Operating Instruction Manual

Generic Slave DTM for CANopen Slave Devices

Configuration of CANopen Slave Devices

Hilscher Gesellschaft für Systemautomation mbH

www.hilscher.com

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1 Introduction

1.1 About this Manual

This manual provides information on how to set up CANopen Slave devices described with EDS files. These devices can be configured with the CANopen generic Slave DTM within an FDT Framework.

**Dialog Panes**

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

<table>
<thead>
<tr>
<th>Section</th>
<th>Subsection</th>
<th>Manual Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration</td>
<td>General Settings</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Special Function Objects</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Object Dictionary</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Process Data Objects</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>PDO Properties</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>PDO Mapping</td>
<td>28</td>
</tr>
<tr>
<td>Device Description</td>
<td>Device</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>EDS</td>
<td>31</td>
</tr>
</tbody>
</table>

**Table 1: Descriptions Dialog Panes**

1.1.1 Online Help

The generic CANopen Slave DTM contains an integrated online help facility.

- To open the online help, click on Help or press F1.
### 1.1.2 List of Revisions

<table>
<thead>
<tr>
<th>Index</th>
<th>Date</th>
<th>Version</th>
<th>Component</th>
<th>Chapter</th>
<th>Revisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>12-11-07</td>
<td>1.7.x.x, 1.7.x.x, 1.0.x.x</td>
<td>CANopenGenSlave DTM.dll, COGenericSlaveDt mGui.ocx, CoEDSParser.dll</td>
<td>All</td>
<td>Revised</td>
</tr>
<tr>
<td>6</td>
<td>13-04-05</td>
<td>1.7.x.x, 1.7.x.x, 1.0.x.x</td>
<td>CANopenGenSlave DTM.dll, COGenericSlaveDt mGui.ocx, CoEDSParser.dll</td>
<td>1.3.1</td>
<td>Section Requirements, Windows 8 added.</td>
</tr>
</tbody>
</table>

### 1.1.3 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>
1.2 Legal Notes

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1.3 About Generic CANopen Slave DTM

You can use the CANopen generic Slave DTM to configure the CANopen Slave devices described with EDS files within a FDT Framework.

The information necessary for the configuration of the CANopen Slave devices is stored within the CANopen Master device when using the CANopen generic Slave DTM and thus the Master device is configured.

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 CANopen Generic Slave DTM**

Requirements for working with the CANopen generic Slave DTM are:
- Installed FDT/DTM V 1.2 compliant frame application
- Installed CANopen Master DTM
- EDS file of the devices to be configured
- The user needs to reload the Device Catalog

**Loading EDS files**

To add devices to the **netDevice** device catalog, you must import the EDS file of the used device via **netDevice** menu **Network > Import Device Descriptions ....** into the EDS folder of the DTM. Then the Device Catalogue must be reloaded. The folder EDS inclusively Windows® XP is located in the application data directory (All Users) of the configuration software (or from with Windows® 7 on in the C:\ProgramData\SYCONnet directory).

For further information refer to section **Configuration Steps** on page 14, under step 1 and 2.
1.4 Dialog Structure of the Generic CANopen Slave 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.

![Dialog Structure of the Generic CANopen Slave DTM](image)

Figure 1: Dialog Structure of the Generic CANopen Slave 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 2: General Device Information
1.4.2 Navigation Area

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

![Navigation Area](image)

*Figure 2: Navigation Area*

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

**Hide / display Navigation**

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

1.4.3 Dialog Panes

At the dialog pane the **Settings** or **Device Description** panes are opened via the corresponding folder in the navigation area.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>The dialog <strong>General Settings</strong> displays EDS file data. For further information see section <em>General Settings</em> on page 18.</td>
</tr>
<tr>
<td>Special Function Objects</td>
<td>The dialog <strong>Special Function Objects</strong> displays data of the synchronization, time stamp and emergency message. For further information see section <em>Special Function Objects</em> on page 19.</td>
</tr>
<tr>
<td>Object Dictionary</td>
<td>The dialog <strong>Object Dictionary</strong> represents the object dictionary of the device. The display shows data read out from the EDS file. For further information see section <em>Object Dictionary</em> on page 22.</td>
</tr>
<tr>
<td>Process Data Objects</td>
<td>PDO Properties: In the dialog <strong>PDO Properties</strong> the transmit and the receive PDOs are displayed. For further information see section <em>PDO Properties</em> on page 25. PDO Mapping: The dialog <strong>PDO Mapping</strong> permits to map the contents of a PDO. For further information see section <em>PDO Mapping</em> on page 28.</td>
</tr>
<tr>
<td>Device Description</td>
<td><strong>Device Info</strong> pane contains the manufacturer information about the device. For further information see section <em>Device</em> on page 28.</td>
</tr>
<tr>
<td>EDS</td>
<td>By use of the <strong>EDS Viewer</strong> pane an EDS file can be viewed and searched through. For further information see section <em>EDS</em> on page 31.</td>
</tr>
</tbody>
</table>

*Table 3: Overview Dialog Panes*
1.4.4 OK, Cancel, Apply and Help

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

<table>
<thead>
<tr>
<th>Table 4: OK, Cancel, Apply and Help</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OK</strong></td>
</tr>
<tr>
<td><strong>Cancel</strong></td>
</tr>
<tr>
<td><strong>Apply</strong></td>
</tr>
<tr>
<td><strong>Help</strong></td>
</tr>
</tbody>
</table>

1.4.5 Table Lines

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

<table>
<thead>
<tr>
<th>Table 5: Selecting, inserting, deleting Table Line</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meaning</strong></td>
</tr>
<tr>
<td><img src="arrow-point-up.png" alt="" /></td>
</tr>
<tr>
<td><img src="arrow-point-left.png" alt="" /></td>
</tr>
<tr>
<td><img src="arrow-point-right.png" alt="" /></td>
</tr>
<tr>
<td><img src="arrow-point-down.png" alt="" /></td>
</tr>
<tr>
<td><img src="add-chart.png" alt="" /></td>
</tr>
<tr>
<td><img src="delete.png" alt="" /></td>
</tr>
</tbody>
</table>
1.4.6 Status Bar

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

![Status Bar Display Example](image)

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

<table>
<thead>
<tr>
<th>Status Field</th>
<th>Icon / Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>DTM Connection States</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Connected</strong>: Icon closed = Device is online</td>
</tr>
<tr>
<td></td>
<td><strong>Disconnected</strong>: Icon opened = Device is offline</td>
</tr>
<tr>
<td>2</td>
<td><strong>Data Source States</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Data set</strong>: The displayed data are read out from the instance data set (database).</td>
</tr>
<tr>
<td></td>
<td><strong>Device</strong>: The displayed data are read out from the device.</td>
</tr>
<tr>
<td>3</td>
<td><strong>States of the instance Data Set</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Valid Modified</strong>: Parameter is changed (not equal to data source).</td>
</tr>
</tbody>
</table>

**Table 6: Status Bar Icons [1]**

---

**Offline State**

![Disconnected Icon]

**Online State**

![Connected Icon]
# Getting started

## 2.1 Configuration Steps

The following overview describes the steps to configure a CANopen Slave device with the CANopen generic Slave DTM as it is typical for many cases. At this time it is presupposed that the CANopen Master DTM installation was already 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.

<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 CANopen 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>17</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 button Reload Catalog.</td>
<td>(See Operating Instruction Manual netDevice and netProject)</td>
<td>12</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>12</td>
</tr>
<tr>
<td>4</td>
<td>Insert Master or Slave device 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 device, - and insert the device via drag and drop to the Master bus line in the network view.</td>
<td>(See Operating Instruction Manual of the Frame Application)</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Configure Slave device</td>
<td>Configure the Slave device. - Double click to the device icon of the Slave. - The Generic Slave DTM configuration dialog is displayed. In the Generic Slave DTM configuration dialog: - select Configuration &gt; Object Dictionary, - define the object filters, - Select Configuration &gt; Special Function Objects, - select the options for the synchronization, time stamp and emergency message, - select Configuration &gt; Process Data Objects &gt; PDO Properties, - configure the PDO to be used for the communication, - select Configuration &gt; Process Data Objects &gt; PDO Mapping, - configure the list of the mappable or the list of the mapped objects each, - close the Generic Slave DTM configuration dialog via the button OK.</td>
<td>Configuring Device Parameters</td>
<td>17</td>
</tr>
<tr>
<td>6</td>
<td>Configuration Steps Master device</td>
<td>Configure the Master device via CANopen Master DTM.</td>
<td>(See Operating Instruction Manual DTM for CANopen Master devices)</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>7</td>
<td>Save project</td>
<td>Depending of the frame application. For the configuration software: - select <strong>File &gt; Save.</strong></td>
<td><em>(See Operating Instruction Manual of the Frame Application)</em></td>
<td>-</td>
</tr>
</tbody>
</table>

*Table 7: Getting started - Configuration Steps*
3 Configuration

3.1 Overview Configuration

Dialog Panes “Configuration”

The table below gives an overview about the available Configuration dialog panes descriptions:

<table>
<thead>
<tr>
<th>Generic CANopen Slave DTM</th>
<th>Folder Name / Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Settings</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Special Function Objects</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Object Dictionary</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Process Data Objects</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>PDO Properties</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>PDO Mapping</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

Table 8: Descriptions of the Dialog Panes Configuration

Notice the descriptions in the section Configuration Steps on page 14.

Note: Access to the configuration panes is enabled without requirement of user rights. However for editing certain user rights are required. Further information can be found in section and User Rights on page 33.
3.2 Configuring Device Parameters

The following steps are needed to configure the device parameters using the Generic CANopen Slave DTM:

**Object Dictionary**
1. Define the object filters.
   - Select Configuration > Object Dictionary in the navigation area.

**Special Function Objects**
2. Select the configuration options for the synchronization, time stamp and emergency message.
   - Select Configuration > Special Function Objects in the navigation area.
   - Select whether:
     - the CANopen Slave device shall generate the synchronization message,
     - the CANopen Slave device shall consume/produce the time stamp message,
     - the CANopen Master device shall be able to receive the emergency message,
     - and whether for each of these messages the 29-bit CAN-ID of the CAN-ID extended frame shall be valid.

**Process Data Objects**
3. Configure the PDO.
   - Select Configuration > Process Data Objects > PDO Properties in the navigation area.
   - Configure the PDO to be used for the communication.
4. Configure the PDO Mapping.
   - Select Configuration > Process Data Objects > PDO Mapping in the navigation area.
   - Configure the list of the mappable or the list of the mapped objects each.

**Close Generic Slave DTM Configuration Dialog**
5. Click OK in order to close the Generic Slave configuration dialog and to store your configuration.

**Further Information**
For more information refer to section Object Dictionary on page 22, Special Function Objects on page 22, PDO Properties on page 25 and PDO Mapping on page 28.
### 3.3 General Settings

The dialog **General Settings** displays EDS file data:

<table>
<thead>
<tr>
<th>Node ID: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device [1000]</td>
</tr>
<tr>
<td>Profile: 401</td>
</tr>
<tr>
<td>Type: 3</td>
</tr>
<tr>
<td>Vendor [1008..100A]</td>
</tr>
<tr>
<td>Device name:</td>
</tr>
<tr>
<td>Hardware version: 5/02</td>
</tr>
<tr>
<td>Software version: 1.00</td>
</tr>
</tbody>
</table>

#### 3.3.1 Node ID, Device, Vendor

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Values / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Node ID</strong></td>
<td>The <strong>Node ID (address)</strong> is required to address the device at the bus and must be unique within the CANopen network. Therefore it is not allowed to use this number twice in the same network and must match with the set Node address of the device. Otherwise it is not possible for the Master to build up a communication to this device.</td>
<td>1 ... 127</td>
</tr>
<tr>
<td><strong>Device Profile and Device Type</strong></td>
<td>Because of the information of the <strong>Device Profile</strong> and the <strong>Device Type</strong> during start of communication, the Master can read out the Object 1000H from the Node and compare it with these data. Each CANopen Node has a mandatory Object 1000H, which must be present in the object directory. This object is named <strong>Device Type</strong>. The <strong>Device Type</strong> also includes the information about the <strong>Device Profile</strong>. The Master reads out the Object 1000H from the Node when starting up the CANopen bus and compares the entries, which are made in the two available fields <strong>Device Profile</strong> and <strong>Device Type</strong>. If the <strong>Device Profile</strong> and the <strong>Device Type</strong> do not match, the Master reports a parameterization error and does not establish a process data transfer to the Node. The verification can be also deactivated.</td>
<td>Value read out from the EDS file</td>
</tr>
<tr>
<td><strong>Device Name, Hard and Software Version</strong></td>
<td>Displayed manufacturer data read out from the EDS file.</td>
<td>Value read out from the EDS file</td>
</tr>
</tbody>
</table>
3.4 Special Function Objects

The **Special Function Objects** dialog displays parameter data of the

- **Synchronization Message**, 
- **TimeStamp Message** 
- and the **Emergency Message**.

The displayed data partly originate from the CANopen specification and cannot be edited here. The **SYNC COB-ID** generally can be changed via the CANopen Master DTM. Select here whether:

- the CANopen Slave device shall generate the synchronization message,
- the CANopen Slave device shall consume/produce the time stamp message,
- the CANopen Master device shall be able to receive the emergency message
- and whether for each of these messages the 29-bit CAN-ID of the CAN-ID extended frame shall be valid.

![Special Function Objects Table]

*Figure 6: Special Function Objects*
### 3.4.1 Synchronization Message

A PDO in CANopen can be configured in Event Driven mode or Cyclic Transmission. Both kinds of transmission types can be synchronized to a special synchronization message which is sent by the master in defined time intervals.

#### Sync COB-ID [1005]

The SYNC COB-ID is assigned by the master and cannot be edited here. It can be changed only by the CANopen Master DTM.

The SYNC COB-ID specifies the Identifier of the synchronization message. If the Communication Cycle Period is not equal to zero, the transmission of the SYNC message is activated.

#### Device generates SYNC message

If checked, the CANopen Slave device generates the synchronization message. Default: Values from EDS file

#### 29-bit

If checked, for this PDO the 29-bit CAN-ID of the CAN-ID extended frame is valid.

If not checked, for this PDO the 11-bit CAN-ID is valid.

#### Communication Cycle Period [1006]

The Communication Cycle Period is assigned by the Master and cannot be edited here. It can be changed only by the CANopen Master DTM.

The Communication Cycle Period specifies the time for the interval for the transmission the SYNC message.

#### Synchronous Window Length [1007]

The Synchronous Window Length is assigned by the master and cannot be edited here. It can be changed only by the CANopen Master DTM.

The Synchronous Window Length specifies the length of the time window for synchronous PDO (process data objects).
### 3.4.2 Time Stamp Message

**Figure 8: Special Function Objects - Time Stamp Message**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Values / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Stamp Message</td>
<td>For transmission of time data.</td>
<td></td>
</tr>
<tr>
<td>TIME COB-ID [1012]</td>
<td>The TIME COB-ID is assigned by the Master and cannot be edited here. It can be changed only by the CANopen Master DTM. The TIME COB-ID specifies the COB-ID of the time stamp object.</td>
<td>Default: 256</td>
</tr>
<tr>
<td>Device consumes TIME message</td>
<td>If checked, the CANopen Slave device consumes the time stamp message.</td>
<td>Default: Values from EDS file</td>
</tr>
<tr>
<td>Device produces TIME message</td>
<td>If checked, the CANopen Slave device produces the time stamp message.</td>
<td></td>
</tr>
<tr>
<td>29-Bit</td>
<td>If checked, for this PDO the 29-bit CAN-ID of the CAN-ID extended frame is valid. If not checked, for this PDO the 11-bit CAN-ID is valid.</td>
<td></td>
</tr>
</tbody>
</table>

**Table 11: Special Function Objects - Time Stamp Message**

### 3.4.3 Emergency Message

**Figure 9: Special Function Objects - Emergency Message**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Values / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Message</td>
<td>Emergency messages are sent by the Node when a node internal event occurs. The CANopen Master can buffer maximally 5 Emergency messages.</td>
<td></td>
</tr>
<tr>
<td>EMCY COB-ID [1014]</td>
<td>The EMCY COB-ID is assigned by the Master and cannot be edited here. It can be changed only by the CANopen Master DTM. The EMCY COB-ID specifies the COB-ID of the Emergency message.</td>
<td>129 … 255, Default (depends from Node ID): 129 (for Node ID =1), 130 (for Node ID =2), …</td>
</tr>
<tr>
<td>EMCY exists</td>
<td>If checked, the CANopen Master can receive EMCY (Emergency) messages.</td>
<td>Default: Values from EDS file</td>
</tr>
<tr>
<td>29-Bit</td>
<td>If checked, for this PDO the 29-bit CAN-ID of the CAN-ID extended frame is valid. If not checked, for this PDO the 11-bit CAN-ID is valid.</td>
<td></td>
</tr>
</tbody>
</table>

**Table 12: Special Function Objects - Emergency Message**
3.5 Object Dictionary

The dialog **Object Dictionary** represents the object dictionary of the device. The display shows data read out from the EDS file.

By means of filters in the table **Object Configuration** lists with configured and/or not configured objects can be displayed. A search function allows searching for a special object within the lists.

![Figure 10: Object Dictionary - Filter Object Configuration](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Values / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>Via Area a filtered object dictionary area can be selected, which is displayed in the table <strong>Object Configuration</strong>. If <strong>All</strong> is selected, in the table <strong>Object Configuration</strong> all objects are displayed, which are defined in the EDS file.</td>
<td>All, 0x1000 … 0x11FF, 0x1200 … 0x13FF, 0x1400 … 0xFFFF, 0x2000 … 0x5FFF, 0x6000 … 0x9FFF, 0xA000 … 0xFFFF, Default: All</td>
</tr>
<tr>
<td>Status</td>
<td>Via Status it is possible to specify whether in the table <strong>Object Configuration</strong> all objects, only the configured objects or only the not configured objects of the selected range are to be displayed. Only the objects configured are relevant for data exchange.</td>
<td>All, configured, not configured, Default: All</td>
</tr>
<tr>
<td>Object</td>
<td>In the searching field <strong>Object</strong> the object index and/or the object index and subindex of a certain object can be entered. If the arrow button -&gt; Go is clicked, the searched object (if available) is displayed in the upper line of the table <strong>Object Configuration</strong>. To enter an object index with subindex a dot is used. Example: 1400.01</td>
<td>Min: 0000 Max: FFFF</td>
</tr>
</tbody>
</table>
The objects read out from the EDS file are displayed in the table **Object Configuration**. For better readability for objects with subindex a heading (object index without subindex) is displayed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Values / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configure</strong></td>
<td>The Objects activated in the configuration are checked. The Objects which are not configured are unchecked.</td>
<td>configured (checked), not configured (unchecked)</td>
</tr>
<tr>
<td>Symbol / Checkbox</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td><strong>Objects activated in the configuration</strong></td>
<td>configured (checkbox locked)</td>
<td></td>
</tr>
<tr>
<td><strong>Objects which are not activated in the configuration</strong></td>
<td>not configured (checkbox locked)</td>
<td></td>
</tr>
<tr>
<td><strong>Index.Sub-index</strong></td>
<td>All objects are addressed in the object index and the corresponding subindex, which are defined by the EDS file.</td>
<td>Object index 0x1000 … 0xFFFF; Sub index 0x00 … 0xFF</td>
</tr>
<tr>
<td><strong>Name</strong></td>
<td>Symbolic name of the object, which is defined by the EDS file.</td>
<td>From EDS file</td>
</tr>
<tr>
<td><strong>Access</strong></td>
<td>Gives the access right of the object, which is defined by the EDS file.</td>
<td>RO = read only (read); RW = read, write (read, write); WO = write only (write); CONST = constant</td>
</tr>
</tbody>
</table>
If in the table **Object Configuration** a line is clicked by the cursor, the selected object, the current value, the default value, the data type, the minimum and maximum value are displayed in the fields below the table. By **Display mode** data display can be chosen in decimal or in hexadecimal mode.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selected Object</strong></td>
<td>In the display field <strong>Selected Object</strong> the object index, the subindex and the name of the selected object are indicated. These data are defined by the EDS file.</td>
<td></td>
</tr>
<tr>
<td><strong>Display Mode</strong></td>
<td>By selection of the <strong>Display Mode</strong> decimal and/or hexadecimal from the list field the values are displayed in decimal and/or hexadecimal mode.</td>
<td>Hexadecimal, Decimal, Default: Hexadecimal</td>
</tr>
<tr>
<td><strong>Current Value</strong></td>
<td>In the input field <strong>Current Value</strong> a value can be assigned to the selected object.</td>
<td></td>
</tr>
<tr>
<td><strong>Default, Data Type, Min/Max</strong></td>
<td>In the display fields <strong>Default, Data Type</strong> and/or <strong>Min/Max</strong> the default value defined in the EDS file, the data type and/or the minimum and maximum value for the object is indicated. The values <strong>Min.</strong> and <strong>Max.</strong> are displayed in decimal mode by default.</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 12: Object Dictionary - Data selected Object*

*Table 15: Object Dictionary - Data selected Object*
3.6  Process Data Objects

3.6.1 PDO Properties

In the dialog **PDO Properties** the transmit and the receive PDOS are displayed. Via **PDO Type** the display can be changed from transmit PDOS (TPDO) to receive PDOS (RPDO) and vice versa.

![PDO Type](image)

_Figure 13: Process Data Objects > PDO Properties - PDO Type_

The PDOS supported by the node are read out of the EDS file and displayed in the table **PDO Configuration**. The PDOS to be used for the communication can be specified i.e. configured in this window.

![PDO Configuration](image)

_Figure 14: Process Data Objects > PDO Properties - PDO Configuration_

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Values / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDO Type</td>
<td>Filter function for the table <strong>PDO Configuration</strong> as - Transmit PDOS - TPDO = Transmit PDO or as - Receive PDOS - RPDO = Receive PDO. Transmit PDOS are sent by the node and are input data of the Master. Receive PDOS are output data of the Master and are received from the node.</td>
<td>TPDO RPDO</td>
</tr>
<tr>
<td>Configure</td>
<td>By activating/configuring of a PDO the PDO is used for the communication. The corresponding parameter values are part of the master configuration. During initialization the master transfers these parameters automatically into the node (default behavior). <strong>Note:</strong> The transmission of the parameters during the initialization phase can also be deactivated and/or become deactivated. i.e., the node uses parameters, which can be different from the parameters set here.</td>
<td>configured (checked), not configured (unchecked)</td>
</tr>
</tbody>
</table>
Each process data object (PDO) has characteristics. These are displayed below the table.

**Table 16: Process Data Objects > PDO Properties - PDO Configuration (examine)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Values / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDO exists</td>
<td>If checked, the PDO is selected for the configuration.</td>
<td>Default: Values from EDS file</td>
</tr>
<tr>
<td>RTR allowed</td>
<td>If checked, for this PDO the message-triggering mode “Remotely requested” is allowed, which means that the transmission of an event-driven PDO is initiated on receipt of a RTR initiated by a PDO consumer. If not checked, for this PDO the message-triggering mode “Remotely requested” is not allowed. Note: A RTR is not allowed to inquire for an emergency transmission. [2]</td>
<td></td>
</tr>
<tr>
<td>PDO Name</td>
<td>Here RxPDO name and/or TxPDO name is indicated. These are defined in the EDS file.</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 15: Process Data Objects > PDO Properties - Data selected Object (Example)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Values / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>COB-ID</td>
<td>The COB-ID contains the CAN identifier and additional parameters for the related communication object. According to the CANopen specification ([2] page 131, Table 73) these are the „exists/not exists bit“, the „remote frame support bit“ (RTR allowed) and the „frame format 11 /29 bit“. COB-ID = Communication Object Identifier. The CAN identifier is the main part of the arbitration field of a CAN data frame or CAN remote frame. It comprises 11 bit (base frame format) or 29 bit (extended frame format). The CAN identifier value determines implicitly the priority for the bus arbitration.</td>
<td>0 … 2047</td>
</tr>
<tr>
<td>PDO exists</td>
<td>If checked, the PDO is selected for the configuration.</td>
<td></td>
</tr>
<tr>
<td>RTR allowed</td>
<td>If checked, for this PDO the message-triggering mode “Remotely requested” is allowed, which means that the transmission of an event-driven PDO is initiated on receipt of a RTR initiated by a PDO consumer. If not checked, for this PDO the message-triggering mode “Remotely requested” is not allowed. Note: A RTR is not allowed to inquire for an emergency transmission. [2]</td>
<td></td>
</tr>
<tr>
<td>PDO Name</td>
<td>Here RxPDO name and/or TxPDO name is indicated. These are defined in the EDS file.</td>
<td></td>
</tr>
</tbody>
</table>
### Parameter | Meaning | Range of Values / Value
--- | --- | ---
29-bit | If checked, for this PDO the 29-bit CAN-ID of the CAN-ID extended frame is valid. If not checked, for this PDO the 11-bit CAN-ID is valid. |  
Transmission Type | For the transmit and/or receive PDOS different transmission types are possible. For a PDO in CANopen event driven, synchronous or asynchronous transmission can be configured. Transmission types can be synchronized to the synchronization message SYNC for example, which is sent by the master in defined time intervals. Synchronous means that the transmission of the PDO is related to the SYNC message. Asynchronous means that the transmission of the PDO is not related to the SYNC message and can be done at any time. **Note:** The support of the different transmission types is manufacturer and device dependent. For CANopen the support of individual and/or all transmission types is not required. Whether a device supports the desired transmission type, must be reread and/or examined in the technical manual of the used device, if necessary. | 0 … 255
SYNC number | For synchronous TPDOs for the transmission type **synchronous cyclic (1-240)** another number is to be set, to which SYNC message the data transmission refers. A SYNC number of 1 means that the message will be transferred with each SYNC message. A SYNC number of n means that the message will be transferred with each n-th SYNC message. Asynchronous TPDOs are not transferred in a temporal correlation with a SYNC. |
Inhibit Time | The Inhibit Timer (if supported) describes the time interval, which at least must be waited between the transmissions of two equal messages. Thus a too frequent transmission of the same message is suppressed.  |
Event Timer | The Event Timer (if supported) is possible only for TPDO transmission types 254 and 255. The expiration of the timer is used in the node as event, in order to send the TPDO. Manufacturer and/or device-specifically also an application event can activate the sending of the TPDOs and reset the Event Timer. | TPDO 254, 255

Table 17: Process Data Objects > PDO Properties - Data selected Object
### 3.6.2 PDO Mapping

The dialog **PDO Mapping** permits to map the contents of a PDO.

By use of the **Filter PDO type** field in the table **Mappable Objects** the receive PDOS (RPDO) or alternatively the transmit PDOS (TPDO) can be displayed.

![Filter PDO type](image)

_Figure 16: Process Data Objects > PDO Mapping - Filter PDO Type_

In the list field **Object Dictionary Area** an object dictionary area can be preselected.

![Object Dictionary Area](image)

_Figure 17: Process Data Objects > PDO Mapping - Object Dictionary Area_

The mappable objects appropriate to the preselection are listed in the table **Mappable Objects**.

![Mappable Objects](image)

_Figure 18: Process Data Objects > PDO Mapping - Mappable Objects_

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object Dictionary Area</td>
<td>Object dictionary filter range.</td>
<td>All, 0x1000 … 0x11FF, 0x1200 … 0x13FF, 0x1400 … 0x1FFF, 0x2000 … 0x5FFF, 0x6000 … 0x9FFF, 0xA000 … 0xFFFF, Default: All</td>
</tr>
<tr>
<td>Mappable Objects</td>
<td>List of the mappable objects.</td>
<td>from EDS file</td>
</tr>
<tr>
<td>Index. Subindex</td>
<td>All objects are addressed in the object index and if necessary in the corresponding subindexes, which are defined by the EDS file.</td>
<td>0x1000 … 0xFFFF as well as 0 … 0xFFFF</td>
</tr>
<tr>
<td>Parameter</td>
<td>Name of the object from the EDS file.</td>
<td>from EDS file</td>
</tr>
<tr>
<td>Data type</td>
<td>Data type of the object from the EDS file respectively according to the data types (Object dictionary data types) listed in the CANopen specification ([2] page 90, Table 44).</td>
<td>from EDS file</td>
</tr>
<tr>
<td>Length</td>
<td>The length of the PDOS in bytes.</td>
<td></td>
</tr>
</tbody>
</table>
Table 18: Process Data Objects > PDO Mapping - Mappable Objects

In the list field PDO Contents Mapping for the PDO is selected, the PDO contents to be displayed.

Figure 19: Process Data Objects > PDO Mapping - Filter Mapped Objects

The mapped objects appropriate to the preselection are listed in the table Mapped Objects.

Figure 20: Process Data Objects > PDO Mapping - Mapped Objects

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Range of Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>Gives the access rights of the process data objects, which are defined by the EDS file.</td>
<td>rw = read, write</td>
</tr>
</tbody>
</table>

Table 19: Process Data Objects > PDO Mapping - Mapped Objects

To change the object sequence in the table Mapped Objects more easily, shifting buttons are available: move completely above, above, down and completely down.
4 Device Description

4.1 Overview Device Description

Descriptions of “Device Description”

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

<table>
<thead>
<tr>
<th>CANopen generic Slave DTM</th>
<th>Folder Name / Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation area</td>
<td>Device</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>EDS</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 20: Descriptions of the Dialog Panes Device Description

4.2 Device

The Device Info dialog contains manufacturer information about the device, which is defined in the EDS file. The following information is indicated:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor Name</td>
<td>Name of the device manufacturer</td>
</tr>
<tr>
<td>Vendor ID</td>
<td>Identification number of the manufacturer</td>
</tr>
<tr>
<td>Product name</td>
<td>Name of the device as specified by the manufacturer</td>
</tr>
<tr>
<td>Product number</td>
<td>Number of the Device as specified by the manufacturer</td>
</tr>
<tr>
<td>Revision number</td>
<td>Hardware reference of the device as specified by the manufacturer</td>
</tr>
<tr>
<td>Order Code</td>
<td>Order Code of the device as specified by the manufacturer</td>
</tr>
</tbody>
</table>

Table 21: Device Description > Device
4.3 EDS

The **EDS Viewer** pane shows the content of the EDS file in a text view.

![EDS Viewer](image)

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

In the **EDS Viewer** pane on the left side, the line number is displayed for simple overview, the further entries show the EDS file in text format.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filename</td>
<td>File directory path and the file name of the displayed EDS file.</td>
</tr>
<tr>
<td>Find what</td>
<td>Search feature to search for text contents within the text of the EDS file.</td>
</tr>
<tr>
<td>Match case</td>
<td>Search option</td>
</tr>
<tr>
<td>Match whole word</td>
<td>Search option</td>
</tr>
</tbody>
</table>

**Table 22: Device Description - EDS Viewer**
5 Appendix

5.1 COB-ID (Predefined Connection Set)

COB-ID stands for communication object identifier. This is the 11 bit covering message identifier of a CAN message. Thereby the upper 4 bits (bit 11 to 8) are the function identifier and the lower 7 bits (bit 7 to bits 0) the bus address of the node.

Broadcast Objects:

<table>
<thead>
<tr>
<th>Object</th>
<th>Function Code</th>
<th>COB-ID hex</th>
<th>COB-ID dec</th>
<th>Index in the Object Dictionary</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMT</td>
<td>0000</td>
<td>00H</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SYNC</td>
<td>0001</td>
<td>80H</td>
<td>128</td>
<td>1005H, 1006H, 1007H</td>
</tr>
<tr>
<td>TIME STAMP</td>
<td>0010</td>
<td>100H</td>
<td>256</td>
<td>1012H, 1013H</td>
</tr>
</tbody>
</table>

Table 23: COB-ID - Broadcast Objects

Peer-to-Peer Objects:

<table>
<thead>
<tr>
<th>Objects</th>
<th>Function Code</th>
<th>COB-ID hex</th>
<th>COB-ID dec</th>
<th>Index in the Object Dictionary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td>0001</td>
<td>81H-FFH</td>
<td>129-255</td>
<td>1014H, 1015H</td>
</tr>
<tr>
<td>PDO 1 (tx)</td>
<td>0011</td>
<td>181H-1FFH</td>
<td>385-511</td>
<td>1800H (1A00H)</td>
</tr>
<tr>
<td>PDO 1 (rx)</td>
<td>0100</td>
<td>201H-27FH</td>
<td>513-639</td>
<td>1400H (1600H)</td>
</tr>
<tr>
<td>PDO 2 (tx)</td>
<td>0101</td>
<td>281H-2FFH</td>
<td>641-767</td>
<td>1801H (1A01H)</td>
</tr>
<tr>
<td>PDO 2 (rx)</td>
<td>0110</td>
<td>301H-37FH</td>
<td>769-895</td>
<td>1401H (1601H)</td>
</tr>
<tr>
<td>PDO 3 (tx)</td>
<td>0111</td>
<td>381H-3FFH</td>
<td>897-1023</td>
<td>1802H (1A02H)</td>
</tr>
<tr>
<td>PDO 3 (rx)</td>
<td>1000</td>
<td>401H-47FH</td>
<td>1025-1151</td>
<td>1402H (1602H)</td>
</tr>
<tr>
<td>PDO 4 (tx)</td>
<td>1001</td>
<td>481H-4FFH</td>
<td>1153-1279</td>
<td>1803H (1A03H)</td>
</tr>
<tr>
<td>PDO 4 (rx)</td>
<td>1010</td>
<td>501H-57FH</td>
<td>1281-1407</td>
<td>1403H (1603H)</td>
</tr>
<tr>
<td>SDO (tx)</td>
<td>1011</td>
<td>581H-5FFH</td>
<td>1409-1535</td>
<td>1200H</td>
</tr>
<tr>
<td>SDO (rx)</td>
<td>1100</td>
<td>601H-67FH</td>
<td>1537-1663</td>
<td>1200H</td>
</tr>
<tr>
<td>NMT Error Control</td>
<td>1110</td>
<td>701H-77FH</td>
<td>1793-1919</td>
<td>1016H, 1017H</td>
</tr>
</tbody>
</table>

Table 24: COB-ID - Peer-to-Peer Objects
5.2 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 Configuration and Device Description panes of the Generic CANopen Slave DTM you do not need special user rights.

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

The Device Description panes do not contain any editable elements. The indicated values in are only for information purposes.

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

### 5.2.1 Configuration

<table>
<thead>
<tr>
<th></th>
<th>Observer</th>
<th>Operator</th>
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<th>Administrator</th>
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<td>D (X)</td>
<td>X</td>
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<tr>
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</tr>
</tbody>
</table>

*Table 25: Configuration (D = Displaying, X = Editing, Configuring)*

### 5.3 References

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


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5.6 Glossary

**CAN-ID**

The CAN identifier is the main part of the arbitration field of a CAN data frame or CAN remote frame. It comprises 11 bit (base frame format) or 29 bit (extended frame format). The CAN identifier value determines implicitly the priority for the bus arbitration.

**COB-ID**

Communication Object Identifier. The COB-ID contains the CAN identifier and additional parameters for the related communication object. According to the CANopen specification ([2] page 131, Table 73) these are the „exists/not exists bit“, the „remote frame support bit“ (RTR allowed) and the „frame format 11/29 bit“.

**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.

**EDS**

An Electronic Data Sheet (EDS) provides information necessary to access and alter the configurable parameters of a device. An Electronic Data Sheet (EDS) is an external file that contains information about configurable attributes for the device, including object addresses of each parameter. The application objects in a device represent the destination addresses for configuration data. These addresses are encoded in the EDS.

**FDT**

Field Device Tool

FDT specifies an interface, in order to be able to use DTM (Device Type Manager) in different applications of different manufacturers.

**Master**

Master devices initiate the data exchange at the bus.

**RTR**

Remote transmission request

**Node ID**

The Node ID is the network address of the device. The network address serves to distinguish itself from other devices on the network. Therefore an unique address must be assigned to each device.

**Slave**

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