



Operating Instruction Manual
DTM for Hilscher PROFINET IO-Device
Configuration of Hilscher Devices
V1.1100

Hilscher Gesellschaft für Systemautomation mbH

www.hilscher.com

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Table of Contents

1	INTRODUCTION.....	6
1.1	About this Manual	6
1.1.1	Descriptions of the Dialog Panes	6
1.1.2	Online Help	7
1.1.3	List of Revisions	7
1.1.4	Conventions in this Manual	8
1.2	Legal Notes.....	9
1.3	Registered Trademarks.....	12
1.4	About PROFINET IO-Device DTM	13
1.4.1	Requirements	14
1.5	Dialog Structure of the PROFINET IO Device DTM.....	15
1.5.1	General Device Information.....	16
1.5.2	Navigation Area	16
1.5.3	Dialog Panes	17
1.5.4	OK, Cancel, Apply and Help.....	18
1.5.5	Table Lines	18
1.5.6	Table View and Handling	19
1.5.7	Status Bar	20
2	SAFETY	21
2.1	General Note.....	21
2.2	Intended Use.....	21
2.3	Personnel Qualification	21
2.4	Safety Instructions.....	21
2.4.1	Communication Stop during Firmware or Configuration Download	22
2.4.2	Mismatching System Configuration.....	22
2.5	Property Damage	23
2.5.1	Power Disconnect while downloading Firmware or Configuration	23
2.5.2	Invalid Firmware	23
2.6	Labeling of Safety Messages	24
2.7	References Safety.....	24
3	GETTING STARTED	25
3.1	Configuration Steps.....	25
3.1.1	Device DTM at the Root-Line (Stand-Alone Slave).....	25
3.1.2	Slave DTM at the Master busline	28
3.2	Safety Messages on Firmware or Configuration Download	31
3.3	PROFINET IO Device Instance	32
4	SETTINGS	33
4.1	Overview Settings	33

4.2	Settings for Driver and Device Assignment	34
4.3	Driver	36
4.3.1	Verify or adapt Driver Settings	36
4.3.2	cifX Device Driver	38
4.3.3	netX Driver	38
4.3.4	Configuring netX Driver	39
4.3.5	netX Driver - USB/RS232 Connection	40
4.3.6	netX Driver - TCP/IP Connection	43
4.4	Device Assignment	46
4.4.1	Scanning for Devices	46
4.4.2	Selecting the Device (with or without firmware)	49
4.4.3	Selecting the Device once more (with Firmware)	50
4.5	Firmware Download	52
5	CONFIGURATION	58
5.1	Overview Configuration	58
5.2	Configuring Device Parameters	59
5.2.1	Slave DTM at the Root-Line (Stand-Alone Slave)	59
5.2.2	Slave DTM at the Master busline	60
5.3	General	62
5.4	Modules	63
5.4.1	Modules Table	64
5.4.2	Indication of the Firmwareversion of the Device Instance	65
5.4.3	Configure Modules	65
5.4.4	Configuration Info	68
5.4.5	Submodules Details	69
5.5	Signal Configuration	70
5.5.1	Signal Configuration Pane	71
5.5.2	Create Signal Configuration	72
5.6	Address Table	76
5.6.1	Explanation of the Parameters	77
5.6.2	Display Mode, CSV Export	77
5.7	Device Settings	78
5.7.1	Start of Bus Communication	79
5.7.2	Application Monitoring	79
5.7.1	Process Image Storage Format	80
5.7.2	IO State Information	81
6	DESCRIPTION	82
6.1	Overview Description	82
6.2	Device Info	83
6.3	Module Info	84
6.4	GSDML Viewer	85
7	ONLINE FUNCTIONS	86

7.1	Connecting/Disconnecting Device	86
7.2	Upload	88
7.3	Download Configuration	89
7.4	Start /Stop Communication	91
8	DIAGNOSIS	92
8.1	Overview Diagnosis	92
8.2	General Diagnosis.....	93
8.3	Firmware Diagnosis	95
9	EXTENDED DIAGNOSIS	96
9.1	Overview Extended Diagnosis.....	96
9.2	Task Information	97
9.3	IniBatch Status.....	98
9.4	General Diagnosis Information	99
9.5	PNIO_DCP.....	100
9.5.1	Extended Diagnosis Information	100
9.6	TCP_UDP	102
9.6.1	IP Information	102
9.6.2	IP Packet Counter	103
9.6.3	IP Code Diagnosis.....	103
9.6.4	TCP_UDP Information.....	104
9.6.5	TCP_UDP Code Diagnosis	104
9.7	RPC	105
9.7.1	Extended Diagnosis Information	105
9.8	PNS_IF	106
9.8.1	PROFINET IO Device Extended Diagnosis Information	106
10	TOOLS	107
10.1	Overview Tools	107
10.2	Packet Monitor	108
10.2.1	Sending Packet	109
10.2.2	Receiving Packet.....	110
10.3	IO Monitor	111
11	ERROR CODES.....	112
11.1	Error Code Definition.....	112
11.2	Overview Error Codes	113
11.3	General Hardware Error Codes.....	114
11.3.1	RCX General Task Errors.....	114
11.3.2	RCX Common Status & Errors Codes	115
11.3.3	RCX Status & Error Codes	116
11.4	Status /Error Codes PROFINET IO Device	117
11.4.1	Packet Status/Error	117

11.5	ODM Error Codes	122
11.5.1	General ODM Error Codes	122
11.5.2	General ODM Driver Error Codes	123
11.5.3	cifX Driver Specific ODM Error Codes	124
11.6	Error Codes cifX Device Driver and netX Driver	127
11.6.1	Generic Error Codes.....	127
11.6.2	Generic Driver Error Codes	128
11.6.3	Generic Device Error Codes	129
11.7	Error Codes netX Driver	130
11.7.1	CIFX API Transport Error Codes.....	130
11.7.2	CIFX API Transport Header State Error Codes	130
11.8	ODM Error Codes DBM V4	131
12	APPENDIX	135
12.1	User Rights	135
12.1.1	Settings.....	135
12.1.2	Configuration	135
12.2	Name encoding	136
12.3	References.....	136
12.4	List of Figures	137
12.5	List of Tables.....	138
12.6	Glossary.....	140
12.7	Contacts.....	143

1 Introduction

1.1 About this Manual

This manual provides information on how to set and configure the device parameters of a netX based PROFINET IO-Device device within a FDT Framework using the PROFINET IO-Device DTM, and what can be read from the diagnosis panes.

In a network project the PROFINET IO-Device DTM can be dropped:

- to the root line (Stand-Alone Slave),
- or to the Master busline of a PROFINET IO-Controller DTM.



Note: This manual edition first provides information for the case if the PROFINET IO-Device DTM is dropped to the root line (Stand-Alone Slave) and in addition important information for the case if the PROFINET IO-Device DTM is dropped to the Master busline of a PROFINET IO-Controller DTM.

1.1.1 Descriptions of the Dialog Panes

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

Section	Subsection	Page
<i>Settings</i>	<i>Overview Settings</i>	33
	<i>Driver</i>	36
	<i>Device Assignment</i>	46
	<i>Firmware Download</i>	52
<i>Configuration</i>	<i>Overview Configuration</i>	58
	<i>General</i>	62
	<i>Modules</i>	63
	<i>Signal Configuration</i>	70
	<i>Address Table</i>	76
	<i>Device Settings</i>	78
<i>Description</i>	<i>Overview Description</i>	82
	<i>Device Info</i>	83
	<i>Module Info</i>	84
	<i>GSDML Viewer</i>	85
<i>Diagnosis</i>	<i>Overview Diagnosis</i>	92
	<i>General Diagnosis</i>	93
	<i>Firmware Diagnosis</i>	95
<i>Extended Diagnosis</i>	<i>Overview Extended Diagnosis</i>	96
<i>Tools</i>	<i>Overview Tools</i>	107
	<i>Packet Monitor</i>	108
	<i>IO Monitor</i>	111

Table 1: Descriptions Dialog Pages

1.1.2 Online Help

The PROFINET IO-Device 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
14	29-01-28	1.1100	5.5 12.2	Section <i>Signal Configuration</i> added. Section <i>Name encoding</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 PROFINET



Note: The PROFINET IO specification defines the designations "Controller" instead of "Master" and "Device" instead of "Slave". In this manual "Controller" and "Device" are used with the PROFINET IO device or the DTM. In connection with general questions about the Master or the Slave functionality, the terms "Master" and "Slave" are used, as in the network configuration on the Master bus line or the „Stand-Alone-Slave“.

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1.4 About PROFINET IO-Device DTM

You can use the PROFINET IO-Device DTM to configure PROFINET IO-Device devices within a FDT Framework and to view the device diagnosis.

In a network project the PROFINET IO-Device DTM can be dropped:

- to the root line (Stand-Alone Slave),
- or to the Master busline of a PROFINET IO-Controller DTM.

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

Insert the PROFINET IO-Device DTM to the root busline if you intend to configure only one single PROFINET IO-Device device.

Device DTM at the Master Busline

Insert the PROFINET IO-Device DTM to the Controller busline of the PROFINET IO-Controller DTM if within the network project the Device device and the Controller device are used, i. e. if you intend to configure the Device device and the Controller 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 PROFINET IO-Device DTM

To configure the PROFINET IO-Device device with the PROFINET IO-Device DTM the following requirements have to be accomplished:

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



Note: If the PROFINET IO-Device DTM and the PROFINET IO-Device 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 PROFINET IO Device 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.

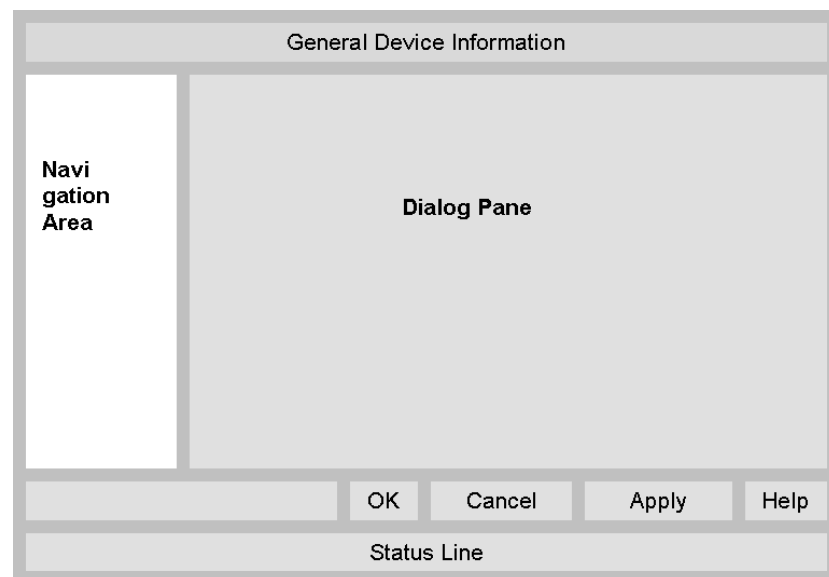


Figure 1: Dialog Structure of the PROFINET IO-Device DTM

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.

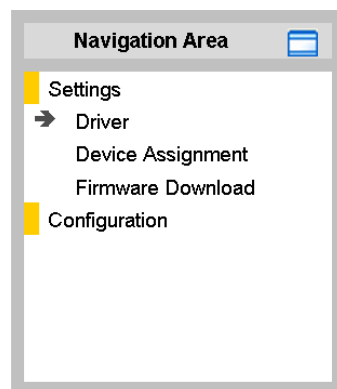


Figure 2: Navigation Area

- 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**, **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 PROFINET IO-Device DTM to the PROFINET IO-Device 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 36.
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 46.
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 52.
Configuration	
General	On the pane General PROFINET IO device information is displayed. For further information, refer to section <i>General</i> on page 62.
Modules	On the Modules pane modules, submodules and parameters can be selected or configured, which are read from the GSDML file. For further information, refer to section <i>Modules</i> on page 63.
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 see section <i>Signal Configuration</i> on page 70.
Address Table	The Address Table shows a list of all dpram addresses used in the process data image. For further information, refer to section <i>Address Table</i> on page 76.
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 78.
Description	
Device	The Device Info pane contains the manufacturer information about the device. For further information, refer to section <i>Device Info</i> on page 83.
Module Info	The Module Info pane shows information for the available modules of this device. For further information, refer to section <i>Module Info</i> on page 84 .
GSDML	By use of the GSDML-Viewer a GSDML file can be viewed and searched through. For further information, refer to section <i>GSDML Viewer</i> on page 85.
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 92 or section <i>Overview Extended Diagnosis</i> on page 96.
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 108 or section <i>IO Monitor</i> on page 111.

Table 4: Overview Dialog Panes



Note: Accessing the **Diagnosis** panes of the PROFINET IO-Device DTM requires an online connection from the PROFINET IO-Device DTM to the PROFINET IO-Device DTM.



For further information, refer to section *Connecting/Disconnecting Device* on page 86.

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.

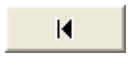
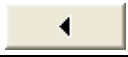

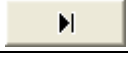


	Meaning
	To select the first line of a table use First Line .
	To select the previous line of a table use Previous Line .
	To select the next line of a table use Next Line .
	To select the last line of a table use Last Line .
	Create a new Line inserts new lines into the table.
	Delete selected Line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

Table 6: Selecting, inserting, deleting Table Line

1.5.6 Table View and Handling

Table elements

Table data can be static or editable or can be filled to special fields (e. g. for an IP address). Table rows can be displayed or hidden on the plus and minus symbols.

- Static: The table data is static.
- Editable: The table data can be edited using an integrated editor.
- Input fields for specific data (eg. as the IP address)
- Plus (+) / minus (-): Display / hide table rows
- Drop-down list (selection list): To click or select an item

Display / hide table rows

	Slot	Sub Slot	!	Module
▶ +	0		✚	CIFX RE/PNS V3.5.35 - V3.x [1250.100]
+	1			1 Byte Input
+	2			1 Byte Input

Figure 3: Hidden table rows

➤ Click on the + sign or press the spacebar.

➤ Additional table rows are displayed.

	Slot	Sub Slot	!	Module
[-]	0		✚	CIFX RE/PNS V3.5.35 - V3.x [1250.100]
		1	✚	CIFX RE/PNS V3.5.35 - V3.x
		32768	✚	PN-IO
		32769	✚	Port 1
		32770	✚	Port 2
[-]	1			1 Byte Input
		1	✚	1 Byte Input
▶ +	2			1 Byte Input

Figure 4: Additional table rows displayed

Drop-down list

➤ To select an entry from the drop-down list, click the appropriate field in the interactive table and select the required entry.

	Slot	Sub Slot	!	Module
+	0		✚	CIFX RE/PNS V3.5.35 - V3.x [1250.100]
▶ +	1			1 Byte Input
+	2			1 Byte Input
				2 Bytes Input
				3 Bytes Input
				4 Bytes Input
				8 Bytes Input
				12 Bytes Input

Figure 5: Drop-down list

1.5.7 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.

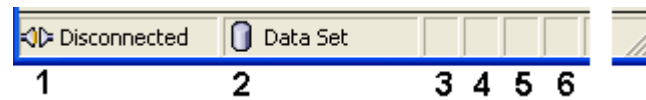
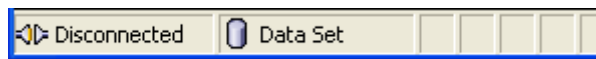


Figure 6: Status Bar – Status Fields 1 to 6

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]

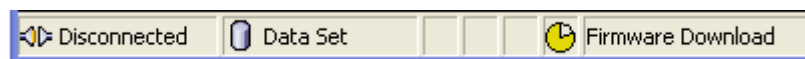
Offline State



Save operation succeeded



Firmware Download



Firmware Download successful



Online State and Diagnosis

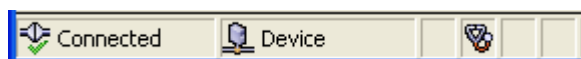


Figure 7: Status Bar Display Examples

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 PROFINET IO-Controller DTM serves for configuration and diagnosis of PROFINET IO-Controller 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 PROFINET IO-Device 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 PROFINET IO-Device 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 PROFINET IO-Device device with PROFINET IO-Device 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:

- Device DTM at the Root-Line (Stand-Alone Slave)
- and Device DTM at the Controller busline.

3.1.1 Device 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 Device into configuration	Depending of the FDT Container: For netDevice: - in the Device Catalog under Gateway / Stand-Alone Slave click to the Device or to the correct device instance . - Check under Device > Info the info about the feature set of the single device instances. <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"></div> <div> <p>Rule 1: Use a device instance (in the Controller and in the Device) that is supported by the used PROFINET IO Device firmware.</p> <p>Rule 2: The device instance that is configured in the Controller for the Device must match the device instance configured in the Device.</p> </div> </div> - Insert the Device or the device instance via drag and drop to the root line in the network view.	(See <i>Operating Instruction Manual netDevice and netProject</i>) <i>PROFINET IO Device Instance</i>	32
4	Open the Slave DTM configuration dialog	Open the Device DTM configuration dialog. - Double click to the device icon of the Device. - The Device DTM configuration dialog is displayed.	-	-



#	Step	Short Description	For detailed information see section	Page
5	Verify or adapt Driver Settings	In the Device DTM configuration dialog: - select Settings > Driver .	<i>Settings for Driver and Device Assignment and Driver</i>	34
		 <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 PROFINET IO-Device DTM is installed on the same PC as the PROFINET IO-Device device.• Use the netX Driver to establish a USB, Serial (RS232) or TCP/IP connection from the PROFINET IO-Device DTM to the PROFINET IO-Device 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>		36
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>	39
7	Assign Device device (with or without firmware)	<p>Assign the device to this driver.</p> <p>In the Device DTM configuration dialog:</p> <p>- select Settings > Device Assignment,</p> <p>- select a Device device (with or without firmware),</p> <p>- therefore check the appropriate checkbox,</p> <p>- select Apply.</p>	<i>Selecting the Device (with or without firmware)</i>	49
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 Master DTM configuration dialog:</p> <p>- select Settings > Firmware Download,</p> <p>- select Browse...,</p> <p>- select a firmware file,</p> <p>- select Open,</p> <p>- select Download and Yes.</p>	<i>Safety Messages on Firmware or Configuration Download</i>	31
			<i>Firmware Download</i>	52

#	Step	Short Description	For detailed information see section	Page
9	Assign Device device once more (with firmware and system channel) <i>For repeated download this step is omitted.</i>	In the Device DTM configuration dialog: - select Settings > Device Assignment , - select Scan , - select the Device device (with loaded firmware and defined system channel), - therefore check the appropriate checkbox, - select Apply , - close the Device DTM configuration dialog via OK .	<i>Selecting the Device once more (with Firmware)</i>	50
10	Configure Device device	Configure the Device. - Double click to the device icon of the Device. - The Device DTM configuration dialog is displayed. In the Device DTM configuration dialog: - select Configuration > Modules , - configure the PROFINET IO device modules, - select Configuration > Signal Configuration , - proceed the signal configuration, - select Configuration > Device Settings (including IOPS interface configuration), - set the Device Settings. - close the Device DTM configuration dialog via OK .	<i>Configuring Device Parameters</i> <i>Modules</i> <i>Signal Configuration</i> <i>Device Settings</i>	59 63 70 78
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 Device device	Depending of the FDT Container. For netDevice: - right click to the device icon of the Device, - select Connect .	<i>Connecting/Disconnecting Device</i>	86
13	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 Device, - select Download .	<i>Safety Messages on Firmware or Configuration Download</i> <i>Download Configuration</i>	31 89
14	Diagnosis	Depending of the FDT Container. For netDevice: - right click to the device icon of the Device, - select Diagnosis . - The Device 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 Device DTM diagnosis dialog via OK .	<i>Overview Diagnosis</i>	92
15	IO Monitor	Depending of the FDT Container: For netDevice: - right click to the device icon of the Device, - select Diagnosis , - select Tools > IO Monitor . - Check the input or output data, - close the IO Monitor dialog via OK .	<i>IO Monitor</i>	111
16	Disconnect	Depending of the FDT Container. For netDevice: - right click to the device icon of the Device, - select Disconnect .	<i>Connecting/Disconnecting Device</i>	86

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

3.1.2 Slave 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 .	(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 Controller or Device into configuration	<p>For netDevice:</p> <ul style="list-style-type: none"> - in the Device Catalog click to the Controller, - and insert the device via drag and drop to the root line in the network view, - in the Device Catalog click to the Device or to the correct device instance. - Check under Device > Info the info about the feature set of the single device instances. <div>  <p>Rule 1: Use a device instance (in the Controller and in the Device) that is supported by the used PROFINET IO Device firmware.</p> <p>Rule 2: The device instance that is configured in the Controller for the Device must match the device instance configured in the Device.</p> </div> <p>- Insert the Device or the device instance via drag and drop to the Controller bus line in the network view.</p>	<p>(See <i>Operating Instruction Manual netDevice and netProject</i>)</p> <p><i>PROFINET IO Device Instance</i></p>	32
4	Open the Slave DTM configuration dialog	<p>Open the Device DTM configuration dialog.</p> <ul style="list-style-type: none"> - Double click to the device icon of the Device. - The Device DTM configuration dialog is displayed. 	-	-
5	Verify or adapt Driver Settings	<p>In the Device DTM configuration dialog:</p> <ul style="list-style-type: none"> - select Settings > Driver. <div>  <p>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.</p> <ul style="list-style-type: none"> • Use the cifX Device Driver if the PROFINET IO-Device DTM is installed on the same PC as the PROFINET IO-Device device. • Use the netX Driver to establish a USB, Serial (RS232) or TCP/IP connection from the PROFINET IO-Device DTM to the PROFINET IO-Device 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> </div> <p>- Verify that the default driver is checked. - If necessary, check another driver or multiple drivers.</p>	<p><i>Settings for Driver and Device Assignment and Driver</i></p>	<p>34</p> <p>36</p>

#	Step	Short Description	For detailed information see section	Page
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> <ul style="list-style-type: none"> - Select Settings > Driver > netX Driver > TCP Connection. - Via  add an IP range. - Under IP Address enter the IP Address of the device or an IP range. - Click Save. <p>Adjust the driver parameters netX Driver USB/RS232 only if they differ from the default settings.</p> <div>  <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. </div>	<i>Configuring netX Driver</i>	39
7	Assign Device device (with or without firmware)	<p>Assign the device to this driver.</p> <p>In the Device DTM configuration dialog:</p> <ul style="list-style-type: none"> - select Settings > Device Assignment, - select a Device device (with or without firmware), - therefore check the appropriate checkbox, - select Apply. 	<i>Selecting the Device (with or without firmware)</i>	49
8	Select and download firmware	<p>If not yet a firmware was loaded to the device:</p> <ul style="list-style-type: none"> - Adhere to the necessary safety precautions to prevent personnel injury and property damage. <p>In the Device DTM configuration dialog:</p> <ul style="list-style-type: none"> - 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> <i>Firmware Download</i>	31 52
9	Assign Device device once more (with firmware and system channel) <i>For repeated download this step is omitted.</i>	<p>In the Device DTM configuration dialog:</p> <ul style="list-style-type: none"> - select Settings > Device Assignment, - select Scan, - select the Device device (with loaded firmware and defined system channel), - therefore check the appropriate checkbox, - select Apply, - close the Device DTM configuration dialog via OK. 	<i>Selecting the Device once more (with Firmware)</i>	50
10	Configure Device device	<p>Configure the Device.</p> <ul style="list-style-type: none"> - Double click to the device icon of the Device. - The Device DTM configuration dialog is displayed. <p>In the Device DTM configuration dialog:</p> <ul style="list-style-type: none"> - select Configuration > Modules, - configure the PROFINET IO device modules, - select Configuration > Signal Configuration, - proceed the signal configuration, - select Configuration > Device Settings, - set the Device Settings. - close the Device DTM configuration dialog via OK. 	<i>Configuring Device Parameters</i> <i>Modules</i> <i>Signal Configuration</i> <i>Device Settings</i>	59 63 70 78
11	Configure Controller device	Configure the Controller device via the PROFINET IO Controller DTM netX.	<i>(See Operating Instruction Manual DTM for PROFINET IO Controller devices)</i>	-
12	Save project	<p>Depending of the frame application.</p> <p>For the configuration software:</p> <ul style="list-style-type: none"> - select File > Save. 	<i>(See Operating Instruction Manual of the Frame Application)</i>	-

#	Step	Short Description	For detailed information see section	Page
13	Connect Device device	Depending of the FDT Container. For netDevice: - right click to the device icon of the Device, - select Connect .	<i>Connecting/Disconnecting Device</i>	86
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 Device, - select Download .	<i>Safety Messages on Firmware or Configuration Download</i> <i>Download Configuration</i>	31 89
15	Diagnosis	Depending of the FDT Container. For netDevice: - right click to the device icon of the Device, - select Diagnosis . - The Device 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 Device DTM diagnosis dialog via OK .	<i>Overview Diagnosis</i>	92
16	IO Monitor	Depending of the FDT Container: For netDevice: - right click to the device icon of the Device, - select Diagnosis , - select Tools > IO Monitor . - Check the input or output data, - close the IO Monitor dialog via OK .	<i>IO Monitor</i>	111
17	Disconnect	Depending of the FDT Container. For netDevice: - right click to the device icon of the Device, - select Disconnect .	<i>Connecting/Disconnecting Device</i>	86

Table 10: Getting started - Configuration Steps (Device 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 PROFINET IO-Device 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.

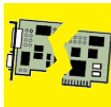
The firmware download overwrites the existing firmware. The communication stop may cause loss of device parameters and possible device damage may occur.

- 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**

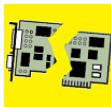
Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury or damage of equipment.

- 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.
-

3.3 PROFINET IO Device Instance

For PROFINET IO > ‚Stand-Alone Slave‘ (Device) in the device catalog all device instances of *one* device description file appear as separate devices. To distinguish the device instances originating from the same device description file, the device name is followed by the *firmware version* or the *range of the firmware versions* the device instance is valid for.

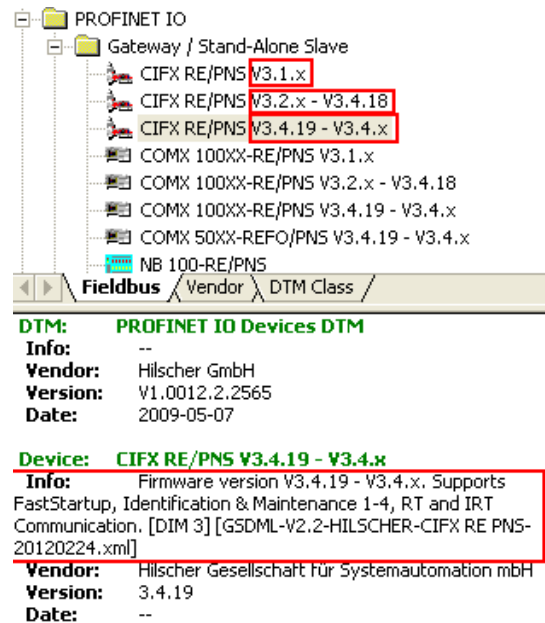


Figure 8: PROFINET IO Device Instance Stand-Alone Slave (Example)

Under **Device > Info** additional information is given about the selected device instance, such as the *firmware version*, the *feature set* or the *name of the device description file*.

The device instance must be selected according to the used *firmware version* and *device type*. According to the version of the PROFINET IO Device firmware the device instance specifies, which features the Device has. The device instance is a module of the GSDML to describe the device parameters device specific.

Rule 1: Use a device instance (in the Controller and in the Device) that is supported by the used PROFINET IO Device firmware.

Example to Rule 2: If you use a Device with the latest firmware, you can use any available device instances. Your Device will work properly then.

Rule 2: The device instance that is configured in the Controller for the Device must match the device instance configured in the Device.

Example to Rule 1: If you use a Device with an earlier firmware and if you select in addition the latest device instance, your system will not work properly.

4 Settings

4.1 Overview Settings

Settings Dialog Panes

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

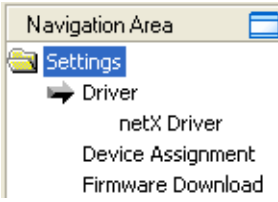
PROFINET IO-Device DTM	Folder Name / Section	Subsection	Manual Page
 <p>Navigation Area – Settings (Example)</p> <p>Additional drivers can be displayed.</p>	Driver		36
		Verify or adapt Driver Settings	36
		cifX Device Driver	38
		netX Driver	38
		Configuring netX Driver	39
	Device Assignment		46
		Scanning for Devices	46
		Scanning for all Devices or for suitable only	48
		Selecting the Device (with or without firmware)	49
		Selecting the Device once more (with Firmware)	50
	Firmware Download		52

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 34.

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 PROFINET IO-Device DTM to the PROFINET IO-Device 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 PROFINET IO-Device 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 PROFINET IO-Device DTM is installed on the same PC as the PROFINET IO-Device device.
- Use the **netX Driver** to establish an USB, Serial (RS232) or TCP/IP connection from the PROFINET IO-Device DTM to the PROFINET IO-Device 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 Device 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 PROFINET IO-Device device icon.
9. Select the **Connect** command from the context menu.
- In the network view the device description at the device icon of the Device is displayed with a green colored background. The PROFINET IO-Device device now is connected to the PROFINET IO-Device 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 PROFINET IO-Device 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 9: 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 PROFINET IO-Device DTM to the PROFINET IO-Device 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 10: 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 11: 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 PROFINET IO-Device DTM to the PROFINET IO-Device device must be supported by the device and must be available for the device.

- Use the **cifX Device Driver** if the PROFINET IO-Device DTM is installed on the same PC as the PROFINET IO-Device device.
 - Use the **netX Driver** to establish a USB, Serial (RS232) or TCP/IP connection from the PROFINET IO-Device DTM to the PROFINET IO-Device 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 12: Manual Selection of multiple drivers (Example)

4.3.2 cifX Device Driver

In the PROFINET IO-Device-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 PROFINET IO-Device DTM is installed in the same PC as the PROFINET IO-Device device.



Note: To establish a connection from a DTM to a Device device via the **cifX Device Driver**, the **cifX Device Driver** must be installed and the driver must have access to the Device 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 13: 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**.

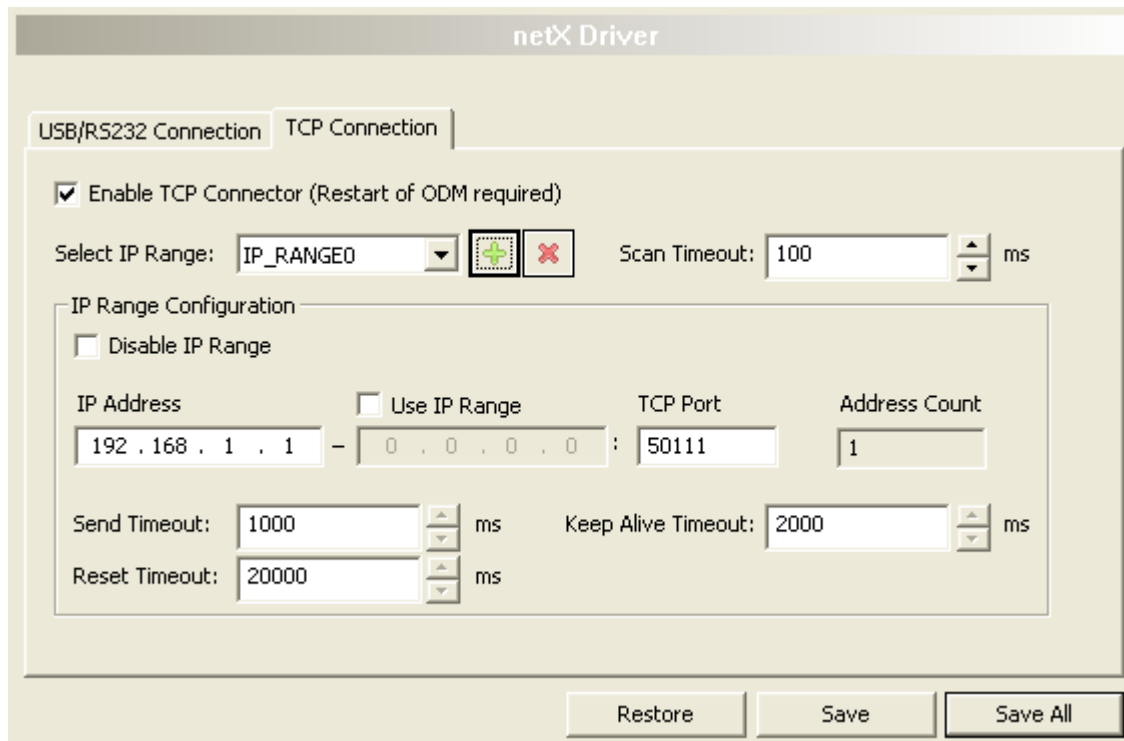





Figure 14: netX Driver > TCP Connection

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 PROFINET IO-Device device to the PROFINET IO-Device DTM by checking the check box. This is essential to establish an online connection from the PROFINET IO-Device DTM to the PROFINET IO-Device device later, as described in section *Connecting/Disconnecting Device* on page 86.

Therefore in the **Device Assignment** dialog pane you scan for the PROFINET IO-Device 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 checked="" type="checkbox"/>	Device Cl*	-/-PROFIBUS/-	1	20148	CIFX Device Driver	Undefined Undefined	...\cifX3_SYS

Figure 15: 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 PROFINET IO-Device 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 PROFINET IO-Device 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**.

Device Assignment							
Scan progress: 5/5 Devices (Current device: -)							
<div>Device selection: all</div>							<div>Scan</div>
	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
<input type="checkbox"/>	Device Cl.*	-/-/DeviceNet/-	n/a	20027	CIFX Device Driver	Undefined Undefined	...\\cifX1_SYS
<input type="checkbox"/>	Device Cl.*	-/-/-/-	n/a	20058	netX Driver	Undefined Undefined	...\\192.168.1..
<input type="checkbox"/>	Device Cl.*	Ethernet/Ethernet/-/-	n/a	20288	CIFX Device Driver	Undefined Undefined	...\\cifX2_SYS
<input type="checkbox"/>	Device Cl.*	-/-/CANopen/-	n/a	20022	CIFX Device Driver	Undefined Undefined	...\\cifX0_SYS

Figure 16: 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 PROFINET IO-Device 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 PROFINET IO-Device DTM can only be established with one PROFINET IO-Device device.

To select the physical PROFINET IO-Device 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 17: 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 PROFINET IO-Device DTM to the PROFINET IO-Device 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 52 or to section *Selecting the Device once more (with Firmware)* on page 50.

4.4.3 Selecting the Device once more (with Firmware)



Note: For repeated download this step is omitted.

To select the PROFINET IO-Device 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 18: 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 PROFINET IO-Device 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 19: 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 PROFINET IO-Device DTM to the PROFINET IO-Device device, refer to section *Connecting/Disconnecting Device* on page 86.

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 Device device (with or without firmware) and the device must be assigned to the hardware. For further information refer to section *Overview Settings* on page 33.

To load the firmware to the device:

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

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

Figure 20: 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:

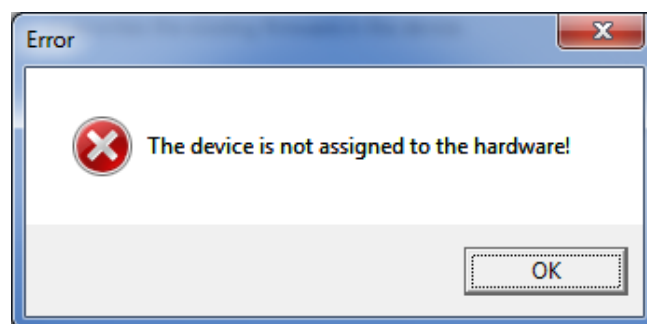


Figure 21: Error Message 'The device is not assigned to the hardware!'

- Click **OK** and select and assign the Device 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**.

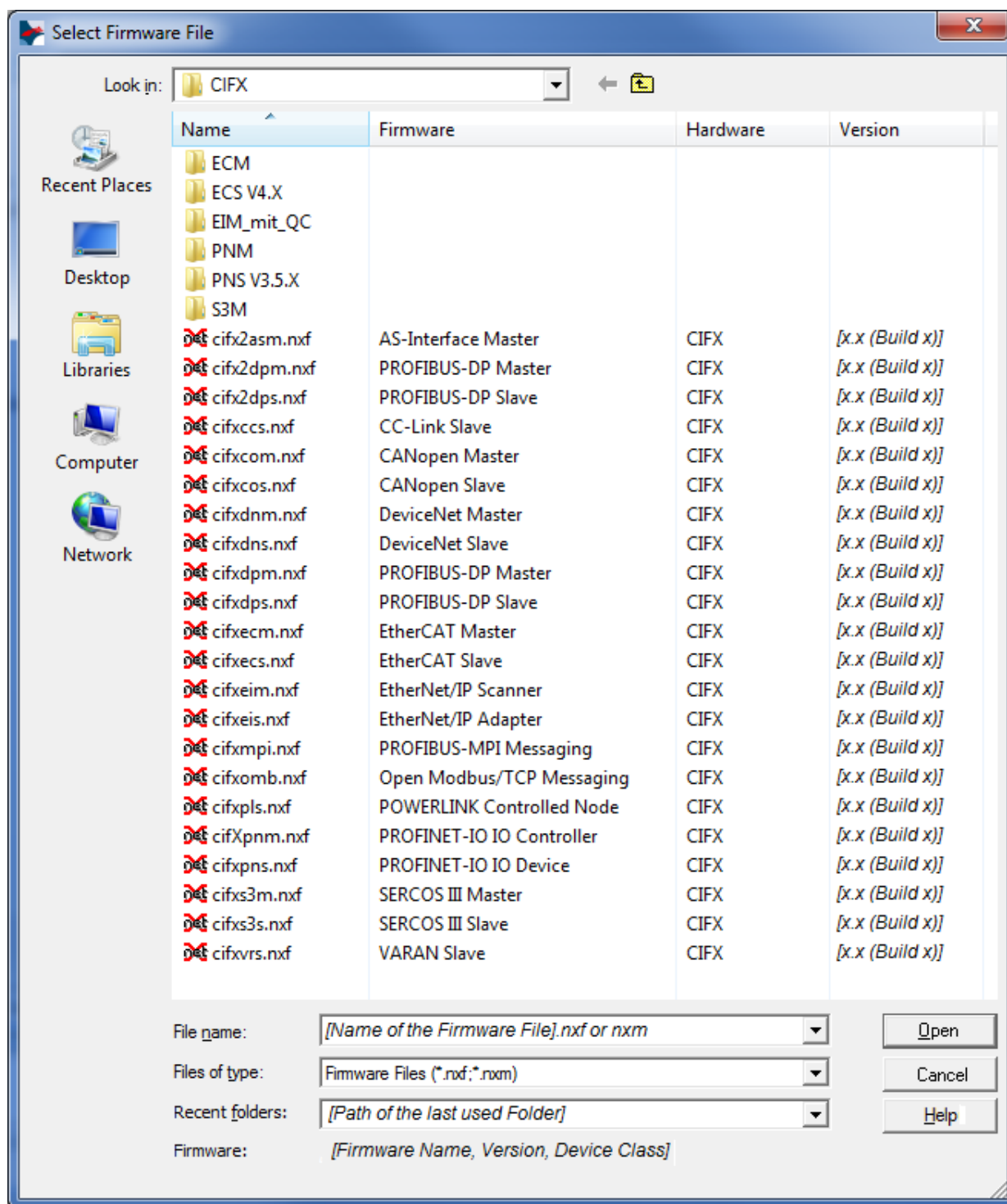


Figure 22: Window 'Select Firmware File' (Example CIFX)


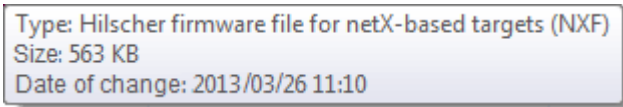
Parameter	Meaning	Range of Value / Default Value
Column Name	File name of the firmware file To sort the entries of the window Select Firmware File by name click to the column head  .	nxf, nxm
Column Firmware	Name of the firmware (consisting of the protocol name and protocol class)	
Column Hardware	Device 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 PROFINET IO-Device 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 PROFINET IO-Device 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 23: 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.

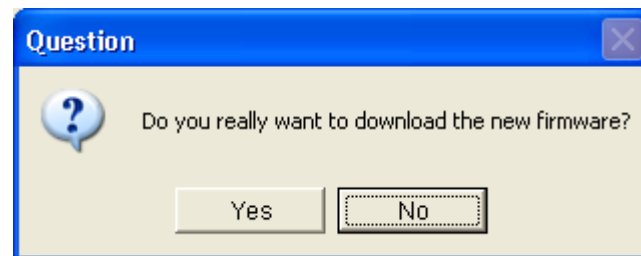


Figure 24: Request - Do you really want to download the firmware?

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.

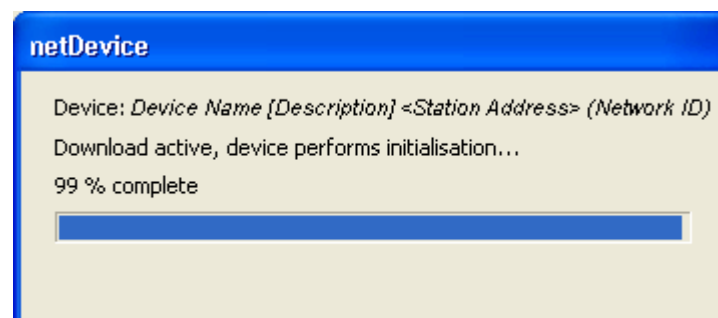


Figure 25: Firmware Download - Progress Bar

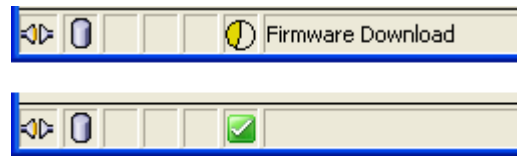


Figure 26: Clock Symbol and Hook Symbol green

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

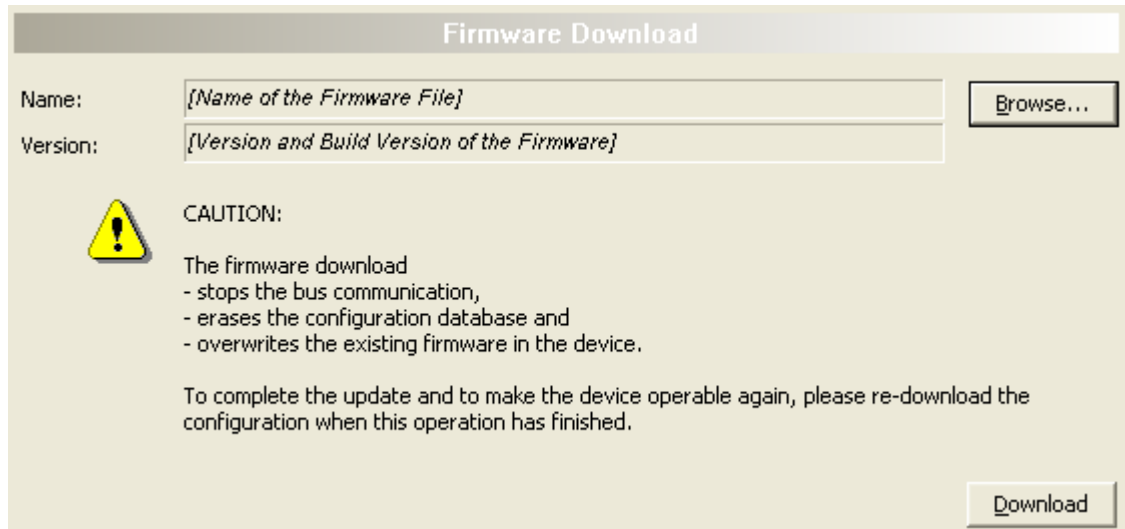


Figure 27: Firmware Download – Download

5 Configuration

5.1 Overview Configuration

Configuration Dialog Panes

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

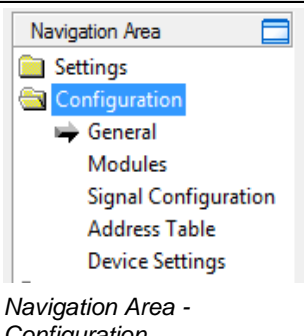
PROFINET IO Device DTM	Folder Name / Section	Page
	<i>General</i>	62
	<i>Address Table</i>	76
	<i>Modules</i>	63
	<i>Signal Configuration</i>	70
	<i>Device Settings</i>	78

Table 18: Descriptions of the Dialog Panes Configuration



Notice the descriptions in the section *Configuration Steps* on page 25.



Note: In order to transfer the configuration to the PROFINET IO Device, download the data of the configuration parameters in the PROFINET IO Device. See section *Download Configuration* on page 89.

5.2 Configuring Device Parameters

The steps provided in the following two sections are alternatively required for the two cases listed hereafter, to configure the parameters of the PROFINET IO-Device device using the PROFINET IO-Device DTM:

- Device DTM at the Root-Line (Stand-Alone Device)
- and Device DTM at the Controller busline.

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

If in the network project the PROFINET IO-Device DTM is dropped to the root busline, proceed as follows:

Modules

1. Configure the modules of the PROFINET IO device.

Therefore you can add either modules or submodules to the configuration or you can change modules. Furthermore you can assign or change slot numbers.

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

Signal Configuration

2. Proceed the **Signal Configuration**:

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

Device Settings

3. 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**.
- Under **IO State Information**: Configure the IOPS interface. Therefore select under **In/Out Producer** or **In/Out Consumer** the mode 'Disabled', 'Bit' or 'Byte'.

Close Device DTM Configuration Dialog

4. Click **OK** in order to close the Device DTM configuration dialog and to store your configuration.

Configuration Download to the PROFINET IO-Device Device

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



Note: In order to transfer the configuration to the PROFINET IO-Device device, download the data of the configuration parameters in the PROFINET IO-Device device. See section *Download Configuration* on page 89.

Further Information



For more information refer to the sections hereafter.

5.2.2 Slave DTM at the Master busline

If in the network project the PROFINET IO-Device DTM is dropped to the Master busline of the PROFINET IO-Controller DTM:

Station Name and IP Settings PROFINET IO Device Station

1. In the PROFINET IO-Controller DTM enter the station name and the IP settings of the PROFINET IO Device station.

Modules

2. Configure the modules of the PROFINET IO device.

Therefore you can add either modules or submodules to the configuration or you can change modules. Furthermore you can assign or change slot numbers.

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

Signal Configuration

3. Proceed the **Signal Configuration**:

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

Device Settings

4. 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**.
- Under **IO State Information**: Configure the IOPS interface. Therefore select under **In/Out Producer** or **In/Out Consumer** the mode 'Disabled', 'Bit' or 'Byte'.

Close Device DTM Configuration Dialog

5. Click **OK** in order to close the Device DTM configuration dialog and to store your configuration.

Configuration Download to the PROFINET IO-Device Device

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



Note: In order to transfer the configuration to the PROFINET IO-Device device, download the data of the configuration parameters in the PROFINET IO-Device device. See section *Download Configuration* on page 89.

Further Information



For more information refer to the sections hereafter.

5.3 General

The **General** dialog pane shows the **Name of Station** of the PROFINET IO device and its IP settings. These values are set in the PROFINET IO Controller.

To access to the **General** dialog pane:

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

Figure 28: Configuration > General

Parameter	Meaning
Name of Station	<p>Network name of the PROFINET IO device station. (1 - 240 characters).</p> <p>The name of station is set in the PROFINET IO Controller DTM. Here it is only displayed. The PROFINET IO Controller uses the name of station to identify the PROFINET IO Device via the PROFINET network and to build up communication.</p> <p>The name of station displayed here must match with the name of station set in the PROFINET IO Device.</p> <p>The name of station must be explicit in the PROFINET network.</p> <p>For information on the approved marks, see section <i>Name encoding</i> on page 136.</p>
Description	Symbolic Name of the PROFINET IO Device station.
IP Settings of the PROFINET IO Device station	
IP Address	<p>The IP address of the PROFINET IO Device station is set in the PROFINET IO Controller DTM. Here it is only displayed.</p> <p>The PROFINET IO Controller device transmits the IP address of the PROFINET IO Device during startup via the PROFINET network to the PROFINET IO Device and thereby configures the PROFINET IO Device.</p>
Network Mask	<p>The Network mask of the PROFINET IO Device station is set in the PROFINET IO Controller DTM. Here it is only displayed.</p> <p>The PROFINET IO Controller device transmits the Network mask of the PROFINET IO Device during startup via the PROFINET network to the PROFINET IO Device and thereby configures the PROFINET IO Device.</p>
Gateway Address	<p>The Gateway address of the PROFINET IO Device station is set in the PROFINET IO Controller DTM. Here it is only displayed.</p> <p>The PROFINET IO Controller device transmits the Gateway address of the PROFINET IO Device during startup via the PROFINET network to the PROFINET IO Device and thereby configures the PROFINET IO Device.</p>

Table 19: General Pane Parameters

5.4 Modules

On the **Modules** pane the configured modules of a PROFINET IO device are displayed. To configure the modules:

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

Slot	Sub Slot	Module
0	1	Device*
1	1	1 Byte Input
2	1	1 Byte Input

Use of slots: 3/5
State of data length: Input 2/3584 Octets, Output 0/3584 Octets, In-Output 2/7168 Octets

Submodule details

Dataset: I/O data Display mode: Decimal

Direction	Consistence	Data type	Text ID	Length
INPUT	--	unsigned8	inputs	1

Figure 29: Configuration > Modules Pane (* The Name of the device is displayed.)

5.4.1 Modules Table

The modules table allows configuring the modules of a PROFINET IO device. I. e., modules or submodules can be added, changed or removed.

Slot	Sub Slot	!	Module
0	1		Device
	1		0x00000000
1	1		1 Byte Input
	1		0x00000003
2	1		1 Byte Input
	1		0x00000003

Figure 30: Configuration > Modules Table (* The Name of the device is displayed.)

Parameter	Meaning
Slot	Shows the current Slot number assigned to a module. When clicking the slot field, the automatically updated drop-down list of the free and allowed Slot numbers is displayed. By changing the slot number, the sequence of the modules can be changed.
Sub Slot	Shows the current Sub Slot assigned to a submodule. When clicking the sub slot field, the automatically updated drop-down list of the free and allowed Sub Slot numbers is displayed. By changing the slot number, the sequence of the modules can be changed.
!	Slot icon tag: indicates the usage of the (sub-)module. : Slot number, subslot number and module name are <u>not</u> changeable. no icon: Slot number, subslot number and module name are changeable.
Module	Module name as defined in the GSDML file.
'Add Module'	Use Add Module to add a module to the device configuration below the current line .
'Add Submodule'	Use Add Submodule to add a submodule to the selected module of the device configuration below the current line .
'Remove'	Use Remove to remove the selected (sub-)module from the configuration below the current line .
	The arrow symbol shows the current line in the table. This line is the reference for Add Module , Add Submodule and Remove .

Table 20: Modules Pane Parameters

5.4.2 Indication of the Firmwareversion of the Device Instance



Note: If during the creation of the network configuration for the PROFINET IO Device a specific device instance was selected, in the top line of the module table, behind the module name, the firmware version of the selected device instance appears.

Modules				
	Slot	Sub Slot	!	Module
▶ □	0		✚	NIC 50-REFD/PNS V1.4.16 - V1.4.x
		1	✚	NIC 50-REFD/PNS V1.4.16 - V1.4.x
		32768	✚	PN-IO
		32769	✚	Port 1
		32770	✚	Port 2

Figure 31: Indication of the Firmwareversion of the Device Instance (Example)



For details about the PROFINET IO device instance refer to section *PROFINET IO Device Instance* on page 32.

5.4.3 Configure Modules

To configure the modules of a PROFINET IO device, first consider the following description on how to proceed:



Note: For devices with GSDML XML schema version = 1.0, every module has one submodule assigned. No additional submodules can be added, and the assigned submodule can not be removed. For devices with GSDML XML version = 2.0, you can configure the submodules, and these submodules can be added or removed from the corresponding module.

Modules description in GSDML file differentiates between *fixed in slot*, *used in slot* and *allowed in slot* modules. *Fixed in slot* and *used in slot* modules are automatically configured, *allowed in slot* modules can be configured.

5.4.3.1 1. Adding Modules or Submodules to the Configuration

To add additional available modules or submodules:

1. Select the line to insert a module or submodule.
2. Click the **Add Module** or **Add Submodule**.
- ↳ Starting from the selected line, additional modules or submodules are added at the next free slot or sub slot.
3. Click **Apply** or **OK** to confirm your changes, or cancel to skip.

5.4.3.2 2. Changing Modules Configuration / remove Module

If you want to change the configuration, follow these steps.

1. Select the line of the module or submodule.
 2. Open the modules' drop-down list.
- The modules' drop-down list shows all available modules or submodules for the respective slot.

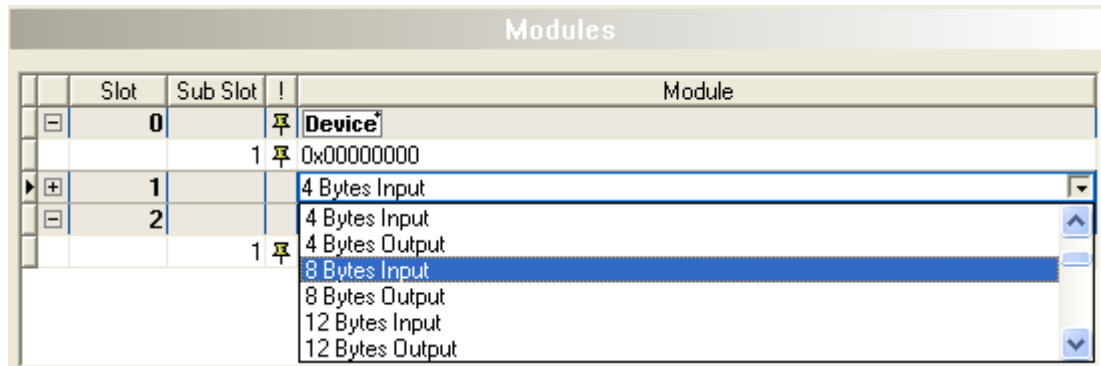


Figure 32: Changing Modules using Drop-Down Control (* The Name of the device is displayed.)



Note: If no appropriate and allowed modules or submodules are displayed in the modules' drop-down list of a slot, then only to the following next free slot modules or submodules can be added .

3. Select the next available and allowed module or submodule.
4. Click on **Apply** or **OK** to confirm your changes, or cancel to skip.


To remove modules or submodules:

- Use **Remove** or press **DELETE** to remove the selected module or submodule from the configuration.

Fixed in slot modules can not be removed.

5.4.3.3 3. Changing Slots



Note: Slot or sub slot numbers for  *fixed in slot* modules or submodules can not be changed.

To change the **Slot** or **SubSlot** numbers of a configured module or submodule:

1. Select the cell of the available slot/sub slot to be changed.
- ↗ The drop-down list shows all free and allowed slots or sub slots of the module or submodule.





	Slot	Sub Slot	!	Module
	0			Device*
		1		0x00000000
▶	1			1 Byte Input
	1	1		0x00000003
	2			1 Byte Input
	4	1		0x00000003

Figure 33: Assigning (Sub) Slots to Modules using Drop-Down Control (* The Name of the device is displayed.)

2. Select the desired slot/sub slot number.
3. Click on **Apply** or **OK** to confirm your changes, or cancel to skip.

5.4.4 Configuration Info

Use of slots: 3/245

State of data length: Input 4/5760 Octets, Output 4/5760 Octets, In-Output 8/11520 Octets

Figure 34: Configuration > Modules - Configuration Info

The configuration is validated regarding the maximum number of input/output bytes and modules.

Parameter	Meaning
Use of slots:	Number of configured modules / max. allowed modules.
State of data length:	Indicates state of data. Input: Current number of input data / max. allowed number of input data. Output: Current number of output data / max. allowed number of output data. In-/Output: Current number of input/output data / max. allowed number of input/output data.

Table 21: Modules Pane Parameters - Configuration Info

5.4.5 Submodules Details

The **Submodule details** configuration area displays the details of the current selected module.

Submodule details

Dataset: I/O data Display mode: Decimal

Direction	Consistence	Data type	Text ID	Length
INPUT	--	OctetString	Inputs	4

Figure 35: Configuration > Modules - Submodules Details > Dataset: I/O data

Submodule details

Dataset: Parameter Display mode: Hexadecimal

Name	Value	Data type	Data range
------	-------	-----------	------------

Figure 36: Configuration > Modules - Submodules Details > Dataset: Parameter

Parameter	Meaning
Dataset	Displayed dataset: I/O data or Parameter
Display mode	Under Display Mode the display mode of the module configuration data is predefined decimally or hex decimally.
Dataset: I/O data	
Direction	Input/output direction of the PROFINET IO-Data
Consistence	Specifies the input characteristics of a submodule. By default the data are transmitted coherently. [2]
Data type	Defines the data type of the data signal. [2]
Text ID	Text ID of the submodule from the GSDML file.
Length	Length of IO-Data.
Dataset: Parameter	
Name	Defines the name of the parameter.
Value	Indicates the value of the parameter.
Datatype	Defines the datatype of the parameter.
Data range	Defines the range of the parameter value.

Table 22: Modules Pane Parameters - Submodules Details

5.5 Signal Configuration

With the PROFINET IO-Device, **modules** and **submodules** are defined at fieldbus level to configure the process data to be transmitted via the bus, with the amount of data transmitted.

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 modules / submodules for the input and output data in the **Modules** dialog pane. Each submodule contains information about length and direction (In / Out). Only carry out the steps for signal configuration afterwards.

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 ...

5.5.1 Signal Configuration Pane

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

Slot	Name	Module Type						
Slot 1 / Subslot 1	1 Byte Input / 1 Byte Input	1 Byte Input						
<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Offset</th> </tr> </thead> <tbody> <tr> <td>Inputs</td> <td>byte</td> <td>0</td> </tr> </tbody> </table>			Name	Type	Offset	Inputs	byte	0
Name	Type	Offset						
Inputs	byte	0						
Slot 2 / Subslot 1	1 Byte Output / 1 Byte Output	1 Byte Output						

Figure 37: Signal Configuration Pane

Parameter	Description	Range of Value/ Value
Slot	Slot1 / Subslot 1 for the first configured module, Slot 2 / Subslot 1 for the second configured module, etc.	Slot 1 / Subslot 1, Slot 2 / Subslot 1, ...
Name	Names of the configured modules of the PROFINET IO device as described in the GSDML file, by which the lengths of the input and output data are defined. The corresponding name is also displayed for the subslot.	Module names from the used GSDML file.
Module Type		
Signal level		
Name	Name of the input or output signal that can be set here. The configuration software assigns names by default: Input or output, as well as an identification of sub-signals by means of a suffix, if necessary.	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, related to the data in the input or output data memory of the PROFINET IO-Device.	

Table 23: Explanations Signal Configuration Pane

5.5.2 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.

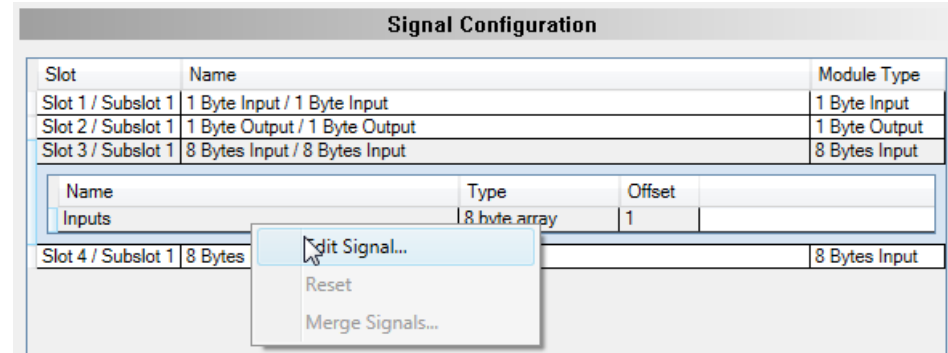


Figure 38: Edit Signal

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

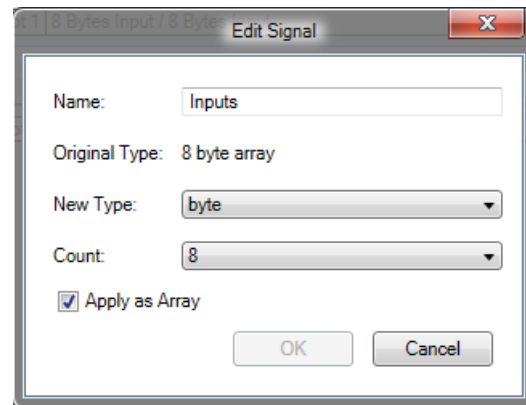


Figure 39: Edit Signal Dialog Pane

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 24: 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.

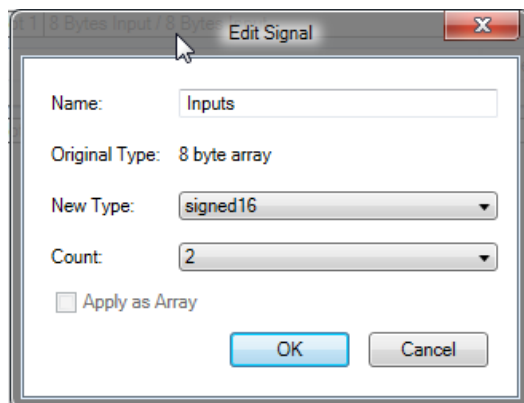


Figure 40: Edit Signal (Example)

- 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 / Subslot 1	1 Byte Input / 1 Byte Input	1 Byte Input	
Slot 2 / Subslot 1	1 Byte Output / 1 Byte Output	1 Byte Output	
Slot 3 / Subslot 1	8 Bytes Input / 8 Bytes Input	8 Bytes Input	
	Name	Type	Offset
	Inputs	8 byte array	1
	Inputs_Byte_0	signed16	1
	Inputs_Byte_2	signed16	3
	Inputs_Byte_4	4 byte array	5
Slot 4 / Subslot 1	8 Bytes Input / 8 Bytes Input	8 Bytes Input	

Figure 41: Signal "Inputs" split (Example)

- You can further split already split signals.

Signal Configuration			
Slot	Name	Module Type	
Slot 1 / Subslot 1	1 Byte Input / 1 Byte Input	1 Byte Input	
Slot 2 / Subslot 1	1 Byte Output / 1 Byte Output	1 Byte Output	
Slot 3 / Subslot 1	8 Bytes Input / 8 Bytes Input	8 Bytes Input	
	Name	Type	Offset
	Inputs	8 byte array	1
	Inputs_Byte_0_Byte_0	signed8	1
	Inputs_Byte_0_Byte_1	signed8	2
	Inputs_Byte_2	signed16	3
	Inputs_Byte_4	4 byte array	5
Slot 4 / Subslot 1	8 Bytes Input / 8 Bytes Input	8 Bytes Input	

Figure 42: Signal "Inputs_Byte_0" 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.

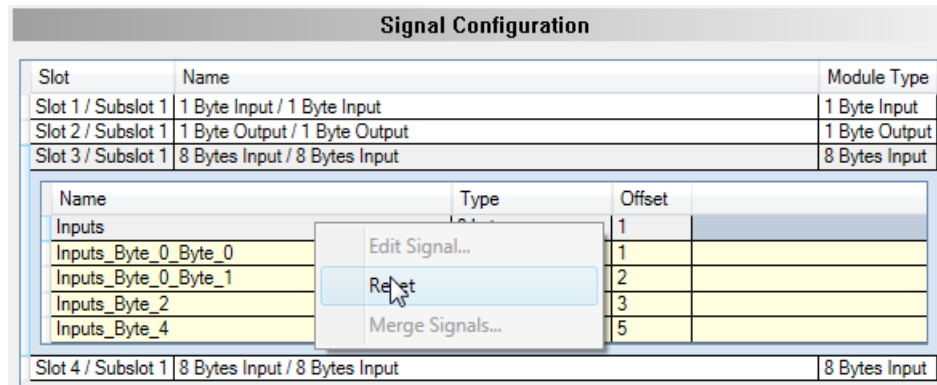


Figure 43: Reset

- 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.

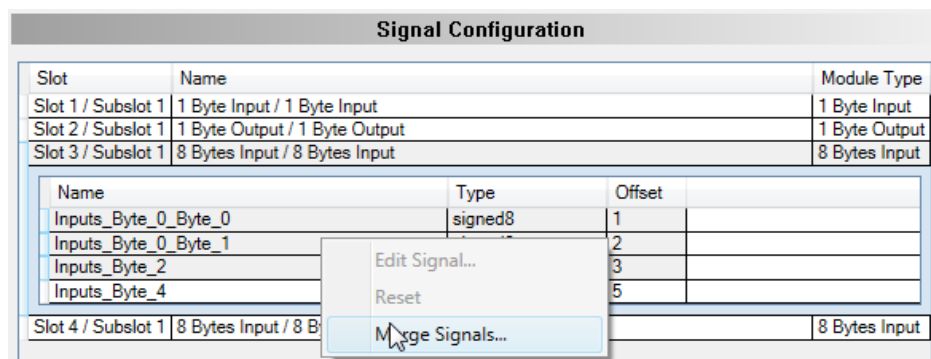


Figure 44: Merge Signals

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

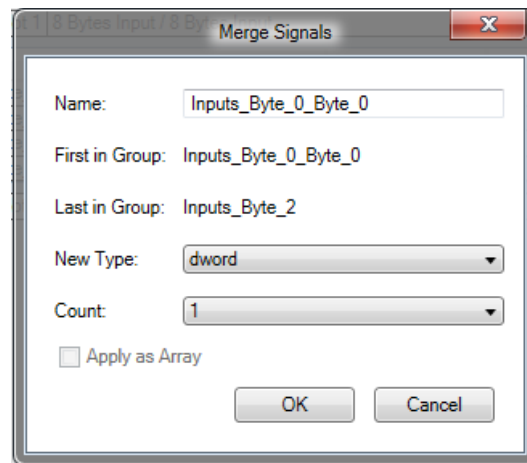


Figure 45: Dialog Pane Merge Signals

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.	Allways checked

Table 25: 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.

5.6 Address Table

The **Address Table** dialog pane shows a list of all addresses used in the process data image. The displayed addresses refer to the used PROFINET IO device.

To edit the address data:

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

The screenshot shows the 'Address Table' dialog pane. At the top, there is a 'Display mode:' dropdown menu set to 'Hexadecimal' and a 'CSV Export' button. Below this, the 'Inputs:' section contains a table with the following data:

Module	Submodule	Type	Length	Address
4 Bit Eingang	0x00000002	IB	0x0000	0x0000

Below the 'Inputs' section, the 'Outputs:' section contains a table with the following data:

Module	Submodule	Type	Length	Address
4 Bit Ausgang	0x00000101	QB	0x0000	0x0000

Figure 46: Configuration > Address Table

5.6.1 Explanation of the Parameters

Parameter	Meaning	Range of Value / Value
Module	Module name	
Submodule	Submodule name	
Type	Data type (QB,QW,IB, IW)	
Length	Length of the Module / Submodule in Bytes.	
Address	Data offset address.	

Table 26: Address Table Pane Parameters - Inputs / Outputs

5.6.2 Display Mode, CSV Export

Display Mode

- Use the Display Mode drop-down list to select data display mode decimal or hexadecimal.



Figure 47: Configuration > Address Table - Display Mode

CSV Export

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

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

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

Sort Addresses

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

5.7 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 89).

Device Settings

Start of bus communication —

☒ Automatically by device
☐ Controlled by application

Application monitoring —

Watchdog time: ms

Process image storage format —

☒ Big Endian (MSB first)
☐ Little Endian (LSB first)

IO State Information —

In/Out Producer:

In/Out Consumer:

Figure 48: 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.

5.7.1 Start of Bus Communication

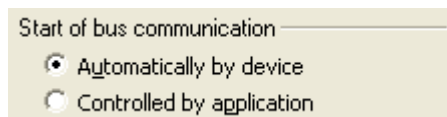


Figure 49: Device Settings > Start of Bus Communication

If **Automatically by device** is selected, the PROFINET IO-Device 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.

5.7.2 Application Monitoring

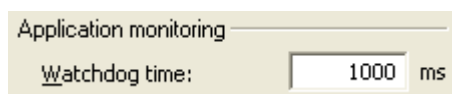


Figure 50: Device Settings > Application Monitoring

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 27: 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.

5.7.1 Process Image Storage Format

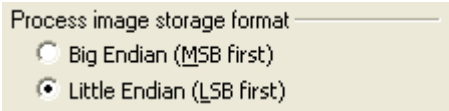


Figure 51: Device Settings > Process Image Storage Format

The **Process Image Storage Format** determines how the data words are stored in the process image.

For the data type Word it is possible to choose **Big Endian** or **Little Endian**.

Storage format (word module)	
Big Endian	MSB/LSB = higher/lower = Motorola format = Big Endian
Little Endian	LSB/MSB = lower/higher = Intel format = Little Endian

Table 28: Master Settings Pane Parameters - Process Image Storage Format



Note: The setting options under **Process Image Storage Format** for client specific variants of the configuration software can differ from the setting options displayed here.

5.7.2 IO State Information

Reference on Firmware: The option **IO State Information** was implemented since PROFINET IO-Device Firmware Version 3.4.x.x.

Under **IO State Information** you can configure the IOPS interface. If configured, the Profinet Input/Output Object Provider State (IOPS) allows to the PROFINET IO-Device application program to detect, whether the data received from the PROFINET IO-Device devices are valid or not and to declare its output data sent to the PROFINET IO-Device devices valid or invalid.

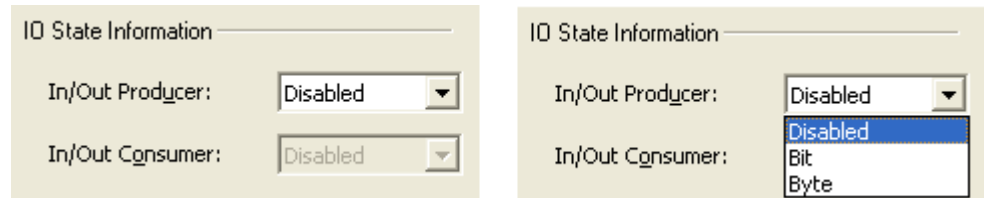


Figure 52: Controller Settings > IO State Information

Parameter	Meaning	Range of Value / Value
In/Out Producer	IOPS interface for In/Out Producer	Disabled, Bit, Byte; Default: Disabled
In/Out Consumer	IOPS interface for In/Out Consumer (not supported)	Disabled, Bit, Byte; Default: Disabled

Table 29: Parameters IO State Information

You can select the three IOPS interface modes 'Disabled', 'Bit' and 'Byte'. The modes for input and output direction can be configured independently.

- **Disabled:** The PROFINET IO-Device application program can not detect, whether the data received from the PROFINET IO-Device devices are valid or declare its output data sent to the PROFINET IO-Device devices valid or invalid.
- **Bit:** In the Dual-Port Memory (DPM) of the PROFINET IO-Device device the IOPS is handled as a bit list. Each submodule description is represented by a single bit. If this bit is set to 1 the data is valid, if the bit is set to 0 the data is invalid.
Note: Submodules with input and output data at the same time have IOPS in input and output direction.
- **Byte:** In the Dual-Port Memory (DPM) of the PROFINET IO-Device device the IOPS is handled as a byte array. Each submodule description is represented by a byte. If the byte is set to 0x80 the data is valid, otherwise it is invalid. In this mode the whole IOPS-byte is directly copied from / to the cyclic frame giving the PROFINET IO-Device application program the possibility to access all bits of IOPS. Typically only the first bit of this IOPS byte is interesting as it stated valid or invalid.



Further information on the IOPS Interface is comprised in the *PROFINET IO Controller Protocol API Manual* [4], in section *IOPS Interface* (e. g. *Revision 16* of the API manual, in section 4.6.).

6 Description

6.1 Overview Description

Description Dialog Panes

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

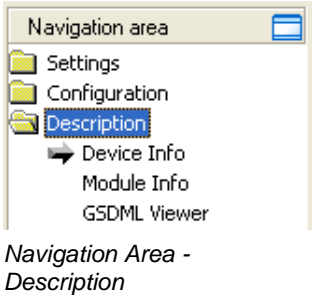
PROFINET IO Device DTM	Folder Name / Section	Page
	<i>Device Info</i>	83
	<i>Module Info</i>	84
	<i>GSDML Viewer</i>	85

Table 30: Descriptions of the Description Panes

6.2 Device Info

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

Name	Value
Main family	Attribute of the GSDML family element. It contains the assignment of the device to a function class. One of the following values are allowed: General Drives, Switching devices, I/O, Valves, Controllers, HMI, Encoders, NC/RC, Gateway, Programmable Logic Controllers, Ident systems, PROFIBUS PA Profile, Network Components Sensors.
Product family	Attribute of the GSDML family element. It contains the vendor specific assignment of the device to a product family. In addition to the main family a device can be assigned to a vendor specific product family.
DAP vendor name	Attribute of the GSDML ModuleInfo/VendorName element. The VendorName element contains the name of the device vendor. The device access point (DAP) is a module of the GSDML to describe the device parameters device specific. The device access point object contains most of the device related keywords.
DAP hardware release	Attribute of the GSDML ModuleInfo/HardwareRelease element. The HardwareRelease element contains the hardware release of the DAP.
DAP software release	Attribute of the GSDML ModuleInfo/SoftwareRelease element. The SoftwareRelease element contains the software release of the DAP.
Extended address assignment	Attribute of the GSDML DeviceAccessPointItem element. It depends from the protocol for the assignment of the IP addresses supported by the DAP. Default: "false", for the Discovery and Configuration (DCP), "true" for the Dynamic Host Configuration Protocol (DHCP)
Physical slots	Attribute of the GSDML DeviceAccessPointItem element. This list describes which slots are supported by the DAP. The Slotnumber of the DAP itself shall be part of the list.
Max. IO data length	Attribute of the GSDML DeviceAccessPointItem IOConfigData element. It contains the maximum length of the output and input data in octets. MaxDataLength shall not be less than the highest value of MaxInputLength or MaxOutputLength. It shall not be greater than the sum of MaxInputLength and MaxOutputLength. If this keyword is not provided, the maximum length is the sum of MaxInputLength and MaxOutputLength.
Max. input data length	Attribute of the GSDML DeviceAccessPointItem IOConfigData element. It contains the maximum length of the data in octets which can be transferred from the IO Device to the IO Controller. This length is defined by the sum of the input data of all used submodules, the corresponding IO producer status and the IO consumer status of the used output submodules.
Max. output data length	Attribute of the GSDML DeviceAccessPointItem IOConfigData element. It contains the maximum length of the data in octets which can be transferred from the IO Controller to the IO Device. This length is defined by the sum of the output data of all used submodules, the corresponding IO producer status and the IO consumer status of the used input submodules.
Info text	GSDML ModuleInfo/InfoText element. This element contains human readable additional text information about the device.

Table 31: Device Info

6.3 Module Info

On the **Module Info** pane the **Select module** drop-down list displays all available modules described in the GSDML file.

In the table below the corresponding information for the current selection (Vendor ID, Main family, ...) is displayed.

Control	Meaning
Select module	Drop-down list, displays all available modules described in the GSDML file. In the table below the corresponding information for the current selection is displayed.
Name	Value
Vendor ID	Identification number of the vendor.
Main family	Attribute of the GSDML family element. It contains the assignment of the device to a function class. One of the following values are allowed: General Drives, Switching devices, I/O, Valves, Controllers, HMI, Encoders, NC/RC, Gateway, Programmable Logic Controllers, Ident systems, PROFIBUS PA Profile, Network Components Sensors.
Product family	Attribute of the GSDML family element. It contains the vendor specific assignment of the device to a product family. In addition to the main family a device can be assigned to a vendor specific product family.
Modules identifier	Identification number of the module.
Order number	GSDML ModuleInfo/OrderNumber element. It contains the order number of a module.
Hardware release	GSDML ModuleInfo/HardwareRelease element. It contains the hardware release of a module.
Software release	GSDML ModuleInfo/SoftwareRelease element. It contains the software release of a module.
Info text	GSDML ModuleInfo/InfoText element. This element contains human readable additional text information about the module.

Table 32: Module Information

6.4 GSDML Viewer

The **GSDML Viewer** displays the content of the GSDML file of the device in HTML style in a text view.

Under **Filename** the absolute file directory path and the file name of the displayed GSDML file is displayed. **Find what** offers a search feature to search for text contents within the text of the GSDML file.

In the GSDML Viewer window the entries show the GSDML file in text format.

Parameter	Meaning
Filename	File directory path and the file name of the displayed GSDML file.
Find what	Search feature to search for text contents within the text of the GSDML file.
Match case	Search option
Match whole word	Search option

Table 33: Device Description – GSDML Viewer

7 Online Functions

7.1 Connecting/Disconnecting Device



Note: Several PROFINET IO-Device DTM functions e. g. **Diagnosis** or the configuration download in the FDT Framework require an online connection from the PROFINET IO-Device DTM to the PROFINET IO-Device device.

Connecting Device

The following steps are needed to establish a connection from the PROFINET IO-Device DTM to a PROFINET IO-Device 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 33.

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 PROFINET IO-Device device icon.
10. Select the **Connect** command from the context menu.

↗ The PROFINET IO-Device device now is connected to the PROFINET IO-Device DTM via an online connection. In the network view the device description at the device icon of the Device is displayed with a green colored background.

Disconnecting Device

To disconnect an online connection from the PROFINET IO-Device device to a PROFINET IO-Device 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 PROFINET IO-Device device icon.
 3. Select the **Disconnect** command from the context menu.
- ⇒ In the network view the device description at the device icon of the Device is not any more displayed with a green colored background. Now the PROFINET IO-Device device is disconnected from the DTM.

7.2 Upload

Using the **Upload** function of the PROFINET IO-Device DTM, you can upload the configuration of a PROFINET IO-Device device via the PROFINET IO-Controller device and the PROFINET IO-Controller DTM to the PROFINET IO-Device DTM and then generate the module configuration. Then you must download the changed configuration of the PROFINET IO-Device device via **Download** to the PROFINET IO-Controller device.

Steps for Upload and Download

1. Upload the PROFINET IO-Device device configuration and generate the module configuration.

- In netDevice: right-click on the device symbol of the PROFINET IO Device DTM.
- Select **Upload** from the context menu.
- ↻ If in the PROFINET IO-Device DTM already a module configuration is present, the dialog **Question – Upload function will overwrite any existing module configuration. Do you wish to proceed?** is displayed.
- To proceed the upload, select **Yes**.
- ↻ The dialog **Devices Symbolic Name of the Device [Device Description] <Device Address> Starting Upload ...** appears. The dialog shows the progress of the upload process. (Depending on the manufacturer of the respective device, also a dialog with some slight deviations from this one may be displayed.)
- ↻ Additionally you are asked whether the module configuration of the PROFINET IO-Device device should be generated.
- Answer the query by **Yes**.
- ↻ The current configuration of the PROFINET IO-Device device is uploaded via the PROFINET IO-Controller device and the PROFINET IO-Controller DTM to the PROFINET IO-Device DTM.
- ↻ The success of the upload procedure is reported in the output window.

2. Download the current configuration of the PROFINET IO-Device device to the PROFINET IO-Controller device.

- In netDevice: right-click on the device symbol of the PROFINET IO-Controller DTM.
- Select **Download** from the context menu.

7.3 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 PROFINET IO Device device an online connection from the PROFINET IO Device DTM to the PROFINET IO Device device is required. Further information can be found in the *Connecting/Disconnecting Device* section on page 86.

Safety Precautions

If you plan to perform a configuration download via the PROFINET IO Device 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 PROFINET IO 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?'

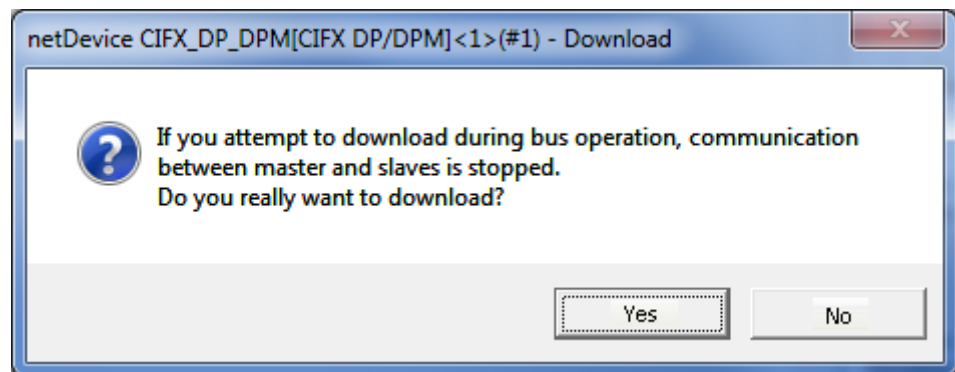


Figure 53: netDevice Message: Download



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**.

7.4 Start /Stop Communication

You can manually start or stop the communication between a PROFINET IO-Controller device and PROFINET IO-Device 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 PROFINET IO-Device-DTM to the PROFINET IO-Device-device is required. Further information can be found in the *Connecting/Disconnecting Device* section on page 86.

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, Overwriting of Firmware or Loss of Device Parameters

Before you stop the communication:

- Stop the application 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:

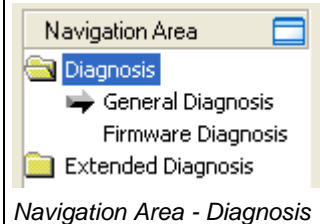
PROFINET IO-Device DTM	Folder Name / Section	Manual Page
	<i>General Diagnosis</i>	93
	<i>Firmware Diagnosis</i>	95

Table 34: Descriptions of the Diagnosis Panes

Online Connection to the Device



Note: Accessing the **Diagnosis** panes of the PROFINET IO-Device DTM requires an online connection from the PROFINET IO-Device DTM to the PROFINET IO-Device device. For further information refer to section *Connecting/Disconnecting Device* on page 86.

How to proceed

1. In the Device 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 96.

8.2 General Diagnosis

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

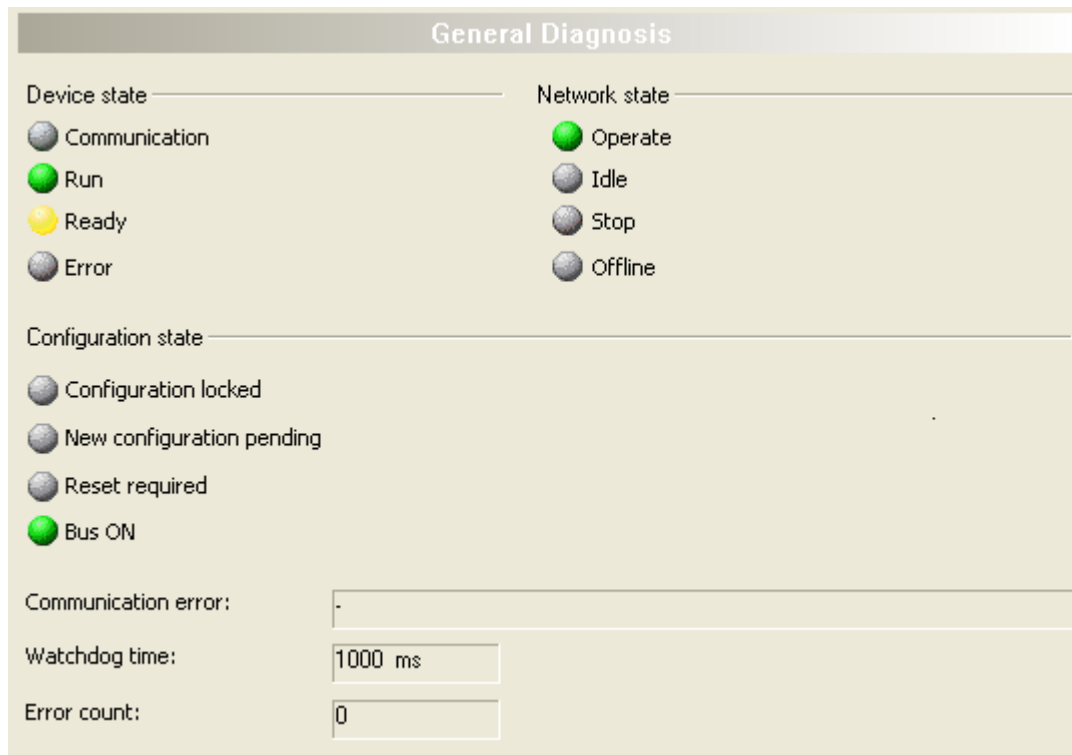














Figure 54: General Diagnosis

LED	Meaning	Color	State
Device State			
Communication	Shows whether the PROFINET IO device executes the network communication.	 (green)	In COMMUNICATION state
		 (gray)	Not in COMMUNICATION state
Run	Shows whether the PROFINET IO device has been configured correctly.	 (green)	Configuration OK
		 (gray)	Configuration not OK
Ready	Shows whether the PROFINET IO device has been started correctly. The PROFINET IO device waits for a configuration.	 (yellow)	Device READY
		 (gray)	Device not READY
Error	Shows whether the PROFINET IO 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	The I/O connection is established and valid I/O data is exchanged between the PROFINET IO Controller and the PROFINET IO Device (at least one CMDEV state is INDATA).*	 (green)	In OPERATION state
		 (gray)	Not in OPERATION state
Idle	The connection establishment is in progress (at least one CMDEV state is > W_CIND and no CMDEV state is INDATA).*	 (yellow)	In IDLE state
		 (gray)	Not in IDLE state













LED	Meaning	Color	State
Stop	The PROFINET IO Device has no communication to the PROFINET IO Controller. Connection establishment is not in progress. The bus state of the PROFINET IO Device may be set to “on” or “off”. *	 (red)	In STOP state
		 (gray)	Not in STOP state
Offline	The PROFINET IO Device has no valid configuration.*	 (yellow)	In OFFLINE state
		 (gray)	Not in OFFLINE state
*Valid for PROFINET IO Device V3.10			
Configuration State			
Configuration locked	Shows whether the PROFINET IO 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 PROFINET IO 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 PROFINET IO 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 35: 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 36: Parameter General Diagnosis

PROFINET IO Device V3.9 and earlier

Implementations of PROFINET IO Device version V3.9 and earlier behave as follows.

Network State	Meaning
Operate	Valid configuration and Bus on and Link up.
Idle	n.a. (Note: this state is not used at all)
Stop	Valid configuration and (Bus off or Link down or Fatal Error).
Offline	No valid configuration.

Table 37: Network State (V3.9 and earlier)

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:

PROFINET IO Device

Version:

3.4.1 (Build 36)

Date:

12.6.2012

Task information:

Task	Name of task	Version	Prio...	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	PNS_IRQ_TSK	0.0	11	The task identifier ...	Task Status ok. (0x00000000)
3	RX_SYSTEM	1.16	32	Middleware Syste...	Task Status ok. (0x00000000)
4	DPM_COMO...	1.0	50	TLR-Router DPM.	Task Status ok. (0x00000000)
5	DPM_COMO...	1.0	51	TLR-Router DPM.	Task Status ok. (0x00000000)
6	TlrTimer	0.0	19	The task identifier ...	Task Status ok. (0x00000000)
7	PNIO_ACP	1.0	18	PROFINET IO ACP...	Task Status ok. (0x00000000)
8	PNIO_DCP	1.0	20	PROFINET IO DCP...	Task Status ok. (0x00000000)
9	PNIO_MGT	1.0	24	PROFINET IO Man...	Task Status ok. (0x00000000)
10	TCP_UDP	2.16	22	TCPUDP task (TCP...	Task Status ok. (0x00000000)
11	RPC	4.0	23	RPC Task.	Task Status ok. (0x00000000)
12	PNIO_CMDEV	1.0	25	PROFINET IO-Dev...	Task Status ok. (0x00000000)
13	PNS_IF	1.0	28	PROFINET IO-Dev...	Task Status ok. (0x00000000)
14	SNMP-Server	4.1	29	SNMP Server Task.	Task Status ok. (0x00000000)
15	Mib-Database	4.1	30	MIB Database for ...	Task Status ok. (0x00000000)
16	LLDP-Task	4.2	26	LLDP protocol task	Task Status ok. (0x00000000)
17	MARSHALLER	2.0	48	Marshaller: Main T...	Task Status ok. (0x00000000)
18	FODMI	0.0	57	The task identifier ...	Task Status ok. (0x00000000)
19	PACKET_RO...	2.0	49	Marshaller: Packet...	Task Status ok. (0x00000000)

Figure 55: 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 38: Description Table Task Information

9 Extended Diagnosis

9.1 Overview Extended Diagnosis

The **Extended Diagnosis** of the PROFINET IO-Device 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:

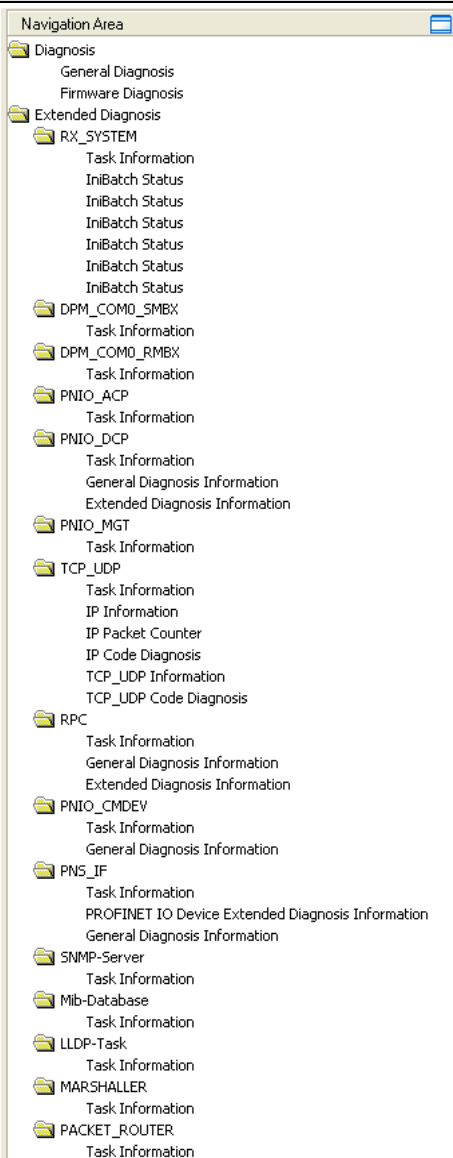
PROFINET IO-Controller DTM	Folder Name in the Navigation Area	Dialog Pane	Manual Page
	<i>RX-SYSTEM</i>	<i>Task Information</i>	97
		<i>IniBatch Status</i>	98
	<i>DPM_COMO_SMBX</i>	<i>Task Information</i>	97
	<i>DPM_COMO_RMBX</i>	<i>Task Information</i>	97
	<i>PNIO_ACP</i>	<i>Task Information</i>	97
	<i>PNIO_DCP</i>	<i>Task Information</i>	97
		<i>General Diagnosis Information</i>	99
		<i>Extended Diagnosis Information</i>	100
	<i>PNIO_MGT</i>	<i>Task Information</i>	97
	<i>TCP_UDP</i>	<i>Task Information</i>	97
		<i>IP Information</i>	102
		<i>IP Packet Counter</i>	103
		<i>IP Code Diagnosis</i>	103
		<i>TCP_UDP Information</i>	104
		<i>TCP_UDP Code Diagnosis</i>	104
	<i>RPC</i>	<i>Task Information</i>	97
		<i>General Diagnosis Information</i>	99
		<i>Extended Diagnosis Information</i>	105
	<i>PNIO_CMDEV</i>	<i>Task Information</i>	97
		<i>General Diagnosis Information</i>	99
	<i>PNS_IF</i>	<i>Task Information</i>	97
		<i>PROFINET IO Device Extended Diagnosis Information</i>	106
	<i>SNMP-Server</i>	<i>Task Information</i>	97
	<i>MiB Database</i>	<i>Task Information</i>	97
	<i>LLDP-Task</i>	<i>Task Information</i>	97
	<i>MARSHALLER</i>	<i>Task Information</i>	97
	<i>PACKET_ROUTER</i>	<i>Task Information</i>	97
<i>Navigation Area - Extended Diagnosis</i>			

Table 39: Descriptions of the Dialog Panes Extended Diagnosis

Online Connection to the Device



Note: Accessing the **Extended Diagnosis** dialog panes of the PROFINET IO-Device DTM requires an online connection from the PROFINET IO-Device DTM to the PROFINET IO-Device device. For further information refer to section *Connecting/Disconnecting Device* on page 86.

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 56: 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 40: 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 57: 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 41: 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 General Diagnosis Information

General Diagnosis Information	
Task states	
Name	Value
Last TLR Error Code	Operation succeeded.
Last PNIO error code	Operation succeeded.
TLR Error Counter (may count single error several times!)	0
PNIO Error Counter (may count single error several times!)	0
Active PM Counter	2
Send Packet Error Counter	0
Malloc Error Counter	0
ErrExternal (Received unsupported Requests)	0
ErrInternal (Received unsupported Confirmations)	0
Calls of PoolPacketGet	0
Calls of PoolPacketRelease	0
Maximum Number of Pool Packets in simultaneous use	0
Actual number of Pool Packets in use	0

Figure 58: Extended Diagnosis > [Folder Name] > General Diagnosis Information

Name	Description
Last TLR error code	Error code of the last internally occurred error.
Last PNIO error code	Error code of the last externally occurred error which has been reported by an IO Device.
TLR Error Counter (may count single error several times!)	Counts the number of occurred TLR error codes.
PNIO Error Counter (may count single error several times!)	Counts the number of occurred PNIO error codes.
Active PM Counter	Counter of the active protocol machines in the task.
Send Packet Error Counter	Counts how often a task sends a packet to another task and this fails.
Malloc Error Counter	Counts how often storage capacity is requested in the operating system and the operating system cannot follow this demand.
ErrExternal (Received unsupported Requests)	Counts how often an unknown request packet was received.
ErrInternal (Received unsupported Confirmations)	Counts how often an unknown confirmation packet was received.
Calls of PoolPacketGet*	Counts how often the PoolPacketGet was called.
Calls of PoolPacketRelease*	Counts how often the PoolPacketRelease was called.
Maximum number of Pool Packets in simultaneous use*	Counts how many pool elements were used simultaneously as a maximum.
Actual number of Pool Packets in use*	Counts how many pool elements are used currently.
*Not used for the diagnosis task „RPC“.	

Table 42: Extended Diagnosis > [Folder Name] > General Diagnosis Information

9.5 PNIO_DCP

9.5.1 Extended Diagnosis Information

Extended Diagnosis Information	
Task states	
Name	Value
Frames received (MCR)	0
Frames sent (MCR)	0
Frames received (UCR)	0
Frames sent (UCR)	0
Frames received (MCS)	0
Frames sent (MCS)	0
Frames received (UCS)	0
Frames sent (UCS)	0
Active Application Timers Counter	1
Erronious Frames received	0
Ident Request received Counter	0
Ident Request sent Counter	0
Ident Response received Counter	0
Identify ALL Request sent Counter	0
DCP SET Requests Received	0
DCP Set Requests sentcounter	0
Positiv DCP Set Responses	0
Negativ DCP Set Responses	0
DCP Get Requests Received	0

Figure 59: Extended Diagnosis > PNIO_DCP > Extended Diagnosis Information

The extended Diagnosis Information PNIO_DCP displays the counter reading of the four state machines from the PROFINET IO DCP protocol.

MCR: Multi Cast Receiver

UCR: Uni Cast Receiver

MCS: Multi Cast Sender

UCS: Uni Cast Sender

Name	Description
Frames received (MCR)	Multi Cast Receiver Frames received
Frames sent (MCR)	Multi Cast Receiver Frames sent
Frames received (UCR)	Uni Cast Receiver Frames received
Frames sent (UCR)	Uni Cast Receiver Frames sent
Frames received (MCS)	Multi Cast Sender Frames received
Frames sent (MCS)	Multi Cast Sender Frames sent
Frames received (UCS)	Uni Cast Sender Frames received
Frames sent (UCS)	Uni Cast Sender Frames sent
Active Application Timers Counter	Software timer actually running in the task
Erroneous Frames received	Counter for erroneous frames received
Ident Request received Counter	Counter for Ident Request received
Ident Request sent Counter	Counter for Ident Requests sent
Ident Response received Counter	Counter for Ident Responses received
Identify ALL Request sent Counter	Counter for Identify ALL Requests sent
DCP Set Requests Received	Counter for DCP Set Received
DCP Set Requests sent Counter	Counter for DCP Set Requests sent
Positive DCP Set Responses	Counter for Positive DCP Set Responses
Negative DCP Set Responses	Counter for Negative DCP Set Responses
DCP Get Requests Received	Counter for DCP Get Requests received

Table 43: Extended Diagnosis > PNIO_DCP > Extended Diagnosis Information

9.6 TCP_UDP

9.6.1 IP Information

IP Information	
Task states	
Name	Value
Task State	1
Error Counter	6
Last Error	0xC00800C8
IP Address	0.0.0.0
Net Mask	0.0.0.0
Gateway	0.0.0.0
Flags (Value from Database)	0
IP Address (Value from Database)	0.0.0.0
Net Mask (Value from Database)	0.0.0.0
Gateway (Value from Database)	0.0.0.0
IP Config source	Database, Warmstart packet

Figure 60: Extended Diagnosis > TCP_UDP > 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 manual)
IP Address	IP address of the PROFINET IO Device station.
Net Mask	Network mask of the PROFINET IO Device station.
Gateway	Gateway address of the PROFINET IO Device 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 44: Extended Diagnosis > TCP_UDP > IP-Information

9.6.2 IP Packet Counter

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

Figure 61: Extended Diagnosis > TCP_UDP > 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 45: Extended Diagnosis > TCP_UDP > Packet Counter

9.6.3 IP Code Diagnosis

IP Code Diagnosis	
Task states	
Name	Value
Information Counter	0
Warning Counter	0
Error Counter	0
Severity Level	None
Code	0
Parameter	0
Module	
Line Number	0

Figure 62: Extended Diagnosis > TCP_UDP > 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 46: Extended Diagnosis > TCP_UDP > IP Code Diagnosis

9.6.4 TCP_UDP Information

TCP_UDP Information	
Task states	
Name	Value
Task State	1
Error Counter	6
Last Error	0xC00800C8

Figure 63: Extended Diagnosis > TCP_UDP > TCP_UDP 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 Count	Counter for errors
Last Error	Last occurred error (Description see appropriate manual)

Table 47: Extended Diagnosis > TCP_UDP > TCP_UDP Information

9.6.5 TCP_UDP Code Diagnosis

TCP_UDP Code Diagnosis	
Task states	
Name	Value
Information Counter	0
Warning Counter	0
Error Counter	0
Severity Level	None
Code	0
Parameter	0
Module	
Line Number	0

Figure 64: Extended Diagnosis > TCP_UDP > TCP_UDP Code Diagnosis

Name	Description
Information 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 48: Extended Diagnosis > TCP_UDP > TCP_UDP Code Diagnosis

9.7 RPC

9.7.1 Extended Diagnosis Information

Extended Diagnosis Information	
Task states	
Name	Value
PINGs sent	0
PINGs received	0
WORKINGs sent	0
WORKINGs received	0
NOCALLs sent	0
NOCALLs received	0
CANCELS sent	0
CANCELS received	0
REJECTs sent	0
REJECTs received	0
Requests sent	0
Requests received	0
Responses sent	0
Responses received	0
Fragments sent	0
Fragments received	0
Active Application Timers	0

Figure 65: Extended Diagnosis > RPC > Extended Diagnosis Information

The parameters under *RPC > Extended Diagnosis Information* represent PROFINET IO specific counters.

For further information refer to the PROFINET IO specification. [3], [5]

9.8 PNS_IF

9.8.1 PROFINET IO Device Extended Diagnosis Information

PROFINET IO Device Extended Diagnosis Information	
Task states	
Name	Value
PNIO Device State	0x7B
Device Information	set
PROFINET Stack	started
API	added
Module in Slot 0	plugged
Submodule in Slot 0 Subslot 1	plugged
Bus on	true
Last Result/Error Code	Operation succeeded.
Link State	No Physical Link
Configuration State	Configured by means of Configuration Files
Communication State	Stop
Communication error	Operation succeeded.

Figure 66: Extended Diagnosis > PNS_IF > PROFINET IO Device Extended Diagnosis Information

Name	Description
PNIO Device State	Summary of the PROFINET IO stack status: set, not set
Device Information	Manufacturer information about the device, which is defined in the GSDML file.
PROFINET Stack	Status of the PROFINET IO stack: started, not started
API	API of the PROFINET IO stack: added, not added
Module in Slot 0	Module in Slot 0 of the PROFINET IO stack: plugged, not plugged
Submodule in Slot 0 Subslot 1	Submodule in Slot 0 Subslot 1 of the PROFINET IO stack: plugged, not plugged
Bus on	Network Communication: true, false
Last Result/Error Code	Last occurred result/ error of the PROFINET IO stack: e. g. "Operation succeeded"
Link State	State of the physical network connection of the PROFINET IO stack: Low Physical Link Speed, No Physical Link
Configuration State	Configuration State of the PROFINET IO stack <ul style="list-style-type: none"> • Not configured • Configured by means of Configuration Files • Error occurred while configuring with Configuration Files • Configured by means of Configuration Packets • Configuring by means of Configuration packets is running • Error occurred during configuring with Configuration Packets
Communication State	Communication State of the PROFINET IO stack <ul style="list-style-type: none"> • Unknown • Not configured • Stop • Idle • Operate • Communication error
Communication error	Communication error of the PROFINET IO stack: e. g. "Operation succeeded"

Table 49: Extended Diagnosis > PNS_IF > PROFINET IO Device Extended Diagnosis Information

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:

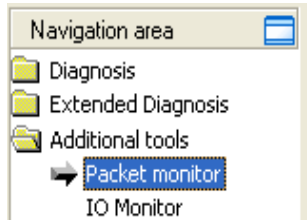
PROFINET IO-Device DTM	Folder Name / Section	Manual Page
 Navigation Area - Tools	Packet Monitor	108
	IO Monitor	111

Table 50: Descriptions of the Diagnosis Panes

Online Connection to the Device



Note: Accessing the **Tools** dialog panes of the PROFINET IO-Device DTM requires an online connection from the PROFINET IO-Device DTM to the PROFINET IO-Device device. For further information refer to section *Connecting/Disconnecting Device* on page 86.

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 67: 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 a 'Send' dialog box with two main sections: 'Packet header' and 'Send data'.

Packet header:

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

Send data:

Counter: 0

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

Buttons: Put cyclic, Put packet

Figure 68: 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 51: 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, 10, 20, 30, 40, 50, 60) and each column represents a bit (0-9). The first row (offset 0) shows bit 0 as 00 and bit 1 as 00, with a counter of 04. Subsequent rows show various bit patterns.

Figure 69: 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 52: 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 70: 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:

```

3 3 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1
1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0
+---+---+-----+-----+
|Sev|C|R|      Facility      |      Code      |
+---+---+-----+-----+
```

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:</i> 0xC02B0001 to 0xC02B4D52
	<i>RCX Common Status & Errors Codes::</i> 0x00000000 to 0xC002000C
	<i>RCX Status & Error Codes:</i> 0x00000000 to 0xC0000008
PROFINET IO Device / Status /Error Codes	<i>Status /Error Codes PROFINET IO Device:</i> 0x00000000 to 0xC030007CL
ODM Server	<i>General ODM Error Codes:</i> 0x8004C700 to 0x8004C761
	<i>General ODM Driver Error Codes:</i> 0x8004C7A0 to 0x8004C7C2
ODM Drivers	<i>cifX Driver Specific ODM Error:</i> 0x8004C001 to 0x8004C0A4
cifX Device Driver and netX Driver	<i>Generic Error:</i> 0x800A0001 to 0x800A0017
	<i>Generic Driver Error:</i> 0x800B0001 to 0x800B0042
	<i>Generic Device Error:</i> 0x800C0010 to 0x800C0041
netX Driver	<i>CIFX API Transport:</i> 0x800D0001 to 0x800D0013
	<i>CIFX API Transport Header State Error:</i> 0x800E0001 to 0x800E000B
DBM	<i>ODM Error Codes:</i> 0xC004C810 to 0xC004C878

Table 53: Overview Error Codes and Ranges



Further 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 54: 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 55: 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 56: 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 57: RCX Status & Error Codes Slave State

11.4 Status /Error Codes PROFINET IO Device

11.4.1 Packet Status/Error

Packet Status/Error Codes		
Error Code (Definition)	Value	Description
TLR_S_OK	0x00000000	Status ok.
TLR_E_PNS_IF_COMMAND_INVALID	0xC0300001	Invalid command.
TLR_E_PNS_IF_OS_INIT_FAILED	0xC0300002	Initialization of PNS Operating system adaptation failed.
TLR_E_PNS_IF_SET_INIT_IP_FAILED	0xC0300003	Initialization of PNS IP address failed.
TLR_E_PNS_IF_PNIO_SETUP_FAILED	0xC0300004	PROFINET IO-Device Setup failed.
TLR_E_PNS_IF_DEVICE_INFO_ALREADY_SET	0xC0300005	Device information set already.
TLR_E_PNS_IF_SET_DEVICE_INFO_FAILED	0xC0300006	Setting of device information failed.
TLR_E_PNS_IF_NO_DEVICE_SETUP	0xC0300007	PROFINET IO-Device stack is not initialized. Send PNS_IF_SET_DEVICEINFO_CNF before PNS_IF_OPEN_DEVICE_CNF
TLR_E_PNS_IF_DEVICE_OPEN_FAILED	0xC0300008	Opening a device instance failed.
TLR_E_PNS_IF_NO_DEVICE_INSTANCE	0xC0300009	No device instance open.
TLR_E_PNS_IF_SET_APPL_READY_FAILED	0xC0300010	Command PNS_IF_SET_APPL_READY_CNF failed.
TLR_E_PNS_IF_PLUG_MODULE_FAILED	0xC030000A	Plugging a module failed.
TLR_E_PNS_IF_PLUG_SUBMODULE_FAILED	0xC030000B	Plugging a submodule failed.
TLR_E_PNS_IF_DEVICE_START_FAILED	0xC030000C	Start of PROFINET IO-Device failed.
TLR_E_PNS_IF_EDD_ENABLE_FAILED	0xC030000D	Start of network communication failed.
TLR_E_PNS_IF_ALLOC_MNGMNT_BUFFER_FAILED	0xC030000E	Allocation of a device instance management buffer failed.
TLR_E_PNS_IF_DEVICE_HANDLE_NULL	0xC030000F	Given device handle is NULL.
TLR_E_PNS_IF_SET_DEVSTATE_FAILED	0xC0300011	Command PNS_IF_SET_DEVSTATE_CNF failed.
TLR_E_PNS_IF_PULL_SUBMODULE_FAILED	0xC0300012	Pulling the submodule failed.
TLR_E_PNS_IF_PULL_MODULE_FAILED	0xC0300013	Pulling the module failed.
TLR_E_PNS_IF_WRONG_DEST_ID	0xC0300014	Destination ID in command invalid.
TLR_E_PNS_IF_DEVICE_HANDLE_INVALID	0xC0300015	Device Handle in command invalid.
TLR_E_PNS_IF_CALLBACK_TIMEOUT	0xC0300016	PNS stack callback timeout.
TLR_E_PNS_IF_PACKET_POOL_EMPTY	0xC0300017	PNS_IF packet pool empty.
TLR_E_PNS_IF_ADD_API_FAILED	0xC0300018	Command PNS_IF_ADD_API_CNF failed.
TLR_E_PNS_IF_SET_SUB_STATE_FAILED	0xC0300019	Setting submodule state failed.
TLR_E_PNS_NO_NW_DBM_ERROR	0xC030001A	No network configuration DBM-file.
TLR_E_PNS_IF_NW_SETUP_TABLE_ERROR	0xC030001B	Error during reading the "SETUP" table of the network configuration DBM-file
TLR_E_PNS_IF_CFG_SETUP_TABLE_ERROR	0xC030001C	Error during reading the "SETUP" table of the PNIO configuration DBM-file .
TLR_E_PNS_NO_CFG_DBM_ERROR	0xC030001D	No PNIO configuration DBM-file.
TLR_E_PNS_IF_DBM_DATASET_ERROR	0xC030001E	Error getting dataset pointer.
TLR_E_PNS_IF_SETUP_EX_TABLE_ERROR	0xC030001F	Error getting dataset pointer(SETUP_EX table).
TLR_E_PNS_IF_AP_TABLE_ERROR	0xC0300020	Error getting either dataset pointer or number of datasets(AP table).
TLR_E_PNS_IF_MODULES_TABLE_ERROR	0xC0300021	Error getting either dataset pointer or number of datasets(MODULE table).

Packet Status/Error Codes		
Error Code (Definition)	Value	Description
TLR_E_PNS_IF_SUBMODULES_TABLE_ERROR	0xC0300022	Error getting either dataset pointer or number of datasets(SUBMODULE table).
TLR_E_PNS_IF_PNIO_SETUP_ERROR	0xC0300023	Error setting up PNIO configuration(PNIO_setup)
TLR_E_PNS_MODULES_GET_REC	0xC0300024	Error getting record of "MODULES" linked table.
TLR_E_PNS_SUBMODULES_GET_REC	0xC0300025	Error getting record of "SUBMODULES" linked table.
TLR_E_PNS_IF_PNS_MODULE_ID_TABLE_ERROR	0xC0300026	Error accessing "PNS_MODULE_ID" table or table record error.
TLR_E_PNS_IF_SIGNALS_TABLE_ERROR	0xC0300027	Error accessing "SIGNALS" table or table record error.
TLR_E_PNS_IF_MODULES_IO_TABLE_ERROR	0xC0300028	Error accessing "MODULES_IO" table or table record error.
TLR_E_PNS_IF_CHANNEL_SETTING_TABLE_ERROR	0xC0300029	Error accessing "CHANNEL_SETTING" table or table record error.
TLR_E_PNS_IF_WRITE_DBM	0xC030002A	Error writing DBM-file.
TLR_E_PNS_IF_DPM_CONFIG	0xC030002B	No basic DPM configuration.
TLR_E_PNS_IF_WATCHDOG	0xC030002C	Application did not trigger the watchdog.
TLR_E_PNS_IF_SIGNALS_SUBMODULES	0xC030002D	Data length in "SIGNALS" table does not correspond to that in "SUBMODULES" table.
TLR_E_PNS_IF_READ_DPM_SUBAREA	0xC030002E	Failed to read DPM subarea.
TLR_E_PNS_IF_MOD_0_NOT_SUB_1	0xC030002F	Module 0 may only have submodule 1. And the data length should be 0.
TLR_E_PNS_IF_SIGNALS_LENGTH	0xC0300030	Length of I/O signals is bigger then the size of DPM subarea.
TLR_E_PNS_IF_SUB_TRANSFER_DIRECTION	0xC0300031	A submodule can not have input and outputs at the same time.
TLR_E_PNS_IF_FORMAT_PNVOLUME	0xC0300032	Error while formatting PNVOLUME.
TLR_E_PNS_IF_MOUNT_PNVOLUME	0xC0300033	Error while mounting PNVOLUME.
TLR_E_PNS_IF_INIT_REMOTE	0xC0300034	Error during initialization of the remote resources of the stack.
TLR_E_PNS_IF_WARMSTART_CONFIG_REDUNDANT	0xC0300035	Warmstart parameters are redundant. The stack was configured with DBM or packets.
TLR_E_PNS_IF_WARMSTART_PARAMETER	0xC0300036	Incorrect warmstart parameter(s).
TLR_E_PNS_IF_SET_APPL_STATE_READY	0xC0300037	PNIO_set_appl_state_ready() returns error.
TLR_E_PNS_IF_SET_DEV_STATE	0xC0300038	PNIO_set_dev_state() returns error.
TLR_E_PNS_IF_PROCESS_ALARM_SEND	0xC0300039	PNIO_process_alarm_send() returns error.
TLR_E_PNS_IF_RET_OF_SUB_ALARM_SEND	0xC030003A	PNIO_ret_of_sub_alarm_send () returns error.
TLR_E_PNS_IF_DIAG_ALARM_SEND	0xC030003B	PNIO_diag_alarm_send() returns error.
TLR_E_PNS_IF_PNIO_DIAG_GENERIC_ADD	0xC030003C	PNIO_diag_generic_add() returns error.
TLR_E_PNS_IF_DIAG_GENERIC_REMOVE	0xC030003D	PNIO_diag_generic_remove() returns error.
TLR_E_PNS_IF_DIAG_CHANNEL_ADD	0xC030003E	PNIO_diag_channel_add() returns error.
TLR_E_PNS_IF_DIAG_CHANNEL_REMOVE	0xC030003F	PNIO_diag_channel_remove() returns error.
TLR_E_PNS_IF_EXT_DIAG_CHANNEL_ADD	0xC0300040	PNIO_ext_diag_channel_add() returns error.

Packet Status/Error Codes		
Error Code (Definition)	Value	Description
TLR_E_PNS_IF_EXT_DIAG_CHANNEL_REMOVE	0xC0300041	PNIO_ext_diag_channel_remove() returns error.
TLR_E_PNS_IF_STATION_NAME_LEN	0xC0300042	Parameter station name length is incorrect.
TLR_E_PNS_IF_STATION_NAME	0xC0300043	Parameter station name is incorrect.
TLR_E_PNS_IF_STATION_TYPE_LEN	0xC0300044	Parameter station type length is incorrect.
TLR_E_PNS_IF_DEVICE_TYPE	0xC0300045	Parameter device type is incorrect.
TLR_E_PNS_IF_ORDER_ID	0xC0300046	Parameter order id is incorrect.
TLR_E_PNS_IF_INPUT_STATUS	0xC0300047	Parameter input data status bytes length is incorrect.
TLR_E_PNS_IF_OUTPUT_STATUS	0xC0300048	Parameter output data status bytes length is incorrect.
TLR_E_PNS_IF_WATCHDOG_PARAMETER	0xC0300049	Parameter watchdog timing is incorrect (must be < 0xFFFF).
TLR_E_PNS_IF_OUT_UPDATE	0xC030004A	Parameter output data update timing is incorrect.
TLR_E_PNS_IF_IN_UPDATE	0xC030004B	Parameter input data update timing is incorrect.
TLR_E_PNS_IF_IN_SIZE	0xC030004C	Parameter input memory area size is incorrect.
TLR_E_PNS_IF_OUT_SIZE	0xC030004D	Parameter output memory area size is incorrect.
TLR_E_PNS_IF_GLOBAL_RESOURCES	0xC030004E	Unable to allocate memory for global access to local resources.
PNS_IF_DYNAMIC_CFG_PCK	0xC030004F	Unable to allocate memory for dynamic configuration packet.
TLR_E_PNS_IF_DEVICE_STOP	0xC0300050	Unable to stop device.
TLR_E_PNS_IF_DEVICE_ID	0xC0300051	Parameter device id is incorrect.
TLR_E_PNS_IF_VENDOR_ID	0xC0300052	Parameter vendor id is incorrect.
TLR_E_PNS_IF_SYS_START	0xC0300053	Parameter system start is incorrect.
TLR_E_PNS_IF_DYN_CFG_IO_LENGTH	0xC0300054	The length of IO data expected by the controller exceeds the limit specified in warmstart parameters.
TLR_E_PNS_IF_DYN_CFG_MOD_NUM	0xC0300055	The count of the IO modules expected by the controller exceeds the supported by the stack count.
TLR_E_PNS_IF_ACCESS_LOCAL_RSC	0xC0300056	No global access to local resources.
TLR_E_PNS_IF_PULL_PLUG	0xC0300057	Plugging and pulling modules during creation of communication is not allowed.
TLR_E_PNS_IF_AR_NUM	0xC0300058	Maximum number of ARs is 1.
TLR_E_PNS_IF_API_NUM	0xC0300059	Only API = 0 is supported.
TLR_E_PNS_IF_ALREADY_OPEN	0xC030005A	Device is already opened.
TLR_E_PNS_IF_API_ADDED	0xC030005B	Application is already added.
TLR_E_PNS_IF_CONFIG_MODE	0xC030005C	Configuration modes should not be mixed (DBM-files,application,warmstart message).
TLR_E_PNS_IF_UNK_LED_MODE	0xC030005D	Unknown LED mode.
TLR_E_PNS_IF_PHYSICAL_LINK	0xC030005E	Physical link is less then 100 Mbit.
TLR_E_PNS_IF_MAX_SLOT_SUBSLOT	0xC030005F	Number of slots or subslots too big.
TLR_E_PNS_IF_AR_REASON_MEM	0xC0300060	Out of memory. Communication error.
TLR_E_PNS_IF_AR_REASON_FRAME	0xC0300061	Add provider or consumer failed. Communication error.
TLR_E_PNS_IF_AR_REASON_MISS	0xC0300062	Miss (consumer). Communication error.

Packet Status/Error Codes		
Error Code (Definition)	Value	Description
TLR_E_PNS_IF_AR_REASON_TIMER	0xC0300063	CMI timeout. Communication error.
TLR_E_PNS_IF_AR_REASON_ALARM	0xC0300064	Alarm-open failed. Communication error.
TLR_E_PNS_IF_AR_REASON_ALSND	0xC0300065	Alarm-send.cnf(-). Communication error.
TLR_E_PNS_IF_AR_REASON_ALACK	0xC0300066	Alarm-ack-send.cnf(-). Communication error.
TLR_E_PNS_IF_AR_REASON_ALLEN	0xC0300067	Alarm-data too long. Communication error.
TLR_E_PNS_IF_AR_REASON_ASRT	0xC0300068	Alarm.ind(err). Communication error.
TLR_E_PNS_IF_AR_REASON_RPC	0xC0300069	RPC-client call.cnf(-). Communication error.
TLR_E_PNS_IF_AR_REASON_ABORT	0xC030006A	AR-abort.req. Communication error.
TLR_E_PNS_IF_AR_REASON_RERUN	0xC030006B	Re-run aborts existing. Communication error.
TLR_E_PNS_IF_AR_REASON_REL	0xC030006C	Got release indication. Communication error.
TLR_E_PNS_IF_AR_REASON_PAS	0xC030006D	Device passivated. Communication error.
TLR_E_PNS_IF_AR_REASON_RMV	0xC030006E	Device/ar removed. Communication error.
TLR_E_PNS_IF_AR_REASON_PROT	0xC030006F	Protocol violation. Communication error.
TLR_E_PNS_IF_AR_REASON_NARE	0xC0300070	NARE error. Communication error.
TLR_E_PNS_IF_AR_REASON_BIND	0xC0300071	RPC-Bind error. Communication error.
TLR_E_PNS_IF_AR_REASON_CONNECT	0xC0300072	RPC-Connect error. Communication error.
TLR_E_PNS_IF_AR_REASON_READ	0xC0300073	RPC-Read error. Communication error.
TLR_E_PNS_IF_AR_REASON_WRITE	0xC0300074	RPC-Write error. Communication error.
TLR_E_PNS_IF_AR_REASON_CONTROL	0xC0300075	RPC-Control error. Communication error.
TLR_E_PNS_IF_AR_REASON_UNKNOWN	0xC0300076	Unknown. Communication error.
TLR_E_PNS_IF_INIT_WATCHDOG	0xC0300077	Watchdog initialization failed.
TLR_E_PNS_IF_NO_PHYSICAL_LINK	0xC0300078	The device is not connected to a network.
TLR_DPM_CYCLIC_IO_RW	0xC0300079	Failed to copy from/ to DPM the cyclic data.
TLR_E_PNS_IF_SUBMODULE	0xC030007A	Wrong submodule number.
TLR_E_PNS_IF_MODULE	0xC030007B	Wrong module number.
TLR_E_PNS_IF_NO_AR	0xC030007C	The AR was closed or the AR handle is not valid.
PNS_IF_WRITE_REC_RES_TIMEOUT	0xC030007D	The timeout while waiting a response to write_record_indication has been reached
PNS_IF_UNREGISTERED_SENDER	0xC030007E	The sender of the request is not registered with request PNS_IF_REGISTER_AP_CNF
TLR_E_PNS_IF_RECORD_HANDLE_INVALID	0xC030007F	Unknown record handle
TLR_E_PNS_IF_REGISTER_AP	0xC0300080	Error during processing request PNS_IF_REGISTER_AP_CNF
TLR_E_PNS_IF_UNREGISTER_AP	0xC0300081	Error during processing request PNS_IF_UNREGISTER_AP_CNF
TLR_E_PNS_IF_CONFIG_DIFFER	0xC0300082	The Must-configuration differs from Is-configuration.
TLR_E_PNS_IF_NO_COMMUNICATION	0xC0300083	No communication processing.
TLR_E_PNS_IF_BAD_PARAMETER	0xC0300084	At least one parameter in a packet was wrong or/and did not meet the requirements.

Packet Status/Error Codes		
Error Code (Definition)	Value	Description
TLR_E_PNS_IF_AREA_OVERFLOW	0xC0300085	Input or Output data requires more space then available.
TLR_E_PNS_IF_WRM_PCK_SAVE	0xC0300086	Saving Warmstart Configuration for later use was not successful.
TLR_E_PNS_IF_AR_REASON_PULLPLUG	0xC0300087	AR error. Pull and Plug are forbidden after check.rsp and before in-data.ind.
TLR_E_PNS_IF_AR_REASON_AP_RMV	0xC0300088	AR error. AP has been removed.
TLR_E_PNS_IF_AR_REASON_LNK_DWN	0xC0300089	AR error. Link "down".
TLR_E_PNS_IF_AR_REASON_MMAC	0xC030008A	AR error. Could not register multicast-MAC.
TLR_E_PNS_IF_AR_REASON_SYNC	0xC030008B	AR error. Not synchronised (Cannot start companion-AR).
TLR_E_PNS_IF_AR_REASON_TOPO	0xC030008C	AR error. Wrong topology (Cannot start companion-AR).
TLR_E_PNS_IF_AR_REASON_DCP_NAME	0xC030008D	AR error. DCP. Station Name changed.
TLR_E_PNS_IF_AR_REASON_DCP_RESET	0xC030008E	AR error. DCP. Reset to factory-settings.
TLR_E_PNS_IF_AR_REASON_PRM	0xC030008F	AR error. Cannot start companion-AR because a 0x8ipp submodule in the first AR /has appl-ready-pending/ is locked/ is wrong or pulled/ .
TLR_E_PNS_IF_PACKET_MNGMNT	0xC0300090	Packet management error.
TLR_E_PNS_IF_WRONG_API_NUM	0xC0300091	Wrong API number.
TLR_E_PNS_IF_WRONG_MODULE_ID	0xC0300092	A wrong module ID has been specified.

Table 58: Status /Error Codes PROFINET IO Device

11.5 ODM Error Codes

11.5.1 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 59: ODM Error Codes - General ODM Error Codes

11.5.2 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 60: ODM Error Codes - General ODM Driver Error Codes

11.5.3 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 61: cifX Driver Specific ODM Error Codes

11.6 Error Codes cifX Device Driver and netX Driver

11.6.1 Generic Error Codes

Error Code (Definition)	Value	Description
CIFX_INVALID_POINTER	0x800A0001L	Invalid pointer (NULL) passed to driver
CIFX_INVALID_BOARD	0x800A0002L	No board with the given nameindex available
CIFX_INVALID_CHANNEL	0x800A0003L	No channel with the given index available
CIFX_INVALID_HANDLE	0x800A0004L	Invalid handle passed to driver
CIFX_INVALID_PARAMETER	0x800A0005L	Invalid parameter
CIFX_INVALID_COMMAND	0x800A0006L	Invalid command
CIFX_INVALID_BUFFERSIZE	0x800A0007L	Invalid buffer size
CIFX_INVALID_ACCESS_SIZE	0x800A0008L	Invalid access size
CIFX_FUNCTION_FAILED	0x800A0009L	Function failed
CIFX_FILE_OPEN_FAILED	0x800A000AL	File could not be opened
CIFX_FILE_SIZE_ZERO	0x800A000BL	File size is zero
CIFX_FILE_LOAD_INSUFF_MEM	0x800A000CL	Insufficient memory to load file
CIFX_FILE_CHECKSUM_ERROR	0x800A000DL	File checksum compare failed
CIFX_FILE_READ_ERROR	0x800A000EL	Error reading from file
CIFX_FILE_TYPE_INVALID	0x800A000FL	Invalid file type
CIFX_FILE_NAME_INVALID	0x800A0010L	Invalid file name
CIFX_FUNCTION_NOT_AVAILABLE	0x800A0011L	Driver function not available
CIFX_BUFFER_TOO_SHORT	0x800A0012L	Given buffer is too short
CIFX_MEMORY_MAPPING_FAILED	0x800A0013L	Failed to map the memory
CIFX_NO_MORE_ENTRIES	0x800A0014L	No more entries available
CIFX_CALLBACK_MODE_UNKNOWN	0x800A0015L	Unkown callback handling mode
CIFX_CALLBACK_CREATE_EVENT_FAILED	0x800A0016L	Failed to create callback events
CIFX_CALLBACK_CREATE_RECV_BUFFER	0x800A0017L	Failed to create callback receive buffer

Table 62: Generic Error Codes

11.6.2 Generic Driver Error Codes

Error Code (Definition)	Value	Description
CIFX_DRV_NOT_INITIALIZED	0x800B0001L	Driver not initialized
CIFX_DRV_INIT_STATE_ERROR	0x800B0002L	Driver init state error
CIFX_DRV_READ_STATE_ERROR	0x800B0003L	Driver read state error
CIFX_DRV_CMD_ACTIVE	0x800B0004L	Command is active on device
CIFX_DRV_DOWNLOAD_FAILED	0x800B0005L	General error during download
CIFX_DRV_WRONG_DRIVER_VERSION	0x800B0006L	Wrong driver version
CIFX_DRV_DRIVER_NOT_LOADED	0x800B0030L	CIFx driver is not running
CIFX_DRV_INIT_ERROR	0x800B0031L	Failed to initialize the device
CIFX_DRV_CHANNEL_NOT_INITIALIZED	0x800B0032L	Channel not initialized (xOpenChannel not called)
CIFX_DRV_IO_CONTROL_FAILED	0x800B0033L	IOControl call failed
CIFX_DRV_NOT_OPENED(0x800B0034L	Driver was not opened
CIFX_DRV_DOWNLOAD_STORAGE_UNKN OWN	0x800B0040L	Unknown download storage type (RAMFLASH based) found
CIFX_DRV_DOWNLOAD_FW_WRONG_CHA NNEL	0x800B0041L	Channel number for a firmware download not supported
CIFX_DRV_DOWNLOAD_MODULE_NO_BAS EOS	0x800B0042L	Modules are not allowed without a Base OS firmware

Table 63: Generic Driver Error Codes

11.6.3 Generic Device Error Codes

Error Code (Definition)	Value	Description
CIFX_DEV_DPM_ACCESS_ERROR	0x800C0010L	Dual port memory not accessible (board not found)
CIFX_DEV_NOT_READY	0x800C0011L	Device not ready (ready flag failed)
CIFX_DEV_NOT_RUNNING	0x800C0012L	Device not running (running flag failed)
CIFX_DEV_WATCHDOG_FAILED	0x800C0013L	Watchdog test failed
CIFX_DEV_SYSERR	0x800C0015L	Error in handshake flags
CIFX_DEV_MAILBOX_FULL	0x800C0016L	Send mailbox is full
CIFX_DEV_PUT_TIMEOUT	0x800C0017L	Send packet timeout
CIFX_DEV_GET_TIMEOUT	0x800C0018L	Receive packet timeout
CIFX_DEV_GET_NO_PACKET	0x800C0019L	No packet available
CIFX_DEV_MAILBOX_TOO_SHORT	0x800C001AL	Mailbox too short
CIFX_DEV_RESET_TIMEOUT	0x800C0020L	Reset command timeout
CIFX_DEV_NO_COM_FLAG	0x800C0021L	COM-flag not set
CIFX_DEV_EXCHANGE_FAILED	0x800C0022L	IO data exchange failed
CIFX_DEV_EXCHANGE_TIMEOUT	0x800C0023L	IO data exchange timeout
CIFX_DEV_COM_MODE_UNKNOWN	0x800C0024L	Unknown IO exchange mode
CIFX_DEV_FUNCTION_FAILED	0x800C0025L	Device function failed
CIFX_DEV_DPMSIZE_MISMATCH	0x800C0026L	DPM size differs from configuration
CIFX_DEV_STATE_MODE_UNKNOWN	0x800C0027L	Unknown state mode
CIFX_DEV_HW_PORT_IS_USED	0x800C0028L	Device is still accessed
CIFX_DEV_CONFIG_LOCK_TIMEOUT	0x800C0029L	Configuration locking timeout
CIFX_DEV_CONFIG_UNLOCK_TIMEOUT	0x800C002AL	Configuration unlocking timeout
CIFX_DEV_HOST_STATE_SET_TIMEOUT	0x800C002BL	Set HOST state timeout
CIFX_DEV_HOST_STATE_CLEAR_TIMEOUT	0x800C002CL	Clear HOST state timeout
CIFX_DEV_INITIALIZATION_TIMEOUT	0x800C002DL	Timeout during channel initialization
CIFX_DEV_BUS_STATE_ON_TIMEOUT	0x800C002EL	Set Bus ON Timeout
CIFX_DEV_BUS_STATE_OFF_TIMEOUT	0x800C002FL	Set Bus OFF Timeout
CIFX_DEV_MODULE_ALREADY_RUNNING	0x800C0040L	Module already running
CIFX_DEV_MODULE_ALREADY_EXISTS	0x800C0041L	Module already exists

Table 64: Generic Device Error Codes

11.7 Error Codes netX Driver

11.7.1 CIFS API Transport Error Codes

Error Code (Definition)	Value	Description
CIFS_TRANSPORT_SEND_TIMEOUT	0x800D0001L	Time out while sending data
CIFS_TRANSPORT_RECV_TIMEOUT	0x800D0002L	Time out waiting for incoming data
CIFS_TRANSPORT_CONNECT	0x800D0003L	Unable to communicate to the device no answer
CIFS_TRANSPORT_ABORTED	0x800D0004L	Transfer has been aborted due to keep alive timeout or interface detachment
CIFS_CONNECTOR_FUNCTIONS_READ_ERROR	0x800D0010L	Error reading the connector functions from the DLL
CIFS_CONNECTOR_IDENTIFIER_TOO_LONG	0x800D0011L	Connector delivers an identifier longer than 6 characters
CIFS_CONNECTOR_IDENTIFIER_EMPTY	0x800D0012L	Connector delivers an empty identifier
CIFS_CONNECTOR_DUPLICATE_IDENTIFIER	0x800D0013L	Connector identifier already used

Table 65: CIFS API Transport Error Codes

11.7.2 CIFS API Transport Header State Error Codes

Error Code (Definition)	Value	Description
CIFS_TRANSPORT_ERROR_UNKNOWN	0x800E0001L	Unknown error code in transport header
CIFS_TRANSPORT_CHECKSUM_ERROR	0x800E0002L	CRC16 checksum failed
CIFS_TRANSPORT_LENGTH_INCOMPLETE	0x800E0003L	Transaction with incomplete length detected
CIFS_TRANSPORT_DATA_TYPE_UNKNOWN	0x800E0004L	Device does not support requested data type
CIFS_TRANSPORT_DEVICE_UNKNOWN	0x800E0005L	Device not available unknown
CIFS_TRANSPORT_CHANNEL_UNKNOWN	0x800E0006L	Channel not available unknown
CIFS_TRANSPORT_SEQUENCE	0x800E0007L	Sequence error detected
CIFS_TRANSPORT_BUFFER_OVERFLOW	0x800E0008L	Buffer overflow detected
CIFS_TRANSPORT_RESOURCE	0x800E0009L	Device signals out of resources
CIFS_TRANSPORT_KEEPA_LIVE	0x800E000AL	Device connection monitoring error (Keep alive)
CIFS_TRANSPORT_DATA_TOO_SHORT	0x800E000BL	Received transaction data too short

Table 66: CIFS API Transport Header State Error Codes

11.8 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 67: 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** and **Diagnosis** panes of the PROFINET IO Device DTM you do not need special user rights. Also all users can select the decimal or hexadecimal Display mode or sort table entries.



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

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

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 68: Settings (D = Displaying, X = Editing, Configuring)

12.1.2 Configuration

	Observer	Operator	Maintenance	Planning Engineer	Administrator
<i>General</i>	D	D	X	X	X
<i>Modules</i>	D	D	X	X	X
<i>Address Table</i>	D	D	X	X	X
<i>Device Settings</i>	D	D	X	X	X

Table 69: Configuration (D = Displaying, X = Editing, Configuring)

12.2 Name encoding

The name is an OctetString with 1 to 240 octets. A name can contain one or more labels separated by a dot [.].

The definition of IETF RFC 5890 and the following syntax applies:

- 1 or more labels, separated by [.]
- Total length is 1 to 240
- Label length is 1 to 63
- Labels consist of [a-z0-9-]
- Labels do not start with [-]
- Labels do not end with [-]
- Labels do not use multiple concatenated [-] except for IETF RFC 5890
- The first label does not have the form “port-xyz” or “port-xyz-abcde” with a, b, c, d, e, x, y, z = 0..9, to avoid wrong similarity with the field AliasNameValue
- Station names do not have the form a.b.c.d with a, b, c, d = 0...999

12.3 References

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- [3] PROFINET IO-Device Protocol API Manual (V3.4), Revision 13, Hilscher GmbH 2013
PROFINET IO-Device Protocol API Manual (V3.5), Revision 5, Hilscher GmbH 2013
- [4] PROFINET IO RT Controller Protocol API Manual, Revision 18, Hilscher GmbH 2013
- [5] Application Layer protocol for decentralized periphery and distributed automation, Technical Specification for PROFINET, Version 2.3Ed2MU2, February 2015, Order No: 2.722, PROFIBUS Nutzerorganisation e.V., Karlsruhe

12.4 List of Figures

Figure 1: Dialog Structure of the PROFINET IO-Device DTM	15
Figure 2: Navigation Area	16
Figure 3: Hidden table rows	19
Figure 4: Additional table rows displayed	19
Figure 5: Drop-down list	19
Figure 6: Status Bar – Status Fields 1 to 6	20
Figure 7: Status Bar Display Examples	20
Figure 8: PROFINET IO Device Instance Stand-Alone Slave (Example)	32
Figure 9: Default Driver ‚cifX Device Driver’ for PC cards cifX	36
Figure 10: Default Driver ‚cifX Device Driver’ for PC cards cifX (example)	36
Figure 11: Default Driver ‚netX Driver’ for Hilscher devices except for PC cards cifX (example)	36
Figure 12: Manual Selection of multiple drivers (Example)	37
Figure 13: netX Driver > USB/RS232 Connection	41
Figure 14: netX Driver > TCP Connection	44
Figure 15: Device Assignment - detected Devices (* The name of the device class is displayed.) – Example for a device without firmware	46
Figure 16: Device Assignment - detected Devices (* The name of the device class is displayed.) Example for Devices without Firmware	48
Figure 17: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for a device without firmware / one Device is selected	49
Figure 18: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for Devices with and without Firmware / one Device is selected	50
Figure 19: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for a device with firmware / one Device is selected	51
Figure 20: Firmware Download	52
Figure 21: Error Message ‘The device is not assigned to the hardware!’	52
Figure 22: Window ‘Select Firmware File’ (Example CIFX)	53
Figure 23: Request Select Firmware File - Example Invalid Firmware	55
Figure 24: Request - Do you really want to download the firmware?	56
Figure 25: Firmware Download - Progress Bar	56
Figure 26: Clock Symbol and Hook Symbol green	57
Figure 27: Firmware Download – Download	57
Figure 28: Configuration > General	62
Figure 29: Configuration > Modules Pane (* The Name of the device is displayed.)	63
Figure 30: Configuration > Modules Table (* The Name of the device is displayed.)	64
Figure 31: Indication of the Firmwareversion of the Device Instance (Example)	65
Figure 32: Changing Modules using Drop-Down Control (* The Name of the device is displayed.)	66
Figure 33: Assigning (Sub) Slots to Modules using Drop-Down Control (* The Name of the device is displayed.)	67
Figure 34: Configuration > Modules - Configuration Info	68
Figure 35: Configuration > Modules - Submodules Details > Dataset: I/O data	69
Figure 36: Configuration > Modules - Submodules Details > Dataset: Parameter	69
Figure 37: Signal Configuration Pane	71
Figure 38: Edit Signal	72
Figure 39: Edit Signal Dialog Pane	72
Figure 40: Edit Signal (Example)	73
Figure 41: Signal “Inputs” split (Example)	73
Figure 42: Signal “Inputs_Byte_0” split again (Example)	73
Figure 43: Reset	74
Figure 44: Merge Signals	74
Figure 45: Dialog Pane Merge Signals	75
Figure 46: Configuration > Address Table	76

Figure 47: Configuration > Address Table - Display Mode	77
Figure 48: Configuration > Device Settings	78
Figure 49: Device Settings > Start of Bus Communication	79
Figure 50: Device Settings > Application Monitoring	79
Figure 51: Device Settings > Process Image Storage Format	80
Figure 52: Controller Settings > IO State Information	81
Figure 53: netDevice Message: Download	90
Figure 54: General Diagnosis	93
Figure 55: Firmware Diagnosis (Example)	95
Figure 56: Extended Diagnosis > [Folder Name] > Task Information Example Display	97
Figure 57: Extended Diagnosis > [Folder Name] > IniBatch Status Example Display	98
Figure 58: Extended Diagnosis > [Folder Name] > General Diagnosis Information	99
Figure 59: Extended Diagnosis > PNIO_DCP > Extended Diagnosis Information	100
Figure 60: Extended Diagnosis > TCP_UDP > IP-Information	102
Figure 61: Extended Diagnosis > TCP_UDP > Packet Counter	103
Figure 62: Extended Diagnosis > TCP_UDP > IP Code Diagnosis	103
Figure 63: Extended Diagnosis > TCP_UDP > TCP_UDP Information	104
Figure 64: Extended Diagnosis > TCP_UDP > TCP_UDP Code Diagnosis	104
Figure 65: Extended Diagnosis > RPC > Extended Diagnosis Information	105
Figure 66: Extended Diagnosis > PNS_IF > PROFINET IO Device Extended Diagnosis Information	106
Figure 67: Packet Monitor	108
Figure 68: Send > Packet Header and Send Data	109
Figure 69: Packet Header and Receive Data	110
Figure 70: IO Monitor	111

12.5 List of Tables

Table 1: Descriptions Dialog Pages	6
Table 2: List of Revisions	7
Table 3: General Device Information	16
Table 4: Overview Dialog Panes	17
Table 5: OK, Cancel, Apply and Help	18
Table 6: Selecting, inserting, deleting Table Line	18
Table 7: Status Bar Icons [1]	20
Table 8: Signal Words	24
Table 9: Getting started - Configuration Steps (Device DTM at the Root-Line (Stand-Alone Slave))	27
Table 10: Getting started - Configuration Steps (Device DTM at the Master busline)	30
Table 11: Descriptions of the Dialog Panes Settings	33
Table 12: Driver Selection List Parameters	36
Table 13: Parameters netX Driver > USB/RS232 Connection	42
Table 14: Parameters netX Driver > TCP Connection	45
Table 15: Parameters of the Device Assignment	47
Table 16: Parameter Firmware Download	52
Table 17: Parameters Select Firmware File	54
Table 18: Descriptions of the Dialog Panes Configuration	58
Table 19: General Pane Parameters	62
Table 20: Modules Pane Parameters	64
Table 21: Modules Pane Parameters - Configuration Info	68
Table 22: Modules Pane Parameters - Submodules Details	69
Table 23: Explanations Signal Configuration Pane	71
Table 24: Explanations Edit Signal Dialog Pane	72
Table 25: Explanations Merge Signals Dialog Pane	75
Table 26: Address Table Pane Parameters - Inputs / Outputs	77

Table 27: Range of Value / Value for the Watchdog time	79
Table 28: Master Settings Pane Parameters - Process Image Storage Format	80
Table 29: Parameters IO State Information	81
Table 30: Descriptions of the Description Panes	82
Table 31: Device Info	83
Table 32: Module Information	84
Table 33: Device Description – GSDML Viewer	85
Table 34: Descriptions of the Diagnosis Panes	92
Table 35: Indication General Diagnosis	94
Table 36: Parameter General Diagnosis	94
Table 37: Network State (V3.9 and earlier)	94
Table 38: Description Table Task Information	95
Table 39: Descriptions of the Dialog Panes Extended Diagnosis	96
Table 40: Extended Diagnosis > [Folder Name] > Task Information	97
Table 41: Extended Diagnosis > [Folder Name] > IniBatch Status	98
Table 42: Extended Diagnosis > [Folder Name] > General Diagnosis Information	99
Table 43: Extended Diagnosis > PNIO_DCP > Extended Diagnosis Information	101
Table 44: Extended Diagnosis > TCP_UDP > IP-Information	102
Table 45: Extended Diagnosis > TCP_UDP > Packet Counter	103
Table 46: Extended Diagnosis > TCP_UDP > IP Code Diagnosis	103
Table 47: Extended Diagnosis > TCP_UDP > TCP_UDP Information	104
Table 48: Extended Diagnosis > TCP_UDP > TCP_UDP Code Diagnosis	104
Table 49: Extended Diagnosis > PNS_IF > PROFINET IO Device Extended Diagnosis Information	106
Table 50: Descriptions of the Diagnosis Panes	107
Table 51: Descriptions Packet Header	109
Table 52: Descriptions Packet Header	110
Table 53: Overview Error Codes and Ranges	113
Table 54: RCX General Task Errors	114
Table 55: RCX Common Status & Errors Codes	115
Table 56: RCX Status & Error Codes	116
Table 57: RCX Status & Error Codes Slave State	116
Table 58: Status /Error Codes PROFINET IO Device	121
Table 59: ODM Error Codes - General ODM Error Codes	122
Table 60: ODM Error Codes - General ODM Driver Error Codes	123
Table 61: cifX Driver Specific ODM Error Codes	126
Table 62: Generic Error Codes	127
Table 63: Generic Driver Error Codes	128
Table 64: Generic Device Error Codes	129
Table 65: CIFS API Transport Error Codes	130
Table 66: CIFS API Transport Header State Error Codes	130
Table 67: ODM Error Codes DBM V4	134
Table 68: Settings (D = Displaying, X = Editing, Configuring)	135
Table 69: Configuration (D = Displaying, X = Editing, Configuring)	135

12.6 Glossary

DCP

Discovery and Configuration Protocol.

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

Device Instance

According to the version of the PROFINET IO Device firmware the device instance specifies, which features the device has. The device instance is a module of the GSDML to describe the device parameters device specific.

In **netDevice** in the device catalog under 'Stand-Alone-Slave' or 'Slave' all device instances that derive from the same device description file, appear as separate devices.

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.

Ethernet

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

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.

GSDML

GSDML = General Station Description Markup Language.

IP

Internet Protocol.

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

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

IP defines special addressing mechanisms, see IP Address.

IP Address

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

a.b.c.d

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

Example: 192.168.30.15

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

The IP address 0.0.0.0 is defined as invalid.

MAC-ID

MAC = Media Access Control

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

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

A-B-C-D-E-F

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

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

Module

Hardware or logical component of a physical device.

Name of Station

The **Name of Station** is defined by the DNS compatible device name in the GSDML file. It can be modified according to the DNS name specification. If the PROFINET IO device does use the name baptism the **Name of Station** is set by the PROFINET IO device.

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.

PROFINET

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

PROFINET IO-Controller

A PROFINET control unit responsible for the defined run-up of an I/O subsystem and the cyclic or acyclic data exchange.

PROFINET IO Device

A PROFINET field device that cyclically receives output data from its IO-Controller and responds with its input data.

Slot

Address of a structural unit within a PROFINET IO device.

Subslot

Subslot address of a structural unit within a slot.

Submodule

Hardware or logical component of a module.

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