**Operating Instruction Manual**

# netDevice and netProject

## FDT Container
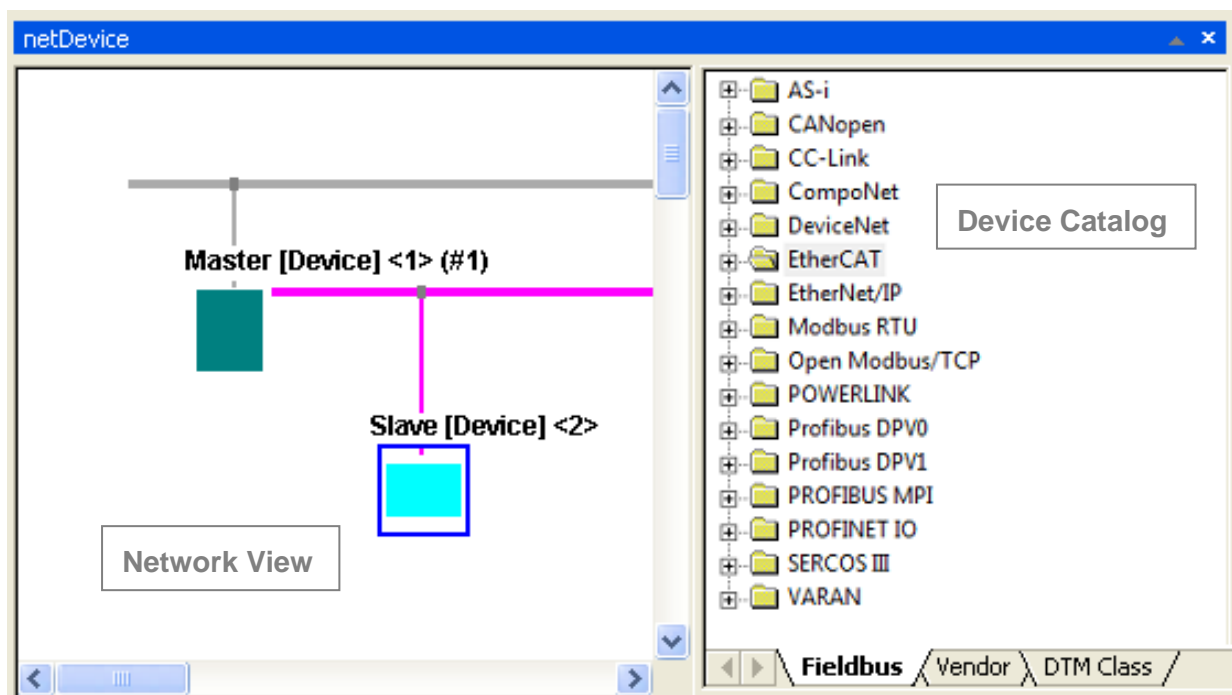
# Table of Contents

# 1 Introduction

## 1.1 About this Manual

**netDevice** is a **FDT Container** for the configuration of field devices of different manufacturers.

### 1.1.1 Overwiew

The table below gives an overview of the descriptions provided in this manual:

| Chapter | Section | Manual Page |
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*Table 1: Overview*

### 1.1.2 Online Help

**netDevice** contains an integrated online help facility.

➢ To open the online help, select **Help** > **Content and Index** or press the **F1** key.

## 1.1.3 List of Revisions

| Index | Date | Version | Component | Chapter | Revision |
|-------|------|---------|-----------|---------|----------|
| 11 | 13-09-06 | 1.1203.x.x | AxSyconu.ocx | 1.2.6, 2.1.2.1, 2.1.2.2, 4.2.3, 4.4 | Section *Registered Trademarks* updated. Section *Search Function in* the Device Catalog added. Section *Notations to the DTM and to the Device* updated, Section *Devices of other Vendors* added. Section *PROFINET IO Device Instance* added. |

## 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>

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# 2 netDevice and netProject

## 2.1 netDevice
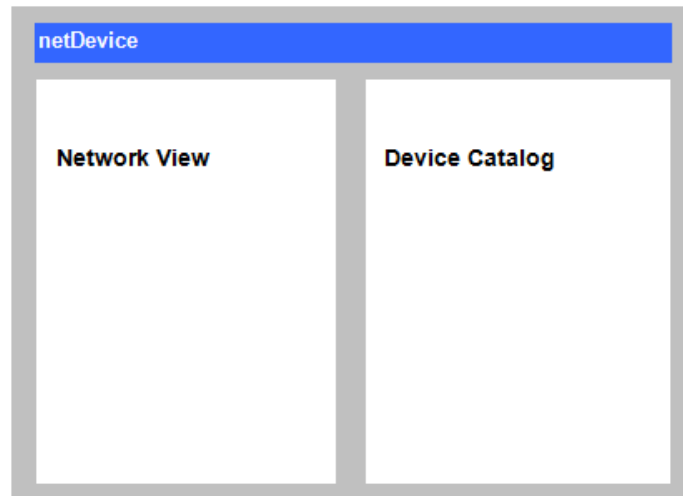


*Figure 1: netDevice - Network View and Device Catalog (Principle)*

The **netDevice** window is divided in two different areas:

- **Graphical Network View**

The left side of the **netDevice** window shows the actual configuration as graphical network view. In the graphical network view you can arrange the single elements (devices and bus lines). A detailed description of the network view you find in section *netDevice - Graphical Network View* on page *10*.

- **Device Catalog**

The right side of the **netDevice** window displays the installed devices as tree structure. Further information about this you find in section *netDevice - Device Catalog* on page *10*.



*Figure 2: Example for netDevice - Network View and Device Catalog*

## 2.1.1    netDevice - Graphical Network View

The graphical network view displays the actual project as graphical network structure. Devices can be added by drag and drop from the device c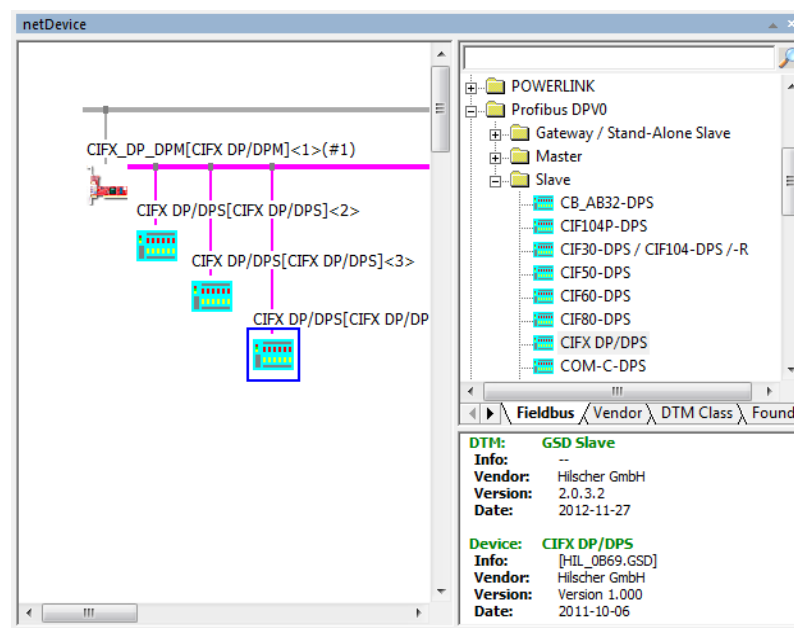atalog and they are displayed as an icon in the network view. For further information refer to section *Insert Device in Project* on page *31* or to section *Arrange Elements in the Graphical Network View* on page 36.

- **Device Symbol and Device Description**

Above or below the device icon the name of the device with the device address are displayed and for master devices a continuous number, the network ID. The position of the text depends on the direction of the connection line.

- **Context Menu**

By a right mouse click on a device icon, the context menu is opened. The context menu contains all entries of the menu **Device** from the menu bar of the frame application. The context menu contains further entries for configuration and diagnostic. A detailed description about the **Device** menu and the context menu you find in section *Menu Device and Context Menu* on page *16*.

- **Configuration Dialog**

For most of the DTM the configuration dialog of the appropriate device opens by a double click on a device icon. Otherwise the context menu is opened. In the configuration dialog all device and bus-specific settings can be made. The possibilities of the configuration are manufacturer specific. Closer information for device configuration can be taken from the technical manual of the manufacturer.

| netProject | netDevice | |
|---|---|---|
| Project Tree | Network View | Device Catalog |

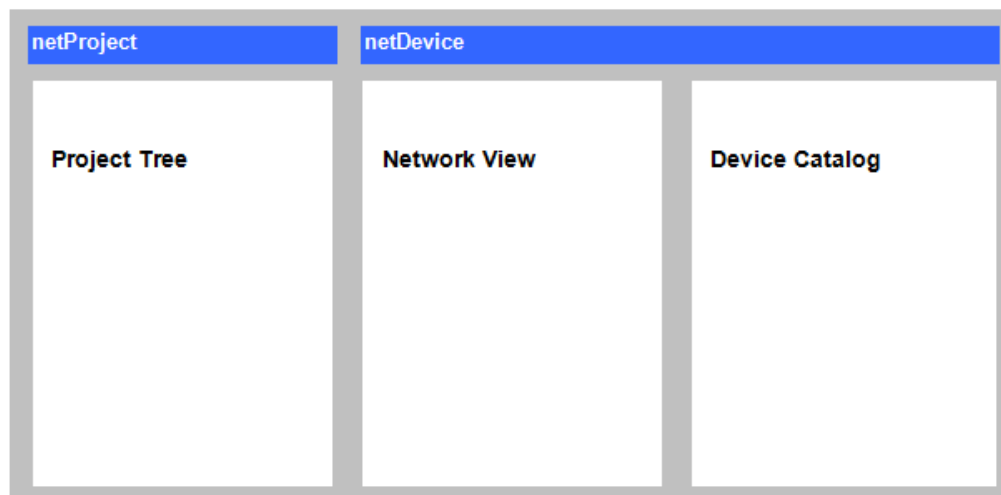*Figure 3: netDevice and netProject - Graphical Network View (Principle)*

The graphical network view in the **netDevice** window is synchronized with the **netProject** window. That means devices which you insert

- in the graphical network view, are also displayed automatically in the **netProject** window.

- in the **netProject** window, are shown in the graphical network view of the **netDevice** window.
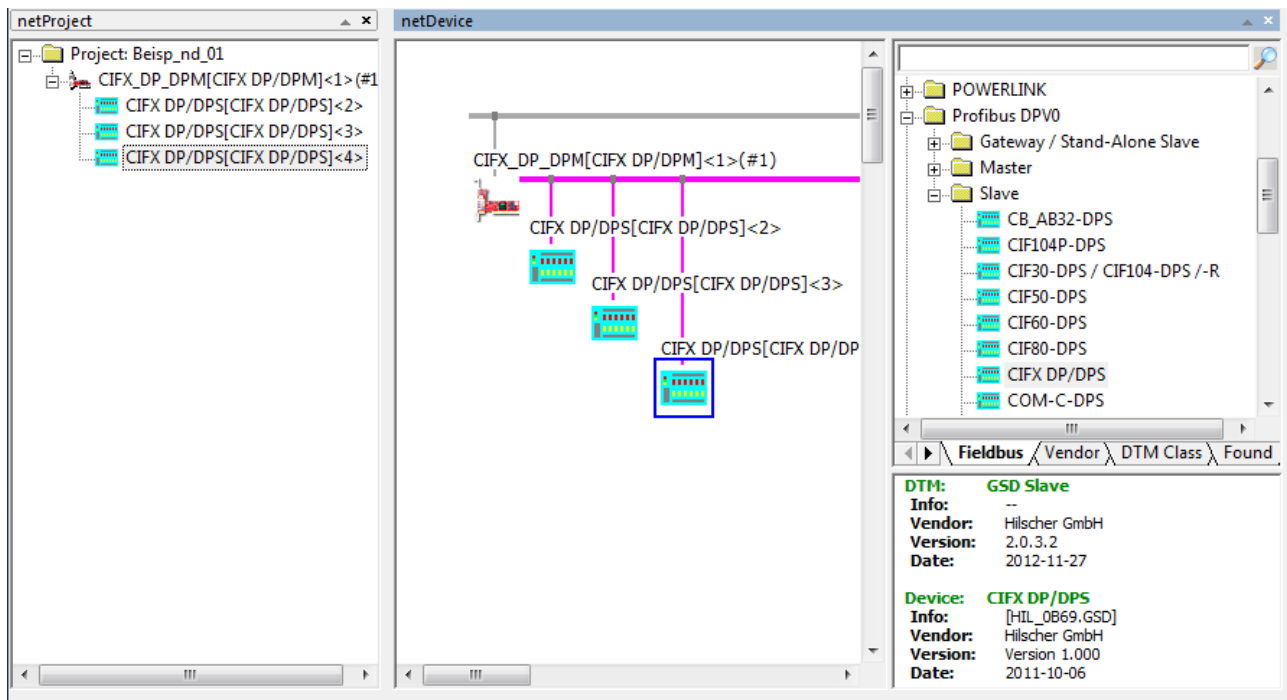
*Figure 4: Example for netDevice and netProject - Graphical Network View*

### 2.1.1.1    Notation of the Device Description

The device description is composed as follows:



| | |
|---|---|
| **YYYYY** | Symbolic Name |
| **[XXXX]** | Device Description |
| **<1>** | Station Address |
| **(#1)** | Network ID |

*Figure 5: Notation of the Device Description*

| Term | Description |
|---|---|
| **Symbolic Name** | In the **Symbolic Name** dialog optionally a symbolic name can be entered. For further information refer to section *Change Symbolic Name* on page *22*. |
| **Device Description** | The **Device Description** indicates the name of the device and can not be edited. <br><br> For PROFINET IO in the device catalog under ‚Stand-Alone-Slave' or ‚Slave' all device instances that derive from the same device description file, appear as separate devices. |
| **Station Address** | The **Station Address** is the device address on the bus and can be changed in the Master DTM configuration dialog. |
| **Network ID** | The **Network ID** is the network address of the Master and it is provided automatically when inserting the device. The network ID is static and cannot be changed. For Slaves no network ID appears. |

*Table 2: Notation of the Device Description*

## 2.1.2      netDevice - Device Catalog

The device catalog displays a list of devices of all DTM installed on this PC. If the device catalog is loaded, it is shown as tree structure in the **netDevice** window.
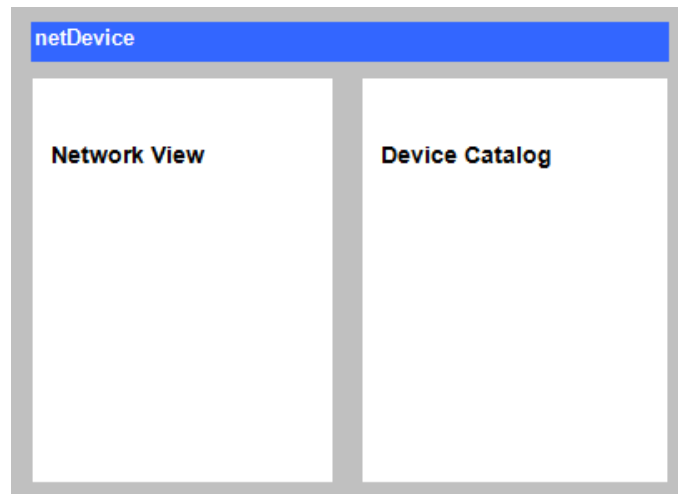


*Figure 6: netDevice - Device Catalog (Principle)*
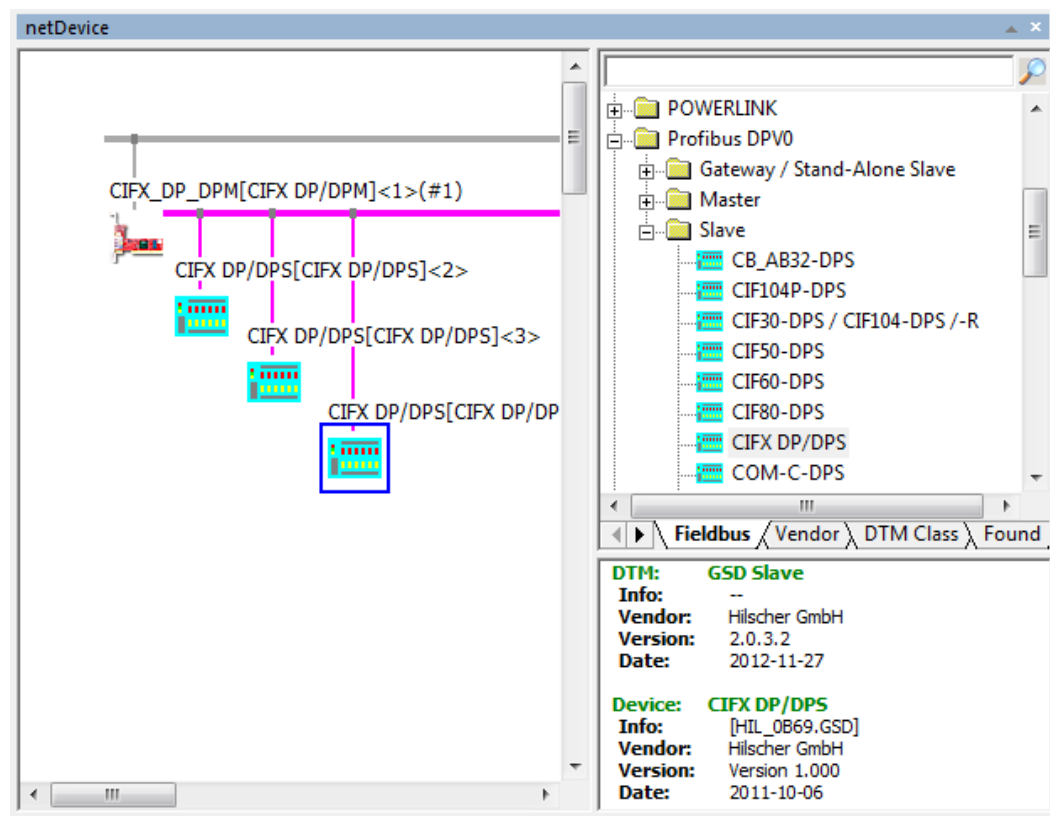


*Figure 7: Example for netDevice - Network View and Device Catalog*

Selecting a register card, the devices are arranged by different criteria, e. g. by **Vendor**, **Fieldbus** or **DTM Class**.

Further information about working with the device catalog you find in section *The Device Catalog* on page *27*.

## 2.1.2.1    Search Function in the Device Catalog

Using the search function in the device catalog, you can search for devices. You can search by device name or any combination of characters.

**Note:** Do not use wildcards.

➢ Select the **Found** tab.



*Figure 8: Search Function in the Device Catalog*

➢ Enter the search text in the search window, for example "COMX".

➢ Press **Return**.

✎ All devices that contain the code "COMX" in the name are displayed.
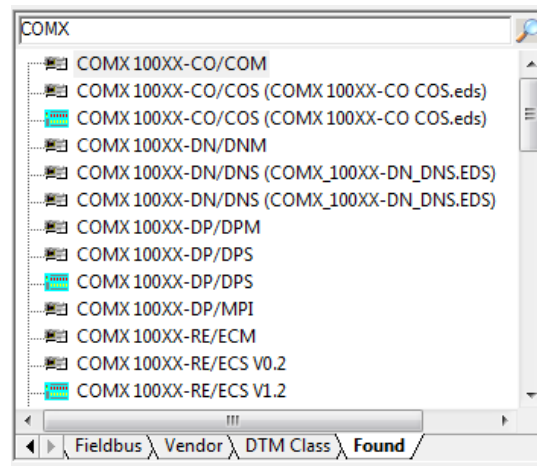


*Figure 9: Search Function in the Device Catalog – Search Result*

### 2.1.2.2		Notations to the DTM and to the Device

In the lower part of the device catalog window appears detailed information about the selected device and DTM. This includs the *DTM Name*, the *Device Name* as well as infor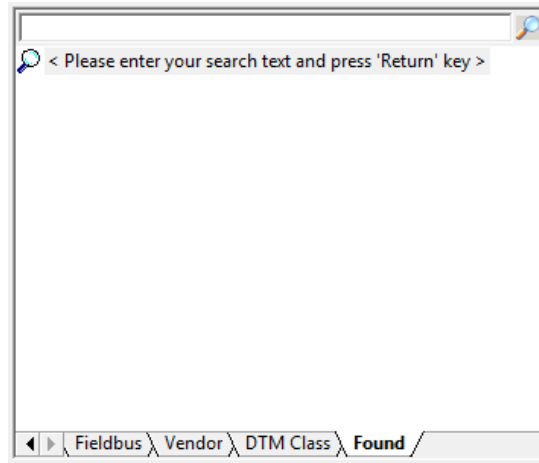mation about the **Vendor**, the **Version** and the **Date**. This information will help you to distinguish Master devices of different manufacturers that appear in the device catalog under the same name, based on their hardware revision or in reference to the date of manufacture. Under **Info** information such as *firmware version*, the *feature set* or the *device description file name* appears, you will need for the PROFINET IO ‚Stand-Alone Slave' (Device) and ‚Slave' (Generic Device) to select the device instance.
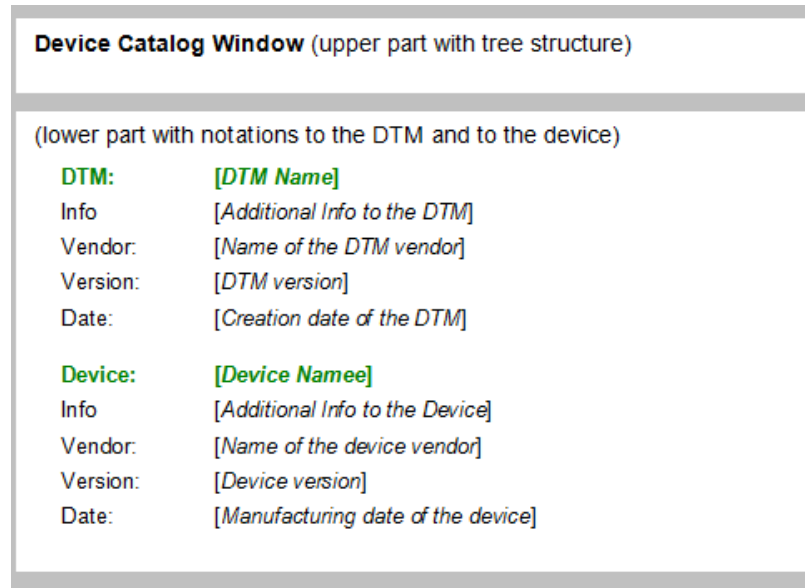


*Figure 10: netDevice - Device Catalog - Notations to the DTM and to the Device (Principle)*
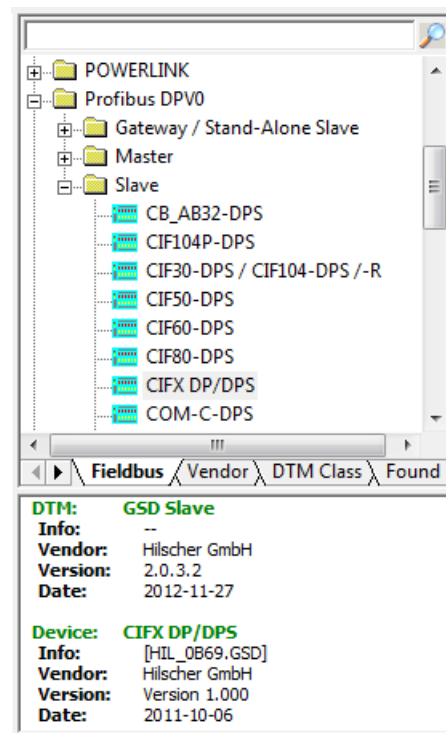


*Figure 11: Example for netDevice - Device Catalog*

## 2.2     netProject - Network

In the **netProject** the actual configuration is displayed as project tree. Besides the device icon the name of the device and the device address are shown. For Master devices additionally a continuous number is displayed, the network ID.

The context menu of a device is opened by a right mouse click on the device icon. Here via **Configuration** the configuration dialog of the DTM can be accessed.

Via a double click on a device icon the configuration dialog of the DTM is opened, if supported by the DTM. In the configuration dialog then the parameter and general settings can be made.

Devices which are inserted in the graphical network view are also displayed in the netProject and the other way, too.
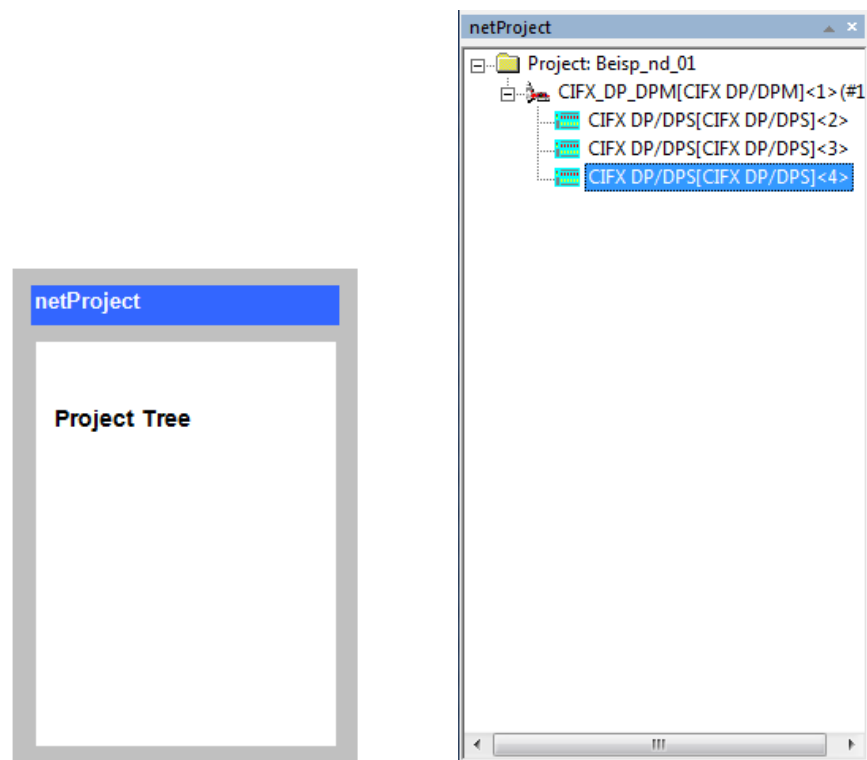


*Figure 12: netProject (Principle) (left side), Example (right side)*

The actual selection in the **netProject** window is synchronized with the graphical network view. More about multiselection you find in section on page *37*.

# 3    Working with the Menus

## 3.1    The Menu Bar

The both menus **Device** and **Network** are displayed in the menu bar of the frame application, if one of the windows **netProject** or **netDevice** is activated. The menu **Network** is a <u>dynamic menu</u>.

## 3.2    Menu Device and Context Menu

The menu **Device** can be selected via the menu bar of the frame application.

The **context menu** can be opened via right click on the device icon in the netDevice network view.

Both menus contain several entries in common. Entries which are greyed out are disabled for the selected device. Possibly some entries are not supported by the device.

| Selecting via | Description |
|---|---|
| Menu **Device** | The menu **Device** in the menu bar of the frame application includes the entries **Connect/Disconnect**, **Download/Upload**, **Configuration, Measured Value**, **Simulation** and **Diagnostic**\* (\*only Master and/or Gateway/Stand-Alone Slaves). |
| Context menu (Right mouse click on the device icon) | Additionally to the entries in the menu **Device** the context menu contains the entries **Cut/Copy/Paste** (enabled only for Slave devices), **Additional Functions**, **Delete** and **Symbolic Name** and for Master devices **Start Debug Mode** and **Network Scan …** . |
|  | Further descriptions about this you find in section *Online Functions via the Context Menu* on page 19. |
|  | The context menu can contain additional manufacturer specific entries. They are not specified here. |

*Table 3: Menu Device and Context Menu*

For further information to the configuration and diagnosis possibilities of a certain device, open the device specific help file.

To open the help file, select **Help** in the DTM dialog or press the **F1** key or refer to the manual of the installed DTM.
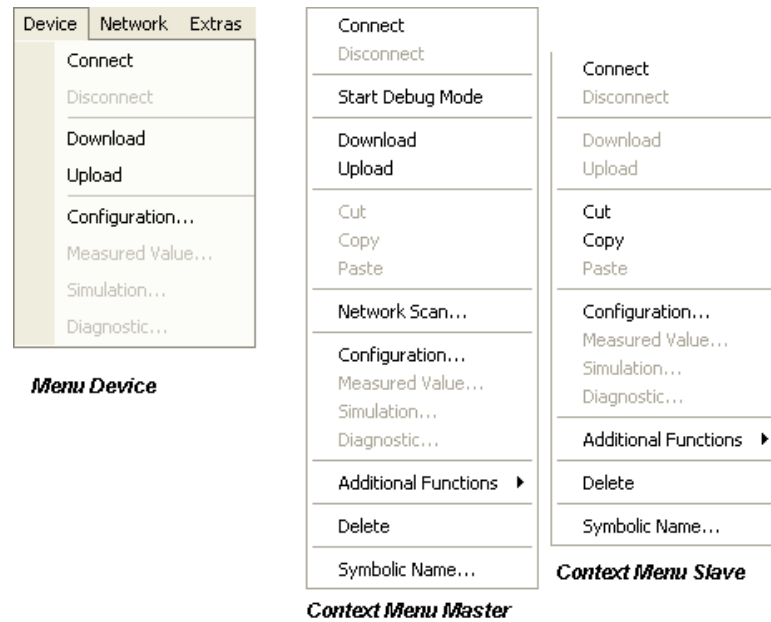
*Figure 13: Menu Device (left), Example Context Menu for Master or Slave (right)*

→ **Note:** The **context menu** can have additional or less entries as described here, depending by software variant.

In the following table you find a description of the entries of the menu **Device** and the further entries of the **context menu**.

| Menu | Meaning |
|------|---------|
| **Connect**[1] | Via **Connect** a connection to the device is built up. |
| | In case of a Master device, only this device will be connected. If the user connects a Slave device, the device will be connected via the communication channel of the Master. So in this case the Master is connected online, too. |
| | When a connection is built up, in netDevice the name of the device is displayed on a green background. Dead times during the connection is established are displayed yellow. This depends from the system speed and is not visible permanently. |
| **Disconnect**[1] | If a device is connected and it should be disconnected, **Disconnect** has to be selected. |
| | When a Master is disconnected, the Slaves of this network get also disconnected. |
| | The name of the device is displayed without green background, if the device is disconnected. |
| **Start Debug Mode**[1] | You first must assign the device to the Master DTM, configure the Master or the Slave device parameters and download the configuration to the Master.<br>Then via context menu > **Start Debug Mode** the status of the cyclical communications between a Master and Slave devices can be identified based on the colors of the bus lines as well as the debug icons. |
| **Download**[1] | With the **Download** menu, the actual configuration is loaded down into this device. |
| | Hardware must be assigned to make a download of the configuration. |
| **Upload**[1] | Selecting **Upload** a configuration stored in this device is loaded in the DTM. For this menu it is necessary that a configuration is stored in the device and this function in the DTM. |
| | A connection to the device is needed to make an upload. |
| **Cut/Copy/Paste**[1] | Via **Cut/Copy/Paste** in the netDevice network view one or multiple Slave devices can be cut or copied at the Master bus line and pasted at this or at an other Master bus line. The Slave device configuration remains maintained and further configuration is not required |
| **Network Scan …** | Via **Network Scan …** the actual bus configuration is read back from the Slave devices. |
| | If e.g. the master is configured at first without a Slave, Slaves already available at the bus then can be inserted in the project via **Network Scan …**. |

| Menu | Meaning |
|---|---|
| **Configuration** | Via **Configuration** the device parameters of the actual device are displayed. |
| | The device parameters are manufacturer specific and cannot be specified here. Also the view of the menu can vary depending by the DTM. |
| | For further details about the device parameters of the used device refer to the manufacturer documentation. |
| **Measured Value** | Via **Measured Value** the measurement values of the device are shown, if supported by the DTM. |
| | For further details about **Measured Value** refer to the manufacturer documentation. |
| **Simulation** | Via **Simulation** an offline simulation for this device is displayed, when supported by the DTM. |
| | For further details about the simulation refer to the manufacturer documentation. |
| **Diagnostics** | With the **Diagnostics** menu, the Diagnostic functions for this device are shown, if supported by the DTM. |
| | The diagnostic functions are manufacturer specific. For further details about the device diagnosis refer to the manufacturer documentation. |
| **Additional Functions** | For information to **Additional Functions** refer to section *Online Functions via the Context Menu* on page 19. |
| **Delete** | **Delete** removes the selected device. |
| **Symbolic Name** | Here an arbitrary name can be assigned to the device. This name is displayed in netDevice and netProject as the first part of the device description. |

*Table 4: Menu Device*

1

**Note:** The entries **Connect**/**Disconnect**, **Start Debug Mode**, **Download**/**Upload** and **Cut/Copy/Paste** are selectable for many devices. If these functions are supported by the selected device can only be seen after activating this menu. If they are not supported, an error will be reported.

## 3.3 Online Functions via the Context Menu

The **context menu** of the device contains all entries of the **Device** menu in the menu bar. Additionally there are further entries in the context menu:

### 3.3.1 Debug Mode

**Note:** Depending by the software variant of the DTM 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**)

- Master device not operable. (Bus line **blue**)

- Master in STOP state. (Bus line **red**)

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**)

- Diagnosis message available at the Master device. (Bus line **yellow** (yellow))

- Slave device not found during boot up. (Bus line **blue**)

- Error in the Slave-to-Master communication. (Bus line **red**)

- Slave device is not configured. (Bus line **gray**)

For details to the **debug mode** refer to the Operating Instruction Manual of the Master DTM.

### 3.3.2 Cut/Copy/Paste

Via the context menu entries **Cut**, **Copy** or **Paste** one or more Slave devices can be cut or copied in the **netDevice** network view at a Master bus line and then can be inserted at the same Master bus line or at another one. I. e. the Slave devices can be cut or copied at a Master bus line by selecting the Slave devices and using the **Cut** or **Copy** command from the context menu. Then the Slave devices can be inserted at the Master bus line by using the **Paste** command from the context menu. The configuration for the pasted Slave devices remains maintained.

A detailed description for the context menu entries **Cut**, **Copy** or **Paste** is given in section *Cutting, copying, pasting Slave* Devices on page 32.

### 3.3.3 Network Scan

The menu entry **Network Scan...**is displayed or not depending by the device.

With **Network Scan...** it is possible to find out automatically which types of Slave devices are attached to the Master device and how these devices are configured.

To scan the network structure, proceed as follows:

1. Select **Network Scan...** from the context menu (right mouse click).

✍ A window with data of the found devices is displayed.

2. Select the **Create Devices** button.

**Note:** For further information to **Network Scan** refer to the Operating Instruction Manual of the respective Master DTM.

### 3.3.4 Additional Functions

| Menu Entry | Meaning |
|---|---|
| **Service** | In the submenu **Service** you can start or stop the communication. Refer to section *Additional Functions > Service > Start /Stop Communication* on page 21. |
| **Export** | In the submenu **Export** the actual project data like project name, the fieldbus command structure and the device parameter are exported as CSV, DBM or XML file. |
| **Print** | The submenu **Print** contains the printing options of the DTM. |

*Table 5: Additional Functions*

Depending by the software variant the context menu > **Additional Functions** can contain additional or less entries as described here. Further information to this is given in the help of the corresponding DTM.

### 3.3.5 Additional Functions > Service > Start /Stop Communication

You can manually start or stop the communication between a Master and Slaves.

- **Start Communication** is enabled, if the communication has been stopped before or if the configuration requires this (Controlled release of communication).

- **Stop Communication** is enabled, if the communication has been 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 Master DTM to the Master device is required. Further information can be found in section *Connect/disconnect Device* on page *39*.

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

↳ The device communicates at the bus.

#### Stop Communication

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

↳ The communication of the device at the bus is stopped.

### 3.3.6    Delete

With the delete function a device is removed from the project. For further information see section *Delete Device from Project* on page *33*.


### 3.3.7    Change Symbolic Name

Generally the **Device Description** as described under section *Notation of the Device Description* on page 11 is used as device name. Via **Symbolic Name** an additional name for the devices can be set.

➢ Right click on the device icon and select **Symbolic Name**.

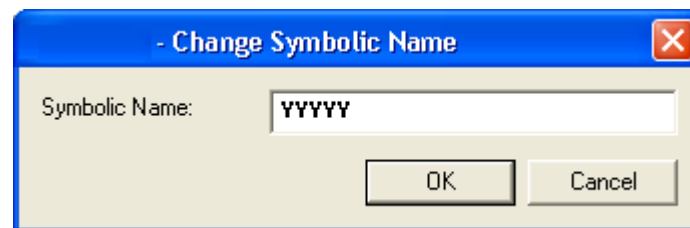✑ The **Change Symbolic Name** dialog is displayed.



*Figure 14: Change Symbolic Name*


➢ Enter a symbolic name.

✑ The used name then is displayed in the windows **netDevice** and **netProject** as name of the device.

The **Device Description** is always displayed in squared brackets behind the symbolic name.

| YYYYY [XXXX] <1> (#1) | |
|---|---|
| **YYYYY** | Symbolic Name |
| **[XXXX]** | Device Description |
| **<1>** | Station Address |
| **(#1)** | Network ID |

*Figure 15: Notation of the Device Description*

# 3.4 Menu Network

The menu **Network** includes the network depending entries

- Add Busline/Delete last Busline,

- Start/Stop Project Debug Mode,

- Device Catalog,

- Import Device Descriptions,

- Print Project Data.

**Note:** The menu entries **Add Busline** and **Remove last Busline** are independent from the connected hardware; it affects only the graphical view of the network created in the netDevice window. It does not affect the real hardware configuration.
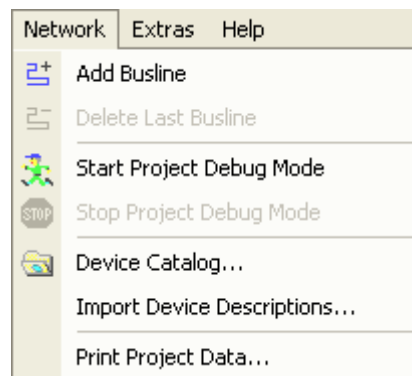


*Figure 16: Menu Network*

| Menu | Meaning |
|------|---------|
| **Add Busline** | Adds a busline to the selected bus in the netDevice window. A Master or a Master line must be selected. |
| **Delete last Busline** | Deletes the last added busline. A Master or a Master line must be selected. |
| **Start Project Debug Mode / Stop Project Debug Mode** | Via the **Start Project Debug Mode / Stop Project Debug Mode** function the debug mode for the entire project can be started or stopped. In the **Project Debug Mode** the status of the cyclical communication between the Master and Slave devices is displayed based on the colors of the bus lines as well as the debug icons. |
| **Device Catalog** | Selecting the **Device Catalog** function, the dialog of the device catalog opens. The device catalog can be loaded or if necessary reloaded. For more information about the device catalog refer to section *The Device Catalog* on page *27*. |
| **Import Device Descriptions …** | Via the **Import Device Descriptions …** dialog a device can be added using a device description file. For more information refer to section *Installing Slave DTM or adding Device Description* on page 29. |
| **Print Project Data** | With the function **Print Project Data** the actual project data like project name, the fieldbus command structure and the device parameters are printed out. |

*Table 6: Menu Network*

### 3.4.1 netDevice Network Toolbar

The network toolbar is faded in and faded out via **View > Device**.

This toolbar contains the entries (from the left to the right):

- **Network** > **Add busline,**
- **Network** > **Delete Last busline** and
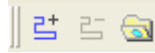- **Network** > **Device Catalog**

*Figure 17: netDevice Toolbar Network*

> **Note:** The **Network** toolbar is enabled, if the focus is put on the **netDevice** or **netProject** window.

### 3.4.2 netDevice Debug Toolbar

> **Note:** The menu entries for the **debug mode** are only available, if the debug mode is supported by the frame application.
> Also, if **Start Project Debug Mode** is enabled, possibly some or all Master DTM in the project do not support the debug mode.

The debug toolbar is faded in and faded out via **View > Debug**.

This toolbar contains the entries (from the left to the right):

- **Debug** > **Start Project Debug Mode**,
- **Debug** > **Stop Project Debug Mode**

*Figure 18: netDevice Debug Toolbar - Start Project Debug Mode*

*Figure 19: netDevice Debug Toolbar - Stop Project Debug Mode*

# 4    Working with netDevice and netProject

## 4.1    Getting Started - Configuration Steps

The following table describes the steps to configure a Master device as it is typical for many cases. It is presupposed that the hardware installation was done.

The configuration for Master devices of different manufacturers may differ for some of the configuration steps of this example.

| # | Step | Short Description | For detailed information see section | Page |
|---|------|-------------------|--------------------------------------|------|
| 1 | Start Program | - Open the configuration software via **Start > Programs**, - enter the user name and password in the dialog. | *(See Operating Instruction Manual of the Frame Application)* | - |
| 2 | Add Slave in the Device Catalog | Add the Slaves in the Device Catalog by importing the device description files to the Device Catalog. - **Network > Import Device Descriptions**. | *Installing Slave DTM or adding Device Description* | *29* |
| 3 | Load device catalog | - select **Network > Device Catalog**, - select button **Reload Catalog**. The Device Catalog is loaded automatically when the configuration software is opened. | *The Device Catalog* | *27* |
| 4 | Create new project | Depending of the frame application. For the configuration software: - select **File > New** or **File > Open**. | *(See Operating Instruction Manual of the Frame Application)* | - |
| 5 | Create Project Configuration | Insert Master or Slave into configuration: - 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. | *Insert Device in Project* | *31* |
| 6 | Scan Network Structure | Alternatively scan the network structure: - Create the project configuration via context menu **Additional Functions > Network Scan**. - Download the configuration to the Master device. | *Network Scan* | *20* |
| 7 | Enlarge Project Configuration | If necessary enlarge project configuration: - Therefore select Slave devices for enlargement. - Select context menu **Cut** and/or **Copy**. - Add Slave devices via context menu **Paste**. - Adapt Slave device address in the Master DTM configuration dialog. | *Multiselection, Cutting, copying, pasting Slave Devices, depends from device - (See help of the device manufacturer)* | *32* *37* |
| 8 | Open the Master DTM configuration dialog | Open the Master DTM configuration dialog. - Double click to the device icon of the Master. - The Master DTM configuration dialog is displayed. | *depends from device - (See help of the device manufacturer)* | - |
| 9 | Select driver | In the Master DTM configuration dialog: - select **Settings > Driver**, - select a driver. - if necessary, configure the driver settings. | *depends from device - (See help of the device manufacturer)* | - |
| 10 | Assign Master device (with or without firmware) | Assign the device to this driver. In the Master DTM configuration dialog: - select **Settings > Device Assignment**, - select a Master device, - select the button **Apply**. | *depends from device - (See help of the device manufacturer)* | - |

| # | Step | Short Description | For detailed information see section | Page |
|---|------|------------------|-------------------------------------|------|
| 11 | Select and download firmware | If not yet a firmware was loaded to the device. In the Master DTM configuration dialog: <br>- select **Settings > Firmware Download**, <br>- select the button **Browse..**, <br>- select a firmware file, <br>- select the button **Open**, <br>- select the buttons **Download** and **Yes**. | *depends from device - (See help of the device manufacturer)* | - |
| 12 | Assign Master device once more (with firmware and system chanal) <br>*For repeated download this step is omitted.* | In the Master DTM configuration dialog: <br>- select **Settings > Device Assignment**, <br>- select **Scan**, <br>- select the Master device (with loaded and defined system channel), <br>- therefore check the appropriate checkbox, <br>- select **Apply**, <br>- close the Master DTM configuration dialog via **OK**. | *depends from device - (See help of the device manufacturer)* | - |
| 13 | For the Slave device with device assignment set driver settings and assign device | - Double click to the device icon of the Slave. <br>- The Slave DTM configuration dialog is displayed. <br>In the Slave DTM configuration dialog: <br>- select **Settings** <br>**-** Set the driver and assign the device. | *depends from device - (See help of the device manufacturer)* | - |
| 14 | Configure Slave device | Configure the Slave device. <br>- Double click to the device icon of the Slave. <br>- The Slave DTM configuration dialog is displayed. <br>In the Slave DTM configuration dialog: <br>- configure the Slave device <br>- close the Slave DTM configuration dialog via **OK**. | *depends from device - (See help of the device manufacturer)* | - |
| 15 | Configure Master device | Configure the Master device. <br>- Double click to the device icon of the Master. <br>- The Master DTM configuration dialog is displayed. <br>In the Master DTM configuration dialog: <br>- configure the Master device <br>- close the Master DTM configuration dialog via **OK**. | *depends from device - (See help of the device manufacturer)* | - |
| 15 | Arrange Project | The project can be arranged in the graphical network view by use of the mouse. | *Arrange Elements in the Graphical Network View* | 36 |
| 16 | Save project | - select **File > Save** <br>or <br>- select **File > Save As** | *(See Operating Instruction Manual of the Frame Application)* | - |
| 17 | Connect Master device | - Right click to the device icon of the Master, <br>- select context menu entry **Device > Connect**. | *Connect/disconnect Device* | *39* |
| 18 | Download Configuration | - Right click to the device icon of the Master, <br>- select context menu **Device > Download**. | *Download to Device* | *40* |
| 19 | Diagnosis | - Right click to the device icon of the Master, <br>- select context menu **Diagnosis**. <br>- The Master DTM diagnosis dialog is displayed. <br>- Continue with further device diagnosis, <br>- close the Master DTM diagnosis dialog via **OK**. | *depends from device - (See help of the device manufacturer)* | - |
| 20 | Disconnect | - Right click to the device icon of the Master, <br>- select **Device > Disconnect**. | *Connect/disconnect Device* | *39* |

*Table 7: Getting Started - Configuration Steps*

## 4.2     The Device Catalog

The device catalog lists all devices, for which a DTM is installed on the used PC. A DTM represents one or more devices.

Before the devices can be used in the configuration, the DTM installed on this PC needs to be loaded in the device catalog. This is done automatically during the first start of the configuration software.

### 4.2.1     Load Device Catalog

Via the menu **Network > Device Catalog** the device catalog is opened and information like name of the device and manufacturer for the individual DTM is displayed.

If a new DTM is installed, the device catalog has to be reloaded, to use the new devices for the configuration. Further information about reloading the device catalog you find in section *Reload Device Catalog* on page *27*.

If the **Device Catalog** is loaded, the installed devices are displayed in the device catalog depiction of the **netDevice** window.

The devices can be inserted in the project via drag and drop from the device catalog depiction in the **netDevice** window.

A detailed description about the device catalog depiction in the netDevice window you find in section *netDevice - Device Catalog* on page *12*.

### 4.2.2     Reload Device Catalog

If new DTM are installed on the PC or device descriptions are imported, the device catalog must be reloaded to use the new devices in the configuration.

Via the menu **Network > Device Catalog** the device catalog opens and selecting the **Reload** button, it is searched for installed DTM on the PC.

→ | **Note:** In order to reload the device catalog the, the current user must have **administrative rights**. Otherwise the **Reload** button is grayed out and the device catalog cannot be loaded.

The DTM are started and some information like device name, bus system, manufacturer and device type are read in when loading the device catalog. With this information the configuration software creates the device catalog.

The tree structure shows the actual installed devices. Now the devices can be inserted in the project and configured there.

## 4.2.3     Devices of other Vendors

In order to select the desired device in the device catalog, note the details about the DTM and the device at the bottom of the window. When sorting by *Fieldbus* multiple devices with identical names by different vendors can be displayed.

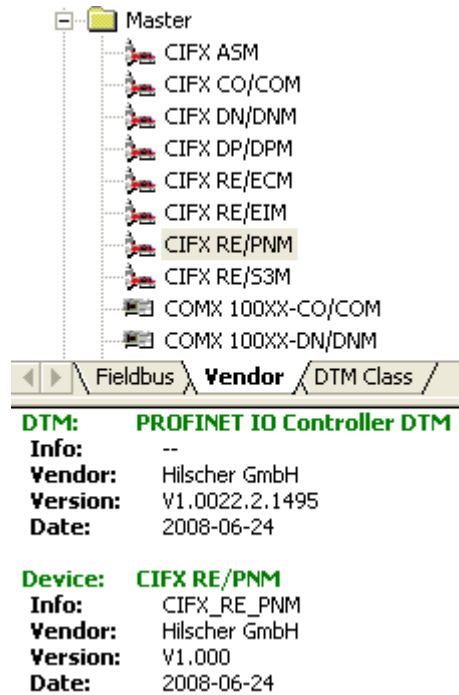The following figure shows the device catalog sorted by *Vendor*.



*Figure 20: Device Catalog – Sorted by Vendor (Example)*
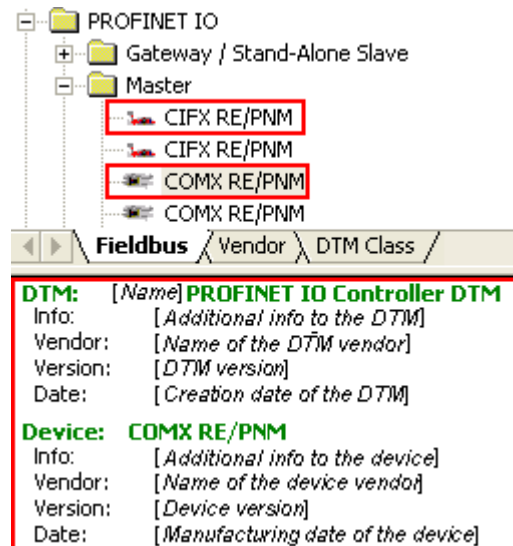
The following figure shows the device catalog sorted by *Fieldbus*.



*Figure 21: Device Catalog – Sorted by Fieldbus (Example)*

For this sorting additional DTMs of other vendors can be displayed.

# 4.3     Installing Slave DTM or adding Device Description

In order to insert further Slave devices to the device catalog:

1. First check, if the Slave manufacturer provides a DTM.

2. Install this DTM.

Alternatively or if no DTM for the Slave is available use the device description file of the device specified by the manufacturer.

| Bus System | | File Type | File Extension |
|---|---|---|---|
| Real-Time Ethernet | EtherCAT | DDF | *.xml |
| | EtherNet/IP | EDS | *.eds |
| | PROFINET | GSDML | *.xml |
| | sercos | SDDML | *.xml |
| Fieldbus | AS-Interface | EDS | *.eds |
| | PROFIBUS-DP | GS, GSD, GSE, GSF | *.gs, *.gsd,*.gse,*.gsf |
| | CANopen | EDS | *.eds |
| | DeviceNet | EDS | *.eds |

*Table 8: Device Description File Types by System*

1. Select **Network > Import Device Descriptions …**.

➮ The file selection dialog **Import Device Description** opens.
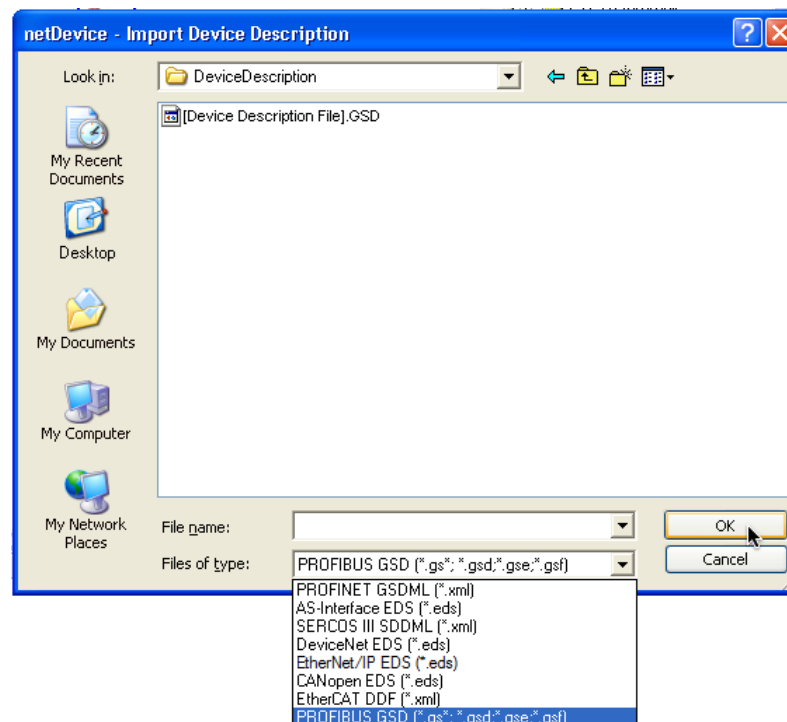


*Figure 22: netDevice – Import Device Description*

2. Select in the **File of type** list the bus system for which you intend to import device description files.

3. Select the path for the device description file.

4. Possibly select the path for the device icon.

5. Reload the device catalog (see section *Reload Device Catalog* on page 27).

## 4.4    PROFINET IO Device Instance

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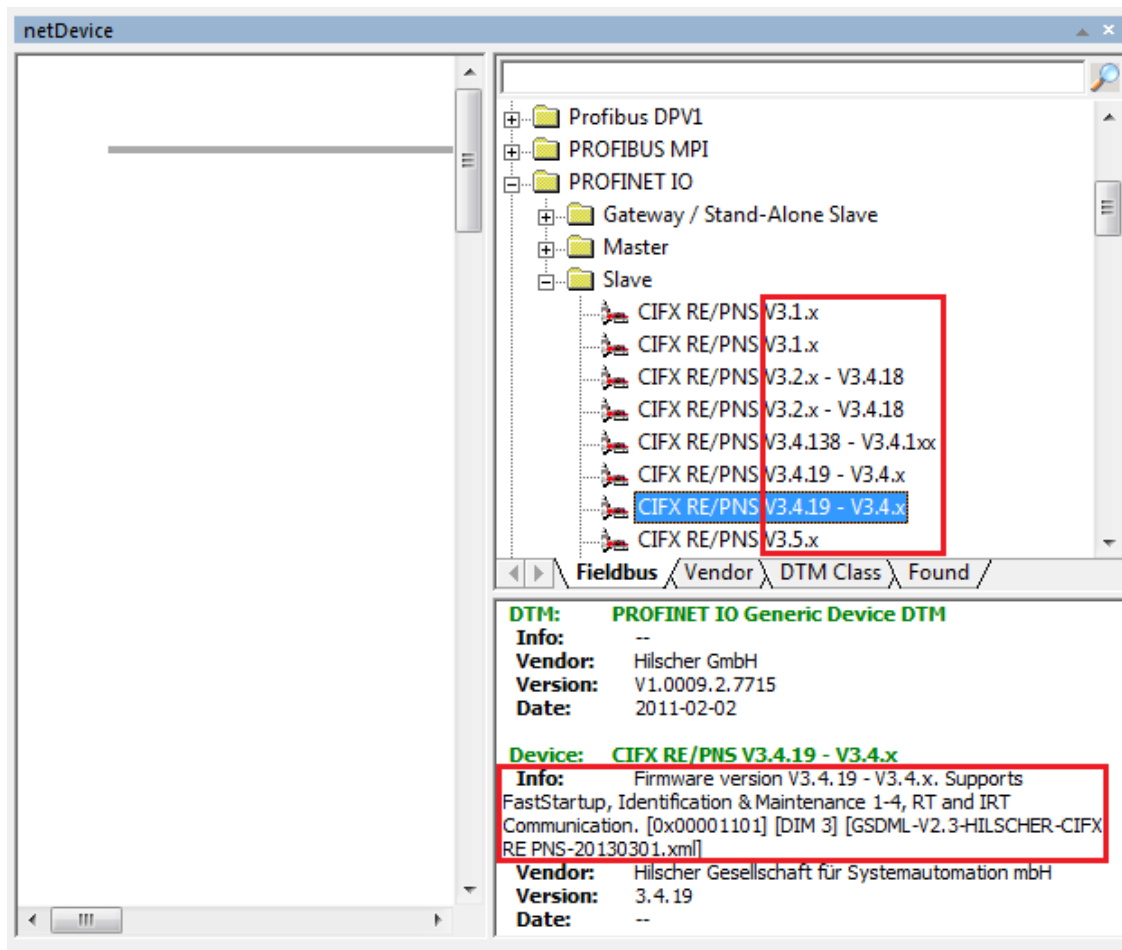


*Figure 23: PROFINET IO Device Instance (Example Stand-Alone Slave)*

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

**Note:** If a device instance appears in the device catalog twice with the same range for the firmware version, you can check under **Info** on which state of the device description file the device instance is referenced.

# 4.5    Insert Device in Project

Devices from the device catalog are added by drag and drop in the configuration area. With this action a DTM-Instance will be created.

**Important!**
- Only devices with the same Fieldbus or Real-time Ethernet system can be connected to the same network.
- In order to select the desired device in the device catalog, note the details about the DTM and the device at the bottom of the window. When sorting by Fieldbus multiple devices with identical names by different vendors can be displayed.

- **Insert Master**

To insert a **Master** device in a project, the Master has to be selected in the depiction of the device catalog in the netDevice window. Via drag and drop the device is inserted in the project.

The device can be inserted in both windows, in the graphical network view of the **netDevice** and in the project tree of the **netProject**. These two windows are synchronized; the device is displayed in both windows.

It is possible to have more than one network in a project and therefore more than one Master.

**Please note:**

In the **netDevice** window the **Master** device has to be inserted on the Root busline (green line). Each inserted communication channel of the Master is displayed at least by one fixed out-bound busline.

In the **netProject** window the **Master** needs to be inserted on the project folder directly.

- **Insert Slave**

**Note:** A Slave or Gateway device can be connected to a bus, if it supports the same bus system.

To insert a **Slave** device in a project, the device has to be selected in the depiction of the device catalog in the netDevice window. The device is inserted into the project via drag and drop to the busline of the communication channel of the Master.

If in the netDevice device catalog view devices are displayed repeatedly under the same name, this devices can be differentiated via their revision or the date (see section *Notations to the DTM and to the Device* on page 14).

**Please note:**

In the **netProject** window the **Slave** device must be inserted on the master icon directly.

**Note:** The **Master busline** or the **busline between the Master busline and the Slave device symbol** are always displayed in the same *fieldbus* or *protocol specific* color.

# 4.6    Cutting, copying, pasting Slave Devices

In the **netDevice** network view Slave devices in a project including all of its configuration settings can be cut or copied and then be pasted.

This way the project configuration can be enlarged by Slave devices the device configuration of which is identical or similar to that of Slave devices already existing in the project.

Via the context menu > **Cut**, **Copy** and **Paste** Slave devices in one or more networks can be cut or copied and pasted at a Master bus line. To allow pasting, the Master must support the fieldbus protocols of all Slaves. If, for example DPV0-PROFIBUS Slaves and PROFIBUS-DPV1 Slaves have been copied, they can be pasted only to a Master which supports DPV0 and DPV1.

By this way the configuration needs to be made only once. The newly added Slave devices do not need to be parameterized and configured once more.

**Important:** Only devices of the same fieldbus or Real-time Ethernet system can be connected in a network.

**Note:** If Slave devices are added in a network via the context menu **Cut**, **Copy** and **Paste**, respectively the user needs to reset the device or station address for these devices in the Master configuration dialog.

## 4.6.1    Enlarging Project Configuration

To enlarge the project configuration via **Cut**, **Copy** or **Paste**, proceed as follows:

1. In the netDevice network view in one or more networks select the Slave devices to be added (see also section *Multiselection* on page 37).

2. Cut or copy the Slave devices via context menu **Cut** or **Copy**.

3. Via the context menu **Paste** paste these Slave devices at the Master bus line in the same or another network.

4. In the Master DTM configuration dialog adapt the device or station address of these Slave devices, device dependent also via the Master DTM context menu **Additional Functions**.

# 4.7    Delete Device from Project

To remove a device from the project configuration:

➢  First select the device by a mouse click.

➢  Then press the **Del** button on the keyboard.

➢  Or select **Delete** in the context menu of the device.

➰  A security question appears, if the device really shall be deleted.

*Figure 24: Security Question Delete Device*

> → **Note:** If a device is deleted, all settings for this device get lost.

➢  Answer to the request by **Yes**.

➰  The device is removed from the project configuration.


If a communication channel should be deleted that has connected Slaves, another security question appears:

*Figure 25: Security Question Delete entire Network*

> → **Note:** If a device is deleted, which has additional devices assigned to; the entire network is also deleted. This might include Gateways with Sub networks.

➢  Answer to the request by **Yes**.

➰  The device is removed from the project configuration.

# 4.8    Working with Buslines

## 4.8.1    Description of the Buslines

Significance of the colors for the bus lines:

- **Root-bus line**: The **gray** bus line is the root bus line. All Masters are connected to this line.

- **Master Busline** or **Branch Line of the Slave device**: These bus lines are always in the respective *specific fieldbus* or *protocol* color.

| Colors of the Bus Line | | Meaning |
|---|---|---|
| | gray | Root Bus line |
| | yellow (dark) | fieldbus specific for AS-Interface Master |
| | magenta | fieldbus specific for PROFIBUS Master |
| | dark green | fieldbus specific for CANopen Master |
| | orange yellow | fieldbus specific for DeviceNet Master |
| | bottle green | protocol specific for PROFINET IO Controller |
| | darkgold | protocol specific for EtherNet/IP Scanner |
| | yellow | protocol specific for EtherCAT Master |
| | red | protocol specific for sercos Master |

*Table 9: Colors of the Bus Lines*

## 4.8.2    Add / Remove Busline

In the graphical network view in the netDevice window the project can be arranged and edited graphically. That means, buslines can be added and removed.

**Note:** The changes add / remove busline in the graphical network view have no effect to the real hardware configuration.

- **Add Busline**

To add a busline:

➢   Select the busline.

➢   Select **Network > Add Busline**.

Or

➢   Select [icon] in the toolbar.

Or

➢   Right click on the busline and select **Add Busline**.

```
Add Busline
Delete Last Busline

Paste
```

↳   A busline is added on the active bus. If more than one bus is selected, the busline is added only at the first selected bus.

- **Delete Last Busline**

To remove a busline:

➢   Select a busline.

➢   Select **Network** > **Delete Last Busline**.

Or

➢   Select [icon] in the toolbar.

Or

➢   Right click on the busline and select **Delete Last Busline**.

```
Add Busline
Delete Last Busline

Paste
```

↳   The lastly added busline of this bus is removed. If more than one bus is selected, only the busline of the first bus is deleted.

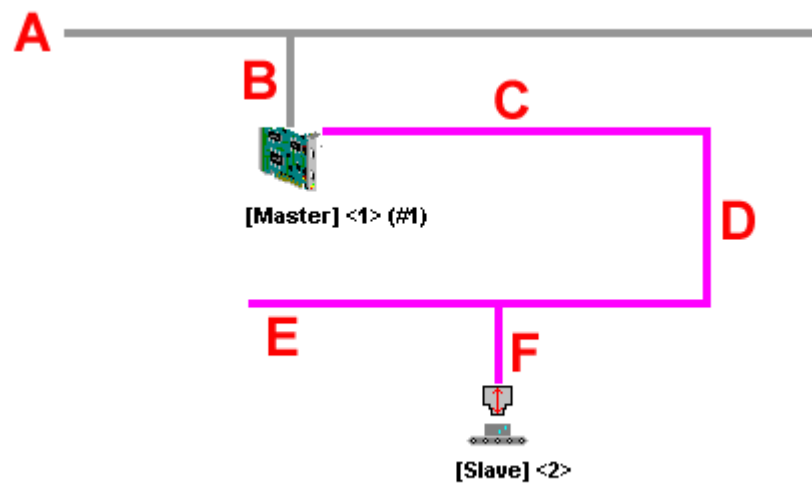### 4.8.3 Arrange Elements in the Graphical Network View



*Figure 26: Buslines*

Buslines and device icons can be selected and moved to arrange them in the graphical configuration.

To move a busline or an icon it is necessary to select it by clicking on it. A selected busline or device is displayed with a blue colored frame around the icon.

- **Move Device Icon**

Each device icon in the project can be moved by clicking and holding the left mouse button. The fixed buslines move with the icons and the built configuration persists.

Another possibility to move the selected device icons consists in using the cursor keys. If the SHIFT key is pressed, the icons are moved faster.

- **Move Buslines**

Busline **A** is the **Root Busline** and it can be positioned by holding the mouse button.

Busline **B** is the **Branch Line of the Master device** and can not be moved. If the Master Icon is moved, the busline moves with this icon automatically.

Busline **C** is the **basic line of the Fieldbus** or **the Real-time Ethernet system** (Master bus line) inherently. It also can not be moved singly, but it is moved with the device icons automatically.

Busline **D** and **E are variable added buslines** (part of the Master bus line) of the Fieldbus. They can be selected and moved or resized.

Busline **F** is the **branch line of the Slave device** (bus line between the Master bus line and the Slave device icon). It is the connection line from the Slave to the bus. This line is moved automatically (like busline B) with the device icon. This line can not be moved independently.

## 4.8.4    Multiselection

Multiselection makes it possible to select more than one device and/or busline. This is helpful if more than one element should be arranged at the same time. Two possibilities are available for multiselection:

- **Only with the Mouse**

➢  Click in the configuration window.

➢  Hold the mouse button and draw a frame around the elements you want to select.

- **With Mouse and the SHIFT Key**

➢  Select the first element with a left mouse click (busline or device icon).

➢  Hold the SHIFT key on the keyboard and click on the next elements you want to select.

**Note:** Only buslines, which can be changed manually, can be selected. Descriptions of the single buslines you find in section *Arrange Elements in the Graphical Network View* on page 36.

# 5 Configuration

## 5.1 Online/Offline Configuration

The configuration of a device is done in the DTM configuration dialog of the device.

This one can be opened via double click to the device in the netDevice network view, via the context menu **Configuration** or via **Device > Configuration**.

A distinction is made between offline configuration and online configuration:

- **Offline Configuration**

If a device is parameterized **offline** in the application, the configuration has to be loaded into the device via the download to transfer the parameter data into the device.

When a configuration already exists in the device, this configuration is overwritten by the download of the new parameter.

If a parameter data is already stored in the device and has to be loaded into the configuration, you have to make an upload.

- **Online Configuration**

Requirement for the **online** configuration is that the hardware is installed and can be activated by the communication DTM.

In case of **online** configuration, the parameter data set in the application is transferred into the device automatically without a download. If the device contains parameter data and supports the online Configuration, the stored parameter data is transferred to the application without an upload from the device.

**Note:** It is manufacturer specific, if the used device supports an online Configuration. For further information about the used device please ask the hardware manufacturer or see the help file of the device when device dialog is open.

**Note:** Upload and Download are not available for each device. If a device supports these functions is manufacturer specific. For further information about the used device please ask the hardware manufacturer or see the help file of the device when device dialog is open.

More information about the Download you find in section *Download to Device* on page *40*. More information about the Upload you find in section *Upload from Device* on page *40*.

# 5.2 Connect/disconnect Device

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

More information about the Download you find in section *Download to Device* on page *40*. More information about the Upload you find in section *Upload from Device* on page *40*.

A device can be connected by marking the device in the netDevice network view and by selecting the menu **Device > Connect** or via the context menu of the device and **Connect**.

If a Master is selected and then **Connect**, only the Master device is connected. If **Connect** is selected in case of a marked Slave device, the device is connected via the parent communication channel. That means the Master is connected, too.

Now the device is online. This is displayed by a green background of the device description.

If the device should be disconnected from the bus, the menu **Device > Disconnect** or the context menu of the device has to be selected and **Disconnect**. In case of a Master the Slaves of this network will be disconnected, too.

That means the Master is connected to the bus automatically, if a Slave is connected; and the Slaves are automatically disconnected, if the Master is disconnected.

For more information on how to connect or disconnect a DTM to the device, refer to the device specific help.

## 5.2.1 Download to Device

**Note:** It is manufacturer depending if the device supports the **Download** function. Look up in the manufacturer specific manual for further information.

If a device is parameterized *offline* in the DTM (application program), a download to the device has to be made to transfer the configuration with the parameter data to the device.

The download is made via the menu **Device > Download** or via the context menu of the device and then **Download**.

Now the actual configuration in the application program is loaded down into the device.

#### netDevice Message: Download

If the download is started as long as the Slave devices are connected to the Master device, the following message is displayed: **If you attempt to download during bus operation, communication between master and Slaves is stopped. Do you really want to download?**

**Important:** If the communication between the Master and the Slave devices is stopped, the data exchange between the Master device and the Slave devices is stopped.

➢ Click to **Yes**, if you intend to download the configuration, otherwise click to **No**.

## 5.2.2 Upload from Device

**Note:** It is manufacturer depending if the device supports the **Upload** function. Look up in the manufacturer specific manual for further information.

If a device contains parameter data and this parameter data should be loaded into the DTM (application program), an upload from the device has to be made.

Then you have to select the menu **Device > Upload** to make an Upload from the device. The actual configuration in the device is loaded into the application program.

# 6   Appendix

## 6.1   User Rights

Apart from the administrator, which has full rights of access, there are four further user levels, which have different rights of access in each case for parameterization and configuration:

| Action | Observer | Operator | Maintenance | Planning Engineer |
|---|---|---|---|---|
| **Menu** Device and Context Menu | | | | |
| Connect | Yes | Yes | Yes | Yes |
| Disconnect | Yes | Yes | Yes | Yes |
| Upload | No | Yes | Yes | Yes |
| Download | No | No | Yes | Yes |
| Cut | No | No | Yes | Yes |
| Copy | No | No | Yes | Yes |
| Paste | No | No | Yes | Yes |
| Configuration | Yes | Yes | Yes | Yes |
| Measured Value | Yes | Yes | Yes | Yes |
| Simulation | Yes | Yes | Yes | Yes |
| Diagnostic | Yes | Yes | Yes | Yes |
| **Menu** Network | | | | |
| Add Busline | No | No | Yes | Yes |
| Remove last Busline | No | No | Yes | Yes |
| Start Project Debug Mode | Yes | Yes | Yes | Yes |
| Stop Project Debug Mode | Yes | Yes | Yes | Yes |
| Device Catalog | Yes | Yes | Yes | Yes |
| Import Device Descriptions … | No | No | Yes | Yes |
| Print Project Data | Yes | Yes | Yes | Yes |

*Table 10: User Levels*

## 6.2    List of Figures

## 6.3    List of Tables

# 6.4   Glossary

**Master**

Master devices determine the data traffic on the bus. A master may send messages without external request, if it is in the possession of the token (bus access authorization).

**Slave**

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

**Device Instance**

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

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

**DTM**

Device Type Manager.

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

**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.

# 6.5    Contacts

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