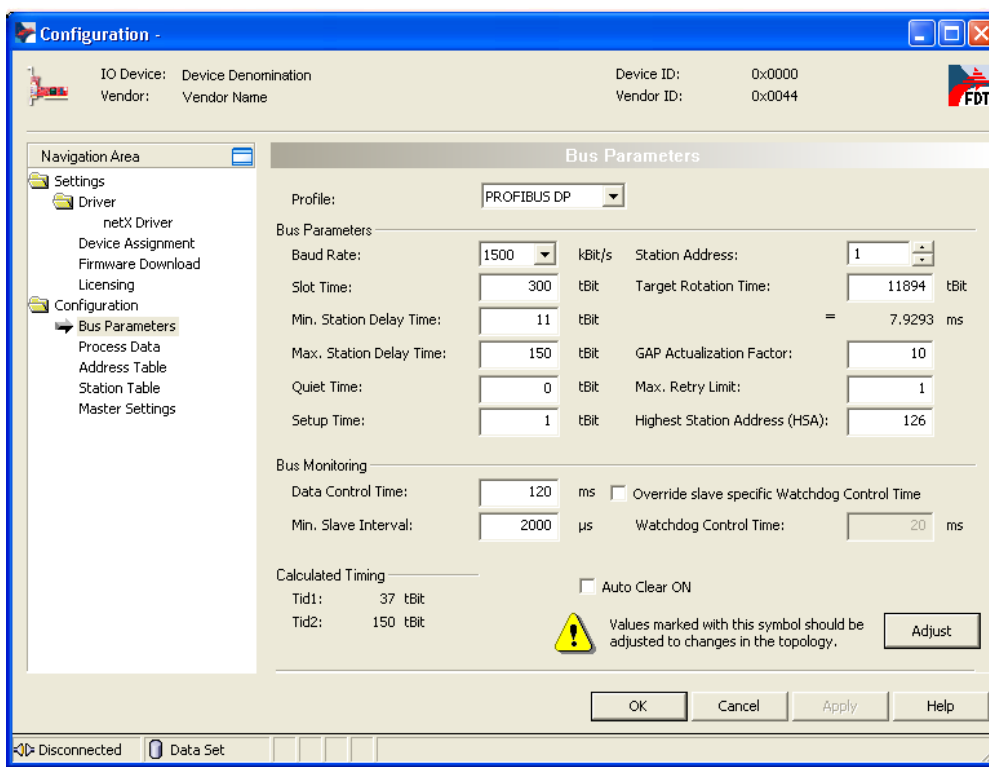


Operating Instruction Manual

DTM for Hilscher PROFIBUS DP Master Devices

Configuration of Hilscher Master Devices

V2.1000



Hilscher Gesellschaft für Systemautomation mbH

www.hilscher.com

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Table of Contents

1	INTRODUCTION.....	7
1.1	About this Manual	7
1.1.1	Descriptions of the Dialog Panes	7
1.1.2	Online Help	7
1.1.3	List of Revisions	8
1.1.4	Conventions in this Manual	9
1.2	Legal Notes.....	10
1.3	Registered Trademarks.....	13
1.4	About PROFIBUS DP Master DTM	14
1.4.1	Requirements	14
1.5	Dialog Structure PROFIBUS DP Master 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	Status Bar	19
2	SAFETY	20
2.1	General Note.....	20
2.2	Intended Use.....	20
2.3	Personnel Qualification	20
2.4	Safety Instructions.....	21
2.4.1	Communication Stop during Firmware or Configuration Download	21
2.4.2	Mismatching System Configuration	21
2.5	Property Damage	22
2.5.1	Power Disconnect while downloading Firmware or Configuration	22
2.5.2	Invalid Firmware	22
2.6	Labeling of Safety Messages	23
2.7	References Safety.....	23
3	GETTING STARTED.....	24
3.1	Configuration Steps.....	24
3.2	Safety Messages on Firmware or Configuration Download	28
3.3	“Configuration in Run” Steps	29
4	SETTINGS	31
4.1	Overview Settings	31
4.2	Settings for Driver and Device Assignment	32
4.3	Driver	34
4.3.1	Verify or adapt Driver Settings	34

4.3.2	cifX Device Driver	36
4.3.3	netX Driver	36
4.3.4	Configuring netX Driver	37
4.3.5	netX Driver - USB/RS232 Connection	38
4.3.6	netX Driver - TCP/IP Connection	40
4.4	Device Assignment	43
4.4.1	Scanning for Devices	43
4.4.2	Selecting the Device (with or without firmware)	46
4.4.3	Selecting the Device once more (with Firmware)	47
4.5	Firmware Download	49
4.6	Licensing	56
5	CONFIGURATION	57
5.1	Overview Configuration	57
5.2	Configuring Device Parameters	58
5.3	Bus Parameters	60
5.3.1	Profile	60
5.3.2	Bus Parameters	61
5.3.3	Bus Monitoring	64
5.3.4	Error Handling	65
5.3.5	Calculated Timing	66
5.4	Process Data	67
5.5	Address Table	68
5.5.1	Auto Addressing, Display Mode, CSV Export	69
5.5.2	Inputs / Outputs	70
5.6	Station Table	71
5.7	Master Settings	72
5.7.1	Start of Bus Communication	73
5.7.2	Application Monitoring	73
5.7.3	Process Image Storage Format	74
5.7.4	Module Alignment	74
5.7.5	Process Data Handshake	75
5.7.6	Advanced	75
5.7.7	Device Status Offset	76
6	ONLINE FUNCTIONS	77
6.1	Connecting/Disconnecting Device	77
6.2	Debug Mode	79
6.2.1	Requirements	80
6.2.2	Starting Debug Mode	81
6.2.3	Debug Mode Busline Colors and Debug Icons	82
6.2.4	Reset of the Diagnosis Information and of the Station Status	83
6.2.5	Stopping Debug Mode	83
6.3	Set Station Address	84
6.4	Live List	85

6.5	'Network Scan' and 'Upload'	86
6.5.1	Starting 'Network Scan'	87
6.5.2	Settings in the Scan Response Dialog of the Master DTM	89
6.5.3	Description on the Scan Response dialog of the Master DTM	90
6.5.4	Creating Devices	92
6.5.5	Download to the PROFIBUS DP Master Device	95
6.5.6	Resolving Module Identifier Conflicts	96
6.6	Download Configuration	99
6.7	Configuration in Run	101
6.7.1	Requirements	102
6.7.2	Overview Steps for "Configuration in Run"	103
6.7.3	Activate „Configuration in Run“	104
6.7.4	Define Number of Bytes after Input Data	104
6.7.5	Create the Configuration	105
6.7.6	Change the Configuration	106
6.7.7	Start the Download	107
6.7.8	Evaluate Configuration Data	108
6.7.9	Activate or reject Changes	112
6.7.10	Increase the Number of Bytes after the Input Data	113
6.7.11	Quick Reference Dialog Pane "Configuration in Run"	115
6.8	Start /Stop Communication	116
6.9	Licensing	117
6.9.1	Open License Dialog	117
6.9.2	License Dialog	118
6.9.3	Which Licenses are present in the Device?	119
6.9.4	How to order a License	121
6.9.5	Selecting License(s)	121
6.9.6	Ordering Data	122
6.9.7	Ordering the License	124
6.9.8	How to get the License and transfer it to the Device	129
7	DIAGNOSIS	130
7.1	Overview Diagnosis	130
7.2	General Diagnosis	131
7.3	Master Diagnosis	133
7.4	Bus Diagnosis	134
7.5	Station Diagnosis	135
7.6	Firmware Diagnosis	136
8	EXTENDED DIAGNOSIS	137
8.1	Overview Extended Diagnosis	137
8.2	Task Information	138
8.3	IniBatch Status	139
8.4	PROFIBUS_DL	140
8.4.1	Bus Parameters	140

8.4.2	Counter	142
8.5	PROFIBUS_FSPMM	143
8.5.1	Application Commands.....	143
8.5.2	DataLink Commands	144
8.5.3	DMPMM Counter	145
8.5.4	MMAC1 Counter	146
8.5.5	Timer.....	146
8.6	PROFIBUS_FSPMM2	147
8.6.1	Task Resources.....	147
8.6.2	Application Commands.....	148
8.7	PROFIBUS_APM	149
8.7.1	Common State.....	149
8.7.2	Global State field	150
8.7.3	Application Commands.....	153
8.7.4	IO Exchange Counter	154
8.7.5	Packet Router	154
9	TOOLS	155
9.1	Overview Tools	155
9.2	Packet Monitor	156
9.2.1	Sending Packet	157
9.2.2	Receiving Packet.....	158
9.2.3	Example – Reading Data via DPV1 Class1	159
9.2.4	Example - Writing Data via DPV1 Class1	166
9.3	IO Monitor	173
9.4	Process Image Monitor	174
10	ERROR CODES.....	176
10.1	Error Code Definition.....	176
10.2	Overview Error Codes.....	177
10.3	General Hardware Error Codes.....	178
10.3.1	RCX General Task Errors.....	178
10.3.2	RCX Common Status & Errors Codes	179
10.3.3	RCX Status & Error Codes	180
10.4	ODM Error Codes	181
10.4.1	General ODM Error Codes	181
10.4.2	General ODM Driver Error Codes	182
10.4.3	cifX Driver Specific ODM Error Codes	183
10.5	Error Codes cifX Device Driver and netX Driver	186
10.5.1	Generic Error Codes.....	186
10.5.2	Generic Driver Error Codes.....	187
10.5.3	Generic Device Error Codes	188
10.6	Error Codes netX Driver	189
10.6.1	CIFX API Transport Error Codes.....	189
10.6.2	CIFX API Transport Header State Error Codes	189
10.7	ODM Error Codes DBM V4	190

11 APPENDIX 194

11.1 User Rights 194

11.1.1 Settings.....194

11.1.2 Configuration194

11.2 References..... 195

11.3 List of Figures 195

11.4 List of Tables..... 197

11.5 Glossary..... 199

11.6 Contacts..... 201

1 Introduction

1.1 About this Manual

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

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>	31
	<i>Driver</i>	34
	<i>Device Assignment</i>	43
	<i>Firmware Download</i>	49
	<i>Licensing</i>	117
<i>Configuration</i>	<i>Overview Configuration</i>	57
	<i>Bus Parameters</i>	60
	<i>Process Data</i>	67
	<i>Address Table</i>	68
	<i>Station Table</i>	71
	<i>Master Settings</i>	72
<i>Diagnosis</i>	<i>Overview Diagnosis</i>	130
	<i>General Diagnosis</i>	131
	<i>Master Diagnosis</i>	133
	<i>Bus Diagnosis</i>	134
	<i>Station Diagnosis</i>	135
	<i>Firmware Diagnosis</i>	136
<i>Extended Diagnosis</i>	<i>Overview Extended Diagnosis</i>	137
<i>Tools</i>	<i>Overview Tools</i>	155
	<i>Packet Monitor</i>	156
	<i>IO Monitor</i>	173
	<i>Process Image Monitor</i>	174

Table 1: Descriptions Dialog Panes

1.1.2 Online Help

The PROFIBUS DP Master DTM contains an integrated online help facility.

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

1.1.3 List of Revisions

In-dex	Date	Version	Chapter	Revision
23	17-01-18	2.100 (and 2.0100)	7.4	Section <i>Bus Diagnosis</i> updated
24	17-02-27	2.100 (and 2.0100)	1.4.1	Section <i>Requirements</i> Internet access added, Windows 8.1 and Windwos 10 added.
25	18-02-16	2.100 (and 2.0100)	2.5.1, 3.2, 4.5, 6.6 5.6, 6.3	Versioning information revised (title page and this section). Safety Message or warning added: Sections <i>Power Disconnect while downloading Firmware or Configuration</i> , <i>Safety Messages on Firmware or Configuration Download</i> , <i>Firmware Download</i> and <i>Download Configuration</i> . Safety communication in the document revised in general. Note added about station address 126: Sections <i>Station Table</i> and <i>Set Station Address</i> .

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>

Positions in Figures

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

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1.4 About PROFIBUS DP Master DTM

You can use the PROFIBUS DP Master DTM to configure the PROFIBUS DP Master device within a FDT Framework.



Important: For a 2-channel device consecutively channel 1 or channel 2 must be assigned to the DTM and each must be configured individually.

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 PROFIBUS DP Master DTM

To configure the PROFIBUS DP Master device with the PROFIBUS DP Master DTM the following requirements have to be accomplished:

- Completed hardware installation of a netX based DTM-compatible PROFIBUS DP Master device, inclusive loaded firmware, license and loaded cifX configuration file
- Installed FDT/DTM V 1.2 compliant frame application
- Loaded DTM in the Device Catalog of the FTD Framework



Note: If the PROFIBUS DP Master DTM and the PROFIBUS DP Master 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.
To get information on how to order and to download the license to the device, please refer to section *Licensing* on page 117.



Note for „Configuration in Run“: The changes of the configuration made via "Configuration in Run" can only be saved using the **cifX Device Driver** and they are saved in the drivers directory. For more refer to section *Requirements* on page 102.

1.5 Dialog Structure PROFIBUS DP Master 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.

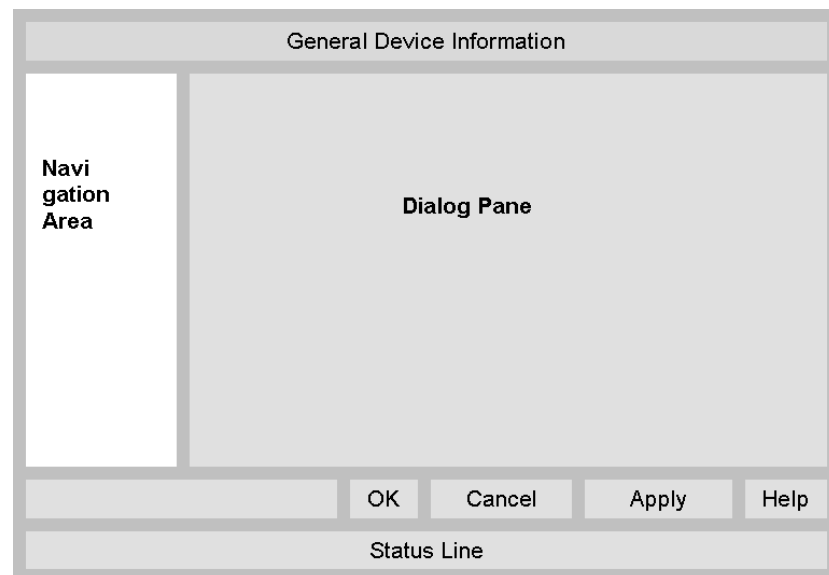


Figure 1: Dialog Structure of the PROFIBUS DP Master DTM

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.

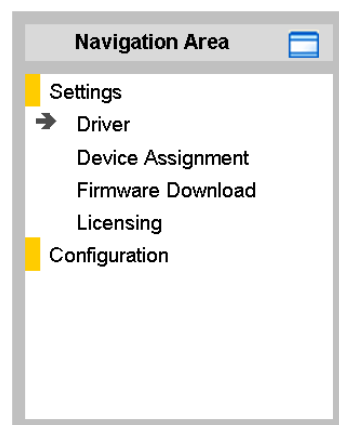


Figure 2: Navigation Area

- 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 PROFIBUS DP Master DTM to the PROFIBUS DP Master 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 34.
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 43.
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 49.
Licensing	Using the license dialog, you can order licenses for Master protocols or Utilities and download them to your device. A detailed description can be found in section <i>Licensing</i> on page 117.
Configuration	
Bus Parameter	The Bus Parameters are the basis of an operating data exchange. For further information refer to section <i>Bus Parameters</i> on page 60.
Process Data	The Process Data pane serves for the PROFIBUS DP Master DTM as an external process data interface. For further information, refer to section <i>Process Data</i> on page 67.
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 68.
Station Table	The Station Table displays the list of all configured slave devices. Further information to the station table can be found in the section <i>Station Table</i> on page 71.
Master Settings	At the Master Settings pane device related settings can be made and the option Configuration in Run can be activated here. For further information, refer to section <i>Master Settings</i> on page 72.
Configuration in Run (Online Function)	
netDevice > contextmenu > Download	For information about the Configuration in Run pane, refer to section <i>Configuration in Run</i> on page 101.
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 130 or section <i>Overview Extended Diagnosis</i> on page 137.
Tools	
Packet Monitor/ IO Monitor/ Process Image 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 156, section <i>IO Monitor</i> on page 173 or section <i>Process Image Monitor</i> on page 174.

Table 4: Overview Dialog Panes



Note: Accessing the **Diagnosis** panes of the PROFIBUS DP Master DTM requires an online connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device.



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

1.5.4 OK, Cancel, Apply and Help

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

	Meaning
OK	To confirm your latest settings, click OK . All changed values will be applied on the frame application database. <i>The dialog then closes.</i>
Cancel	To cancel your latest changes, click Cancel . Answer to the safety query Configuration data has been changed. Do you want to save the data? by Yes , No or Cancel . Yes: The changes are saved or the changed values are applied on the frame application database. <i>The dialog then closes.</i> No: The changes are <u>not</u> saved or the changed values are not applied on the frame application database. <i>The dialog then closes.</i> Cancel: <i>Back to the DTM.</i>
Apply	To confirm your latest settings, click Apply . All changed values will be applied on the frame application database. <i>The dialog remains opened.</i>
Help	To open the DTM online help, click Help .

Table 5: OK, Cancel, Apply and Help

1.5.5 Status Bar

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

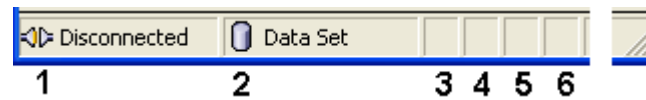
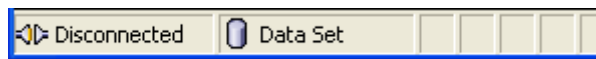


Figure 3: Status Bar – Status Fields 1 to 6

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

Table 6: Status Bar Icons [1]

Offline State



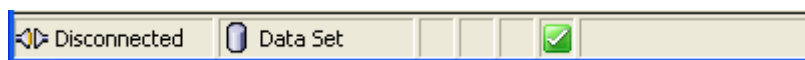
Save operation succeeded



Firmware Download



Firmware Download successful



Online State and Diagnosis

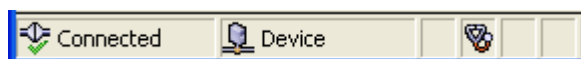


Figure 4: Status Bar Display Examples

2 Safety

2.1 General Note

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

2.2 Intended Use

The PROFIBUS DP Master DTM serves for configuration and diagnosis of PROFIBUS DP Master 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 PROFIBUS DP Master 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.

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 PROFIBUS DP Master 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.

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

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

Power Drop during Write and Delete Accesses in the File System

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

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

2.5.2 Invalid Firmware

Loading invalid firmware files could render your 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 7: 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 PROFIBUS DP Master device with PROFIBUS DP Master 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*.



Important: For a 2-channel device consecutively channel 1 or channel 2 must be assigned to the DTM and each must be configured individually.

#	Step	Short Description	For detailed information see section	Page
1	Add PROFIBUS DP Slave in the Device Catalog	Add the Slave in the Device Catalog by importing the device description file to the Device Catalog. Depending of the FDT Container. For netDevice: - Network > Import Device Descriptions.	(See <i>Operating Instruction Manual netDevice and netProject</i>)	-
2	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>)	-
3	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>)	-
4	Insert Master or Slave into configuration	Depending of the FDT Container: For netDevice: <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"></div> <div> <p>Important! In order to select the desired device in the device catalog, note the details about the DTM and the device at the bottom of the window. When sorting by <i>Fieldbus</i> multiple devices with identical names by different vendors can be displayed.</p> <ul style="list-style-type: none"> - in the Device Catalog click to the Master, - and insert the device via drag and drop to the line in the network view, - in the Device Catalog click to the Slave*, - and insert the device via drag and drop to the Master bus line in the network view.* <p>(*This step won't be necessary if the network structure is scanned automatically. See <i>step 17</i>.)</p> </div> </div> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"></div> <div> <p>Note! You can select a device PROFIBUS DPV0 (with cyclic communication), a device PROFIBUS DPV1 (with acyclic communication) as well as a device PROFIBUS DPV2 (with cyclic and acyclic communication and Time Sync configuration fo the Slave)</p> </div> </div>	(See <i>Operating Instruction Manual netDevice and netProject</i>)	-
5	Open the Master DTM configuration dialog	Open the Master DTM configuration dialog. - Double click to the device icon of the Master. - The Master DTM configuration dialog is displayed.	-	-

#	Step	Short Description	For detailed information see section	Page
6	Verify or adapt Driver Settings	<p>In the Master DTM configuration dialog: - select Settings > Driver.</p>	<p><i>Settings for Driver and Device Assignment and Driver</i></p>	32
		<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 PROFIBUS DP Master DTM is installed on the same PC as the PROFIBUS DP Master device. • Use the netX Driver to establish a USB, Serial (RS232) or TCP/IP connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master 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>		34
7	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: - 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> <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. 	<p><i>Configuring netX Driver</i></p>	37
8	Assign Master device (with or without firmware)	<p>Assign the device to this driver.</p> <p>In the Master DTM configuration dialog: - select Settings > Device Assignment, - select a Master device (with or without firmware), - therefore check the appropriate checkbox, - select Apply.</p>	<p><i>Selecting the Device (with or without firmware)</i></p>	46
9	Select and download firmware	<p>If not yet a firmware was loaded to the device: - Adhere to the necessary safety precautions to prevent personnel injury and property damage.</p> <p>In the Master DTM configuration dialog: - select Settings > Firmware Download, - select Browse..., - select a firmware file, - select Open, - select Download and Yes.</p>	<p><i>Safety Messages on Firmware or Configuration Download</i></p>	28
			<p><i>Firmware Download</i></p>	49

#	Step	Short Description	For detailed information see section	Page
10	Assign Master device once more (with firmware and system channel) <i>For repeated download this step is omitted.</i>	In the Master DTM configuration dialog: - select Settings > Device Assignment , - select Scan , - select the Master device (with loaded and defined system channel), - therefore check the appropriate checkbox, - select Apply , - close the Master DTM configuration dialog via OK .	<i>Selecting the Device once more (with Firmware)</i>	47
11	Configure Slave device* (*This step won't be necessary if the network structure is scanned automatically. See step 17.)	Configure the Slave device. - Double click to the device icon of the Slave. - The Slave DTM configuration dialog is displayed. In the Slave DTM configuration dialog: - select Configuration > General , - set the Watchdog control and Interval, - select Configuration > Modules , - configure the Modules of the Slave, - select Configuration > Signal Configuration , - proceed the signal configuration, - select Configuration > Parameters , - set the module Parameters, - Select Configuration > Groups , - assign the Slave to a group, - select Configuration > Extensions , - set the Extension parameters, - select Configuration > DPV1 , - configure the DPV1 functions, - select Configuration > DPV2 , - configure the DPV2 functions, - select Configuration > Redundancy , - perform the redundancy configuration, - close the Slave DTM configuration dialog via OK .	<i>(See Operating Instruction Manual Generic Slave DTM for PROFIBUS DP Slave Devices)</i>	-
12	Configure Master device	Configure the Master device. - Double click to the device icon of the Master. - The Master DTM configuration dialog is displayed. In the Master DTM configuration dialog: - select Configuration > Bus Parameters , - set the bus parameters, - select Configuration > Process data , - set symbolic names for the configured modules or signals. - select Configuration > Address table , - set the device address if necessary, - select Configuration > Station Table , - set the station address of the devices, - select Configuration > Master Settings , - set the Master Settings . - For the option Enable configuration download during network state "operate" refer to the descriptions about Configuration in Run. - close the Master DTM configuration dialog via OK .	<i>Configuring Device Parameters</i> <i>Bus Parameters</i> <i>Process Data</i> <i>Address Table</i> <i>Station Table</i> <i>Master Settings</i> <i>Configuration in Run</i>	58 60 67 68 71 72 101
13	Save project	Depending of the frame application. For the configuration software: - select File > Save .	<i>(See Operating Instruction Manual of the Frame Application)</i>	-
14	Connect Master device	Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select Connect .	<i>Connecting/Disconnecting Device</i>	77
15	Licensing	How to order licenses later and how to transfer them to the device.	<i>Licensing</i>	117

#	Step	Short Description	For detailed information see section	Page
16	Download Configuration	<p>- Adhere to the necessary safety precautions to prevent personnel injury and property damage.</p> <p>Depending of the FDT Container.</p> <p>For netDevice:</p> <ul style="list-style-type: none"> - right click to the device icon of the Master, - select Download. - For "Configuration in Run" refer to the descriptions about Configuration in Run. 	<p><i>Safety Messages on Firmware or Configuration Download</i></p> <p><i>Download Configuration</i></p> <p><i>Configuration in Run</i></p>	<p>28</p> <p>99</p> <p>101</p>
17	Network Scan / Live List	<p>As an alternative to manually configure the Slave device, you can automatically scan the network structure by using the context menu Network Scan. Then confirm the query whether the module configuration of the Slave device shall be generated and download the configuration to the Master device.</p> <p>Therefore proceed the following steps:</p> <ol style="list-style-type: none"> 1. Start the Network Scan function. 2. Make the settings in the Scan Response dialog of the Master DTM. 3. Click Create devices. 4. Download of the Slave configuration to the Master device (Download). <p>Via the context menu Additional Functions > Live List you can display the devices present at the bus.</p>	<p><i>'Network Scan' and 'Upload'</i></p> <p><i>Live List</i></p>	<p>86</p> <p>85</p>
18	Diagnosis	<p>Depending of the FDT Container.</p> <p>For netDevice:</p> <ul style="list-style-type: none"> - right click to the device icon of the Master, - select Diagnosis. - The Master DTM diagnosis dialog is displayed. <p>(1) Check whether the communication is OK: Diagnosis > General Diagnosis > Device status "Communication" must be green!</p> <p>(2) "Communication" is green: Open the IO Monitor and test the input or output data.</p> <p>(3) "Communication" is not green: Use Diagnosis and Extended diagnosis for troubleshooting.</p> <ul style="list-style-type: none"> - Close the Master DTM diagnosis dialog via OK. 	<i>Overview Diagnosis</i>	130
19	IO Monitor	<p>Depending of the FDT Container:</p> <p>For netDevice:</p> <ul style="list-style-type: none"> - right click to the device icon of the Master, - select Diagnosis, - select Tools > IO Monitor. - Check the input or output data, - close the IO Monitor dialog via OK. 	<i>IO Monitor</i>	173
20	Disconnect	<p>Depending of the FDT Container.</p> <p>For netDevice:</p> <ul style="list-style-type: none"> - right click to the device icon of the Master, - select Disconnect. 	<i>Connecting/Disconnecting Device</i>	77

Table 8: Getting started - Configuration Steps

3.2 Safety Messages on Firmware or Configuration Download

⚠ 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.

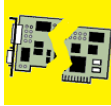
The firmware download overwrites the existing firmware. The communication stop may cause loss of device parameters and possible device damage may occur.

- 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**

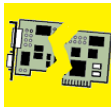
Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury or damage of equipment.

- 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 “Configuration in Run” Steps

The following table describes the required steps to perform a configuration-update in network status OPERATE:

#	Step	Short Description	For detailed information see section	Page
1	Preparation:	<p><u>1. Activate “Configuration in Run”</u></p> <ul style="list-style-type: none"> - Double click to the device icon of the Master. In the Master DTM configuration dialog: - select Configuration > Master Settings, - check Enable configuration download during network state “operate”. <p><u>2. Define the Number of Bytes after Input Data</u></p> <ul style="list-style-type: none"> - In the Master Settings pane set Device Status Offset to Static. - Enter in the field bytes after last input data the number of bytes to be left free between the last input data byte and the device status. - Close the Master DTM configuration dialog via OK. <p><u>3. Create the Configuration.</u></p> <ul style="list-style-type: none"> - Create the network configuration and in the PROFIBUS DP Slave DTM the parameter settings for the respective Slave device, (refer to <i>step 3, 4 and 12</i> in the table <i>Getting started - Configuration Steps</i> on page 27). <hr/> <p> Note: The <i>Address</i> and the <i>Baud Rate</i> of the PROFIBUS DP Master device can not be changed in the new configuration (new database).</p> <hr/> <p><u>4. Start the Download of the new Configuration.</u></p> <ul style="list-style-type: none"> - Adhere to the necessary safety precautions to prevent personnel injury and property damage. <p>For netDevice:</p> <ul style="list-style-type: none"> - Right click to the device icon of the Master. - Select Download. - The download is performed. - The dialog pane Configuration in Run is opened. <p><u>5. Activate Changes.</u></p> <ul style="list-style-type: none"> - Select Activate changes. - The Configuration in Run dialog closes. - The Information pane with the text The database changes were successfully activated. is displayed. <p><i>For more see next page.</i></p>	<p><i>Overview Steps for “Configuration in Run”,</i></p> <p><i>Activate „Configuration in Run”,</i></p> <p><i>Define Number of Bytes after Input Data,</i></p> <p><i>Create the Configuration,</i></p> <p><i>Safety Messages on Firmware or Configuration Download</i></p> <p><i>Start the Download,</i></p> <p><i>Activate or reject Changes</i></p>	<p>103</p> <p>104</p> <p>104</p> <p>105</p> <p>28</p> <p>107</p> <p>112</p>



#	Step	Short Description	For detailed information see section	Page
2	Change Configuration via Configuration in Run	<p><u>1. Expand or change the Configuration.</u></p> <ul style="list-style-type: none"> - Change the network configuration and adjust the parameter settings for the respective Slave device in the PROFIBUS DP Slave DTM, (refer to <i>step 3, 4 and 12</i> in the table <i>Getting started - Configuration Steps</i> on page 27). - Close the Slave DTM configuration dialog via OK. <p> Note: The <i>Address</i> and the <i>Baud Rate</i> of the PROFIBUS DP Master device can not be changed in the new configuration (new database).</p> <p><u>2. Start the Download of the changed Configuration.</u></p> <ul style="list-style-type: none"> - Adhere to the necessary safety precautions to prevent personnel injury and property damage. <p>For netDevice:</p> <ul style="list-style-type: none"> - Right click to the device icon of the Master. - Select Download. - The download is performed. - The dialog pane Configuration in Run is opened. <p><u>3. Evaluate Configuration Data.</u></p> <ul style="list-style-type: none"> - Check in the dialog pane Configuration in Run, whether the changed configuration (new data base) can be applied or not. <p><u>4. Activate or reject Changes.</u></p> <p> Note: The changed configuration (new database) can only be accepted if:</p> <ul style="list-style-type: none"> - the changes to the database parameters are possible, - the Master Settings (<i>Startup, Watchdog, Statusoffset, Busparameter</i>) have not changed and - the Master State is OK (= 0x00000000). <ul style="list-style-type: none"> - In the Configuration in Run pane select Activate changes. - The Configuration in Run dialog closes. - The Information pane with the text The database changes were successfully activated. is displayed or respectively an error message. 	<p><i>Change the Configuration</i></p> <p><i>Safety Messages on Firmware or Configuration Download</i></p> <p><i>Start the Download</i></p> <p><i>Evaluate Configuration Data,</i></p> <p><i>Activate or reject Changes</i></p>	<p>106</p> <p>28</p> <p>107</p> <p>108</p> <p>112</p>
3	If the new configuration can not be applied	In this case you may need to increase the number of bytes after the input data.	<i>Increase the Number of Bytes after the Input Data</i>	113

Table 9: Getting started - "Configuration in Run" Steps

4 Settings

4.1 Overview Settings

Settings Dialog Panes

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

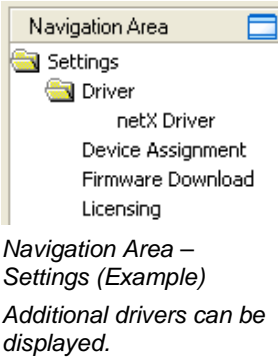
PROFIBUS DP Master DTM	Folder Name / Section	Subsection	Manual Page
	Driver		34
		Verify or adapt Driver Settings	34
		cifX Device Driver	36
		netX Driver	36
		Configuring netX Driver	37
	Device Assignment		43
		Scanning for Devices	43
		Scanning for all Devices or for suitable only	45
		Selecting the Device (with or without firmware)	46
		Selecting the Device once more (with Firmware)	47
	Firmware Download		49
	Licensing		117

Table 10: 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 32.

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



Note: The configuration changes via "Configuration in Run" can only be saved in the driver's directory using the **cifX Device Driver**. For more information refer to section *Requirements* on page 102 .



Important: For a 2-channel device consecutively channel 1 or channel 2 must be assigned to the DTM.

The following steps are needed to establish a connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master 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 PROFIBUS DP Master 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 PROFIBUS DP Master DTM is installed on the same PC as the PROFIBUS DP Master device.
- Use the **netX Driver** to establish an USB, Serial (RS232) or TCP/IP connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master 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 Master 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 PROFIBUS DP Master device icon.
9. Select the **Connect** command from the context menu.
- In the network view the device description at the device icon of the Master is displayed with a green colored background. The PROFIBUS DP Master device now is connected to the PROFIBUS DP Master 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 PROFIBUS DP Master DTM to establish a device communication connection.



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

Driver			
	Driver	Version	ID
<input checked="" type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A6BEA91}
<input type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 5: Default Driver 'CIFX Device Driver' for PC cards cifX

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

Table 11: Driver Selection List Parameters

To establish a connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device, verify if the default driver is checked and respectively check another driver or multiple drivers.

4.3.1 Verify or adapt Driver Settings

Proceed as follows:

1. Select **Settings > Driver** in the navigation area.
- The **Driver** dialog pane is displayed with the available drivers and the setting for the default driver.

Driver			
	Driver	Version	ID
<input checked="" type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A6BEA91}
<input type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 6: Default Driver 'CIFX Device Driver' for PC cards cifX (example)

Driver			
	Driver	Version	ID
<input type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A6BEA91}
<input checked="" type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

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

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

Default Driver (Pre-settings in the Configuration Software): For PC cards cifX the **cifX Device Driver** is preset as a default driver. For all the other Hilscher devices the **netX Driver** is preset as a default driver.

3. Respectively check another driver.



Note! The driver used for the connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device must be supported by the device and must be available for the device.

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

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

4. Respectively check multiple drivers.

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

Driver			
	Driver	Version	ID
<input checked="" type="checkbox"/>	CIFX Device Driver	1.101.1.9801	{368BEC5B-0E92-4C0E-B4A9-64F62AE7AAFA}
<input type="checkbox"/>	3SGateway Driver for netX (V3.x)	0.9.1.2	{787CD3A9-4CF6-4259-8E4D-109B6A6BEA91}
<input checked="" type="checkbox"/>	netX Driver	1.103.2.5183	{B54C8CC7-F333-4135-8405-6E12FC88EE62}

Figure 8: Manual Selection of multiple drivers (Example)

4.3.2 cifX Device Driver

In the PROFIBUS DP Master 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 PROFIBUS DP Master DTM is installed in the same PC as the PROFIBUS DP Master device.



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

4.3.3 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:

The screenshot shows the 'netX Driver' configuration window with the 'USB/RS232 Connection' tab selected. The 'TCP Connection' tab is also visible. The 'Enable USB/RS232 Connector (Restart of ODM required)' checkbox is checked. The 'Select Port:' dropdown is set to 'COM1'. The 'Port Configuration' section contains several settings: 'Disable Port' is unchecked, 'Baud Rate' is '115.2 kBit/s', 'Byte Size' is '8 Byte', 'Stop Bits' is '1 Stopbit', 'Parity' is 'No Parity', 'Send Timeout' is '1000 ms', 'Reset Timeout' is '10000 ms', and 'Keep Alive Timeout' is '2000 ms'. At the bottom, there are three buttons: 'Restore', 'Save', and 'Save All'.

Figure 9: netX Driver > USB/RS232 Connection


Parameter	Meaning	Range of Value / Default Value
Enable USB/RS232 Connector (Restart of ODM required)	<p>checked: The netX Driver can communicate via the USB/RS232 interface.</p> <p>unchecked: The netX Driver can <u>not</u> communicate via the USB/RS232 interface.</p> <p>If the check mark for Enable USB/RS232 Connector is set or removed, then the ODM server must be restarted¹, to make the new setting valid.</p> <p>¹ Restart the ODM server via the ODMV3 Tray Application:</p> <p>- In the foot line click on  using the right mouse key.</p> <p>- In the context menu select Service > Start.</p>	checked, unchecked; Default: unchecked
Select Port	Depending on the COM ports (interfaces) available on the PC, they will be listed under Select Port .	COM 1 to COM N
Port Configuration		
Disable Port	<p>checked: No connection.</p> <p>unchecked: The netX Driver tries to establish a connection using the configured USB/RS232 interface.</p>	checked, unchecked (Default)
Baud rate	<p>Transfer rate: number of bits per second.</p> <p>The device must support the baud rate.</p>	9.6, 19.2, 38.4, 57.6 or 115.2 [kBit/s]; Default (RS232): 115.2 [kBit/s]
Stop bits	Number of stop bits sent after the transfer of the send data for synchronization purposes to the receiver.	Stop bit: 1, 1.5, 2; Default (RS232): 1
Send Timeout	Maximum time before the transfer of the transmission data is canceled, when the send process fails, for example, because of the transfer buffer is full.	100 ... 60.000 [ms]; Default (RS232 and USB): 1000 ms
Reset Timeout	Maximum time for a device reset, including the re-initialization of the physical interface used for the communication.	100 ... 60.000 [ms]; Default (RS232 and USB): 5000 ms
Byte size	Number of bits per byte by byte specification	7 Bit, 8 Bit; Default (RS232): 8 Bit
Parity	<p>In the error detection in data transmission using parity bits, "parity" describes the number of bits occupied with 1 in the transmitted information word.</p> <p>No Parity: no parity bit</p> <p>Odd Parity: The parity is "odd" if the number of bits occupied with 1 in the transmitted information word will be odd.</p> <p>Even parity: The parity is "even" if the number of bits occupied with 1 in the transmitted information word will be even.</p> <p>Mark Parity: if the parity bit is always 1, this will be named mark-parity (the bit does not contain any information).</p> <p>Space Parity: if the parity bit always 0, this will be named space-parity (the bit represents an empty space).</p>	No Parity, Odd Parity, Even Parity, Mark Parity, Space Parity; Default (RS232): No Parity
Keep Alive Timeout	The "Keep Alive" mechanism is used to monitor whether the connection to the device is active. Connection errors are detected using a periodic heartbeat mechanism. The heartbeat mechanism will be initiated after the set time has elapsed if the communication has failed.	100 ... 60.000 [ms]; Default (RS232 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 12: Parameters netX Driver > USB/RS232 Connection

4.3.6 netX Driver - TCP/IP Connection

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

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

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



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

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

4.3.6.1 Driver Parameters for netX Driver - TCP/IP Connection

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

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

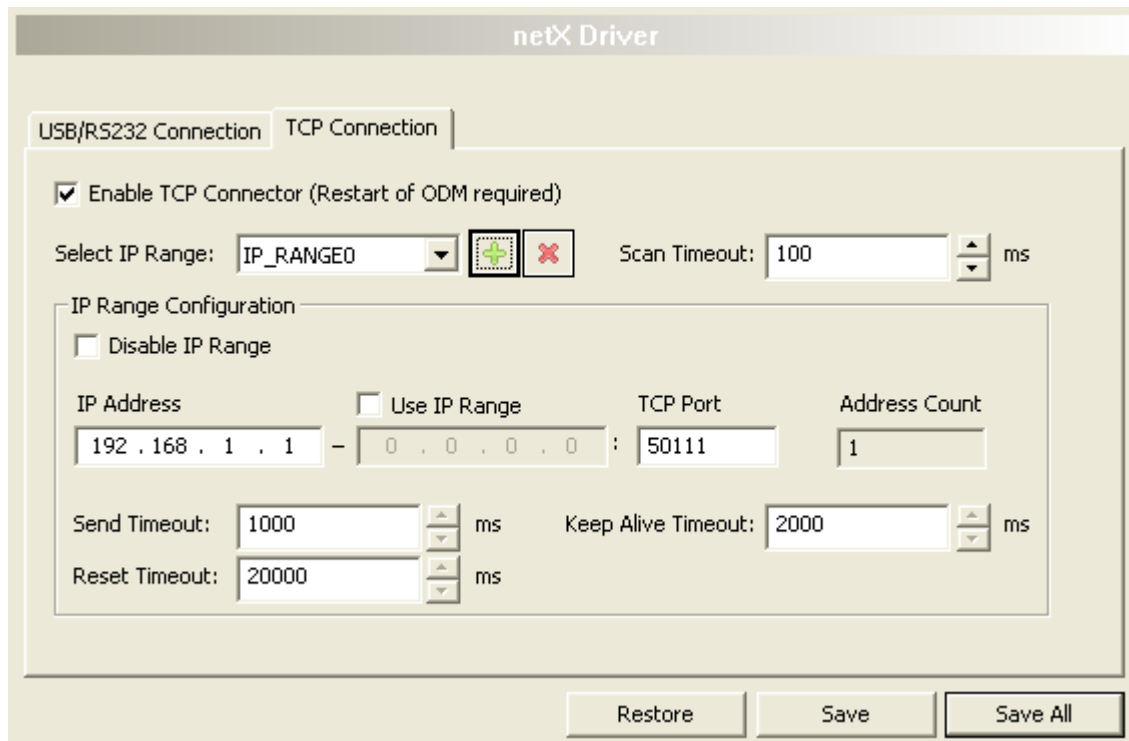





Figure 10: netX Driver > TCP Connection

Parameter	Meaning	Range of Value / Default Value
Enable TCP Connector (Restart of ODM required)	<p>checked: The netX Driver can communicate via the TCP/IP interface.</p> <p>unchecked: The netX Driver can <u>not</u> communicate via the TCP/IP interface.</p> <p>If the check mark for Enable TCP Connector is set or removed, then the ODM server must be restarted¹, to make the new setting valid.</p> <p>¹ Restart the ODM server via the ODMV3 Tray Application:</p> <ul style="list-style-type: none"> - In the foot line click on  using the right mouse key. - In the context menu select Service > Start. 	checked, unchecked; Default: unchecked
Select IP Range	<p>Via Select IP Range already created IP ranges can be selected.</p> <p>Via  an additional IP range can be added.</p> <p>Via  an IP range can be deleted.</p>	

Parameter	Meaning	Range of Value / Default Value
Scan Timeout [ms]	With Scan Timeout can be set, how long to wait for a response while a connection is established.	10 ... 10,000 [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 ... 99,999 [ms]; Default (TCP/IP): 20.000 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 13: 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 PROFIBUS DP Master device to the PROFIBUS DP Master DTM by checking the check box. This is essential to establish an online connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device later, as described in section *Connecting/Disconnecting Device* on page 77.

Therefore in the **Device Assignment** dialog pane you scan for the PROFIBUS DP Master 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.



Important: For a 2-channel device consecutively channel 1 or channel 2 must be assigned to the DTM.

4.4.1 Scanning for Devices

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

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

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

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

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

➤ In the table all devices are displayed, which can be connected to the PROFIBUS DP Master 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.

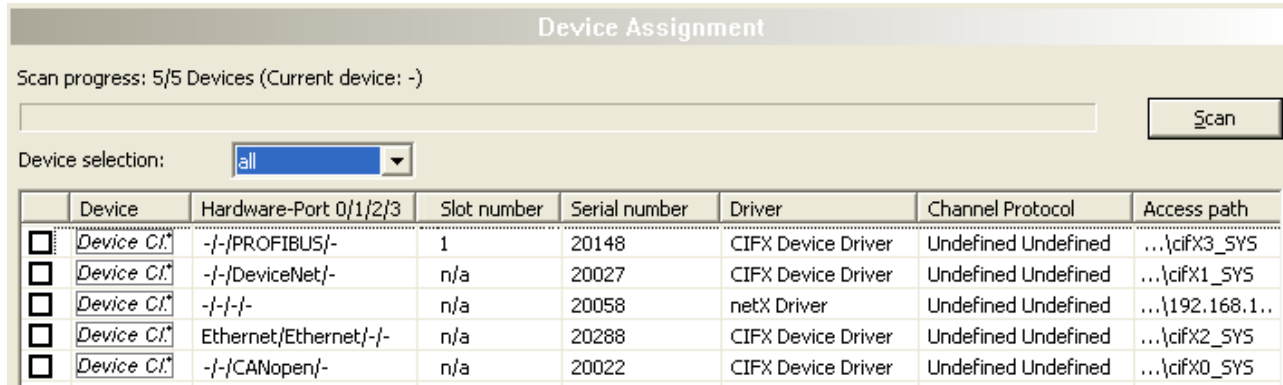
Parameter	Meaning	Range of Value / Default Value
Device selection	Selecting suitable only or all devices.	suitable only, all
Device	Device class of the PROFIBUS DP Master Devices.	
Hardware Port 0/1/2/3	Shows, which hardware is assigned to which communication interface.	
Slot number	Shows the Slot Number (Card ID) preset at the PC card cifX via the Rotary Switch Slot Number (Card ID) . The indication n/a means, that no Slot-Nummer (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 14: 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: -)

Device selection: all

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

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



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

suitable only

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

- ⇒ In the table all devices are displayed, which can be connected to the PROFIBUS DP Master 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 PROFIBUS DP Master DTM can only be established with one PROFIBUS DP Master device.

To select the physical PROFIBUS DP Master device (with or without firmware):

1. 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	CFX Device Driver	PROFIBUS Master	...\\cifx3_SYS

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

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

- Under **Access path** (below in the dialog pane) the access path to the device, e. g. the driver identification, or depending on the used driver additional access data of the device are displayed.

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



Note: Before an online connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master 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 *Firmware Download* on page 49 or to section *Selecting the Device once more (with Firmware)* on page 47.

4.4.3 Selecting the Device once more (with Firmware)



Note: For repeated download this step is omitted.

To select the PROFIBUS DP Master 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 Assignment

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

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

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

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



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

- In the column **Channel Protocol**: the data for the firmware for the used channel
- In the column **Access path** or under **Access path** (below in the dialog pane): the data: ...\\cifX[0toN]_Ch[0to3].
 cifX[0toN] = board number 0 to N
 Ch[0to3] = channel number 0 to 3

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

Or:

suitable only

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

Device Assignment

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

Device selection: suitable only Scan

	Device	Hardware Port 0/1/2/3	Slot number	Serial number	Driver	Channel Protocol	Access path
<input checked="" type="checkbox"/>	Device Cl*	-/-/PROFIBUS/-	1	20148	CIFX Device Driver	PROFIBUS-DP Master	...\cifX3_Ch0

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

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



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

- In the column **Channel Protocol**: the data for the firmware for the used channel
- In the column **Access path** or under **Access path** (below in the dialog pane): the data: ...\\cifX[0toN]_Ch[0to3].
cifX[0toN] = board number 0 to N
Ch[0to3] = channel number 0 to 3

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



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

4.5 Firmware Download

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



Note: Prior to the firmware download, you must select the driver and the Master device (with or without firmware) and the device must be assigned to the hardware.



For further information refer to section **Overview Settings** on page 31.

To load the firmware to the device:

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

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

Figure 16: Firmware Download

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

Table 15: Parameter Firmware Download

2. Select the firmware file.

➤ Select **Browse**.

Device is not assigned to the Hardware

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

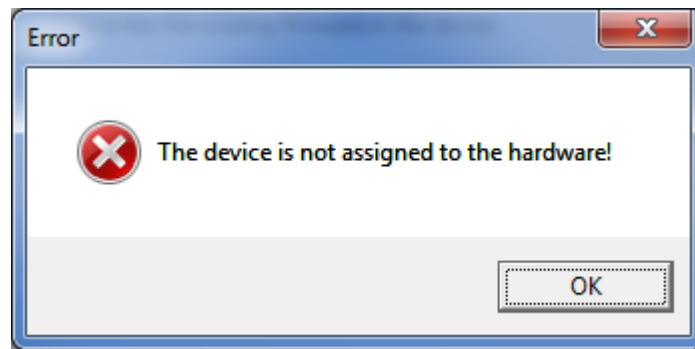


Figure 17: Error Message 'The device is not assigned to the hardware!'

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

Device is assigned to the Hardware

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

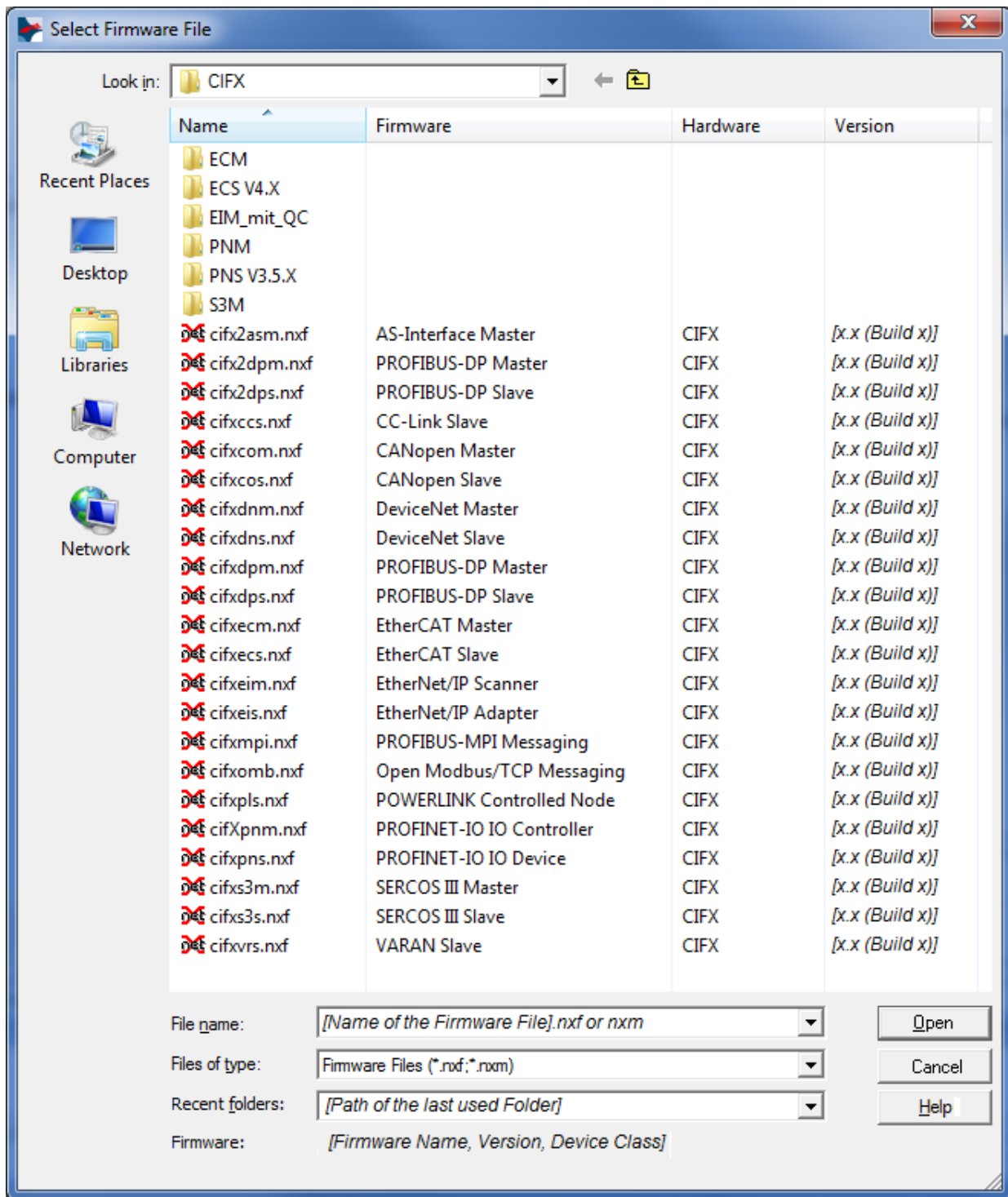


Figure 18: Window 'Select Firmware File' (Example CIFX)

Parameter	Meaning	Range of Value / Default Value
Column Name	File name of the firmware file To sort the entries of the window Select Firmware File by name click to the column head Name .	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. <div> Type: Hilscher firmware file for netX-based targets (NXF) Size: 563 KB Date of change: 2013/03/26 11:10 </div>	
Files of Type	„All Files (*.*)“ if before in the Device Assignment pane under Device selection all 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 16: 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 PROFIBUS DP Master 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.
- In the selection window select the **Open** button.

Validation

-  A validation is made, whether the selected firmware file is suitable for the PROFIBUS DP Master device.

Invalid Firmware

NOTICE

Invalid Firmware

Loading invalid firmware files could render your device unusable.

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

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



Figure 19: Request Select Firmware File - Example Invalid Firmware

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

Valid Firmware

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

5. Start firmware upgrade.

⚠ WARNING

Communication Stop caused by Firmware Update, faulty System Operation possible, Overwriting of Firmware or Loss of Device Parameters

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

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

NOTICE

Firmware Corruption or Loss of Parameters caused by Power Disconnect during Firmware Download

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

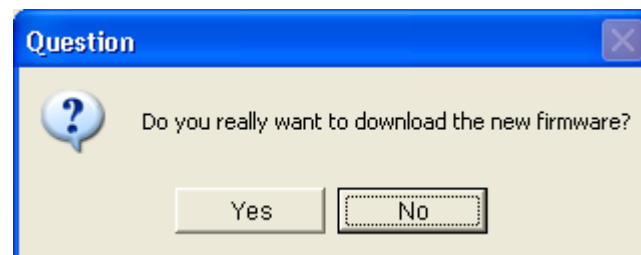


Figure 20: Request - Do you really want to download the firmware?

6. Click **Yes**.

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

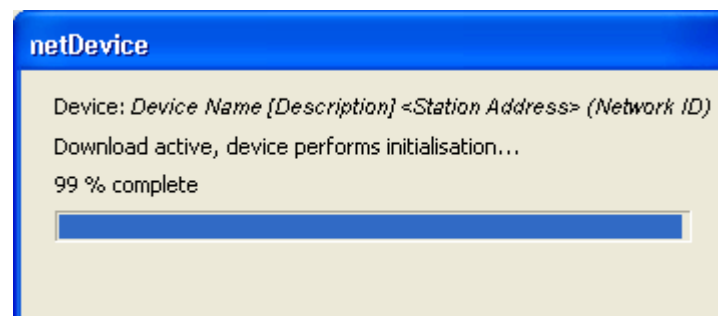


Figure 21: Firmware Download - Progress Bar

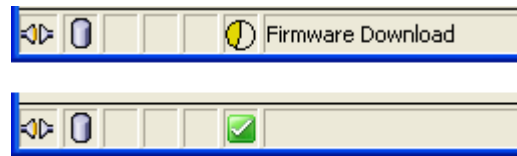


Figure 22: Clock Symbol and Hook Symbol green

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

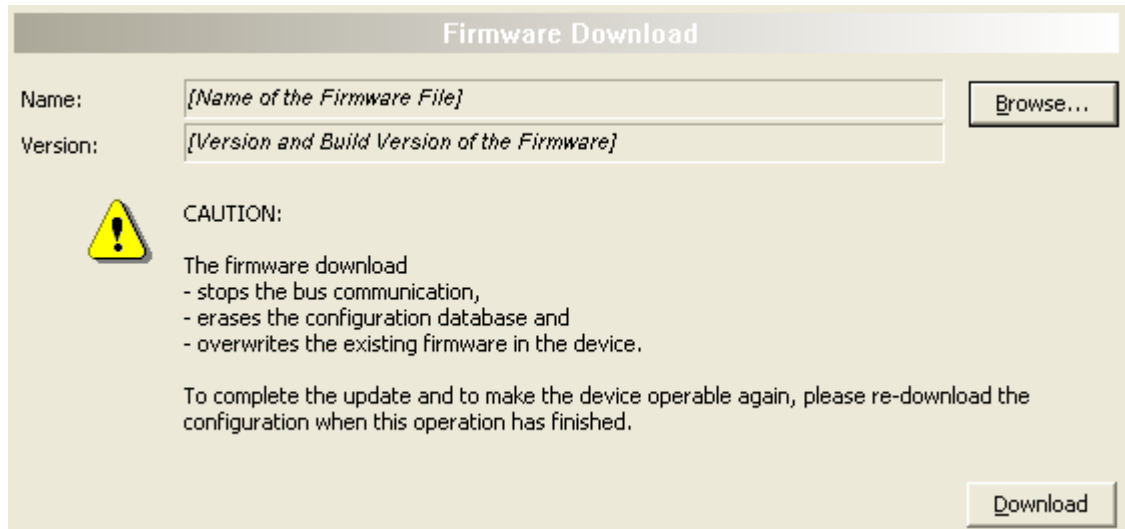


Figure 23: Firmware Download – Download

h

4.6 Licensing

To open the Licensing pane:

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

Licensing

License Type

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

Request Form, please fill out

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

Fields marked with "*" are mandatory.

Hilscher Germany

E-mail... license@hilscher.com

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

Telephone... +49 6190 9907-0

Export License Request...

Download License

Figure 24: Licensing



For a detailed description refer to section *Licensing* on page 117.

5 Configuration

5.1 Overview Configuration

Configuration Dialog Panes

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

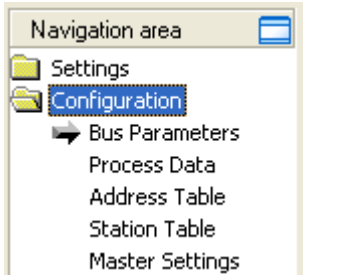
PROFIBUS DP Master DTM	Folder Name / Section	Subsection	Page
 Navigation Area – Configuration	<i>Bus Parameters</i>	<i>Profile</i>	60
		<i>Bus Parameters</i>	61
		<i>Bus Monitoring</i>	64
		<i>Error Handling</i>	65
		<i>Calculated Timing</i>	66
	<i>Process Data</i>		67
	<i>Address Table</i>		68
	<i>Station Table</i>		71
	<i>Master Settings</i>		72
		<i>Start of Bus Communication</i>	73
		<i>Application Monitoring</i>	73
		<i>Process Image Storage Format</i>	74
		<i>Module Alignment</i>	74
		<i>Process Data Handshake</i>	75
		<i>Advanced</i>	75

Table 17: Descriptions of the Dialog Panes Configuration



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

For information on how to proceed a configuration update during network is in OPERATE state, please refer to section *Configuration in Run* on page 101

5.2 Configuring Device Parameters



Important: For a 2-channel device consecutively channel 1 or channel 2 each must be configured individually.

The following steps are required to configure the parameters of the PROFIBUS DP Master device using the PROFIBUS DP Master DTM:

Bus Parameters

1. Set the Bus Parameters.
 - Select **Configuration > Bus Parameters** in the navigation area.
 - Put the settings for the bus parameters (e. g. baud rate or station address) and for the bus monitoring parameters.

Process Data

2. Set the process data:
 - Select **Configuration > Process Data** in the navigation area.
 - Set symbolic names for the configured modules or signals.

Address Table

3. Set the device address:
 - Select **Configuration > Address Table** in the navigation area.

Station Table

4. Set the station address of the devices:
 - Select **Configuration > Station Table** in the navigation area.

Master Settings

5. Set the Master Settings:
 - Select **Configuration > Master Settings** in the navigation area.
 - Under **Start of Bus Communication** select **Automatically by device** or **Controlled by application** option.
 - Under **Application Monitoring** set the **Watchdog time**.
 - Under **Module Alignment** set the options **Byte boundaries** or **2 Byte boundaries**.
 - Under **Process Data Handshakes** select the **Process Data Handshake** type to be used.
 - Under **Advanced** check **Enable configuration download during network state “operate”** to enable configuration download during network state “operate” (Configuration in Run).
 - Under **Device Status Offset** select **Automatic calculation** or **Static** option.

Close Master DTM Configuration Dialog

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

Configuration Download to the PROFIBUS DP Master Device

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



Note: In order to transfer the configuration to the PROFIBUS DP Master device, download the data of the configuration parameters in the PROFIBUS DP Master device. See section *Download Configuration* on page 99.

Further Information



For more information refer to section *Safety Messages on Firmware or Configuration Download* on page 28, to section *Bus Parameters* on page 60, to section *Process Data* on page 67, to section *Address Table* on page 68, to section *Station Table* on page 71 and to section *Master Settings* on page 72, of this document. For information on how to perform a configuration-update in network status OPERATE (Configuration in Run), refer to section *Configuration in Run* on page 101.

5.3 Bus Parameters

The **Bus Parameters** are the basis of an operating data exchange. This section contains information for setting the Bus Parameters as well as the description of the individual parameters.



Basic Rule: The Bus Parameters must be set the same for all devices. The Station Address, on the other hand, must be different from device to device

5.3.1 Profile



Figure 25: Bus Parameters > Profile

The following Profiles are available for the Master DTM:

- PROFIBUS DP (Decentralized Periphery)
- PROFIBUS-PA (Process Automation)

According to the selected profile the associated standard bus parameters are displayed when opening the dialog for the first time. Each parameter can be edited.

For the PROFIBUS DP profile several baud rates can be selected. In the PROFIBUS-PA profile the baud rate 93.75 kBit/s is preset.

5.3.2 Bus Parameters

Bus Parameters

Baud Rate:	1500	kBit/s	Station Address:	1
Slot Time:	300	tBit	Target Rotation Time:	11894 tBit = 7.9293 ms
Min. Station Delay Time:	11	tBit	GAP Actualization Factor:	10
Max. Station Delay Time:	150	tBit	Max. Retry Limit:	1
Quiet Time:	0	tBit	Highest Station Address (HSA):	126
Setup Time:	1	tBit		

Figure 26: Bus Parameters > Bus Parameters



Note: The changing of Bus Parameters can cause communication interruptions.

The offline Bus Parameters are displayed. The Bus Parameters are transferred to the device after the download of the configuration.



A description about the download you find in section *Download Configuration* on page 99.

Bus Parameters	Meaning		
Baud Rate	The Baud Rate is the data transfer speed: number of Bits per second. The Baud Rate must be set to be the same for all devices on the bus. The result of changing the Baud rate is that all other parameters must be re-calculated.		
	Baud Rate	Bit time (t _{Bit})	Max cable length (type A)
	9,6 kBit/s	104,2 μs	1200 m
	19,2 kBit/s	52,1 μs	1200 m
	31,25 kBit/s	32 μs	1200 m
	45,45 kBit/s	22 μs	1200 m
	93,75 kBit/s	10,7 μs	1200 m
	187,5 kBit/s	5,3 μs	1000 m
	500 kBit/s	2 μs	400 m
	1500 kBit/s	666,7 ns	200 m
3000 kBit/s	333,3 ns	100 m	
6000 kBit/s	166,7 ns	100 m	
12000 kBit/s	83,3 ns	100 m	
Slot time (T _{SL})	'Wait for receipt' – Monitoring time of the sender (Requestor) of telegram for the acknowledgement of the recipient (Responder). After expiration, a retry occurs in accordance with the value of 'Max. telegram retries'. Value range: 37 .. 16383 (The default value depends from the baud rate.)		
Min. Station Delay Time (min T _{SDR})	This is the shortest time period that must elapse before a remote recipient (Responder) may send an acknowledgement of a received query telegram. The shortest time period between the reception of the last Bit of a telegram to the sending of the first Bit of a following telegram. Value range: 1 .. 11 . 65535		
Max. Station Delay Time (max T _{SDR})	This is the longest time period that must elapse before a Sender (Requestor) may send a further query telegram. Greatest time period between the reception of the last Bit of a telegram to the sending of the first Bit of a following telegram. The Sender (Requestor, Master) must wait at least for this time period after the sending of an unacknowledged telegram (e.g. Broadcast only) before a new telegram is sent. Value range: 1 .. 65535 (The default value depends from the baud rate.)		
Quiet Time (T _{QUI})	This is the time delay that occurs for modulators (Modulator-trip time) and Repeaters (Repeater-switch time) for the change over from sending to receiving. Value range: 0 .. 127 (The default value depends from the baud rate.)		

Bus Parameters	Meaning
Setup Time (T_{SET})	Minimum period "reaction time" between the receipt of an acknowledgement to the sending of a new query telegram (Reaction) by the Sender (Requestor). Value range: 1 .. 255 (The default value depends from the baud rate.)
Station Address	The Station Address is the individual device address of the Master device on the bus. Value range: 0 .. 125
Target Rotation Time (T_{TR})	Pre-set nominal Token cycling time within the Sender authorization (Token) will cycle around the ring. How much time the Master still has available for sending data telegrams to the Slaves is dependent on the difference between the nominal and the actual token cycling time. The Target rotation time (T_{TR}) is shown in Bit times (tBit) like the other Bus Parameters. Below the displayed Bit time, the Target rotation time is also displayed in milliseconds (ms). Value range: 1 .. 2 ²⁴ -1 (=16.777.215) (The default value depends of the number of Slaves attached to the Master and their module configuration)
GAP Actualization Factor (G)	Factor for determining after how many Token cycles an added participant is accepted into the Token ring. After expiry of the time period G*T _{TR} , the Station searches to see whether a further participant wishes to be accepted into the logical ring. Value range: 0 .. 10 .. 255
Max. Retry Limit	Maximum number of repeats in order to reach a Station. Value range: 1 .. 15 (The default value depends from the baud rate.)
Highest Station Address (HSA)	The Highest Station Address is the highest bus address up to which a Master searches for another Master at the bus in order to pass on the Token. This station address must on no account be smaller than the Master station address. Value range: 1 .. 126

Table 18: Bus Parameters > Bus Parameters

5.3.2.1 Adjust Bus Parameters

If the bus configuration has changed and these changes have an impact on the bus parameters, a note symbol appears beside the concerned parameters, which displayed values are out of date now.



Figure 27: Note bus configuration was changed, Bus Parameters not longer actual

With **Adjust** the bus parameters on basis of the current bus configuration are calculated again and updated in the bus parameter dialog.

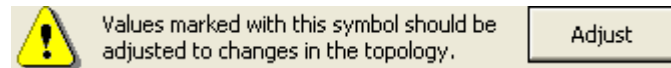


Figure 28: Adjust Bus Parameters

If no note symbol is displayed beside the parameters of the bus configuration, the indicated values are up to date and valid.

5.3.2.2 Additional Conditions for correct Communication

$$T_{\text{QUI}} < \min T_{\text{SDR}}$$

$$T_{\text{RDY}} < \min T_{\text{SDR}}$$

$$T_{\text{QUI}} < T_{\text{RDY}}$$

5.3.2.3 Representation of the Bus Parameters

All times for the Bus parameters are given in Bit times. The Bit time t_{Bit} is the result of the reciprocal of the Baud rate:

$$t_{\text{Bit}} = 1 / \text{Baud rate (Baud rate in Bit/s)}$$

The conversion from milliseconds into a Bit time is shown in the following formula:

$$\text{Bit time} = \text{Time [milliseconds]} * \text{Baud rate}$$

5.3.3 Bus Monitoring

Bus Monitoring

Data Control Time: ms ☒ Override slave specific Watchdog Control Time

Min. Slave Interval: μs Watchdog Control Time: ms

Figure 29: Bus Parameters > Bus Monitoring

Bus Parameters	Meaning
Data Control Time	The Data Control Time defines the time within the Data_Transfer_List is updated at least once. After the expiration of this period, the Master (class 1) reports its operating condition automatically via the Global_Control command. Value range: 10 .. 655350 (The default value depends from the baud rate.)
Min. Slave Interval	The Min Slave Interval defines the minimum time period between two Slave list cycles. The maximum value that the active Stations require is always given. Value range: 100 .. 6553500 (The default value depends of the Slave types)
Override slave specific Watchdog Control Time	Each Slave returns a specific Watchdog Control Time to the Master. The option Override slave specific Watchdog Control Time allows the user to override individual slave specific settings with an equal value for all slaves configured at this master, for example to set a consistent value for slower transmission rates (which may require extended Watchdog Control Times) in critical environments.
Watchdog Control Time	The DP Slaves utilizes the Watchdog Control Time setting in order to detect communication errors to the assigned Master. When the Slave finds an interruption of an already operational communication, defined by a Watchdog time, then the Slave carries out an independent Reset and places the outputs into the secure condition. Value range: 20 .. 650250 (The default value depends of the number of Slaves attached to the Master and their configuration)

Table 19: Bus Parameters > Bus Monitoring

5.3.3.1 Adjust Bus Monitoring Parameter

If the bus configuration has changed and these changes have an impact on the bus parameters, a note symbol appears beside the concerned parameters, which displayed values are out of date now.

Figure 30: Note Bus configuration was changed, Bus Monitoring Parameters not longer actual

With **Adjust** the bus parameters on basis of the current bus configuration are calculated again and updated in the bus parameter dialog.

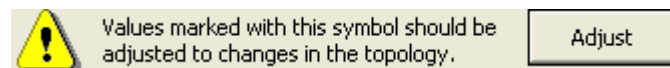


Figure 31: Adjust Bus Monitoring Parameters

If no note symbol is displayed beside the parameters of the bus monitoring configuration, the indicated values are up to date and valid.

5.3.4 Error Handling

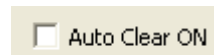


Figure 32: Bus Parameters > Error Handling

For PROFIBUS DP, the **Auto Clear** setting is provided for global error handling.

The DP Master monitors the data exchange to all DP Slaves by means of a timer.

- Auto Clear ON (Enabled)

The **Masters Operation Mode** will change from **Operate** to **Clear** and it shuts down the communication to all assigned Slaves if at least one Slave is not responding within the **Data Control Time**.

- Auto Clear OFF (Not Selected)

The **Master Operation Mode** will stay in the mode **Operate** and the communication to all available Slaves is kept up.



For further information to the **Masters Operation Mode** refer to section *General Diagnosis* on page 131 or to the **Data Control Time** refer to section *Bus Monitoring* on page 64.

5.3.5 Calculated Timing



Note: The **Calculated Timing** cannot be set; they result from the given calculations. The display of these times is only for information.

Calculated Timing	
Tid1:	37 ms
Tid2:	150 ms

Figure 33: Bus Parameters > Calculated Timing

The **Calculated Timing** is the time that the Sender spends at idle after the receipt of the last Bit of a telegram on the Bus, until the first Bit of a new telegram is sent on the Bus.

Depending on the type of the telegram:

Bus Time	Meaning	Formula
Tid1	Tid1 starts after the Initiator has received an acknowledgement, answer or a Token telegram.	Tid1 = max (T _{QUI} + 2 * T _{SET} + 2 + T _{SYN} , min T _{SDR}) T _{SYN} (*)
Tid2	Tid2 starts after the Initiator has sent a telegram that is not acknowledged.	Tid2 = max (T _{QUI} + 2 * T _{SET} + 2 + T _{SYN} , max T _{SDR}) T _{SYN} (*)

Table 20: Bus Parameters > Calculated Timing

Depending on the utilized ASIC and the utilized Baud Rate, the **Tid1** and **Tid2** can assume somewhat different values because of the ASIC software.

(*) T_{SYN}:

This is the minimum time that must be available to each device as a rest condition before it is allowed to accept the start of a query and it is determined at 33 Bit times.

5.4 Process Data

For the PROFIBUS DP Master DTM the **Process Data** pane serves as an external process data interface, e. g. for data transfer to a PLC unit. The process data pane lists the Slave devices connected to the Master, as well as the configured modules or input or output signals of the devices. This makes the fieldbus structure visible.

For the configured modules or signals names can be set (Column *Tag*).

In addition signal data available to the OPC server can be checked (Column *SCADA*).
















Process Data				
		Typ	Tag	SCADA
		Slave Device* <2>	Slave Device*	<input checked="" type="checkbox"/>
		1 byte input (0x10) <Slot 1>	1 byte input (0x10)	<input type="checkbox"/>
		(8 Bit) byte input	Input_1	<input type="checkbox"/>
		8 byte input (0x17) <Slot 2>	8 byte input (0x17)	<input checked="" type="checkbox"/>
		(8 Bit) byte input	Input_1	<input type="checkbox"/>
		(8 Bit) byte input	Input_2	<input type="checkbox"/>
		(8 Bit) byte input	Input_3	<input type="checkbox"/>
		(8 Bit) byte input	Input_4	<input checked="" type="checkbox"/>
		(8 Bit) byte input	Input_5	<input type="checkbox"/>
		(8 Bit) byte input	Input_6	<input type="checkbox"/>
		(8 Bit) byte input	Input_7	<input type="checkbox"/>
		(8 Bit) byte input	Input_8	<input type="checkbox"/>
		2 word input (0x51) <Slot 3>	2 word input (0x51)	<input checked="" type="checkbox"/>
		(16 Bit) int input	Input_1	<input type="checkbox"/>
		(16 Bit) int input	Input_2	<input checked="" type="checkbox"/>

Figure 34: Process Data (*The name of the Slave device is displayed.)








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

Table 21: Process Data

5.5 Address Table

The **Address Table** dialog pane shows a list of all addresses used in the process data image. The displayed addresses refer to the used PROFIBUS DP Master.

To configure the address data:

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

Address Table

☒ Auto addressing Display mode: Hexadecimal CSV Export

Inputs:

Station ...	Device	Name	Module	Type	Length	Address
	2 CB_AB32-DPS	CB_AB32-DPS	2 byte input IB		2	0
	0 CB_AB32-DPS	CB_AB32-DPS	2 byte input IB		2	2

Outputs:

Station ...	Device	Name	Module	Type	Length	Address
	2 CB_AB32-DPS	CB_AB32-DPS	2 byte output QB		2	0
	0 CB_AB32-DPS	CB_AB32-DPS	2 byte output QB		2	2

Figure 35: Configuration > Address Table (In the Figure shown here, in the column Device or Name example devices are displayed.)

5.5.1 Auto Addressing, Display Mode, CSV Export

Auto Addressing

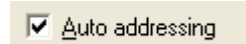


Figure 36: Configuration > Address Table - Auto Addressing

The **Auto Addressing** is used by default. For manual addressing the check-box must be unchecked.

Display Mode

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

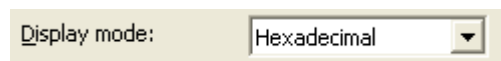


Figure 37: Configuration > Address Table - Display Mode

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.

5.5.2 Inputs / Outputs

If manual addressing is allowed, you assign the input or output addresses of the modules manually:

- Click on an address of a module.
- Edit the field and type in a new address.

Inputs:						
Station ...	Device	Name	Module	Type	Length	Address
2	CB_AB32-DPS	CB_AB32-DPS	2 byte input IB		2	0
0	CB_AB32-DPS	CB_AB32-DPS	2 byte input IB		2	2

Outputs:						
Station ...	Device	Name	Module	Type	Length	Address
2	CB_AB32-DPS	CB_AB32-DPS	2 byte output QB		2	0
0	CB_AB32-DPS	CB_AB32-DPS	2 byte output QB		2	2

Figure 38: Configuration > Address Table - Inputs / Outputs (In the Figure shown here, in the column Device or Name example devices are displayed.)

Parameter	Meaning
Station Address	Station address of the assigned Slave device
Device	Actual device name of the assigned Slave device from the GSE file.
Name	Free definable symbolic name of the assigned Slave device.
Module	Name of the module according GSD
Type	Input data type or output data type
Length	Number of the Signals included (IB, QB, IW or QW)
Address	Output data offset address or input data offset address

Table 22: Address Table Pane Parameters - Inputs / Outputs

- Confirm your modifications by clicking on the **OK** button.
- The manually changed address is now set.

5.6 Station Table

The **Station Table** shows the list of all slave devices configured in the master configuration.

Activate	Station ...	Device	Name	Vendor
<input checked="" type="checkbox"/>	2	CB_AB32-DPS	CB_AB32-DPS	[Name of the Manufacturer]
<input checked="" type="checkbox"/>	0	CB_AB32-DPS	CB_AB32-DPS	[Name of the Manufacturer]

Figure 39: Station Table (In the Figure shown here, in the column Device or Name example devices are displayed.)

Column	Meaning
Activate	Checkbox, to activate / deactivate a station
Station Address	Station address of the slave assigned Range for valid station address: 0 – 125 Note: The station address 126 is used exclusively for commissioning a slave device. If station address 126 is used, I/O communication from the master device to this slave device is excluded.
Device	Current device name of the assigned Slave device from the GSE file.
Name	Free definable symbolic name of the assigned Slave device.
Vendor	Name of the vendor of the device

Table 23: Station Table

5.7 Master Settings

At the **Master Settings** pane device related settings can be made. These settings only become active after the configuration was downloaded to the device.



Information about the download you find in section *Download Configuration* on page 99).

➤ Open **Configuration > Master Settings**.

Figure 40: Configuration > Master Settings



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

5.7.1 Start of Bus Communication

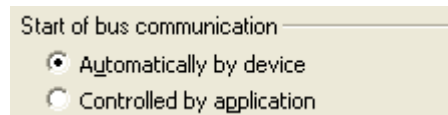


Figure 41: Master Settings > Start of Bus Communication

If **Automatically by device** is selected, the PROFIBUS DP Master device will start with the data exchange on the bus after the initialization has been ended.

When **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

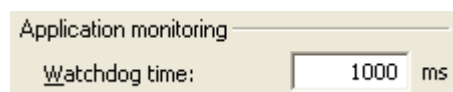


Figure 42: Master Settings > Application Monitoring

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 / Default Value
Permissible range of values	20 ... 65535 ms
Default	1000 ms
The software watchdog is deactivated.	0 ms

Table 24: 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.

5.7.3 Process Image Storage Format

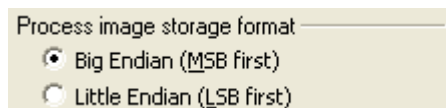


Figure 43: Master Settings > Process Image Storage Format

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 25: 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.

5.7.4 Module Alignment

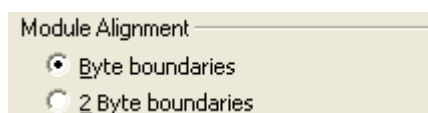


Figure 44: Master Settings > Module Alignment

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

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

Table 26: Parameters Master Settings > Module Alignment



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

5.7.5 Process Data Handshake

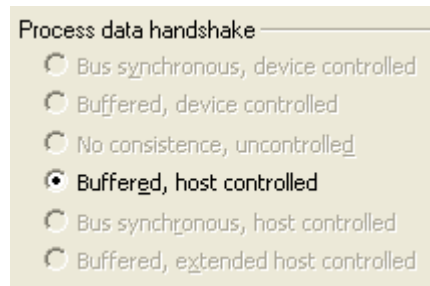


Figure 45: Master Settings > Process Data Handshake

The various types of **Process Data Handshakes** are used for setting the handshake of the process data for the PROFIBUS DP Master device.

The selection of the used process data handshake is important for the correct data exchange between the application program and the device.

The used handshake of the process data needs to be supported by the used application program.

Only the **Buffered, host controlled** handshake mode is supported.



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

5.7.6 Advanced

The **Enable configuration download during network state “operate”** option for the PROFIBUS network allows to change the configuration of a running PROFIBUS network without resetting the devices.

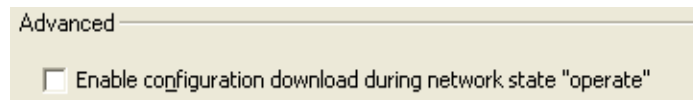


Figure 46: Master Settings > Advanced

- Check **Enable configuration download during network state “operate”** to enable configuration download during network state “operate”.
- A new configuration is downloaded and the configuration of the PROFIBUS network is changed and saved.



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

5.7.7 Device Status Offset

Reference to Firmware: The option **Device Status Offset** was implemented since PROFIBUS DP Master Firmware CIFXDPM.NXF Version 2.3.14.0.

The option **Device Status Offset** allows via **Automatic calculation** to calculate the offset for the start address of the device status in the dual-port memory automatically or via **Static** to preset the offset.

Device status offset

☒ Automatic calculation

☐ Static: Starts bytes after last input data

Current offset address is:

Figure 47: Master Settings > Device Status Offset

Device Status Offset	Meaning
Automatic calculation:	Device status always after the last input byte. If further input data are added in the configuration, then the starting address of the device status in the dual-port memory will move.
Static:	Here, the distance (free buffer) between the last input byte and the start of the device status can be set. If further input data are added in the configuration, then the distance will be reduced, so that the start address of the device status in the dual-port memory remains the same. If more input data are added in the configuration as free buffer exists, then the start address of the device status in the dual-port memory must be moved.

Table 27: Option Master Settings > Device Status Offset



Note: The setting options under **Device Status Offset** for customer specific variants of the configuration software can differ from the setting options displayed here.

6 Online Functions

Getting Access to SYCON.net Online Functions



Note! If under 'Configuration' > 'Master Settings' > 'Start of bus communication' > 'Controlled by application' is selected, after 'Power on Reset' the Master device is in 'Offline' state! In this state you can not use the SYCON.net online functions 'Debug Mode', 'LifeList' and 'Network Scan'. To get access to the online functions in case the Master device is used together with an application program, you must make sure that the application program will start the communication. Alternatively you can start the communication manually from the context menu 'Start communication' of the the Master device.

6.1 Connecting/Disconnecting Device



Note: Several PROFIBUS DP Master DTM functions e. g. **Diagnosis** or the configuration download in the FDT Framework require an online connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device.

Connecting Device

The following steps are needed to establish a connection from the PROFIBUS DP Master DTM to a PROFIBUS DP Master 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 28.

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 31.

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 PROFIBUS DP Master device icon.
 10. Select the **Connect** command from the context menu.
- The PROFIBUS DP Master device now is connected to the PROFIBUS DP Master DTM via an online connection. In the network view the device description at the device icon of the Master is displayed with a green colored background.

Disconnecting Device

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



Important: For a 2-channel device channel 1 or channel 2 each must be connected to the DTM separately.




6.2 Debug Mode







Note: Depending by the software variant of the frame application the **debug mode** is available or not.

The **debug mode** allows identifying the status of the cyclical communication between a Master device and its Slave devices on a network based on the colors of the bus lines as well as the debug icons.

For the Master device or the Master bus line this is valid:

- Master device in operation, cyclical communication runs. (Bus line **light green**/debug icon „RUN“  next to the Master device icon)
- Master device not operable.
(Bus line **blue**/debug icon „ATTENTION“  next to the Master device icon)
- Master in STOP state.
(Bus line **red**/debug icon „STOP“  next to the Master device icon)

For the Slave device or the bus line from the Master bus line to the Slave device this is valid:

- Slave device in operation, cyclical communication to the Master device runs. (Bus line **light green**/debug icon „RUN“  next to the Slave device icon)
- Diagnosis message available at the Master device.
(Bus line **yellow** (yellow)/debug icon „RUN“  next to the Slave device icon)
- Slave device not found during cyclical communication boot up.
(Bus line **blue**/ debug icon „ATTENTION“  next to the Slave device icon)
- Error in the Slave-to-Master communication.
(Bus line **red**/debug icon „STOP“  next to the Slave device icon)
- Slave device is not configured.
(Bus line **gray**)

6.2.1 Requirements



Note: You first must:

- assign the Master device to the Master DTM,
- configure the Master or the Slave device parameters,
- and download the configuration to the Master.

Only then the debug mode can be used appropriately.



For details to the device assignment, refer to section *Settings for Driver and Device Assignment* on page 32.

For information on how to configure the Master device or how to download the configuration, refer to this Operating Instruction Manual and to the Operating Instruction Manual for the netDevice.

For information on how to configure the Slave device, refer to the Operating Instruction Manual of the Slave DTM.

6.2.2 Starting Debug Mode




Note: The menu entries for the **debug mode** will be only available if the debug mode is supported by the frame application and the Master DTM.

For a single network:

- Therefore open the context menu of the Master via right mouse click to the device icon.
- Select the **Start Debug Mode** command from the context menu.

For the entire project:

- Click to the menu **Network > Start Project Debug Mode** or in the netDevice toolbar **Debug** to the icon .
- In the debug mode, the bus lines in the network view are displayed depending on the status of the cyclical communications in various colors. Additionally next to the device icon different debug icons are displayed.

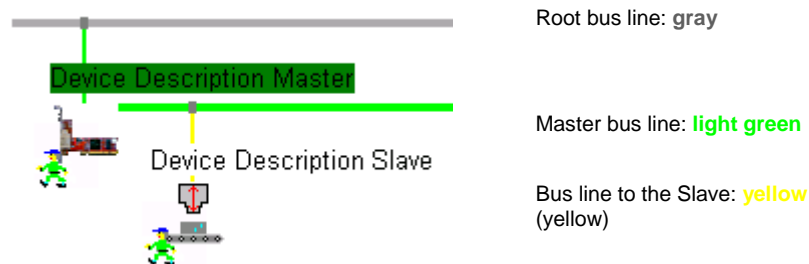


Figure 48: Example Debug Mode with pending Diagnosis, Network View of a Project with one Network (Master and Slave)

- **Root Busline:** This busline is displayed always in **gray**.
- **Branch Line of the Master device** (Busline from the Root to the Master Busline): During the debug mode this busline is displayed **light green**, **blue** or **red** colored. If the debug mode is not used, this bus line will be displayed **gray** colored.
- **Master Busline or Branch Line of the Slave device:** During the debug mode these buslines are displayed **light green**, **yellow** (yellow), **blue** or **red** colored. If the debug mode is not used, this bus line will be displayed in the respective *fieldbus* or *protocol specific* color (PROFIBUS: **violet**).

6.2.3 Debug Mode Busline Colors and Debug Icons

The following table contains information about the displayed colors of the bus lines and on the icons in the debug mode.








Debug Mode Busline Colors	Debug Icon	Meaning
Master Busline	Next to the Master device icon	
light green		The Master device has cyclic communication
blue		The Master device is not operable. This may have different causes. For example: - There is no valid license in the Master device. - There is no valid firmware in the Master device.
red		The Master device is in STOP state. The cyclic communication has been stopped.
Branch Line of the Slave device	Next to the Slave device icon	Meaning
light green		The Master device has cyclic communication to this Slave device.
yellow (yellow)		The Master device has cyclic communication to this Slave device, but in the diagnostic buffer of the Master device a diagnostic information about this Slave is pending.
blue		The device was not found. This may have different causes. For example: - The configuration download to the Master device is still missing. - The Slave device is not available in the network. - There is no valid firmware in the Master device. - Parameter or configuration error at the Master device. - The cyclic communication to this Slave device has been stopped (without diagnosis information at the Master).
red		Due to a communication error, the cyclic communication from the Master device to this Slave device is not possible. This may have different causes. For example: - The cyclical communication to this Slave device has been stopped. - Parameter or configuration error at the Slave device. - The validation of the manufacturer or device ID shows different values. - The diagnostic buffer of the Master device still a diagnostic information about this Slave is pending and the cyclic communication to this Slave device has been stopped.
gray	-	The Slave device is not configured. I. e., in the configuration of the Master device there are no configuration parameters to this Slave available.

Table 28: Debug Mode Busline Colors and Debug Icons

6.2.4 Reset of the Diagnosis Information and of the Station Status

To analyze the diagnosis information:

- Select the diagnosis windows in the Master DTM dialog.
- Therefore select **Diagnosis** > [*diagnosis window*] in the navigation area.

To read the diagnosis buffer of the Master device and thus to reset the device:

- Select **Diagnosis** > **Station diagnosis** in the navigation area.
- In the window **Station diagnosis** click with the right mouse button to the station status LED for the device (yellow).
- From the context menu select **Reset** or **Reset All**.

In the window **Station diagnosis** the station status LED for the device is displayed in green and the network will display the bus line from the Master device icon to the Slave device icon in **light green**.

6.2.5 Stopping Debug Mode

For a single network:

- Therefore open the context menu of the Master via right mouse click to the device icon.
- Select the **Stop Debug Mode** command from the context menu.

For the entire project:

- Click to the menu **Network** > **Stop Project Debug Mode** or in the netDevice toolbar **Debug** to the icon .

6.3 Set Station Address

With the dialog **Set Station Address** the PROFIBUS station address of the device can be changed.

To set the station address, proceed as described hereafter:

1. Select and connect the device.
2. Disconnect the device (only if the device is online).



Note: The dialog **Set Station Address** is enabled only during offline mode. The online-connection between the PROFIBUS DP Master DTM and the PROFIBUS DP Master device must be disconnected.



For further information how to establish or how to disconnect an online connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device, refer to section *Connecting/Disconnecting Device* on page 77.

3. Select **Additional Functions > Set Station Address** from the context menu (right mouse click).

Current station address: 4

New station address: 5

No additional changing: ☐

Remote slave parameter: AA0FE6

Set address Cancel

Figure 49: Set Station Address



Note: The station address 126 is used exclusively for commissioning a slave device. If station address 126 is used, I/O communication from the master device to this slave device is excluded.

4. Enter the new station address and select **Set Address**.
- The new station address of the device is set and in addition it is displayed in the **Current station address** list.

6.4 Live List

The **Live List** gives an overview of the devices, which are physically present in the actual PROFIBUS network constellation. The live list works online. Present Master devices are represented as a **green circle area**, present Slave as a **blue circle area**, all other non present devices in grey, whereby the number indicates the PROFIBUS station address of the device. The meaning of the other colors is given in the list below the table.

To work with the **Live List**, proceed as follows:

1. Connecting Device:



Note: Accessing the **Live List** display requires an online connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device.



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

2. Select **Additional Functions > Live List** from the context menu (right mouse click).



Figure 50: Live List

The display is not updated automatically as this function loads the PROFIBUS network. However, the Live List can be renewed with the **Update** button.

6.5 'Network Scan' and 'Upload'

With the function **Network Scan...** of the PROFIBUS DP Master DTM you can find out automatically which PROFIBUS DP Slaves are attached to the PROFIBUS DP Master device and how these devices are configured. During the network scan the Master device requests the ident codes of the Slave devices found at the bus. For each connected Slave device its ident code is read out.

In the **Scan Response** dialog of the Master DTM the assigned device description files or DTM devices are displayed. Exactly one ident code is assigned to each device description file and to each DTM device. Different versions (also language versions) of the same device description file are defined by the same ident code. For every identified device you can select the assigned DTM device according to the firmware loaded in that Slave device. Via **Create Devices** for each Slave device the selected DTM device is created.

The **Upload** of the configuration is proceeded subsequent to a network scan procedure. The upload function allows to upload module configuration data from all PROFIBUS DP Slave devices via the PROFIBUS DP Master device and the PROFIBUS DP Master DTM to the PROFIBUS DP Slave DTMs.

Requirements

The PROFIBUS DP Master device must be configured.



Important: The configuration of the Master device must be downloaded to the Master device. For more see section *Configuration Steps* on page 24.

Overview of the Steps

1. Starting the **Network Scan** function of the Master DTM.
2. Make the settings in the **Scan Response** dialog of the Master DTM.
3. Click **Create Devices**.
4. Via the **Download** function of the Master DTM, download the current configurations of the Slave devices to the Master device.



Note: If a module identifier conflict occurs when scanning the modul configuration, the **Upload** dialog appears, where occurred conflicts are displayed in red. For information to resolve identified module identifier conflicts refer to section *Resolving Module Identifier Conflicts* on page 96.

6.5.1 Starting 'Network Scan'

1. Starting the **Network Scan** function of the Master DTM.

- In netDevice: right-click on the device symbol of the PROFIBUS DP Master DTM.
- Select **Network Scan...** from the context menu.

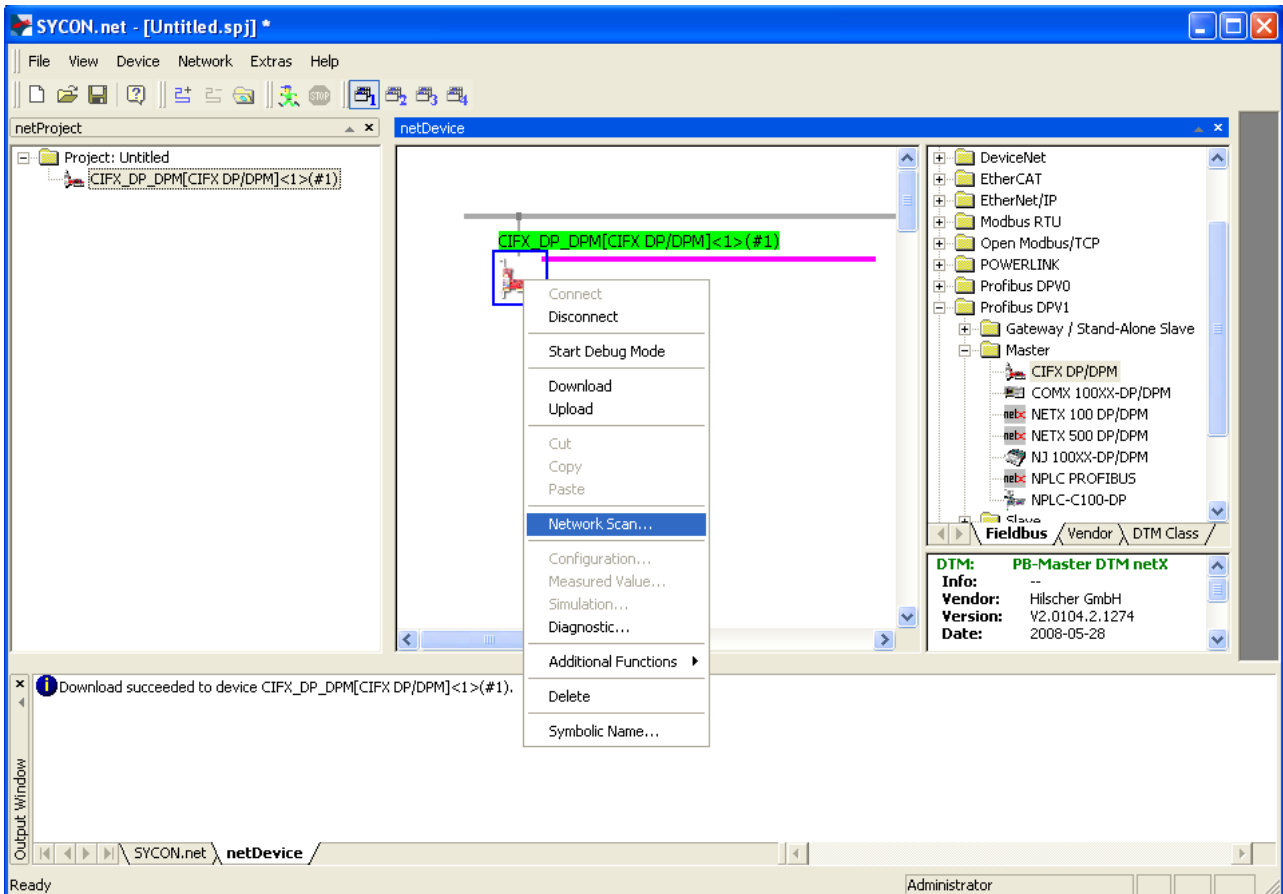


Figure 51: Starting 'Network Scan' (Example)

- Wait for a short time.
- If the query is displayed if the IO communication shall be stopped, click **Yes**.



Note: It can last some seconds, until the **Network Scan...** dialog is displayed.

Via **Network Scan...** an online connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device is established. The configuration software scans, which PROFIBUS DP Slaves are attached to the PROFIBUS network or to the PROFIBUS DP Master device.

➤ The **Scan Response** dialog of the Master DTM is displayed.

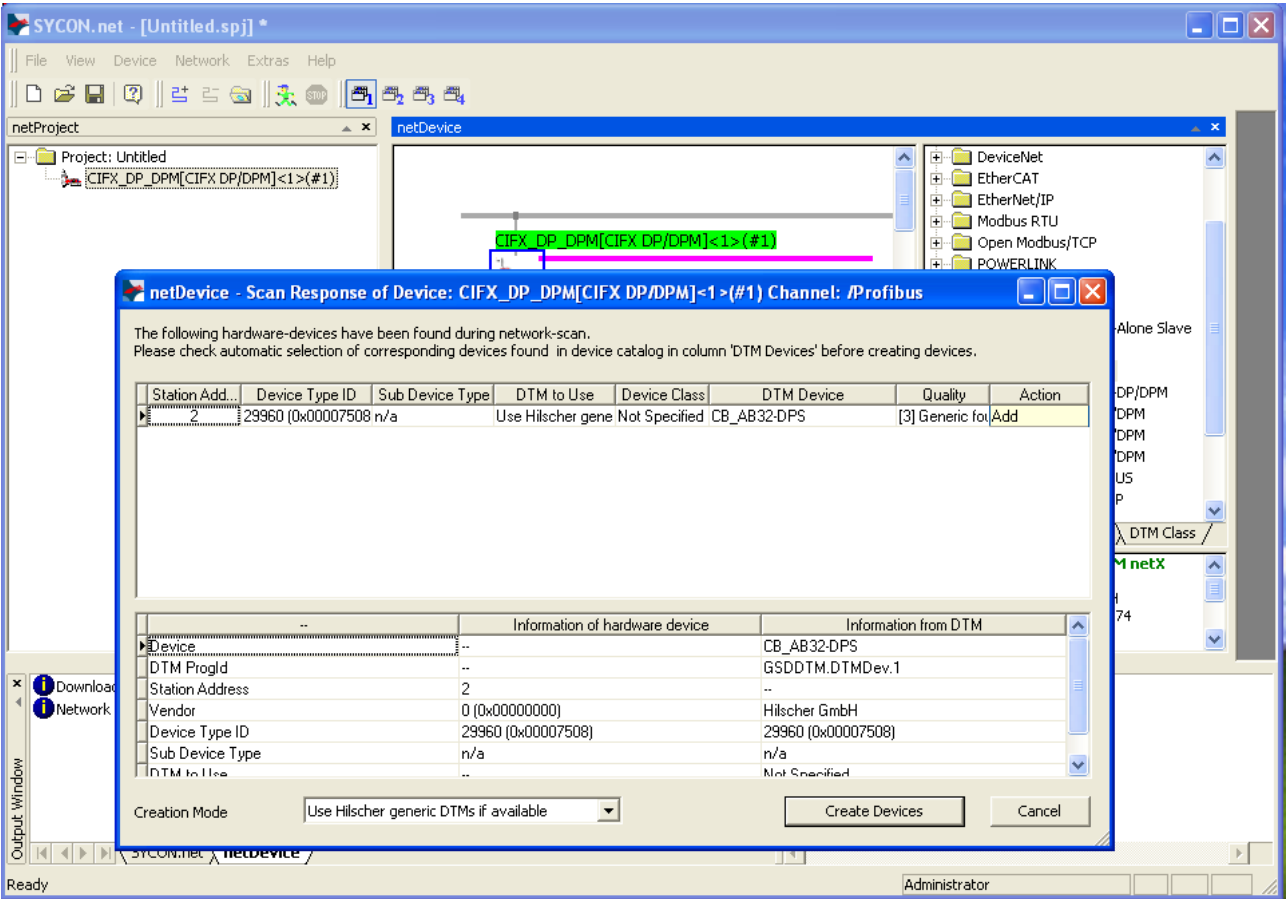


Figure 52: Scan Response dialog of the Master DTM (Example)

6.5.2 Settings in the Scan Response Dialog of the Master DTM

2. Make the settings in the **Scan Response** dialog of the Master DTM

- In the **DTM to Use** column the DTM devices assigned to the found ident codes appear.

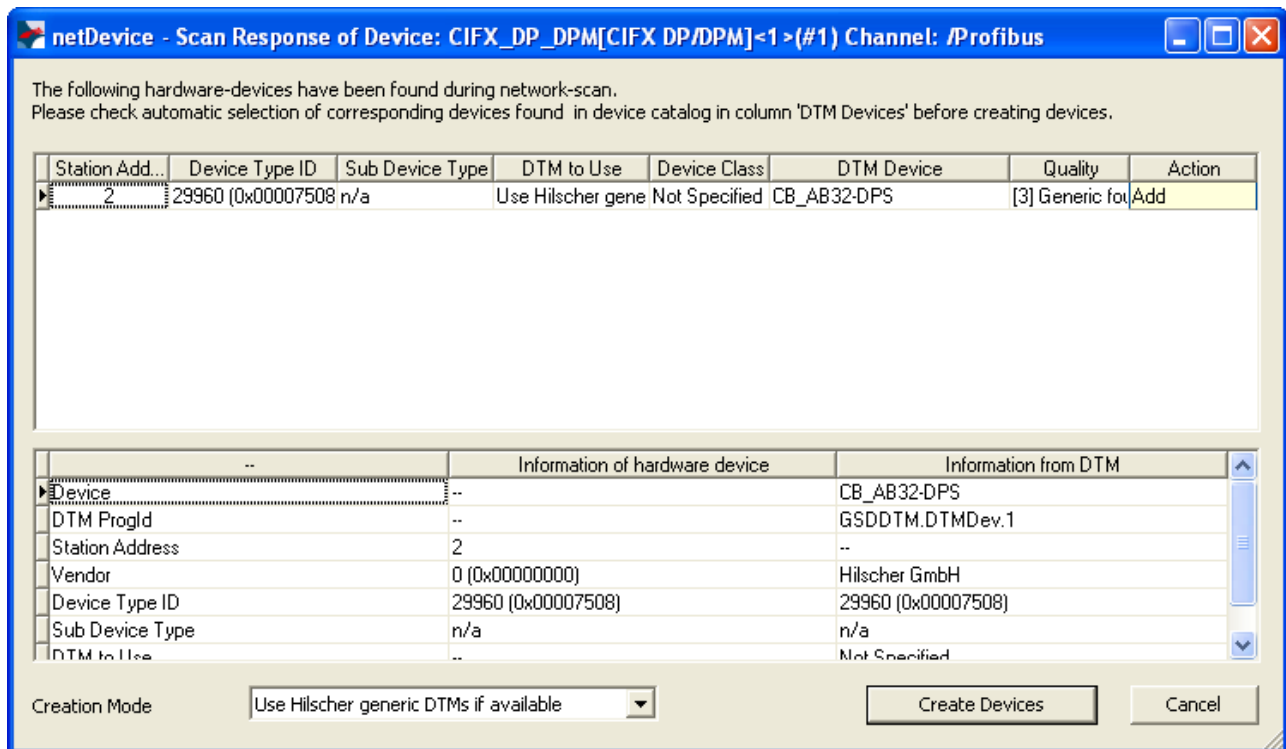


Figure 53: Scan Response dialog of the Master DTM (Example)

- In the **DTM to Use** column select for every identified device the DTM device corresponding to the firmware loaded in this Slave device.
- If in the **DTM to Use** column no DTM device or a DTM device not desired is displayed, add the required DTM devices to the device catalog.
- or adapt the creation mode under **Creation Mode**.
- In the **Action** column select, whether the found DTM device shall be:
 - *added* or *skipped*
(if a device is not yet present in the project),
 - *replaced* or *skipped*
(if a device is already present in the project)

6.5.3 Description on the Scan Response dialog of the Master DTM

In the following table you find a description about the **Scan Response** dialog of the Master DTM.

Column	Description
Title Bar	With the text: <i>Symbolic Name of the Master Device [Device Description] <Device Address> (#Network ID) channel//Profibus.</i>
Instruction	In the Network Scan window the instruction text is displayed: The following hardware-devices have been found during network scan. Please check automatic selection of corresponding devices found in device catalog in column 'DTM Devices' before creating devices.
Station Address	PROFIBUS DP station address, which displays the logical sequence of the devices within a PROFIBUS network.
Colors	Meaning of colors in the Scan Response dialog of the Master DTM: <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <div style="background-color: red; width: 20px; height: 15px; display: inline-block;"></div> Red <div style="background-color: yellow; width: 20px; height: 15px; display: inline-block;"></div> Yellow </div> <div> <p>If a field marked in red appears in column Station address, the respective DTM device is already present on the network.</p> <p>If a field appears marked in yellow, a selection can be made by a combo box.</p> </div> </div>
Device Type ID	Identification (ID): Ident code read out from each device (Unique Identifier)
Sub Device Type	Not used for PROFIBUS.
DTM to Use	<p>Display of the DTM devices, which are assigned to the ident codes found during scanning:</p> <p>If <u>Use Hilscher generic DTMs if available</u> is displayed <i>without color marking</i>, there is no selection possibility.</p> <p>If <u>Use Hilscher generic DTMs if available</u> is displayed <i>marked in yellow</i>, the following selection can be made:</p> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="border: 1px solid gray; padding: 2px;"> <div style="background-color: #f0f0f0; padding: 2px;">Use Hilscher generic DTMs if available</div> <div style="background-color: #e0e0e0; padding: 2px;">Use Hilscher generic DTMs if available</div> <div style="background-color: #d0d0d0; padding: 2px;">Use vendors DTMs if available</div> </div> <div style="margin-left: 10px;">(In the figure shown example DTMs are displayed.)</div> </div> <p>A selection will only be displayed if under Creation Mode > Choose for each device was selected and if another DTM has been found for the respective device.</p>
Device Class	Device class of the PROFIBUS DP Slave devices.
DTM Device	<p>Found DTM device (the device name as taken from the DTM)</p> <p>Only the device description files or DTM devices can be displayed within the column DTM Devices:</p> <ul style="list-style-type: none"> • Which are available in the device catalog for the scanned ident code, • Respectively, which belong to the selection made under Creation Mode • and which belong to the selection made under Creation Mode > Choose for each device under DTM to create. <div style="display: flex; margin-top: 10px;"> <div style="flex: 1;"> <p>For each device type ID in the column DTM Device the following is displayed:</p> <ul style="list-style-type: none"> • <u>no</u> device, • <u>one</u> single device • or <u>multiple</u> devices (within a combobox). </div> <div style="flex: 1; margin-left: 20px;"> <p>This means, within the device catalog of netDevice for the found ident code and the selected Creation Mode these alternatives are available:</p> <ul style="list-style-type: none"> • no DTM • A device description file or a DTM device of the manufacturer • One or more device description files or DTM devices of a manufacturer </div> </div>
Quality	<p>Associated quality information</p> <p>Display: [1] DTM found, [3] Generic found</p>


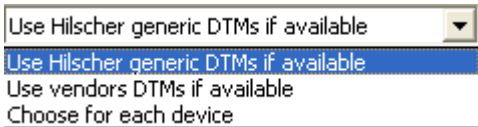
Column	Description
Action	<p>The action to be performed with the corresponding device during the process of device creation.</p> <ul style="list-style-type: none"> If no device is present within the current project, the selection Add/Skip will appear. If there is already a device present within the current project, the selection Replace/Skip will appear. <p>Add adds a new instance for the selected DTM during the process of creation of a device.</p> <p>Skip skips the process of creation of a device for the respective device address.</p> <p>Replace erases the instance of the DTM currently located at this address during the process of creation of a device, and replaces it with the instance of the chosen DTM.</p>
Table below	<p>The lower table in the Scan Response dialog of the Master DTM shows a comparison of possible differences in device information taken from:</p> <ul style="list-style-type: none"> The hardware device (displayed in central column of 3) and the DTM (displayed in right column of 3) <p>The left column contains which information is compared between the information sources 'Hardware Device' and 'DTM'.</p> <hr/> <p> Note: If a field contains the text 'n/a', the corresponding information is not applicable in the current context (fieldbus).</p>
Creation Mode	<p>Under Creation Mode one of the following options can be selected:</p> <ul style="list-style-type: none"> Use Hilscher generic DTM if available Use vendors DTMs if available Choose for each device <div data-bbox="379 996 858 1122">  </div> <p><i>Scan Response dialog of the Master DTM > 'Creation Mode'</i></p>
Create Devices	<p>About Create Devices ...</p> <ul style="list-style-type: none"> for each Slave device the previously selected DTM device is created. the Slave device configuration is uploaded to the created Slave-DTM and thereby the module configuration is generated. <p>In case a conflict occurs between a device description file and a device, the Upload dialog appears, where conflicts are displayed in red.</p>
Cancel	Click Cancel to leave the dialog without creating a Device.

Table 29: Description on the Scan Response dialog of the Master DTM

6.5.4 Creating Devices

3. Click **Create Devices**

- In the **Scan Response** dialog of the Master DTM click **Create Devices**.
- For each Slave device the previously selected DTM device is created.
- The dialog **Network Scan – Creating Devices** appears showing the progress bar **Creating DTM Device** and **Starting Upload**
The dialog shows the the progress of the device creating and the upload process.



Note: Depending on the manufacturer of the respective device, also a dialog with some slight deviations from this one may be displayed.

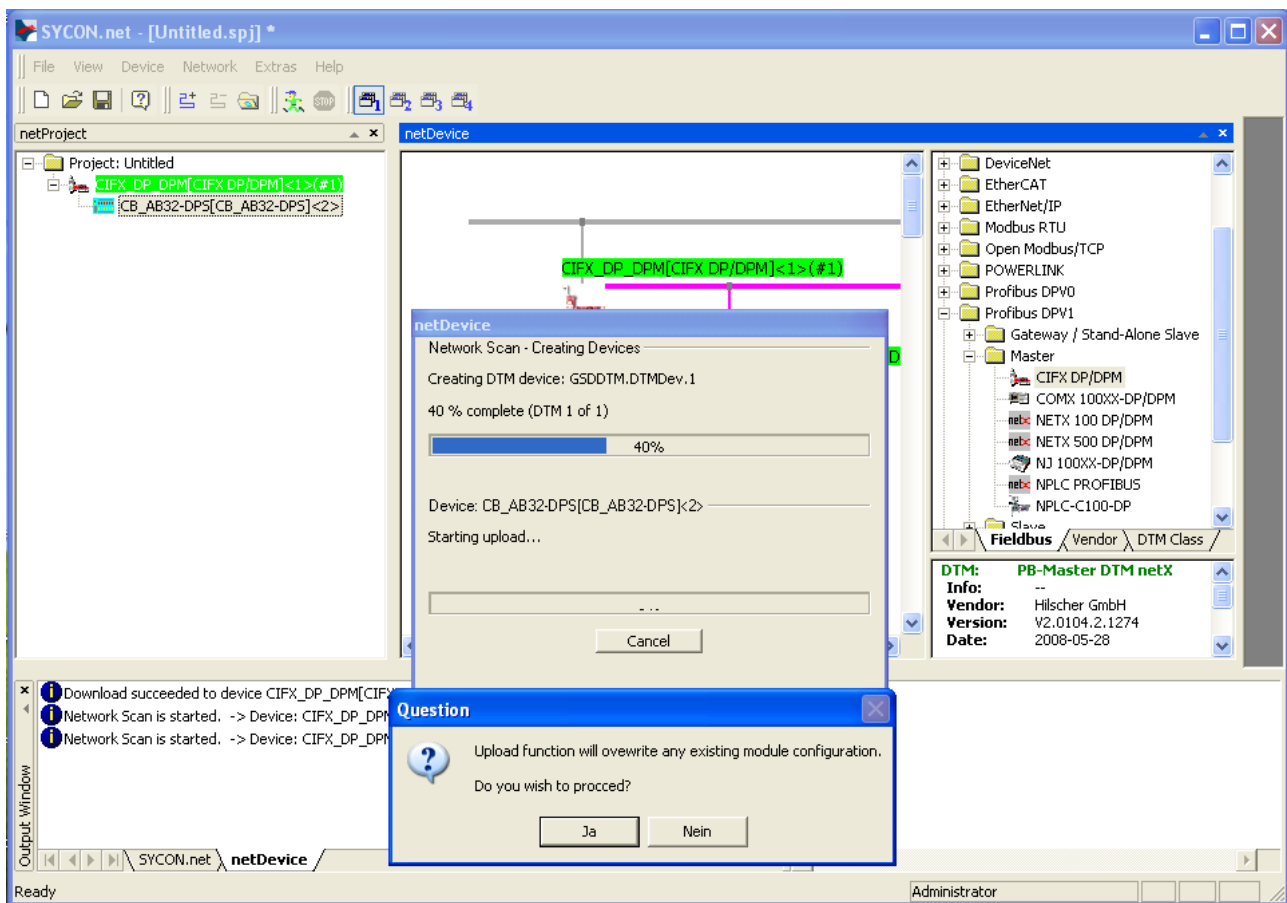


Figure 54: Query about the Generation of the Module Configuration (Example)

- Answer the query whether the module configuration of the PROFIBUS DP Slave should be generated by **Yes**.
- For every Slave device its current configuration is uploaded via the Master device and the Master DTM to the Slave DTM and the success of the upload procedure is reported in the output window.

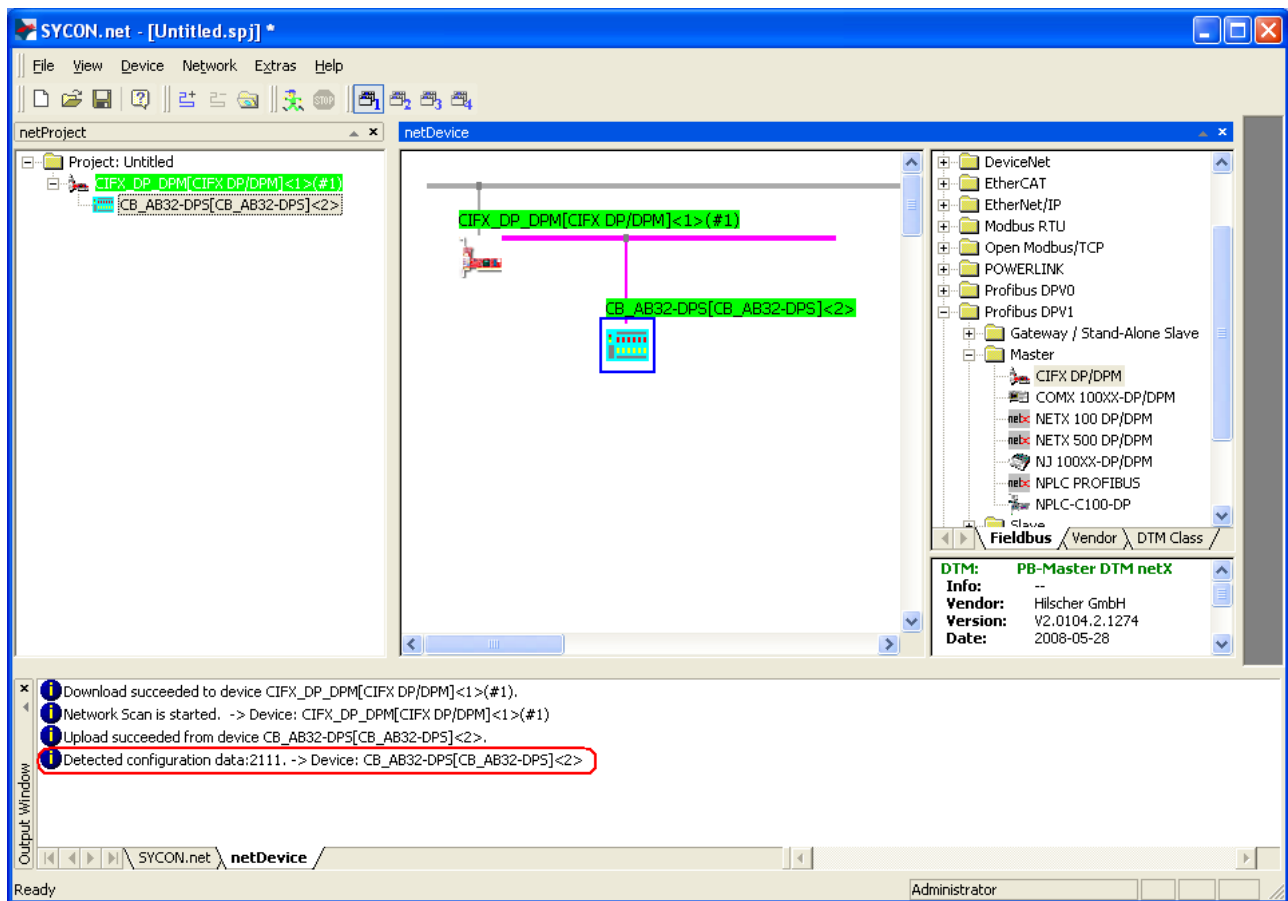


Figure 55: Upload succeeded (Example)



Note: If a module identifier conflict occurs when scanning the modul configuration, the **Upload** dialog appears, where occurred conflicts are displayed in red. For information to resolve identified module identifier conflicts refer to section *Resolving Module Identifier Conflicts* on page 96.

After the I/O module configuration of the PROFIBUS DP Slave device has been created, you can display the uploaded modules by double-clicking the Slave device symbol.

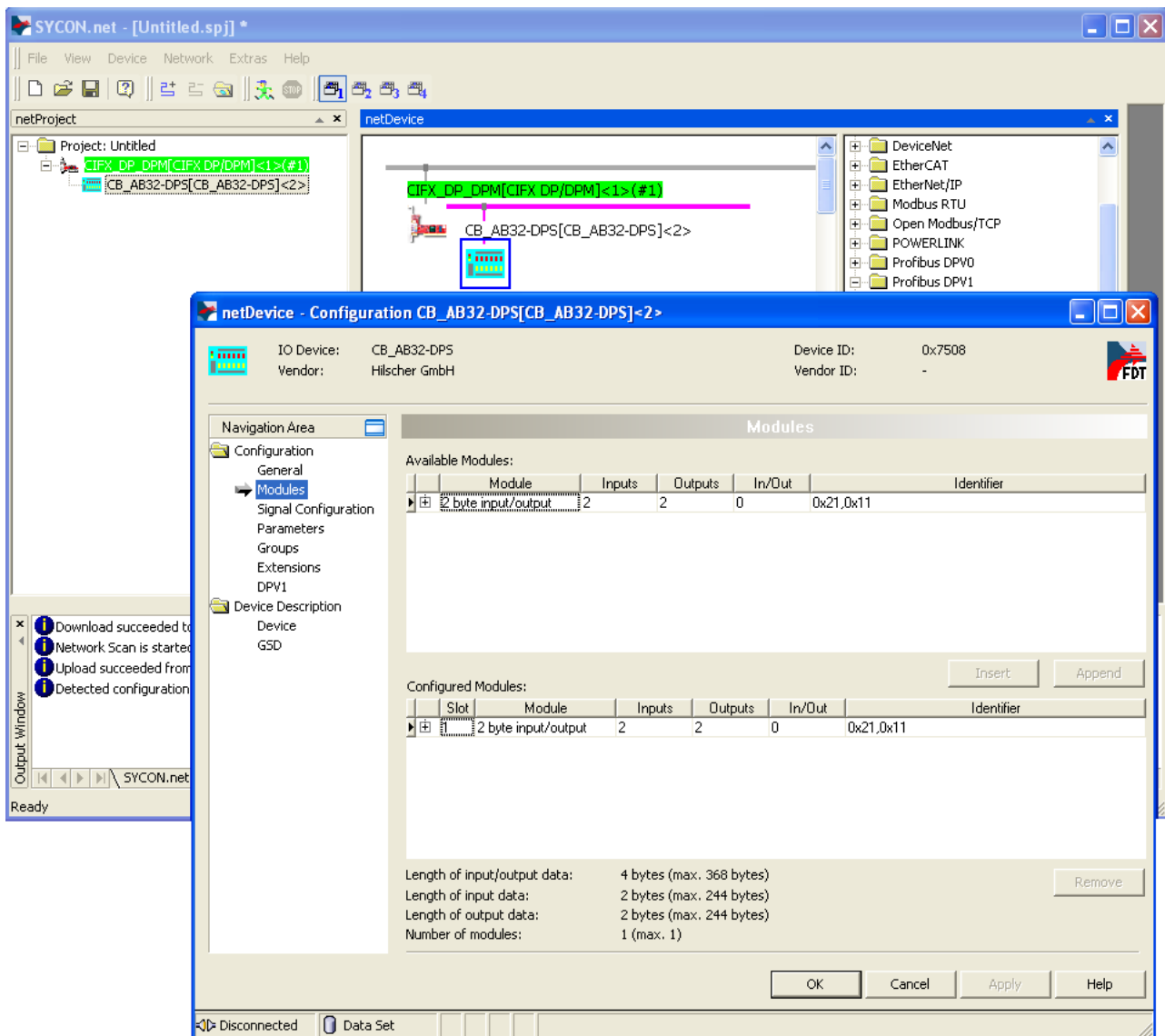


Figure 56: Uploaded Modules (Example)

6.5.5 Download to the PROFIBUS DP Master Device



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 28.

4. Via the **Download** function of the Master DTM, download the current configurations of the Slave devices to the Master device.
 - In netDevice: right-click on the device symbol of the PROFIBUS DP Master DTM.
 - Select **Download** from the context menu.
 - The Dialog **netDevice - Download** appears:

If you attempt to download during bus operation, communication between master and slaves is stopped.

Do you really want to download?
 - Click **Yes**.
 - The dialog **netDevice** appears showing the progress bar **Download active, device performs initialisation...**
 - The **netDevice** window shows the message (example): **Download succeeded to device CIFX_RE_DPM[CIFX RE/DPM]<>(# 1).**

6.5.6 Resolving Module Identifier Conflicts

6.5.6.1 Upload Dialog of the Slave DTM

The **Upload** pane of the Slave DTM is displayed only if modules are detected, which show a module identifier conflict, i. e., modules which have the same module identifier and not a unique one each. These modules then are listed under **Configured Modules** marked in red.

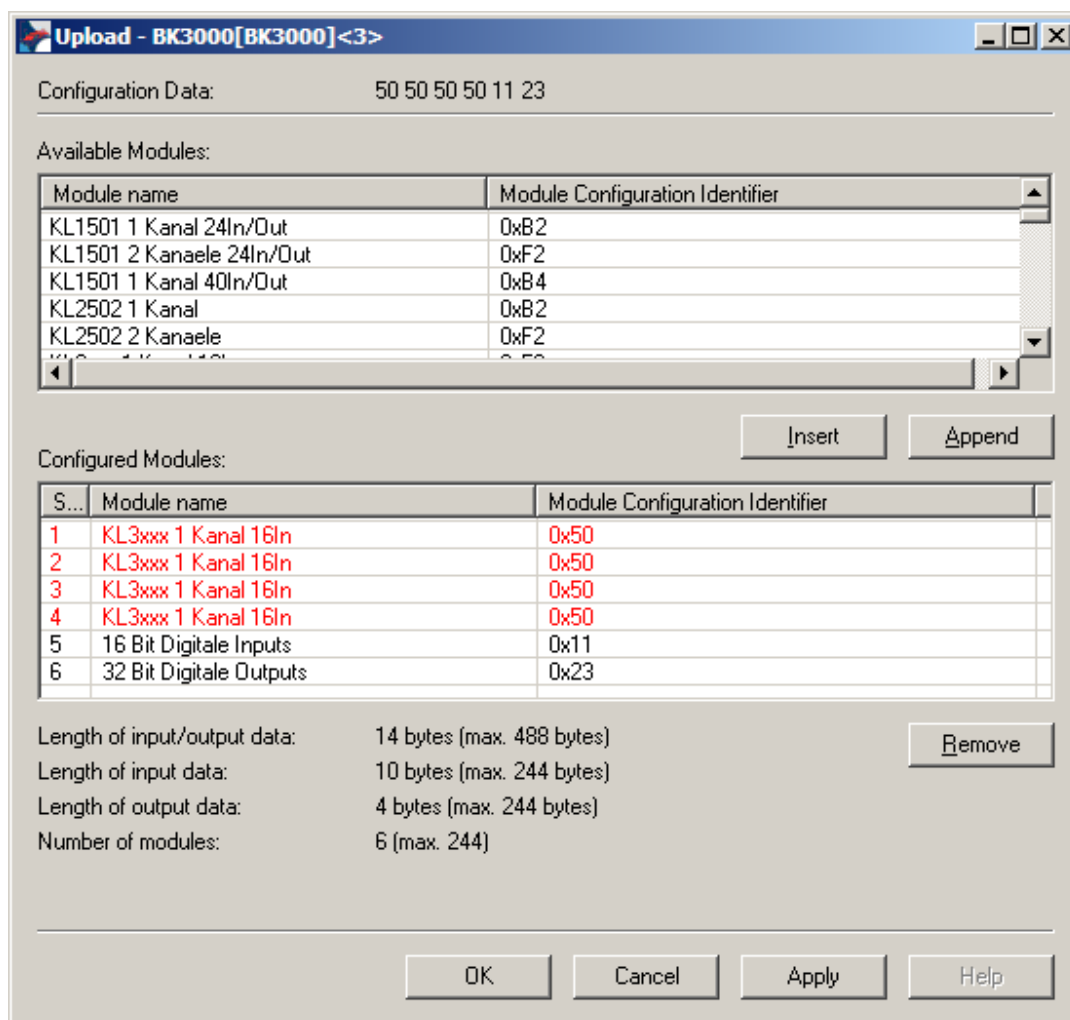


Figure 57: Network Scan > Create Devices > Upload

Column	Description
Configuration Data	Shows the scanned module configuration (sequence of the module configuration identifier).
Available Modules	Shows all possible modules of the Slave.
Configured Modules	In case of a modular Slave, the scanned module configuration is displayed here.
Module name	Shows the name of the available respectively of the configured modules.
Module Configuration Identifier	Shows all identifier of the modules in the same row. For more information refer to the Operating Instruction Manual of the Generic Slave DTM.
Slot	Shows the sequential number for modules.

Table 30: Network Scan > Create Devices > Upload

6.5.6.2 Module Identifier Conflicts

During the upload detected module identifier conflicts are displayed in the **Upload** dialog marked in red. This allows the user to clarify whether the scanned module configuration of a Slave corresponds to the actual physical module sequence in the Slave device or not. The user must replace scanned modules indicating a conflict using **Remove**, **Insert** or **Append**.

6.5.6.3 Resolving Module Identifier Conflicts

If the module configuration of a Slave device is indicated with a conflict, you must check and manually adapt this scanned module configuration.



Note: The sequence of the modules in the list **Configured Modules** is important and must match with the sequence which exists in the Slave. Typically, the sequence is the actual physical sequence. There are Slaves to which this rule does not apply and where for example first analogue modules and then digital modules must be entered, independent of their actual sequence.

If the Slave device has only one module, this module is taken over automatically in the table **Configured Modules** and can not be deleted.



For further information about the modules of the used Slave see the manual of the device manufacturer.

1. Check if the scanned module configuration of a Slave corresponds to the actual physical module sequence in the Slave device or not.
2. Replace scanned modules which do not correspond to the physical module sequence using the **Remove**, **Insert** or **Append** buttons:
 - Delete these scanned modules from the list **Configured Modules** using the **Remove** button.
 - Then Insert the required modules from the selection list **Available Modules** into the list **Configured Modules**.

You can append or insert one or several modules to the list **Configured Modules**.



Note: A multiselection is possible. Therefore click in the list **Available Modules** on several modules while holding the SHIFT key.

- Appending Modules
 - Under **Available Modules** click on one or several modules and click on **Append**.
 - Or double click on these modules.
 - The modules appear at the lower end of the list **Configured Modules**.

- Inserting Modules
 - Under **Available Modules** click on one or several modules.
 - Under **Configured Modules** click to the module before which the additional modules shall be inserted.
 - Click **Insert**.
 - The modules appear in the list **Configured Modules** before the selected module.
 - Click on **OK** to confirm your selection. If the selection should not be taken over, click the **Cancel** button.

6.6 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 PROFIBUS DP Master device an online connection from the PROFIBUS DP Master DTM to the PROFIBUS DP Master device is required. Further information can be found in the *Connecting/Disconnecting Device* section on page 77.

Safety Precautions

If you plan to perform a configuration download via the PROFIBUS DP Master 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 PROFIBUS DP Master 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?'

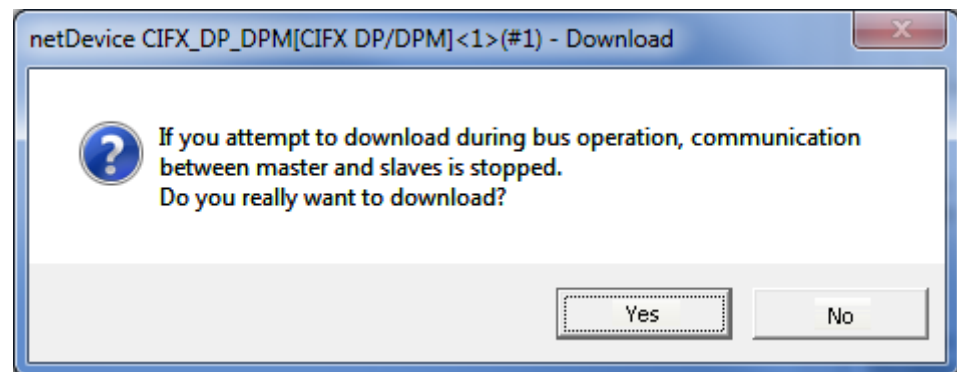


Figure 58: netDevice Message: Download



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**.

6.7 Configuration in Run

Using the **Configuration in Run** method you can change the configuration of the PROFIBUS network in OPERATE state, but a reset of the connected devices is not required. This means, the Master will remain in data exchange with the unchanged Slave. With the configuration software or your application program as host you can activate the changes of database parameters.

Process to activate the Changes

The process to activate the changes (configuration-update) includes the exchange of messages between the host and the device firmware (PROFIBUS DP Master) as requests and confirmations. **SYCON.net** as a configuration software with the components "Device Type Manager" (DTM), "Online Data Manager" (ODM) or "ODM driver" sends or receives data packets, while the exchange of I/O data is only possible using an appropriate application program.

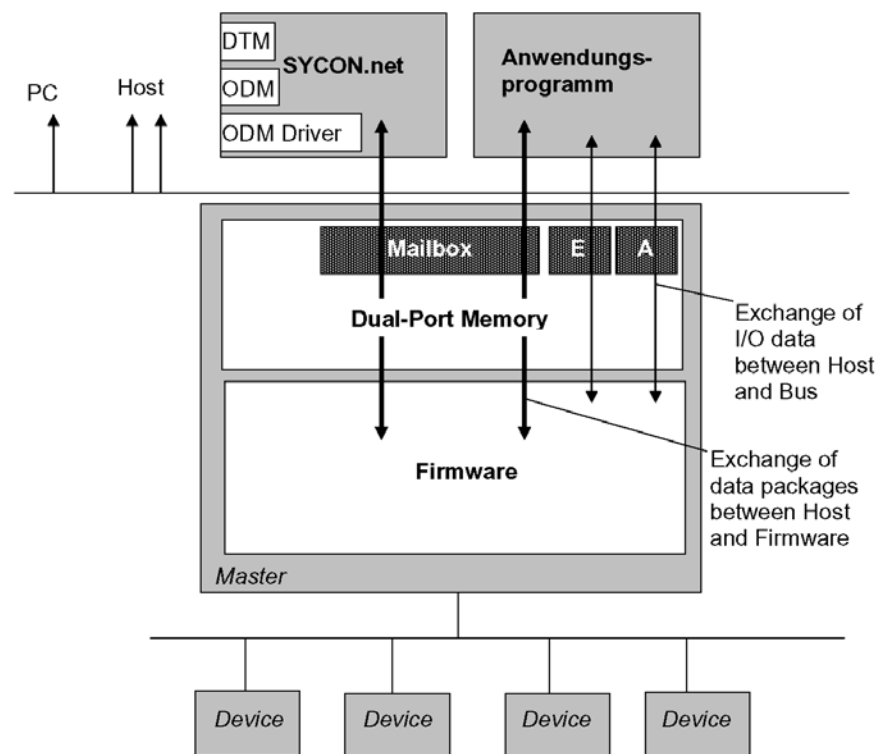


Figure 59: Overview Configuration Software and Master Firmware

6.7.1 Requirements

For a successful configuration-update of the PROFIBUS network (in the status OPERATE), the following conditions and criteria are valid:

1. In the PROFIBUS DP Master DTM **Enable configuration download during network state “operate”** must be checked.
2. The PROFIBUS DP Master DTM set **Device status offset** to **Static** and enter the number of bytes to be left free between the last input data byte and the device status. This way later during network in OPERATE ("Configuration in Run" activated) and with activated "Auto-addressing" additional input data deriving from newly inserted Slave devices or modules can be saved.
3. The *Address* and the *Baud Rate* of the PROFIBUS DP Master device can not be changed in the new configuration.
4. The changed configuration (new database) can only be accepted if:
 - the **changes to the database parameters** are possible,
 - the **Master Settings** (*Startup*, *Watchdog*, *Statusoffset*, *Busparameter*) have not changed and
 - The **Master State** is OK (= 0x00000000).
5. The configuration changes can only be saved in the driver's directory using the **cifX Device Driver**.



Note: If the **cifX Device Driver** (ODMnetX) is used, a persistent storage of the updated configuration database will only work on flash-based hardware and ONLY if there is no configuration stored in the remote cifX Driver / Toolkit.

Safety Precautions



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 28.

6.7.2 Overview Steps for “Configuration in Run”

Preparation

In preparation for a configuration update during network state OPERATE, you must perform Step 1 to Step 5.

1. Activate „Configuration in Run“.
2. Define number of bytes after input data
3. Create the configuration.
4. Start the download of the new configuration.
5. Activate the changes.

To use "Configuration in Run", you must first activate **Configuration in Run** in the PROFIBUS DP Master DTM, set the number of bytes after the last input data, create the configuration, download the configuration using the configuration software and activate the new configuration in the **Configuration in Run** pane. Further details on each step, see the following subsections.

Change Configuration via Configuration in Run

To perform a configuration update during network state OPERATE, you must perform Step 1 to Step 4.

1. Expand or change the configuration.
2. Start the download of the changed configuration.
3. Evaluate the configuration data.
4. Activate or reject the changes.

If you want to change the configuration via the "Configuration in Run", first adjust your configuration and restart the download of the configuration. Then check at **Configuration in Run** pane, whether the evaluation of the Slave devices and of the Master device allows to apply the new configuration (new database) during network state OPERATE and activate the new configuration or reject it. The new configuration is then applied to the Master device or discarded. Further details on each step, see the following subsections.

If the new Configuration can not be applied

If the new configuration can not be applied, you may need to increase the number of bytes after the input data.

6.7.3 Activate „Configuration in Run“

- Open the Master DTM configuration dialog (in the netDevice pane via double click on the device icon of the Master).
- Select **Configuration > Master Settings** (refer to section *Advanced* on page 75).
- Check **Enable configuration download during network state “operate”**.

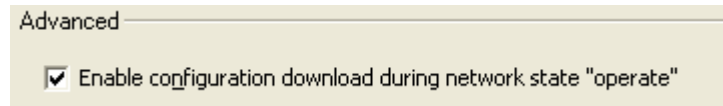


Figure 60: Enable configuration download during network state “operate” - checked

- Click **Apply**.
- The setting made will be saved. Via **OK** the DTM configuration dialog will be closed.

6.7.4 Define Number of Bytes after Input Data

- Open the Master DTM configuration dialog (in the netDevice pane via double click on the device icon of the Master).
- Select **Configuration > Master Settings** (refer to section *Device Status Offset* on page 76).
- Set **Device Status Offset** to **Static**.

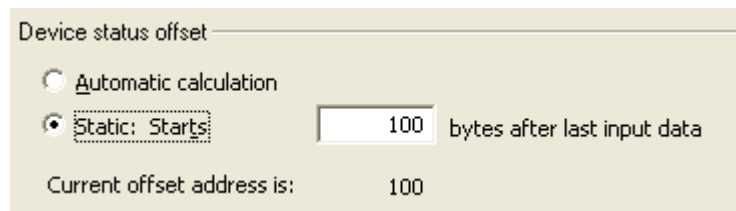


Figure 61: Master Settings > Device Status Offset

- Enter in the field **bytes after last input data** the number of bytes to be left free between the last input data byte and the device status.
- Click **Apply**.
- The setting made will be saved. Via **OK** the DTM configuration dialog will be closed.

6.7.5 Create the Configuration

Create the configuration of the Slave devices (and the possibly for the Master device). The configuration consists from the network configuration of the Master device and the Slave devices as well as for the Slave devices the configuration of the I/O data and the parameter settings to be made in the PROFIBUS DP Slave DTM.

1. Create the network configuration of the Slave device (and possibly for the Master device).
 - Insert Master device (inclusively Firmware Download).
 - Insert new Slave devices (inclusively I/O data).
2. Perform the parameter settings for the Slave device in the PROFIBUS DP Slave DTM.
 - Click **OK**.
 - ↻ The setting made will be saved. The Slave DTM configuration dialog will be closed.
3. If so, perform the parameter settings for the Master device in the PROFIBUS DP Master DTM.



Note: The *Address* and the *Baud Rate* of the PROFIBUS DP Master device can not be changed in the new configuration (new database).

- Click **OK**.
- ↻ The setting made will be saved. The Slave DTM configuration dialog will be closed.



Notice the descriptions in the sections “*Configuration in Run*” on page 29 or *Configuring Device Parameters* on page 58 .

6.7.6 Change the Configuration

Change the configuration of the Slave devices (and the possibly for the Master device).

1. Change the network configuration of the Slave device.
 - Insert new Slave devices (inclusively I/O data).
 - Adapt existing Slave devices (change).
 - Delete Slave devices (deactivate).
2. Adjust the parameter settings for the Slave device in the PROFIBUS DP Slave DTM.
 - Click **OK**.
 - ⇒ The setting made will be saved. The Slave DTM configuration dialog closes.
3. If so, perform the parameter settings for the Master device in the PROFIBUS DP Master DTM.



Note: The *Address* and the *Baud Rate* of the PROFIBUS DP Master device can not be changed in the new configuration (new database).

- Click **OK**.
- ⇒ The setting made will be saved. The Master DTM configuration dialog will be closed.



Notice the descriptions in the sections “*Configuration in Run*” on page 29 or *Configuring Device Parameters* on page 58 .

6.7.7 Start the Download



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 28.

Start the Download of the configuration in the user interface to the configuration software. It depends on your FDT container, how to start the download. For the FDT container **netDevice** proceed as follows:

- Right-click to the device icon for the Master.
- Select **Download**.
- The download is performed.
- The **Configuration in Run** pane is displayed and it shows the evaluation of the configuration by the PROFIBUS DP Master DTM.

During the download in the PROFIBUS DP Master DTM the internal value *for the File Download* gets valid. The PROFIBUS DP Master DTM sends the request *to verify the database* to the PROFIBUS DP Master firmware. The PROFIBUS DP Master firmware compares the newly downloaded configuration (new database) with the previously valid configuration (previous database) and sends the confirmation (response) *to verify the database* to PROFIBUS DP Master DTM.

6.7.8 Evaluate Configuration Data

- Evaluate the configuration data displayed in the **Configuration in Run** pane. Check whether the new configuration (new database) can be applied or not.

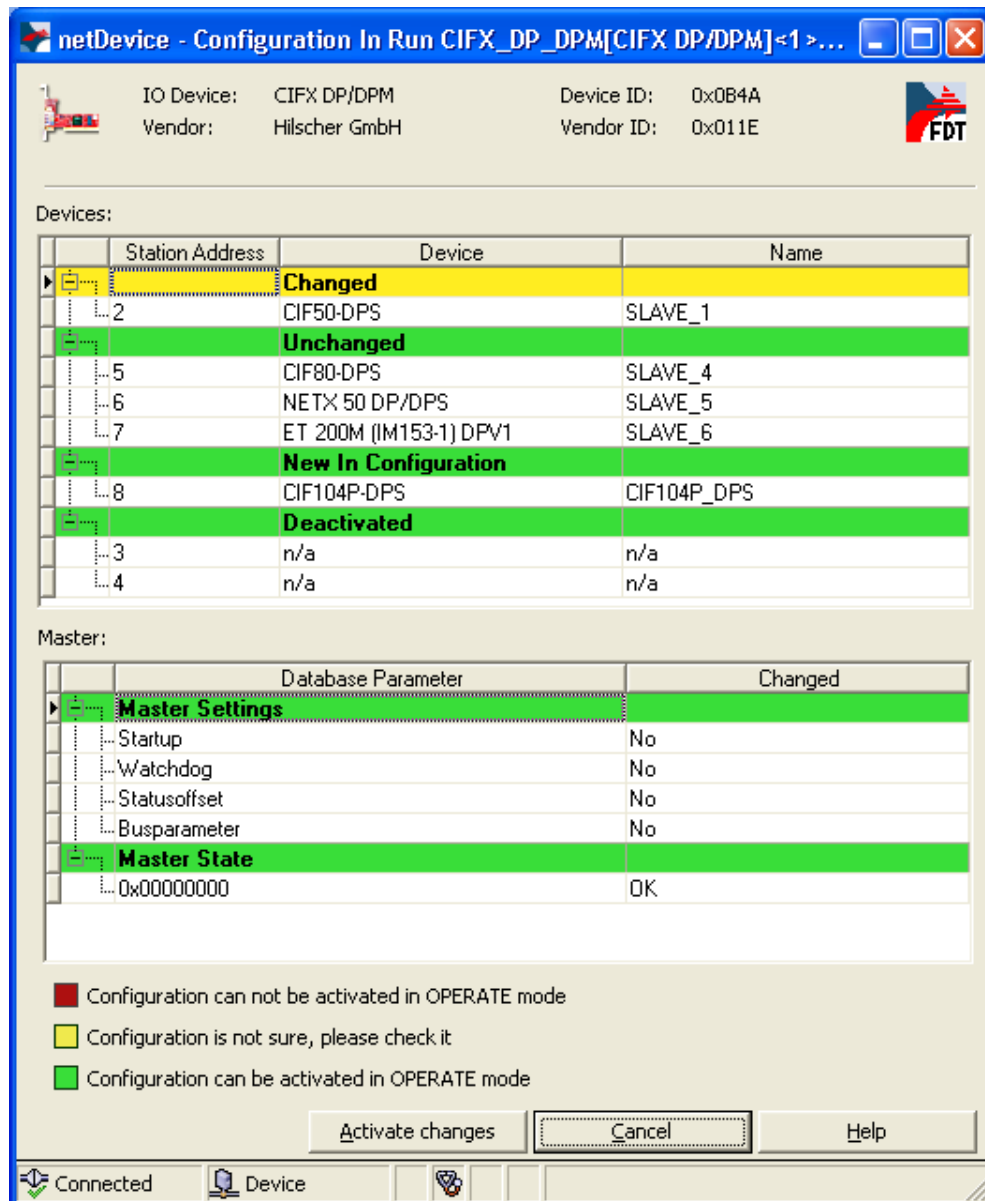


Figure 62: Dialog Pane Configuration in Run (Example)

In the **Configuration in Run** dialog pane for the **Devices** and the **Master** you can see the status of configuration changes and activate changes. In the dialog pane, you see:

- In the list **Devices** all slave devices assigned to the status.
- In the list **Master** whether one of the **Master Settings** *Startup*, *Watchdog*, *Statusoffset* or *Busparameter* has been changed and whether the **Master State** shows errors.
- The evaluations are shown by different colors.

6.7.8.1 “Devices” List

Devices:

	Station Address	Device	Name
▶		Changed	
	2	CIF50-DPS	SLAVE_1
▶		Unchanged	
	5	CIF80-DPS	SLAVE_4
	6	NETX 50 DP/DPS	SLAVE_5
	7	ET 200M (IM153-1) DPV1	SLAVE_6
▶		New In Configuration	
	9	CIF104P-DPS	SLAVE_7_2
▶		Deactivated	
	3	n/a	n/a
	4	n/a	n/a
	8	n/a	n/a

Figure 63: Dialog Pane Configuration in Run (Example) – „Devices“

In the **Devices** list, all Slave devices are displayed, which are contained in the database of the Master device and for each device the status of the network configuration. Each device is identified by its **Station Address**. In the column **Device**, the *device name* from the *device description file* is displayed and under **Name** an additional *symbolic name*.

For each Slave device in a state entry an evaluation is displayed textually and by the color. The evaluation indicates the Slave device state in regard to the configuration update, or whether its configuration (network configuration or Slave device parameter set) has changed. The following evaluations may be displayed:

- **Changes not possible** (red): The changes of the Slave device parameter set can not be activated.
- **Changed** (yellow): The Slave device parameter set has changed.
- **Unchanged** (green): The Slave device parameter set has not changed.
- **New in Configuration** (green): The device has been inserted into the network configuration newly.
- **Deactivated** (green): The device was removed from the network configuration ("n/a" = not available).

Meaning of the Colors

In the list **Devices** the colors have the following meanings:




-  Configuration can not be activated in OPERATE mode
-  Configuration is not sure, please check it
-  Configuration can be activated in OPERATE mode

Figure 64: Dialog Pane Configuration in Run – Meaning of the Colors

- For a **red** configuration state entry you can not activate the changed Slave device parameter set in the OPERATE mode. It is not possible to apply the changed Slave device parameter set in the OPERATE mode to the concerned Slave device.
- For a **yellow** configuration state entry it is not clear whether you can apply the changed Slave device parameter set in the OPERATE mode to the Slave device concerned. If you activate changes, the following cases may occur:
 - (1) Changes can be applied.**
The changed Slave device parameter set can be applied to the concerned Slave device in the OPERATE mode. The Slave device will remain in the cyclic data exchange with the Master.
 - (2) Changes can NOT be applied.**
The changed Slave device parameter set can not be applied to the concerned Slave device in the OPERATE mode. The cyclic data exchange from the Master to this Slave device is briefly interrupted. The Slave is reconfigured and parameterized and put back into the cyclic data exchange. This applies to Slave devices, in which a change in configuration or a re-parameterization can be performed only if the cyclic communication is interrupted.
- For **green** status entries you can activate the changed Slave device parameter set in the OPERATE mode and apply the set to the concerned Slave device. It is sure that the changed Slave device parameter set can be applied to the concerned Slave device in the OPERATE mode.

6.7.8.2 “Master” List

Master:

	Database Parameter	Changed
▶	Master Settings	
...	Startup	No
...	Watchdog	No
...	Statusoffset	Yes
...	Busparameter	Yes
▶	Master State	
...	0x00000000	OK

Figure 65: Dialog Pane Configuration in Run (Example) – „Master“



Note: If one of the Master Settings *Startup*, *Watchdog*, *Statusoffset* or *Busparameter* is changed, the complete Master Settings can not be applied for the configuration update.

Furthermore, the **Master State** gives information on whether the communication between the Master and the devices (Slaves) works error-free. Only in that case Master Settings can be applied.

The data under **Master** have the following meanings:

1. If the line **Master Settings** OR **Master State** is displayed in **red** the Master Settings or the changes of the Master configuration can not be applied in the OPERATE mode to the Master.
 - Line **Master Settings** **red** and under **Changed** **Yes** and **No**: The Master Settings have been changed and can not be applied.
 - Line **Master State** **red** / 0x00000000, under **Changed** **Error**: An error has occurred during the communication between Master and Slave. The changed database parameters can not be applied.
2. The Master Settings or the changes of the Master configuration can only be applied in the OPERATE mode to the Master if the line **Master Settings** AND the line **Master State** are displayed in **green**.
 - Line **Master Settings** **green** and under **Changed** **No**: The Master Settings have not been changed and can be applied if also the Master State is free of errors.
 - Line **Master State** **green** / = 0x00000000, under **Changed** **OK**: The communication between Master and Slave device is free of errors. The Master Settings can be applied if none of the Master Settings *Startup*, *Watchdog*, *Statusoffset* or *Busparameter* was changed.

6.7.9 Activate or reject Changes



Note: The changed configuration (new database) can only be accepted if:

- the **changes to the database parameters** are possible,
- the **Master Settings** (*Startup, Watchdog, Statusoffset, Busparameter*) have not changed and
- the **Master State** is OK (= 0x00000000).

Activate Changes

If the configuration displayed in the **Configuration in Run** dialog pane gives the result, that the updated configuration (new database) can be applied, you can activate the modified database parameters (configuration update):

- Therefore select in the dialog pane **Configuration in Run > Activate changes**.



Figure 66: Dialog Pane Configuration in Run – Activate changes, Cancel, Help

- The **Configuration in Run** dialog closes. The pane **Information** with the text **The database changes were successfully activated.** is displayed.

Internally the PROFIBUS DP Master firmware activates the new configuration (new database) and sends back the confirmation (response) *to activate the database* to the PROFIBUS DP Master DTM. The DTM saves the new configuration. The changed database parameters (new database) are downloaded to the device, applied and used as new configuration during network state OPERATE.



Note: If you activate the changes in spite of the configuration can not be applied, an error is detected during the verification of the data base. The pane **Error** is displayed, e. g. with the text **Error by activation of data base! A packet index has been not in the expected sequence..**

Cancel - Rejecting Changes

Reject the modified database parameters, if the configuration displayed in the **Configuration in Run** dialog pane gives the result, that the updated configuration (new database) can not be applied:

- Therefore select in the pane **Configuration in Run > Cancel**.
- The modified database parameters are discarded. The **Configuration in Run** dialog closes.

6.7.10 Increase the Number of Bytes after the Input Data

If the new configuration can not be applied, you may need to increase the number of bytes after the input data. Proceed as is described below.

1. Disconnect device.

For **netDevice**:

- Right-click on the PROFIBUS DP Master device icon.
 - Select the **Disconnect** command from the context menu.
 - Now the PROFIBUS DP Master device is disconnected from the PROFIBUS DP Master DTM.
2. Deactivate „Configuration in Run“.
- Open the Master DTM configuration dialog (in the netDevice pane via double click on the device icon of the Master).
 - Select **Configuration > Master Settings**.
 - Uncheck **Enable configuration download during network state “operate”**.
 - Click **OK**.
 - The setting made will be saved. The DTM configuration dialog will be closed.



Important! In this situation the "Configuration in Run" option is no longer usable.

3. Start the Download of the Configuration.

For **netDevice**:

- Right-click to the device icon for the Master.
- Select **Download**.
- The download is performed.

4. Increase the number of **bytes after the last input data**.

- Open the Master DTM configuration dialog (in the netDevice pane via double click on the device icon of the Master).
- Select **Configuration > Master Settings**.
- Enter in the field **bytes after last input data** the number of bytes to be left free between the last input data byte and the device status.

For more see next page.

5. Reactivate „Configuration in Run“.
 - Check **Enable configuration download during network state “operate”**.
 - Click **OK**.
 - ⇒ The setting made will be saved. The Master DTM configuration dialog will be closed.
6. Start the download of the configuration.

Für **netDevice**:

 - Right-click to the device icon for the Master.
 - Select **Download**.
 - ⇒ The download is performed.
 - ⇒ **Configuration in Run** now can be used again. The Master-DTM shows the evaluation of the configuration in the dialog pane **Configuration in Run**.

6.7.11 Quick Reference Dialog Pane "Configuration in Run"

Devices		
Station Address	Station address of the assigned Slave device: The PROFIBUS DP station address displays the addresses of the devices (Master and Slave) within a PROFIBUS network. Range for valid station address: 0 - 125	
Device	Actual device name of the assigned Slave device from the device description file.	
Name	Free definable symbolic name of the assigned Slave device.	
For each Slave device an evaluation is displayed and whether the changes of the configuration can be applied. The following evaluations may be displayed:		
Changes not possible (red)	The changes of the Slave device parameter set can not be activated.	
Changed (yellow)	The Slave device parameter set has changed.	
Unchanged (green)	The Slave device parameter set has <u>not</u> changed.	
New in Configuration (green)	The device has been inserted into the network configuration <u>newly</u> .	
Deactivated (green)	The device was removed from the network configuration ("n/a" = not available).	
In the list Devices the colors have the following meanings:		
<ul style="list-style-type: none">Red: You can <u>not</u> activate the changed Slave device parameter set in the OPERATE mode or apply the set to the device concerned.Yellow: It is not clear whether you can apply the changed Slave device parameter set in the OPERATE mode to the device concerned or not. For some Slave devices the configuration can only be changed if the cyclic communication to this Slave device is disconnected.Green: You can activate the changed Slave device parameter set in the OPERATE mode or download the set to the device concerned.		
Master		
Database Parameters	Changed	
Master Settings - Startup, - Watchdog, - Statusoffset, - Busparameter	<div><div>! Yes</div><div>No</div></div>	<div><div>↻</div> The Master Settings have been <u>changed</u> and can <u>not be applied</u>.</div> <div><div>↻</div> The Master Settings have <u>not been changed</u> and can <u>be applied</u> if the Master State is free of errors.</div> <div>If one of the Master Settings <i>Startup</i>, <i>Watchdog</i>, <i>Statusoffset</i> or <i>Busparameter</i> was changed, the complete Master Settings can not be applied for the configuration update.</div>
Master State = 0x0000000 <input type="checkbox"/> 0x0000000	<div><div>OK</div><div>! Error</div></div>	<div><div>↻</div> The communication between Master and Slave device is <u>free of errors</u>. The Master Settings can <u>be applied</u> if none of the Master Settings <i>Startup</i>, <i>Watchdog</i>, <i>Statusoffset</i> or <i>Busparameter</i> were changed.</div> <div><div>↻</div> During the communication between Master and Slave an <u>error has occurred</u>. The changed database parameters <u>can not be applied</u>. In this case reject the changes via Cancel.</div>
Under Master the colors have the following meanings:		
<ul style="list-style-type: none">If the line Master Settings OR Master State is displayed in red, you can <u>not</u> activate the Master Settings or the changes of the Master configuration in the OPERATE mode and download the configuration to the Master.If the line Master Settings OR Master State is displayed in green, you can activate the Master Settings or the changes of the Master configuration in the OPERATE mode and download the configuration to the Master.		
Activate changes, Cancel, Help		
Via Activate changes you can download and apply <i>possible</i> changes to the configuration of devices and the Master in the OPERATE mode (configuration update). A message is displayed, that the database has been activated successfully or respectively an error message.		
Via Cancel you discard the configuration changes. The Configuration in Run pane closes.		
About Help you open the help topic-related information from the online help.		

Table 31: Quick Reference Dialog Pane "Configuration in Run"

6.8 Start /Stop Communication

You can manually start or stop the communication between a PROFIBUS DP Master device and PROFIBUS DP Slave 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 PROFIBUS DP Master DTM to the PROFIBUS DP Master device is required. Further information can be found in the *Connecting/Disconnecting Device* section on page 77.

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

Stop Communication



Faulty System Operation possible, 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.

6.9 Licensing

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

6.9.1 Open License Dialog

You first open the **License** window.



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

How to proceed:

A.) Assigning the Master device to the DTM

1. Open the DTM configuration dialog.
 - In the FDT container **netDevice** double click to the device icon.
2. Select one or several drivers.
 - Select **Settings > Driver**.
 - Check the drivers.
3. Configure the driver if necessary.
 - Select **Settings > Driver > [Name of the assigned driver]**.
 - Configure the driver settings.
4. Scan for and select the devices.
 - Select **Settings > Device Assignment**.
 - Under **Device selection** select *suitable only* or *all* and then **Scan**.
 - In the table check the required devices.
 - Select **Apply**.
5. Close the DTM configuration dialog via **OK**.



For details to the device assignment, refer to section **Overview Settings** on page 31.

B.) Open the License pane

- In the FDT container **netDevice** right click to the device icon.
- From the context menu select **Additional Functions > License**.
- The **License pane** opens.

6.9.2 License Dialog

In the **License**¹ pane you can:

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

License Type

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

Request Form, please fill out

Name	Value
License type	User Single Device License
Manufacturer*	0x0001
Article number*	1251100
Serial number*	20007
Chiptype*	0x00000001
Step*	0x00000000
Romcode revision*	0x00000000

Fields marked with "*" are mandatory.

E-mail...
Print Fax Form...
Telephone...
Export License Request...

Download License

Close Help

Figure 67: License Pane



Note: To display further entries under **License Type**, move the scroll box ① downwards or upwards. To display further entries under **Request Form, please fill out**, move the scroll box ② downwards or upwards.

¹ The title bar contains the notation of the **device description**:
Symbolic Name [Device Description] <Station Address> (#Network ID).

6.9.3 Which Licenses are present in the Device?

Check, which licenses are present in the device.

How to proceed:

- Open the **License** pane as described.

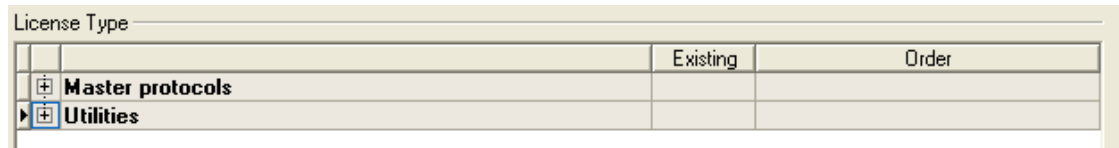


Figure 68: License Pane - License Type

- Under **License Type** click at **Master protocols**.

➤ The **Master protocols** overview opens:

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

Figure 69: License Pane – License Type / Master protocols

- Or click at **Utilities**.

➤ The **Utilities** overview opens:

	Existing	Order
OPC Server	NO	<input type="checkbox"/>
SYCON.net	NO	<input type="checkbox"/>
QVis Minimum Size	NO	<input type="checkbox"/>
QVis Standard Size	NO	<input type="checkbox"/>
QVis Maximum Size	NO	<input type="checkbox"/>
CoDeSys Minimum Size	NO	<input type="checkbox"/>

Figure 70: License Pane – License Type / Utilities

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

Yes = License is present in the device.

No = License is not present in the device.



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

6.9.3.1 License for Master Protocols

One General Master License:

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

Two General Master Licenses:

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

The license includes the following Master protocols:

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

6.9.3.2 License for Utilities

- SYCON.net
- OPC Server
- QVis Minimum Size
- QVis Standard Size
- QVis Maximum Size
- CoDeSys Minimum Size
- CoDeSys Standard Size
- CoDeSys Maximum Size

For the utilities QVis and CoDeSys, only one license each may be chosen alternatively as:

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

6.9.4 How to order a License


To order a license, proceed as follows:

	<i>Refer to Section:</i>	<i>Page</i>
1. Open the license dialog.	<i>Open License Dialog</i>	117
2. Select the required licenses.	<i>Selecting License</i>	121
3. Enter the ordering data.	<i>Ordering Data</i>	122
4. Place your order.	<i>Ordering the License</i>	124


6.9.5 Selecting License(s)

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

1. Selecting license(s) for Master protocol(s):

- Under **License Type** click  at **Master protocols** in the **License** pane.
- Under **Order** check as many licenses must run simultaneously on your device:
One General Master License or
Two General Master Licenses.

2. And/or select license(s) for utility(utilities):

- In the **License** pane under **License Type** click  at **Utilities**.
- Under **Order** check the required utility(utilities) (*single or several*)²:
 - SYCON.net
 - OPC Server
 - QVis Minimum Size*
 - QVis Standard Size*
 - QVis Maximum Size*
 - CoDeSys Minimum Size**
 - CoDeSys Standard Size**
 - CoDeSys Maximum Size**

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

6.9.6 Ordering Data

1. Device Information

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

2. Ordering Data

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

- Enter the **Data to manage the Order**.

6.9.6.1 Device Information (Ordering data read from the Device)

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

- Manufacturer
- Device number
- Serial number
- Chiptype
- Step (chip revision)
- Romcode revision
- Checksum (checksum of the device data)

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

Request Form, please fill out

Name	Value
Manufacturer*	0x0001
Article number*	1251100
Serial number*	20007
Chiptype*	0x00000001
Step*	0x00000000
Romcode revision*	0x00000000
Checksum*	G

Fields marked with '*' are mandatory.

Figure 71: License Pane - Request Form, please fill out / Device Information

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

6.9.6.2 Data to manage the Order (License Information)

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

1. License Type (User Single Device License).

Name	Value
License type	User Single Device License

Figure 72: License Pane - Request Form, please fill out / License Type

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

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

Fields marked with '*' are mandatory.

Figure 73: License Pane - Request Form, please fill out / Mandatory data

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

6.9.7 Ordering the License

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



Figure 74: License Pane – Selecting the Subsidiary / Ordering / Contacts

1. Select the **Subsidiary** (4), to which the order shall be send.
2. Place the order:

- | | <i>Refer to Section:</i> | <i>Page</i> |
|---|---|-------------|
| • by E-Mail (5), | <i>Ordering the License <u>by E Mail</u></i> | 125 |
| • or by Fax (6)
or by Telephone (7), | <i>Ordering the License <u>by Fax or by Telephone</u></i> | 126 |
| • or in a File (8). | <i><u>Exporting License Request to a File</u></i> | 128 |
- The **Contact Data** of the selected subsidiary are displayed under Position (9), (10) and (11).

6.9.7.1 Ordering the License by E Mail

You can place your order by e-mail.



Figure 75: License Pane – placing the order by E-mail

- Click **E-mail...** 5.
- The order E-mail **License request** opens:

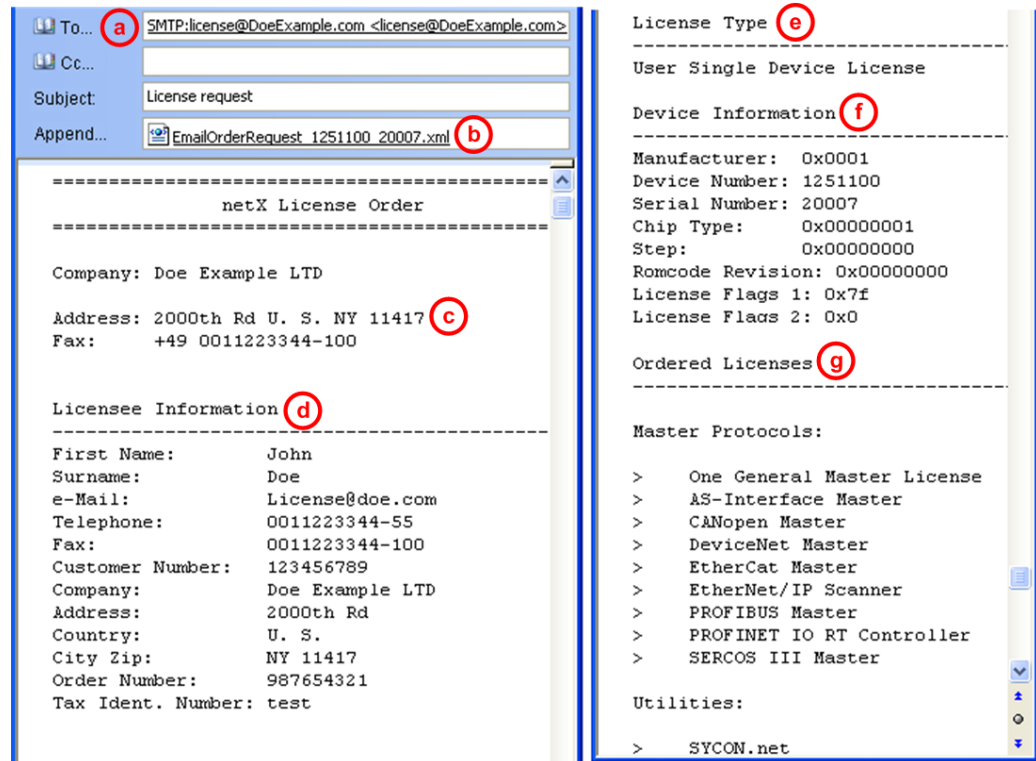


Figure 76: Example: Order E-Mail License request

- The order e-mail **License request** contains:
 - the **E-mail...** of the selected subsidiary a,
 - the automatically generated **XML file** b *EmailOrderRequest_[Devicenumbrer]_[Serialnumber].xml* with a summary info of the **order information**,
 - the **Order Address** c,
 - the **License Information** d,
 - the **License Type** e,
 - the **Device Data** f,
 - the **ordered Licenses** g.
- Send the order e-mail **License request**.
- The order process is complete.

6.9.7.2 Ordering the License by Fax or by Telephone

You can place your order by Fax or by Telephone.



Figure 77: License Pane - placing the order by Fax or by Telephone

- Click **Print Fax Form** 6 or **Telephone...** 7.
- The summary of the ordering data *PrintOrderRequest_[Devicenum-ber]_[Serialnumber].html* is opened in a browser window.



Note: If your browser does not display the order data or the window **Move Element** or **Copy Element** are displayed, check the safety settings of your system.

netX License Order Form

Doe Example LTD
2000th Rd

NY 11417
U. S.
fax: +11223344-100

Licensee Information d

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

License Type e

User Single Device License

Device Information f

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

Ordered Licenses g

Master Protocols

- One General Master License
- Sercos III Master

Utilities

- SYCON.net

Date: _____

Signature: _____

Figure 78: Example: Order Data Form *PrintOrderRequest*

- The order data form contains:
- the **Order Address** ^c,
- the **License Information** ^d,
- the **License Type** ^e,
- the **Device Data** ^f,
- the **ordered Licenses** ^g.
- Print the order data form, sign it and send it by Fax.



Figure 79: License Pane – Fax Number of the selected Subsidiary

- Use the Fax number ¹⁰, which is displayed after the subsidiary was selected in the **License** pane.

Or:

- Keep ready the order data form and communicate the order data via telephone.

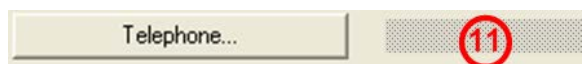


Figure 80: License Pane – Telephone Number of the selected Subsidiary

- Use the telephone number ¹¹, which is displayed after the subsidiary was selected in the **License** pane.
- The order process is complete.

6.9.7.3 Exporting License Request to a File

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



Figure 81: License Pane - Ordering by exported File and E-Mail

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

6.9.8 How to get the License and transfer it to the Device



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

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

Steps how to proceed


1. Save the license file to a PC or a disk.
 - Click to the **Link to download the License File** in the e-mail.
 - Save the license file *.nxl to a PC or a removable disk.
2. Download the license file to the device.
 - Respectively connect the removable disk with the license file to the PC, which is connected to your device.
 - Click **Download License**  in the **License** pane in the configuration software.



Figure 82: License Pane - Download License

- The File selection window **Open** is displayed.
 - Therein select the license file *netX License Files (*.nxl)*.
 - Click **Open**.
 - The license file is transferred to the device.
 - After this the license is present in the device and is activated with the next device reset.
3. Activate Device Reset



Hint: To activate the license in the first device, a device reset is required.

- To check whether the license has been activated, follow the steps in section *Which Licenses are present in the Device?*

7 Diagnosis

7.1 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:

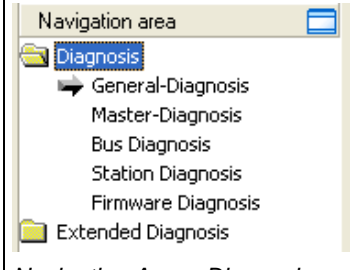
PROFIBUS DP Master DTM	Folder Name / Section	Manual Page
	<i>General Diagnosis</i>	131
	<i>Master Diagnosis</i>	133
	<i>Bus Diagnosis</i>	134
	<i>Station Diagnosis</i>	135
	<i>Firmware Diagnosis</i>	136
<i>Navigation Area - Diagnosis</i>		

Table 32: Descriptions of the Diagnosis Panes

Online Connection to the Device



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



Important: For a 2-channel device channel 1 or channel 2 each must be connected to the DTM separately.

How to proceed

1. In the Master 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 137.

7.2 General Diagnosis

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

General Diagnosis

Device state

- ☐ Communication
- ☒ Run
- ☐ Ready
- ☐ Error

Network state

- ☒ Operate
- ☐ Idle
- ☐ Stop
- ☐ Offline

Configuration state













- ☐ Configuration locked
- ☐ New configuration pending
- ☐ Reset required
- ☒ Bus ON

Communication error:

Watchdog time:

Error count:

Figure 83: General Diagnosis

LED	Meaning	Color	State
Device State			
Communication	Shows whether the PROFIBUS DP device executes the network communication.	 (green)	In COMMUNICATION state
		 (gray)	Not in COMMUNICATION state
Run	Shows whether the PROFIBUS DP device has been configured correctly.	 (green)	Configuration OK
		 (gray)	Configuration not OK
Ready	Shows whether the PROFIBUS DP device has been started correctly. The PROFIBUS DP device waits for a configuration.	 (yellow)	Device READY
		 (gray)	Device not READY
Error	Shows whether the PROFIBUS DP device records a device status error. For further information about the error characteristics and the number of counted errors refer to the extended diagnosis.	 (red)	ERROR
		 (gray)	No ERROR
Network State			
Operate	Shows whether the PROFIBUS DP device is in data exchange. In a cyclic data exchange the input data or the output data of the PROFIBUS DP Master are transmitted to the PROFIBUS DP Slave.	 (green)	In OPERATION state
		 (gray)	Not in OPERATION state
Idle	Shows whether the PROFIBUS DP device is in idle state.	 (yellow)	In IDLE state
		 (gray)	Not in IDLE state













LED	Meaning	Color	State
Stop	Shows whether the PROFIBUS DP device is in Stop state: There is no cyclic data exchange at the PROFIBUS DP network. The PROFIBUS DP device was stopped by the application program or it changed to the Stop state because of a bus error.	 (red)	In STOP state
		 (gray)	Not in STOP state
Offline	The PROFIBUS DP Master is offline as long as it does not have a valid configuration.	 (yellow)	In OFFLINE state
		 (gray)	Not in OFFLINE state
Configuration State			
Configuration locked	Shows whether the PROFIBUS DP 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 PROFIBUS DP 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 PROFIBUS DP 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 33: 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 34: Parameter General Diagnosis

7.3 Master Diagnosis

Information regarding the Slave State, slave errors and slaves configured, active or in diagnostic are displayed in the **Master Diagnosis** dialog.

Master Diagnosis	
Slave state	failed
Slave error log indicator	available
Configured slaves	2
Active slaves	0
Slaves with diagnostic	2

Figure 84: Master Diagnosis

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

Table 35: Parameter Master Diagnosis

7.4 Bus Diagnosis

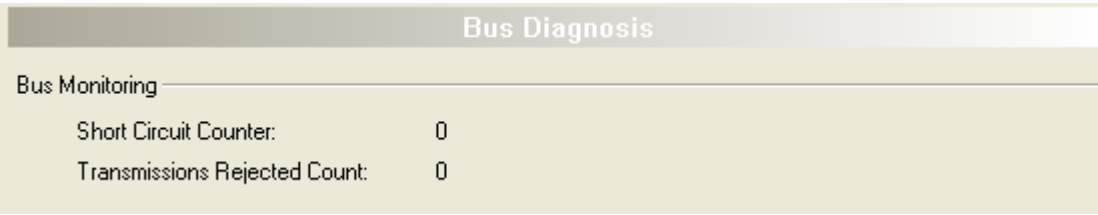


Figure 85: Bus Diagnosis - Bus Monitoring

Bus Monitoring	Meaning
Short Circuit Counter	The Short Circuit Counter counts the short circuit on the PROFIBUS, which were detected by the Master. Range of Value: 0 .. 65535 (rollover possible)
Transmission Rejected Count	The Transmissions Rejected Count displays the number of rejected telegrams. A possible reason for this is, that the Master itself can not receive the token anymore. Range of Value: 0 .. 65535 (rollover possible)

Table 36: Bus Diagnosis - Bus Monitoring

7.5 Station Diagnosis

Station Status

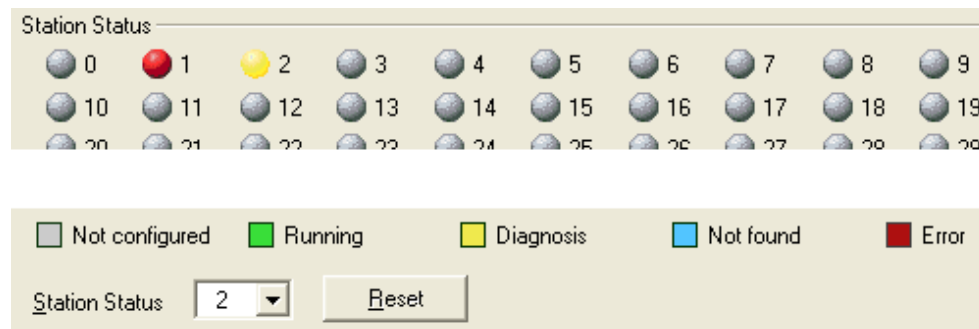


Figure 86: Station Diagnosis - Station Status

Under **Station Status** all disposal station addresses (0-125) and their states are shown as LED. If the device is connected, the DTM will update this display cyclically.

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

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

Table 37: Possible Values for the Status

Reset Station Status for Status Diagnosis (yellow):

To check if the station status Diagnosis (yellow) persists, the **Station status** can be reset for every device separately. Therefore:

1. Select in the list field **Stations Status** the station address of the device.
2. Select **Reset**.

7.6 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:	Firmware Name*				
Version:	2.2.0 (Build 2)				
Date:	18.12.2008				
Task information:					
Task	Name of task	Version	Priority	Description	State
0	RX_IDLE	0.0	63	The task identifier is unknown.	Task Status ok. (0x000000)
1	RX_TIMER	0.0	1	The task identifier is unknown.	Task Status ok. (0x000000)
2	RX_SYSTEM	1.16	8	Middleware System Task.	Task Status ok. (0x000000)
3	DPM_COMO_SMBX	1.0	50	TLR-Router DPM.	Task Status ok. (0x000000)
4	DPM_COMO_RMBX	1.0	51	TLR-Router DPM.	Task Status ok. (0x000000)
5	TLR_TIMER	0.0	39	The task identifier is unknown.	Task Status ok. (0x000000)
6	PROFIBUS_DL	2.0	41	PROFIBUS Data Link Layer Task.	Task Status ok. (0x000000)
7	PROFIBUS_FSPMM	1.2	40	PROFIBUS Master Fieldbus Service Protocol Machine Task.	Task Status ok. (0x000000)
8	PROFIBUS_FSPMM2	1.0	43	PROFIBUS FSPMM2 Task.	Task Status ok. (0x000000)
9	PROFIBUS_APM	1.2	42	PROFIBUS Master Application Task.	Task Status ok. (0x000000)

Figure 87: Firmware Diagnosis (*The name of the Firmware is displayed.)

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

8 Extended Diagnosis

8.1 Overview Extended Diagnosis

The **Extended Diagnosis** of the PROFIBUS DP Master 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:

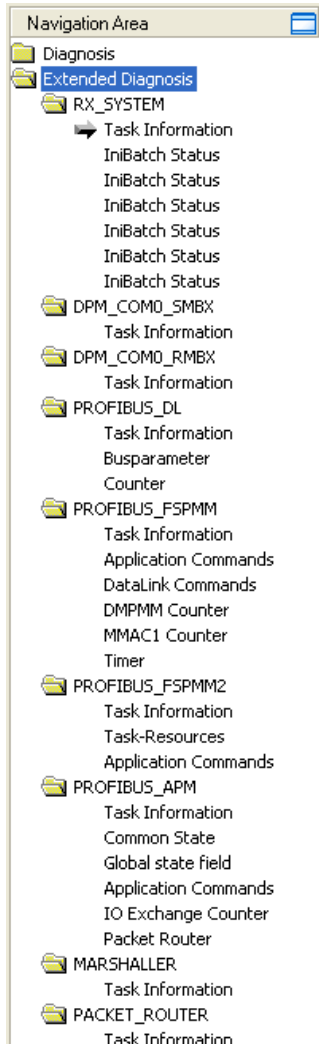
PROFIBUS DP Master DTM	Folder Name / Section	Subsection	Manual Page
 <p>Navigation Area - Extended Diagnosis</p>	RX-SYSTEM	Task Information	138
		IniBatch Status	139
	DPM_COMO_SMBX	Task Information	138
	DPM_COMO_RMBX	Task Information	138
	PROFIBUS_DL	Task Information	138
		Bus Parameters	140
		Counter	142
	PROFIBUS_FSPMM	Task Information	138
		Application Commands	143
		DataLink Commands	144
		DMPMM Counter	145
		MMAC1 Counter	146
	PROFIBUS_FSPMM2	Task Information	138
		Task Resources	147
		Application Commands	148
	PROFIBUS_APM	Task Information	138
		Common State	149
		Global State field	150
		Application Commands	153
		IO Exchange Counter	154
	MARSHALLER	Task Information	138
	PACKET_ROUTER	Task Information	138

Table 39: Descriptions of the Dialog Panes Extended Diagnosis

Online Connection to the Device



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

8.2 Task Information

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

Figure 88: 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

8.3 IniBatch Status

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

Figure 89: 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.

8.4 PROFIBUS_DL

8.4.1 Bus Parameters

Under **Extended Diagnosis > PROFIBUS_DL > Busparameter** the values of the configured bus parameters are displayed which are active at the bus. This one is also described in section *Bus Parameters* on page 61.

Busparameter	
Task states	
Name	Value
Station Address	1
Baudrate	93.75 KBAud
Slot Time (tBit)	4095
Min. Station Delay Time (tBit)	22
Max. Station Delay Time (tBit)	1000
Quiet Time (tBit)	0
Setup Time (tBit)	150
Target Rotation Time (tBit)	24307
GAP Factor	10
Highest Station Address (HSA)	126
Max. Retry Limit:	1

Figure 90: Extended Diagnosis > PROFIBUS_DL > Busparameter

Bus Parameters	Meaning		
Station Address	The Station Address is the individual device address of the Master device on the bus. Value range: 0 .. 125		
Baud Rate	The Baud Rate is the data transfer speed: number of Bits per second. The Baud Rate must be set to be the same for all devices on the bus. The result of changing the Baud rate is that all other parameters must be re-calculated.		
	Baud Rate	Bit time (t _{Bit})	Max cable length (type A)
	9,6 kBit/s	104,2 μs	1200 m
	19,2 kBit/s	52,1 μs	1200 m
	31,25 kBit/s	32 μs	1200 m
	45,45 kBit/s	22 μs	1200 m
	93,75 kBit/s	10,7 μs	1200 m
	187,5 kBit/s	5,3 μs	1000 m
	500 kBit/s	2 μs	400 m
	1500 kBit/s	666,7 ns	200 m
3000 kBit/s	333,3 ns	100 m	
6000 kBit/s	166,7 ns	100 m	
12000 kBit/s	83,3 ns	100 m	
Slot time (tBit)	'Wait for receipt' – Monitoring time of the sender (Requestor) of telegram for the acknowledgement of the recipient (Responder). After expiration, a retry occurs in accordance with the value of 'Max. telegram retries'. Value range: 37 .. 16383 (The default value depends from the baud rate.)		
Min. Station Delay Time (tBit)	This is the shortest time period that must elapse before a remote recipient (Responder) may send an acknowledgement of a received query telegram. The shortest time period between the reception of the last Bit of a telegram to the sending of the first Bit of a following telegram. Value range: 1 .. 11 . 65535		
Max. Station Delay Time (tBit)	This is the longest time period that must elapse before a Sender (Requestor) may send a further query telegram. Greatest time period between the reception of the last Bit of a telegram to the sending of the first Bit of a following telegram. The Sender (Requestor, Master) must wait at least for this time period after the sending of an unacknowledged telegram (e.g. Broadcast only) before a new telegram is sent. Value range: 1 .. 65535 (The default value depends from the baud rate.)		

Bus Parameters	Meaning
Quiet Time (tBit)	This is the time delay that occurs for modulators (Modulator-trip time) and Repeaters (Repeater-switch time) for the change over from sending to receiving. Value range: 0 .. 127 (The default value depends from the baud rate.)
Setup Time (tBit)	Minimum period "reaction time" between the receipt of an acknowledgement to the sending of a new query telegram (Reaction) by the Sender (Requestor). Value range: 1 .. 255 (The default value depends from the baud rate.)
Target Rotation Time (tBit)	Pre-set nominal Token cycling time within the Sender authorization (Token) will cycle around the ring. How much time the Master still has available for sending data telegrams to the Slaves is dependent on the difference between the nominal and the actual token cycling time. The Target rotation time (T_{TR}) is shown in Bit times (tBit) like the other Bus Parameters. Below the displayed Bit time, the Target rotation time is also displayed in milliseconds (ms). Value range: 1 .. 2 ²⁴ -1 (=16.777.215) (The default value depends on the number of Slaves attached to the Master and their module configuration)
GAP Factor	Factor for determining after how many Token cycles an added participant is accepted into the Token ring. After expiry of the time period G*T _{TR} , the Station searches to see whether a further participant wishes to be accepted into the logical ring. Value range: 0 .. <u>10</u> .. 255
Highest Station Address (HSA)	The Highest Station Address is the highest bus address up to which a Master searches for another Master at the bus in order to pass on the Token. This station address must on no account be smaller than the Master station address. Value range: 1 .. <u>126</u>
Max. Retry Limit	Maximum number of repeats in order to reach a Station. Value range: 1 .. 15 (The default value depends from the baud rate.)

Table 42: Extended Diagnosis > PROFIBUS_DL > Busparameter

8.4.2 Counter

Counter	
Task states	
Name	Value
Receive Frames	7592
Transmit Frames	22555
Transmit Error	0
Receive Error	0
Target Rotation Timeout	0

Figure 91: Extended Diagnosis > PROFIBUS_DL > Counter

The values of the counter **Receive Frames** and **Transmit Frames** show generally whether there is bus activity or not.

Name	Description
Receive Frames	Counter for number received frames
Transmit Frames	Counter for number transmitted frames
Transmit Error	Counter for number transmitted errors
Receive Error	Counter for number received errors
Target Rotation Timeout	Counter for number target rotation timeout

Table 43: Extended Diagnosis > PROFIBUS_DL > Counter

8.5 PROFIBUS_FSPMM

8.5.1 Application Commands

Application Commands	
Task states	
Name	Value
Register Application Req.	1
Register Application Cnf. Pos.	1
Register Application Cnf. Neg.	0
Initialisation Req.	1
Initialisation Cnf. Pos.	1
Initialisation Cnf. Neg.	0
Download Req.	1
Download Cnf. Pos.	1
Download Cnf. Neg.	0
Reset Req.	6
Reset Cnf. Pos.	6
Reset Cnf. Neg.	0
Change Mode Ind.	0
Change Mode Ind. Ret.	0
Change Mode Req.	3
Change Mode Cnf. Pos.	3
Change Mode Cnf. Neg.	0
Set Output Data Req.	0
Set Output Data Cnf. Pos.	0
Set Output Data Cnf. Neg.	0
Get Input Data Req.	8789
Get Input Data Cnf. Pos.	8789
Get Input Data Cnf. Neg.	0
Slave Diag Ind.	1
Slave Diag Ind. Ret.	1
Get Slave Diag Req.	0
Get Slave Diag Cnf. Pos.	0
Get Slave Diag Cnf. Neg.	0
DPV1 C1 Read Req.	0
DPV1 C1 Read Cnf. Pos.	0
DPV1 C1 Read Cnf. Neg.	0
DPV1 C1 Write Req.	0
DPV1 C1 Write Cnf. Pos.	0
DPV1 C1 Write Cnf. Neg.	0
DPV1 C1 R/W Abort Req.	0
DPV1 C1 R/W Abort Cnf. Pos.	0
DPV1 C1 R/W Abort Cnf. Neg.	0
DPV1 Alarm Ind.	0
DPV1 Alarm Ind. Ret.	0
DPV1 Alarm Ack. Req.	0
DPV1 Alarm Ack. Cnf. Pos.	0
DPV1 Alarm Ack. Cnf. Neg.	0
Global Control Req.	0
Global Control Cnf. Pos.	0
Global Control Cnf. Neg.	0
New Input Ind.	0
New Input Ind. Ret.	0
Process End Req.	0
Unknown Command	0
Last Unknown Command	0x00000000

Figure 92: Extended Diagnosis > PROFIBUS_FSPMM > Application Commands

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

Table 44: Extended Diagnosis > PROFIBUS_FSPMM > Application Commands

8.5.2 DataLink Commands

DataLink Commands	
Task states	
Name	Value
DL Start Req.	1
DL Start Cnf. Pos.	1
DL Start Cnf. Neg.	0
Set Parm Req.	1
Set Parm Cnf. Pos.	1
Set Parm Cnf. Neg.	0
SAP Activate Req.	5
SAP Activate Cnf. Pos.	5
SAP Activate Cnf. Neg.	0
RSAP Activate Req.	1
RSAP Activate Cnf. Pos.	1
RSAP Activate Cnf. Neg.	0
Data Reply Req.	8942
Data Reply Cnf. Pos.	8939
Data Reply Cnf. Neg.	2
Data Req.	598
Data Cnf. Pos.	598
Data Cnf. Neg.	0
Stop DL Req.	0
Stop DL Cnf. Pos.	0
Stop DL Cnf. Neg.	0
SAP DeActivate Req.	0
SAP DeActivate Cnf. Pos.	0
SAP DeActivate Cnf. Neg.	0
RSAP DeActivate Req.	0
RSAP DeActivate Cnf. Pos.	0
RSAP DeActivate Cnf. Neg.	0
DataReplyUpdate Req.	0
DataReplyUpdate Cnf. Pos.	0
DataReplyUpdate Cnf. Neg.	0
DataReply Ind.	0
Data Ind.	0
DataAck Ind.	0

Figure 93: Extended Diagnosis > PROFIBUS_FSPMM > DataLink Commands

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

Table 45: Extended Diagnosis > PROFIBUS_FSPMM > DataLink Commands

8.5.3 DMPMM Counter

DMPMM Counter	
Task states	
Name	Value
Global Control Req.	623
Global Control Cnf.	623
Data Exchange Req.	9313
Data Exchange Cnf.	9312
Diag Req.	2
Diag Cnf.	2
Cfg Req.	1
Cfg Cnf.	1
Prm Req.	1
Prm Cnf.	1
Ext Prm Req.	0
Ext Prm Cnf.	0

Figure 94: Extended Diagnosis > PROFIBUS_FSPMM > DMPMM Counter

Name	Description
[Service]	DMPMM counter of the FSPMM layer. Indicates the services [2] processed.

Table 46: Extended Diagnosis > PROFIBUS_FSPMM > DMPMM Counter

8.5.4 MMAC1 Counter

MMAC1 Counter	
Task states	
Name	Value
GetMasterDiag Ind.	0
GetMasterDiag Rsp. Pos.	0
GetMasterDiag Rsp. Neg.	0
Upload Ind.	0
Upload Rsp. Pos.	0
Upload Rsp. Neg.	0
Download Ind.	0
Download Rsp. Pos.	0
Download Rsp. Neg.	0
StartSequence Ind.	0
StartSequence Rsp. Pos.	0
StartSequence Rsp. Neg.	0
EndSequence Ind.	0
EndSequence Rsp. Pos.	0
EndSequence Rsp. Neg.	0
ActivateParam Ind.	0
ActivateParam Rsp. Pos.	0
ActivateParam Rsp. Neg.	0
ActivateParamBrct Ind.	0

Figure 95: Extended Diagnosis > PROFIBUS_FSPMM > MMAC1 Counter

Name	Description
[Service]	MMAC1 counter of the FSPMM layer: Counter for the Master-Master communications services[2]. Indicates which services in this Master have been requested by a class 2 Master. The counter will be incremented by 1 if this Master has been requested by a class 2 Master.

Table 47: Extended Diagnosis > PROFIBUS_FSPMM > MMAC1 Counter

8.5.5 Timer

Timer	
Task states	
Name	Value
DataControlTime Counter	676
MinSlaveIntervall Counter	232558
C1 Timer Expiration	0

Figure 96: Extended Diagnosis > PROFIBUS_FSPMM > Timer

Name	Description
DataControlTime Counter	Counter for Data Control Time expiration reports. (Further information is given in section <i>Bus Monitoring</i> on page 64.)
MinSlaveIntervall Counter	Counter for the number of Min Slave Interval cycles. I. e., for the number of slave list cycles. (Further information is given in section <i>Bus Monitoring</i> on page 64.)
C1 Timer Expiration	Expiration time for C1 services* (* acyclic services for all Slaves) This counter will be incremented if a Slave doesn't respond to a DPV1C1 service.

Table 48: Extended Diagnosis > PROFIBUS_FSPMM > Timer

8.6 PROFIBUS_FSPMM2

8.6.1 Task Resources

Task-Resources	
Task_states	
Name	Value
Memory Used Static (Bytes):	39788
Memory Used Dynamic (Bytes):	0
Max. supported DPV1C2 connections	128
Used DPV1C2 connections	0

Figure 97: Extended Diagnosis > PROFIBUS_FSPMM2 > Task Resources

Name	Description
Memory Used Static (Bytes)	Memory used static from the FSPMM2 task in Bytes
Memory Used Dynamic (Bytes)	Memory used dynamic for the FSPMM2 task in Bytes
Max. supported DPV1C2 connections	Max. possible number DPV1C2 connections, which can be managed via the FSPMM2 task
Used DPV1C2 connections	Used number DPV1C2 connections, which are managed via the FSPMM2 task

Table 49: Extended Diagnosis > PROFIBUS_FSPMM2 > Task Resources

8.6.2 Application Commands

Application Commands		
Task states		
Name	Value	
Register Application Req.	0	
Register Application Cnf. Pos.	0	
Register Application Cnf. Neg.	0	
Initialisation Req.	7	
Initialisation Cnf. Pos.	7	
Initialisation Cnf. Neg.	0	
Reset Req.	6	
Reset Cnf. Pos.	6	
Reset Cnf. Neg.	0	
Initiate Req.	0	
Initiate Cnf. Pos.	0	
Initiate Cnf. Neg.	0	
Read Req.	0	
Read Cnf. Pos.	0	
Read Cnf. Neg.	0	
Write Req.	0	
Write Cnf. Pos.	0	
Write Cnf. Neg.	0	
Data Transport Req.	0	
Data Transport Cnf. Pos.	0	
Data Transport Cnf. Neg.	0	
Abort Req.	0	
Abort Cnf. Pos.	0	
Abort Cnf. Neg.	0	
Read Slave Diag Req.	0	
Read Slave Diag Cnf. Pos.	0	
Read Slave Diag Cnf. Neg.	0	
Read Input Req.	0	
Read Input Cnf. Pos.	0	
Read Input Cnf. Neg.	0	
Read Output Req.	0	
Read Output Cnf. Pos.	0	
Read Output Cnf. Neg.	0	
Get Config Req.	0	
Get Config Cnf. Pos.	0	
Get Config Cnf. Neg.	0	
Set Slave Address Req.	0	
Set Slave Address Cnf. Pos.	0	
Set Slave Address Cnf. Neg.	0	
Get Master Diag Req.	0	
Get Master Diag Cnf. Pos.	0	
Get Master Diag Cnf. Neg.	0	
Start Sequence Req.	0	
Start Sequence Cnf. Pos.	0	
Start Sequence Cnf. Neg.	0	
Download Req.	0	
Download Cnf. Pos.	0	
Download Cnf. Neg.	0	
Upload Req.	0	
Upload Cnf. Pos.	0	
Upload Cnf. Neg.	0	
Follow-up of the list		
End Sequence Req.	0	
End Sequence Cnf. Pos.	0	
End Sequence Cnf. Neg.	0	
Activate Param Req.	0	
Activate Param Cnf. Pos.	0	
Activate Param Cnf. Neg.	0	
Activate Param Brct Req.	0	
Activate Param Brct Cnf. Pos.	0	
Activate Param Brct Cnf. Neg.	0	
Live List Req.	2	
Live List Cnf. Pos.	2	
Live List Cnf. Neg.	0	
Abort Ind.	0	
Abort Res.	0	
Closed Ind.	0	
Closed Res.	0	
Reject Ind.	0	
Reject Res.	0	
Event Ind.	0	
Event Res.	0	
Fault Ind.	0	
Fault Res.	0	
UnknownCommand.	0	

Figure 98: Extended Diagnosis > PROFIBUS_FSPMM2 > Application Commands

Name	Description
[Service]	<p>Diagnosis counter of the FSPMM2 layer for Application Commands: Counter for acyclic DPV1 services class 2 (DPV1 C2 services).</p> <p>This counter indicates the services processed. (The services of the single packets are described in the API manual.)</p>

Table 50: Extended Diagnosis > PROFIBUS_FSPMM2 > Application Commands

8.7 PROFIBUS_APM

8.7.1 Common State

Common State	
Task_states	
Name	Value
Network State	Operate
Communication Error	0x00000000
Watchdog Time	1000 ms
Number errors in total	0
Number errors logged	0
Number of Configured Slaves	1
Number of Active Slaves	1
Number of Diagnostic Slaves	1

Figure 99: Extended Diagnosis > PROFIBUS_APM > Common State

The values shown under **Common State** correspond to the **General Diagnosis** (see section *General Diagnosis* on page 131).

The values for **Number of Configured Slaves**, **Number of Active Slaves** and **Number of Diagnostic Slaves** are summed up values of the single configured, active or diagnosis Slaves. In section *Global State field* on page 150 these values are specified bitwise for the single Slaves.

Name	Description
Network State	The Network State is a general diagnosis state. Possible network states are: <u>Operate</u> : Shows that the PROFIBUS stack is in data exchange. <u>Idle</u> : Shows that the PROFIBUS stack is in idle mode. <u>Stop</u> : Shows that the PROFIBUS stack is in Stop state. <u>Offline</u> : The PROFIBUS DP Master is offline pending it does not have a valid configuration. (Further information is given in section <i>General Diagnosis</i> on page 131)
Communication Error	Unique Error Code according to protocol stack This field holds the current error code of the communication channel. If the cause of error is resolved, the communication error field will be set to zero (= RCX_S_OK) again.
Watchdog Time	Shows the configured watchdog time in ms.
Number errors in total	This field holds the total number of errors detected since power-up, respectively after reset. The protocol stack will count all sorts of errors in this field, no matter if they were network related or caused internally.
Number errors logged	This field holds the number of entries in the internal error log. If all entries are read from the log, the field will be set to zero.
Number of Configured Slaves	Shows number of configured slaves. Number of configured slaves in the network according to the slave list derived from the configuration database created by the configuration software . The list includes the slaves to which the master has to open a connection.
Number of Active Slaves	Shows number of active slaves. Number of slaves in data exchange mode. The list includes the slaves to which the master has successfully opened a connection.
Number of Diagnostic Slaves	Shows number of slaves with diagnostic. Number of Slaves with diagnosis or error slaves.

Table 51: Extended Diagnosis > PROFIBUS_APM > Common State

8.7.2 Global State field

Global state field			
Task states			
Name	Value		
Global Bits	0x00		
Control Error	false		
Autoclear Error	false		
Non Exchange Error	false		
Fatal Error	false		
Application State	Ready		
Timeout Error	false		
Master State	OPERATE		
Error Address	0		
Error Event	0		
Bus Error Counter	0		
Bus Timeout Counter	0		
Configured Slaves 7 .. 0	0x04		
Configured Slaves 15 .. 8	0x00		
Configured Slaves 23 .. 16	0x00		
Configured Slaves 31 .. 24	0x00		
Configured Slaves 39 .. 32	0x00		
Configured Slaves 47 .. 40	0x00		
Configured Slaves 55 .. 48	0x00		
Configured Slaves 63 .. 56	0x00		
Configured Slaves 71 .. 64	0x00		
Configured Slaves 79 .. 72	0x00		
Configured Slaves 87 .. 80	0x00		
Configured Slaves 95 .. 88	0x00		
Configured Slaves 103 .. 96	0x00		
Configured Slaves 111 .. 104	0x00		
Configured Slaves 119 .. 112	0x00		
Configured Slaves 127 .. 120	0x00		
Active Slaves 7 .. 0	0x04		
Active Slaves 15 .. 8	0x00		
Active Slaves 23 .. 16	0x00		
Active Slaves 31 .. 24	0x00		
Active Slaves 39 .. 32	0x00		
Active Slaves 47 .. 40	0x00		
Active Slaves 55 .. 48	0x00		
Active Slaves 63 .. 56	0x00		
Active Slaves 71 .. 64	0x00		
Active Slaves 79 .. 72	0x00		
Active Slaves 87 .. 80	0x00		
Active Slaves 95 .. 88	0x00		
Active Slaves 103 .. 96	0x00		
Active Slaves 111 .. 104	0x00		
Active Slaves 119 .. 112	0x00		
Active Slaves 127 .. 120	0x00		
Diagnostic Slaves 7 .. 0	0x04		
Diagnostic Slaves 15 .. 8	0x00		
Diagnostic Slaves 23 .. 16	0x00		
Diagnostic Slaves 31 .. 24	0x00		
Diagnostic Slaves 39 .. 32	0x00		
Diagnostic Slaves 47 .. 40	0x00		
Diagnostic Slaves 55 .. 48	0x00		
Diagnostic Slaves 63 .. 56	0x00		
Diagnostic Slaves 71 .. 64	0x00		
Diagnostic Slaves 79 .. 72	0x00		
Diagnostic Slaves 87 .. 80	0x00		
Diagnostic Slaves 95 .. 88	0x00		
Diagnostic Slaves 103 .. 96	0x00		
Diagnostic Slaves 111 .. 104	0x00		
Diagnostic Slaves 119 .. 112	0x00		
Diagnostic Slaves 127 .. 120	0x00		

Follow-up of the list

Diagnostic Slaves 55 .. 48	0x00
Diagnostic Slaves 63 .. 56	0x00
Diagnostic Slaves 71 .. 64	0x00
Diagnostic Slaves 79 .. 72	0x00
Diagnostic Slaves 87 .. 80	0x00
Diagnostic Slaves 95 .. 88	0x00
Diagnostic Slaves 103 .. 96	0x00
Diagnostic Slaves 111 .. 104	0x00
Diagnostic Slaves 119 .. 112	0x00
Diagnostic Slaves 127 .. 120	0x00

Figure 100: Extended Diagnosis > PROFIBUS_APM > Global State field

In the **Global State** field window the values of the single configured, active or diagnosis Slaves are specified bitwise for the single Slaves.

Name	Description
Global Bits	Bit field to show bus and master main errors: CONTROL-ERROR AUTO-CLEAR-ERROR NON-EXCHANGE-ERROR FATAL-ERROR HOST-NOT-READY TIMEOUT-ERROR
Control Error	The CONTROL-ERROR displays that a parameterization error has occurred.
Autoclear Error	The AUTO-CLEAR-ERROR displays, that the device has stopped the communication to all Slaves and it has reached the auto-clear end state.
Non Exchange Error	The NON-EXCHANGE-ERROR shows, that at least one Slave is not in the cyclic data exchange with the DP Master.
Fatal Error	A FATAL-ERROR has occurred. Because of a heavy bus error no further bus communication is possible.
Application State	HOST-NOT-READY shows, that the application program has not yet started or stopped the DP Master (READY / NOT-READY).
Timeout Error	The TIMEOUT-ERROR indicates that the device has detected a skipped TIMEOUT supervision time because of rejected PROFIBUS telegrams. It's an indication for bus short circuits while the Master interrupts the communication. The number of detected timeouts is fixed in the field Bus Monitoring (see section <i>Bus Diagnosis</i> on page 134). The bit will be set when the first timeout was detected and can only be deleted via a reset of the device.
Master State	This variable represents the main state of the master system. Following values are possible: OPERATE : The DP Master is in data exchange. In a data exchange the inputs of the DP Slaves are read and the output information is transferred to all DP Slaves. CLEAR : The DP Master reads the input information of the DP Slaves and holds the outputs of the DP Slaves in a safe condition. STOP : The Master is in the state Stop that means no data exchange takes place between the DP Master and the DP-Slaves. The Master was stopped by the application program or it had to go in the state Stop because of a bus error. OFFLINE : The DP Master does not exist on the bus, it is not on-line. This can happen if no or faulty bus parameters are set for the PROFIBUS DP Master. Furthermore this can happen if the correct bus parameters are set, but the application program has not activated the DP Master for data exchange on the bus.
Error Address	ERROR REMOTE ADDRESS : Displays the lowest station address, which signals diagnosis. For further information see section <i>Station Diagnosis</i> on page 135.
Error Event	ERROR EVENT : Indicates the occurred error of the 'Error address' as error code. All possible numbers are listed in [3]. For further information see section <i>Station Diagnosis</i> on page 135.
Bus Error Counter	BUS ERROR COUNTER : Counter for heavy bus error events, for example bus short circuits. The 'Bus error counter' is increased, whenever an increased number of faulty PROFIBUS frames were detected. For further information see section <i>Bus Diagnosis</i> on page 134.
Bus Timeout Counter	TIMEOUT COUNTER : Counter for bus timeouts This counter counts the number of reported bus-off-events, i. e. the number of rejected PROFIBUS telegrams because of heavy bus error. For further information see section <i>Bus Diagnosis</i> on page 134.
Configured Slaves 7- 0	8 Bit parameter state Slave 0-7
Configured Slaves 15- 8	8 Bit parameter state Slave 8-15

Name	Description
...	...
Configured Slaves 127-120	8 Bit parameter state Slave 127- 120
Active Slaves 7- 0	8 Bit active state Slave 0-7
Active Slaves 15- 8	8 Bit active state Slave 8-15
...	...
Active Slaves 127- 120	8 Bit active state Slave 127- 120
Diagnostic Slaves 7- 0	8 Bit diagnostic state Slave 0-7
Diagnostic Slaves 15- 8	8 Bit diagnostic state Slave 8-15
...	...
Diagnostic Slaves 127-120	8 Bit diagnostic state Slave 127- 120

Table 52: Extended Diagnosis > PROFIBUS_APM > Global State field

8.7.3 Application Commands

Application Commands	
Task states	
Name	Value
Cyclic Event	67853
Initialisation Req.	1
Initialisation Cnf. Pos.	1
Initialisation Cnf. Neg.	0
Set Bus Mode Req.	3
Set Bus Mode Cnf. Pos.	3
Set Bus Mode Cnf. Neg.	0
Download Req.	1
Download Cnf. Pos.	1
Download Cnf. Neg.	0
Set Slave Output Data Req.	0
Set Slave Output Data Cnf. Pos.	0
Set Slave Output Data Cnf. Neg.	0
Get Slave Output Data Req.	67853
Get Slave Output Data Cnf. Pos.	67853
Get Slave Output Data Cnf. Neg.	0
Slave Diagnosis Ind.	1
DPV1 Alarm Ind.	0
Change Bus Mode Ind.	0
Fault Ind.	0
Last Fault	0x00000000
Unknown Command	0
Last Unknown Command	0x00000000
Process End Req.	0

Figure 101: Extended Diagnosis > PROFIBUS_APM > Application Commands

Name	Description
[Service]	<p>Diagnosis counter of the PROFIBUS_APM layer for Application Commands. Number of requested services of the FSPMM layer. Indicates the services processed.</p> <p>Note: The sum of the enumerated services must put together each of the positively and negatively counted number of services.</p>

Table 53: Extended Diagnosis > PROFIBUS_APM > Application Commands

8.7.4 IO Exchange Counter

IO Exchange Counter	
Task states	
Name	Value
Host Input Update Req.	0
Input Update	17122
Host Output Update Req.	0
Output Update	0

Figure 102: Extended Diagnosis > PROFIBUS_APM > IO Exchange Counter

Name	Description
Host Input Update Req.	Counter, how often the host has read the input data.
Input Update	Counter, how often the input data have been updated at the bus.
Host Output Update Req.	Counter, how often the host has written the output data.
Output Update	Counter, how often the output data have been updated at the bus.

Table 54: Extended Diagnosis > PROFIBUS_APM > IO Exchange Counter

8.7.5 Packet Router

Packet Router	
Task states	
Name	Value
Fspmm Task Commands	1
Fspmm Task Commands Route Pos.	0
Fspmm Task Commands Route Neg.	0
Fspmm Task Command Not Registerd.	0
DL Task Commands	0
DL Task Commands Route Pos.	0
DL Task Commands Route Neg.	0
DL Task Command Not Registerd.	0
FSPMM2 Task Commands	0
FSPMM2 Task Commands Route Pos.	0
FSPMM2 Task Commands Route Neg.	0
FSPMM2 Task Command Not Registerd.	0

Figure 103: Extended Diagnosis > PROFIBUS_APM > Packet Router

Name	Description
[Service]	Diagnosis counter of the PROFIBUS_APM layer for by the user to the appropriate task routed commands. Indicates the services processed.

Table 55: Extended Diagnosis > PROFIBUS_APM > Packet Router

9 Tools

9.1 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:

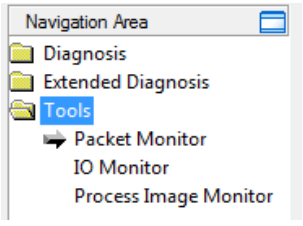
PROFIBUS DP Master DTM	Folder Name / Section	Manual Page
 <i>Navigation Area - Tools</i>	<i>Packet Monitor</i>	156
	<i>IO Monitor</i>	173
	<i>Process Image Monitor</i>	174

Table 56: Descriptions of the Diagnosis Panes

Online Connection to the Device



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

9.2 Packet Monitor

The **Packet Monitor** serves for test and diagnosis purposes.

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

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



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

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

Figure 104: Packet Monitor

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

- Select **Reset Counter** to reset the packet counter.

9.2.1 Sending Packet

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

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

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

Figure 105: 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 57: Descriptions Packet Header

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

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

Send Data

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

Sending Packets once or cyclic

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

9.2.2 Receiving Packet

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 grid with columns 0-9 and rows 0-60. A counter shows 'Counter: 0'. The data grid shows hexadecimal values: row 0 has 00 00 00 00 00 00 00 00 00 04; row 10 has 00 00 01 00 01 00 00 00; and rows 20-60 are empty.

Figure 106: 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 58: 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.

9.2.3 Example – Reading Data via DPV1 Class1

To **read** data from a Slave device via **DPV1 Class1** using the packet monitor, you must proceed as described below. The single steps are explained with the help of sample data.



For more information on the steps under **Settings** and **Configuration** refer to the corresponding chapters in this manual. Required information is easy to find via the overview in the section *Configuration Steps* on page 24.

Requirements

The function **DPV1 Class1 read** can only be used if:

- The used device supports **DPV1 Class1 read** and answers DPV1 Class1 requests.
- The used Master and Slave devices are configured. I. e., in the Slave configuration under **DPV1 > enable DPV1** must be checked.
- The used Master and Slave devices are operational.

How to proceed

1. In the Master DTM under **Settings**:

- Select the cifX device driver and assign the Master device.

Alternative to the connection via the cifX device driver via the netX driver an USB, serial or TCP connection can be used.

2. In the Slave DTM **Configuration**:

- Check the DPV1setting.



Important: Under **DPV1 > enable DPV1** must be checked.

Packet Description Read Request

structure PROFIBUS_FSPMM_PACKET_READ_REQ_T				
Type: Request				
Area	Variable	Type	Value / Range	Description
Head structure TLR_PACKET_HEADER_T				
(A)	ulDest	UINT32	0x20/ FSPMM_QUE	Destination queue handle
	ulSrc	UINT32	0 ... $2^{32}-1$	Source queue handle
	ulDestId	UINT32	ulFSPMM0Id	Destination end point identifier, specifying the final receiver of the packet within the destination process. Set to 0 for the Initialization Packet
	ulSrcId	UINT32	ulAPMS0Id	Source end point identifier, specifying the origin of the packet inside the source process
	ulLen	UINT32	16	Packet data length in bytes
	ulId	UINT32	0 ... $2^{32}-1$	Packet identification as unique number generated by the Source process of the packet
	ulSta	UINT32		See section 7.1 Error Codes of the FSPMM-Task
	ulCmd	UINT32	0x2210	PROFIBUS_FSPMM_CMD_READ_REQ_T - Command
	ulExt	UINT32	0	Extension not in use, set to zero for compatibility reasons
	ulRout	UINT32	x	Routing, do not change
Data structure PROFIBUS_FSPMM_READ_REQ_T				
(D)	ulRemAdd	UINT32	0 ... 125	Slave address
(E)	ulSlot	UINT32	0 ... 254	Requested slot
(F)	ulIndex	UINT32	0 ... 254	Requested index
(G)	ulLength	UINT32	1 ... 240	Requested data length

Figure 107: Packet Description PROFIBUS_FSPMM_CMD_READ_REQ – V1 Class 1 Read Request



Further information on the packet description for this example are comprised in the *PROFIBUS DP Master Protocol API Manual*, in section *PROFIBUS_FSPMM_CMD_READ_REQ/CNF – V1 Class 1 Read Request* (e. g. Revision 22 of the API manual, in section 6.1.9.) .

1. Open Packet Monitor.
- **Tools > Packet Monitor.**
2. Enter data for Packet header.

Send > Packet header

- Under **Dest** enter or select the receiver.
- Under **Cmd** enter the read command identification.

	Sample Data	
(A) Receiver	0x20	(Destination Queue Handle)
(C) Read Command Identification	00002210	PROFIBUS_FSPMM_ PACKET_READ_REQ_T (Request)

Send

Packet header

Dest: **(A)** 0x20

Src: 00000000 State: 00000000

Dest ID: 00000000 Cmd: **(C)** 00002210

Src ID: 00000000 Ext: 00000000

Len: 00000010 Rout: 00000000

ID: 00000002 Auto Increment ID ☐

Figure 108: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Send > Packet header

3. Enter send data.

Send > Send Data

For slot and index for the Slave device, see the description of the equipment manufacturer.

	Range of Value	Sample Data	
(D) Slave Address	0 ... 125	02 00 00 00*	(for Slave 2)
(E) Slot Number	0 ... 254	0A 00 00 00*	(for Slot 10)
(F) Index	0 ... 254	04 00 00 00*	(for Index 4)
(G) Indication of Length	1 ... 240	06 00 00 00*	(for the Indication of Length 6 Bytes)
	(UINT32 = 4 Bytes)	*Intel format, e. g. LSB first;	

Send data: Counter: 3

	00	01	02	03	04	05	06	07	08	09
0000	02	00	00	00	04	00	00	00	04	00
0004	00	00	06	00	00	00				
0014										
001E										
0028										
0032										
003C										

Put cyclic Put packet

Figure 109: Example - Reading data via DPV1 Class 1 - FSPMM_QUE –Send > Send Data

4. Sending/Receiving Packets.

➤ To send packet once, select **Put packet**.

➤ The entered values are sent from the packet monitor to the connected Slave device and received packets are displayed.

Packet Description Read Confirmation

structure PROFIBUS_FSPMM_PACKET_READ_CNF_T				
Type: Confirmation				
Area	Variable	Type	Value / Range	Description
Head	structure TLR_PACKET_HEADER_T			
	(A) ulDest	UINT32		Destination queue handle, unchanged
	ulSrc	UINT32		Source queue handle, unchanged
	ulDestId	UINT32	ulAPM0Id	Destination end point identifier, unchanged
	ulSrcId	UINT32	ulFSPMM0Id	Source end point identifier, unchanged
	ulLen	UINT32	12 + n	Packet data length in bytes
	ulId	UINT32	0 ... $2^{32}-1$	Packet identification as unique number generated by the Source process of the packet
	ulSta	UINT32		See section 7.1 Error Codes of the FSPMM-Task
	(C) ulCmd	UINT32	0x2211	PROFIBUS_FSPMM_CMD_READ_CNF_T - Command
	ulExt	UINT32	0	Extension, unchanged
	ulRout	UINT32	*	Routing, do not change
Data	structure PROFIBUS_FSPMM_READ_CNF_T			
	(D) ulRemAdd	UINT32	0 ... 125	Slave address
	(E) ulSlot	UINT32	0 ... 254	Slot
	(F) ulIndex	UINT32	0 ... 254	Index
	(H) abData	UINT8[]		Requested data

Figure 110: Packet Description PROFIBUS_FSPMM_CMD_READ_CNF – Confirmation of V1 Class 1 Read Request



Further information on the packet description for this example are comprised in the *PROFIBUS DP Master Protocol API Manual*, in section *PROFIBUS_FSPMM_CMD_READ_REQ/CNF – V1 Class 1 Read Request* (e. g. Revision 22 of the API manual, in section 6.1.9.) .

5. Evaluate received packet.

Receive > Packet header

Under **Dest** the receiver is displayed.

Under **State** the status code or possibly an error code is displayed.



All status and error codes are either to be found in this manual via the section *Overview Error Codes* on page 177, in the *Dual Port Memory Manual* or in the *PROFIBUS DP Slave Protocol API Manual*.

Under **Cmd** the response identification read request is displayed.

Receive	
Packet header	
Dest: A	00000020
Src:	00000000
State: B	00000000
Dest ID:	00000000
Cmd: C	00002211
Src ID:	00000000
Ext:	00000000
Len:	00000012
Rout:	00000000
ID:	00000002

Figure 111: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Receive > Packet header

	Sample Data	
A Receiver	0x20	(Destination Queue Handle)
B State	00000000	indicates that the read request could be executed without error. If during the execution of the read request an error was detected, an error code will be displayed.
C Response Identification Read Request	00002211	PROFIBUS_ FSPMM_PACKET_READ_CNF_T (Confirmation)

Receive > Receive data

➤ Under **Receive data** the data of the receive packet are displayed.

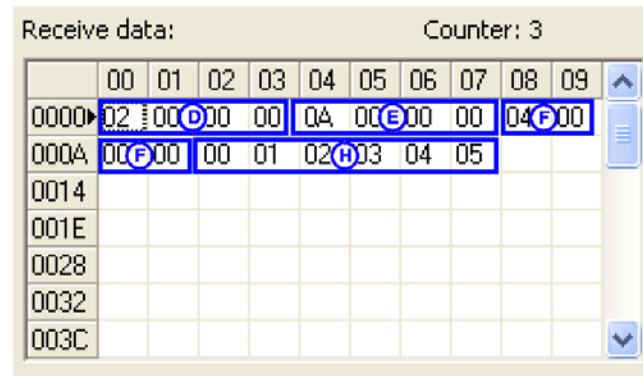


Figure 112: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Receive > Receive data

	Range of Value	Sample Data	
(D) Slave Address	0 ... 125	02 00 00 00*	(for Slave 2)
(E) Slot Number	0 ... 254	0A 00 00 00*	(for Slot 10)
(F) Index	0 ... 254	04 00 00 00*	(for Index 4)
(H) Receive Data	00 01 02 03 04 05	(6 Bytes)	
	(UINT32 = 4 Bytes)	*Intel format, e. g. LSB first;	

9.2.4 Example - Writing Data via DPV1 Class1

To **write** data to a Slave device via **DPV1 Class1** using the packet monitoring, you must proceed as described below. The single steps are explained with the help of sample data.



For more information on the steps under **Settings** and **Configuration** refer to the corresponding chapters in this manual. Required information is easy to find via the overview in the section *Configuration Steps* on page 24.

Requirements

The function **DPV1 Class1 writing** can only be used if:

- The used device supports **DPV1 Class1 writing** and answers DPV1 Class1 requests.
- The used Master and Slave devices are configured. I. e., in the Slave configuration under **DPV1 > enable DPV1** must be checked.
- The used Master and Slave devices are operational.

How to proceed

1. In the Master DTM under **Settings**:

- Select the cifX device driver and assign the Master device.

Alternative to the connection via the cifX device driver via the netX driver an USB, serial or TCP connection can be used.

2. In the Slave DTM **Configuration**:

- Check the DPV1setting.



Important: Under **DPV1 > enable DPV1** must be checked.

Packet Description Write Request

structure PROFIBUS_FSPMM_PACKET_WRITE_REQ_T				
Type: Request				
Area	Variable	Type	Value / Range	Description
Head	structure TLR_PACKET_HEADER_T			
	A ulDest	UINT32	0x20/ FSPMM_QUE	Destination queue handle
	ulSrc	UINT32	0 ... $2^{32}-1$	Source queue handle
	ulDestId	UINT32	ulFSPMM0Id	Destination end point identifier, specifying the final receiver of the packet within the destination process. Set to 0 for the Initialization Packet
	ulSrcId	UINT32	ulAPMS0Id	Source end point identifier, specifying the origin of the packet inside the source process
	ulLen	UINT32	12 + PROFIBUS_FS PM_MAX_IO_D ATA_LEN	Packet data length in bytes
	ulId	UINT32	0 ... $2^{32}-1$	Packet identification as unique number generated by the Source process of the packet
	ulSta	UINT32		See section 7.1 Error Codes of the FSPMM-Task
	C ulCmd	UINT32	0x2212	PROFIBUS_FSPMM_CMD_WRITE_REQ_T - Command
	ulExt	UINT32	0	Extension not in use, set to zero for compatibility reasons
	ulRout	UINT32	x	Routing, do not change
Data	structure PROFIBUS_FSPMM_WRITE_REQ_T			
	D ulRemAdd	UINT32	0 ... 125	Slave address
	E ulSlot	UINT32	0 ... 254	Slot
	F ulIndex	UINT32	0 ... 254	Index
	I abData	UINT8[]		Write data

Figure 113: Packet Description PROFIBUS_FSPMM_CMD_WRITE_REQ – V1 Class 1 Write Request



Further information on the packet description for this example are comprised in the *PROFIBUS DP Master Protocol API Manual*, in section *PROFIBUS_FSPMM_CMD_WRITE_REQ/CNF – V1 Class 1 Write Request* (e. g. Revision 22 of the API manual, in section 6.1.10.) .

1. Open Packet Monitor.
- **Tools > Packet Monitor.**
2. Enter data for Packet header.

Send > Packet header

- Under **Dest** enter or select the receiver.
- Under **Cmd** enter the write command identification.

	<i>Sample Data</i>	
(A) Receiver	0x20	(Destination Queue Handle)
(C) Write Command Identification	00002212	PROFIBUS_FSPMM_ PACKET_WRITE_REQ_T (Request)

Send

Packet header

Dest: **(A)** 00000020

Src: 00000000 State: 00000000

Dest ID: 00000000 Cmd: **(C)** 00002212

Src ID: 00000000 Ext: 00000000

Len: 0000000E Rout: 00000000

ID: 00000002 Auto Increment ID ☐

Figure 114: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Send > Packet header

3. Enter send data.

Send > Send Data

For slot and index for the Slave device, see the description of the equipment manufacturer.

	Range of Value	Sample Data	
(D) Slave Address	0 ... 125	02 00 00 00*	(for Slave 2)
(E) Slot Number	0 ... 254	0A 00 00 00*	(for Slot 10)
(F) Index	0 ... 254	04 00 00 00*	(for Index 4)
(G) Data to be sent		01 02	(2 Bytes)
	(UINT32 = 4 Bytes)	*Intel format, e. g. LSB first;	

Send data: Counter: 1

	00	01	02	03	04	05	06	07	08	09
0000	02	00	(D)00	00	0A	00	(E)00	00	04	(F)00
0004	(F)00	01	(G)02							
0014										
001E										
0028										
0032										
003C										

Put cyclic Put packet

Figure 115: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Send > Send Data

4. Sending/Receiving Packets.

➤ To send packet once, select **Put packet**.

↗ The entered values are sent from the packet monitor to the connected Slave device and received packets are displayed.

Packet Description Write Confirmation

structure PROFIBUS_FSPMM_PACKET_WRITE_CNF_T				
Type: Request				
Area	Variable	Type	Value / Range	Description
Head	structure TLR_PACKET_HEADER_T			
	A ulDest	UINT32		Destination queue handle, unchanged
	ulSrc	UINT32		Source queue handle, unchanged
	ulDestId	UINT32	ulAPM0Id	Destination end point identifier, unchanged
	ulSrcId	UINT32	ulFSPMM0Id	Source end point identifier, unchanged
	ulLen	UINT32	12 15	Packet data length in bytes Only in case of error TLR_E_PROFIBUS_FSPMM_MSAC1_NRS
	ulId	UINT32	0 ... $2^{32}-1$	Packet identification as unique number generated by the Source process of the packet
	ulSta	UINT32		See section 7.1 Error Codes of the FSPMM-Task
	C ulCmd	UINT32	0x2213	PROFIBUS_FSPMM_CMD_WRITE_CNF_T - Command
	ulExt	UINT32	0	Extension, unchanged
Data	ulRout	UINT32	x	Routing, do not change
	structure PROFIBUS_FSPMM_WRITE_CNF_T			
	D ulRemAdd	UINT32	0...125	Slave address
	E ulSlot	UINT32	0...254	Slot
	F ulIndex	UINT32	0...254	Index
	The following three variables are only present in case of error TLR_E_PROFIBUS_FSPMM_MSAC1_NRS			
	bErrorDecode	UINT8	128	A value of 128 here indicates DP V1 error handling is applied.
	bErrorCode1	UINT8	0...255	ErrorCode1, see section 5.3.2.2. of this document
	bErrorCode2	UINT8	0...255	ErrorCode2, meaning depends on bErrorCode1

Figure 116: Packet Description PROFIBUS_FSPMM_CMD_WRITE_CNF – Confirmation of V1 Class 1 Write Request



Further information on the packet description for this example are comprised in the *PROFIBUS DP Master Protocol API Manual*, in section *PROFIBUS_FSPMM_CMD_WRITE_REQ/CNF – V1 Class 1 Write Request* (e. g. Revision 22 of the API manual, in section 6.1.10.) .

5. Evaluate received packet.

Receive > Packet header

➤ Under **Dest** the receiver is displayed.

➤ Under **State** the status code or possibly an error code is displayed.



All status and error codes are either to be found in this manual via the section *Overview Error Codes* on page 177, in the *Dual Port Memory Manual* or in the *PROFIBUS DP Slave Protocol API Manual*.

➤ Under **Cmd** the response identification write request is displayed.

Receive	
Packet header	
Dest: A	00000020
Src:	00000000
State: B	00000000
Dest ID:	00000000
Cmd: C	00002213
Src ID:	00000000
Ext:	00000000
Len:	0000000C
Rout:	00000000
ID:	00000002

Figure 117: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Receive > Packet header

	Sample Data	
A Receiver	0x20	(Destination Queue Handle)
B State	00000000	indicates that the write request could be executed without error. If during the execution of the write request an error was detected, an error code will be displayed.
C Response Identification Writing Request	00002213	PROFIBUS_FSPMM_PACKET_ WRITE_CNF_T (Confirmation)

Receive > Receive data

Under **Receive data** the data of the receive packet are displayed.

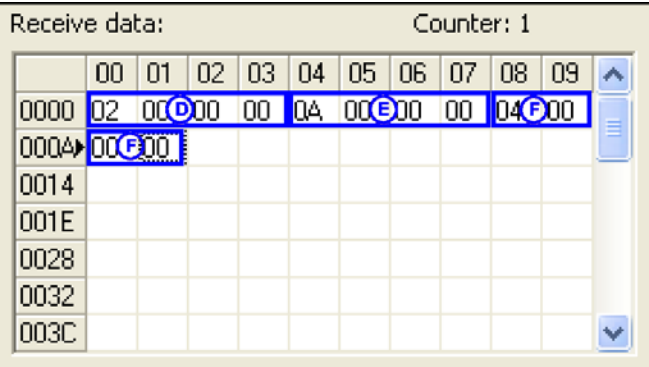


Figure 118: Example – Writing data via DPV1 Class 1 - FSPMM_QUE – Receive > Receive data

	Range of Value	Sample Data	
(D) Slave Address	0 ... 125	02 00 00 00*	(for Slave 2)
(E) Slot Number	0 ... 254	0A 00 00 00*	(for Slot 10)
(F) Index	0 ... 254	04 00 00 00*	(for Index 4)
	(UINT32 = 4 Bytes)	*Intel format, e. g. LSB first;	

9.3 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 119: 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.

9.4 Process Image Monitor

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

- Open **Tools > Process Image Monitor**.

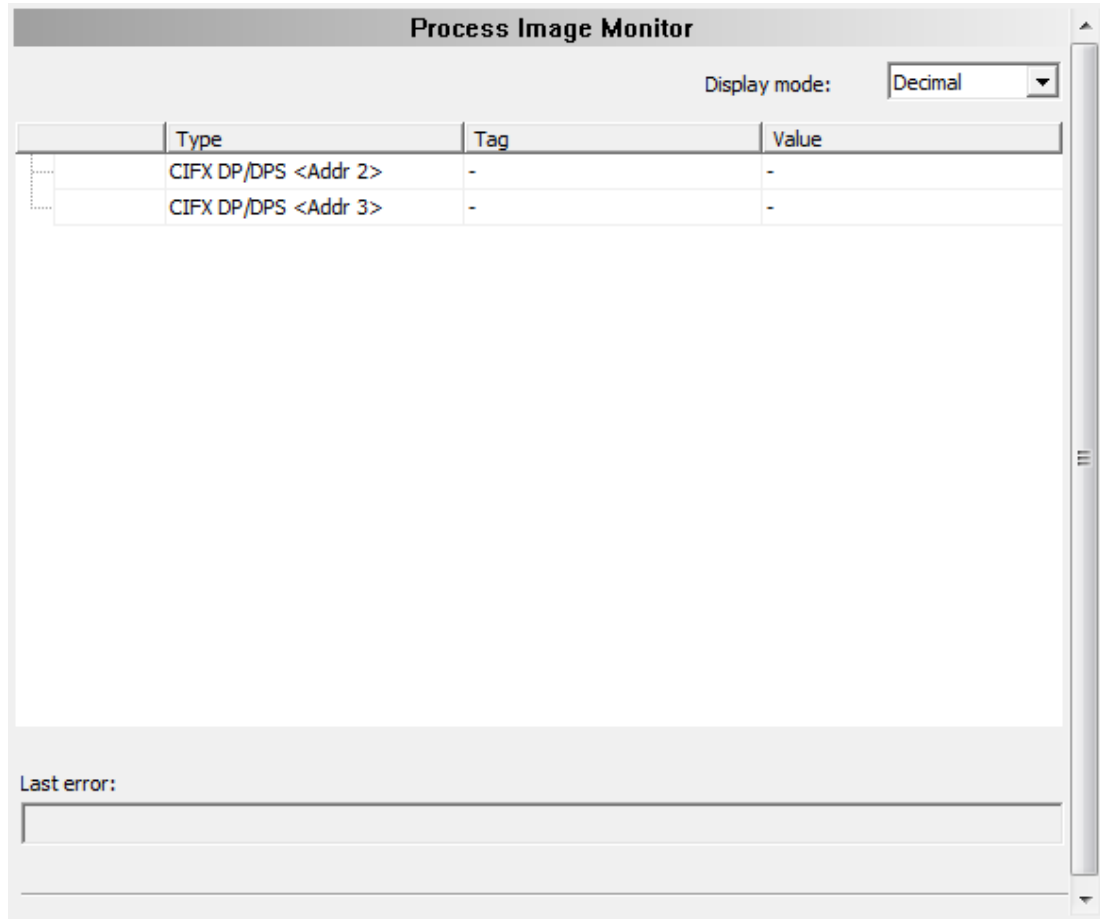
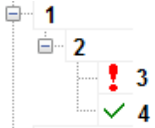





Figure 120: Window 'Process Image Monitor'

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

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

Table 59: Notes to the Window 'Process Image Monitor'

10 Error Codes

10.1 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.

10.2 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
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 60: Overview Error Codes and Ranges



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

10.3 General Hardware Error Codes

10.3.1 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 61: RCX General Task Errors

10.3.2 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 62: RCX Common Status & Errors Codes

10.3.3 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 63: RCX Status & Error Codes

10.3.3.1 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 64: RCX Status & Error Codes Slave State

10.4 ODM Error Codes

10.4.1 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 65: ODM Error Codes - General ODM Error Codes

10.4.2 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 66: ODM Error Codes - General ODM Driver Error Codes

10.4.3 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 67: cifX Driver Specific ODM Error Codes

10.5 Error Codes cifX Device Driver and netX Driver

10.5.1 Generic Error Codes

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

Table 68: Generic Error Codes

10.5.2 Generic Driver Error Codes

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

Table 69: Generic Driver Error Codes

10.5.3 Generic Device Error Codes

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

Table 70: Generic Device Error Codes

10.6 Error Codes netX Driver

10.6.1 CIFS API Transport Error Codes

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

Table 71: CIFS API Transport Error Codes

10.6.2 CIFS API Transport Header State Error Codes

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

Table 72: CIFS API Transport Header State Error Codes

10.7 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 73: ODM Error Codes DBM V4

11 Appendix

11.1 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 PROFIBUS DP Master 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.

11.1.1 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 74: Settings (D = Displaying, X = Editing, Configuring)

11.1.2 Configuration

	Observer	Operator	Maintenance	Planning Engineer	Administrator
<i>Bus Parameters</i>	D	D	X	X	X
<i>Process Data</i>	D	D	X	X	X
<i>Address Table</i>	D	D	X	X	X
<i>Station Table</i>	D	D	X	X	X
<i>Master Settings</i>	D	D	X	X	X

Table 75: Configuration (D = Displaying, X = Editing, Configuring)

11.2 References

- [1] Device Type Manager (DTM) Style Guide, Version 1.0 ; FDT-JIG - Order No. <0001-0008-000>
- [2] IEC 61158 Third edition, 2003
- [3] PROFIBUS DP Master Protocol API Manual, Revision 22, Hilscher GmbH 2017
- [4] PROFIBUS DP Slave Protocol API Manual, Revision 19, Hilscher GmbH 2017

11.3 List of Figures

Figure 1: Dialog Structure of the PROFIBUS DP Master DTM	15
Figure 2: Navigation Area	16
Figure 3: Status Bar – Status Fields 1 to 6	19
Figure 4: Status Bar Display Examples	19
Figure 5: Default Driver ‚cifX Device Driver’ for PC cards cifX	34
Figure 6: Default Driver ‚cifX Device Driver’ for PC cards cifX (example)	34
Figure 7: Default Driver ‚netX Driver’ for Hilscher devices except for PC cards cifX (example)	34
Figure 8: Manual Selection of multiple drivers (Example)	35
Figure 9: netX Driver > USB/RS232 Connection	38
Figure 10: netX Driver > TCP Connection	41
Figure 11: Device Assignment - detected Devices (* The name of the device class is displayed.) – Example for a device without firmware	43
Figure 12: Device Assignment - detected Devices (* The name of the device class is displayed.) Example for Devices without Firmware	45
Figure 13: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for a device without firmware / one Device is selected	46
Figure 14: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for Devices with and without Firmware / one Device is selected	47
Figure 15: Device Assignment - Selecting the Device (* The name of the device class is displayed.) – Example for a device with firmware / one Device is selected	48
Figure 16: Firmware Download	49
Figure 17: Error Message ‘The device is not assigned to the hardware!’	50
Figure 18: Window ‘Select Firmware File’ (Example CIFX)	51
Figure 19: Request Select Firmware File - Example Invalid Firmware	53
Figure 20: Request - Do you really want to download the firmware?	54
Figure 21: Firmware Download - Progress Bar	54
Figure 22: Clock Symbol and Hook Symbol green	55
Figure 23: Firmware Download – Download	55
Figure 24: Licensing	56
Figure 25: Bus Parameters > Profile	60
Figure 26: Bus Parameters > Bus Parameters	61
Figure 27: Note bus configuration was changed, Bus Parameters not longer actual	63
Figure 28: Adjust Bus Parameters	63
Figure 29: Bus Parameters > Bus Monitoring	64
Figure 30: Note Bus configuration was changed, Bus Monitoring Parameters not longer actual	65
Figure 31: Adjust Bus Monitoring Parameters	65
Figure 32: Bus Parameters > Error Handling	65
Figure 33: Bus Parameters > Calculated Timing	66
Figure 34: Process Data (*The name of the Slave device is displayed.)	67
Figure 35: Configuration > Address Table (In the Figure shown here, in the column Device or Name example devices are displayed.)	68
Figure 36: Configuration > Address Table - Auto Addressing	69
Figure 37: Configuration > Address Table - Display Mode	69

Figure 38: Configuration > Address Table - Inputs / Outputs (In the Figure shown here, in the column Device or Name example devices are displayed.)	70
Figure 39: Station Table (In the Figure shown here, in the column Device or Name example devices are displayed.)	71
Figure 40: Configuration > Master Settings	72
Figure 41: Master Settings > Start of Bus Communication	73
Figure 42: Master Settings > Application Monitoring	73
Figure 43: Master Settings > Process Image Storage Format	74
Figure 44: Master Settings > Module Alignment	74
Figure 45: Master Settings > Process Data Handshake	75
Figure 46: Master Settings > Advanced	75
Figure 47: Master Settings > Device Status Offset	76
Figure 48: Example Debug Mode with pending Diagnosis, (Master and Slave)	81
Figure 49: Set Station Address	84
Figure 50: Live List	85
Figure 51: Starting 'Network Scan' (Example)	87
Figure 52: Scan Response dialog of the Master DTM (Example)	88
Figure 53: Scan Response dialog of the Master DTM (Example)	89
Figure 54: Query about the Generation of the Module Configuration (Example)	92
Figure 55: Upload succeeded (Example)	93
Figure 56: Uploaded Modules (Example)	94
Figure 57: Network Scan > Create Devices > Upload	96
Figure 58: netDevice Message: Download	100
Figure 59: Overview Configuration Software and Master Firmware	101
Figure 60: Enable configuration download during network state "operate" - checked	104
Figure 61: Master Settings > Device Status Offset	104
Figure 62: Dialog Pane Configuration in Run (Example)	108
Figure 63: Dialog Pane Configuration in Run (Example) – „Devices“	109
Figure 64: Dialog Pane Configuration in Run – Meaning of the Colors	110
Figure 65: Dialog Pane Configuration in Run (Example) – „Master“	111
Figure 66: Dialog Pane Configuration in Run – Activate changes, Cancel, Help	112
Figure 67: License Pane	118
Figure 68: License Pane - License Type	119
Figure 69: License Pane – License Type / Master protocols	119
Figure 70: License Pane – License Type / Utilities	119
Figure 71: License Pane - Request Form, please fill out / Device Information	122
Figure 72: License Pane - Request Form, please fill out / License Type	123
Figure 73: License Pane - Request Form, please fill out / Mandatory data	123
Figure 74: License Pane – Selecting the Subsidiary / Ordering / Contacts	124
Figure 75: License Pane – placing the order by E-mail	125
Figure 76: Example: Order E-Mail License request	125
Figure 77: License Pane - placing the order by Fax or by Telephone	126
Figure 78: Example: Order Data Form PrintOrderRequest	126
Figure 79: License Pane – Fax Number of the selected Subsidiary	127
Figure 80: License Pane – Telephone Number of the selected Subsidiary	127
Figure 81: License Pane - Ordering by exported File and E-Mail	128
Figure 82: License Pane - Download License	129
Figure 83: General Diagnosis	131
Figure 84: Master Diagnosis	133
Figure 85: Bus Diagnosis - Bus Monitoring	134
Figure 86: Station Diagnosis - Station Status	135
Figure 87: Firmware Diagnosis (*The name of the Firmware is displayed.)	136
Figure 88: Extended Diagnosis > [Folder Name] > Task Information Example Display	138

Figure 89: Extended Diagnosis > [Folder Name] > IniBatch Status Example Display	139
Figure 90: Extended Diagnosis > PROFIBUS_DL > Busparameter	140
Figure 91: Extended Diagnosis > PROFIBUS_DL > Counter	142
Figure 92: Extended Diagnosis > PROFIBUS_FSPMM > Application Commands	143
Figure 93: Extended Diagnosis > PROFIBUS_FSPMM > DataLink Commands	144
Figure 94: Extended Diagnosis > PROFIBUS_FSPMM > DMPMM Counter	145
Figure 95: Extended Diagnosis > PROFIBUS_FSPMM > MMAC1 Counter	146
Figure 96: Extended Diagnosis > PROFIBUS_FSPMM > Timer	146
Figure 97: Extended Diagnosis > PROFIBUS_FSPMM2 > Task Resources	147
Figure 98: Extended Diagnosis > PROFIBUS_FSPMM2 > Application Commands	148
Figure 99: Extended Diagnosis > PROFIBUS_APM > Common State	149
Figure 100: Extended Diagnosis > PROFIBUS_APM > Global State field	150
Figure 101: Extended Diagnosis > PROFIBUS_APM > Application Commands	153
Figure 102: Extended Diagnosis > PROFIBUS_APM > IO Exchange Counter	154
Figure 103: Extended Diagnosis > PROFIBUS_APM > Packet Router	154
Figure 104: Packet Monitor	156
Figure 105: Send > Packet Header and Send Data	157
Figure 106: Packet Header and Receive Data	158
Figure 107: Packet Description PROFIBUS_FSPMM_CMD_READ_REQ – V1 Class 1 Read Request	160
Figure 108: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Send > Packet header	161
Figure 109: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Send > Send Data	162
Figure 110: Packet Description PROFIBUS_FSPMM_CMD_READ_CNF – Confirmation of V1 Class 1 Read Request	163
Figure 111: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Receive > Packet header	164
Figure 112: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Receive > Receive data	165
Figure 113: Packet Description PROFIBUS_FSPMM_CMD_WRITE_REQ – V1 Class 1 Write Request	167
Figure 114: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Send > Packet header	168
Figure 115: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Send > Send Data	169
Figure 116: Packet Description PROFIBUS_FSPMM_CMD_WRITE_CNF – Confirmation of V1 Class 1 Write Request	170
Figure 117: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Receive > Packet header	171
Figure 118: Example – Writing data via DPV1 Class 1 - FSPMM_QUE – Receive > Receive data	172
Figure 119: IO Monitor	173
Figure 120: Window 'Process Image Monitor'	174

11.4 List of Tables

Table 1: Descriptions Dialog Panes	7
Table 2: List of Revisions	8
Table 3: General Device Information	16
Table 4: Overview Dialog Panes	17
Table 5: OK, Cancel, Apply and Help	18
Table 6: Status Bar Icons [1]	19
Table 7: Signal Words	23
Table 8: Getting started - Configuration Steps	27
Table 9: Getting started - "Configuration in Run" Steps	30
Table 10: Descriptions of the Dialog Panes Settings	31
Table 11: Driver Selection List Parameters	34
Table 12: Parameters netX Driver > USB/RS232 Connection	39
Table 13: Parameters netX Driver > TCP Connection	42
Table 14: Parameters of the Device Assignment	44
Table 15: Parameter Firmware Download	49
Table 16: Parameters Select Firmware File	52

Table 17: Descriptions of the Dialog Panes Configuration	57
Table 18: Bus Parameters > Bus Parameters	62
Table 19: Bus Parameters > Bus Monitoring	64
Table 20: Bus Parameters > Calculated Timing	66
Table 21: Process Data	67
Table 22: Address Table Pane Parameters - Inputs / Outputs	70
Table 23: Station Table	71
Table 24: Range of Value / Value for the Watchdog time	73
Table 25: Master Settings Pane Parameters - Process Image Storage Format	74
Table 26: Parameters Master Settings > Module Alignment	74
Table 27: Option Master Settings > Device Status Offset	76
Table 28: Debug Mode Busline Colors and Debug Icons	82
Table 29: Description on the Scan Response dialog of the Master DTM	91
Table 30: Network Scan > Create Devices > Upload	96
Table 31: Quick Reference Dialog Pane "Configuration in Run"	115
Table 32: Descriptions of the Diagnosis Panes	130
Table 33: Indication General Diagnosis	132
Table 34: Parameter General Diagnosis	132
Table 35: Parameter Master Diagnosis	133
Table 36: Bus Diagnosis - Bus Monitoring	134
Table 37: Possible Values for the Status	135
Table 38: Description Table Task Information	136
Table 39: Descriptions of the Dialog Panes Extended Diagnosis	137
Table 40: Extended Diagnosis > [Folder Name] > Task Information	138
Table 41: Extended Diagnosis > [Folder Name] > IniBatch Status	139
Table 42: Extended Diagnosis > PROFIBUS_DL > Busparameter	141
Table 43: Extended Diagnosis > PROFIBUS_DL > Counter	142
Table 44: Extended Diagnosis > PROFIBUS_FSPMM > Application Commands	143
Table 45: Extended Diagnosis > PROFIBUS_FSPMM > DataLink Commands	144
Table 46: Extended Diagnosis > PROFIBUS_FSPMM > DMPMM Counter	145
Table 47: Extended Diagnosis > PROFIBUS_FSPMM > MMAC1 Counter	146
Table 48: Extended Diagnosis > PROFIBUS_FSPMM > Timer	146
Table 49: Extended Diagnosis > PROFIBUS_FSPMM2 > Task Resources	147
Table 50: Extended Diagnosis > PROFIBUS_FSPMM2 > Application Commands	148
Table 51: Extended Diagnosis > PROFIBUS_APM > Common State	149
Table 52: Extended Diagnosis > PROFIBUS_APM > Global State field	152
Table 53: Extended Diagnosis > PROFIBUS_APM > Application Commands	153
Table 54: Extended Diagnosis > PROFIBUS_APM > IO Exchange Counter	154
Table 55: Extended Diagnosis > PROFIBUS_APM > Packet Router	154
Table 56: Descriptions of the Diagnosis Panes	155
Table 57: Descriptions Packet Header	157
Table 58: Descriptions Packet Header	158
Table 59: Notes to the Window 'Process Image Monitor'	175
Table 60: Overview Error Codes and Ranges	177
Table 61: RCX General Task Errors	178
Table 62: RCX Common Status & Errors Codes	179
Table 63: RCX Status & Error Codes	180
Table 64: RCX Status & Error Codes Slave State	180
Table 65: ODM Error Codes - General ODM Error Codes	181
Table 66: ODM Error Codes - General ODM Driver Error Codes	182
Table 67: cifX Driver Specific ODM Error Codes	185
Table 68: Generic Error Codes	186
Table 69: Generic Driver Error Codes	187

Table 70: Generic Device Error Codes	188
Table 71: CIFS API Transport Error Codes	189
Table 72: CIFS API Transport Header State Error Codes	189
Table 73: ODM Error Codes DBM V4	193
Table 74: Settings (D = Displaying, X = Editing, Configuring)	194
Table 75: Configuration (D = Displaying, X = Editing, Configuring)	194

11.5 Glossary

CODESYS

The term CODESYS is an acronym and stands for COntroller DEvelopment SYStem.

CODESYS is a development environment for programming controller applications according to the international industrial standard IEC 61131-3.

Reference: wikipedia

Data Packets

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. Using the configuration software feature *Packet Monitor* 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.

DTM

Device Type Manager

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

DPV0

PROFIBUS DP with cyclic communication

DPV1

PROFIBUS DP with acyclic communication

DPV2

PROFIBUS DP with cyclic and acyclic communication and Time Sync configuration for the Slave

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.

Master

PROFIBUS DP Master devices initiate the data traffic on the bus. In the PROFIBUS protocol Master devices are called active participants. A master may send messages without external request.

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.

Slave

Slave devices are peripheral devices, like for example I/O devices or drives. Slave devices are also called passive participants. They do not receive the bus access authorization. That means, they may only accept received messages from the Master or send a message to the Master after enquiry of the Master.

11.6 Contacts

Headquarters

Germany

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

Support

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

Subsidiaries

China

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

Support

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

France

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

Support

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

India

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

Italy

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

Support

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

Japan

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

Support

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

Korea

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

Switzerland

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

Support

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

USA

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

Support

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