Manual App
Reconstruction

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App Reconstruction
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Chapter 1

IT Reconstruction
1 IT Reconstruction

1.1 Welcome

We congratulate you on your purchase of Reconstruction, and thank you for it which you decided for one of our products.

With the Reconstruction it is possible to regain lost or non up-to-date ETS project data by reading out the plant.

The Reconstruction discovers all the devices connected to the Bus and collects all the data from the relevant storage.

The available functions in Reconstruction may be restricted by the used ETS license. In addition you find further details in the on-line help of the ETS.

Knowledge of Windows and ETS is necessary for an understanding of the contents described.

Reconstruction Features

How to ...

- Reconstruct an EIB/KNX installation (Reverse Engineering)
- Compare an EIB/KNX installation with an ETS project

Windows

- Main Window

Symbol bar

- Buttons: Load State, Save Current State, Scan Topology, Scan Devices, Check Products (only ETS4), Read Products (only ETS5), Read Devices, Reconstruct, Compare, Help

Additional Information

- Contact (Orders, Hotline)

1.1.1 Conventions

The following conventions were used for this manual:

- **Bold** print either highlights important terms, denotes a menu command or pressing a button.
- **Italic** print indicates a variable text, e.g. Project file indicates that the name of your project file is meant here.
- > and >> the symbol > in a brief description denotes an operational sequence. In front of the sequence symbol > there may be a site specification e.g. main menu or context menu.

Example: main menu > Edit > Properties properties-page > General means that in the main menu you should first select the Edit menu command and in it the Properties command, then proceed in the dialog which has opened up to the General properties page.

If a double mouse click is necessary the sequence symbol will be doubled >>. The terms left/right mouse button refer to the standard Windows setting.

Screen images and operating sequences refer to a Windows XP operating system. If you use another operating system, your display or operation may deviate from the illustrations in this manual.
1.1.2 Features

Reconstruction helps you to reconstruct lost or outdated ETS project data by reading the programmed devices. Reconstruction discovers all devices present on the bus and reads the relevant memory ranges. Using the product data for the devices, it then tries to create an ETS project that would lead to exactly the read device data.

Compared to the reconstruction for the ETS3, the reconstruction App for ETS4/ETS5 has been completely redesigned and offers, particularly regarding performance, significantly improved mechanisms for reconstruction. In the latest version, there are still other more intelligent, fast and fault-tolerant capabilities for reading and reconstructing projects from existing plants realized.

Area of application

- Recovery of lost ETS project data
- Update of outdated ETS project data
- Extension of unknown installations
- Creation of data for visualization (e.g. for Elvis)

This data can be recovered.

This data is not programmed into the devices and therefore cannot be recovered.

Restrictions

In some cases, reconstruction might fail or finish incomplete:

- Devices that are not supported by the ETS4 / ETS5, can not be reconstructed.

- Devices locked with an unknown BCU password cannot be read. This depends on the specific product. In most cases, readout is possible without problems, but the device cannot be reprogrammed without knowing the BCU password (there may be exceptions here as well).

- Devices that are programmed with an ETS Plug-in, can be read and reconstructed only if the device manufacturer supports this (by a corresponding Reconstruction Plug-in).

- Some application programs contain parameters that are not programmed into the device (e.g. comments for documentation). These functionally ineffectual parameters can therefore not be recovered.

- It is possible that application programs exist with complex parameter interdependencies that cannot be resolved by Reconstruction (the message "Reconstruction incomplete" will appear). Please contact our Support in this case, we will then try to find a solution.

1.1.3 System requirements

- You can use this software only together with the EIB/KNX Engineering Tool Software ETS 4.1.7 / ETS 5.0.4 or higher.
  
  For ETS2 and ETS3, older Reconstruction versions are available directly from IT GmbH.
All operating systems are supported where ETS 4.1 / ETS 5 can be installed.
The software uses less than 1MByte space on the hard disk.

1.2 Procedures

1.2.1 Launching Reconstruction

To work with the reconstruction, you first need an ETS project.
If you have no project data for installation, please create a new project in ETS and open it.
If there is already an ETS project available, but for example incomplete or outdated, please open this project.

Reconstruction integrates itself as menu command in Extras > IT GmbH (in the ETS 5 in the menu Apps -> IT GmbH). If you use Reconstruction regularly, you will find it useful to add Reconstruction as a button in the ETS toolbar.

Click on the menu item or toolbar button to open reconstruction window.

1.2.2 Project file

The current state of Reconstruction (scanned areas, lines and devices, read device data) can be saved at any time into a file and loaded later to continue work. Use the command Save Current State in the reconstruction tool bar for this task.

The Reconstruction project files have the file extension ".xml". It is also possible to load reconstruction files with extension ".prj" created by IT reconstruction for ETS3.

After certain steps such as loading, scanning, reading devices, etc., the current state is also automatically stored in the local Temp directory in the IT GmbH\Reconstruction subfolder. The file name consists of the ETS-internal project ID and the name of the project. You can navigate to your local Temp folder by entering %temp% in the Windows search box. Here you can find the latest version of your reconstruction file.

1.2.3 Reconstruct an ETS project

Using Reconstruction, you can create an ETS project from an existing installation. This is useful if no ETS project is available at all. Please add an new project with ETS, open this new project and activate the reconstruction panel.

Also, you can update an existing ETS project with data read from the installation. This is useful, if an ETS project is available but does not reflect the current status (e.g. an outdated backup copy). Please open this project and activate the reconstruction panel.

The following pages will guide you through the process of reconstructing a project. During the process, you can save at any time the current data into a project file and load it again later.

When done, you may edit the created project with ETS:
- Enter meaningful names for lines, devices and group addresses.
- Create a building structure and assign the devices to rooms.
- Reconstruction tries to assign to each found application program (software) a suitable product (hardware). For one application program there may exist more than one product in the ETS. You
may correct the assignment done by Reconstruction in Products Page or manually in ETS. Note that a product assignment not reflecting the real product has no adverse effect on functionality.

1.2.3.1 1. Define Topology

Initially, the topology (area/line structure) must be created. Reconstruction offers several ways which can also be combined.

Scan topology from installation

How it works

Reconstruction scans the installation for line and backbone couplers and derives the possible areas and lines from this information.

Prerequisites

As for all bus functions, it is important that the individual address of the gateway is set correctly (suitable to the line connected, no collision with other addresses).

- Option 1: Connect a RS232/USB module to a flush-mounted BCU already existing in the installation. Then you automatically have a correct gateway address.

- Option 2: If you connect your own gateway to the installation, first determine the line address (e.g. by pressing the programming button on another device on the same line and reading the address using ETS - result: area.line.dev). Then set the gateway address to e.g. area.line.254, scan the line area.line in ETS and and finally set the gateway address to a free address.

Procedure

- Select the "Scan Topology" and click on the corresponding button.

- Scanning the topology may take several minutes; you can abort the operation at any time.

Result

- During scan task Reconstruction checks if there is any area or line coupler for all possible line addresses (0.0 to 15.15). As result you will get a list of all those areas and lines in installation for which an area or line coupler was found (without devices). Names of areas and line are not stored in installation, therefore they cannot be recovered.

  You may save the result by "Save current State".

Enter topology manually

It is possible (e.g. if the topology is known) to enter areas and lines manually:

- Select the "Add Area" from the context menu (right mouse click in the left area of the reconstruction window). A new area is added; you can edit the automatically assigned area address immediately in area's property dialog.

- Select an area in the list and add a new line by the "Add Line" command from the context menu. You can edit the automatically assigned line address immediately in line's property dialog.

- If you accidentally created an area or line, you can remove it using the "Delete" command from the context menu.
1.2.3.1.1 Scan Single Device

If you want to read out and reconstruct just a single device with known address, of course you do not need the complete topology of installation.

- Select the "Scan Single Device" command from the context menu (right mouse click in the left side of the reconstruction window), specify the device address in the dialog box and confirm with OK. An area with a line and a device with the specified address will be inserted - if not already exist - and the scanning starts automatically.
- After the scan the device should be properly identified with Application Program ID. You can continue working with "Product data" now.

1.2.3.2 2. Scan Devices

After the topology has been defined, Reconstruction can search for the devices connected to some or all lines.

How it works

Reconstruction scans through all possible device addresses 1-255 in the selected lines. If a device is found at an address, the mask version and the Application Program ID are read to identify the device.

Prerequisite

As for all bus functions, it is important that the individual address of the gateway is set correctly (suitable to the line connected, no collision with other addresses).

Procedure

- If you are looking for devices only in certain areas or lines, please switch to the option Selected in the left window below and mark the areas or lines to be scanned with "✓". This check mark is only taken into account if the Selected option is active. If option All is active the marking is ignored at all, all areas and lines are scanned.
- Select "Scan devices" button from the reconstruction tool bar.
- Scanning the devices may take several minutes; you can abort the operation at any time.

Result

- As result you will get a list of all devices found in installation including information about individual address of each device, mask version and application program id (here still without group addresses and parameters).
- Device status should be "No product data" or "not read". In case of "Not identified" please use "Scan single device" or scan complete line once more. You may save the result by "Save current State".
Hint: The scanning process creates a considerable bus load on the affected lines. This gets worse by the fact that this function by its nature also tries to contact non-existing addresses which leads to corresponding repetitions. If you experience problems (e.g. with line/backbone couplers), you can limit the bus load by scanning the installation line by line or at least area by area, and connecting the PC directly to the line (main line) to be scanned.

No devices found?

Scan single device

1.2.3.3 3. Product data

After scanning the devices it is known which application programs are used in the installation. You can find a list on the Product Page in the reconstruction window.

If there are already product data available for all devices and all product data are assigned with correct order number you may ship this item.

In ETS4 project Reconstruction searches the ETS product data automatically for matching products. Please continue with ETS4: Check products.

In ETS5 project there are available only those product data which are already used or known in current project. Please continue with ETS5: Read products.

For devices with hint "Please select product" please open the the list with the available products by double clicking and select the desired product. If list is empty you have to import product data.

Why does Reconstruction need product data for reading devices?

1.2.3.3.1 ETS4: Check products

This section is not relevant for ETS5.

Reconstruction searches the ETS product data automatically for matching products. You should now check the product list for entries whose column application program contains only the Application Program ID and hint "Not found, please import product data".

These devices cannot be reconstructed, and may be not even read, if you do not import a suitable product database now. On Report Page or Product Page, you can export a list of Application Program IDs with missing product data.

Please note that for reading device the same product data are needed as used for programming, that applies also to the version of the application program (= the last two digits of the Application program ID)

Where do I find suitable product data?
1.2.3.3.2 ETS5: Read products

This section is not relevant for ETS4

In ETS5 project there are available only those product data which are already used or known in project. By "Read products" Reconstruction scans all manufacturer catalog items, all other opened projects and - if selected - also the online catalog for product data and adds them to current project. Depending on size of catalog this may take some time.

Read Products button in tool bar offers two options. When you click the left (main) part of the button product data searching in ETS product catalog starts for missing Application Program IDs in project. This is also the behaviour of Read products button in the yellow note window that appears just before the first run of "Read Product".

Using the small arrow in the right part of the button, you'll get a sub menu with the two entries:

- Read all products: all product data are read regardless whether were already found or not.
- Read missing products: function as above: read product data only for those Application Program IDs which were not found yet.

Of course, the second option will be faster. But after import into ETS of some new catalog entries with additional order numbers which should be used for devices with existing product data, please use the option "Read all products".

When "Read products" has finished you will be passed on Product Page. Please check the product list for entries with status "No found, please import product data". The associated devices cannot be reconstructed, and may be not even read, if you do not import a suitable product database now or open another project which contains product data.

It is necessary to perform "Read products" once more to add the new product data into the current project.

On Report Page or Product Page, you can export a list of Application Program IDs with missing product data.

💡 Where do I find suitable product data?

1.2.3.4 4. Read Devices

In this step, Reconstruction reads the relevant data from all found or selected devices.

Procedure

- If you want to read out only certain devices, please switch to the option Selected in the left window below and mark the devices to be read with ✔️. This check mark is only taken into account if the Selected option is active. If option All is active the marking is ignored at all, all devices are read out.
- Select "Read Devices" from reconstruction tool bar and click on the corresponding button.
- Reading the devices may take a very long time; you can abort the operation at any time.

Result

- As result you will get for each device information about the associated group addresses (only address, no name or text), flags and priority of connected group objects and the (not decoded) memory content of parameters (as defined in product data).
- Device Status is "Read".
  You may save the result by "Save current State".
5. Update project

This is the last step in recovering an ETS project. Access to the bus is not required.

Choose this method if the ETS project data do not exist or are outdated. You may also use this method to reconstruct a project in several iterations by reading only a part of the installation and then incrementally update it for more parts step by step.

**Note** that update overwrites the original data. Consider making a backup copy first.

During project update names, comments and other data are preserved, all newly discovered areas, lines, devices and group addresses are added, and parameters and group address assignments are updated. Areas, lines, devices and group addresses present in the ETS project, but not in the installation are not deleted.

**Procedure**

To update the project, select the "Reconstruct" button in the upper part of the reconstruction window.

**Output for reconstruction**

During the scanning, reading and reconstructing warnings, error messages, and other information are logged and listed on the Output Page.

**Result**

- In current ETS project devices and group addresses are added or updated.
  Note: names or descriptions are not stored in device's memory, so they cannot be recovered.

- **Device Status** should be "Reconstruction OK". If status is "Reconstruction incomplete", see "Incomplete Reconstruction"
  You may save the result by "Save current State".

1.2.4 Compare

You can use Reconstruction to compare an EIB/KNX installation with an existing ETS project. This is useful to

- verify the identity of design and installation (e.g. for acceptance)
- analyze problems which are otherwise difficult to find

Execute steps 1 to 4 as described for reconstructing a project or load a previous project file.

Select the "Compare" button from the reconstruction window. Access to the bus is not required during compare.

Compare will always work against the current ETS project. The comparison may take a very long time; you can abort the operation at any time.
1.3 Reference

1.3.1 User Interface

1.3.1.1 Reconstruction Window

To work with the reconstruction, you first need an ETS project.
If you have no project data, please create a new project in ETS and open it.
If there is already an ETS project available, but for example incomplete or outdated, please open this project.

The reconstruction window contains a Toolbar with the operation steps necessary for the reconstruction and displays information on the following pages:

- **Project**: Displays the topology with devices and associated group addresses.
  With the options *All* and *Selected* in the left window below you can switch between two different modes: in mode *Selected* you can mark individual areas, lines or devices via a check box, the reconstruction operations then only refer to these marked elements, In mode *All* all contained elements are processed.
  More details for selected object items you can find on the Properties dialog on the right side in ETS.
- **Products**: Overview of product data for the read Application Program IDs
- **Reports**: Reports for missing product data and devices with problems during reading or reconstruct
- **Output**: Log file for reading and reconstruction or comparison operation

Below Toolbar, in configuration (expandable) settings can be changed such as the maximum number of iterations during the reconstruction (=> incomplete reconstruction) or file path of product finder catalog file or whether the online catalog should be used for products read (only for ETS5).

1.3.1.2 Tool Bar

The Tool Bar offers the tools to work with the Reconstruction.

- **Load State** opens and loads an existing Reconstruction state from a xml or prj file
- **Save current State** saves the current state of the Reconstruction into a xml file
- **Scan Topology** scans the topology structure of the installation and adds the found areas and lines on the Project Page.
- **Scan Devices** scans for all devices in the lines listed on the Project Page, reads out their physical addresses, mask versions and Application Program IDs and displays the device items on the Project Page.
- **Check Products (only ETS4)** goes to Product Page and displays a list of all used products and Application Program ID with information if the product data are already available in ETS or have to be imported yet.
- **Read Products (only ETS5)** searches in ETS manufacturer catalog items, all opened projects and - depending on settings - also in online catalog for product data and adds them into the current project, goes to Product Page and displays a list of all used products and Application Program ID with information if the product data are already available in ETS or have to be imported yet.
Using the small arrow on the right part of the split button, two sub-menu entries are available, which differ only in the extent of the search area: Read all products performs same operation as Read products: looks for all product data in manufacturer's catalog items which matches Application Program ID - regardless whether product data are already known or not. This can be useful after importing additional catalog entries with different order numbers to an existing application program. Read missing products includes only application program IDs without known product data in project.

Read Device
reads the relevant memory data from all devices.

Reconstruct
updates ETS project based on the read data: adds - if not already exist - group addresses, areas, lines and devices in to the ETS project, calculates for each device a parameter configuration that fits to read download image and updates the parameter values in the ETS, sets the flags of group objects and links the group addresses

Compare
compares the read data with the current ETS project (same mechanism as for reconstruct but without update, only logging the differences)

Help
opens the help file

1.3.1.3 Project Page

This tab page displays all areas, lines and devices found in the installation.

Areas and Lines (left pane)
On the left, the bus topology is displayed. For area and line addresses, the number of contained devices is displayed in {} brackets.
The topology definition is always the first step when using Reconstruction. Reconstruction may scan the topology from the installation or you may create/edit the topology manually.

The buttons All and Selected indicate which elements are effected by an action. Is All clicked all elements in the topology will be affected by any action, in case Selected is clicked the action will only refer to the marked areas, lines and devices in the topology. Note that check mark is only taken into account if the Selected option is active. If option All is active the marking is ignored at all, all areas, lines and devices are effected by any action.

Devices (right pane)
On the right, all devices in the selected line are displayed. The individual columns are:

<table>
<thead>
<tr>
<th>Address</th>
<th>Individual address (device address)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Status for device data</td>
</tr>
<tr>
<td>Mask Version</td>
<td>Mask version of the device</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Manufacturer of the application program. If a number is displayed instead of the name, the manufacturer is eventually not (yet) known in the ETS4 or in current ETS5 project. In ETS5 the manufacturer's name is updated by &quot;Read products&quot;. Apart from that are line coupler, whose manufacturer code is not saved in the device.</td>
</tr>
</tbody>
</table>
If still a number > 0 is displayed, please ask our Support for an up-to-date list of the manufacturer codes.

**Application Program** Application Program ID of the device; if the corresponding product data is available in the ETS, the name of the application program is displayed.

**Product** Name of the Product (catalog entry) for the device
For some application programs more than one product assignment is possible. In this case the assignment can be made by double clicking on the list box and choosing an entry (= Change product). If you change it here the change takes affect only to current device.

**Order ID** Order number of the manufacturer (unique per manufacturer)

**Group Addresses** assigned Group Addresses

### 1.3.1.4 Products Page

On this tab page the Application programs - found in the installation - are displayed.

The meaning of the column entries are:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer</strong></td>
<td>Manufacturer of the application program. If a number is displayed instead of the name, the manufacturer is eventually not (yet) known in the ETS4 or in current ETS5 project. In ETS5 the manufacturer's name is updated by &quot;Read products&quot;. Apart from that are line coupler, whose manufacturer code is not saved in the device. If still a number &gt; 0 is displayed, please ask our Support for an up-to-date list of the manufacturer codes.</td>
</tr>
<tr>
<td><strong>Application Program</strong></td>
<td>Application Program ID of the device and name of the application if found in the ETS4 database / current ETS5 project. For user of ProductFinder who had added a product finder catalog file to configuration settings of Reconstruction: If only Application Program ID with hint &quot;Not found, please import product data&quot; is displayed, please use double-click on Application Program ID to get a complete list of all product and project files which contains product data for current Application Program ID (as query result of product finder catalog file). Using the context menu, you can copy the file path and insert it into the ETS import catalog dialog.</td>
</tr>
<tr>
<td><strong>Product</strong></td>
<td>name of the product. For some application programs more than one product assignment is possible. In this case the assignment can be made by double clicking on the list box and choosing an entry (see also: Change product). If you change it here the changes take affect to all devices with the previous selected product.</td>
</tr>
<tr>
<td><strong>Devices</strong></td>
<td>number of times the product is used by devices in the current project</td>
</tr>
</tbody>
</table>

If there are lines without application program or product information:
• in ETS5: please perform “Read products” (if not done before).
  If there are still product data missing, please import the current product data from the manufacturer (=> "Where do I find suitable product data?") and / or open another project where the required product data are used and perform “Read products” in current project once one.

• in ETS 4: please import the current product data from the manufacturer (=> "Where do I find suitable product data").

The reconstruction can be successful only if all application programs are entered and at least are assigned to one product.

With button "Export ApplIds without product data" right below you can create a text file with all Application Program IDs, which have currently no corresponding product in ETS4 database or current ETS5 project and for which an import of product data is required.

1.3.1.5 Reports Page

On this tab page the reports of the current state of reconstruction will be shown.

The Output is shown in a split window. In the left area of the window the available reports are listed and selectable. The content of a chosen report will be displayed within the right area of the report page. Here you have the possibility to print the report, to save a marked part of the report or to zoom into or out the report by clicking on the icons shown above.

The box on the lower part of the report page gives the possibility to search for text within the report. Enter the text you want to search for. If you click on the right arrow or press enter the report is searched downwards. To search upwards click on the left arrow.

In addition different search options are supported. By clicking on the black down arrow the search can be restricted.

1.3.1.5.1 Missing Products

In this report all missing products are listed with their manufacturer number and their Application program ID if the device is installed in the topology but does not exist in the ETS.

1.3.1.5.2 Problem Device

When errors appear while reading, reconstructing or comparing a device, the device will be listed in this report. The device address and the problem will be shown in the report problem device.

1.3.1.5.3 Report All Devices

List of all device data in reconstruction panel.

1.3.1.6 Output Page

This tab lists all warnings, information and error messages that occurred during the scanning, reading, reconstruct, or compare.

In contrast to the Properties dialog which displays only the information about the currently selected device, all devices in the overview will appear.

Using the button "save log file’ right below you can save the log output to a text file.

1.3.1.7 Details

This dialog displays all data regarding the marked row. Depending on what you have marked - an area, a line or a device on ProjectPage or a product on ProductPage - the dialog will appear with different
information. For multiple selection only those information are displayed which are the same for all selected entries.

Accordingly we have the following dialogs

for ProjectPage:
- **Area Details**
- **Line Details**
- **Device Details**

for ProductPage:
- **Product Details**

1.3.1.7.1 Area Details

The window shows the detail information for the area

<table>
<thead>
<tr>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of the area. If no device is listed for the area it is possible to change the address</td>
</tr>
</tbody>
</table>

1.3.1.7.2 Line Details

You have the ability to change the following Line Details in case no device exists in the line

<table>
<thead>
<tr>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of the current line</td>
</tr>
<tr>
<td>Medium Type</td>
</tr>
<tr>
<td>Medium type of the current line</td>
</tr>
</tbody>
</table>

1.3.1.7.3 Device Details

The Device Details list a higher amount of parameters than area or line details. Therefore it is divided into four parts:
- **General**
- **Communication Part Info**
- **Parameter Info**
- **Reconstruction Info**

**Common**

The general information are listed to get a more comfortable overview.

<table>
<thead>
<tr>
<th>Area</th>
<th>Line</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of area and line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address of the device, can be modified as long as the device has not yet been identified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of reconstruction for the current device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mask Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mask version of the device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer of the device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appl Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Program ID of the device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appl Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of application program for the current device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product description (Catalog entry) for the device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order number for the device (unique per manufacturer)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group addresses connected to this device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Addresses</th>
</tr>
</thead>
</table>

**Communication Part Info**

This table shows all group objects of the device and for each object the flags, priority, the length in bits and the associated group addresses.
Parameter Info

The raw image segment with parameters for the device are shown. To see the complete list use the Tool Tip.

Reconstruction Info

If a reconstruction had been started before the information for the device is shown here, if not the Reconstruction Info is invisible.

1.3.1.7.4 Product Details

These information are available (only read access).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Manufacturer's name</td>
</tr>
<tr>
<td>Appl Key</td>
<td>Application program ID or name of application program</td>
</tr>
<tr>
<td>Product</td>
<td>Product description (Catalog entry)</td>
</tr>
<tr>
<td>Devices</td>
<td>List of all devices' addresses which are assigned to current product</td>
</tr>
<tr>
<td>Product data available in</td>
<td>If you use the ProductFinder tool you may add a product finder catalog file</td>
</tr>
<tr>
<td>these file(s)</td>
<td>(xml) in configuration settings of Reconstruction. If done so, a list of all</td>
</tr>
<tr>
<td></td>
<td>product and project files will displayed here as result of a query of looking</td>
</tr>
<tr>
<td></td>
<td>for product data with current Application program ID in this product finder</td>
</tr>
<tr>
<td></td>
<td>catalog file. Using the context menu, you can copy the file path and insert</td>
</tr>
<tr>
<td></td>
<td>it into the ETS import dialog.</td>
</tr>
</tbody>
</table>

1.3.1.8 Configuration Dialog

In ETS4 the configuration dialog is located under Settings - ETS Apps.
In ETS5 you will find the list of installed apps via button "Apps" bottom right at ETS start page.
Please mark the app Reconstruction in the list of installed apps, and open the dialog via the "Configuration" button in ETS4 or via the icon (gray gear) in toolbar in ETS5.

The options set here are used for each newly created project, but can be changed project-specifically. The project-specific options are stored in the ETS import file (knxproj), so they are available after ETS import.

The project-specific options will be found in App Window at the top of the toolbar at options.

You may change the following options:

Product data handling:

- only in ETS5: Use Online catalog: If selected "Read products" will also include products from online catalog. Exception: Coupler data can only be searched locally in the product catalog.

- Manufacturer for couplers: If this option is selected together with a manufacturer from the list, during Read products only coupler products of this manufacturer are imported into the current project and offered in the product selection dialog. Please note that for couplers that have already been read out, the product data may not be changed.

- use Productfinder catalog file: here you can store the catalog file from Productfinder with information which file (on your computer) contains which application program.

Use double-click on Application Program ID at Products Page to get a complete list of all product and project files which contains product data for current Application Program ID (as query result of product finder catalog file). Using the context menu, you can copy the file path and insert it into the ETS import catalog dialog.
Identifying / reading

- only in ETS5: use long frames if supported: Try to use long frames if possible. This will considerably speed up reading devices if supported by the device, the interface and any couplers in between. In case of read-out problems, re-try with this option unchecked.
- identify unloaded devices: As unloaded devices usually do not contain any meaningful data in the device memory, they are skipped during identification. With this option, the Reconstruction also reads the identifiers from these devices so that they can be read and reconstructed in exceptional cases.
- Show warning for devices identified or read out with a previous version of reconstruction

Reconstruction

- Overwrite existing device: You can choose between the options "Always", "Never" and "Prompt". For "Always" devices already existing in ETS project are overwritten with the reconstructed parameters and group address data, for "Never" they will be skipped, and for "Prompt" you will be asked for each device before reconstruction starts with the possibility to confirm, skip, change to "Always" or cancel the procedure.
- Maximum of iterations for undetermined parameter values: some products contain many virtual parameters, which the Reconstruction cannot determine in one step because of too many possible combinations. The maximum number of iteration steps is set to 100 so that the reconstruction does not take an extremely long time to calculate and possibly does not find a suitable solution. You can use this option to change this number.
- Use algorithm for ETS4 applications also for older products (PreETS4 style): activation of this option is recommended, as most older devices can also be quickly reconstructed using the reconstruction mechanism specially developed for ETS4-native application programs. Only for a few multifunctional devices with many virtual parameters and communication objects the method for older devices may be more useful. In this case please deactivate the option and execute the reconstruction for these devices individually. Usually the reconstruction has to be performed several times until all necessary parameters are determined.

1.4 Questions and Answers

1.4.1 Result of reconstruction

As result Reconstruction provides an updated ETS project with devices and group addresses used in current installation (see: Procedures > Reconstruct an ETS project). Parameter settings of devices and group object associations are set corresponding to installation.

This applies under the condition that all devices in installation can be read out completely, that all product data are available in the current ETS and can be used and that a suitable parameter combination could be calculated basing on the product data and the data in the parameter image of the devices. For not fully reconstructed devices, see reconstruction incomplete.

Building structure as well as names and descriptions etc. of areas, lines, devices and group addresses are not stored in installation, so they cannot be recovered (Which data can't be recovered?). When Reconstruction inserts a new area, line, main or middle group or group address into the current ETS project these items will get the name “Added by reconstruction”. It is recommended to replace this name by appropriate labels in the context of the post processing of the project.

If you choose the command "Compare" instead of "Reconstruct", the status of the devices in the reconstruction window informs you whether differences on the project were found or not. Reconstruction will compare only on the basis of the data in current installation, this means that devices that exist in ETS project, but not in the installation, shall be disregarded.
1.4.2 Does reconstruction work also for old projects?

Reconstruction also works for old projects which were created with a previous ETS version (since ETS1).

The only important criterion is that the product data which had been used for programming are now present in current ETS version - exactly with the same Application programm ID as used for programming.

Product data should exist at least in ETS2 format, so that they can be imported into the current ETS. The exact format does not matter (vdx... vd5 or knxprod), even a project file is sufficient (prx... pr5 or knxproj).

However, a few old products are no longer supported in ETS4/ETS5 - in the ETS product catalog or device overview it will be marked by "Re-import required". If these devices cannot be inserted into a current ETS project, so they cannot be reconstructed.

1.4.3 How long takes reconstruction?

There is no universal answer for this question. Time needed for reading and reconstructing depends on the size of the installation, kind of integrated devices, bus traffic, gateway etc..

A reconstruction task contains the topology scan, scanning and reading devices in installation (bus access is needed for each one) and the reconstruction and then the real reconstruction process (offline) which creates (or compares) devices and connected group addresses in the current ETS project based on data read from installation.

If topology of installation is known, scan of topology can be replaced by editing the areas and lines manually.

Scanning and reading will be faster if the local gateway is mounted in each line (note: adapt address of gateway to current line) and so the devices in installation will be read line by line.

The real reconstruction process (adding device in ETS project, parameter settings, connections with group addresses) can be done in less than a minute but also take about one or more hours. This depends on product data (parameter structure).

Normally, devices with BCU1 can be read and reconstructed faster than devices with other masks.

1.4.4 Why does scan topology find only area 0 and area 15?

Possible causes:

- The individual address of the data interface as configures in ETS has not been set or does not match the line where the interface is connected (e.g. local address 15.15.255 on line 1.1).

- The line address can be determined e.g. by putting a device on the same line into programming mode and read its address with the ETS function Diagnostics/Individual Addresses.

- What to do: configure a correct address for the data interface (in ETS 4 in Settings - Communication, in ETS5 in Bus - Connections - Interfaces).

1.4.5 Why no devices are found?

Possible causes:
The individual address of the data interface as configured in ETS does not match the line where the interface is connected (e.g. local address 1.1.250 on line 1.7).

The line address can be determined e.g. by putting a device on the same line into programming mode and read its address with the ETS function Diagnostics/Individual Addresses.

**What to do:** configure a correct address for the data interface.

A device in the installation has the same individual address as the data interface.

In ETS4 you can check this in Settings - Communication in ETS5 in Bus - Connections - Interfaces

**What to do:** configure a correct address for the data interface.

A line coupler is configured incorrectly

**What to do:** Scan line by line.

There are special devices for the purpose to inhibit programming and read-out of devices on the bus.

Try to read a device with the ETS function Device Info (you can determine the address as above via programming mode). If that does not work, such a device might be the cause.

**What to do:** you have to locate (that's the difficult part) and remove the interfering device.

The installation contains only one physical line (no line couplers) but the devices have addresses with different line parts (e.g.: 1.1.3, 1.2.5, 1.4.200).

Such an installation does not conform to the KNX/EIB topology; reconstruction therefore cannot determine the topology.

**What to do:** Enter the topology manually in reconstruction (Edit > Add area/line)
- or -
Change the local address for each of the "lines" e.g. for 1.1.3 to 1.1.x, for 1.2.5 to 1.2.x etc.
- or -
Correct the device addresses using ETS before using reconstruction.

**1.4.6 Why can't devices be read out?**

**Possible causes:**

No product data found.

**What to do:** Import product data - and for ETS5 perform "Read products". (=> What means "No Productdata"?)
The Device is locked with a BCU password.

What to do: delete BCU password.

The Device uses a PlugIn software (supplementary software).

Such devices can be only read out and reconstructed, if the device manufacturer supports this (with an appropriate Reconstruction Plugin).

What to do: If the device uses a product-specific parameters dialog (see "parameters" in ETS) please take a look there for a product-specific reconstruction.

If the device is not already in ETS project, please mark it in the reconstruction window and perform "Reconstruct", so it will be inserted into ets project. Alternatively, you can also add it manually from product catalog. Please observe the correct individual address.

Application program is unloaded. To check, read the device via the ETS device info and check the loaded state

What to do: if device is unloaded the device memory may not contain consistent data. Using option "identify unloaded devices" in Configuration you may read also devices with unloaded application programs. However, the result usually does not contain any useful data.

Only for ETS5: ETS try to use long frames. This will considerable speed up reading devices if supported by the device, the interface and any couplers in between.

What to do: disabled "use long frames if supported" in Configuration and try reading device once more.

1.4.7 Which data can be recovered?

- Topology (areas and lines)
- Devices
  - Individual address
  - Used application program
  - Parameter settings
  - Communication object flags and priority
  - Assigned group addresses
- Group addresses

1.4.8 Which data can't be recovered?

- Building and function structure
- Names and descriptions of areas, lines, devices and group addresses
Some application programs contain parameters, which are not programmed into the Device (e.g. comments on the documentation). These functionally insignificant parameter values cannot be reconstructed therefore.

1.4.9 What means "No Productdata"?

Reconstruction cannot find any product data in ETS4 database or in current ETS5 project which matches for the read Application Program Id.

For reading and reconstruction product data will be needed with actually the same application program (manufacturer, device type and version number) as it was used for programming the device. An former or newer version of the application program won't help you.

If you use ETS4, please import missing product data (=> Where do I find suitable product data?)

If you use ETS5, please perform “Read products” first to look for product data in ETS5 manufacturers’ catalog items and also in online catalog (if selected in configuration) and add them into current ETS5 project. If you want to get product data used in another project please open this project and perform "Read products" once more.

If nevertheless no product data are found, please import missing product data (=> Where do I find suitable product data?) and perform "Read products" once more.

1.4.10 Where do I find suitable product data?

- Import the current product databases of the listed manufacturers.
  
  In ETS5: When all import ist done, please perform "Read products" in current reconstruction project.
  
- If that does not help: Ask the product manufacturer; with the help of the Application Program ID, they may be able to provide you with the missing data.
  
  For reading and reconstruction product data will be needed with actually the same application program (manufacturer, device type and version number) as it was used for programming the device. An former or newer version of the application program won't help you. Product data format (ETS2, ETS3 or ETS4/5 product data or even an ETS2, ETS3 or ETS4/5 project file) is not relevant.
  
- For couplers Mask version is used instead of Application Program ID. Because there is no manufacturer code to read any coupler program with the appropriate mask version of any manufacturer's product data will be sufficient to read out of the device. A read coupler device requires for reconstruction that product data which was used to read.
  
- For some (only few) products a re-import of product data is required. Please contact the product manufacturer.

- Reconstruction can also work with product data that were inserted into ETS by project import - even if they are not available in ETS catalog. If there is any (older) ETS project file (prx, pr1, ..., pr5 and knxproj) with a device using the required product, please import it into ETS.
  
  In ETS5: Please open also this project and perform "Read products" in current reconstruction project.

- For the customers of a reconstruction tool there is a special tool ProductFinder available which helps to get an overview of all Application Program IDs stored on your computer in product data files (vdx, vdl, ..., vds and knxprod) or ETS project files (prx, pr1, ..., pr5 and knxproj) and provides searching for a special application program in these files.
  
  ProductFinder is available at the IT GmbH.

Only for users of ProductFinder: starting with version 4.0.431 you may add a product finder catalog file (xml) in configuration settings of Reconstruction. Use double-click on Application...
Program ID at Product page of Reconstruction to get a complete list of all product and project files which contains product data for current Application Program ID (as query result of product finder catalog file). Using the context menu, you can copy the file path and insert it into the ETS import dialog.

**Attention!**

**Important in ETS5:** When all import is done, please perform "Read products" in current reconstruction project. If also product data from another project should be used, please open this project before "Read products".

**1.4.11 Why is the product data needed?**

In Contrast to former versions of Reconstruction (e.g. 1.x and 2.x) the current version of Reconstruction needs the complete product data for all types of devices before reading:

- Devices with external processor can in general not be read completely without product data, even if they report mask version $001x$, because they normally contain additional memory ranges.

- Devices with ETS Plug-ins can in general only be read with the help of special Reconstruction Plug-ins, because they have possibly different memory layout.

- BCU2 and BIM M112 based devices can be read much faster with product data, because the relevant memory ranges can be accessed selectively.

**1.4.12 What means "Please select product"?**

Reconstruction cannot find a unique assignment between Application Program ID read from device and product data in ETS4 database or ETS5 project. Possible reasons:

- product data contains only application program but no products, list of available product data (project page or product page) is empty.
  Please import product data (and for ETS5 perform "Read Products").

- product data contains more than one product entries with different order numbers.
  Please double click in the column Product (project page or product page) and select one entry (=> "Change product settings").
  In particular this applies for coupler devices which are not yet read. Here is only the mask version known and the list of available products contains all coupler products from all manufacturers.

- product data in ETS4 database or ETS5 project does not contain the combination of order number (stored in project file) and application program.
  Please open the list of available products and select another one (=> "Change product settings") or import new product data (and perform "Read Products" for ETS5).

**1.4.13 Change product settings**

There may be more than one product entry for an application program.

On the product page double click on an entry in the column Product, a list appears with all product entries currently available in ETS database for the appropriate application program. If necessary, please correct the taken mappings after reading. This mapping applies to all devices with the previous selected product.

If different devices with the same Application Program ID should use different product entries please make changes on project page for each device.
Note: Application Program ID can not and must not be modified manually in reconstruction. Application Program ID is unique within all product data and identifies exactly the application program which was used for programming the device. If changed reconstruction would try to access invalid device memory.

### 1.4.14 Info for device status

Depending on progress of the read or reconstruction result for devices there are different values for device status:

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not identified</td>
<td>Device was yet not identified, e.g. Application Program ID or mask version is missing, may happen in case of an error during scanning or when device was added manually but address could not be found in installation. It is also possible that the application program is not loaded. In this case, the device memory most likely does not contain any consistent data. However, you can still identify the device using the &quot;Identify unloaded devices&quot; option in the configuration dialog. If device is part of installation please use &quot;Scan single device&quot; or scan complete line once more.</td>
</tr>
<tr>
<td>Local</td>
<td>Device is local gateway and will not be identified neither read neither reconstructed</td>
</tr>
<tr>
<td>No product data</td>
<td>ETS does not contain - or maybe for ETS5 does not (yet) know - corresponding product data for the Application Program ID. If you use ETS4, please import them. If you use ETS5, please perform &quot;Read products&quot; first. If there are nevertheless product data missing please import new product data and perform &quot;Read products&quot; once more. For reconstruction product data with same Application Program ID are required. (=&gt; What means &quot;No Productdata&quot;?)</td>
</tr>
<tr>
<td>Re-import product data</td>
<td>Only for a few devices: required product data are already in ETS database but current version of product cannot be inserted into ETS project. Please import product data (with same Application Program ID) which are up-to-date.</td>
</tr>
<tr>
<td>Not read</td>
<td>Device was yet not read</td>
</tr>
<tr>
<td>Read</td>
<td>Device was read without errors</td>
</tr>
<tr>
<td>Read incomplete</td>
<td>Device data read are incomplete, e.g. parameter image or group communication tables are missing or incomplete (=&gt; please try read again)</td>
</tr>
<tr>
<td>Not reconstructed</td>
<td>Device was read, but not yet reconstructed or compared</td>
</tr>
<tr>
<td>Reconstruction OK</td>
<td>Last reconstruction was successful, the ETS device's download image is identical to the read image</td>
</tr>
<tr>
<td>Reconstruction incomplete</td>
<td>Last reconstruction was not successful, e.g. the ETS device's download image is different from the read image, or assigning group addresses with group objects failed because of inactive group objects or mismatch</td>
</tr>
</tbody>
</table>
of length. You may increment the parameter settings' iterations steps, as described in Incomplete reconstruction.

Identical
Last compare did not find any differences, the ETS device's download image is identical to the read image.

Differences found
Last compare found differences

1.4.15 Incomplete reconstruction

Although most devices can be reconstructed easily and completely, there are individual exceptions. Please see Reconstruction info on property page for details.

- Devices with Plug-In software can use its own reconstruction methods. If the device uses a product-specific parameters dialog (see "parameters" in ETS) please take a look there for a product-specific reconstruction.

- There are some application programs with complex parameter interdependencies that cannot be resolved by Reconstruction in some combinations.

In these cases, the reconstruction mechanism performs an iteration through various combinations with the aim of finding a parameter configuration which would produce the same download image as the data read. Because the creation of the virtual device image is a very memory-intensive operation, the reconstruction stops after 100 iterations. If not all possible combinations have been tried, a corresponding message is displayed in the reconstruction info in the device's Properties dialog.

In these cases, it can be useful to increment the upper limit of 100 iteration attempts. Please expand configuration settings just below the tool bar of Reconstruction and increment the number of iterations for undetermined parameters. Now re-start reconstruction only for the incomplete reconstructed device by using the option selected. Note that reconstruction may work long time.

- Another option for older multifunctional devices with a lot of virtual parameters: Disable the option "Use algorithm for ETS4 applications also for older products" in the configuration settings. Now please only reconstruct the previously incompletely reconstructed device using the option "Marked", repeat this procedure several times until all required parameters are determined.

- Reconstruction will also fail when there are group addresses which cannot be linked with group objects.

Maybe reconstructed parameters do not activate the mentioned group object. If there is a hint in reconstruction info that not all parameter combinations are tested, please increase the number of iterations for undetermined parameters as described above. Alternatively, sometimes deactivating the option "Use algorithm for ETS4 applications also for older products" with subsequent multiple reconstructions can help.

Or maybe the group address is already connected to another group object with different length. In this case of inconsistent data Reconstruction will fail even until the invalid association is removed.

In ETS5 group addresses without a connection can also get a datapoint type. If this datapoint type does not match the connections the Reconstruction wants to create, please delete group address in ETS first, Reconstruction will insert it.

If the device is still not reconstructed completely, please contact our Support, we will then try to find a solution.
1.4.16 Reconstruction and plug-ins

Devices which use plug-ins normally can not be reconstructed without same additional information. So Reconstruction provides an interface for a special reconstruction plug-in which can be implemented by the product manufacturer and distributed by product data.

This special reconstruction plug-in will be automatically executed during device reconstruction and can either implement its own reconstruction mechanism for parameter and group objects or restitute this order to standard mechanism of Reconstruction.

If a special reconstruction plug-in is used you will find a hint like "External association compare for Plugin .." or "External association update for Plugin .." in reconstruction info.

Plug-in devices without this reconstruction interface cannot be reconstructed by Reconstruction, but some of them can be (partially) read at least.

Some plug-in devices provide an own reconstruction option in the product-specific parameter dialog: If device is not yet part of ETS project, please add it with correct individual address, then select "parameter" and open the product specific parameter dialog.
Chapter 2

Imprint
2 Imprint

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Chapter 3

Contact
3 Contact

Orders
ETS App Reconstruction is available only at KNX Onlineshop. For information and orders please contact our sales office:
- Phone: +49 (0) 911 518349-0 (Mo-Fr 9 a.m. to 16 p.m.)
- Fax: +49 (0) 911 5183688
- Email: vertrieb@it-gmbh.de

Hotline Service
If you have questions or problems, you may contact our Hotline:
- Phone: +49 (0) 911 518349-10 (Mo-Fr 9 a.m. to 4 p.m.)
- Fax: +49 (0) 911 5183688
- Email: hotline@it-gmbh.de
- WEB: problem report

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Chapter 4
Feedback
4 Feedback

Please help us to improve Reconstruction. Your feedback may influence further development so that in subsequent Reconstruction versions and manual editions your wishes and requirements may be taken into consideration. We look forward to receiving your comments and wishes on the content, representation of associations as well as comprehensibility regarding Reconstruction program parts or documentation. Please also let us know if you have any improvement suggestions with regard to support, training or sales.

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