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1 Introduction

1.1 About this Manual

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

1.1.1 Dialog Panes

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

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<th>Page</th>
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<tr>
<td></td>
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<td>136</td>
</tr>
</tbody>
</table>

Table 1: Descriptions Dialog Panes

1.1.2 Online Help

The DeviceNet 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>11</td>
<td>13-04-16</td>
<td>1.307.x.x</td>
<td>DNMasterDTMx.dll</td>
<td>All, 1.3.1, 3.6, 5.5</td>
<td>Revised and updated, Windows 8 added. Section Requirements updated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DNMasterGuix.ocx</td>
<td></td>
<td>Section Licensing added, Section ‘Network Scan’ and ‘Upload’ added.</td>
</tr>
<tr>
<td>12</td>
<td>13-09-16</td>
<td>1.307.x.x</td>
<td>DNMasterDTMx.dll</td>
<td>All, 2.1, 3.2, 3.3, 3.5, 8.4</td>
<td>Note about the configuration of 2-channel devices added, Section Configuration Steps, Settings for Driver and Device Assignment and Driver updated. Section Firmware Download updated. Section Process Image Monitor added.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DNMasterGuix.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 *3, B, C ...* or *A, B, C ...* refer to the figure used in that section. If the numbers reference to a section outside the current section then a cross reference to that section and figure is indicated.
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1.3 About DeviceNet Master DTM

You can use the DeviceNet Master DTM to configure the DeviceNet 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® 7 (64 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 DeviceNet Master DTM**

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

- Completed hardware installation of a netX based DTM-compatible DeviceNet 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 DeviceNet Master DTM and the DeviceNet 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 86.
1.4 Dialog Structure of the DeviceNet 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.

![Diagram of the dialog structure of the DeviceNet Master DTM](image)

Figure 1: Dialog Structure of the DeviceNet 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

- Hiding the navigation area (above right side).
- Opening the navigation area (below left side).
### 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>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver</td>
<td>To establish a connection from the DeviceNet Master DTM to the DeviceNet 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 25.</td>
</tr>
<tr>
<td>Device Assignment</td>
<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 34.</td>
</tr>
<tr>
<td>Firmware Download</td>
<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 40.</td>
</tr>
<tr>
<td>Licensing</td>
<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 86.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Parameter</td>
<td>The Bus Parameters are the basis of an operating data exchange. For further information refer to section Bus Parameters on page 50.</td>
</tr>
<tr>
<td>Server Parameters</td>
<td>The Server Parameters contain DeviceNet specific server parameters with which the device is able to be a server at the same time being a Master. Further information can be found in section Server Parameters on page 52.</td>
</tr>
<tr>
<td>Process Data</td>
<td>The Process Data pane serves for the DeviceNet Master DTM as an external process data interface. For further information, refer to section Process Data on page 53.</td>
</tr>
<tr>
<td>Address Table</td>
<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 54.</td>
</tr>
<tr>
<td>MAC ID Table</td>
<td>The MAC ID Table, also called device table, shows the MAC IDs, Device Names and Device Descriptions of the configured slaves. Further information can be found in section MAC ID Table on page 55.</td>
</tr>
<tr>
<td>Quick Connect Table</td>
<td>In the Quick Connect Table pane you need to define for every DeviceNet Slave device wether the Master Device shall accelerate connection establishment to this Slave by using the „Quick Connect“ option. Further information can be found in section Quick Connect Table on page 56.</td>
</tr>
<tr>
<td>Master Settings</td>
<td>At the Master Settings pane device related settings can be made. For further information, refer to section Master Settings on page 60.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis/Extended Diagnosis</td>
<td>At the Diagnosis panes information can be read for troubleshooting. For further information, refer to section Overview Diagnosis on page 99 or section Overview Extended Diagnosis on page 108.</td>
</tr>
</tbody>
</table>

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

**Table 4: Overview Dialog Panes**

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

For further information, refer to section Connecting/Disconnecting Device on page 65.
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>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OK</strong></td>
</tr>
<tr>
<td>To confirm your latest settings, click <strong>OK</strong>. All changed values will be applied on the frame application database.</td>
</tr>
<tr>
<td><em>The dialog then closes.</em></td>
</tr>
<tr>
<td><strong>Cancel</strong></td>
</tr>
<tr>
<td>To cancel your latest changes, click <strong>Cancel</strong>.</td>
</tr>
<tr>
<td>Answer to the safety query <strong>Configuration data has been changed. Do you want to save the data?</strong> by <strong>Yes</strong>, <strong>No</strong> or <strong>Cancel</strong>.</td>
</tr>
<tr>
<td><strong>Yes</strong>: The changes are saved or the changed values are applied on the frame application database.</td>
</tr>
<tr>
<td><em>The dialog then closes.</em></td>
</tr>
<tr>
<td><strong>No</strong>: The changes are not saved or the changed values are not applied on the frame application database.</td>
</tr>
<tr>
<td><em>The dialog then closes.</em></td>
</tr>
<tr>
<td><strong>Cancel</strong>: Back to the DTM.</td>
</tr>
<tr>
<td><strong>Apply</strong></td>
</tr>
<tr>
<td>To confirm your latest settings, click <strong>Apply</strong>. All changed values will be applied on the frame application database.</td>
</tr>
<tr>
<td><em>The dialog remains opened.</em></td>
</tr>
<tr>
<td><strong>Help</strong></td>
</tr>
<tr>
<td>To open the DTM online help, click <strong>Help</strong>.</td>
</tr>
</tbody>
</table>

*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>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Line</strong></td>
</tr>
<tr>
<td>To select the first line of a table use <strong>First Line</strong>.</td>
</tr>
<tr>
<td><strong>Previous Line</strong></td>
</tr>
<tr>
<td>To select the previous line of a table use <strong>Previous Line</strong>.</td>
</tr>
<tr>
<td><strong>Next Line</strong></td>
</tr>
<tr>
<td>To select the next line of a table use <strong>Next Line</strong>.</td>
</tr>
<tr>
<td><strong>Last Line</strong></td>
</tr>
<tr>
<td>To select the last line of a table use <strong>Last Line</strong>.</td>
</tr>
<tr>
<td><strong>Create a new Line</strong></td>
</tr>
<tr>
<td>inserts new lines into the table.</td>
</tr>
<tr>
<td><strong>Delete selected Line</strong></td>
</tr>
<tr>
<td>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>DTM Connection States</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Connected" /> Icon closed = Device is online</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Disconnected" /> Icon opened = Device is offline</td>
</tr>
<tr>
<td>2</td>
<td>Data Source States</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Data set" /> The displayed data are read out from the instance data set (database).</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Device" /> The displayed data are read out from the device.</td>
</tr>
<tr>
<td>3</td>
<td>States of the instance Date Set</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Valid" /> Parameter is changed (not equal to data source).</td>
</tr>
<tr>
<td>4</td>
<td>Changes directly made on the Device</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Load/configure diagnosis parameters" />: Diagnosis is activated.</td>
</tr>
<tr>
<td>6</td>
<td>Device Diagnosis Status</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Save operation succeeded" />: The save operation has been successful. Further messages due to successful handling of device data.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Firmware Download" />: Firmware Download is running</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Save operation failed" />: The save operation has failed. Further fail operation messages due to incorrect communication due to malfunction in the field device or its peripherals.</td>
</tr>
</tbody>
</table>

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

![Status Bar Display Examples](image)

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

### 2.1 Configuration Steps

The following overview provides to you the step sequence on how to configure a netX based DeviceNet Master device with DeviceNet 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 DeviceNet 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>
<tr>
<td>6</td>
<td>Verify or adapt Driver Settings</td>
<td>In the Master DTM configuration dialog: - select Settings &gt; Driver. <strong>Note!</strong> 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 DeviceNet Master DTM is installed on the same PC as the DeviceNet Master device.  • Use the netX Driver to establish a USB, Serial (RS232) or TCP/IP connection from the DeviceNet Master DTM to the DeviceNet 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.</td>
<td>Settings for Driver and Device Assignment and Driver</td>
<td>23 25</td>
</tr>
<tr>
<td>7</td>
<td>Configure Driver</td>
<td>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 &gt; Driver &gt; netX Driver &gt; 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. <strong>Note!</strong>  • The cifX Device Driver requires no configuration.  • The configuration of the 3SGateway Driver for netX (V3.x) is carried out via the CODESYS surface.</td>
<td>Configuring netX Driver</td>
<td>28</td>
</tr>
<tr>
<td>8</td>
<td>Assign Master device (with or without firmware)</td>
<td>Assign the device to this driver.  In the Master DTM configuration dialog: - select Settings &gt; Device Assignment.  - select a Master device (with or without firmware), - therefore check the appropriate checkbox,  - select Apply.</td>
<td>Selecting the Device (with or without firmware)</td>
<td>37</td>
</tr>
<tr>
<td>9</td>
<td>Select and download firmware</td>
<td>If not yet a firmware was loaded to the device.  In the Master DTM configuration dialog: - select Settings &gt; Firmware Download,  - select Browse...  - select a firmware file,  - select Open,  - select Download and Yes.</td>
<td>Firmware Download</td>
<td>40</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>10</td>
<td>Assign Master device once more (with firmware and system channel)</td>
<td>In the Master DTM configuration dialog: - select <strong>Settings &gt; Device Assignment</strong>, - select <strong>Scan</strong>, - select the Master device (with loaded and defined system channel), - therefore check the appropriate checkbox, - select <strong>Apply</strong>, - close the Master DTM configuration dialog via <strong>OK</strong>.</td>
<td>Selecting the Device once more (with Firmware)</td>
<td>38</td>
</tr>
<tr>
<td>11</td>
<td>Configure Slave device</td>
<td>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 <strong>Configuration &gt; General</strong>, - set UCMM and Fragmentation Timeout, - select <strong>Configuration &gt; Connection</strong>, - configure the device connection, - select <strong>Configuration &gt; Parameter</strong>, - set the parameter data of the device, - close the Slave DTM configuration dialog via <strong>OK</strong>.</td>
<td>(See Operating Instruction Manual Generic Slave DTM for DeviceNet Slave Devices)</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Configure Master device</td>
<td>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 <strong>Configuration &gt; Bus Parameters</strong>, - set the bus parameters, - select <strong>Configuration &gt; Server Parameter</strong>, - set the server parameters, - select <strong>Configuration &gt; Process Data</strong>, - set symbolic names for the configured modules or signals. - select <strong>Configuration &gt; MAC ID Table</strong>, - set the MAC ID table options, - select <strong>Configuration &gt; Quick Connect Table</strong>, - check <strong>Quick Connect</strong> for the Slave device(s), which shall work as „Quick Connect“ Slave, - select <strong>Configuration &gt; Master Settings</strong>, - set the Master <strong>Settings</strong>, - close the Master DTM configuration dialog via <strong>OK</strong>.</td>
<td>Configuring Device Parameters</td>
<td>47</td>
</tr>
<tr>
<td>13</td>
<td>Save project</td>
<td>Depending of the frame application. For the configuration software: - select <strong>File &gt; Save</strong>.</td>
<td>(See Operating Instruction Manual of the Frame Application)</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Connect Master device</td>
<td>Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select <strong>Connect</strong>.</td>
<td>Connecting/Disconnecting Device</td>
<td>65</td>
</tr>
<tr>
<td>15</td>
<td>Licensing</td>
<td>How to order licenses later and how to transfer them to the device.</td>
<td>Licensing</td>
<td>86</td>
</tr>
<tr>
<td>16</td>
<td>Download Configuration</td>
<td>Depending of the FDT Container. For netDevice: - right click to the device icon of the Master, - select <strong>Download</strong>.</td>
<td>Download Configuration</td>
<td>84</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>17</td>
<td>Network Scan/</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. <strong>Upload</strong> of the Device configurations and generate the connection configurations. 5. Download of the Slave device configurations 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>'Network Scan' and 'Upload'</td>
<td>74</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 Communication</strong> 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>99</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>135</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>65</td>
</tr>
</tbody>
</table>

*Table 8: Getting started - Configuration 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>DeviceNet Master DTM</th>
<th>Folder Name / Section</th>
<th>Subsection</th>
<th>Manual Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation Area</td>
<td>Driver</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verify or adapt Driver Settings</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>cifX Device Driver</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>netX Driver</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Configuring netX Driver</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Device Assignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scanning for Devices</td>
<td></td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Scanning for all Devices or for suitable only</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Selecting the Device (with or without firmware)</td>
<td></td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Selecting the Device once more (with Firmware)</td>
<td></td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Firmware Download</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Licensing</td>
<td></td>
<td>86</td>
</tr>
</tbody>
</table>

Table 9: 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 23.

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

**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 DeviceNet Master DTM to the DeviceNet 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 DeviceNet 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 DeviceNet Master DTM is installed on the same PC as the DeviceNet Master device.
- Use the **netX Driver** to establish a USB, Serial (RS232) or TCP/IP connection from the DeviceNet Master DTM to the DeviceNet 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 DeviceNet 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 DeviceNet Master device now is connected to the DeviceNet 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 DeviceNet Master DTM to establish a device communication connection.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver</td>
<td>Name of the driver (for more details see descriptions hereafter)</td>
</tr>
<tr>
<td>Version</td>
<td>ODMV3 Version of the respective driver</td>
</tr>
<tr>
<td>ID</td>
<td>ID of the driver (driver identification)</td>
</tr>
</tbody>
</table>

Table 10: Driver Selection List Parameters

To establish a connection from the DeviceNet Master DTM to the DeviceNet 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.

   ![Figure 6: Default Driver, cifX Device Driver' for PC cards cifX (example)](image)

2. Verify that the default driver is checked.

   ![Figure 7: Default Driver, netX Driver' for Hilscher devices except for PC cards cifX (example)](image)

   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 DeviceNet Master DTM to the DeviceNet Master device must be supported by the device and must be available for the device.

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

<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>{368EECE3-0E92-4C0E-84A9-64F62AE7AFA}</td>
</tr>
<tr>
<td>3SGateway Driver for netX (V3.x)</td>
<td>0.9.1.2</td>
<td>{787CAD6-4CF6-4275-8F4C-10956A6F8A9}</td>
</tr>
<tr>
<td>netX Driver</td>
<td>1.103.2.5183</td>
<td>{B54C88C7-F333-4135-8405-6E12FCB8E62}</td>
</tr>
</tbody>
</table>

Figure 8: Manual Selection of multiple drivers (Example)
3.3.2 cifX Device Driver

In the DeviceNet 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 DeviceNet Master DTM is installed in the same PC as the DeviceNet 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:
### Parameter | Meaning | Range of Value / Default Value
--- | --- | ---
Enable USB/RS232 Connector (Restart of ODM required) | checked: The netX Driver can communicate via the USB/RS232 interface. unchecked: The netX Driver can 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. | checked, unchecked; Default: unchecked

\(^1\) 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**.

Select Port | Depending on the COM ports (interfaces) available on the PC, they will be listed under **Select Port**. | COM 1 to COM N

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Default Value</th>
</tr>
</thead>
<tbody>
<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 <strong>netX Driver &gt; Save USB/RS232 Connection</strong>, i. e. only for the selected connection type.</td>
<td></td>
</tr>
</tbody>
</table>
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.

---

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Default Value</th>
</tr>
</thead>
<tbody>
<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 11: Parameters netX Driver > USB/RS232 Connection*
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.  
unchecked: 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. | 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. | |

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.
### Table 12: 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>
</tbody>
</table>
| Disable IP Range       | checked: No connection.  
                     unchecked: The netX Driver tries to establish a connection using the configured TCP/IP interface. | checked, unchecked (Default) |
| **IP Address (left)**  | Enter the IP address of the device, (if Use IP Range is not checked).  
                     Enter the start address of the IP scanning range, (if Use IP Range is checked). | valid IP address; Default: 192.168.1.1 |
| Use IP Range           | checked: An IP address range is used.  
                     unchecked: Only one IP address is used. | checked, unchecked; Default: unchecked |
| **IP Address (right)** | Enter the ending address of the IP scanning range, (only if Use IP Range is checked). | valid IP address; Default: 0.0.0.0 |
| Address Count          | Displays the scanning range address count, depending on the selected IP-start or IP-end address. (For this read the note given below.) | recommended: 10 |
| TCP Port               | Identifies the endpoint of a logical connection or addresses a specific endpoint on the device or PC. | 0 - 65535; Default Hilscher device: 50111 |
| **Send Timeout [ms]**  | Maximum time before the transfer of the transmission data is canceled, when the send process fails, for example, because of the transfer buffer is full. | 100 … 60.000 [ms]; Default (TCP/IP): 1000 ms |
| **Reset Timeout [ms]** | Maximum time for a device reset, including the re-initialization of the physical interface used for the communication. | 100 … 60.000 [ms]; Default (TCP/IP): 2000 ms |
| **Keep Alive Timeout [ms]** | The "Keep Alive" mechanism is used to monitor whether the connection to the device is active. Connection errors are detected using a periodic heartbeat mechanism. The heartbeat mechanism will be initiated after the set time has elapsed if the communication has failed. | 100 … 60.000 [ms]; Default (TCP/IP): 2000 ms |
| **Restore**            | Resets all settings in the configuration dialog to the default values. |                                |
| **Save**               | Saving all settings made in the configuration dialog netX Driver > Save TCP/IP Connection, i. e. only for the selected connection type. |                                |
| **Save All**           | Saving all settings made in the configuration dialog netX Driver, i. e. for all connection types. |                                |

**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 DeviceNet Master device to the DeviceNet Master DTM by checking the check box. This is essential to establish an online connection from the DeviceNet Master DTM to the DeviceNet Master device later, as described in section *Connecting/Disconnecting Device* on page 65.

Therefore in the *Device Assignment* dialog pane you scan for the DeviceNet 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.

   ![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 DeviceNet 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 DeviceNet 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 <code>n/a</code> means, that no <strong>Slot Number (Card ID)</strong> exists. This will occur 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</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: <code>...\cifX\[0toN\]_SYS</code>, b.) For devices with firmware: <code>...\cifX\[0toN\]_Ch\[0to3\]</code>. <code>cifX\[0toN\] = Board number 0 to N</code>, <code>Ch\[0to3\] = Channel number 0 to 3</code></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: <code>...\cifX\[0toN\]_SYS</code>, b.) For devices with firmware: <code>...\cifX\[0toN\]_Ch\[0to3\]</code>. <code>cifX\[0toN\] = Board number 0 to N</code>, <code>Ch\[0to3\] = Channel number 0 to 3</code></td>
<td><strong>driver identification (ID)</strong> depending on the device and on the driver: board or channel number, IP address or COM interface</td>
</tr>
</tbody>
</table>

*Table 13: 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**.

![Device Assignment](image)

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 DeviceNet 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 DeviceNet Master DTM can only be established with one DeviceNet Master device.

To select the physical DeviceNet 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 DeviceNet Master DTM to the DeviceNet Master device can be established, a firmware must be loaded to the device and the device must be selected once more.

For further information refer to section Firmware Download on page 40 or to section Selecting the Device once more (with Firmware) on page 38.
3.4.3 Selecting the Device once more (with Firmware)

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

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

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

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

3. Check the appropriate device.

**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 DeviceNet 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 0/1* /-PROFIEUS/-</td>
<td>1</td>
<td>20148</td>
<td>CIFX Device Driver</td>
<td>PROFIEUS-DCF Master</td>
<td>... (\text{cifX}_{0\text{to}N}) _Ch(0\text{to}3)</td>
<td></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: ... \(\text{cifX}_{0\text{to}N}\) \_Ch\(0\text{to}3\).

\(\text{cifX}_{0\text{to}N}\) = board number 0 to N
\(\text{Ch}[0\text{to}3]\) = 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 DeviceNet Master DTM to the DeviceNet Master device, refer to section **Connecting/Disconnecting Device** on page 65.
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 22.

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](image)

   **Table 14: Parameter 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>

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 <em>Select Firmware File</em> by name click to the column head <em>Name</em>.</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>
Table 15: Parameters Select Firmware File

<table>
<thead>
<tr>
<th>Column</th>
<th>Version</th>
<th>Firmware version x.x (build x)</th>
</tr>
</thead>
</table>

**Tooltip**
To view the tooltip information move with the mouse pointer over the selected firmware line.

**Files of Type**
- *All Files (.*)* if before in the Device Assignment pane under Device selection all was selected.
- Firmware Files (*.nxm) or Firmware Files (*.nxf) if before in the Device Assignment pane under Device selection suitable only was selected.

**Recent folders**
Path of the recently opened folder

**Firmware**
As soon as the firmware file has been selected, under Firmware the name, the version and the build version as well as the device class for the selected firmware is displayed.

**Help**
Button, to open the online help of the DTM.

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
  - all files from the selected folder
  - only firmware files from the selected folder
  - *All Files (.*)*
  - „Firmware Files (*.nxm)“
  - „Firmware Files (*.nxf)“
  - 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 DeviceNet 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.

4. 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.

4. A validation is made, whether the selected firmware file is suitable for the DeviceNet Master DTM.

4. In the dialog pane Firmware Download during the validation Download is grayed out.

4. 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**.

   The dialog **Licensing** pane is displayed.

   ![Licensing Pane]

   Figure 23: Licensing

For a detailed description refer to section **Licensing** on page 86.
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>DeviceNet 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>General</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bus Parameters</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Error Handling</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Server Parameters</td>
<td></td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Process Data</td>
<td></td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Address Table</td>
<td></td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>MAC ID Table</td>
<td></td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Quick Connect Table</td>
<td></td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Master Settings</td>
<td>Start of Bus Communication</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Application Monitoring</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Module Alignment</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Process Data Handshake</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advanced</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Device Status Offset</td>
<td>64</td>
</tr>
</tbody>
</table>

Table 16: Descriptions of the Dialog Panes Configuration

Notice the descriptions in the section Configuration Steps on page 18.
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 DeviceNet Master device using the DeviceNet Master DTM:

**Bus parameters**
1. Set the bus parameters:
   - Select **Configuration > Bus Parameters** in the navigation area.

**Server Parameter**
2. Set the server parameters:
   - Select **Configuration > Server Parameter** in the navigation area.

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

**MAC ID Table**
4. Activate memory space for the data exchange with the slave or possibly adapt the MAC ID:
   - Select **Configuration > MAC ID Table** in the navigation area.

**Quick Connect Table**
5. Set the „Quick Connect“ option:
   - Select **Configuration > Quick Connect Table** in the navigation area.
   - Check **Quick Connect** for the Slave device(s), which shall work as „Quick Connect“ Slave.

**Master Settings**
6. 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 **Device Status Offset** select **Automatic calculation** or **Static** option.

**Close Master DTM Configuration Dialog**
7. Click **OK** in order to close the Master DTM configuration dialog and to store your configuration.
Configuration Download to the DeviceNet Master Device

Note: In order to transfer the configuration to the DeviceNet Master device, download the data of the configuration parameters in the DeviceNet Master device. See section Download Configuration on page 84.

Further Information

For more information refer to the sections Bus Parameters on page 50, Server Parameters on page 52, Process Data on page 53, MAC ID Table on page 55, Quick Connect Table on page 56 and Master Settings on page 60.
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.

![Bus Parameters](image)

**Figure 24: Bus Parameters**
4.3.1 General

The symbolic name of the device is displayed in the field **Device Description** and can be changed via entering.

4.3.2 Bus Parameters

**MAC ID**
- The MAC ID is the device address of the DeviceNet Master. Each device must have an own (unique) MAC ID to distinguish it in the network.
- Range of value: 0 … 63

**Baud Rate**
- This value shows the baud rate to be set to the DeviceNet Master.
- Range of value: 125 kBits/s, 250 kBits/s, 500 kBits/s

<table>
<thead>
<tr>
<th>Bus Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC ID</td>
<td>The MAC ID is the device address of the DeviceNet Master. Each device must have an own (unique) MAC ID to distinguish it in the network. Range of value: 0 … 63</td>
</tr>
<tr>
<td>Baud Rate</td>
<td>This value shows the baud rate to be set to the DeviceNet Master. Range of value: 125 kBits/s, 250 kBits/s, 500 kBits/s</td>
</tr>
</tbody>
</table>

4.3.3 Error Handling

**Auto Clear**
- The **Auto Clear** feature defines the behavior of the Master if the communication to a Slave device is disturbed or breaks down.

If **Auto Clear** is checked and a communication disturbance to at least one Slave occurs, the Master operation mode will change from **Operate** to **Clear** and after this into **Stop** and so the communication to all Slaves is stopped. The Master can leave this state only by a reset.

If the **Auto clear** is not activated and a communication disturbance to one or more Slaves occurs, the Master stays in the operation mode **Operate**. The Master still communicates with the existing devices and tries to build up the communication to the missing or faulty devices.

For further information see section **General Diagnosis** on page 100.
4.4 Server Parameters

The **Server Parameters** contain DeviceNet specific Server Parameters with which the device is able to be a server at the same time being a Master. This allows an other Master in the network to exchange I/O data with this device, too.

<table>
<thead>
<tr>
<th>Server Parameters</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O Connection Consumer</td>
<td>If checked, the server functionality for the Consume Connection (Receiving data) is enabled and the I/O Consume Connection size can be entered in the field <strong>Connection size</strong>. Range of value: 0 … 255</td>
</tr>
<tr>
<td>I/O Connection Producer</td>
<td>If checked, the server functionality for the Produce Connection (Sending data) is enabled and the I/O Produce Connection size can be entered in the field <strong>Connection size</strong>. Range of value: 0 … 255</td>
</tr>
</tbody>
</table>

**Figure 28: Server Parameters**

**Table 18: Server Parameters**


4.5 Process Data

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

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

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

![Process Data](image)

Figure 29: 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 19: Process Data
4.6 Address Table

The Address Table dialog pane shows a list of all addresses used in the process data image. The displayed addresses refer to the used DeviceNet Master. To configure the address data:

- Select Configuration > Address Table in the navigation area.

### Inputs:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC-ID</td>
<td>Device Network Address</td>
</tr>
<tr>
<td>Device</td>
<td>Device Name of the Slave device</td>
</tr>
<tr>
<td>Name</td>
<td>Designation for the Slave device</td>
</tr>
<tr>
<td>Connection Mode</td>
<td>Mode of the input or output data</td>
</tr>
<tr>
<td>Length</td>
<td>Input data length or output data length</td>
</tr>
<tr>
<td>Address</td>
<td>Output data offset address or input data offset address</td>
</tr>
</tbody>
</table>

### Outputs:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC-ID</td>
<td>Device Network Address</td>
</tr>
<tr>
<td>Device</td>
<td>Device Name of the Slave device</td>
</tr>
<tr>
<td>Name</td>
<td>Designation for the Slave device</td>
</tr>
<tr>
<td>Connection Mode</td>
<td>Mode of the input or output data</td>
</tr>
<tr>
<td>Length</td>
<td>Input data length or output data length</td>
</tr>
<tr>
<td>Address</td>
<td>Output data offset address or input data offset address</td>
</tr>
</tbody>
</table>

Figure 30: Configuration > Address Table (In the Figure shown here, in the column Device or Name example devices are displayed.)

### Description of the Parameters

- **Parameter**
  - **Meaning**
    - MAC-ID: Device Network Address
    - Device: Device Name of the Slave device
    - Name: Designation for the Slave device
    - Connection Mode: Mode of the input or output data
    - Length: Input data length or output data length
    - Address: Output data offset address or input data offset address

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC-ID</td>
<td>Device Network Address</td>
</tr>
<tr>
<td>Device</td>
<td>Device Name of the Slave device</td>
</tr>
<tr>
<td>Name</td>
<td>Designation for the Slave device</td>
</tr>
<tr>
<td>Connection Mode</td>
<td>Mode of the input or output data</td>
</tr>
<tr>
<td>Length</td>
<td>Input data length or output data length</td>
</tr>
<tr>
<td>Address</td>
<td>Output data offset address or input data offset address</td>
</tr>
</tbody>
</table>

Table 20: Parameters Address Table Pane - Inputs / Outputs

### 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.
4.7 MAC ID Table

The MAC ID Table, also called device table, shows the MAC IDs, Device Names and Device Descriptions of the currently existing devices in the configuration.

<table>
<thead>
<tr>
<th>Column</th>
<th>Meaning</th>
</tr>
</thead>
</table>
| Activate   | If the field **Activate** is checked, memory for process data of this Slave is reserved in the Master and the Master makes a data exchange to this Slave on the bus. 
If this setting is deactivated, the Master reserves memory in the process data image for this Slave, but no data exchange to this Slave is made at the bus. |
| MAC-ID     | Device Network Address 
The displayed values of the MAC IDs can be changed by editing. The entered MAC ID must be unique; otherwise an error message is displayed. |
| Device     | Device name of the slave device assigned                                 |
| Name       | The symbolic name of the slave device assigned                           |
| Vendor     | Name of the vendor of the device                                        |

Table 21: Parameters of the MAC-ID Table

![Figure 31: Configuration >MAC ID Table (In the Figure shown here, in the column Device or Name example devices are displayed.)](image-url)
### 4.8 Quick Connect Table

In the **Quick Connect Table** pane you need to define for every DeviceNet Slave device in the DeviceNet Master configuration whether the Master Device for the cyclic data exchange shall accelerate connection establishment to this Slave by using the „Quick Connect“ option (see also [3] 2-3.4).

Therefore proceed as follows:

- Select **Configuration > Quick Connect Table**.

For every DeviceNet Slave device:

- **Check Quick Connect**, if the connection from the DeviceNet Master device to this Slave device shall be established using the „Quick Connect“ option.

- **Uncheck Quick Connect**, if the connection from the DeviceNet Master device to this Slave device shall be established without using the „Quick Connect“ option.

#### Table 22: Parameters of the Quick Connect Table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick Connect</td>
<td>If the field <strong>Quick Connect</strong> is checked for a Slave device, the connection from the DeviceNet Master device to this Slave device is established using the „Quick Connect“ option.</td>
<td>checked, unchecked</td>
</tr>
<tr>
<td></td>
<td>If the field <strong>Quick Connect</strong> is unchecked for a Slave device, the connection from the DeviceNet Master device to this Slave device is established without using the „Quick Connect“ option.</td>
<td></td>
</tr>
<tr>
<td>MAC-ID</td>
<td>Network Address of the Slave device as set in the MAC ID table (compare section <strong>MAC ID Table</strong> on page 55). This parameter defines the DeviceNet address of the device within the network.</td>
<td>0 ... 63</td>
</tr>
<tr>
<td>Device</td>
<td>Device name of the slave device assigned and of the EDS file</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>The symbolic name of the slave device assigned and of the EDS file</td>
<td></td>
</tr>
</tbody>
</table>

For further information on the „Quick Connect“ option, refer to subsections hereafter.
4.8.1 What is „Quick Connect“?

The „Quick Connect“ feature allows a reconnected Slave device on a DeviceNet network to quickly go into operation (e.g. after a tool exchange) by shortening the time required to make the logical connection between it and the Master. [5]

4.8.2 How does „Quick Connect“ work?

**DeviceNet Master Device**

The „Quick Connect“ feature is activated also in the DeviceNet Master device, if in the Master configuration at least for one DeviceNet Slave device is defined, that the Master device shall establish the connection to this Slave device using „Quick Connect“. [6] S. 97.

Specifically, „Quick Connect“ enables a DeviceNet Master device to initiate a connection request as soon as a “dup mac” request is received from a newly connected Slave device. [5]

When a Slave device is defined as „Quick Connect“ Slave, the Master concurrently sends UCMM and Alloc Master/Slave requests. Depending on the response of the Slave, an explicit connection will be established via „UCMM“ or „Group 2 Only Explicit Connection Port“. [6] S. 97.

**DeviceNet Slave Device**

At the DeviceNet Slave device the „Quick Connect“ option effects, that the connection request from the Master device will be accepted without waiting for the 2-second delay in its typical power-up sequence. [5]

When „Quick Connect“ is enabled, the Slave device transitions to the OnLine state concurrently with sending the first duplicate MAC ID request message. But the Slave device is still required to execute the network State Transition Diagram ([3] 2-3.1), including going offline anytime a duplicate MAC ID response message is received. [3] 2-3.4
4.8.3 Requirements for the use of „Quick Connect“

Must both, the DeviceNet Master device and the DeviceNet Slave device support „Quick Connect“?

What happens, if the Master uses „Quick Connect“ to connect a Slave that does not support „Quick Connect“?

As prerequisite for the optimal use of „Quick Connect“, the Master device and the Slave device both must support „Quick Connect“. That is, the Slave device must support „UCMM“ or „Predefined Master/Slave Connection“ as a connection type. The Hilscher DeviceNet Slave devices support the connection type „Predefined Master/Slave Connection“.

What combinations are possible?

In the following cases, „Quick Connect“ is available:
1. Master supports „Quick Connect“, Slave supports „Quick Connect“
The time to establish the connection until the I/O data exchange starts is reduced optimally.
2. Master supports „Quick Connect“, Slave does not support „Quick Connect“
The time to establish the connection until the I/O data exchange starts is shorter than without „Quick Connect“.
3. Master does not support „Quick Connect“, Slave supports „Quick Connect“
The time to establish the connection until the I/O data exchange starts is shorter than without „Quick Connect“.

In this case, „Quick Connect“ is not possible:
4. Master does not support „Quick Connect“, Slave does not support „Quick Connect“
The time to establish the connection until the I/O data exchange starts is not shorter than without „Quick Connect“.

What the user needs to observe for „Quick Connect“?

Important: Generally for DeviceNet and specifically for the use of „Quick Connect“ it is left up to the user:

(1) to guarantee that no Slave exist with the same MAC ID
AND
(2) that no more than one Master device is configured to access the same Slave device using the "Predefined Master/Slave Connection Set“ ([3] section 3-15.1.).

Bus errors may occur if either of these conditions exists. Further details can be found in [3] Section 2-3.4.
4.8.4 How fast the I/O connection can be established with Quick-Connect?

If Quick-Connect is supported by both, the Master device and the Slave device, the connection is established faster. The required time to establish the connection is reduced from 3 s (seconds) to less than 200 ms (milliseconds) approximately.

The following times are required to establish the I/O connection. The values are valid for Hilscher Master Devices.

- **below 200 ms**
  *If both the Master device and the Slave device support Quick-Connect.*
  - Immediately after the Slave device has sent the duplicate MAC ID request, the Master device sends the „Quick Connect“ request.
  - Depending on the reaction time of the Slave, the delay time up to the I/O data exchange can be 20 … 200 milliseconds.

- **Approx. 2 s**
  *If only the Master device supports „Quick Connect“ and the Slave device does not support „Quick Connect“.*
  - Immediately after the Slave device has sent the duplicate MAC ID request, the Master device sends the „Quick Connect“ request.
  - Immediately after the Slave device has sent the second duplicate MAC ID request, the Master device sends the „Quick Connect“ request and the I/O connection is established.

- **Approx. 2 … 3 s**
  *If the Master device does not support „Quick Connect“ but only the Slave device supports „Quick Connect“.*

In contrary to

- **Approx. 2 … 5 s**
  *If neither the Master device nor the Slave device support „Quick Connect“.*
4.9 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 84).

---

<table>
<thead>
<tr>
<th>Master Settings</th>
<th>Module Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of bus communication</td>
<td>Byte boundaries</td>
</tr>
<tr>
<td>Automatically by device</td>
<td>2 Byte boundaries</td>
</tr>
<tr>
<td>Controlled by application</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application monitoring</th>
<th>Process data handshake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watchdog time: <strong>1000</strong> ms</td>
<td>Bus synchronous, device controlled</td>
</tr>
<tr>
<td></td>
<td>Buffered, device controlled</td>
</tr>
<tr>
<td></td>
<td>No consistency, uncontrolled</td>
</tr>
<tr>
<td></td>
<td>Buffered, host controlled</td>
</tr>
<tr>
<td></td>
<td>Bus synchronous, host controlled</td>
</tr>
<tr>
<td></td>
<td>Buffered, extended host controlled</td>
</tr>
</tbody>
</table>

**Advanced**

- **Enable configuration download during network state "operate"**

**Device status offset**

- **Automatic calculation**
- **Static:** Starts: **0** bytes after last input data

Current offset address is: **0**

---

*Figure 33: Configuration > Master Settings*

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

![Configuration 61/162](image)

If **Automatically by device** is selected, the DeviceNet 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.

### 4.9.2 Application Monitoring

![Configuration 61/162](image)

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>

**Table 23: Range of Value / Value for the Watchdog time**

**Note:** The setting options under **Application Monitoring** for client specific variants of the configuration software can differ from the setting options displayed here.
4.9.3 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 24: 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.
4.9.4 Process Data Handshake

The various types of **Process Data Handshakes** are used for setting the handshake of the process data for the DeviceNet 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.

4.9.5 Advanced (For future Application)

The **Enable configuration download during network state “operate”** option for the DeviceNet network allows to change the configuration of a running DeviceNet 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 DeviceNet 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.
4.9.6 Device Status Offset

Reference to Firmware: The option **Device Status Offset** was implemented since DeviceNet Master Firmware CIFXDNM.NXF Version 2.2.2.0.

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

![Device status Offset](image)

**Figure 39: Master Settings > Device Status Offset**

<table>
<thead>
<tr>
<th>Device Status Offset</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automatic calculation:</strong></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><strong>Static:</strong></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 25: 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 DeviceNet Master DTM functions e.g. Diagnosis or the configuration download in the FDT Framework require an online connection from the DeviceNet Master DTM to the DeviceNet Master device.

Connecting Device

The following steps are needed to establish a connection from the DeviceNet Master DTM to a DeviceNet 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 22.

8. In the DTM interface dialog select the OK button, to apply the selection and to close the DTM interface dialog.
10. Select the Connect command from the context menu.

The DeviceNet Master device now is connected to the DeviceNet Master DTM via an online connection. In the network view the device description at the device icon of the Master is displayed with a green colored background.
**Disconnecting Device**

To disconnect an online connection from the DeviceNet Master device to a DeviceNet 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 DeviceNet 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 DeviceNet 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 23.
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>Debug Mode Busline Colors</th>
<th>Debug Icon</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Busline</td>
<td>Next to the Master device icon</td>
<td>The Master device has cyclic communication</td>
</tr>
<tr>
<td>light green</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>blue</td>
<td></td>
<td>The Master device is in STOP state. The cyclic communication has been stopped.</td>
</tr>
<tr>
<td>Branch Line of the Slave device</td>
<td>Next to the Slave device icon</td>
<td>The Master device has cyclic communication to this Slave device.</td>
</tr>
<tr>
<td>light green</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>yellow (yellow)</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 26: 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 MAC ID

With the dialog Set MAC ID the DeviceNet MAC ID of the device can be changed.

To set the MAC ID, proceed as described hereafter:
1. Select and connect the device.
2. Disconnect the device (only if the device is online).

Note: The dialog Set MAC ID is enabled only during offline mode. The online-connection between the DeviceNet Master DTM and the DeviceNet Master device must be disconnected.

For further information how to establish or how to disconnect an online connection from the DeviceNet Master DTM to the DeviceNet Master device, refer to section Connecting/Disconnecting Device on page 65.

3. Select Additional Functions > Set MAC ID from the context menu (right mouse click).

4. In the Current MAC ID list field, select the current MAC ID.
5. In the field New MAC ID enter the new MAC ID and select Set MAC ID.

The new MAC ID of the device is set and in addition it is displayed in the Current MAC ID list.
5.4 Live List

The Live List gives an overview of the devices, which are physically present in the actual DeviceNet network constellation.

The live list works online. Present devices are represented as a blue circle area, all other non present devices are displayed in grey, whereby the number indicates the DeviceNet address (MAC ID) of the device.

To work with the Live List, proceed as follows:
1. Connecting Device:

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

   For further information refer to section Connecting/Disconnecting Device on page 65.

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

Remember that all devices on DeviceNet have to proceed the autobaud detection phase first to get wholly run. This can take up to some milliseconds.

![Live List](image)

The display is not updated automatically as this function loads the DeviceNet network. However, the Live List can be renewed with the Update button.
5.5 ‘Network Scan’ and ‘Upload’

Reference to Firmware: The option Network Scan was implemented since DeviceNet Master Firmware CIFXDNM.NXF Version 2.3.11.0.

With the function Network Scan... of the DeviceNet Master DTM you can find out automatically which DeviceNet Slaves are attached to the DeviceNet 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 connection configuration data from all DeviceNet Slave devices via the DeviceNet Master device and the DeviceNet Master DTM to the DeviceNet Slave DTMs.

Requirements

The DeviceNet Master device must be configured. Under Settings > Bus Parameters you must set the baud rate and the MAC ID of the Master.

Important: The configuration of the Master device must be downloaded in the Master device. For more see section Configuration Steps on page 18.

Overview 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.
   For all Slave devices:
4. Via the Upload function of the Slave DTMs, upload the configurations of the Slave devices into the Slave DTMs.
5. Via the Download function of the Master DTM, download the current configurations of the Slave devices to the Master device.
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 DeviceNet Master DTM.
   - Select **Network Scan…** from the context menu.

   ![Figure 43: Starting 'Network Scan' (Example)](image)

   [Figure 43: Starting 'Network Scan' (Example)]

   - Wait for a short time.

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

   Via **Network Scan**... an online connection from the DeviceNet Master DTM to the DeviceNet Master device is established. The configuration software scans, which DeviceNet Slave devices are attached to the PROFIBUS network or to the DeviceNet Master device.
The **Scan Response** dialog of the Master DTM is displayed.

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

**Figure 44: 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 identifiers appear.

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

- 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><strong>Title Bar</strong></td>
<td>With the text: <strong>Symbolic Name of the Master Device [Device Description]</strong> (&lt;Device Address&gt; (#Network ID) channel//DeviceNet).</td>
</tr>
<tr>
<td><strong>Instruction</strong></td>
<td>In the Network Scan window the instruction text is displayed: <strong>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.</strong></td>
</tr>
<tr>
<td><strong>Station Address</strong></td>
<td>DeviceNet station address, which displays the logical sequence of the devices within a DeviceNet network. <strong>Note:</strong> The station address displayed here is not identical to the station address of the device stored in the hardware configuration.</td>
</tr>
<tr>
<td><strong>Colors</strong></td>
<td>Meaning of colors in the <strong>Scan Response</strong> dialog of the Master DTM:</td>
</tr>
<tr>
<td><strong>Red</strong></td>
<td>If a field marked in red appears in column <strong>Station address</strong>, the respective DTM device is already present on the network.</td>
</tr>
<tr>
<td><strong>Yellow</strong></td>
<td>If a field appears marked in yellow, a selection can be made by a combo box.</td>
</tr>
<tr>
<td><strong>Device Type ID</strong></td>
<td>Identification (ID): Ident code read out from each device (Unique Identifier)</td>
</tr>
<tr>
<td><strong>Sub Device Type</strong></td>
<td>Sub type of the device type if applicable</td>
</tr>
<tr>
<td><strong>DTM to Use</strong></td>
<td>Display of the DTM devices, which are assigned to the ident codes found during scanning:</td>
</tr>
<tr>
<td></td>
<td><strong>If Use Hilscher generic DTNs f available</strong> is displayed without color marking, there is no selection possibility.</td>
</tr>
<tr>
<td></td>
<td><strong>If Use Hilscher generic DTNs f available</strong> 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><strong>Use Hilscher generic DTNs if available</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Use vendors DTNs f available</strong></td>
</tr>
<tr>
<td><strong>Device Class</strong></td>
<td>Device class of the DeviceNet Slave devices.</td>
</tr>
<tr>
<td><strong>DTM Device</strong></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 <strong>DTM Devices</strong>:</td>
</tr>
<tr>
<td></td>
<td>- Which are available in the device catalog for the scanned ident code,</td>
</tr>
<tr>
<td></td>
<td>- Respectively, which belong to the selection made under <strong>Creation Mode</strong></td>
</tr>
<tr>
<td></td>
<td>- and which belong to the selection made under <strong>Creation Mode &gt; Choose for each device</strong> under <strong>DTM to create</strong>.</td>
</tr>
<tr>
<td></td>
<td>For each device type ID in the column <strong>DTM Device</strong> the following is displayed:</td>
</tr>
<tr>
<td></td>
<td>- <strong>no device</strong>, <strong>one single device</strong>, <strong>or multiple devices</strong> (within a combobox).</td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td>Associated quality information Display: <strong>[1] DTM found, [3] Generic found</strong></td>
</tr>
</tbody>
</table>

This means, within the device catalog of netDevice for the found ident code and the selected **Creation Mode** these alternatives are available:

- **no DTM**
- A device description file or a DTM device of a manufacturer
- One or more device description files or DTM devices of the manufacturer
The action to be performed with the corresponding device during the process of device creation.
- If no device is present within the current project, the selection **Add/Skip** will appear.
- If there is already a device present within the current project, the selection **Replace/Skip** will appear.

**Add** adds a new instance for the selected DTM during the process of creation of a device.

**Skip** skips the process of creation of a device for the respective device address.

**Replace** erases the instance of the DTM currently located at this address during the process of creation of a device, and replaces it with the instance of the chosen DTM.

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.
- an upload of the Slave configuration can be proceeded.

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

*Table 27: Description on the Scan Response dialog of the Master DTM*
5.5.4 Creating Devices, Starting 'Upload'

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.

   ![Figure 46: DTM device is created (Example)](image)

   Note: Depending on the manufacturer of the respective device, also a dialog with some slight deviations from this one may be displayed.
4. Via the **Upload** function of the Slave DTMs, upload the configurations of the Slave devices into the Slave DTMs.

- In **netDevice**: right-click on the device symbol of the DeviceNet Slave DTM.
- Select **Upload** from the context menu.

![Figure 47: 'Upload' the Slave Device Configuration (Example)](image)

- The dialog **Devices Symbolic Name of the Master Device [Device Description] <Device Address> Starting Upload ...** appears. The dialog shows the progress of 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.

- Additionally you are asked whether the module configuration (for DeviceNet this means ‘Connection configuration’) of the DeviceNet Slave device should be generated.
Answer the query by **Yes**.

For the Slave device its current configuration is uploaded via the Master device and the Master DTM to the Slave DTM.

The success of the upload procedure is reported in the output window.
After the connection configuration of the DeviceNet Slave device has been created, you can display the uploaded connection configuration by double-clicking the Slave device symbol.

Figure 50: Uploaded Connection Configuration (Example)

5.5.5 Download to the DeviceNet Master Device

5. 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 DeviceNet Master DTM.
- Select Download from the context menu.
5.6 Download Configuration

**Note:** To download configuration parameter data to the DeviceNet Master device an online connection from the DeviceNet Master DTM to the DeviceNet Master device is required.

Further information can be found in the section *Connecting/Disconnecting Device* on page 65.

To transfer the configuration with the corresponding parameter data to the DeviceNet Master device you download the data to it using the frame application of the configuration software.
5.7 Start/Stop Communication

You can manually start or stop the communication between a DeviceNet Master device and DeviceNet 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 DeviceNet Master DTM to the DeviceNet Master device is required.

   Further information can be found in the *Connecting/Disconnecting Device* section on page 65.

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.
5.8 Licensing

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

5.8.1 Open License Dialog

You first open the License window.

**Note:** You first need to assign the Controller 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 Controller 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 driver/s.
   - Select Settings > Driver.
   - Check the driver/s.
3. Configure the driver, if necessary.
   - Select Settings > Driver > [Name of the assigned driver].
   - Configure the driver settings.
4. Scan for and select the device/s.
   - Select Settings > Device Assignment.
   - Select suitable only or all and then Scan.
   - Under Device selection check the required device/s.
   - Select Apply.
5. Close the DTM configuration dialog via OK.

For details to the device assignment, refer to section Overview Settings on page 22.

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.
5.8.2 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.

![Figure 51: License Pane](image)

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

---

1 The title bar contains the notation of the device description: Symbolic Name [Device Description] <Station Address> (#Network ID).
5.8.3 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 86.

**Figure 52: License Pane - License Type**

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

**Figure 53: License Pane – License Type / Master protocols**

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

**Figure 54: License Pane – License Type / Utilities**

- The column **Existing** indicates which licenses are present in the device.
  
  **Yes** = License is present in the device.
  
  **No** = License is not present in the device.

**Note:** In newer versions of the present configuration software under **License Type** may be displayed additional licenses or other protocols that can be ordered later.
5.8.3.1 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

5.8.3.2 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.
5.8.4  How to order a License

To order a license, proceed as follows:

1. Open the license dialog.  
   Refer to Section:  
   Page
   
   Open License Dialog 86

2. Select the required licenses.  
   Selecting License 90

3. Enter the ordering data.  
   Ordering Data 91

4. Place your order.  
   Ordering the License 93

5.8.5  Selecting License(s)

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

1. Selecting license(s) for Master protocol(s):
   - Under License Type click at Master protocols in the License pane.
   - Under Order check as many licenses must run simultaneously on your device:
     One General Master License or
     Two General Master Licenses.

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

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


5.8.6 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 92).

5.8.6.1 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>0x000001</td>
</tr>
<tr>
<td>Article number</td>
<td>1251130</td>
</tr>
<tr>
<td>Serial number</td>
<td>20007</td>
</tr>
<tr>
<td>Chiptype</td>
<td>0x0000000001</td>
</tr>
<tr>
<td>Step</td>
<td>0x00000000</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 55: License Pane - Request Form, please fill out / Device Information

- These ordering data read out from the device are displayed automatically from the device.
5.8.6.2 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>

   > 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

   > 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.
5.8.7 Ordering the License

Place your order in the License pane. Therefore:

1. Select the Subsidiary, to which the order shall be send.
2. Place the order:

- by E-Mail,
- or by Fax or by Telephone,
- or in a File.

Refer to Section: Ordering the License by E Mail 94
Ordering the License by Fax or by Telephone 95
Exporting License Request to a File 97

The Contact Data of the selected subsidiary are displayed under Position 9, 10 and 11.

---

Figure 58: License Pane – Selecting the Subsidiary / Ordering / Contacts
5.8.7.1 Ordering the License by E-Mail

You can place your order by e-mail.

Figure 59: License Pane – placing the order by E-mail

- Click E-mail…

The order E-mail License request opens:

Figure 60: Example: Order E-Mail License request

- 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.
5.8.7.2 Ordering the License by Fax or by Telephone

You can place your order by Fax or by Telephone.

Figure 61: License Pane - placing the order by Fax or by Telephone

- Click **Print Fax Form** or **Telephone**.
- The summary of the ordering data `PrintOrderRequest_[Devicenumber]_[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**

<table>
<thead>
<tr>
<th>Licensee Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Name:</strong> John</td>
</tr>
<tr>
<td><strong>Surname:</strong> Doe</td>
</tr>
<tr>
<td><strong>e-Mail:</strong> <a href="mailto:License@doe.com">License@doe.com</a></td>
</tr>
<tr>
<td><strong>Telephone:</strong> 0011223344-55</td>
</tr>
<tr>
<td><strong>Fax:</strong> 0011223344-100</td>
</tr>
<tr>
<td><strong>Customer No.:</strong> 123456789</td>
</tr>
<tr>
<td><strong>Company:</strong> Doe Example LTD</td>
</tr>
<tr>
<td><strong>Address:</strong> 2000th Rd</td>
</tr>
<tr>
<td><strong>Country:</strong> U.S.</td>
</tr>
<tr>
<td><strong>City Zip:</strong> NY 11417</td>
</tr>
<tr>
<td><strong>Order Number:</strong> 987654321</td>
</tr>
<tr>
<td><strong>Tax Ident. Number:</strong> test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer:</strong> 0x0001</td>
</tr>
<tr>
<td><strong>Device Number:</strong> 1234567</td>
</tr>
<tr>
<td><strong>Serial Number:</strong> 20007</td>
</tr>
<tr>
<td><strong>Chip Type:</strong> 0x000000000</td>
</tr>
<tr>
<td><strong>Step:</strong> 0x000000000</td>
</tr>
<tr>
<td><strong>PID/Rev:</strong> 0x000000000</td>
</tr>
<tr>
<td><strong>License Flags 1:</strong> 0x000000000</td>
</tr>
<tr>
<td><strong>License Flags 2:</strong> 0x000000000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ordered Licenses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Master Protocols</strong></td>
</tr>
<tr>
<td>- One General Master License</td>
</tr>
<tr>
<td>- Sercom III Master</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Utilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>- SYCON.net</td>
</tr>
</tbody>
</table>

**Figure 62: Example: Order Data Form PrintOrderRequest**
The order data form contains:

- the **Order Address** [C],
- the **License Information** [d],
- the **License Type** [e],
- the **Device Data** [f],
- the **ordered Licenses** [g].

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

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

*Figure 63: License Pane – Fax Number of the selected Subsidiary*

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

Or:

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

![Telephone...](11)

*Figure 64: License Pane – Telephone Number of the selected Subsidiary*

- Use the telephone number [11], which is displayed after the subsidiary was selected in the **License** pane.
- The order process is complete.
5.8.7.3 **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 65: 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 87).
- The order process is complete.
5.8.8 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.

   ![Image of License Pane - Download License](image)

   - 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 88.
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>DeviceNet Master DTM</th>
<th>Folder Name / Section</th>
<th>Manual Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation area</td>
<td>General Diagnosis</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Master Diagnosis</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>Bus Diagnosis</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>Station Diagnosis</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>Firmware Diagnosis</td>
<td>107</td>
</tr>
</tbody>
</table>

Table 28: Descriptions of the Diagnosis Panes

Online Connection to the Device

Note: Accessing the Diagnosis panes of the DeviceNet Master DTM requires an online connection from the DeviceNet Master DTM to the DeviceNet Master device. For further information refer to section Connecting/Disconnecting Device on page 65.

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 108.
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>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 DeviceNet device executes the network communication.</td>
<td>green</td>
<td>In COMMUNICATION state</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gray</td>
<td>Not in COMMUNICATION state</td>
</tr>
<tr>
<td>Run</td>
<td>Shows whether the DeviceNet device has been configured correctly.</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>Ready</td>
<td>Shows whether the DeviceNet device has been started correctly. The DeviceNet device waits for a configuration.</td>
<td>yellow</td>
<td>Device READY</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gray</td>
<td>Device not READY</td>
</tr>
<tr>
<td>Error</td>
<td>Shows whether the DeviceNet 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 DeviceNet device is in data exchange. In a cyclic data exchange the input data or the output data of the DeviceNet Master are transmitted to the DeviceNet Slave.</td>
<td>green</td>
<td>In OPERATION state</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gray</td>
<td>Not in OPERATION state</td>
</tr>
<tr>
<td>Idle</td>
<td>Shows whether the DeviceNet device is in idle state.</td>
<td>yellow</td>
<td>In IDLE state</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gray</td>
<td>Not in IDLE state</td>
</tr>
</tbody>
</table>
### 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 29: Indication General Diagnosis

<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 DeviceNet device is in Stop state: There is no cyclic data exchange at the DeviceNet network. The DeviceNet device was stopped by the application program or it changed to the Stop state because of a bus error.</td>
<td>(red)</td>
<td>In STOP state</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>Not in STOP state</td>
</tr>
<tr>
<td>Offline</td>
<td>The DeviceNet Master is offline as long as it does not have a valid configuration.</td>
<td>(yellow)</td>
<td>In OFFLINE state</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>Not in OFFLINE state</td>
</tr>
<tr>
<td><strong>Configuration State</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configuration locked</td>
<td>Shows whether the DeviceNet device configuration is locked, to avoid the configuration data are typed over.</td>
<td>(yellow)</td>
<td>Configuration LOCKED</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>Configuration not LOCKED</td>
</tr>
<tr>
<td>New Configuration pending</td>
<td>Shows whether a new DeviceNet device configuration is available.</td>
<td>(yellow)</td>
<td>New Configuration pending</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(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 DeviceNet device configuration has been loaded into the device.</td>
<td>(yellow)</td>
<td>RESET required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(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>(green)</td>
<td>Bus ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>Bus OFF</td>
</tr>
</tbody>
</table>

#### Table 30: Parameter 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>

**Figure 68: Master Diagnosis**
<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 diagnosis shows whether the Master is in cyclic data exchange to all configured slaves. In case there is at least one slave missing or if the slave has a diagnostic request pending, the status will be set to FAILED. For protocols that support non-cyclic communication only, the slave state is set to OK as soon as a valid configuration is found.</td>
<td>UNDEFINED, OK, FAILED</td>
</tr>
<tr>
<td>Slave error log indicator</td>
<td>Shows whether the Slave Error Log Indicator is available. The error log indicator field holds the number of entries in the internal error log. If all entries are read from the log, the field will be set to zero.</td>
<td>EMPTY, AVAILABLE</td>
</tr>
<tr>
<td>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>
<td></td>
</tr>
<tr>
<td>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>
<td></td>
</tr>
<tr>
<td>Slaves with diagnostic</td>
<td>Shows number of slaves with diagnostic. Number of Slaves with diagnosis or error slaves.</td>
<td></td>
</tr>
</tbody>
</table>

*Table 31: Parameter Master Diagnosis*
### 6.4 Bus Diagnosis

#### Bus Diagnosis

<table>
<thead>
<tr>
<th>Master Status</th>
<th>Not Ready</th>
<th>Slave Error</th>
<th>Control Error</th>
<th>Auto Clear</th>
<th>Fatal Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMAC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDUP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Server Status</th>
<th>Poll I/O Connection</th>
<th>Explicit Connection</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Bus Monitoring</th>
<th>Event</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN active to passive counter</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CAN bus off counter</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 69: Bus Diagnosis - Bus Monitoring*
6.4.1 Master Status

The Master Status shows individual bus errors. A pending error is displayed by a red LED. The meaning of the individual errors is described in the following:

<table>
<thead>
<tr>
<th>LED</th>
<th>Meaning</th>
<th>Color</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMAC</td>
<td>The DUPLICATE-MAC-ID indicates that the Master has found another device in the network which has the same MAC ID.</td>
<td>(red)</td>
<td>DUPLICATE-MAC-ID found</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>no DUPLICATE-MAC-ID found</td>
</tr>
<tr>
<td>PDUP</td>
<td>The DUPLICATE-MAC-ID check is performed. As long this bit is set; the Master is involved in handling the duplicate MAC-ID check.</td>
<td>(red)</td>
<td>DUPLICATE-MAC-ID check is performed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>DUPLICATE-MAC-ID check is not performed</td>
</tr>
<tr>
<td>Not Ready</td>
<td>HOST-NOT-READY shows, that the application program has not started or it has stopped the DeviceNet Master.</td>
<td>(red)</td>
<td>HOST-NOT-READY</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>HOST-READY</td>
</tr>
<tr>
<td>Auto Clear</td>
<td>The AUTO-CLEAR-ERROR displays, that device has stopped the communication to all Slaves and it has reached the auto-clear end state.</td>
<td>(red)</td>
<td>AUTO-CLEAR-ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>no AUTO-CLEAR-ERROR</td>
</tr>
<tr>
<td>Slave Error</td>
<td>The NON-EXCHANGE-ERROR shows, that at least one Slave is not in the cyclic data exchange with the DeviceNet Master.</td>
<td>(red)</td>
<td>NON-EXCHANGE-ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>no NON-EXCHANGE-ERROR</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>
<td>(red)</td>
<td>FATAL-ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>no FATAL-ERROR</td>
</tr>
<tr>
<td>Control Error</td>
<td>The CONTROL-ERROR displays that a parameterization error has occurred.</td>
<td>(red)</td>
<td>CONTROL-ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>no CONTROL-ERROR</td>
</tr>
</tbody>
</table>

Table 32: Bus Diagnosis - Master Status
### 6.4.2 Server Status

**Figure 71: Bus Diagnosis - Server Status**

<table>
<thead>
<tr>
<th>LED</th>
<th>Meaning</th>
<th>Color</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poll I/O Connection</td>
<td>Indicates that the Master as server has build up a Poll I/O Connection.</td>
<td>(red)</td>
<td>Poll I/O Connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>no Poll I/O Connection</td>
</tr>
<tr>
<td>Explicit Connection</td>
<td>Indicates that the Master as server has build up an Explicit Connection.</td>
<td>(red)</td>
<td>Explicit Connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>no Explicit Connection</td>
</tr>
</tbody>
</table>

**Table 33: Bus Diagnosis - Server Status**

### 6.4.3 Bus Monitoring

**Figure 72: Bus Diagnosis - Bus Monitoring**

<table>
<thead>
<tr>
<th>LED</th>
<th>Meaning</th>
<th>Color</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event</td>
<td>The used CAN chip has detected transmission errors. The number of detected events is counted in the CAN bus off counter and the CAN active to passive counter. The bit will be set when the first event was detected and will not be deleted until the Master is reset.</td>
<td>(red)</td>
<td>EVENT (transmission errors detected)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(gray)</td>
<td>no EVENT (no transmission errors detected)</td>
</tr>
<tr>
<td>CAN active to passive counter</td>
<td>This value indicates a bad transmission quality at the CAN bus. This counter is based on a Transmission Rejected Error of the CAN chip, which is always reported, whenever an increased number of faulty CAN frames were detected.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CAN bus off counter</td>
<td>This counter counts the number of reported bus off events. A bus off event occurs whenever the CAN bus was disturbed substantially during the transmission of CAN frames and therefore the communication chip has to withdraw itself from the bus.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Table 34: Bus Diagnosis - Bus Monitoring**
6.5 Station Diagnosis

**Station Status**

![Station Diagnosis - Station Status](image)

Under Station Status all disposal station addresses (0-63) and their states are shown as LED. If a connection to the device exists, the DTM updates 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 35: Possible Values for the Status*
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](image)

**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>

*Figure 74: Firmware Diagnosis (*The name of the Firmware is displayed.*)

*Table 36: Description Table Task Information*
7 Extended Diagnosis

7.1 Overview Extended Diagnosis

The Extended Diagnosis of the DeviceNet 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>DeviceNet Master DTM</th>
<th>Folder Name / Section</th>
<th>Subsection</th>
<th>Manual Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended Diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RX_SYSTEM Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>IniBatch Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPM COM0 SMBX Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>DPM COM0 RMBX Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>CAN_DL Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>CAN Driver Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPM COM0 SMBX Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>DPM COM0 RMBX Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>CAN_DL Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>App Commands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAN Driver Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPM COM0 SMBX Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>DPM COM0 RMBX Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>CAN_DL Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>App Commands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAN Driver Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEVNET FAL Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>Application Diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Device Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosis Error</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timeout Counter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinit Counter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DeviceNet CAN Diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEVNET AP Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>MARSHALLER Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>PACKET_ROUTER Task Info</td>
<td>Task Info</td>
<td>109</td>
<td></td>
</tr>
</tbody>
</table>

Table 37: Descriptions of the Dialog Panes Extended Diagnosis

Online Connection to the Device

Note: Accessing the Extended Diagnosis dialog panes of the DeviceNet Master DTM requires an online connection from the DeviceNet Master DTM to the DeviceNet Master device. For further information refer to section Connecting/Disconnecting Device on page 65.
7.2 Task Info

![Task Info Table]

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id</td>
<td>Identification number of the task</td>
</tr>
<tr>
<td>Major Ver.</td>
<td>Task version, contains incompatible changes</td>
</tr>
<tr>
<td>Minor Ver.</td>
<td>Task version, contains compatible changes</td>
</tr>
<tr>
<td>Max Packet Size</td>
<td>Maximum packet size, which the task sends</td>
</tr>
<tr>
<td>Default Que</td>
<td>Queue handle, which is accessible via DPM by mailbox.</td>
</tr>
<tr>
<td>Unique Id</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. The description of the error codes can be found in this manual or in the corresponding software reference manuals.</td>
</tr>
</tbody>
</table>

*Table 38: Extended Diagnosis > [Folder Name] > Task Info*
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; Discriminating packets in progress; Retrying to send last packet;</td>
</tr>
<tr>
<td></td>
<td>Error</td>
</tr>
<tr>
<td>IniBatch Result</td>
<td>Ok; No DBM file; No Packet table; No data set available; Data set is</td>
</tr>
<tr>
<td></td>
<td>shorter than packet length; Packet Buffer is shorter than Packet length;</td>
</tr>
<tr>
<td></td>
<td>Invalid packet destination; Logical queue not defined; Send packet failed;</td>
</tr>
<tr>
<td></td>
<td>Too many retries; 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; (</td>
</tr>
<tr>
<td></td>
<td>10) is.</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 39: Extended Diagnosis > [Folder Name] > IniBatch Status

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

7.4.1 App Commands

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Req</td>
<td>0</td>
</tr>
<tr>
<td>Pos Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Neg Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Can DL Ind</td>
<td>0</td>
</tr>
<tr>
<td>Can DL Res</td>
<td>0</td>
</tr>
<tr>
<td>Can DL Start Req</td>
<td>3</td>
</tr>
<tr>
<td>Pos Start Cnf</td>
<td>3</td>
</tr>
<tr>
<td>Neg Start Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Stop Req</td>
<td>0</td>
</tr>
<tr>
<td>Pos Stop Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Neg Stop Cnf</td>
<td>0</td>
</tr>
<tr>
<td>App Req Req</td>
<td>3</td>
</tr>
<tr>
<td>Pos App Req Cnf</td>
<td>3</td>
</tr>
<tr>
<td>Neg App Req Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Set Param Req</td>
<td>3</td>
</tr>
<tr>
<td>Pos Set Param Cnf</td>
<td>3</td>
</tr>
<tr>
<td>Neg Set Param Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Set Filter Req</td>
<td>0</td>
</tr>
<tr>
<td>Pos Set Filter Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Neg Set Filter Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Enable Rx Id Req</td>
<td>13</td>
</tr>
<tr>
<td>Pos Enable Rx Id Cnf</td>
<td>13</td>
</tr>
<tr>
<td>Neg Enable Rx Id Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Event Ind</td>
<td>3</td>
</tr>
<tr>
<td>Event Req</td>
<td>3</td>
</tr>
<tr>
<td>Event Ack Req</td>
<td>0</td>
</tr>
<tr>
<td>Pos Event Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Neg Event Cnf</td>
<td>0</td>
</tr>
<tr>
<td>TX Abort Req</td>
<td>0</td>
</tr>
<tr>
<td>Pos TX Abort Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Neg TX Abort Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Init Req</td>
<td>4</td>
</tr>
<tr>
<td>Pos Init Cnf</td>
<td>4</td>
</tr>
<tr>
<td>Neg Init Cnfs</td>
<td>0</td>
</tr>
<tr>
<td>Hi Priority Data Req</td>
<td>0</td>
</tr>
<tr>
<td>Pos Hi Priority Data Cnf</td>
<td>0</td>
</tr>
<tr>
<td>Neg Hi Priority Data Cnf</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 77: Extended Diagnosis > CAN_DL > App Commands

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

Table 40: Extended Diagnosis > CAN_DL > App Commands
### 7.4.2 CAN Driver Status

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Diagnosis status of CAN specific error levels. Indicates the respective status of the CAN bus. (For further information refer to the API manual.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN Status</td>
<td>collection bits for Bus Off, Error Warning and Error Passive</td>
<td></td>
</tr>
<tr>
<td>Bus Off</td>
<td>true / false CAN status - The CAN is in Bus Off state</td>
<td></td>
</tr>
<tr>
<td>Error Warning</td>
<td>true / false Error Warning - The CAN is in the status Error Warning</td>
<td></td>
</tr>
<tr>
<td>Error Passive</td>
<td>true / false Error Warning - The CAN is in Error Passive</td>
<td></td>
</tr>
<tr>
<td>Reserved</td>
<td>true / false Status or Error message</td>
<td></td>
</tr>
<tr>
<td>24 Volt Network Error</td>
<td>true / false - 24 Volt Network Error - The CAN is in 24 Volt Network Error</td>
<td></td>
</tr>
<tr>
<td>TX Frame OK</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>TX Error Summary</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RX Frame OK</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RX Error Summary</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RX Error Counter</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Arbitration Lost</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Ind Dropped (Fifo full)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cnt Dropped (Fifo full)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RX Std Frames Filtered</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RX Ext Frames Filtered</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RX Std Frames Passed</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RX Ext Frames Passed</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 41: Extended Diagnosis > CAN_DL > CAN Driver Status
### 7.5 DEVNET_FAL

#### 7.5.1 Application Diagnosis

<table>
<thead>
<tr>
<th>Task States</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Register Application Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Register Application Confirmation</td>
<td>1</td>
</tr>
<tr>
<td>Negative Register Application Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Initialisation Requests</td>
<td>0</td>
</tr>
<tr>
<td>Positive Initialisation Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Initialisation Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Download Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Download Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Download Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Clear Configuration Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Clear Configuration Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Clear Configuration Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Mode Change Indication</td>
<td>0</td>
</tr>
<tr>
<td>Mode Change Response</td>
<td>0</td>
</tr>
<tr>
<td>Set Mode Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Set Mode Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Set Mode Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Set Output Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Set Output Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Set Output Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Get Input Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Get Input Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Get Input Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Slave Diagnosis Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Slave Diagnosis Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Slave Diagnosis Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Get Attribute Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Get Attribute Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Get Attribute Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Set Attribute Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Set Attribute Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Set Attribute Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Abort Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Abort Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Abort Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Get Set Attribute Indication</td>
<td>0</td>
</tr>
<tr>
<td>Get Set Attribute Response</td>
<td>0</td>
</tr>
<tr>
<td>Get Set Attribute Response Request</td>
<td>0</td>
</tr>
<tr>
<td>Positive Get Set Attribute Response Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>Negative Get Set Attribute Response Confirmation</td>
<td>0</td>
</tr>
<tr>
<td>New Input Indication</td>
<td>0</td>
</tr>
<tr>
<td>New Input Response</td>
<td>0</td>
</tr>
<tr>
<td>End Process Request</td>
<td>0</td>
</tr>
<tr>
<td>Unknown Command</td>
<td>0</td>
</tr>
<tr>
<td>Last Unknown Command</td>
<td>0</td>
</tr>
</tbody>
</table>

*Figure 79: Extended Diagnosis > DEVNET_FAL > Application Diagnosis*
### Extended Diagnosis

#### 7.5.2 Device Status

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

Table 42: Extended Diagnosis > DEVNET_FAL > Application Diagnosis

**Device Status**

<table>
<thead>
<tr>
<th>Task states</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device 0 State</td>
<td>5000</td>
</tr>
<tr>
<td>Device 1 State</td>
<td>5000</td>
</tr>
<tr>
<td>Device 2 State</td>
<td>5000</td>
</tr>
<tr>
<td>Device 3 State</td>
<td>5000</td>
</tr>
<tr>
<td>Device 4 State</td>
<td>5000</td>
</tr>
</tbody>
</table>

Figure 80: Extended Diagnosis > DEVNET_FAL > Device Status

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Status]</td>
<td>Diagnosis status of the single devices. Indicates the current status of the single devices. (For further information refer to the API manual.)</td>
</tr>
</tbody>
</table>

Table 43: Extended Diagnosis > DEVNET_FAL > Device Status
7.5.3 Diagnosis Error

![Table screenshot](image1.png)

**Figure 81: Extended Diagnosis > DEVNET_FAL > Diagnosis Error**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Error Code]</td>
<td>Error codes of the device diagnosis. Indicates the error codes by each device. (For further information refer to the API manual.)</td>
</tr>
</tbody>
</table>

**Table 44: Extended Diagnosis > DEVNET_FAL > Diagnosis Error**

7.5.4 Timeout Counter

![Table screenshot](image2.png)

**Figure 82: Extended Diagnosis > DEVNET_FAL > Timeout Counter**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Service]</td>
<td>Diagnosis counter for device timeout. Indicates the number of timeouts for each device. (For further information refer to the API manual.)</td>
</tr>
</tbody>
</table>

**Table 45: Extended Diagnosis > DEVNET_FAL > Timeout Counter**
7.5.5 Reinit Counter

![Figure 83: Extended Diagnosis > DEVNET_FAL > Reinit Counter](image)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Service]</td>
<td>Diagnosis counter for device reinitialization. Indicates the number of reinitialization for each device. (For further information refer to the API manual.)</td>
</tr>
</tbody>
</table>

Table 46: Extended Diagnosis > DEVNET_FAL > Reinit Counter

7.5.6 DeviceNet CAN Diagnosis

![Figure 84: Extended Diagnosis > DEVNET_FAL > DeviceNet CAN Diagnosis](image)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus State</td>
<td>Status of the CAN bus</td>
</tr>
<tr>
<td>Receive CAN Frame</td>
<td>Counter for received CAN frames</td>
</tr>
<tr>
<td>Transmitted CAN Frame</td>
<td>Counter for transmitted CAN frames</td>
</tr>
<tr>
<td>Bus Off Counter</td>
<td>Status level error counter for „Off“ [2]</td>
</tr>
<tr>
<td>Error Passive Counter</td>
<td>Status level error counter for „Passive“ [2]</td>
</tr>
<tr>
<td>Error Warning Counter</td>
<td>Status level error counter for „Warning“ [2]</td>
</tr>
</tbody>
</table>

Table 47: Extended Diagnosis > DEVNET_FAL > DeviceNet CAN Diagnosis
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>DeviceNet 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>118</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>IO Monitor</td>
<td>135</td>
</tr>
<tr>
<td>Extended Diagnosis</td>
<td>Process Image Monitor</td>
<td>136</td>
</tr>
</tbody>
</table>

*Table 48: Descriptions of the Diagnosis Panes*

**Online Connection to the Device**

*Note:* Accessing the **Tools** dialog panes of the DeviceNet Master DTM requires an online connection from the DeviceNet Master DTM to the DeviceNet Master device. For further information refer to section *Connecting/Disconnecting Device* on page 65.
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 49: Descriptions Packet Header**

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

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

**Send Data**

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

### 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</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>

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.

![Packet Header](image)

Table 50: Descriptions Packet Header

Receive Data

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

### 8.2.3 Example – Reading Data via „Get Attribute“

To read data from a Slave device via „Get Attribute“ using the packet monitor, you must proceed as described below. The single steps are explained with 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 18.

Requirements

The function DeviceNet - read data „Get Attribute“ can only be used, if:

- The used Master and Slave devices support the „Get Attribute“ function.
- The used Master and Slave devices are configured. I. e., in the Slave configuration under General Settings the UCMM must be unchecked where required.
- 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:
   - In the General Settings examine UCMM and uncheck when the Slave device does not support UCMM.
   The documentation for the device will indicate if UCMM can be used or not.
Packet Description Read Request

<table>
<thead>
<tr>
<th>Type: Request</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Figure 88: Packet Description DEVNET_FAL_CMD_GET_ATT_REQ - Get Attribute Request

Further information on the packet description for this example is comprised in the DeviceNet Master Protocol API Manual, in section DEVNET_FAL_CMD_GET_ATT_REQ/CNF – Get Attribute Request (e.g. Revision 07 of the API manual, in section 5.2.4.).
1. Open Packet Monitor.
   - **Tools > Packet Monitor.**

2. Enter data for Packet header.

**Send > Packet header**
- Under **Dest** enter or select the receiver.
- Under **Cmd** enter the read command identification.

**Sample Data**

- **Receiver** 0x20 (Destination Queue Handle)
- **Read Command identification** 0000380A

![Sample Data](image)

Figure 89: Example - Reading data via „Get Attribute“ – Send > Packet header
3. Enter send data.

**Send > Send Data**

<table>
<thead>
<tr>
<th>Device Address</th>
<th>Range of Value</th>
<th>Sample Data</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserved</td>
<td>0 ... 63</td>
<td>01</td>
<td>(for MAC ID 1)</td>
</tr>
<tr>
<td>Class ID</td>
<td>0 ... 2^{16-1}</td>
<td>01 00*</td>
<td>(for Class-ID 1)</td>
</tr>
<tr>
<td>Instance ID</td>
<td>0 ... 2^{16-1}</td>
<td>01 00*</td>
<td>(for Instance-ID 1)</td>
</tr>
<tr>
<td>Attribute ID</td>
<td>0 ... 2^{16-1}</td>
<td>06 00*</td>
<td>(for Attribute-ID 6)</td>
</tr>
<tr>
<td>Reserved</td>
<td>0</td>
<td>00 00</td>
<td></td>
</tr>
</tbody>
</table>

*Intel format, e. g. LSB first;

Reserved

![Figure 90: Example - Read data via „Get Attribute“ - 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 Read Confirmation

**structure DN_FAL_PACKET_GET_ATT_CNF_T**

<table>
<thead>
<tr>
<th>Type: Request</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Area</th>
<th>Variable</th>
<th>Type</th>
<th>Value / Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>tHead</td>
<td>structure TLR_PACKET_HEADER_T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ulDest</td>
<td>UINT32</td>
<td></td>
<td>Destination Queue-Handle</td>
</tr>
<tr>
<td></td>
<td>ulSrc</td>
<td>UINT32</td>
<td></td>
<td>Source Queue-Handle of AP-Task Process Queue</td>
</tr>
<tr>
<td></td>
<td>ulDestId</td>
<td>UINT32</td>
<td>0</td>
<td>Destination End Point Identifier, specifying the final receiver of the packet within the Destination Process. Set to 0 for the Initialization Packet</td>
</tr>
<tr>
<td></td>
<td>ulSrcId</td>
<td>UINT32</td>
<td>0...2^{32}-1</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 + n</td>
<td>DN_FAL_GETSET_ATT_CNF_SIZE + number of attribute data received</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>0</td>
<td>See section 6.2 Status/Error Codes DevNet FAL - Task</td>
</tr>
<tr>
<td></td>
<td>ulCmd</td>
<td>UINT32</td>
<td>0x3803</td>
<td>DEVNET_FAL_CMD_GET_ATT_CNF - Command</td>
</tr>
<tr>
<td></td>
<td>ulExt</td>
<td>UINT32</td>
<td>0</td>
<td>Extension not in use</td>
</tr>
<tr>
<td></td>
<td>ulRoute</td>
<td>UINT32</td>
<td>x</td>
<td>Routing</td>
</tr>
<tr>
<td>lData</td>
<td>structure DN_FAL_SDN_GETSET_ATT_CNF_T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>bDeviceAddr</td>
<td>UINT8</td>
<td>0-63</td>
<td>MAC-ID of the device that was addressed</td>
</tr>
<tr>
<td></td>
<td>abReserved[3]</td>
<td>UINT8</td>
<td>0</td>
<td>Reserved zero</td>
</tr>
<tr>
<td></td>
<td>usClass</td>
<td>UINT16</td>
<td>0...2^{16}-1</td>
<td>Class ID, returned</td>
</tr>
<tr>
<td></td>
<td>usInstance</td>
<td>UINT16</td>
<td>0...2^{16}-1</td>
<td>Instance ID, returned</td>
</tr>
<tr>
<td></td>
<td>usAttribute</td>
<td>UINT16</td>
<td>0...2^{16}-1</td>
<td>Attribute ID, returned</td>
</tr>
<tr>
<td></td>
<td>bGenErr</td>
<td>UINT8</td>
<td>0..255</td>
<td>See Table below</td>
</tr>
<tr>
<td></td>
<td>bAddrErr</td>
<td>UINT8</td>
<td>0..255</td>
<td>See Table below</td>
</tr>
<tr>
<td></td>
<td>abAttData[0..512]</td>
<td>UINT8 array</td>
<td>xxx</td>
<td>Attribute Data received</td>
</tr>
</tbody>
</table>

**Figure 91: Packet Description DEVNET_FAL_CMD_GET_ATT_CNF - Confirmation of Get Attribute Request**

Further information on the packet description for this example is comprised in the DeviceNet Master Protocol API Manual, in section DEVNET_FAL_CMD_GET_ATT_REQ/CNF – Get Attribute Request (e. g. Revision 07 of the API manual, in section 5.2.4.).
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 139, in the *Dual Port Memory Manual* or in the *DeviceNet Slave Protocol API Manual*.

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

![Figure 92: Example - Reading data via „Get Attribute“ – Receive > Packet header](image)

Sample Data

<table>
<thead>
<tr>
<th>Receiver</th>
<th>0x20</th>
<th>(Destination Queue Handle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>00000000</td>
<td>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 is displayed.</td>
</tr>
<tr>
<td>Response Identification Read Request</td>
<td>0000380B</td>
<td>DN_FAL_PACKET_GET_ATT_CNFE_T (Confirmation)</td>
</tr>
</tbody>
</table>
**Receive > Receive data**

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

![Image](image.png)

**Figure 93: Example - Reading data via „Get Attribute“ – Receive > Receive data**

<table>
<thead>
<tr>
<th></th>
<th>Range of Value</th>
<th>Sample Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong> Device Address</td>
<td>0 … 63</td>
<td>01</td>
</tr>
<tr>
<td><strong>E</strong> Reserved</td>
<td>0</td>
<td>00 00 00</td>
</tr>
<tr>
<td><strong>F</strong> Class ID</td>
<td>0 … $2^{16}$-1</td>
<td>01 00*</td>
</tr>
<tr>
<td><strong>G</strong> Instance ID</td>
<td>0 … $2^{16}$-1</td>
<td>01 00*</td>
</tr>
<tr>
<td><strong>H</strong> Attribute ID</td>
<td>0 … $2^{16}$-1</td>
<td>06 00*</td>
</tr>
<tr>
<td><strong>K</strong> General Errors</td>
<td>0 … 255</td>
<td>00</td>
</tr>
<tr>
<td><strong>L</strong> Additional Errors</td>
<td>0 … 255</td>
<td>00</td>
</tr>
<tr>
<td><strong>M</strong> Receive Data (in the example =Serial number)</td>
<td>0 … $2^{32}$-1</td>
<td>D2 07 00 00*</td>
</tr>
</tbody>
</table>

*Intel format, e.g. LSB first;
8.2.4 Example – Writing Data via „Set Attribute“

To write data to a Slave device via „Set Attribute“ 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 18.

Requirements

The function DeviceNet - write data „Set Attribute“ can only be used, if:

- The used Master and Slave devices support the „Set Attribute“ function.

- The used Master and Slave devices are configured. I. e., in the Slave configuration under General Settings the UCMM must be unchecked where required.

- 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:

   - In the General Settings examine UCMM and uncheck when the Slave device does not support UCMM.

The documentation for the device will indicate if UCMM can be used or not.
Packet Description Write Request

Structure DN_FAL_PACKET_SET_ATT_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>tHead</td>
<td>u1Dest</td>
<td>UINT32</td>
<td></td>
<td>Destination Queue Handle</td>
</tr>
<tr>
<td></td>
<td>u1Src</td>
<td>UINT32</td>
<td></td>
<td>Source Queue Handle of AP-Task Process Queue</td>
</tr>
<tr>
<td></td>
<td>u1DestId</td>
<td>UINT32</td>
<td>0</td>
<td>Destination End Point Identifier, specifying the final receiver of the packet within the Destination Process. Set to 0 for the Initialization Packet</td>
</tr>
<tr>
<td></td>
<td>u1SrcId</td>
<td>UINT32</td>
<td>0...2^32-1</td>
<td>Source End Point Identifier, specifying the origin of the packet inside the Source Process</td>
</tr>
<tr>
<td></td>
<td>u1Len</td>
<td>UINT32</td>
<td>12 + n</td>
<td>sizeof(DN_FAL_SDU_GETSET_ATT_REQ_T) + number of attribute data to set</td>
</tr>
<tr>
<td></td>
<td>u1Id</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>u1SVA</td>
<td>UINT32</td>
<td>0</td>
<td>Set to zero</td>
</tr>
<tr>
<td></td>
<td>u1Cmd</td>
<td>UINT32</td>
<td>0x380C</td>
<td>DEVNET_FAL_CMD_SET_ATT_REQ - Command</td>
</tr>
<tr>
<td></td>
<td>u1Ext</td>
<td>UINT32</td>
<td>0</td>
<td>Extension not in use, set to zero for compatibility reasons</td>
</tr>
<tr>
<td></td>
<td>u1Rout</td>
<td>UINT32</td>
<td>0</td>
<td>Routing, set to zero</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>tData</th>
<th>structure DN_FAL_SDU_GETSET_ATT_REQ_T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bDeviceAddr</td>
</tr>
<tr>
<td></td>
<td>abReserved[3]</td>
</tr>
<tr>
<td></td>
<td>usClass</td>
</tr>
<tr>
<td></td>
<td>usInstance</td>
</tr>
<tr>
<td></td>
<td>usAttribute</td>
</tr>
<tr>
<td></td>
<td>usReserved</td>
</tr>
<tr>
<td></td>
<td>abAttribData[0..512]</td>
</tr>
</tbody>
</table>

Figure 94: Packet Description DEVNET_FAL_CMD_SET_ATT_REQ - Set Attribute Request

Further information on the packet description for this example is comprised in the DeviceNet Master Protocol API Manual, in section DEVNET_FAL_CMD_SET_ATT_REQ/CNF – Set Attribute Request (e.g. Revision 07 of the API manual, in section 5.2.5.).
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.

### Sample Data

<table>
<thead>
<tr>
<th>Receiver</th>
<th>0x20</th>
<th>(Destination Queue Handle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write Command Identification</td>
<td>0000380C</td>
<td>DN_FAL_PACKET_SET_ATT_REQ_T (Request)</td>
</tr>
</tbody>
</table>

![Packet Header Diagram](image)

*Figure 95: Example - Writing data via „Set Attribute“ – Send > Packet header*
3. Enter send data.

**Send > Send Data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range of Value</th>
<th>Sample Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Address</td>
<td>0 … 63</td>
<td>01</td>
</tr>
<tr>
<td>Reserved</td>
<td>0</td>
<td>00 00 00</td>
</tr>
<tr>
<td>Class ID</td>
<td>0 … 2^{16}-1</td>
<td>64 00*</td>
</tr>
<tr>
<td>Instance ID</td>
<td>0 … 2^{16}-1</td>
<td>01 00*</td>
</tr>
<tr>
<td>Attribute ID</td>
<td>0 … 2^{16}-1</td>
<td>02 00*</td>
</tr>
<tr>
<td>Reserved</td>
<td>0</td>
<td>00 00</td>
</tr>
<tr>
<td>Data to be sent</td>
<td></td>
<td>FF</td>
</tr>
</tbody>
</table>

*Intel format, e. g. LSB first; (UINT16 = 2 Bytes) (write 1 Byte with the value 255)

![Figure 96: Example - Writing data via „Set Attribute“ – 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

The packet description for the Write Confirmation is shown below. Further information on the packet description for this example is comprised in the DeviceNet Master Protocol API Manual, in section DEVNET_FAL_COMMAND_SETATTR_REQ/CNF – Set Attribute Request (e.g. Revision 07 of the API manual, in section 5.2.5.).

**Figure 97: Packet Description DEVNET_FAL_COMMAND_SETATTR_REQ - Confirmation of Set Attribute Request**

<table>
<thead>
<tr>
<th>Field</th>
<th>Data Type</th>
<th>Value / Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>tHead</td>
<td>NULL</td>
<td>Destination Queue-Handle</td>
<td></td>
</tr>
<tr>
<td>ulDest</td>
<td>UINT32</td>
<td>Source Queue-Handle of AP-Task Process Queue</td>
<td></td>
</tr>
<tr>
<td>ulSrc</td>
<td>UINT32</td>
<td>Destination End Point Identifier, specifying the final receiver of the packet within the Destination Process. Set to 0 for the Initialization Packet</td>
<td></td>
</tr>
<tr>
<td>ulDestId</td>
<td>UINT32</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>ulSrcId</td>
<td>UINT32</td>
<td>0...231-1</td>
<td>Source End Point Identifier, specifying the origin of the packet inside the Source Process</td>
</tr>
<tr>
<td>ulLen</td>
<td>UINT32</td>
<td>12</td>
<td>DN_FAL_GETSET_ATT_CNFG_SIZE</td>
</tr>
<tr>
<td>ulId</td>
<td>UINT32</td>
<td>0...231-1</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>x</td>
<td>See section 6.2 Status/Error Codes DevNet FAL – Task</td>
</tr>
<tr>
<td>ulCmd</td>
<td>UINT32</td>
<td>0x380D</td>
<td>DEVNET_FAL_COMMAND_SETATTR_REQ - Command</td>
</tr>
<tr>
<td>ulExt</td>
<td>UINT32</td>
<td>0</td>
<td>Extension not in use</td>
</tr>
<tr>
<td>ulOut</td>
<td>UINT32</td>
<td>x</td>
<td>Routing, don’t touch</td>
</tr>
<tr>
<td>tData</td>
<td>NULL</td>
<td>Device address, MAC/ID of device that was addressed</td>
<td></td>
</tr>
<tr>
<td>bDeviceAddr</td>
<td>UINT8</td>
<td>0-63</td>
<td></td>
</tr>
<tr>
<td>abReserved[3]</td>
<td>UINT8</td>
<td>0</td>
<td>Reserved zero</td>
</tr>
<tr>
<td>usClass</td>
<td>UINT16</td>
<td>0...215-1</td>
<td>Class ID, returned</td>
</tr>
<tr>
<td>usInstance</td>
<td>UINT16</td>
<td>0...215-1</td>
<td>Instance ID, returned</td>
</tr>
<tr>
<td>usAttrib</td>
<td>UINT16</td>
<td>0...215-1</td>
<td>Attribute ID, returned</td>
</tr>
<tr>
<td>bGenErr</td>
<td>UINT8</td>
<td>0...255</td>
<td>See Table below</td>
</tr>
<tr>
<td>bAddErr</td>
<td>UINT8</td>
<td>0...255</td>
<td>See Table below</td>
</tr>
<tr>
<td>chAttData[0..511]</td>
<td>UINT8 array</td>
<td>0</td>
<td>Unused in confirmation packet</td>
</tr>
</tbody>
</table>
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 139, in the **Dual Port Memory Manual** or in the **DeviceNet Slave Protocol API Manual**.

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

---

![Diagram](image-url)

**Figure 98: Example - Writing data via „Set Attribute“ – Receive > Packet header**

<table>
<thead>
<tr>
<th>Sample Data</th>
<th>Receiver</th>
<th>State</th>
<th>Response Identification Writing Request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver</td>
<td>0x20</td>
<td></td>
<td>(Destination Queue Handle)</td>
</tr>
<tr>
<td>State</td>
<td>00000000</td>
<td></td>
<td>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 is displayed.</td>
</tr>
<tr>
<td>Response Identification Writing Request</td>
<td>0000380D</td>
<td>DN_FAL_PACKET_SET_ATT_CNF_T</td>
<td>(Confirmation)</td>
</tr>
</tbody>
</table>
**Receive > Receive data**

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

![Receive data](image)

**Figure 99: Example – Writing data via „Set Attribute“ – Receive > Receive data**

<table>
<thead>
<tr>
<th>Device Address</th>
<th>Range of Value</th>
<th>Sample Data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong></td>
<td>0 ... 63</td>
<td>01</td>
<td>(for MAC ID 1)</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td>0</td>
<td>00 00 00</td>
<td></td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>0 ... 2^{16-1}</td>
<td>64 00*</td>
<td>(for Class-ID 100)</td>
</tr>
<tr>
<td><strong>G</strong></td>
<td>0 ... 2^{16-1}</td>
<td>01 00*</td>
<td>(for Instance-ID 1)</td>
</tr>
<tr>
<td><strong>H</strong></td>
<td>0 ... 2^{16-1}</td>
<td>02 00*</td>
<td>(for Attribute-ID 2)</td>
</tr>
<tr>
<td><strong>K</strong></td>
<td>0 ... 255</td>
<td>00</td>
<td>Slave device reports OK, no error</td>
</tr>
<tr>
<td><strong>L</strong></td>
<td>0 ... 255</td>
<td>00</td>
<td>Slave device reports OK, no error</td>
</tr>
</tbody>
</table>

*Intel format, e. g. LSB first; (UINT16 = 2 Bytes)*
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.

### 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**.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Mode</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></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>?</td>
<td>Display when the input and output data are not completely read and analyzed.</td>
<td></td>
</tr>
<tr>
<td>!</td>
<td>Display when the input and output data are not valid.</td>
<td></td>
</tr>
<tr>
<td>✓</td>
<td>Display when the input and output data are valid.</td>
<td></td>
</tr>
<tr>
<td>Typ</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>
</tbody>
</table>
### Table 51: Notes to the Window ‘Process Image Monitor’

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value / Value</th>
</tr>
</thead>
<tbody>
<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>
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></td>
</tr>
<tr>
<td>RCX Operating System</td>
<td>RCX General Task: 0xC02B0001 to 0xC02B4D52</td>
</tr>
<tr>
<td></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 bis 0x800A0017</td>
</tr>
<tr>
<td></td>
<td>Generic Driver Error: 0x800B0001 bis 0x800B0042</td>
</tr>
<tr>
<td></td>
<td>Generic Device Error: 0x800C010 bis 0x800C0041</td>
</tr>
<tr>
<td>netX Driver</td>
<td>CIFX API Transport: 0x800D0001 bis 0x800D0013</td>
</tr>
<tr>
<td></td>
<td>CIFX API Transport Header State Error: 0x800E0001 bis 0x800E000B</td>
</tr>
<tr>
<td>DBM</td>
<td>ODM Error Codes: 0xC004C810 to 0xC004C878</td>
</tr>
</tbody>
</table>

*Table 52: Overview Error Codes and Ranges*

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_INDEXUNKNOWN</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_INDEXUNKNOWN</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_PACKET_OUT_OF_SEQ</td>
<td>0xC02B0023</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_AVAIL</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 Invalid 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>0xC02B4B54</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 53: 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>0xC00000D</td>
<td>Invalid List Type</td>
</tr>
<tr>
<td>RCX_E_UNKNOWN_HANDLE</td>
<td>0xC00000E</td>
<td>Unknown Handle</td>
</tr>
<tr>
<td>RCX_E_PACKET_OUT_OF_SEQ</td>
<td>0xC00000F</td>
<td>Out Of Sequence</td>
</tr>
<tr>
<td>RCX_E_PACKET_OUT_OF_MEMORY</td>
<td>0xC000010</td>
<td>Out Of Memory</td>
</tr>
<tr>
<td>RCX_E_QUE_PACKETDONE</td>
<td>0xC000011</td>
<td>Queue Packet Done</td>
</tr>
<tr>
<td>RCX_E_QUE_SENDPACKAGE</td>
<td>0xC000012</td>
<td>Queue Send Packet</td>
</tr>
<tr>
<td>RCX_E_POOL_PACKET_GET</td>
<td>0xC000013</td>
<td>Pool Packet Get</td>
</tr>
<tr>
<td>RCX_E_POOL_GET_LOAD</td>
<td>0xC000015</td>
<td>Pool Get Load</td>
</tr>
<tr>
<td>RCX_E_REQUEST_RUNNING</td>
<td>0xC00001A</td>
<td>Request Already Running</td>
</tr>
<tr>
<td>RCX_E_INIT_FAULT</td>
<td>0xC000100</td>
<td>Initialization Fault</td>
</tr>
<tr>
<td>RCX_E_DATABASE_ACCESS_FAILED</td>
<td>0xC000101</td>
<td>Database Access Failed</td>
</tr>
<tr>
<td>RCX_E_NOT_CONFIGURED</td>
<td>0xC000119</td>
<td>Not Configured</td>
</tr>
<tr>
<td>RCX_E_CONFIGURATION_FAULT</td>
<td>0xC000120</td>
<td>Configuration Fault</td>
</tr>
<tr>
<td>RCX_E_INCONSISTENT_DATA_SET</td>
<td>0xC000121</td>
<td>Inconsistent Data Set</td>
</tr>
<tr>
<td>RCX_E_DATA_SET_MISMATCH</td>
<td>0xC000122</td>
<td>Data Set Mismatch</td>
</tr>
<tr>
<td>RCX_E_INSUFFICIENT_LICENSE</td>
<td>0xC000123</td>
<td>Insufficient License</td>
</tr>
<tr>
<td>RCX_E_PARAMETER_ERROR</td>
<td>0xC000124</td>
<td>Parameter Error</td>
</tr>
<tr>
<td>RCX_E_INVALID_NETWORK_ADDRESS</td>
<td>0xC000125</td>
<td>Invalid Network Address</td>
</tr>
<tr>
<td>RCX_E_NO_SECURITY_MEMORY</td>
<td>0xC000126</td>
<td>No Security Memory</td>
</tr>
<tr>
<td>RCX_E_NETWORK_FAULT</td>
<td>0xC000140</td>
<td>Network Fault</td>
</tr>
<tr>
<td>RCX_E_CONNECTION_CLOSED</td>
<td>0xC000141</td>
<td>Connection Closed</td>
</tr>
<tr>
<td>RCX_E_CONNECTION_TIMEOUT</td>
<td>0xC000142</td>
<td>Connection Timeout</td>
</tr>
<tr>
<td>RCX_E_LONELY_NETWORK</td>
<td>0xC000143</td>
<td>Lonely Network</td>
</tr>
<tr>
<td>RCX_E_DUPLICATE_NODE</td>
<td>0xC000144</td>
<td>Duplicate Node</td>
</tr>
<tr>
<td>RCX_E_CABLE_DISCONNECT</td>
<td>0xC000145</td>
<td>Cable Disconnected</td>
</tr>
<tr>
<td>RCX_E_BUS_OFF</td>
<td>0xC000180</td>
<td>Network Node Bus Off</td>
</tr>
<tr>
<td>RCX_E_CONFIG_LOCKED</td>
<td>0xC000181</td>
<td>Configuration Locked</td>
</tr>
<tr>
<td>RCX_E_APPLICATION_NOT_READY</td>
<td>0xC000182</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 54: 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_UNDEFINED</td>
<td>0xC02B0002</td>
<td>UNKNOWN QUEUE_INDEX</td>
</tr>
<tr>
<td>RCX_S_TASK_UNDEFINED</td>
<td>0xC02B0003</td>
<td>UNKNOWN TASK</td>
</tr>
<tr>
<td>RCX_S_TASK_INDEX_UNDEFINED</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_UNDEFINED</td>
<td>0xC02B0006</td>
<td>UNKNOWN INDEX</td>
</tr>
<tr>
<td>RCX_S_FILE_XFR_TYPE_UNDEFINED</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>UNKNOWN LENGTH</td>
</tr>
<tr>
<td>RCX_S_UNKNOWN_COMMAND</td>
<td>0xC0000007</td>
<td>UNKNOWN COMMAND</td>
</tr>
<tr>
<td>RCX_S_INVALID_EXTENSION</td>
<td>0xC0000008</td>
<td>INVALID EXTENSION</td>
</tr>
</tbody>
</table>

*Table 55: 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 56: 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_COMCATEGORY_MANANGER_FAILED</td>
<td>0x8004C712</td>
<td>Component Category Manager could not be instantiated</td>
</tr>
<tr>
<td>CODM3_E_COMCATEGORY 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_NECESSARY</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 57: 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 58: 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_OS_VERSION_ERROR</td>
<td>0x8004C00E</td>
<td>DEVICE Signals wrong OS version</td>
</tr>
<tr>
<td>DRV_E_DEV_SYSERR</td>
<td>0x8004C00F</td>
<td>DEVICE Error in dual port flags</td>
</tr>
<tr>
<td>DRV_E_DEV_MAILBOX_FULL</td>
<td>0x8004C010</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>
<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_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_EUSR_DEVICE_NAME_INVALID</td>
<td>0x8004C051</td>
<td>USER Device name invalid</td>
</tr>
<tr>
<td>DRV_EUSR_DEVICE_NAME_UNKNOWN</td>
<td>0x8004C052</td>
<td>USER Device name unknown</td>
</tr>
<tr>
<td>DRV_EUSR_DEVICE_FUNC_NOTIMPL</td>
<td>0x8004C053</td>
<td>USER Device function not implemented</td>
</tr>
<tr>
<td>DRV_EUSR_FILE_OPEN_FAILED</td>
<td>0x8004C064</td>
<td>USER File could not be opened</td>
</tr>
<tr>
<td>DRV_EUSR_FILE_SIZE_ZERO</td>
<td>0x8004C065</td>
<td>USER File size zero</td>
</tr>
<tr>
<td>DRV_EUSR_FILE_NO_MEMORY</td>
<td>0x8004C066</td>
<td>USER Not enough memory to load file</td>
</tr>
<tr>
<td>DRV_EUSR_FILE_READ_FAILED</td>
<td>0x8004C067</td>
<td>USER File read failed</td>
</tr>
<tr>
<td>DRV_EUSR_INVALID_FILETYPE</td>
<td>0x8004C068</td>
<td>USER File type invalid</td>
</tr>
<tr>
<td>DRV_EUSR_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_FW_DOWNLOAD_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>
</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_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_READ_FAILED</td>
<td>0x8004C07B</td>
<td>USER Configuration file read failed</td>
</tr>
<tr>
<td>DRV_E_CF_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_DESCR_TABLE_VERSION</td>
<td>0x8004C096</td>
<td>CONFIG Version of the descrit 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 59: 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>0x800A0001L</td>
<td>Invalid pointer (NULL) passed to driver</td>
</tr>
<tr>
<td>CIFX_INVALID_BOARD</td>
<td>0x800A0002L</td>
<td>No board with the given name/index available</td>
</tr>
<tr>
<td>CIFX_INVALID_CHANNEL</td>
<td>0x800A0003L</td>
<td>No channel with the given index available</td>
</tr>
<tr>
<td>CIFX_INVALID_HANDLE</td>
<td>0x800A0004L</td>
<td>Invalid handle passed to driver</td>
</tr>
<tr>
<td>CIFX_INVALID_PARAMETER</td>
<td>0x800A0005L</td>
<td>Invalid parameter</td>
</tr>
<tr>
<td>CIFX_INVALID_COMMAND</td>
<td>0x800A0006L</td>
<td>Invalid command</td>
</tr>
<tr>
<td>CIFX_INVALID_BUFFERSIZE</td>
<td>0x800A0007L</td>
<td>Invalid buffer size</td>
</tr>
<tr>
<td>CIFX_INVALID_ACCESS_SIZE</td>
<td>0x800A0008L</td>
<td>Invalid access size</td>
</tr>
<tr>
<td>CIFX_FUNCTION_FAILED</td>
<td>0x800A0009L</td>
<td>Function failed</td>
</tr>
<tr>
<td>CIFX_FILE_OPEN_FAILED</td>
<td>0x800A000AL</td>
<td>File could not be opened</td>
</tr>
<tr>
<td>CIFX_FILE_SIZE_ZERO</td>
<td>0x800A000BL</td>
<td>File size is zero</td>
</tr>
<tr>
<td>CIFX_FILE_LOAD_INSUFF_MEM</td>
<td>0x800A000CL</td>
<td>Insufficient memory to load file</td>
</tr>
<tr>
<td>CIFX_FILE_CHECKSUM_ERROR</td>
<td>0x800A000DL</td>
<td>File checksum compare failed</td>
</tr>
<tr>
<td>CIFX_FILE_READ_ERROR</td>
<td>0x800A000EL</td>
<td>Error reading from file</td>
</tr>
<tr>
<td>CIFX_FILE_TYPE_INVALID</td>
<td>0x800A000FL</td>
<td>Invalid file type</td>
</tr>
<tr>
<td>CIFX_FILE_NAME_INVALID</td>
<td>0x800A0010L</td>
<td>Invalid file name</td>
</tr>
<tr>
<td>CIFX_FUNCTION_NOT_AVAILABLE</td>
<td>0x800A0011L</td>
<td>Driver function not available</td>
</tr>
<tr>
<td>CIFX_BUFFER_TOO_SHORT</td>
<td>0x800A0012L</td>
<td>Given buffer is too short</td>
</tr>
<tr>
<td>CIFX_MEMORY_MAPPING_FAILED</td>
<td>0x800A0013L</td>
<td>Failed to map the memory</td>
</tr>
<tr>
<td>CIFX_NO_MORE_ENTRIES</td>
<td>0x800A0014L</td>
<td>No more entries available</td>
</tr>
<tr>
<td>CIFX_CALLBACK_MODE_UNKNOWN</td>
<td>0x800A0015L</td>
<td>Unknown callback handling mode</td>
</tr>
<tr>
<td>CIFX_CALLBACK_CREATE_EVENT_FAILED</td>
<td>0x800A0016L</td>
<td>Failed to create callback events</td>
</tr>
<tr>
<td>CIFX_CALLBACK_CREATE_RECV_BUFFER</td>
<td>0x800A0017L</td>
<td>Failed to create callback receive buffer</td>
</tr>
</tbody>
</table>

*Table 60: 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>0x800B0001L</td>
<td>Driver not initialized</td>
</tr>
<tr>
<td>CIFX_DRV_INIT_STATE_ERROR</td>
<td>0x800B0002L</td>
<td>Driver init state error</td>
</tr>
<tr>
<td>CIFX_DRV_READ_STATE_ERROR</td>
<td>0x800B0003L</td>
<td>Driver read state error</td>
</tr>
<tr>
<td>CIFX_DRV_CMD_ACTIVE</td>
<td>0x800B0004L</td>
<td>Command is active on device</td>
</tr>
<tr>
<td>CIFX_DRV_DOWNLOAD_FAILED</td>
<td>0x800B0005L</td>
<td>General error during download</td>
</tr>
<tr>
<td>CIFX_DRV_WRONG_DRIVER_VERSION</td>
<td>0x800B0006L</td>
<td>Wrong driver version</td>
</tr>
<tr>
<td>CIFX_DRV_DRIVER_NOT_LOADED</td>
<td>0x800B0030L</td>
<td>CIFx driver is not running</td>
</tr>
<tr>
<td>CIFX_DRV_INIT_ERROR</td>
<td>0x800B0031L</td>
<td>Failed to initialize the device</td>
</tr>
<tr>
<td>CIFX_DRV_CHANNEL_NOT_INITIALIZED</td>
<td>0x800B0032L</td>
<td>Channel not initialized (xOpenChannel not called)</td>
</tr>
<tr>
<td>CIFX_DRV_IO_CONTROL_FAILED</td>
<td>0x800B0033L</td>
<td>IOControl call failed</td>
</tr>
<tr>
<td>CIFX_DRV_NOT_OPENED</td>
<td>0x800B0034L</td>
<td>Driver was not opened</td>
</tr>
<tr>
<td>CIFX_DRV_DOWNLOAD_STORAGE_UNKNOWN</td>
<td>0x800B0040L</td>
<td>Unknown download storage type (RAMFLASH based) found</td>
</tr>
<tr>
<td>CIFX_DRV_DOWNLOAD_FW_WRONG_CHANNEL</td>
<td>0x800B0041L</td>
<td>Channel number for a firmware download not supported</td>
</tr>
<tr>
<td>CIFX_DRV_DOWNLOAD_MODULE_NO_BASE_EOS</td>
<td>0x800B0042L</td>
<td>Modules are not allowed without a Base OS firmware</td>
</tr>
</tbody>
</table>

*Table 61: 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>0x800C0010L</td>
<td>Dual port memory not accessible (board not found)</td>
</tr>
<tr>
<td>CIFX_DEV_NOT_READY</td>
<td>0x800C0011L</td>
<td>Device not ready (ready flag failed)</td>
</tr>
<tr>
<td>CIFX_DEV_NOT_RUNNING</td>
<td>0x800C0012L</td>
<td>Device not running (running flag failed)</td>
</tr>
<tr>
<td>CIFX_DEV_WATCHDOG_FAILED</td>
<td>0x800C0013L</td>
<td>Watchdog test failed</td>
</tr>
<tr>
<td>CIFX_DEV_SYSERR</td>
<td>0x800C0015L</td>
<td>Error in handshake flags</td>
</tr>
<tr>
<td>CIFX_DEV_MAILBOX_FULL</td>
<td>0x800C0016L</td>
<td>Send mailbox is full</td>
</tr>
<tr>
<td>CIFX_DEV_PUT_TIMEOUT</td>
<td>0x800C0017L</td>
<td>Send packet timeout</td>
</tr>
<tr>
<td>CIFX_DEV_GET_TIMEOUT</td>
<td>0x800C0018L</td>
<td>Receive packet timeout</td>
</tr>
<tr>
<td>CIFX_DEV_GET_NO_PACKET</td>
<td>0x800C0019L</td>
<td>No packet available</td>
</tr>
<tr>
<td>CIFX_DEV_MAILBOX_TOO_SHORT</td>
<td>0x800C001AL</td>
<td>Mailbox too short</td>
</tr>
<tr>
<td>CIFX_DEV_RESET_TIMEOUT</td>
<td>0x800C0020L</td>
<td>Reset command timeout</td>
</tr>
<tr>
<td>CIFX_DEV_NO_COM_FLAG</td>
<td>0x800C0021L</td>
<td>COM-flag not set</td>
</tr>
<tr>
<td>CIFX_DEV_EXCHANGE_FAILED</td>
<td>0x800C0022L</td>
<td>IO data exchange failed</td>
</tr>
<tr>
<td>CIFX_DEV_EXCHANGE_TIMEOUT</td>
<td>0x800C0023L</td>
<td>IO data exchange timeout</td>
</tr>
<tr>
<td>CIFX_DEV_COM_MODE_UNKNOWN</td>
<td>0x800C0024L</td>
<td>Unknown IO exchange mode</td>
</tr>
<tr>
<td>CIFX_DEV_FUNCTION_FAILED</td>
<td>0x800C0025L</td>
<td>Device function failed</td>
</tr>
<tr>
<td>CIFX_DEV_DPMSIZE_MISMATCH</td>
<td>0x800C0026L</td>
<td>DPM size differs from configuration</td>
</tr>
<tr>
<td>CIFX_DEV_STATE_MODE_UNKNOWN</td>
<td>0x800C0027L</td>
<td>Unknown state mode</td>
</tr>
<tr>
<td>CIFX_DEV_HW_PORT_IS_USED</td>
<td>0x800C0028L</td>
<td>Device is still accessed</td>
</tr>
<tr>
<td>CIFX_DEV_CONFIG_LOCK_TIMEOUT</td>
<td>0x800C0029L</td>
<td>Configuration locking timeout</td>
</tr>
<tr>
<td>CIFX_DEV_CONFIG_UNLOCK_TIMEOUT</td>
<td>0x800C002AL</td>
<td>Configuration unlocking timeout</td>
</tr>
<tr>
<td>CIFX_DEV_HOST_STATE_SET_TIMEOUT</td>
<td>0x800C002BL</td>
<td>Set HOST state timeout</td>
</tr>
<tr>
<td>CIFX_DEV_HOST_STATE_CLEAR_TIMEOUT</td>
<td>0x800C002CL</td>
<td>Clear HOST state timeout</td>
</tr>
<tr>
<td>CIFX_DEV_INITIALIZATION_TIMEOUT</td>
<td>0x800C002DL</td>
<td>Timeout during channel initialization</td>
</tr>
<tr>
<td>CIFX_DEV_BUS_STATE_ON_TIMEOUT</td>
<td>0x800C002EL</td>
<td>Set Bus ON Timeout</td>
</tr>
<tr>
<td>CIFX_DEV_BUS_STATE_OFF_TIMEOUT</td>
<td>0x800C002FL</td>
<td>Set Bus OFF Timeout</td>
</tr>
<tr>
<td>CIFX_DEV_MODULE_ALREADY_RUNNING</td>
<td>0x800C0040L</td>
<td>Module already running</td>
</tr>
<tr>
<td>CIFX_DEV_MODULE_ALREADY_EXISTS</td>
<td>0x800C0041L</td>
<td>Module already exists</td>
</tr>
</tbody>
</table>

Table 62: 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>0x800D0001L</td>
<td>Time out while sending data</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_RECV_TIMEOUT</td>
<td>0x800D0002L</td>
<td>Time out waiting for incoming data</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_CONNECT</td>
<td>0x800D0003L</td>
<td>Unable to communicate to the device no answer</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_ABORTED</td>
<td>0x800D0004L</td>
<td>Transfer has been aborted due to keep alive time out</td>
</tr>
<tr>
<td>CIFX_CONNECTOR_FUNCTIONS_READ_ERROR</td>
<td>0x800D0010L</td>
<td>Error reading the connector functions from the DLL</td>
</tr>
<tr>
<td>CIFX_CONNECTOR_IDENTIFIER_TOO_LONG</td>
<td>0x800D0011L</td>
<td>Connector delivers an identifier longer than 6 characters</td>
</tr>
<tr>
<td>CIFX_CONNECTOR_IDENTIFIER_EMPTY</td>
<td>0x800D0012L</td>
<td>Connector delivers an empty identifier</td>
</tr>
<tr>
<td>CIFX_CONNECTOR_DUPLICATE_IDENTIFIER</td>
<td>0x800D0013L</td>
<td>Connector identifier already used</td>
</tr>
</tbody>
</table>

Table 63: 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>0x800E0001L</td>
<td>Unknown error code in transport header</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_CHECKSUM_ERROR</td>
<td>0x800E0002L</td>
<td>CRC16 checksum failed</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_LENGTH_INCOMPLETE</td>
<td>0x800E0003L</td>
<td>Transaction with incomplete length detected</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_DATA_TYPE_UNKNOWN</td>
<td>0x800E0004L</td>
<td>Device does not support requested data type</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_DEVICE_UNKNOWN</td>
<td>0x800E0005L</td>
<td>Device not available unknown</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_CHANNEL_UNKNOWN</td>
<td>0x800E0006L</td>
<td>Channel not available unknown</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_SEQUENCE</td>
<td>0x800E0007L</td>
<td>Sequence error detected</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_BUFFEROVERFLOW</td>
<td>0x800E0008L</td>
<td>Buffer overflow detected</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_RESOURCE</td>
<td>0x800E0009L</td>
<td>Device signals out of resources</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_KEEPALIVE</td>
<td>0x800E000AL</td>
<td>Device connection monitoring error (Keep alive)</td>
</tr>
<tr>
<td>CIFX_TRANSPORT_DATA_TOO_SHORT</td>
<td>0x800E000BL</td>
<td>Received transaction data too short</td>
</tr>
</tbody>
</table>

Table 64: 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>0x004C810</td>
<td>Checksum invalid</td>
</tr>
<tr>
<td>CDBM_E_INTERNALERROR</td>
<td>0x004C811</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>0x004C813</td>
<td>Error in a file containing the old DBM Header format.</td>
</tr>
<tr>
<td>CDBM_E_CHECKSUM_INVALID</td>
<td>0x004C814</td>
<td>The Checksum of the old Header is invalid</td>
</tr>
<tr>
<td>CDBM_E_DB_ALREADY_LOADED_FORMAT</td>
<td>0x004C815</td>
<td>A database is already loaded</td>
</tr>
<tr>
<td>CDBM_E_NO_VALID_TRANSACTION</td>
<td>0x004C816</td>
<td>No valid transaction handle given</td>
</tr>
<tr>
<td>CDBM_E_STD_STRUCT_ERROR</td>
<td>0x004C817</td>
<td>An error occurred during validation of data</td>
</tr>
<tr>
<td>CDBM_E_UNSUPPORTED_DATA_TYPE_FORMAT</td>
<td>0x004C818</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>0x004C81B</td>
<td>A structure definition of an Element in a Table is invalid</td>
</tr>
<tr>
<td>CDBM_E_NO_DATA_AVAILABLE</td>
<td>0x004C81C</td>
<td>No data available for this operation</td>
</tr>
<tr>
<td>CDBM_E_NO_VALID_STRUCTURE</td>
<td>0x004C81D</td>
<td>No valid structure available for this operation</td>
</tr>
<tr>
<td>CDBM_E_NO_TOGGLE_STRING_FOUND</td>
<td>0x004C81E</td>
<td>No Toggle string found for this number</td>
</tr>
<tr>
<td>CDBM_E_ELEMENT_OUT_OF_RANGE</td>
<td>0x004C81F</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>0x004C820</td>
<td>The element is not part of the Table</td>
</tr>
<tr>
<td>CDBM_E_CANNOT_CONVERT_INTO_CLIENT_TYPE</td>
<td>0x004C821</td>
<td>The data can’t be converted into the Client type</td>
</tr>
<tr>
<td>CDBM_E_TRANSACTION_ALREADY_OPEN</td>
<td>0x004C822</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>(Informational) Use of an old DBM file Format without Header</td>
</tr>
<tr>
<td>CDBM_E_HR_FROM</td>
<td>0x004C824</td>
<td>An HRESULT was received from a Subroutine</td>
</tr>
<tr>
<td>CDBM_E_PARAMETER</td>
<td>0x004C825</td>
<td>A Parameter is invalid</td>
</tr>
<tr>
<td>CDBM_E_NOTIMPL</td>
<td>0x004C826</td>
<td>Method is currently not implemented</td>
</tr>
<tr>
<td>CDBM_E_OUTOFMEMORY</td>
<td>0x004C827</td>
<td>Out of memory</td>
</tr>
<tr>
<td>CDBM_E_NO_OPEN_TRANSACTION</td>
<td>0x004C828</td>
<td>No transaction open</td>
</tr>
<tr>
<td>CDBM_E_NO_CONTENTS</td>
<td>0x004C829</td>
<td>No contents available</td>
</tr>
<tr>
<td>CDBM_REC_NO_NOT_FOUND</td>
<td>0x004C82A</td>
<td>Record not found</td>
</tr>
<tr>
<td>CDBM_STRUCTURE_ELEMENT_NOT_FOUND</td>
<td>0x004C82B</td>
<td>Element of the Structure not found</td>
</tr>
<tr>
<td>CDBM_E_NO_MORE_RECORDS_IN_TABTYPE</td>
<td>0x004C82C</td>
<td>Table type 3 can contain only one record</td>
</tr>
<tr>
<td>CDBM_E_WRITE</td>
<td>0x004C82D</td>
<td>The data in the VARIANT must be given in a SafeArray</td>
</tr>
<tr>
<td>CDBM_E_WRITE_NO_PARRAY</td>
<td>0x004C82E</td>
<td>The VARIANT contains no valid [parray] element</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_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>0X4040C83F</td>
<td>(Informational) 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>CDBM_I_COUNT_OF_TABLES_EXCEEDS_OLDDBM_RANGE</td>
<td>0X4040C840</td>
<td>(Informational) The count of Tables exceeds the DBM32.DLL range of Tables. This can cause problems if the file is used with older Tools using the DBM32.DLL</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>
<tr>
<td>ODM Error Codes DBM V4</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<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_ADDR</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_NEREC</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>(Informational) 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>(Warning) The string exceeds the maximum length and will be limited to the maximum length</td>
</tr>
<tr>
<td>CDBM_I_STRING_TOO_SHORT</td>
<td>0X4004C859</td>
<td>(Informational) The string is below the minimum length. The minimum length will be reduced.</td>
</tr>
<tr>
<td>CDBM_I_STRING_TOO_LONG</td>
<td>0X4004C85A</td>
<td>(Informational) The string is exceeding the maximum. The maximum length will be extended.</td>
</tr>
<tr>
<td>CDBM_E_STRING_TOO_SHORT</td>
<td>0XC004C85B</td>
<td>(Error) The string is below the minimum length.</td>
</tr>
<tr>
<td>CDBM_E_STRING_TOO_LONG</td>
<td>0XC004C85C</td>
<td>(Error) The string is exceeding the maximum length</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_INSTRUCTURED_RECORDS</td>
<td>0XC004C85E</td>
<td>Method IDbObject::AppendData is not allowed for structured records</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_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_ESTRUCT_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 filed 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 65: 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 DeviceNet 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>Maintenanc e</th>
<th>Planning Engineer</th>
<th>Adminis-trator</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 66: Settings (D = Displaying, X = Editing, Configuring)*

### 10.1.2 Configuration

<table>
<thead>
<tr>
<th></th>
<th>Observer</th>
<th>Operator</th>
<th>Maintenanc e</th>
<th>Planning Engineer</th>
<th>Adminis-trator</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>Server 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>MAC ID Table</td>
<td>D</td>
<td>D</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Quick Connect 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 67: 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>

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10.5 Glossary

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.

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.

MAC ID

MAC = Media Access Control

The network address of a device serves to distinguish itself on a DeviceNet fieldbus system from any other device or Slave on this network. This should be a unique number for each device. A valid MAC-ID address is within a range of 0 to 63 and can be re-entered and changed in the MAC-ID box in the Device Configuration Dialog.

Master

Master devices initiate the data exchange at the bus.

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.

Predefined Master/Slave Connection

The “predefined Master/Slave connection” is a connection type, for which the properties of the connection between the Master device and the Slave device is established.

Slave

Slave devices are configured by the Master and perform then the communication.

UCMM

Unconnected Message Manager

UCMM is a connection type that allows to negotiate the connection properties during the connection is established between the Master device and the Slave device.
10.6 Contacts

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