# WAGO-Software

## Manual


# WAGO ETS Plug-in
## for the Configuration of WAGO KNX Devices

**Version 3.0.1**

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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

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We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally protected by trademark or patent.

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# 1 Notes about this Documentation

**Note**

**Always retain this documentation!**
This documentation is part of the product. Therefore, retain the documentation during the entire service life of the product. Pass on the documentation to any subsequent user. In addition, ensure that any supplement to this documentation is included, if necessary.

## 1.1 Scope

This documentation applies for the WAGO ETS Plug-in in conjunction with ETS and the KNX IP controller 750-889.

## 1.2 Copyright

## 1.3 Symbols

**⚠ DANGER**

**Personal Injury!**
Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

**⚠ DANGER**

**Personal Injury Caused by Electric Current!**
Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

**⚠ WARNING**

**Personal Injury!**
Indicates a moderate-risk, potentially hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ CAUTION**

**Personal Injury!**
Indicates a low-risk, potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**NOTICE**

**Damage to Property!**
Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

**NOTICE**

**Damage to Property Caused by Electrostatic Discharge (ESD)!**
Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

**Note**

**Important Note!**
Indicates a potential malfunction which, if not avoided, however, will not result in damage to property.

**Information**

**Additional Information:**
Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

## 1.4 Number Notation

Table 1: Number Notation

| Number Code | Example | Note |
|---|---|---|
| Decimal | 100 | Normal notation |
| Hexadecimal | 0x64 | C notation |
| Binary | '100'<br>'0110.0100' | In quotation marks, nibble separated with dots (.) |

## 1.5 Font Conventions

Table 2: Font Conventions

| Font Type | Indicates |
|---|---|
| *italic* | Names of paths and data files are marked in italic-type.<br>e.g.: *C:\Program Files\WAGO Software* |
| **Menu** | Menu items are marked in bold letters.<br>e.g.: **Save** |
| > | A greater-than sign between two names means the selection of a menu item from a menu.<br>e.g.: **File** > **New** |
| **Input** | Designation of input or optional fields are marked in bold letters,<br>e.g.: **Start of measurement range** |
| “Value” | Input or selective values are marked in inverted commas.<br>e.g.: Enter the value “4 mA” under **Start of measurement range**. |
| **[Button]** | Pushbuttons in dialog boxes are marked with bold letters in square brackets.<br>e.g.: **[Input]** |
| **[Key]** | Keys are marked with bold letters in square brackets.<br>e.g.: **[F5]** |

# 2 Important Notes

This section describes the legal principles and system requirements for using the software in compliance with intended purpose, underlying provisions and stated specifications.

## 2.1 Legal Bases

### 2.1.1 Subject to Changes

WAGO Kontakttechnik GmbH & Co. KG reserves the right to provide for any alterations or modifications that serve to increase the efficiency of technical progress. WAGO Kontakttechnik GmbH & Co. KG owns all rights arising from the granting of patents or from the legal protection of utility patents. Third-party products are always mentioned without any reference to patent rights. Thus, the existence of such rights cannot be excluded.

### 2.1.2 Personnel Qualification

Any steps related to the use of WAGO software may only be performed by qualified employees with sufficient knowledge of handling the respective PC system used.

Steps in which files are created or changed on the PC system may only be performed by qualified employees with sufficient knowledge in the administration of the PC system used in addition to the aforementioned.

Steps in which the behavior of the PC system in a network is changed may only be performed by qualified employees with sufficient knowledge in the administration of the network used in addition to the aforementioned.

## 2.2 System Requirements

Table 3: ETS System Requirement

| | |
|---|---|
| **CPU** | Min. 2 GHz processor capacity |
| **Operating System** | Windows Vista (SP2), Windows 7 (SP1), Windows 8, Windows 8.1, Windows 10 |
| **Main memory (RAM)** | Min. 2 GB, 4 GB recommended |
| **Fixed disk storage (HDD)** | Min. 20 GB |
| **Monitor** | Super VGA or higher |
| **Resolution** | 1024 × 768 |
| **Mouse** | Recommended |
| **Interface** | USB, KNXnet/IP controller 750-889 as router, KNXnet/IP |
| **Others** | The ETS Plug-in requires the ETS in version 4.0 or higher |

**Note**

**Importing *e!COCKPIT* .xml Files**
When using ***e!****COCKPIT*, the product database for the KNX/EIB/TP1 module (753-646) must be the following version number or higher:
Wago_TP1Klemme_753-646_2_0_367_581.vd4

## 2.3 Safety Advice (Precautions)

**Note**

**Use up-to-date security software!**
Secure operation of the PC system can be at risk as a result of malware such a viruses and Trojans, as well as related threats such as denial-of-service attacks. Therefore, make sure that the latest security software and definitions are always installed on the PC system.

**Note**

**Disable or uninstall software that is no longer required!**
The vulnerability of a PC system against malware and related threats increases with the number of installed or active software components (applications and services). Therefore, uninstall or disable software components that are not needed for the purpose at hand.

# 3 ETS

The ETS (Engineering Tool Software) was specially developed for planning, project design and startup of KNX/EIB networks. During its development, ETS functionality was optimized and the latest version includes options for setting up, maintaining, servicing and expanding KNX networks.

The software integrates all the major components of a KNX network such as lines, devices and building areas into an intuitive, easy-to-use package that enables controllers and device behaviors to be set up or modified. The software programs and configures individual devices within the bus system in order to implement new requirements effectively and quickly.

The manufacturer-independent design of ETS enables manufacturers in the building automation industry to integrate their devices into the ETS product database using certified standards. This manual describes devices developed WAGO Kontakttechnik GmbH & Co. KG.

**Information**

**Additional information**
Additional information about ETS can be found on the manufacturer's website http://www.knx.org.

## 3.1 WAGO ETS Plug-ins

The WAGO ETS Plug-ins described in this document are an extension of the ETS product database for using WAGO devices such as the KNX/EIB/TP1 Module (753-646) and the KNX IP Controller (750-889), as well as the KNXnet/IP Router (consisting of the KNX Module and KNX IP Controller). This extension enables you to configure WAGO devices via ETS.

The software's enhanced structure offers intuitive navigation — providing both new experienced ETS users with exceptional usability.

The key feature of the KNX/EIB/TP1 Module and Controller software is the ability to map WAGO network variables 1:1 to communication objects in the ETS.

Communication objects are activated via a checkbox in the "Edit Parameters" dialog. The communication object is visible in the topology area of the ETS when this checkbox is checked, and is hidden when the checkbox is unchecked.

Communication objects are given the same name as the network variable they are mapped to. This ensures that the internal mapping of the WAGO software is also represented inside ETS.

## 3.2 Access to KNX Devices via ETS5

ETS provides the following options in order to access KNX devices within a bus system:

- USB
- ETHERNET (“KNXnet/IP” or “KNXnet/IP Routing”)

The ETS5-equipped PC used for project design must be connected to a KNX interface.
Within ETS5, an interface can be configured via “**Bus**” > **Connections** > **Interfaces** > **Configured Interfaces** > **[+]**.

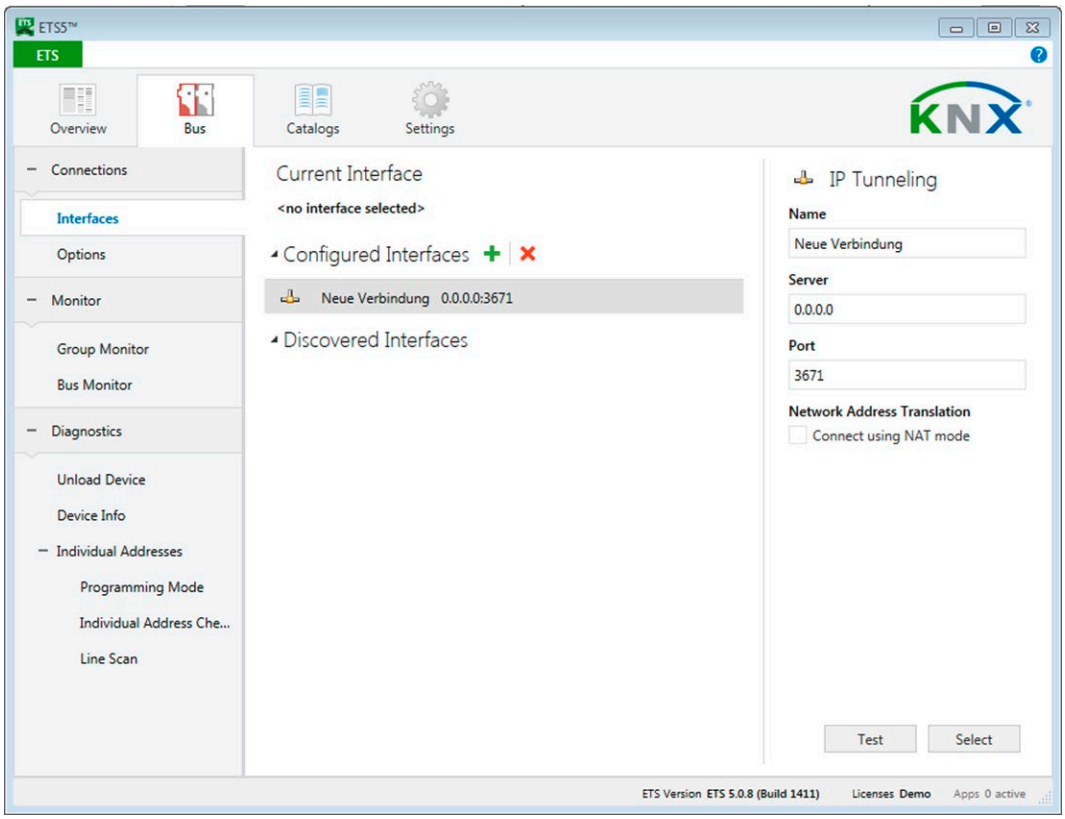


Figure 1: “Bus” Tab

If the KNX IP Controller functions as a KNXnet/IP Router, you can connect it directly to a standard ETHERNET interface on your PC using an RJ-45 cable.

In this case, the cable runs from ETHERNET to twisted pair and twisted pair to ETHERNET via the KNX IP Controller (750-889) and the KNX/EIB/TP1 Modules (see also Section “KNXnet/IP Router Parameterization”).

## 3.3 Interworking Datapoint Types (DPTs)

DPTs describe defined formats and data widths of communication objects.
The KNX Module supports the following EIB data widths:

- 1 … 7 bits
- 1 … 4 bytes

- 6 bytes
- 8 bytes
- 10 bytes
- 14 bytes

**Note**

**Additional information about “Interworking Datapoint Types”!**
Additional information about “Interworking Datapoint Types” can be found at http://www.knx.org.

## 3.4 Syntax of Network Variable Names

Each network variable name contains the program name. It is preceded and separated from the actual name by a period.

**Note**

**“Show short name” option**
The “Show short name” option in the ETS Plug-in user interface (see Section “KNX/EIB/TP1 Module/KNX IP Controller” >… > “'View' menu item”) makes it possible to suppress the display of the program name. This also removes the prefix, infix (in this case, the “period” character between the basic name and the suffix) and suffix. The communication objects in the ETS user interface are then also displayed accordingly in abbreviated form!

### 3.4.1 Syntax for Simple Variable

The syntax for simple variable names is:

<Program name>.M<No1>_<No2>_<Basic name>

Table 4: Syntax for Simple Variable

| Wildcard | Length | Explanation |
|---|---|---|
| <No1> | Digits | KNX Module number |
| <No2> | 3 digits | Data address |

### 3.4.2 Syntax for Array Variables

The syntax for array variable names is:

<Program name>.M<No1>_<No2>_<Basic name>[<No3>]

Table 5: Syntax for Array Variable

| Wildcard | Length | Explanation |
|---|---|---|
| <No1> | Digits | KNX Module number |
| <No2> | 3 digits | Identifies variable array |
| <No3> | Digits | Identifies variable in array |

### 3.4.3 Syntax for Nested Variables

The syntax for names of nested variables is:

<Program name>.M<No1>_<No2>_<Basic name>[<No3>]

Table 6: Syntax for Nested Variables

| Wildcard | Length | Explanation |
|---|---|---|
| <No1> | Digits | KNX Module number |
| <No2> | 3 digits | Identifies variable group |
| <No3> | Digits | Identifies variable in group |

### 3.4.4 Syntax for Nested Array Variables

The syntax for names of nested array variables is:

<Program name>.M<No1>_<No2>_<Basic name>._<No3><Suffix>[<No4>]

Table 7: Syntax for Nested Variables

| Wildcard | Length | Explanation |
|---|---|---|
| <No1> | Digits | KNX Module number |
| <No2> | 3 digits | Identifies main group |
| <No3> | Digits | Identifies subgroup in main group |
| <No4> | Digits | Identifies variable in subgroup |

## 3.5 Importing the ETS-Plug-in in ETS5

To import the ETS plug-in, select the corresponding vd4 file:

1. Click the "**Catalogs**" tab in the ribbon.
2. Click the **[Import…]** button.

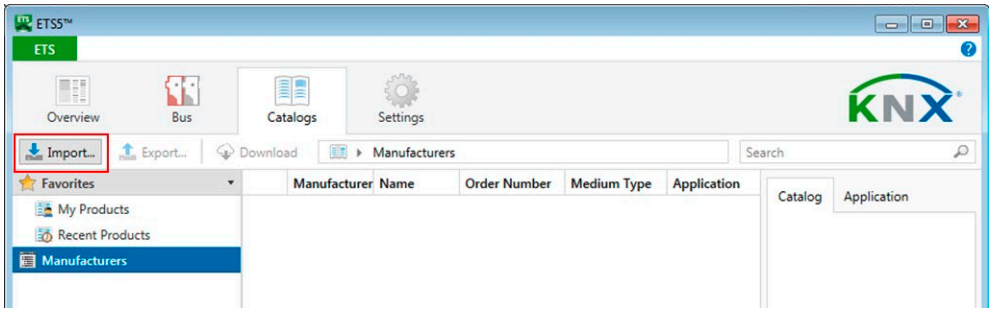


Figure 2: Importing Products

The "Open product file" dialog appears.

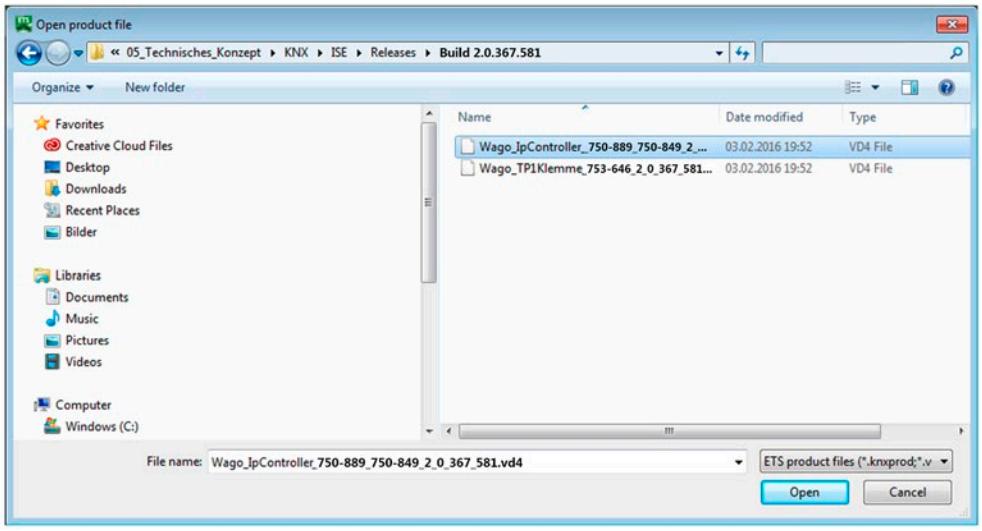


Figure 3: Importing Products – Select File Path

3. Find the file path of the product file to be imported in the directory and click **[Open]**.

**Note**

**Multiple selections are possible.**
To import multiple products at the same time, press and hold the **[SHIFT]** button.

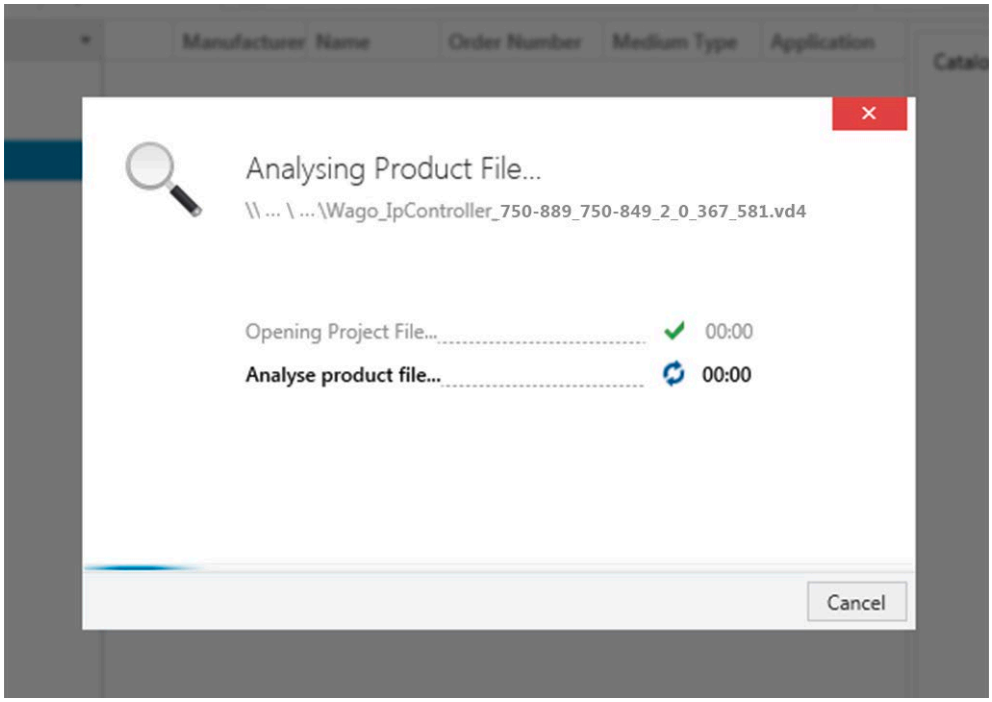


Figure 4: Progress Display – Analysis

A prompt shows you the progress of the import. The product file is analyzed. You are then prompted to select the product language(s):

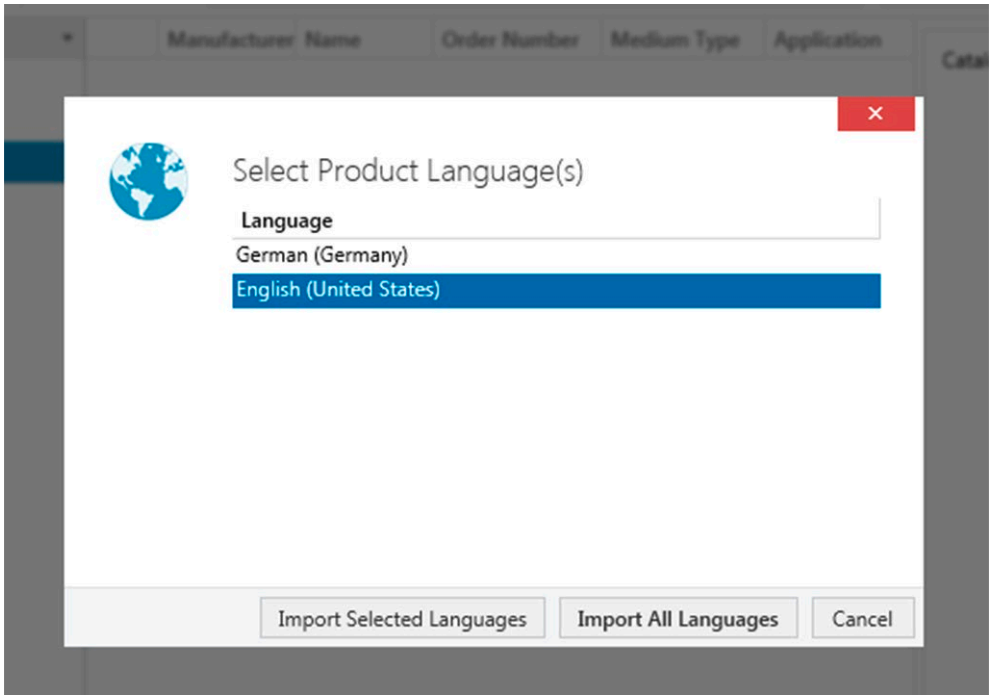


Figure 5: Selecting the Product Language

4. Select the product language(s):

   - Click the language(s) you want to select. To select multiple languages, press and hold the **[SHIFT]** button. The languages selected are highlighted in blue. Then click the **[Import Selected Languages]** button.

- If you want to import all available languages in the software interface, click the **[Import All Languages]** button directly.

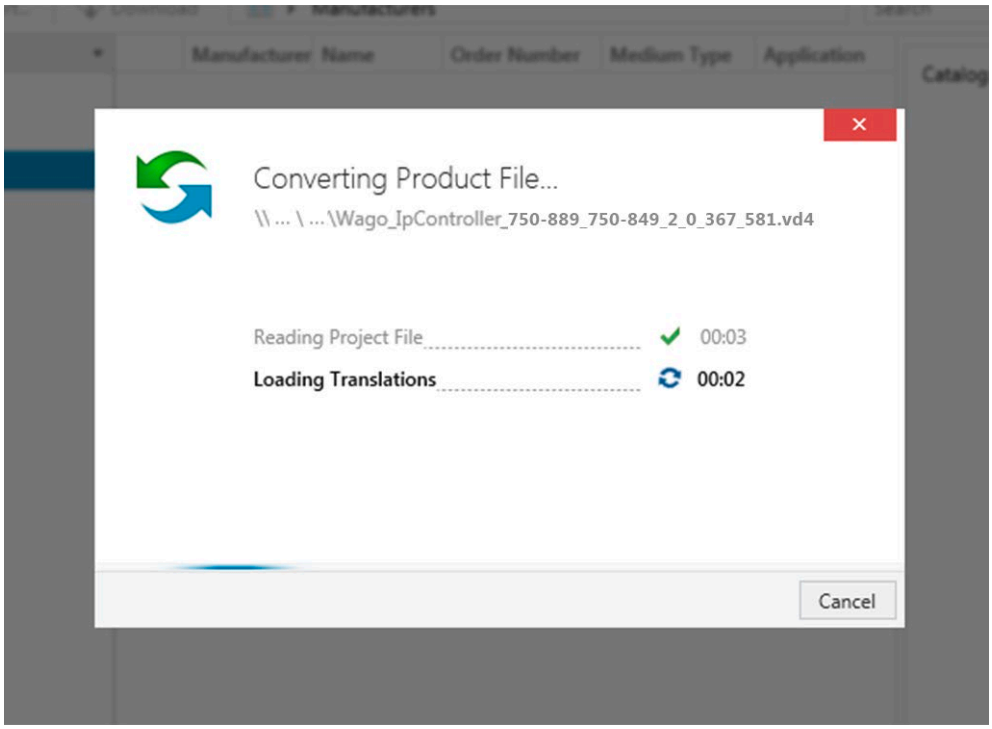


Figure 6: Progress Display – Conversion

A prompt shows you the progress of the import:
The project file is read, translation(s) loaded and the project file converted.

If you had selected multiple product files for import, the process is repeated for each product file..

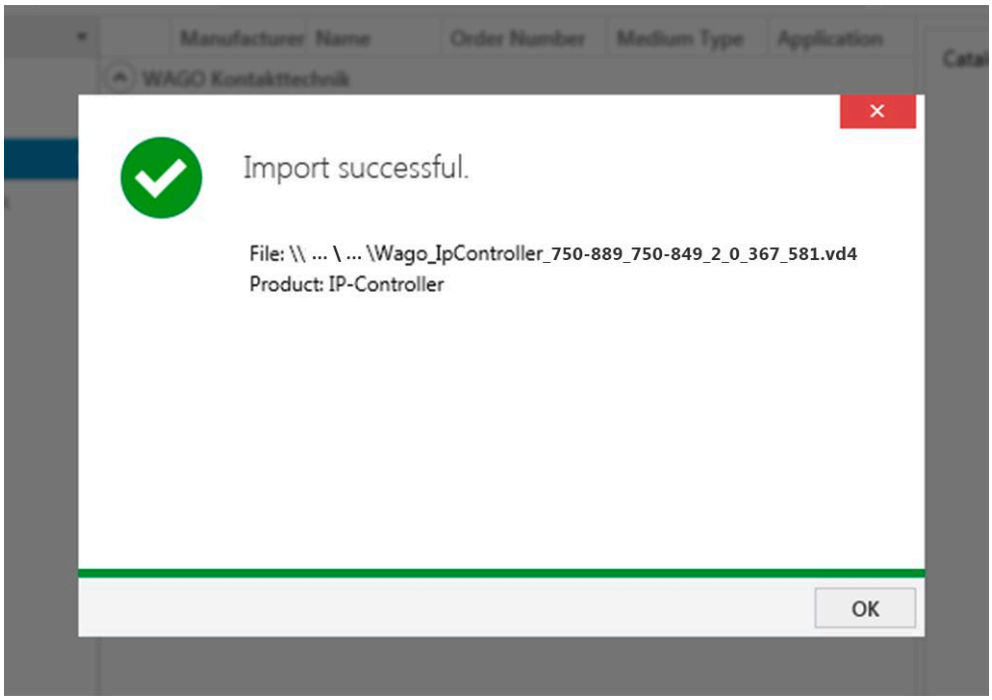


Figure 7: Progress Display – Completion

5. A message then appears that the import has been completed successfully. Click **[OK]** to close the window.

   The ETS product database is updated and henceforth includes imported products, e.g., KNX module and KNX IP controller in this example.

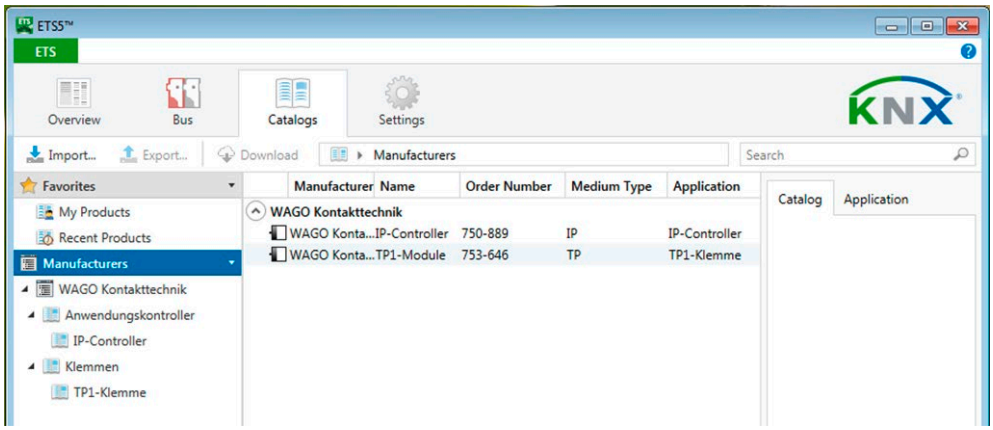


Figure 8: Product Catalog (Extract)

**Note**

**Importing *e!COCKPIT* .xml Files**

When using ***e!****COCKPIT*, the product database for the KNX/EIB/TP1 module (753-646) must be the following version number or higher: Wago_TP1Klemme_753-646_2_0_367_581.vd4

If an older file was added, the project or database may need to be discarded to correctly import the current product database.

## 3.6 Opening a Project

1. To open a project in the ETS, select the “Overview” tab.

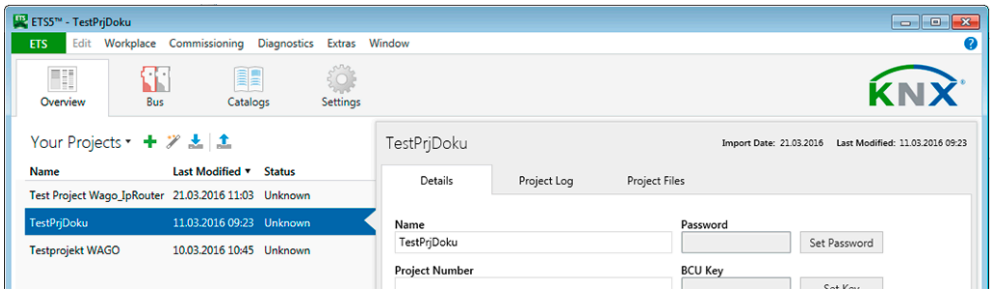


Figure 9: Selecting a Project (Extract)

2. Double-click the required project to view the project.

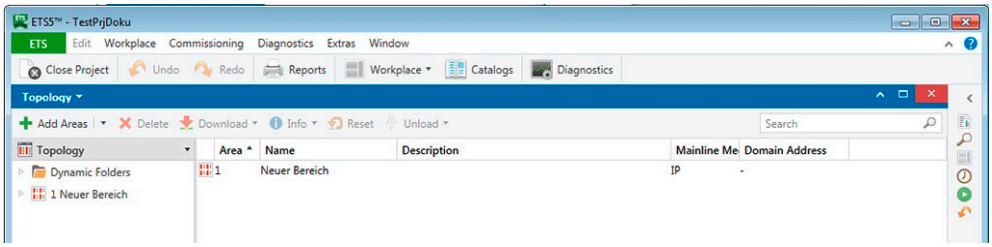


Figure 10: Project in the ETS – Topology View (Extract)

# 4 KNX/EIB/TP1 Module / KNX IP Controller Parameterization

The KNX/EIB/TP1 Module (753-646), referred to as the KNX Module, and the KNX IP Controller (750-889) use the same ETS Plug-in; however, the controller offers additional functions. This description applies to both the KNX Module and the Controller. Other functions are described.

The following section describes the procedure for using the ETS Plug-in for the KNX Module and the KNX IP Controller within the ETS. The ETS Plug-in is contained in the product database.

## 4.1 Opening the ETS Plug-in

1. To go to the plug-in interface, select the required device in the topology view.

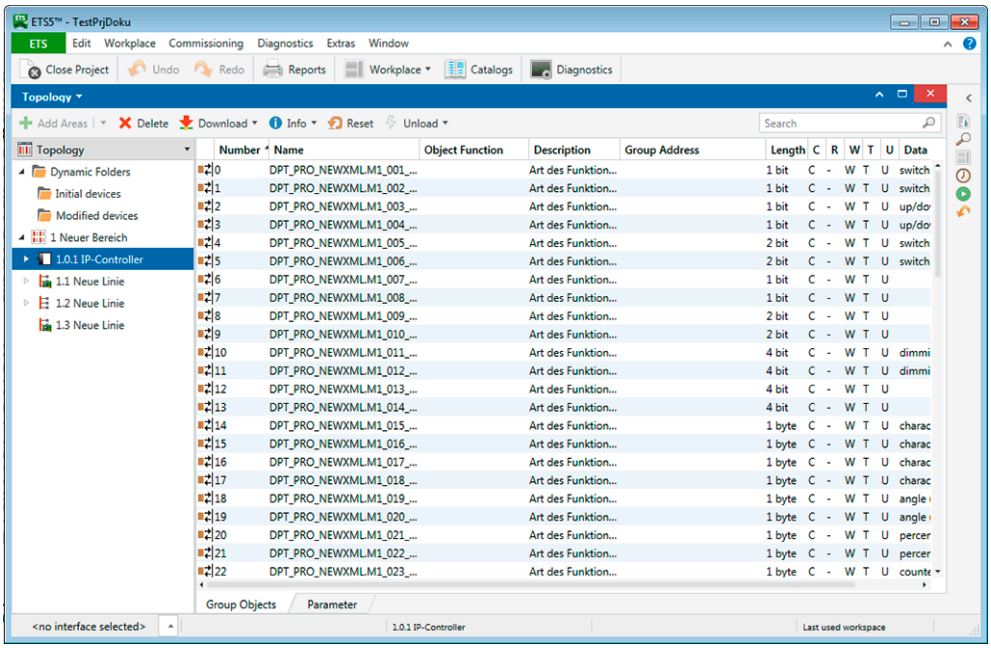


Figure 11: Selecting a Device

2. Go to the "**Parameter**" tab if necessary.

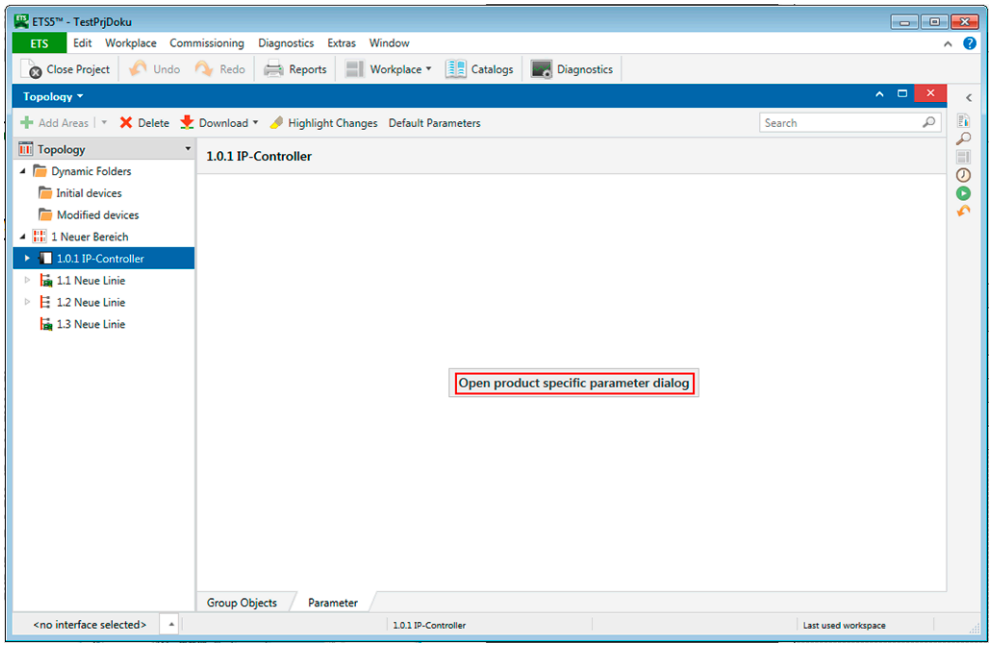


Figure 12: Opening the “Parameter” Dialog

3. Click the **[Open product specific parameter dialog]** button.
The plug-in for the selected device opens.

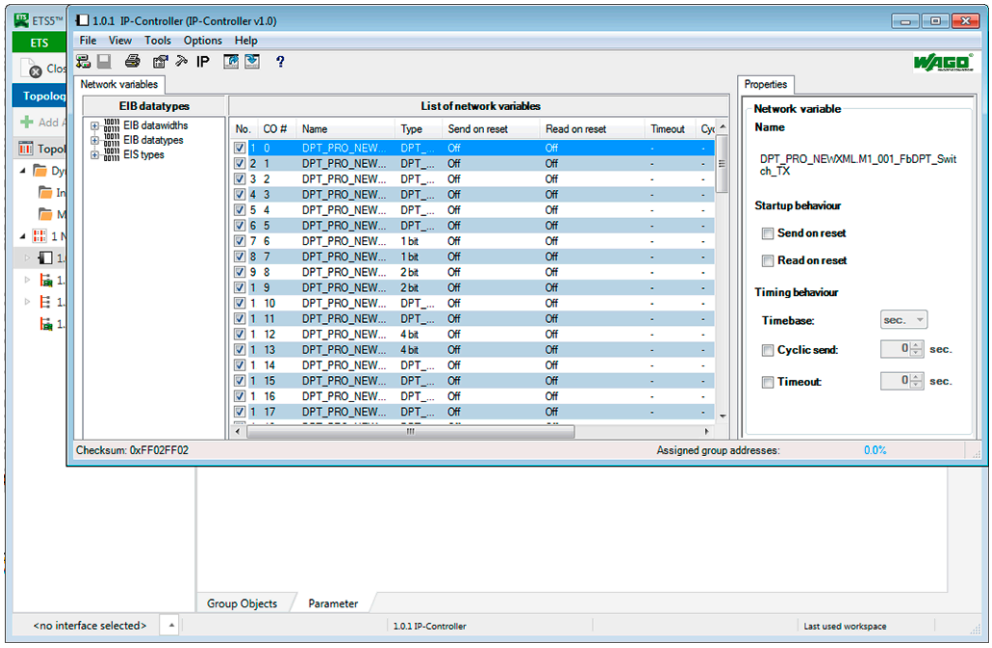


Figure 13: Plug-ins Window

## 4.2 Graphical User Interface of the ETS Plug-in

The graphical user interface displays all relevant data applicable to configuring the KNX Module.

The main window is divided into various areas, which are described in the following sections:

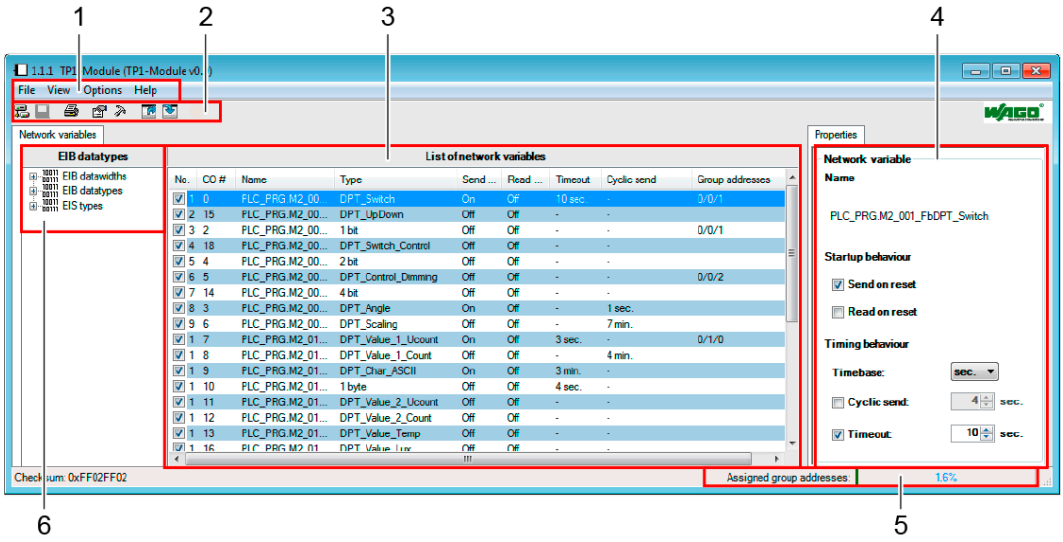


Figure 14: Overview of the ETS Plug-in

Table 8: Legend for the “Overview of the ETS Plug-in” Figure

| Pos. | Description/Section |
|---|---|
| 1 | Main Menu |
| 2 | Toolbar |
| 3 | “Network Variables” tab – List of network variables |
| 4 | “Properties” tab |
| 5 | Status bar – Percentage bar |
| 6 | “Network variables” tab – EIB datatypes |

This display structure cannot be changed, although the toolbar and the Properties window may be shown or hidden above the View menu item in the main menu. It is also possible to use the mouse to resize the individual window panes to the desired height and width.

### 4.2.1 Main Menu

The main menu contains the following items, each contains its own submenu items:

- File
- View
- Tools*
- Options
- Help

*only when configuring controllers

#### 4.2.1.1 “File” Menu Item

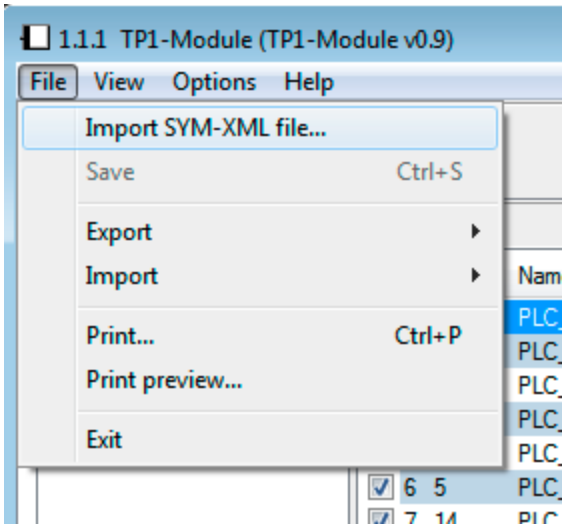


Figure 15: “File” Menu Item

Table 9: “File” Menu Item

| Menu Item | Description |
|---|---|
| **Import SYM-XML file…** | Imports an SYM_XML file. |
| **Save** | Saves the settings to the database of the ETS. The basic changes made via the ETS Plug-in are saved in the ETS. The menu item is only activated if changes were made. |

Table 9: “File” Menu Item

| Menu Item | Description |
|---|---|
| **Export** | The following submenu items enable you to export the current configuration. |
| | **XML (Backup)**<br>Export as XML file (not a SYM_XML file). All settings of WAGO devices (assignment of network variables, their properties, the settings of network variables and the assignment of communication objects to group addresses, etc.) are saved as an XML file. This file is used as a backup or as a template for the ETS Plug-in. When importing this file, the predefined settings are accepted in the devices and replace any existing settings. |
| | **CSV (editing parameters)**<br>Export as CSV file. The exported ASCII text contains a table of the network variables visible in the ETS. The first row is used as the header and contains the property names. Any additional row corresponds to a network variable. The property values (table columns) are separated by semicolons. You can open and edit the exported *.csv file with Excel or a text editor.<br><br>**Note**<br><br>**Notes on saving a *.csv file after editing!**<br>Excel cannot save any additional information in CSV format, such as cell formats, row heights or column widths. Therefore when saving, confirm the format warning prompt with “Yes” in order to retain the *.csv file format! |

Table 9: “File” Menu Item

| Menu Item | Description |
|---|---|
| **Import** | Use the following submenu items to import a configuration. |
| | **XML (Restore)**<br>Import as an XML file. This is not a SYM_XML file. |
| | **CSV**<br>Export as a CSV file. The imported .csv file must have been previously exported and, if necessary, edited with Excel or a text editor. This enables you to change group address associations and other properties of network variables. However, name, data type (DPT) and CO number cannot be changed.<br>**Note**<br>**CSV file does not contain a fully specified configuration!**<br>Unlike an exported XML file, the CSV file does not contain a fully specified configuration. It is therefore not suitable for:<br>• transferring the configuration to a different device<br>• reimporting after a manual change of the ETS visibility of variables<br>• reimporting after an XML or SYM_XML import. |
| **Print...** | Prints the current configuration.<br>Two different **documentation types** can be selected:<br>• “Based on group addresses”<br>• “Based on network variables”. |
| **Print preview…** | Displays the print preview. The same two documentation types can be selected (see “Print…” menu item). |
| **Exit…** | Closes the Plug-in. If the modifications have not been saved, the software will provide a prompt with the option to save the changes. |

#### 4.2.1.1.1 Exporting a Configuration as an XML File (Backup)

1. In the main menu choose **File** > **Export** > **XML (Backup)**.
2. Enter a storage location in the opened dialog.
3. Left-click **[Save]** to save the configuration and close the dialog.

**Note**

**Routinely save the configurations!**
It is recommended that the configurations are regularly exported to create a backup file.

#### 4.2.1.1.2 Exporting a Configuration as a CSV File

**Note**

**CSV file does not contain a fully specified configuration!**
Unlike an XML file, the CSV file does not contain a fully specified configuration. It is therefore not suitable as a backup file.

1. In the main menu choose **File** > **Export** > **CSV**.
2. Enter a storage location in the opened dialog.
3. Left-click **[Save]** to save the configuration and close the dialog.

**Note**

**Simple editing of group address associations and other properties of network variables!**
You can edit the properties of network variables with Excel or a text editor. Many text fields start with an additional blank space in order to prevent accidental automatic Excel conversions.
After editing, be sure to save the file again in *.csv file format.

#### 4.2.1.1.3 Import XML File (Backup Restore)

1. In the main menu, choose **File** > **Import** > **XML (Restore)**.
2. Search for the required XML file in the dialog that opens.
3. Left-click **[Open]** to import the configuration file and close the dialog.
4. A warning prompt indicates that importing a configuration will overwrite all existing settings and assignments. If you agree, click the **[Yes]** button**.**

**Note**

**Retain settings via the ETS Import/Export function (XML)!**
The export or import function (XML) enables you to recover previous settings after a new installation of the ETS, or to load them another PC.

#### 4.2.1.1.4 Importing a CSV File

**Note**

**CSV files do not contain a fully specified configuration!**
Unlike an exported XML file, the CSV file does not contain a fully specified configuration. It is therefore not suitable for:
• transferring the configuration to a different device
• reimporting after a manual change of the ETS visibility of variables
• reimporting after an XML or SYM_XML import.

1. In the main menu, choose **File** > **Import** > **CSV**.
2. In the dialog that opens, search for the CSV file required.
3. Left-click **[Open]** to import the file and close the dialog.
4. A warning prompt indicates that importing a configuration will overwrite all existing settings and assignments. If you agree, click the **[Yes]** button**.**

### 4.2.1.2 "View" Menu Item

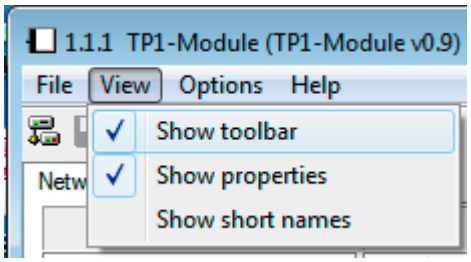


Figure 16: "View" Menu Item

Table 10: "View" Menu Item

| Menu Item | Description |
|---|---|
| **Show toolbar** | When checked, displays the toolbar. The toolbar is otherwise hidden. |
| **Show properties** | When checked, the "Properties" tab is displayed on the right in the window. It is otherwise hidden. |
| **Show short names** | The network variable names are displayed in short form, e.g., "FbDPT_Switch" instead of "PLC_PRG.M2_001_FbDPT_Switch". |

Selecting the Show Short Name option displays the network variable names in abbreviated form — both in the Plug-in window, as well as with the communication objects in the ETS user interface.

The short name omits the following:
- the preceding program name, including the separator
- the prefix for identifying the KNX Module and index of the DPT function block

- the infix (between basic name and suffix) for identification when nesting.

Table 11: Structure of the Network Variable Name – Long/Short Form

| Langform | Short form |
|---|---|
| <Program name>.<Basic name> | <Basic name> |
| <Program name>.KNX<No>_<Basic name> | <Basic name> |
| <Program name>.M<No1>_<No2><Basic name> | <Basic name> |
| <Program name>.M<No1>_<No2><Basic name>[<No3>] | <Basic name>[<No3>] |
| <Program name>.M<No1>_<No2><Basic name>.<Suffix> | <Basic name>.<Suffix> |
| <Program name>.M<No1>_<No2><Basic name>. <Suffix> <No4>] | <Basic name>.<Suffix>[<No4>] |

More information on the syntax of network variable names can be found in the Section “ETS” > … > “Syntax of Network Variable Names.”

#### 4.2.1.3 “Tools” Menu Item

The Tools menu item is only displayed for controller configuration.

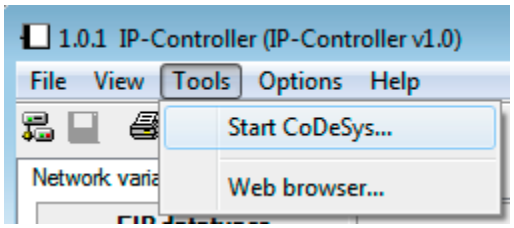


Figure 17: “Tools” Menu Item

Table 12: “Tools” Menu Item

| Menu Item | Description |
|---|---|
| **Start CODESYS…** | Start the WAGO-I/O-*PRO* software *) |
| **Web browser…** | Start the web browser with the Web-based Management (WBM) **) |

*) Requirement: Correct path to the .exe file of the software, see Section “Finding the File Path to WAGO-I/O-*PRO*”
**) Requirement: Available connection to the controller.

**Note**

**Configure the IP parameters prior to CODESYS or web access!**
To start CODESYS or the web browser via ETS, the IP parameters must be set via **Options** > **IP Parameters…** (see Section “Setting IP Parameters”).

#### 4.2.1.4 “Options” Menu Item

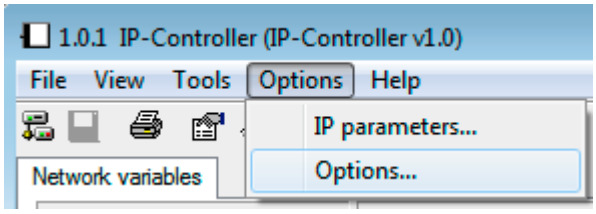


Figure 18: “Options” Menu Item – Controller Example

Table 13: “Options” Menu Item

| Menu Item | Description |
|---|---|
| **IP parameters…** *) | This opens the “IP Controller” dialog to set the IP parameters for the controller. *) |
| **Options…** | This opens the “Options” dialog to enter settings for functions such as telegram delay and automatic save. |

*) only when configuring controllers

The **Options…** menu item opens the “Options” dialog.

The “Options” dialog consists of 3 tabs:
- Parameters
- CODESYS
- Autosave

#### 4.2.1.4.1 Defining the Telegram Delay After Reset

Use the “Parameters” tab to define the telegram delay after a reset.

This is the smallest interval that must be observed between successive telegrams. 0, 50, 100, 250 and 500 milliseconds [ms] can be selected.

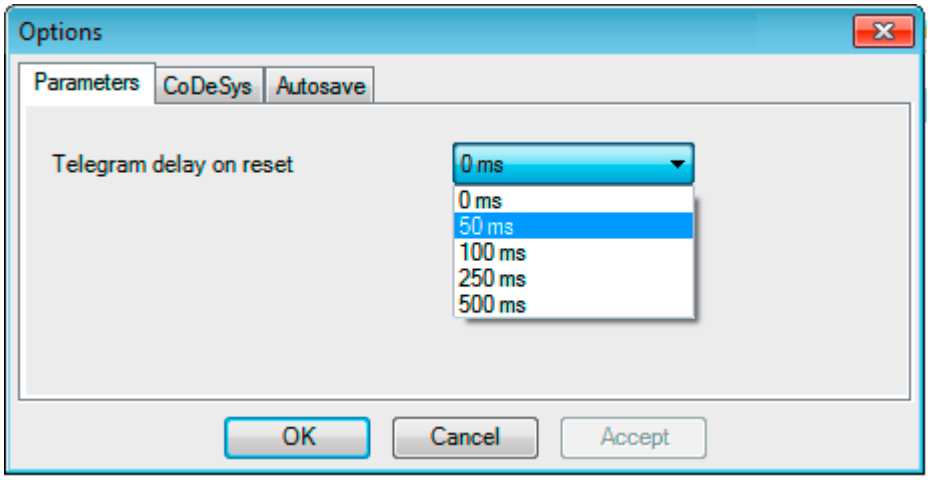


Figure 19: “Options” Dialog – “Parameters” Tab

#### 4.2.1.4.2 Finding the File Path to WAGO-I/O-*PRO*

In the “CODESYS” tab, enter the file path of the .exe file for the WAGO-I/O-*PRO* (CODESYS) software.

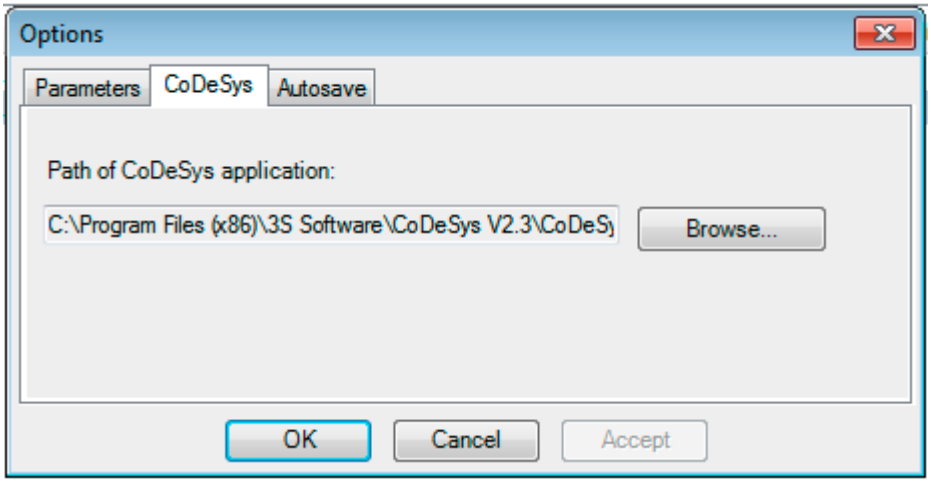


Figure 20: “Options” Dialog – “CODESYS” Tab

#### 4.2.1.4.3 Setting the Autosave Function

Use the “Autosave” tab to define automatic save for the current configuration. For this, the Enable automatic save of the configuration checkbox must be checked. Enter a number that defines the save interval in minutes.

**Note**

**“Autosave” function saves changes in the database!**
The “Autosave” function is identical to the normal “Save” function and saves changes in the ETS database.
An XML file is not saved (as is the case with **File** > **Export** > **XML (Backup)**).

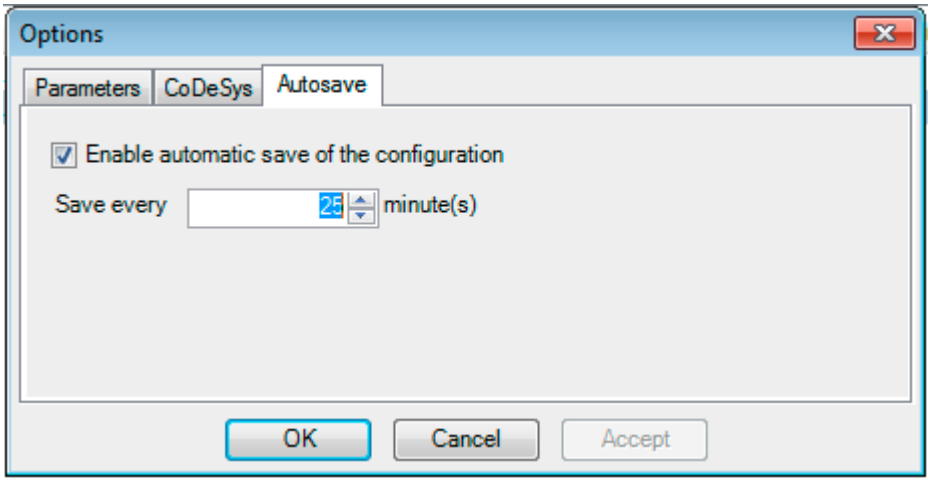


Figure 21: “Options” Dialog – “Autosave” Tab

#### 4.2.1.4.4 Setting IP Parameters

The IP Parameters… menu item is only displayed when configuring the controller. This opens the “IP Controller” dialog:

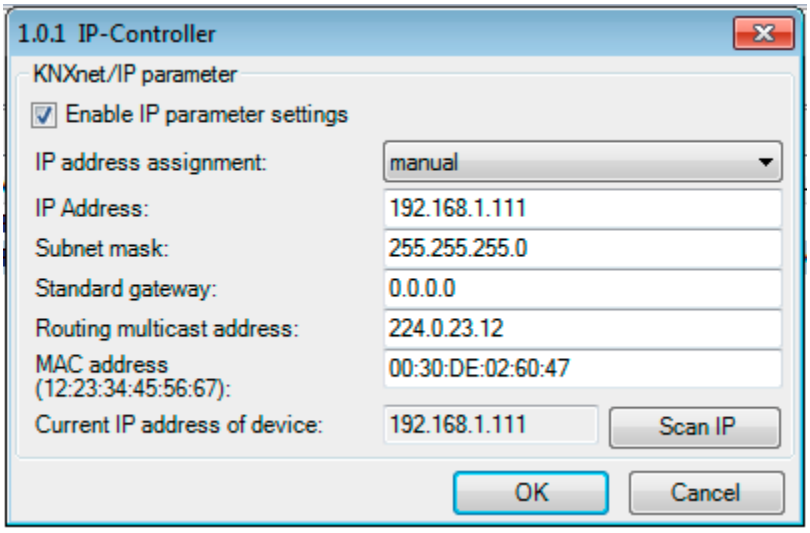


Figure 22: “IP Controller” Dialog – KNXnet/IP Parameters of the KNX IP Controller

The KNX IP Controller needs an IP address for network integration. Various options for assigning the IP address include “manual,” “BootP,” “DHCP.”

Use the **[Scan IP]** button to search the network for the IP address of the controller specified by the MAC address. If no suitable device is found for the MAC address, the device is marked accordingly. An automatic search is also performed for the device after opening the parameters dialog.

**Note**

**Specify the MAC address in the IP parameters dialog!**
The MAC address of the KNX IP Controller must be specified in the MAC address field. The address is located on the back of the controller and on a self-adhesive, tear-off label on the side of the controller.

### 4.2.1.5 “Help” Menu Item

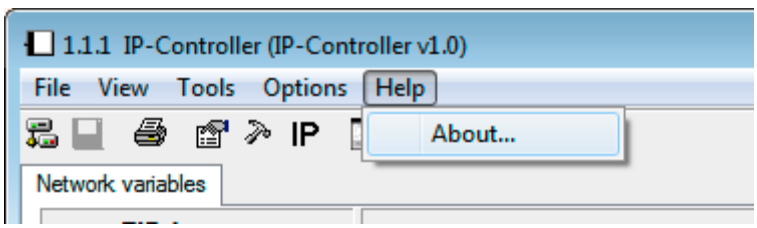


Figure 23: “Help” Menu Item

Table 14: “Help” Menu Item

| Menu Item | Description |
|---|---|
| **About…** | Displays information about the ETS Plug-in. |

## 4.2.2 Toolbar

The toolbar provides fast and convenient access to frequently used functions of the main menu.


Figure 24: Toolbar

Table 15: Toolbar

| Button | Action |
|---|---|
| | Imports an SYM_XML file, similar to selection of the SYM_XML file. |
| | Saves the settings to the ETS. The SYM_XML file is not changed. |
| | Prints the current configuration. |
| | Shows or hides the “Properties” tab. |
| | Opens the “Options” dialog. |
| IP | Opens the “IP Parameters” dialog. *) |
| | Exports the current configuration as an XML file (not a SYM_XML file). |
| | Imports a configuration as an XML file (not a SYM_XML file). |

*) only when configuring controllers

## 4.2.3 “Network Variables” Tab – List of Network Variables

A “List of network variables” is located in the middle of the “Network Variables” tab. This lists all the network variables available that you can associate with group addresses from the ETS. These network variables each have a specific data point type by which they can be filtered (see Section “'Network Variables' Tab – Datatypes”).

**Note**

**Observe naming conventions of network variables!**
Observe the syntax conventions for network variable names, which are described in detail in the Section “ETS” > … > “Syntax of Network Variable Names.”

The following properties are listed in the “List of Network Variables” table:

Table 16: List of Network Variables

| Table Column | Value | Description |
|---|---|---|
| | ☑ / ☐ | **Checkbox** for enabling or disabling visibility in the ETS. |
| **No.** | (Table row number) | Consecutive number of the table rows. |
| **CO #** | (Communication object number) | Communication object number in the ETS' topology. The communication object number is assigned automatically. |
| **Name** | (Network variable name) | The network variable name is taken from WAGO-I/O-*PRO* (CODESYS) and is preceded by the "program name." With the appropriate setting in the "View" menu item, only the **short name** is shown; the display of the program name is disabled. |
| **Type** | (Data point type name **or**, if without type, amount + unit of data width) | Data point type name. If the data point has no type, its data width is shown. |
| **Send on reset** | On/Off | If the controller is reset, this variable automatically sends the current value on the bus or not.<br>This function can be used to initialize the specific group object. |
| **Read on reset** | On/Off | If the controller is reset, this variable automatically reads the current value from the bus or not.<br>This function can be used to initialize the associated function block. |
| **Timeout** | (amount + unit) | The data point has a watchdog and expects an update within the specified time. |
| **Cyclic send** | (amount + unit) | Time interval for repetitive cyclic send operation. |
| **Group addresses** | (x/x/x) | Assigned KNX group addresses.<br>A data point can be associated with several group addresses, maximum 253 group addresses/assignments. Data points and group addresses are associated in the topology window of the ETS. |

**Checkbox for Visibility in the ETS**

The checkbox at the beginning of the line for each list entry defines whether the corresponding network variable in the ETS is visible as a communication object and appears in the topology list.

Some of the current properties/values of the network variables, e.g., "Read on reset," can be edited in the area of the "Properties" tab (see Section "'Properties' Tab").

**Note**

**Multiple selection is supported!**
In order to change the properties of several network variables at the same time, you can mark several lines in the “List of network variables” simultaneously. The changes that you make in the “Properties” tab then apply to all network variables marked in the list.

### 4.2.4 “Network Variables” Tab – EIB Datatypes

The “Network Variables” tab contains the “EIB datatypes” in the left-hand area of the user interface. The tree structure displayed enables you to filter the “List of network variables” by EIB datawidth, EIB datatypes or EIS types.

The EIB and EIS types represent the available data point types in the ETS. The “List of network variables” only shows those network variables that correspond to the data type you have selected.

The “EIB datawidths” tree node enables you to filter the network variables independently by datawidth rather than the actual data type. This enables you to also list the new datawidths without a type.

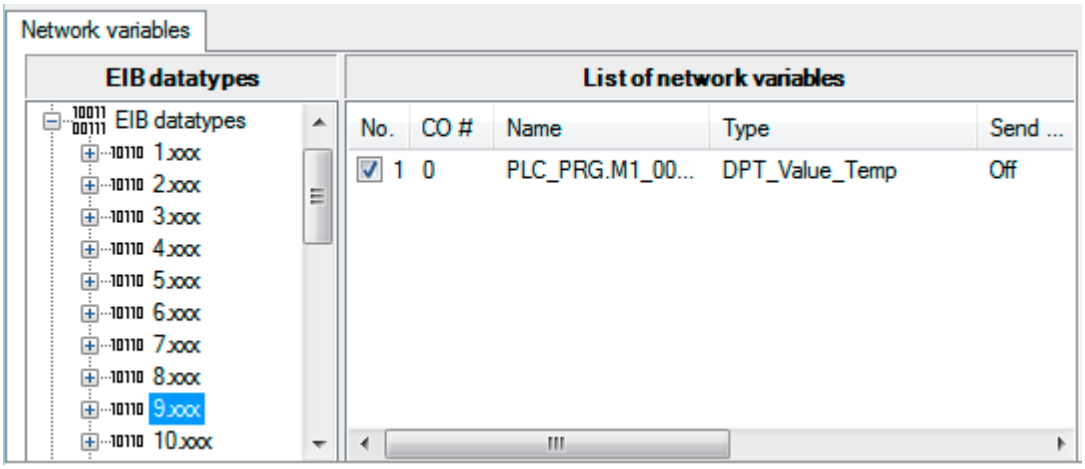


Figure 25: Selection of EIB Datatype 9 xxx, Corresponds to DPT_Value_Temp

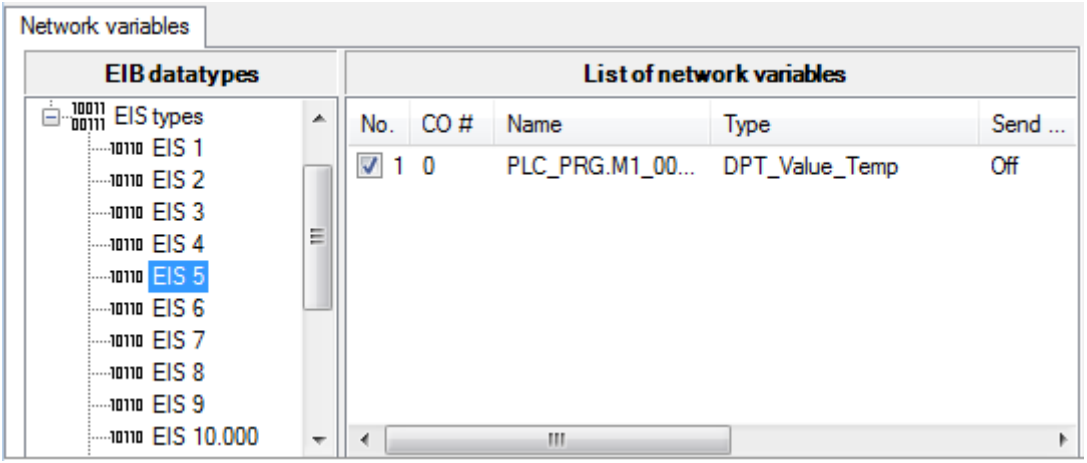


Figure 26: Selection of EIS Type EIS 5, Corresponds to DPT_Value_Temp

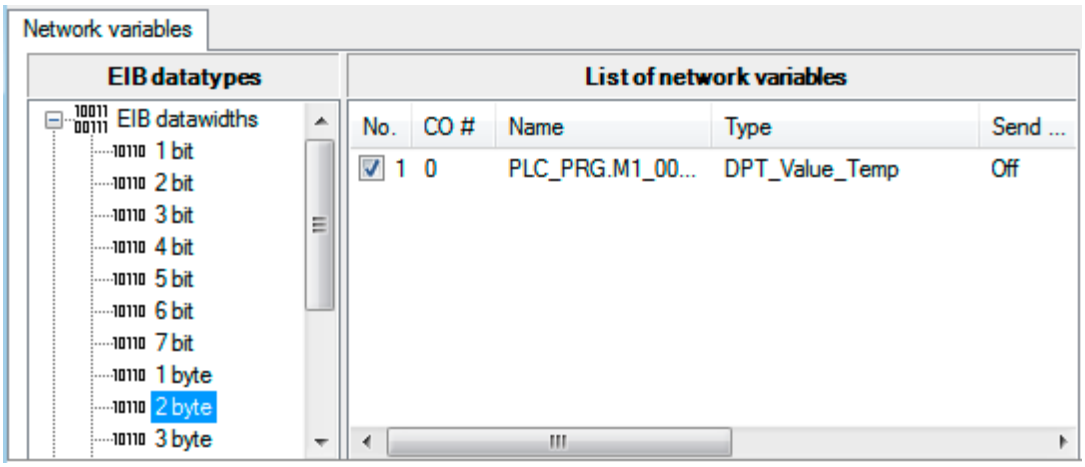


Figure 27: Selection of EIB Datawidth 2 Byte, also Contains DPT_Value_Temp

## Note

**Only one attribute (data type/datawidth) can be used as a filter!**
Only one attribute can be entered as a filter.
Multiple selection in the EIB datatype window is not possible.

## 4.2.5 “Properties” Tab

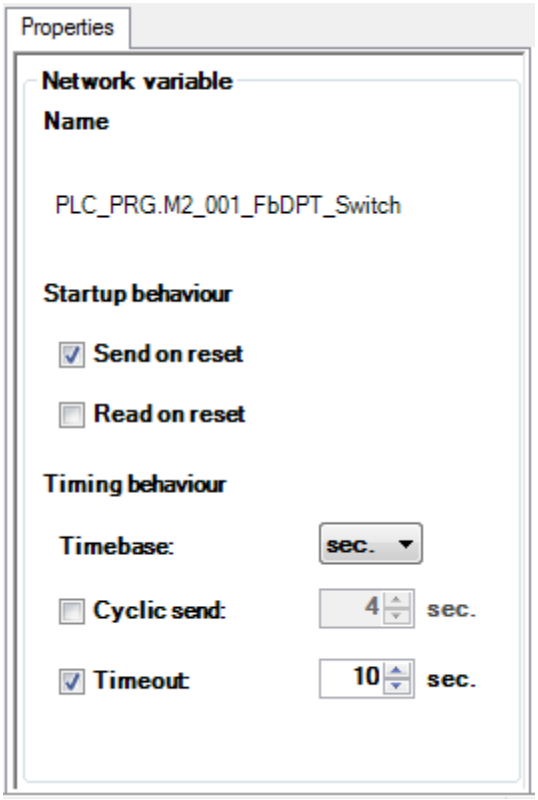


Figure 28: “Properties” Tab

The “Properties” tab displays the properties of selected network variables. You can read or write properties here. The settings made are immediately updated in the “List of Network Variables” table.

Table 17: Properties of Network Variables

| Designation | Explanation | Read / Write |
|---|---|---|
| **Name** | Description of the selected network variable. If several network variables are selected: empty | R |
| **Startup behavior** | | |
| **Send on reset** checkbox | If the checkbox is checked, values are updated after a device reset. The values are updated with a voltage reset, the reset of the node from the ETS and a software reset of the IEC application. | RW |
| **Read on reset** checkbox | If the checkbox is checked, the device reads the current value from the bus after a device reset. | RW |
| **Timing behavior** | | |
| **Timebase** | Conversion of the timebase to seconds [sec.] or minutes [min.]. Only enabled if the **Cyclic send** or **Timeout** checkbox is selected | R/RW |
| **Cyclic send** checkbox | If the checkbox is checked, the device sends its value to the bus with the defined interval. | R/RW |
| **Timeout** checkbox | If the checkbox is checked and the telegram is not updated within the specified time, the device indicates a timeout on the corresponding FbDPT function block in the PLC. The data point has a watchdog and expects a program update within the specified time. | R/RW |

If you have made multiple selections in the “List of network variables,” the properties of all selected network variables can be updated simultaneously. Checkboxes in which the selected network variables are different are marked in blue (see figure “Multiple Selection for Editing Network Variables”).

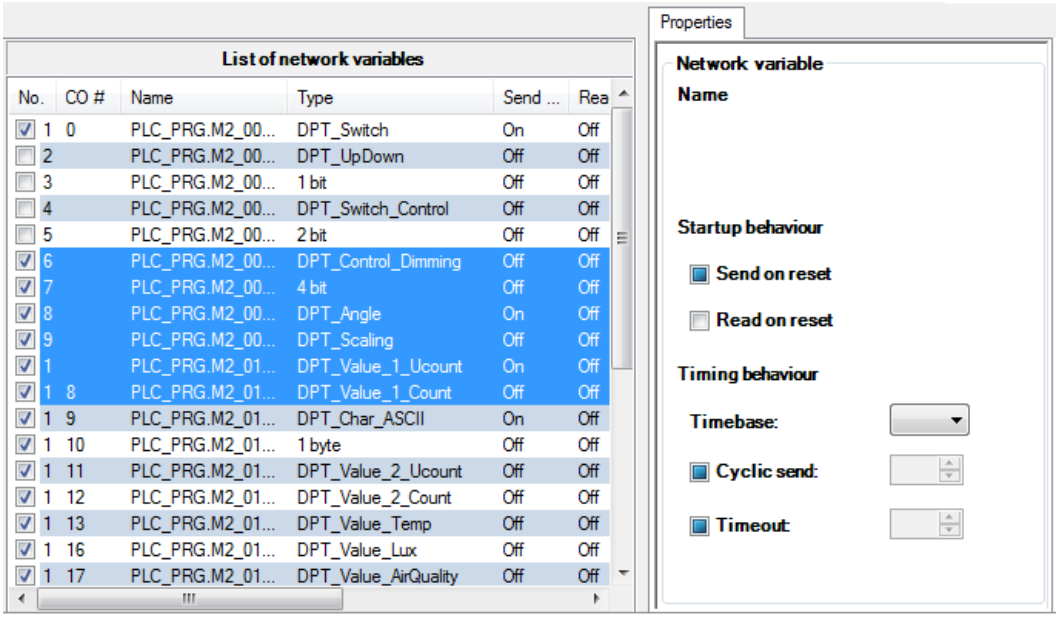


Figure 29: Multiple Selection for Editing Network Variables

## 4.2.6 Status Bar

The “Assigned group addresses” percentage bar is shown on the right of the status bar. This indicates the relative usage of the ETS Plug-in based on the following limits:

- **253 communication objects** for the configuration of controller and modules
- **254 group addresses** for the configuration of controller and modules
- **254 associations** for the configuration of controller and modules.

Usage is stated as a percentage of the specified capacity. It is displayed as a green bar.

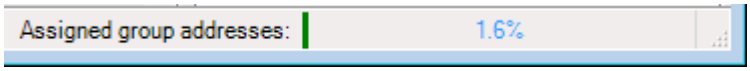


Figure 30: “Assigned Group Addresses” Percentage Bar (Example)

**Example:**

The system is at full capacity when there are 253 communication objects **or** 254 group addresses **or** 254 associations present.

If two communication objects with 127 group addresses each are connected, this makes 254 associations. The system is then at full capacity.

No further assignments are possible with 100 % rate of usage.

## 4.3 Importing a Symbol File in the ETS Plug-in

Specific configurations are required to operate the KNX Module and the KNX IP Controller. The WAGO-I/O-*PRO* software generates these configurations and exports them to an “SYM_XML” icon file.

In the Plug-in window:

1. Click **[File]** in the main menu of the plug-in user interface.
2. Select the **Import SYM-XML file…** menu item.

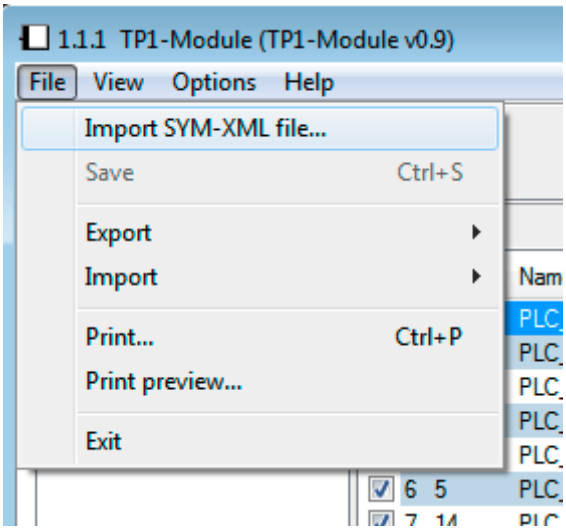


Figure 31: “Import SYM-XML File…” Menu Item

3. In the “Select SYM-XML file for this device” window, select a SYM_XML file containing the specific configuration of the KNX Module or KNX IP Controller.

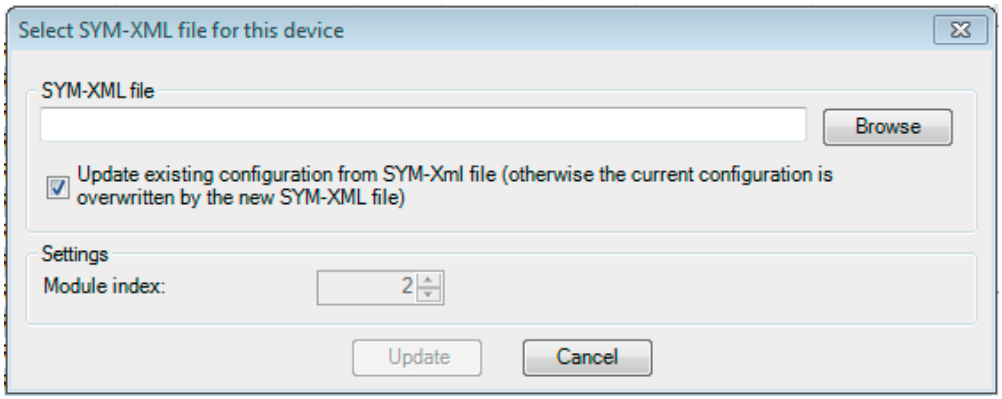


Figure 32: “Select SYM-XML File for this Device” Dialog

A checkbox is provided below the entry field for the source file.

- If the box is unchecked, the device configuration is overwritten with the data in the SYM_XML file.

- If it is checked, the current device configuration is synchronized with the settings specified in the SYM_XML file.

If a node contains several KNX Modules, the DPTs of all bus modules are contained in the SYM_XML file. In this case, proceed as follows:

4. In the **Module index** selection field (“Settings” area), select the KNX Module number for the DPTs to be imported.

5. Click **[Update]** to start the synchronization.

**Note**

**Observe the index counting method and designation!**
If a second KNX Module of this type is used on a KNX IP Controller (750-889), it will operate in device mode. The first KNX Module is automatically set to router mode. Although the first KNX Module cannot be accessed via the IEC application, the second KNX Module is addressed via index 2 (see also the manual of the KNX IP 750-889 Controller).
The selected module index influences the naming of the network variables (see Section “Network Variables”).

**Note**

**Configure KNX Modules individually!**
Several KNX Modules cannot be configured at the same time.

## 4.4 Associating Network Variables and Group Addresses

The basic task of the ETS software is visualizing the associations of network variables of the KNX Module or KNX IP Controller with group addresses in the ETS and enabling them to be edited.

### 4.4.1 Creating Associations

Associations between communication objects and group addresses are created using “drag & drop” in the ETS.

1. Click and hold on the required network variable from the **Topology** view and drag it to the required group address in the **Group Addresses** view.

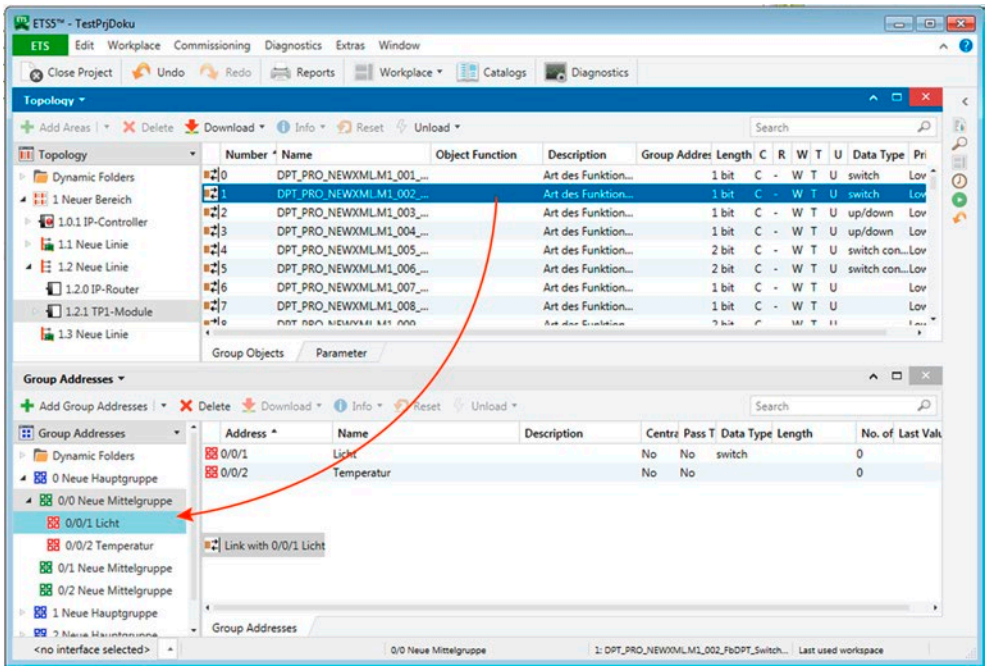


Figure 33: Creating an Association Using “Drag & Drop”

Invalid association attempts are detected and indicated.

**Note**

**Associated network variable sets the type for further associations!**
If a group address is associated with a network variable, only additional variables of the same type can be associated with the relevant group address.

Alternatively, you can also create the association via the context menu of the relevant communication object:

1. Right-click the communication object to open the context menu.
2. In the context menu, select **Link with…**.

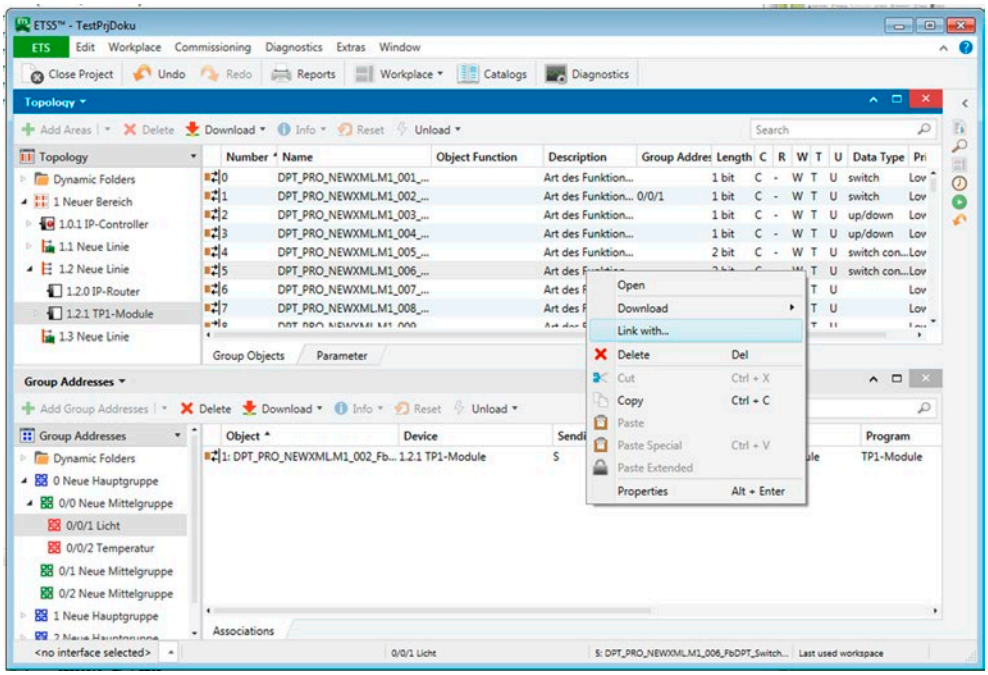


Figure 34: Object Context Menu

The “Link With Group Address” dialog opens:

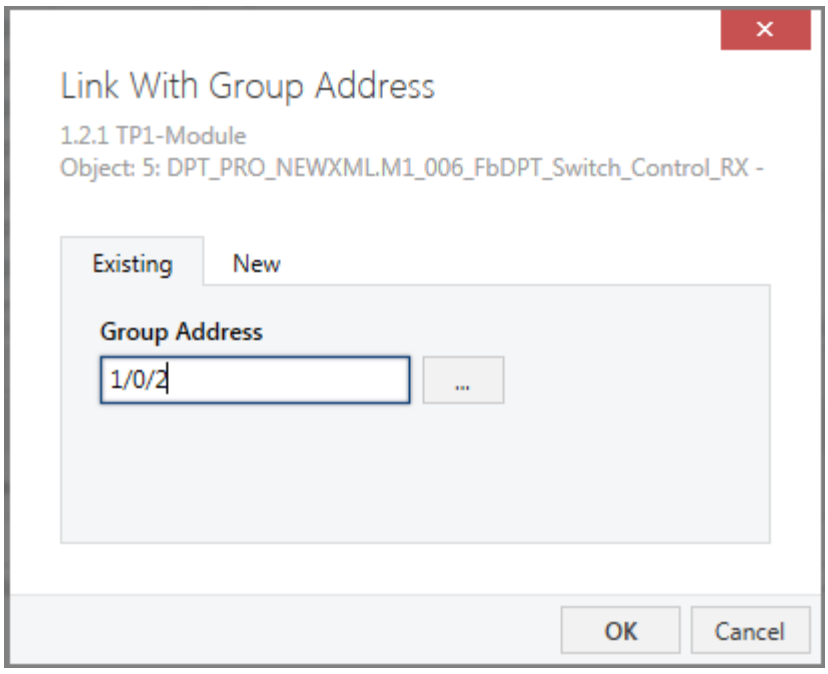


Figure 35: “Link With Group Address” Dialog

3. To go to a list with available group addresses, click the **[…]** button.

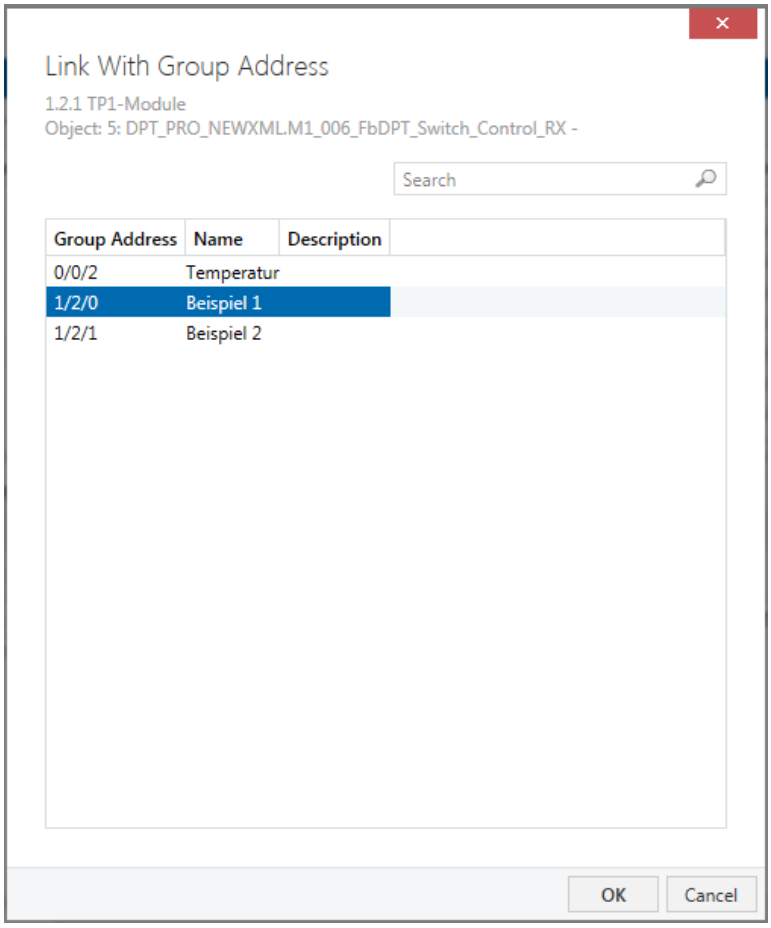


Figure 36: Drop-down List with Group Addresses

4. Select a target group address and click **[OK]** to confirm. The connection is established and the drop-down list is closed.

5. Alternatively, you can create a new group address under the “New” tab directly that is immediately associated with the network variable. Click **[OK]** to confirm.

The syntax of the address entered is monitored. If you make an invalid entry, the input field is outlined in red and no **[OK]** button appears:

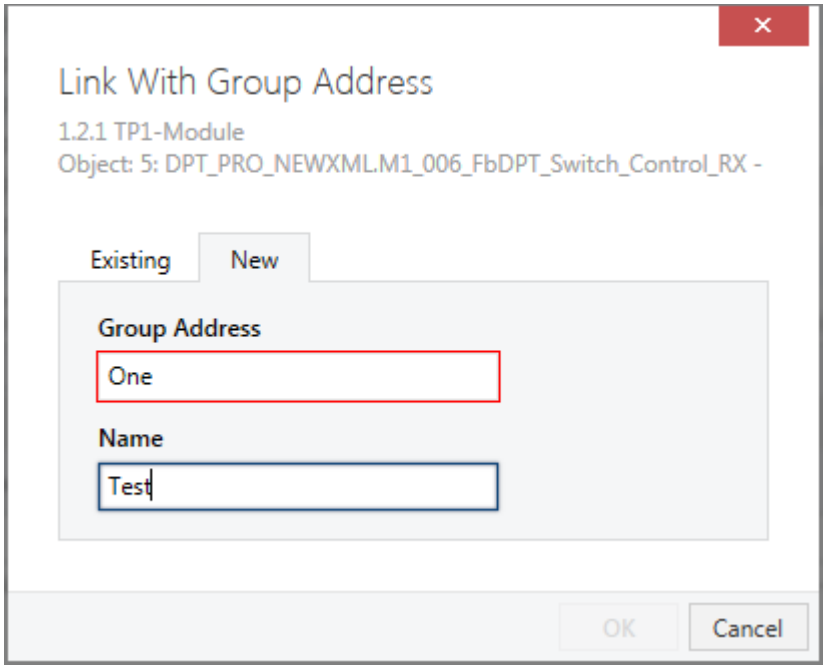


Figure 37: Example of Signaling an Incorrect Entry

6. When you have entered a correct group address (*x/x/x*) and name (*free form text*), the **[OK]** button appears. Clicking the button confirms the group address you created and the window closes:

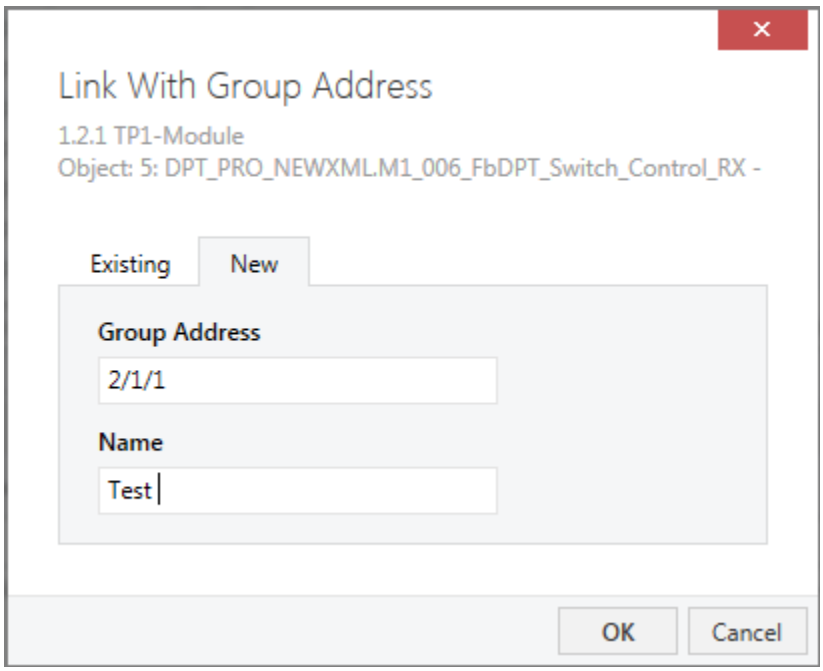


Figure 38: “New” Tab

## 4.4.2 Deleting Associations

1. To remove a network variable/group address association, click an object in the **Group Addresses** view. A context menu appears.

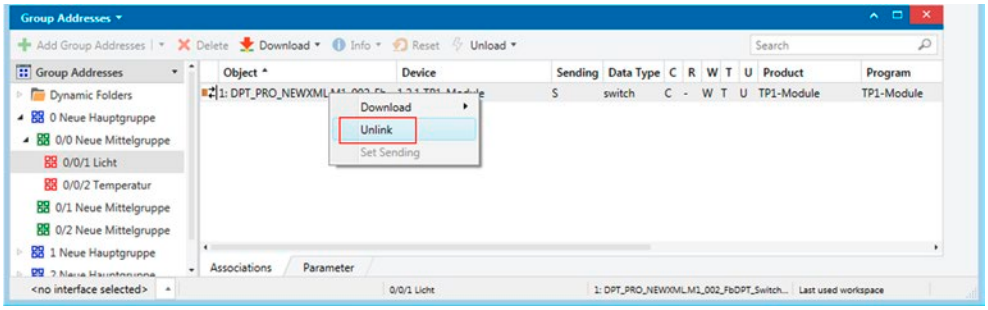


Figure 39: Object Context Menu

2. Clicking the **Unlink** menu item removes the connection between the communications object and the group address.

# 5 Parameterization of the KNXnet/IP-Router in ETS5

The first KNX Module behind a KNX IP Controller (and possibly behind other non-KNX Modules) extends the function of the KNX IP Controller to a KNXnet/IP Router. Any subsequent KNX modules operate in device mode. The KNXnet/IP Router routes telegrams from IP to a twisted-pair cable and vice versa.

The following section describes the steps for using the KNXnet/IP router within the ETS.

## 5.1 “IP-Router” Dialog

Proceed as follows to parameterize the KNXnet/IP Router:

1. Select the IP router in the ETS **Topology** view.

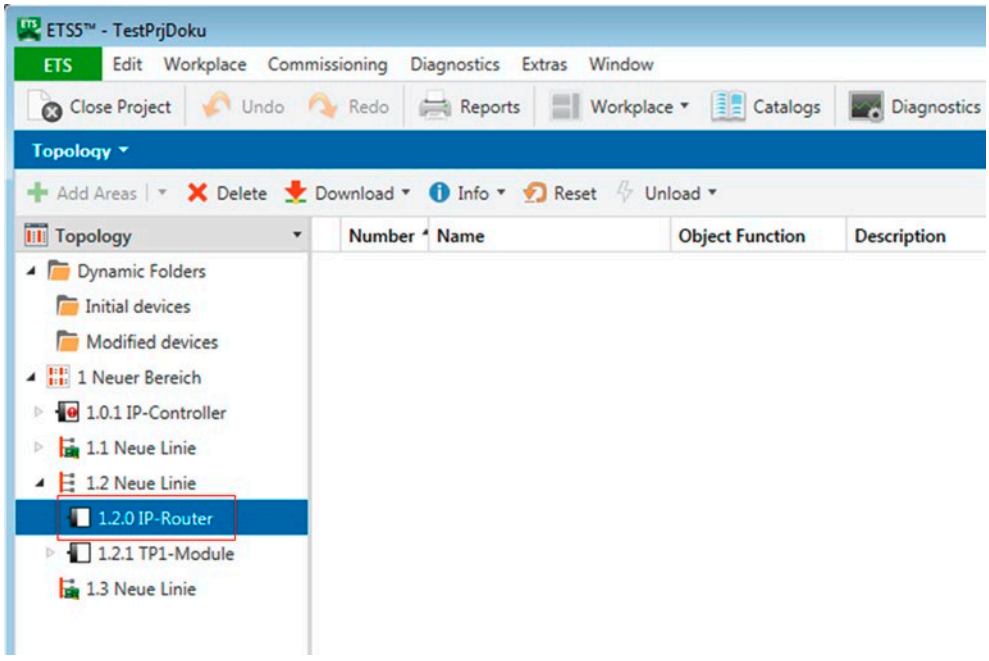


Figure 40: Selecting the IP-Router

2. Switch from the “**Group Objects**” tab to the “**Parameter**” tab to display the device settings.

3. Click **[+]** before **Device Settings** to expand the submenu points.

   - Extended Settings
   - IP -> TP
   - TP -> IP

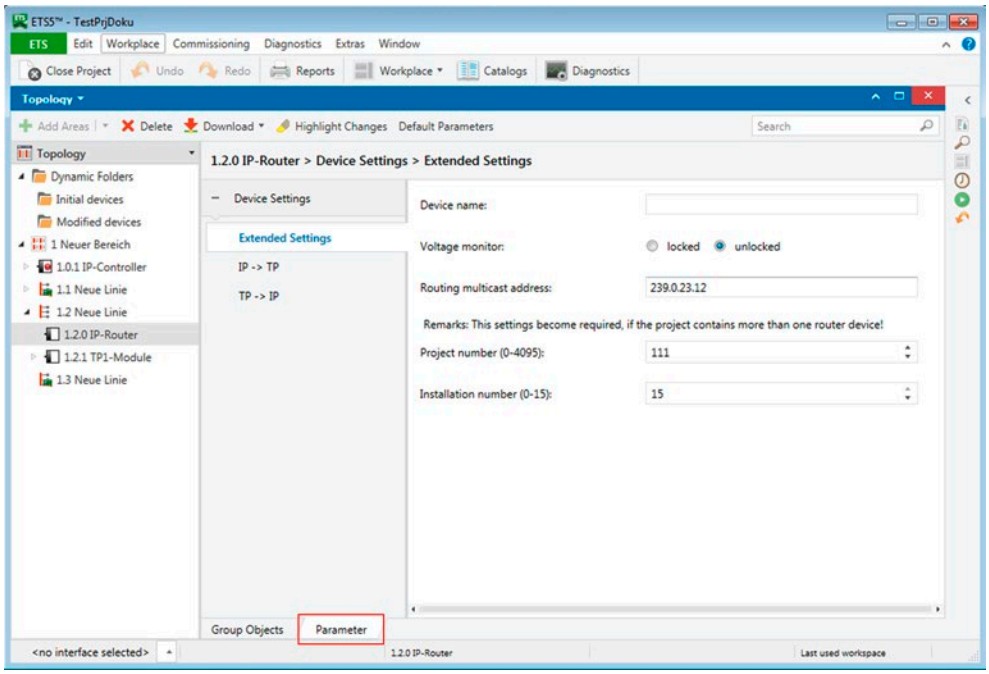


Figure 41: “Parameter” Tab

## 5.2 Operation

The software has the basic task of setting up the KNXnet/IP Router and adapting its IP parameters to the network.

### 5.2.1 Extended Settings

You can view and set general data such as the device name, project number and installation number in the **Extended Settings** menu item.

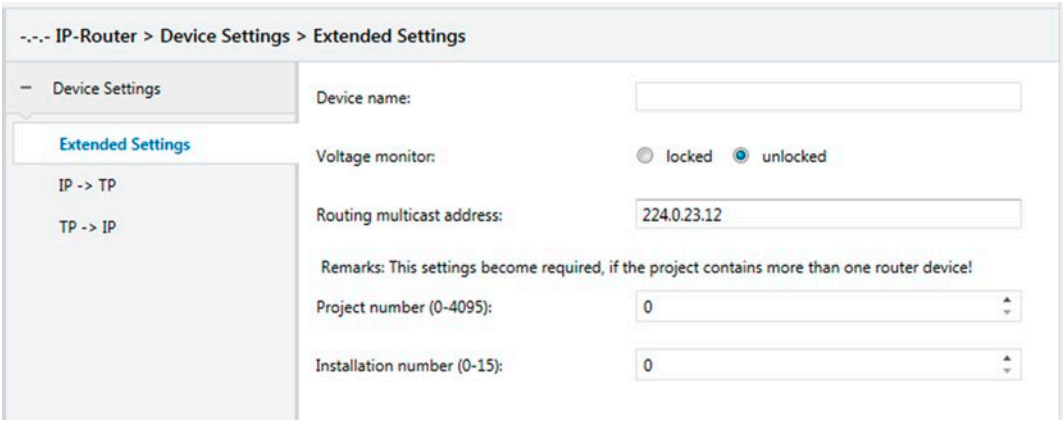


Figure 42: Extended Settings

Table 18: “Extended Settings” Menu Item of the KNXnet/IP Router

| Parameter | Description |
|---|---|
| **Device name** | Freely selectable device name with a maximum of 30 characters to identify the device in the ETS. |

Table 18: “Extended Settings” Menu Item of the KNXnet/IP Router

| Parameter | Description |
|---|---|
| **Voltage monitor** | Response of the device to a bus power failure:<br>“locked”: Power failure and restoration are not reported.<br>“unlocked”: Failure and restoration of power on the bus line are reported by KNXnet/IP (default). |
| **Routing multicast address** | IP address for KNXnet/IP routing:<br>address reserved for KNXnet/IP: 224.0.23.12<br>general address: 239.0.0.0 … 239.255.255.255<br>valid address range: 224.0.0.0.0…239.255.255.255 |
| **Project number** *) | Setting the Project number<br>(value range 0 … 4096) |
| **Installation number** *) | Setting the installation number<br>(value range 0 … 15) |

*) These settings are only required if the project contains more than one router

**Note**

**Bus power failure and return are reported via KNX!**
If a power failure is detected on the bus line, the error is output as a KNXnet/IP telegram. Power restoration is also indicated via KNXnet/IP.
Exception: Bus power failure and return are not reported if you select the “locked” option for **Voltage monitor**.

**Note**

**Ensure uniqueness of physical addresses!**
The physical address (tunneling address) is not managed by the ETS. For this reason, the ETS cannot prevent a double assignment of the same physical address and it is recommended that an address in the upper value range is used (e.g., 1.1.254).

**Note**

**Assign value “0” to project and installation numbers!**
The project and installation numbers are used for the compatibility of future ETS developments and should have the value “0” for current ETS projects.

**Note**

**Watch for different project numbers!**
The project number in the “Extended Device Parameters” dialog is not identical to the project number assigned in the ETS.

**Note**

**Incorrect entries will not be saved!**
Incorrect entries are not saved in the system!

**Note**

**IP Parameter Settings**
The controller plug-in can be used to set the IP parameters from the ETS (IP Addr., Subnet, etc.), see section *"KNX/EIB/TP1 Module / Controller KNX IP Parameterization" > ... > "Setting IP Parameters"*!

## 5.2.2 IP -> TP

In the **IP -> TP** menu item, set the parameters for filtering and confirmation of telegrams transmitted from the IP medium to twisted pair (TP).

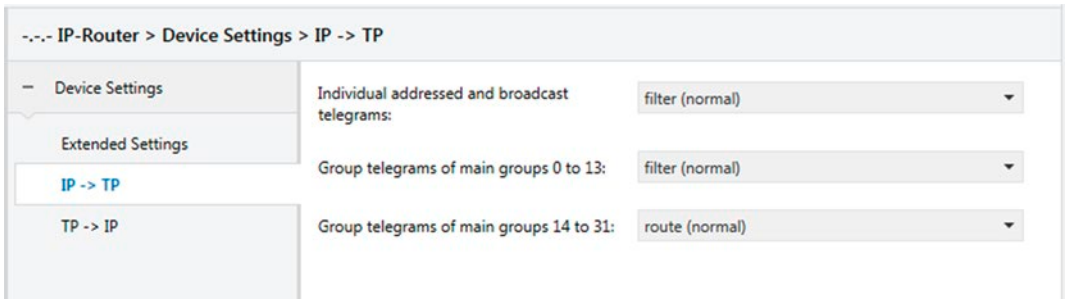


Figure 43: IP -> TP

### 5.2.2.1 Individual Addressed and Broadcast Telegrams

In this selection box, you set the filtering of physically addressed and broadcast telegrams:

- route: All telegrams are routed.
- lock: No telegram is routed.
- filter (normal): Filtering is performed according to the filter table.

### 5.2.2.2 Group Telegrams of Main Groups 0 to 13

In this selection box, you set the filtering of telegrams for the main groups 0 to 13:

- route: All telegrams are routed.
- lock: No telegram is routed.
- filter (normal): Filtering is performed according to the filter table.

### 5.2.2.3 Group Telegrams of Main Groups 14 to 31

In this selection box, you set the filtering of telegrams for the main groups 14 to 31:

- route (normal): All telegrams are routed.

- lock: No telegram is routed.
- filter: Filtering is performed according to the filter table.

## 5.2.3 TP -> IP

In the **IP -> TP** menu item, set the parameters for filtering and confirmation of telegrams transmitted from the twisted pair (TP) to the IP medium

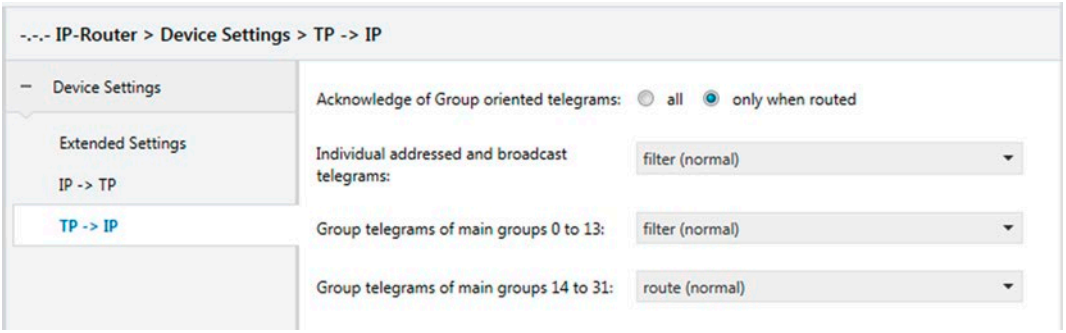


Figure 44: TP -> IP

### 5.2.3.1 Acknowledge of Group Oriented Telegrams

This selection box sets how telegrams for group-oriented telegrams are confirmed:

- all: All telegrams are confirmed.
- only when routed: All routed telegrams are confirmed.

### 5.2.3.2 Individual Addressed and Broadcast Telegrams

This selection box sets filtering for the physically addressed telegrams and broadcast telegrams:

- route: All telegrams are routed.
- lock: No telegram is routed.
- filter (normal): Filtering is performed according to the filter table.

### 5.2.3.3 Group Telegrams of Main Groups 0 to 13

In this selection box, you set the filtering of telegrams for the main groups 0 to 13:

- route: All telegrams are routed.
- lock: No telegram is routed.
- filter (normal): Filtering is performed according to the filter table.

### 5.2.3.4 Group Telegrams of Main Groups 14 to 31

In this selection box, you set the filtering of telegrams for the main groups 14 to 31:

- route (normal): All telegrams are routed.
- lock: No telegram is routed.
- filter: Filtering is performed according to the filter table.

# 6 Uninstalling the ETS Plug-in

Proceed as follows to remove the software from your system.

For controller:

1. On your PC, open the Control Panel and click “Programs,” **[Uninstall a program]**. The entry “Wago-IEC61131Controller-IpRouter” is shown in the software list.

2. Right-click the required entry and choose **[Uninstall]** in the context menu.

For modules:

1. On your PC, open the Control Panel and click “Programs,” **[Uninstall a program]**. The entry “Wago-TP1Clamp” is shown in the software list.

2. Right-click the required entry and choose **[Uninstall]** in the context menu.

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