For detailed information see section	Page
5	Verify or adapt Driver Settings	In the Adapter DTM configuration dialog: - select Settings > Driver .	<i>Settings for Driver and Device Assignment and Driver</i>	33
		 <ul style="list-style-type: none">• 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 Adapter DTM is installed on the same PC as the EtherNet/IP Adapter device.• Use the netX Driver to establish a USB, Serial (RS232) or TCP/IP connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device.• The 3SGateway Driver for netX (V3.x) is used only in relationship with CODESYS. <p>To search for devices you can check one or multiple drivers simultaneously.</p> <p>- Verify that the default driver is checked. - If necessary, check another driver or multiple drivers.</p>		35
6	Configure Driver	If you use the netX Driver , you respectively must configure it. For netX Driver and communication via TCP/IP set the IP address of the device: - 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 . Adjust the driver parameters netX Driver USB/RS232 only if they differ from the default settings.	<i>Configuring netX Driver</i>	38
6	Configure Driver (continued)	 Note! <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 surface.	<i>Configuring netX Driver</i>	38
7	Assign Adapter device (with or without firmware)	Assign the device to this driver. In the Adapter DTM configuration dialog: - select Settings > Device Assignment , - select a Adapter device (with or without firmware), - therefore check the appropriate checkbox, - select Apply .	<i>Selecting the Device (with or without firmware)</i>	48
8	Select and download firmware	If not yet a firmware was loaded to the device: - Adhere to the necessary safety precautions to prevent personnel injury and property damage In the Adapter DTM configuration dialog: - select Settings > Firmware Download , - select Browse... , - select a firmware file, - select Open , - select Download and Yes .	<i>Safety Messages on Firmware or Configuration Download</i>	31
			<i>Firmware Download</i>	51

#	Step	Short Description	For detailed information see section	Page
9	Assign Adapter device once more (with firmware and system channel) <i>For repeated download this step is omitted.</i>	In the Adapter DTM configuration dialog: - select Settings > Device Assignment , - select Scan , - select the Adapter device (with loaded firmware and defined system channel), - therefore check the appropriate checkbox, - select Apply , - close the Adapter DTM configuration dialog via OK .	<i>Selecting the Device once more (with Firmware)</i>	49
10	Configure Adapter device	Configure the Adapter device. - Double click to the device icon of the Adapter. - The Adapter DTM configuration dialog is displayed. In the Adapter DTM configuration dialog: - 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, - select Configuration > Signal Configuration , - proceed the signal configuration, - select Configuration > Device Settings , - set the Device Settings . - configure the device settings, - close the Adapter DTM configuration dialog via OK .	<i>Configuring Adapter Parameters</i> <i>Electronic Keying</i> <i>Connection</i> <i>Assembly</i> <i>Signal Configuration</i> <i>Device Settings</i>	58 64 65 66 67 73
11	Configure Scanner device	Configure the Scanner device via the EtherNet/IP Scanner DTM netX.	<i>(See Operating Instruction Manual DTM for EtherNet/IP Scanner devices)</i>	-
12	Save project	Depending of the frame application. For the configuration software: - select File > Save .	<i>(See Operating Instruction Manual of the Frame Application)</i>	-
13	Connect Adapter device	Depending of the FDT Container. For netDevice: - right click to the device icon of the Adapter, - select Connect .	<i>Connecting/Disconnecting Device</i>	77
14	Download Configuration	- Adhere to the necessary safety precautions to prevent personnel injury and property damage. Depending of the FDT Container. For netDevice: - right click to the device icon of the Adapter, - select Download .	<i>Safety Messages on Firmware or Configuration Download</i> <i>Download Configuration</i>	31 79
15	Diagnosis	Depending of the FDT Container. For netDevice: - right click to the device icon of the Adapter, - select Diagnosis . - The Adapter 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 Adapter DTM diagnosis dialog via OK .	<i>Overview Diagnosis</i>	82

#	Step	Short Description	For detailed information see section	Page
16	IO Monitor	Depending of the FDT Container: For netDevice: - right click to the device icon of the Adapter, - select Diagnosis , - select Tools > IO Monitor . - Check the input or output data, - close the IO Monitor dialog via OK .	<i>IO Monitor</i>	106
17	Disconnect	Depending of the FDT Container. For netDevice: - right click to the device icon of the Adapter, - select Disconnect .	<i>Connecting/Disconnecting Device</i>	77

Table 10: Getting started - Configuration Steps (Adapter DTM at the Master busline)

3.2 Safety Messages on Firmware or Configuration Download

If you perform a firmware download or a configuration download via the EtherNet/IP Adapter DTM be aware of the following:

⚠ 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.

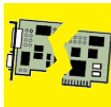
The firmware download overwrites the existing firmware. The communication stop may cause loss of device parameters and possible device damage may occur.

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

⚠ WARNING**Mismatching System Configuration**

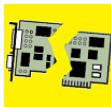
Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury or damage of equipment.

- 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.

4 Settings

4.1 Overview Settings

Settings Dialog Panes

The table below gives an overview for the individual **Settings** dialog panes descriptions:

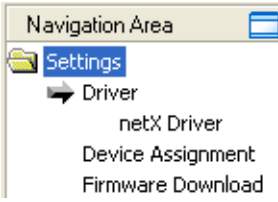
EtherNet/IP Adapter DTM	Folder Name / Section	Subsection	Manual Page
 <p>Navigation Area – Settings (Example)</p> <p>Additional drivers can be displayed.</p>	Driver		35
		Verify or adapt Driver Settings	35
		cifX Device Driver	37
		netX Driver	37
		Configuring netX Driver	38
	Device Assignment		45
		Scanning for Devices	45
		Scanning for all Devices or for suitable only	47
		Selecting the Device (with or without firmware)	48
		Selecting the Device once more (with Firmware)	49
	Firmware Download		51

Table 11: Descriptions of the Dialog Panes Settings



Note: To edit the **Settings** dialog panes you need *User Rights* for “Maintenance”.



Notice the descriptions in the section *Settings for Driver and Device Assignment* on page 33.

To access to the online help with the descriptions of the drivers:

- Select **Settings > Driver > [Name of the assigned driver]**.
- Press the **F1** key.

4.2 Settings for Driver and Device Assignment

The following steps are needed to establish a connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device:

Verifying or adapting Driver Settings

Verify the Driver Settings and adapt them if necessary.

1. Open the DTM configuration dialog.
 - In the FDT container **netDevice** double click to the EtherNet/IP Adapter device icon.
2. Verify that the default driver is checked and respectively check another or multiple 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 Adapter DTM is installed on the same PC as the EtherNet/IP Adapter device.
- Use the **netX Driver** to establish an USB, Serial (RS232) or TCP/IP connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device.
- The **3SGateway Driver for netX (V3.x)** is used only in relationship with CODESYS.

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

- Verify that the default driver for your device is checked.
- If necessary, check another driver or multiple drivers.

Configuring Driver



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.

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

3. Configure the **netX Driver** if necessary.

For the driver **netXDriver** an individual driver dialog window can be opened where you can configure the driver.

- Select **Settings > Driver > netX Driver**.
- 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.

Assigning the Adapter device to the DTM

4. Scan for and select the devices (with or without firmware).
 - Select **Settings > Device Assignment**.
 - Under **Device selection** select *suitable only* or *all* and then **Scan**.
 - In the table check the required devices.
 - Select **Apply**.

Selecting and downloading the Firmware

5. 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**.
 - Select **Apply**.
6. 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.
7. Close the DTM configuration dialog via **OK**.

Connecting the Device

8. In **netDevice** put a right-click on the EtherNet/IP Adapter device icon.
9. Select the **Connect** command from the context menu.
- In the network view the device description at the device icon of the Adapter is displayed with a green colored background. The EtherNet/IP Adapter device now is connected to the EtherNet/IP Adapter DTM via an online connection.

Further Information



For descriptions about these steps refer to the sections following hereafter.

4.3 Driver

The **Driver** dialog pane displays the drivers to be used for a EtherNet/IP Adapter DTM to establish a device communication connection.



Note! A **default driver** is set in the configuration software.

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-109B6A6BEA91}
<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

Parameter	Meaning
Driver	Name of the driver (for more details see descriptions hereafter)
Version	ODMV3 Version of the respective driver
ID	ID of the driver (driver identification)

Table 12: Driver Selection List Parameters

To establish a connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device, verify if the default driver is checked and respectively check another driver or multiple drivers.

4.3.1 Verify or adapt Driver Settings

Proceed as follows:

1. Select **Settings > Driver** in the navigation area.
- The **Driver** dialog pane is displayed with the available drivers and the setting for 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-109B6A6BEA91}
<input type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 6: 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-109B6A6BEA91}
<input checked="" type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 7: Default Driver 'netX Driver' for Hilscher devices except for PC cards cifX (example)

2. Verify that the default driver is checked.
- Verify that the default driver for your device is checked.

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.

3. Respectively check another driver.



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

- Use the **cifX Device Driver** if the EtherNet/IP Adapter DTM is installed on the same PC as the EtherNet/IP Adapter device.
- Use the **netX Driver** to establish a USB, Serial (RS232) or TCP/IP connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter 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.

➤ Check the checkbox for the driver in the selection list.

4. Respectively check multiple drivers.

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-109B6A6BEA91}
<input checked="" type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 8: Manual Selection of multiple drivers (Example)

4.3.2 cifX Device Driver

In the EtherNet/IP Adapter-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 Adapter DTM is installed in the same PC as the EtherNet/IP Adapter device.



Note: To establish a connection from a DTM to a Adapter device via the **cifX Device Driver**, the **cifX Device Driver** must be installed and the driver must have access to the Adapter device.

4.3.3 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.

4.3.4 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. Select **Settings > Driver > netX Driver > USB/RS232 Connection**.
 - Set the driver netX Driver USB/RS232 parameters.

TCP/IP Connection

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

1. Select **Settings > Driver > netX Driver > TCP Connection**.
2. Set IP Address of the device:
 - Add an IP Range via **Select IP Range** .
3. Under **IP Range Configuration > IP Address** enter the IP Address of the device (**Use IP Range** is unchecked).

Or

4. 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).
 5. Click **Save**, to save the IP address or the IP range.
- After saving the changed driver parameters, these parameters are used for the device assignment when scanning devices.

4.3.5 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.


4.3.5.1 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 9: netX Driver > USB/RS232 Connection

Parameter	Meaning	Range of Value / Default Value
Enable USB/RS232 Connector (Restart of ODM required)	checked: The netX Driver can communicate via the USB/RS232 interface. unchecked: The netX Driver can <u>not</u> communicate via the USB/RS232 interface. If the check mark for Enable USB/RS232 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 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	checked: No connection. unchecked: The netX Driver tries to establish a connection using the configured USB/RS232 interface.	checked, unchecked (Default)
Baud rate	Transfer rate: number of bits per second. The device must support the baud rate.	9.6, 19.2, 38.4, 57.6 or 115.2 [kBit/s]; Default (RS232): 115.2 [kBit/s]

Parameter	Meaning	Range of Value / Default Value
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 and USB): 5000 ms
Byte size	Number of bits per byte by byte specification	7 Bit, 8 Bit; Default (RS232): 8 Bit
Parity	In the error detection in data transmission using parity bits, "parity" describes the number of bits occupied with 1 in the transmitted information word. No Parity: no parity bit Odd Parity: The parity is "odd" if the number of bits occupied with 1 in the transmitted information word will be odd. Even parity: The parity is "even" if the number of bits occupied with 1 in the transmitted information word will be even. Mark Parity: if the parity bit is always 1, this will be named mark-parity (the bit does not contain any information). Space Parity: if the parity bit always 0, this will be named space-parity (the bit represents an empty space).	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 and USB): 2000 ms
Restore	Resets all settings in the configuration dialog to the default values.	
Save	Saving all settings made in the configuration dialog netX Driver > Save USB/RS232 Connection , i. e. only for the selected connection type.	
Save All	Saving all settings made in the configuration dialog netX Driver , i. e. for all connection types.	

Table 13: Parameters netX Driver > USB/RS232 Connection

4.3.6 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.

4.3.6.1 Driver Parameters for netX Driver - TCP/IP Connection

The settings of 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 10: netX Driver > TCP Connection

Parameter	Meaning	Range of Value / Default Value
Enable TCP Connector (Restart of ODM required)	<p>checked: The netX Driver can communicate via the TCP/IP interface.</p> <p>unchecked: The netX Driver can <u>not</u> communicate via the TCP/IP interface.</p> <p>If the check mark for Enable TCP Connector is set or removed, then the ODM server must be restarted¹, to make the new setting valid.</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 IP Range	<p>Via Select IP Range already created IP ranges can be selected.</p> <p>Via  an additional IP range can be added.</p> <p>Via  an IP range can be deleted.</p>	

Parameter	Meaning	Range of Value / Default Value
Scan Timeout [ms]	With Scan Timeout can be set, how long to wait for a response while a connection is established.	10 ... 10000 [ms]; Default: 100 ms
IP Range Configuration		
Disable IP Range	checked: No connection. unchecked: The netX Driver tries to establish a connection using the configured TCP/IP interface.	checked, unchecked (Default)
IP Address (left)	Enter the IP address of the device, (if Use IP Range is not checked). Enter the start address of the IP scanning range, (if Use IP Range is 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 ending 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 [ms]	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 (TCP/IP): 1000 ms
Reset Timeout [ms]	Maximum time for a device reset, including the re-initialization of the physical interface used for the communication.	100 ... 60.000 [ms]; Default (TCP/IP): 2000 ms
Keep Alive Timeout [ms]	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 netX Driver > Save TCP/IP Connection , i. e. only for the selected connection type.	
Save All	Saving all settings made in the configuration dialog netX Driver , i. e. for all connection types.	

Table 14: 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 Device Assignment



Note: In the **Device Assignment** dialog pane you first must assign the EtherNet/IP Adapter device to the EtherNet/IP Adapter DTM by checking the check box. This is essential to establish an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device later, as described in section *Connecting/Disconnecting Device* on page 77.

Therefore in the **Device Assignment** dialog pane you scan for the EtherNet/IP Adapter 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.

4.4.1 Scanning for Devices

1. Select **Settings > Device Assignment** in the navigation area.

➤ The dialog pane **Device Assignment** is displayed.

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

Figure 11: Device Assignment - detected Devices (* The name of the device class is displayed.) – Example for a device without firmware

2. Under **Device Selection** select *suitable only*.
3. Select **Scan**, to start the scanning process.

➤ In the table all devices are displayed, which can be connected to the EtherNet/IP Adapter DTM via the preselected driver.



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	Meaning	Range of Value / Default Value
Device selection	Selecting suitable only or all devices.	suitable only, all
Device	Device class of the EtherNet/IP Adapter devices.	
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 n/a 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 are displayed. For the cifX Device Driver the following data are displayed: a.) For devices without firmware: ...cifX[0toN]_SYS, b.) For devices with firmware: ...cifX[0toN]_Ch[0to3]. cifX[0toN] = Board number 0 to N Ch[0to3] = 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 are displayed: a.) For devices without firmware: ...cifX[0toN]_SYS, b.) For devices with firmware: ...cifX[0toN]_Ch[0to3]. cifX[0toN] = Board number 0 to N Ch[0to3] = 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 15: Parameters of the Device Assignment

4.4.1.1 Scanning for all Devices or for suitable only

all

1. Under **Device Selection** select *all*.
2. Select **Scan**.

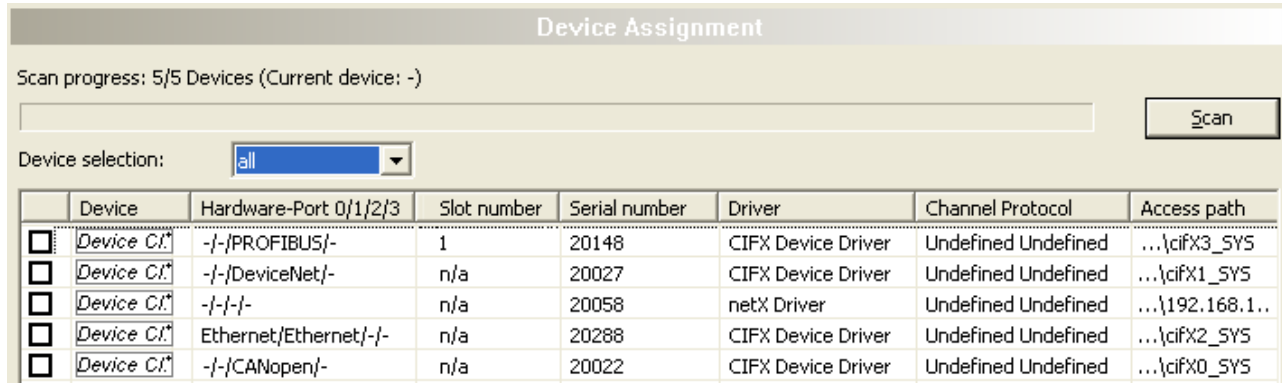


Figure 12: Device Assignment - detected Devices (* The name of the device class is displayed.) Example for Devices without Firmware

- ⇒ 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

1. Under **Device Selection** select *suitable only*.
2. Select **Scan**.

- ⇒ In the table all devices are displayed, which can be connected to the EtherNet/IP Adapter DTM via the preselected drivers.



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 Adapter DTM can only be established with one EtherNet/IP Adapter device.

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

1. Check the appropriate device.

Device Assignment

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

Device 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

Access path: {368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}\cifx3_SYS

Figure 13: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for a device without firmware / one Device is selected

- 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 are displayed.

2. Select **Apply**, to apply the selection.



Note: Before an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter 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 to section *Firmware Download* on page 51 or to section *Selecting the Device once more (with Firmware)* on page 49.

4.4.3 Selecting the Device once more (with Firmware)



Note: For repeated download this step is omitted.

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

all

1. Under **Device Selection** select *all*.
2. Select **Scan**.
- In the table all devices are displayed, which are attainable in the network and which can be connected to a DTM via the preselected drivers.
3. Check the appropriate device.

	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-DP Master	...\cifX3_Ch0
<input type="checkbox"/>	Device Cl.*	-/-/DeviceNet/-	n/a	20027	CIFX Device Driver	DeviceNet Master	...\cifX1_Ch0
<input type="checkbox"/>	Device Cl.*	-/-/-/-	n/a	20058	netX Driver	Undefined Undefined	...\192.168....
<input type="checkbox"/>	Device Cl.*	Ethernet/Ethernet/-/-	n/a	20288	CIFX Device Driver	PROFINET IO Device	...\cifX2_Ch0
<input type="checkbox"/>	Device Cl.*	-/-/CANopen/-	n/a	20022	CIFX Device Driver	Undefined Undefined	...\cifX0_SYS

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

Figure 14: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for Devices with and without Firmware / one Device is selected



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

4. Select **Apply**, to apply the selection.
5. Or select **OK**, to apply the selection and to close the DTM interface dialog.
6. Connect the DTM to the device using the context menu (right mouse click).

Or:

suitable only

1. Under **Device Selection** select *suitable only*.
2. Select **Scan**.
- In the table all devices are displayed, which can be connected to the EtherNet/IP Adapter DTM via the preselected drivers.
3. Check the appropriate device.

Device Assignment

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

Device selection: suitable only Scan

	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-DP Master	...\cifX3_Ch0

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

Figure 15: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for a device with firmware / one Device is selected



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

4. Select **Apply**, to apply the selection.
5. Or select **OK**, to apply the selection and to close the DTM interface dialog.
6. Connect the DTM to the device using the context menu (right mouse click).



For further information how to establish an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device, refer to section *Connecting/Disconnecting Device* on page 77.

4.5 Firmware Download

Using the **Firmware Download** dialog a firmware can be transferred to the device.



Note: Prior to the firmware download, you must select the driver and the Adapter device (with or without firmware) and the device must be assigned to the hardware. For further information refer to section *Overview Settings* on page 32.

To load the firmware to the device:

1. In the navigation area select **Settings > Firmware Download**.

➤ The dialog **Firmware-Download** pane is displayed.

Figure 16: Firmware Download

Element	Meaning
Name	The path and name of the firmware file selected are displayed.
Version	The version and build version of the firmware file selected are displayed.
Browse...	Via 'Browse...' you can select the firmware file for the download.
Download	Via 'Download' you can download the firmware to the device.

Table 16: Parameter Firmware Download

➤ Select **Browse**.

Device is not assigned to the Hardware

If the device is not assigned to the Hardware, the error message 'The device is not assigned to the hardware!' is displayed:

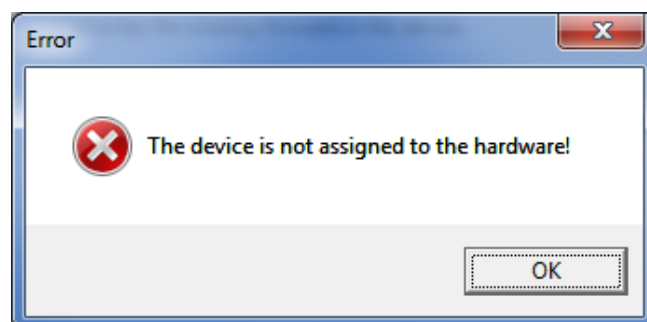


Figure 17: Error Message 'The device is not assigned to the hardware!'

- Click **OK** and select and assign the Adapter device as described in section *Device Assignment*.

Device is assigned to the Hardware

- The selection window **Select Firmware File** is displayed.
- Enlarge the selection window to view the columns **Hardware** and **Version**.

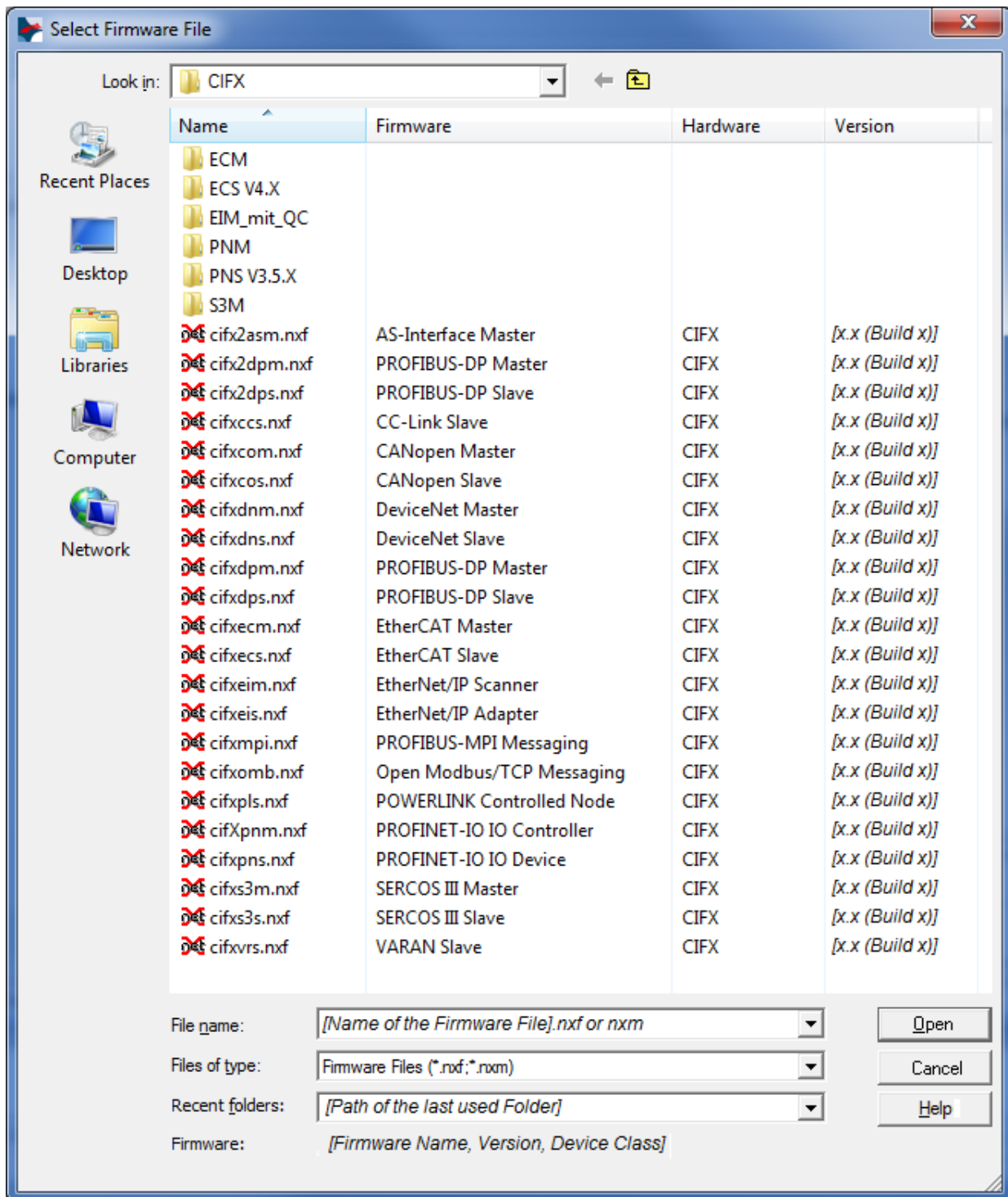


Figure 18: Window 'Select Firmware File' (Example CIFX)


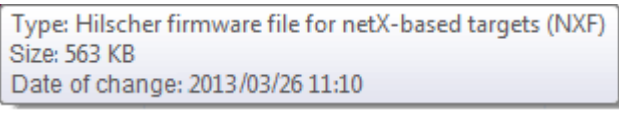
Parameter	Meaning	Range of Value / Default Value
Column Name	File name of the firmware file To sort the entries of the window Select Firmware File by name click to the column head  .	nxf, nxm
Column Firmware	Name of the firmware (consisting of the protocol name and protocol class)	
Column Hardware	Device class of the associated 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 information move with the mouse pointer over the selected firmware line. 	
Files of Type	„All Files (*.*)“ if before in the Device Assignment pane under Device selection <i>all</i> was selected. „Firmware Files (*.nxm)“ or <i>Firmware Files (*.nxf)</i> if before in the Device Assignment pane under Device selection <i>suitable only</i> 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 17: 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 are displayed or set:

(for 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 Files of Type *:	„All Files (*.*)“	„Firmware Files (*.nxm)“, „Firmware Files (*.nxf)“
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 Adapter DTM.

*These settings in the selection window **Select Firmware File** can also be changed manually.

- 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.

4. In the selection window select the **Open** button.

Validation

- A validation is made, whether the selected firmware file is suitable for the EtherNet/IP Adapter device.

Invalid Firmware

NOTICE

Invalid Firmware

Loading invalid firmware files could render your device unusable.

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

- If a firmware file is selected, which is not valid for the assigned device, the request **Select Firmware File** will be displayed.
'Invalid firmware for assigned device!
[detailed explication]
Shall firmware file nevertheless be applied for the download?'



Figure 19: Request Select Firmware File - Example Invalid Firmware

- Answer to the request with **No** and select a valid firmware.
- The selection window is closed.

Valid Firmware

➤ The selection window is directly closed (without dialog).

5. Start firmware upgrade.

⚠ 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 placed 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.

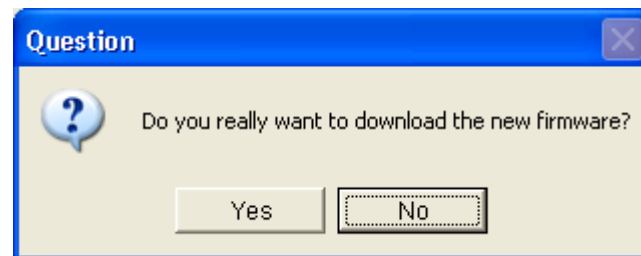


Figure 20: Request - Do you really want to download the firmware?

6. 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** **Download** is grayed out.

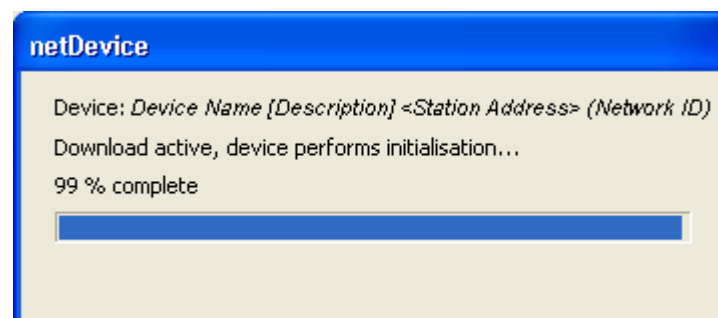


Figure 21: Firmware Download - Progress Bar

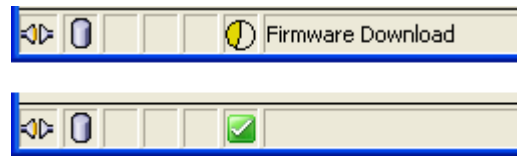


Figure 22: Clock Symbol and Hook Symbol green

- In the **Firmware-Download** dialog pane the path and name as well as the version of the selected firmware file are displayed.

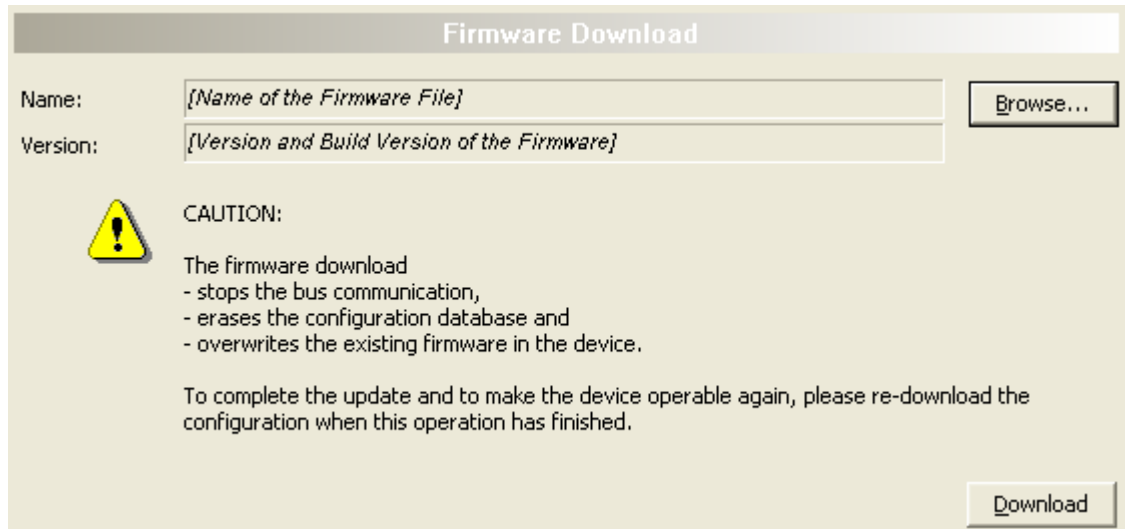


Figure 23: Firmware Download – Download

5 Configuration

5.1 Overview Configuration

Configuration Dialog Panes

The table below gives an overview for the **Configuration** dialog panes descriptions:

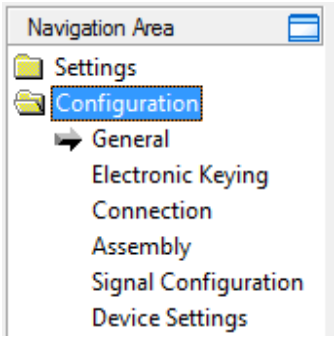
EtherNet/IP Adapter DTM	Folder Name / Section	Page
 Navigation Area - Configuration	General	61
	Electronic Keying	64
	Connection	65
	Assembly	66
	Signal Configuration	67
	Device Settings	73

Table 18: Descriptions of the Dialog Panes Configuration



Notice the descriptions in the section *Configuration Steps* on page 24.



Note: In order to transfer the configuration to the EtherNet/IP Adapter device, download the data of the configuration parameters in the EtherNet/IP Adapter device. See section *Download Configuration* on page 79.

5.2 Configuring Adapter Parameters

The steps provided in the following two sections are alternatively required for the two cases listed hereafter, to configure the parameters of the EtherNet/IP Adapter device using the EtherNet/IP Adapter DTM:

Adapter DTM at the Root-Line (Stand-Alone Adapter)

- and Adapter DTM at the Scanner busline.

5.2.1 Slave DTM at the Root-Line (Stand-Alone Slave)

If in the network project the EtherNet/IP Adapter DTM is dropped to the root busline, proceed as follows:

General

1. Set the **IP settings** of the Slave device:

- Select **Configuration > General** in the navigation area.

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

Electronic Keying

2. Select the keying method and configure it if necessary:

- Select **Configuration > Electronic Keying** in the navigation area.

Connection

3. Configure the connection points:

- Select **Configuration > Connection** in the navigation area.

Assembly

4. Configure Instance ID and Data length:

- Select **Configuration > Assembly** in the navigation area.

Signal Configuration

5. Proceed the **Signal Configuration**:

- Select **Configuration > Signal Configuration** in the navigation area.

Device Settings

6. Set the **Device Settings**:

- Select **Configuration > Device Settings** in the navigation area.
- Under **Start of Bus Communication** > select **Automatically by device** or **Controlled by application** option.
- Under **Application Monitoring** > set **Watchdog time**.

Close Adapter DTM Configuration Dialog

7. Click **OK** in order to close the Adapter DTM configuration dialog and to store your configuration.

Configuration Download to the EtherNet/IP Adapter Device

- Adhere to the necessary safety precautions to prevent personnel injury and property damage.



Note: In order to transfer the configuration to the EtherNet/IP Adapter device, download the data of the configuration parameters in the EtherNet/IP Adapter device. See section *Download Configuration* on page 79.

Further Information



For more information refer to the sections hereafter.

5.2.2 Adapter DTM at the Master busline

If in the network project the EtherNet/IP Adapter DTM is dropped to the Master busline of the EtherNet/IP Scanner DTM:

Electronic Keying

1. Select the keying method and configure it if necessary:
 - Select **Configuration > Electronic Keying** in the navigation area.

Connection

2. Configure the connection points:
 - Select **Configuration > Connection** in the navigation area.

Assembly

3. Configure Instance ID and Data length:
 - Select **Configuration > Assembly** in the navigation area.

Signal Configuration

4. Proceed the **Signal Configuration**:
 - Select **Configuration > Signal Configuration** in the navigation area.

Device Settings

5. Set the **Device Settings**:
 - Select **Configuration > Device Settings** in the navigation area.
 - Under **Start of Bus Communication** > select **Automatically by device** or **Controlled by application** option.
 - Under **Application Monitoring** > set **Watchdog time**.

Close Adapter DTM Configuration Dialog

6. Click **OK** in order to close the Adapter DTM configuration dialog and to store your configuration.

Configuration Download to the EtherNet/IP Adapter Device

- Adhere to the necessary safety precautions to prevent personnel injury and property damage.



Note: In order to transfer the configuration to the EtherNet/IP Adapter device, download the data of the configuration parameters in the EtherNet/IP Adapter device. See section *Download Configuration* on page 79.

Further Information



For more information refer to the sections hereafter.

5.3 General

The **General** dialog pane shows the **Description** of the EtherNet/IP Adapter. The **IP Address** is set by the EtherNet/IP Scanner.

General

Description:

[Symbolic Name of the EtherNet/IP Adapter Device]

IP Settings

IP Address:

192 . 168 . 10 . 2

Figure 24: Configuration > General (with EtherNet/IP Scanner)

Parameter	Description
Description	Symbolic Name of the EtherNet/IP Adapter device.
IP Settings of the EtherNet/IP Adapter device	
IP Address	<div>The IP address of the EtherNet/IP Adapter device is set in the EtherNet/IP Scanner DTM. Here it is only displayed.</div> <div>The EtherNet/IP Scanner device transmits the IP address of the EtherNet/IP Adapter during startup via the EtherNet/IP network to the EtherNet/IP Adapter and thereby configures the EtherNet/IP Adapter.</div>

Table 19: General Pane Parameters

If the EtherNet/IP-Adapter is not configured to an EtherNet/IP Scanner, the dialog pane **General** displays further IP Settings.

Figure 25: Configuration > General (without EtherNet/IP Scanner)

Parameter	Description	Range of Value / Value
Description	Symbolic Name of the EtherNet/IP Adapter device.	
IP Settings of the EtherNet/IP Adapter-device (editable)		
DHCP	To set the IP address, activate/deactivate DHCP protocol.	
BootP	To set the IP address, activate/deactivate BootP protocol.	
Fixed Addresses	Activate/deactivate fix IP settings.	
IP Address	IP address of the EtherNet/IP Adapter-device.	
Network Mask	Network mask of the EtherNet/IP Adapter device.	
Gateway Address	Gateway address of the EtherNet/IP Adapter- device.	
Port1 / Port 2		
Operation mode	Operation mode of the EtherNet/IP Adapter	Speed/Duplex mode/ Auto negotiation

Parameter	Description	Range of Value / Value
MDI Mode	<p>MDI mode of the EtherNet/IP Adapter for Port 1 or Port 2</p> <p>According to EtherNet/IP specification [4] the following rules are valid:</p> <p>When in Quick-Connect mode, a port is configured for forced speed and duplex mode, the Quick-Connect devices shall not use Auto-MDIX (detection of the required cable connection type). This detection may take more time than the allotted Quick-Connect system connection time. To enable the use of straight-thru cables when Auto-MDIX is disabled, the following rules shall be applied:</p> <ol style="list-style-type: none"> 1. On a device with only one port: the port shall be configured as MDI. 2. On devices with 2 external Ethernet ports: <ol style="list-style-type: none"> a. The labels for the 2 external ports shall include an ordinal indication (e.g.: Port 1 and Port 2, or A and B). b. The port with the lower ordinal indication shall be configured as MDI. c. The port with the upper ordinal indication shall be configured as MDIX. <p>Note: For DLR capable devices this requirement overrides the requirement that DLR capable devices shall have "forced Auto-MDIX" when speed & duplex are fixed.</p> <p><i>MDI Mode options:</i></p> <p><u>Auto MDI-X:</u> In the operatin mode 'Auto-Negotiation' the 'MDI Mode' can not be clicked. In this case automatically 'Auto MDI-X' is valid.</p> <p><u>MDI' und 'MDI-X:</u> The data directions RX an TX are assigned to the cable ends statically. This leads to the fact that IO connections are established much faster. A statical definition is used exclusively with Quick Connect</p>	<p>'Auto MDI-X', 'MDI' 'MDI-X'</p>

Table 20: General Pane Parameters

5.4 Electronic Keying

The concept of **Electronic Keying** was introduced by Allen-Bradley, RA. EtherNet/IP scanner implements compatible concept.

A set of attributes of an EtherNet/IP Adapter can be regarded as its electronic identity which can be used to differentiate adapters based on these attributes. EtherNet/IP scanner employs this electronic identity to build an **Electronic Key** and uses it to verify that an adapter connected to the network is the expected one. **Electronic keying** allows flexible online validation of adapters, provides a method for reliable network configuration.

Attributes of the electronic identity that can be used in keying are as follows: Minor Revision, Major Revision, Product Code, Product Type and Vendor ID.

- Select **Configuration > Electronic Keying** in the navigation area.

Figure 26: Configuration > Electronic Keying

- Select a **Keying method**.

Method	Description
Exact match	To validate an EtherNet/IP adapter connected to the network all attributes for the electronic identity must correspond to the attributes of an expected device.
Custom keying	To validate an EtherNet/IP adapter connected to the network all attributes must correspond to the configured keying.
No keying	No validation of the device identity.

Table 21: Electronic Keying > Keying Method

For Custom Keying:

- Select **Custom Keying** and configure the keying attributes.

Parameter	Description
Relaxed Match	If checked: Restricted validation of the electronic identity for devices. To indicate relaxed match to an adapter, the scanner sets bit 7 in major revision.
Minor Revision	If checked: For electronic keying consistency to minor revision is relevant and gets verified.
Major Revision	If checked: For electronic keying consistency to major revision is relevant and gets verified.
Product Code	If checked: For electronic keying consistency to product code is relevant and gets verified.
Product Type	If checked: For electronic keying consistency to product type is relevant and gets verified.
Vendor	If checked: For electronic keying consistency to vendor ID is relevant and gets verified.

Table 22: Electronic Keying > Custom Keying

5.5 Connection

At the **Connection** pane the connectin can be parameterized. Usually the settings are made as given in the EDS file in section connection manager.

Connection

Connection name:

Originator to Target

RT transfer format:

Target to Originator

RT transfer format:

Note: The max. process IO data length depends on existence of run/idle header (O2T, T2O)

Figure 27: Configuration > Connection

Parameter	Description	Range of Value / Value
Connection name	Name of the connection, defined by the operator or by the EDS file.	Standard: „Connect1“
Originator to Target (O2T)		
RT transfer format	Real time transfer format for transfer direction originator to target	Connection is pure data and is modeless, heartbeat, 32-bit Run/Idle header
Target to Originator (T2O)		
RT transfer format	Real time transfer format for transfer direction target to originator	Connection is pure data and is modeless, 32-bit run/idle header

Table 23: Parameter Configuration > Connection

Run/Idle Mode for RealtimeTransfer Format

The Run/Idle header is a 32-bit field added to packets flowing in the O2T or T2O direction. In O2T direction It contains several bits of status info. Of primary interest is the least significant bit, which reflects the mode of the connection originator. When this bit is set it means the originator is in Run mode, actively controlling I/O. When cleared this indicates that the originator is in Idle mode, not actively controlling the I/O. Run/Idle is not counted as part of the configured data size in the EDS Connection Manager section. It is counted in the FwdOpen Message O2T and T2O sizes however.

5.6 Assembly

The **Assembly** dialog pane is used to configure and display the input/output connections of the EtherNet/IP Adapter. Here the parameters **Instance ID** and **Data length** can be configured.

- Select **Configuration > Assembly** in the navigation area.

Assembly						
Assembly instances:						
IN/OUT	Connection name	Instance ID	Data length	Min. length	Max. length	
IN	Connect1	101	32	0	504	
OUT	Connect1	100	32	0	504	

Figure 28: Configuration > Assembly

Parameter	Description	Range of Value / Value
IN/OUT	Input or output connection configured to the EtherNet/IP Adapter.	Connection type: IN (input) or OUT (output)
Connection name	Name of the input or output connection configured to the EtherNet/IP Adapter. Can be set in the configuration dialog Connection .	Connection1
Instance ID	Instance ID of the connection (editable)	1-255, Default: 100 for output data, 101 for input data
Data length	Data length in Bytes (editable) The data length set here affects the signal configuration. If you increase the data length, a corresponding number of signals with the corresponding data type are added. If you decrease the data length, a corresponding number of signals is deleted.	0 ... 504
Min. length	Minimum data length in Bytes	0
Max. length	Maximum data length in Bytes	504

Table 24: Parameters Dialog Pane Assembly

5.7 Signal Configuration

With the EtherNet/IP Adapter, the process data to be transmitted via the bus is configured at fieldbus level as the number of data for the **connection**.

The application requires the information on the meaning and data type of the input and output data specified via the **signals**.



Important: First, configure the length of the input and output data in the **Assembly** dialog pane. Do not perform the signal configuration steps until you have finished.

In the **Signal Configuration** dialog you can define the data structure of the input or output data of your device and define the I/O data for your application

- assign data types,
- assign names or signal names, and
- define data structures.

The aim is to create a suitable signal configuration, which subsequently enables easy identification of the transmitted input and output data. This requires a structuring of the input and output data according to signals and the configuration of signal names or data types suitable for the individual application cases.

Signal names

The names assigned by default by the configuration software for the signals distinguish between input and output signals. You can replace these general names with suitable designations, such as "Setpoint" or "Status".

Merging or splitting signals

You can merge or split signals or data types by configuring the data type and the number of signals.

Example: 1 "Word (input)" = 16 "Bit (input)".

This means that 1 "word input data" corresponds to 16 signals with the data type "Bit".

To identify split data types, the configuration software assigns appropriate suffixes to the signal names, which depend on the selected new data type, for example _Byte_0, _Byte_4 ... or _Bit_1, _Bit_2 ...

5.7.1 Signal Configuration Pane

- Select **Configuration > Signal Configuration** in the navigation area.
- The dialog pane **Signal Configuration** is displayed.

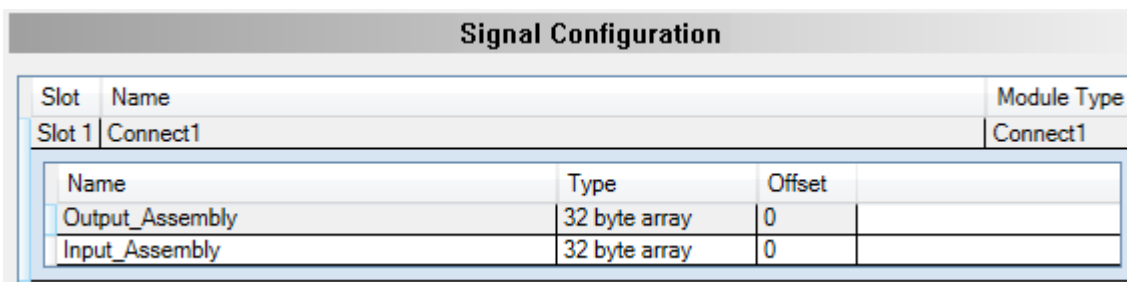


Figure 29: Signal Configuration Pane

Parameter	Description	Range of Value/ Value
Slot	Slot1 for connection1	Slot1
Name	Name of the input or output connection configured to the EtherNet/IP Adapter. Can be set in the configuration dialog Connection .	Connect1
Module Type		
Signal level		
Name	Name of the input or output signal that can be set here. The configuration software assigns names by default: Output_Assembly, Input_Assembly	String
Type	Data type of the input or output signal (depending on the configured size of the I/O data).	bit, byte, signed8, unsigned8, word, signed16/24, unsigned16/24, dword, signed32/40/48/56, unsigned32/40/48/56, lword, signed64, unsigned64, real32, real64
Offset	Offset of the input or output signal, in relation to the data in the connection.	

Table 25: Explanations Signal Configuration Pane

5.7.2 Create Signal Configuration

In the **Signal Configuration** pane, you can edit the signal configuration in the lower table.

Edit Signal

- Right-click on the signal to be configured to open the context menu.

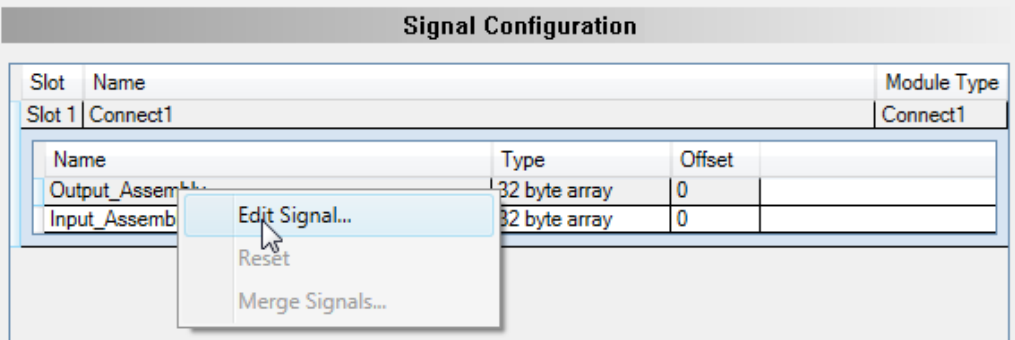


Figure 30: Edit Signal

- Click **Edit Signal**.
- The **Edit Signal** dialog pane is opened.

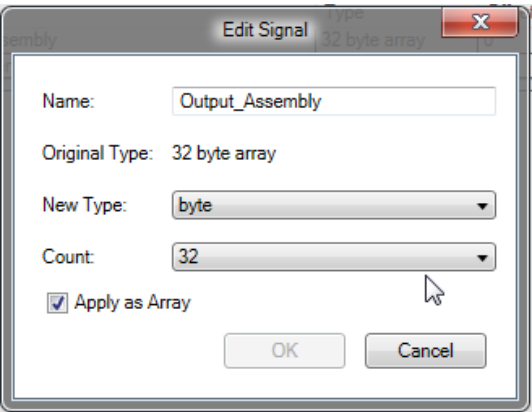


Figure 31: Edit Signal Dialog Pane

Parameter	Description	Range of Value/Value
Name	Here you can edit the signal name.	String
Original Type	Input or output signal data type preconfigured by the configuration software or by the user.	
New Type	Here you can edit the new data type for the input or output signal. Only permitted data types are displayed in the selection list.	bit, byte, signed8, unsigned8, word, signed16/24, unsigned16/24, dword, signed32/40/48/56, unsigned32/40/48/56, lword, signed64, unsigned64, real32, real64
Count	Here you can set the number of signals with the data type "New Type".	
Apply as Array	If checked, the signal is displayed as an array. If unchecked, the individual signals are displayed.	Checked, unchecked, Default: checked

Table 26: Explanations Edit Signal Dialog Pane

- In the field **Name** edit the signal name.
- Use **New Type** to define the new data type or **Count** to define the number of signals.

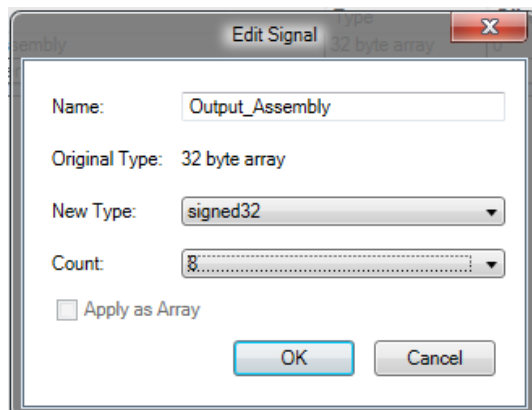


Figure 32: Edit Signal (Example)

- Click **OK**.
- When splitting signals, the configuration software assigns suitable standard suffixes to the signal name to identify the subordinate signals.

Signal Configuration			
Slot	Name	Module Type	
Slot 1	Connect1	Connect1	
Name	Type	Offset	
Output_Assembly	32 byte array	0	
Output_Assembly_Byte_0	signed32	0	
Output_Assembly_Byte_4	signed32	4	
Output_Assembly_Byte_8	signed32	8	
Output_Assembly_Byte_12	signed32	12	
Output_Assembly_Byte_16	signed32	16	
Output_Assembly_Byte_20	signed32	20	
Output_Assembly_Byte_24	signed32	24	
Output_Assembly_Byte_28	signed32	28	
Input_Assembly	32 byte array	0	

Figure 33: Signal Output_Assembly split (Example)

- You can further split already split signals.

Signal Configuration			
Slot	Name	Module Type	
Slot 1	Connect1	Connect1	
Name	Type	Offset	
Output_Assembly_Byte_0	signed32	0	
Output_Assembly_Byte_4	signed32	4	
Output_Assembly_Byte_4_Byte_0	word	4	
Output_Assembly_Byte_4_Byte_2	word	6	
Output_Assembly_Byte_8	signed32	8	
Output_Assembly_Byte_12	signed32	12	
Output_Assembly_Byte_16	signed32	16	
Output_Assembly_Byte_20	signed32	20	
Output_Assembly_Byte_24	signed32	24	
Output_Assembly_Byte_28	signed32	28	
Input_Assembly	32 byte array	0	

Figure 34: Signal Output_Assembly_Byte_4 split again (Example)

- Click **Apply** to save the created configuration.

Reset



Note: As long as you have not applied the created signal configuration, you can undo the steps you have taken by clicking **Reset**.

- Right-click on the configured signal to open the context menu.

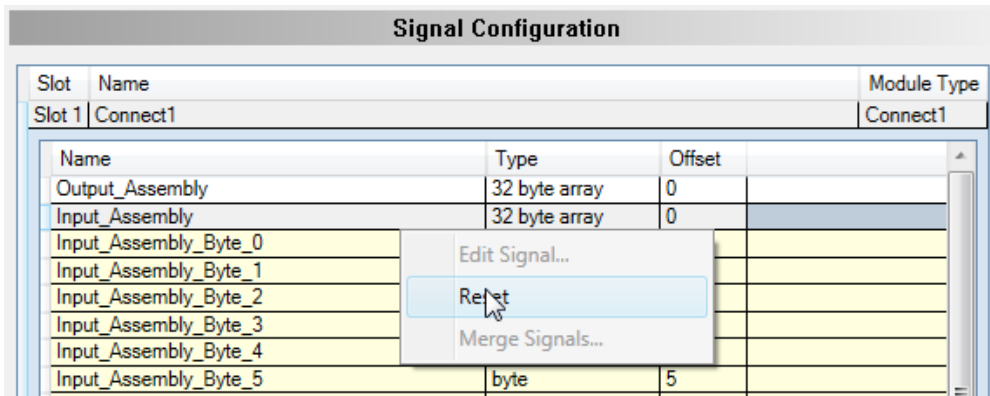


Figure 35: Reset

- Click **Reset**.
- The created signal configuration with a splitting of a signal is undone.

Merge Signals

- First, confirm a signal splitting with **Apply**.
- Then press **Shift** and mark the signals to be merged with the mouse pointer.
- Open the context menu by right-clicking on the marked signals.

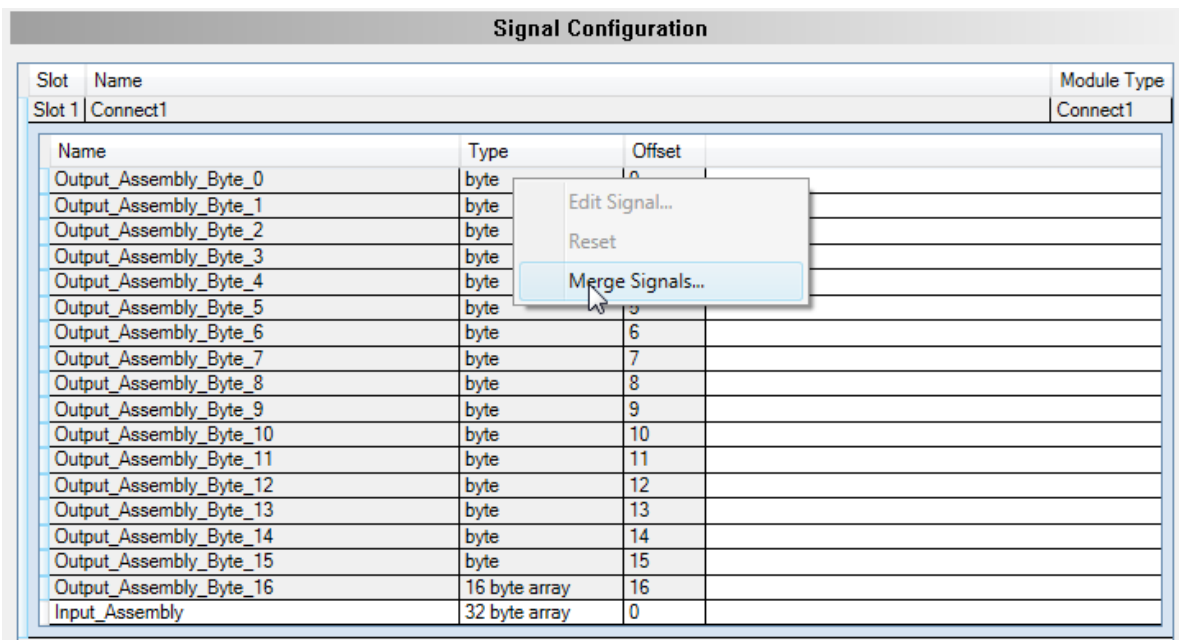


Figure 36: Merge Signals

- Click **Merge Signals**.
- The dialog pane **Merge Signals** opens.

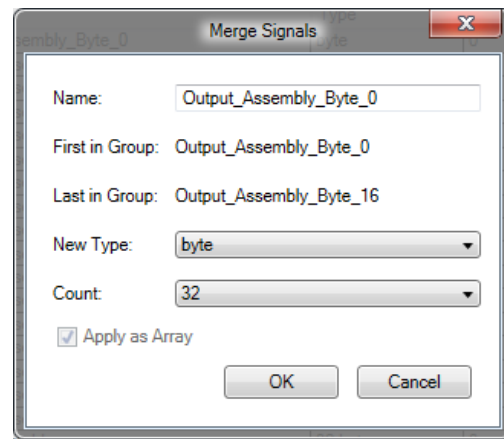


Figure 37: Dialog Pane Merge Signals

Parameter	Description	Range of Value/Value
Name	Here you can edit the signal name. The name displayed here contains the suffix assigned by the configuration software, example "_Byte_0".	String
First in Group	Shows the name of the first signal from which the merge will start.	
Last in Group	Shows the name of the last signal up to which the merge is performed.	
New Type	Here you can edit the new data type for the input or output signal. Only permitted data types are displayed in the selection list.	bit, byte, signed8, unsigned8, word, signed16/24, unsigned16/24, dword, signed32/40/48/56, unsigned32/40/48/56, lword, signed64, unsigned64, real32, real64
Count	Shows the number of data types of the merged signal, which you can adjust here.	
Apply as Array	An array is formed when merging.	Always checked

Table 27: Explanations Merge Signals Dialog Pane

- For the signals that you want to merge, specify the name via **Name**, the data type via **New Type** or the number of data types of the merged signal via **Count**.
- Click **OK**.
- The signals are merged.
- Click **Apply** to save the created configuration.

5.8 Device Settings

At the **Device Settings** pane device related settings can be made. These settings are assigned after a download of the configuration.



Information about the download you find in section *Download Configuration* on page 79).

- Select **Configuration > Device Settings** in the navigation area.

Figure 38: Configuration > Device Settings



Note: The setting options at the dialog pane **Device Settings** for client specific variants of the configuration software can differ from the setting options displayed here.

5.8.1 Start of Bus Communication

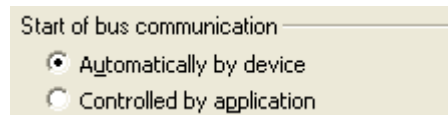


Figure 39: Device Settings > Start of Bus Communication

If **Automatically by device** is selected, the EtherNet/IP Adapter device starts with the data exchange on the bus after the initialization has been ended.

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



Note: The setting options under **Start of Bus Communication** for client specific variants of the configuration software can differ from the setting options displayed here.

5.8.2 Application Monitoring

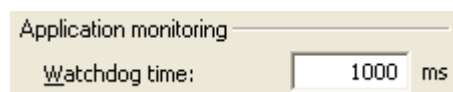


Figure 40: Device Settings > Application Monitoring

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 28: Range of Value / Value for the Watchdog time



Note: The setting options under **Application Monitoring** for client specific variants of the configuration software can differ from the setting options displayed here.

6 Description

6.1 Overview Description

Dialog Panes “Description”

The table below gives an overview for the **Description** dialog panes descriptions:

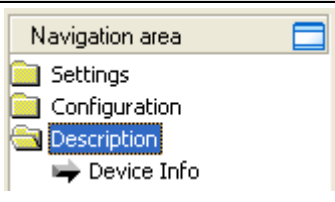
EtherNet/IP Adapter DTM	Folder Name / Section	Page
 <p>Navigation area</p> <p>Settings</p> <p>Configuration</p> <p>Description</p> <p>Device Info</p> <p>Navigation Area - Description</p>	Device Info	75

Table 29: Descriptions of the Dialog Panes ‘Description’

6.2 Device Info

The **Device Info** pane displays manufacturer information about the device, which is defined in the EDS file.

- Select **Description > Device Info** in the navigation area.

Device Info	
Name	Value
Vendor name	Hilscher GmbH
Vendor ID	283
Device type	12
Device type name	Communication Adapter
Product code	257
Product name	CIFX RE/EIS
Major revision	1
Minor revision	1
Catalog	CIFX RE/EIS
Icon file	C:\Program Files (x86)\Hilscher GmbH\SYCONnet\Ethernet/IPAdapterDT...

Figure 41: Description > Device Info (Example)

Parameter	Description	Range of Value/Value
Vendor name	Vendor name of the device	
Vendor ID	Identification number of the manufacturer	0 ... 65535, Hilscher: 283
Device type	Device type of the EtherNet/IP Adapter device from the EDS file	0 ... 65535, Default: 12
Device type name	Device type name of the EtherNet/IP Adapter device from the EDS file	Communication Adapter
Product code	Product code of the device as specified by the manufacturer	0 ... 65535, Default: CIFX RE/EIS: 257 COMX 100XX-RE/EIS: 259 NJ 50X-RE/EIS: 278 NJ 100XX-RE/EIS: 279 NT 50-EN/EIS: 275 NT 100-RE/EIS: 271 NB 100-RE/EIS: 273

Parameter	Description	Range of Value/Value
Product name	Name of the device station as character string.	0 - 31 ASCII characters, Examples: C1FX RE/EIS, NT 50-EN/EIS, NT 100-RE/EIS, NB 100-RE/EIS
Major revision	Major revision of the EtherNet/IP Adapter device according to the EtherNet/IP specification.	0 ... 255, Default: 1
Minor revision	Minor revision of the EtherNet/IP Adapter device according to the EtherNet/IP specification.	0 ... 255, Default: 1
Catalog	Device name in the device catalog of the configuration software	
Icon file	Storage path of the device icon file to be displayed in the configuration software	

Table 30: Descriptions about Description > Device Info

7 Online Functions

7.1 Connecting/Disconnecting Device



Note: Several EtherNet/IP Adapter DTM functions e. g. **Diagnosis** or the configuration download in the FDT Framework require an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device.

Connecting Device

The following steps are needed to establish a connection from the EtherNet/IP Adapter DTM to a EtherNet/IP Adapter device:

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

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

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

3. Scan for the devices (with or without firmware).
4. 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. For more refer to section *Safety Messages on Firmware or Configuration Download* on page 31.

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

5. Select and download the firmware.

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

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



An overview of the descriptions for these steps you find in the section *Overview Settings* on page 32.

8. In the DTM interface dialog select the **OK** button, to apply the selection and to close the DTM interface dialog.
9. Put a right-click on the EtherNet/IP Adapter device icon.
10. Select the **Connect** command from the context menu.

➤ The EtherNet/IP Adapter device now is connected to the EtherNet/IP Adapter DTM via an online connection. In the network view the device description at the device icon of the Adapter is displayed with a green colored background.

Disconnecting Device

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

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

7.2 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 Adapter device an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device is required. Further information can be found in the *Connecting/Disconnecting Device* section on page 77.

Safety Precautions

If you plan to perform a configuration download via the EtherNet/IP Adapter DTM be aware of the following:

⚠ WARNING

Communication Stop due to 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 placed 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 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!

For more see next page.

Download Steps

To transfer the configuration with the corresponding parameter data to the EtherNet/IP Adapter device you download the data using the frame application of the configuration software.

For netDevice the download is made via **Device > Download** or use the context menu with **Download**.

1. 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?'

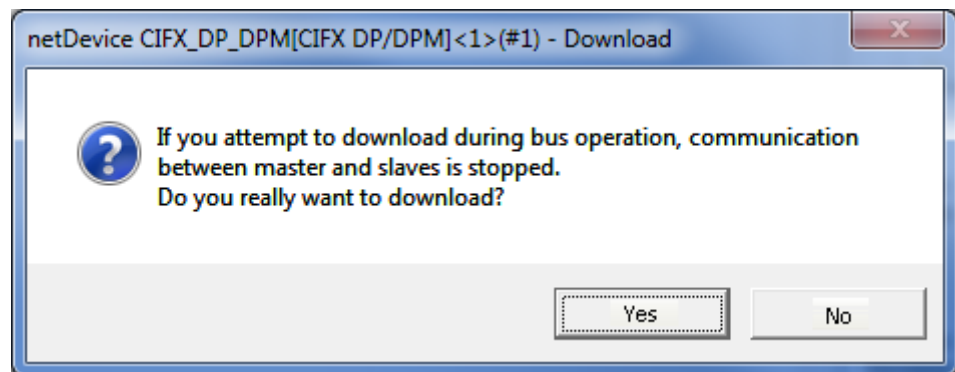


Figure 42: netDevice Message: Download



Important: If the communication between the Master and the Slave devices is stopped, the data exchange between the Master device and the Slave devices is stopped.

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

7.3 Start /Stop Communication

You can manually start or stop the communication between a 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

1. Connecting device:



Note: To start the communication of the device at the bus manually, an online connection from the EtherNet/IP Scanner DTM to the EtherNet/IP Scanner device is required. Further information can be found in the *Connecting/Disconnecting Device* section on page 77.

2. Select **Additional Functions > Service > Start Communication** from the context menu (right mouse click).
- The device communicates at the bus.

Stop Communication



Faulty System Operation possible or Loss of Device Parameters

Before you stop the communication:

- Stop the PLC program.
 - Make sure that all network devices are placed in a fail-safe condition.
1. Select **Additional Functions > Service > Stop Communication** from the context menu (right mouse click).
- The communication of the device at the bus is stopped.

8 Diagnosis

8.1 Overview Diagnosis

The dialog **Diagnosis** serves to diagnose the device behavior and communication errors. For diagnosis the device must reside in online state.

Diagnosis Panes

The table below gives an overview for the individual **Diagnosis** dialog panes descriptions:

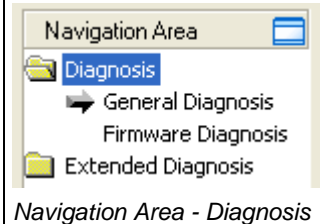
EtherNet/IP Adapter DTM	Folder Name / Section	Manual Page
	<i>General Diagnosis</i>	83
	<i>Firmware Diagnosis</i>	85

Table 31: Descriptions of the Diagnosis Panes



Online Connection to the Device

Note: Accessing the **Diagnosis** panes of the EtherNet/IP Adapter DTM requires an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device. For further information refer to section *Connecting/Disconnecting Device* on page 77.

How to proceed

1. In the Adapter DTM diagnosis dialog 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.

Extended Diagnosis

The **Extended Diagnosis** helps to find communication and configuration errors, when default diagnosis fails. For further information refer to section *Overview Extended Diagnosis* on page 86.

8.2 General Diagnosis

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

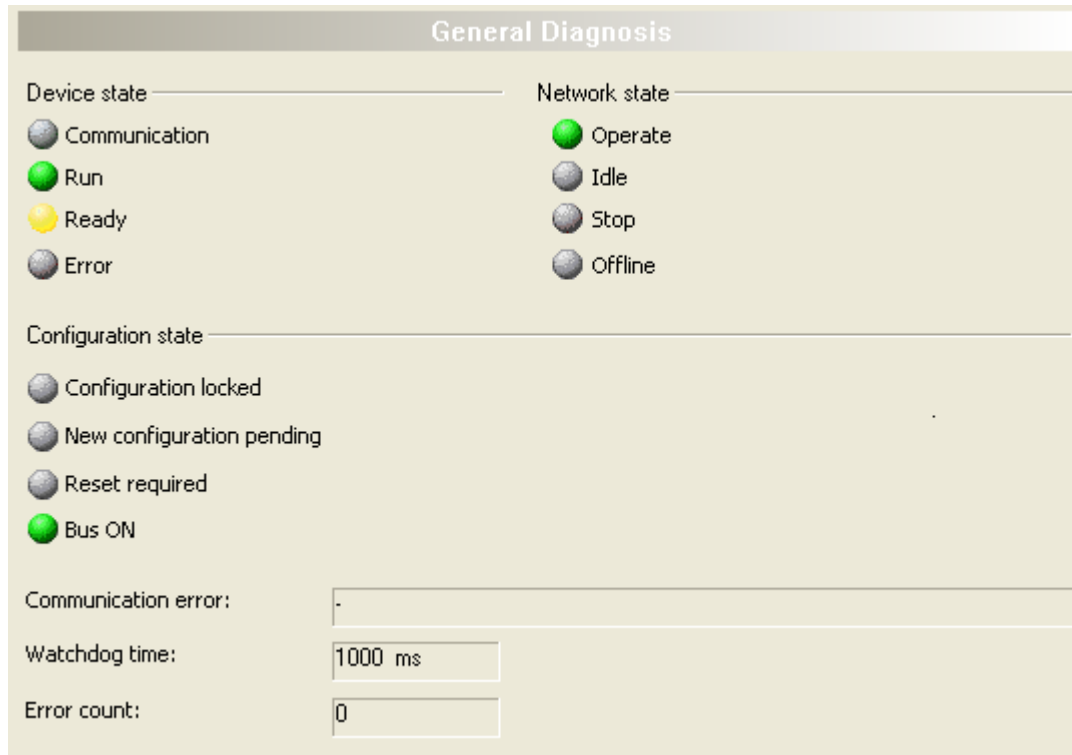














Figure 43: General Diagnosis

LED	Meaning	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 Adapter are transmitted to the EtherNet/IP Scanner.	 (green)	In OPERATION state
		 (gray)	Not in OPERATION state
Idle	Shows whether the EtherNet/IP device is in idle state.	 (yellow)	In IDLE state
		 (gray)	Not in IDLE state













LED	Meaning	Color	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
Offline	The EtherNet/IP Adapter 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 are typed over.	 (yellow)	Configuration 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 32: Indication General Diagnosis

Parameter	Meaning
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 33: Parameter General Diagnosis

8.3 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 Adapter

Version:

2.7.1 (Build 7)

Date:

8.3.2013

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 un...	Task Status ok. (0x00000000)
3	RX_SYSTEM	1.16	32	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	EIS_CL1_TASK	1.1	19	EthernetIP Encapsulati...	Task Status ok. (0x00000000)
8	EIS_ENCAP_TASK	1.10	37	EthernetIP Encapsulati...	Task Status ok. (0x00000000)
9	EIS_OBJECT_T...	1.22	38	EthernetIP Object Task.	Task Status ok. (0x00000000)
10	EIS_TCPUDP	2.23	22	TCPUDP task (TCP/IP s...	Failed to initialize the task.Accept Init packets...
11	EIS_AP_TASK	1.20	47	EtherNet/Ip Adapter A...	Task is not communicating. (0x00000002)
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 Rou...	Task Status ok. (0x00000000)

Figure 44: Firmware Diagnosis (Example)

Task Information:

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

Column	Meaning
Task	Task number
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 34: Description Table Task Information

9 Extended Diagnosis

9.1 Overview Extended Diagnosis

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

Dialog Panes “Extended Diagnosis”

The table below gives an overview for the **Extended Diagnosis** dialog panes descriptions:

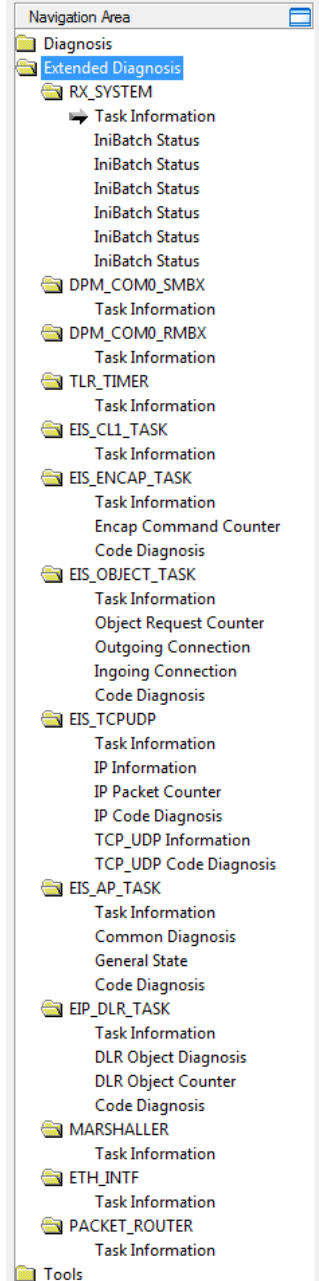
EtherNet/IP Adapter DTM	Folder Name in the Navigation Area	Subsection	Page
	<i>RX_SYSTEM</i>	<i>Task Information</i>	87
		<i>IniBatch Status</i>	88
	<i>DPM_COMO_SMBX</i>	<i>Task Information</i>	87
	<i>DPM_COMO_RMBX</i>	<i>Task Information</i>	87
	<i>TLR_TIMER</i>	<i>Task Information</i>	87
	<i>EIS_CL1_TASK</i>	<i>Task Information</i>	87
	<i>EIS_ENCAP_TASK</i>	<i>Task Information</i>	87
		<i>Encap Command Counter</i>	90
		<i>Code Diagnosis</i>	89
	<i>EIS_OBJECT_TASK</i>	<i>Task Information</i>	87
		<i>Object Request</i>	91
		<i>Outgoing Connection</i>	92
		<i>Ingoing Connection</i>	92
		<i>Code Diagnosis</i>	89
	<i>EIS_TCPUDP</i>	<i>Task Information</i>	87
		<i>IP Information</i>	93
		<i>IP Paket Counter</i>	94
		<i>IP Code Diagnosis</i>	95
		<i>TCP_UDP Information</i>	96
		<i>TCP_UDP Code Diagnosis</i>	97
	<i>EIS_AP_TASK</i>	<i>Task Information</i>	87
		<i>Common Diagnosis</i>	98
		<i>General State</i>	98
		<i>Code Diagnosis</i>	89
	<i>EIS_DLR_TASK</i>	<i>Task Information</i>	87
		<i>DLR Object Diagnosis</i>	99
		<i>DLR Objekt Counter</i>	101
		<i>Code Diagnosis</i>	89
	<i>MARSHALLER</i>	<i>Task Information</i>	87
	<i>ETH_INTF</i>	<i>Task Information</i>	87
	<i>PACKET_ROUTER</i>	<i>Task Information</i>	87

Table 35: Descriptions of the Dialog Panes Extended Diagnosis

Online Connection to the Device



Note: Accessing the **Extended Diagnosis** dialog panes of the EtherNet/IP Adapter DTM requires an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device. For further information refer to section *Connecting/Disconnecting Device* on page 77.

9.2 Task Information

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

Figure 45: 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 are 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 36: Extended Diagnosis > [Folder Name] > Task Information

9.3 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 46: 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
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 data base 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 37: Extended Diagnosis > [Folder Name] > IniBatch Status

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

9.4 Code Diagnosis

Code Diagnosis	
Task states	
Name	Value
Info counter	
Warning counter	
Error counter	<i>[The displayed values depend from the corresponding task]</i>
Error level	
Error code	
Parameter	
Line number	
Module	

Figure 47: Extended Diagnosis > [Folder Name] > Code Diagnosis

Name	Description
Info Counter	Counter for information reports
Warning Counter	Counter for warning reports
Error Counter	Counter for errors
Error Level	Level of the last occurred error
Error Code	Code of the last occurred error
Parameter	Additional information to the error
Line number	Line number inside the software module
Module	Software module

Table 38: Extended Diagnosis > [Folder Name] > Code Diagnosis

9.5 EIS_ENCAP_TASK

9.5.1 Encap Command Counter

Encap Command Counter	
Task states	
Name	Value
NOP	0
List Taarget	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 48: Extended Diagnosis > EIS_ENCAP_TASK > Encap Command Counter

Name	Description
NOP	Counter incoming encapsulation telegrams
List Target	Counter incoming encapsulation telegrams
List Identity	Counter incoming encapsulation telegrams
List Services	Counter incoming encapsulation telegrams
List Interfaces	Counter incoming encapsulation telegrams
Register Session	Counter incoming encapsulation telegrams
Unregister Session	Counter incoming encapsulation telegrams
Process data	Unit Date RR Data telegrams
Unknown Command	Counter incoming encapsulation telegrams
Good Reply	Counter incoming encapsulation telegrams
Error Reply	Counter incoming encapsulation telegrams

Table 39: Extended Diagnosis > EIS_ENCAP_TASK > Encap Command Counter

9.6 EIS_OBJECT_TASK

9.6.1 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 49: Extended Diagnosis > EIS_OBJECT_TASK > Object Request Counter

The **Object Request Counter** table indicates the respective number of services sent to different objects.

Name	Description
Identity Get Attribute Single	Counter for the <i>Get Attribute Single</i> services to the <i>identity</i> object.
Identity Get Attribute All	Counter for the <i>Get Attribute All</i> services to the <i>identity</i> object.
Identity Reset	Counter for the <i>Reset</i> services to the <i>identity</i> object.
Identity unknown Command	Counter for the <i>Unknown Command</i> services to the <i>identity</i> object.
Assembly Get Attribute Single	Counter for the <i>Get Attribute Single</i> services to the <i>assembly</i> object.
[Object] [Service]	Counter for the [Object] services to the [Service] object.

Table 40: Extended Diagnosis > EIS_OBJECT_TASK > Object Request Counter

9.6.2 Outgoing 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 50: Extended Diagnosis > EIS_OBJECT_TASK > Outgoing Connection

Name	Description
Issue Open	Counter for open issues
Issue Close	Counter for closed issues
Open Connections	Actual open connection
Last error instance	Last error instance
Last GRC	Last General Status Code
Last ERC	Last Extended Status Code

Table 41: Extended Diagnosis > EIS_OBJECT_TASK > Outgoing Connection

9.6.3 Ingoing Connection

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

Figure 51: Extended Diagnosis > EIS_OBJECT_TASK > Ingoing Connection

Name	Description
Last Errors Address	IP Address
Last GRC	Last General Status Code
Last ERC	Last Extended Status Code
Actual Connection	Actual open connection

Table 42: Extended Diagnosis > EIS_OBJECT_TASK > Ingoing Connection

9.7 EIS_TCPUDP

9.7.1 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 52: Extended Diagnosis > EIS_TCPUDP > IP Information

Name	Description
Task State	Actual state of the protocol process: 0 = Task not initialized 1 = Task is running 2 = Task initialized 3 = Initialization error
Error Counter	Counter for errors
Last Error	Last occurred error (Description see appropriate Application Programming Manual)
IP Address	IP address of the Adapter station.
Net Mask	Network mask of the Adapter station.
Gateway	Gateway address of the Adapter station.
IP config source	IP configuration is done through the following sources: None (receive no configuration), DHCP server, BOOTP server, Database, warm-start packet, ICMP (ping) (not supported), Hilscher NetIdent protocol

Table 43: Extended Diagnosis > EIS_TCPUDP > IP Information

9.7.2 IP Paket 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 53: Extended Diagnosis > EIS_TCPUDP > IP Packet Counter

Name	Description
Packet Recv TCP	Counter for received TCP packets
Packet Recv UDP	Counter for received UDP packets
Packet Recv ICMP	Counter for received ICMP packets
Packet Recv IP Header Err	Counter for received IP packets with errors
Packet Recv ARP	Counter for received ARP packets
Packet Recv Unknown	Counter for received packets of an unknown type

Table 44: Extended Diagnosis > EIS_TCPUDP > IP Packet Counter

9.7.3 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 54: Extended Diagnosis > EIS_TCPUDP > IP-Code Diagnosis

Name	Description
Info Counter	Counter for information reports
Warning Counter	Counter for warning reports
Error Counter	Counter for errors
Severity Level	Level of the last occurred error
Code	Code of the last occurred error
Parameter	Additional information to the error
Module	Software module
Line number	Line number inside the software module

Table 45: Extended Diagnosis > EIS_TCPUDP > IP-Code Diagnosis

9.7.4 TCP_UDP Information

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

Figure 55: Extended Diagnosis > EIS_TCPUDP > TCP_UDP

Name	Description
Task State	Actual state of the protocol process: 0 = Task not initialized 1 = Task is running 2 = Task initialized 3 = Initialization error
Error Count	Counter for errors
Last Error	Last occurred error (Description see appropriate Application Programming Manual)

Table 46: Extended Diagnosis > EIS_TCPUDP > TCP_UDP Information

9.7.5 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 56: Extended Diagnosis > EIS_TCPUDP > TCP_UDP Code Diagnosis

Name	Description
Info Counter	Counter for information reports
Warning Counter	Counter for warning reports
Error Counter	Counter for errors
Severity Level	Level of the last occurred error
Code	Code of the last occurred error
Parameter	Additional information to the error
Module	Software module
Line number	Line number inside the software module

Table 47: Extended Diagnosis > EIS_TCPUDP > TCP_UDP Code Diagnosis

9.8 EIS_AP_TASK

9.8.1 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 57: Extended Diagnosis > EIS_AP_TASK > Common Diagnosis

Name	Description
Status field	Communication change of state
Bus state	Communication state
Communication Error	Unique Error Code according to protocol stack (not supported yet)
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 error since power-up or reset

Table 48: Extended Diagnosis > EIS_AP_TASK > Common Diagnosis

9.8.2 General State

General State	
Task states	
Name	Value
Error code	0

Figure 58: Extended Diagnosis > EIS_AP_TASK > General State

Name	Description
Error Code	Code es zuletzt aufgetretenen Fehlers

Table 49: Extended Diagnosis > EIS_AP_TASK > General State

9.9 EIS_DLR_TASK

9.9.1 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
MAC node 5	00-00-00-00-00-00
IP node 5	0.0.0.0

Figure 59: Extended Diagnosis > EIS_DLR_TASK > DLR Object Diagnosis

Name	Description
Network Topology	Possible Values: Linear or Ring
Network Status	Possible Values: Normal, Ring fault, Unexpected loop detected, Partial network fault, Rapid fault/Restore cycle
Ring Supervisor Status	Possible Values: Backup, Active ring supervisor, Normal ring node, None DLR device, Current supervisor parameters not supported
Ring Supervisor Mode	Possible Values: Deactivated, Activated
Ring Supervisor Precedence	Precedence value assigned to a ring supervisor, and transmitted in Beacon frames (further see www.odva.org)
Beacon-Interval (Mikro-Sek)	Ring interval at which the supervisor sends beacon frames (further see www.odva.org)

Name	Description
Beacon-Timeout (Mikro-Sek)	Amount of time nodes will wait before timing out reception of Beacon frames and taking the appropriate action (depending on whether supervisor or normal ring node). (further see www.odva.org)
VLAN-ID	VLAN ID used when sending DLR protocol frames.
Ring faults count	Counts Ring faults
MAC of last active node port 1	MAC Address of last active node at port 1
IP of last active node port 1	IP Address of last active node at port 1
MAC of last active node port 2	MAC Address of last active node at port 2
IP of last active node port 2	IP Address of last active node at port 2
Ring participants count	Ring participants count
MAC of active ring supervisor	MAC Address of active ring supervisor
IP of active ring supervisor	IP Address of active ring supervisor
Precedence of active ring supervisor	The precedence the supervisor has in the ring.
Capability Flags	Indicates which capabilities the supervisor has.
MAC Node 1	MAC Address Node 1
IP Node 1	IP Address Node 1
to	
MAC Node 10	MAC Address Node 2
IP Node 10	IP Address Node 2

Table 50: Extended Diagnosis > EIS_DLR_TASK > DLR Object Diagnosis

9.9.2 DLR Objekt 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 60: Extended Diagnosis > EIS_DLR_TASK > DLR Object 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 51: Extended Diagnosis > EIS_DLR_TASK > DLR Object Counter

10 Tools

10.1 Overview Tools

Under **Tools** the Packet Monitor and the IO Monitor are provided for test and diagnosis purposes.

Tools Panes

The table below gives an overview for the individual **Tools** dialog panes descriptions:

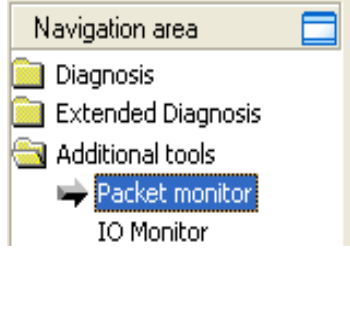
EtherNet/IP Adapter DTM	Folder Name / Section	Manual Page
	Packet Monitor	103
	IO Monitor	106
Navigation Area - Tools		

Table 52: Descriptions of the Diagnosis Panes

Online Connection to the Device



Note: Accessing the **Tools** dialog panes of the EtherNet/IP Adapter DTM requires an online connection from the EtherNet/IP Adapter DTM to the EtherNet/IP Adapter device. For further information refer to section Connecting/Disconnecting Device on page 77.

10.2 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 are added.



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

- Open the **Packet Monitor** via **Tools > Packet Monitor**.

Figure 61: 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.

10.2.1 Sending Packet

The screenshot shows the 'Send' dialog box. The 'Packet header' section contains the following fields:

- Dest: 00000001
- Src: 00000000
- Dest ID: 00000000
- Src ID: 00000000
- Len: 00000012
- ID: 00000001
- State: 00000000
- Cmd: 00002F00
- Ext: 00000000
- Rout: 00000000
- Auto Increment ID: ☒

The 'Send data' section shows a 'Counter: 0' and a table with 10 columns (0-9) and 7 rows (0-60). The table is currently empty. Below the table are two buttons: 'Put cyclic' and 'Put packet'.

Figure 62: 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 (destination task queue 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 53: 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**.

10.2.2 Receiving Packet

The screenshot shows a software interface for receiving packets. On the left, under 'Receive', is the 'Packet header' section with fields for:

- Dest: 00000001
- Src: 00000000
- Dest ID: 00000000
- Src ID: 00000000
- Len: 00000012
- ID: 0000003E
- State: 00000000
- Cmd: 00002F01
- Ext: 00000000
- Rout: 00000000

 On the right, under 'Receive data:', is a table with columns 0-9 and a 'Counter: 0' label. The data is displayed in a grid where each row represents a byte offset (0 to 60) and each column represents a bit (0 to 9). The first row (offset 0) shows bit 0 as 00 and bit 9 as 04. Subsequent rows show bit 0 as 00 and bit 9 as 00.

Figure 63: 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 (destination task queue 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 54: 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) are displayed.

10.3 IO 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 are 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	n	n	n	n	n	n	n	n	n	n

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	n	n	n	n	n	n	n	n	n	n

Update

Figure 64: 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**.

➤ Always the data of the process image are displayed, also when these Bytes have not been reserved by the configuration.

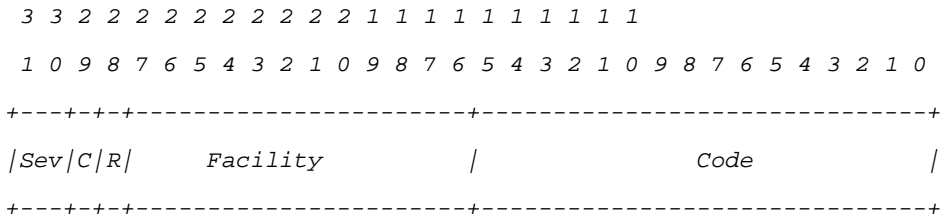
11 Error Codes

11.1 Error Code Definition

For COM based application, like the ODM Server and ODM drivers, a common error definition is used, similar to the Microsoft Windows® HRESULT definition.

Error Code Structure:

COM Errors are HRESULTs, which are 32 bit values using the following layout:



where

- Sev - is the severity code:
 - 00 - Success
 - 01 - Informational
 - 10 - Warning
 - 11 - Error
- C - is the Customer code flag
- R - is a reserved bit
- Facility - is the facility code
- Code - is the facility's status code

In this common error definition, several error code regions are already reserved by Windows® itself, the ODM and some other modules.

11.2 Overview Error Codes

Overview Error Codes	Range
General Hardware Errors RCX Operating System	<i>RCX General Task: 0xC02B0001 to 0xC02B4D52</i>
	<i>RCX Common Status & Errors Codes: 0x00000000 to 0xC002000C</i>
	<i>RCX Status & Error Codes: 0x00000000 to 0xC0000008</i>
EtherNet/IP Adapter / Packet Status& Packet Errors	<i>Error Codes Ethernet/IP Encapsulation - EipEncap: 0xC01E0001L to 0xC01EFFFFL</i>
	<i>Error Codes Ethernet/IP Object - EipObject Error: 0xC01F0001L to 0xC01FFFFFL</i>
	<i>Error Codes Ethernet/IP Application Task: 0xC0590001 to 0xC059000F</i>
	<i>TCP Error Codes: 0xC0070001L to 0xC008FFFFL</i>
	<i>Status & Error Codes TCP_IP-Task: 0xC0070034L to 0xC0080315L</i>
EtherNet/IP General CIP Errors	<i>General Error CIP Codes: 00 to D0-FF</i>
CIP Connection Manager Object Instance Extended Status Codes	<i>CIP Connection-Manager-Object-Instance Codes zum Erweiterten Status: General Status: 0x01 to 0x15 and Extended Status: 0x0000 to 0xFCFF</i>
ODM Server	<i>General ODM Error Codes: 0x8004C700 to 0x8004C761</i>
	<i>General ODM Driver Error Codes: 0x8004C7A0 to 0x8004C7C2</i>
ODM Drivers	<i>cifX Driver Specific ODM Error: 0x8004C001 to 0x8004C0A4</i>
cifX Device Driver and netX Driver	<i>Generic Error: 0x800A0001 bis 0x800A0017</i>
	<i>Generic Driver Error: 0x800B0001 bis 0x800B0042</i>
	<i>Generic Device Error: 0x800C0010 bis 0x800C0041</i>
netX Driver	<i>CIFX API Transport: 0x800D0001 bis 0x800D0013</i>
	<i>CIFX API Transport Header State Error: 0x800E0001 bis 0x800E000B</i>
DBM	<i>ODM Error Codes: 0xC004C810 to 0xC004C878</i>

Table 55: Overview Error Codes and Ranges



The fieldbus specific error codes are described in the manuals of the corresponding protocol tasks.

11.3 General Hardware Error Codes

11.3.1 RCX General Task Errors

Error Code (Definition)	Value	Description
RCX_E_QUE_UNKNOWN	0xC02B0001	Unknown Queue
RCX_E_QUE_INDEX_UNKNOWN	0xC02B0002	Unknown Queue Index
RCX_E_TASK_UNKNOWN	0xC02B0003	Unknown Task
RCX_E_TASK_INDEX_UNKNOWN	0xC02B0004	Unknown Task Index
RCX_E_TASK_HANDLE_INVALID	0xC02B0005	Invalid Task Handle
RCX_E_TASK_INFO_IDX_UNKNOWN	0xC02B0006	Unknown Index
RCX_E_FILE_XFR_TYPE_INVALID	0xC02B0007	Invalid Transfer Type
RCX_E_FILE_REQUEST_INCORRECT	0xC02B0008	Invalid File Request
RCX_E_TASK_INVALID	0xC02B000E	Invalid Task
RCX_E_SEC_FAILED	0xC02B001D	Security EEPROM Access Failed
RCX_E_EEPROM_DISABLED	0xC02B001E	EEPROM Disabled
RCX_E_INVALID_EXT	0xC02B001F	Invalid Extension
RCX_E_SIZE_OUT_OF_RANGE	0xC02B0020	Block Size Out Of Range
RCX_E_INVALID_CHANNEL	0xC02B0021	Invalid Channel
RCX_E_INVALID_FILE_LEN	0xC02B0022	Invalid File Length
RCX_E_INVALID_CHAR_FOUND	0xC02B0023	Invalid Character Found
RCX_E_PACKET_OUT_OF_SEQ	0xC02B0024	Packet Out Of Sequence
RCX_E_SEC_NOT_ALLOWED	0xC02B0025	Not Allowed In Current State
RCX_E_SEC_INVALID_ZONE	0xC02B0026	Security EEPROM Invalid Zone
RCX_E_SEC_EEPROM_NOT_AVAIL	0xC02B0028	Security EEPROM Eeprom Not Available
RCX_E_SEC_INVALID_CHECKSUM	0xC02B0029	Security EEPROM Invalid Checksum
RCX_E_SEC_ZONE_NOT_WRITEABLE	0xC02B002A	Security EEPROM Zone Not Writeable
RCX_E_SEC_READ_FAILED	0xC02B002B	Security EEPROM Read Failed
RCX_E_SEC_WRITE_FAILED	0xC02B002C	Security EEPROM Write Failed
RCX_E_SEC_ACCESS_DENIED	0xC02B002D	Security EEPROM Access Denied
RCX_E_SEC_EEPROM_EMULATED	0xC02B002E	Security EEPROM Emulated
RCX_E_INVALID_BLOCK	0xC02B0038	Invalid Block
RCX_E_INVALID_STRUCT_NUMBER	0xC02B0039	Invalid Structure Number
RCX_E_INVALID_CHECKSUM	0xC02B4352	Invalid Checksum
RCX_E_CONFIG_LOCKED	0xC02B4B54	Configuration Locked
RCX_E_SEC_ZONE_NOT_READABLE	0xC02B4D52	Security EEPROM Zone Not Readable

Table 56: RCX General Task Errors

11.3.2 RCX Common Status & Errors Codes

Error Code (Definition)	Value	Description
RCX_S_OK	0x00000000	Success, Status Okay
RCX_E_FAIL	0xC0000001	Fail
RCX_E_UNEXPECTED	0xC0000002	Unexpected
RCX_E_OUTOFMEMORY	0xC0000003	Out Of Memory
RCX_E_UNKNOWN_COMMAND	0xC0000004	Unknown Command
RCX_E_UNKNOWN_DESTINATION	0xC0000005	Unknown Destination
RCX_E_UNKNOWN_DESTINATION_ID	0xC0000006	Unknown Destination ID
RCX_E_INVALID_PACKET_LEN	0xC0000007	Invalid Packet Length
RCX_E_INVALID_EXTENSION	0xC0000008	Invalid Extension
RCX_E_INVALID_PARAMETER	0xC0000009	Invalid Parameter
RCX_E_WATCHDOG_TIMEOUT	0xC000000C	Watchdog Timeout
RCX_E_INVALID_LIST_TYPE	0xC000000D	Invalid List Type
RCX_E_UNKNOWN_HANDLE	0xC000000E	Unknown Handle
RCX_E_PACKET_OUT_OF_SEQ	0xC000000F	Out Of Sequence
RCX_E_PACKET_OUT_OF_MEMORY	0xC0000010	Out Of Memory
RCX_E_QUE_PACKETDONE	0xC0000011	Queue Packet Done
RCX_E_QUE_SENDPACKET	0xC0000012	Queue Send Packet
RCX_E_POOL_PACKET_GET	0xC0000013	Pool Packet Get
RCX_E_POOL_GET_LOAD	0xC0000015	Pool Get Load
RCX_E_REQUEST_RUNNING	0xC000001A	Request Already Running
RCX_E_INIT_FAULT	0xC0000100	Initialization Fault
RCX_E_DATABASE_ACCESS_FAILED	0xC0000101	Database Access Failed
RCX_E_NOT_CONFIGURED	0xC0000119	Not Configured
RCX_E_CONFIGURATION_FAULT	0xC0000120	Configuration Fault
RCX_E_INCONSISTENT_DATA_SET	0xC0000121	Inconsistent Data Set
RCX_E_DATA_SET_MISMATCH	0xC0000122	Data Set Mismatch
RCX_E_INSUFFICIENT_LICENSE	0xC0000123	Insufficient License
RCX_E_PARAMETER_ERROR	0xC0000124	Parameter Error
RCX_E_INVALID_NETWORK_ADDRESS	0xC0000125	Invalid Network Address
RCX_E_NO_SECURITY_MEMORY	0xC0000126	No Security Memory
RCX_E_NETWORK_FAULT	0xC0000140	Network Fault
RCX_E_CONNECTION_CLOSED	0xC0000141	Connection Closed
RCX_E_CONNECTION_TIMEOUT	0xC0000142	Connection Timeout
RCX_E_LONELY_NETWORK	0xC0000143	Lonely Network
RCX_E_DUPLICATE_NODE	0xC0000144	Duplicate Node
RCX_E_CABLE_DISCONNECT	0xC0000145	Cable Disconnected
RCX_E_BUS_OFF	0xC0000180	Network Node Bus Off
RCX_E_CONFIG_LOCKED	0xC0000181	Configuration Locked
RCX_E_APPLICATION_NOT_READY	0xC0000182	Application Not Ready
RCX_E_TIMER_APPL_PACKET_SENT	0xC002000C	Timer App Packet Sent

Table 57: RCX Common Status & Errors Codes

11.3.3 RCX Status & Error Codes

Error Code (Definition)	Value	Description
RCX_S_OK	0x00000000	SUCCESS, STATUS OKAY
RCX_S_QUE_UNKNOWN	0xC02B0001	UNKNOWN QUEUE
RCX_S_QUE_INDEX_UNKNOWN	0xC02B0002	UNKNOWN QUEUE INDEX
RCX_S_TASK_UNKNOWN	0xC02B0003	UNKNOWN TASK
RCX_S_TASK_INDEX_UNKNOWN	0xC02B0004	UNKNOWN TASK INDEX
RCX_S_TASK_HANDLE_INVALID	0xC02B0005	INVALID TASK HANDLE
RCX_S_TASK_INFO_IDX_UNKNOWN	0xC02B0006	UNKNOWN INDEX
RCX_S_FILE_XFR_TYPE_INVALID	0xC02B0007	INVALID TRANSFER TYPE
RCX_S_FILE_REQUEST_INCORRECT	0xC02B0008	INVALID FILE REQUEST
RCX_S_UNKNOWN_DESTINATION	0xC0000005	UNKNOWN DESTINATION
RCX_S_UNKNOWN_DESTINATION_ID	0xC0000006	UNKNOWN DESTINATION ID
RCX_S_INVALID_LENGTH	0xC0000007	INVALID LENGTH
RCX_S_UNKNOWN_COMMAND	0xC0000004	UNKNOWN COMMAND
RCX_S_INVALID_EXTENSION	0xC0000008	INVALID EXTENSION

Table 58: RCX Status & Error Codes

11.3.3.1 RCX Status & Error Codes Slave State

Error Code (Definition)	Value	Description
RCX_SLAVE_STATE_UNDEFINED	0x00000000	UNDEFINED
RCX_SLAVE_STATE_OK	0x00000001	OK
RCX_SLAVE_STATE_FAILED	0x00000002	FAILED (at least one slave)

Table 59: RCX Status & Error Codes Slave State

11.4 Status & Error Codes EtherNet/IP Adapter

11.4.1 Error Codes Ethernet/IP Encapsulation - EipEncap Error

Status & Error Codes EtherNet/IP - EipEncap Error		
Error Code (Definition)	Value	Description
TLR_E_EIP_ENCAP_COMMAND_INVALID	0xC01E0001	Invalid command received.
TLR_E_EIP_ENCAP_NOT_INITIALIZED	0xC01E0002	Encapsulation layer is not initialized.
TLR_E_EIP_ENCAP_OUT_OF_MEMORY	0xC01E0003	System is out of memory.
TLR_E_EIP_ENCAP_OUT_OF_PACKETS	0xC01E0010	Task runs out of empty packets at the local packet pool.
TLR_E_EIP_ENCAP_SEND_PACKET	0xC01E0011	Sending a packet failed.
TLR_E_EIP_ENCAP_SOCKET_OVERRUN	0xC01E0012	No free socket is available.
TLR_E_EIP_ENCAP_INVALID_SOCKET	0xC01E0013	Socket ID is invalid.
TLR_E_EIP_ENCAP_CEP_OVERRUN	0xC01E0014	Connection could not be open. No resource for a new Connection Endpoint available.
TLR_E_EIP_ENCAP_UCMM_OVERRUN	0xC01E0015	Message couldn't send. All Unconnect Message Buffers are in use.
TLR_E_EIP_ENCAP_TRANSP_OVERRUN	0xC01E0016	Connection couldn't be opened. All transports are in use.
TLR_E_EIP_ENCAP_UNKNOWN_CONN_TYP	0xC01E0017	Received Message include an unknown connection typ.
TLR_E_EIP_ENCAP_CONN_CLOSED	0xC01E0000	Connection was closed.
TLR_E_EIP_ENCAP_CONN_RESETE	0xC01E0019	Connection is reseted from remote device.
TLR_S_EIP_ENCAP_CONN_UNREGISTER	0x001E001A	We closed the connction successful. With an unregister command.
TLR_E_EIP_ENCAP_CONN_STATE	0xC01E001B	Wrong connection state for this service.
TLR_E_EIP_ENCAP_CONN_INACTIV	0xC01E001C	Encapsulation session was deactivated
TLR_E_EIP_ENCAP_INVALID_IPADDR	0xC01E001D	received an invalid IP address.
TLR_E_EIP_ENCAP_INVALID_TRANSP	0xC01E001E	Invalid transport typ.
TLR_E_EIP_ENCAP_TRANSP_INUSE	0xC01E001F	Transport is still in use.
TLR_E_EIP_ENCAP_TRANSP_CLOSED	0xC01E0020	Transport is closed.
TLR_E_EIP_ENCAP_INVALID_MSGID	0xC01E0021	The received message has a invalid message ID.
TLR_E_EIP_ENCAP_INVALID_MSG	0xC01E0022	invalid encapsulation message received.
TLR_E_EIP_ENCAP_INVALID_MSGLEN	0xC01E0023	Received message with invalid length.
TLR_E_EIP_ENCAP_CL3_TIMEOUT	0xC01E0030	Class 3 connection runs into timeout.
TLR_E_EIP_ENCAP_UCMM_TIMEOUT	0xC01E0031	Unconnected message gets a timeout.
TLR_E_EIP_ENCAP_CL1_TIMEOUT	0xC01E0032	Timeout of a class 3 connection.
TLR_W_EIP_ENCAP_TIMEOUT	0x801E0033	Encapsulation service is finished by timeout.
TLR_E_EIP_ENCAP_CMDRUNNING	0xC01E0034	Encapsulation service is still running.
TLR_E_EIP_ENCAP_NO_TIMER	0xC01E0035	No empty timer available.
TLR_E_EIP_ENCAP_INVALID_DATA_IDX	0xC01E0036	The data index is unknown by the task. Please ensure that it is the same as at the indication.
TLR_E_EIP_ENCAP_INVALID_DATA_AREA	0xC01E0037	The parameter of the data area are invalid. Please check length and offset.

Status & Error Codes EtherNet/IP - EipEncap Error		
Error Code (Definition)	Value	Description
TLR_E_EIP_ENCAP_INVALID_DATA_LEN	0xC01E0038	Packet length is invalid. Please check length of the packet.
TLR_E_EIP_ENCAP_TASK_RESETING	0xC01E0039	Ethernet/IP Encapsulation Layer runs a reset.

Table 60: Status & Error Codes EtherNet/IP - EipEncap Error

11.4.2 Error Codes Ethernet/IP Object - EipObject Error

Error Code (Definition)	Value	Description
TLR_E_EIP_OBJECT_COMMAND_INVALID	0xC01F0001	Invalid command received.
TLR_E_EIP_OBJECT_OUT_OF_MEMORY	0xC01F0002	System is out of memory.
TLR_E_EIP_OBJECT_OUT_OF_PACKETS	0xC01F0003	Task runs out of empty packets at the local packet pool.
TLR_E_EIP_OBJECT_SEND_PACKET	0xC01F0004	Sending a packet failed.
TLR_E_EIP_OBJECT_AS_ALLREADY_EXIST	0xC01F0010	Assembly instance already exist.
TLR_E_EIP_OBJECT_AS_INVALID_INST	0xC01F0011	Invalid Assembly Instance.
TLR_E_EIP_OBJECT_AS_INVALID_LEN	0xC01F0012	Invalid Assembly length.
TLR_E_EIP_OBJECT_CONN_OVERRUN	0xC01F0020	No free connection buffer available
TLR_E_EIP_OBJECT_INVALID_CLASS	0xC01F0021	Object class is invalid.
TLR_E_EIP_OBJECT_SEGMENT_FAULT	0xC01F0022	Segment of the path is invalid.
TLR_E_EIP_OBJECT_CLASS_ALLREADY_EXIST	0xC01F0023	Object Class is already used.
TLR_E_EIP_OBJECT_CONNECTION_FAIL	0xC01F0024	Connection failed.
TLR_E_EIP_OBJECT_CONNECTION_PARAM	0xC01F0025	Unknown format of connection parameter
TLR_E_EIP_OBJECT_UNKNOWN_CONNECTION	0xC01F0026	Invalid connection ID.
TLR_E_EIP_OBJECT_NO_OBJ_RESSOURCE	0xC01F0027	No resource for creating a new class object available.
TLR_E_EIP_OBJECT_ID_INVALID_PARAMETER	0xC01F0028	Invalid request parameter.
TLR_E_EIP_OBJECT_CONNECTION_FAILED	0xC01F0029	See also General Error Code and Extended Error Code for more details.
TLR_E_EIP_OBJECT_PACKET_LEN	0xC01F0030	Packet length of the request is invalid.
TLR_E_EIP_OBJECT_READONLY_INST	0xC01F0031	Access denied. Instance is read only.
TLR_E_EIP_OBJECT_DPM_USED	0xC01F0032	DPM address is already used by an other instance.
TLR_E_EIP_OBJECT_SET_OUTPUT_RUNNING	0xC01F0033	Set Output command is already running.
TLR_E_EIP_OBJECT_TASK_RESETING	0xC01F0034	Ethernet/IP Object Task is running a reset.

Table 61: Status & Error Codes EtherNet/IP - EipObject Error

11.4.3 Error Codes Ethernet/IP Application Task

Error Code (Definition)	Value	Description
TLR_E_EIP_APS_COMMAND_INVALID	0xC0590001	Invalid command received.
TLR_E_EIP_APS_PACKET_LENGTH_INVALID	0xC0590002	Invalid packet length.
TLR_E_EIP_APS_PACKET_PARAMETER_INVALID	0xC0590003	Parameter of the packet are invalid.
TLR_E_EIP_APS_TCP_CONFIG_FAIL	0xC0590004	Configuration of TCP/IP failed.
TLR_E_EIP_APS_CONNECTION_CLOSED	0xC0590005	Existing connection is closed.
TLR_E_EIP_APS_ALREADY_REGISTERED	0xC0590006	A application is already registered.
TLR_E_EIP_APS_ACCESS_FAIL	0xC0590007	Command is not allowed.
TLR_E_EIP_APS_STATE_FAIL	0xC0590008	Command not allowed at this state.
TLR_E_EIP_APS_IO_OFFSET_INVALID	0xC0590009	Invalid offset for I/O data.
TLR_E_EIP_APS_FOLDER_NOT_FOUND	0xC059000A	Folder for database not found.
TLR_E_EIP_APS_CONFIG_DBM_INVALID	0xC059000B	Configuration database invalid.
TLR_E_EIP_APS_NO_CONFIG_DBM	0xC059000C	Configuration database not found.
TLR_E_EIP_APS_NWID_DBM_INVALID	0xC059000D	network database invalid.
TLR_E_EIP_APS_NO_NWID_DBM	0xC059000E	network database not found.
TLR_E_EIP_APS_NO_DBM	0xC059000F	no database found.

Table 62: Status & Error Codes EtherNet/IP - Application Task

11.4.4 TCP Error Codes

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_IP_ERR_INIT_NO_ETHERNET_ADDR	0xC0070034	There is no Ethernet address (MAC address) available.
TLR_E_IP_ERR_INIT_INVALID_FLAG	0xC0070036	The start parameters contains one or more unknown flags.
TLR_E_IP_ERR_INIT_INVALID_IP_ADDR	0xC0070037	The start parameters contains an invalid IP address.
TLR_E_IP_ERR_INIT_INVALID_NETMASK	0xC0070038	The start parameters contains an invalid subnet mask.
TLR_E_IP_ERR_INIT_UNKNOWN_HARDWARE	0xC007003B	The device type is unknown.
TLR_E_IP_ERR_INIT_NO_IP_ADDR	0xC007003C	Failed to obtain an IP address from the specified source(s).
TLR_E_IP_ERR_INIT_DRIVER_FAILED	0xC007003D	The initialisation of the driver layer (EDD) is failed.
TLR_E_IP_ERR_INIT_NO_IP_ADDR_CFG	0xC007003E	There is no source for an IP address (BOOTP, DHCP, IP address parameter) specified.
TLR_E_IP_ERR_ETH_ADDR_INVALID_IP_CMD_SET_PARAM	0xC007007C	The Ethernet address (MAC address) abEthernetAddr in command TCPIP_IP_CMD_SET_PARAM_REQ is invalid. Invalid means, abEthernetAddr is equal to the broadcast address FF-FF-FF-FF-FF-FF.
TLR_E_IP_ERR_ARP_CACHE_FULL_IP_CMD_SET_PARAM	0xC0070083	The command TCPIP_IP_CMD_SET_PARAM_REQ could not be executed, because the ARP cache is full. The ARP cache has per default configuration 64 entries.
TLR_E_IP_ERR_ARP_ENTRY_NOT_FOUND_IP_CMD_SET_PARAM	0xC0070086	The specified ARP entry in command TCPIP_IP_CMD_SET_PARAM_REQ could not be deleted. The ARP entry was not found in ARP cache.
TLR_E_IP_ERR_ARP_ENTRY_NOT_FOUND_IP_CMD_GET_PARAM	0xC0070087	The requested ARP information in command TCPIP_IP_CMD_GET_PARAM_REQ could not be delivered. The ARP entry was not found in ARP cache.
TLR_E_IP_ERR_DELAYED	0xC00700FE	Special internal error code returned by IpStart function.
TLR_E_IP_ERR_GENERIC	0xC00700FF	Special internal error code returned by IpStart function.
TLR_E_TCPIP_TCP_TASK_COMMAND_INVALID	0xC0080001	Invalid command received.
TLR_E_TCPIP_TCP_TASK_PROCESS_CANCELED	0xC0080002	Cancel process is in progress, command can not be executed.
TLR_E_TCP_ERR_INIT_IP_TASK_NOT_READY	0xC0080032	The IP layer is not ready.
TLR_E_TCP_ERR_INIT_IP_TASK_FAILED	0xC0080034	The initialization of IP layer has failed.
TLR_E_TCP_ERR_INIT_CREATE_INFO_FIELD	0xC0080040	The creation of an information field (task state) has failed.
TLR_W_TCP_ERR_INIT_TPIF_INIT_REQ_PKT	0x80080043	Warning: A pending application packet has discarded (because of a new application packet).

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_ERR_INIT_OS_CYCLETIME	0xC0080044	The configured operating system cycletime is out of range (0.1 ms ... 20 ms).
TLR_E_TCP_ERR_INIT_OS_AND_TCPUDP_CYCLETIME	0xC0080045	The combination of configured operating system cycletime and TCP/IP stacks cycletime (startup-parameter ulTcpCycleEvent) is not possible. The operating system cycletime must be smaller or equal than the TCP/IP stacks cycletime.
TLR_E_TCP_ERR_SOCKET_INVALID	0xC0080070	The socket handle ulDestId is invalid. A further reason for this error: The command (Mode) is not applicable on this socket type (TCP/UDP).
TLR_E_TCP_ERR_OPTION_NOT_SUPPORTED_TCP_CMD_SEND	0xC0080074	The option parameter ulOptions in command TCPIP_TCP_CMD_SEND_REQ is invalid.
TLR_E_TCP_ERR_PARAMETER_INVALID_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080075	The parameter ulTtl (ulMode = TCP_SOCKET_TTL) or ulMulticastTtl (ulMode = TCP_SOCKET_MULTICAST_TTL) or ulMulticastLoop (ulMode = TCP_SOCKET_MULTICAST_LOOP) in command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ is invalid.
TLR_E_TCP_ERR_CONN_CLOSED	0xC0080078	The connection has closed (Graceful close).
TLR_E_TCP_ERR_CONN_RESET	0xC0080079	The Connection has closed by reset (Hard close).
TLR_E_TCP_ERR_PROTOCOL_UNKNOWN_TCP_UDP_CMD_OPEN	0xC008007A	The protocol parameter ulProtocol in command TCPIP_TCP_UDP_CMD_OPEN_REQ is invalid.
TLR_E_TCP_ERR_NO_SOCKETS_TCP_UDP_CMD_OPEN	0xC008007B	Command TCPIP_TCP_UDP_CMD_OPEN_REQ: There are no socket handles available.
TLR_E_TCP_ERR_MAX_PKT_CNT_EXCEEDED_UDP_CMD_SEND	0xC0080084	Command TCPIP_UDP_CMD_SEND_REQ: The maximum number of queued packets (= TCPHDL_RCX_PKT_QUEUED_MAX (6)) has exceeded. The request command was rejected. The application must wait for at least one confirmation command from stack before sending the next request command.
TLR_E_TCP_ERR_MAX_GROUP_EXCEEDED_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080085	Command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ, ulMode = TCP_SOCKET_ADD_MEMBERSHIP: The maximum number of IP multicast groups has exceeded (Default configuration = 64).
TLR_E_TCP_ERR_DISCARD_KEPT_REQ_CMD	0xC0080086	A kept request command has discarded. This confirmation has no further meaning for the application, unless the application must give back this packet to their resource pool!
TLR_E_TCP_ERR_UNEXP_ANSWER	0xC0080095	An unexpected/unknown confirmation command has received.

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_TASK_F_MESSAGESIZE	0xC0080097	The packet length parameter ulLen is invalid. The correct packet length depends on the command parameter ulCmd.
TLR_E_TCP_TASK_F_MESSAGECOMMAND	0xC0080098	The command ulCmd is unknown.
TLR_E_TCP_TASK_F_MESSAGECOMMANDRUNNING	0xC008009E	The command cannot be executed, because the previous command is still running.
TLR_E_TCP_TASK_F_NOT_INITIALIZED	0xC00800C8	The task is not initialized.
TLR_E_TCP_TASK_F_BUSY	0xC00800C9	The task is busy (intern).
TLR_E_TCP_TASK_F_DATABASE	0xC00800D2	The configuration database is not available.
TLR_E_TCP_TASK_F_DATABASE_READ	0xC00800D4	Error while reading configuration database.
TLR_E_IP_ERR_IP_ADDR_INVALID_IP_CMD_PING	0xC0070100	The IP address parameter ullpAddr in command TCPIP_IP_CMD_PING_REQ is invalid. This means, the IP address ullpAddr is equal to the TCP/IP stacks own IP address.
TLR_E_TCP_ERR_IP_ADDR_INVALID_TCP_UDP_CMD_OPEN	0xC0080101	The IP address parameter ullpAddr in command TCPIP_TCP_UDP_CMD_OPEN_REQ is invalid. The parameter ullpAddr must be zero (0.0.0.0) or equal to the TCP/IP stacks own IP address.
TLR_E_TCP_ERR_IP_ADDR_INVALID_TCP_CMD_CONNECT	0xC0080102	The IP address parameter ullpAddr in command TCPIP_TCP_CMD_CONNECT_REQ is invalid. The parameter ullpAddr must be unequal to the TCP/IP stacks own IP address.
TLR_E_TCP_ERR_IP_ADDR_INVALID_UDP_CMD_SEND	0xC0080103	The IP address parameter ullpAddr in command TCPIP_UDP_CMD_SEND_REQ is invalid or doesn't match to the local sub network. This error occurs, if the IP address is zero (0.0.0.0) or equal to the address of the local subnet.
TLR_E_TCP_ERR_IP_ADDR_INVALID_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080104	The parameter ulMulticastGroup (ulMode = TCP_SOCKET_ADD_MEMBERSHIP or TCP_SOCKET_DROP_MEMBERSHIP) in command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ is invalid. The parameter ulMulticastGroup must be a valid Multicast address. Valid Multicast addresses are 224.0.0.1 ... 239.255.255.255 (224.0.0.0 is reserved as Base-multicast address).
TLR_E_TCP_ERR_PORT_INVALID_TCP_UDP_CMD_OPEN	0xC0080110	The port parameter ulPort in command TCPIP_TCP_UDP_CMD_OPEN_REQ is invalid or not available. The parameter ulPort must be in range 0 ... 65535.
TLR_E_TCP_ERR_PORT_INVALID_TCP_CMD_CONNECT	0xC0080111	The port parameter ulPort in command TCPIP_TCP_CMD_CONNECT_REQ is invalid or not available. The parameter ulPort must be in range 1 ... 65535.

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_ERR_PORT_INVALID_UDP_CMD_SEND	0xC0080112	The port parameter ulPort in command TCPIP_UDP_CMD_SEND_REQ is invalid or not available. The parameter ulPort must be in range 0 ... 65535.
TLR_E_IP_ERR_TIMEOUT_INVALID_IP_CMD_PING	0xC0070120	The timeout parameter ulTimeout in command TCPIP_IP_CMD_PING_REQ is invalid.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_UDP_CMD_CLOSE	0xC0080121	The timeout parameter ulTimeout in command TCPIP_TCP_UDP_CMD_CLOSE_REQ is invalid. Consider the distinction between TCP and UDP sockets! For UDP sockets, ulTimeout must be zero.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_UDP_CMD_CLOSE_ALL	0xC0080122	The timeout parameter ulTimeout in command TCPIP_TCP_UDP_CMD_CLOSE_ALL_REQ is invalid.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_CMD_WAIT_CONNECT	0xC0080123	The timeout parameter ulTimeoutSend and/or ulTimeoutListen in command TCPIP_TCP_CMD_WAIT_CONNECT_REQ is invalid.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_CMD_CONNECT	0xC0080124	The timeout parameter ulTimeoutSend and/or ulTimeoutConnect in command TCPIP_TCP_CMD_CONNECT_REQ is invalid.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080125	The timeout parameter ulTimeoutSend (ulMode = TCP_SOCKET_SEND_TIMEOUT) or ulTimeoutInactive (ulMode = TCP_SOCKET_INACTIVE_TIMEOUT) or ulTimeoutKeepAlive (ulMode = TCP_SOCKET_KEEPA_LIVE_TIMEOUT) in command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ is invalid.
TLR_E_IP_ERR_MODE_UNKNOWN_IP_CMD_SET_PARAM	0xC0070130	The mode parameter ulMode in command TCPIP_IP_CMD_SET_PARAM_REQ is invalid.
TLR_E_IP_ERR_MODE_UNKNOWN_IP_CMD_GET_PARAM	0xC0070131	The mode parameter ulMode in command TCPIP_IP_CMD_GET_PARAM_REQ is invalid.
TLR_E_TCP_ERR_MODE_UNKNOWN_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080132	The mode parameter ulMode in command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ is invalid.
TLR_E_TCP_ERR_MODE_UNKNOWN_TCP_UDP_CMD_GET_SOCKET_OPTION	0xC0080133	The mode parameter ulMode in command TCPIP_TCP_UDP_CMD_GET_SOCKET_OPTION_REQ is invalid.
TLR_E_TCP_ERR_MODE_UNKNOWN_FATAL_DUMMY	0xC0080134	Internal fatal error in module TcpiPcphdIPckt.c!
TLR_E_TCP_ERR_MAX_DATA_LEN_EXCEEDED_TCP_CMD_SEND	0xC0080140	The maximum TCP data count n in command TCPIP_TCP_CMD_SEND_REQ has exceeded. See parameter ulLen. The maximum value for n is TCPIP_MAX_TCP_DATA_CNT (1460).

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_ERR_MAX_DATA_LEN_EXCEEDED_UDP_CMD_SEND	0xC0080141	The maximum UDP data count n in command TCPIP_UDP_CMD_SEND_REQ has exceeded. See parameter ulLen. The maximum value for n is TCPIP_MAX_UDP_DATA_CNT (1472).
TLR_E_TCP_ERR_SOCKET_STATE_TCP_CMD_WAIT_CONNECT	0xC0080200	The command TCPIP_TCP_CMD_WAIT_CONNECT_REQ cannot be executed, because the socket is in an inappropriate state.
TLR_E_TCP_ERR_SOCKET_STATE_TCP_CMD_CONNECT	0xC0080201	The command TCPIP_TCP_CMD_CONNECT_REQ cannot be executed, because the socket is in an inappropriate state.
TLR_E_TCP_ERR_SOCKET_STATE_TCP_CMD_SEND	0xC0080202	The command TCPIP_TCP_CMD_SEND_REQ cannot be executed, because the socket is in an inappropriate state.
TLR_E_TCP_ERR_NO_FREE_QUEUE_ELEMENT_TCP_CMD_SEND	0xC0080210	The TCP send command TCPIP_TCP_CMD_SEND_REQ must be rejected, because the list of free queue elements is empty. Remark: Per default configuration, the initial size of this list is 128. Every send command (TCPIP_TCP_CMD_SEND_REQ or TCPIP_UDP_CMD_SEND_REQ) occupy one queue element, until the confirmation command is given back to the application. To avoid this resource problem, the application must reduce the count of open send jobs over all sockets.
TLR_E_TCP_ERR_NO_FREE_QUEUE_ELEMENT_UDP_CMD_SEND	0xC0080211	The UDP send command TCPIP_UDP_CMD_SEND_REQ must be rejected, because the list of free queue elements is empty. Remark: Per default configuration, the initial size of this list is 128. Every send command (TCPIP_TCP_CMD_SEND_REQ or TCPIP_UDP_CMD_SEND_REQ) occupy one queue element, until the confirmation command is given back to the application. To avoid this resource problem, the application must reduce the count of open send jobs over all sockets.
TLR_E_TCP_ERR_NO_ETH_OUT_BUFFER_UDP_CMD_SEND	0xC0080212	The UDP send command TCPIP_UDP_CMD_SEND_REQ must be rejected, because all outgoing Ethernet buffers are occupied.
TLR_E_TCP_ERR_MCAST_CREATE	0xC0080220	Failed to create an IP Multicast group.
TLR_E_IP_ERR_DEST_UNREACHABLE_IP_CMD_PING	0xC0070300	The target IP address ullpAddr in command TCPIP_IP_CMD_PING_REQ is not reachable.
TLR_E_TCP_ERR_DEST_UNREACHABLE_TCP_UDP_CMD_CLOSE	0xC0080301	Command TCPIP_TCP_UDP_CMD_CLOSE_REQ: The destination (host, network, or port) is unreachable.

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_ERR_DEST_UNREACHABLE_TCP_UDP_CMD_CLOSE_ALL	0xC0080302	Command TCPIP_TCP_UDP_CMD_CLOSE_ALL_REQ: The destination (host, network, or port) is unreachable.
TLR_E_TCP_ERR_DEST_UNREACHABLE_TCP_CMD_WAIT_CONNECT	0xC0080303	Command TCPIP_TCP_CMD_WAIT_CONNECT_REQ: The destination (host, network, or port) is unreachable.
TLR_E_TCP_ERR_DEST_UNREACHABLE_TCP_CMD_CONNECT	0xC0080304	Command TCPIP_TCP_CMD_CONNECT_REQ: The destination (host, network, or port) is unreachable.
TLR_E_TCP_ERR_DEST_UNREACHABLE_UDP_CMD_SEND	0xC0080305	Command TCPIP_UDP_CMD_SEND_REQ: The destination (host, network, or port) is unreachable.
TLR_E_IP_ERR_TIMEOUT_IP_CMD_PING	0xC0070310	The specified timeout ulTimeout in command TCPIP_IP_CMD_PING_REQ has expired. The specified host is not reachable.
TLR_E_TCP_ERR_TIMEOUT_TCP_UDP_CMD_CLOSE	0xC0080311	The TCP Close timeout has expired. A connection to the remote host could not be closed gracefully within this time. For this timeout, see command TCPIP_TCP_UDP_CMD_CLOSE_REQ, parameter ulTimeout.
TLR_E_TCP_ERR_TIMEOUT_TCP_UDP_CMD_CLOSE_ALL	0xC0080312	The TCP Close timeout has expired. One or more connections to remote host(s) could not be closed gracefully within this time. For this timeout, see command TCPIP_TCP_UDP_CMD_CLOSE_ALL_REQ, parameter ulTimeout.
TLR_E_TCP_ERR_TIMEOUT_TCP_CMD_WAIT_CONNECT	0xC0080313	The TCP Connect timeout has expired. No remote host has connected within this time. For this timeout, see command TCPIP_TCP_CMD_WAIT_CONNECT_REQ, parameter ulTimeoutListen.
TLR_E_TCP_ERR_TIMEOUT_TCP_CMD_CONNECT	0xC0080314	The TCP Connect timeout has expired. A connection to the specified remote host could not be established within this time. For this timeout, see command TCPIP_TCP_CMD_CONNECT_REQ, parameter ulTimeoutConnect.
TLR_E_TCP_ERR_TIMEOUT_TCP_CMD_SEND	0xC0080315	The TCP Send timeout has expired by sending TCP data with command TCPIP_TCP_CMD_SEND_REQ. The remote host has not answered within the Send Timeout. The TCP Send timeout is set in command TCPIP_TCP_CMD_WAIT_CONNECT_REQ or TCPIP_TCP_CMD_CONNECT_REQ, parameter ulTimeoutSend (Default = 31 s).

Table 63: TCP Error Codes

11.4.5 Status & Error Codes TCP_IP-Task

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_S_OK	0x00000000	Status ok
TLR_E_IP_ERR_INIT_NO_ETHERNET_ADDR	0xC0070034	There is no Ethernet address (MAC address) available.
TLR_E_IP_ERR_INIT_INVALID_FLAG	0xC0070036	The start parameters contain one or more unknown flags.
TLR_E_IP_ERR_INIT_INVALID_IP_ADDR	0xC0070037	The start parameters contain an invalid IP address.
TLR_E_IP_ERR_INIT_INVALID_NETMASK	0xC0070038	The start parameters contain an invalid subnet mask.
TLR_E_IP_ERR_INIT_UNKNOWN_HARDWARE	0xC007003B	The device type is unknown.
TLR_E_IP_ERR_INIT_NO_IP_ADDR	0xC007003C	Failed to obtain an IP address from the specified source(s).
TLR_E_IP_ERR_INIT_DRIVER_FAILED	0xC007003D	The initialization of the driver layer (EDD) is failed.
TLR_E_IP_ERR_INIT_NO_IP_ADDR_CFG	0xC007003E	There is no source for an IP address (BOOTP, DHCP, IP address parameter) specified.
TLR_E_IP_ERR_ETH_ADDR_INVALID_IP_CMD_SET_PARAM	0xC007007C	The Ethernet address (MAC address) abEthernetAddr in command TCPIP_IP_CMD_SET_PARAM_REQ is invalid. Invalid means, abEthernetAddr is equal to the broadcast address FF-FF-FF-FF-FF-FF.
TLR_E_IP_ERR_ARP_CACHE_FULL_IP_CMD_SET_PARAM	0xC0070083	The command TCPIP_IP_CMD_SET_PARAM_REQ could not be executed, because the ARP cache is full. The ARP cache has per default configuration 64 entries.
TLR_E_IP_ERR_ARP_ENTRY_NOT_FOUND_IP_CMD_SET_PARAM	0xC0070086	The specified ARP entry in command TCPIP_IP_CMD_SET_PARAM_REQ could not be deleted. The ARP entry was not found in ARP cache.
TLR_E_IP_ERR_ARP_ENTRY_NOT_FOUND_IP_CMD_GET_PARAM	0xC0070087	The requested ARP information in command TCPIP_IP_CMD_GET_PARAM_REQ could not be delivered. The ARP entry was not found in ARP cache.
TLR_E_IP_ERR_DELAYED	0xC00700FE	Special internalIpStart function.
TLR_E_IP_ERR_GENERIC	0xC00700FF	Special internalIpStart function.
TLR_E_TCPIP_TCP_TASK_COMMAND_INVALID	0xC0080001	Invalid command received.
TLR_E_TCPIP_TCP_TASK_PROCESS_CANCELED	0xC0080002	Cancel process is in progress, command can not be executed.
TLR_E_TCP_ERR_INIT_IP_TASK_NOT_READY	0xC0080032	The IP layer is not ready.
TLR_E_TCP_ERR_INIT_IP_TASK_FAILED	0xC0080034	The initialization of IP layer has failed.
TLR_E_TCP_ERR_INIT_CREATE_INFO_FIELD	0xC0080040	The creation of an information field (task state) has failed.
TLR_W_TCP_ERR_INIT_TPIF_INIT_REQ_PCKT	0x80080043	Warning: A pending application packet has discarded (because of a new application packet).
TLR_E_TCP_ERR_INIT_OS_CYCLETIME	0xC0080044	The configured operating system cycle time is out of range (0.1 ms ... 20 ms).

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_ERR_INIT_OS_AND_TCPUDP_CYCLETIME	0xC0080045	The combination of configured operating system cycle time and TCP/IP stacks cycle time (startup-parameter ulTcpCycleEvent) is not possible. The operating system cycle time must be smaller or equal than the TCP/IP stacks cycle time.
TLR_E_TCP_ERR_SOCKET_INVALID	0xC0080070	The socket handle ulDestId is invalid. A further reason for this error: The command (Mode) is not applicable on this socket type (TCP/UDP).
TLR_E_TCP_ERR_OPTION_NOT_SUPPORTED_TCP_CMD_SEND	0xC0080074	The option parameter ulOptions in command TCPIP_TCP_CMD_SEND_REQ is invalid.
TLR_E_TCP_ERR_PARAMETER_INVALID_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080075	The parameter ulTtl (ulMode = TCP_SOCKET_TTL) or ulMulticastTtl (ulMode = TCP_SOCKET_MULTICAST_TTL) or ulMulticastLoop (ulMode = TCP_SOCKET_MULTICAST_LOOP) in command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ is invalid.
TLR_E_TCP_ERR_CONN_CLOSED	0xC0080078	The connection has closed (Graceful close).
TLR_E_TCP_ERR_CONN_RESET	0xC0080079	The Connection has closed by reset (Hard close).
TLR_E_TCP_ERR_PROTOCOL_UNKNOWN_TCP_UDP_CMD_OPEN	0xC008007A	The protocol parameter ulProtocol in command TCPIP_TCP_UDP_CMD_OPEN_REQ is invalid.
TLR_E_TCP_ERR_NO_SOCKETS_TCP_UDP_CMD_OPEN	0xC008007B	Command TCPIP_TCP_UDP_CMD_OPEN_REQ: There are no socket handles available.
TLR_E_TCP_ERR_MAX_PKT_CNT_EXCEEDED_UDP_CMD_SEND	0xC0080084	Command TCPIP_UDP_CMD_SEND_REQ: The maximum number of queued packets (= TCPHDL_RCX_PKT_QUEUED_MAX (6)) has exceeded. The request command was rejected. The application must wait for at least one confirmation command from stack before sending the next request command.
TLR_E_TCP_ERR_MAX_GROUP_EXCEEDED_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080085	Command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ, ulMode = TCP_SOCKET_ADD_MEMBERSHIP: The maximum number of IP multicast groups has exceeded (Default configuration = 64).
TLR_E_TCP_ERR_DISCARD_KEPT_REQ_CMD	0xC0080086	A kept request command has discarded. This confirmation has no further meaning for the application, unless the application must give back this packet to their resource pool!
TLR_E_TCP_ERR_UNEXP_ANSWER	0xC0080095	An unexpected/unknown confirmation command has received.
TLR_E_TCP_TASK_F_MESSAGESIZE	0xC0080097	The packet length parameter ulLen is invalid. The correct packet length depends on the command parameter ulCmd.

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_TASK_F_MESSAGECOMMAND	0xC0080098	The command ulCmd is unknown.
TLR_E_TCP_TASK_F_MESSAGECOMMANDRUNNING	0xC008009E	The command cannot be executed, because the previous command is still running.
TLR_E_TCP_TASK_F_NOT_INITIALIZED	0xC00800C8	The task is not initialized.
TLR_E_TCP_TASK_F_BUSY	0xC00800C9	The task is busy (intern).
TLR_E_TCP_TASK_F_DATABASE	0xC00800D2	The configuration database is not available.
TLR_E_TCP_TASK_F_DATABASE_READ	0xC00800D4	Error while reading configuration database.
TLR_E_IP_ERR_IP_ADDR_INVALID_IP_CMD_PING	0xC0070100	The IP address parameter ullpAddr in command TCPIP_IP_CMD_PING_REQ is invalid. This means, the IP address ullpAddr is equal to the TCP/IP stacks own IP address.
TLR_E_TCP_ERR_IP_ADDR_INVALID_TCP_UDP_CMD_OPEN	0xC0080101	The IP address parameter ullpAddr in command TCPIP_TCP_UDP_CMD_OPEN_REQ is invalid. The parameter ullpAddr must be zero (0.0.0.0) or equal to the TCP/IP stacks own IP address.
TLR_E_TCP_ERR_IP_ADDR_INVALID_TCP_CMD_CONNECT	0xC0080102	The IP address parameter ullpAddr in command TCPIP_TCP_CMD_CONNECT_REQ is invalid. The parameter ullpAddr must be unequal to the TCP/IP stacks own IP address.
TLR_E_TCP_ERR_IP_ADDR_INVALID_UDP_CMD_SEND	0xC0080103	The IP address parameter ullpAddr in command TCPIP_UDP_CMD_SEND_REQ is invalid or doesn't match to the local sub network. This error occurs, if the IP address is zero (0.0.0.0) or equal to the address of the local subnet.
TLR_E_TCP_ERR_IP_ADDR_INVALID_TCP_UDP_CMD_SET SOCK_OPTION	0xC0080104	The parameter ulMulticastGroup (ulMode = TCP_SOCK_ADD_MEMBERSHIP or TCP_SOCK_DROP_MEMBERSHIP) in command TCPIP_TCP_UDP_CMD_SET SOCK_OPTION_REQ is invalid. The parameter ulMulticastGroup must be a valid Multicast address. Valid Multicast addresses are 224.0.0.1 ... 239.255.255.255 (224.0.0.0 is reserved as Base-multicast address).
TLR_E_TCP_ERR_PORT_INVALID_TCP_UDP_CMD_OPEN	0xC0080110	The port parameter ulPort in command TCPIP_TCP_UDP_CMD_OPEN_REQ is invalid or not available. The parameter ulPort must be in range 0 ... 65535.
TLR_E_TCP_ERR_PORT_INVALID_TCP_CMD_CONNECT	0xC0080111	The port parameter ulPort in command TCPIP_TCP_CMD_CONNECT_REQ is invalid or not available. The parameter ulPort must be in range 1 ... 65535.
TLR_E_TCP_ERR_PORT_INVALID_UDP_CMD_SEND	0xC0080112	The port parameter ulPort in command TCPIP_UDP_CMD_SEND_REQ is invalid or not available. The parameter ulPort must be in range 0 ... 65535.

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_IP_ERR_TIMEOUT_INVALID_IP_CMD_PING	0xC0070120	The timeout parameter ulTimeout in command TCPIP_IP_CMD_PING_REQ is invalid.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_UDP_CMD_CLOSE	0xC0080121	The timeout parameter ulTimeout in command TCPIP_TCP_UDP_CMD_CLOSE_REQ is invalid. Consider the distinction between TCP and UDP sockets! For UDP sockets, ulTimeout must be zero.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_UDP_CMD_CLOSE_ALL	0xC0080122	The timeout parameter ulTimeout in command TCPIP_TCP_UDP_CMD_CLOSE_ALL_REQ is invalid.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_CMD_WAIT_CONNECT	0xC0080123	The timeout parameter ulTimeoutSend and/or ulTimeoutListen in command TCPIP_TCP_CMD_WAIT_CONNECT_REQ is invalid.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_CMD_CONNECT	0xC0080124	The timeout parameter ulTimeoutSend and/or ulTimeoutConnect in command TCPIP_TCP_CMD_CONNECT_REQ is invalid.
TLR_E_TCP_ERR_TIMEOUT_INVALID_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080125	The timeout parameter ulTimeoutSend (ulMode = TCP_SOCKET_SEND_TIMEOUT) or ulTimeoutInactive (ulMode = TCP_SOCKET_INACTIVE_TIMEOUT) or ulTimeoutKeepAlive (ulMode = TCP_SOCKET_KEEPA_LIVE_TIMEOUT) in command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ is invalid.
TLR_E_IP_ERR_MODE_UNKNOWN_IP_CMD_SET_PARAM	0xC0070130	The mode parameter ulMode in command TCPIP_IP_CMD_SET_PARAM_REQ is invalid.
TLR_E_IP_ERR_MODE_UNKNOWN_IP_CMD_GET_PARAM	0xC0070131	The mode parameter ulMode in command TCPIP_IP_CMD_GET_PARAM_REQ is invalid.
TLR_E_TCP_ERR_MODE_UNKNOWN_TCP_UDP_CMD_SET_SOCKET_OPTION	0xC0080132	The mode parameter ulMode in command TCPIP_TCP_UDP_CMD_SET_SOCKET_OPTION_REQ is invalid.
TLR_E_TCP_ERR_MODE_UNKNOWN_TCP_UDP_CMD_GET_SOCKET_OPTION	0xC0080133	The mode parameter ulMode in command TCPIP_TCP_UDP_CMD_GET_SOCKET_OPTION_REQ is invalid.
TLR_E_TCP_ERR_MODE_UNKNOWN_FATAL_DUMMY	0xC0080134	Internal fatal error in module TcpiTcphdIPckt.c!
TLR_E_TCP_ERR_MAX_DATA_LEN_EXCEEDED_TCP_CMD_SEND	0xC0080140	The maximum TCP data count n in command TCPIP_TCP_CMD_SEND_REQ has exceeded. See parameter ulLen. The maximum value for n is TCPIP_MAX_TCP_DATA_CNT (1460).
TLR_E_TCP_ERR_MAX_DATA_LEN_EXCEEDED_UDP_CMD_SEND	0xC0080141	The maximum UDP data count n in command TCPIP_UDP_CMD_SEND_REQ has exceeded. See parameter ulLen. The maximum value for n is TCPIP_MAX_UDP_DATA_CNT (1472).
TLR_E_TCP_ERR_SOCKET_STATE_TCP_CMD_WAIT_CONNECT	0xC0080200	The command TCPIP_TCP_CMD_WAIT_CONNECT_REQ cannot be executed, because the socket is in an inappropriate state.

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_ERR_SOCKET_STATE_TCP_CMD_CONNECT	0xC0080201	The command TCPIP_TCP_CMD_CONNECT_REQ cannot be executed, because the socket is in an inappropriate state.
TLR_E_TCP_ERR_SOCKET_STATE_TCP_CMD_SEND	0xC0080202	The command TCPIP_TCP_CMD_SEND_REQ cannot be executed, because the socket is in an inappropriate state.
TLR_E_TCP_ERR_NO_FREE_QUEUE_ELEMENT_TCP_CMD_SEND	0xC0080210	The TCP send command TCPIP_TCP_CMD_SEND_REQ must be rejected, because the list of free queue elements is empty. Remark: Per default configuration, the initial size of this list is 128. Every send command (TCPIP_TCP_CMD_SEND_REQ or TCPIP_UDP_CMD_SEND_REQ) occupy one queue element, until the confirmation command is given back to the application. To avoid this resource problem, the application must reduce the count of open send jobs over all sockets.
TLR_E_TCP_ERR_NO_FREE_QUEUE_ELEMENT_UDP_CMD_SEND	0xC0080211	The UDP send command TCPIP_UDP_CMD_SEND_REQ must be rejected, because the list of free queue elements is empty. Remark: Per default configuration, the initial size of this list is 128. Every send command (TCPIP_TCP_CMD_SEND_REQ or TCPIP_UDP_CMD_SEND_REQ) occupy one queue element, until the confirmation command is given back to the application. To avoid this resource problem, the application must reduce the count of open send jobs over all sockets.
TLR_E_TCP_ERR_NO_ETH_OUT_BUFFER_UDP_CMD_SEND	0xC0080212	The UDP send command TCPIP_UDP_CMD_SEND_REQ must be rejected, because all outgoing Ethernet buffers are occupied.
TLR_E_TCP_ERR_MCAST_CREATE	0xC0080220	Failed to create an IP Multicast group.
TLR_E_IP_ERR_DEST_UNREACHABLE_IP_CMD_PING	0xC0070300	The target IP address ulIpAddr in command TCPIP_IP_CMD_PING_REQ is not reachable.
TLR_E_TCP_ERR_DEST_UNREACHABLE_TCP_UDP_CMD_CLOSE	0xC0080301	Command TCPIP_TCP_UDP_CMD_CLOSE_REQ: The destination (host, network, or port) is unreachable.
TLR_E_TCP_ERR_DEST_UNREACHABLE_TCP_UDP_CMD_CLOSE_ALL	0xC0080302	Command TCPIP_TCP_UDP_CMD_CLOSE_ALL_REQ: The destination (host, network, or port) is unreachable.
TLR_E_TCP_ERR_DEST_UNREACHABLE_TCP_CMD_WAIT_CONNECT	0xC0080303	Command TCPIP_TCP_CMD_WAIT_CONNECT_REQ: The destination (host, network, or port) is unreachable.
TLR_E_TCP_ERR_DEST_UNREACHABLE_TCP_CMD_CONNECT	0xC0080304	Command TCPIP_TCP_CMD_CONNECT_REQ: The destination (host, network, or port) is unreachable.

Status & Error Codes TCP_IP-Task		
Error Code (Definition)	Value	Description
TLR_E_TCP_ERR_DEST_UNREACHABLE_UDP_CMD_SEND	0xC0080305	Command TCPIP_UDP_CMD_SEND_REQ: The destination (host, network, or port) is unreachable.
TLR_E_IP_ERR_TIMEOUT_IP_CMD_PING	0xC0070310	The specified timeout ulTimeout in command TCPIP_IP_CMD_PING_REQ has expired. The specified host is not reachable.
TLR_E_TCP_ERR_TIMEOUT_TCP_UDP_CMD_CLOSE	0xC0080311	The TCP Close timeout has expired. A connection to the remote host could not be closed gracefully within this time. For this timeout, see command TCPIP_TCP_UDP_CMD_CLOSE_REQ, parameter ulTimeout.
TLR_E_TCP_ERR_TIMEOUT_TCP_UDP_CMD_CLOSE_ALL	0xC0080312	The TCP Close timeout has expired. One or more connections to remote host(s) could not be closed gracefully within this time. For this timeout, see command TCPIP_TCP_UDP_CMD_CLOSE_ALL_REQ, parameter ulTimeout.
TLR_E_TCP_ERR_TIMEOUT_TCP_CMD_WAIT_CONNECT	0xC0080313	The TCP Connect timeout has expired. No remote host has connected within this time. For this timeout, see command TCPIP_TCP_CMD_WAIT_CONNECT_REQ, parameter ulTimeoutListen.
TLR_E_TCP_ERR_TIMEOUT_TCP_CMD_CONNECT	0xC0080314	The TCP Connect timeout has expired. A connection to the specified remote host could not be established within this time. For this timeout, see command TCPIP_TCP_CMD_CONNECT_REQ, parameter ulTimeoutConnect.
TLR_E_TCP_ERR_TIMEOUT_TCP_CMD_SEND	0xC0080315	The TCP Send timeout has expired by sending TCP data with command TCPIP_TCP_CMD_SEND_REQ. The remote host has not answered within the Send Timeout. The TCP Send timeout is set in command TCPIP_TCP_CMD_WAIT_CONNECT_REQ or TCPIP_TCP_CMD_CONNECT_REQ, parameter ulTimeoutSend (Default = 31 s).

Table 64: Status & Error Codes TCP_IP-Task

11.5 General Error CIP Codes

The following table contains the possible General Error Codes defined within the CIP standard.

General CIP Error Codes		
General Error Codes (hexa decimal)	Status Name	Description
00	Success	The service has successfully been performed by the specified object.
01	Connection failure	A connection-related service failed. This happened at any location along the connection path.
02	Resource unavailable	Some resources which were required for the object to perform the requested service were not available.
03	Invalid parameter value	See status code 0x20, which is usually applied in this situation.
04	Path segment error	A path segment error has been encountered. Evaluation of the supplied path information failed.
05	Path destination unknown	The path references an unknown object class, instance or structure element causing the abort of path processing.
06	Partial transfer	Only a part of the expected data could be transferred.
07	Connection lost	The connection for messaging has been lost.
08	Service not supported	The requested service has not been implemented or has not been defined for this object class or instance.
09	Invalid attribute value	Detection of invalid attribute data
0A	Attribute list error	An attribute in the Get_Attribute_List or Set_Attribute_List response has a status not equal to 0.
0B	Already in requested mode/state	The object is already in the mode or state which has been requested by the service
0C	Object state conflict	The object is not able to perform the requested service in the current mode or state
0D	Object already exists	It has been tried to create an instance of an object which already exists.
0E	Attribute not settable	It has been tried to change a non-modifiable attribute.
0F	Privilege violation	A check of permissions or privileges failed.
10	Device state conflict	The current mode or state of the device prevents the execution of the requested service.
11	Reply data too large	The data to be transmitted in the response buffer requires more space than the size of the allocated response buffer
12	Fragmentation of a primitive value	The service specified an operation that is going to fragment a primitive data value, i.e. half a REAL data type.
13	Not enough data	The service did not supply all required data to perform the specified operation.
14	Attribute not supported	An unsupported attribute has been specified in the request
15	Too much data	More data than was expected were supplied by the service.
16	Object does not exist	The specified object does not exist in the device.
17	Service fragmentation sequence not in progress	Fragmentation sequence for this service is not currently active for this data.
18	No stored attribute data	The attribute data of this object has not been saved prior to the requested service.
19	Store operation failure	The attribute data of this object could not be saved due to a failure during the storage attempt.

General CIP Error Codes		
General Error Codes (hexa decimal)	Status Name	Description
1A	Routing failure, request packet too large	The service request packet was too large for transmission on a network in the path to the destination. The routing device was forced to abort the service.
1B	Routing failure, response packet too large	The service response packet was too large for transmission on a network in the path from the destination. The routing device was forced to abort the service.
1C	Missing attribute list entry data	The service did not supply an attribute in a list of attributes that was needed by the service to perform the requested behavior.
1D	Invalid attribute value list	The service returns the list of attributes containing status information for invalid attributes.
1E	Embedded service error	An embedded service caused an error.
1F	Vendor specific error	A vendor specific error has occurred. This error should only occur when none of the other general error codes can correctly be applied.
20	Invalid parameter	A parameter which was associated with the request was invalid. The parameter does not meet the requirements of the CIP specification and/or the requirements defined in the specification of an application object.
21	Write-once value or medium already written	An attempt was made to write to a write-once medium for the second time, or to modify a value that cannot be changed after being established once.
22	Invalid reply received	An invalid reply is received. Possible causes can for instance be among others a reply service code not matching the request service code or a reply message shorter than the expectable minimum size.
23-24	Reserved	Reserved for future extension of CIP standard
25	Key failure in path	The key segment (i.e. the first segment in the path) does not match the destination module. More information about which part of the key check failed can be derived from the object specific status.
26	Path size Invalid	Path cannot be routed to an object due to lacking information or too much routing data have been included.
27	Unexpected attribute in list	It has been attempted to set an attribute which may not be set in the current situation.
28	Invalid member ID	The Member ID specified in the request is not available within the specified class/ instance or attribute
29	Member cannot be set	A request to modify a member which cannot be modified has occurred
2A	Group 2 only server general failure	This DeviceNet-specific error cannot occur in EtherNet/IP
2B-CF	Reserved	Reserved for future extension of CIP standard
D0-FF	Reserved for object class and service errors	An object class specific error has occurred.

Table 65: General CIP Error Codes

11.5.1 CIP Connection-Manager-Object-Instance Codes zum Erweiterten Status

Additionally to the General CIP Error Codes the CIP Connection Manager Object Instance Extended Status Codes are valid.

CIP Connection Manager Object Instance Extended Status Codes		
General Status (hexa decimal)	Extended Status	Description
0x00		Service completed successfully
0x01	0x0000 through 0x00FF	Obsolete
0x01	0x0100	CONNECTION IN USE OR DULTPLICATE FORWARD OPEN This extended status code shall be returned when an originator is trying to make connection to a target with which the originator may have already established a connection (Non-Null/matching Forward_Open — see section 3-5.5.2.1.2). [Ref.] THE CIP NETWORKS LIBRARY, Volume 1
0x01	0x0101 through 0x0102	Reserved by CIP
0x01	0x0103	TRANSPORT CLASS AND TRIGGER COMBINATION NOT SUPPORTED A transport class and trigger combination has been specified which is not supported by the target. Routers shall not fail the connection based on the transport class and trigger combination. Only targets shall return this extended status code.
0x01	0x0104 through 0x0105	Reserved by CIP
0x01	0x0106	OWNERSHIP CONFLICT The connection cannot be established since another connection has exclusively allocated some of the resources required for this connection. An example of this would be that only one exclusive owner connection can control an output point on an I/O Module. If a second exclusive owner connection (or redundant owner connection) is attempted, this error shall be returned. This extended status code shall only be returned by a target node.
0x01	0x0107	TARGET CONNECTION NOT FOUND This extended status code shall be returned in response to the forward_close request, when the connection that is to be closed is not found at the target node. This extended status code shall only be returned by a target node. Routers shall not generate this extended status code. If the specified connection is not found at the intermediate node, the close request shall still be forwarded using the path specified in the Forward_Close request.
0x01	0x0108	INVALID NETWORK CONNECTION PARAMETER This extended status code shall be returned as the result of specifying a connection type, connection priority, redundant owner or fixed / variable that is not supported by the target application. Only a target node shall return this extended status code.
0x01	0x0109	INVALID CONNECTION SIZE This extended status code is returned when the target or router does not support the specified connection size. This could occur at a target because the size does not match the required size for a fixed size connection. It could occur at a router if the requested size is too large for the specified network. An additional status may follow indicating the maximum connection size supported by the responding node. The additional status word is required when issued in response to the Large_Forward_Open.

CIP Connection Manager Object Instance Extended Status Codes				
General Status (hexa decimal)	Extended Status	Description		
0x01	0x010A through 0x010F	Reserved by CIP		
0x01	0x0110	TARGET FOR CONNECTION NOT CONFIGURED This extended status code shall be returned when a connection is requested to a target application that has not been configured and the connection request does not contain a data segment for configuration. Only a target node shall return this extended status code. Reference section C-1.4.5 — DATA SEGMENT [Ref.] THE CIP NETWORKS LIBRARY, Volume 1		
0x01	0x0111	RPI NOT SUPPORTED. This extended status code shall be returned if the device can not support the requested O->T or T->O RPI. This extended status code shall also be used if the connection time-out multiplier produces a time-out value that is not supported by the device or the production inhibit time is not valid. Note: it is highly recommended to use Extended Status 0x112 when the RPI values(s) are not acceptable.		
0x01	0x0112	RPI VALUE(S) NOT ACCEPTABLE This error is to be returned when the RPI value(s) in the forward open request are outside the range required by the application in the target device or the target is producing at different interval, The target shall include information with acceptable RPI(s). for this error, the extended status size is 6 16-bit words and is formatted as follows:		
		Data Type	Value	Explanation of field
		UINT	0x0112	Extended status code
		USINT	variable	Acceptable Originator to Target RPI (see below) type, values: 0 — the RPI specified in the forward open was acceptable (the Originator to Target RPI value is ignored). ¹ 1 — unspecified (used to suggest an alternate RPI, e. g. default) 2— minimum acceptable RPI (used when RPI was too fast for range) 3 — maximum acceptable RPI (used when RPI was too slow for range) 4— required RPI to correct mismatch (used when data already being consumed at a different interval) 5-255 — reserved
		UDSINT	variable	Acceptable Target to Originator RPI (see below) type, values: 0— the RPI specified in the forward open was acceptable (the Target to Originator RPI value is ignored). ¹ 1 — unspecified (used to suggest an alternate RPI, e.g. default) 2— minimum acceptable RPI (used when RPI was too fast for range) 3 — maximum acceptable RPI (used when RPI was too slow for range) 4— required RPI to current mismatch (used when data already being produced at a different interval, typically multicast) 5-255— reserved

CIP Connection Manager Object Instance Extended Status Codes				
General Status (hexa decimal)	Extended Status	Description		
		UDINT	variable	Value of Originator to Target RPI that is within the acceptable range for the application. This field is defined the same as the RPI parameter in the forward open request.
		UDINT	variable	Value of Target to Originator RPI that is within the acceptable range for the application. This field is defined the same as the RPI parameter in the forward open request.
		1 The value of the Originator to Target and Target to Originator type shall not both be 0.		
0x01	0x0113	OUT OF CONNECTIONS Connection Manager cannot support any more connections. The maximum number of connections supported by the Connection Manager <u>has already been created</u> .		
0x01	0x0114	VENDOR OR PRODUCT CODE MISMATCH The Product Code or Vendor Id specified in the electronic key logical segment does not match the Product Code or Vendor Id of the target device.		
0x01	0x0115	PRODUCT TYPE MISMATCH The Product Type specified in the electronic key logical segment does not match the Product Typ of the target device.		
0x01	0x0116	REVISION MISMATCH The major and minor revision specified in the electronic key logical segment does not correspond to a -valid revision <u>of the target</u> device,		
0x01	0x0117	INVALID PRODUCED OR CONSUMED APPLICATION PATH The produced or consumed application path specified in the connection path does not correspond to a valid produced or consumed application path within the target application. This error could also be returned if a produced or consumed application path was required, but not provided by a connection request.		
0x01	0x0118	INVALID OR INCONSISTENT CONFIGURATION APPLICATION PATH An application path specified for the configuration data does not correspond to a configuration application or is inconsistent with the consumed or produced application paths. For example the connection path specifies float configuration data while the produced or consumed paths specify integer data.		
0x01	0x0119	NON-LISTEN ONLY CONNECTION NOT OPENED Connection request fails since there are no non-listen only connection types currently open. Refer to Section 3.6 for a description of application connection types. The extended status code shall be returned when an attempt is made to establish a listen only connection type to a target, which has no non-listen only connection already established. [Ref.] THE CIP NETWORKS LIBRARY, Volume 1		
0x01	0x011A	TARGET OBJECT OUT OF CONNECTIONS The maximum number of connections supported by this instance of the target object has been exceeded. For example, the Connection Manager could support 20 connections while the target object can only support 10 connections, On the 11th Connection Request to the target object, this extended status code would be used to signify that the maximum number of connections already exist to the target object.		
0x01	0x011B	RPI IS SMALLER THAN THE PRODUCTION INHIBIT TIME The Target to Originator RPI is smaller than the Target to Originator Production Inhibit Time.		
0x01	0x011B through 0x0202	Reserved by CIP		

CIP Connection Manager Object Instance Extended Status Codes		
General Status (hexa decimal)	Extended Status	Description
0x01	0x0203	CONNECTION TIMED OUT This extended status code shall occur when a client tries to send a connected message over a connection that has been timed-out. This extended status code shall only occur locally at the producing node.
0x01	0x0204	UNCONNECTED REQUEST TIMED OUT The Unconnected Request Timed Out error shall occur when the UCMM times out before a reply is received. This may occur for an Unconnected_Send, Forward_Open, or Forward_Close service. This typically means that the UCMM has tried a link specific number of times using a link specific retry timer and has not received an acknowledgement or reply. This may be the result of congestion at the destination node or may be the result of a node not being powered up or present. This extended status code shall be returned by the originating node or any intermediate node.
0x01	0x0205	PARAMETER ERROR IN UNCONNECTED REQUEST SERVICE For example, this shall be caused by a Connection Tick Time (see section 3-5.5.1.3) and Connection time-out combination in an Unconnected_Send, Forward_Open, or Forward_Close service that is not supported by an intermediate node.
0x01	0x0206	MESSAGE TOO LARGE FOR UNCONNECTED_SEND SERVICE This shall be caused when the Unconnected_Send is too large to be sent out on a network.
0x01	0x0207	UNCONNECTED ACKNOWLEDGE WITHOUT REPLY The message was sent via the unconnected message service and an acknowledge was received but a data response message was not received.
0x01	0x0208 through 0x0300	Reserved by CIP
0x01	0x0301	NO BUFFER MEMORY AVAILABLE The extended status code shall occur when insufficient connection buffer memory is available in the target or any router devices. Routers and target nodes shall return this error.
0x01	0x0302	NETWORK BANDWIDTH NOT AVAILABLE FOR DATA This extended status code shall be returned by any device in the path that is a producer and can not allocate sufficient bandwidth for the connection on its link. This can occur at any node. This can only occur for connections that are specified a scheduled priority
0x01	0x0303	NO CONSUMED CONNECTION ID FILTER AVAILABLE Any device in the path that contains a link consumer for the connection and does not have an available consumed_connection_id filter available shall return this extended status code.
0x01	0x0304	NOT CONFIGURED TO SEND SCHEDULED PRIORITY DATA If requested to make a connection that specifies scheduled priority, any device that is unable to send packets during the scheduled portion of the network update time interval shall return this extended status code. For example, on ControlNet this code shall be returned by a node whose MAC is greater than maximum scheduled node (SMAX).
0x01	0x0305	SCHEDULE SIGNATURE MISMATCH This extended status code shall be returned when the connection scheduling information in the originator device is not consistent with the connection scheduling information on the target network.
0x01	0x0306	SCHEDULE SIGNATURE VALIDATION NOT POSSIBLE This extended status code shall be returned when the connection scheduling information in the originator device can not be validated on the target network. For example, on ControlNet this code shall be returned when there is no keeper in the master state.

CIP Connection Manager Object Instance Extended Status Codes		
General Status (hexa decimal)	Extended Status	Description
0x01	0x0307 through 0x0310	Reserved by CIP
0x01	0x0311	PORT NOT AVAILABLE A Port specified in a Port Segment is Not Available or does not exist.
0x01	0x0312	LINK ADDRESS NOT VALID Link Address specified in Port Segment Not Valid This extended status code is the result of a port segment that specifies a link address that is not valid for the target network type. This extended status code shall not be used for link addresses that are valid for the target network type but do not respond.
0x01	0x0313 through 0x0314	Reserved by CIP
0x01	0x0315	INVALID SEGMENT IN CONNECTION PATH Invalid Segment Type or Segment Value in Connection Path This extended status code is the result of a device being unable to decode the connection path. This could be caused by an unrecognized path type, a segment type occurring unexpectedly, or a myriad of other problems in the connection path.
0x01	0x0316	FORWARD CLOSE SERVICE CONNECTION PATH MISMATCH The connection path in the Forward_Close Service does not match the connection path in the connection being closed.
0x01	0x0317	SCHEDULING NOT SPECIFIED Either the Schedule Network Segment was not present or the Encoded Value in the Schedule Network Segment is invalid (0).
0x01	0x0318	LNK ADDRESS TO SELF INVALID Under some conditions (depends on the device), a link address in the Port Segment which points to the same device (loopback to yourself) is invalid.
0x01	0x0319	SECONDARY RESOURCES UNAVAILABLE In a dual chassis redundant system, a connection request that is made to the primary system shall be duplicated on the secondary system. If the secondary system is unable to duplicate the connection request, then this extended status code shall be returned.
0x01	0x031A	RACK CONNECTION ALREADY ESTABLISHED A request for a module connection has been refused because part of the corresponding data is already included in a rack connection.
0x01	0x031B	MODULE CONNECTION ALREADY ESTABLISHED A request for a rack connection has been refused because part of the corresponding data is already included in a module connection.
0x01	0x031C	MISCELLANEOUS This extended status is returned when no other extended status code applies for a connection related error.
0x01	0x031D	REDUNDANT CONNECTION MISMATCH This extended status code shall be returned when the following fields do not match when attempting to establish a redundant owner connection to the same target path: - O->T_RPI - O->T_connection_parameters - T->O_RPI - T->O_connection_parameters - xport_type_and_trigger.

CIP Connection Manager Object Instance Extended Status Codes		
General Status (hexa decimal)	Extended Status	Description
0x01	0x031E	NO MORE USER CONFIGURABLE LINK CONSUMER RESOURCES AVAILABLE IN THE PRODUCING MODULE A target shall return this extended status when the configured number of consumers for a producing application is already in use.
0x01	0x031F	NO MORE USER CONFIGURABLE LINK CONSUMER RESOURCES AVAILABLE IN THE PRODUCING MODULE A target shall return this extended status when there are no consumers configured for a producing application to use.
0x01	0x0320 0x07FF	Vendor specific
0x01	0x0800	Network link in path to module is offline
0x01	0x0801 through 0x080F	Reserved by CIP
0x01	0x0810	NO TARGET APPLICATION DATA AVAILABLE This extended status code is returned when the target application does not have valid data to produce for the requested connection. Only the target side of a connection shall return this extended status code.
0x01	0x0811	NO ORIGINATOR APPLICATION DATA AVAILABLE This extended status code is returned when the originator application does not have valid data to produce for the requested connection. Only the originator side of connection shall indicate this extended status code.
0x01	0x0812	NODE ADDRESS HAS CHANGED SINCE THE NETWORK WAS SCHEDULED A router on a scheduled network (e.g.: ControlNet) has a different node address than the value configured in the connection originator.
0x01	0x0813	NOT CONFIGURED FOR OFF-SUBNET MULTICAST A multicast connection has been requested between a producer and a consumer that are on different subnets, and the producer is not configured for off-subnet multicast.
0x01	0x0814	INVALID PRODUCE/CONSUME DATA FORMAT Information in the data segment indicates that the format of the produced and/or consumed data is not valid.
0x01	0x0815 through 0xFCFF	Reserved by CIP
0x09	Index to Element	ERROR IN DATA SEGMENT This general status code shall be returned when there is an error in the data segment of a forward open. The Extended Status shall be the index to where the error was encountered in the Data Segment (Reference section C-1.4.5 — DATA SEGMENT). [Ref.] THE CIP NETWORKS LIBRARY, Volume 1
0x0C	Optional	OBJECT STATE ERROR This general status code shall be returned when the state of the target object of the connection prevents the service request from being handled. The Extended Status reports the object's present state. The extended status is optional. For example, a target (application) object of the connection may need to be in an edit mode before attributes can be set. This is different from a service being rejected due to the state of the device.

CIP Connection Manager Object Instance Extended Status Codes		
General Status (hexa decimal)	Extended Status	Description
0x10	Optional	DEVICE STATE ERROR This general status code shall be returned when the state of the device prevents the service request from being handled. The Extended Status reports the device's present state. The extended status is optional. For example, a controller may have a key switch which when set to the "hard run" state causes Service Requests to several different objects to fail (i.e. program edits). This general status code would then be returned.
0x13	None	Not enough data. The service did not supply enough data to perform the specified operation.
0x15	None	Ton much data. The service supplied more data than was expected.

Table 66: CIP Connection Manager Object Instance Extended Status Codes

[Ref.] THE CIP NETWORKS LIBRARY, Volume 1, Common Industrial Protocol (CIPTM), Edition 3.8, April 2010 on page 119 to 127

11.6 ODM Error Codes

11.6.1 General ODM Error Codes

Error Code (Definition)	Value	Description
CODM3_E_INTERNALERROR	0x8004C700	Internal ODM Error
ODM3_E_DESCRIPTION_NOTFOUND	0x8004C701	Description not found in ODM database
CODM3_E_WRITEREGISTRY	0x8004C710	Error writing to the registry
CODM3_E_BAD_REGULAR_EXPRESSION	0x8004C711	Invalid regular expression
CODM3_E_COMCATEGORIE_MANAGER_FAILED	0x8004C712	Component Category Manager could not be instantiated
CODM3_E_COMCATEGORIE_ENUMERATION_FAILED	0x8004C713	Driver could not be enumerated by the Category Manager
CODM3_E_CREATE_LOCAL_BUFFER	0x8004C714	Error creating local buffers
CODM3_E_UNKNOWNHANDLE	0x8004C715	Unknown handle
CODM3_E_QUEUE_LIMIT_REACHED	0x8004C717	Queue size limit for connection reached
CODM3_E_DATASIZE_ZERO	0x8004C718	Zero data length passed
CODM3_E_INVALID_DATA	0x8004C719	Invalid data content
CODM3_E_INVALID_MODE	0x8004C71A	Invalid mode
CODM3_E_DATABASE_READ	0x8004C71B	Error reading database
CODM3_E_CREATE_DEVICE_THREAD	0x8004C750	Error creating device thread
CODM3_E_CREATE_DEVICE_THREAD_STOP_EVENT	0x8004C751	Error creating device thread stop event
CODM3_E_CLIENT_NOT_REGISTERED	0x8004C752	Client is not registered at the ODM
CODM3_E_NO_MORE_CLIENTS	0x8004C753	Maximum number of clients reached
CODM3_E_MAX_CLIENT_CONNECTIONS_REACHED	0x8004C754	Maximum number of client connections reached
CODM3_E_ENTRY_NOT_FOUND	0x8004C755	Driver/device not found
CODM3_E_DRIVER_NOT_FOUND	0x8004C757	The requested driver is unknown to the ODM
CODM3_E_DEVICE_ALREADY_LOCKED	0x8004C758	Device is locked by another process
CODM3_E_DEVICE_UNLOCKED_FAILED	0x8004C759	Device could not be unlocked, lock was set by another process
CODM3_E_DEVICE_LOCK_NECESSARY	0x8004C75A	Operation requires a device lock to be set
CODM3_E_DEVICE_SUBSCRIPTIONLIMIT	0x8004C75B	Maximum number of servers registered for this device reached
CODM3_E_DEVICE_NOTSUBSCRIBED	0x8004C75C	Process is not registered as a server on this device
CODM3_E_DEVICE_NO_MESSAGE	0x8004C75D	No message available
CODM3_E_TRANSFERTIMEOUT	0x8004C760	Message transfer timeout
CODM3_E_MESSAGE_INSERVICE	0x8004C761	Message in service

Table 67: ODM Error Codes - General ODM Error Codes

11.6.2 General ODM Driver Error Codes

Error Code (Definition)	Value	Description
CODM3_E_DRV_OPEN_DEVICE	0x8004C7A0	Packet type unsupported by driver
CODM3_E_DRV_INVALID_IDENTIFIER	0x8004C7A1	Invalid device identifier
CODM3_E_DRV_DEVICE_PARAMETERS_MISMATCH	0x8004C7A3	Parameters differ from requested device
CODM3_E_DRV_BROWSE_NO_DEVICES	0x8004C7A4	No devices found
CODM3_E_DRV_CREATE_DEVICE_INST	0x8004C7A5	Device instance could not be created
CODM3_E_DRV_DEVICE_NOMORE_TX	0x8004C7A6	Device connection limit reached
CODM3_E_DRV_DEVICE_DUPLICATE_TX	0x8004C7A7	Duplicate transmitter ID
CODM3_E_DRV_DEVICE_NOT_CONFIGURED	0x8004C7A8	Device is not configured
CODM3_E_DRV_DEVICE_COMMUNICATION	0x8004C7A9	Device communication error
CODM3_E_DRV_DEVICE_NO_MESSAGE	0x8004C7AA	No message available
CODM3_E_DRV_DEVICE_NOT_READY	0x8004C7AB	Device not ready
CODM3_E_DRV_INVALIDCONFIGURATION	0x8004C7AC	Invalid driver configuration
CODM3_E_DRV_DLINVALIDMODE	0x8004C7C0	Invalid download mode
CODM3_E_DRV_DLINPROGRESS	0x8004C7C1	Download is active
CODM3_E_DRV_ULINPROGRESS	0x8004C7C2	Upload is active

Table 68: ODM Error Codes - General ODM Driver Error Codes

11.6.3 cifX Driver Specific ODM Error Codes

cifX Driver Specific ODM Error Codes		
Error Code (Definition)	Value	Description
DRV_E_BOARD_NOT_INITIALIZED	0x8004C001	DRIVER Board not initialized
DRV_E_INIT_STATE_ERROR	0x8004C002	DRIVER Error in internal init state
DRV_E_READ_STATE_ERROR	0x8004C003	DRIVER Error in internal read state
DRV_E_CMD_ACTIVE	0x8004C004	DRIVER Command on this channel is active
DRV_E_PARAMETER_UNKNOWN	0x8004C005	DRIVER Unknown parameter in function
DRV_E_WRONG_DRIVER_VERSION	0x8004C006	DRIVER Version is incompatible with DLL
DRV_E_PCI_SET_CONFIG_MODE	0x8004C007	DRIVER Error during PCI set configuration mode
DRV_E_PCI_READ_DPM_LENGTH	0x8004C008	DRIVER Could not read PCI dual port memory length
DRV_E_PCI_SET_RUN_MODE	0x8004C009	DRIVER Error during PCI set run mode
DRV_E_DEV_DPM_ACCESS_ERROR	0x8004C00A	DEVICE Dual port ram not accessible(board not found)
DRV_E_DEV_NOT_READY	0x8004C00B	DEVICE Not ready (ready flag failed)
DRV_E_DEV_NOT_RUNNING	0x8004C00C	DEVICE Not running (running flag failed)
DRV_E_DEV_WATCHDOG_FAILED	0x8004C00D	DEVICE Watchdog test failed
DRV_E_DEV_OS_VERSION_ERROR	0x8004C00E	DEVICE Signals wrong OS version
DRV_E_DEV_SYSERR	0x8004C00F	DEVICE Error in dual port flags
DRV_E_DEV_MAILBOX_FULL	0x8004C010	DEVICE Send mailbox is full
DRV_E_DEV_PUT_TIMEOUT	0x8004C011	DEVICE PutMessage timeout
DRV_E_DEV_GET_TIMEOUT	0x8004C012	DEVICE GetMessage timeout
DRV_E_DEV_GET_NO_MESSAGE	0x8004C013	DEVICE No message available
DRV_E_DEV_RESET_TIMEOUT	0x8004C014	DEVICE RESET command timeout
DRV_E_DEV_NO_COM_FLAG	0x8004C015	DEVICE COM-flag not set. Check if Bus is running
DRV_E_DEV_EXCHANGE_FAILED	0x8004C016	DEVICE I/O data exchange failed
DRV_E_DEV_EXCHANGE_TIMEOUT	0x8004C017	DEVICE I/O data exchange timeout
DRV_E_DEV_COM_MODE_UNKNOWN	0x8004C018	DEVICE I/O data mode unknown
DRV_E_DEV_FUNCTION_FAILED	0x8004C019	DEVICE Function call failed
DRV_E_DEV_DPMSIZE_MISMATCH	0x8004C01A	DEVICE DPM size differs from configuration
DRV_E_DEV_STATE_MODE_UNKNOWN	0x8004C01B	DEVICE State mode unknown
DRV_E_DEV_HW_PORT_IS_USED	0x8004C01C	DEVICE Output port already in use
DRV_E_USR_OPEN_ERROR	0x8004C01E	USER Driver not opened (device driver not loaded)
DRV_E_USR_INIT_DRV_ERROR	0x8004C01F	USER Can't connect to device
DRV_E_USR_NOT_INITIALIZED	0x8004C020	USER Board not initialized (DevInitBoard not called)
DRV_E_USR_COMM_ERR	0x8004C021	USER IOCTL function failed
DRV_E_USR_DEV_NUMBER_INVALID	0x8004C022	USER Parameter DeviceNumber invalid
DRV_E_USR_INFO_AREA_INVALID	0x8004C023	USER Parameter InfoArea unknown
DRV_E_USR_NUMBER_INVALID	0x8004C024	USER Parameter Number invalid
DRV_E_USR_MODE_INVALID	0x8004C025	USER Parameter Mode invalid
DRV_E_USR_MSG_BUF_NULL_PTR	0x8004C026	USER NULL pointer assignment
DRV_E_USR_MSG_BUF_TOO_SHORT	0x8004C027	USER Message buffer too small

cifX Driver Specific ODM Error Codes		
Error Code (Definition)	Value	Description
DRV_E_USR_SIZE_INVALID	0x8004C028	USER Parameter Size invalid
DRV_E_USR_SIZE_ZERO	0x8004C02A	USER Parameter Size with zero length
DRV_E_USR_SIZE_TOO_LONG	0x8004C02B	USER Parameter Size too long
DRV_E_USR_DEV_PTR_NULL	0x8004C02C	USER Device address null pointer
DRV_E_USR_BUF_PTR_NULL	0x8004C02D	USER Pointer to buffer is a null pointer
DRV_E_USR_SENDSIZE_TOO_LONG	0x8004C02E	USER Parameter SendSize too large
DRV_E_USR_RECVSIZE_TOO_LONG	0x8004C02F	USER Parameter ReceiveSize too large
DRV_E_USR_SENDBUF_PTR_NULL	0x8004C030	USER Pointer to send buffer is a null pointer
DRV_E_USR_RECVBUF_PTR_NULL	0x8004C031	USER Pointer to receive buffer is a null pointer
DRV_E_DMA_INSUFF_MEM	0x8004C032	DMA Memory allocation error
DRV_E_DMA_TIMEOUT_CH4	0x8004C033	DMA Read I/O timeout
DRV_E_DMA_TIMEOUT_CH5	0x8004C034	DMA Write I/O timeout
DRV_E_DMA_TIMEOUT_CH6	0x8004C035	DMA PCI transfer timeout
DRV_E_DMA_TIMEOUT_CH7	0x8004C036	DMA Download timeout
DRV_E_DMA_DB_DOWN_FAIL	0x8004C037	DMA Database download failed
DRV_E_DMA_FW_DOWN_FAIL	0x8004C038	DMA Firmware download failed
DRV_E_CLEAR_DB_FAIL	0x8004C039	DMA Clear database on the device failed
DRV_E_DEV_NO_VIRTUAL_MEM	0x8004C03C	DMA USER Virtual memory not available
DRV_E_DEV_UNMAP_VIRTUAL_MEM	0x8004C03D	DMA USER Unmap virtual memory failed
DRV_E_GENERAL_ERROR	0x8004C046	DRIVER General error
DRV_E_DMA_ERROR	0x8004C047	DRIVER General DMA error
DRV_E_WDG_IO_ERROR	0x8004C048	DRIVER I/O WatchDog failed
DRV_E_WDG_DEV_ERROR	0x8004C049	DRIVER Device Watchdog failed
DRV_E_USR_DRIVER_UNKNOWN	0x8004C050	USER Driver unknown
DRV_E_USR_DEVICE_NAME_INVALID	0x8004C051	USER Device name invalid
DRV_E_USR_DEVICE_NAME_UNKNOWN	0x8004C052	USER Device name unknown
DRV_E_USR_DEVICE_FUNC_NOTIMPL	0x8004C053	USER Device function not implemented
DRV_E_USR_FILE_OPEN_FAILED	0x8004C064	USER File could not be opened
DRV_E_USR_FILE_SIZE_ZERO	0x8004C065	USER File size zero
DRV_E_USR_FILE_NO_MEMORY	0x8004C066	USER Not enough memory to load file
DRV_E_USR_FILE_READ_FAILED	0x8004C067	USER File read failed
DRV_E_USR_INVALID_FILETYPE	0x8004C068	USER File type invalid
DRV_E_USR_FILENAME_INVALID	0x8004C069	USER Invalid filename
DRV_E_FW_FILE_OPEN_FAILED	0x8004C06E	USER Firmware file could not be opened
DRV_E_FW_FILE_SIZE_ZERO	0x8004C06F	USER Not enough memory to load firmware file
DRV_E_FW_FILE_NO_MEMORY	0x8004C070	USER Not enough memory to load firmware file
DRV_E_FW_FILE_READ_FAILED	0x8004C071	USER Firmware file read failed
DRV_E_FW_INVALID_FILETYPE	0x8004C072	USER Firmware file type invalid
DRV_E_FW_FILENAME_INVALID	0x8004C073	USER Firmware file name not valid
DRV_E_FW_DOWNLOAD_ERROR	0x8004C074	USER Firmware file download error
DRV_E_FW_FILENAME_NOT_FOUND	0x8004C075	USER Firmware file not found in the internal table
DRV_E_FW_BOOTLOADER_ACTIVE	0x8004C076	USER Firmware file BOOTLOADER active

cifX Driver Specific ODM Error Codes		
Error Code (Definition)	Value	Description
DRV_E_FW_NO_FILE_PATH	0x8004C077	USER Firmware file no file path
DRV_E_CF_FILE_OPEN_FAILED	0x8004C078	USER Configuration file could not be opened
DRV_E_CF_FILE_SIZE_ZERO	0x8004C079	USER Configuration file size zero
DRV_E_CF_FILE_NO_MEMORY	0x8004C07A	USER Not enough memory to load configuration file
DRV_E_CF_FILE_READ_FAILED	0x8004C07B	USER Configuration file read failed
DRV_E_CF_INVALID_FILETYPE	0x8004C07C	USER Configuration file type invalid
DRV_E_CF_FILENAME_INVALID	0x8004C07D	USER Configuration file name not valid
DRV_E_CF_DOWNLOAD_ERROR	0x8004C07E	USER Configuration file download error
DRV_E_CF_FILE_NO_SEGMENT	0x8004C07F	USER No flash segment in the configuration file
DRV_E_CF_DIFFERS_FROM_DBM	0x8004C080	USER Configuration file differs from database
DRV_E_DBM_SIZE_ZERO	0x8004C083	USER Database size zero
DRV_E_DBM_NO_MEMORY	0x8004C084	USER Not enough memory to upload database
DRV_E_DBM_READ_FAILED	0x8004C085	USER Database read failed
DRV_E_DBM_NO_FLASH_SEGMENT	0x8004C086	USER Database segment unknown
DEV_E_CF_INVALID_DESCRIPTOR_VERSION	0x8004C096	CONFIG Version of the descriptor table invalid
DEV_E_CF_INVALID_INPUT_OFFSET	0x8004C097	CONFIG Input offset is invalid
DEV_E_CF_NO_INPUT_SIZE	0x8004C098	CONFIG Input size is 0
DEV_E_CF_MISMATCH_INPUT_SIZE	0x8004C099	CONFIG Input size does not match configuration
DEV_E_CF_INVALID_OUTPUT_OFFSET	0x8004C09A	CONFIG Invalid output offset
DEV_E_CF_NO_OUTPUT_SIZE	0x8004C09B	CONFIG Output size is 0
DEV_E_CF_MISMATCH_OUTPUT_SIZE	0x8004C09C	CONFIG Output size does not match configuration
DEV_E_CF_STN_NOT_CONFIGURED	0x8004C09D	CONFIG Station not configured
DEV_E_CF_CANNOT_GET_STN_CONFIG	0x8004C09E	CONFIG Cannot get the Station configuration
DEV_E_CF_MODULE_DEF_MISSING	0x8004C09F	CONFIG Module definition is missing
DEV_E_CF_MISMATCH_EMPTY_SLOT	0x8004C0A0	CONFIG Empty slot mismatch
DEV_E_CF_MISMATCH_INPUT_OFFSET	0x8004C0A1	CONFIG Input offset mismatch
DEV_E_CF_MISMATCH_OUTPUT_OFFSET	0x8004C0A2	CONFIG Output offset mismatch
DEV_E_CF_MISMATCH_DATA_TYPE	0x8004C0A3	CONFIG Data type mismatch
DEV_E_CF_MODULE_DEF_MISSING_NO_SI	0x8004C0A4	CONFIG Module definition is missing,(no Slot/Idx)

Table 69: cifX Driver Specific ODM Error Codes

11.7 Error Codes cifX Device Driver and netX Driver

11.7.1 Generic Error Codes

Error Code (Definition)	Value	Description
CIFX_INVALID_POINTER	0x800A0001	Invalid pointer (NULL) passed to driver
CIFX_INVALID_BOARD	0x800A0002	No board with the given nameindex available
CIFX_INVALID_CHANNEL	0x800A0003	No channel with the given index available
CIFX_INVALID_HANDLE	0x800A0004	Invalid handle passed to driver
CIFX_INVALID_PARAMETER	0x800A0005	Invalid parameter
CIFX_INVALID_COMMAND	0x800A0006	Invalid command
CIFX_INVALID_BUFFERSIZE	0x800A0007	Invalid buffer size
CIFX_INVALID_ACCESS_SIZE	0x800A0008	Invalid access size
CIFX_FUNCTION_FAILED	0x800A0009	Function failed
CIFX_FILE_OPEN_FAILED	0x800A000A	File could not be opened
CIFX_FILE_SIZE_ZERO	0x800A000B	File size is zero
CIFX_FILE_LOAD_INSUFF_MEM	0x800A000C	Insufficient memory to load file
CIFX_FILE_CHECKSUM_ERROR	0x800A000D	File checksum compare failed
CIFX_FILE_READ_ERROR	0x800A000E	Error reading from file
CIFX_FILE_TYPE_INVALID	0x800A000F	Invalid file type
CIFX_FILE_NAME_INVALID	0x800A0010	Invalid file name
CIFX_FUNCTION_NOT_AVAILABLE	0x800A0011	Driver function not available
CIFX_BUFFER_TOO_SHORT	0x800A0012	Given buffer is too short
CIFX_MEMORY_MAPPING_FAILED	0x800A0013	Failed to map the memory
CIFX_NO_MORE_ENTRIES	0x800A0014	No more entries available
CIFX_CALLBACK_MODE_UNKNOWN	0x800A0015	Unkown callback handling mode
CIFX_CALLBACK_CREATE_EVENT_FAILED	0x800A0016	Failed to create callback events
CIFX_CALLBACK_CREATE_RECV_BUFFER	0x800A0017	Failed to create callback receive buffer

Table 70: Generic Error Codes

11.7.2 Generic Driver Error Codes

Error Code (Definition)	Value	Description
CIFX_DRV_NOT_INITIALIZED	0x800B0001	Driver not initialized
CIFX_DRV_INIT_STATE_ERROR	0x800B0002	Driver init state error
CIFX_DRV_READ_STATE_ERROR	0x800B0003	Driver read state error
CIFX_DRV_CMD_ACTIVE	0x800B0004	Command is active on device
CIFX_DRV_DOWNLOAD_FAILED	0x800B0005	General error during download
CIFX_DRV_WRONG_DRIVER_VERSION	0x800B0006	Wrong driver version
CIFX_DRV_DRIVER_NOT_LOADED	0x800B0030	CIFx driver is not running
CIFX_DRV_INIT_ERROR	0x800B0031	Failed to initialize the device
CIFX_DRV_CHANNEL_NOT_INITIALIZED	0x800B0032	Channel not initialized (xOpenChannel not called)
CIFX_DRV_IO_CONTROL_FAILED	0x800B0033	IOControl call failed
CIFX_DRV_NOT_OPENED(0x800B0034	Driver was not opened
CIFX_DRV_DOWNLOAD_STORAGE_UNKNOWN	0x800B0040	Unknown download storage type (RAMFLASH based) found
CIFX_DRV_DOWNLOAD_FW_WRONG_CHANNEL	0x800B0041	Channel number for a firmware download not supported
CIFX_DRV_DOWNLOAD_MODULE_NO_BASEOS	0x800B0042	Modules are not allowed without a Base OS firmware

Table 71: Generic Driver Error Codes

11.7.3 Generic Device Error Codes

Error Code (Definition)	Value	Description
CIFX_DEV_DPM_ACCESS_ERROR	0x800C0010	Dual port memory not accessible (board not found)
CIFX_DEV_NOT_READY	0x800C0011	Device not ready (ready flag failed)
CIFX_DEV_NOT_RUNNING	0x800C0012	Device not running (running flag failed)
CIFX_DEV_WATCHDOG_FAILED	0x800C0013	Watchdog test failed
CIFX_DEV_SYSERR	0x800C0015	Error in handshake flags
CIFX_DEV_MAILBOX_FULL	0x800C0016	Send mailbox is full
CIFX_DEV_PUT_TIMEOUT	0x800C0017	Send packet timeout
CIFX_DEV_GET_TIMEOUT	0x800C0018	Receive packet timeout
CIFX_DEV_GET_NO_PACKET	0x800C0019	No packet available
CIFX_DEV_MAILBOX_TOO_SHORT	0x800C001A	Mailbox too short
CIFX_DEV_RESET_TIMEOUT	0x800C0020	Reset command timeout
CIFX_DEV_NO_COM_FLAG	0x800C0021	COM-flag not set
CIFX_DEV_EXCHANGE_FAILED	0x800C0022	IO data exchange failed
CIFX_DEV_EXCHANGE_TIMEOUT	0x800C0023	IO data exchange timeout
CIFX_DEV_COM_MODE_UNKNOWN	0x800C0024	Unknown IO exchange mode
CIFX_DEV_FUNCTION_FAILED	0x800C0025	Device function failed
CIFX_DEV_DPMSIZE_MISMATCH	0x800C0026	DPM size differs from configuration
CIFX_DEV_STATE_MODE_UNKNOWN	0x800C0027	Unknown state mode
CIFX_DEV_HW_PORT_IS_USED	0x800C0028	Device is still accessed
CIFX_DEV_CONFIG_LOCK_TIMEOUT	0x800C0029	Configuration locking timeout
CIFX_DEV_CONFIG_UNLOCK_TIMEOUT	0x800C002A	Configuration unlocking timeout
CIFX_DEV_HOST_STATE_SET_TIMEOUT	0x800C002B	Set HOST state timeout
CIFX_DEV_HOST_STATE_CLEAR_TIMEOUT	0x800C002C	Clear HOST state timeout
CIFX_DEV_INITIALIZATION_TIMEOUT	0x800C002D	Timeout during channel initialization
CIFX_DEV_BUS_STATE_ON_TIMEOUT	0x800C002E	Set Bus ON Timeout
CIFX_DEV_BUS_STATE_OFF_TIMEOUT	0x800C002F	Set Bus OFF Timeout
CIFX_DEV_MODULE_ALREADY_RUNNING	0x800C0040	Module already running
CIFX_DEV_MODULE_ALREADY_EXISTS	0x800C0041	Module already exists

Table 72: Generic Device Error Codes

11.8 Error Codes netX Driver

11.8.1 CIFS API Transport Error Codes

Error Code (Definition)	Value	Description
CIFS_TRANSPORT_SEND_TIMEOUT	0x800D0001	Time out while sending data
CIFS_TRANSPORT_RECV_TIMEOUT	0x800D0002	Time out waiting for incoming data
CIFS_TRANSPORT_CONNECT	0x800D0003	Unable to communicate to the device no answer
CIFS_TRANSPORT_ABORTED	0x800D0004	Transfer has been aborted due to keep alive timeout or interface detachment
CIFS_CONNECTOR_FUNCTIONS_READ_ERROR	0x800D0010	Error reading the connector functions from the DLL
CIFS_CONNECTOR_IDENTIFIER_TOO_LONG	0x800D0011	Connector delivers an identifier longer than 6 characters
CIFS_CONNECTOR_IDENTIFIER_EMPTY	0x800D0012	Connector delivers an empty identifier
CIFS_CONNECTOR_DUPLICATE_IDENTIFIER	0x800D0013	Connector identifier already used

Table 73: CIFS API Transport Error Codes

11.8.2 CIFS API Transport Header State Error Codes

Error Code (Definition)	Value	Description
CIFS_TRANSPORT_ERROR_UNKNOWN	0x800E0001	Unknown error code in transport header
CIFS_TRANSPORT_CHECKSUM_ERROR	0x800E0002	CRC16 checksum failed
CIFS_TRANSPORT_LENGTH_INCOMPLETE	0x800E0003	Transaction with incomplete length detected
CIFS_TRANSPORT_DATA_TYPE_UNKNOWN	0x800E0004	Device does not support requested data type
CIFS_TRANSPORT_DEVICE_UNKNOWN	0x800E0005	Device not available unknown
CIFS_TRANSPORT_CHANNEL_UNKNOWN	0x800E0006	Channel not available unknown
CIFS_TRANSPORT_SEQUENCE	0x800E0007	Sequence error detected
CIFS_TRANSPORT_BUFFER_OVERFLOW	0x800E0008	Buffer overflow detected
CIFS_TRANSPORT_RESOURCE	0x800E0009	Device signals out of resources
CIFS_TRANSPORT_KEEPA_LIVE	0x800E000A	Device connection monitoring error (Keep alive)
CIFS_TRANSPORT_DATA_TOO_SHORT	0x800E000B	Received transaction data too short

Table 74: CIFS API Transport Header State Error Codes

11.9 ODM Error Codes DBM V4

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_E_MD5_INVALID	0XC004C810	Checksum invalid
CDBM_E_INTERNALERROR	0XC004C811	Internal Error
CDBM_W_WRITEREGISTRY	0X8004C812	Error writing to the registry
CDBM_E_UNEXPECTED_VALUE_IN_OLD_HEADER_FORMAT	0XC004C813	Error in a file containing the old DBM Header format.
CDBM_E_CHECKSUM_INVALID	0XC004C814	The Checksum of the old Header is invalid
CDBM_E_DB_ALREADY_LOADED_FORMAT	0XC004C815	A database is already loaded
CDBM_E_NO_VALID_TRANSACTION	0XC004C816	No valid transaction handle given
CDBM_E_STD_STRUCT_ERROR	0XC004C817	An error occurred during validation of data
CDBM_E_UNSUPPORTED_DATA_TYPE_FORMAT	0XC004C818	Unsupported DataType
CDBM_W_CLASS_DELETED_FORMAT	0X8004C819 (Warning)	Using an Object which is marked as deleted
CDBM_W_CLIENT_DISCONNECTED	0X8004C81A (Warning)	A Client has already an outstanding connection to a Table. The connection is now destroyed.
CDBM_E_STRUCTURE_DEFINITION_INVALID	0XC004C81B	A structure definition of an Element in a Table is invalid
CDBM_E_NO_DATA_AVAILABLE	0XC004C81C	No data available for this operation
CDBM_E_NO_VALID_STRUCTURE	0XC004C81D	No valid structure available for this operation
CDBM_E_NO_TOGGLE_STRING_FOUND	0XC004C81E	No Toggle string found for this number
CDBM_E_ELEMENT_OUT_OF_RANGE	0XC004C81F	An element wasn't found in the Record of a Table
CDBM_E_ELEMENT_NOT_IN_TABLE	0XC004C820	The element is not part of the Table
CDBM_E_CANNOT_CONVERT_INTO_CLIENT_TYPE	0XC004C821	The data can't be converted into the Client type
CDBM_E_TRANSACTION_ALREADY_OPEN	0XC004C822	A transaction is already open. Please close this one first before opening a new one.
CDBM_I_OLD_WITHOUT_HEADER	0X4004C823 (Informational)	Use of an old DBM file Format without Header
CDBM_E_HR_FROM	0XC004C824	An HRESULT was received from a Subroutine
CDBM_E_PARAMETER	0XC004C825	A Parameter is invalid
CDBM_E_NOTIMPL	0XC004C826	Method is currently not implemented
CDBM_E_OUTOFMEMORY	0XC004C827	Out of memory
CDBM_E_NO_OPEN_TRANSACTION	0XC004C828	No transaction open
CDBM_E_NO_CONTENTS	0XC004C829	No contents available
CDBM_REC_NO_NOT_FOUND	0XC004C82A	Record not found
CDBM_STRUCTURE_ELEMENT_NOT_FOUND	0XC004C82B	Element of the Structure not found
CDBM_E_NO_MORE_RECORDS_IN_TABTYPE	0XC004C82C	Table type 3 can contain only one record
CDBM_E_WRITE	0XC004C82D	The data in the VARIANT must be given in a SafeArray
CDBM_E_WRITE_NO_PARRAY	0XC004C82E	The VARIANT contains no valid [parray] element

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_E_WRITE_CANT_ACCESS_DATA	0XC004C82F	Unable to access SafeArray Data in the VARIANT
CDBM_E_WRITE_DATA	0XC004C830	To write the data of this Element it must be given as a BSTR, or as an Array of VT_UI1/VT_I1
CDBM_E_WRITE_BSTR_E1	0XC004C831	The BSTR string must have an even length.
CDBM_E_WRITE_BSTR_E2	0XC004C832	The BSTR string must contain only hex digits (0..9 and a/A..f/F).
CDBM_E_WRITE_CANT_INTERPRET_ARRAY	0XC004C833	Unable to interpret data in the SafeArray.
CDBM_E_WRITE_VT_ERROR	0XC004C834	Data type in the SafeArray is not VT_UI1 or VT_I1.
CDBM_E_WRITE_LENGTH	0XC004C835	Data length is invalid for write operation of this type.
CDBM_WRITE_ELEMENT	0XC004C836	Element not found in the Record of the Table
CDBM_MIN_MAX_ERROR	0XC004C837	Can't write data because of min underflow or max overflow
CDBM_TABLE_EXIST	0XC004C838	Table already exist in the database
CDBM_MIN_MAX_INVALID	0XC004C839	The Min value is greater than the Max Value
CDBM_DEF_MIN_MAX_INVALID	0XC004C83A	The Default Value is not in the range between the Min value and the Max Value
CDBM_CANT_CHANGE_STRUCTURE_WHILE_RECORDS_EXIST	0XC004C83B	It's not allowed to change the structure while Records exist in the Table
CDBM_NEW_STRUCT_NEEDS_TYPE	0XC004C83C	In a newly added structure the data type must be set also
CDBM_VALUE_ERROR	0XC004C83D	Range error while validating a value
CDBM_DATATYPE_UNSUPPORTED_IN_RCS	0XC004C83E	The data type is unsupported in the RCS file format
CDBM_I_COUNT_OF_TABLES_EXCEEDS_RCS_RANGE	0X4004C83F (Informational)	The count of Tables exceeds the RCS range of Tables. This can cause problems if the file is downloaded to RCS Systems
CDBM_I_COUNT_OF_TABLES_EXCEEDS_OLDDBM_RANGE	0X4004C840 (Informational)	The count of Tables exceeds the DBM32.DLL range of Tables. This can cause problems if the file is used with older Tools using the DBM32.DLL
CDBM_UNSUPPORTED_DATATYPE_IN_RCS_MODE	0XC004C841	The Data type is not compatible with the old database format
CDBM_WRITE_UNSTRUCTURED_1	0XC004C842	The data of an unstructured record can only be written with the 'Write' Method not with 'WriteElement'.
CDBM_READ_UNSTRUCTURED_1	0XC004C843	The data of an unstructured record can only be read with the 'Read' Method not with 'ReadElement'
CDBM_WRITE_DATA_LENGTH_INVALID	0XC004C844	The given data length doesn't correspond with the expected data length.
CDBM_UNKNOWN_VIEW_MODE	0XC004C845	The View Mode is unknown.
CDBM_E_DIAG_TABLE	0XC004C846	It doesn't make much sense to add or delete records from a diagnostic table because those changes are never saved.
CDBM_E_ADR_STRING_ERROR	0XC004C847	The given Address string doesn't fit the required format of this type where all address bytes must be in the range between 0 and FF

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_ERROR_FROM_VAR_CHANGE_TYPE	0XC004C848	Function VariantChangeType return an error when trying to convert the Parameter
CDBM_E_MINERROR	0XC004C849	Error while comparing the Value with the lower range
CDBM_E_MAXERROR	0XC004C84A	Error while comparing the Value with the upper range
CDBM_E_RANGE_ERROR	0XC004C84B	Value out of Range
CDBM_E_TABLE_TYPE1	0XC004C84C	Table type 1 doesn't have a unique record length over all records
CDBM_E_TABLE_TYPE3_ADDREC	0XC004C84D	Table type 3 doesn't allow to insert more than one Record
CDBM_E_TABTYPE1	0XC004C84E	It's not allowed to insert more Records than structure definitions in Table Type 1
CDBM_E_TOGGLE_NOT_FOUND	0XC004C84F	Could not find the string for this value in the list of valid toggle strings
CDBM_E_TOGGLE_VALUE_IS_EMPTY_STRING	0XC004C850	The toggle string for this value is empty.
CDBM_VARIANT2BYTEARRAY_ERROR	0XC004C851	Error during conversion of Variant to byte array
CDBM_E_SET_ELEM_PROP_DEPENDENCY	0XC004C852	The Toggle Type needs also the additional string and the additional number entries in the Method
CDBM_E_TABTYPE1_REC_DOESNT_CORRESPOND_WITH_ELEMENT	0XC004C853	When reading the records of Table type 1 elementwise the record number must correspond with the element number
CDBM_TABTYPE1_NO_DATA_FOUND_FOR_RECORD	0XC004C854	When reading the records of Table type 1 and structure definitions are present it's assumed that for each structure element a corresponding record must exist
CDBM_E_TABTYPE1_WRITE_ELEMENT_NE_RECORD	0XC004C855	When writing the records of Table type 1 elementwise and structure definitions are present it's only allowed to write the corresponding element number in each record
CDBM_E_TABTYPE1_WRITE_ELEMENT_NOT_FOUND	0XC004C856	When writing the records of Table type 1 with an array and structure definitions are present it's assumed that a corresponding element number of this record exist
CDBM_I_TABLE_NAME_EXCEEDS_RCS_RANGE	0X4004C857 (Informational)	The Table name exceeds the maximum length of RCS compatible Table names
CDBM_W_CUT_STRING	0X8004C858 (Warning)	The string exceeds the maximum length and will be limited to the maximum length
CDBM_I_STRING_TOO_SHORT	0X4004C859 (Informational)	The string is below the minimum length. The minimum length will be reduced.
CDBM_I_STRING_TOO_LONG	0X4004C85A (Informational)	The string is exceeding the maximum. The maximum length will be extended.
CDBM_E_STRING_TOO_SHORT	0XC004C85B (Error)	The string is below the minimum length.
CDBM_E_STRING_TOO_LONG	0XC004C85C (Error)	The string is exceeding the maximum length
CDBM_E_WRONG_TYPE_FOR_WRITE	0XC004C85D	Writing on the Element type with the given Data type is not implemented
CDBM_E_NO_APPEND_IN_STRUCTURED_RECORDS	0XC004C85E	Method IDbmRecord::AppendData is not allowed for structured records

ODM Error Codes DBM V4		
Error Code (Definition)	Value	Description
CDBM_E_DATA_UNAVAILABLE	0XC004C85F	No data available
CDBM_E_CANT_CONVERT_INT	0XC004C860	Unable to convert the value into the Element type
CDBM_E_DBM_FILE_OVERFLOW	0XC004C861	You try to write a RCS like database which needs too much bytes
CDBM_E_PW_ERROR	0XC004C862	Password not correct
CDBM_E_FILELENGTH_CORRUPT	0XC004C863	The file length doesn't correspond to the length given in the Header.
CDBM_E_STRUCT_TYPE	0XC004C864	Error in the file.
CDBM_E_MD5SUM_INVALID	0XC004C865	MD5 sum invalid
CDBM_E_STRUCT_LENGTH	0XC004C866	Error in the expected and given structure length at a specific offset in the file.
CDBM_E_APPEND	0XC004C867	Append of data is only allowed if the Record contains only one data field and the field type will support this
CDBM_APPEND_NOT_SUPPORTED	0XC004C868	Append of Data not supported by this filed type
CDBM_DATA_TYPE_APPEND_ERROR	0XC004C869	Can't append Data of this type.
CDBM_E_UNSTRUCTURED_TABLE_DOESNT_SUPPORT_LENGTH	0XC004C86A	A Table without structure information doesn't support a record length
CDBM_E_DISABLED_WHILE_TRANSACTION_IS_OPEN	0XC004C86B	The Method is disabled while a transaction is open. Please close this one first and call the Method again.
CDBM_E_UNABLE_TO_CALL_READ_ON_LINKED_LIST	0XC004C86C	The Method is disabled on a LinkedList type. Please use the IRecordCollection on this type.
CDBM_E_ELEMENT_HAS_NO_SUBSTRUCTURE	0XC004C86D	An Element from a Table has no substructure
CDBM_STRUCT_ERROR_FROM_VAR_CHANGE_TYPE	0XC004C86E	Error from calling VariantChangeType
CDBM_E_FOREIGNKEY_DEF	0XC004C86F	The definition of a FOREIGNKEY must contain the name of the related Table in the description and this Table must exist at this time
CDBM_E_FOREIGNKEY_REF_TAB	0XC004C870	The description of a FOREIGNKEY must refer to a Table of type 'eDbmTableTypeLinkedList'
CDBM_E_KEY	0XC004C871	To create a Record Collection with a KEY it's necessary to have the data type KEY at the first position in all Records of the searched Table
CDBM_E_KEY_TABLE_TYPE	0XC004C872	This Method needs a Table of type 'eDbmTableTypeLinkedList'
CDBM_DATATYPE_NOT_IMPLEMENTED	0XC004C873	This data type is currently not implemented
CDBM_INSERT_POS_NOT_FOUND	0XC004C874	The position of the Record where the new one should be inserted wasn't found
CDBM_E_INSERT_REC_QI	0XC004C875	Error during insertion of a Record
CDBM_E_TAB_PROP	0XC004C876	Invalid Property in Table
CDBM_E_KEY_NOT_FOUND	0XC004C877	The KEY wasn't found in the Table
CDBM_E_KEY_INVALID	0XC004C878	The KEY is invalid for this operation

Table 75: ODM Error Codes DBM V4

12 Appendix

12.1 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**, **Description** and **Diagnosis** panes of the EtherNet/IP Adapter 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 **Device Description** panes do not contain any editable elements. The indicated values in are only for information purposes.

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

12.1.1 Settings

	Observer	Operator	Maintenance	Planning Engineer	Administrator
<i>Driver</i>	D	D	X	X	X
<i>Verify or adapt Driver Settings</i>	-	-	X	X	X
<i>Configuring netX Driver</i>	-	-	X	X	X
<i>Device Assignment</i>	D	D	X	X	X
<i>Scanning for Devices</i>	-	-	X	X	X
<i>Selecting the Device (with or without firmware)</i>	-	-	X	X	X
<i>Selecting the Device once more (with Firmware)</i>	-	-	X	X	X
<i>Firmware Download</i>	D	D	X	X	X

Table 76: Settings (D = Displaying, X = Editing, Configuring)

12.1.2 Configuration

	Observer	Operator	Maintenance	Planning Engineer	Administrator
<i>Configuration</i>	D	D	X	X	X
<i>General</i>	D	D	X	X	X
<i>Connection</i>	D	D	X	X	X
<i>Electronic Keying</i>	D	D	X	X	X
<i>Assembly</i>	D	D	X	X	X
<i>Device Settings</i>	D	D	X	X	X

Table 77: Configuration (D = Displaying, X = Editing, Configuring)

12.2 References

- [1] Device Type Manager (DTM) Style Guide, Version 1.0 ; FDT-JIG - Order No. <0001-0008-000>
- [2] EtherNet/IP Adapter Protocol API Manual, Revision 12, Hilscher GmbH 2013
- [3] THE CIP NETWORKS LIBRARY, Volume 2, EtherNet/IP Adaptation of CIP, Edition 1.19, April 2015

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Table 77: Configuration (D = Displaying, X = Editing, Configuring)

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12.5 Glossary

Assembly

Connection Point

CIP

Common Industrial Protocol (Control and Information Protocol)

DHCP

Dynamic Host Configuration Protocol

DLR

Device Level Ring

Protocol that helps in redundant communication with EtherNet / IP to increase system stability in a ring topology.

DNS

Domain Name Service.

DTM

Device Type Manager.

The Device Type Manager (DTM) is a software module with graphical user interface for the configuration or for diagnosis of device.

EDS

An Electronic Data Sheet (EDS) provides information necessary to access and alter the configurable parameters of a device. An Electronic Data Sheet (EDS) is an external file that contains information for the device.

EtherNet/IP

EtherNet/Industrial Protocol (CIP on Ethernet)

EtherNet/IP Scanner

A Scanner exchanges real-time I/O data with Adapters and Scanners. This type of node can respond to connection requests and can also initiate connections on its own.

EtherNet/IP-Adapter

An Adapter emulates functions provided by traditional rack-adapter products. This type of node exchanges real-time I/O data with a Scanner Class product. It does not 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.

MDI

Medium-dependent interface

The media-dependent interface is in the information technology part of the transmitter/receiver unit of a network device. It forms the mechanical connection between the physical interface (PHY) and the transport medium (cable). In general, the connection of a network adapter for the network cable - this means the network socket - is named this way. Especially in distribution devices (hubs, switches) this term has prevailed for the individual connections (ports). [Source: *Wikipedia*]

ODMV3

The Online-Data-Manager Version 3 (ODMV3) is an application interface. The ODMV3 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.

TCP/IP

Transmission Control Protocol / Internet Protocol

UDP

User Datagram Protocol.

12.6 Contacts

Headquarters

Germany

Hilscher Gesellschaft für
Systemautomation mbH
Rheinstrasse 15
65795 Hattersheim
Phone: +49 (0) 6190 9907-0
Fax: +49 (0) 6190 9907-50
E-Mail: info@hilscher.com

Support

Phone: +49 (0) 6190 9907-99
E-Mail: de.support@hilscher.com

Subsidiaries

China

Hilscher Systemautomation (Shanghai) Co. Ltd.
200010 Shanghai
Phone: +86 (0) 21-6355-5161
E-Mail: info@hilscher.cn

Support

Phone: +86 (0) 21-6355-5161
E-Mail: cn.support@hilscher.com

France

Hilscher France S.a.r.l.
69500 Bron
Phone: +33 (0) 4 72 37 98 40
E-Mail: info@hilscher.fr

Support

Phone: +33 (0) 4 72 37 98 40
E-Mail: fr.support@hilscher.com

India

Hilscher India Pvt. Ltd.
Pune, Delhi, Mumbai
Phone: +91 8888 750 777
E-Mail: info@hilscher.in

Italy

Hilscher Italia S.r.l.
20090 Vimodrone (MI)
Phone: +39 02 25007068
E-Mail: info@hilscher.it

Support

Phone: +39 02 25007068
E-Mail: it.support@hilscher.com

Japan

Hilscher Japan KK
Tokyo, 160-0022
Phone: +81 (0) 3-5362-0521
E-Mail: info@hilscher.jp

Support

Phone: +81 (0) 3-5362-0521
E-Mail: jp.support@hilscher.com

Korea

Hilscher Korea Inc.
Seongnam, Gyeonggi, 463-400
Phone: +82 (0) 31-789-3715
E-Mail: info@hilscher.kr

Switzerland

Hilscher Swiss GmbH
4500 Solothurn
Phone: +41 (0) 32 623 6633
E-Mail: info@hilscher.ch

Support

Phone: +49 (0) 6190 9907-99
E-Mail: ch.support@hilscher.com

USA

Hilscher North America, Inc.
Lisle, IL 60532
Phone: +1 630-505-5301
E-Mail: info@hilscher.us

Support

Phone: +1 630-505-5301
E-Mail: us.support@hilscher.com