# Table of Contents

## 1 Introduction

1.1 About this Manual

   1.1.1 Descriptions of the Dialog Panes
   1.1.2 Online Help
   1.1.3 List of Revisions
   1.1.4 Conventions in this Manual

1.2 Legal Notes

   1.2.1 Copyright
   1.2.2 Important Notes
   1.2.3 Exclusion of Liability
   1.2.4 Warranty
   1.2.5 Export Regulations
   1.2.6 Registered Trademarks

1.3 About PROFIBUS DP Master DTM

   1.3.1 Requirements

1.4 Dialog Structure PROFIBUS DP Master DTM

   1.4.1 General Device Information
   1.4.2 Navigation Area
   1.4.3 Dialog Panes
   1.4.4 OK, Cancel, Apply and Help
   1.4.5 Table Lines
   1.4.6 Status Bar

## 2 Getting Started

2.1 Configuration Steps

2.2 “Configuration in Run” Steps

## 3 Settings

3.1 Overview Settings

3.2 Settings for Driver and Device Assignment

3.3 Driver

   3.3.1 Verify or adapt Driver Settings
   3.3.2 cifX Device Driver
   3.3.3 netX Driver
   3.3.4 Configuring netX Driver
   3.3.5 netX Driver - USB/RS232 Connection
   3.3.6 netX Driver - TCP/IP Connection

3.4 Device Assignment

   3.4.1 Scanning for Devices
   3.4.2 Selecting the Device (with or without firmware)
   3.4.3 Selecting the Device once more (with Firmware)

3.5 Firmware Download
# Table of Contents

3.6 Licensing................................................................................................................. 48

4 CONFIGURATION .................................................................................................... 49

4.1 Overview Configuration ...................................................................................... 49

4.2 Configuring Device Parameters ......................................................................... 50

4.3 Bus Parameters .................................................................................................... 52
  4.3.1 Profile .............................................................................................................. 52
  4.3.2 Bus Parameters ............................................................................................... 53
  4.3.3 Bus Monitoring .............................................................................................. 56
  4.3.4 Error Handling ............................................................................................... 57
  4.3.5 Calculated Timing ......................................................................................... 58

4.4 Process Data ........................................................................................................ 59

4.5 Address Table ..................................................................................................... 60
  4.5.1 Auto Addressing, Display Mode, CSV Export .............................................. 61
  4.5.2 Inputs / Outputs ............................................................................................ 62

4.6 Station Table ....................................................................................................... 63

4.7 Master Settings ................................................................................................... 64
  4.7.1 Start of Bus Communication ......................................................................... 65
  4.7.2 Application Monitoring ................................................................................ 65
  4.7.3 Process Image Storage Format ...................................................................... 66
  4.7.4 Module Alignment ......................................................................................... 66
  4.7.5 Process Data Handshake ................................................................................ 67
  4.7.6 Advanced ....................................................................................................... 67
  4.7.7 Device Status Offset ..................................................................................... 68

5 ONLINE FUNCTIONS ............................................................................................... 69

5.1 Connecting/Disconnecting Device ...................................................................... 69

5.2 Debug Mode ........................................................................................................ 71
  5.2.1 Requirements ............................................................................................... 72
  5.2.2 Starting Debug Mode .................................................................................... 73
  5.2.3 Debug Mode Busline Colors and Debug Icons ............................................ 74
  5.2.4 Reset of the Diagnosis Information and of the Station Status ....................... 75
  5.2.5 Stopping Debug Mode .................................................................................. 75

5.3 Set Station Address .............................................................................................. 76

5.4 Live List ............................................................................................................... 77

5.5 ‘Network Scan’ and ‘Upload’ ............................................................................... 78
  5.5.1 Starting ‘Network Scan’ ................................................................................ 79
  5.5.2 Settings in the Scan Response Dialog of the Master DTM ......................... 81
  5.5.3 Description on the Scan Response dialog of the Master DTM ....................... 82
  5.5.4 Creating Devices ........................................................................................... 84
  5.5.5 Download to the PROFIBUS DP Master Device ......................................... 87
  5.5.6 Resolving Module Identifier Conflicts ........................................................... 88

5.6 Download Configuration ...................................................................................... 90

5.7 Configuration in Run ........................................................................................... 91
  5.7.1 Requirements ............................................................................................... 92
Table of Contents

5.7.2 Overview Steps for "Configuration in Run" ......................................................... 93
5.7.3 Activate „Configuration in Run“ ........................................................................ 94
5.7.4 Define Number of Bytes after Input Data ....................................................... 94
5.7.5 Create the Configuration .................................................................................. 95
5.7.6 Change the Configuration ................................................................................. 96
5.7.7 Start the Download ............................................................................................ 97
5.7.8 Evaluate Configuration Data ................................................................................ 98
5.7.9 Activate or reject Changes ............................................................................... 102
5.7.10 Increase the Number of Bytes after the Input Data ........................................ 103
5.7.11 Quick Reference Dialog Pane "Configuration in Run“ .................................. 105

5.8 Start /Stop Communication .................................................................................. 106

5.9 Licensing ............................................................................................................ 107
5.9.1 Open License Dialog ........................................................................................ 107
5.9.2 License Dialog .................................................................................................. 108
5.9.3 Which Licenses are present in the Device? ....................................................... 109
5.9.4 How to order a License .................................................................................... 111
5.9.5 Selecting License(s) ........................................................................................ 111
5.9.6 Ordering Data .................................................................................................. 112
5.9.7 Ordering the License ....................................................................................... 114
5.9.8 How to get the License and transfer it to the Device ....................................... 119

6  DIAGNOSIS ........................................................................................................... 120
6.1 Overview Diagnosis ............................................................................................ 120
6.2 General Diagnosis ............................................................................................... 121
6.3 Master Diagnosis ................................................................................................. 123
6.4 Bus Diagnosis ..................................................................................................... 124
6.5 Station Diagnosis ................................................................................................. 125
6.6 Firmware Diagnosis ............................................................................................ 126

7  EXTENDED DIAGNOSIS ..................................................................................... 127
7.1 Overview Extended Diagnosis .............................................................................. 127
7.2 Task Information .................................................................................................. 128
7.3 IniBatch Status .................................................................................................... 129
7.4 PROFIBUS_DL .................................................................................................... 130
7.4.1 Bus Parameters ............................................................................................... 130
7.4.2 Counter ............................................................................................................ 132
7.5 PROFIBUS_FSPMM ........................................................................................... 133
7.5.1 Application Commands ................................................................................... 133
7.5.2 DataLink Commands ...................................................................................... 134
7.5.3 DMPMM Counter ........................................................................................... 135
7.5.4 MMAC1 Counter ............................................................................................ 136
7.5.5 Timer ............................................................................................................... 136
7.6 PROFIBUS_FSPMM2 ....................................................................................... 137
7.6.1 Task Resources ............................................................................................... 137
7.6.2 Application Commands ................................................................................... 138
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.6 Contacts</td>
<td>191</td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
<th>Section</th>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settings</td>
<td>Overview Settings</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Driver</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Device Assignment</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Firmware Download</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Licensing</td>
<td>107</td>
</tr>
<tr>
<td>Configuration</td>
<td>Overview Configuration</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Bus Parameters</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Process Data</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Address Table</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Station Table</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Master Settings</td>
<td>64</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Overview Diagnosis</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>General Diagnosis</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>Master Diagnosis</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>Bus Diagnosis</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>Station Diagnosis</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>Firmware Diagnosis</td>
<td>126</td>
</tr>
<tr>
<td>Extended Diagnosis</td>
<td>Overview Extended Diagnosis</td>
<td>127</td>
</tr>
<tr>
<td>Tools</td>
<td>Overview Tools</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>Packet Monitor</td>
<td>146</td>
</tr>
<tr>
<td></td>
<td>IO Monitor</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>Process Image Monitor</td>
<td>164</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Index</th>
<th>Date</th>
<th>Version</th>
<th>Component</th>
<th>Chapter</th>
<th>Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>12-08-14</td>
<td>2.104.x.x</td>
<td>PBMasterDTMx.dll</td>
<td>All, 1.3.1, 5.5</td>
<td>Revised, Section Requirements updated. Section 'Network Scan' and 'Upload' revised and completed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.104.x.x</td>
<td>PBMasterGui.ocx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>13-08-13</td>
<td>2.107.x.x</td>
<td>PBMasterDTMx.dll</td>
<td>1.3.1, 2.1, 3.2, 3.3, 3.5, 3.6, 5.5, 8.4</td>
<td>Section Requirements, Windows 8 added. Sections Configuration Steps, Settings for Driver and Device Assignment and Driver updated. Section Firmware Download updated. Section Licensing added. Section 'Network Scan' and 'Upload' revised. Section Process Image Monitor added.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.107.x.x</td>
<td>PBMasterGui.ocx</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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>

- Note: <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 ④, ⑤, ⑥ ... or ⑦, ⑧, ⑨ ... 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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- in life support systems;
- in systems in which failures in the software could lead to personal injury or injuries leading to death.

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1.3 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.

### 1.3.1 Requirements

**System Requirements**
- PC with 1 GHz processor or higher
- Windows® XP SP3, Windows® Vista (32 bit) SP2, Windows® 7 (32 bit) SP1, Windows® 8 (32 bit) or Windows® 8 (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

**Note:** If the project file is saved and opened again or if it is used on another PC, the system requirements must match. Particularly the DTM must be installed on the used PC.

**Restriction**

Touch screen is not supported.

**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 107.
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 92.

1.4 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
### 1.4.1 General Device Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO Device</td>
<td>Name of the device</td>
</tr>
<tr>
<td>Vendor</td>
<td>Vendor name of the device</td>
</tr>
<tr>
<td>Device ID</td>
<td>Identification number of the device</td>
</tr>
<tr>
<td>Vendor ID</td>
<td>Identification number of the vendor</td>
</tr>
</tbody>
</table>

Table 3: General Device Information

### 1.4.2 Navigation Area

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

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

**Hide / display Navigation**

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiding</td>
<td>Hiding the navigation area (above right side).</td>
</tr>
<tr>
<td>Opening</td>
<td>Opening the navigation area (below left side).</td>
</tr>
</tbody>
</table>

Figure 2: Navigation Area
1.4.3 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.

<table>
<thead>
<tr>
<th>Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver</td>
</tr>
<tr>
<td>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 Driver on page 28.</td>
</tr>
<tr>
<td>Device Assignment</td>
</tr>
<tr>
<td>On the pane Device Assignment you select the device and assign the device to the driver. For further information, refer to section Device Assignment on page 37.</td>
</tr>
<tr>
<td>Firmware Download</td>
</tr>
<tr>
<td>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 Firmware Download on page 43.</td>
</tr>
<tr>
<td>Licensing</td>
</tr>
<tr>
<td>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 Licensing on page 107.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Parameter</td>
</tr>
<tr>
<td>The Bus Parameters are the basis of an operating data exchange. For further information refer to section Bus Parameters on page 52.</td>
</tr>
<tr>
<td>Process Data</td>
</tr>
<tr>
<td>The Process Data pane serves for the PROFIBUS DP Master DTM as an external process data interface. For further information, refer to section Process Data on page 59.</td>
</tr>
<tr>
<td>Address Table</td>
</tr>
<tr>
<td>The Address Table shows a list of all dpram addresses used in the process data image. For further information, refer to section Address Table on page 60.</td>
</tr>
<tr>
<td>Station Table</td>
</tr>
<tr>
<td>The Station Table displays the list of all configured slave devices. Further information to the station table can be found in the section Station Table on page 63.</td>
</tr>
<tr>
<td>Master Settings</td>
</tr>
<tr>
<td>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 Master Settings on page 64.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Configuration in Run (Online Function)</th>
</tr>
</thead>
<tbody>
<tr>
<td>netDevice &gt; contextmenu &gt; Download</td>
</tr>
<tr>
<td>For information about the Configuration in Run pane, refer to section Configuration in Run on page 91.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis/ Extended Diagnosis</td>
</tr>
<tr>
<td>At the Diagnosis panes information can be read for troubleshooting. For further information, refer to section Overview Diagnosis on page 120 or section Overview Extended Diagnosis on page 127.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packet Monitor/ IO Monitor/ Process Image Monitor</td>
</tr>
<tr>
<td>Under Tools the Packet Monitor and the IO Monitor are provided for test and diagnosis purposes. For further information, refer to section Packet Monitor on page 146, section IO Monitor on page 163 or section Process Image Monitor on page 164.</td>
</tr>
</tbody>
</table>

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 69.
### 1.4.4 OK, Cancel, Apply and Help

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

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

**Table 5: OK, Cancel, Apply and Help**

### 1.4.5 Table Lines

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

<table>
<thead>
<tr>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="First Line" /></td>
<td>To select the first line of a table use <strong>First Line</strong>.</td>
</tr>
<tr>
<td><img src="image" alt="Previous Line" /></td>
<td>To select the previous line of a table use <strong>Previous Line</strong>.</td>
</tr>
<tr>
<td><img src="image" alt="Next Line" /></td>
<td>To select the next line of a table use <strong>Next Line</strong>.</td>
</tr>
<tr>
<td><img src="image" alt="Last Line" /></td>
<td>To select the last line of a table use <strong>Last Line</strong>.</td>
</tr>
<tr>
<td><img src="image" alt="Create a new Line" /></td>
<td>Create a new Line inserts new lines into the table.</td>
</tr>
<tr>
<td><img src="image" alt="Delete selected Line" /></td>
<td>Delete selected Line deletes the selected line from the table.</td>
</tr>
</tbody>
</table>

**Table 6: Selecting, inserting, deleting Table Line**
1.4.6 Status Bar

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

![Status Bar Icons](image)

**Figure 3: Status Bar – Status Fields 1 to 6**

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

**Table 7: Status Bar Icons [1]**

![Status Bar Display Examples](image)

**Figure 4: Status Bar Display Examples**
## 2 Getting started

### 2.1 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.

<table>
<thead>
<tr>
<th>#</th>
<th>Step</th>
<th>Short Description</th>
<th>For detailed information see section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Add PROFIBUS DP Slave in the Device Catalog</td>
<td>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 &gt; Import Device Descriptions.</td>
<td>(See Operating Instruction Manual netDevice and netProject)</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Load device catalog</td>
<td>Depending of the FDT Container: For netDevice: - select Network &gt; Device Catalog, - select Reload Catalog.</td>
<td>(See Operating Instruction Manual netDevice and netProject)</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Create new project / Open existing project</td>
<td>Depending of the frame application. For the configuration software: - select File &gt; New or File &gt; Open.</td>
<td>(See Operating Instruction Manual of the Frame Application)</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Insert Master or Slave into configuration</td>
<td>Depending of the FDT Container: For netDevice: - 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.* (*This step won’t be necessary if the network structure is scanned automatically. See step 17.)</td>
<td>(See Operating Instruction Manual netDevice and netProject)</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Open the Master DTM configuration dialog</td>
<td>Open the Master DTM configuration dialog. - Double click to the device icon of the Master, - The Master DTM configuration dialog is displayed.</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>#</td>
<td>Step</td>
<td>Short Description</td>
<td>For detailed information see section</td>
<td>Page</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>------</td>
</tr>
</tbody>
</table>
| 6  | Verify or adapt Driver Settings     | In the Master DTM configuration dialog:  
- select **Settings > Driver**.  
**Note!** For PC cards cifX the **cifX Device Driver** is preset as a default driver. For all the other Hilscher devices the **netX Driver** is preset as a default driver.  
- 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.  
To search for devices you can check one or multiple drivers simultaneously.  
- Verify that the default driver is checked.  
- If necessary, check another driver or multiple drivers. | Settings for Driver and Device Assignment and Driver | 26  
28 |
| 7  | Configure Driver                   | If you use the **netX Driver**, you respectively must configure it.  
For **netX Driver and communication via TCP/IP** set the IP address of the device:  
- Select **Settings > Driver > netX Driver > TCP Connection**.  
- Via add an IP range.  
- Under **IP Address** enter the IP Address of the device or an IP range.  
- Click **Save**.  
Adjust the driver parameters **netX Driver USB/RS232** only if they differ from the default settings.  
**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. | Configuring netX Driver | 31 |
| 8  | Assign Master device (with or without firmware) | Assign the device to this driver.  
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**. | Selecting the Device (with or without firmware) | 40 |
| 9  | Select and download firmware       | If not yet a firmware was loaded to the device:  
In the Master DTM configuration dialog:  
- select **Settings > Firmware Download**.  
- select **Browse...**  
- select a firmware file,  
- select **Open**.  
- select **Download and Yes**. | Firmware Download | 43 |
<table>
<thead>
<tr>
<th>#</th>
<th>Step</th>
<th>Short Description</th>
<th>For detailed information see section</th>
<th>Page</th>
</tr>
</thead>
</table>
| 10 | Assign Master device once more (with firmware and system channel)   | 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**. | Selecting the Device once more (with Firmware)                                                                                                                                                           | 41   |
| 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 > Parameter**,  
- set the module Parameters,  
- Select **Configuration > Group**,  
- assign the Slave to a group,  
- select **Configuration > Extensions**,  
- set the Extension parameters,  
- select **Configuration > DPV1**,  
- configure the DPV1 functions,  
- close the Slave DTM configuration dialog via **OK**. | (See Operating Instruction Manual Generic Slave DTM for PROFIBUS DP Slave Devices)                                                                 |      |
| 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 Step 17 of this table.  
- close the Master DTM configuration dialog via **OK**. | Configuring Device Parameters | 50   |
|    |                                                                     |                                                                                                                                                                                                             | Bus Parameters                                                                                     | 52   |
|    |                                                                     |                                                                                                                                                                                                             | Process Parameters                                                                                 | 59   |
| 13 | Save project                                                        | Depending of the frame application.  
For the configuration software:  
- select **File > Save**.  
(See Operating Instruction Manual of the Frame Application)                                                                                                  |                                                                                                      |      |
| 14 | Connect Master device                                              | Depending of the FDT Container.  
For netDevice:  
- right click to the device icon of the Master,  
- select **Connect**.  
Connecting/Disconnecting Device                                                                                                                                  |                                                                                                      | 69   |
| 15 | Licensing                                                           | How to order licenses later and how to transfer them to the device.                                                                                                                                           | Licensing                                                                                            | 107  |
| 16 | Download Configuration                                             | Depending of the FDT Container.  
For netDevice:  
- right click to the device icon of the Master,  
- select **Download**.  
- For "Configuration in Run" refer to Step 17 of this table.                                                                                                    | Download Configuration                                                                               | 90   |
<table>
<thead>
<tr>
<th>#</th>
<th>Step</th>
<th>Short Description</th>
<th>For detailed information see section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Network Scan / Live List</td>
<td>As an alternative to manually configure the Slave device, you can automatically scan the network structure by using the context menu <strong>Network Scan</strong>. Then confirm the query whether the module configuration of the Slave device shall be generated and download the configuration to the Master device. Therefore proceed the following steps: 1. Start the <strong>Network Scan</strong> function. 2. Make the settings in the <strong>Scan Response</strong> dialog of the Master DTM. 3. Click <strong>Create devices</strong>. 4. Download of the Device configuration to the Master device (<strong>Download</strong>). Via the context menu <strong>Additional Functions &gt; Live List</strong> you can display the devices present at the bus.</td>
<td>&quot;Network Scan' and 'Upload&quot;</td>
<td>78</td>
</tr>
<tr>
<td>18</td>
<td>Diagnosis</td>
<td>Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select <strong>Diagnosis</strong>. - The Master DTM diagnosis dialog is displayed. (1) Check whether the communication is OK: <strong>Diagnosis &gt; General Diagnosis &gt; Device status</strong> &quot;Communication&quot; must be green! (2) &quot;Communication&quot; is green: Open the IO Monitor and test the input or output data. (3) &quot;Communication&quot; is not green: Use Diagnosis and Extended diagnosis for troubleshooting. - close the Master DTM diagnosis dialog via <strong>OK</strong>.</td>
<td>Overview Diagnosis</td>
<td>120</td>
</tr>
<tr>
<td>19</td>
<td>IO Monitor</td>
<td>Depending of the FDT Container: For netDevice: - right click to the device icon of the Master, - select <strong>Diagnosis</strong>. - select <strong>Tools &gt; IO Monitor</strong>. - Check the input or output data, - close the IO Monitor dialog via <strong>OK</strong>.</td>
<td>IO Monitor</td>
<td>163</td>
</tr>
<tr>
<td>20</td>
<td>Disconnect</td>
<td>Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select <strong>Disconnect</strong>.</td>
<td>Connecting/Disconnecting Device</td>
<td>69</td>
</tr>
</tbody>
</table>

*Table 8: Getting started - Configuration Steps*
### 2.2 “Configuration in Run” Steps

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

<table>
<thead>
<tr>
<th>#</th>
<th>Step</th>
<th>Short Description</th>
<th>For detailed information see section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation:</td>
<td>1. Activate “Configuration in Run”&lt;br&gt;- Double click to the device icon of the Master.&lt;br&gt;In the Master DTM configuration dialog:&lt;br&gt;- select <strong>Configuration &gt; Master Settings</strong>,&lt;br&gt;- check <strong>Enable configuration download during network state “operate”</strong>.&lt;br&gt;2. Define the Number of Bytes after Input Data&lt;br&gt;- In the <strong>Master Settings</strong> pane set <strong>Device Status Offset to Static</strong>.&lt;br&gt;- Enter in the field <strong>bytes after last input data</strong> the number of bytes to be left free between the last input data byte and the device status.&lt;br&gt;- Close the Master DTM configuration dialog via <strong>OK</strong>.&lt;br&gt;3. Create the Configuration.&lt;br&gt;- Create the network configuration and in the PROFIBUS Slave DTM the parameter settings for the respective Slave device, refer to Step 3, 4 and 12 of this table.</td>
<td>Overview Steps for “Configuration in Run”;&lt;br&gt;Activate „Configuration in Run”;&lt;br&gt;Define Number of Bytes after Input Data,&lt;br&gt;Create the Configuration,</td>
<td>93</td>
</tr>
<tr>
<td>2</td>
<td>Change Configuration via Configuration in Run</td>
<td>1. Expand or change the Configuration.&lt;br&gt;- Change the network configuration and adjust the parameter settings for the respective Slave device in the PROFIBUS Slave DTM, refer to Step 3, 4 and 12 of this table.&lt;br&gt;- Close the Slave DTM configuration dialog via <strong>OK</strong>.&lt;br&gt;Note: The <strong>Address</strong> and the <strong>Baud Rate</strong> of the PROFIBUS DP Master device can not be changed in the new configuration (new database).</td>
<td>Change the Configuration</td>
<td>96</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>2. Start the Download of the changed Configuration.&lt;br&gt;For netDevice:&lt;br&gt;- Right click to the device icon of the Master.&lt;br&gt;- Select <strong>Download</strong>.&lt;br&gt;- The download is performed.&lt;br&gt;- The dialog pane <strong>Configuration in Run</strong> is opened.&lt;br&gt;Note: The <strong>Address</strong> and the <strong>Baud Rate</strong> of the PROFIBUS DP Master device can not be changed in the new configuration (new database).</td>
<td>Start the Download,</td>
<td>97</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>3. Activate Changes.&lt;br&gt;- Select <strong>Activate changes</strong>.&lt;br&gt;- The <strong>Configuration in Run</strong> dialog closes.&lt;br&gt;- The <strong>Information</strong> pane with the text <strong>The database changes were successfully activated</strong>. is displayed.&lt;br&gt;For more see next page.</td>
<td>Activate or reject Changes</td>
<td>102</td>
</tr>
<tr>
<td>#</td>
<td>Step</td>
<td>Short Description</td>
<td>For detailed information see section</td>
<td>Page</td>
</tr>
<tr>
<td>----</td>
<td>-----------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>continued</td>
<td>3. Evaluate Configuration Data.</td>
<td>Evaluate Configuration Data.</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Check in the dialog pane <strong>Configuration in Run</strong>, whether the changed configuration (new data base) can be applied or not.</td>
<td>Activate or reject Changes.</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note</strong>: The changed configuration (new database) can only be accepted if:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- the changes to the database parameters are possible,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- the Master Settings (Startup, Watchdog, Statusoffset, Busparameter) have not changed and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- the Master State is <strong>OK</strong> (= 0x00000000).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- In the <strong>Configuration in Run</strong> pane select <strong>Activate changes</strong>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The <strong>Configuration in Run</strong> dialog closes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The Information pane with the text <strong>The database changes were successfully activated</strong> is displayed or respectively an error message.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Activate or reject Changes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If the new configuration can not be applied</td>
<td>In this case you may need to increase the number of bytes after the input data.</td>
<td>Increase the Number of Bytes after the Input Data</td>
<td>103</td>
</tr>
</tbody>
</table>

Table 9: Getting started - “Configuration in Run” Steps
3 Settings

3.1 Overview Settings

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

<table>
<thead>
<tr>
<th>PROFIBUS DP Master DTM</th>
<th>Folder Name / Section</th>
<th>Subsection</th>
<th>Manual Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Driver</td>
<td>Verify or adapt Driver Settings</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cifX Device Driver</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>netX Driver</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Configuring netX Driver</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Device Assignment</td>
<td>Scanning for Devices</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scanning for all Devices or for suitable only</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Selecting the Device (with or without firmware)</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Selecting the Device once more (with Firmware)</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Firmware Download</td>
<td></td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Licensing</td>
<td></td>
<td>107</td>
</tr>
</tbody>
</table>

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 26.

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

- Select Settings > Driver > [Name of the assigned driver].
- Press the F1 key.
3.2 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 92.

**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:

**Verify or adapt 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 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.

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.

**Configure 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**.

Select and download 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 devices.

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.
3.3 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.

<table>
<thead>
<tr>
<th>Driver</th>
<th>Version</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIFX Device Driver</td>
<td>1.101.1.9801</td>
<td>(868ECE5E-CE92-4C0E-84A9-64F63AF7A3FA)</td>
</tr>
<tr>
<td>3SGateway Driver for netX (V3.x)</td>
<td>0.9.1.2</td>
<td>(787CD3A9-4CF6-4259-8E4D-10986A68EA91)</td>
</tr>
<tr>
<td>netX Driver</td>
<td>1.103.2.5183</td>
<td>(B54C8CC7-F333-4135-3405-6E12FC8BE6E2)</td>
</tr>
</tbody>
</table>

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.

3.3.1 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.

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.

![Figure 8: Manual Selection of multiple drivers (Example)](image-url)
3.3.2 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.

3.3.3 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.
3.3.4 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.
3.3.5 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.

3.3.5.1 Driver Parameters for netX Driver - USB/RS232 Connection

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

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

- The **USB/RS232 Connection** dialog is displayed:

![Figure 9: netX Driver > USB/RS232 Connection](image)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable USB/RS232 Connector (Restart of ODM required)</td>
<td>checked: The netX Driver can communicate via the USB/RS232 interface. unchecked: The netX Driver can not communicate via the USB/RS232 interface. If the check mark for Enable USB/RS232 Connector is set or removed, then the ODM server must be restarted 1, to make the new setting valid.</td>
<td>checked, unchecked; Default: unchecked</td>
</tr>
<tr>
<td>Select Port</td>
<td>Depending on the COM ports (interfaces) available on the PC, they will be listed under Select Port.</td>
<td>COM 1 to COM N</td>
</tr>
<tr>
<td>Port Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disable Port</td>
<td>checked: No connection. unchecked: The netX Driver tries to establish a connection using the configured USB/RS232 interface.</td>
<td>checked, unchecked (Default)</td>
</tr>
<tr>
<td>Baud rate</td>
<td>Transfer rate: number of bits per second. The device must support the baud rate.</td>
<td>9.6, 19.2, 38.4, 57.6 or 115.2 [kBit/s]; Default (RS232): 115.2 [kBit/s]</td>
</tr>
<tr>
<td>Stop bits</td>
<td>Number of stop bits sent after the transfer of the send data for synchronization purposes to the receiver.</td>
<td>Stop bit: 1, 1.5, 2; Default (RS232): 1</td>
</tr>
<tr>
<td>Send Timeout</td>
<td>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.</td>
<td>100 … 60.000 [ms]; Default (RS232 and USB): 1000 ms</td>
</tr>
<tr>
<td>Reset Timeout</td>
<td>Maximum time for a device reset, including the re-initialization of the physical interface used for the communication.</td>
<td>100 … 60.000 [ms]; Default (RS232 and USB): 5000 ms</td>
</tr>
<tr>
<td>Byte size</td>
<td>Number of bits per byte by byte specification</td>
<td>7 Bit, 8 Bit; Default (RS232): 8 Bit</td>
</tr>
<tr>
<td>Parity</td>
<td>In the error detection in data transmission using parity bits, &quot;parity&quot; describes the number of bits occupied with 1 in the transmitted information word. No Parity: no parity bit Odd Parity: The parity is &quot;odd&quot; if the number of bits occupied with 1 in the transmitted information word will be odd. Even parity: The parity is &quot;even&quot; if the number of bits occupied with 1 in the transmitted information word will be even. Mark Parity: if the parity bit is always 1, this will be named mark-parity (the bit does not contain any information). Space Parity: if the parity bit always 0, this will be named space-parity (the bit represents an empty space).</td>
<td>No Parity, Odd Parity, Even Parity, Mark Parity, Space Parity; Default (RS232): No Parity</td>
</tr>
<tr>
<td>Keep Alive Timeout</td>
<td>The &quot;Keep Alive&quot; 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.</td>
<td>100 … 60.000 [ms]; Default (RS232 and USB): 2000 ms</td>
</tr>
<tr>
<td>Restore</td>
<td>Resets all settings in the configuration dialog to the default values.</td>
<td></td>
</tr>
<tr>
<td>Save</td>
<td>Saving all settings made in the configuration dialog netX Driver &gt; Save USB/RS232 Connection, i. e. only for the selected connection type.</td>
<td></td>
</tr>
<tr>
<td>Save All</td>
<td>Saving all settings made in the configuration dialog netX Driver, i. e. for all connection types.</td>
<td></td>
</tr>
</tbody>
</table>

Table 12: Parameters netX Driver > USB/RS232 Connection
3.3.6 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.
3.3.6.1 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](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Default Value</th>
</tr>
</thead>
</table>
| Enable TCP Connector (Restart of ODM required) | checked: The netX Driver can communicate via the TCP/IP interface.  
uncheked: The netX Driver can not communicate via the TCP/IP interface.  
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.  
¹ Restart the ODM server via the ODMV3 Tray Application:  
- In the foot line click on using the right mouse key.  
- In the context menu select Service > Start. | checked, unchecked; Default: unchecked |
| Select IP Range | Via Select IP Range already created IP ranges can be selected.  
Via an additional IP range can be added.  
Via an IP range can be deleted. |
### Table 13: Parameters netX Driver > TCP Connection

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scan Timeout [ms]</strong></td>
<td>With Scan Timeout can be set, how long to wait for a response while a connection is established.</td>
<td>10 … 10000 [ms]; Default: 100 ms</td>
</tr>
<tr>
<td><strong>IP Range Configuration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disable IP Range</td>
<td>checked: No connection. uncheck: The netX Driver tries to establish a connection using the configured TCP/IP interface.</td>
<td>checked, unchecked (Default)</td>
</tr>
<tr>
<td>IP Address (left)</td>
<td>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).</td>
<td>valid IP address; Default: 192.168.1.1</td>
</tr>
<tr>
<td>Use IP Range</td>
<td>checked: An IP address range is used. uncheck: Only one IP address is used.</td>
<td>checked, unchecked; Default: unchecked</td>
</tr>
<tr>
<td>IP Address (right)</td>
<td>Enter the ending address of the IP scanning range, (only if Use IP Range is checked).</td>
<td>valid IP address; Default: 0.0.0.0</td>
</tr>
<tr>
<td>Address Count</td>
<td>Displays the scanning range address count, depending on the selected IP-start or IP-end address. (For this read the note given below.)</td>
<td>recommended: 10</td>
</tr>
<tr>
<td>TCP Port</td>
<td>Identifies the endpoint of a logical connection or addresses a specific endpoint on the device or PC.</td>
<td>0 - 65535; Default Hilscher device: 50111</td>
</tr>
<tr>
<td>Send Timeout [ms]</td>
<td>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.</td>
<td>100 … 60.000 [ms]; Default (TCP/IP): 1000 ms</td>
</tr>
<tr>
<td>Reset Timeout [ms]</td>
<td>Maximum time for a device reset, including the re-initialization of the physical interface used for the communication.</td>
<td>100 … 60.000 [ms]; Default (TCP/IP): 2000 ms</td>
</tr>
<tr>
<td>Keep Alive Timeout [ms]</td>
<td>The &quot;Keep Alive&quot; 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.</td>
<td>100 … 60.000 [ms]; Default (TCP/IP): 2000 ms</td>
</tr>
<tr>
<td><strong>Restore</strong></td>
<td>Resets all settings in the configuration dialog to the default values.</td>
<td></td>
</tr>
<tr>
<td><strong>Save</strong></td>
<td>Saving all settings made in the configuration dialog netX Driver &gt; Save TCP/IP Connection, i.e. only for the selected connection type.</td>
<td></td>
</tr>
<tr>
<td><strong>Save All</strong></td>
<td>Saving all settings made in the configuration dialog netX Driver, i.e. for all connection types.</td>
<td></td>
</tr>
</tbody>
</table>

**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.
3.4 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 69.

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.

### 3.4.1 Scanning for Devices

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

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

   ![Device Assignment dialog pane](image)

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

*Table 14: Parameters of the Device Assignment*
3.4.1.1 Scanning for all Devices or for suitable only

**all**

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

---

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

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

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

**suitable only**

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

In the table all devices are displayed, which can be connected to the 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.
3.4.2 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 Assignment](image)

**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 to section **Firmware Download** on page 43 or to section **Selecting the Device once more (with Firmware)** on page 41.
3.4.3 Selecting the Device once more (with Firmware)

**Note:** For repeated download this step is omitted.

To select the PROFINET-IO Master device (with firmware and defined system channel) once more, proceed as described hereafter:

1. **Under Device Selection select all.**
2. Select **Scan.**
3. **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.**
4. **Check the appropriate device.**

---

**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).**
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.

<table>
<thead>
<tr>
<th>Device</th>
<th>Hardware Port 0/1/2/3</th>
<th>Slot number</th>
<th>Serial number</th>
<th>Driver</th>
<th>Channel Protocol</th>
<th>Access path</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔ Device 0/</td>
<td>/PROFIBUS/</td>
<td>1</td>
<td>20148</td>
<td>CifX Device Driver</td>
<td>PROFIBUS DP Master</td>
<td>./cifX/Ch0</td>
</tr>
</tbody>
</table>

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 69.
3.5 Firmware Download

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

CAUTION! The firmware download
- Stops the bus communication,
- erases the configuration data base and
- overwrites the existing firmware in the device.

To complete the update and to make the device operable again, please re-download the configuration when this operation has finished.

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

For further information refer to section Overview Settings on page 25.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name of the Firmware</td>
</tr>
<tr>
<td>Version</td>
<td>Version and Build Version of the Firmware</td>
</tr>
<tr>
<td>Browse…</td>
<td>Button to select the firmware file.</td>
</tr>
<tr>
<td>Download</td>
<td>Button to download the firmware.</td>
</tr>
</tbody>
</table>

   Table 15: Parameter Firmware Download

2. Select Browse.
   - The selection window Select Firmware File is displayed.
   - Enlarge the selection window to view the columns Hardware and Version.
### Figure 17: Window ‘Select Firmware File’ (Example CIFX)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Column Name</strong></td>
<td>File name of the firmware file</td>
<td>nxf, nxm</td>
</tr>
<tr>
<td></td>
<td>To sort the entries of the window <strong>Select Firmware File</strong> by name click to the column head <strong>[Name]</strong>.</td>
<td></td>
</tr>
<tr>
<td><strong>Column Firmware</strong></td>
<td>Name of the firmware (consisting of the protocol name and protocol class)</td>
<td>e.g. CIFX, COMX, COMX 51, NETJACK 10, NETJACK 50,</td>
</tr>
<tr>
<td><strong>Column Hardware</strong></td>
<td>Device class of the associated hardware</td>
<td></td>
</tr>
</tbody>
</table>

- ECM
- ECS V4.0
- ELM_mit_QC
- PNM
- PNS V3.5.0
- SIM
- CIF
- CIF-DP
- CIF-DPS
- CIF-CCS
- CIF-COM
- CIF-COS
- CIF-DSM
- CIF-DPM
- CIF-DPS
- CIF-CMM
- CIF-CDS
- CIF-CCS
- CIF-DSM
- CIF-DPM
- CIF-DPS
- CIF-CCS
- CIF-CDS
- CIF-CCS
- CIF-CCS
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 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.

3. In the selection window mark the firmware file to be loaded using the mouse.
   - In the selection window under **Firmware** the name and the version of the firmware are displayed.

4. In the selection window select the **Open** button.
   - A validation is made, whether the selected firmware file is suitable for the PROFIBUS DP Master DTM.
   - In the dialog pane **Firmware Download** during the validation **Download** is grayed out.
   - The selection window is closed.

5. In the dialog pane **Firmware Download** click to the **Download** button,
to download the firmware.

Firmware is not valid for the selected device

➢ If a firmware file is selected, which is not valid for the assigned device, the request **Select Firmware File** will be displayed.

![Select Firmware File](image)

Figure 18: Request Select Firmware File - Example

➢ Answer to the request with **No**.

![Firmware Download](image)

Figure 19: Firmware Download – Download

➢ The request **Do you really want to download the firmware?** is displayed.

![Question](image)

Figure 20: Firmware-Download – Question
During the download a progress bar is displayed, in the status line a clock / green hook symbol is displayed and Download is grayed out.

Figure 21: Clock Symbol and Hook Symbol green

Figure 22: Firmware Download - Progress Bar
3.6 Licensing

To open the Licensing pane:
1. In the navigation area select Settings > Licensing.
2. The dialog Licensing pane is displayed.

Figure 23: Licensing

For a detailed description refer to section Licensing on page 107.
4 Configuration

4.1 Overview Configuration

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

<table>
<thead>
<tr>
<th>PROFIBUS DP Master DTM</th>
<th>Folder Name / Section</th>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bus Parameters</td>
<td>Profile</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bus Parameters</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bus Monitoring</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Error Handling</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calculated Timing</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>Process Data</td>
<td></td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Address Table</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Station Table</td>
<td></td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Master Settings</td>
<td></td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Start of Bus Communication</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Application Monitoring</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Process Image Storage Format</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Module Alignment</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Process Data Handshake</td>
<td></td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Advanced</td>
<td></td>
<td>67</td>
</tr>
</tbody>
</table>

Table 17: Descriptions of the Dialog Panes Configuration

Notice the descriptions in the section Configuration Steps on page 19.
For information on how to proceed a configuration update during network is in OPERATE state, please refer to section Configuration in Run on page 91.
4.2 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:

**Busparameters**
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

**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 90.

Further Information

For more information refer to section *Bus Parameters* on page 52, to section *Process Data* on page 59, to section *Address Table* on page 60, to section *Station Table* on page 63 and to section *Master Settings* on page 64, 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 91,
4.3 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.

### 4.3.1 Profile

![Figure 24: Bus Parameters > Profile](image)

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.
4.3.2 Bus Parameters

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 90.

<table>
<thead>
<tr>
<th>Bus Parameters</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baud Rate</strong></td>
<td>The <strong>Baud Rate</strong> is the data transfer speed: number of Bits per second. The <strong>Baud Rate</strong> 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.</td>
</tr>
<tr>
<td><strong>Baud Rate</strong></td>
<td><strong>Bit time (tBit)</strong></td>
</tr>
<tr>
<td>9.6 kBit/s</td>
<td>104.2 us</td>
</tr>
<tr>
<td>19.2 kBit/s</td>
<td>52.1 us</td>
</tr>
<tr>
<td>31.25 kBit/s</td>
<td>32 us</td>
</tr>
<tr>
<td>45.45 kBit/s</td>
<td>22 us</td>
</tr>
<tr>
<td>93.75 kBit/s</td>
<td>10.7 us</td>
</tr>
<tr>
<td>187.5 kBit/s</td>
<td>5.3 us</td>
</tr>
<tr>
<td>300 kBit/s</td>
<td>2 us</td>
</tr>
<tr>
<td><strong>1500 kBit/s</strong></td>
<td><strong>666.7 ns</strong></td>
</tr>
<tr>
<td>3000 kBit/s</td>
<td>333.3 ns</td>
</tr>
<tr>
<td>6000 kBit/s</td>
<td>166.7 ns</td>
</tr>
<tr>
<td>12000 kBit/s</td>
<td>83.3 ns</td>
</tr>
</tbody>
</table>

**Slot time (TSL)**

"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 TSDR)**

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 TSDR)**

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 (TQUI)**

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.)
<table>
<thead>
<tr>
<th>Bus Parameters</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup Time (TSET)</td>
<td>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: 0 .. 255 (The default value depends from the baud rate.)</td>
</tr>
<tr>
<td>Station Address</td>
<td>The Station Address is the individual device address of the Master device on the bus. Value range: 0 .. 125</td>
</tr>
<tr>
<td>Target Rotation Time (TTR)</td>
<td>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)</td>
</tr>
<tr>
<td>GAP Actualization Factor (G)</td>
<td>Factor for determining after how many Token cycles an added participant is accepted into the Token ring. After expiry of the time period ( G \times T_{TR} ), the Station searches to see whether a further participant wishes to be accepted into the logical ring. Value range: 0 .. 10 .. 255</td>
</tr>
<tr>
<td>Max. Retry Limit</td>
<td>Maximum number of repeats in order to reach a Station. Value range: 1 .. 15 (The default value depends from the baud rate,)</td>
</tr>
<tr>
<td>Highest Station Address (HSA)</td>
<td>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</td>
</tr>
</tbody>
</table>

*Table 18: Bus Parameters > Bus Parameters*
### 4.3.2.1 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.

![Note bus configuration was changed, Bus Parameters not longer actual](image_url)

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

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

### 4.3.2.2 Additional Conditions for correct Communication

\[
T_{QUI} < \min T_{SDR} \\
T_{RDY} < \min T_{SDR} \\
T_{QUI} < T_{RDY}
\]

### 4.3.2.3 Representation of the Bus Parameters

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

\[
t_{\text{Bit}} = \frac{1}{\text{Baud rate (Baud rate in Bit/s)}}
\]

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

\[
\text{Bit time} = \text{Time [milliseconds]} \times \text{Baud rate}
\]
4.3.3 **Bus Monitoring**

<table>
<thead>
<tr>
<th>Bus Parameters</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Control Time</strong></td>
<td>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: 1.. $2^{31}$-1 (= 4,294,967,295) (The default value depends from the baud rate.)</td>
</tr>
<tr>
<td><strong>Min. Slave Interval</strong></td>
<td>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: 1 .. 65535 (The default value depends of the Slave types)</td>
</tr>
<tr>
<td><strong>Override slave specific Watchdog Control Time</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Watchdog Control Time</strong></td>
<td>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 .. 65025 (The default value depends of the number of Slaves attached to the Master and their configuration)</td>
</tr>
</tbody>
</table>

Table 19: Bus Parameters > Bus Monitoring

![Figure 28: Bus Parameters > Bus Monitoring](image-url)
4.3.3.1 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.

![Bus Monitoring Parameters](image)

*Figure 29: 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 30: 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.

4.3.4 Error Handling

*Figure 31: 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 121 or to the **Data Control Time** refer to section **Bus Monitoring** on page 56.
4.3.5 Calculated Timing

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

<table>
<thead>
<tr>
<th>Calculated Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tid1: 37 ms</td>
</tr>
<tr>
<td>Tid2: 150 ms</td>
</tr>
</tbody>
</table>

*Figure 32: 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:

<table>
<thead>
<tr>
<th>Bus Time</th>
<th>Meaning</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tid1</td>
<td>Tid1 starts after the Initiator has received an acknowledgement, answer or a Token telegram.</td>
<td>$T_{id1} = \max (T_{QUI} + 2 \cdot T_{SET} + 2 + T_{SYN}, \min T_{SDR})$</td>
</tr>
<tr>
<td>Tid2</td>
<td>Tid2 starts after the Initiator has sent a telegram that is not acknowledged.</td>
<td>$T_{id2} = \max (T_{QUI} + 2 \cdot T_{SET} + 2 + T_{SYN}, \max T_{SDR})$</td>
</tr>
</tbody>
</table>

*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.
4.4 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).

<table>
<thead>
<tr>
<th>Type</th>
<th>Tag</th>
<th>SCADA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 byte input</td>
<td>Input_1</td>
<td></td>
</tr>
<tr>
<td>8 byte input</td>
<td>Input_2</td>
<td></td>
</tr>
<tr>
<td>16 bit int input</td>
<td>Input_3</td>
<td></td>
</tr>
<tr>
<td>2 word input</td>
<td>Input_4</td>
<td></td>
</tr>
<tr>
<td>32 bit load</td>
<td>Input_5</td>
<td></td>
</tr>
<tr>
<td>32 bit store</td>
<td>Input_6</td>
<td></td>
</tr>
<tr>
<td>32 bit move</td>
<td>Input_7</td>
<td></td>
</tr>
<tr>
<td>32 bit load</td>
<td>Input_8</td>
<td></td>
</tr>
<tr>
<td>32 bit store</td>
<td>Input_9</td>
<td></td>
</tr>
</tbody>
</table>

Figure 33: Process Data (*The name of the Slave device is displayed.*)

<table>
<thead>
<tr>
<th>Column</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Device labeling provided by the hardware: Also description of the modules or input or output signals configured to the device.</td>
</tr>
<tr>
<td>Tag</td>
<td>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).</td>
</tr>
<tr>
<td>SCADA</td>
<td>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“.</td>
</tr>
</tbody>
</table>

Table 21: Process Data
4.5 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](image)

*Figure 34: Configuration > Address Table (In the Figure shown here, in the column Device or Name example devices are displayed.)*
4.5.1 Auto Addressing, Display Mode, CSV Export

**Auto Addressing**

![Auto Addressing](image)

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.

![Display Mode](image)

**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.
4.5.2 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.

**Figure 37: Configuration > Address Table - Inputs / Outputs (In the Figure shown here, in the column Device or Name example devices are displayed.)**

<table>
<thead>
<tr>
<th>Station Address</th>
<th>Device</th>
<th>Name</th>
<th>Module</th>
<th>Type</th>
<th>Length</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 CB_AE32-DPS</td>
<td>CB_AE32-DPS</td>
<td>2 byte input IB</td>
<td>2</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>0 CB_AE32-DPS</td>
<td>CB_AE32-DPS</td>
<td>2 byte input IB</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station Address</th>
<th>Device</th>
<th>Name</th>
<th>Module</th>
<th>Type</th>
<th>Length</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 CB_AE32-DPS</td>
<td>CB_AE32-DPS</td>
<td>2 byte output QG</td>
<td>2</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>0 CB_AE32-DPS</td>
<td>CB_AE32-DPS</td>
<td>2 byte output QG</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

**Table 22: Address Table Pane Parameters - Inputs / Outputs**

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

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

**Figure 38: Station Table (In the Figure shown here, in the column Device or Name example devices are displayed.)**

<table>
<thead>
<tr>
<th>Column</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activate</td>
<td>Checkbox, to activate / deactivate a station</td>
</tr>
<tr>
<td>Station Address</td>
<td>Station address of the salve assigned</td>
</tr>
<tr>
<td></td>
<td>Range for valid station address: 0 - 125</td>
</tr>
<tr>
<td>Device</td>
<td>Actual device name of the assigned Slave device from the GSE file.</td>
</tr>
<tr>
<td>Name</td>
<td>Free definable symbolic name of the assigned Slave device.</td>
</tr>
<tr>
<td>Vendor</td>
<td>Name of the vendor of the device</td>
</tr>
</tbody>
</table>

*Table 23: Station Table*
4.7 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 90).

➢ Open Settings > Master Settings.

![Figure 39: Configuration > Master Settings](Image)

**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.
4.7.1 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.

4.7.2 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.

<table>
<thead>
<tr>
<th>Watchdog time</th>
<th>Range of Value / Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range of values</td>
<td>20 … 65535 ms</td>
</tr>
<tr>
<td>Default</td>
<td>1000 ms</td>
</tr>
<tr>
<td>The software watchdog is deactivated</td>
<td>0 ms</td>
</tr>
</tbody>
</table>

**Note:** The setting options under **Application Monitoring** for client specific variants of the configuration software can differ from the setting options displayed here.
4.7.3 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.

<table>
<thead>
<tr>
<th>Storage format (word module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Endian</td>
</tr>
<tr>
<td>Little Endian</td>
</tr>
</tbody>
</table>

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.

4.7.4 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byte boundaries</td>
<td>The module address can start at any byte offset.</td>
</tr>
<tr>
<td>2 Byte boundaries</td>
<td>The module address can only start at even byte offsets.</td>
</tr>
</tbody>
</table>

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.
4.7.5 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.

---

4.7.6 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.

- 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.
4.7.7 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.

![Figure 46: Master Settings > Device Status Offset](image)

<table>
<thead>
<tr>
<th>Device Status Offset</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic calculation:</td>
<td>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.</td>
</tr>
<tr>
<td>Static:</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.
5 Online Functions

5.1 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. Select one or several 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 devices (with or without firmware) and apply the selection.

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 25.

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.
**Dismissing 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.
5.2 Debug Mode

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

The debug mode allows to identify 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**)
5.2.1 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 26.
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.
5.2.2 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.

- **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**).
### 5.2.3 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.

<table>
<thead>
<tr>
<th>Master Busline</th>
<th>Next to the Master device icon</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>light green</td>
<td></td>
<td>The Master device has cyclic communication</td>
</tr>
<tr>
<td>blue</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>red</td>
<td></td>
<td>The Master device is in STOP state. The cyclic communication has been stopped.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Branch Line of the Slave device</th>
<th>Next to the Slave device icon</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>light green</td>
<td></td>
<td>The Master device has cyclic communication to this Slave device.</td>
</tr>
<tr>
<td>yellow (yellow)</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>blue</td>
<td></td>
<td>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).</td>
</tr>
<tr>
<td>red</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>gray</td>
<td></td>
<td>The Slave device is not configured. I.e., in the configuration of the Master device there are no configuration parameters to this Slave available.</td>
</tr>
</tbody>
</table>

*Table 28: Debug Mode Busline Colors and Debug Icons*
5.2.4 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.

5.2.5 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 .

5.3 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 69.

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

![Figure 48: Set Station Address](image)

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.
5.4 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 69.

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

   Figure 49: 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.
5.5 ‘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 in the Master device. For more see section *Configuration Steps* on page 19.

**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 88.
5.5.1 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.

   ![Network Scan Example](image)

   **Figure 50: 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.

![Scan Response dialog of the Master DTM](image)

*Figure 51: Scan Response dialog of the Master DTM (Example)*
5.5.2 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.

   ![Scan Response dialog of the Master DTM](image)

   **Figure 52: 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)
5.5.3 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.

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Bar</td>
<td>With the text: Symbolic Name of the Master Device [Device Description] &lt;Device Address&gt; (#Network ID) channel/Profibus.</td>
</tr>
<tr>
<td>Instruction</td>
<td>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.</td>
</tr>
<tr>
<td>Station Address</td>
<td>PROFIBUS DP station address, which displays the logical sequence of the devices within a PROFIBUS network.</td>
</tr>
<tr>
<td>Colors</td>
<td>Meaning of colors in the Scan Response dialog of the Master DTM:</td>
</tr>
<tr>
<td></td>
<td><strong>Red</strong>: If a field marked in red appears in column Station address, the respective DTM device is already present on the network.</td>
</tr>
<tr>
<td></td>
<td><strong>Yellow</strong>: If a field appears marked in yellow, a selection can be made by a combo box.</td>
</tr>
<tr>
<td>Device Type ID</td>
<td>Identification (ID): Ident code read out from each device (Unique Identifier)</td>
</tr>
<tr>
<td>Sub Device Type</td>
<td>Not used for PROFIBUS.</td>
</tr>
<tr>
<td>DTM to Use</td>
<td>Display of the DTM devices, which are assigned to the ident codes found during scanning:</td>
</tr>
<tr>
<td></td>
<td><em>Use Hilscher generic DTMs if available</em> is displayed without color marking, there is no selection possibility.</td>
</tr>
<tr>
<td></td>
<td><em>Use Hilscher generic DTNs if available</em> is displayed marked in yellow, the following selection can be made:</td>
</tr>
<tr>
<td></td>
<td>(In the figure shown example DTMs are displayed.)</td>
</tr>
<tr>
<td></td>
<td>A selection will only be displayed if under Creation Mode &gt; Choose for each device was selected and if another DTM has been found for the respective device.</td>
</tr>
<tr>
<td>Device Class</td>
<td>Device class of the PROFIBUS DP Slave devices.</td>
</tr>
<tr>
<td>DTM Device</td>
<td>Found DTM device (the device name as taken from the DTM)</td>
</tr>
<tr>
<td></td>
<td>Only the device description files or DTM devices can be displayed within the column DTM Devices:</td>
</tr>
<tr>
<td></td>
<td><em>Which are available in the device catalog for the scanned ident code,</em></td>
</tr>
<tr>
<td></td>
<td><em>Respectively, which belong to the selection made under Creation Mode</em></td>
</tr>
<tr>
<td></td>
<td><em>and which belong to the selection made under Creation Mode &gt; Choose for each device under DTM to create.</em></td>
</tr>
<tr>
<td></td>
<td>For each device type ID in the column DTM Device the following is displayed:</td>
</tr>
<tr>
<td></td>
<td><em>no device,</em></td>
</tr>
<tr>
<td></td>
<td><em>one single device</em></td>
</tr>
<tr>
<td></td>
<td><em>or multiple devices (within a combobox).</em></td>
</tr>
<tr>
<td>Column</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>Action</td>
<td>The action to be performed with the corresponding device during the process of device creation.</td>
</tr>
<tr>
<td></td>
<td>- If no device is present within the current project, the selection <strong>Add/Skip</strong> will appear.</td>
</tr>
<tr>
<td></td>
<td>- If there is already a device present within the current project, the selection <strong>Replace/Skip</strong> will appear.</td>
</tr>
<tr>
<td></td>
<td><strong>Add</strong> adds a new instance for the selected DTM during the process of creation of a device.</td>
</tr>
<tr>
<td></td>
<td><strong>Skip</strong> skips the process of creation of a device for the respective device address.</td>
</tr>
<tr>
<td></td>
<td><strong>Replace</strong> 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.</td>
</tr>
</tbody>
</table>

### Table below

The lower table in the **Scan Response** dialog of the Master DTM shows a comparison of possible differences in device information taken from:

- The hardware device (displayed in central column of 3)
- and the DTM (displayed in right column of 3)

The left column contains which information is compared between the information sources ‘Hardware Device’ and ‘DTM’.

**Note**: If a field contains the text ‘*n/a*’, the corresponding information is not applicable in the current context (fieldbus).

### Creation Mode

Under **Creation Mode** one of the following options can be selected:

- User Hilscher generic DTM if available
- Use vendors DTMs if available
- Choose for each device

### Create Devices

About **Create Devices** …

- 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.

In case a conflict occurs between a device description file and a device, the **Upload** dialog appears, where conflicts are displayed in red.

**Cancel**

Click **Cancel** to leave the dialog without creating a Device.

---

*Table 29: Description on the Scan Response dialog of the Master DTM*
5.5.4 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 53: Query about the Generation of the Module Configuration (Example)](image)

- 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.
Note: If a module identifier conflict occurs when scanning the module 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 88.
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 55: Uploaded Modules (Example)
5.5.5 Download to the PROFIBUS DP Master Device

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).**
5.5.6 Resolving Module Identifier Conflicts

5.5.6.1 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.

![Upload Dialog](Figure 56: Network Scan > Create Devices > Upload)

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

*Table 30: Network Scan > Create Devices > Upload*
5.5.6.2 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**.

5.5.6.3 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.

### 5.6 Download Configuration

**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 section **Connecting/Disconnecting Device** on page 69.

To transfer the configuration with the corresponding parameter data to the PROFIBUS DP Master device you download the data to it using the frame application of the configuration software.
5.7 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 57: Overview Configuration Software and Master Firmware](image_url)
5.7.1 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.**
5.7.2 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 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.
5.7.3 **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 67).
- Check **Enable configuration download during network state "operate"**.

![Figure 58: Enable configuration download during network state "operate" - checked](image)

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

5.7.4 **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 68).
- Set **Device Status Offset** to **Static**.

![Figure 59: Master Settings > Device Status Offset](image)

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

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

Notice the descriptions in the sections “Configuration in Run” on page 23 or Configuring Device Parameters on page 50.
5.7.6 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 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 Master DTM.
   - Click OK.
   - The setting made will be saved. The Master DTM configuration dialog will be closed.

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

Notice the descriptions in the sections “Configuration in Run” on page 23 or Configuring Device Parameters on page 50.
5.7.7  Start the Download

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.
5.7.8 **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.

![Configuration in Run Dialog](image)

- 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.

*Figure 60: Dialog Pane Configuration in Run (Example)*
### “Devices” List

<table>
<thead>
<tr>
<th>Station Address</th>
<th>Device</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>CIF50-DPS</td>
<td>SLAVE_1</td>
</tr>
<tr>
<td>5</td>
<td>CIF80-DPS</td>
<td>SLAVE_4</td>
</tr>
<tr>
<td>6</td>
<td>NETX 50 DP/DPS</td>
<td>SLAVE_5</td>
</tr>
<tr>
<td>7</td>
<td>E1 200M IM153-1 DPV1</td>
<td>SLAVE_6</td>
</tr>
</tbody>
</table>

Figure 61: 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:

- **Red**: Configuration can not be activated in OPERATE mode.
- **Yellow**: Configuration is not sure, please check it.
- **Green**: Configuration can be activated in OPERATE mode.

*Figure 62: Dialog Pane Configuration in Run – Meaning of the Colors*

- For a **red** configuration state entry you cannot 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.
5.7.8.2 "Master" List

<table>
<thead>
<tr>
<th>Database Parameter</th>
<th>Changed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Settings</td>
<td></td>
</tr>
<tr>
<td>Startup</td>
<td>No</td>
</tr>
<tr>
<td>Watchdog</td>
<td>No</td>
</tr>
<tr>
<td>Statusoffset</td>
<td>Yes</td>
</tr>
<tr>
<td>Busparameter</td>
<td>Yes</td>
</tr>
<tr>
<td>Master State</td>
<td>OK</td>
</tr>
<tr>
<td>0x00000000</td>
<td></td>
</tr>
</tbody>
</table>

Figure 63: 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 / 0x0000000, 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 / = 0x0000000, 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.
5.7.9 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 64: Dialog Pane Configuration in Run – Activate changes, Cancel, Help](image)

- 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 database. The pane **Error** is displayed, e.g. with the text **Error by activation of database! 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.
5.7.10 **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**.
5.7.11 Quick Reference Dialog Pane "Configuration in Run"

<table>
<thead>
<tr>
<th>Devices</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Station Address</td>
<td>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</td>
</tr>
<tr>
<td>Device Name</td>
<td>Actual device name of the assigned Slave device from the device description file.</td>
</tr>
<tr>
<td>Name</td>
<td>Free definable symbolic name of the assigned Slave device.</td>
</tr>
<tr>
<td>For each Slave device an evaluation is displayed and whether the changes of the configuration can be applied. The following evaluations may be displayed:</td>
<td></td>
</tr>
<tr>
<td>Changes not possible (red)</td>
<td>The changes of the Slave device parameter set can not be activated.</td>
</tr>
<tr>
<td>Changed (yellow)</td>
<td>The Slave device parameter set has changed.</td>
</tr>
<tr>
<td>Unchanged (green)</td>
<td>The Slave device parameter set has not changed.</td>
</tr>
<tr>
<td>New in Configuration (green)</td>
<td>The device has been inserted into the network configuration newly.</td>
</tr>
<tr>
<td>Deactivated (green)</td>
<td>The device was removed from the network configuration (&quot;n/a&quot; = not available).</td>
</tr>
</tbody>
</table>

In the list Devices the colors have the following meanings:
- **Red**: You can not 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.

<table>
<thead>
<tr>
<th>Master</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Parameters</td>
<td>Changed</td>
</tr>
<tr>
<td>Master Settings</td>
<td></td>
</tr>
<tr>
<td>- Startup,</td>
<td></td>
</tr>
<tr>
<td>- Watchdog,</td>
<td></td>
</tr>
<tr>
<td>- Statusoffset,</td>
<td></td>
</tr>
<tr>
<td>- Busparameter</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>If one of the Master Settings Startup, Watchdog, Statusoffset or Busparameter was changed, the complete Master Settings can not be applied for the configuration update.</td>
<td></td>
</tr>
<tr>
<td>Master State</td>
<td>OK</td>
</tr>
<tr>
<td>= 0x00000000</td>
<td></td>
</tr>
<tr>
<td>□ 0x00000000</td>
<td>Error</td>
</tr>
</tbody>
</table>

Under Master the colors have the following meanings:
- If the line Master Settings OR Master State is displayed in red, you can not 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 possible 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"
5.8 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 69.

   2. Select **Additional Functions > Service > Start Communication** from the context menu (right mouse click).

      The device communicates at the bus.

**Stop Communication**

1. Select **Additional Functions > Service > Stop Communication** from the context menu (right mouse click).

      The communication of the device at the bus is stopped.
5.9 Licensing

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

5.9.1 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.
5. Select Apply.
6. Close the DTM configuration dialog via OK.

For details to the device assignment, refer to section Overview Settings on page 25.

**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.
5.9.2 License Dialog

In the License pane you can:

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

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

1 The title bar contains the notation of the device description:
Symbolic Name [Device Description] <Station Address> (#Network ID).
5.9.3 Which Licenses are present in the Device?

Check, which licenses are present in the device.

How to proceed:

- Open the **License** pane as described under section *Open License Dialog* on page 107.

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

- The **Master protocols** overview opens:

  - 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.

- Or click **Utilities**.

- The **Utilities** overview opens:
5.9.3.1 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

5.9.3.2 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.
5.9.4 How to order a License

To order a license, proceed as follows:

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open the license dialog.</td>
</tr>
<tr>
<td>2.</td>
<td>Select the required licenses.</td>
</tr>
<tr>
<td>3.</td>
<td>Enter the ordering data.</td>
</tr>
<tr>
<td>4.</td>
<td>Place your order.</td>
</tr>
</tbody>
</table>

Refer to Section: Page

- Open License Dialog 107
- Selecting License 111
- Ordering Data 112
- Ordering the License 114

5.9.5 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
     - Two General Master Licenses.

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

2 For *) and **) minimum size, standard size or maximum size can be selected only as an alternative.
5.9.6 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 (therefore refer to section Data to manage the Order (License Information) on page 113).

5.9.6.1 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:

```
<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer*</td>
<td>0x0001</td>
</tr>
<tr>
<td>Article number&quot;</td>
<td>1251100</td>
</tr>
<tr>
<td>Serial number*</td>
<td>20007</td>
</tr>
<tr>
<td>Chiptype*</td>
<td>0x000000001</td>
</tr>
<tr>
<td>Step*</td>
<td>0x000000000</td>
</tr>
<tr>
<td>Romcode revision*</td>
<td>0x000000000</td>
</tr>
<tr>
<td>Checksum*</td>
<td>G</td>
</tr>
</tbody>
</table>
```

Fields marked with * are mandatory.

Figure 69: License Pane - Request Form, please fill out / Device Information

- These ordering data read out from the device are displayed automatically from the device.
### 5.9.6.2 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).**

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>License type</td>
<td>User Single Device License</td>
</tr>
</tbody>
</table>

*Figure 70: 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

*Figure 71: 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.
5.9.7 Ordering the License

Place your order in the License pane. Therefore:

![License Pane – Selecting the Subsidiary / Ordering / Contacts](image)

1. Select the **Subsidiary**, to which the order shall be send.
2. Place the order:
   - by **E-Mail**, Refer to Section: Ordering the License by E-Mail
   - by **Fax** or by **Telephone**, Refer to Section: Ordering the License by Fax or by Telephone
   - or in a **File**, Refer to Section: Exporting License Request to a File

The **Contact Data** of the selected subsidiary are displayed under **Position** 9, 10 and 11.
5.9.7.1 Ordering the License by E Mail

You can place your order by e-mail.

Figure 73: License Pane – placing the order by E-mail

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

  ![Diagram of License Pane](image)

  - The order E-mail **License request** contains:
    - the **E-mail** of the selected subsidiary
    - the automatically generated **XML file** `EmailOrderRequest-<Devicenumber>-<Serialnumber>.xml` with a summary info of the **order information**,
    - the **Order Address**
    - the **License Information**
    - the **License Type**
    - the **Device Data**
    - the **ordered Licenses**

  - Send the order e-mail **License request**.
  - The order process is complete.
5.9.7.2 Ordering the License by Fax or by Telephone

You can place your order by Fax or by Telephone.

Figure 75: License Pane - placing the order by Fax or by Telephone

- Click **Print Fax Form** or **Telephone**…
- 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**

```
Doc Example LTD
2000th Rd
NY 11417
U. S.
fix: +11223344-100

Licensee Information
- **First Name:** John
- **Surname:** Doe
- **e-Mail:** License@doe.com
- **Telephone:** 0911123344-55
- **Fax:** 0911223344-106
- **Customer No.:** 123456789
- **Company:** Doc Example LTD
- **Address:** 2000th Rd
- **Country:** U. S.
- **City Zip:** NY 11417
- **Order Number:** 987654321
- **Tax Idnt. Number:** test

License Type: User Single Device License

Device Information
- **Manufacturer:** 600001
- **Device Number:** 1232100
- **Serial Number:** 20007
- **Chip Type:** 6000000001
- **Step:** 6000000000
- **Romcode Revision:** 5000000000
- **License Flag 1:** 0x7f
- **License Flag 2:** 0x0

Ordered Licenses
- **Master Protocols**
  - One General Master License
  - Serco II Master
- **Utilities**
  - SYCON.net

Date: ____________________  Signature: ____________________
```

Figure 76: Example: Order Data Form PrintOrderRequest
The order data form contains:

- the **Order Address**
- the **License Information**
- the **License Type**
- the **Device Data**
- the **ordered Licenses**

- Print the order data form, sign it and send it by Fax.

![Print Fax Form...](10)

*Figure 77: License Pane – Fax Number of the selected Subsidiary*

- Use the Fax number, 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.

![Telephone...](11)

*Figure 78: License Pane – Telephone Number of the selected Subsidiary*

- Use the telephone number, which is displayed after the subsidiary was selected in the **License** pane.
- The order process is complete.
5.9.7.3 **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.

![Export License Request](image)

*Figure 79: License Pane - Ordering by exported File and E-Mail*

- Click **Export License Request…**
- 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 - [Devicenumber]_[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 Figure License Pane on page 108).
- The order process is complete.
5.9.8 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.

   ![Download License](image)
   
   *Figure 80: 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?** on page 109.
6 Diagnosis

6.1 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:

<table>
<thead>
<tr>
<th>PROFIBUS DP Master DTM</th>
<th>Folder Name / Section</th>
<th>Manual Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General Diagnosis</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>Master Diagnosis</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>Bus Diagnosis</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>Station Diagnosis</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>Firmware Diagnosis</td>
<td>126</td>
</tr>
</tbody>
</table>

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 69.

**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 127.
### 6.2 General Diagnosis

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

#### General Diagnosis

<table>
<thead>
<tr>
<th>Device state</th>
<th>Network state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Operate</td>
</tr>
<tr>
<td>Run</td>
<td>Idle</td>
</tr>
<tr>
<td>Ready</td>
<td>Stop</td>
</tr>
<tr>
<td>Error</td>
<td>Offline</td>
</tr>
</tbody>
</table>

**Configuration state**

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

**Communication error:**

- Watchdog time: 1000 ms
- Error count: 0

#### LED

<table>
<thead>
<tr>
<th>LED</th>
<th>Meaning</th>
<th>Color</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device State</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>Shows whether the PROFIBUS DP device executes the network communication.</td>
<td>(green)</td>
<td>In COMMUNICATION state</td>
</tr>
<tr>
<td>Run</td>
<td>Shows whether the PROFIBUS DP device has been configured correctly.</td>
<td>(gray)</td>
<td>Not in COMMUNICATION state</td>
</tr>
<tr>
<td>Ready</td>
<td>Shows whether the PROFIBUS DP device has been started correctly. The PROFIBUS DP device waits for a configuration.</td>
<td>(green)</td>
<td>Configuration OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>Configuration not OK</td>
</tr>
<tr>
<td>Error</td>
<td>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.</td>
<td>(red)</td>
<td>ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>No ERROR</td>
</tr>
<tr>
<td><strong>Network State</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operate</td>
<td>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.</td>
<td>(green)</td>
<td>In OPERATION state</td>
</tr>
<tr>
<td>Idle</td>
<td>Shows whether the PROFIBUS DP device is in idle state.</td>
<td>(gray)</td>
<td>Not in IDLE state</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(yellow)</td>
<td>In IDLE state</td>
</tr>
</tbody>
</table>
## LED Meanings

<table>
<thead>
<tr>
<th>LED</th>
<th>Meaning</th>
<th>Color</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop</td>
<td>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.</td>
<td><img src="red" alt="red" /></td>
<td>In STOP state</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="gray" alt="gray" /></td>
<td>Not in STOP state</td>
</tr>
<tr>
<td>Offline</td>
<td>The PROFIBUS DP Master is offline as long as it does not have a valid configuration.</td>
<td><img src="yellow" alt="yellow" /></td>
<td>In OFFLINE state</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="gray" alt="gray" /></td>
<td>Not in OFFLINE state</td>
</tr>
</tbody>
</table>

## Configuration State

<table>
<thead>
<tr>
<th>Configuration State</th>
<th>Meaning</th>
<th>Color</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration locked</td>
<td>Shows whether the PROFIBUS DP device configuration is locked, to avoid the configuration data are typed over.</td>
<td><img src="yellow" alt="yellow" /></td>
<td>Configuration LOCKED</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="gray" alt="gray" /></td>
<td>Configuration not LOCKED</td>
</tr>
<tr>
<td>New Configuration pending</td>
<td>Shows whether a new PROFIBUS DP device configuration is available.</td>
<td><img src="yellow" alt="yellow" /></td>
<td>New Configuration pending</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="gray" alt="gray" /></td>
<td>No new Configuration pending</td>
</tr>
<tr>
<td>Reset required</td>
<td>Shows whether a firmware reset is required as a new PROFIBUS DP device configuration has been loaded into the device.</td>
<td><img src="yellow" alt="yellow" /></td>
<td>RESET required</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="gray" alt="gray" /></td>
<td>No RESET required</td>
</tr>
<tr>
<td>Bus ON</td>
<td>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.</td>
<td><img src="green" alt="green" /></td>
<td>Bus ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="gray" alt="gray" /></td>
<td>Bus OFF</td>
</tr>
</tbody>
</table>

### Table 33: Indication General Diagnosis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Error</td>
<td>Shows the name of the communication error. If the cause of error is resolved, the value will be set to zero again.</td>
</tr>
<tr>
<td>Watchdog time</td>
<td>Shows the watchdog time in ms.</td>
</tr>
<tr>
<td>Error Count</td>
<td>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.</td>
</tr>
</tbody>
</table>

### Table 34: Parameter General Diagnosis
6.3 Master Diagnosis

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

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

Table 35: Parameter Master Diagnosis
6.4 Bus Diagnosis

### Bus Monitoring

<table>
<thead>
<tr>
<th>Event</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVENT-ERROR</td>
<td>The EVENT-ERROR shows that the device has detected bus short circuits. The number of detected events is fixed in the next row Short Circuit Counter. The bit will be set when the first event was detected and will not be deleted any more. This result and the counters are only set back by a reset of the DP Master.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Short Circuit Counter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Short Circuit Counter counts the short circuit on the PROFIBUS, which were detected by the Master. Range of Value: 0 .. 65535 (rollover possible)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transmission Rejected Count</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Transmission 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)</td>
</tr>
</tbody>
</table>
6.5 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.

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

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**.
### 6.6 Firmware Diagnosis

In the dialog **Firmware Diagnosis** the actual 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

<table>
<thead>
<tr>
<th>Task</th>
<th>Name of Task</th>
<th>Version</th>
<th>Priority</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX_IDLE 0</td>
<td>0.0</td>
<td>63</td>
<td>The task identifier is unknown.</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>RX_TIMER 1</td>
<td>0.0</td>
<td>1</td>
<td>The task identifier is unknown.</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>RX_SYSTEM 2</td>
<td>1.16</td>
<td>0</td>
<td>Middleware System Task</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>DPM_COMO_SMX 3</td>
<td>1.0</td>
<td>50</td>
<td>TLR-Router DPM</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>DPM_COMO_RMX 4</td>
<td>1.0</td>
<td>51</td>
<td>TLR-Router DPM</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>TLP_TIMER 5</td>
<td>0.0</td>
<td>39</td>
<td>The task identifier is unknown.</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>PROFIBUS_DL 6</td>
<td>2.0</td>
<td>41</td>
<td>PROFIBUS Data Link Layer Task</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>PROFIBUS_FSPMM 7</td>
<td>1.2</td>
<td>40</td>
<td>PROFIBUS Master Fieldbus Service Protocol Machine Task</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>PROFIBUS_FSPMM2 8</td>
<td>1.0</td>
<td>43</td>
<td>PROFIBUS FSPMM2 Task</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
<tr>
<td>PROFIBUS_APM 9</td>
<td>1.2</td>
<td>42</td>
<td>PROFIBUS Master Application Task</td>
<td>Task Status ok, (0x000000)</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 85: 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.

<table>
<thead>
<tr>
<th>Column</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task</td>
<td>Task number</td>
</tr>
<tr>
<td>Name of task</td>
<td>Name of the task</td>
</tr>
<tr>
<td>Version</td>
<td>Version of the task</td>
</tr>
<tr>
<td>Prio</td>
<td>Priority of the task</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the task</td>
</tr>
<tr>
<td>Status</td>
<td>Status of the task</td>
</tr>
</tbody>
</table>

**Table 38: Description Table Task Information**
7 Extended Diagnosis

7.1 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:

<table>
<thead>
<tr>
<th>PROFIBUS DP Master DTM</th>
<th>Folder Name / Section</th>
<th>Subsection</th>
<th>Manual Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RX-SYSTEM</td>
<td>Task Information</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td></td>
<td>InitBatch Status</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>DPM_COMO_SMBX</td>
<td>Task Information</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>DPM_COMO_RMBX</td>
<td>Task Information</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>PROFIBUS_DL</td>
<td>Task Information</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bus Parameters</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Counter</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td>PROFIBUS_FSPMM</td>
<td>Task Information</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Application Commands</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DataLink Commands</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DMPMM Counter</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MMAC1 Counter</td>
<td>136</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Timer</td>
<td>136</td>
</tr>
<tr>
<td></td>
<td>PROFIBUS_FSPMM2</td>
<td>Task Information</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Task Resources</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Application Commands</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>PROFIBUS_APM</td>
<td>Task Information</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Common State</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global State field</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Application Commands</td>
<td>143</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IO Exchange Counter</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Packet Router</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>MARSHALLER</td>
<td>Task Information</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>PACKET_ROUTER</td>
<td>Task Information</td>
<td>128</td>
</tr>
</tbody>
</table>

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 69.
7.2 Task Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier</td>
<td>Identification number of the task</td>
</tr>
<tr>
<td>Major version</td>
<td>Task version, contains incompatible changes</td>
</tr>
<tr>
<td>Minor version</td>
<td>Task version, contains compatible changes</td>
</tr>
<tr>
<td>Maximum packet size</td>
<td>Maximum packet size, which the task sends</td>
</tr>
<tr>
<td>Default Queue</td>
<td>Queue handle, which is accessible via DPM by mailbox.</td>
</tr>
<tr>
<td>UUID</td>
<td>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).</td>
</tr>
<tr>
<td>Init result</td>
<td>Error Code, 0= no Error&lt;br&gt;The description of the error codes can be found in this manual or in the corresponding software reference manuals.</td>
</tr>
</tbody>
</table>

Figure 86: Extended Diagnosis > [Folder Name] > Task Information Example Display

Table 40: Extended Diagnosis > [Folder Name] > Task Information
### 7.3 IniBatch Status

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Channel</td>
<td>Number of the communication channel used by the device.</td>
</tr>
<tr>
<td>Current State</td>
<td>Idle;</td>
</tr>
<tr>
<td></td>
<td>IniBatch packets in progress;</td>
</tr>
<tr>
<td></td>
<td>Retrying to send last packet;</td>
</tr>
<tr>
<td></td>
<td>Error</td>
</tr>
<tr>
<td>IniBatch Result</td>
<td>Ok;</td>
</tr>
<tr>
<td></td>
<td>No DBM file;</td>
</tr>
<tr>
<td></td>
<td>No Packet table;</td>
</tr>
<tr>
<td></td>
<td>No data set available;</td>
</tr>
<tr>
<td></td>
<td>Data set is shorter than packet length;</td>
</tr>
<tr>
<td></td>
<td>Packet Buffer is shorter than Packet length;</td>
</tr>
<tr>
<td></td>
<td>Invalid packet destination;</td>
</tr>
<tr>
<td></td>
<td>Logical queue not defined</td>
</tr>
<tr>
<td></td>
<td>Send packet failed;</td>
</tr>
<tr>
<td></td>
<td>Too many retries;</td>
</tr>
<tr>
<td></td>
<td>Error in confirmation packet status</td>
</tr>
<tr>
<td>OpenDbm Result</td>
<td>Error when opening the IniBatch data base</td>
</tr>
<tr>
<td></td>
<td>Under &quot;OpenDbm Result&quot; the error code is typed in, when &quot;IniBatch Result&quot; ==</td>
</tr>
<tr>
<td></td>
<td>&quot;No DBM file&quot; (1) is.</td>
</tr>
<tr>
<td>SendPacket Result</td>
<td>Error when sending a packet</td>
</tr>
<tr>
<td></td>
<td>Under &quot;SendPacket Result&quot; the error code is typed in, when &quot;IniBatch Result&quot;</td>
</tr>
<tr>
<td></td>
<td>== &quot;send packet failed&quot; (8) is.</td>
</tr>
<tr>
<td>Confirmation Result</td>
<td>Confirmation error when sending packets</td>
</tr>
<tr>
<td></td>
<td>Under &quot;Confirmation Result&quot; the packet specific error code from the ulSta is</td>
</tr>
<tr>
<td></td>
<td>typed in, when &quot;IniBatch Result&quot; == &quot;Error in confirmation packet status&quot; (10)</td>
</tr>
<tr>
<td>Last Packet Number</td>
<td>Value depends by the communication system.</td>
</tr>
<tr>
<td>Last Packet Command</td>
<td>Value depends by the communication system.</td>
</tr>
<tr>
<td>Last Packet Length</td>
<td>Value depends by the communication system.</td>
</tr>
<tr>
<td>Last Packet Destination</td>
<td>Value depends by the communication system.</td>
</tr>
</tbody>
</table>

![Table 41: Extended Diagnosis > [Folder Name] > IniBatch Status](image)

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

7.4.1 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 53.

<table>
<thead>
<tr>
<th>Task states</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station Address</td>
<td>1</td>
</tr>
<tr>
<td>Baud rate</td>
<td>93.75 kBit/s</td>
</tr>
<tr>
<td>Slot Time (tBit)</td>
<td>4095</td>
</tr>
<tr>
<td>Min. Station Delay Time (tBit)</td>
<td>22</td>
</tr>
<tr>
<td>Max. Station Delay Time (tBit)</td>
<td>1000</td>
</tr>
<tr>
<td>Quiet Time (tBit)</td>
<td>0</td>
</tr>
<tr>
<td>Setup Time (tBit)</td>
<td>150</td>
</tr>
<tr>
<td>Target Rotation Time (tBit)</td>
<td>24307</td>
</tr>
<tr>
<td>GAP Factor</td>
<td>10</td>
</tr>
<tr>
<td>Highest Station Address (HSA)</td>
<td>126</td>
</tr>
<tr>
<td>Max. Retry Limit</td>
<td>1</td>
</tr>
</tbody>
</table>

**Figure 88: Extended Diagnosis > PROFIBUS_DL > Busparameter**

<table>
<thead>
<tr>
<th>Baud Rate</th>
<th>Bit time (tBit)</th>
<th>Max cable length (type A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.6 kBit/s</td>
<td>104.2 us</td>
<td>1200 m</td>
</tr>
<tr>
<td>19.2 kBit/s</td>
<td>52.1 us</td>
<td>1200 m</td>
</tr>
<tr>
<td>31.25 kBit/s</td>
<td>32 us</td>
<td>1200 m</td>
</tr>
<tr>
<td>45.45 kBit/s</td>
<td>22 us</td>
<td>1200 m</td>
</tr>
<tr>
<td>93.75 kBit/s</td>
<td>10.7 us</td>
<td>1200 m</td>
</tr>
<tr>
<td>187.5 kBit/s</td>
<td>5.3 us</td>
<td>1000 m</td>
</tr>
<tr>
<td>500 kBit/s</td>
<td>2 us</td>
<td>400 m</td>
</tr>
<tr>
<td><strong>1500 kBit/s</strong></td>
<td><strong>666.7 ns</strong></td>
<td><strong>200 m</strong></td>
</tr>
<tr>
<td>3000 kBit/s</td>
<td>333.3 ns</td>
<td>100 m</td>
</tr>
<tr>
<td>6000 kBit/s</td>
<td>166.7 ns</td>
<td>100 m</td>
</tr>
<tr>
<td>12000 kBit/s</td>
<td>83.3 ns</td>
<td>100 m</td>
</tr>
</tbody>
</table>

**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 not 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

<table>
<thead>
<tr>
<th>Bus Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quiet Time (tBit)</strong></td>
<td>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.)</td>
</tr>
<tr>
<td><strong>Setup Time (tBit)</strong></td>
<td>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: 0 .. 255 (The default value depends from the baud rate.)</td>
</tr>
<tr>
<td><strong>Target Rotation Time (tBit)</strong></td>
<td>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 <strong>Target rotation time</strong> ($T_{TR}$) is shown in Bit times (tBit) like the other Bus Parameters. Below the displayed Bit time, the <strong>Target rotation time</strong> is also displayed in milliseconds (ms). Value range: $1 \cdot 2^{24}-1 (=16,777,215)$ (The default value depends on the number of Slaves attached to the Master and their module configuration)</td>
</tr>
<tr>
<td><strong>GAP Factor</strong></td>
<td>Factor for determining after how many Token cycles an added participant is accepted into the Token ring. After expiry of the time period $G \cdot T_{TR}$, the Station searches to see whether a further participant wishes to be accepted into the logical ring. Value range: 0 .. 10 .. 255</td>
</tr>
<tr>
<td><strong>Highest Station Address (HSA)</strong></td>
<td>The <strong>Highest Station Address</strong> 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</td>
</tr>
<tr>
<td><strong>Max. Retry Limit</strong></td>
<td>Maximum number of repeats in order to reach a Station. Value range: 1 .. 15 (The default value depends from the baud rate.)</td>
</tr>
</tbody>
</table>

*Table 42: Extended Diagnosis > PROFIBUS_DL > Busparameter*
### 7.4.2 Counter

![Counter Table]

**Table 43: Extended Diagnosis > PROFIBUS_DL > Counter**

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

```plaintext
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive Frames</td>
<td>Counter for number received frames</td>
</tr>
<tr>
<td>Transmit Frames</td>
<td>Counter for number transmitted frames</td>
</tr>
<tr>
<td>Transmit Error</td>
<td>Counter for number transmitted errors</td>
</tr>
<tr>
<td>Receive Error</td>
<td>Counter for number received errors</td>
</tr>
<tr>
<td>Target Rotation Timeout</td>
<td>Counter for number target rotation timeout</td>
</tr>
</tbody>
</table>
```
7.5 PROFIBUS_FSPMM

7.5.1 Application Commands

<table>
<thead>
<tr>
<th>Task states</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td></td>
</tr>
<tr>
<td>Register Application Req.</td>
<td>1</td>
</tr>
<tr>
<td>Register Application Crf. Pos.</td>
<td>1</td>
</tr>
<tr>
<td>Register Application Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Initialisation Req.</td>
<td>1</td>
</tr>
<tr>
<td>Initialisation Crf. Pos.</td>
<td>1</td>
</tr>
<tr>
<td>Initialisation Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Download Req.</td>
<td>1</td>
</tr>
<tr>
<td>Download Crf. Pos.</td>
<td>1</td>
</tr>
<tr>
<td>Download Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Reset Req.</td>
<td>6</td>
</tr>
<tr>
<td>Reset Crf. Pos.</td>
<td>6</td>
</tr>
<tr>
<td>Reset Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Change Mode Ind.</td>
<td>0</td>
</tr>
<tr>
<td>Change Mode Ind. Ret.</td>
<td>0</td>
</tr>
<tr>
<td>Change Mode Req.</td>
<td>3</td>
</tr>
<tr>
<td>Change Mode Crf. Pos.</td>
<td>3</td>
</tr>
<tr>
<td>Change Mode Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Set Output Data Req.</td>
<td>0</td>
</tr>
<tr>
<td>Set Output Data Crf. Pos.</td>
<td>0</td>
</tr>
<tr>
<td>Set Output Data Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Get Input Data Req.</td>
<td>0x789</td>
</tr>
<tr>
<td>Get Input Data Crf. Pos.</td>
<td>0x789</td>
</tr>
<tr>
<td>Get Input Data Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Slave Diag Ind.</td>
<td>1</td>
</tr>
<tr>
<td>Slave Diag Ind. Ret.</td>
<td>1</td>
</tr>
<tr>
<td>Get Slave Diag Req.</td>
<td>0</td>
</tr>
<tr>
<td>Get Slave Diag Crf. Pos.</td>
<td>0</td>
</tr>
<tr>
<td>Get Slave Diag Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Read Req.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Read Crf. Pos.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Read Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Write Req.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Write Crf. Pos.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Write Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl R/W Abort Req.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl R/W Abort Crf. Pos.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl R/W Abort Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Alarm Ind.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Alarm Ind. Ret.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Alarm Ack. Req.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Alarm Ack. Crf. Pos.</td>
<td>0</td>
</tr>
<tr>
<td>DPV1 Cl Alarm Ack. Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Global Control Req.</td>
<td>0</td>
</tr>
<tr>
<td>Global Control Crf. Pos.</td>
<td>0</td>
</tr>
<tr>
<td>Global Control Crf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>New Input Ind.</td>
<td>0</td>
</tr>
<tr>
<td>New Input Ind. Ret.</td>
<td>0</td>
</tr>
<tr>
<td>Process End Req.</td>
<td>0</td>
</tr>
<tr>
<td>Unknown Command</td>
<td>0</td>
</tr>
<tr>
<td>Last Unknown Command</td>
<td>0x00000000</td>
</tr>
</tbody>
</table>

Figure 90: Extended Diagnosis > PROFIBUS_FSPMM > Application Commands

Table 44: Extended Diagnosis > PROFIBUS_FSPMM > Application Commands

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Service]</td>
<td>Diagnosis counter of the FSPMM layer for Application Commands. Indicates the</td>
</tr>
<tr>
<td></td>
<td>services processed. (The services of the single packets are described in the</td>
</tr>
<tr>
<td></td>
<td>API manual.)</td>
</tr>
</tbody>
</table>

Table 44: Extended Diagnosis > PROFIBUS_FSPMM > Application Commands
7.5.2 DataLink Commands

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Service]</td>
<td>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.)</td>
</tr>
</tbody>
</table>

Figure 91: Extended Diagnosis > PROFIBUS_FSPMM > DataLink Commands

Table 45: Extended Diagnosis > PROFIBUS_FSPMM > DataLink Commands
7.5.3 DMPMM Counter

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Control Req.</td>
<td>623</td>
</tr>
<tr>
<td>Global Control Cnf.</td>
<td>623</td>
</tr>
<tr>
<td>Data Exchange Req.</td>
<td>9313</td>
</tr>
<tr>
<td>Data Exchange Cnf.</td>
<td>9312</td>
</tr>
<tr>
<td>Diag Req.</td>
<td>2</td>
</tr>
<tr>
<td>Diag Cnf.</td>
<td>2</td>
</tr>
<tr>
<td>Cfg Req.</td>
<td>1</td>
</tr>
<tr>
<td>Cfg Cnf.</td>
<td>1</td>
</tr>
<tr>
<td>Prm Req.</td>
<td>1</td>
</tr>
<tr>
<td>Prm Cnf.</td>
<td>1</td>
</tr>
<tr>
<td>Ext Prm Req.</td>
<td>0</td>
</tr>
<tr>
<td>Ext Prm Cnf.</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 92: Extended Diagnosis > PROFIBUS_FSPMM > DMPMM Counter

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
</table>

Table 46: Extended Diagnosis > PROFIBUS_FSPMM > DMPMM Counter
7.5.4 **MMAC1 Counter**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Service]</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Table 47: Extended Diagnosis > PROFIBUS_FSPMM > MMAC1 Counter**

7.5.5 **Timer**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DataControlTime Counter</td>
<td>Counter for Data Control Time expiration reports.</td>
</tr>
<tr>
<td></td>
<td>(Further information is given in section Bus Monitoring on page 56.)</td>
</tr>
<tr>
<td>MinSlaveInterval Counter</td>
<td>Counter for the number of Min Slave Interval cycles. I. e., for the number of slave list cycles.</td>
</tr>
<tr>
<td></td>
<td>(Further information is given in section Bus Monitoring on page 56.)</td>
</tr>
<tr>
<td>C1 Timer Expiration</td>
<td>Expiration time for C1 services* (* acyclic services for all Slaves)</td>
</tr>
<tr>
<td></td>
<td>This counter will be incremented if a Slave doesn't respond to a DPV1C1 service.</td>
</tr>
</tbody>
</table>

**Table 48: Extended Diagnosis > PROFIBUS_FSPMM > Timer**
7.6 PROFIBUS_FSPMM2

7.6.1 Task Resources

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Used Static (Bytes)</td>
<td>Memory used static from the FSPMM2 task in Bytes</td>
</tr>
<tr>
<td>Memory Used Dynamic (Bytes)</td>
<td>Memory used dynamic for the FSPMM2 task in Bytes</td>
</tr>
<tr>
<td>Max. supported DPV1C2 connections</td>
<td>Max. possible number DPV1C2 connections, which can be managed via the FSPMM2 task</td>
</tr>
<tr>
<td>Used DPV1C2 connections</td>
<td>Used number DPV1C2 connections, which are managed via the FSPMM2 task</td>
</tr>
</tbody>
</table>
### 7.6.2 Application Commands

#### Table 50: Extended Diagnosis > PROFIBUS_FSPMM2 > Application Commands

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

7.7.1 Common State

The values shown under **Common State** correspond to the **General Diagnosis** (see section General Diagnosis on page 121).

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 140 these values are specified bitwise for the single Slaves.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network State</td>
<td>The <strong>Network State</strong> is a general diagnosis state. Possible network states are: Operate: Shows that the PROFIBUS stack is in data exchange. Idle: Shows that the PROFIBUS stack is in idle mode. Stop: Shows that the PROFIBUS stack is in Stop state. Offline: The PROFIBUS DP Master is offline pending it does not have a valid configuration. (Further information is given in section General Diagnosis on page 121)</td>
</tr>
<tr>
<td>Communication Error</td>
<td>Unique Error Code according to protocol stack</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Watchdog Time</td>
<td>Shows the configured watchdog time in ms.</td>
</tr>
<tr>
<td>Number errors in total</td>
<td>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.</td>
</tr>
<tr>
<td>Number errors logged</td>
<td>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.</td>
</tr>
<tr>
<td>Number of Configured Slaves</td>
<td>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.</td>
</tr>
<tr>
<td>Number of Active Slaves</td>
<td>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.</td>
</tr>
<tr>
<td>Number of Diagnostic Slaves</td>
<td>Shows number of slaves with diagnostic. Number of Slaves with diagnosis or error slaves.</td>
</tr>
</tbody>
</table>

Table 51: Extended Diagnosis > PROFIBUS_APM > Common State
### Global State field

<table>
<thead>
<tr>
<th>Task states</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Bits</td>
<td>0:00</td>
</tr>
<tr>
<td>Control Error</td>
<td>False</td>
</tr>
<tr>
<td>Autoclear Error</td>
<td>False</td>
</tr>
<tr>
<td>Norm Exchange Error</td>
<td>False</td>
</tr>
<tr>
<td>Fatal Error</td>
<td>False</td>
</tr>
<tr>
<td>Application State</td>
<td>Ready</td>
</tr>
<tr>
<td>Timeout Error</td>
<td>False</td>
</tr>
<tr>
<td>Master State</td>
<td>OPERATE</td>
</tr>
<tr>
<td>Error Address</td>
<td>0</td>
</tr>
<tr>
<td>Error Event</td>
<td>0</td>
</tr>
<tr>
<td>Bus Error Counter</td>
<td>0</td>
</tr>
<tr>
<td>Bus Timeout Counter</td>
<td>0</td>
</tr>
<tr>
<td>Configured Slaves 7 .. 0</td>
<td>0:04</td>
</tr>
<tr>
<td>Configured Slaves 15 .. 18</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 23 .. 16</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 31 .. 24</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 39 .. 32</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 47 .. 40</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 55 .. 48</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 63 .. 56</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 71 .. 64</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 79 .. 72</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 87 .. 80</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 95 .. 88</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 103 .. 96</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 111 .. 104</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 119 .. 112</td>
<td>0:00</td>
</tr>
<tr>
<td>Configured Slaves 127 .. 120</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 7 .. 0</td>
<td>0:04</td>
</tr>
<tr>
<td>Active Slaves 15 .. 18</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 23 .. 16</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 31 .. 24</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 39 .. 32</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 47 .. 40</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 55 .. 48</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 63 .. 56</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 71 .. 64</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 79 .. 72</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 87 .. 80</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 95 .. 88</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 103 .. 96</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 111 .. 104</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 119 .. 112</td>
<td>0:00</td>
</tr>
<tr>
<td>Active Slaves 127 .. 120</td>
<td>0:00</td>
</tr>
</tbody>
</table>

Follow-up of the list

---

**Figure 98: 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.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Bits</td>
<td>Bit field to show bus and master main errors: CONTROL-ERROR AUTO-CLEAR-ERROR NON-EXCHANGE-ERROR FATAL-ERROR HOST-NOT-READY TIMEOUT-ERROR</td>
</tr>
<tr>
<td>Control Error</td>
<td>The CONTROL-ERROR displays that a parameterization error has occurred.</td>
</tr>
<tr>
<td>Autoclear Error</td>
<td>The AUTO-CLEAR-ERROR displays, that the device has stopped the communication to all Slaves and it has reached the auto-clear end state.</td>
</tr>
<tr>
<td>Non Exchange Error</td>
<td>The NON-EXCHANGE-ERROR shows, that at least one Slave is not in the cyclic data exchange with the DP Master.</td>
</tr>
<tr>
<td>Fatal Error</td>
<td>A FATAL-ERROR has occurred. Because of a heavy bus error no further bus communication is possible.</td>
</tr>
<tr>
<td>Application State</td>
<td>HOST-NOT-READY shows, that the application program has not yet started or stopped the DP Master (READY / NOT-READY).</td>
</tr>
<tr>
<td>Timeout Error</td>
<td>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 Bus Diagnosis on page124). The bit will be set when the first timeout was detected and can only be deleted via a reset of the device.</td>
</tr>
<tr>
<td>Master State</td>
<td>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.</td>
</tr>
<tr>
<td>Error Address</td>
<td>ERROR REMOTE ADDRESS: Displays the lowest station address, which signals diagnosis. For further information see section Station Diagnosis on page 125.</td>
</tr>
<tr>
<td>Error Event</td>
<td>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 Station Diagnosis on page 125.</td>
</tr>
<tr>
<td>Bus Error Counter</td>
<td>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 Bus Diagnosis on page124.</td>
</tr>
<tr>
<td>Bus Timeout Counter</td>
<td>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 Bus Diagnosis on page124.</td>
</tr>
<tr>
<td>Configured Slaves 7-0</td>
<td>8 Bit parameter state Slave 0-7</td>
</tr>
<tr>
<td>Configured Slaves 15-8</td>
<td>8 Bit parameter state Slave 8-15</td>
</tr>
</tbody>
</table>
Table 52: Extended Diagnosis > PROFIBUS_APM > Global State field

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Configured Slaves 127-120</td>
<td>8 Bit parameter state Slave 127-120</td>
</tr>
<tr>
<td>Active Slaves 7-0</td>
<td>8 Bit active state Slave 0-7</td>
</tr>
<tr>
<td>Active Slaves 15-8</td>
<td>8 Bit active state Slave 8-15</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Active Slaves 127-120</td>
<td>8 Bit active state Slave 127-120</td>
</tr>
<tr>
<td>Diagnostic Slaves 7-0</td>
<td>8 Bit diagnostic state Slave 0-7</td>
</tr>
<tr>
<td>Diagnostic Slaves 15-8</td>
<td>8 Bit diagnostic state Slave 8-15</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Diagnostic Slaves 127-120</td>
<td>8 Bit diagnostic state Slave 127-120</td>
</tr>
</tbody>
</table>
### 7.7.3 Application Commands

#### Service

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Service]</td>
<td>Diagnosis counter of the PROFIBUS_APM layer for Application Commands. Number of requested services of the FSPMM layer. Indicates the services processed.</td>
</tr>
</tbody>
</table>

**Note:** The sum of the enumerated services must put together each of the positively and negatively counted number of services.

#### Table 53: Extended Diagnosis > PROFIBUS_APM > Application Commands

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclic Event</td>
<td>67853</td>
</tr>
<tr>
<td>Initialisation Req.</td>
<td>1</td>
</tr>
<tr>
<td>Initialisation Cnf. Pos.</td>
<td>1</td>
</tr>
<tr>
<td>Initialisation Cnf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Set Bus Mode Req.</td>
<td>3</td>
</tr>
<tr>
<td>Set Bus Mode Cnf. Pos.</td>
<td>3</td>
</tr>
<tr>
<td>Set Bus Mode Cnf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Download Req.</td>
<td>1</td>
</tr>
<tr>
<td>Download Cnf. Pos.</td>
<td>1</td>
</tr>
<tr>
<td>Download Cnf. Neg.</td>
<td>0</td>
</tr>
<tr>
<td>Set Slave Output Data Req.</td>
<td>0</td>
</tr>
<tr>
<td>Set Slave Output Data Cnf.</td>
<td>0</td>
</tr>
<tr>
<td>Set Slave Output Data Cnf.</td>
<td>0</td>
</tr>
<tr>
<td>Get Slave Output Data Req.</td>
<td>67853</td>
</tr>
<tr>
<td>Get Slave Output Data Cnf.</td>
<td>67853</td>
</tr>
<tr>
<td>Get Slave Output Data Cnf.</td>
<td>0</td>
</tr>
<tr>
<td>Slave Diagnosis Ind.</td>
<td>1</td>
</tr>
<tr>
<td>DPIV Alarm Ind.</td>
<td>0</td>
</tr>
<tr>
<td>Change Bus Mode Ind.</td>
<td>0</td>
</tr>
<tr>
<td>Fault Ind.</td>
<td>0</td>
</tr>
<tr>
<td>Last Fault</td>
<td>0x00000000</td>
</tr>
<tr>
<td>Unknown Command</td>
<td>0</td>
</tr>
<tr>
<td>Last Unknown Command</td>
<td>0x00000000</td>
</tr>
<tr>
<td>Process End Req.</td>
<td>0</td>
</tr>
</tbody>
</table>
7.7.4 IO Exchange Counter

![Table 54: Extended Diagnosis > PROFIBUS_APM > IO Exchange Counter](image)

7.7.5 Packet Router

![Table 55: Extended Diagnosis > PROFIBUS_APM > Packet Router](image)
8 Tools

8.1 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:

<table>
<thead>
<tr>
<th>PROFIBUS DP Master DTM</th>
<th>Folder Name / Section</th>
<th>Manual Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation Area</td>
<td>Packet Monitor</td>
<td>146</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>IO Monitor</td>
<td>163</td>
</tr>
<tr>
<td>Extended Diagnosis</td>
<td>Process Image Monitor</td>
<td>164</td>
</tr>
</tbody>
</table>

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 69.
8.2 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.**

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

- **Select Reset Counter** to reset the packet counter.
8.2.1 Sending Packet

**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.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dest</td>
<td>Destination Queue Handle</td>
</tr>
<tr>
<td>Src</td>
<td>Source Queue Handle</td>
</tr>
<tr>
<td>Dest ID</td>
<td>Destination Queue Reference</td>
</tr>
<tr>
<td>Src ID</td>
<td>Source Queue Reference</td>
</tr>
<tr>
<td>Len</td>
<td>Packet Data Length (in Bytes)</td>
</tr>
<tr>
<td>ID</td>
<td>Packet Identification As Unique Number</td>
</tr>
<tr>
<td>State</td>
<td>Status / Error Code</td>
</tr>
<tr>
<td>Cmd</td>
<td>Command / Response Code</td>
</tr>
<tr>
<td>Ext</td>
<td>Extension</td>
</tr>
<tr>
<td>Rout</td>
<td>Routing Information</td>
</tr>
</tbody>
</table>

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.

Figure 103: Send > Packet Header and Send Data
Sending Packets once or cyclic

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

### 8.2.2 Receiving Packet

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

**Figure 104: 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.

**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.
8.2.3 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 19.

**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 DPV1 setting.

**Important:** Under **DPV1 > enable DPV1** must be checked.
### Packet Description Read Request

#### Structure

<table>
<thead>
<tr>
<th>Type: Request</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area</strong></td>
</tr>
<tr>
<td>Head</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Data</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

---

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 15 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.

<table>
<thead>
<tr>
<th>Sample Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Receiver</strong></td>
<td>0x20</td>
</tr>
<tr>
<td><strong>Read Command Identification</strong></td>
<td>00002210</td>
</tr>
</tbody>
</table>

**PROFIBUS_FSPMM:**
- **PACKET_READ_REQ_T** (Request)

![Packet Monitor Sample Data](image)

*Figure 106: Example - Reading data via DPV1 Class 1 - FSPMM_QUEUE – 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.

<table>
<thead>
<tr>
<th></th>
<th>Range of Value</th>
<th>Sample Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slave Address</strong></td>
<td>0 … 125</td>
<td>02 00 00 00*</td>
</tr>
<tr>
<td><strong>Slot Number</strong></td>
<td>0 … 254</td>
<td>0A 00 00 00*</td>
</tr>
<tr>
<td><strong>Index</strong></td>
<td>0 … 254</td>
<td>04 00 00 00*</td>
</tr>
<tr>
<td><strong>Indication of Length</strong></td>
<td>0 … 240</td>
<td>06 00 00 00*</td>
</tr>
</tbody>
</table>

*Intel format, e.g. LSB first;

![Sample Data](image)

Figure 107: 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

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Value / Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Head</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ulDest</td>
<td>UINT32</td>
<td></td>
<td>Destination queue handle, unchanged</td>
</tr>
<tr>
<td>ulSrc</td>
<td>UINT32</td>
<td></td>
<td>Source queue handle, unchanged</td>
</tr>
<tr>
<td>ulDestId</td>
<td>UINT32</td>
<td>ulAPM0Id</td>
<td>Destination end point identifier, unchanged</td>
</tr>
<tr>
<td>ulSrcId</td>
<td>UINT32</td>
<td>ulFSPMM0Id</td>
<td>Source end point identifier, unchanged</td>
</tr>
<tr>
<td>ulLen</td>
<td>UINT32</td>
<td>12 + n</td>
<td>Packet data length in bytes</td>
</tr>
<tr>
<td>ulId</td>
<td>UINT32</td>
<td>0 .. 2^{32}-1</td>
<td>Packet identification as unique number generated by the Source process of the packet</td>
</tr>
<tr>
<td>ulSta</td>
<td>UINT32</td>
<td></td>
<td>See section 7.1 Error Codes of the FSPMM-Task</td>
</tr>
<tr>
<td>ulCmd</td>
<td>UINT32</td>
<td>0x2211</td>
<td>PROFIBUS_FSPMM_CMD_READ_CNF_T - Command</td>
</tr>
<tr>
<td>ulExt</td>
<td>UINT32</td>
<td>0</td>
<td>Extension, unchanged</td>
</tr>
<tr>
<td>ulRout</td>
<td>UINT32</td>
<td>x</td>
<td>Routing, do not change</td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ulRemAdd</td>
<td>UINT32</td>
<td>0 .. 125</td>
<td>Slave address</td>
</tr>
<tr>
<td>ulSlot</td>
<td>UINT32</td>
<td>0 .. 254</td>
<td>Slot</td>
</tr>
<tr>
<td>ulIndex</td>
<td>UINT32</td>
<td>0 .. 254</td>
<td>Index</td>
</tr>
<tr>
<td>abData</td>
<td>UINT8[]</td>
<td></td>
<td>Requested data</td>
</tr>
</tbody>
</table>

**Figure 108:** 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 15 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 167, in the **Dual Port Memory Manual** or in the **PROFIBUS DP Slave Protocol API Manual**.

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

![Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Receive > Packet header](image)

**Sample Data**

- **Receiver** 0x20 (Destination Queue Handle)
- **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.
- **Response Identification Read Request** 00002211 `PROFIBUS_FSPMM_PACKET_READ_CNFT (Confirmation)`
**Receive > Receive data**

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

![Diagram of receive data](image)

### Figure 110: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Receive > Receive data

<table>
<thead>
<tr>
<th>Slaves Address</th>
<th>Range of Value</th>
<th>Sample Data</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong></td>
<td>0 … 125</td>
<td>02 00 00 00*</td>
<td>(for Slave 2)</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td>0 … 254</td>
<td>0A 00 00 00*</td>
<td>(for Slot 10)</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>0 … 254</td>
<td>04 00 00 00*</td>
<td>(for Index 4)</td>
</tr>
<tr>
<td><strong>H</strong> Receive Data</td>
<td></td>
<td>00 01 02 03 04 05</td>
<td>(6 Bytes)</td>
</tr>
</tbody>
</table>

(UINT32 = 4 Bytes)

*Intel format, e.g. LSB first;*
8.2.4 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 19.

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

<table>
<thead>
<tr>
<th>Area</th>
<th>Variable</th>
<th>Type</th>
<th>Value / Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ulDest</td>
<td>UINT32</td>
<td>0x20/FSPPM_QUB</td>
<td>Destination queue handle</td>
</tr>
<tr>
<td></td>
<td>ulSrc</td>
<td>UINT32</td>
<td>0 ... 2^32-1</td>
<td>Source queue handle</td>
</tr>
<tr>
<td></td>
<td>ulDestId</td>
<td>UINT32</td>
<td>ulFSPMM0Id</td>
<td>Destination end point identifier, specifying the final receiver of the packet inside the destination process. Set to 0 for the Initialization Packet</td>
</tr>
<tr>
<td></td>
<td>ulSrcId</td>
<td>UINT32</td>
<td>ulAPMS0Id</td>
<td>Source end point identifier, specifying the origin of the packet inside the source process</td>
</tr>
<tr>
<td></td>
<td>ulLen</td>
<td>UINT32</td>
<td>12 + PROFIBUS_FSPM_MAX_IO_DATA_LEN</td>
<td>Packet data length in bytes</td>
</tr>
<tr>
<td></td>
<td>ulId</td>
<td>UINT32</td>
<td>0 ... 2^32-1</td>
<td>Packet identification as unique number generated by the Source process of the packet</td>
</tr>
<tr>
<td></td>
<td>ulSta</td>
<td>UINT32</td>
<td></td>
<td>See section 7.1 Error Codes of the FSPMM-Task</td>
</tr>
<tr>
<td></td>
<td>ulCmd</td>
<td>UINT32</td>
<td>0x2212</td>
<td>PROFIBUS_FSPMM_CMD_WRITE_REQ_T - Command</td>
</tr>
<tr>
<td></td>
<td>ulExt</td>
<td>UINT32</td>
<td>0</td>
<td>Extension not in use, set to zero for compatibility reasons</td>
</tr>
<tr>
<td></td>
<td>ulRout</td>
<td>UINT32</td>
<td>x</td>
<td>Routing, do not change</td>
</tr>
<tr>
<td>Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ulRemAdd</td>
<td>UINT32</td>
<td>0 ... 125</td>
<td>Slave address</td>
</tr>
<tr>
<td></td>
<td>ulSlot</td>
<td>UINT32</td>
<td>0 ... 254</td>
<td>Slot</td>
</tr>
<tr>
<td></td>
<td>ulIndex</td>
<td>UINT32</td>
<td>0 ... 254</td>
<td>Index</td>
</tr>
<tr>
<td></td>
<td>abData</td>
<td>UINT8[]</td>
<td></td>
<td>Write data</td>
</tr>
</tbody>
</table>

---

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 15 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.

<table>
<thead>
<tr>
<th>Sample Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Receiver</strong></td>
</tr>
<tr>
<td>**Write Command</td>
</tr>
<tr>
<td>Identification</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

![Packet Monitor Screenshot](image)

**Figure 112: 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.

<table>
<thead>
<tr>
<th>Range of Value</th>
<th>Sample Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slave Address</td>
<td>02 00 00 00* (for Slave 2)</td>
</tr>
<tr>
<td>Slot Number</td>
<td>0A 00 00 00* (for Slot 10)</td>
</tr>
<tr>
<td>Index</td>
<td>04 00 00 00* (for Index 4)</td>
</tr>
<tr>
<td>Data to be sent</td>
<td>01 02 (2 Bytes)</td>
</tr>
</tbody>
</table>

*Intel format, e. g. LSB first;

![Figure 113: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Send > Send Data](image)

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

<table>
<thead>
<tr>
<th>Structure</th>
<th>PROFIBUS_FSPMM_PACKET_WRITE_CNF_T</th>
</tr>
</thead>
</table>

**Type:** Request

<table>
<thead>
<tr>
<th>Area</th>
<th>Variable</th>
<th>Type</th>
<th>Value / Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>uIDest</td>
<td>UINT32</td>
<td></td>
<td>Destination queue handle, unchanged</td>
</tr>
<tr>
<td></td>
<td>uSrc</td>
<td>UINT32</td>
<td></td>
<td>Source queue handle, unchanged</td>
</tr>
<tr>
<td></td>
<td>uDestId</td>
<td>UINT32</td>
<td>uAPM0ld</td>
<td>Destination end point identifier, unchanged</td>
</tr>
<tr>
<td></td>
<td>uSrcld</td>
<td>UINT32</td>
<td>uFSPMM0ld</td>
<td>Source end point identifier, unchanged</td>
</tr>
<tr>
<td></td>
<td>uLen</td>
<td>UINT32</td>
<td>12</td>
<td>Packet data length in bytes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>Only in case of error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TLR_E_PROFIBUS_FSPMM_MSAC1_NRS</td>
</tr>
<tr>
<td></td>
<td>ulId</td>
<td>UINT32</td>
<td>0 ... 2^32-1</td>
<td>Packet identification as unique number generated by the Source process of the packet</td>
</tr>
<tr>
<td></td>
<td>ulSta</td>
<td>UINT32</td>
<td></td>
<td>See section 7.1 Error Codes of the FSPMM-Task</td>
</tr>
<tr>
<td></td>
<td>ulCmd</td>
<td>UINT32</td>
<td>0x2213</td>
<td>PROFIBUS_FSPMM_CMD_WRITE_CNF_T - Command</td>
</tr>
<tr>
<td></td>
<td>ulExt</td>
<td>UINT32</td>
<td>0</td>
<td>Extension, unchanged</td>
</tr>
<tr>
<td></td>
<td>ulRout</td>
<td>UINT32</td>
<td>x</td>
<td>Routing, do not change</td>
</tr>
</tbody>
</table>

**Data**

<table>
<thead>
<tr>
<th>Structure</th>
<th>PROFIBUS_FSPMM_WRITE_CNF_T</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Value / Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>uIRcmAdd</td>
<td>UINT32</td>
<td>0...125</td>
<td>Slave address</td>
</tr>
<tr>
<td>uISlot</td>
<td>UINT32</td>
<td>0...254</td>
<td>Slot</td>
</tr>
<tr>
<td>uINdex</td>
<td>UINT32</td>
<td>0...254</td>
<td>Index</td>
</tr>
</tbody>
</table>

The following three variables are only present in case of error TLR_E_PROFIBUS_FSPMM_MSAC1_NRS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Value / Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bErrorDec</td>
<td>UINT8</td>
<td>128</td>
<td>A value of 128 here indicates DP V1 error handling is applied.</td>
</tr>
<tr>
<td>bErrorCode1</td>
<td>UINT8</td>
<td>0...255</td>
<td>ErrorCode1, see section 5.3.2.2. of this document</td>
</tr>
<tr>
<td>bErrorCode2</td>
<td>UINT8</td>
<td>0...255</td>
<td>ErrorCode2, meaning depends on bErrorCode1</td>
</tr>
</tbody>
</table>

Figure 114: 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 15 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 167, in the **Dual Port Memory Manual** or in the **PROFIBUS DP Slave Protocol API Manual**.

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

![Figure 115: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Receive > Packet header](image)

<table>
<thead>
<tr>
<th>Sample Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Receiver</td>
<td>0x20 (Destination Queue Handle)</td>
</tr>
<tr>
<td><strong>B</strong> State</td>
<td>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.</td>
</tr>
<tr>
<td><strong>C</strong> Response Identification Writing Request</td>
<td>00002213 PROFIBUS_FSPMM_PACKET_WRITE_CNF_T (Confirmation)</td>
</tr>
</tbody>
</table>
**Receive > Receive data**

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

![Figure 116: Example – Writing data via DPV1 Class 1 - FSPMM_QUE – Receive > Receive data](image)

<table>
<thead>
<tr>
<th>Range of Value</th>
<th>Sample Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slave Address</td>
<td>02 00 00 00* (for Slave 2)</td>
</tr>
<tr>
<td>Slot Number</td>
<td>0A 00 00 00* (for Slot 10)</td>
</tr>
<tr>
<td>Index</td>
<td>04 00 00 00* (for Index 4)</td>
</tr>
</tbody>
</table>

(UINT32 = 4 Bytes)

*Intel format, e. g. LSB first;
8.3 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.

**Figure 117: 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.
8.4 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 118: Window 'Process Image Monitor']

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display Mode</strong></td>
<td>Display of the values in the column <strong>Value</strong> in decimal or hexadecimal mode.</td>
<td>Decimal (Default), Hexadecimal</td>
</tr>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>The tree shows the structure of the devices (1), modules (2) and the input data (3) and output data (4).</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>Display when the input and output data are not completely read and analyzed.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>Display when the input and output data are not valid.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td>Display when the input and output data are valid.</td>
<td></td>
</tr>
<tr>
<td><strong>Typ</strong></td>
<td>Device labeling provided by the hardware: Also description of the modules or input or output signals configured to the device.</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Meaning</td>
<td>Range of Value / Value</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>TAG</td>
<td>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 &gt; Process Data).</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>Display of the valid input and output data values.</td>
<td></td>
</tr>
<tr>
<td>Last Error</td>
<td>Last occurred error (Description see appropriate Application Programming Manual)</td>
<td></td>
</tr>
</tbody>
</table>

*Table 59: Notes to the Window ‘Process Image Monitor’*
9 Error Codes

9.1 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:

```
+---+-+-+-----------------------+-------------------------------+
|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.
## 9.2 Overview Error Codes

<table>
<thead>
<tr>
<th>Overview Error Codes</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Hardware Errors</td>
<td>RCX General Task: 0xC02B0001 to 0xC02B4D52</td>
</tr>
<tr>
<td>RCX Operating System</td>
<td>RCX Common Status &amp; Errors Codes: 0x00000000 to 0xC002000C</td>
</tr>
<tr>
<td></td>
<td>RCX Status &amp; Error Codes: 0x00000000 to 0xC0000008</td>
</tr>
<tr>
<td>ODM Server</td>
<td>General ODM Error Codes: 0x8004C700 to 0x8004C761</td>
</tr>
<tr>
<td></td>
<td>General ODM Driver Error Codes: 0x8004C7A0 to 0x8004C7C2</td>
</tr>
<tr>
<td>ODM Drivers</td>
<td>cifX Driver Specific ODM Error: 0x8004C001 to 0x8004C0A4</td>
</tr>
<tr>
<td>cifX Device Driver and netX Driver</td>
<td>Generic Error: 0x800A0001 to 0x800A0017</td>
</tr>
<tr>
<td></td>
<td>Generic Driver Error: 0x800B0001 to 0x800B0042</td>
</tr>
<tr>
<td></td>
<td>Generic Device Error: 0x800C0010 to 0x800C0041</td>
</tr>
<tr>
<td>netX Driver</td>
<td>CIFX API Transport: 0x800D0001 to 0x800D0013</td>
</tr>
<tr>
<td></td>
<td>CIFX API Transport Header State Error: 0x800E0001 to 0x800E000B</td>
</tr>
<tr>
<td>DBM</td>
<td>ODM Error Codes: 0xC004C810 to 0xC004C878</td>
</tr>
</tbody>
</table>

The fieldbus specific error codes are described in the manuals of the corresponding protocol tasks.
## 9.3 General Hardware Error Codes

### 9.3.1 RCX General Task Errors

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX_E_QUE_UNKNOWN</td>
<td>0xC02B0001</td>
<td>Unknown Queue</td>
</tr>
<tr>
<td>RCX_E_QUE_INDEX_UNKNOWN</td>
<td>0xC02B0002</td>
<td>Unknown Queue Index</td>
</tr>
<tr>
<td>RCX_E_TASK_UNKNOWN</td>
<td>0xC02B0003</td>
<td>Unknown Task</td>
</tr>
<tr>
<td>RCX_E_TASK_INDEX_UNKNOWN</td>
<td>0xC02B0004</td>
<td>Unknown Task Index</td>
</tr>
<tr>
<td>RCX_E_TASK_HANDLE_INVALID</td>
<td>0xC02B0005</td>
<td>Invalid Task Handle</td>
</tr>
<tr>
<td>RCX_E_TASK_INFO_IDX_UNKNOWN</td>
<td>0xC02B0006</td>
<td>Unknown Index</td>
</tr>
<tr>
<td>RCX_E_FILE_XFR_TYPE_INVALID</td>
<td>0xC02B0007</td>
<td>Invalid Transfer Type</td>
</tr>
<tr>
<td>RCX_E_FILE_REQUEST_INCORRECT</td>
<td>0xC02B0008</td>
<td>Invalid File Request</td>
</tr>
<tr>
<td>RCX_E_TASK_INVALID</td>
<td>0xC02B000E</td>
<td>Invalid Task</td>
</tr>
<tr>
<td>RCX_E_SEC_FAILED</td>
<td>0xC02B001D</td>
<td>Security EEPROM Access Failed</td>
</tr>
<tr>
<td>RCX_E_EEPROM_DISABLED</td>
<td>0xC02B001E</td>
<td>EEPROM Disabled</td>
</tr>
<tr>
<td>RCX_E_INVALID_EXT</td>
<td>0xC02B001F</td>
<td>Invalid Extension</td>
</tr>
<tr>
<td>RCX_E_SIZE_OUT_OF_RANGE</td>
<td>0xC02B0020</td>
<td>Block Size Out Of Range</td>
</tr>
<tr>
<td>RCX_E_INVALID_CHANNEL</td>
<td>0xC02B0021</td>
<td>Invalid Channel</td>
</tr>
<tr>
<td>RCX_E_INVALID_FILE_LEN</td>
<td>0xC02B0022</td>
<td>Invalid File Length</td>
</tr>
<tr>
<td>RCX_E_INVALID_CHAR_FOUND</td>
<td>0xC02B0023</td>
<td>Invalid Character Found</td>
</tr>
<tr>
<td>RCX_E_PACKET_OUT_OF_SEQ</td>
<td>0xC02B0024</td>
<td>Packet Out Of Sequence</td>
</tr>
<tr>
<td>RCX_E_SEC_NOT_ALLOWED</td>
<td>0xC02B0025</td>
<td>Not Allowed In Current State</td>
</tr>
<tr>
<td>RCX_E_SEC_INVALID_ZONE</td>
<td>0xC02B0026</td>
<td>Security EEPROM Invalid Zone</td>
</tr>
<tr>
<td>RCX_E_SEC_EEPROM_NOT_AVAL</td>
<td>0xC02B0028</td>
<td>Security EEPROM Eeprom Not Available</td>
</tr>
<tr>
<td>RCX_E_SEC_INVALID_CHECKSUM</td>
<td>0xC02B0029</td>
<td>Security EEPROM Checksum</td>
</tr>
<tr>
<td>RCX_E_SEC_ZONE_NOT_WRITEABLE</td>
<td>0xC02B002A</td>
<td>Security EEPROM Zone Not Writeable</td>
</tr>
<tr>
<td>RCX_E_SEC_READ_FAILED</td>
<td>0xC02B002B</td>
<td>Security EEPROM Read Failed</td>
</tr>
<tr>
<td>RCX_E_SEC_WRITE_FAILED</td>
<td>0xC02B002C</td>
<td>Security EEPROM Write Failed</td>
</tr>
<tr>
<td>RCX_E_SEC_ACCESS_DENIED</td>
<td>0xC02B002D</td>
<td>Security EEPROM Access Denied</td>
</tr>
<tr>
<td>RCX_E_SEC_EEPROM_EMULATED</td>
<td>0xC02B002E</td>
<td>Security EEPROM Emulated</td>
</tr>
<tr>
<td>RCX_E_INVALID_BLOCK</td>
<td>0xC02B0038</td>
<td>Invalid Block</td>
</tr>
<tr>
<td>RCX_E_INVALID_STRUCT_NUMBER</td>
<td>0xC02B0039</td>
<td>Invalid Structure Number</td>
</tr>
<tr>
<td>RCX_E_INVALID_CHECKSUM</td>
<td>0xC02B4352</td>
<td>Invalid Checksum</td>
</tr>
<tr>
<td>RCX_E_CONFIG_LOCKED</td>
<td>0xC02B4854</td>
<td>Configuration Locked</td>
</tr>
<tr>
<td>RCX_E_SEC_ZONE_NOT_READABLE</td>
<td>0xC02B4D52</td>
<td>Security EEPROM Zone Not Readable</td>
</tr>
</tbody>
</table>

*Table 61: RCX General Task Errors*
### 9.3.2 RCX Common Status & Errors Codes

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

Table 62: RCX Common Status & Errors Codes
## 9.3.3 RCX Status & Error Codes

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX_S_OK</td>
<td>0x00000000</td>
<td>SUCCESS, STATUS OKAY</td>
</tr>
<tr>
<td>RCX_S_QUE_UNKNOWN</td>
<td>0xC02B0001</td>
<td>UNKNOWN QUEUE</td>
</tr>
<tr>
<td>RCX_S_QUE_INDEX_UNKNOWN</td>
<td>0xC02B0002</td>
<td>UNKNOWN QUEUE INDEX</td>
</tr>
<tr>
<td>RCX_S_TASK_UNKNOWN</td>
<td>0xC02B0003</td>
<td>UNKNOWN TASK</td>
</tr>
<tr>
<td>RCX_S_TASK_INDEX_UNKNOWN</td>
<td>0xC02B0004</td>
<td>UNKNOWN TASK INDEX</td>
</tr>
<tr>
<td>RCX_S_TASK_HANDLE_INVALID</td>
<td>0xC02B0005</td>
<td>INVALID TASK HANDLE</td>
</tr>
<tr>
<td>RCX_S_TASK_INFO_IDX_UNKNOWN</td>
<td>0xC02B0006</td>
<td>UNKNOWN INDEX</td>
</tr>
<tr>
<td>RCX_S_FILE_XFR_TYPE_INVALID</td>
<td>0xC02B0007</td>
<td>INVALID TRANSFER TYPE</td>
</tr>
<tr>
<td>RCX_S_FILE_REQUEST_INCORRECT</td>
<td>0xC02B0008</td>
<td>INVALID FILE REQUEST</td>
</tr>
<tr>
<td>RCX_S_UNKNOWN_DESTINATION</td>
<td>0xC0000005</td>
<td>UNKNOWN DESTINATION</td>
</tr>
<tr>
<td>RCX_S_INVALID_LENGTH</td>
<td>0xC0000006</td>
<td></td>
</tr>
<tr>
<td>RCX_S_UNKNOWN_COMMAND</td>
<td>0xC0000007</td>
<td></td>
</tr>
<tr>
<td>RCX_S_INVALID_EXTENSION</td>
<td>0xC0000008</td>
<td></td>
</tr>
</tbody>
</table>

*Table 63: RCX Status & Error Codes*

## 9.3.3.1 RCX Status & Error Codes Slave State

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX_SLAVE_STATE_UNDEFINED</td>
<td>0x00000000</td>
<td>UNDEFINED</td>
</tr>
<tr>
<td>RCX_SLAVE_STATE_OK</td>
<td>0x00000001</td>
<td>OK</td>
</tr>
<tr>
<td>RCX_SLAVE_STATE_FAILED</td>
<td>0x00000002</td>
<td>FAILED (at least one slave)</td>
</tr>
</tbody>
</table>

*Table 64: RCX Status & Error Codes Slave State*
## 9.4 ODM Error Codes

### 9.4.1 General ODM Error Codes

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CODM3_E_INTERNALERROR</td>
<td>0x8004C700</td>
<td>Internal ODM Error</td>
</tr>
<tr>
<td>ODM3_E_DESCRIPTION_NOTFOUND</td>
<td>0x8004C701</td>
<td>Description not found in ODM database</td>
</tr>
<tr>
<td>CODM3_E_WRITEREGISTRY</td>
<td>0x8004C710</td>
<td>Error writing to the registry</td>
</tr>
<tr>
<td>CODM3_E_BAD_REGULAR_EXPRESSION</td>
<td>0x8004C711</td>
<td>Invalid regular expression</td>
</tr>
<tr>
<td>CODM3_E_COMCATEGORIE_MANAGER_FAILED</td>
<td>0x8004C712</td>
<td>Component Category Manager could not be instantiated</td>
</tr>
<tr>
<td>CODM3_E_COMCATEGORIE_ENUMERATION_FAILED</td>
<td>0x8004C713</td>
<td>Driver could not be enumerated by the Category Manager</td>
</tr>
<tr>
<td>CODM3_E_CREATE_LOCAL_BUFFER</td>
<td>0x8004C714</td>
<td>Error creating local buffers</td>
</tr>
<tr>
<td>CODM3_E_UNKNOWNHANDLE</td>
<td>0x8004C715</td>
<td>Unknown handle</td>
</tr>
<tr>
<td>CODM3_E_QUEUE_LIMIT_REACHED</td>
<td>0x8004C717</td>
<td>Queue size limit for connection reached</td>
</tr>
<tr>
<td>CODM3_E_DATASIZE_ZERO</td>
<td>0x8004C718</td>
<td>Zero data length passed</td>
</tr>
<tr>
<td>CODM3_E_INVALID_DATA</td>
<td>0x8004C719</td>
<td>Invalid data content</td>
</tr>
<tr>
<td>CODM3_E_INVALID_MODE</td>
<td>0x8004C71A</td>
<td>Invalid mode</td>
</tr>
<tr>
<td>CODM3_E_DATABASE_READ</td>
<td>0x8004C71B</td>
<td>Error reading database</td>
</tr>
<tr>
<td>CODM3_E_CREATE_DEVICE_THREAD</td>
<td>0x8004C750</td>
<td>Error creating device thread</td>
</tr>
<tr>
<td>CODM3_E_CREATE_DEVICE_THREAD_STOP_EVENT</td>
<td>0x8004C751</td>
<td>Error creating device thread stop event</td>
</tr>
<tr>
<td>CODM3_E_CLIENT_NOT_REGISTERED</td>
<td>0x8004C752</td>
<td>Client is not registered at the ODM</td>
</tr>
<tr>
<td>CODM3_E_NO_MORE_CLIENTS</td>
<td>0x8004C753</td>
<td>Maximum number of clients reached</td>
</tr>
<tr>
<td>CODM3_E_MAX_CLIENT_CONNECTIONS_REACHED</td>
<td>0x8004C754</td>
<td>Maximum number of client connections reached</td>
</tr>
<tr>
<td>CODM3_E_ENTRY_NOT_FOUND</td>
<td>0x8004C755</td>
<td>Driver/device not found</td>
</tr>
<tr>
<td>CODM3_E_DRIVER_NOT_FOUND</td>
<td>0x8004C757</td>
<td>The requested driver is unknown to the ODM</td>
</tr>
<tr>
<td>CODM3_E_DEVICE_ALREADY_LOCKED</td>
<td>0x8004C758</td>
<td>Device is locked by another process</td>
</tr>
<tr>
<td>CODM3_E_DEVICE_UNLOCKED_FAILED</td>
<td>0x8004C759</td>
<td>Device could not be unlocked, lock was set by another process</td>
</tr>
<tr>
<td>CODM3_E_DEVICE_LOCK_NECCESSARY</td>
<td>0x8004C75A</td>
<td>Operation requires a device lock to be set</td>
</tr>
<tr>
<td>CODM3_E_DEVICE_SUBSCRIPTIONLIMIT</td>
<td>0x8004C75B</td>
<td>Maximum number of servers registered for this device reached</td>
</tr>
<tr>
<td>CODM3_E_DEVICE_NOTSUBSCRIBED</td>
<td>0x8004C75C</td>
<td>Process is not registered as a server on this device</td>
</tr>
<tr>
<td>CODM3_E_DEVICE_NO_MESSAGE</td>
<td>0x8004C75D</td>
<td>No message available</td>
</tr>
<tr>
<td>CODM3_E_TRANSFERTIMEOUT</td>
<td>0x8004C760</td>
<td>Message transfer timeout</td>
</tr>
<tr>
<td>CODM3_E_MESSAGE_INSERVICE</td>
<td>0x8004C761</td>
<td>Message in service</td>
</tr>
</tbody>
</table>

*Table 65: ODM Error Codes - General ODM Error Codes*
### 9.4.2 General ODM Driver Error Codes

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

Table 66: ODM Error Codes - General ODM Driver Error Codes
## 9.4.3 cifX Driver Specific ODM Error Codes

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

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRV_E_USR_SIZE_INVALID</td>
<td>0x8004C028</td>
<td>USER Parameter Size invalid</td>
</tr>
<tr>
<td>DRV_E_USR_SIZE_ZERO</td>
<td>0x8004C02A</td>
<td>USER Parameter Size with zero length</td>
</tr>
<tr>
<td>DRV_E_USR_SIZE_TOO_LONG</td>
<td>0x8004C02B</td>
<td>USER Parameter Size too long</td>
</tr>
<tr>
<td>DRV_E_USR_DEV_PTR_NULL</td>
<td>0x8004C02C</td>
<td>USER Device address null pointer</td>
</tr>
<tr>
<td>DRV_E_USR_BUF_PTR_NULL</td>
<td>0x8004C02D</td>
<td>USER Pointer to buffer is a null pointer</td>
</tr>
<tr>
<td>DRV_E_USR_SENDSIZE_TOO_LONG</td>
<td>0x8004C02E</td>
<td>USER Parameter SendSize too large</td>
</tr>
<tr>
<td>DRV_E_USR_RECVSIZE_TOO_LONG</td>
<td>0x8004C02F</td>
<td>USER Parameter ReceiveSize too large</td>
</tr>
<tr>
<td>DRV_E_USR_SENDBUF_PTR_NULL</td>
<td>0x8004C030</td>
<td>USER Pointer to send buffer is a null pointer</td>
</tr>
<tr>
<td>DRV_E_USR_RECVBUF_PTR_NULL</td>
<td>0x8004C031</td>
<td>USER Pointer to receive buffer is a null pointer</td>
</tr>
<tr>
<td>DRV_E_DMA_INSUFF_MEM</td>
<td>0x8004C032</td>
<td>DMA Memory allocation error</td>
</tr>
<tr>
<td>DRV_E_DMA_TIMEOUT_CH4</td>
<td>0x8004C033</td>
<td>DMA Read I/O timeout</td>
</tr>
<tr>
<td>DRV_E_DMA_TIMEOUT_CH5</td>
<td>0x8004C034</td>
<td>DMA Write I/O timeout</td>
</tr>
<tr>
<td>DRV_E_DMA_TIMEOUT_CH6</td>
<td>0x8004C035</td>
<td>DMA PCI transfer timeout</td>
</tr>
<tr>
<td>DRV_E_DMA_TIMEOUT_CH7</td>
<td>0x8004C036</td>
<td>DMA Download timeout</td>
</tr>
<tr>
<td>DRV_E_DMA_DB_DOWN_FAIL</td>
<td>0x8004C037</td>
<td>DMA Database download failed</td>
</tr>
<tr>
<td>DRV_E_DMA_FW_DOWN_FAIL</td>
<td>0x8004C038</td>
<td>DMA Firmware download failed</td>
</tr>
<tr>
<td>DRV_E_CLEAR_DB_FAIL</td>
<td>0x8004C039</td>
<td>DMA Clear database on the device failed</td>
</tr>
<tr>
<td>DRV_E_DEV_NO_VIRTUAL_MEM</td>
<td>0x8004C03C</td>
<td>DMA USER Virtual memory not available</td>
</tr>
<tr>
<td>DRV_E_DEV_UNMAP_VIRTUAL_MEM</td>
<td>0x8004C03D</td>
<td>DMA USER Unmap virtual memory failed</td>
</tr>
<tr>
<td>DRV_E_GENERAL_ERROR</td>
<td>0x8004C046</td>
<td>DRIVER General error</td>
</tr>
<tr>
<td>DRV_E_DMA_ERROR</td>
<td>0x8004C047</td>
<td>DRIVER General DMA error</td>
</tr>
<tr>
<td>DRV_E_WDG_IO_ERROR</td>
<td>0x8004C048</td>
<td>DRIVER I/O WatchDog failed</td>
</tr>
<tr>
<td>DRV_E_WDG_DEV_ERROR</td>
<td>0x8004C049</td>
<td>DRIVER Device Watchdog failed</td>
</tr>
<tr>
<td>DRV_EUSR_DRIVER_UNKNOWN</td>
<td>0x8004C050</td>
<td>USER Driver unknown</td>
</tr>
<tr>
<td>DRV_E_USR_DEVICE_NAME_INVALID</td>
<td>0x8004C051</td>
<td>USER Device name invalid</td>
</tr>
<tr>
<td>DRV_E_USR_DEVICE_NAME_UNKNOWN</td>
<td>0x8004C052</td>
<td>USER Device name unknown</td>
</tr>
<tr>
<td>DRV_E_USR_DEVICE_FUNC_NOTIMPL</td>
<td>0x8004C053</td>
<td>USER Device function not implemented</td>
</tr>
<tr>
<td>DRV_E_USR_FILE_OPEN_FAILED</td>
<td>0x8004C064</td>
<td>USER File could not be opened</td>
</tr>
<tr>
<td>DRV_E_USR_FILE_SIZE_ZERO</td>
<td>0x8004C065</td>
<td>USER File size zero</td>
</tr>
<tr>
<td>DRV_E_USR_FILE_NO_MEMORY</td>
<td>0x8004C066</td>
<td>USER Not enough memory to load file</td>
</tr>
<tr>
<td>DRV_E_USR_FILE_READ_FAILED</td>
<td>0x8004C067</td>
<td>USER File read failed</td>
</tr>
<tr>
<td>DRV_E_USR_INVALID_FILETYPE</td>
<td>0x8004C068</td>
<td>USER File type invalid</td>
</tr>
<tr>
<td>DRV_E_USR_FILENAME_INVALID</td>
<td>0x8004C069</td>
<td>USER Invalid filename</td>
</tr>
<tr>
<td>DRV_E_FW_FILE_OPEN_FAILED</td>
<td>0x8004C06E</td>
<td>USER Firmware file could not be opened</td>
</tr>
<tr>
<td>DRV_E_FW_FILE_SIZE_ZERO</td>
<td>0x8004C06F</td>
<td>USER Not enough memory to load firmware file</td>
</tr>
<tr>
<td>DRV_E_FW_FILE_NO_MEMORY</td>
<td>0x8004C070</td>
<td>USER Not enough memory to load firmware file</td>
</tr>
<tr>
<td>DRV_E_FW_FILE_READ_FAILED</td>
<td>0x8004C071</td>
<td>USER Firmware file read failed</td>
</tr>
<tr>
<td>DRV_E_FW_INVALID_FILETYPE</td>
<td>0x8004C072</td>
<td>USER Firmware file type invalid</td>
</tr>
<tr>
<td>DRV_E_FW_FILENAME_INVALID</td>
<td>0x8004C073</td>
<td>USER Firmware file name not valid</td>
</tr>
<tr>
<td>DRV_E_FWDOWNLOAD_ERROR</td>
<td>0x8004C074</td>
<td>USER Firmware file download error</td>
</tr>
<tr>
<td>DRV_E_FW_FILENAME_NOT_FOUND</td>
<td>0x8004C075</td>
<td>USER Firmware file not found in the internal table</td>
</tr>
<tr>
<td>DRV_E_FW_BOOTLOADER_ACTIVE</td>
<td>0x8004C076</td>
<td>USER Firmware file BOOTLOADER active</td>
</tr>
<tr>
<td>Error Code (Definition)</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>DRV_E_FW_NO_FILE_PATH</td>
<td>0x8004C077</td>
<td>USER Firmware file no file path</td>
</tr>
<tr>
<td>DRV_E_CF_FILE_OPEN_FAILED</td>
<td>0x8004C078</td>
<td>USER Configuration file could not be opened</td>
</tr>
<tr>
<td>DRV_E_CF_FILE_SIZE_ZERO</td>
<td>0x8004C079</td>
<td>USER Configuration file size zero</td>
</tr>
<tr>
<td>DRV_E_CF_FILE_NO_MEMORY</td>
<td>0x8004C07A</td>
<td>USER Not enough memory to load configuration file</td>
</tr>
<tr>
<td>DRV_E_CF_FILE_READ_FAILED</td>
<td>0x8004C07B</td>
<td>USER Configuration file read failed</td>
</tr>
<tr>
<td>DRV_E_CF_INVALID_FILETYPE</td>
<td>0x8004C07C</td>
<td>USER Configuration file type invalid</td>
</tr>
<tr>
<td>DRV_E_CF_FILENAME_INVALID</td>
<td>0x8004C07D</td>
<td>USER Configuration file name not valid</td>
</tr>
<tr>
<td>DRV_E_CF_DOWNLOAD_ERROR</td>
<td>0x8004C07E</td>
<td>USER Configuration file download error</td>
</tr>
<tr>
<td>DRV_E_CF_FILE_NO_SEGMENT</td>
<td>0x8004C07F</td>
<td>USER No flash segment in the configuration file</td>
</tr>
<tr>
<td>DRV_E_CF_DIFFERS_FROM_DBM</td>
<td>0x8004C080</td>
<td>USER Configuration file differs from database</td>
</tr>
<tr>
<td>DRV_E_DBM_SIZE_ZERO</td>
<td>0x8004C083</td>
<td>USER Database size zero</td>
</tr>
<tr>
<td>DRV_E_DBM_NO_MEMORY</td>
<td>0x8004C084</td>
<td>USER Not enough memory to upload database</td>
</tr>
<tr>
<td>DRV_E_DBM_READ_FAILED</td>
<td>0x8004C085</td>
<td>USER Database read failed</td>
</tr>
<tr>
<td>DRV_E_DBM_NO_FLASH_SEGMENT</td>
<td>0x8004C086</td>
<td>USER Database segment unknown</td>
</tr>
<tr>
<td>DEV_E_CF_INVALID_DESCRIPT_VERSION</td>
<td>0x8004C096</td>
<td>CONFIG Version of the descript table invalid</td>
</tr>
<tr>
<td>DEV_E_CF_INVALID_INPUT_OFFSET</td>
<td>0x8004C097</td>
<td>CONFIG Input offset is invalid</td>
</tr>
<tr>
<td>DEV_E_CF_NO_INPUT_SIZE</td>
<td>0x8004C098</td>
<td>CONFIG Input size is 0</td>
</tr>
<tr>
<td>DEV_E_CF_MISMATCH_INPUT_SIZE</td>
<td>0x8004C099</td>
<td>CONFIG Input size does not match configuration</td>
</tr>
<tr>
<td>DEV_E_CF_INVALID_OUTPUT_OFFSET</td>
<td>0x8004C09A</td>
<td>CONFIG Invalid output offset</td>
</tr>
<tr>
<td>DEV_E_CF_NO_OUTPUT_SIZE</td>
<td>0x8004C09B</td>
<td>CONFIG Output size is 0</td>
</tr>
<tr>
<td>DEV_E_CF_MISMATCH_OUTPUT_SIZE</td>
<td>0x8004C09C</td>
<td>CONFIG Output size does not match configuration</td>
</tr>
<tr>
<td>DEV_E_CF_STN_NOT_CONFIGURED</td>
<td>0x8004C09D</td>
<td>CONFIG Station not configured</td>
</tr>
<tr>
<td>DEV_E_CF_CANNOT_GET_STN_CONFIG</td>
<td>0x8004C09E</td>
<td>CONFIG Cannot get the Station configuration</td>
</tr>
<tr>
<td>DEV_E_CF_MODULE_DEF_MISSING</td>
<td>0x8004C09F</td>
<td>CONFIG Module definition is missing</td>
</tr>
<tr>
<td>DEV_E_CF_MISMATCH_EMPTY_SLOT</td>
<td>0x8004C0A0</td>
<td>CONFIG Empty slot mismatch</td>
</tr>
<tr>
<td>DEV_E_CF_MISMATCH_INPUT_OFFSET</td>
<td>0x8004C0A1</td>
<td>CONFIG Input offset mismatch</td>
</tr>
<tr>
<td>DEV_E_CF_MISMATCH_OUTPUT_OFFSET</td>
<td>0x8004C0A2</td>
<td>CONFIG Output offset mismatch</td>
</tr>
<tr>
<td>DEV_E_CF_MISMATCH_DATA_TYPE</td>
<td>0x8004C0A3</td>
<td>CONFIG Data type mismatch</td>
</tr>
<tr>
<td>DEV_E_CF_MODULE_DEF_MISSING_NO_SI</td>
<td>0x8004C0A4</td>
<td>CONFIG Module definition is missing,(no Slot/idx)</td>
</tr>
</tbody>
</table>

Table 67: cifX Driver Specific ODM Error Codes
## 9.5 Error Codes cifX Device Driver and netX Driver

### 9.5.1 Generic Error Codes

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

*Table 68: Generic Error Codes*
### 9.5.2 Generic Driver Error Codes

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

*Table 69: Generic Driver Error Codes*
### 9.5.3 Generic Device Error Codes

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

*Table 70: Generic Device Error Codes*
9.6 Error Codes netX Driver

9.6.1 CIFX API Transport Error Codes

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIFX_TRANSPORT_SEND_TIMEOUT</td>
<td>0x8000D0001</td>
<td>Time out while sending data</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_RECV_TIMEOUT</td>
<td>0x8000D0002</td>
<td>Time out waiting for incoming data</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_CONNECT</td>
<td>0x8000D0003</td>
<td>Unable to communicate to the device answer</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_ABORTED</td>
<td>0x8000D0004</td>
<td>Transfer has been aborted due to keep alive timeout or interface detachment</td>
</tr>
<tr>
<td>CIFX_CONNECTOR_FUNCTIONS_READ_ERROR</td>
<td>0x8000D0010</td>
<td>Error reading the connector functions from the DLL</td>
</tr>
<tr>
<td>CIFX_CONNECTOR_IDENTIFIER_TOO_LONG</td>
<td>0x8000D0011</td>
<td>Connector delivers an identifier longer than 6 characters</td>
</tr>
<tr>
<td>CIFX_CONNECTOR_IDENTIFIER_EMPTY</td>
<td>0x8000D0012</td>
<td>Connector delivers an empty identifier</td>
</tr>
<tr>
<td>CIFX_CONNECTOR_DUPLICATE_IDENTIFIER</td>
<td>0x8000D0013</td>
<td>Connector identifier already used</td>
</tr>
</tbody>
</table>

Table 71: CIFX API Transport Error Codes

9.6.2 CIFX API Transport Header State Error Codes

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIFX_TRANSPORT_ERROR_UNKNOWN</td>
<td>0x800E0001</td>
<td>Unknown error code in transport header</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_CHECKSUM_ERROR</td>
<td>0x800E0002</td>
<td>CRC16 checksum failed</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_LENGTH_INCOMPLETE</td>
<td>0x800E0003</td>
<td>Transaction with incomplete length detected</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_DATA_TYPE_UNKNOWN</td>
<td>0x800E0004</td>
<td>Device does not support requested data type</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_DEVICE_UNKNOWN</td>
<td>0x800E0005</td>
<td>Device not available unknown</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_CHANNEL_UNKNOWN</td>
<td>0x800E0006</td>
<td>Channel not available unknown</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_SEQUENCE</td>
<td>0x800E0007</td>
<td>Sequence error detected</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_BUFFEROVERFLOW</td>
<td>0x800E0008</td>
<td>Buffer overflow detected</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_RESOURCE</td>
<td>0x800E0009</td>
<td>Device signals out of resources</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_KEEPALIVE</td>
<td>0x800E000A</td>
<td>Device connection monitoring error (Keep alive)</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_DATA_TOO_SHORT</td>
<td>0x800E000B</td>
<td>Received transaction data too short</td>
</tr>
</tbody>
</table>

Table 72: CIFX API Transport Header State Error Codes
## 9.7 ODM Error Codes DBM V4

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDBM_E_MD5_INVALID</td>
<td>0XC004C810</td>
<td>Checksum invalid</td>
</tr>
<tr>
<td>CDBM_E_INTERNALERROR</td>
<td>0XC004C811</td>
<td>Internal Error</td>
</tr>
<tr>
<td>CDBM_W_WRITEREGISTRY</td>
<td>0X8004C812</td>
<td>Error writing to the registry</td>
</tr>
<tr>
<td>CDBM_E_UNEXPECTED_VALUE_IN_OLD_HEADER_FORMAT</td>
<td>0XC004C813</td>
<td>Error in a file containing the old DBM Header format.</td>
</tr>
<tr>
<td>CDBM_E_CHECKSUM_INVALID</td>
<td>0XC004C814</td>
<td>The Checksum of the old Header is invalid</td>
</tr>
<tr>
<td>CDBM_E_DB_ALREADY_LOADED_FORMAT</td>
<td>0XC004C815</td>
<td>A database is already loaded</td>
</tr>
<tr>
<td>CDBM_E_NO_VALID_TRANSACTION</td>
<td>0XC004C816</td>
<td>No valid transaction handle given</td>
</tr>
<tr>
<td>CDBM_E_STD_STRUCT_ERROR</td>
<td>0XC004C817</td>
<td>An error occurred during validation of data</td>
</tr>
<tr>
<td>CDBM_E_UNSUPPORTED_DATA_TYPE_FORMAT</td>
<td>0XC004C818</td>
<td>Unsupported DataType</td>
</tr>
<tr>
<td>CDBM_W_CLASS_DELETED_FORMAT</td>
<td>0X8004C819</td>
<td>(Warning) Using an Object which is marked as deleted</td>
</tr>
<tr>
<td>CDBM_W_CLIENT_DISCONNECTED</td>
<td>0X8004C81A</td>
<td>(Warning) A Client has already an outstanding connection to a Table. The connection is now destroyed.</td>
</tr>
<tr>
<td>CDBM_E_STRUCTURE_DEFINITION_INVALID</td>
<td>0XC004C81B</td>
<td>A structure definition of an Element in a Table is invalid</td>
</tr>
<tr>
<td>CDBM_E_NO_DATA_AVAILABLE</td>
<td>0XC004C81C</td>
<td>No data available for this operation</td>
</tr>
<tr>
<td>CDBM_E_NO_VALID_STRUCTURE</td>
<td>0XC004C81D</td>
<td>No valid structure available for this operation</td>
</tr>
<tr>
<td>CDBM_E_NO_TOGGLE_STRING_FOUND</td>
<td>0XC004C81E</td>
<td>No Toggle string found for this number</td>
</tr>
<tr>
<td>CDBM_E_ELEMENT_OUT_OF_RANGE</td>
<td>0XC004C81F</td>
<td>An element wasn’t found in the Record of a Table</td>
</tr>
<tr>
<td>CDBM_E_ELEMENT_NOT_IN_TABLE</td>
<td>0XC004C820</td>
<td>The element is not part of the Table</td>
</tr>
<tr>
<td>CDBM_E_CANNOT_CONVERT_INTO_CLIENT_TYPE</td>
<td>0XC004C821</td>
<td>The data can’t be converted into the Client type</td>
</tr>
<tr>
<td>CDBM_E_TRANSACTION_ALREADY_OPEN</td>
<td>0XC004C822</td>
<td>A transaction is already open. Please close this one first before opening a new one.</td>
</tr>
<tr>
<td>CDBM_I_OLD_WITHOUT_HEADER</td>
<td>0X4004C823</td>
<td>Use of an old DBM file Format without Header</td>
</tr>
<tr>
<td>CDBM_E_HR_FROM</td>
<td>0XC004C824</td>
<td>An HRESULT was received from a Subroutine</td>
</tr>
<tr>
<td>CDBM_E_PARAMETER</td>
<td>0XC004C825</td>
<td>A Parameter is invalid</td>
</tr>
<tr>
<td>CDBM_E_NOTIMPL</td>
<td>0XC004C826</td>
<td>Method is currently not implemented</td>
</tr>
<tr>
<td>CDBM_E_OUTOFMEMORY</td>
<td>0XC004C827</td>
<td>Out of memory</td>
</tr>
<tr>
<td>CDBM_E_NO_OPEN_TRANSACTION</td>
<td>0XC004C828</td>
<td>No transaction open</td>
</tr>
<tr>
<td>CDBM_E_NO_CONTENTS</td>
<td>0XC004C829</td>
<td>No contents available</td>
</tr>
<tr>
<td>CDBM_REC_NO_NOT_FOUND</td>
<td>0XC004C82A</td>
<td>Record not found</td>
</tr>
<tr>
<td>CDBM_STRUCTURE_ELEMENT_NOT_FOUND</td>
<td>0XC004C82B</td>
<td>Element of the Structure not found</td>
</tr>
<tr>
<td>CDBM_E_NO_MORE_RECORDS_IN_TABTYPE</td>
<td>0XC004C82C</td>
<td>Table type 3 can contain only one record</td>
</tr>
<tr>
<td>CDBM_E_WRITE</td>
<td>0XC004C82D</td>
<td>The data in the VARIANT must be given in a SafeArray</td>
</tr>
<tr>
<td>CDBM_E_WRITE_NO_PARRAY</td>
<td>0XC004C82E</td>
<td>The VARIANT contains no valid [parray] element</td>
</tr>
<tr>
<td>Error Code (Definition)</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>CDBM_E_WRITE_CANT_ACCESS_DATA</td>
<td>0XC004C82F</td>
<td>Unable to access SafeArray Data in the VARIANT</td>
</tr>
<tr>
<td>CDBM_E_WRITE_DATA</td>
<td>0XC004C830</td>
<td>To write the data of this Element it must be given as a BSTR, or as an Array of VT_UI1/VT_I1</td>
</tr>
<tr>
<td>CDBM_E_WRITE_BSTR_E1</td>
<td>0XC004C831</td>
<td>The BSTR string must have an even length.</td>
</tr>
<tr>
<td>CDBM_E_WRITE_BSTR_E2</td>
<td>0XC004C832</td>
<td>The BSTR string must contain only hex digits (0..9 and a/A..f/F).</td>
</tr>
<tr>
<td>CDBM_E_WRITE_CANT_INTERPRET_ARRAY</td>
<td>0XC004C833</td>
<td>Unable to interpret data in the SafeArray.</td>
</tr>
<tr>
<td>CDBM_E_WRITE_VT_ERROR</td>
<td>0XC004C834</td>
<td>Data type in the SafeArray is not VT_UI1 or VT_I1.</td>
</tr>
<tr>
<td>CDBM_E_WRITE_LENGTH</td>
<td>0XC004C835</td>
<td>Data length is invalid for write operation of this type.</td>
</tr>
<tr>
<td>CDBM_WRITE_ELEMENT</td>
<td>0XC004C836</td>
<td>Element not found in the Record of the Table</td>
</tr>
<tr>
<td>CDBM_MIN_MAX_ERROR</td>
<td>0XC004C837</td>
<td>Can't write data because of min underflow or max overflow</td>
</tr>
<tr>
<td>CDBM_TABLE_EXIST</td>
<td>0XC004C838</td>
<td>Table already exist in the database</td>
</tr>
<tr>
<td>CDBM_MIN_MAX_INVALID</td>
<td>0XC004C839</td>
<td>The Min value is greater than the Max Value</td>
</tr>
<tr>
<td>CDBM_DEF_MIN_MAX_INVALID</td>
<td>0XC004C83A</td>
<td>The Default Value is not in the range between the Min value and the Max Value</td>
</tr>
<tr>
<td>CDBM_CANT_CHANGE_STRUCTURE_WHILE_RECORDS_EXIST</td>
<td>0XC004C83B</td>
<td>It's not allowed to change the structure while Records exist in the Table</td>
</tr>
<tr>
<td>CDBM_NEW_STRUCT_NEEDS_TYPE</td>
<td>0XC004C83C</td>
<td>In a newly added structure the data type must be set also</td>
</tr>
<tr>
<td>CDBM_VALUE_ERROR</td>
<td>0XC004C83D</td>
<td>Range error while validating a value</td>
</tr>
<tr>
<td>CDBM_DATATYPE_UNSUPPORTED_IN_RCS</td>
<td>0XC004C83E</td>
<td>The data type is unsupported in the RCS file format</td>
</tr>
<tr>
<td>CDBM_I_COUNT_OF_TABLES_EXCEEDS_RCS_RANGE</td>
<td>0X4004C83F</td>
<td>The count of Tables exceeds the RCS range of Tables. This can cause problems if the file is downloaded to RCS Systems</td>
</tr>
<tr>
<td></td>
<td>(Informational)</td>
<td></td>
</tr>
<tr>
<td>CDBM_I_COUNT_OF_TABLES_EXCEEDS_OLDDBM_RANGE</td>
<td>0X4004C840</td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>(Informational)</td>
<td></td>
</tr>
<tr>
<td>CDBM_UNSUPPORTED_DATATYPE_IN_RCS_MODE</td>
<td>0XC004C841</td>
<td>The Data type is not compatible with the old database format</td>
</tr>
<tr>
<td>CDBM_WRITE_UNSTRUCTURED_1</td>
<td>0XC004C842</td>
<td>The data of an unstructured record can only be written with the 'Write' Method not with 'WriteElement'.</td>
</tr>
<tr>
<td>CDBM_READ_UNSTRUCTURED_1</td>
<td>0XC004C843</td>
<td>The data of an unstructured record can only be read with the 'Read' Method not with 'ReadElement'</td>
</tr>
<tr>
<td>CDBM_WRITE_DATA_LENGTH_INVALID</td>
<td>0XC004C844</td>
<td>The given data length doesn't correspond with the expected data length.</td>
</tr>
<tr>
<td>CDBM_UNKNOWN_VIEW_MODE</td>
<td>0XC004C845</td>
<td>The View Mode is unknown.</td>
</tr>
<tr>
<td>CDBM_E_DIAG_TABLE</td>
<td>0XC004C846</td>
<td>It doesn't make much sense to add or delete records from a diagnostic table because those changes are never saved.</td>
</tr>
<tr>
<td>CDBM_E_ADR_STRING_ERROR</td>
<td>0XC004C847</td>
<td>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</td>
</tr>
</tbody>
</table>
## ODM Error Codes DBM V4

<table>
<thead>
<tr>
<th>Error Code (Definition)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDBM_ERROR_FROM_VAR_CHANGE_TYPE</td>
<td>0XC004C848</td>
<td>Function VariantChangeType return an error when trying to convert the Parameter</td>
</tr>
<tr>
<td>CDBM_E_MINERROR</td>
<td>0XC004C849</td>
<td>Error while comparing the Value with the lower range</td>
</tr>
<tr>
<td>CDBM_E_MAXERROR</td>
<td>0XC004C84A</td>
<td>Error while comparing the Value with the upper range</td>
</tr>
<tr>
<td>CDBM_E_RANGE_ERROR</td>
<td>0XC004C84B</td>
<td>Value out of Range</td>
</tr>
<tr>
<td>CDBM_E_TABLE_TYPE1</td>
<td>0XC004C84C</td>
<td>Table type 1 doesn’t have a unique record length over all records</td>
</tr>
<tr>
<td>CDBM_E_TABLE_TYPE3_ADDREC</td>
<td>0XC004C84D</td>
<td>Table type 3 doesn’t allow to insert more than one Record</td>
</tr>
<tr>
<td>CDBM_E_TABTYPE1</td>
<td>0XC004C84E</td>
<td>It’s not allowed to insert more Records than structure definitions in Table Type 1</td>
</tr>
<tr>
<td>CDBM_E_TOGGLE_NOT_FOUND</td>
<td>0XC004C84F</td>
<td>Could not find the string for this value in the list of valid toggle strings</td>
</tr>
<tr>
<td>CDBM_E_TOGGLE_VALUE_IS_EMPTY_STRING</td>
<td>0XC004C850</td>
<td>The toggle string for this value is empty.</td>
</tr>
<tr>
<td>CDBM_VARIANT2BYTEARRAY_ERROR</td>
<td>0XC004C851</td>
<td>Error during conversion of Variant to byte array</td>
</tr>
<tr>
<td>CDBM_E_SET_ELEM_PROP_DEPENDENCY</td>
<td>0XC004C852</td>
<td>The Toggle Type needs also the additional string and the additional number entries in the Method</td>
</tr>
<tr>
<td>CDBM_E_TABTYPE1_REC_DOESNT_CORRESPOND_WITH_ELEMENT</td>
<td>0XC004C853</td>
<td>When reading the records of Table type 1 elementwise the record number must correspond with the element number</td>
</tr>
<tr>
<td>CDBM_TABTYPE1_NO_DATA_FOUND_FOR_RECORD</td>
<td>0XC004C854</td>
<td>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</td>
</tr>
<tr>
<td>CDBM_E_TABTYPE1_WRITE_ELEMENT_N_E_RECORD</td>
<td>0XC004C855</td>
<td>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</td>
</tr>
<tr>
<td>CDBM_E_TABTYPE1_WRITE_ELEMENT_NOT_FOUND</td>
<td>0XC004C856</td>
<td>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</td>
</tr>
<tr>
<td>CDBM_I_TABLE_NAME_EXCEEDS_RCS_RANGE</td>
<td>0X4004C857</td>
<td>The Table name exceeds the maximum length of RCS compatible Table names</td>
</tr>
<tr>
<td>CDBM_W_CUT_STRING</td>
<td>0X8004C858</td>
<td>The string exceeds the maximum length and will be limited to the maximum length (Warning)</td>
</tr>
<tr>
<td>CDBM_I_STRING_TOO_SHORT</td>
<td>0X4004C859</td>
<td>The string is below the minimum length. The minimum length will be reduced. (Informational)</td>
</tr>
<tr>
<td>CDBM_I_STRING_TOO_LONG</td>
<td>0X4004C85A</td>
<td>The string is exceeding the maximum. The maximum length will be extended. (Informational)</td>
</tr>
<tr>
<td>CDBM_E_STRING_TOO_SHORT</td>
<td>0XC004C85B</td>
<td>The string is below the minimum length. (Informational)</td>
</tr>
<tr>
<td>CDBM_E_STRING_TOO_LONG</td>
<td>0XC004C85C</td>
<td>The string is exceeding the maximum length (Error)</td>
</tr>
<tr>
<td>CDBM_E_WRONG_TYPE_FOR_WRITE</td>
<td>0XC004C85D</td>
<td>Writing on the Element type with the given Data type is not implemented</td>
</tr>
<tr>
<td>CDBM_E_NO_APPEND_IN_STRUCTURED_RECORDS</td>
<td>0XC004C85E</td>
<td>Method IDbmRecord::AppendData is not allowed for structured records</td>
</tr>
<tr>
<td>Error Code (Definition)</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>CDBM_E_DATA_UNAVAILABLE</td>
<td>0XC004C85F</td>
<td>No data available</td>
</tr>
<tr>
<td>CDBM_E_CANT_CONVERT_Into</td>
<td>0XC004C860</td>
<td>Unable to convert the value into the Element type</td>
</tr>
<tr>
<td>CDBM_E_DBM_FILE_OVERFLOW</td>
<td>0XC004C861</td>
<td>You try to write a RCS like database which needs too much bytes</td>
</tr>
<tr>
<td>CDBM_E_PW_ERROR</td>
<td>0XC004C862</td>
<td>Password not correct</td>
</tr>
<tr>
<td>CDBM_E_FILELENGTH_CORRUPT</td>
<td>0XC004C863</td>
<td>The file length doesn't correspond to the length given in the Header.</td>
</tr>
<tr>
<td>CDBM_E_STRUCT_TYPE</td>
<td>0XC004C864</td>
<td>Error in the file.</td>
</tr>
<tr>
<td>CDBM_E_MD5SUM_INVALID</td>
<td>0XC004C865</td>
<td>MD5 sum invalid</td>
</tr>
<tr>
<td>CDBM_E_STRUCT_LENGTH</td>
<td>0XC004C866</td>
<td>Error in the expected and given structure length at a specific offset in the file.</td>
</tr>
<tr>
<td>CDBM_E_APPEND</td>
<td>0XC004C867</td>
<td>Append of data is only allowed if the Record contains only one data field and the field type will support this</td>
</tr>
<tr>
<td>CDBM_APPEND_NOT_SUPPORTED</td>
<td>0XC004C868</td>
<td>Append of Data not supported by this field type</td>
</tr>
<tr>
<td>CDBM_DATA_TYPE_APPEND_ERROR</td>
<td>0XC004C869</td>
<td>Can't append Data of this type.</td>
</tr>
<tr>
<td>CDBM_E_UNSTRUCTURED_TABLE DOESNT_SUPPORT_LENGTH</td>
<td>0XC004C86A</td>
<td>A Table without structure information doesn't support a record length</td>
</tr>
<tr>
<td>CDBM_E_DISABLED WHILE TRANSACTION IS OPEN</td>
<td>0XC004C86B</td>
<td>The Method is disabled while a transaction is open. Please close this one first and call the Method again.</td>
</tr>
<tr>
<td>CDBM_E_UNABLE TO CALL READ ON LINKED LIST</td>
<td>0XC004C86C</td>
<td>The Method is disabled on a LinkedList type. Please use the IRecordCollection on this type.</td>
</tr>
<tr>
<td>CDBM_E_ELEMENT_HAS_NO_SUBSTRUCTURE</td>
<td>0XC004C86D</td>
<td>An Element from a Table has no substructure</td>
</tr>
<tr>
<td>CDBM_STRUCT_ERROR_FROM_VAR_CHANGE_TYPE</td>
<td>0XC004C86E</td>
<td>Error from calling VariantChangeType</td>
</tr>
<tr>
<td>CDBM_E_FOREIGNKEY_DEF</td>
<td>0XC004C86F</td>
<td>The definition of a FOREIGNKEY must contain the name of the related Table in the description and this Table must exist at this time</td>
</tr>
<tr>
<td>CDBM_E_FOREIGNKEY_REF_TAB</td>
<td>0XC004C870</td>
<td>The description of a FOREIGNKEY must refer to a Table of type 'eDbmTableTypeLinkedList'</td>
</tr>
<tr>
<td>CDBM_E_KEY</td>
<td>0XC004C871</td>
<td>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</td>
</tr>
<tr>
<td>CDBM_E_KEY_TABLE_TYPE</td>
<td>0XC004C872</td>
<td>This Method needs a Table of type 'eDbmTableTypeLinkedList'</td>
</tr>
<tr>
<td>CDBM_DATATYPE_NOT_IMPLEMENTED</td>
<td>0XC004C873</td>
<td>This data type is currently not implemented</td>
</tr>
<tr>
<td>CDBM_INSERT_POS_NOT_FOUND</td>
<td>0XC004C874</td>
<td>The position of the Record where the new one should be inserted wasn't found</td>
</tr>
<tr>
<td>CDBM_E_INSERT_REC_QI</td>
<td>0XC004C875</td>
<td>Error during insertion of a Record</td>
</tr>
<tr>
<td>CDBM_E_TAB_PROP</td>
<td>0XC004C876</td>
<td>Invalid Property in Table</td>
</tr>
<tr>
<td>CDBM_E_KEY_NOT_FOUND</td>
<td>0XC004C877</td>
<td>The KEY wasn't found in the Table</td>
</tr>
<tr>
<td>CDBM_E_KEY_INVALID</td>
<td>0XC004C878</td>
<td>The KEY is invalid for this operation</td>
</tr>
</tbody>
</table>

Table 73: ODM Error Codes DBM V4
10 Appendix

10.1 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.

### 10.1.1 Settings

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

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

### 10.1.2 Configuration

<table>
<thead>
<tr>
<th></th>
<th>Observer</th>
<th>Operator</th>
<th>Maintenance</th>
<th>Planning Engineer</th>
<th>Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Parameters</td>
<td>D</td>
<td>D</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Process Data</td>
<td>D</td>
<td>D</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Address Table</td>
<td>D</td>
<td>D</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Station Table</td>
<td>D</td>
<td>D</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Master Settings</td>
<td>D</td>
<td>D</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

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

[1] Device Type Manager (DTM) Style Guide, Version 1.0 ; FDT-JIG - Order No. 0001-0008-000

10.3 List of Figures

Figure 1: Dialog Structure of the PROFIBUS DP Master DTM 14
Figure 2: Navigation Area 15
Figure 3: Status Bar – Status Fields 1 to 6 18
Figure 4: Status Bar Display Examples 18
Figure 5: Default Driver ’cifX Device Driver’ for PC cards cifX 28
Figure 6: Default Driver ’cifX Device Driver’ for PC cards cifX (example) 28
Figure 7: Default Driver ,netX Driver’ for Hilscher devices except for PC cards cifX (example) 28
Figure 8: Manual Selection of multiple drivers (Example) 29
Figure 9: netX Driver > USB/RS232 Connection 32
Figure 10: netX Driver > TCP Connection 35
Figure 11: Device Assignment - detected Devices (* The name of the device class is displayed.) – Example for a device without firmware 37
Figure 12: Device Assignment - detected Devices (* The name of the device class is displayed.) Example for Devices without Firmware 39
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 40
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 41
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 42
Figure 16: Firmware Download 43
Figure 17: Window ‘Select Firmware File’ (Example CIFX) 44
Figure 18: Request Select Firmware File - Example 46
Figure 19: Firmware Download – Download 46
Figure 20: Firmware-Download – Question 46
Figure 21: Clock Symbol and Hook Symbol green 47
Figure 22: Firmware Download - Progress Bar 47
Figure 23: Licensing 48
Figure 24: Bus Parameters > Profile 52
Figure 25: Bus Parameters > Bus Parameters 53
Figure 26: Note bus configuration was changed, Bus Parameters not longer actual 55
Figure 27: Adjust Bus Parameters 55
Figure 28: Bus Parameters > Bus Monitoring 56
Figure 29: Note Bus configuration was changed, Bus Monitoring Parameters not longer actual 57
Figure 30: Adjust Bus Monitoring Parameters 57
Figure 31: Bus Parameters > Error Handling 57
Figure 32: Bus Parameters > Calculated Timing 58
Figure 33: Process Data (*The name of the Slave device is displayed.) 59
Figure 34: Configuration > Address Table (In the Figure shown here, in the column Device or Name example devices are displayed.) 60
Figure 35: Configuration > Address Table - Auto Addressing 61
Figure 36: Configuration > Address Table - Display Mode 61
Figure 37: Configuration > Address Table - Inputs / Outputs (In the Figure shown here, in the column Device or Name example devices are displayed.) 62
Figure 38: Station Table (In the Figure shown here, in the column Device or Name example devices are displayed.)

Figure 39: Configuration > Master Settings

Figure 40: Master Settings > Start of Bus Communication

Figure 41: Master Settings > Application Monitoring

Figure 42: Master Settings > Process Image Storage Format

Figure 43: Master Settings > Module Alignment

Figure 44: Master Settings > Process Data Handshake

Figure 45: Master Settings > Advanced

Figure 46: Master Settings > Device Status Offset

Figure 47: Example Debug Mode with pending Diagnosis, Network View of a Project with one Network (Master and Slave)

Figure 48: Set Station Address

Figure 49: Live List

Figure 50: Starting ‘Network Scan’ (Example)

Figure 51: Scan Response dialog of the Master DTM (Example)

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

Figure 53: Query about the Generation of the Module Configuration (Example)

Figure 54: Upload succeeded (Example)

Figure 55: Uploaded Modules (Example)

Figure 56: Network Scan > Create Devices > Upload

Figure 57: Overview Configuration Software and Master Firmware

Figure 58: Enable configuration download during network state “operate” - checked

Figure 59: Master Settings > Device Status Offset

Figure 60: Dialog Pane Configuration in Run (Example)

Figure 61: Dialog Pane Configuration in Run (Example) – „Devices“

Figure 62: Dialog Pane Configuration in Run – Meaning of the Colors

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

Figure 64: Dialog Pane Configuration in Run – Activate changes, Cancel, Help

Figure 65: License Pane

Figure 66: License Pane - License Type

Figure 67: License Pane – License Type / Master protocols

Figure 68: License Pane – License Type / Utilities

Figure 69: License Pane - Request Form, please fill out / Device Information

Figure 70: License Pane - Request Form, please fill out / License Type

Figure 71: License Pane - Request Form, please fill out / Mandatory data

Figure 72: License Pane – Selecting the Subsidiary / Ordering / Contacts

Figure 73: License Pane – placing the order by E-mail

Figure 74: Example: Order E-Mail License request

Figure 75: License Pane - placing the order by Fax or by Telephone

Figure 76: Example: Order Data Form PrintOrderRequest

Figure 77: License Pane – Fax Number of the selected Subsidiary

Figure 78: License Pane – Telephone Number of the selected Subsidiary

Figure 79: License Pane - Ordering by exported File and E-Mail

Figure 80: License Pane - Download License

Figure 81: General Diagnosis

Figure 82: Master Diagnosis

Figure 83: Bus Diagnosis - Bus Monitoring

Figure 84: Station Diagnosis - Station Status

Figure 85: Firmware Diagnosis (*The name of the Firmware is displayed.)

Figure 86: Extended Diagnosis > [Folder Name] > Task Information Example Display

Figure 87: Extended Diagnosis > [Folder Name] > IniBatch Status Example Display

Figure 88: Extended Diagnosis > PROFIBUS_DL > Busparameter
10.4 List of Tables

Table 1: Descriptions Dialog Panes 7
Table 2: List of Revisions 8
Table 3: General Device Information 15
Table 4: Overview Dialog Panes 16
Table 5: OK, Cancel, Apply and Help 17
Table 6: Selecting, inserting, deleting Table Line 17
Table 7: Status Bar Icons [1] 18
Table 8: Getting started - Configuration Steps 22
Table 9: Getting started - "Configuration in Run" Steps 24
Table 10: Descriptions of the Dialog Panes Settings 25
Table 11: Driver Selection List Parameters 28
Table 12: Parameters netX Driver > USB/RS232 Connection 33
Table 13: Parameters netX Driver > TCP Connection 36
Table 14: Parameters of the Device Assignment 38
Table 15: Parameter Firmware Download 43
Table 16: Parameters Select Firmware File 45
Table 17: Descriptions of the Dialog Panes Configuration 49
Table 18: Bus Parameters > Bus Parameters 54

Figure 89: Extended Diagnosis > PROFIBUS_DL > Counter 132
Figure 90: Extended Diagnosis > PROFIBUS_FSPMM > Application Commands 133
Figure 91: Extended Diagnosis > PROFIBUS_FSPMM > DataLink Commands 134
Figure 92: Extended Diagnosis > PROFIBUS_FSPMM > DMPMM Counter 135
Figure 93: Extended Diagnosis > PROFIBUS_FSPMM > MMAC1 Counter 136
Figure 94: Extended Diagnosis > PROFIBUS_FSPMM > Timer 136
Figure 95: Extended Diagnosis > PROFIBUS_FSPMM2 > Task Resources 137
Figure 96: Extended Diagnosis > PROFIBUS_FSPMM2 > Application Commands 138
Figure 97: Extended Diagnosis > PROFIBUS_APM > Common State 139
Figure 98: Extended Diagnosis > PROFIBUS_APM > Global State field 140
Figure 99: Extended Diagnosis > PROFIBUS_APM > Application Commands 143
Figure 100: Extended Diagnosis > PROFIBUS_APM > IO Exchange Counter 144
Figure 101: Extended Diagnosis > PROFIBUS_APM > Packet Router 144
Figure 102: Packet Monitor 146
Figure 103: Send > Packet Header and Send Data 147
Figure 104: Packet Header and Receive Data 148
Figure 105: Packet Description PROFIBUS_FSPMM_CMD_READ_REQ – V1 Class 1 Read Request 150
Figure 106: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Send > Packet header 151
Figure 107: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Send > Send Data 152
Figure 108: Packet Description PROFIBUS_FSPMM_CMD_READ_CNF – Confirmation of V1 Class 1 Read Request 153
Figure 109: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Receive > Packet header 154
Figure 110: Example - Reading data via DPV1 Class 1 - FSPMM_QUE – Receive > Receive data 155
Figure 111: Packet Description PROFIBUS_FSPMM_CMD_WRITE_REQ – V1 Class 1 Write Request 157
Figure 112: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Send > Packet header 158
Figure 113: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Send > Send Data 159
Figure 114: Packet Description PROFIBUS_FSPMM_CMD_WRITE_CNF – Confirmation of V1 Class 1 Write Request 160
Figure 115: Example - Writing data via DPV1 Class 1 - FSPMM_QUE – Receive > Packet header 161
Figure 116: Example – Writing data via DPV1 Class 1 - FSPMM_QUE – Receive > Receive data 162
Figure 117: IO Monitor 163
Figure 118: Window ‘Process Image Monitor’ 164
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Bus Parameters &gt; Bus Monitoring</td>
</tr>
<tr>
<td>20</td>
<td>Bus Parameters &gt; Calculated Timing</td>
</tr>
<tr>
<td>21</td>
<td>Process Data</td>
</tr>
<tr>
<td>22</td>
<td>Address Table Pane Parameters - Inputs / Outputs</td>
</tr>
<tr>
<td>23</td>
<td>Station Table</td>
</tr>
<tr>
<td>24</td>
<td>Range of Value / Value for the Watchdog time</td>
</tr>
<tr>
<td>25</td>
<td>Master Settings Pane Parameters - Process Image Storage Format</td>
</tr>
<tr>
<td>26</td>
<td>Parameters Master Settings &gt; Module Alignment</td>
</tr>
<tr>
<td>27</td>
<td>Option Master Settings &gt; Device Status Offset</td>
</tr>
<tr>
<td>28</td>
<td>Debug Mode Busline Colors and Debug Icons</td>
</tr>
<tr>
<td>29</td>
<td>Description on the Scan Response dialog of the Master DTM</td>
</tr>
<tr>
<td>30</td>
<td>Network Scan &gt; Create Devices &gt; Upload</td>
</tr>
<tr>
<td>31</td>
<td>Quick Reference Dialog Pane “Configuration in Run”</td>
</tr>
<tr>
<td>32</td>
<td>Descriptions of the Diagnosis Panes</td>
</tr>
<tr>
<td>33</td>
<td>Indication General Diagnosis</td>
</tr>
<tr>
<td>34</td>
<td>Parameter General Diagnosis</td>
</tr>
<tr>
<td>35</td>
<td>Parameter Master Diagnosis</td>
</tr>
<tr>
<td>36</td>
<td>Bus Diagnosis - Bus Monitoring</td>
</tr>
<tr>
<td>37</td>
<td>Possible Values for the Status</td>
</tr>
<tr>
<td>38</td>
<td>Description Table Task Information</td>
</tr>
<tr>
<td>39</td>
<td>Descriptions of the Dialog Panes Extended Diagnosis</td>
</tr>
<tr>
<td>40</td>
<td>Extended Diagnosis &gt; [Folder Name] &gt; Task Information</td>
</tr>
<tr>
<td>41</td>
<td>Extended Diagnosis &gt; [Folder Name] &gt; IniBatch Status</td>
</tr>
<tr>
<td>42</td>
<td>Extended Diagnosis &gt; PROFIBUS_DL &gt; Busparameter</td>
</tr>
<tr>
<td>43</td>
<td>Extended Diagnosis &gt; PROFIBUS_DL &gt; Counter</td>
</tr>
<tr>
<td>44</td>
<td>Extended Diagnosis &gt; PROFIBUS_FSPMM &gt; Application Commands</td>
</tr>
<tr>
<td>45</td>
<td>Extended Diagnosis &gt; PROFIBUS_FSPMM &gt; DataLink Commands</td>
</tr>
<tr>
<td>46</td>
<td>Extended Diagnosis &gt; PROFIBUS_FSPMM &gt; DMPMM Counter</td>
</tr>
<tr>
<td>47</td>
<td>Extended Diagnosis &gt; PROFIBUS_FSPMM &gt; MMAC1 Counter</td>
</tr>
<tr>
<td>48</td>
<td>Extended Diagnosis &gt; PROFIBUS_FSPMM &gt; Timer</td>
</tr>
<tr>
<td>49</td>
<td>Extended Diagnosis &gt; PROFIBUS_FSPMM2 &gt; Task Resources</td>
</tr>
<tr>
<td>50</td>
<td>Extended Diagnosis &gt; PROFIBUS_FSPMM2 &gt; Application Commands</td>
</tr>
<tr>
<td>51</td>
<td>Extended Diagnosis &gt; PROFIBUS_APM &gt; Common State</td>
</tr>
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<td>52</td>
<td>Extended Diagnosis &gt; PROFIBUS_APM &gt; Global State field</td>
</tr>
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<td>53</td>
<td>Extended Diagnosis &gt; PROFIBUS_APM &gt; Application Commands</td>
</tr>
<tr>
<td>54</td>
<td>Extended Diagnosis &gt; PROFIBUS_APM &gt; IO Exchange Counter</td>
</tr>
<tr>
<td>55</td>
<td>Extended Diagnosis &gt; PROFIBUS_APM &gt; Packet Router</td>
</tr>
<tr>
<td>56</td>
<td>Descriptions of the Diagnosis Panes</td>
</tr>
<tr>
<td>57</td>
<td>Descriptions Packet Header</td>
</tr>
<tr>
<td>58</td>
<td>Descriptions Packet Header</td>
</tr>
<tr>
<td>59</td>
<td>Notes to the Window ‘Process Image Monitor’</td>
</tr>
<tr>
<td>60</td>
<td>Overview Error Codes and Ranges</td>
</tr>
<tr>
<td>61</td>
<td>RCX General Task Errors</td>
</tr>
<tr>
<td>62</td>
<td>RCX Common Status &amp; Errors Codes</td>
</tr>
<tr>
<td>63</td>
<td>RCX Status &amp; Error Codes</td>
</tr>
<tr>
<td>64</td>
<td>RCX Status &amp; Error Codes Slave State</td>
</tr>
<tr>
<td>65</td>
<td>ODM Error Codes - General ODM Error Codes</td>
</tr>
<tr>
<td>66</td>
<td>ODM Error Codes - General ODM Driver Error Codes</td>
</tr>
<tr>
<td>67</td>
<td>cifX Driver Specific ODM Error Codes</td>
</tr>
<tr>
<td>68</td>
<td>Generic Error Codes</td>
</tr>
<tr>
<td>69</td>
<td>Generic Driver Error Codes</td>
</tr>
<tr>
<td>70</td>
<td>Generic Device Error Codes</td>
</tr>
<tr>
<td>71</td>
<td>CIFX API Transport Error Codes</td>
</tr>
</tbody>
</table>
10.5 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 cyclic and acyclic communication

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.
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