Parameter editor

.MAP120

User manual

Date: 06.05.2024

File name: D000043592 dotMAP120 User manual en AB.docx

Revision history

Version	Date	Comments
a	22.05.2012	First edition.
b	06.07.2012	Changes to .MAP120 release 2.1.
c	04.04.2013	Changes to .MAP120 release 2.2.
d	15.11.2013	Changes to .MAP120 release 2.3; Support for Windows 8, comparison of device descriptions, separate layout definitions for print and comparison. Print preview changed, check for update can be called up from "About" window. Several minor changes (text, screenshots, index).
e	09.12.2014	Changes to .MAP120 release 3.0 (see also read-me file); Communication with message security and additional access mechanisms (authentication), individual passwords and keys per device, enhanced storage policy for keys and passwords, enhanced character set for passwords, new icons in communication toolbar, new folder icon in tree, new representation of errors and warnings. Document structure modified.
f	17.03.2015	Changes to .MAP120 release 3.1 (see also read-me file); Toolbars and status bar of device description window changed, new progress visualisation while reading from device, creating or opening device descriptions.
g	26.10.2015	Changes to .MAP120 release 3.4 (see also read-me file); Operating System Windows 10 supported, "Uninstall" removed from start menu, "File new" split into two menu items, block transfer for write, set and action services can be enabled/disabled in the DLMS application layer settings, several minor changes (text, screenshots, index).
h	07.09.2016	Changes to .MAP120 release 3.7 (see also read-me file); New version of communication settings, TCP and UDP supported in network layer, New search function added to the tree view toolbar, Update to Microsoft .NET framework 4.6. About box extended with license information.
k	31.05.2017	Changes to .MAP120 release 3.9 (see also read-me file); New section 2.3 for required setting when operating .MAP120 on high resolution displays, several shifts of menu items in the menu bar, changed firmware selection for creation of new device descriptions, updated parameterisation wizard for new device types, new version of communication settings, extended access levels, new level authentication using SHA-256, several minor changes (text, screenshots).
m	18.07.2019	Changes to .MAP120 release 4.4 (see also read-me file); adaptation to changed communication user interfaces.
n	13.01.2020	Changes to .MAP120 release 4.5 (see also read-me file); adaptation to changed communication user interfaces. New screenshots with Windows 10 operating system.
p	04.12.2023	Landis+Gyr contact address updated.
AA	18.12.2023	Windows OS version updated.
AB	06.05.2024	Info on the new user management license added in section 3.2.

Table of contents

Introduction

Scope

The present user manual is designed for the Landis+Gyr .MAP120 Parameter Editor **Release 4.5** and higher.

Purpose

This user manual contains all information required for the use of the Landis+Gyr .MAP120 Parameter Editor. It not only provides explanations concerning functionality and general procedures, but also gives detailed, illustrated instructions on how to use the software.

Target group

The contents of this user manual are intended for technically qualified personnel of energy supply companies responsible for system planning, parameter setting and installation of devices.

Conditions

The Landis+Gyr .MAP120 Parameter Editor runs on PCs with Windows operating system. To understand this user manual, you need basic knowledge of Windows and its terms, as well as a general idea of how to operate a PC. Furthermore, you need to be familiar with the functional principles of the various devices supported by the Landis+Gyr .MAP120 Parameter Editor, which are described in the corresponding user manuals and functional descriptions.

Conventions

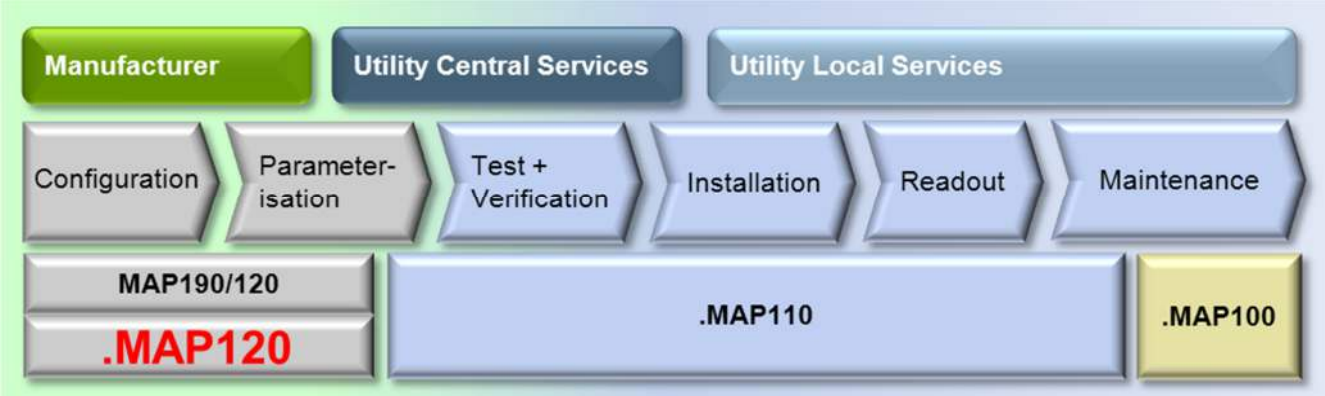
The following conventions are used in this manual:

1. 2. 3.	Ordinal numbers are used for individual steps in the instructions.
Tools	Buttons, menu names and individual menu items appear in bold text.
[F1]	Keys are shown in square brackets.
[Ctrl]+[V]	Key combinations are shown with a plus sign (e.g. [Ctrl] key kept pressed while pressing [V] key)
"Options"	Names of windows and elements appear in quotation marks.

1 Overview

The Landis+Gyr .MAP120 Parameter Editor supports services needed to edit and download complete device descriptions (parameterisations) into the supported Landis+Gyr devices.

The following diagram illustrates the various fields of application of the Landis+Gyr MAP and .MAP Tools.



1.1 Functions

The Landis+Gyr .MAP120 Parameter Editor supports the following main use cases:

1. Creating a device description file for manufacturing and documentation purposes
2. Changing parameters of a connected device (e.g. at utility central services)

The range of functions comprises:

- Create and edit device descriptions
- Read complete device descriptions from devices
- Write complete device descriptions or specific parameter groups (e.g. time of use, security system) to devices and execute related actions (e.g. clock setting, register reset)
- Save and open complete device descriptions
- Print device descriptions
- Compare two device descriptions

1.2 Communication channels

The Landis+Gyr .MAP120 Parameter Editor can communicate with the devices via the following communication channels:

- **Serial:** Optical reading head, Bluetooth reading head, RS232, RS485, CS, M-Bus
- **Modem:** PSTN, GSM
- **Network:** GPRS, Ethernet

1.3 Communication protocols

The Landis+Gyr .MAP120 Parameter Editor supports the following communication protocols:

- DLMS / HDLC
- DLMS / TCP (wrapper) with IPv4 and IPv6
- DLMS / UDP (wrapper) with IPv4 and IPv6
- IEC 62056-21 (formerly known as IEC 1107)

1.4 DLMS security

The Landis+Gyr .MAP120 Parameter Editor supports the following DLMS security features:

- DLMS access security (low level and high level security)
- DLMS message security (security suite 0)

1.5 Editions

The Landis+Gyr .MAP120 Parameter Editor is only available in a Standard Edition.

1.6 Supported devices

Please refer to the read-me file (see section 7.9 "Displaying release notes") for a list of supported devices.

2 Installation and Uninstallation

This section describes the installation of the Landis+Gyr .MAP120 Parameter Editor on your PC and its uninstallation if it is no longer used.

2.1 Installation

System requirements

To be able to run the Landis+Gyr .MAP120 Parameter Editor, your PC must be equipped with the operating system Windows 10 or Windows 11.

For 64 bit operating systems dedicated hardware drivers (e.g. for the optical head or other communication equipment) might be needed. Please contact the vendor of your devices to obtain a driver update, if necessary.

Additionally, the following system component, which is not part of the Landis+Gyr .MAP120 Parameter Editor, must be installed on your PC:

- .NET Framework Version 4.6.1 or later

Administrator privileges

Administrator privileges on your computer are required for the installation and the licensing.

Installation software

The installation software for the Landis+Gyr .MAP120 Parameter Editor can be downloaded to your PC via the Internet from the Landis+Gyr homepage www.landisgyr.eu. Please contact your sales representative to receive the required username and password for the download.

Language

The required language must be selected at installation time. It can be changed again at any time in the Landis+Gyr .MAP120 Parameter Editor.

Preparation

Please read the file "dMAP120_Readme.txt" with current information about the present release of the Landis+Gyr .MAP120 Parameter Editor.

First installation

Start the installation file "Setup.exe" and then follow the instructions of the setup wizard.

Upgrades

Close the Landis+Gyr .MAP120 Parameter Editor, if it is in use. Then start the installation file "Setup.exe" and follow the instructions of the setup wizard.

When **upgrading a former release 4.5** to the latest release 4.5, the former release will be automatically replaced by the newer one. All data including the license and the communication settings is kept.

When **upgrading a former release 2.x, 3.x, 4.0, 4.1, 4.2, 4.3 or 4.4** to the latest release 4.5, the new release can be installed in parallel to a former release in a separate directory. All data including the license and the communication settings is kept.

Former releases 1.x can't be upgraded.

Landis+Gyr recommends removing older releases since they will no longer be supported.

2.2 Uninstallation

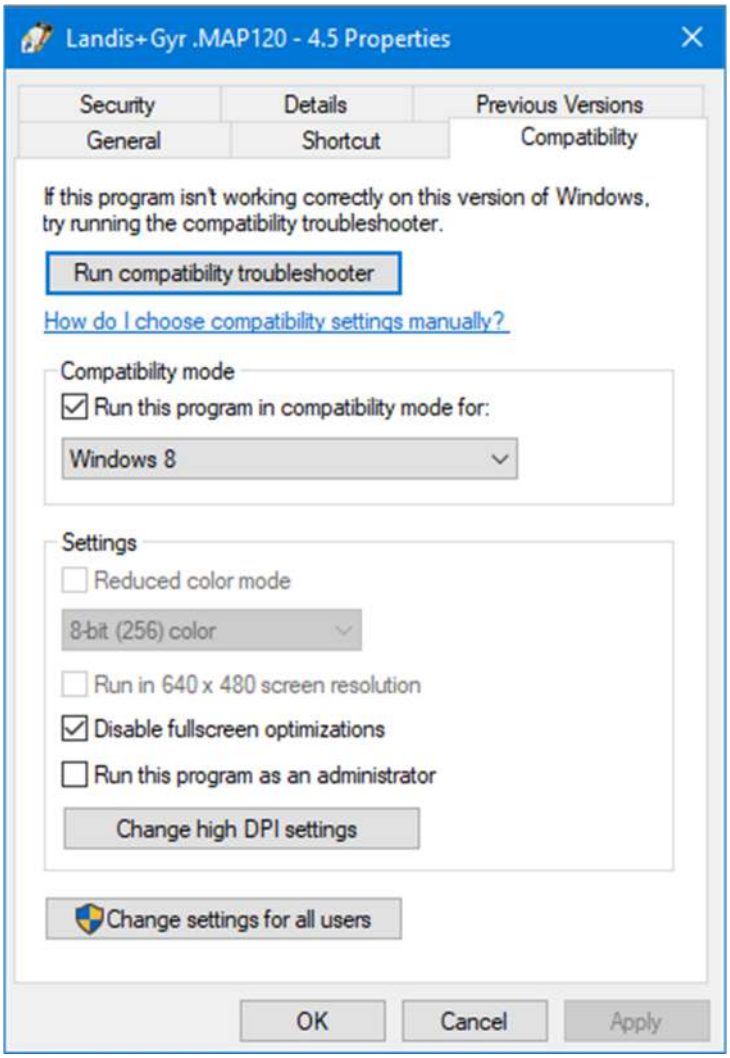
If the Landis+Gyr .MAP120 Parameter Editor is no longer needed, it should be uninstalled.

To do so, open the Windows Control Panel and use "Uninstall a program" from the "Programs" category.

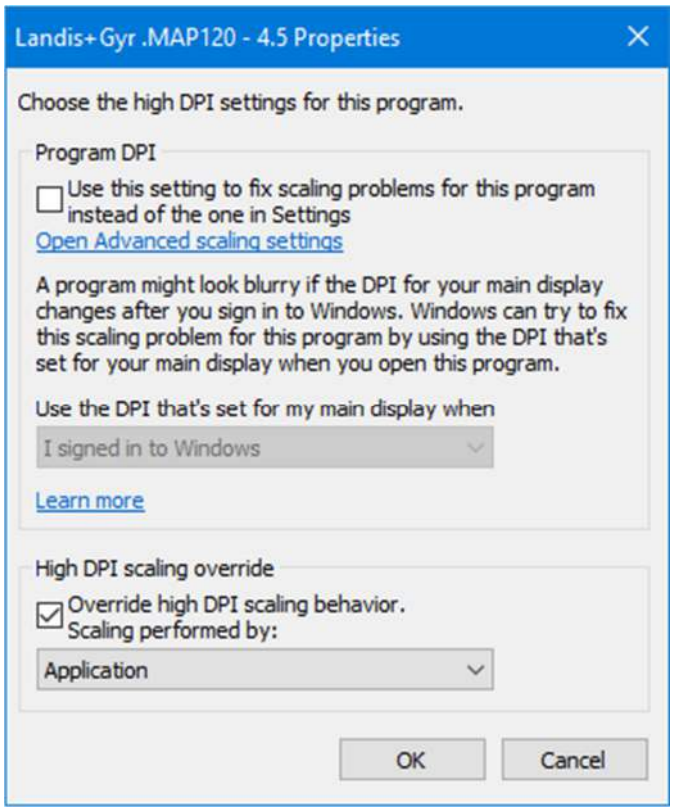
2.3 Required setting when operating .MAP120 on high resolution displays

On computers with high resolution displays (e.g. UHD with 3840 x 2160 pixels) or in general when using a Windows display scale factor of more than 150% a special setting is required to operate the Landis+Gyr .MAP120 Parameter Editor. Without this setting the tool will appear very small with a scale factor of 100% and can hardly be used.

The Landis+Gyr .MAP120 Parameter Editor must be started using a link in which the "Disable fullscreen optimizations" checkbox is ticked in the "Compatibility" tab:



Furthermore the "Override high DPI scaling behaviour." checkbox in the additional window which appears after clicking the button **Change high DPI settings** must be ticked:



Nevertheless a few icons in the application tool bar still will be shown minimized. But this doesn't affect the usability of the Landis+Gyr .MAP120 Parameter Editor.

It is planned to modify the program so that it will work properly in the future without this setting.

3 Licensing

Landis+Gyr provides two different license types.

- The standard license
- The user management license

This section explains the licensing concept and describes the steps necessary for licensing the Landis+Gyr .MAP120 Parameter Editor.

3.1 Concept of the standard license

After installation, the Landis+Gyr .MAP120 Parameter Editor is in the unlicensed state, i.e. it can only be used as demo version with reduced range of functions. In order to permit the use of the Landis+Gyr .MAP120 Parameter Editor without restrictions, it must be licensed. For this purpose, the following licensing data can be obtained from the Landis+Gyr representative responsible, which must be entered in the Landis+Gyr .MAP120 Parameter Editor:

- User Name
- User Group
- License Key

The procedure is described in section 3.1.1 "Entering license data".

MAP120 licence key is not valid for .MAP120
The license key for the former Landis+Gyr MAP120 Parameter Editor cannot be used for the Landis+Gyr .MAP120 Parameter Editor. A new licence key is required.

The license of the Landis+Gyr .MAP120 Parameter Editor release 2.2 or later is handled individually per Windows user and per .MAP120 main release on a single PC. If several persons share the same PC, the required .MAP120 user group with its specific functionality can therefore be individually assigned to each Windows user (up to release 2.0 the same license was used for all Windows users of a single PC and all .MAP120 releases).

When upgrading a former .MAP120 release 2.x to release 2.2 or later the current license is kept, i.e. it is copied once for each Windows user of the PC from the former release.

From release 2.1 any license change or a new license only affects the current Windows user and the current .MAP120 main release.

The license conditions remain unchanged, i.e. all existing and new licenses can be further used by one or several Windows users on one or several PCs. Please note, that normally the user name in the .MAP120 licence and the Windows user name are different.

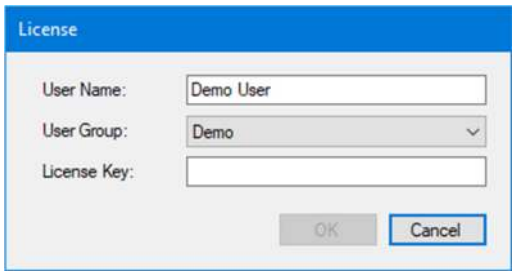
3.1.1 Entering license data

This section describes the licensing procedure required for unrestricted use of the Landis+Gyr .MAP120 Parameter Editor. The license data received from Landis+Gyr following your order is required for this purpose.

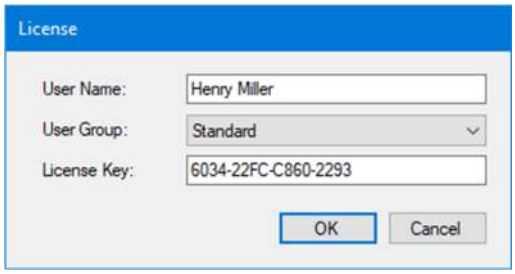
Administrator privileges required
Administrator privileges on your computer are required for the licensing.

Procedure:

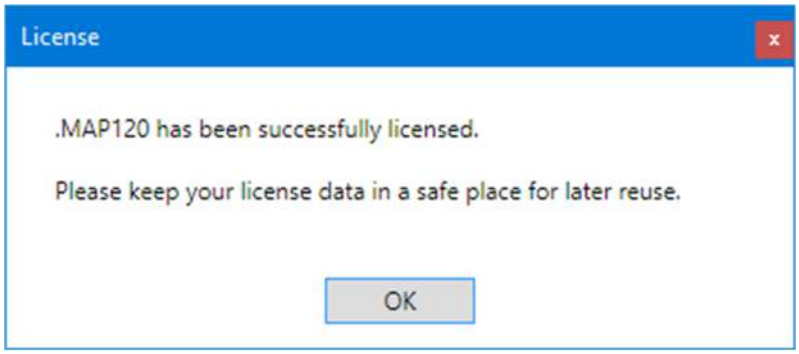
1. Click on **Start** and then under **All programs** select the **Landis+Gyr** program group.
2. Right click on the **Landis+Gyr .MAP120 - 4.5** command and then select the entry "Run as administrator" in the popup menu appearing.
   The Landis+Gyr .MAP120 Parameter Editor is started.
3. Select **License** from the **Tools** menu.
   The "License" window appears.



4. Enter the user name provided by Landis+Gyr in the "User Name" entry box.
5. Select the user group provided by Landis+Gyr in the "User Group" drop down list.
6. Enter the licence key provided by Landis+Gyr in the "License Key" entry box.



7. Click on **OK**.
   The licence data is checked and a success message is displayed.



8. Click on **OK**.
   The licensing procedure is terminated.

The Landis+Gyr .MAP120 Parameter Editor is now ready for use according to the instructions given in the following sections.

Keep the license key in a safe place
Please note that due to security reasons the license key is not shown anymore if the "License" window is reopened. Keep the license key in a safe place for further use.

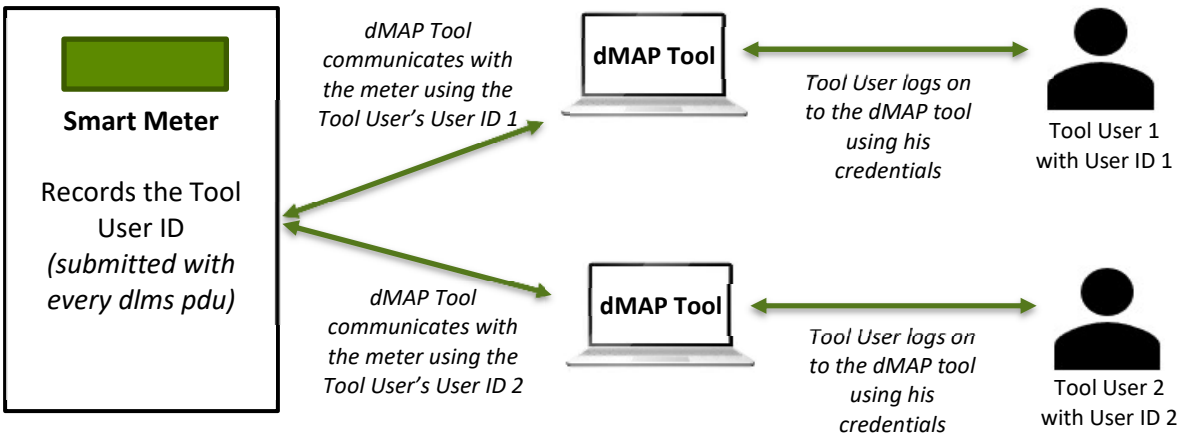
3.2 User management license

In the last few years many utilities have understood that smart metering is a part of their smart grid and with this, part of critical infrastructure. Millions of smart meters, deployed in every residential home, must be protected against misuse as an entry point into the utility IT network. This triggers increased security at smart meters and also at any field tools and in particular the Landis+Gyr dMAP tools.

Our dMAP tools (dMAP120 ver. 4.14.x and later) with the new user management address these needs. With the user management license, dMAP Tool Users must authenticate themselves when using the dMAP tools by entering their username and password. For each dMAP Tool User, the dMAP transmits a pre-defined user ID to the linked meter. The meter then stores this user ID, allowing utilities to identify the tool user who communicated with a meter and to some extent the changes made to the meter parametrisation.

For maximum security, it is even possible to “dongle” a Tool User to one specific PC. If activated, the dMAP tool traces the login data of the Tool User and transmits it to a SFTP server.

Detailed information is described in an additional user manual, which will be provided with the user management license. Please get in touch with your Landis+Gyr representative for a commercial offer on this new functionality.



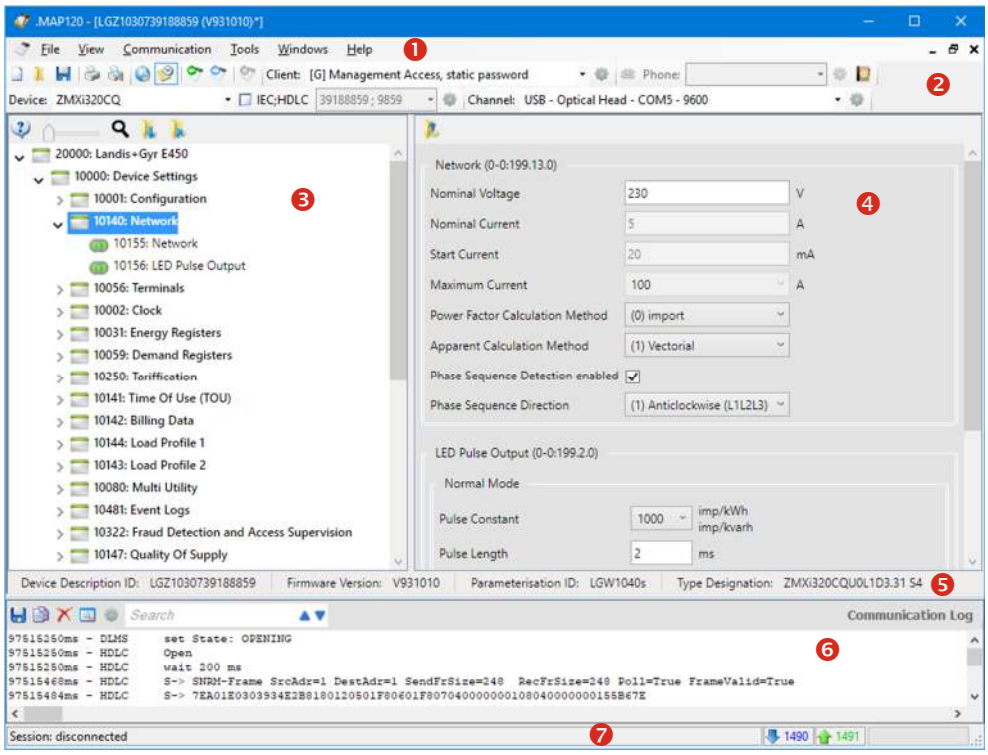
4 Description of user interface and general functions

This section describes the user interface of the Landis+Gyr .MAP120 Parameter Editor and contains procedures to use its functions.

4.1 Overview

The user interface of the Landis+Gyr .MAP120 Parameter Editor comprises the following areas:

- Menu bar (1) with menus to select functions.
- Toolbars (2):
  - Application toolbar
  - Access level toolbar
  - Address toolbar (either phone number or IP address is visible)
  - Device toolbar
  - Communication channel toolbar
- Device description window:
  - Tree view of device description (3)
  - Detail view of device description (4)
  - Status bar of device description (5)
- Communication log (6) for recording and analysing communication activities
- Status bar (7) for displaying data about the current communication status.



The sizes of the areas for the tree view, detail view and communication log can be set individually with the movable separators situated in between (click separator and move with mouse button pressed).

The status bar and the communication log can be faded in or out using the corresponding menu points of the "View" or "Communication" menu.

4.2 Menu bar

The menu bar of the Landis+Gyr .MAP120 Parameter Editor contains the following menus for selecting functions:

Menu	Menu entry	Description of function
File	New…	See section 5.1.1 "Creating new device descriptions"
	Open…	See section 5.1.2 "Opening existing device descriptions"
	Save	See section 5.1.3 "Saving device descriptions"
	Save as…	See section 5.1.4 "Saving device descriptions under a new name"
	Close	Closes the active device description window
	New from OMT file…	For LG internal purposes only
	Change firmware version…	For LG internal purposes only
	Print page setup…	See section 5.1.5 "Defining the print layout for device descriptions"
	Print…	See section 5.1.7 "Printing device descriptions"
	Print preview	See section 5.1.8 "Previewing the printout on the screen"
	Exit	Terminates the Landis+Gyr .MAP120 application
View	Compare to file…	See section 5.1.11 "Comparing a device description to a file"
	Compare page setup…	See section 5.1.6 "Defining the print layout for compare results"
	Status bar	See section 5.1.9 "Switching the status bar on and off"
Communication	Connect	Dials the selected phone number to establish a modem connection
	Disconnect	Terminates an existing modem connection
	Load from device	See section 5.1.10 "Reading device descriptions from a device"
	Send to device	See section 5.3.2 "Starting the parameterisation wizard"
	Abort	Interrupts the existing communication session
	Communication settings…	See section 6.2 "Communication settings"
	Communication log	See section 4.5 "Communication log"
Tools	ASCII character converter…	See section 7.1 "Converting ASCII to text or vice versa"
	Licence…	See section 3.1.1 "Entering license data"
	Startup language…	See section 7.2 "Changing the language of the user interface"
	Options…	See section 7.5 "Defining storage location of communication settings"

Menu	Menu entry	Description of function
Windows	Cascade	Arranges windows in an overlapped fashion
	Tile vertical	Arranges windows in non-overlapped vertical tiles
	Tile horizontal	Arranges windows in non-overlapped horizontal tiles
	Close all	Closes all open device description windows
Help	Help	See section 7.8 "Displaying tool help"
	Release notes	See section 7.9 "Displaying release notes"
	About .MAP120…	See section 7.10 "Displaying the current program release and checking for updates"

4.3 Toolbars

4.3.1 Application toolbar

The application toolbar contains the following buttons for direct selection of frequently required functions:


Creates a new device description
(see section 5.1.1 "Creating new device descriptions")


Opens a stored device description file
(see section 5.1.2 "Opening existing device descriptions")


Saves the selected device description file
(see section 5.1.3 "Saving device descriptions")


Prints the selected device description
(see section 5.1.7 "Printing device descriptions")


Displays a print preview of the selected device description
(see section 5.1.8 "Previewing the printout on the screen")


Displays the communication settings window
(see section 6.2 "Communication settings")


Fades the command log in or out
(see section 4.5 "Communication log")


Loads the device description (all parameters) from the device
(see section 5.1.10 "Reading device descriptions from a device")


Starts the parameter wizard
(see section 5.3.2 "Starting the parameterisation wizard")


Interrupts the existing communication session

Buttons which are not applicable in a specific situation are disabled and shown in grey.

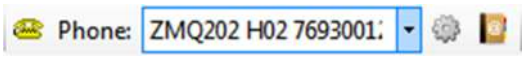
4.3.2 Client toolbar

The access level toolbar allows selection of the required access level. Only fully defined access levels are displayed, a level can occur more than once with different settings for different devices.

Clicking on  in the access level toolbar displays the access level settings (see section 6.2.3.3 "Access levels").

4.3.3 Address toolbar

The phone number or IP address drop down lists displayed depending on the communication settings allow selection of the corresponding entry in the address book.



The phone number of the required modem can be selected in the "Phone" drop down list if a modem is selected as communication channel.

Clicking on  in the address toolbar makes the connection to the selected phone number. When the connection is made, the drop down list is blocked and the icon on the button changes its appearance.

Clicking on  in the address toolbar terminates the modem connection.

The IP address and port number of the required device can be selected in the "IP Address" drop down list, provided a network card is selected as interface in the communication profile settings. The phone Icon is deactivated.

Clicking on  in the address toolbar displays the selected address book entry.

Clicking on  in the address toolbar displays the address book (see section 6.2.4 "Address data").

4.3.4 Device toolbar

The device toolbar allows the selection of devices with predefined settings (device series and device addresses).

With the checkbox "IEC;HDLC" you can deactivate and again activate the device address and in the drop down list you can select all defined device addresses.

Clicking on  in the device toolbar displays the device settings (see section 6.2.3 "Device data").

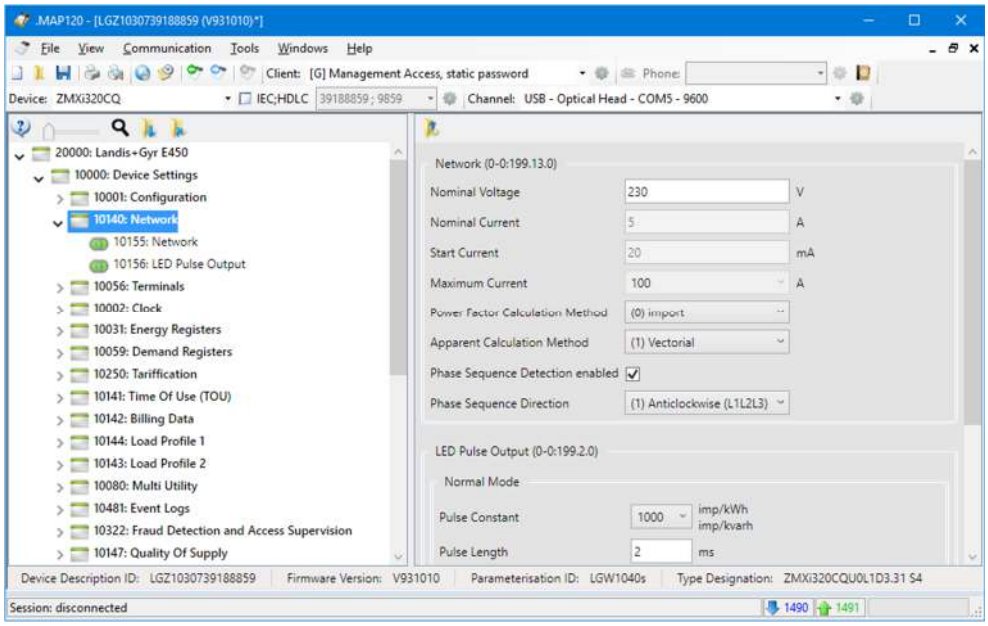
4.3.5 Communication channel toolbar

The communication channel toolbar allows the selection of communication channels with predefined settings (e.g. interface, transmission protocols etc.).

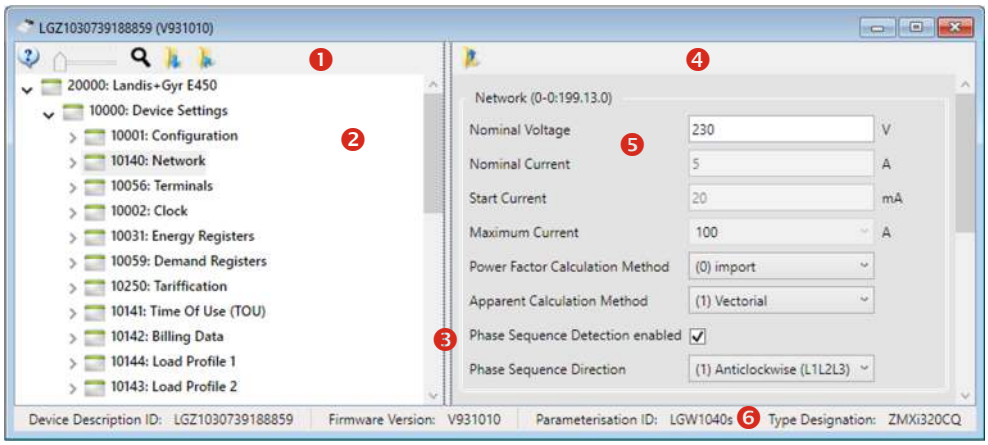
Clicking on  in the communication channel toolbar displays the channel settings (see section 6.2.2 "Communication channel data").

4.4 Device description window

The device description window shows the parameters of a device. Normally it is shown maximised, i.e. it uses the entire space in the .MAP120 Parameter Editor.



Clicking the  button in the upper right corner of the .MAP120 downsizes the device description window, so that more than one device description window can be displayed at once. Using the entries "Cascade" or "Tile" from the "Windows" menu allows automatic arrangement of windows.



1 Toolbar of tree view

2 Tree view

3 Movable separator

4 Toolbar of detail view

5 Detail view (detailed view of selected tree items)

6 Status bar of device description

Device description windows are divided into two by a movable separator (can be moved by clicking and shifting the separator). The tree view on the left side of the window contains a general tree representation, while the detail view on the right side displays details of the currently selected tree item (parameter or folder).

Both sectors of the window have horizontal and/or vertical picture scrolling functions if part of the window half cannot be seen. Scrolling does not affect the focus.

Clicking the  button in the upper right corner of a downsized device description window maximises the device description window again.

Tree view toolbar

The toolbar of the tree view contains the following elements:

Displays the online help for the device displayed in the tree (details see below under "Displaying device help")

Zooms the content of both sectors of the device description window in a range from 1.00 to 3.00 in steps of 0.20:

- Fully left = magnification factor 1.00, i.e. original size
- Fully right = magnification factor 3.00, i.e. 3 times bigger size

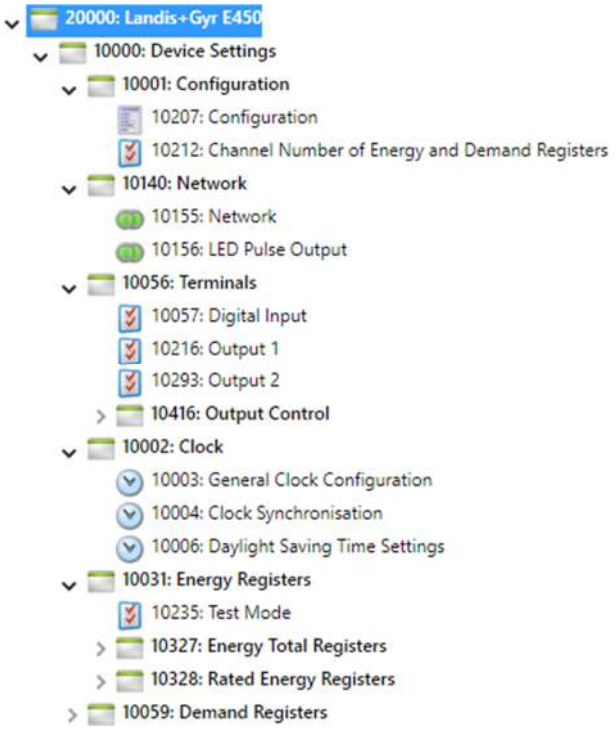
Allows a full text search in the tree (details see below under "Full text search in tree view")

Expands all folders of the tree

Collapses all folders of the tree

Tree view

A tree view, e.g. as generally familiar from the file system tree of Windows Explorer, is ideally suited for navigating in ordered structures with folders and subfolders.



Tree items

For the Landis+Gyr .MAP120 Parameter Editor the tree consists of a hierarchical arrangement of tree items (folders and parameters).

Tree items are shown as follows:

 Folder

 Configuration parameters

 Network parameters

 Clock parameters

 Time of use parameters

 Communication parameters

 Other parameters

Folder handling

Each folder can be expanded and collapsed individually.

Collapsed folder items are preceded by an expansion icon, expanded folder items by a collapse icon.

To expand or collapse individual folders there are the following possibilities:

Using the mouse:

- Clicking on the expansion icon of a folder expands this folder (the expansion icon changes to a collapse icon).
- Clicking on the collapse icon of a folder collapses this folder (the collapse icon changes to an expansion icon).
- Double-clicking on a closed folder icon or on the folder name behind the icon expands or collapses this folder.

Using the keyboard:

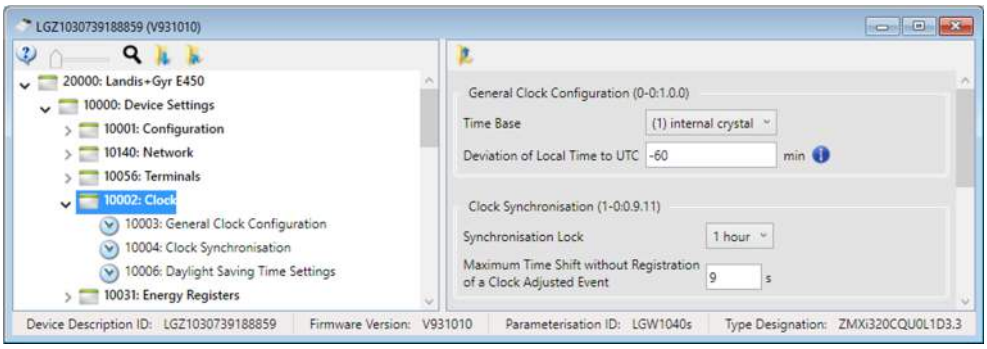
- Pressing the **[*] key** of the numerical keyboard expands the whole tree of the selected folder (i.e. subfolders in the folder will also be expanded).
- Pressing the **[+] key** of the numerical keyboard expands the selected folder, but doesn't expand its subfolders.
- Pressing the **[–] key** of the numerical keyboard collapses the selected open folder or the next higher folder if a closed folder was selected.

Using the buttons in the tree view toolbar:

- Clicking on  expands all folders of the tree.
- Clicking on  collapses all folders of the tree.

Detail view of device description

Details of the selected parameter in the tree are displayed in the right-hand part of the device description window where the parameters can be edited in the corresponding fields.



Detail view toolbar

The toolbar of the detail view contains the folder up button  . Clicking on this button selects the next higher folder above the currently selected tree item.

Device description status bar

The status bar below the device description displays the following device description values:

- Device Description ID
- Firmware Version
- Parameterisation ID
- Type Designation

Note: In newly created device descriptions the Device Description ID and the Parameterisation ID are still undefined.

Displaying device help

Clicking on  in the toolbar of the tree view of the device description window displays the online help for the opened device description. These help texts correspond to the contents of the device functional description.

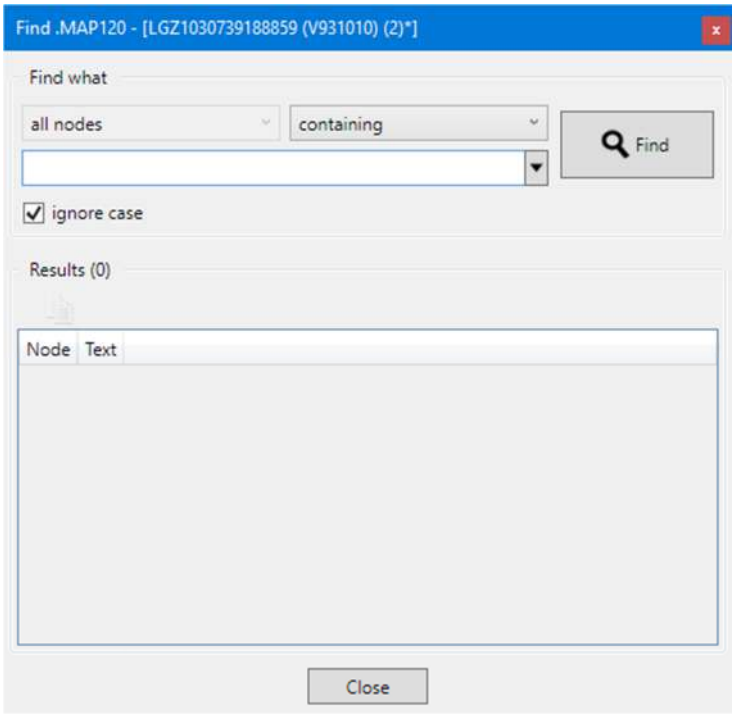
Find the desired information. Since the help function is a standard Windows function, it will not be explained at this point. More details are found in the Windows manual belonging to your PC.

Full text search in tree view

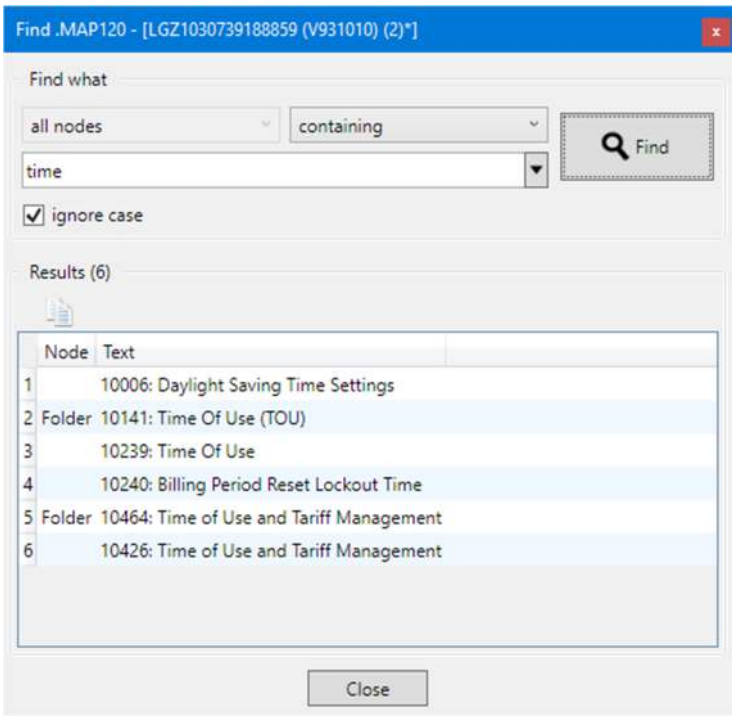
With the search function you can perform a full text search in the tree view of the device description window (Note: The detail view of the device description window is not included in the search).

Procedure:

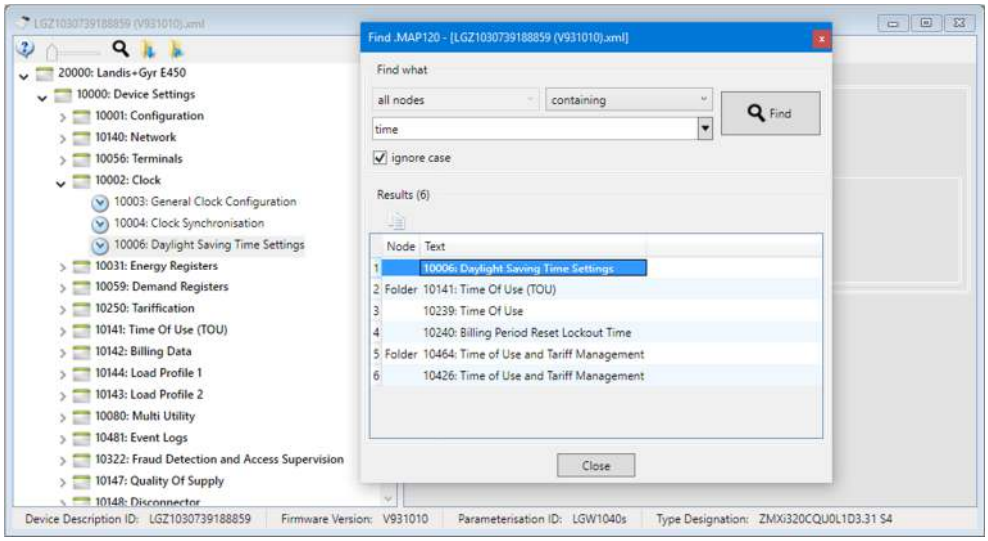
1. Click on  in the tree view toolbar.
   The "Find .MAP120" window appears.



2. Enter the term you want to find in the entry box.
   If you have already carried out searches previously, you can click on the arrow behind the entry box and select one of the previous terms in the appearing list. The terms remain in the list until the program is terminated.
3. Deactivate the check box "ignore case" if the search shall be case sensitive.
4. In the selection field select
   - **containing** to search for the term at any place within the tree text,
   - **starting with** to search for the term at the beginning of the text or
   - **ending with** to search for the term at the end of the text.
5. Click on "Find".
   The search result is listed in the "Results" area.
   In the example shown with the term "time" and the attributes "containing" and "ignore case" all folders and elements containing the term "Time" are listed.
   Note that the whole text is considered, including the item number. Therefore a search for "time" with attribute "starting with" would not show any result, whereas a search for "time" with attribute "ending with" would show for instance the element "10240: Billing Period Reset Lockout Time" since here the term "Time" appears at the end of the text.



6. Click on a result line in the list to highlight the corresponding folder or element in the tree (the folder containing the element is automatically expanded).



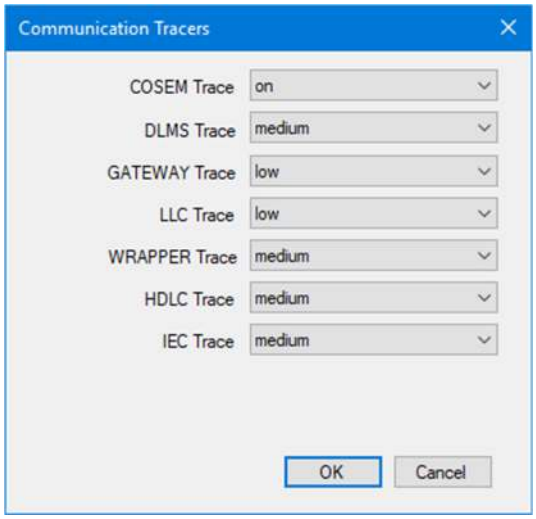
4.5 Communication log

Additional knowledge required
Additional knowledge is required to analyse communication activities.

Clicking on  in the application toolbar shows or hides the communication log, where all communication activities can be traced and analysed.

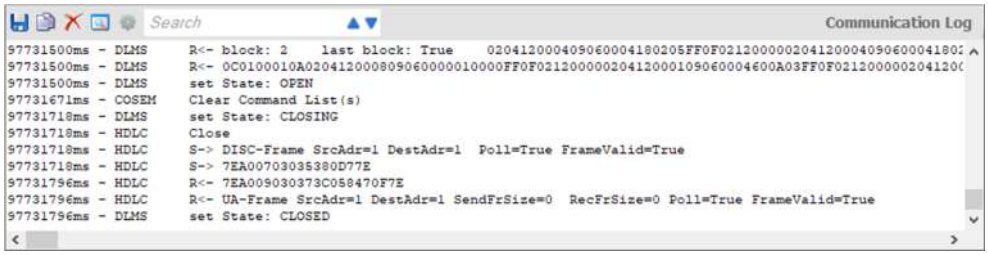
First, the trace level has to be adjusted for each trace type supported as follows:

1. Click on  in the communication log toolbar.
   The ".MAP120 - Communication Tracers" window appears.

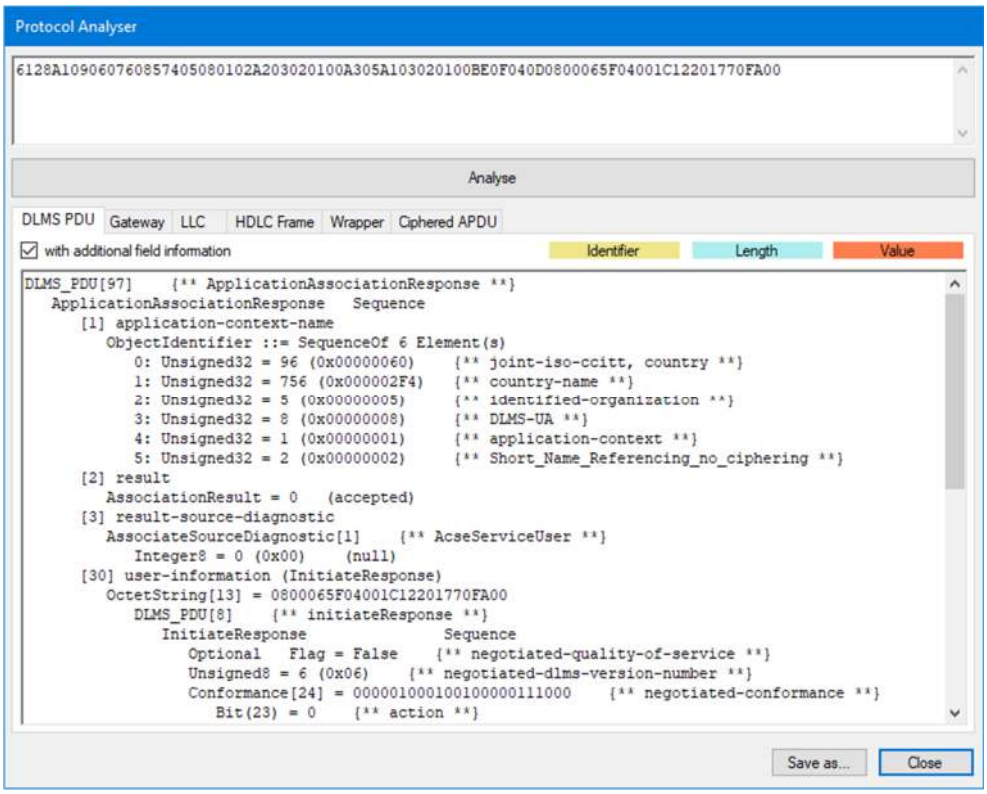


2. Select in the "COSEM Trace" drop down list whether the COSEM Trace shall be on or off.
3. Select in the other drop down lists the resolution of the DLMS, GATEWAY, LCC, WRAPPER, HDLC and IEC tracers (low, medium, high) or switch them off.
4. Click on **OK**.

All communication activities are traced in the communication log according to the settings made.



To analyse a specific string, mark it and click on  in the communication log toolbar. This opens the ".MAP120 - Protocol Analyzer" window.



Clicking on  in the communication log toolbar opens the "Open Communication Log" dialogue window to display logs previously saved again. Clicking the right mouse button in the communication log followed by selection of the **Open Log File** menu item in the pop-up menu appearing has the same effect.

Clicking on  in the communication log toolbar opens the "Save as" dialogue window to save the log displayed in a freely selected directory either as RTF file (default) or as text file. Clicking the right mouse button in the communication log followed by selection of the **Save as** menu item in the pop-up menu appearing has the same effect.

Clicking on  in the communication log toolbar copies the content of the communication log to the Windows clipboard, from where it can be inserted into another application (e.g. in a word processing program). Clicking the right mouse button in the command log followed by selection of the **Copy all** menu item in the pop-up menu appearing has the same effect.

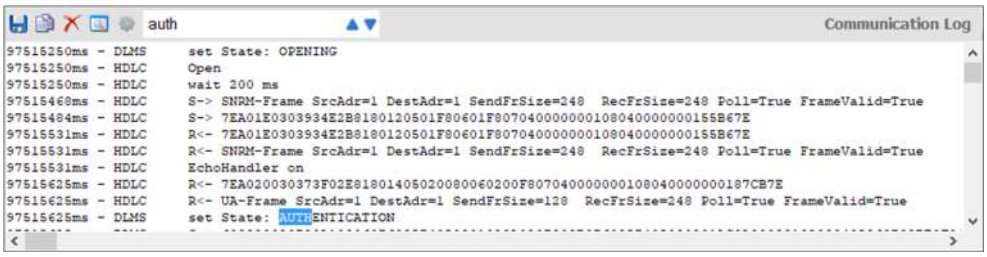
Clicking on  in the communication log toolbar deletes the communication log. Clicking the right mouse button in the communication log followed by selection of the **Clear** menu item in the pop-up menu appearing has the same effect.

Full text search

With the search function you can perform a full text search in the communication log window.

Enter the term you want to find in the entry box of the toolbar (the search is not case sensitive) and then click on ▼ or ▲ for searching downwards or upwards starting from the currently marked position in the communication log window. The first occurrence of the searched term is highlighted.

Example: Searching the term "auth" finds as first occurrence the DLMS entry "set State: AUTHENTICATION".



Clicking again on ▼ or ▲ searches for further occurrences of the term.

4.6 Status bar

The following data is normally displayed in the status bar:

- Session information, e.g. connected, busy or disconnected
- Protocol, port and transmission rate (in parentheses)
- Number of objects sent (blue) and received (green)
- Data indication (running from left to right while data is transmitted)

During and after editing communication settings the status bar shows information about the communication settings, e.g.

- loading (while loading)
- loaded (while the communication settings are displayed for editing)
- saving (while saving)
- saved (after editing the communication settings)

5 Device description functions

The Landis+Gyr .MAP120 Parameter Editor is used to edit and download complete device descriptions (parameterisations) into supported Landis+Gyr devices.

5.1 General functions

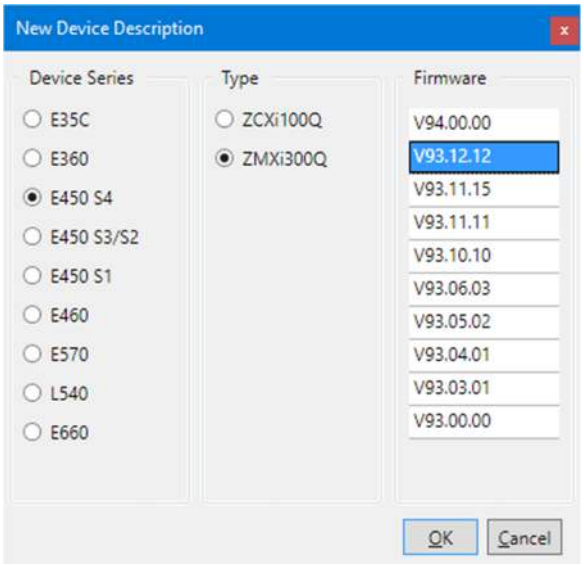
This section describes general functions selectable in the menus of the menu bar (see section 4.2 "Menu bar").

5.1.1 Creating new device descriptions

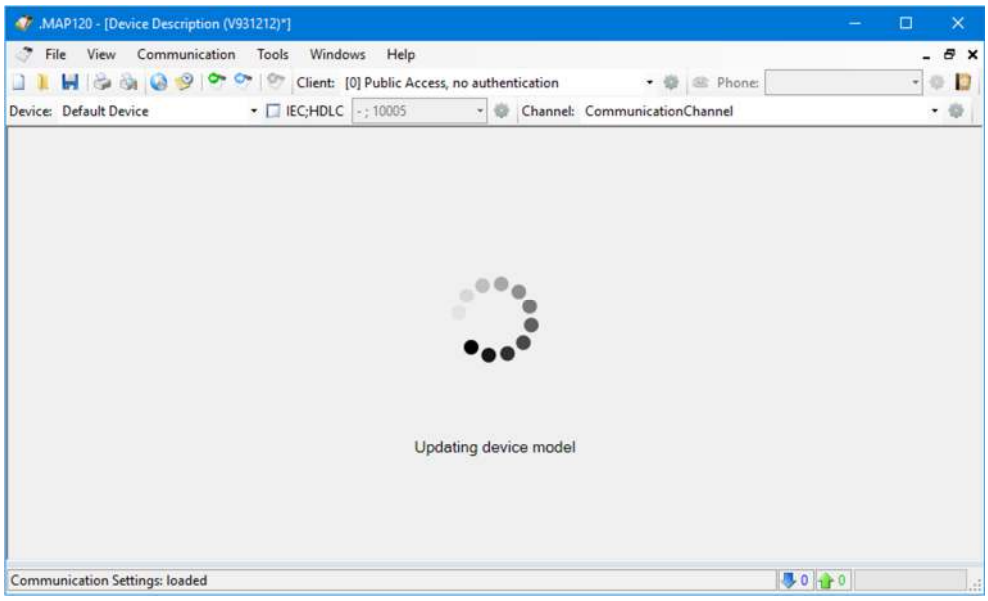
New device descriptions can be created for any supported device firmware version from templates available in the .MAP120 application.

Procedure:

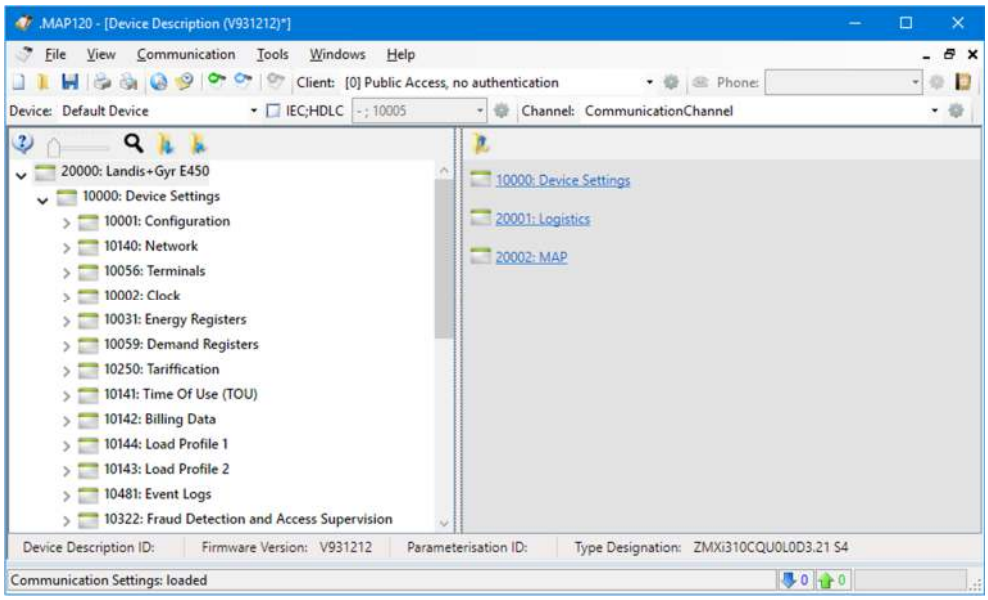
1. Click on  in the application toolbar or select **New** from the **File** menu.
   The "New Device Description" window appears.
2. Select the device series, the type and the firmware version.



3. Click on **OK**.
   The selected device description is created and loaded into the .MAP120 Parameter Editor.
   During this operation, an indication in the device description window informs about the step in progress, e.g. "Loading tree".



Afterwards, the selected device description is displayed in the .MAP120 Parameter Editor.



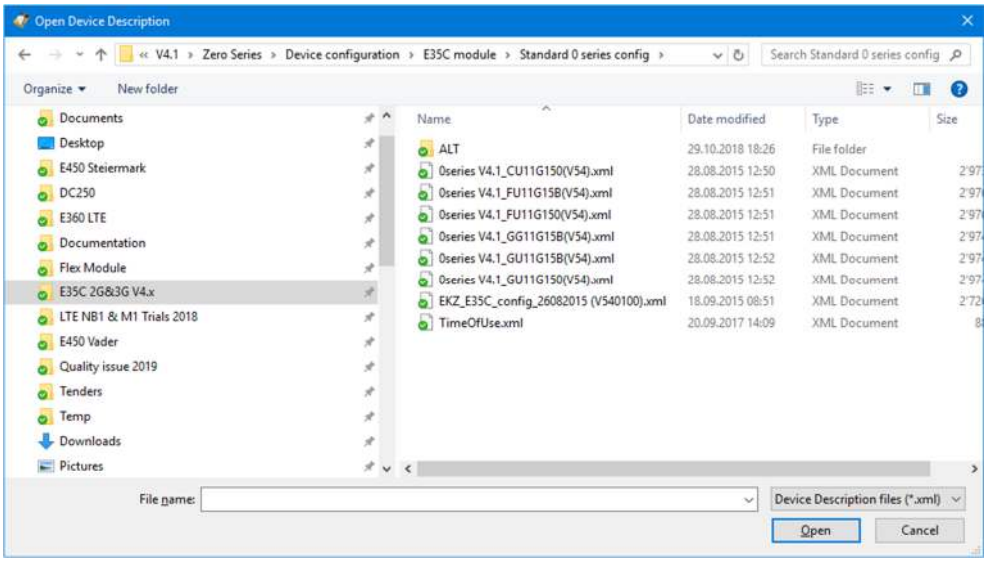
4. Perform the intended work with the device description: You can edit the parameters of the device description (see section 5.2 "Editing parameters"), save it (see section 5.1.3 "Saving device descriptions") or write it into a device (see section 5.3.1 "Parameterisation wizard").

5.1.2 Opening existing device descriptions

Existing device descriptions can be opened in the .MAP120 Parameter Editor.

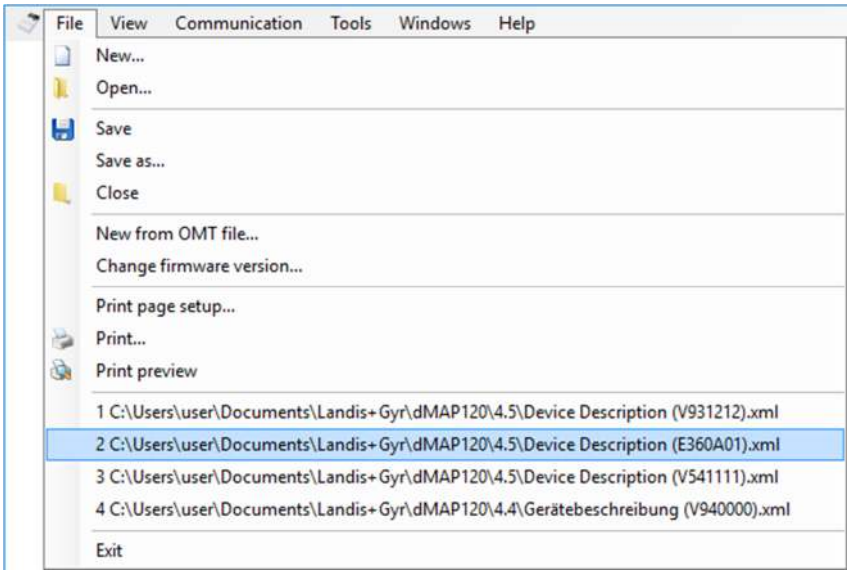
Procedure:

1. Click on  in the application toolbar or select **Open** from the **File** menu.
   The "Open" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).

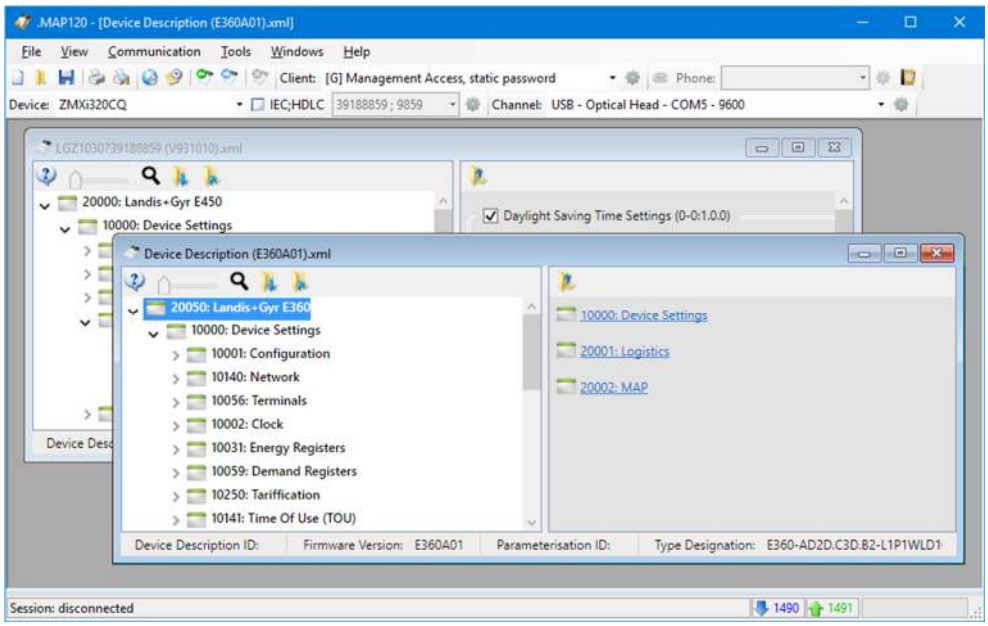


2. Select your personal data folder in the displayed tree structure if it is not already displayed.

3. Double-click on the desired entry in the list or select it and then click on **Open**.
   The selected device description will be loaded and displayed.
   It is also possible to select a recently opened device description from the MRU (most recently used) list in the **File** menu. This list contains as maximum the last 6 opened file names. Clicking on a list entry opens the corresponding device description directly.



The device description just opened becomes the active window.



4. Perform the intended work with the device description: You can edit the parameters of the device description (see section 5.2 "Editing parameters"), save it (see section 5.1.3 "Saving device descriptions") or write it into a device (see section 5.3.1 "Parameterisation wizard").

5.1.3 Saving device descriptions

Complete device descriptions can be saved in device description files under the original name. If the device description was newly created or is to be saved under a new name, you have to proceed as described in section 5.1.4 "Saving device descriptions under a new name".

Procedure:

1. Activate the window with the device description to be saved.

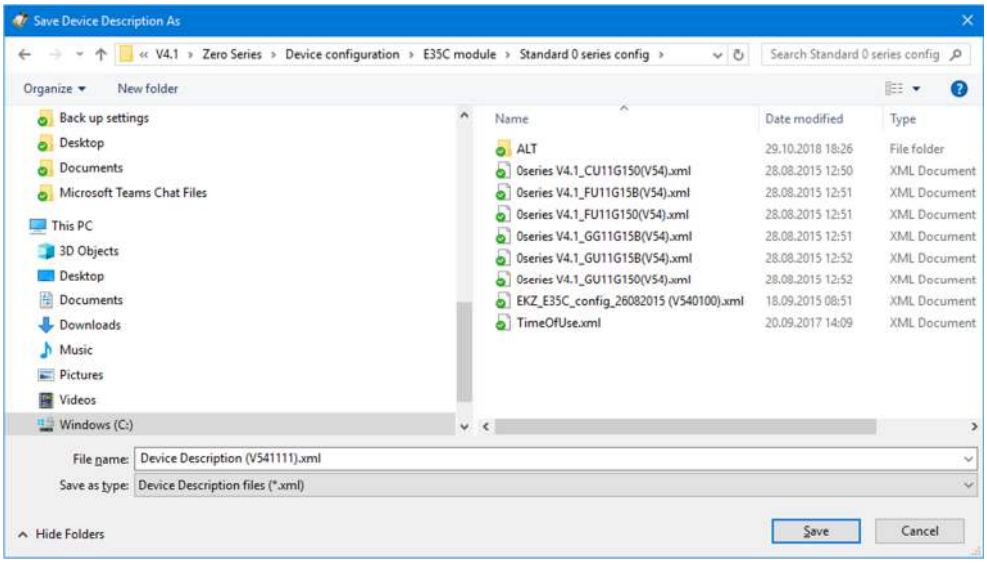
2. Click on  in the application toolbar or select **Save** from the **File** menu.
   If the device description was modified since it was last saved (recognisable by the asterisk in the title bar) the modified data will overwrite the previously stored data without any warning.
   If the device description was not modified (no asterisk in the title bar) it will not be saved again.
   If a new device description has not yet been saved, it will be saved using the "Save As" function described in the next section.

5.1.4 Saving device descriptions under a new name

Complete device descriptions can be saved under a new name.

Procedure:

1. Activate the window with the device description to be saved under a new name.
2. Select **Save As** from the **File** menu.
   The "Save as" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).
3. Select the desired data folder in the displayed tree structure if it is not already displayed.
   A list of all stored device description files of the same type will be shown.



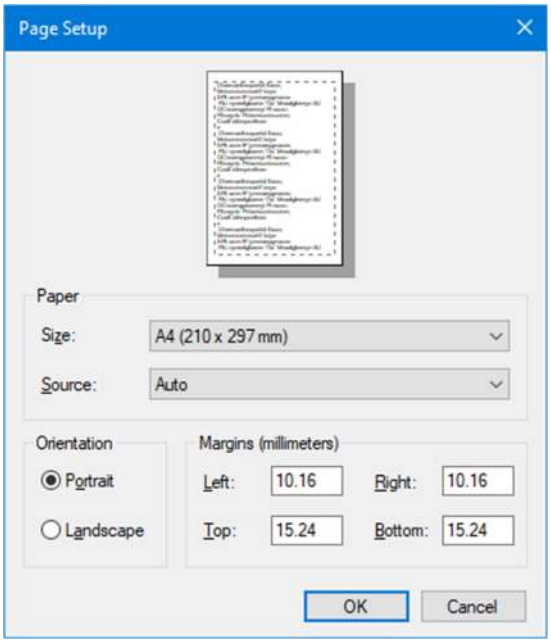
4. Enter the desired name for the device description in the entry box "File name".
   If the device description was newly created, the proposed name corresponds to the connected device. Otherwise the name formerly used is proposed. You can overwrite this proposal.
5. Click on **Save**.
   The device description will be saved. The device description name in the title bar changes according to the selected name.

5.1.5 Defining the print layout for device descriptions

The "Print page setup" function allows you to determine the desired page layout for printouts of a device description.

Procedure:

1. Select **Print page setup** from the **File** menu.
   The "Page Setup" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).



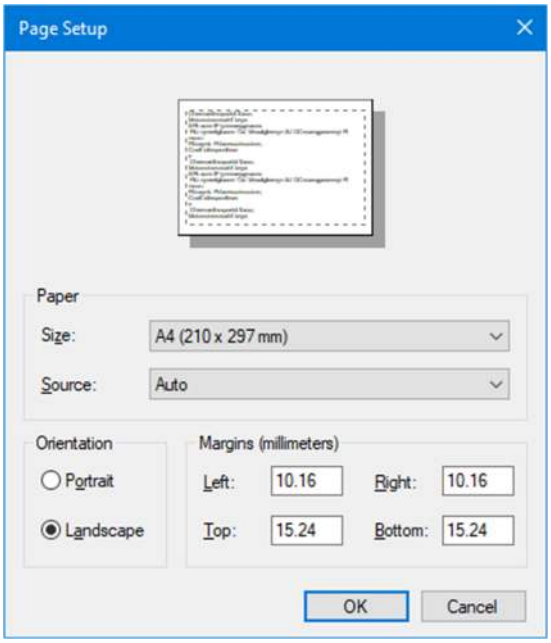
2. Make the required settings.
3. Click on **OK**.
   This terminates the page setup for printing. You can now perform a print preview on the screen (see section 5.1.8 "Previewing the printout on the screen") or start the printout directly (see section 5.1.7 "Printing device descriptions").

5.1.6 Defining the print layout for compare results

The "Compare page setup" function allows you to determine the desired page layout for printouts of the compare results.

Procedure:

1. Select **Compare page setup** from the **View** menu.
   The "Page Setup" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).



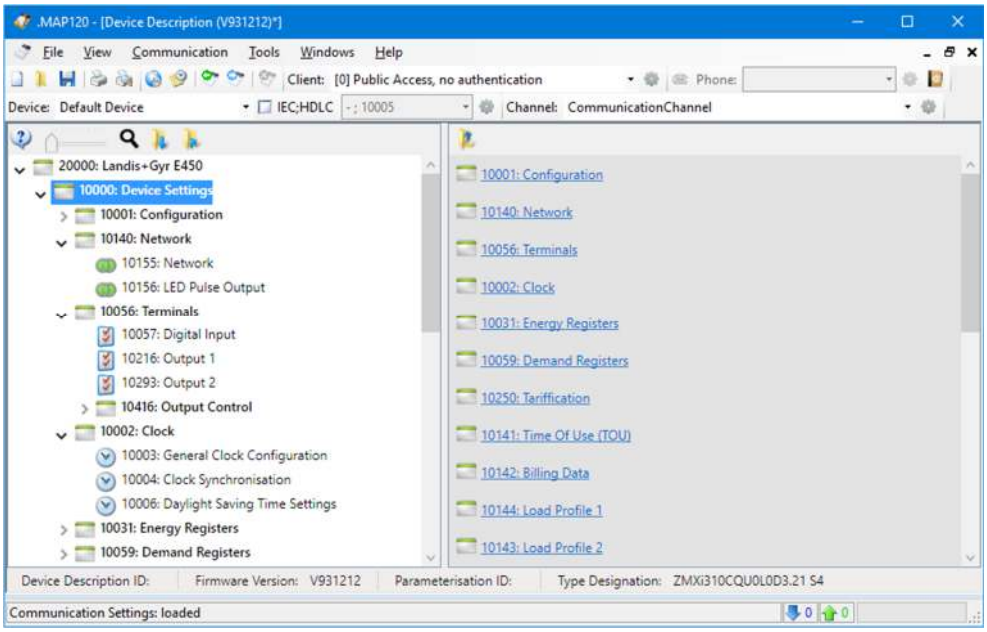
2. Make the required settings.
3. Click on **OK**.
   This terminates the page setup for compare results. You can now display a compare preview on the screen (see section 5.1.11 "Comparing a device description to a file") and start the printout directly from there.

5.1.7 Printing device descriptions

The "Print" function prints out the device description in the predefined form (see section 5.1.5 "Defining the print layout for device descriptions").

Procedure:

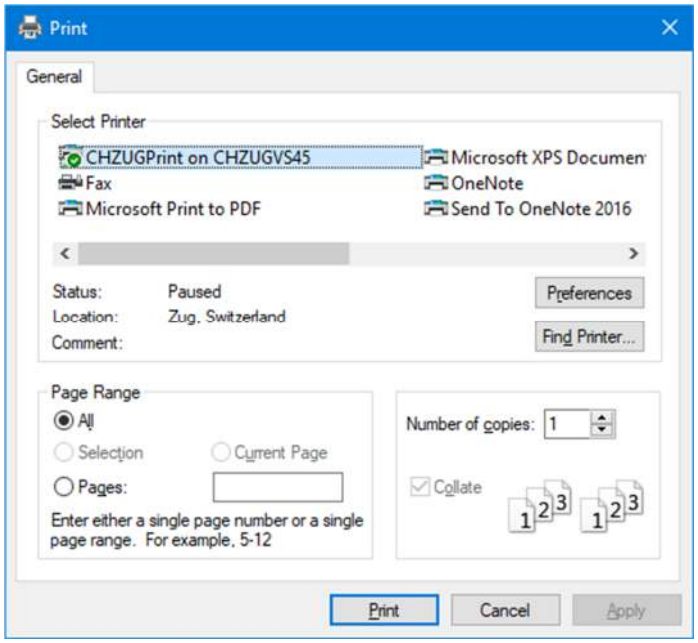
1. Activate the device description window you want to print.



2. Select **Print** from the **File** menu.
   The "Print" window appears.

   Clicking on  in the application toolbar would start printing immediately without displaying the "Print" window.

3. Make the necessary settings (number of pages and copies).



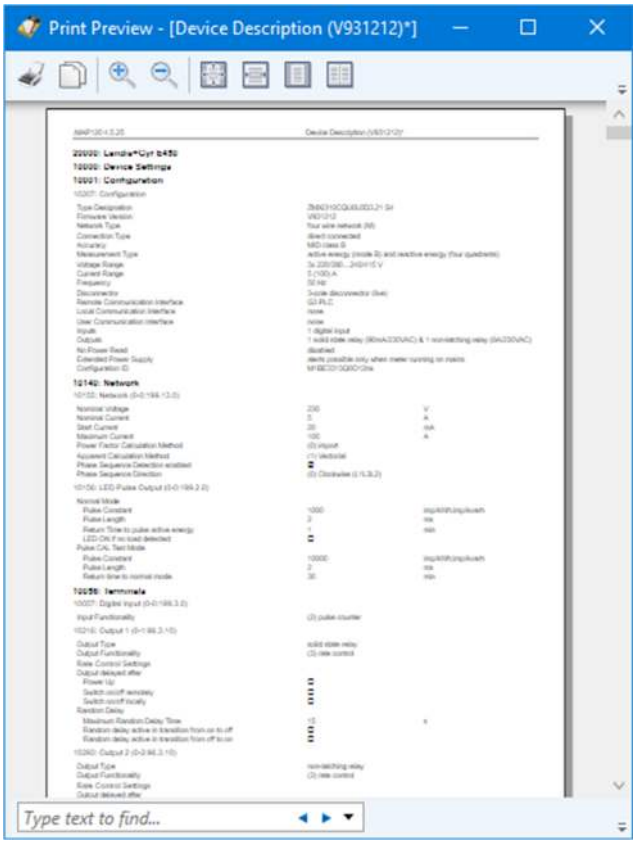
4. Click on **Print**.
   The device description is printed out on the selected printer as defined by default.
   If desired, the print layout can be changed individually (see section 5.1.5 "Defining the print layout for device descriptions").
   A preview prior to printing can also be performed (see section 5.1.8 "Previewing the printout on the screen").

5.1.8 Previewing the printout on the screen

The "Print Preview" function allows you to check the result of the page setup by previewing the printout on the screen prior to printing.

Procedure:

1. Activate the device description window you want to preview on the screen.
2. Click on  in the application toolbar or select **Print preview** from the **File** menu.
   The "Print Preview" window appears.



   The parameter designations are listed in the left column, the parameter values in the right column.
3. Select the display size by clicking one of the icons in the top line of the window:

    Display original size (100 %)

    Display page width

    Display whole page

    Display two pages

 Stepwise increase the display size

 Stepwise decrease the display size

4. If you are looking for a specific parameter designation or value you can either navigate to the corresponding position by scrolling with the mouse wheel or by using the scroll bar or you can use the search function (full text search) in the bottom line of the window:

Enter the text to find in the entry box. Clicking on the blue arrows finds the next or previous occurrence of the text string and highlights it in the page preview. In the drop down list behind the blue arrows you can select match criteria, e.g. match case.

5. Click on  if you want to copy a previously highlighted text section into the Windows clipboard from where you can insert it into a document using the insert function [Ctrl]+[V].

6. Click on  if you want to print the device description.
The "Print" window appears (the dialog language depends on the version of your Windows user interface).
Make the necessary settings (printer selection, printer properties, paper size, source and orientation) then click on **Print**.

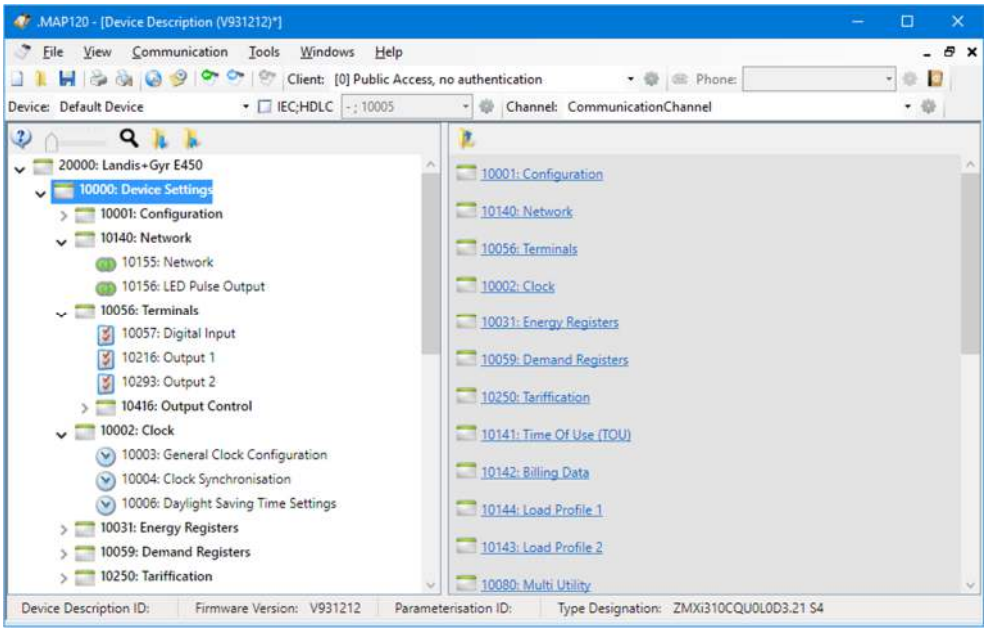
7. Close the "Print Preview" window if you don't want to print the device description.

5.1.9 Switching the status bar on and off

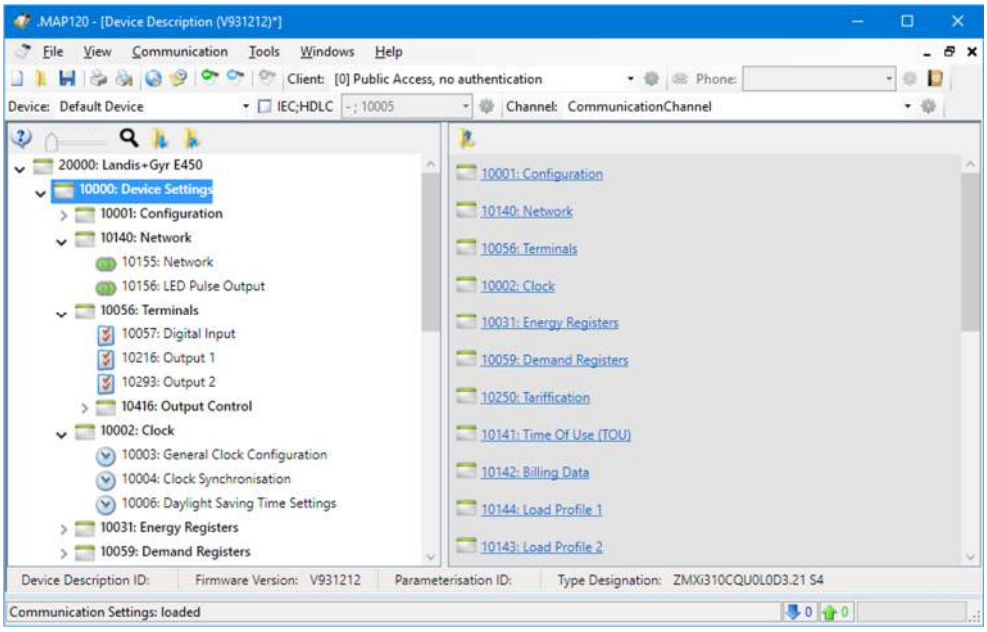
The "Status bar" toggle function enables you to hide or show the status bar in the main window of the application.

Procedure:

1. Select **Status bar** from the **View** menu.
   A tick in front of the menu item indicates that the status bar is currently switched on. After clicking on the menu item the tick in front of it disappears and the status bar is no longer visible.



2. Select **Status bar** again from the **View** menu, if you want to show the status bar (toggle function).
   No tick in front of the menu item indicates that the status bar is currently invisible. After clicking on the menu item the tick in front of it reappears and the status bar is displayed again.



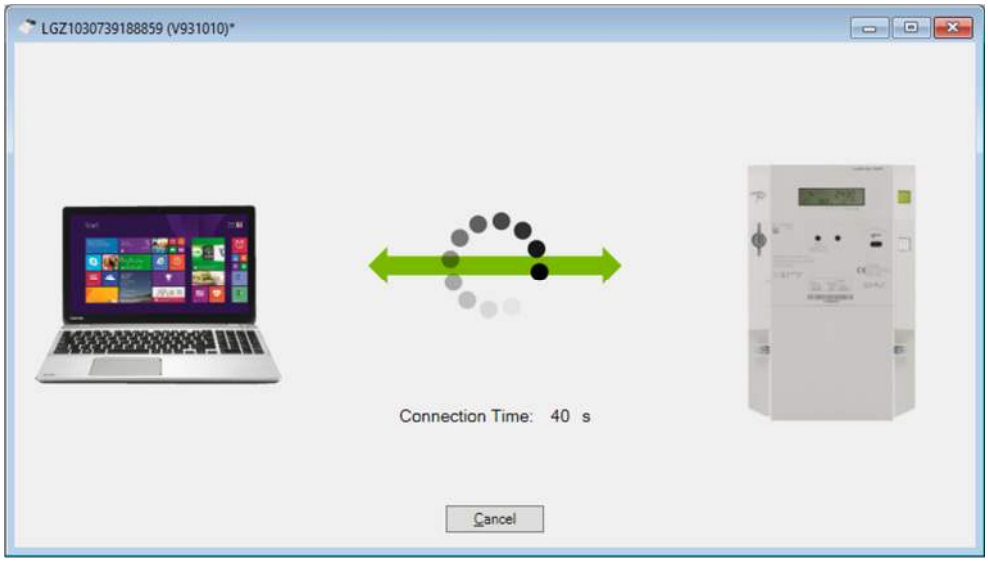
5.1.10 Reading device descriptions from a device

Device descriptions can be read from supported Landis+Gyr devices via the available communication channels of these devices. Please note that always a new device description is created when reading from a device. It is not possible to overwrite the currently open device description.

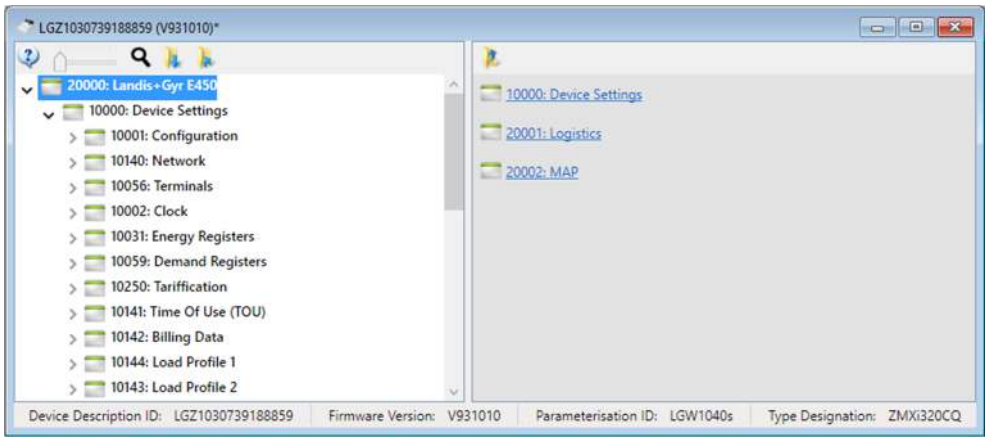
Procedure:

1. Prepare the communication as described in section 6.2 "Communication settings".

2. Click on  in the application toolbar or select **Load from device** from the **Communication** menu.
   The connection to the selected device is established via the selected communication channel and the device description is read from the device into a new device description window. The device identification and the firmware version are displayed in the title bar. During the readout process, which can take several minutes depending on the number of items to be read, a rotating display is shown in the device description window.



   After completing the readout the device description is displayed.



3. Perform the intended work with the device description: You can edit the parameters of the device description (see section 5.2 "Editing parameters"), save it (see section 5.1.3 "Saving device descriptions") or write it into a device (see section 5.3.1 "Parameterisation wizard").

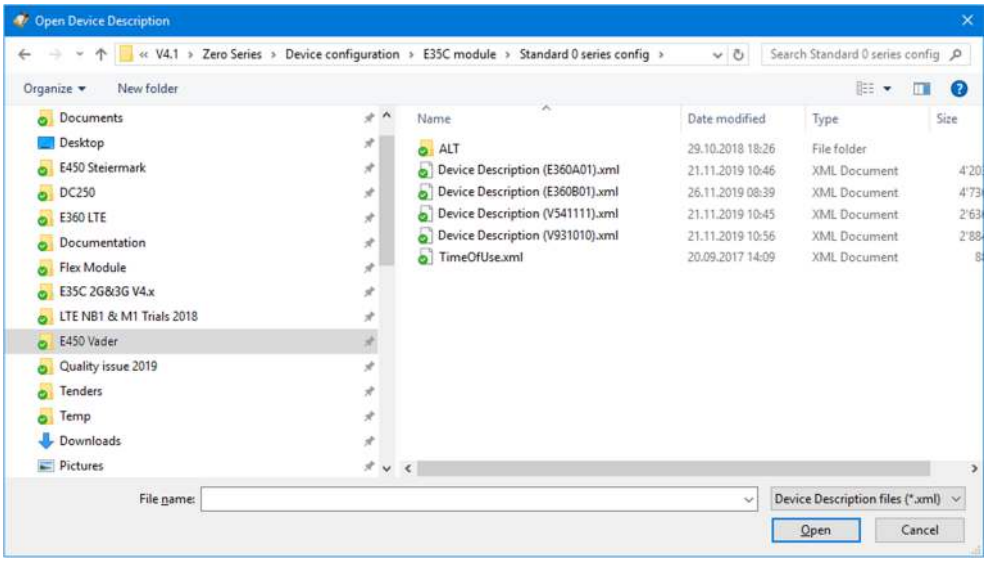
5.1.11 Comparing a device description to a file

This function allows you to compare the displayed device description with a device description saved in a file.
The compare page setup can be defined as described in section 5.1.6 "Defining the print layout for compare results".

Procedure:

1. Display the device description which you intend to compare with another device description saved in a file (proceed as described in section 5.1.2 "Opening existing device descriptions") or in section 5.1.10 "Reading device descriptions from a device").

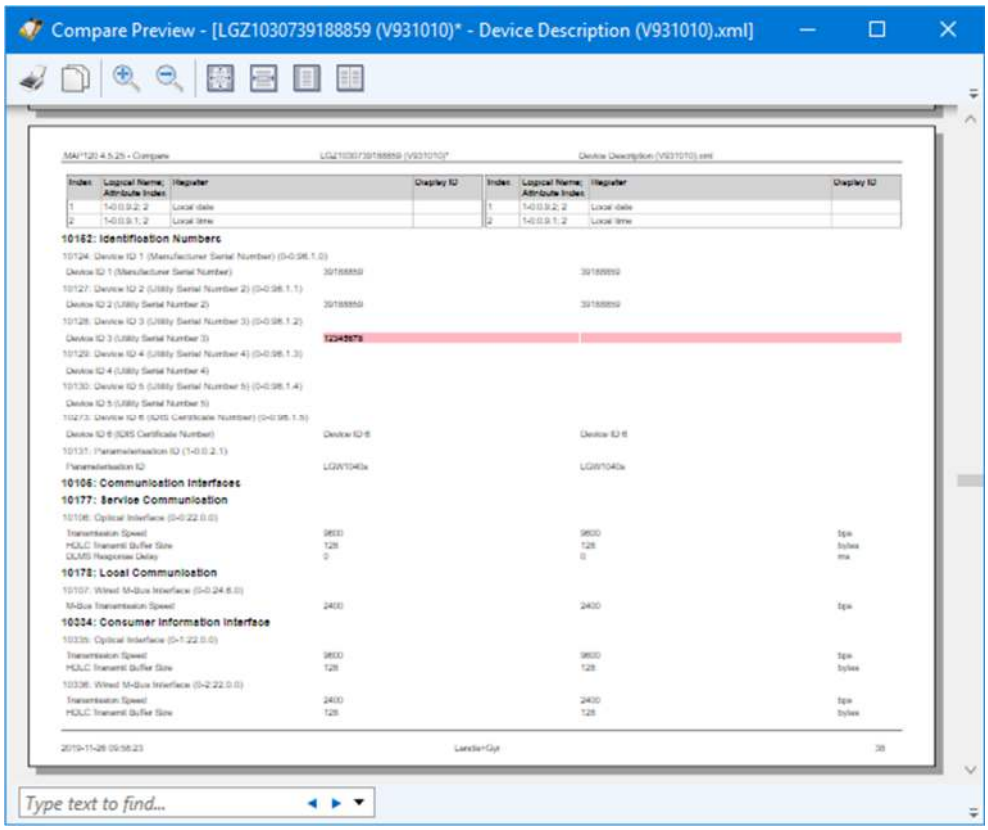
2. Select **Compare to file** from the **View** menu.
   The "Open" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).



3. Select your personal data folder in the displayed tree structure if it is not already displayed.

4. Double-click on the desired entry in the list or select it and then click on **Open**.
   The displayed device description will be compared with the selected device description and compare result displayed in the "Compare Preview" window.

   The parameter designations are listed in the left column, the parameter values of the displayed device description in the centre column and the parameter values of the device description from the file in the right column. Differing parameter values are highlighted with the defined colour (see section 7.3 "Defining colours").



See section 5.1.8 "Previewing the printout on the screen" for a description of the handling features in the "Compare Preview" window.

5.2 Editing parameters

A parameter can be edited in the detail view of the device description window after selecting the parameter or folder containing the parameter in the tree view of the device description window (see section 4.4 "Device description window").

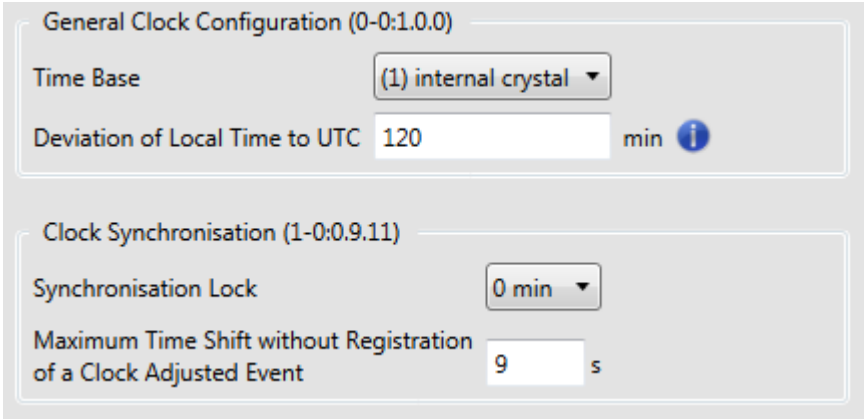
Depending on the parameter type, parameters can be modified in different manners:

- Entering parameter values in entry boxes (see section 5.2.1)
- Selecting parameter values in drop down lists (see section 5.2.2)
- Selecting option parameters (see section 5.2.3)
- Activating or deactivating checkboxes (see section 5.2.4)
- Defining lists by selecting objects (see section 5.2.5)
- Using special functions (e.g. importing time of use tables) (see section 5.2.6)

The corresponding procedures and special features are explained in the indicated sections with some examples. Specific instructions are contained in the functional descriptions of the supported devices.

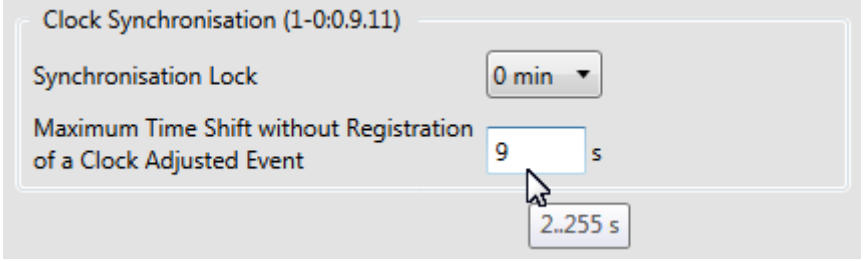
5.2.1 Entering parameter values

Certain parameter values can be entered in entry boxes, in the following example the deviation of local time to UTC and the maximum time shift without registration of a clock adjustment event.

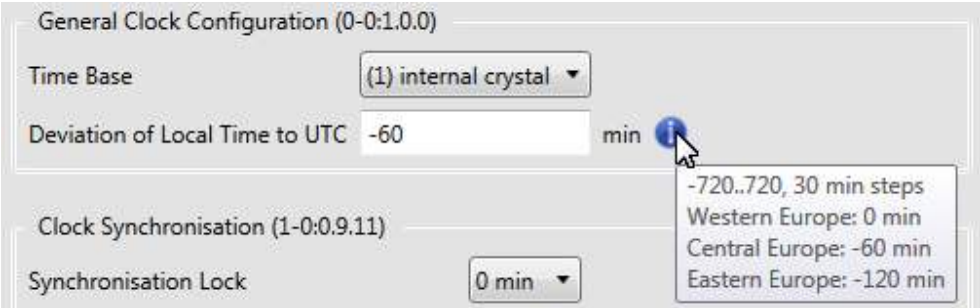


The unit of the value is indicated behind the entry box.

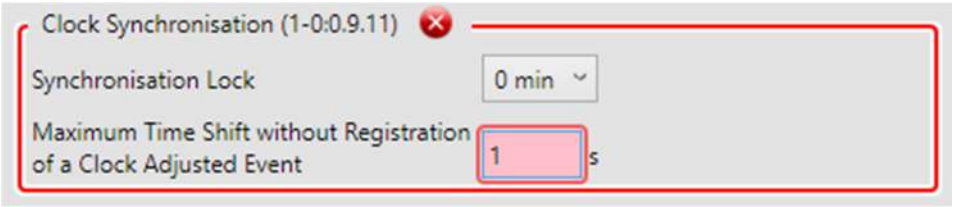
The allowed entry range is indicated with a tooltip if the mouse pointer is positioned on the entry box (in the example shown the value must be in a range from 2 to 255 s).



If an icon is displayed behind the entry box, you can position the mouse pointer over this icon to display a tooltip with information (more complex instructions and examples) about the entry box, e.g. about the deviation between local time and UTC:



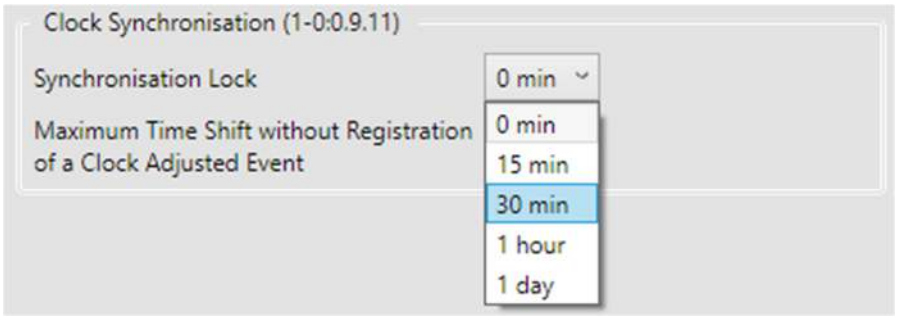
The entries made will be validated against the allowed values. If a value exceeds the allowed range this is indicated with a red blinking frame around the entry box with red background and a red frame around the area.



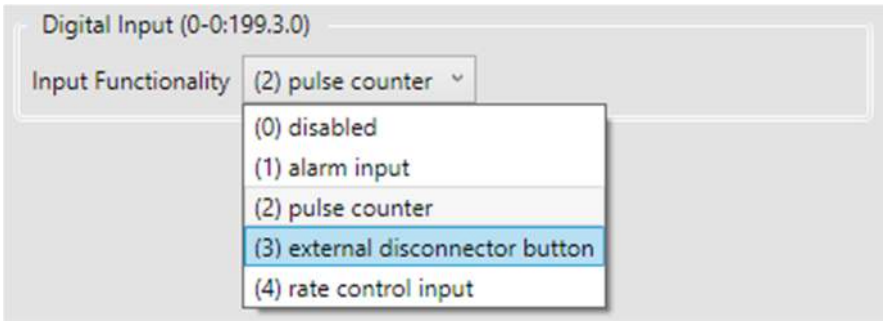
If you position the mouse pointer over the error icon , a tooltip with information about the error is displayed:

5.2.2 Selecting parameter values

Certain parameter values can't be entered in entry boxes but must be selected from a given number of possibilities, in the following example the synchronisation look time can only be set to one of the five values presented in the drop down list.

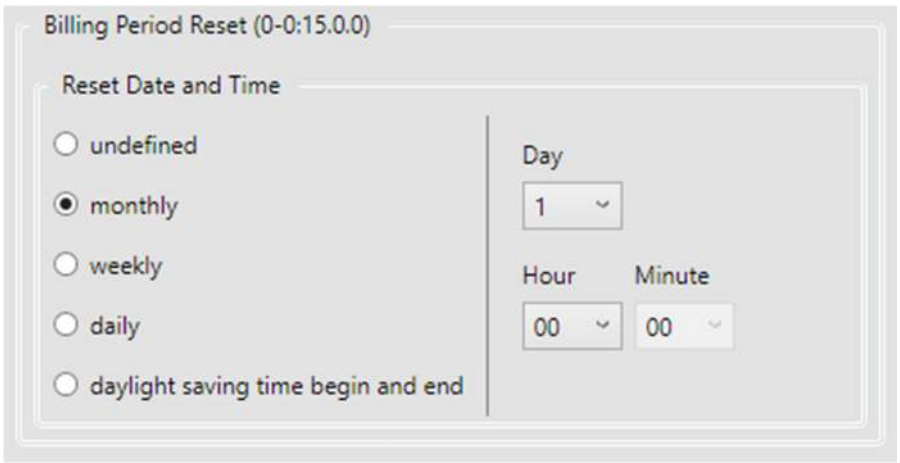


Not only values but also features can be selected in drop down lists.



5.2.3 Selecting option parameters

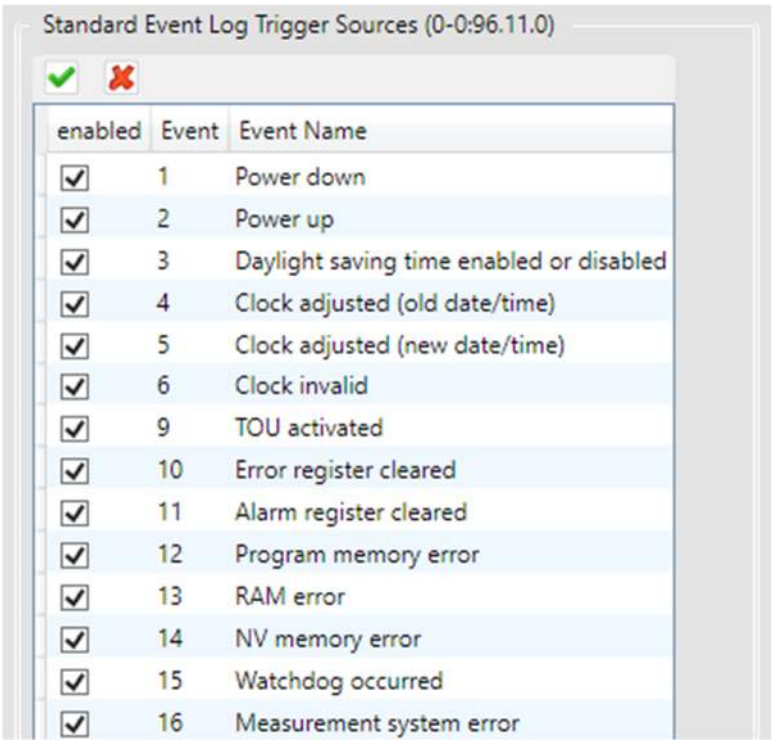
Certain parameters can be set by selecting one of the indicated options, in the following example the date and time reset.



Changing the selection can have an immediate influence on other parameters or parameter attributes. In the above example the fields on the right side disappear for instance if "undefined" is selected.

5.2.4 Activating or deactivating checkboxes

Certain parameters can be set by selecting several of the indicated options, in the following example the standard event trigger sources.

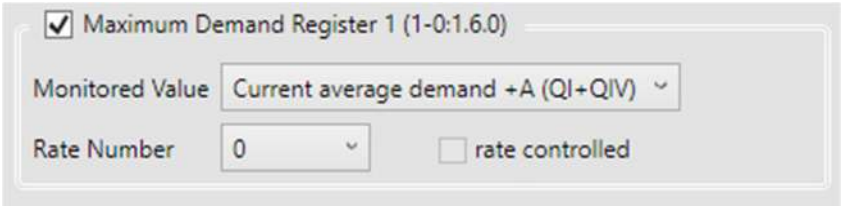


Clicking on a checkbox toggles between activated (tick set) and deactivated (tick removed).

Clicking on the icon activates all checkboxes.

Clicking on the icon deactivates all checkboxes.

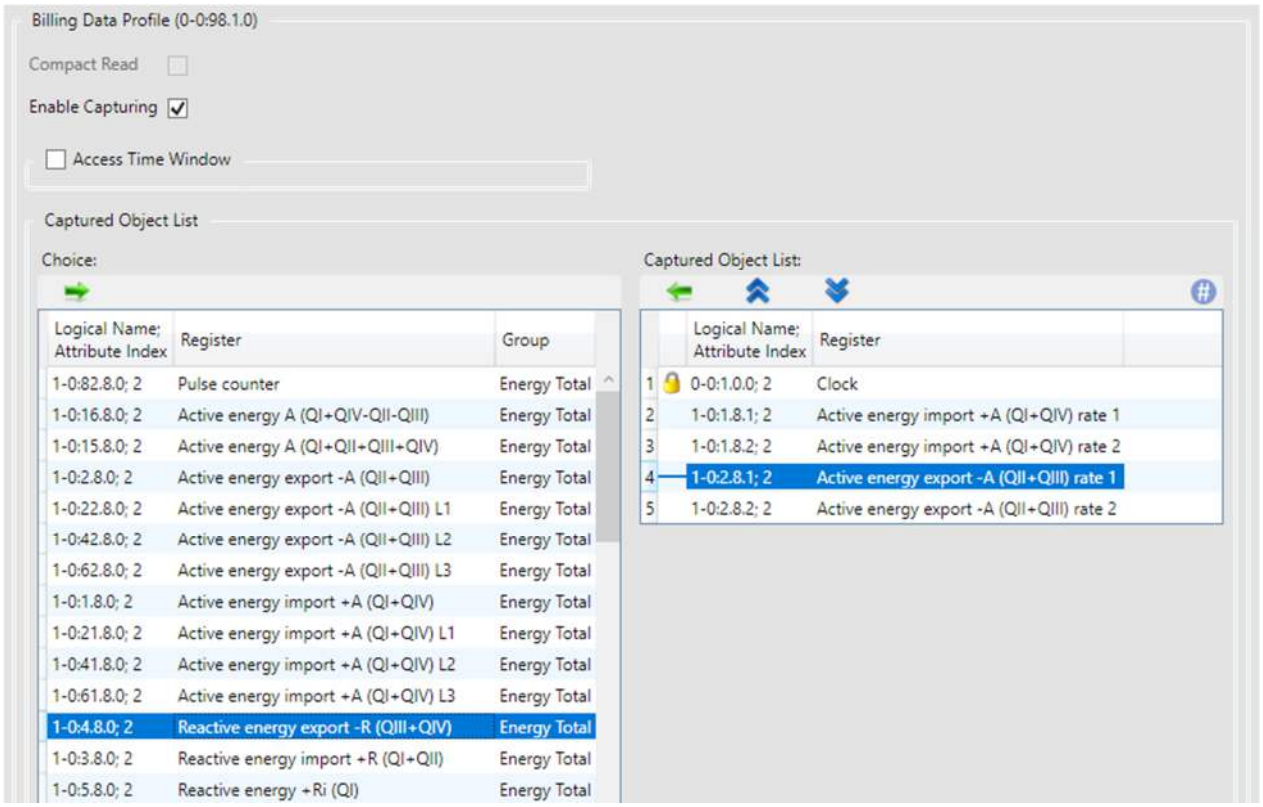
Activating or deactivating a checkbox can have an immediate influence on the parameter display. In the following example the maximum demand register parameters are only displayed with activated checkbox.



With deactivated checkbox the parameters are not visible.

5.2.5 Defining lists by selecting objects

Certain parameters (e.g. profiles, display lists, service lists etc.) can be set by copying a number of objects from a choice list into a captured object list and defining the order of the selected list entries.



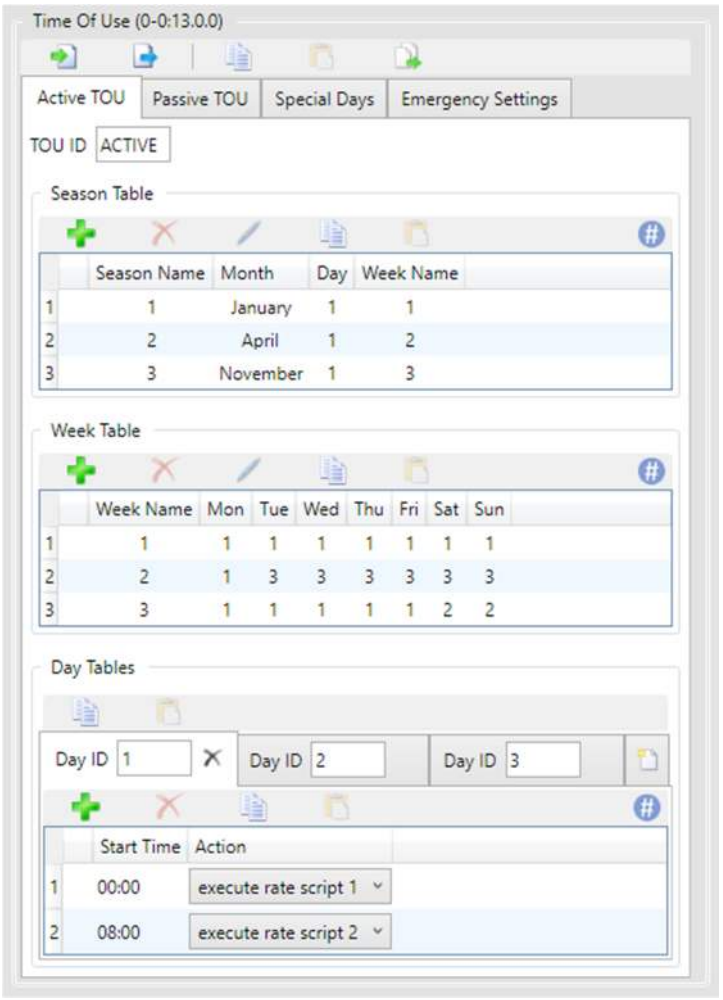
Clicking on  moves the selected entry of the choice list to the captured object list (to the first position if no entry is currently selected in the list or otherwise underneath the selected entry in the list).

Clicking on  moves the selected entry of the captured object list back to the choice list (to the original predefined position).

Clicking on  or  moves the selected entry of the captured object list one position up or down.

5.2.6 Using special functions

Certain parameters can be set using special functions, in the following example the definition of time of use tables.

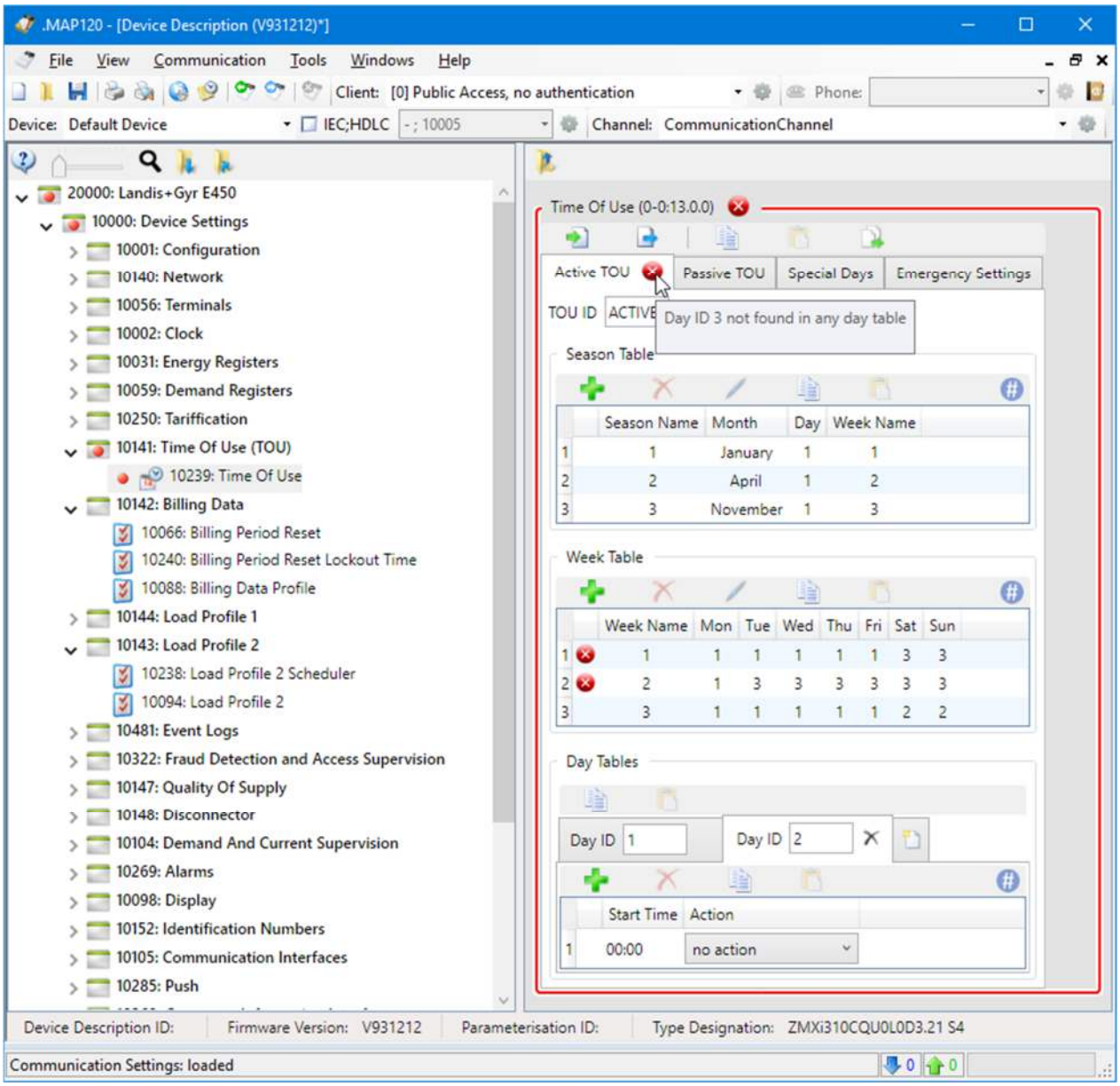


The special functions (import, save, copy, paste, add, remove etc.) can be selected by clicking on the corresponding icons (their function is indicated in a tooltip if the mouse pointer is positioned on the icon).

Specific instructions for the use of these functions are contained in the functional descriptions of the supported devices.

5.2.7 Invalid parameter settings

Invalid parameter settings are indicated with an error icon and a red frame around the invalid area in the detail view. Additionally, an error icon is displayed in the tree item with the invalid parameter and in all hierarchical higher folders.



The reason for the error (in the above example a missing day table) can be indicated with a tooltip if the mouse pointer is positioned on the error icon.

Please note, that only an error icon is displayed in the tree but not the cause of the error.

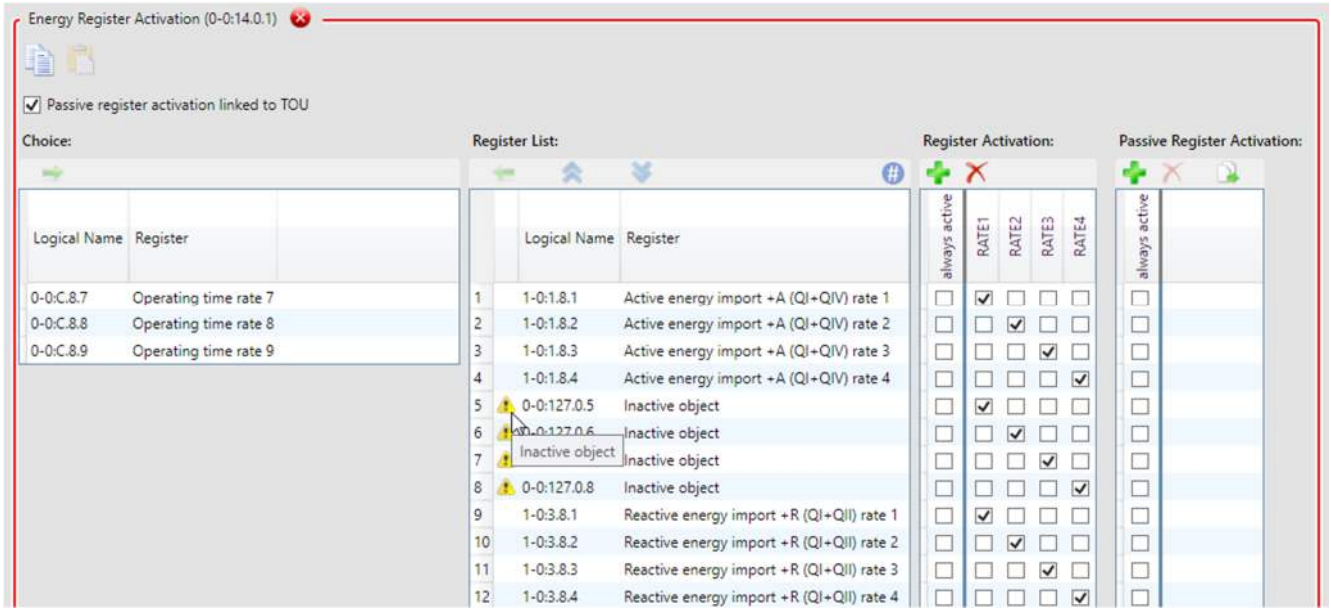
Possibility of consecutive errors
The error indicated in the tree can also be a consecutive error whose reason is another modified parameter.

5.2.8 Local warnings

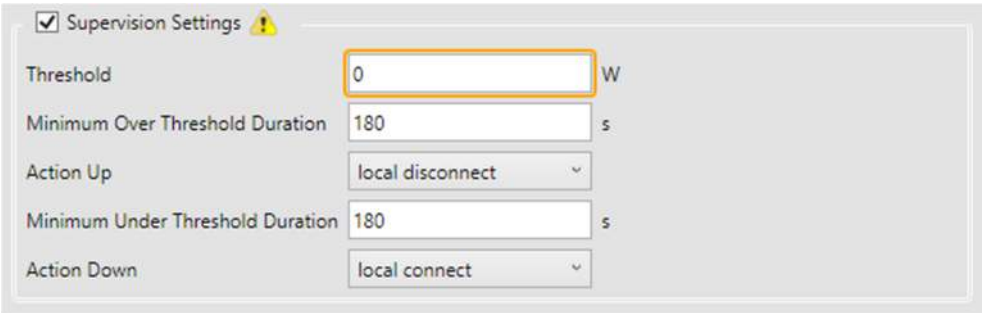
Parameter settings which affect a function – but are not invalid – are identified with a local warning indicated in the detail view but not in the tree. Such parameter settings are admissible (i.e. they may be intended) and do not need to be corrected.

The local warning is indicated with a warning icon (e.g. in lists) or with an orange frame (e.g. around entry boxes).

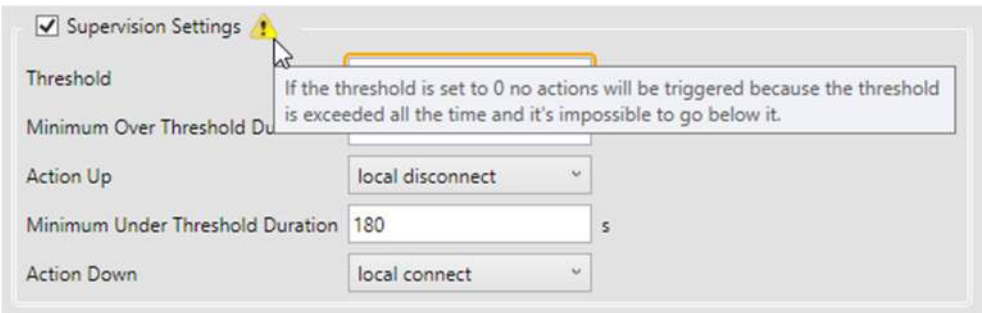
In the example below the warning icons indicate, that the corresponding registers are inactive (because the energy registers 13 to 16 have been disabled). By positioning the mouse pointer on the warning icon the cause of the warning is displayed as tooltip.



In the following example the orange frame around the entry box "Threshold" indicates that the supervision has been switched off by entering the value "0".



By positioning the mouse pointer on the on the warning icon or the entry box with the orange frame the cause of the warning is displayed as tooltip.



5.3 Sending device description or parameter group to a device

5.3.1 Parameterisation wizard

The parameterisation wizard is used to write a complete device description or a selected parameter group to a device in a secure manner to guarantee that devices are parameterised consistently. Therefore the wizard always checks the necessary access rights before writing any parameter. Only changed parameters are written to the device.

The following parameter groups can be selected in the parameterisation wizard:

- All parameters including TOU but without security system
- TOU only
- Security system only (access rights, security definitions, passwords)

For the parameterisation of devices with all parameters except the security system the parameterisation wizard permits the input of individual parameter values, such as device and parameterisation identification numbers for convenient parameterisation of several devices with the same parameters. The identification numbers entered are written to the device instead of the corresponding values from the device description. Furthermore the device clock can be set to PC time or to PC time plus an offset in the range of ±12 hours.

The parameterisation wizard also allows actions to be performed after parameterisation, e.g. resetting registers and profiles.

The starting of the parameterisation wizard and its various parameterisation possibilities are described in the following sub-sections.

Note: The available functions – especially the security system settings – differ depending on the device type.

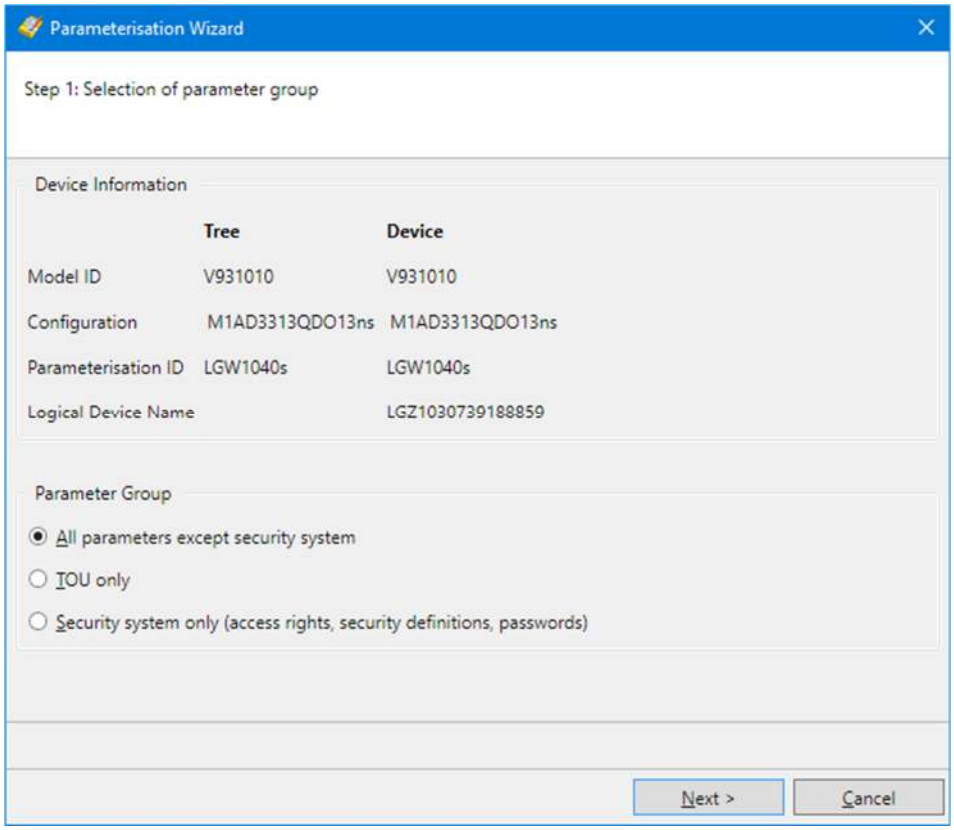
5.3.2 Starting the parameterisation wizard

The precondition for selecting the parameterisation wizard is that a device description is displayed in the .MAP120, either read out from a device, opened as file or newly created and edited.

Procedure:

Click on  in the application toolbar or select **Send to device** from the **Communication** menu.
The window "Step 1: Selection of parameter group" of the parameterisation wizard appears, communication is started and the data is read from the connected device.

The firmware version, the configuration ID and the parameterisation ID of the device description (column "Tree") and the device connected (column "Device") are displayed in the "Device Information" area, e.g. for a connected E450 ZMX310G meter:



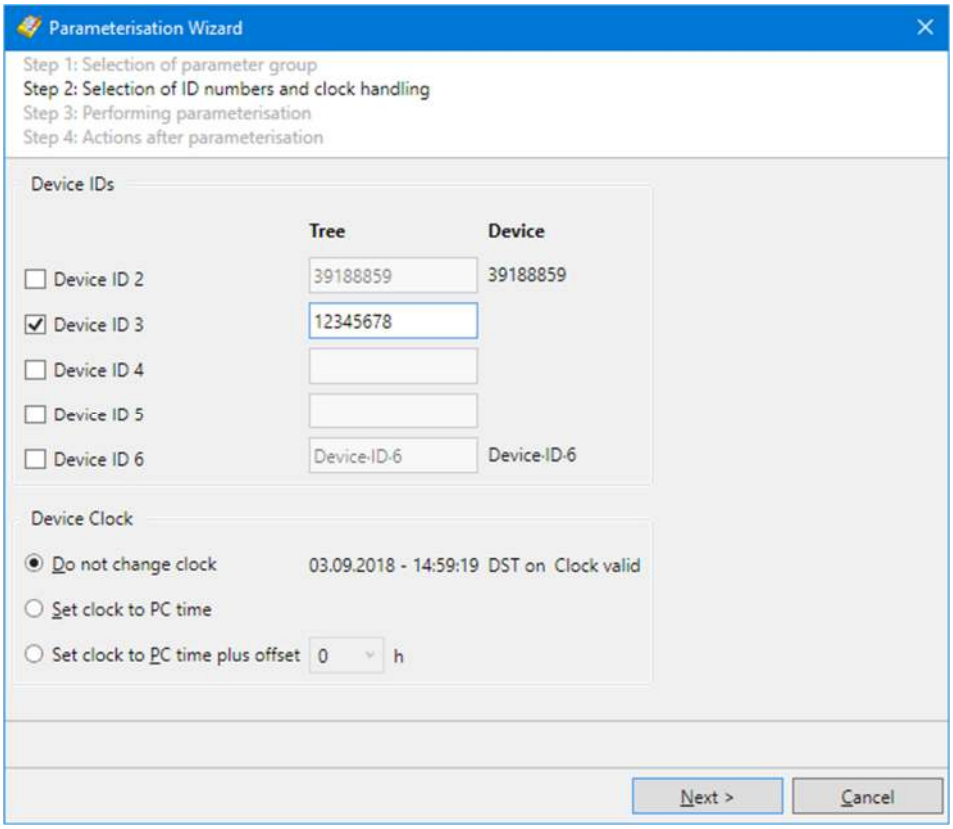
In the "Parameter Group" area the required parameter group can be selected if the indicated conditions are fulfilled:

- **All parameters except security system**
  can only be selected if the firmware and the configuration ID of tree and device correspond.
- **TOU only**
  can only be selected if the tree and the device have a time switch according to the configuration and both belong to the same device series.
- **Security System only**
  can only be selected if the firmware of tree and device correspond and the necessary security level has been selected. Please contact your local Landis+Gyr representative to get more information.

5.3.3 Parameterising all parameters except security system

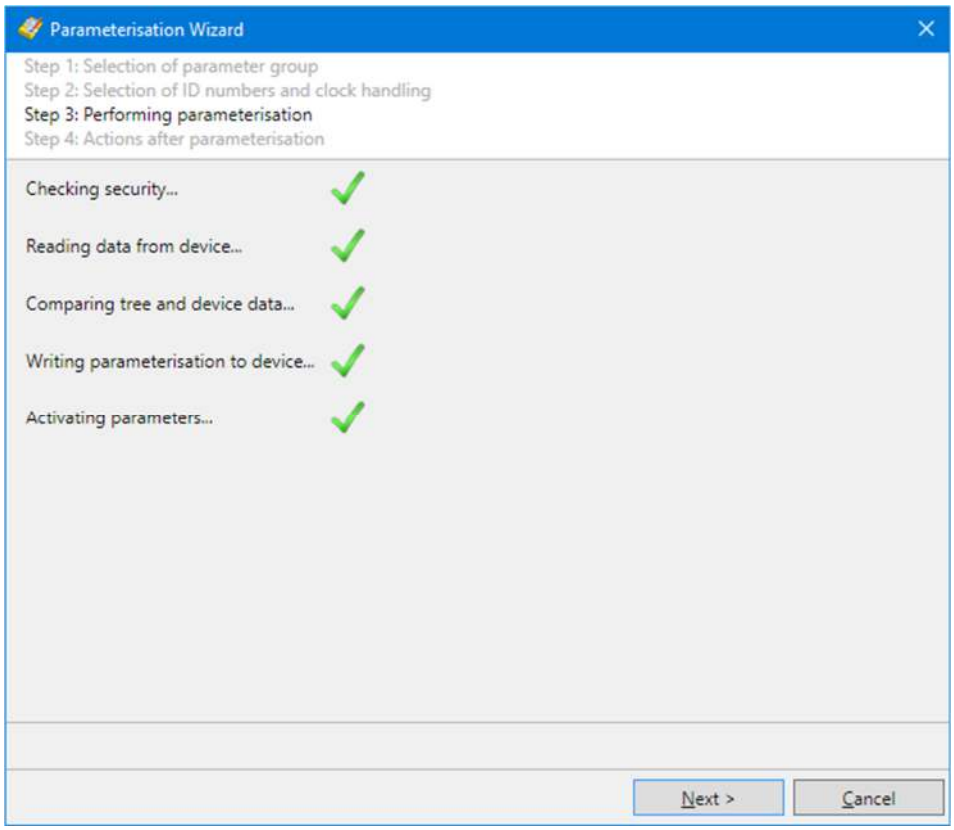
Procedure:

1. Start the parameterisation wizard (see section 5.3.2 "Starting the parameterisation wizard").
2. Select the parameter group option "All parameters except security system".
3. Click on **Next >**.
   The window "Step 2: Selection of ID numbers and clock handling" appears. The device identification numbers and the clock data are displayed. Please note that the display is depending on the device connected, i.e. the number of available IDs can be different.
4. Select the IDs which are to be modified and enter the desired values in the input boxes of the "Tree" column.
   Please note that the entered values are only used for the parameterisation of the device but are not stored in the device description displayed in the .MAP120. Only the selected IDs will be written to the device (an empty entry box deletes the corresponding value in the device).
5. Select the desired device clock handling option (the date and time, the DST bit and the clock invalid bit of the device clock status are shown):
   - Do not change clock
   - Set clock to PC time
   - Set clock to PC time plus offset (possible range: ± 12 hours)

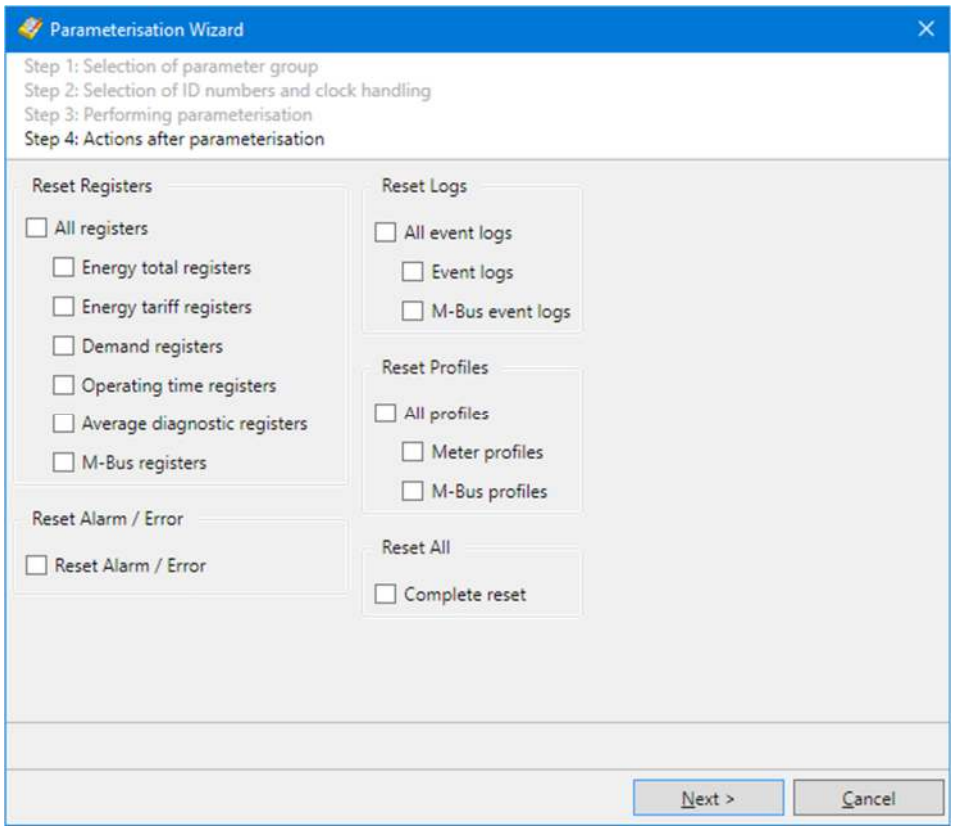


6. Click on **Next >**.
   The window "Step 3: Performing parameterisation" appears. In order to guarantee that the device is parameterised consistently the wizard checks the necessary access rights, reads the data from the device and compares the data before writing the changed parameters to the device. The progress

of the parameterisation is indicated with a progress bar and a green tick is set for every action executed successfully. At the end the currently active communication channel will be closed.

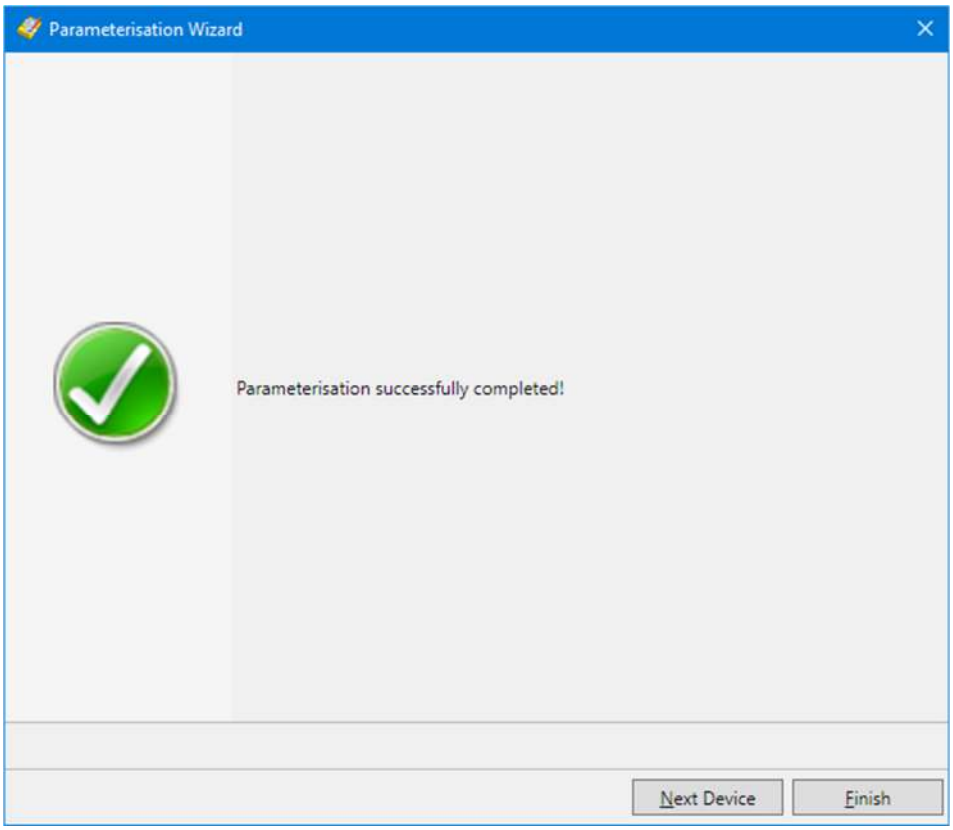


7. Click on **Next >**.
   The window "Step 3: Actions after parameterisation" appears.



8. Select the desired resetting actions.
   The possible selection is determined by the configuration of the device and is related to the capabilities of the device.

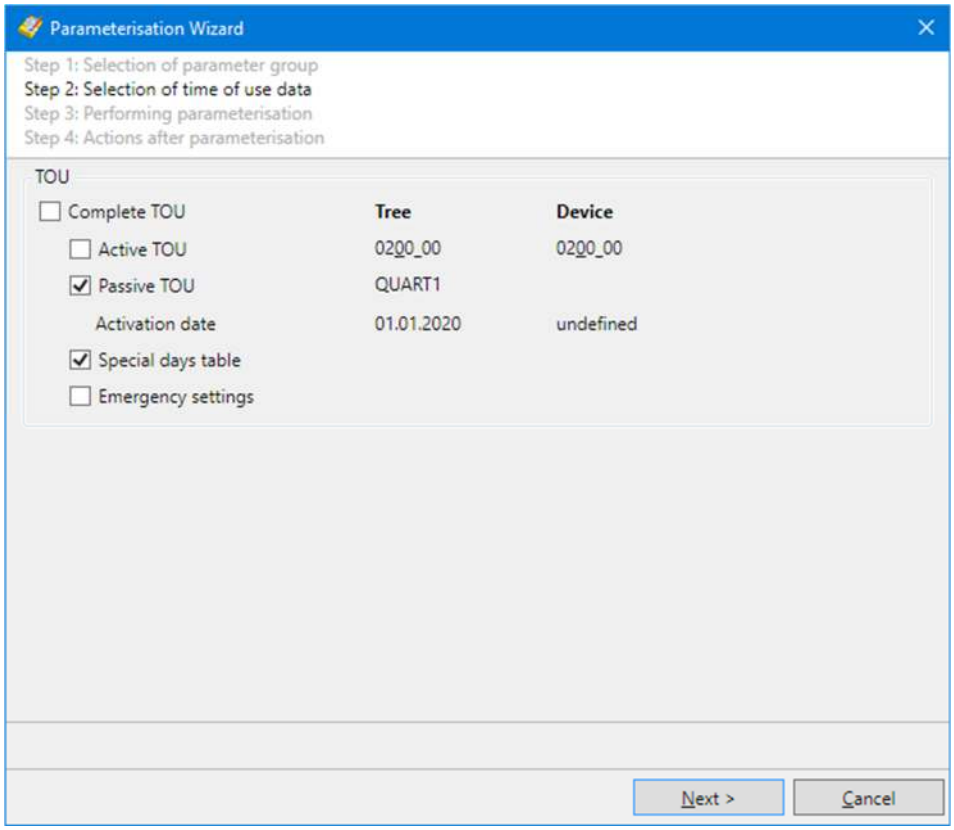
9. Click on **Next >**.
   If at least one action was selected, the communication with the device is established, the access rights for the selected actions are checked and the actions are performed if possible. At the end the currently active communication channel will be closed and the end window is displayed.



10. Click on **Next Device** if another device shall be parameterised or click on **Finish** to terminate parameterisation.
    The parameterisation wizard is restarted or terminated depending on the button clicked.

5.3.4 Parameterising time of use

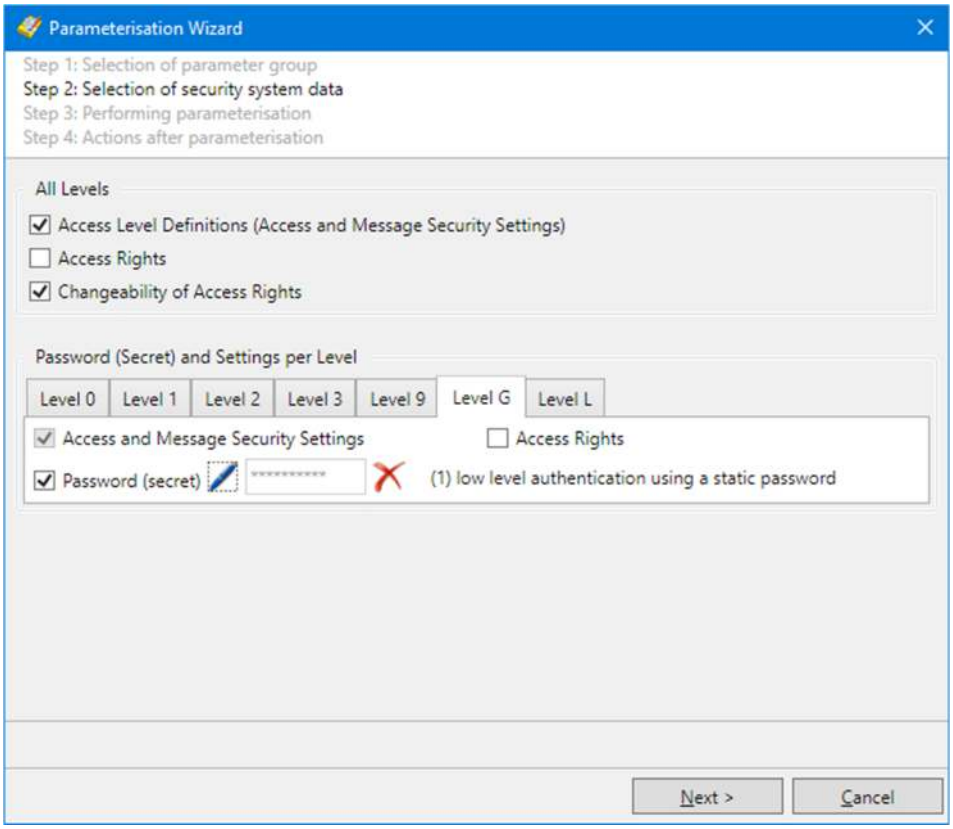
1. Start the parameterisation wizard (see section 5.3.2 "Starting the parameterisation wizard").
2. Select the parameter group option "TOU only".
3. Click on **Next >**.
   The window "Step 2: Selection of time of use data" appears.
4. Select the time of use data to be written to the device (either complete time of use or only individual parts).



5. Click on **Next >**.
   The window "Step 3: Performing parameterisation" appears and the parameterisation is performed (see point 6 to 10 in section 5.3.3 "Parameterising all parameters except security system").

5.3.5 Parameterising device security system

1. Start the parameterisation wizard (see section 5.3.2 "Starting the parameterisation wizard").
2. Select the parameter group option "Security System Only".
3. Click on **Next >**.
   The window "Step 2: Selection of security system data" appears.
4. Select the settings which shall apply to all levels:
   - Access Level Definitions (Access and Message Security Settings)
   - Access Rights
   - Changeability of Access Rights
5. In the "Password (Secret) and Settings per Level" area select one tab after the other and where required activate the checkboxes "Access and Message Security Settings" and "Access Rights" if not already set for all levels.
   Please note that the number of displayed level tabs is dependent from the connected device.
6. Activate the checkbox "Password (secret)" if the password of the corresponding level shall to be modified and enter the desired values in the "Enter New Password (Secret)" window, which appears after clicking on the Edit icon  in front of the corresponding password entry box.
   Please note that the entered values are only used for the parameterisation of the device but are not stored in the device description. Only the selected passwords will be written to the device.



Click on  behind the password field, if you want to delete again an entered password.

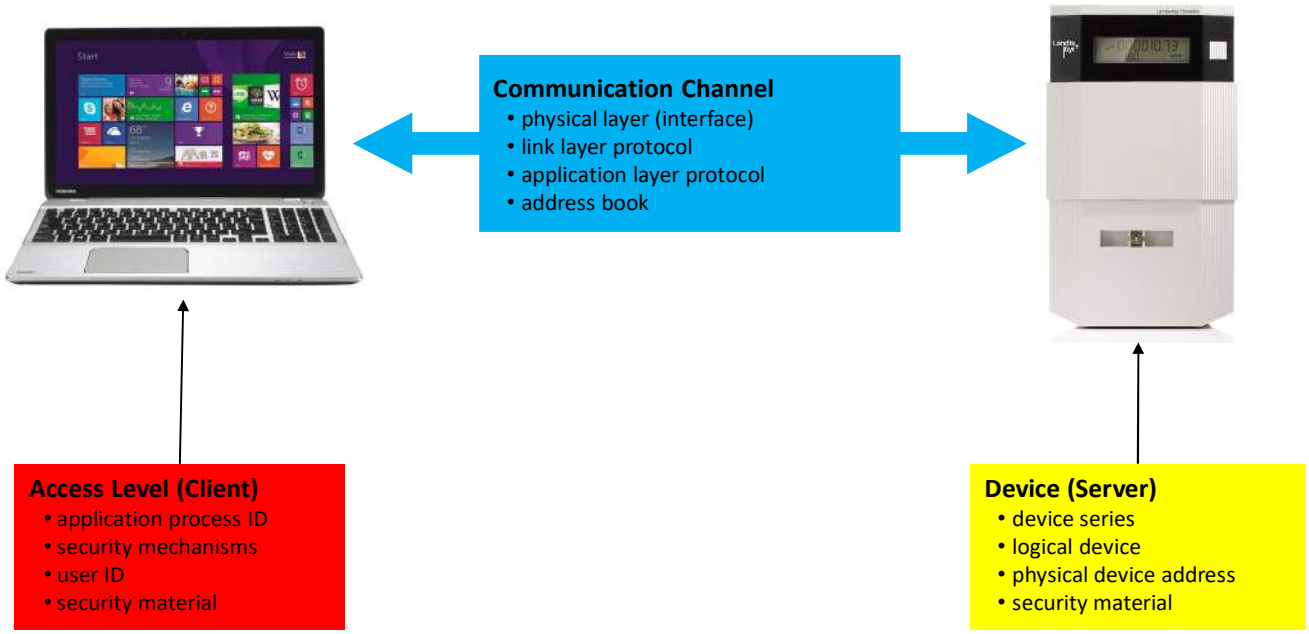
7. Click on **Next >**.
   The window "Step 3: Performing parameterisation" appears and the parameterisation is performed (see point 6 to 10 in section 5.3.3 "Parameterising all parameters except security system").

6 Communication with devices

This section describes all aspects of communication with devices, in particular the communication settings in the Landis+Gyr .MAP120 Parameter Editor for various applications.

6.1 Basic principle

The communication between the Landis+Gyr .MAP120 Parameter Editor and a device via a communication channel is strictly client/server based. The client is part of the .MAP120 Parameter Editor, the server is located in the end device (e.g. the meter).



The required settings in the Landis+Gyr .MAP120 Parameter Editor comprise the following three main areas:

- Communication channel
- Device (Server)
- Access level (Client)

6.1.1 Communication channel

The communication connection from the Landis+Gyr .MAP120 Parameter Editor to one or more devices can be made in various ways:

- With a **serial** connection to a device.
  - With an optical reading head placed at the optical interface of the device (only point-to-point connection to a device possible).
  - With a Bluetooth reading head (radio transmission over short distances, only point-to-point connection to a device possible).
  - With a direct connection to a device, e.g. via an RS232, M-Bus, CS or network interface as used in various communication units. If the communication unit has a second interface (e.g. RS485), multiple connections are possible to further devices.

- With a **modem** connection to a device or several devices, if these are connected together by a multiple connection by RS485, CS or M-Bus. Note: the modem must first have been installed and configured on the PC.
- With a **network** connection over a network interface or the Internet to one or several devices, if these are connected together by a multiple connection by RS485, CS or M-Bus.

In addition to the physical communication channel also various other settings are stored here, e.g. used protocol variants, transmission rates, delays, timeouts, etc.

6.1.2 Device

In this area, optional device-specific data can be specified. This mainly includes the device type or the device series as well as some address information to address the device (server) via a multiple connection.

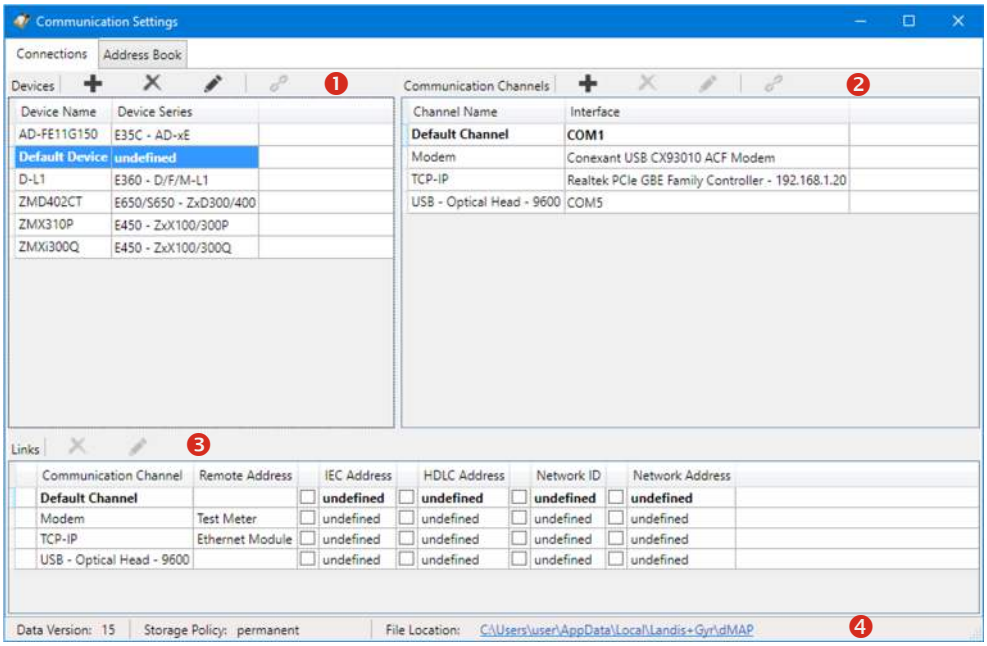
6.1.3 Access level

An access level defines all settings required on the Landis+Gyr .MAP side (client). This includes in particular the identification of the client as well as the algorithms used for the access and message security. If desired, the necessary keys and passwords can also be stored.

6.2 Communication settings

All communication settings can be defined and modified in the "Communication Settings" window.

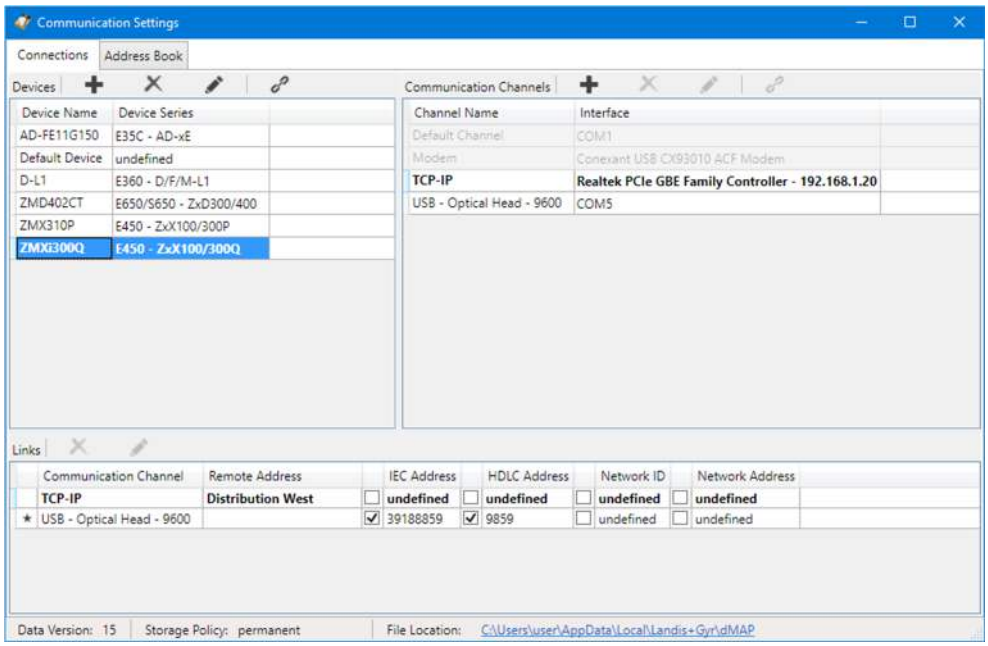
Click on  in the application toolbar or select **Communication settings** from the **Communication** menu.
The "Communication Settings" window appears with selected "Connections" tab.



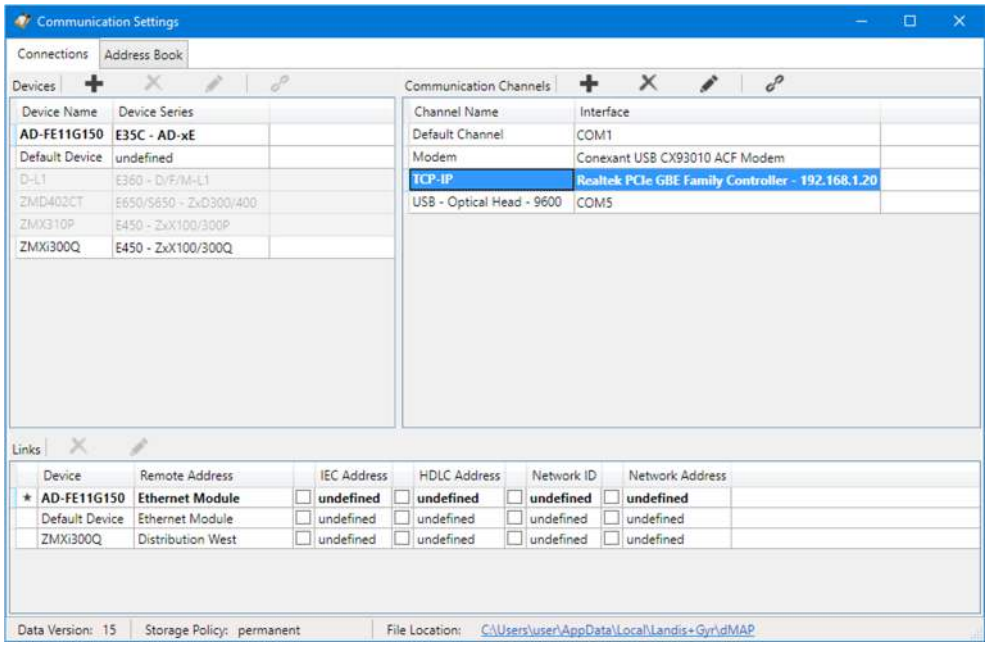
The "Communication Settings" window is subdivided into the following areas:

- List of devices (1) with their names and the associated device series.
  - The list can be sorted by any column in ascending or descending order, by default the devices are displayed in ascending order by name.
  - The currently selected device is highlighted and the selection is not changed by a new sorting.
- List of communication channels (2) with their names and the associated interface, e.g. COM port, modem or network card.
  - The list can be sorted by any column in ascending or descending order, by default the communication channels are displayed in ascending order by name.
  - The currently selected communication channel is highlighted and the selection is not changed by a new sorting.
- List of links (3) between devices and communication channels with the possible additional information, particularly with addresses and phone numbers. The items displayed depend on the selected device or communications channel (see also section 6.2.5 "Links between devices and communication channels").
- Status bar (4), in which the currently used version of the communication data and their location (see section 7.5 "Defining storage location of communication settings") can be seen as well as the current storage policy of passwords and keys (see section 7.6 "Defining storage policy for keys and passwords").

In the following figure a device (highlighted blue) is selected in the list of devices. All the communication channels not linked are greyed out in the list of communication channels and the links with their attributes are shown in the list of links.



In the figure below a communication channel (highlighted blue) is selected in the list of communication channels. All the devices not linked are greyed out in the list of devices and the links with their attributes are shown in the list of links.



6.2.1 Recommended input sequence

Landis+Gyr recommends defining the required data in the following sequence:

1. Communication channels (see section 6.2.2 "Communication channel data")
2. Devices including the corresponding access data (see section 6.2.3 "Device data")
3. Addresses (see section 6.2.4 "Address data")
4. Links between devices and communication channels including the relevant attributes (see section 6.2.5 "Links between devices and communication channels"

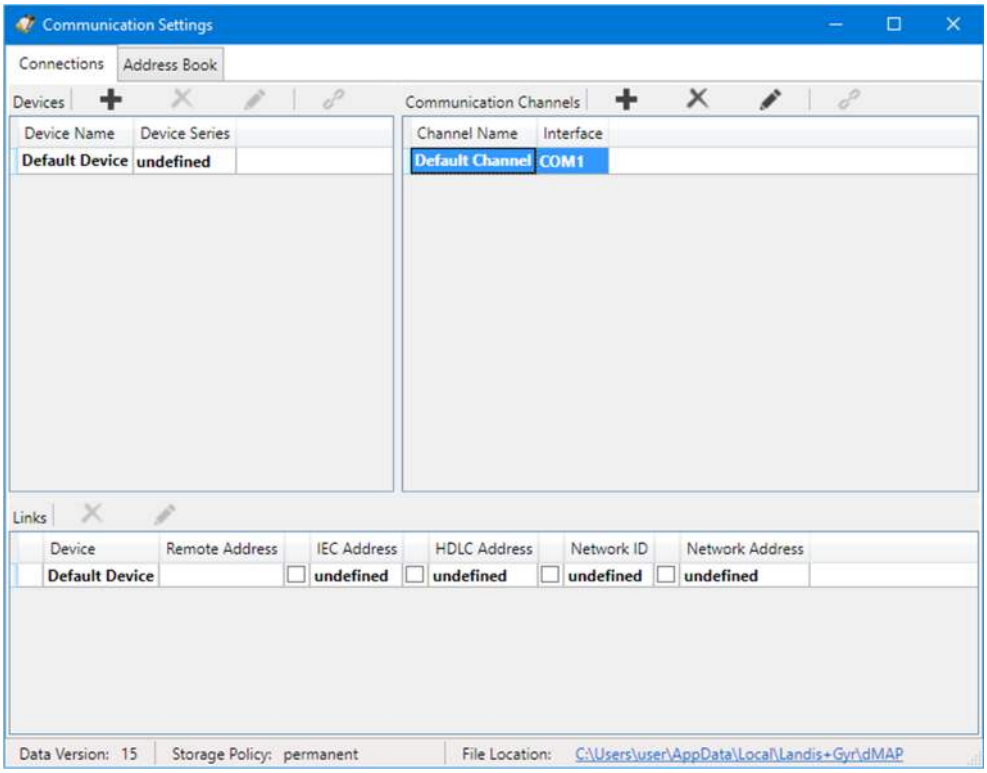
6.2.2 Communication channel data

After the installation of the .MAP120 Parameter Editor only a default device named "Default Device" and a default communication channel named "Default Channel" are defined. These default communication settings are the basis for a local readout of a meter with an optical reading head connected to the serial interface. At least the serial interface (COM port) has to be adapted in most cases.

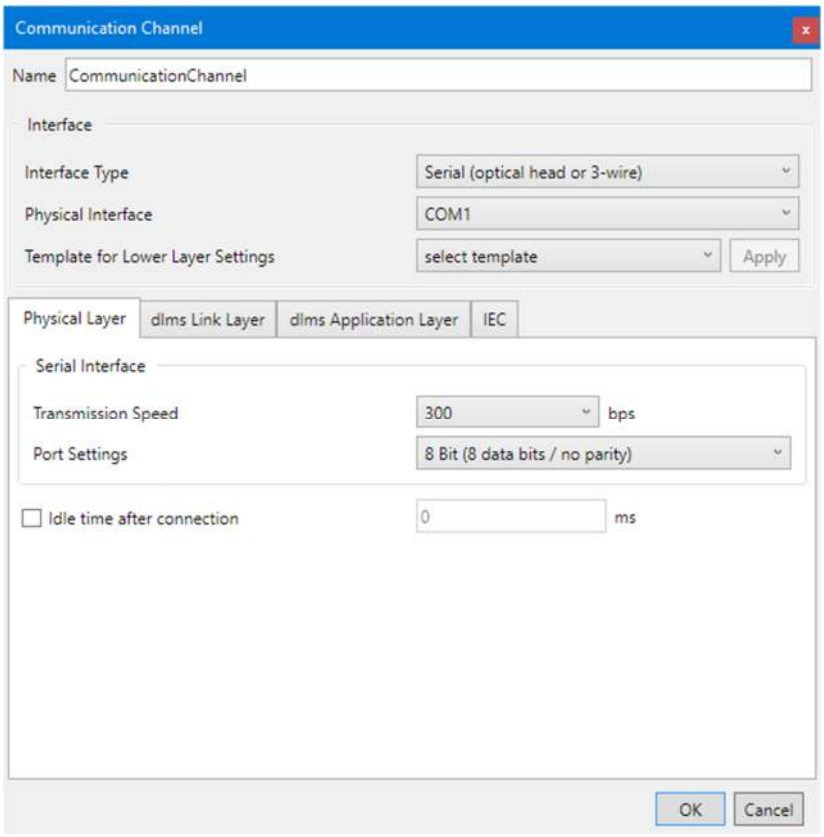
The following basic procedure should be adopted to create and store a new communication channel definition (specific examples are given in section 6.5 "Communication examples"):

1. Click on  in the application toolbar or select **Communication settings** from the **Communication** menu.
   The "Communication Settings" window appears with selected tab "Connections" (as shown here with the default communication settings or with additional data, if already defined).

2. Highlight a communication channel in the communication channel list (default channel or any other communication channel, if already defined).



3. Click on  in the window toolbar in the "Communication Channels" area.
   The "Communication Channel" window appears. The entry box "Name" contains the placeholder name "CommunicationChannel", all other fields contain a copy of the data of the selected communication channel and can now be modified.



4. Enter a name for the new communication channel definition in the entry box "Name".
5. Select the interface type of the connected device in the "Interface type" drop down list:
   - Serial (optical head or 3-wire)
   - Bluetooth optical head (PMR_1)
   - Bluetooth optical head (PMR_1A)
   - Modem
   - Network
6. Select the used interface in the "Physical interface" drop down list:
   - an available COM port if "Serial" or "Bluetooth optical head" was selected as interface type (the COM port number of a serial interface can be found in the Windows device manager),
   - an available modem if "Modem" was selected as interface type or
   - an available network adapter if "Network" was selected as interface type.
7. Select the suitable template for the communication channel settings in the "Template for lower layer settings" drop down list. The following templates are available (selection possibilities dependent on the selected physical interface and interface type):
   - Serial - IEC
     (start protocol IEC with 300 bps)
   - Serial - dlms
     (DLMS/HDLC protocol with 9600 bps)
   - M-Bus - dlms
     (DLMS/HDLC protocol with 9600 bps and 9 Bit transmission)

- Bluetooth - IEC
  (same as "Serial – IEC", but with special control of the Bluetooth reading head)
- Bluetooth - DLMS
  (same as "Serial – dlms", but with special control of the Bluetooth reading head)
- PSTN Modem
  (DLMS/HDLC protocol with extended timeouts of 5 s)
- GSM Modem
  (DLMS/HDLC protocol with extended timeouts of 10 s)
- Wired - HDLC
  (DLMS/HDLC protocol via wired network, e.g. Ethernet)
- Wired - Wrapper
  (DLMS/Wrapper protocol via wired network, e.g. Ethernet)
- Wireless - HDLC
  (same as "Wired – HDLC", but with extended timeouts since the transmission times can be significantly higher e.g. with GPRS)
- Wireless - Wrapper
  (same as "Wired – Wrapper", but with extended timeouts since the transmission times can be significantly higher e.g. with GPRS)

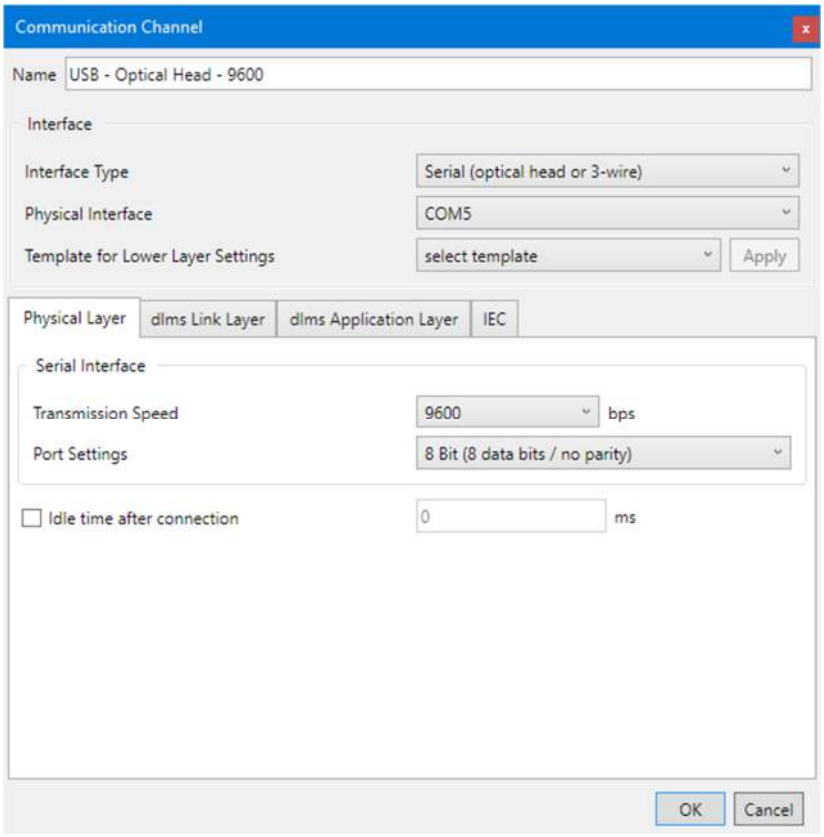
After selection of a template the button "Apply" is activated. If you click on it, all communication channel settings are set automatically according to the template.

8. Now you can directly continue according to subsection 6.2.2.5 "Terminating the communication channel definition" or check the settings on each tab according to the following subsections.

6.2.2.1 Physical Layer

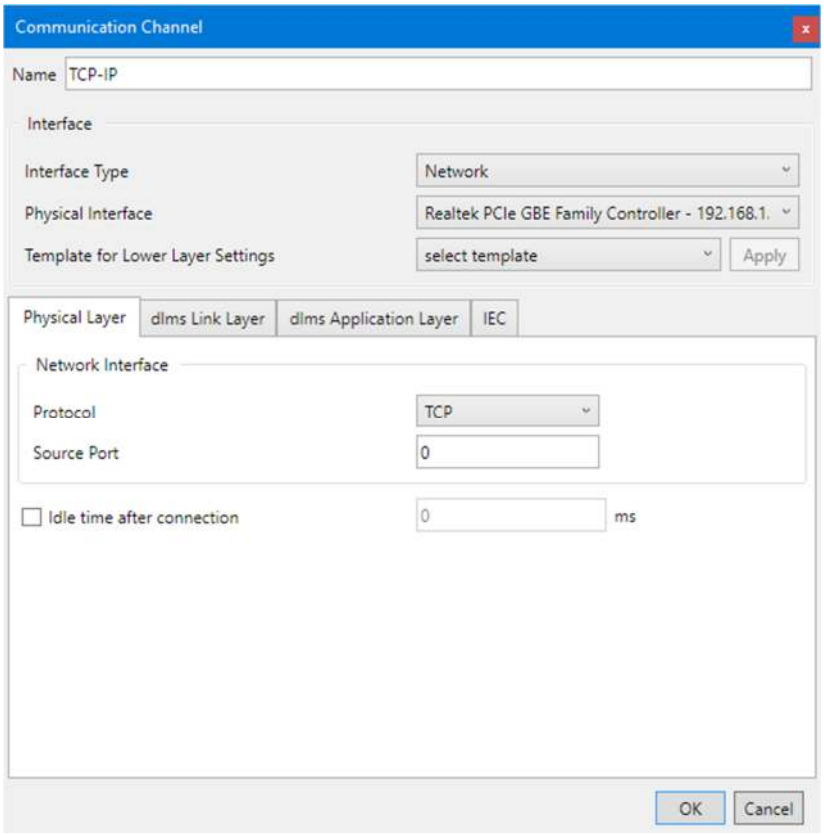
1. Select the "Physical Layer" tab.
   Depending on the interface type selected the setting possibilities are different.

If interface type "Serial" or "Bluetooth optical head" is selected:



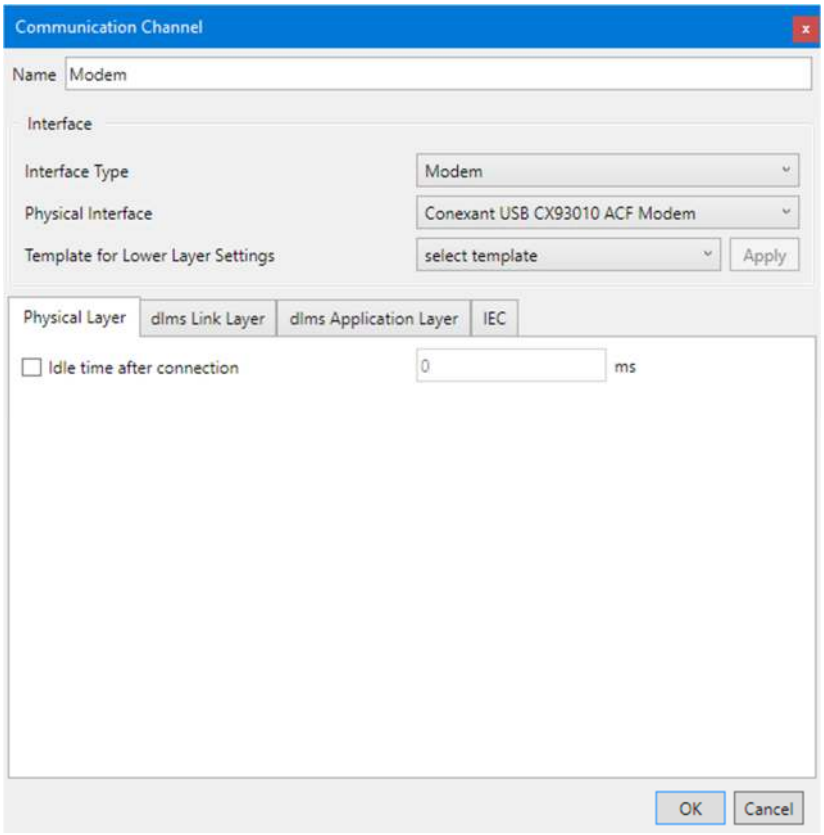
2. Select the transmission rate corresponding to the device in the "Transmission speed" drop down list for local communication.
3. Select the required communication port settings in the "Port settings" drop down list:
   - **8 Bit (8 data bits / no parity)** (default), to be used normally
   - **9 Bit (8 data bits / even parity)**, to be used if the connection to the serial interface of the PC is made via an USB M-Bus converter
4. Tick the "Idle time after connection" checkbox if you want to modify the default initial delay (IEC standard value = 0 ms). Then enter the required value in the "Idle time after connection" entry box.

If interface type "Network" is selected:



2. Select the required communication protocol in the "Protocol" drop down list:
   - **TCP** (Transmission Control Protocol)
   - **UDP** (User Datagram Protocol)
3. If required enter a source port number (only if IPv6 is used) otherwise do not change the default setting "0" (automatic selection).
4. Tick the "Idle time after connection" checkbox if you want to modify the default initial delay (IEC standard value = 0 ms). Then enter the required value in the "Idle time after connection" entry box.

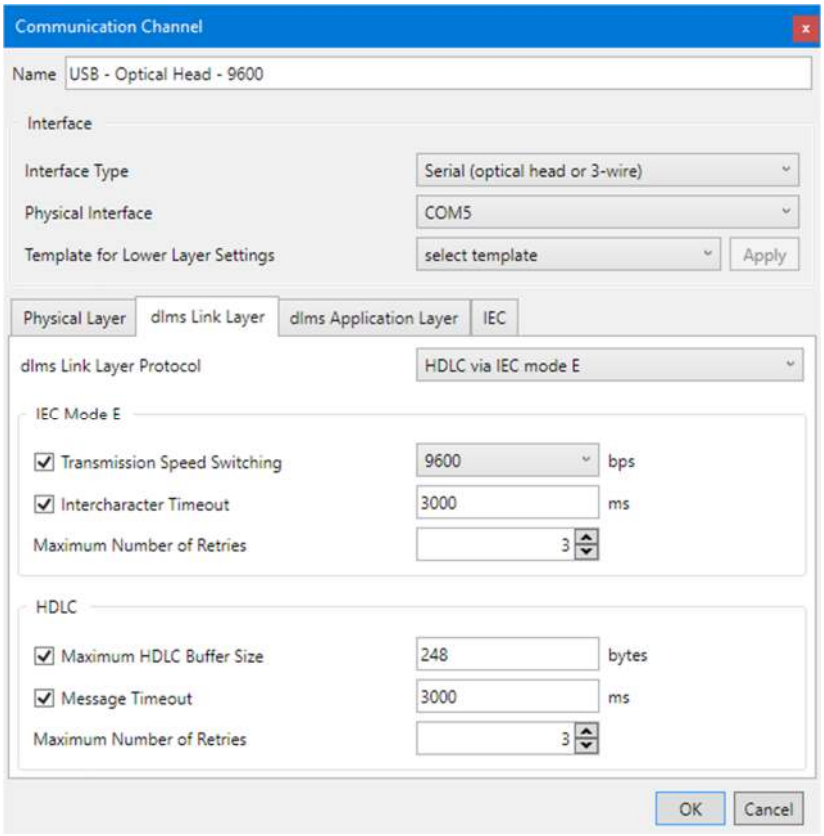
If interface type "Modem" is selected:



2. Tick the "Idle time after connection" checkbox if you want to modify the default initial delay (IEC standard value = 0 ms), e.g. with GSM networks. Then enter the required value in the "Idle time after connection" entry box.

6.2.2.2 dlms Link Layer

1. Select the "dlms Link Layer" tab.
   The settings on this tab apply if the DLMS protocol is used.
2. Select the required protocol for the planned activity in the "dlms Link layer protocol" drop down list. Possible settings:
   - **HDLC**, if the HDLC protocol must be used
   - **HDLC via IEC mode E** (default), if the IEC protocol must be used for opening the communication
   - **COSEM Wrapper**, if the COSEM Wrapper over the TCP protocol must be used



3. Depending on the selected link layer protocol, the IEC Mode E, HDLC or COSEM Wrapper areas are displayed to make the required settings.

   In the **IEC Mode E** area (only displayed if "HDLC via IEC mode E" is selected as link layer protocol):

   - Transmission Speed Switching: Select the required maximum transmission rate (default = 9600 bps). Untick the checkbox if you don't want to allow transmission rate switching.
     Note: In case of modem or network connections no real change is made but only the transmission rate character in the protocol is altered.
   - Intercharacter Timeout: After expiration of the set time the transmission is automatically ended if no further data is transmitted. If you untick the checkbox, no automatic termination of the transmission occurs.
   - Maximum Number of Retries: Select the number of retries (default value = 3). If you select 0, no retries occur.

In the **HDLC** area (only displayed if "HDLC" or "HDLC via IEC mode E" is selected as link layer protocol):

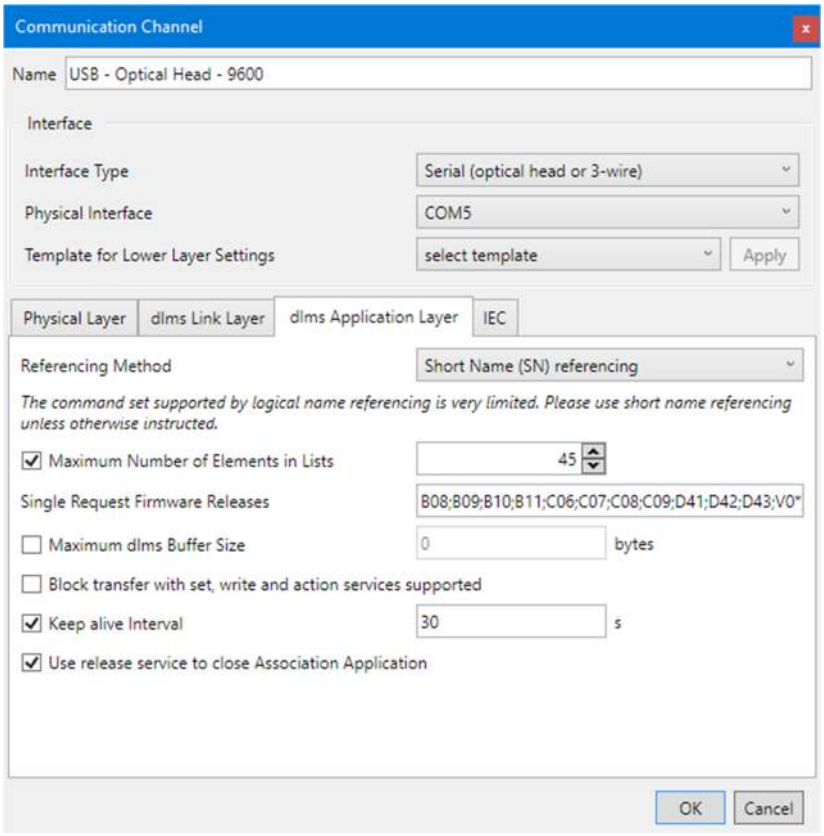
- Maximum HDLC Buffer Size: Tick the checkbox if you want to modify the default value (128 bytes). The HDLC buffer size determines how many useful data can be transmitted in one data packet. Reduce the value in case of communication problems.
- Message Timeout: If you untick the checkbox, no automatic termination of the transmission occurs.
- Maximum Number of Retries: Select the number of retries (default value = 3). If you select 0, no retries occur.

In the **COSEM Wrapper** area (only displayed if "COSEM Wrapper" is selected as link layer protocol):

- Message Timeout: If you untick the checkbox, no automatic termination of the transmission occurs.

6.2.2.3 dlms Application Layer

1. Select the "dlms Application Layer" tab.
   The settings on this tab apply if the DLMS protocol is used.

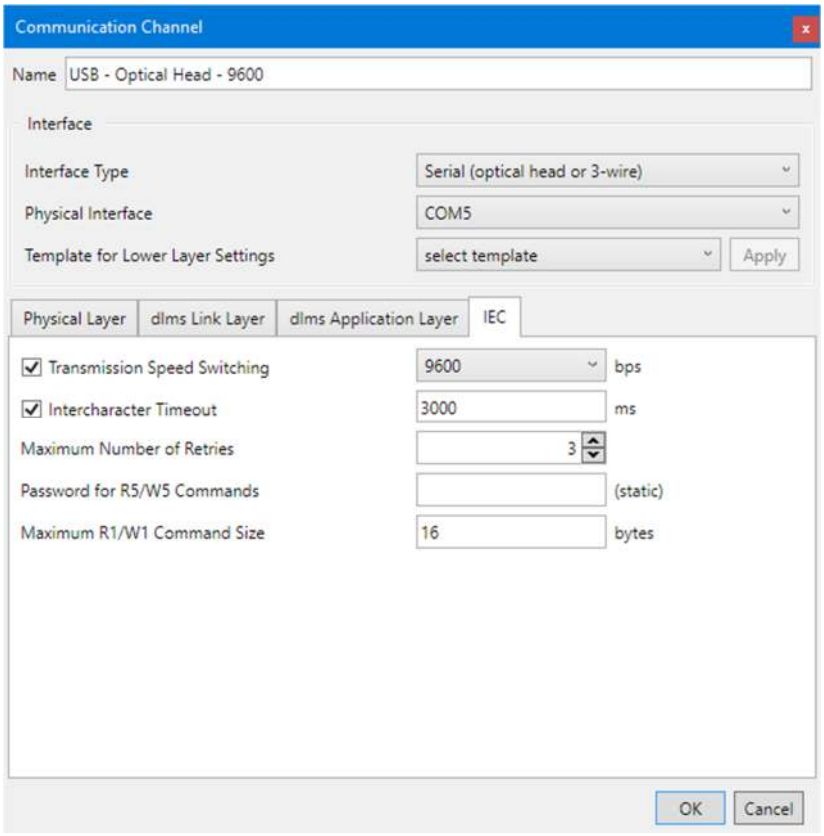


2. Select "Short Name (SN) referencing" or "Logical Name (LN) referencing" method. The command set supported by LN referencing is very limited. The .MAP tools only work with short names. Therefore SN referencing is the preferred choice unless otherwise instructed.
3. Tick the "Maximum Number of Elements in Lists" checkbox to activate the use of lists for read and write operations. Enter the maximum number of elements in lists. In case of readout problems this value (default = 45) can be reduced down to 1. It should be noted that this slows down the readout significantly.

4. If required, modify the "Single Request Firmware Releases". This entry box contains all releases (separated by semicolons), for which automatically single requests will be used, i.e. no list requests are used.
5. Tick the "Maximum dlms Buffer Size" checkbox if you want to limit the maximum buffer size in the .MAP tool for writing of data (default value = 0). Then enter the required value in the "Maximum dlms Buffer Size" entry box. Principally the buffer sizes for writing and reading reported from the device are used. If a maximum buffer size is determined, this size is not exceeded during writing, even if the device reports a bigger write buffer size. If you untick the checkbox, the buffer size is unlimited, i.e. buffer size indicated by the device is used.
6. Tick the "Block transfer with set, write and action services supported" checkbox if you want to allow write operations with blocks and if your device also supports block transfers. The use of blocks for writing depends on the data quantity, the maximum number of list items and the DLMS buffer size. It is recommended to disable this setting in case of transmission problems.
7. Keep alive interval: After this time an "Alive-Packet" is to be sent in order to maintain the connection. The value must be greater than the message timeout value (default = 30 s). If you untick the checkbox, the function is switched off.
8. Tick the "Use release service to close Association Application" checkbox if a release request shall be sent before closing the HDLC connection (with COSEM Wrapper a release request is always sent).

6.2.2.4 IEC

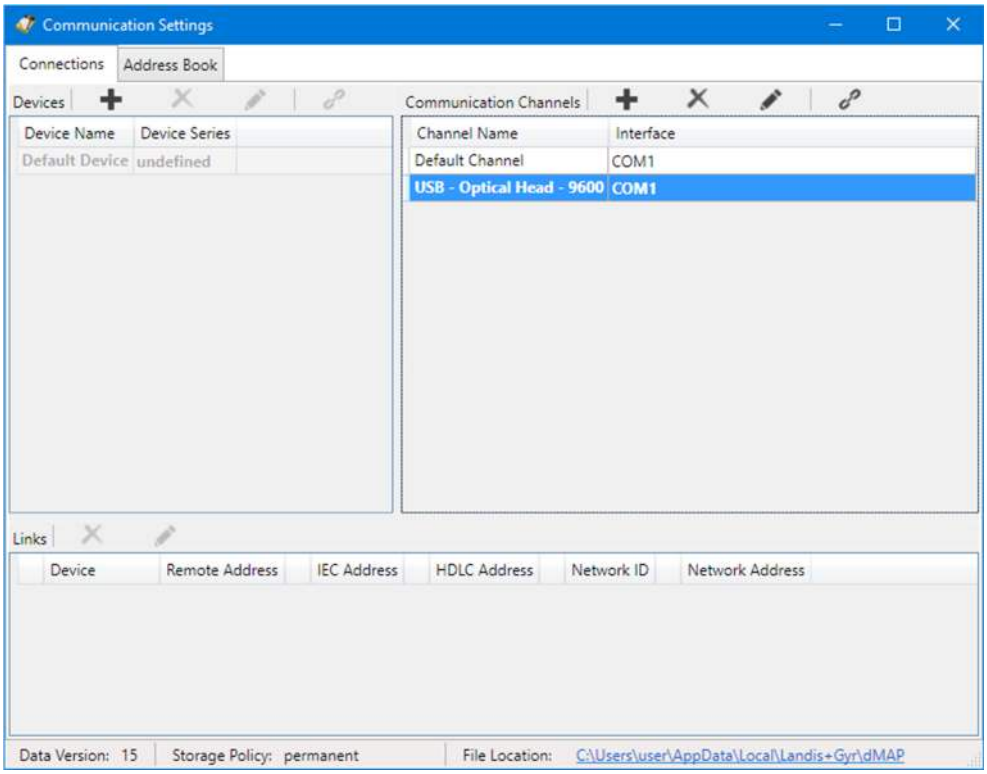
1. Select the "IEC" tab.
   The settings on this tab apply for devices that support solely the IEC protocol.



2. Select the required maximum transmission rate (default = 9600 bps) in the "Transmission Speed Switching" drop down list. Untick the checkbox if you don't want to allow transmission rate switching.
   Note: In case of modem or network connections no real change is made but only the transmission rate character in the protocol is altered.
3. Intercharacter Timeout: After expiration of the set time the transmission is automatically ended if no further data is transmitted. If you untick the "Intercharacter Timeout" checkbox, no automatic termination of the transmission occurs.
4. Select the number of retries (default value = 3) in the "Maximum Number of Retries" entry box. If you select 0, no retries occur.
5. Enter the required static password (8 characters) for R5/W5 commands in the "Password for R5/W5 Commands" entry box.
6. Enter the maximum length in bytes of the R1/W1 commands in the "Maximum R1/W1 Command Size" entry box.
   This value limits the block size for the transmission of large amounts of data, e.g. display lists or tables of use. Values greater than 16 bytes are not supported by all devices. Please refer to the respective device documentation to find out which values are supported by your device.

6.2.2.5 Terminating the communication channel definition

1. Click on **OK**.
   The new communication channel definition is saved. A new entry with the defined name appears in the communication channel list.



2. Define further required communication channels in the same way.
3. Close the "Communication Settings" window.

Modifying or deleting communication channel definitions

If you intend to modify or delete a communication channel definition, mark the corresponding entry in the communication channel list and then

- click on  in the window toolbar in the "Communication Channels" area to modify the marked entry of the communication channel list or double click on the entry.
- click on  in the window toolbar in the "Communication Channels" area to delete the marked entry of the communication channel list (deletions must be confirmed).

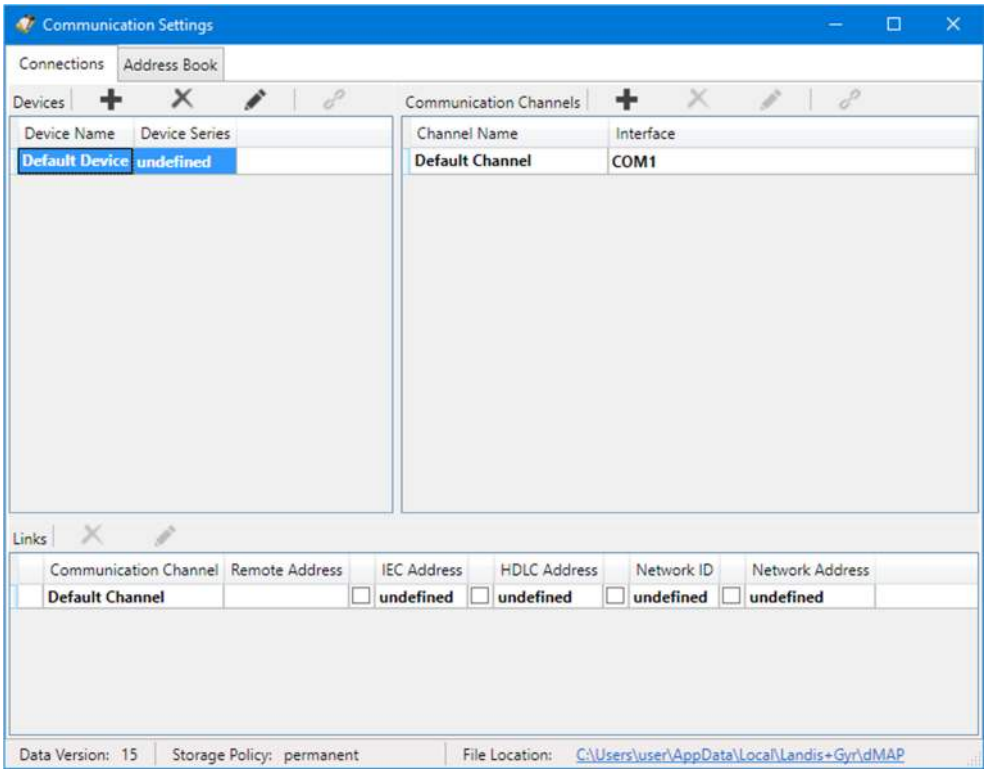
6.2.3 Device data

After the installation of the .MAP120 Parameter Editor, only a default device named "Default Device" and a default communication channel named "Default Channel" are defined. These default communication settings are the basis for a local readout of a meter with an optical reading head connected to a serial interface.

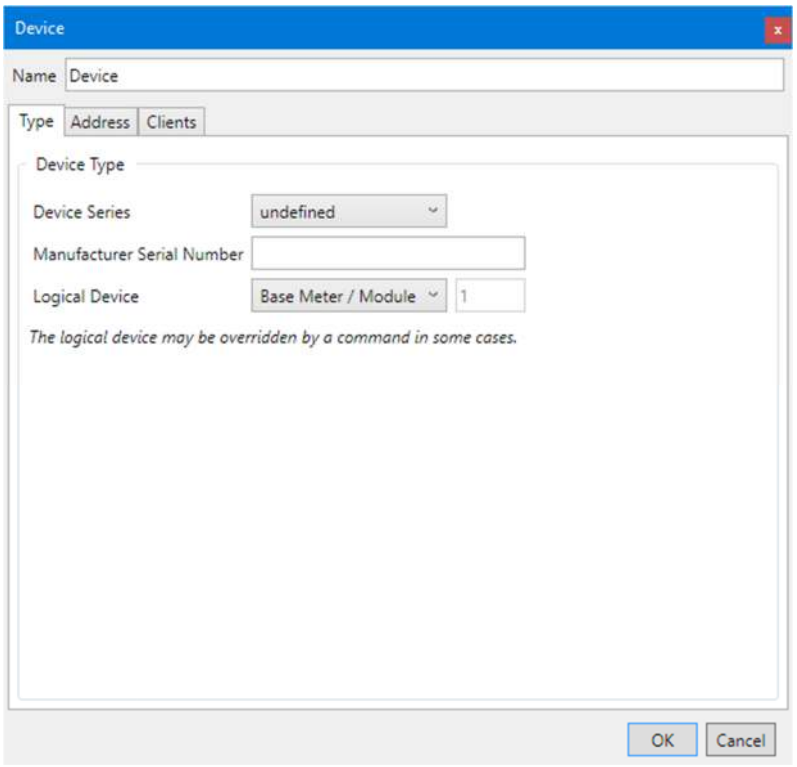
Additionally, other device-specific properties can be defined here, if required.

The following basic procedure should be adopted to create and store a new device definition (specific examples are given in section 6.5 "Communication examples"):

1. Click on  in the application toolbar or select **Communication settings** from the **Communication** menu.
   The "Communication Settings" window appears with selected tab "Links".
2. Highlight a device in the device list (any device or other device, if already defined).



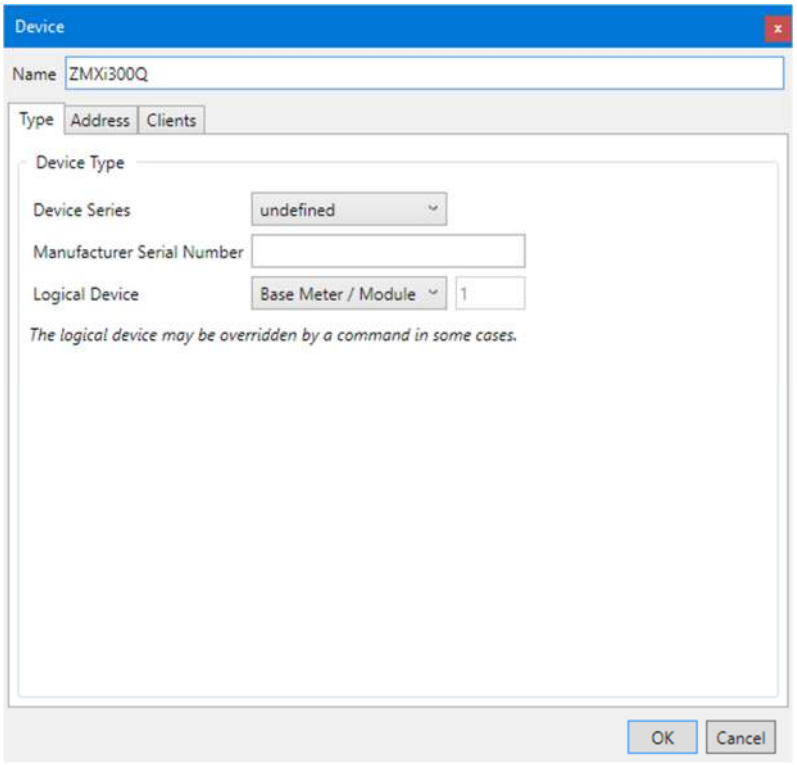
3. Click on  in the window toolbar in the "Devices" area.
   The "Device" window appears. The entry box "Name" contains the place-holder name "Device", all other boxes contain the data of the selected device and can now be modified.



4. Enter a name for the new device definition in the entry box "Name".

6.2.3.1 Type

1. Select the "Type" tab.



2. Select the device series in the "Device Series" drop down list.
   The selected device series has the effect, that the command tree will be changed accordingly, if the device is selected in the device toolbar. If you leave "undefined", no adaptation of the command tree occurs.

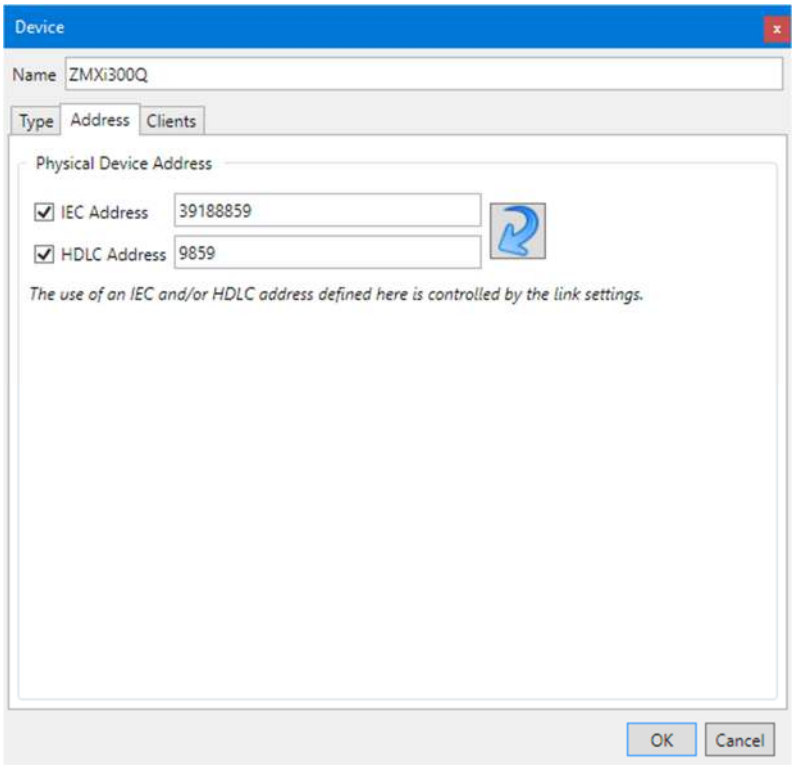
3. If required, enter the manufacturer serial number with a maximal length of 20 characters and a restricted character set ('0'..'9', 'A'..'Z', 'a'..'z') in the "Manufacturer Serial Number" entry box.
   Please note that this entry has currently no meaning but may be used for extended device management in the future.

4. Select the device type in the "Logical Device" drop down list: "Base Meter / Module" (=1) or "Communication Unit" (=17) or "user defined" for devices from third party suppliers (in this case, you must enter the logical device number according to the manufacturer information).
   Note that this selection is only possible if the device series is set to "undefined". Otherwise it is fix set to "Base Meter / Module" (=1) or "Communication Unit" (=17), depending on the selected device series. Also note that the logical device may be overridden by a command in some cases, if the command is implemented only for a specific logical device (e.g. communication unit).

6.2.3.2 Address

1. Select the "Address" tab, if a device address shall be used.

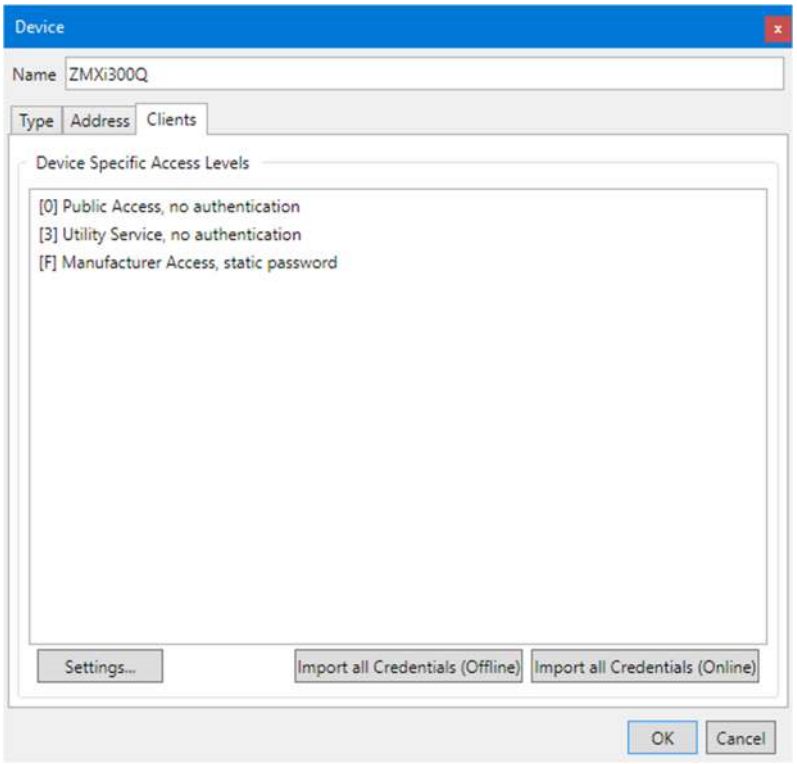
2. Set a tick to the "IEC address" and/or "HDLC address" checkbox and enter the address(es).
   If you enter an IEC address first and then click on the arrow button behind the two entry boxes, the HDLC address is automatically calculated and entered (see section 6.3 "Addressing devices").



6.2.3.3 Access levels

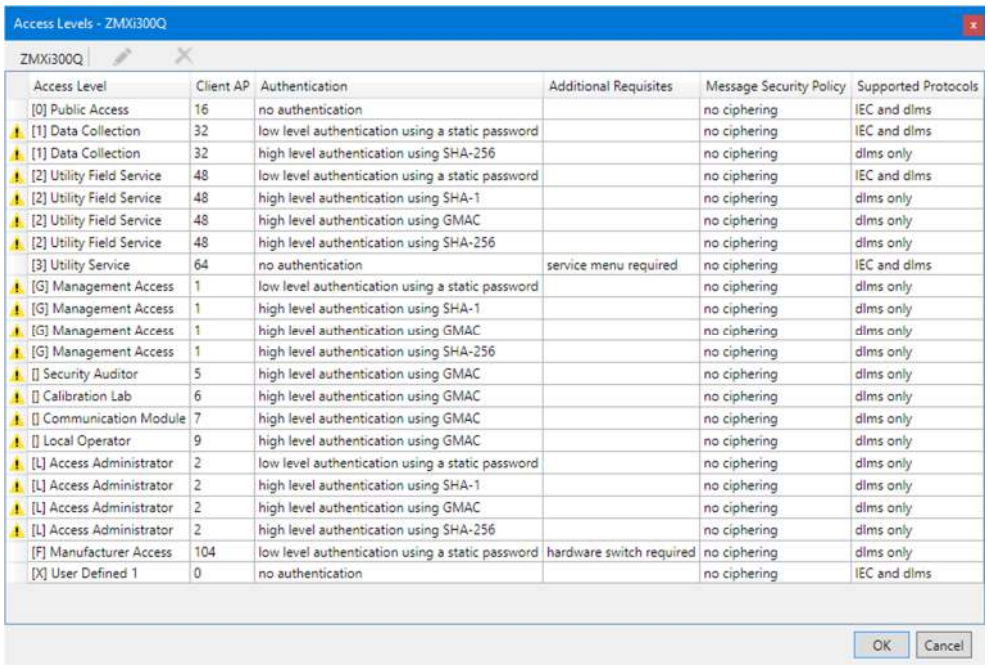
The various access levels and their fields of application are described in section 9 "Short description of device security system".

1. Select the "Clients" tab to define the device-specific access levels.



After the installation of the .MAP120 Parameter Editor no passwords for the different access levels are defined. Therefore only the access levels without password protection, e.g. "[0] Public Access" or with fix set password as "[F] Manufacturer Access" can be used. They are shown in the list of device specific access levels by default. For all other required access levels the credentials have to be entered as described below or imported (see section 6.2.3.4 "Importing keys").

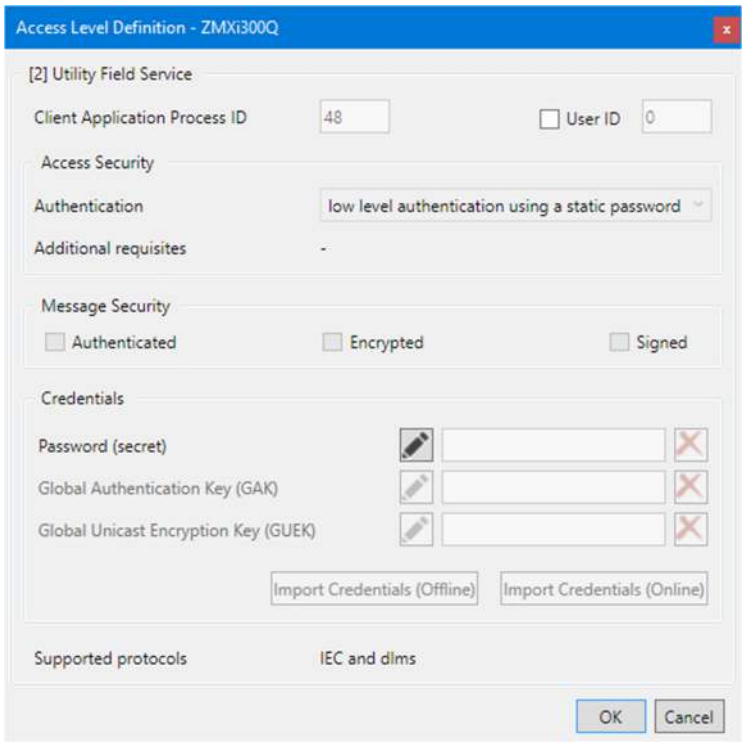
2. Click on **Settings**.
   The "Access Levels" window appears for the specified device.
   The device name is displayed in the top left corner.
   The window contains a list of all access levels with "Client AP" (User ID, UID), authentication, additional requisites, message security policy, security setup and supported protocols that can be used for any device.
   An ⚠ icon is displayed in the first column as long as the access level is not correctly defined (e.g. missing or incomplete password). Accordingly marked access levels will not be shown in the Client toolbar.



Access Level	Client AP	Authentication	Additional Requisites	Message Security Policy	Supported Protocols
[0] Public Access	16	no authentication		no ciphering	IEC and dlms
[1] Data Collection	32	low level authentication using a static password		no ciphering	IEC and dlms
[1] Data Collection	32	high level authentication using SHA-256		no ciphering	dlms only
[2] Utility Field Service	48	low level authentication using a static password		no ciphering	IEC and dlms
[2] Utility Field Service	48	high level authentication using SHA-1		no ciphering	dlms only
[2] Utility Field Service	48	high level authentication using GMAC		no ciphering	dlms only
[2] Utility Field Service	48	high level authentication using SHA-256		no ciphering	dlms only
[3] Utility Service	64	no authentication	service menu required	no ciphering	IEC and dlms
[G] Management Access	1	low level authentication using a static password		no ciphering	dlms only
[G] Management Access	1	high level authentication using SHA-1		no ciphering	dlms only
[G] Management Access	1	high level authentication using GMAC		no ciphering	dlms only
[G] Management Access	1	high level authentication using SHA-256		no ciphering	dlms only
[] Security Auditor	5	high level authentication using GMAC		no ciphering	dlms only
[] Calibration Lab	6	high level authentication using GMAC		no ciphering	dlms only
[] Communication Module	7	high level authentication using GMAC		no ciphering	dlms only
[] Local Operator	9	high level authentication using GMAC		no ciphering	dlms only
[L] Access Administrator	2	low level authentication using a static password		no ciphering	dlms only
[L] Access Administrator	2	high level authentication using SHA-1		no ciphering	dlms only
[L] Access Administrator	2	high level authentication using GMAC		no ciphering	dlms only
[L] Access Administrator	2	high level authentication using SHA-256		no ciphering	dlms only
[F] Manufacturer Access	104	low level authentication using a static password	hardware switch required	no ciphering	dlms only
[X] User Defined 1	0	no authentication		no ciphering	IEC and dlms

3. Specify the access levels to be used by double clicking the corresponding entry (or by selecting it and clicking on the edit icon ) and then making the necessary entries in the appearing "Access level Definition" window.

   Depending on the access level to be defined and other inputs, the individual fields can be modified or are set immutable.



4. Only for user defined access levels: Enter a "Client Application Process ID" (default is 16).
   For all other access levels the "Client Application Process ID" is fix assigned in a range from 1 to 255 and cannot be changed.

5. Tick the "User ID" checkbox if you want to send additional information about the user to the device and then enter a user ID in the range from 1 to 255 (0 = don't use a user ID). The device only allows to establish a connection if this user ID is also enabled there.

A user ID is currently only supported by a few devices. Please refer to the respective device documentation to find out whether this is supported by your device or not (not to be selected as default).

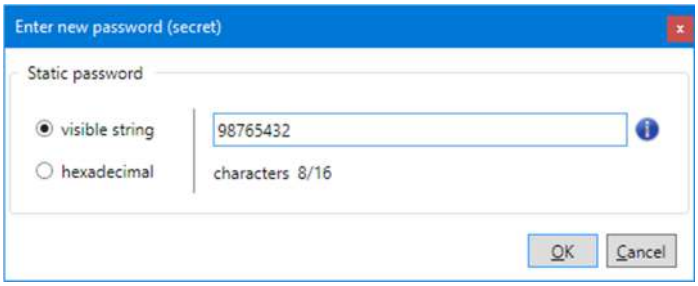
6. Only for user defined access levels: Select the type of authentication in the "Authentication" drop down list.
   The selection is described in section 9.2 "Security attributes" under "Access authentication"). For all other access levels the authentication is fix assigned and cannot be changed.

   The unchangeable display "Additional requisites" shows information about specific access levels as "service menu required" or "hardware switch required".

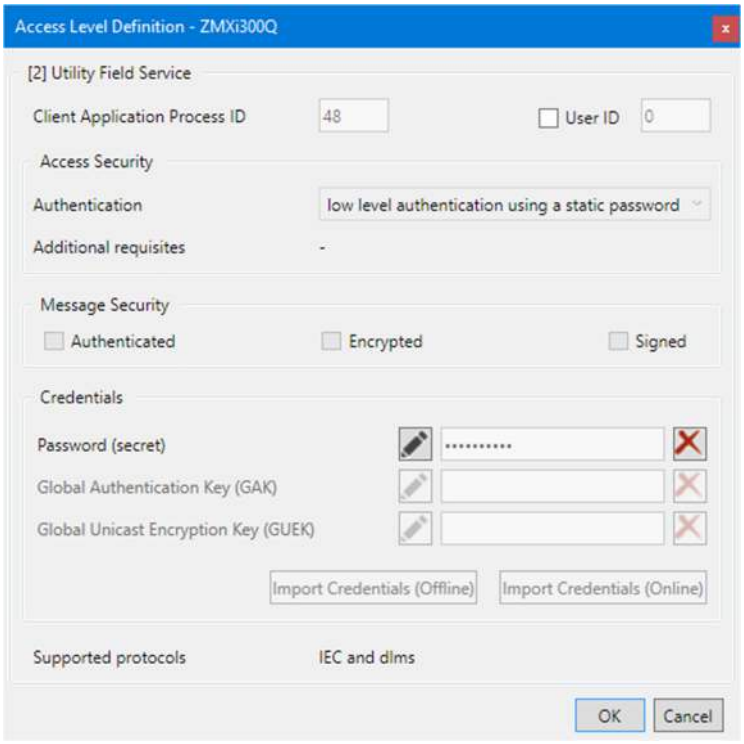
7. Only for access levels with high level authentication using GMAC and SHA-256: Tick the "Authenticated" and or "Encrypted" checkboxes for the corresponding message security (for both request and response).
   "Signed" is reserved for future use and can therefore not be selected.

8. Only for access levels with low level authentication or with high level authentication using SHA-1:

   Click on the edit icon  and then enter the password or key in the appearing "Enter new password (secret)" window either as visible string or hexadecimal and then confirm the entry with **OK**.



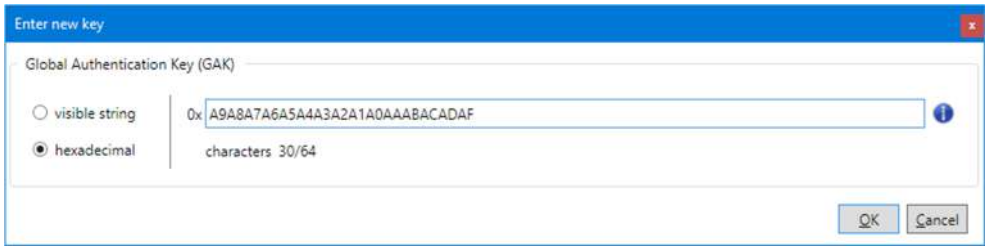
For security reasons, the password (secret) is only visible as you type it in. After entering a placeholder is shown with asterisks. In case of a future modification, it must be re-entered.



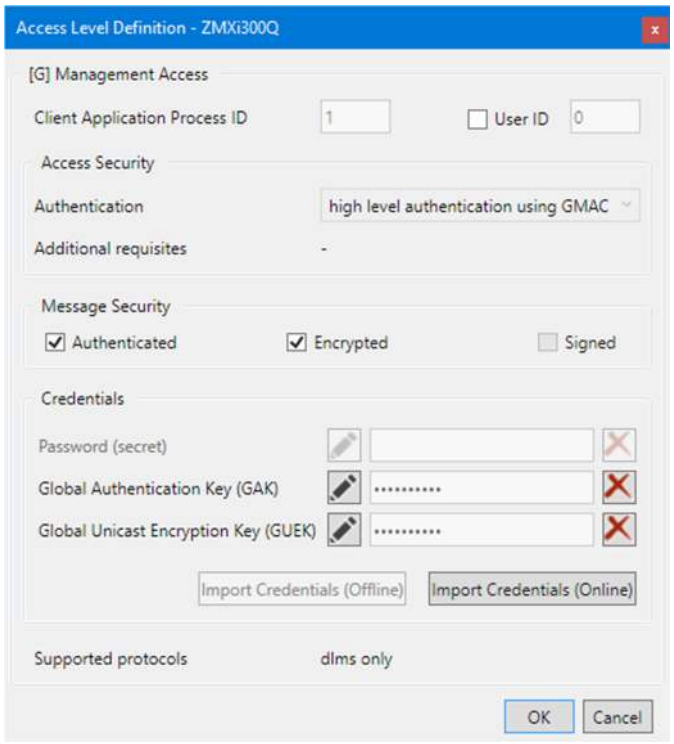
Click on the  icon behind the password entry box if you want to delete a previously defined password (secret).

9. Only for access levels with high level authentication: Either import the required authentication and/or encryption keys (GAK and GUEK) from a received key file (see section 6.2.3.4 "Importing keys") or

   click on the corresponding edit icon  and type in the key in the "Enter new key" window either as visible string or hexadecimal and then confirm the entry with **OK**.

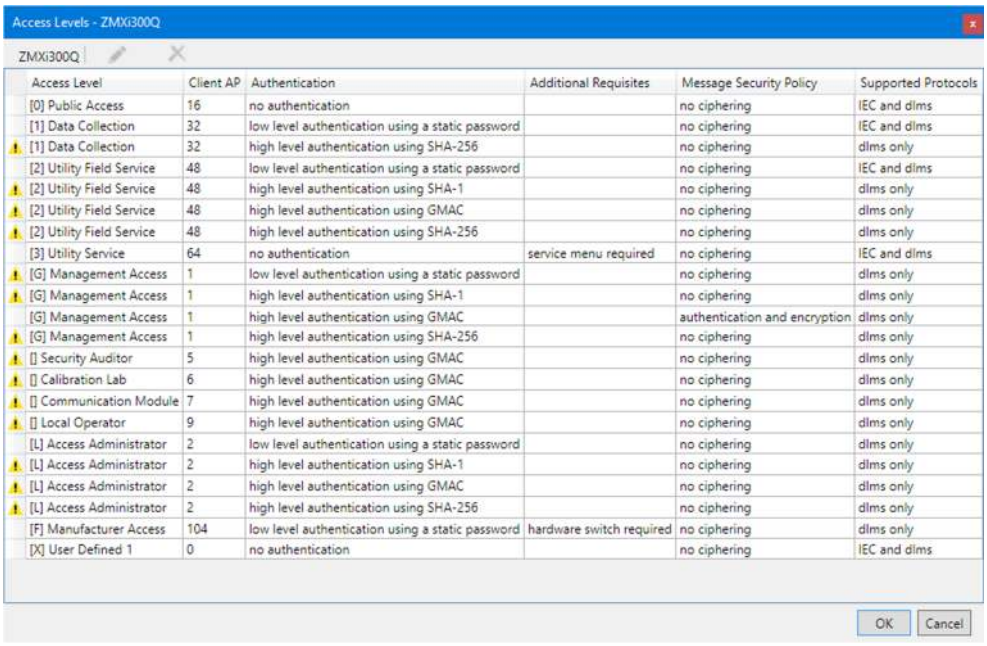


For security reasons, the key is only visible as you type it in. After entering a placeholder is shown with asterisks. In case of a future modification, it must be re-entered.



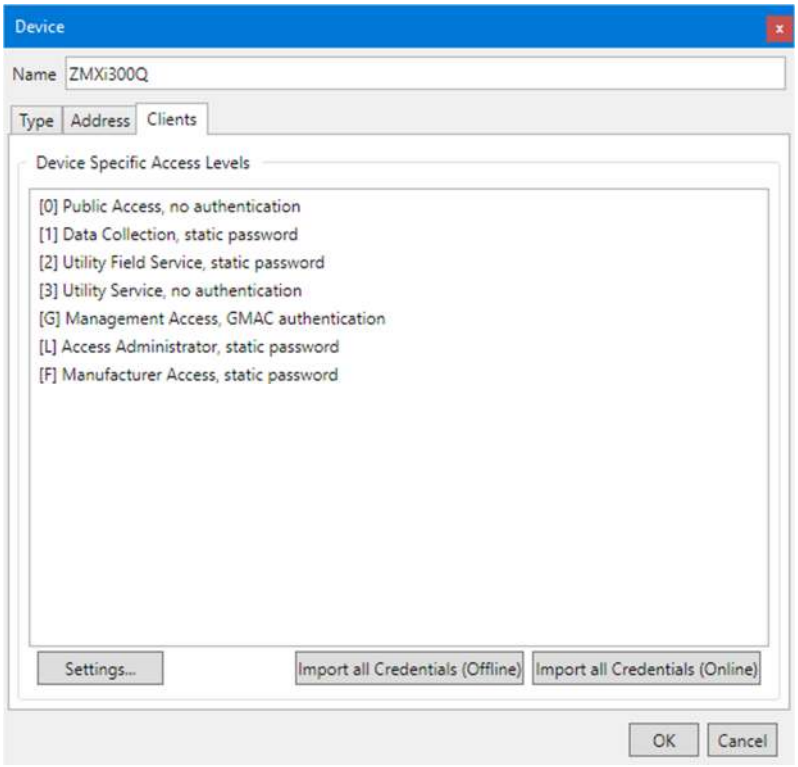
The fixed display "Supported protocols" shows the supported protocols for the access level. Possible values are "IEC and dlms" and "dlms only".

10. Click on **OK**.
    The "Access Levels" window appears again.
    No ⚠ icons are displayed in the first column of the newly defined access levels.

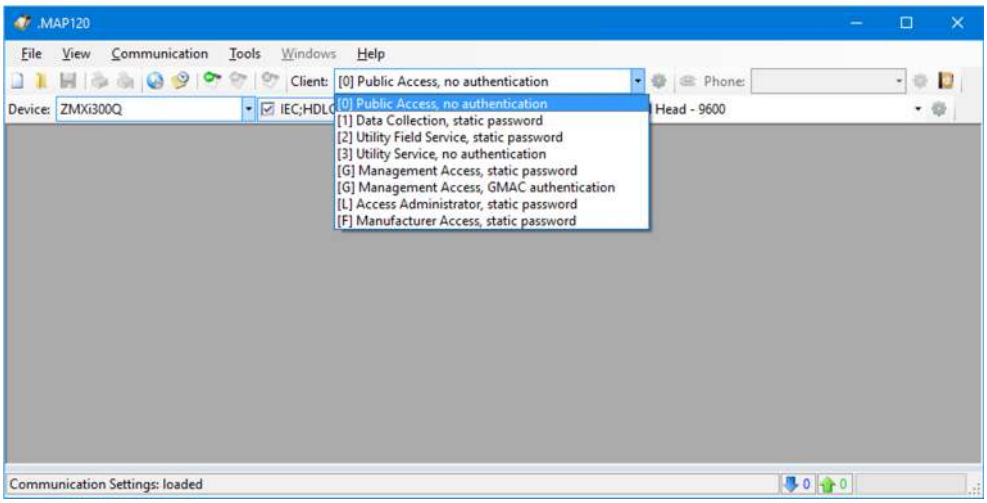


Access Level	Client AP	Authentication	Additional Requisites	Message Security Policy	Supported Protocols
[0] Public Access	16	no authentication		no ciphering	IEC and dlms
[1] Data Collection	32	low level authentication using a static password		no ciphering	IEC and dlms
⚠ [1] Data Collection	32	high level authentication using SHA-256		no ciphering	dlms only
[2] Utility Field Service	48	low level authentication using a static password		no ciphering	IEC and dlms
⚠ [2] Utility Field Service	48	high level authentication using SHA-1		no ciphering	dlms only
⚠ [2] Utility Field Service	48	high level authentication using GMAC		no ciphering	dlms only
⚠ [2] Utility Field Service	48	high level authentication using SHA-256		no ciphering	dlms only
[3] Utility Service	64	no authentication	service menu required	no ciphering	IEC and dlms
⚠ [G] Management Access	1	low level authentication using a static password		no ciphering	dlms only
⚠ [G] Management Access	1	high level authentication using SHA-1		no ciphering	dlms only
[G] Management Access	1	high level authentication using GMAC		authentication and encryption	dlms only
⚠ [G] Management Access	1	high level authentication using SHA-256		no ciphering	dlms only
⚠ [] Security Auditor	5	high level authentication using GMAC		no ciphering	dlms only
⚠ [] Calibration Lab	6	high level authentication using GMAC		no ciphering	dlms only
⚠ [] Communication Module	7	high level authentication using GMAC		no ciphering	dlms only
⚠ [] Local Operator	9	high level authentication using GMAC		no ciphering	dlms only
[L] Access Administrator	2	low level authentication using a static password		no ciphering	dlms only
⚠ [L] Access Administrator	2	high level authentication using SHA-1		no ciphering	dlms only
⚠ [L] Access Administrator	2	high level authentication using GMAC		no ciphering	dlms only
⚠ [L] Access Administrator	2	high level authentication using SHA-256		no ciphering	dlms only
[F] Manufacturer Access	104	low level authentication using a static password	hardware switch required	no ciphering	dlms only
[X] User Defined 1	0	no authentication		no ciphering	IEC and dlms

11. Click on **OK**.
    On the "Clients" tab of the "Device" window the defined device-specific access levels are displayed.



All these fully defined access levels can be selected in the "Client" drop down list in the client toolbar if the corresponding device is selected in the "Device" drop down list.



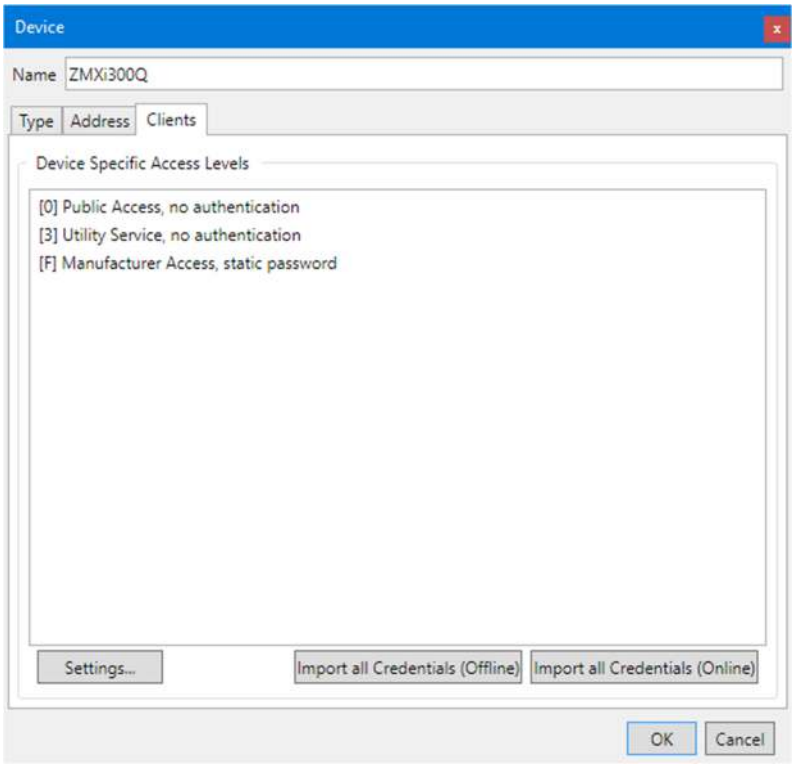
12. Continue as described in section 6.2.3.5 "Terminating the device data definition".

6.2.3.4 Importing keys

If the authentication and/or encryption keys are not available in a legible form, you can import them from key files (offline) or from a remote key management system (online).

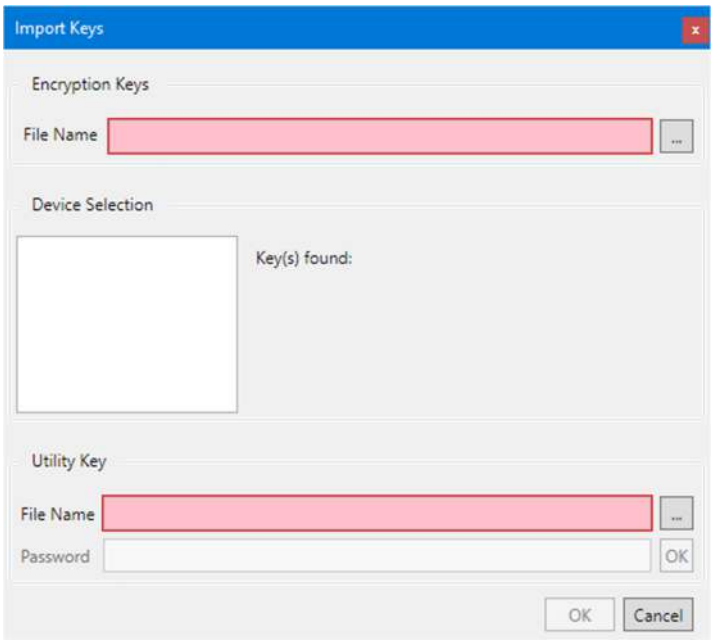
Offline key import

Required key files
The required key files will be supplied to you by your Landis+Gyr representative.

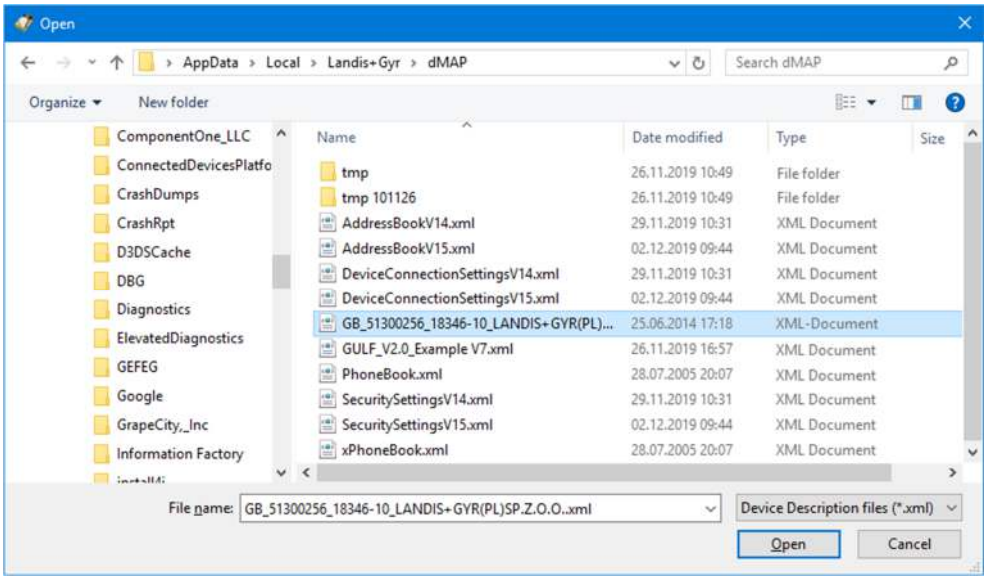


Proceed as follows to import keys from key files:

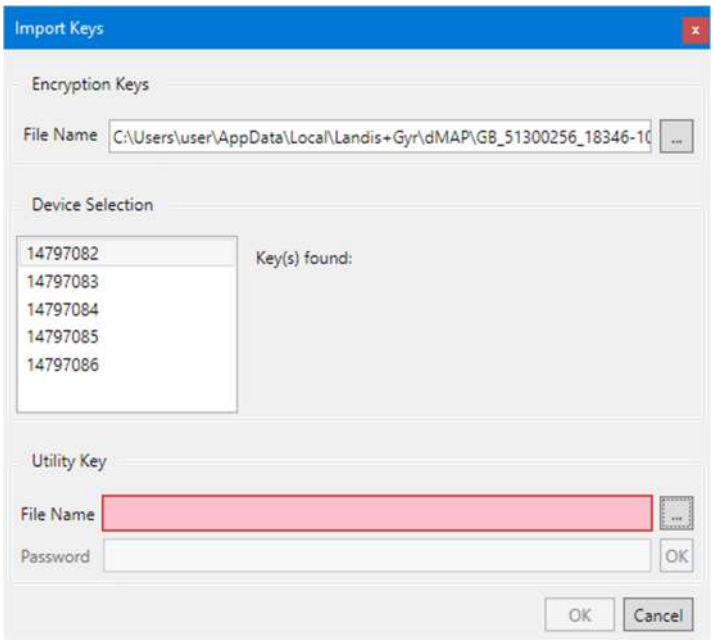
1. Click on **Import all Credentials (Offline)**.
   The "Import Keys" window appears.



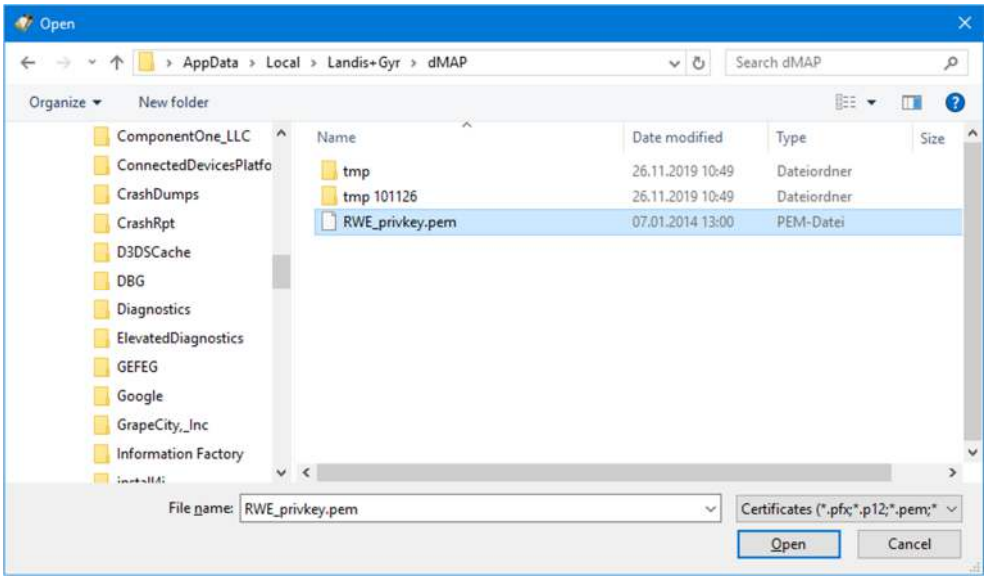
2. Click on  in the "Encryption Keys" area.
   The "Open" window appears.
3. Select the directory where the encryption key file is stored in the displayed tree.
4. Select the encryption key file you want to import.



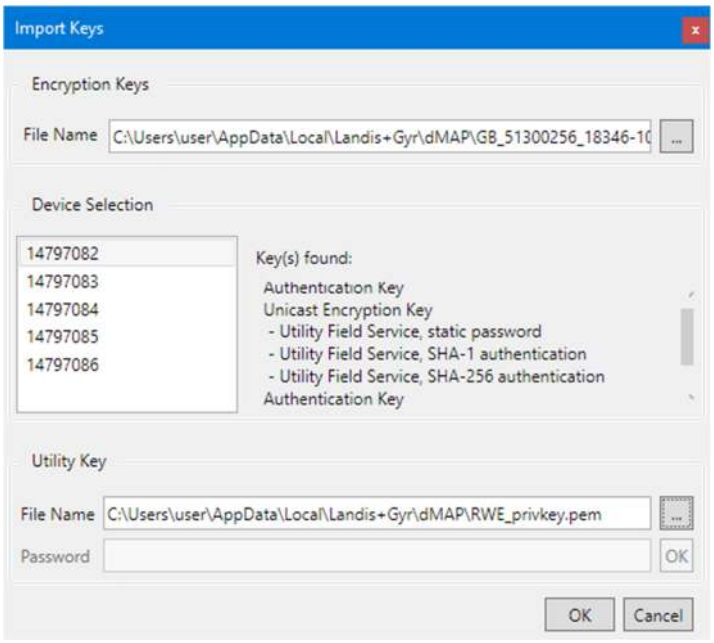
5. Click on **Open**.
   The keys are imported from the encryption key file and the available device serial numbers will be listed in the "Device Selection" area.



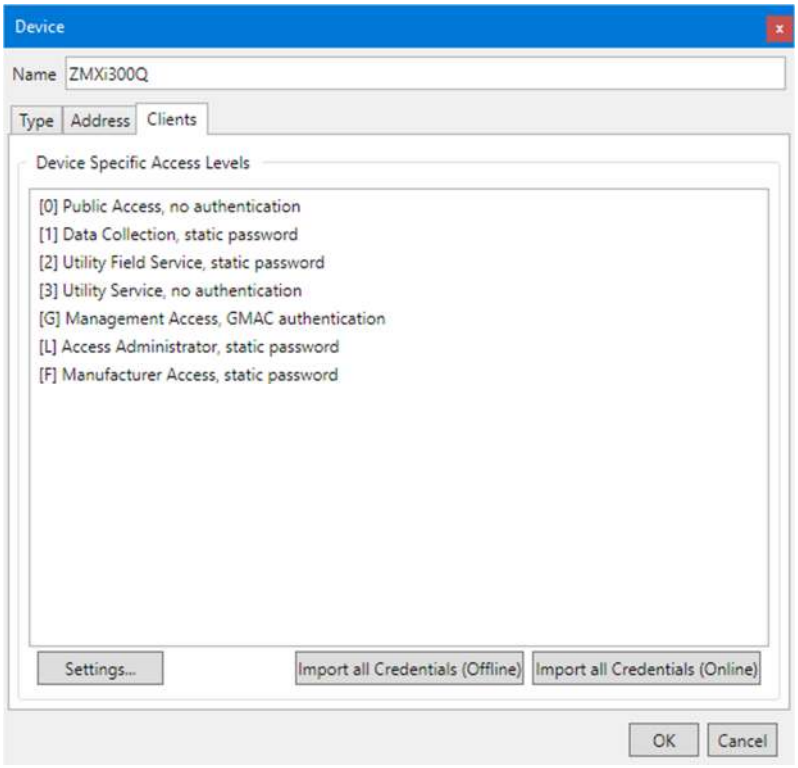
6. Click on  in the "Utility Key" area.
   The "Open" window appears.
7. Select the directory where the utility key file is stored in the displayed tree.
8. Select the utility key file you want to import.
   This file is required to decrypt the key file.



9. Click on **Open**.
   The utility key is imported from the key file.

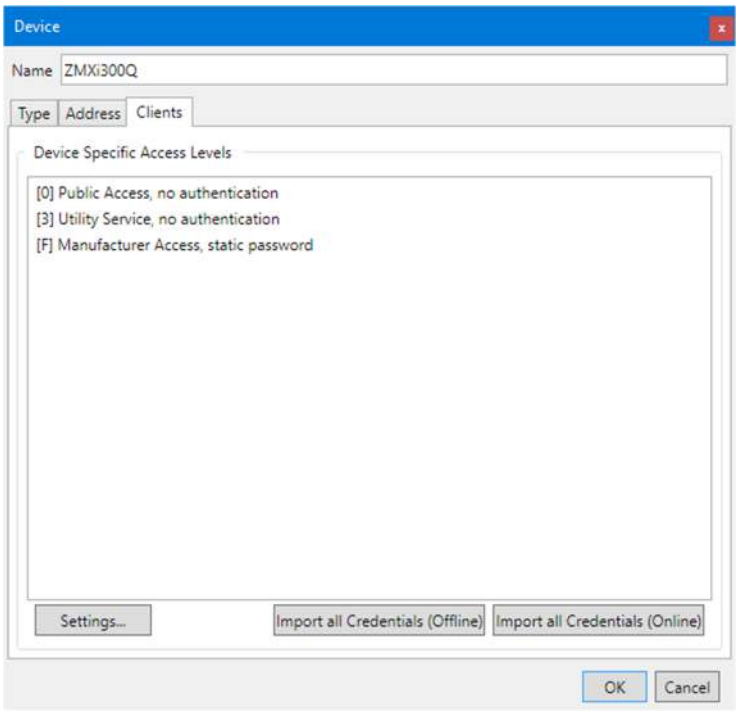


10. Click on **OK**.
    The "Import Keys" window disappears and the associated device-specific access levels are displayed.



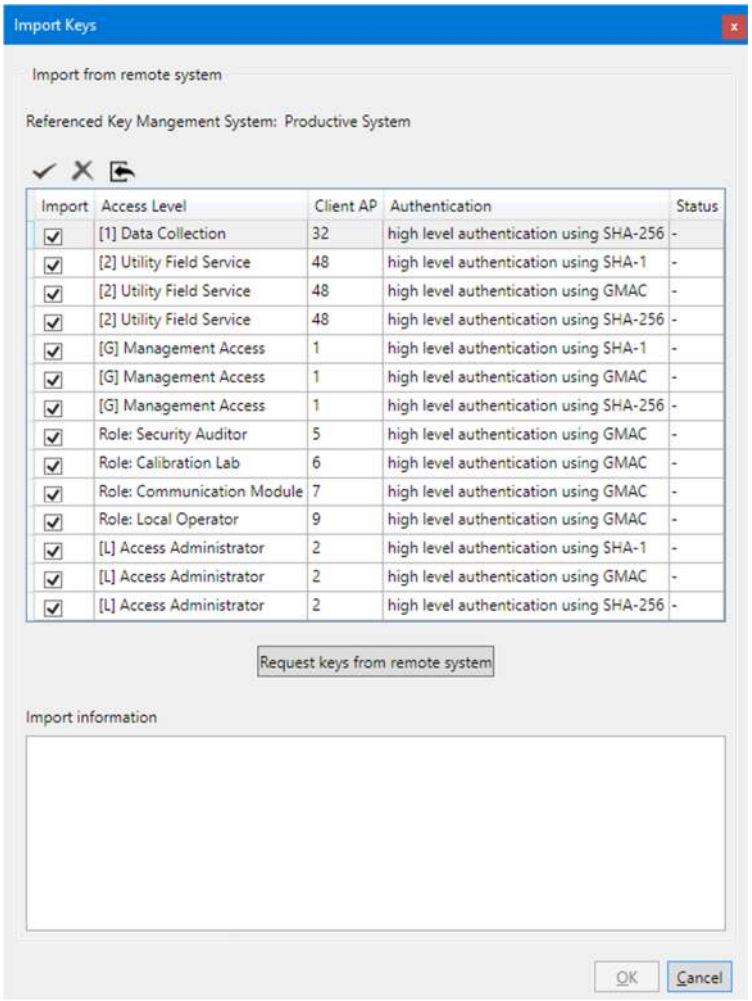
Online key import

Required prerequisites
Before you can import keys online from a remote key management system the required credentials must have been entered on tab "Key Management system" in the "Options" window (see section 7.7 "Defining the key management system").



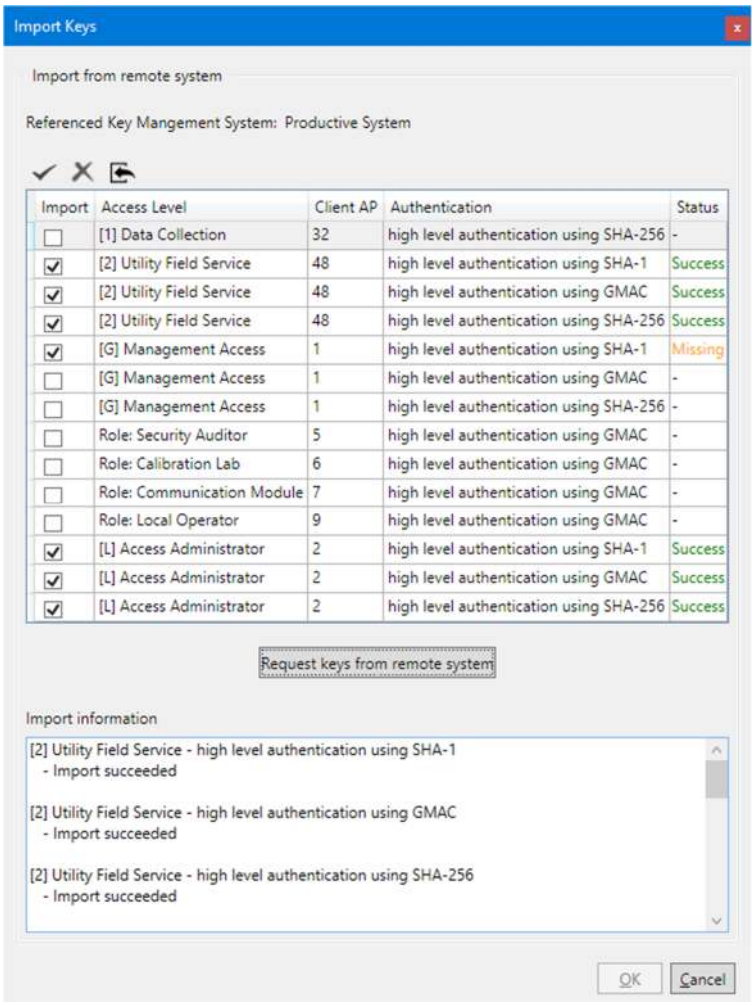
Proceed as follows to import keys from a remote key management system:

1. Click on **Import all Credentials (Online)**.
   The "Import Keys" window appears.

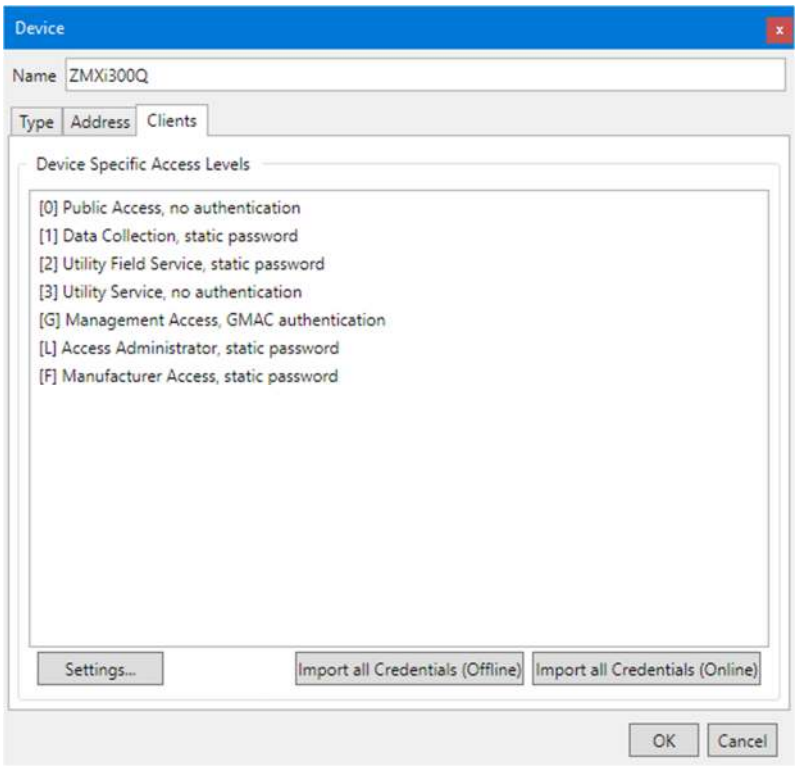


2. In column "Import" set a tick to all access levels for which you want to import keys from the remote key management system.
    in the window toolbar selects all checkboxes and
    in the window toolbar unselects all checkboxes.

3. Click on  in the window toolbar or on **Request keys from remote system**.
   If the keys are available on the remote key management system they will be imported. This is indicated with "Success" in column "Status" and with "Import succeeded" in the "Import information" area.
   If a key is not available on the remote key management system this is indicated with "Missing" in column "Status" and with "No appropriate data in response" in the "Import information" area (in this case the **OK** button is not released; untick the checkbox for the corresponding access level and repeat the request).

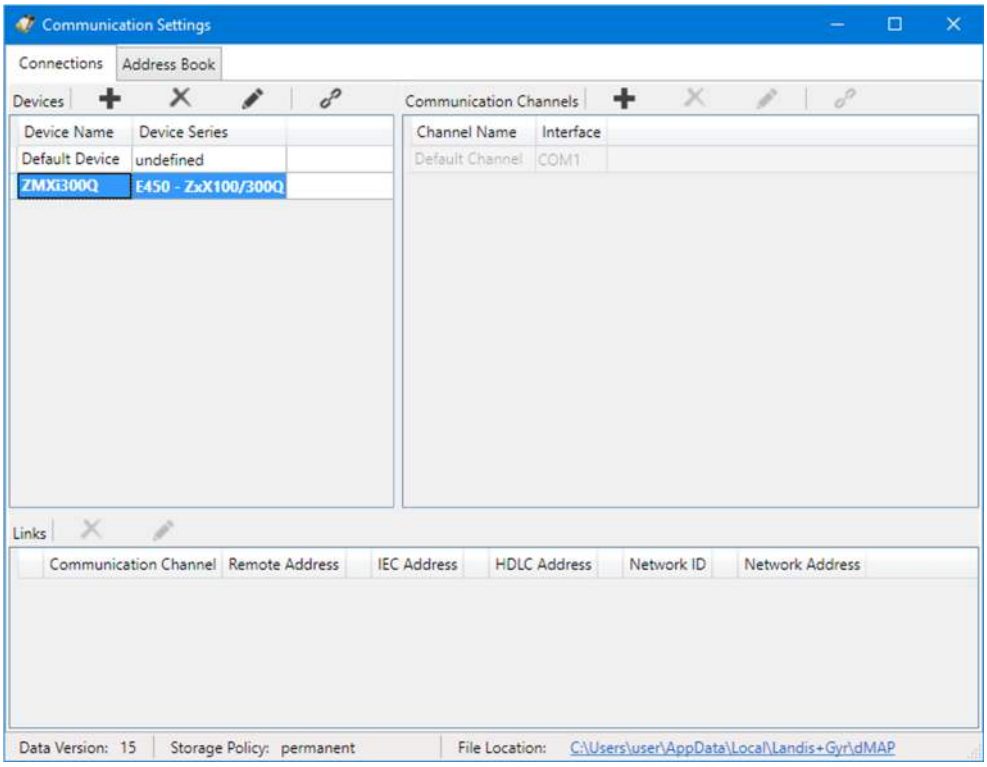


4. Click on **OK**.
   The "Import Keys" window disappears and the associated device-specific access levels are displayed.


Device
Name ZMXi300Q
Type
Address
Clients
Device Specific Access Levels
[0] Public Access, no authentication
[1] Data Collection, static password
[2] Utility Field Service, static password
[3] Utility Service, no authentication
[G] Management Access, GMAC authentication
[L] Access Administrator, static password
[F] Manufacturer Access, static password
Settings...
Import all Credentials (Offline)
Import all Credentials (Online)
OK
Cancel

6.2.3.5 Terminating the device data definition

1. Click on **OK**.
   The new device definition is saved. A new entry with the defined name appears in the device list.



2. Define further devices in the same way, if required.
3. If you have imported address data from a MAP110 phone book, modify the "undefined" device series to the appropriate device series and delete imported devices which are not required.
4. Close the "Communications settings" window.

Link to communication channel is required
Each device must be linked to at least one communication channel (see section 6.2.5.1 "Defining link between device and communication channel"), so that it can be used.

Modifying or deleting device definitions

If you intend to modify or delete a device definition, mark the corresponding entry in the device list and then

- click on  in the window toolbar in the "Devices" area to modify the marked device definition or double click on the device definition.
- click on  in the window toolbar in the "Devices" area to delete the marked device definition. Deletions must be confirmed.
  The default device definition "any device" can't be deleted.

6.2.4 Address data

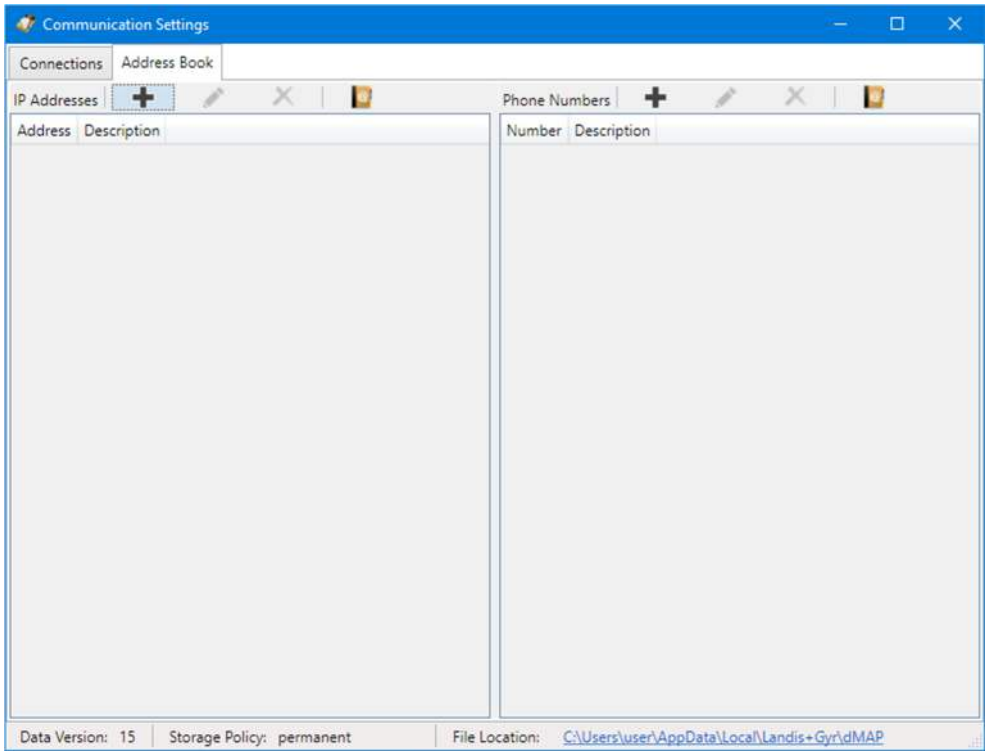
After the installation of the .MAP120 Parameter Editor, no address data (IP addresses and phone numbers) are defined.

Proceed as described in the following subsections to generate address book entries.

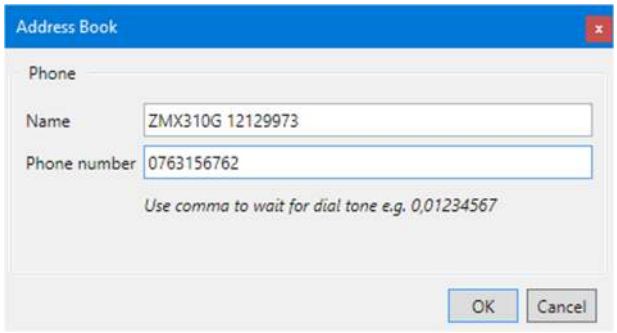
6.2.4.1 Phone numbers

Define the phone numbers required for modem connections as follows:

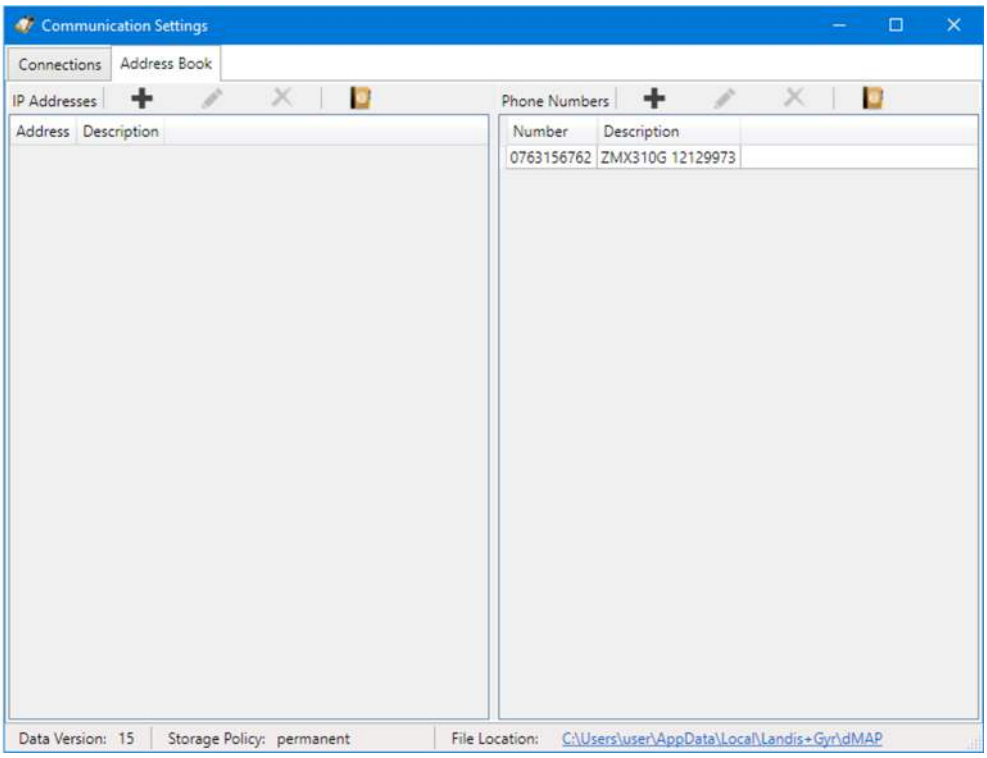
1. Click on  in the application toolbar or select **Communication settings** from the **Communication** menu.
   The "Communication Settings" window appears with selected tab "Connections".
2. Select the "Address Book" tab.



3. Click on  in the window toolbar for phone numbers (right window).
   The "Address Book" window appears.
4. Enter a clear designation of the device in the "Name" entry box and the phone number of the desired device in the "Phone number" entry box.



5. Click on **OK**.
   The "Address Book" window disappears. The phone number is saved and then appears as entry in the address book.



6. Define further phone numbers in the same way, if required.
7. Close the "Communications settings" window.

Modifying or deleting phone numbers

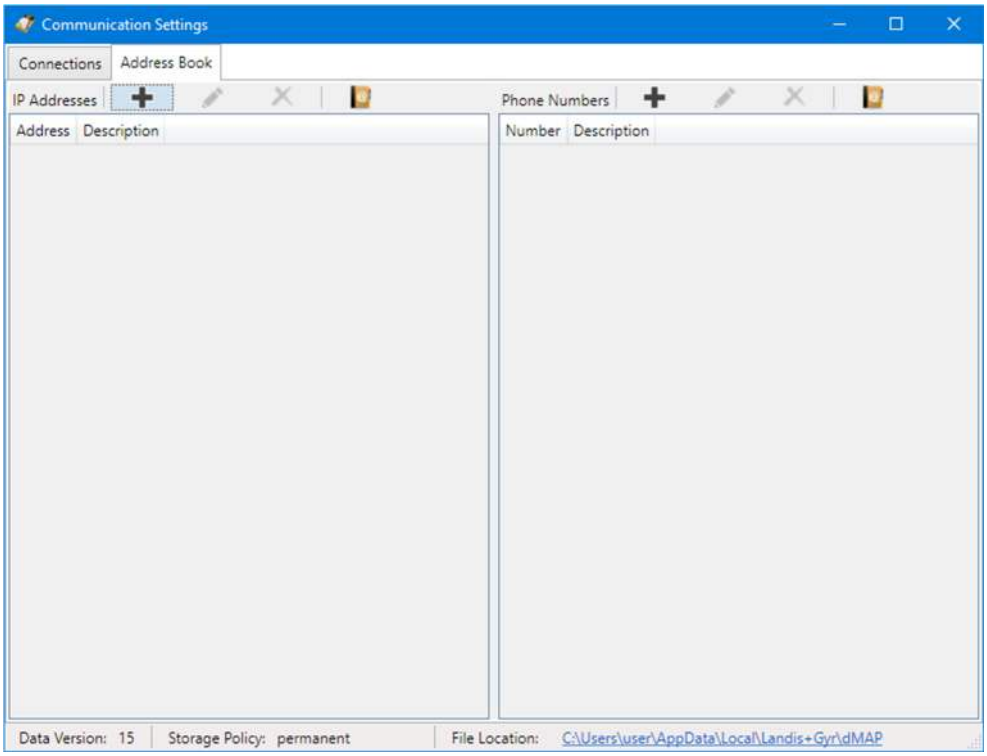
If you intend to modify or delete a phone number, select the corresponding entry in the phone number list and then then

- click on  in the window toolbar in the "Phone Numbers" area to modify the marked entry of the address book or double click on the entry.
- click on  in the window toolbar in the "Phone Numbers" area to delete the marked entry of the address book (deletions must be confirmed).

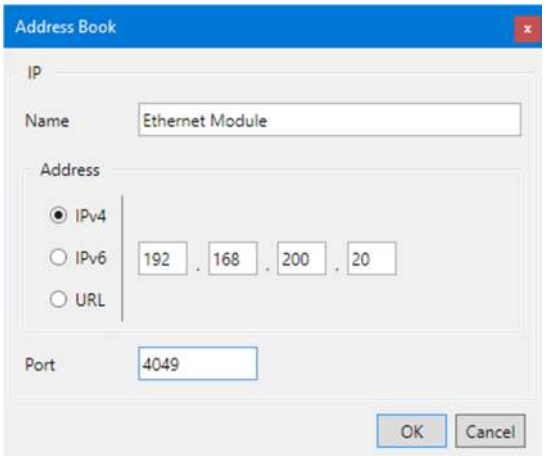
6.2.4.2 IP addresses

Define the IP addresses required for TCP/IP connections as follows:

1. Click on  in the application toolbar or select **Communication settings** from the **Communication** menu.
   The "Communication Settings" window appears with selected tab "Connections".
2. Select the "Address Book" tab.

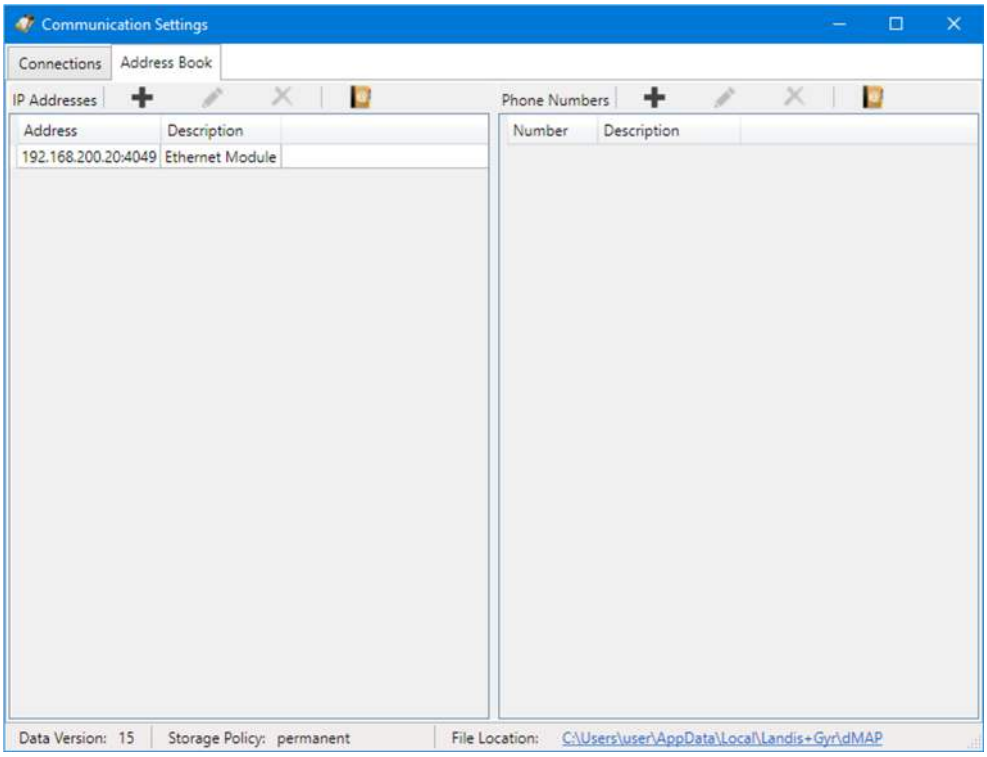


3. Click on  in the window toolbar for IP addresses (left window).
   The "Address Book" window appears.
4. Enter a clear designation of the device location in the "Name" entry box.
5. Select with the corresponding radio button whether an IPv4 address or an IPv6 address or an URL shall be entered. Enter the IPv4 or IPv6 address or the URL in the corresponding entry box and the port number of the desired device in the "Port" entry box.



Please note that when you use an URL, a corresponding service must be active (e.g. dyn DNS), which forwards the requests to the correct address in the underlying network.

6. Click on **OK**.
   The "Address Book" window disappears. The IP address is saved and then appears as entry in the address book.



7. Define further IP addresses in the same way.
8. Close the "Communications settings" window.

Modifying or deleting IP addresses

If you intend to modify or delete an IP address, select the corresponding entry in the IP address list and then then

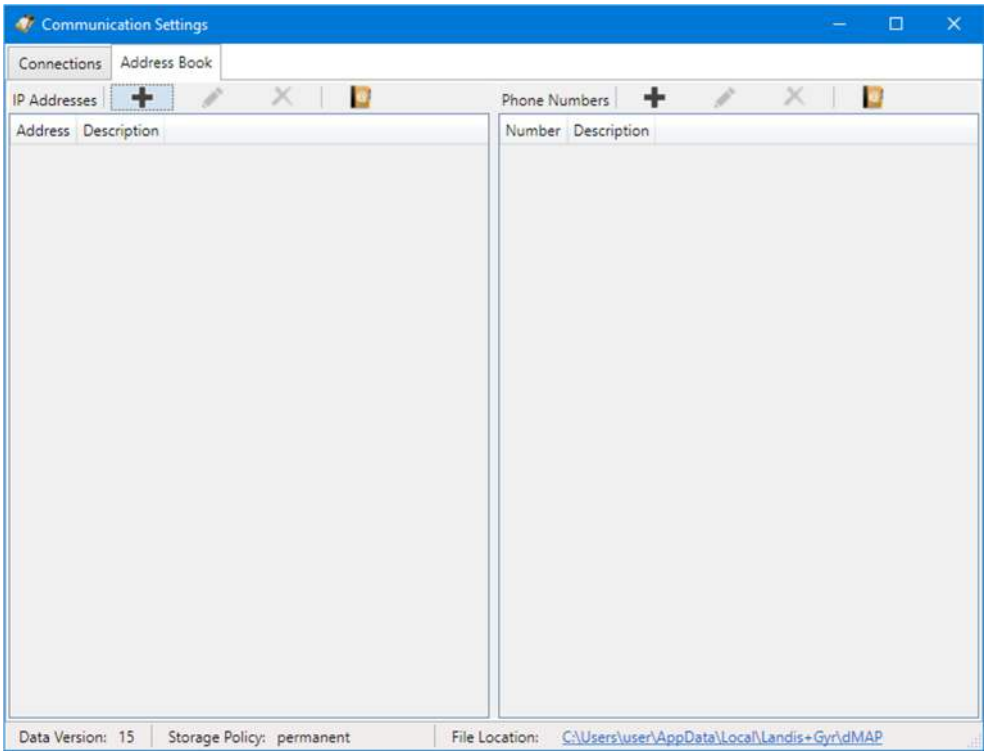
- click on  in the window toolbar in the "IP Addresses" area to modify the marked entry of the address book or double click on the entry.
- click on  in the window toolbar in the "IP Addresses" area to delete the marked entry of the address book (deletions must be confirmed).

6.2.4.3 Importing address book

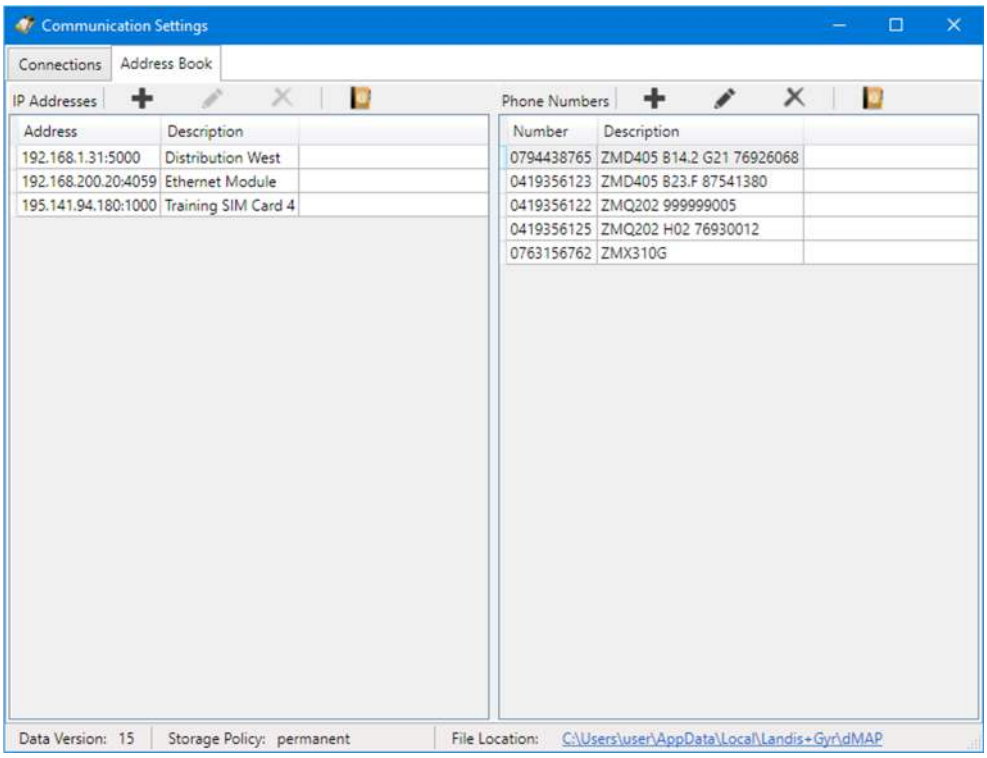
If the Landis+Gyr MAP110 Service Tool is already installed on the PC, its phone book can be imported. Likewise, the address book of a Landis+Gyr .MAP tool from another source (e.g. from another PC or another directory) can be imported.

Import an existing address book as follows:

1. Click on  in the application toolbar or select **Communication settings** from the **Communication** menu.
   The "Communication Settings" window appears with selected tab "Links".
2. Select the "Address Book" tab.



3. Click on  in the window toolbar for IP addresses or phone numbers.
   The "Open" window appears.
4. Select in the "Open" window the phone book file to be imported (the corresponding directory of the latest installed MAP110 release 3.x will be selected by default, to directories of other .MAP releases you must navigate yourself):
   - "PhoneBook.xml" for importing a MAP110 phone book or
   - "AddressBookVxx.xml" (xx = data version) for importing a .MAP phone book.
5. Click on **Open**.
   All IP addresses and phone numbers are imported from the selected address book if not already existing in the .MAP110 address book. The imported data appear as entries in the IP addresses list and in the phone number list.
   When a MAP110 phone book "PhoneBook.xml" has been imported, additionally all device addresses are converted into devices.



6. Close the "Communications settings" window.

7. If you have imported address data from a MAP110 phone book "PhoneBook.xml", check the device settings (see section 6.2.3 "Device data") again, since device addresses from the imported phone book have been converted into devices. Before you can use the device definitions created that way these have to be linked manually with a communication channel (see section 6.2.5 "Links between devices and communication channels").

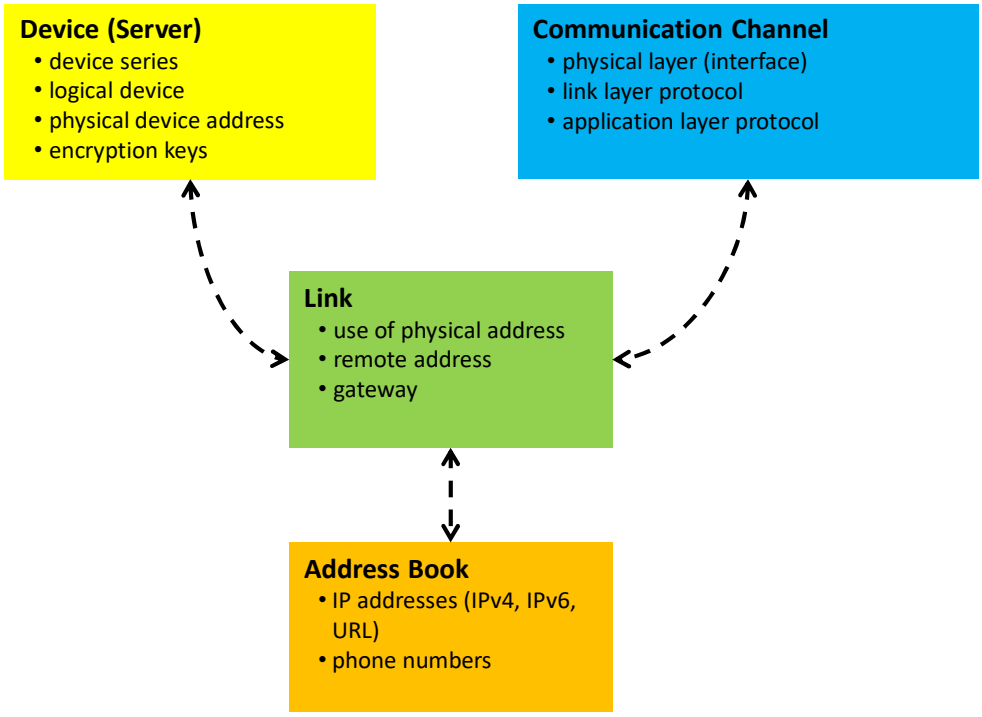
Modifying or deleting address book entries

If you intend to modify or delete an address book entry, select the corresponding address book entry in the IP address or phone number list and then then

- click on  in the window toolbar in the "IP Addresses" or "Phone Numbers" area to modify the marked entry of the address book or double click on the entry.
- click on  in the window toolbar in the "IP Addresses" or "Phone Numbers" area to delete the marked entry of the address book (deletions must be confirmed).

6.2.5 Links between devices and communication channels

Device and communication channel are connected by a link in an appropriate manner to each other (see the overview below) to allow a flexible and convenient use.



The link determines how a device can be reached via a communication channel.

Each device must be linked to at least one communication channel, so that it can be used.

Only the available (linked) communication channels can be selected in the "channel" drop down list (see section 4.3.5 "Communication channel toolbar") for a specific device.

For each device/communication channel link the following attributes can, if required, be defined:

- IEC address (if defined for the device)
- HDLC address (if defined for the device)
- Phone number (for modem communications channels only)
- IP address and port number (for TCP/IP communication channels only)
- dlms gateway network ID and network address

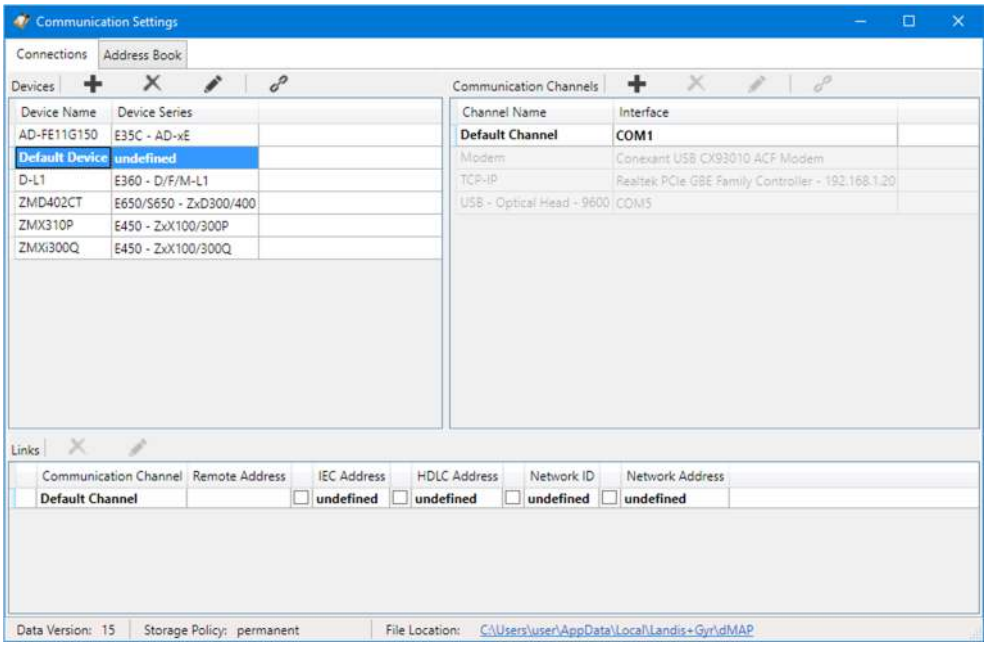
  If a DLMS device in a local network is not directly accessible, a dlms gateway must be used (e.g. Zigbee device via Ethernet gateway). The dlms gateway requires additional information in order to forward DLMS requests to the correct device in the local network.

Each defined device can be linked to one or more defined communication channels and each communication channel with one or more devices.

6.2.5.1 Defining link between device and communication channel

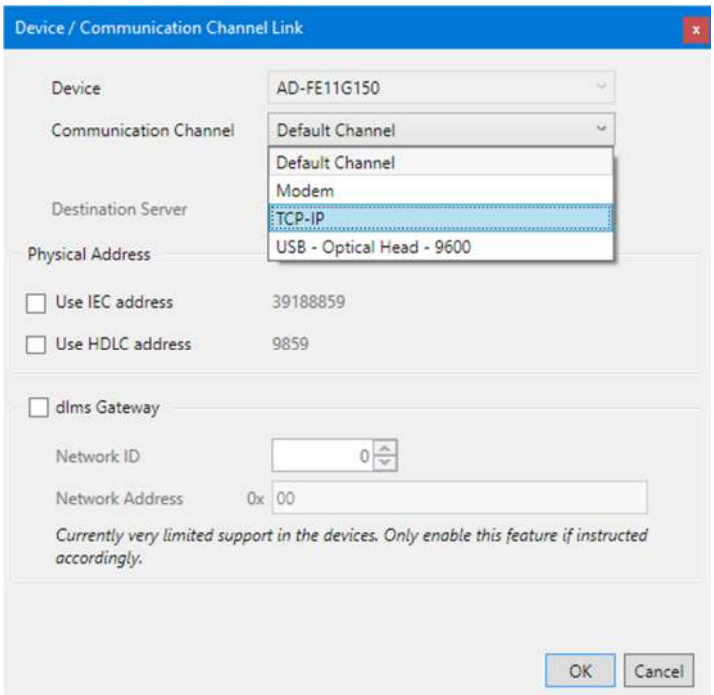
Procedure:

1. Click on  in the application toolbar or select **Communication settings** from the **Communication** menu.
   The "Communication Settings" window appears with selected tab "Connections". The device list and the communication list are displayed.

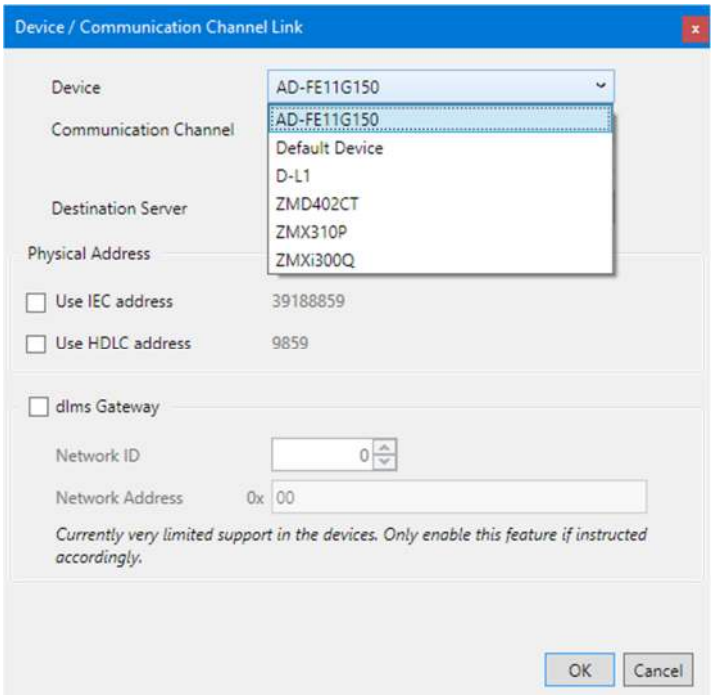


2. Select a device from the device list (or alternatively a channel from the communication channels list).

3. Click on  in the window toolbar in the "Devices" area (or alternatively in the "Communications Channels" area).
   The "Device/Communication Channel Link" window appears with the device fixed and the communication channel selectable:



or alternatively with the communication channel fixed and the device selectable:

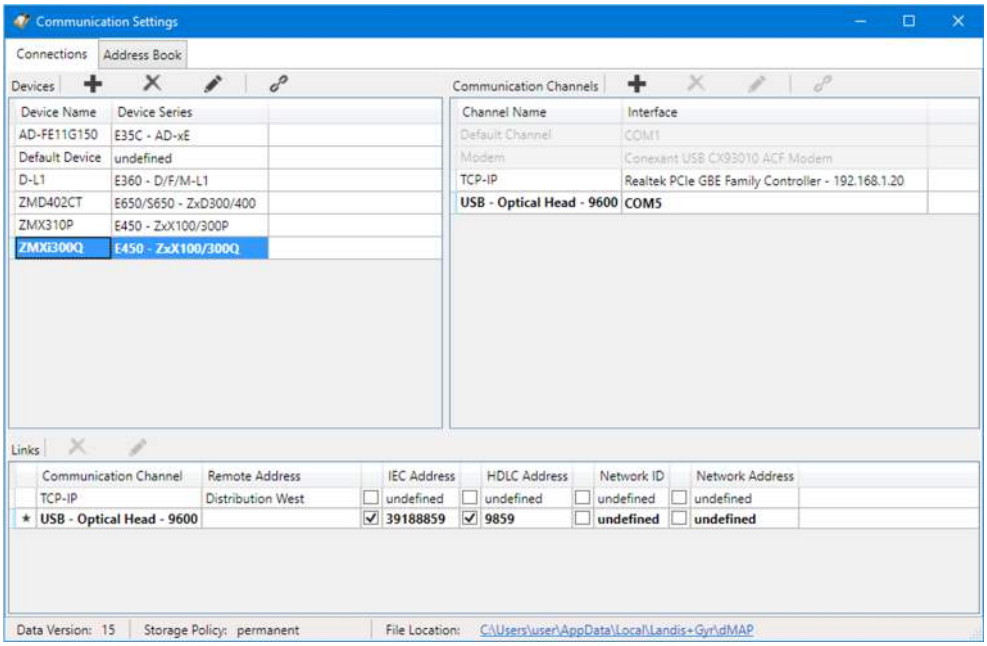


4. In the "Communication Channel" drop down list select one of the defined communication channels (or alternatively in the "Device" drop down list one of the defined devices).
5. If more than one communication channel is defined for a device, one channel can be determined as preferred channel. When selecting this device the preferred channel is always selected as default channel. Tick for this the checkbox "This is the preferred channel for this device". The preferred channel is then marked with a yellow star in the "Communication Settings" window.
6. Only for modem communication channels: in the "Phone Number" drop down list select one of the defined phone numbers.
7. Only for TCP/IP communication channels: in the "Destination Server" drop down list select one of the defined IP addresses.
8. If the IEC or HDLC address defined for the device shall be used: set a tick to the "Use IEC address" or "Use HDLC address" checkbox. See also section 6.3 "Addressing devices").
9. If a dlms gateway shall be used: set a tick to the "dlms Gateway" checkbox, select a network ID and define the additional information in order to forward DLMS requests to the correct device in the local network:
   - the network must be identified by a number (network ID) and
   - the address of the device in the local network must be specified in the correct format (network address).

dlms Gateway feature not yet supported by Landis+Gyr devices
Please note that the dlms gateway feature is for future expansion only and not yet supported by the Landis+Gyr devices. For the time being make sure to disable it.

6.2.5.2 Terminating the link definition

1. Click on **OK**.
   The "Device/Communication Channel Link" window disappears and the new defined link is displayed in the communication channel links list.
2. If more than one communication channels shall be usable to access the device (or alternatively if more than one device shall be accessible via the communication channel), define another link the same way.



3. Define the links for all devices (or alternatively for all communication channels) the same way.
4. Close the "Communications settings" window.

Modifying or deleting links

If you intend to modify or delete a link, select the corresponding entry in the link list and then

- click on  in the window toolbar in the "Links" area to modify the marked entry of the link list or double click on the entry.
- click on  in the window toolbar in the "Links" area to delete the marked entry of the link list (deletions must be confirmed).

Note: Links related to the default device "Default Device" can't be deleted, they only can be edited.

6.3 Addressing devices

For point-to-point connections, the device does not need to be specially addressed. However, with multi-drop, all devices connected to a bus system (RS485 or CS) must have their own address for individual access. This address is called the **physical device address**. In fact, even two physical device addresses are used, one for the IEC protocol (IEC device address) and the other for the DLMS protocol (HDLC device address).

Unless otherwise specified on the order, the following parameter values are set as defaults for these physical device addresses:

- Physical **IEC** device address = serial number (printed on face plate of device), e.g. 73852799.
- Physical **HDLC** device address = last 4 digits of serial number plus 1000 (because with DLMS the range of addresses is limited and some addresses are reserved), e.g. 3799 for a serial number 73852799 (2799 + 1000 = 3799).

The physical device addresses are saved as parameters of the basic meter and not in the possibly used E65C communication unit. A change of the E65C communication unit does therefore not affect the addressing. With the Landis+Gyr .MAP110 Service Tool, the physical device addresses of the devices can be read with the read commands under "Communication" or modified with the write commands under "Communication".

6.4 Establishing the communication with devices

Once the communication settings have been made (see section 6.1 "Basic principle") the communication with a device can be established as follows:

- Select (optional) the required device from the "Device" drop down list or use the setting "any device".
- Select the required communication channel from the "Channel" drop down list.
  Only those communication channels linked to the selected device are available. In the case of "any device" all communication channels are available.
- Select the required access level from the "Client" drop down list (for modem connections the predefined access level is used and the drop down list is inhibited until the connection is established, then the selection is possible).
  Only access levels, which have been defined completely in the communication settings, are displayed for selection (see also section 6.2.3.3 "Access levels").
  The device-specific access levels appear with attached device name at the top of the list.
- Only for modem connections: select the required phone number from the "Phone" drop down list.
- Only for modem connections: click on  in the address toolbar to establish the connection to the device.
- Only for network connections: select the required IP address number from the "IP Address" drop down list.
- Perform the intended activity.

6.5 Communication examples

This section provides some examples to show how communication connections are made to devices via various communication paths and for various applications:

- Serial connection via the optical interface (see section 6.5.1)
- Modem connection (see section 6.5.2)
- Network connection via a LAN (see section 6.5.3)
- Network connection via a WLAN and the Internet (see section 6.5.4)

It is assumed in all examples that the physical connections (e.g. cable or modem connections) have already been made and the Landis+Gyr .MAP120 Parameter Editor has already been started.

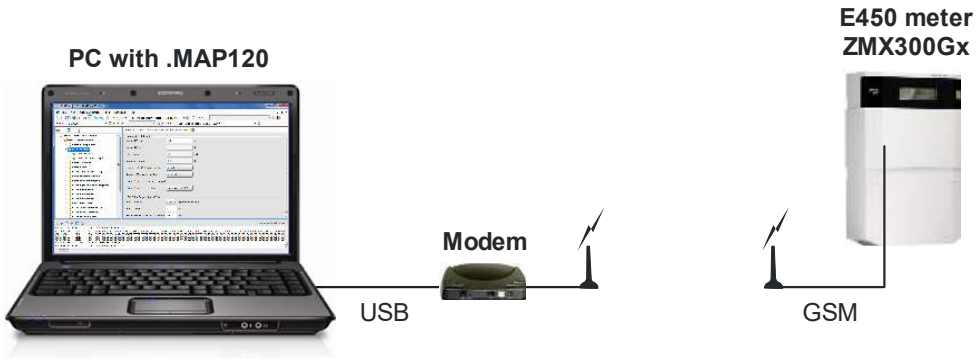
6.5.1 Serial connection via the optical interface

This example shows how a local connection is made to a device via the optical interface. Depending on the device series used DLMS or IEC is used as communication protocol.

Procedure:

1. In the "Device" drop down list, select the desired device (e.g. E450 meter) and in the "Channel" drop down list the corresponding channel (if more than one channel is assigned to this device) or create a new device definition with the following settings (procedure see section 6.2.2 "Communication channel data" and section 6.2.3 "Device data"):
   - Physical interface = COM-Port assigned to the serial interface
   - Interface Type = Serial (optical head or 3-wire)
   - Template for lower layer settings = Serial – dlms or "Serial – IEC" according to the device used.
2. In the "Client" drop down list select the required access level for the intended activity e.g. "[2] Utility Field Service".
3. Perform the intended activity.

6.5.2 Mo

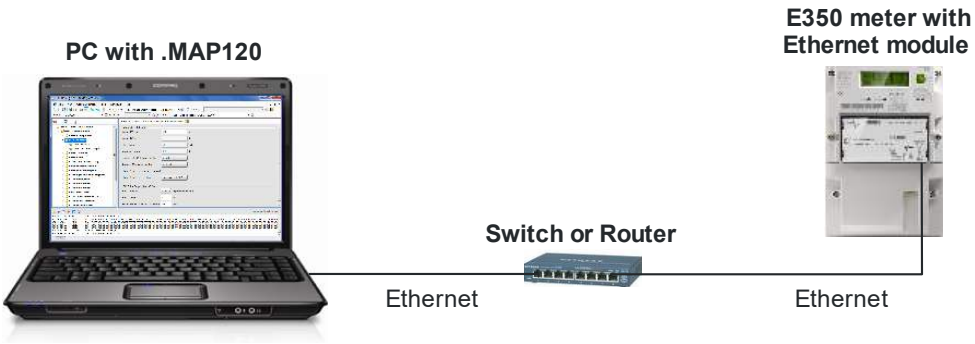


Procedure:

1. In the "Device" drop down list, select the desired device (e.g. E450 meter) and in the "Channel" drop down list the corresponding channel (if more than one channel is assigned to this device) or create a new device definition with the following settings (procedure see section 6.2.2 "Communication channel data" and section 6.2.3 "Device data"):
   - Physical interface = The available PSTN or GSM modem
   - Template for lower layer settings = PSTN or GSM modem
2. In the "Client" drop down list select the required access level for the intended work e.g. "[G] Management Access".
3. In the "Phone" drop down list select the required phone number of the connected device. If not already predefined, define it (for procedure see section 6.2.4 "Address data").
4. Click on  in the address toolbar to make connection to the modem. While making the connection the Command" window is displayed with a progress indication.
   When the connection is made, it is indicated in the status bar.
5. Perform the intended activity.
6. Click on  in the address toolbar to conclude the modem connection when the work is done.

6.5.3 Network connection via a LAN

This example shows how a point-to-point connection is made via a LAN to a single E350 meter equipped with a communication module AD-xE.

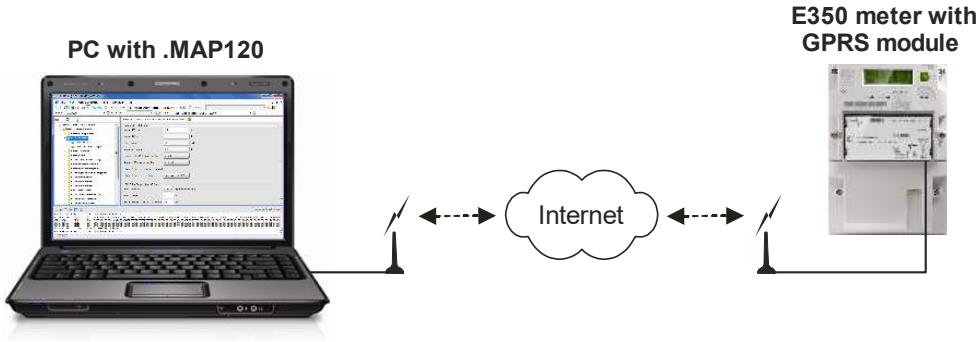


Procedure:

1. In the "Device" drop down list, select the desired device (e.g. AD-xE Ethernet module) and in the "Channel" drop down list the corresponding channel (if more than one channel is assigned to this device) or create a new device definition with the following settings (procedure see section 6.2.2 "Communication channel data" and section 6.2.3 "Device data"):
   - Physical interface = The available network card
   - Template for lower layer settings = Wired – HDLC or "Wired – Wrapper" according to the device used.
2. In the "Client" drop down list select the required access level for the intended work e.g. "[2] Utility Field Service".
3. In the "IP Address" drop down list select the required IP address of the connected device. If not already predefined, define it (for procedure see section 6.2.4.2 "IP addresses").
4. Perform the intended activity.

6.5.4 Network connection via a WLAN and the Internet

This example shows how a point-to-point connection is made via a WLAN and the Internet to a single E350 meter equipped with a communication module AD-xG.



Procedure:

1. In the "Device" drop down list, select the desired device (e.g. AD-xG GPRS module) and in the "Channel" drop down list the corresponding channel (if more than one channel is assigned to this device) or create a new device definition with the following settings (procedure see section 6.2.2 "Communication channel data" and section 6.2.3 "Device data"):
   - Physical interface = The available WLAN network card
   - Template for lower layer settings = "Wireless – HDLC" or "Wireless – Wrapper" according to the device used.
2. In the "Client" drop down list select the required access level for the intended activity e.g. "[7] Remote Service".
3. In the "IP Address" drop down list select the required IP address of the connected device. If not already predefined, define it (for procedure see section 6.2.4.2 "IP addresses").
4. Perform the intended activity.

6.6 Reference to other documents

Detailed information about Landis+Gyr Dialog communication solutions can be found in the following documents.

- **Data sheets** for various devices
- **User manuals** for various devices
- **Functional descriptions** of devices
- Detailed **application notes** for numerous reference applications with various devices for different transmission media

All these documents as well as advisory services are available from the competent representative of Landis+Gyr.

7 Auxiliary functions

This section describes auxiliary functions of the Landis+Gyr .MAP120 Parameter Editor:

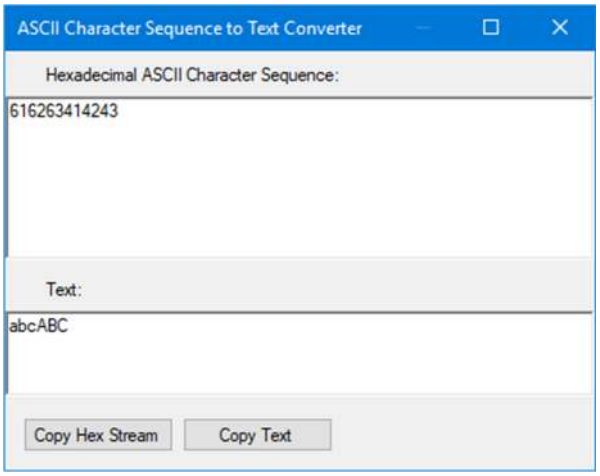
- Converting ASCII to text or vice versa
- Changing the language of the user interface
- Defining colours
- Switching the saving prompt on and off
- Defining storage location of communication settings
- Defining storage policy for keys and passwords
- Displaying tool help
- Displaying release notes
- Displaying the current program release and checking for updates

7.1 Converting ASCII to text or vice versa

This function allows conversion of ASCII code into text or vice versa.

Procedure:

1. Select **ASCII character converter** from the **Tools** menu.
   The "ASCII Character Sequence to Text Converter" window appears.
2. Enter a hexadecimal ASCII character sequence or a text string in the corresponding entry box.
   The converted text or sequence is displayed immediately.



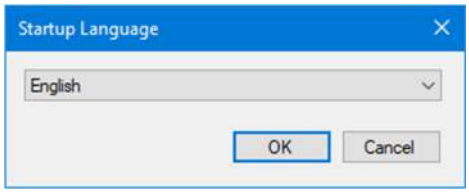
3. Click on **Copy Hex Stream** to copy the content of the hexadecimal ASCII character sequence box into the Windows clipboard or click on **Copy Text** to copy the content of the text box into the Windows clipboard.
   You then can insert this to any place using the paste function [Ctrl]+[V].
4. Click on **Exit** to close the "ASCII Character Sequence to Text Converter" window.

7.2 Changing the language of the user interface

This function allows changing the language of the .MAP120 Parameter Editor user interface.

Procedure:

1. Select **Startup language** from the **Tools** menu.
   The "Startup Language" window appears.



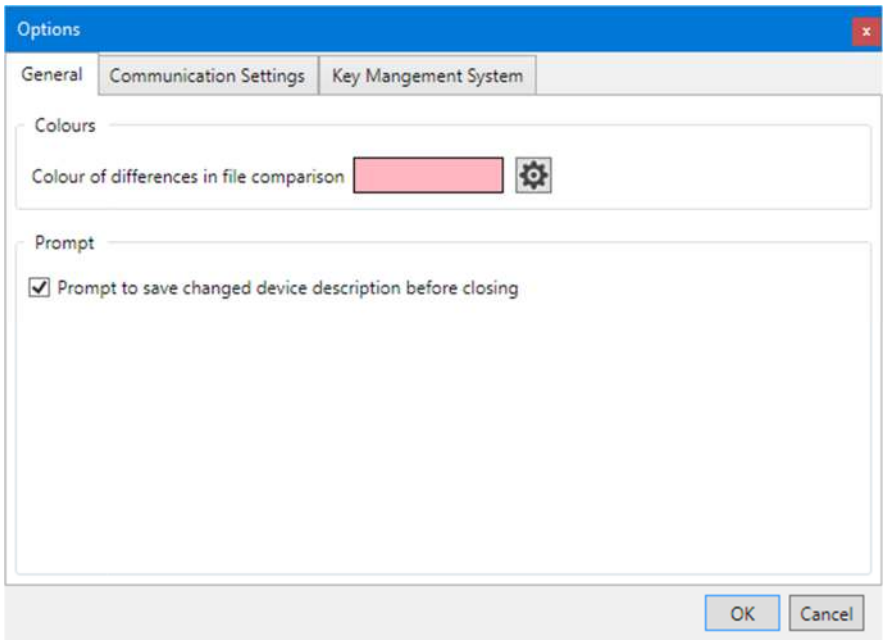
2. Select the desired language in the drop down list.
   English and German are available.
3. Click on **OK**.
   The "Startup Language" window disappears.
   The selected language will be used upon the next startup of the .MAP120 Parameter Editor.

7.3 Defining colours

The colour for modified values in comparisons can be set with this setting.

Procedure:

1. Select **Options** from the **Tools** menu.
   The "Options" window appears with selected "General" tab.



2. In the "Colours" area click on the button  .
   The "Colour" window appears with a colour palette.
3. Select the desired colour and click on **OK**.
   The "Colour" window disappears and the selected colour is shown in the field "Colour of differences in file comparison".

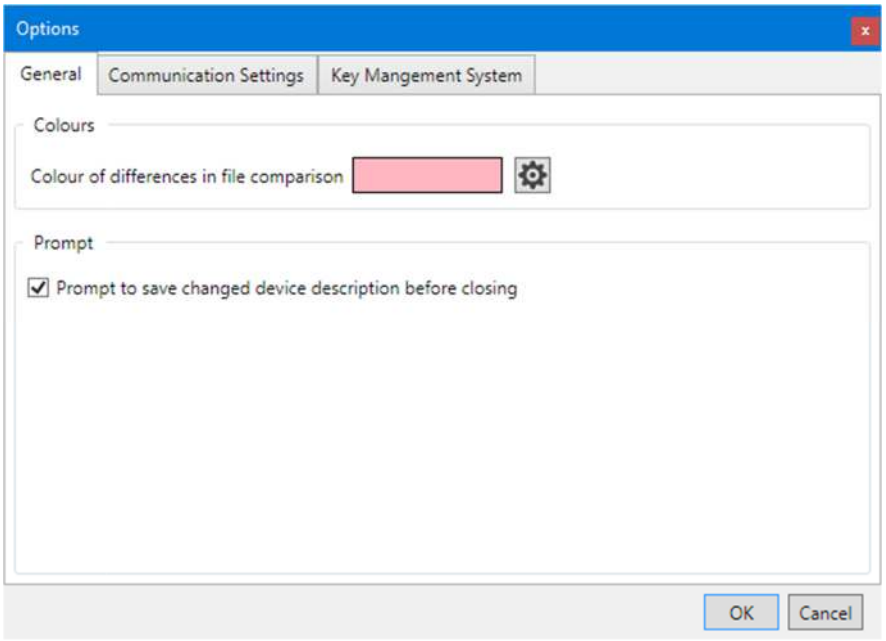
4. Click on **OK**.
   The "Options" window disappears and the selected colour will be saved.

7.4 Switching the saving prompt on and off

With this setting, you can specify whether a saving prompt shall appear when closing a modified device description or not.

Procedure:

1. Select **Options** from the **Tools** menu.
   The "Options" window appears with selected "General" tab.



2. Tick the checkbox in the "Prompt" area if a saving prompt shall be displayed before closing a changed device description or remove the tick if you do not want to get a prompt.
3. Click on **OK**.
   The "Options" window disappears and the saving prompt setting will be saved.

7.5 Defining storage location of communication settings

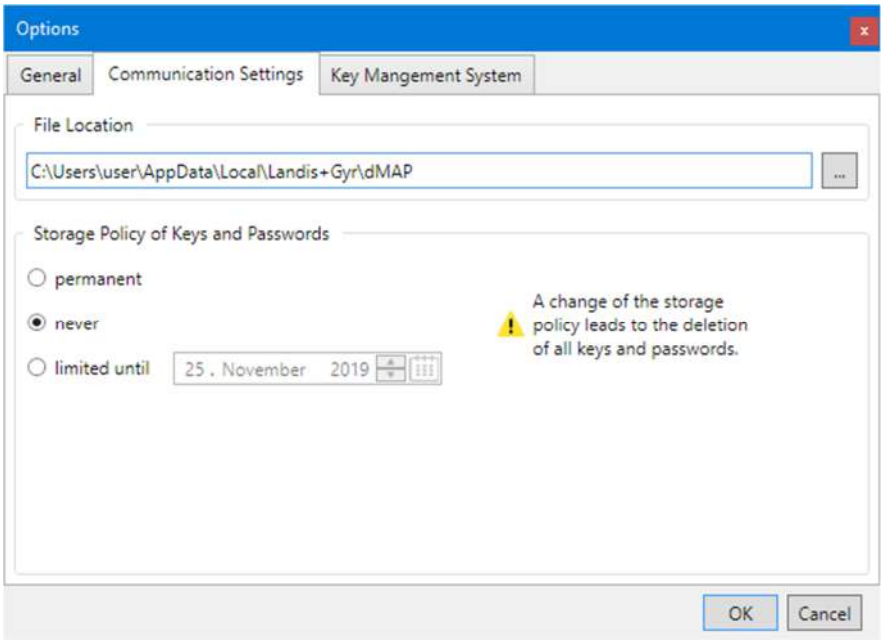
The path to the directory where communication settings are stored can be defined with this setting.

The communication settings can be shared for all .MAP tools.

Since the keys, passwords and the storage policy are stored encrypted per Windows user, the communication settings cannot be used by other Windows users on the same PC.

Procedure:

1. Select **Options** from the **Tools** menu.
   The "Options" window appears with selected "General" tab.
2. Select the "Communication Settings" tab.
3. In the "File Locations" area click on ... and select a directory in the tree appearing or enter the path to the desired directory.



4. Click on **OK**.
   The "Options" window disappears and the new settings are saved.

All communication settings are stored in the files "DeviceConnectionSettings Vxx.xml", "AddressBookVxx.xml" and "SecuritySettingsVxx.xml" (xx = data version, e.g. 12). Please note that these files will not be automatically transferred into the new directory. If required, the files have to be copied or moved manually.

The default directory for an initial installation is "C:\Users\Current User\AppData\Local\Landis+Gyr\dMAP".

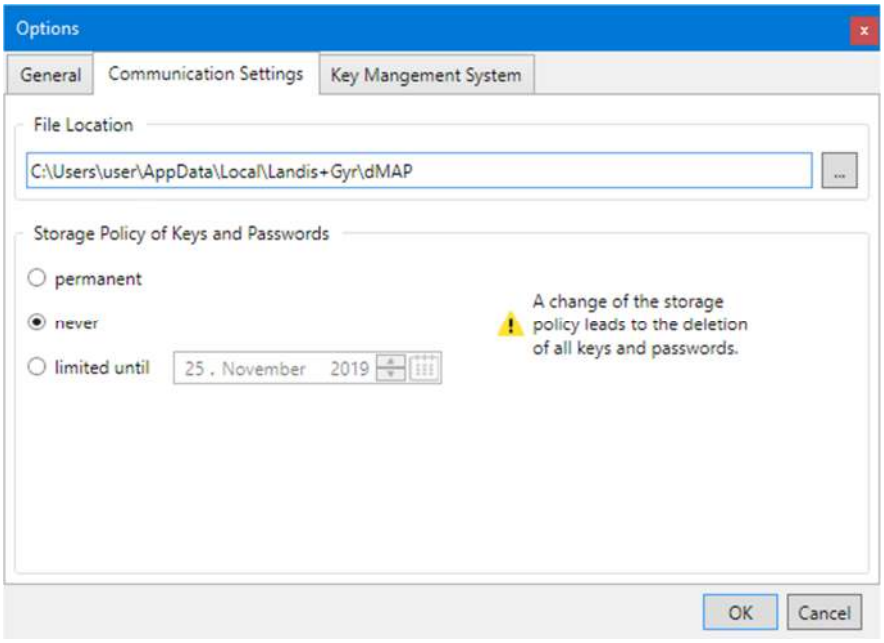
7.6 Defining storage policy for keys and passwords

With this setting, you can set the storage policy for passwords and keys.

Data deletion with each modification
Any modification in the storage policy causes a deletion of all passwords and keys.

Procedure:

1. Select **Options** from the **Tools** menu.
   The "Options" window appears.
2. Select the "Communication Settings" tab.



3. Select the desired storage policy.

   permanent: The passwords and keys are permanently stored on the PC.

   never: The passwords and keys are not stored, i.e. they will be lost when you exit the .MAP tool.

   limited until: The passwords and keys are stored on the PC until the specified expiration date is reached on the PC, and then deleted.

4. Click on **OK**.
   The "Options" window disappears and the new settings are saved.

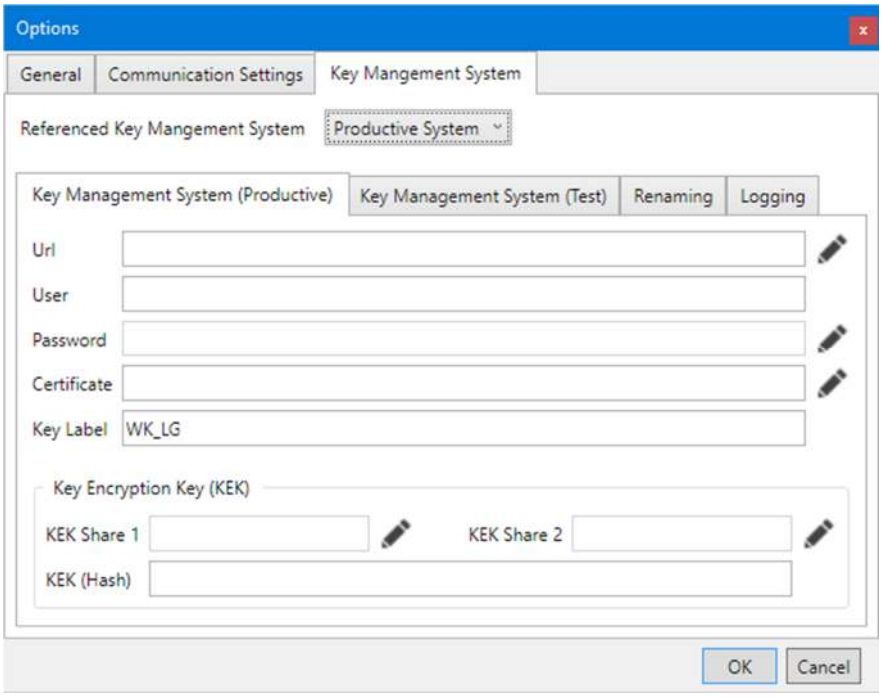
7.7 Defining the key management system

With this setting, you can set the credentials for accessing the productive and test key management system.

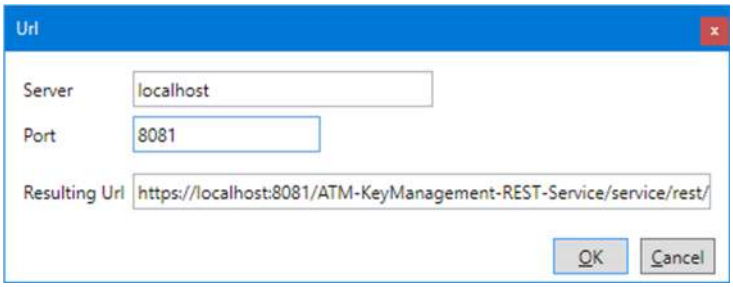
Required credentials
All required credentials will be supplied to you by your Landis+Gyr representative.

Procedure:

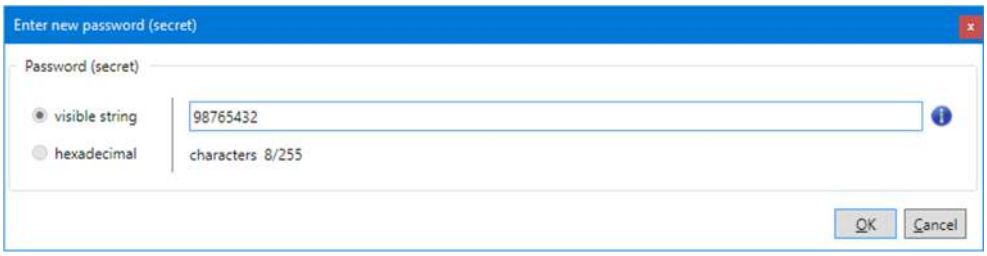
1. Select **Options** from the **Tools** menu.
   The "Options" window appears.
2. Select the "Key Management System" tab.



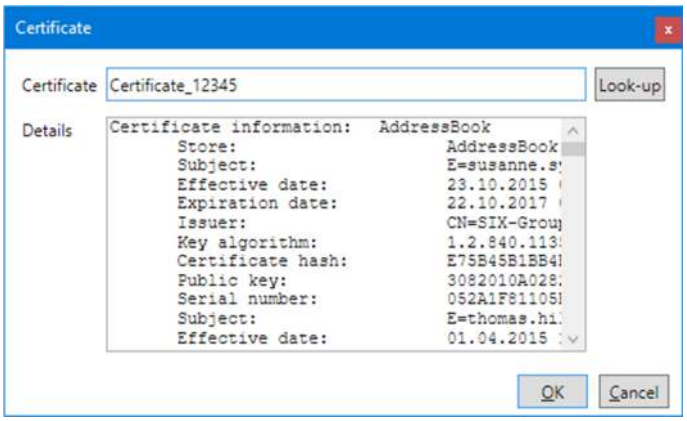
3. In the selection box "Referenced Key Management System" select "Productive System".
4. Click on  behind the "Url" entry box.
   The "Url" window appears.
5. Enter the server name in the "Server" entry box and the port number in the "Port" entry box.
   The resulting Url is displayed in the corresponding box underneath.



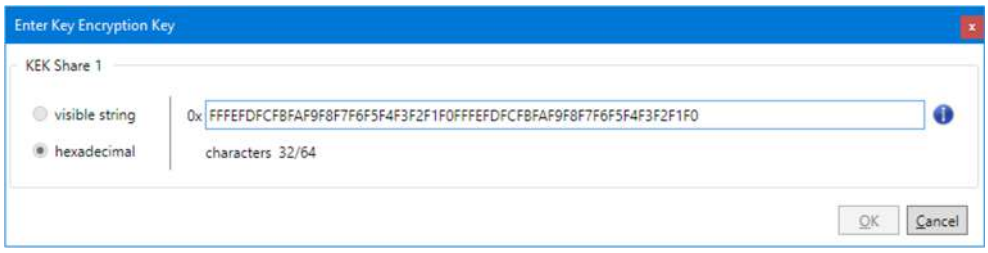
6. Click on **OK**.
   The "Url" window disappears and the Url is displayed in the corresponding entry box in the "Options" window.
7. Enter the user name in the "User" entry box.
8. Click on  behind the "Password" entry box.
   The "Enter new password (secret)" window appears.
9. Enter the password as visible string in the "Password (secret)" entry box.



10. Click on **OK**.
    The "Enter new password (secret)" window disappears and the password is displayed with asterisks in the corresponding entry box in the "Options" window.
11. Click on  behind the "Certificate" entry box.
    The "Certificate" window appears.
12. Enter the certificate name in the "Certificate" entry box.
    Klick on **Look-up** to decrypt the certificate and display the details of the certificate.

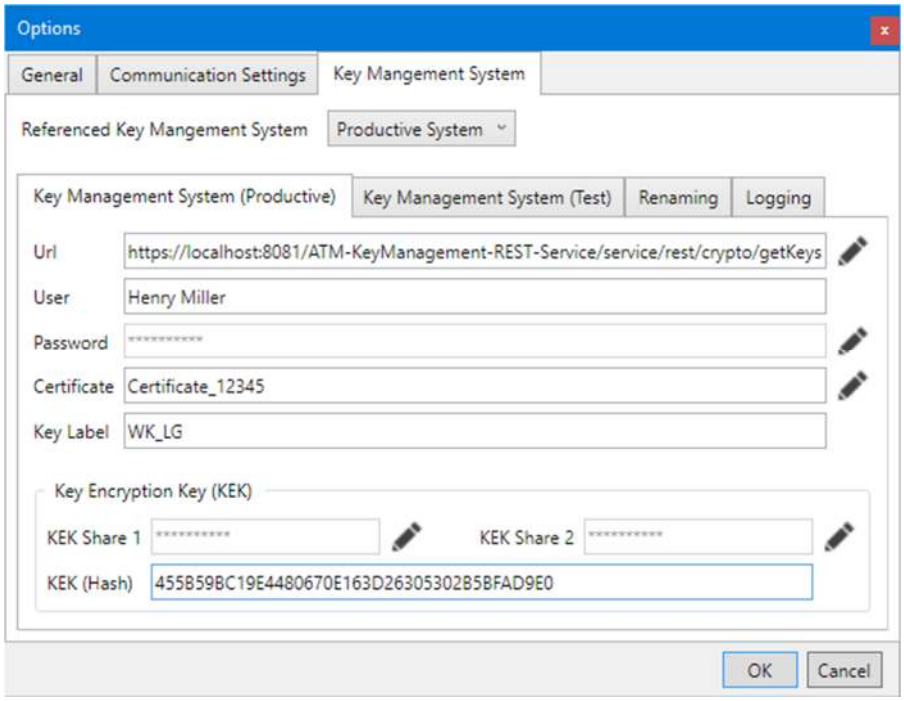


13. Click on **OK**.
    The "Certificate" window disappears and the certificate name is displayed in the corresponding entry box in the "Options" window.
14. Enter an unambiguous key label in the "Key Label" entry box.
    Default value is "WK_LG".
15. Click on  behind the "KEK Share 1" entry box.
    The "Enter Key Encryption Key" window appears.
16. Enter the key encryption key share 1 (part 1) as hexadecimal string in the "KEK Share 1" entry box.



17. Click on **OK**.
    The "Enter Key Encryption Key" window disappears and the key encryption key is displayed with asterisks in the corresponding entry box in the "Options" window.

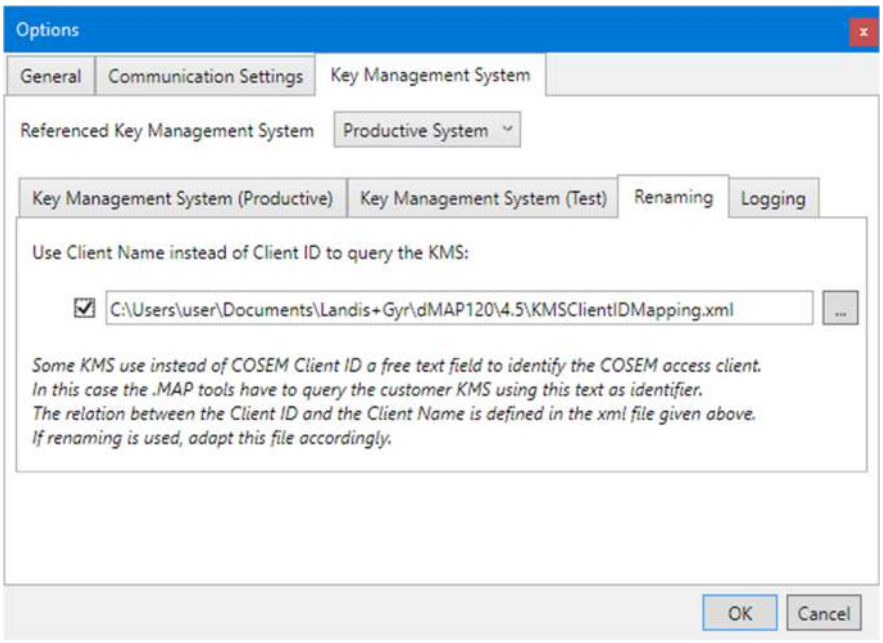
18. Enter the key encryption key share 2 (part 2) in the same way.
    The key encryption key hash value is calculated out of the two parts entered and displayed in the "KEK (Hash)" box.



19. In the selection box "Referenced Key Management System" select "Test System" and repeat points 4 to 18.

20. Select the "Renaming" tab if the key management system used has to be identified with a client name instead of a COSEM client ID.
    The relation between the COSEM client ID and the client name is defined in the file "KMSClientIDMapping.xml". This file has to be adapted according to the key management system used.

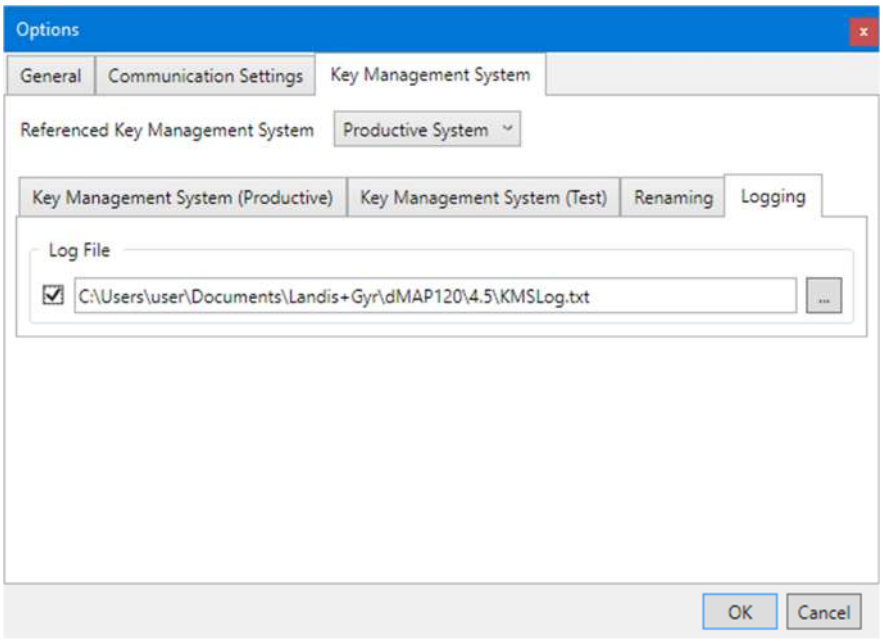
21. Tick the checkbox on the "Renaming" tab and click on ... to select the folder with the file "KMSClientIDMapping.xml" in the "Open" window which then appears or enter the path to the file in the entry box.



22. Select the "Logging" tab if the queries to the key management system shall be logged.

23. Tick the checkbox on the "Logging" tab and enter the path and the desired name of the log file in the entry box.
    The log file will then be created automatically in the corresponding folder. As default value the file name "KMSLog.txt" and the default folder of the used .MAP120 version is used.

    If you have already created a log file, click on ... to select the folder and the file in the "Open" window which then appears.



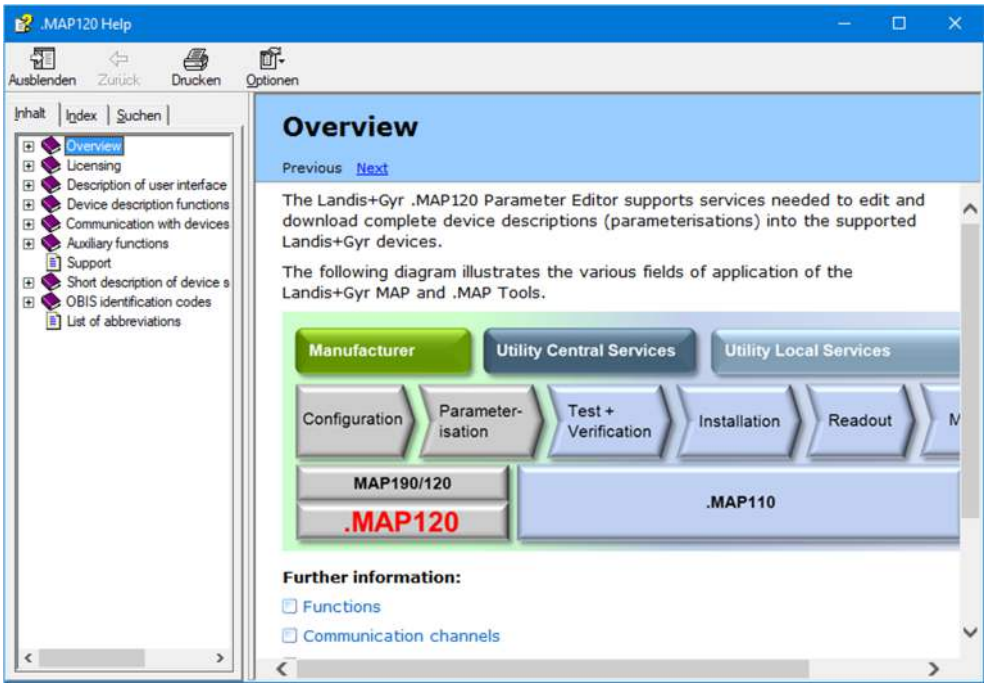
24. Click on **OK**.
    The "Options" window disappears and the new settings are saved.

7.8 Displaying tool help

This function permits access to the help texts for the Landis+Gyr .MAP120 Parameter Editor. These help texts correspond to the contents of this user manual.

Procedure:

1. Press function key [F1] or select **Help** from the **Help** menu.
   The online help for the Landis+Gyr .MAP120 Parameter Editor appears.



2. Find the desired information.
   Since the help function is a standard Windows function, it will not be explained at this point. More details are found in the Windows manual belonging to your PC.

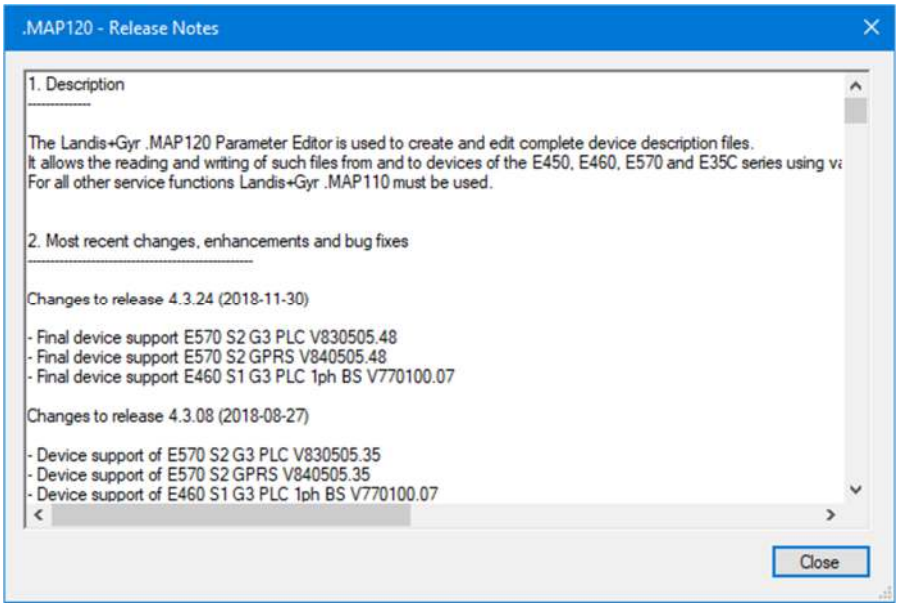
3. Click on  to close the online help.

7.9 Displaying release notes

This function displays the latest read-me file.

Procedure:

1. Select **Release notes** from the **Help** menu.
   The latest read-me file appears.



2. Obtain the information you are interested in.
3. Click on **Close** to close the read-me file again.

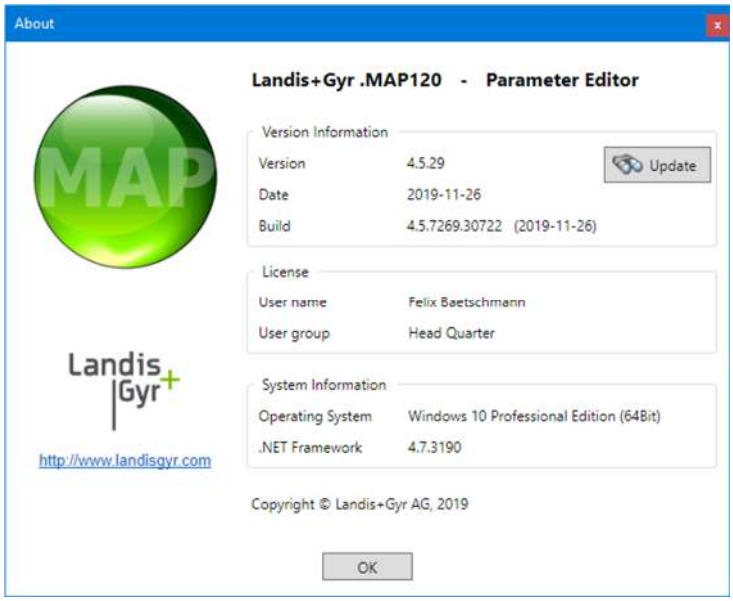
7.10 Displaying the current program release and checking for updates

This function permits the display of information on the current program release and checking whether the installed .MAP120 release is up to date.

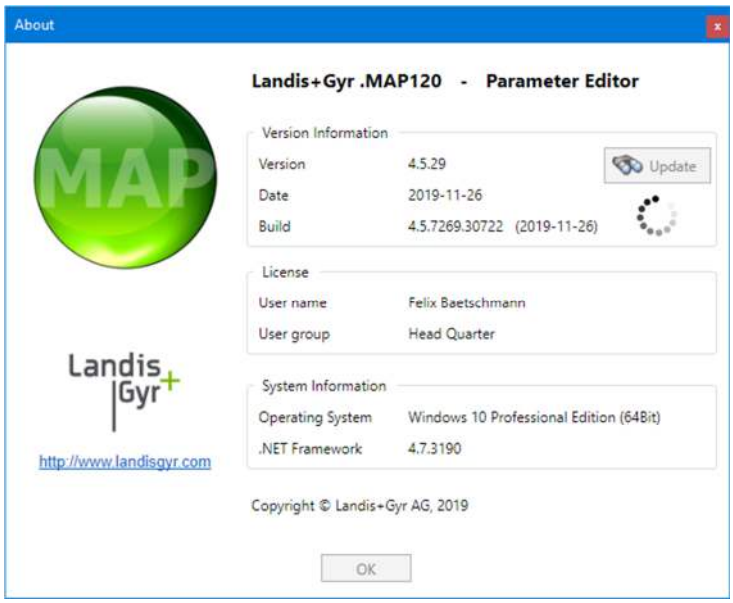
Internet access required
To perform a check for updates the PC must have access to the Internet, since the .MAP Home Page must be contacted for this.

Procedure:

1. Select **About .MAP120** from the **Help** menu.
   The "About" window appears. It contains information about the current version, the license and the operating system and .NET Framework installed on this computer.



2. Click on **Check for Update** if you want to check whether the installed .MAP120 release is up to date.
   An automatic query is performed on the .MAP Home Page to determine the latest released release available.



The  icon is displayed while the query is performed.

The  icon is displayed, if the installed release is up to date.

If a later release is available, the  icon appears. To download and install the latest release of the .MAP120 software click on this icon or on the MAP icon to access the MAP Software Download area.

If the  icon is displayed, no information is available or the internet access failed.

3. Click on **OK**.
   The "About" window disappears.

8 Support

The following is designed to help you take the right measure to tackle any problems you may experience when using the Landis+Gyr .MAP120 Parameter Editor.

If a problem arises try to solve it yourself first by applying the following measures:

- Consult the appropriate section of this user manual.
- Invoke the help function as described in section 7.8 "Displaying tool help".
- Read the content of the read-me file, supplied with the software as described in section 7.9 "Displaying release notes".

If these measures do not help, contact your local Landis+Gyr representative.

9 Short description of device security system

9.1 Introduction

The data and parameters of the Landis+Gyr devices are protected against unintended or improper access by a flexible, multi-stage security system. It is very similar to the one used in computer systems and consists of several access levels (users) with different access rights.

Detailed information on the security system for the relevant devices is provided in the corresponding functional descriptions.

9.2 Security attributes

For each access level, various security attributes can be defined that must be fulfilled to gain access.

Switches protected by the verification seal

Protected by the verification seal, there is for many devices (e.g. under the main face plate) a block of security switches or jumpers. Their position must be defined in order to gain access to a particular level.

Entering the service menu

It may be defined that access to a certain level will only be granted from the service menu. To enter the service menu, the utility seal must be removed.

Access authentication

For each access level it is defined how the authentication has to be performed. The following authentication types are defined:

- no authentication (access possible without password)
- low level authentication using a static password
- high level authentication using a coded password
- high level authentication using TEA (Tiny Encryption Algorithm)
- high level authentication using MD5 (Message-Digest Algorithm 5)
- high level authentication using SHA-1 (Secure Hash Algorithm)
- high level authentication using SHA-256 (Secure Hash Algorithm)
- high level authentication using GMAC (Galois Message Authentication Code)

In some cases multiple authentication types are selectable per access level.

If a static password is used, the user only needs to know the password. It is checked by the device and access is granted if the passwords match.

For all other passwords and keys the user not only needs to know the password but also an encryption algorithm. Due to the encryption, a Landis+Gyr tool is required to access such a level.

Passwords/Keys

A password or a key must be defined for some authentication types. Static and coded passwords as well as SHA keys comprise 16 characters, TEA and MD5 keys 32 characters.

Communication channels

The access to a certain level may be restricted so that it is only granted via selected communication channels. Access is for instance possible via the optical interface, the integrated interface and both communication channels of the communication unit.

Message security

To ensure the message safety, the messages can be authenticated and/or encrypted, provided a high level authentication using MD5, SHA or GMAC is used for access authentication. The necessary keys are stored in one or several security setup objects.

9.3 Access levels

The Landis+Gyr devices feature up to 15 different access levels with different access rights to groups of registers and parameters. The access rights per group (read and write access) can be individually configured for every access level.

Each access level is protected by security attributes which must be fulfilled to gain access. In order to simplify the handling and to ensure compatibility to other device series, most of the security attributes have been partially or completely fixed.

All access levels are technically strictly independent i.e. a higher access level does not automatically bear all rights of the lower access levels.

9.4 Access levels and their application

The table below describes all access levels with their security attributes and their typical application. The access rights are defined by the utility when ordering the device. They depend on the needs of the utility and on the national regulations.

For levels 0 to 4 access is possible via the DLMS and the IEC protocol, for levels 5 to G via the DLMS protocol only. The UID (user identification) is used in DLMS communication to select the access level.

Please note that not all access levels are available in all devices, the table below therefore just gives an overview. Please always refer to the functional description of the currently used device.

Level	Security attributes	Access rights and typical application examples
0 Public Access UID = 16	without password without breaking a seal all interfaces	This access level is always available. All DLMS devices can be accessed on this level. Some data can be read but there is no write access.
1 Data Collection UID = 32	with static password or high level authentication without breaking a seal interfaces selectable	Readout of billing data by means of a handheld terminal or possibly by a central system. All billing data is readable. Limited write access possible, e.g. time/date.
2 Utility Field Service UID = 48	with coded password, encryption key or high level authentication without breaking a seal interfaces selectable Landis+Gyr Tool required if coded password or encryption algorithm is used.	Maintenance tasks. All parameters and all billing data are readable. Limited write access to uncritical data is possible, e.g. device addresses, identification numbers, phone numbers etc.
3 Utility Service UID = 64	without password breaking the utility seal necessary local interfaces only	Installation or maintenance work in the utility and in the field. All parameters and all billing data are readable. Limited write access to settable data is possible, e.g. battery operating time, switching tables etc.

Level	Security attributes	Access rights and typical application examples
4 Extended Utility Service UID = 80	without password breaking the verification seal necessary local interfaces only	Installation or maintenance work in the utility. Verification is usually required afterwards. All parameters and all billing data are readable. Write access to all data is possible, e.g. parameterisation, register clearing, password setting etc.
5 Extended Consumer UID = 17	with static password without breaking a seal interfaces selectable	Write access for the end user. All parameters and most billing data are readable. Limited write access to the end user data is possible, e.g. monitor thresholds.
6 Remote Data Collection UID = 18	with static password without breaking a seal remote interfaces only	Remote readout of billing data by a central system. All billing data is readable. Limited write access is possible, e.g. time/date.
7 Remote Service UID = 19	with static password without breaking a seal remote interfaces only	Installation or maintenance work in connection with a central system. All parameters and all billing data are readable. Limited write access to settable data is possible, e.g. switching tables, device addresses, identification numbers, phone numbers etc.
G Management UID = 1	with static password or high level authentication without breaking a seal all interfaces	Installation or maintenance work after verification (locally or via a central system). All parameters and all billing data are readable. Limited write access to settable data is possible, e.g. switching tables, device addresses, identification numbers, phone numbers etc.
L Access Administrator UID = 2	with static password or high level authentication without breaking a seal all interfaces	The same purpose as Level G, additionally the access rights of the other levels can be modified.
8		Reserved for future expansion.
9 Broadcast UID = 102	without breaking a seal remote interfaces only	Pre-established, to send unconfirmed messages to multiple devices (broadcast) not available in .MAP tools.
A Utility Defined UID = 22	attributes selectable at ordering time	No typical application defined. Access rights defined at ordering time according to the needs of the utility.
B		Reserved for future expansion.
C Read Administrator UID = 96	with static password without breaking a seal	Allocation of read access rights All parameter and all billing data are readable. Read access rights for all lower levels (0 to B) can be allocated.
D Utility Administrator UID = 97	with coded password breaking the verification seal necessary local interfaces only Landis+Gyr Tool required because of coded password	Same as level 4. In addition, changes in the utility security system are possible: Read and write access rights can be adapted and all passwords can be changed.

Level	Security attributes	Access rights and typical application examples
E Distributor Service UID = 100	with coded password breaking the verification seal necessary local interfaces only Landis+Gyr Tool required because of coded password	Service access of the distributor. Identical to level D. In addition, changing the access rights and the password of the utility administrator is possible.

10 OBIS identification codes

10.1 General description

For OBIS (Object Identification System) the structure **A-B:C.D.E.F** applies, whereby the individual groups have the following significance:

A Defines the characteristic of the data item to be identified, e.g. abstract data, electricity-, gas-, heat- or water-related data.

B Defines the channel number, i.e. the number of the input of a metering equipment having several inputs for the measurement of energy of the same or different types (e.g. in data concentrators, registration units). This enables data from different sources to be identified.

C Defines the abstract or physical data items related to the information source concerned, e.g. active power, reactive power, apparent power, power factor, current or voltage.

D Defines types, or the result of the processing of physical quantities according to various specific algorithms. The algorithms can deliver energy and demand quantities as well as other physical quantities.

E Defines the further processing of measurement results to tariff registers, according to the tariffs in use. For abstract data or for measurement results for which tariffs are not relevant, this value group can be used for further classification.

F Defines the storage of data according to different billing periods. Where this is not relevant, this value group can be used for further classification.

To simplify the reading in the index field, individual groups of the OBIS code can be omitted. The abstract or physical data C and type of data D must be shown. **A full specification of the OBIS identification number system can be found in standard IEC 62056-61.**

Only the values of interest to metering devices are explained below with a collection of examples.

Group A

Group A of the OBIS identification can theoretically have values in the range between 0 and 9. Only the values
0 (abstract objects) and
1 (electricity related objects)
appear in the Landis+Gyr .MAP120 Parameter Editor.

Group B

Group B of the OBIS identification can theoretically have values in the range between 0 and 64. Only the values
0 (no channel specified)
1 (channel 1) and
2 (channel 2)
appear in the Landis+Gyr .MAP120 Parameter Editor.

Group C

Group C of the OBIS identification can have values in the range between 0 and 255. The individual values are differently assigned depending on the value of group A. The values for abstract items (group A = 0) are of no interest at this point, since they are largely specific to either context, country or manufacturer.

The following table shows the values of group C of the OBIS identification for electricity related objects. It has the form of a matrix and is read as follows: the value **46** for instance stands for reactive power in the second quadrant for phase L2.

General purpose objects			**0**					
Active power	+A (QI+QIV) [1]	$\sum L_i$	**1**	L_1	**21**	L_2	**41**	L_3	**61**
Active power	-A (QII+QIII)	$\sum L_i$	**2**	L_1	**22**	L_2	**42**	L_3	**62**
Reactive power	+R (QI+QII)	$\sum L_i$	**3**	L_1	**23**	L_2	**43**	L_3	**63**
Reactive power	-R (QIII+QIV)	$\sum L_i$	**4**	L_1	**24**	L_2	**44**	L_3	**64**
Reactive power	+Ri (QI)	$\sum L_i$	**5**	L_1	**25**	L_2	**45**	L_3	**65**
Reactive power	-Rc (QII)	$\sum L_i$	**6**	L_1	**26**	L_2	**46**	L_3	**66**
Reactive power	-Ri (QIII)	$\sum L_i$	**7**	L_1	**27**	L_2	**47**	L_3	**67**
Reactive power	+Rc (Q IV)	$\sum L_i$	**8**	L_1	**28**	L_2	**48**	L_3	**68**
Apparent power	+VA (QI +QIV)	$\sum L_i$	**9**	L_1	**29**	L_2	**49**	L_3	**69**
Apparent power	-VA (QII+QIII)	$\sum L_i$	**10**	L_1	**30**	L_2	**50**	L_3	**70**
Current		[2]	**11**	L_1	**31**	L_2	**51**	L_3	**71**
Voltage		[2]	**12**	L_1	**32**	L_2	**52**	L_3	**72**
Power factor		$\sum L_i$	**13**	L_1	**33**	L_2	**53**	L_3	**73**
Supply frequency			**14**	L_1	**34**	L_2	**54**	L_3	**74**
Active power	|+A|+|-A|		**15**	L_1	**35**	L_2	**55**	L_3	**75**
Active power	|+A|-|-A|		**16**	L_1	**36**	L_2	**56**	L_3	**76**
Active power	+A (QI)		**17**	L_1	**37**	L_2	**57**	L_3	**77**
Active power	-A (QII)		**18**	L_1	**38**	L_2	**58**	L_3	**78**
Active power	-A (QIII)		**19**	L_1	**39**	L_2	**59**	L_3	**79**
Active power	+A (QIV)		**20**	L_1	**40**	L_2	**60**	L_3	**80**
Phase angles			**81**						
Neutral current			**91**						
Neutral voltage			**92**						
Service entries [3]			**96**						
Error messages [3]			**97**						
List objects [3]			**98**						
Data profiles [3]			**99**						

[1] QI, QII, QIII, QIV = Quadrant 1, 2, 3, 4

[2] any phase

[3] In all data readouts the OBIS code is shown in .MAP tools in numeric format only (as defined in the standard) instead of partly using characters. Affected values: "C"=96, "F"=97, "L"=98 and "P"=99. This now allows a correct referencing to the standard.

The values 128 to 255 have manufacturer-specific definitions.
Some examples of Landis+Gyr definitions are:

Value	Application
130	Sum of all phases: reactive power quadrant I+IV+II+III
131	Sum of all phases: reactive power quadrant I+II-III-IV
132	Sum of all phases: reactive power quadrant I+IV
133	Sum of all phases: reactive power quadrant II+III
150	Phase 1: reactive power quadrant I+IV+II+III
151	Phase 1: reactive power quadrant I+II-III-IV
152	Phase 1: reactive power quadrant I+IV
153	Phase 1: reactive power quadrant II+III
170	Phase 2: reactive power quadrant I+IV+II+III
171	Phase 2: reactive power quadrant I+II-III-IV
172	Phase 2: reactive power quadrant I+IV
173	Phase 2: reactive power quadrant II+III
190	Phase 3: reactive power quadrant I+IV+II+III
191	Phase 3: reactive power quadrant I+II-III-IV
192	Phase 3: reactive power quadrant I+IV
193	Phase 3: reactive power quadrant II+III

Group D

Group D of the OBIS identification can have values in the range between 0 and 255. The individual values are differently assigned depending on the value of group A and C, but are not described here.

Group E

Group E of the OBIS identification can have values in the range between 0 and 255. In the Landis+Gyr .MAP120 Parameter Editor for group E for electricity-related items (group A = 1) the values corresponding to the number of tariffs specified mainly appear (0 = total of all tariffs, 1 = tariff 1, 2 = tariff 2, etc.). Other values apply for specific values of group C, but these are not described here.

Group F

Group F of the OBIS identification can have values in the range between 0 and 255. In the Landis+Gyr .MAP120 Parameter Editor group F is not used and is therefore always set to 255.

10.2 Examples

The following table shows a selection of OBIS identification numbers and explains their significance.

OBIS code (decimal)	OBIS code (hex) A B C D E F	Description
0-0:1.0.0	00 00 01 00 00 FF	Clock
0-0:42.0.0	00 00 2A 00 00 FF	DLMS device identification
0-0:96.1.0	00 00 60 01 00 FF	Identification number 2.1
0-0:96.1.1	00 00 60 01 01 FF	Identification number 2.2

OBIS code (decimal)	OBIS code (hex) A B C D E F	Description
0-0:96.2.0	00 00 60 02 00 FF	Number of parameterisations
0-0:96.2.1	00 00 60 02 01 FF	Date and time of last parameterisation
0-0:96.2.2	00 00 60 02 02 FF	Activation date TOU
0-0:96.2.3	00 00 60 02 03 FF	Date of last RCR program change
0-0:96.240.0	00 00 60 F0 00 FF	EEPROM identification
0-0:96.240.13	00 00 60 F0 0D FF	Hardware ID
0-0:96.3.1	00 00 60 03 01 FF	Input terminal states base meter
0-0:96.3.2	00 00 60 03 02 FF	Output terminal states base meter
0-0:96.4.0	00 00 60 04 00 FF	Internal control signal states
0-0:96.5.0	00 00 60 05 00 FF	Internal operating state
0-0:96.6.0	00 00 60 06 00 FF	Operating time of battery
0-0:96.6.3	00 00 60 06 03 FF	Battery voltage
0-0:96.7.0	00 00 60 07 00 FF	Number of phase fails L1..L3
0-0:96.7.1	00 00 60 07 01 FF	Number of phase fails L1
0-0:96.7.2	00 00 60 07 02 FF	Number of phase fails L2
0-0:96.7.3	00 00 60 07 03 FF	Number of phase fails L3
0-0:96.8.0	00 00 60 08 00 FF	Total operating time
0-0:96.8.t	00 00 60 08 t FF	Operating time (t = tariff number)
0-0:96.90	00 00 60 5A FF FF	Configuration ID
0-0:96.90.1	00 00 60 5A 01 FF	Physical IEC device address
0-0:96.90.2	00 00 60 5A 02 FF	Physical HDLC device address
1-0:96.2.7	00 00 60 02 07 FF	Activation date passive TOU
0-0:97.97.0	00 00 61 61 00 FF	Error code register
0-0:98.1.0*126	00 00 62 01 00 7E	Stored values
0-0:240.1.0	00 00 F0 01 00 FF	Device functions
0-1:96.2.5	00 01 60 02 05 FF	Date and time of last calibration
0-1:96.240.8	00 01 60 F0 08 FF	Hardware ID of base meter
0-1:96.3.1	00 01 60 03 01 FF	Input terminal states extension board
0-1:96.3.2	00 01 60 03 02 FF	Output terminal states extension board
0-2:96.240.8	00 02 60 F0 08 FF	Hardware ID of extension board
0-2:96.240.9	00 02 60 F0 09 FF	Reference hardware ID of extension board
1-0:0.0.1	01 00 00 00 00 FF	Identification number 1.1
1-0:0.0.2	01 00 00 00 01 FF	Identification number 1.2
1-0:0.0.3	01 00 00 00 02 FF	Identification number 1.3
1-0:0.0.4	01 00 00 00 03 FF	Identification number 1.4
1-0:0.1.0	01 00 00 01 00 FF	Reset counter

OBIS code (decimal)	OBIS code (hex) A B C D E F	Description
1-0:0.1.2	01 00 00 01 02 FF	Time and date of last billing period reset
1-0:0.2.0	01 00 00 02 00 FF	Software ID
1-0:0.2.1	01 00 00 02 01 FF	Parameterisation ID
1-0:0.2.3	01 00 00 02 03 FF	Ripple control receiver ID
1-0:0.2.4	01 00 00 02 04 FF	Connection ID
1-0:0.2.7	01 00 00 02 07 FF	Passive TOU ID
1-0:0.9.5	01 00 00 09 05 FF	Weekday
1-0:96.99.8	01 00 60 69 08 FF	Display and IEC readout ID
1-0:99.1.0	01 00 63 01 00 FF	Load profile
1-0:99.98.0	01 00 63 62 00 FF	Event log
1-1:0.3.0	01 01 00 03 00 FF	Meter constant active energy
1-1:0.3.1	01 01 00 03 01 FF	Meter constant reactive energy
1-1:0.4.0	01 01 00 04 00 FF	Scale factor for demand display
1-1:0.4.1	01 01 00 04 01 FF	Scale factor for energy display
1-1:0.4.2	01 01 00 04 02 FF	Current transformer ratio
1-1:0.4.3	01 01 00 04 03 FF	Voltage transformer ratio
1-1:13.0.0	01 01 0D 00 00 FF	Average billing period power factor
1-1:13.3.n	01 01 0D 03 n FF	Power factor minimum (n = number)
1-1:13.31.n	01 01 0D 23 n FF	Power factor threshold (n = number)
1-1:13.35.n	01 01 0D 23 n FF	Power factor monitor threshold (n = number)
1-1:13.5.0	01 01 0D 00 00 FF	Last average power factor
1-1:13.7.0	01 01 0D 07 00 FF	Total power factor
1-1:14.7.0	01 01 0E 07 00 FF	Mains frequency
1-1:31.7.0	01 01 1F 07 00 FF	Current L1
1-1:31.35.0	01 01 1F 23 00 FF	Overcurrent threshold L1
1-1:32.7.0	01 01 20 07 00 FF	Voltage L1
1-1:32.31.0	01 01 20 1F 00 FF	Undervoltage threshold L1
1-1:32.35.0	01 01 20 23 00 FF	Overvoltage threshold L1
1-1:33.7.0	01 01 21 07 00 FF	Power factor L1
1-1:51.7.0	01 01 33 07 00 FF	Current L2
1-1:51.35.0	01 01 33 23 00 FF	Overcurrent threshold L2
1-1:52.7.0	01 01 34 07 00 FF	Voltage L2
1-1:52.31.0	01 01 34 1F 00 FF	Undervoltage threshold L2
1-1:52.35.0	01 01 34 23 00 FF	Overvoltage threshold L2
1-1:53.7.0	01 01 35 07 00 FF	Power Factor L2
1-1:71.7.0	01 01 47 07 00 FF	Current L3
1-1:71.35.0	01 01 47 23 00 FF	Overcurrent threshold L3

OBIS code (decimal)	OBIS code (hex) A B C D E F	Description
1-1:72.7.0	01 01 48 07 00 FF	Voltage L3
1-1:72.31.0	01 01 48 1F 00 FF	Undervoltage threshold L3
1-1:72.35.0	01 01 48 23 00 FF	Overvoltage threshold L3
1-1:73.7.0	01 01 49 07 00 FF	Power Factor L3
1-1:81.7.0	01 01 51 07 00 FF	Angle U(L1) to U(L1)
1-1:81.7.1	01 01 51 07 01 FF	Angle U(L2) to U(L1)
1-1:81.7.2	01 01 51 07 02 FF	Angle U(L3) to U(L1)
1-1:81.7.3	01 01 51 07 04 FF	Angle I(L1) to U(L1)
1-1:81.7.4	01 01 51 07 05 FF	Angle I(L2) to U(L1)
1-1:81.7.5	01 01 51 07 06 FF	Angle I(L3) to U(L1)
1-1:91.7.0	01 01 5B 07 00 FF	Neutral current
1-1:91.35.0	01 01 5B 23 00 FF	Overcurrent threshold N
1-1:m.2.0	01 01 m 02 00 FF	Cumulative maximum demand (m = measured quantity)
1-1:m.4.0	01 01 m 04 00 FF	Current average demand (m = measured quantity)
1-1:m.6.t	01 01 m 06 t FF	Maximum demand register (m = measured quantity, t = tariff number)
1-1:m.8.0	01 01 m 08 00 FF	Total energy register (m = measured quantity)
1-1:m.8.t	01 01 m 08 t FF	Energy register (cumulative) (m = measured quantity, t = tariff number)
1-1:m.9.t	01 01 m 09 t FF	Energy register (billing period delta value) (m = measured quantity, t = tariff number)
1-1:m.29.t	01 01 m 1D t FF	Energy register (registration period delta value) (m = measured quantity, t = tariff number)
1-1:m.35.n	01 01 m 23 n FF	Demand register monitor threshold (m = measured quantity, n = number)
1-2:82.8.0	01 02 52 08 00 FF	Counter S0 pulses input 1
1-3:82.8.0	01 03 52 08 00 FF	Counter S0 pulses input 2
a-2:m.8.0	a 02 m 08 00 FF	External pulse input 1 (a = medium, m = measured quantity)
a-3:m.8.0	a 03 m 08 00 FF	External pulse input 2 (a = medium, m = measured quantity)

11 List of abbreviations

This section explains some abbreviations used in this user manual or on dialogue windows of the Landis+Gyr .MAP120 application in alphabetical order.

Abbreviation	Definition Description
DLMS	**Distribution Line Message Specification** Messaging system defined originally as part of the application layer of the protocol stack for distribution line carrier systems (IEC 61334-4-41, 1996). Its universality and its independence of the actual communication channel allowed DLMS to become the choice of the metering industry for any metering application (Device Language Message Specification).
EDIS	**Energy Data Identification System** Identification number system for clear identification of energy data according to DIN 43863-3:1997.
GSM	**Global System for Mobile communications** Wireless communication network for data and voice transmission.
HDLC	**High Level Data Link Control** Communication protocol used by COSEM (IEC 62056-46), specifying the data link layer. The HDLC standard is ISO/IEC 13239, 2000 (second edition). Some older COSEM implementations rely on the first, 1996 edition of the standard.
IEC	**International Electrotechnical Commission** IEC 62056-21 is the standard "Electricity metering - Data exchange for meter reading, tariff and load control - Part 21: Direct local data exchange". This is the third edition of the formerly well-known standard IEC 61107 (IEC 1107).
.MAP	**Meter Application Product** The .MAP software tools have been developed and distributed by Landis+Gyr to support electricity meters. This group of tools comprises the .MAP 110 Parameter Editor and the .MAP120 Parameter Editor.
OBIS	**Object Identification System** Identification number system for clear identification of DLMS items.
PSTN	**Public Switched Telephone Network** The public switched telephone network can be used for data transmission. To this purpose a modem (modulator/demodulator) must be inserted between computer and telephone network and also between the telephone network and the remote device.
VDEW	**Vereinigung Deutscher Elektrizitätswerke** VDEW is the central organisation of the German electrical industry. It combines and represents the interests of its members and is consultant and forward-looking body for energy questions (refer also to www.strom.de).

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