

.MAP110

User Manual



Revision history

Version	Date	Comments
a	28.02.2005	First edition
b	31.05.2005	Changes to release 1.1
c	22.09.2005	Changes to release 1.2
d	05.12.2006	Changes to release 2.2
e	14.12.2006	Field strength indication for GSM installation support changed
f	14.01.2010	Changes to release 3.3 New document number D000011475 replaces H 71 0200 0332 (version index continued)
g	29.01.2009	Changes to release 3.4
h	06.03.2010	Sections 1 "Overview" and 2 "Installation" updated. All communication surveys new with photos. All communication screenshots adapted to changed software. Designation "meter" generally replaced with "device". Section 5.8 "Command Tree" expanded with user command tree. Section 7.2.5 "Generating Export Files for MAP100" new. Section 7.3.2 "Firmware Update AD-xP/xG" new. Section 7.5.6 "Setting MAP100 File Export" new. Section 7.5.7 "Checking for Updates" new. Section 10 "Short Description of Device Security System" updated Several minor changes (text, layout, screenshots, index).
k	20.12.2010	Changes to .MAP110 release 4.0
m	12.01.2011	Adaptation to tool changes: progress bar no longer in status bar, command tree command name changes, several minor changes (text, layout, screenshots).
n	30.05.2011	Changes to .MAP110 release 4.1
p	02.11.2011	Changes to .MAP110 release 4.2
q	02.03.2012	Changes to .MAP110 release 4.3
r	21.05.2012	Changes to .MAP110 release 4.4; New Licensing.
s	12.10.2012	Changes to .MAP110 release 4.5; New command tree structure with generic and device specific commands; Time base selection for profile readout for devices supporting this feature.
t	22.11.2013	Changes to .MAP110 release 4.8; Support for Windows 8, command used is shown in result window, check for update can be called up from "About" window. Several minor changes (text, figures, screenshots, index).
u	31.01.2014	Windows XP screenshots replaced by Windows 7 screenshots. Section 6.4.4 "Network connection via the Internet" and section 7.4.5 "Load profile analysis" removed.
v	04.12.2014	Changes to .MAP110 release 5.0 (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.
w	26.10.2015	Changes to .MAP110 release 5.3 (see also read-me file); Operating System Windows 10 supported, "Uninstall" removed from start menu, block transfer for write, set and action services can be enabled/disabled in the dlms application layer settings, firmware update E450, E570 and E35C 4.x changed, command tables in section 12 updated, several minor changes (text, screenshots, index).

Nothing in this document shall be construed as a representation or guarantee in respect of the performance, quality or durability of the specified product. Landis+Gyr accepts no liability whatsoever in respect of the specified product under or in relation to this document. Subject to change without notice.

Version	Date	Comments
x	07.09.2016	Changes to .MAP110 release 5.5 (see also read-me file); New version of communication settings, TCP and UDP supported in network layer, Update to Microsoft .NET framework 4.6. About box extended with license information, firmware update also for E460.
x	31.05.2017	Changes to .MAP110 release 5.6 (see also read-me file); New section 2.3 for required setting when operating .MAP110 on high resolution displays, new version of communication settings, extended access levels, new level authentication using SHA-256, several minor changes (text, screenshots), table "functional range per user group" updated.

Introduction

Scope	The present user manual is designed for the Landis+Gyr .MAP110 Service Tool Version 5.6 and higher.										
Purpose	This user manual contains all information required for the use of the Landis+Gyr .MAP110 Service Tool. 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 service tasks (installation, readout and maintenance) for Landis+Gyr devices.										
Conditions	The Landis+Gyr .MAP110 Service Tool 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 .MAP110 Service Tool, which are described in the corresponding user manuals and functional specifications.										
Conventions	The following conventions are used in this manual: <table><tr><td>1. 2. 3.</td><td>Ordinal numbers are used for individual steps in the instructions.</td></tr><tr><td>Extra</td><td>Buttons, menu names and individual menu items appear in bold text.</td></tr><tr><td>[F1]</td><td>Keys are shown in square brackets.</td></tr><tr><td>[Ctrl]+[V]</td><td>Key combinations are shown with a plus sign (e.g. [Ctrl] key kept pressed while pressing [V] key)</td></tr><tr><td>"Options"</td><td>Names of windows and elements appear in quotation marks.</td></tr></table>	1. 2. 3.	Ordinal numbers are used for individual steps in the instructions.	Extra	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. 2. 3.	Ordinal numbers are used for individual steps in the instructions.										
Extra	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.										

Table of contents

1	Overview	8
1.1	Functions	8
1.2	Communication channels	8
1.3	Communication protocols	9
1.4	dlms security	9
1.5	Editions	9
1.6	Supported devices	9
2	Installation and uninstallation	10
2.1	Installation	10
2.2	Uninstallation	11
2.3	Required setting when operating .MAP110 on high resolution displays	11
3	Licensing	12
3.1	Licensing concept	12
3.2	Entering license data	13
3.3	Changing the license	14
4	First steps	15
5	Description of user interface	18
5.1	Overview	18
5.2	Menu bar	19
5.3	Toolbars	19
5.3.1	Application toolbar	19
5.3.2	Client toolbar	19
5.3.3	Address toolbar	19
5.3.4	Device toolbar	20
5.3.5	Communication channel toolbar	20
5.4	Command tree	21
5.5	Result window	24
5.6	Command log	25
5.7	Communication log	26
5.8	Status bar	28
5.9	Evaluation window	28
6	Communication with the devices	29
6.1	Basic principle	29
6.1.1	Communication channel	29
6.1.2	Device	30
6.1.3	Access level	30
6.2	Communication settings	31
6.2.1	Recommended input sequence	32
6.2.2	Communication channel data	33
6.2.2.1	Physical Layer	35
6.2.2.2	dlms Link Layer	38
6.2.2.3	dlms Application Layer	39
6.2.2.4	IEC	40
6.2.2.5	Terminating the communication channel definition	41
6.2.3	Device data	42
6.2.3.1	Type	43
6.2.3.2	Address	44
6.2.3.3	Access levels	45
6.2.3.4	Keys	46
6.2.3.5	Importing keys	48

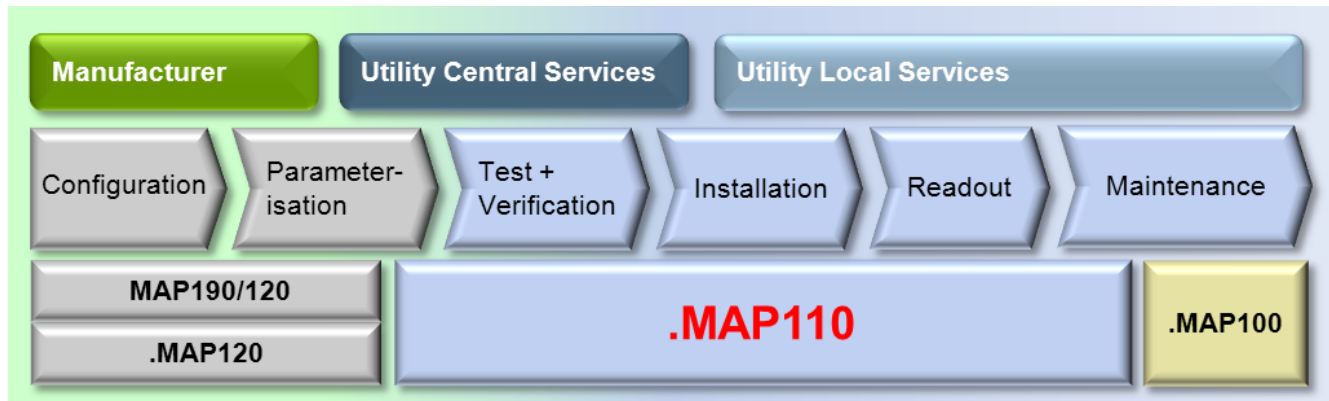
6.2.3.6	Terminating the device data definition	50
6.2.4	Address data	51
6.2.4.1	Phone numbers	51
6.2.4.2	IP addresses	53
6.2.4.3	Importing address book	55
6.2.5	Links between devices and communication channels	57
6.2.5.1	Defining link between device and communication channel	58
6.2.5.2	Terminating the link definition	60
6.2.6	Access levels	61
6.2.6.1	Access security	62
6.2.6.2	Message security	64
6.2.6.3	Terminating the access level definition	65
6.3	Addressing devices	66
6.4	Establishing the communication with devices	66
6.5	Communication examples	67
6.5.1	Serial connection via the optical interface	67
6.5.2	Serial connection to a local bus	68
6.5.3	Modem connection	69
6.5.4	Network connection via a LAN	70
6.5.5	Network connection via a WLAN and the Internet	71
6.6	Reference to other documents	71
7	Commands	72
7.1	Read commands	72
7.1.1	Simple read commands	72
7.1.2	Extended read commands	73
7.1.3	Read commands for profiles	74
7.1.4	Emergency readout	77
7.2	Write commands	78
7.2.1	Set communication inputs	79
7.2.2	Modify SMS configuration settings	80
7.2.3	Modify communication unit settings	81
7.2.4	Modify time of use	82
7.2.5	Primary values adaptation	84
7.3	Execute commands	85
7.3.1	SMS test transmission	86
7.3.2	Firmware update AD-xP/xG 3.x	87
7.3.3	Firmware update E450, E460, E570 and E35C 4.x	90
7.4	Diagnostic commands	94
7.4.1	Vector diagram	94
7.4.2	GSM installation support	95
7.4.3	DIP table	96
7.4.4	Security system	98
8	Auxiliary functions	99
8.1	Changing the language of the user interface	99
8.2	Setting colour for disabled commands	100
8.3	Selecting the calendar base for IEC commands	101
8.4	Defining storage location of communication settings	102
8.5	Defining storage policy for keys and passwords	103
8.6	Setting delay times	104
8.7	Activating command confirmation	105
8.8	Enabling .MAP100 file export	106
8.9	Displaying help topics	108
8.10	Displaying release notes	109
8.11	Displaying the current program release and checking for updates	110

9	Support	112
10	Short description of device security system	113
10.1	Introduction	113
10.2	Security attributes	113
10.3	Access levels	114
10.4	Access levels and their application	114
11	OBIS identification codes	117
11.1	General description	117
11.2	Examples	119
12	Functional range per user group	123
13	List of abbreviations	138
14	Index	139

1 Overview

The Landis+Gyr .MAP110 Service Tool supports services needed to install Landis+Gyr devices (meters, communication modules and communication units), to read billing and diagnostic values and to perform maintenance operations.

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



1.1 Functions

The Landis+Gyr .MAP110 Service Tool supports the following range of functions:

- **Installation:**
setting of clock and ID numbers, reset of registers and profiles, communication test functions, vector diagram, primary data adaptation
- **Reading of data:**
billing values, diagnostic values, profiles, export data
- **Maintenance:**
readout and modification of time of use, of all communication parameters or of selected parameters (e.g. various thresholds), visualization of the security system, firmware update

1.2 Communication channels

The Landis+Gyr .MAP110 Service Tool 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 .MAP110 Service Tool 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 .MAP110 Service Tool supports the following dlms security features:

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

1.5 Editions

To ensure the maximum possible flexibility for users of the Landis+Gyr .MAP110 Service Tool, the software can be licensed for various user groups with different functionality:

- Standard (full functionality, currently the same as Certification)
- Certification (certification authority)
- Engineering (laboratory use)
- Installation (field use)
- Reader (local and remote)
- Field Inspection (installation check)
- Consumer (final customer)

The edition is determined by the licence data (see section 3 "Licensing").

Detailed information on the functions which can be performed by the user groups can be found in section 12 "Functional range per user group".

1.6 Supported devices

Please refer to the read-me file (see section 8.10 "Displaying release notes") for a list of supported devices.

2 Installation and uninstallation

This section describes the installation of the Landis+Gyr .MAP110 Service Tool on the hard disk of your PC and its uninstallation if it is no longer used.

2.1 Installation

System requirements	To be able to run the Landis+Gyr .MAP110 Service Tool, your PC must be equipped with the operating system Windows 10, Windows 8, Windows 7 or Windows Vista. 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 components, which are not part of the Landis+Gyr .MAP110 Service Tool, must be installed on your PC: • .NET Framework Version 4.6.1 or later • MS Excel 2003 or later (for enhanced diagnostic functions)
Administrator privileges	Administrator privileges on your computer are required for the installation and the licensing.
Installation software	The installation software for the Landis+Gyr .MAP110 Service Tool 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 .MAP110 Service Tool.
Preparation	Please read the file "dMAP110_ReadMe.txt" with current information about the present release of the Landis+Gyr .MAP110 Service Tool.
First installation	Start the installation file "Setup.exe" and then follow the instructions of the setup wizard.
Upgrades	Close the Landis+Gyr .MAP110 Service Tool, 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 5.6 to the latest release 5.6, 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 4.x, 5.0, 5.1, 5.2, 5.3, 5.4 or 5.5 to the latest release 5.6, 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, 2.x and 3.x can't be upgraded. Landis+Gyr recommends to remove older releases since they will no longer be supported.

2.2 Uninstallation

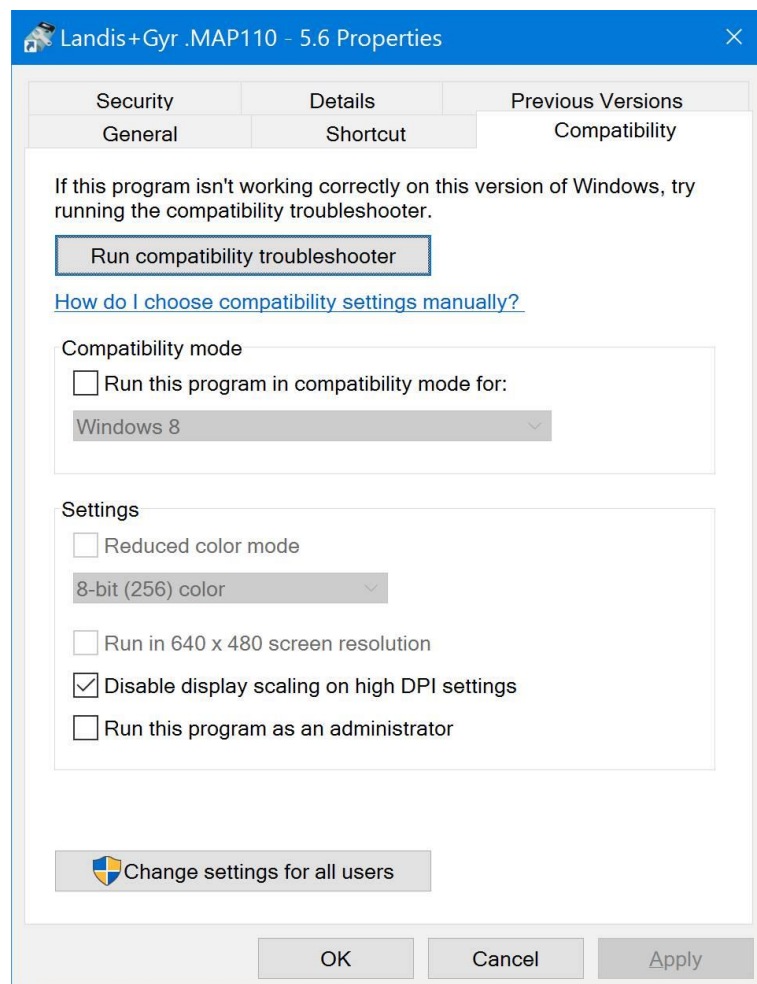
If the Landis+Gyr .MAP110 Service Tool is no longer needed, it should be uninstalled.

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

2.3 Required setting when operating .MAP110 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 .MAP110 Service Tool. Without this setting the tool will appear very small with a scale factor of 100% and can hardly be used.

The Landis+Gyr .MAP110 Service Tool must be started using a link in which the "Disable display scaling on high DPI settings" property is ticked in the "Compatibility" tab:



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 .MAP110 Service Tool.

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

3 Licensing

This section explains the licensing concept and describes the steps necessary for licensing the Landis+Gyr .MAP110 Service Tool.

3.1 Licensing concept

After installation, the Landis+Gyr .MAP110 Service Tool 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 .MAP110 Service Tool without restrictions, it must be licensed for the intended use (available editions see section 1.5 "Editions"). For this purpose, the following licensing data can be obtained from the Landis+Gyr representative responsible, which must be entered in the Landis+Gyr .MAP110 Service Tool:

- User Name
- User Group
- License Key

The procedure is described in section 3.2 "Entering license data".

The license of the Landis+Gyr .MAP110 Service Tool release 4.4 or later is handled individually per Windows user and per .MAP110 main release on a single PC. If several persons share the same PC, the required .MAP110 user group with its specific functionality can therefore be individually assigned to each Windows user (with former releases the same license was used for all Windows users of a single PC and all .MAP110 releases).

When upgrading a former .MAP110 release 4.0, 4.1, 4.2 or 4.3 to release 4.4 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 4.4 any license change or a new license only affects the current Windows user and the current .MAP110 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 .MAP110 licence and the Windows user name are different.

3.2 Entering license data

This section describes the licensing procedure required for unrestricted use of the Landis+Gyr .MAP110 Service Tool. 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:

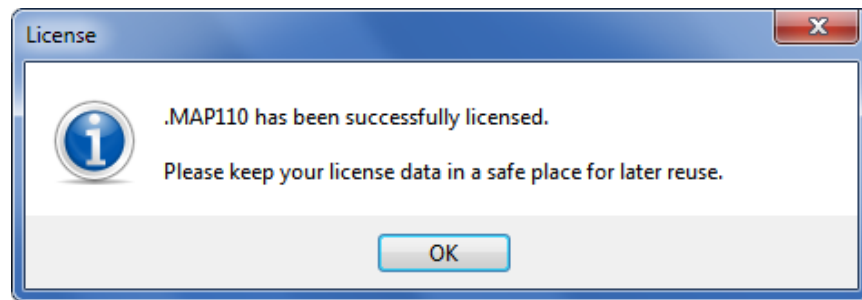
1. Click on **Start** and then under **All programs** select the **Landis+Gyr** program group.
2. Right click on the **Landis+Gyr .MAP110 - 5.6** command and then select the entry "Run as administrator" in the popup menu appearing. The Landis+Gyr .MAP110 Service Tool is started.
3. Select **License** from the **Tools** menu. The "License" window appears.

A screenshot of the 'License' dialog box. It has three input fields: 'User Name' with the text 'Demo User', 'User Group' with a dropdown menu showing 'Demo', and 'License Key' which is empty. At the bottom right are 'OK' and 'Cancel' buttons.

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.

A screenshot of the 'License' dialog box with data entered. The 'User Name' field contains 'Henry Miller', the 'User Group' dropdown shows 'Installation', and the 'License Key' field contains '6034-22FC-C860-2293'. The 'OK' button is highlighted with a blue border.

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 accessible commands or device types, respectively, can be selected in the drop down list above the command tree and the available commands are displayed in the command tree.



The Landis+Gyr .MAP110 Service Tool is now ready for use according to the instructions given in sections 4 "First steps" or 7 "Commands", respectively.



Keep the license key in a safe place

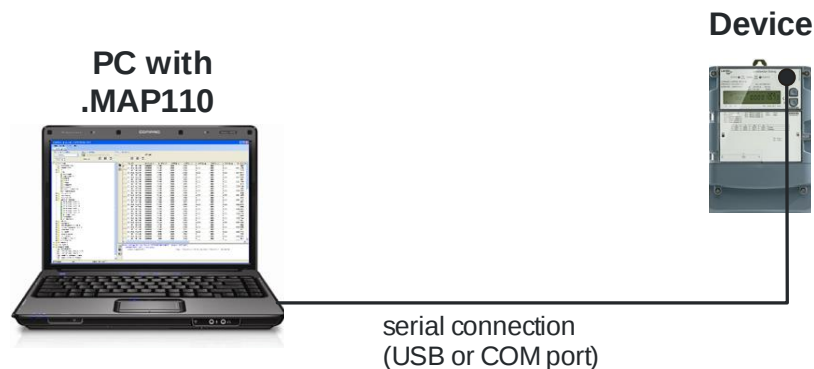
Please note that due to security reasons the license key is not shown anymore if the "License" window is reopened. Keep the license key in a safe place for further use.

3.3 Changing the license

The license can be changed by requesting new license data from Landis+Gyr and entering this in the "License" window (see section 3.2 "Entering license data").

4 First steps

This section gives an introductory example of how a communication connection is made to a device with the Landis+Gyr .MAP110 Service Tool and how data can be read from the device.



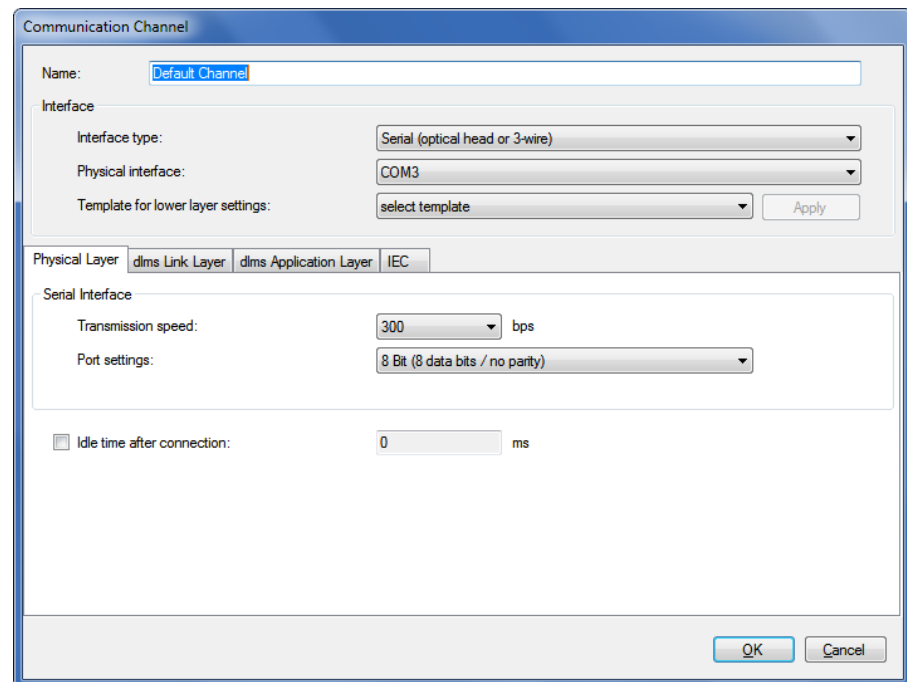
A device ready for operation and an optical reading head for connection to a serial interface (USB or COM port) are required for this purpose. The Landis+Gyr .MAP110 Service Tool must also be installed on the PC and licensed, e.g. for user group "Installation".

Procedure:

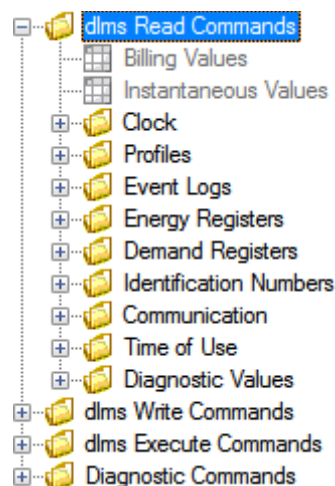
1. Connect the optical reading head to the PC and install the required drivers.
2. Click on **Start** and then under **All programs** in the **Landis+Gyr** program group select the **Landis+Gyr .MAP110 - 5.6** command. The Landis+Gyr .MAP110 Service Tool is started.



3. Click on  in the communication channel toolbar (see red arrow in above figure). The "Communication Channel" window appears.



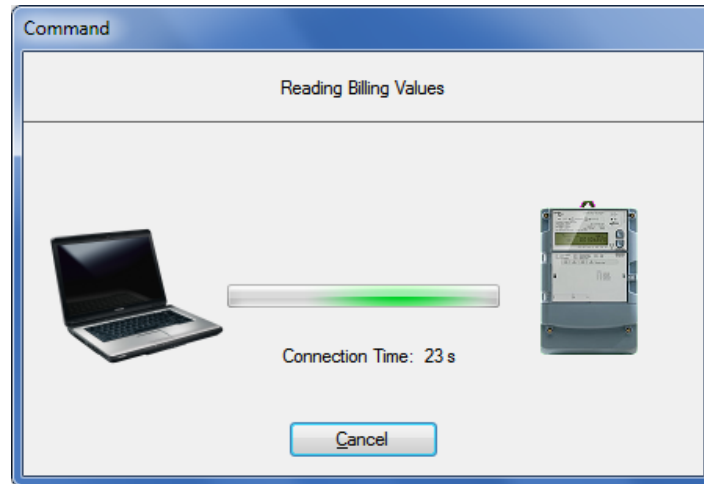
4. In the "Interface type" drop down list select the "Serial (optical head or 3-wire)", "Bluetooth optical head (PMR_1)" or "Bluetooth optical head (PMR_1A)" type depending on the optical reading head used.
5. In the "Physical interface" drop down list select the serial interface to which the optical reading head is connected.
6. According to the features of the used meter, in the "Template for lower layer settings" drop down list select the template "Serial - dlms" (e.g. for E450, E570, E850) or "Serial - IEC" (e.g. for E230, E350, E550, E650) and then click on "Apply".
7. Click on "OK".
The communication settings will be saved and the "Communication Channel" window will be closed.
8. In the drop down list above the command tree select either the entry "all dlms commands" or the device series connected.
9. Open the "dlms Read Commands" folder in the command tree.
For this purpose click the  icon before the "dlms Read Commands" folder or double-click on the folder icon .
The available commands for the selected device type are displayed:



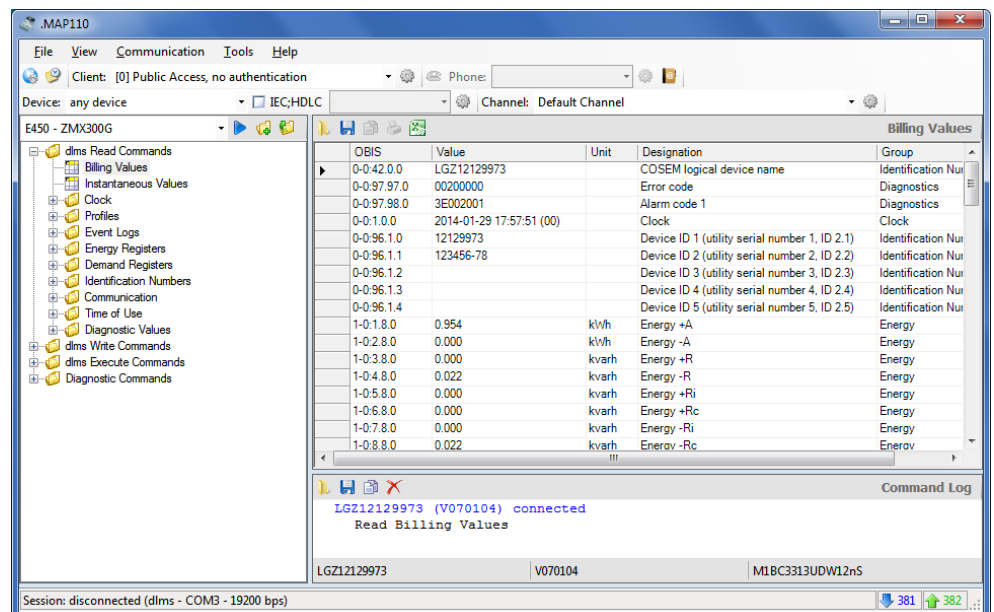
10. Mark the "Billing Values" command in the command tree under "dlms Read Commands" by clicking it.

11. Click on the  button above the command tree to execute the "Billing Values" command.

Communication begins after selecting the command and the device data are read from the device connected. During this process, which can take several minutes depending on the number of items to be read, the "Command" window is displayed.



After completing the readout the device data is displayed in the display area of the Landis+Gyr .MAP110 Service Tool.



12. Examine the data read out in the table in the display area.

By clicking  the data read out can be saved in an XML or text file.

By clicking  the data read out can be transferred to the Microsoft Excel table calculation program.

This concludes the introductory example. Further instructions with more detailed explanations are provided in the following sections.

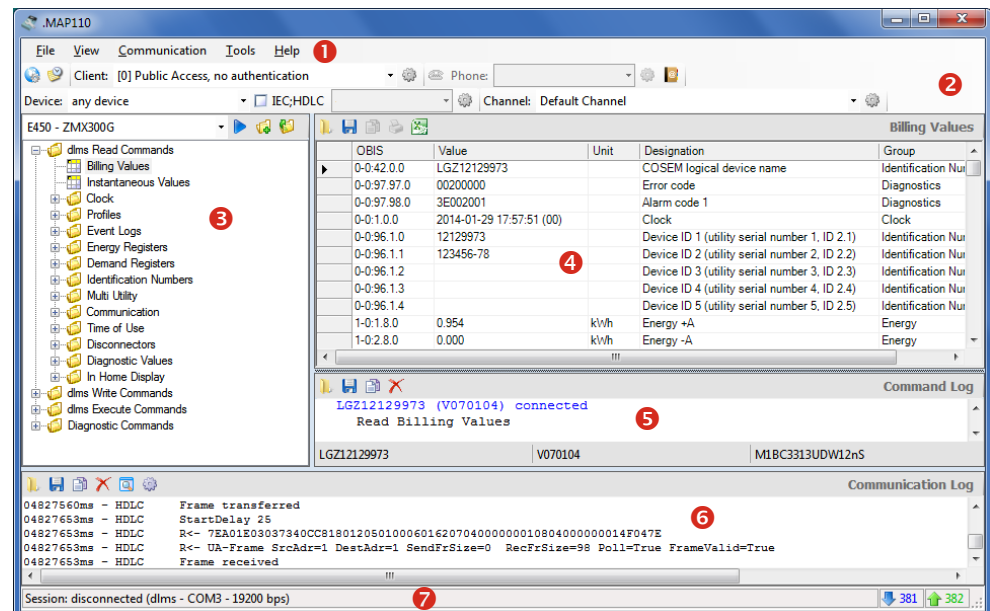
5 Description of user interface

This section describes the user interface of the Landis+Gyr .MAP110 Service Tool.

5.1 Overview

The user interface of the Landis+Gyr .MAP110 Service Tool comprises the following areas:

- Menu bar (1) with the "File", "View", "Communication", "Tools" and "Help" menus to select functions.
- Toolbars (2):
 - Application toolbar
 - Client toolbar
 - Address toolbar (either phone number or IP address is visible)
 - Device toolbar
 - Communication channel toolbar
- Command tree (3)
- Result window (4)
- Command log (5) for recording events, results, error messages, etc.
- Communication log (6) for recording and analysing communication activities
- Status bar (7) for displaying characteristic data of the device connected.



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

The items in the selection area can be arranged individually by moving to another position (click dotted line and move with mouse button pressed).

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

5.2 Menu bar

The menu bar of the Landis+Gyr .MAP110 Service Tool contains the following menus for selecting functions:

- **File** menu for saving result or log window data, for opening data saved in the result or log windows and for ending the application.
- **View** menu to fade in or out the status bar and the communication log.
- **Communication** menu to connect and disconnect devices and to make communication settings.
- **Tools** menu to select functions for licensing, startup language setting and option setting.
- **Help** menu to select online help, release notes and release display and to check for available updates.

5.3 Toolbars

5.3.1 Application toolbar



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

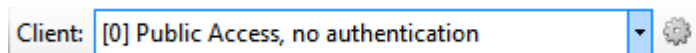


opens the communication settings window



fades the command log window in or out

5.3.2 Client toolbar

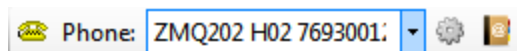


The client toolbar allows selection of the required access level. Only fully defined access levels are displayed, a level can occur more than once with different settings.

Clicking on  in the client toolbar displays the access level settings (see section 6.2.6 "Access levels").

5.3.3 Address toolbar

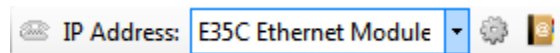
The phone number or IP address drop down lists displayed depending on the communication settings allow selection of the corresponding entry in the address book.



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 interrupts 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 definition in the "Address Book" window, where it can be modified.

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

5.3.4 Device toolbar



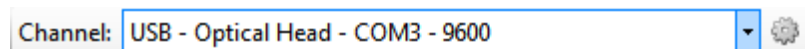
The device toolbar allows the selection of devices with predefined settings (device series and device addresses).

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 6.2.3.6 "Device data").

5.3.5 Communication channel toolbar

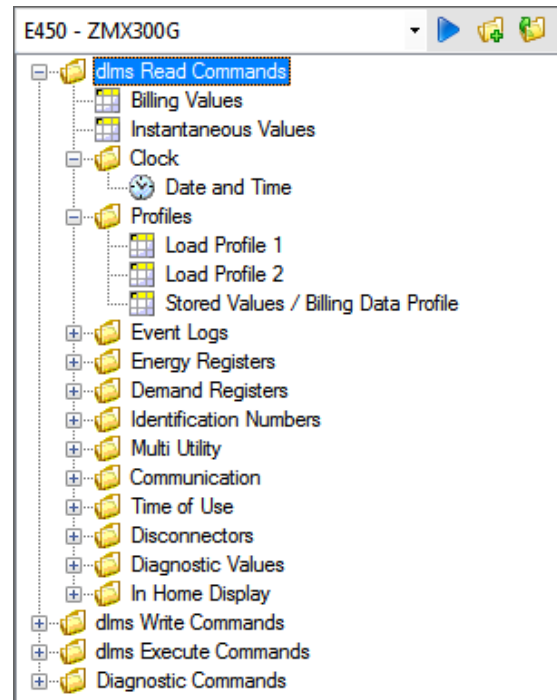


The communication channel toolbar allows the selection of communication channels with predefined settings (e.g. interface, transmission protocols etc.).

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

5.4 Command tree

All available commands for the licensed user group are displayed in a tree view corresponding to the device selected in the drop down list on the top left side of the window. Instead of a specific device, selection of all IEC commands or of all dlms commands is also possible.



Instead of a specific device type it is also possible to choose one of the following command groups in the command tree:

- all generic dlms commands
- all device specific dlms commands
- all generic IEC commands
- all device specific IEC commands

Generic commands work with all devices, with new, not yet supported Landis+Gyr devices as well as with devices of other manufacturers. There are only few generic dlms commands available but many generic IEC commands.

Device specific commands only work with Landis+Gyr devices supporting the corresponding command. All commands not available for the connected device are marked in colour in the command tree (see paragraph "Display of disabled commands in the command tree").

When selecting a device in the device toolbar the command tree is automatically switched to the corresponding device type.

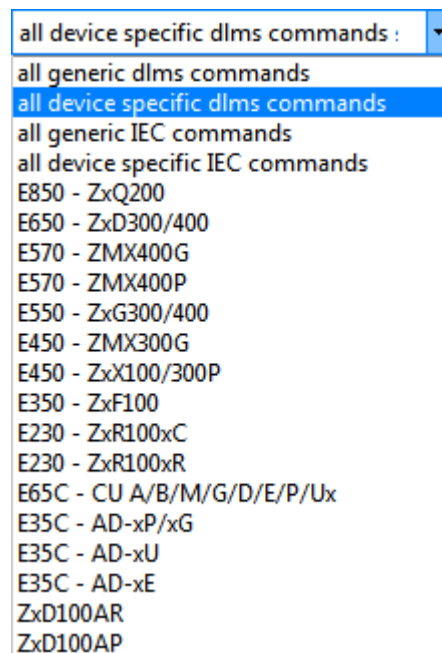
Toolbar

The toolbar of the command tree contains the following buttons:

-  Executes the selected command of the tree
-  Expands all folders of the tree
-  Collapses all folders of the tree

Drop down list

In the drop down list of the command tree it is possible to choose command sets for all supported Landis+Gyr devices and also the generic and device specific command groups described above:



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 .MAP110 Service Tool the command tree consists of a hierarchic arrangement of tree items (folders and commands).

Tree items are shown as follows:

-  Folders
-  Read commands for values (device values, profiles, etc.)
-  Read or write commands for date and time
-  Read commands for parameters (e.g. read identification number)
-  Write commands for parameters (e.g. write identification number)
-  Execute commands (e.g. reset register)
-  Excel evaluation (e.g. load profile analysis)
-  GSM installation support
-  Vector diagram
-  DIP table
-  Emergency readout

Folder handling

Each folder can be expanded and collapsed individually.

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

Use the buttons  or  of the command tree toolbar to expand or collapse all folders. Clicking the right mouse button inside the command tree and then selecting the "Expand all" or "Collapse all" entry in the pop-up menu appearing has the same effect.

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

Using the mouse:

- Clicking on the expansion sign  of a folder expands this folder (the expansion sign changes to a collapse sign .
- Clicking on the collapse sign  of a folder collapses this folder (the collapse sign changes to an expansion sign .
- The relevant folder is opened or closed by double-clicking  or the text following.

Using the keyboard:

- Pressing the **[*]** key of the numerical keyboard expands the whole tree below the selected folder (i.e. all subfolders and commands will be visible).
- Pressing the **[+]** or **[-]** key of the numerical keyboard toggles between the expanded and collapsed tree view.

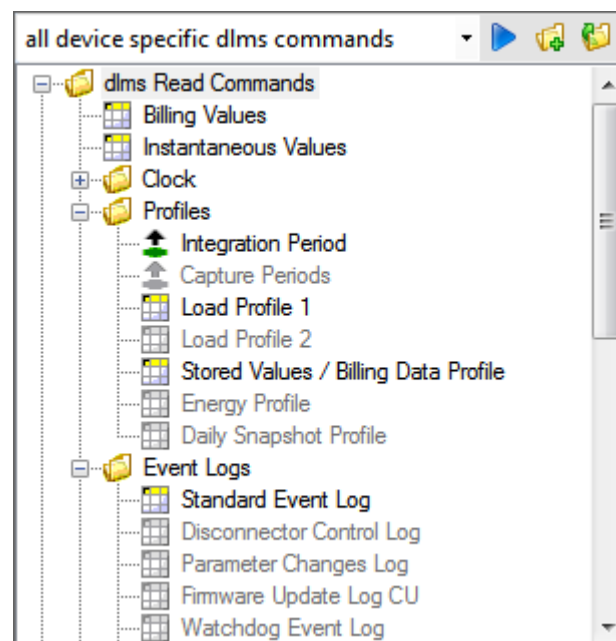
Command execution

A command can be executed in various ways:

- double-clicking on the command or
- marking the command by clicking and then clicking on the  button of the command tree toolbar or
- clicking the right mouse button on the command and then selecting the "Execute selected command" entry in the pop-up menu appearing.

Display of disabled commands in the command tree

All commands not available in the connected device are marked in colour (grey in the example below) in the command tree. The identification colour can be set under **Options** in the **Tools** menu (see section 8.2 "Setting colour for disabled commands").



If there is no connection to a device, all commands are shown unavailable. The commands can be selected, however, e.g. read out a value. Once a connection to the meter has been set up, the commands available are then displayed correctly corresponding to the connected device.

5.5 Result window

Readout results (device values, profiles, etc.) are shown in tabular form or as graphic evaluation (e.g. DIP table) in the result window. The following example shows current device values.

Billing Values					
	OBIS	Value	Unit	Designation	Group
►	0-0.42.0.0	LGZ12129973		COSEM logical device name	Identification Numbers
	0-0.97.97.0	00200000		Error code	Diagnostics
	0-0.97.98.0	3E002001		Alarm code 1	Diagnostics
	0-0.1.0.0	2014-01-29 18:30:29 (00)		Clock	Clock
	0-0.96.1.0	12129973		Device ID 1 (utility serial number 1, ID 2.1)	Identification Numbers
	0-0.96.1.1	123456-78		Device ID 2 (utility serial number 2, ID 2.2)	Identification Numbers
	0-0.96.1.2			Device ID 3 (utility serial number 3, ID 2.3)	Identification Numbers
	0-0.96.1.3			Device ID 4 (utility serial number 4, ID 2.4)	Identification Numbers
	0-0.96.1.4			Device ID 5 (utility serial number 5, ID 2.5)	Identification Numbers
	1-0.1.8.0	0.954	kWh	Energy +A	Energy
	1-0.2.8.0	0.000	kWh	Energy -A	Energy
	1-0.3.8.0	0.000	kvarh	Energy +R	Energy
	1-0.4.8.0	0.022	kvarh	Energy -R	Energy
	1-0.5.8.0	0.000	kvarh	Energy +Ri	Energy
	1-0.6.8.0	0.000	kvarh	Energy +Rc	Energy

The data can either be displayed by readout from a device with the corresponding command or by opening a previously saved file.

The column widths of tables can be changed with the mouse (click edge of column and move while holding down the mouse button).

Clicking on  in the result window toolbar opens the "Open Result File" dialogue window to display result files previously saved again in the result window.

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

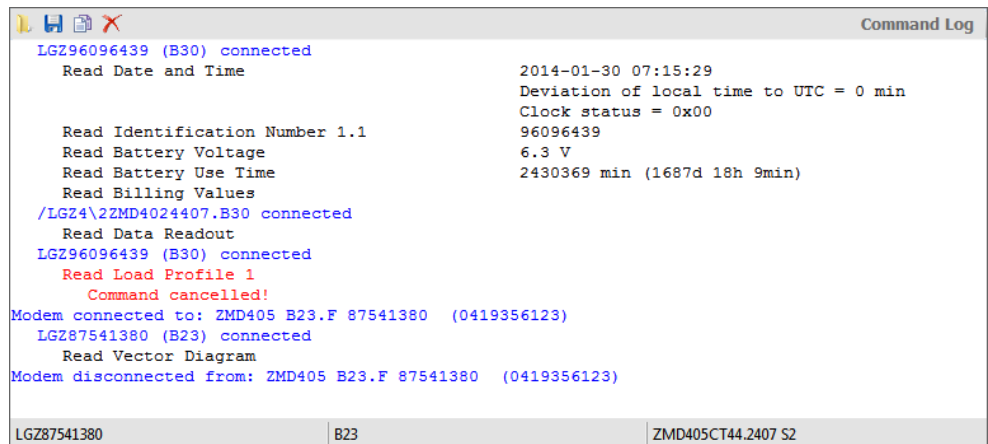
Clicking on  in the result window toolbar exports the data displayed for any desired further processing in the Excel table calculation program. Clicking the right mouse button in the result window followed by selection of the **Open with Excel** menu item in the pop-up menu appearing has the same effect.

Provided no data is yet shown in the result window, e.g. after starting the Landis+Gyr .MAP110 Service Tool, the following background picture can be seen in the result window.



5.6 Command log

In the command log window, all activities are logged.



This includes connection messages (blue), command execution messages (black) and error messages (red).

For the command execution messages the result is displayed immediately afterwards if it is not displayed as a table in the result window (e.g. readout of current values) or as evaluation in its own window (e.g. vector diagram).

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

Clicking on  in the command 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 command log window followed by selection of the **Save as** menu item in the pop-up menu appearing has the same effect.

Clicking on  in the command log toolbar copies the content of the command log window 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 window followed by selection of the **Copy all** menu item in the pop-up menu appearing has the same effect.

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

The contents of the command log window can be processed as required, e.g. by inserting comments, deletion of individual points, marking of points and copying these with [Ctrl]+[C] to the Windows clipboard, etc.

By selecting the **Open** entry in the **File** menu protocols previously saved can be displayed again in the command log window.

The following device data is displayed in the status bar of the command log window as soon as a connection is made to the device and at least one command has been executed:

- Logical device name (left)
- Software identification (centre)
- Device configuration (hard and software) (right)

5.7 Communication log



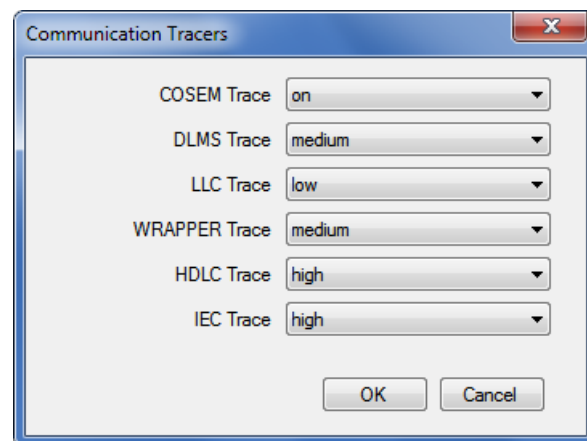
Additional knowledge required

Additional knowledge is required to analyse communication activities.

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

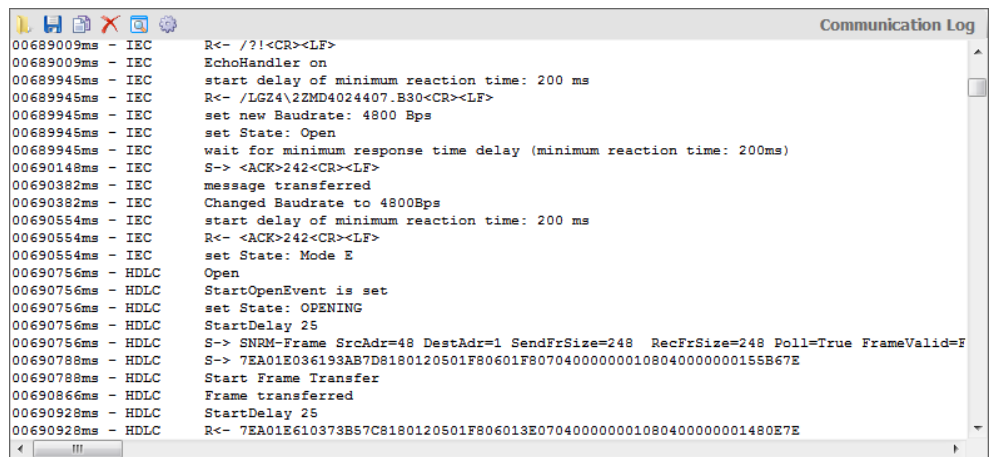
First, the trace level has to be adjusted for each trace type supported as follows:

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

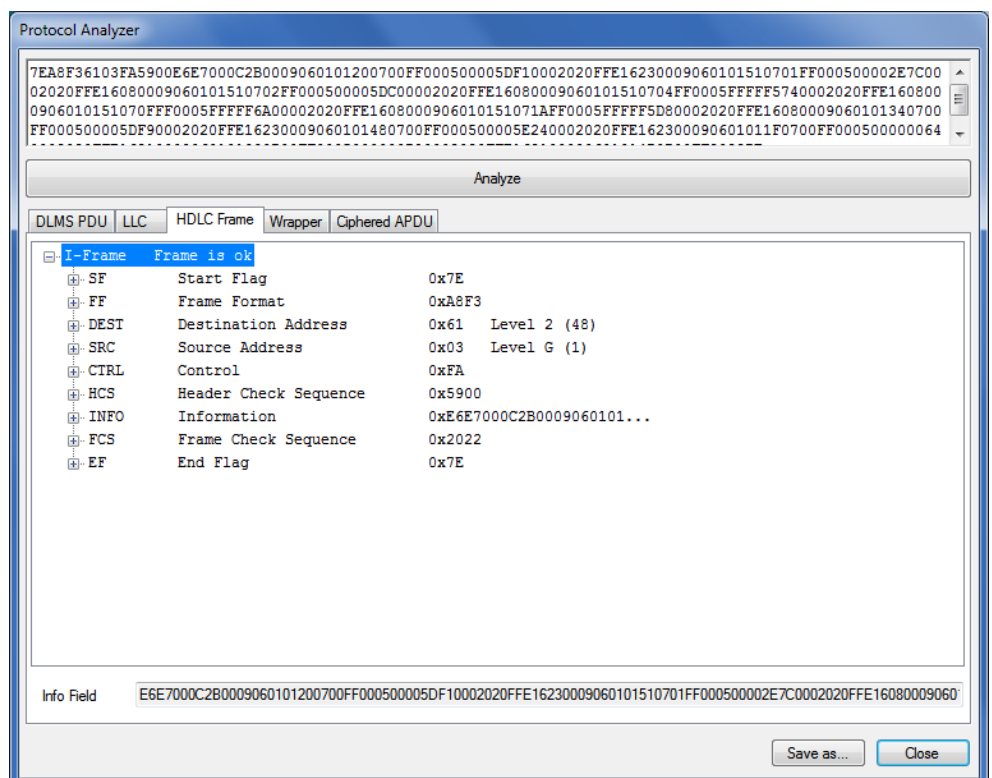


2. Select in the "COSEM Trace" drop down list whether the COSEM Trace shall be on or off.
3. Select in the other drop down lists the resolution of the DLMS, LCC, WRAPPER, HDLC and IEC tracers (low, medium, high) or switch them off.
4. Click on **OK**.

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 "Protocol Analyzer" window.



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

5.8 Status bar

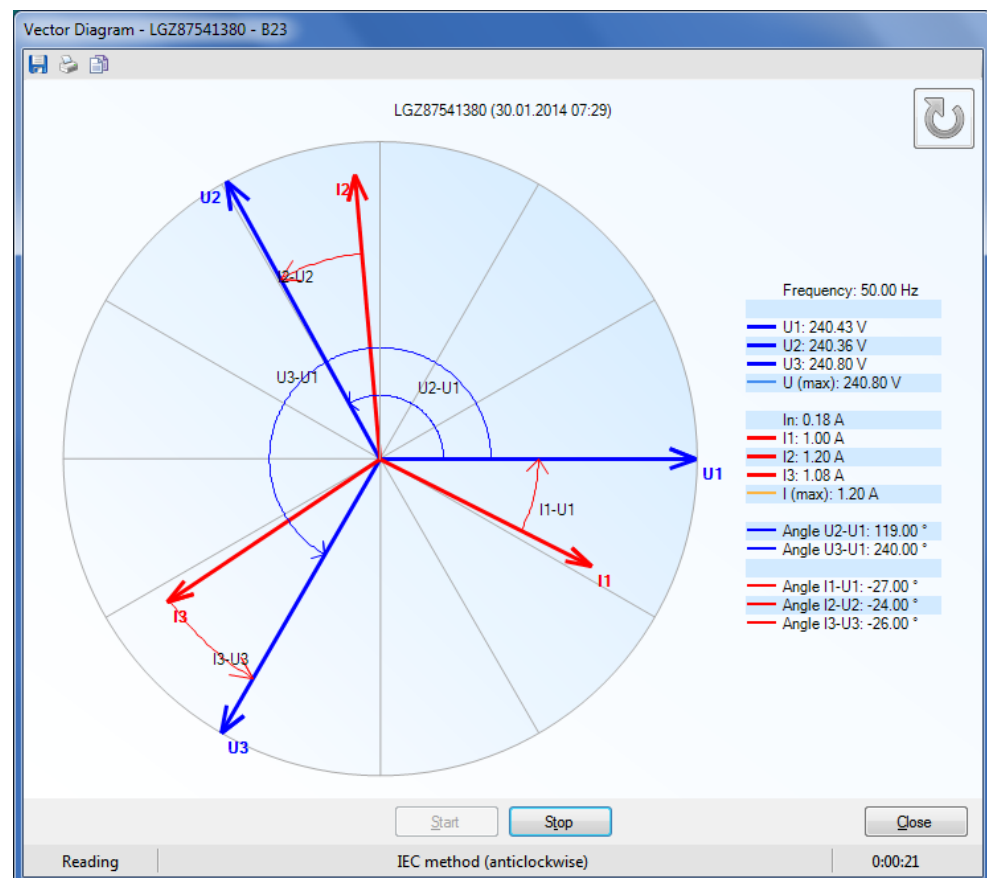
Session: disconnected (dlms - COM3 - 4800 bps)  58  62

The following data is displayed in the status bar:

- Session information, e.g. busy or disconnected (left)
- Protocol, port and transmission rate (in parentheses)
- Number of objects sent (blue) and received (green)

5.9 Evaluation window

Diagnostic commands such as "GSM Installation Support" or "Vector Diagram" are displayed in separate evaluation windows.

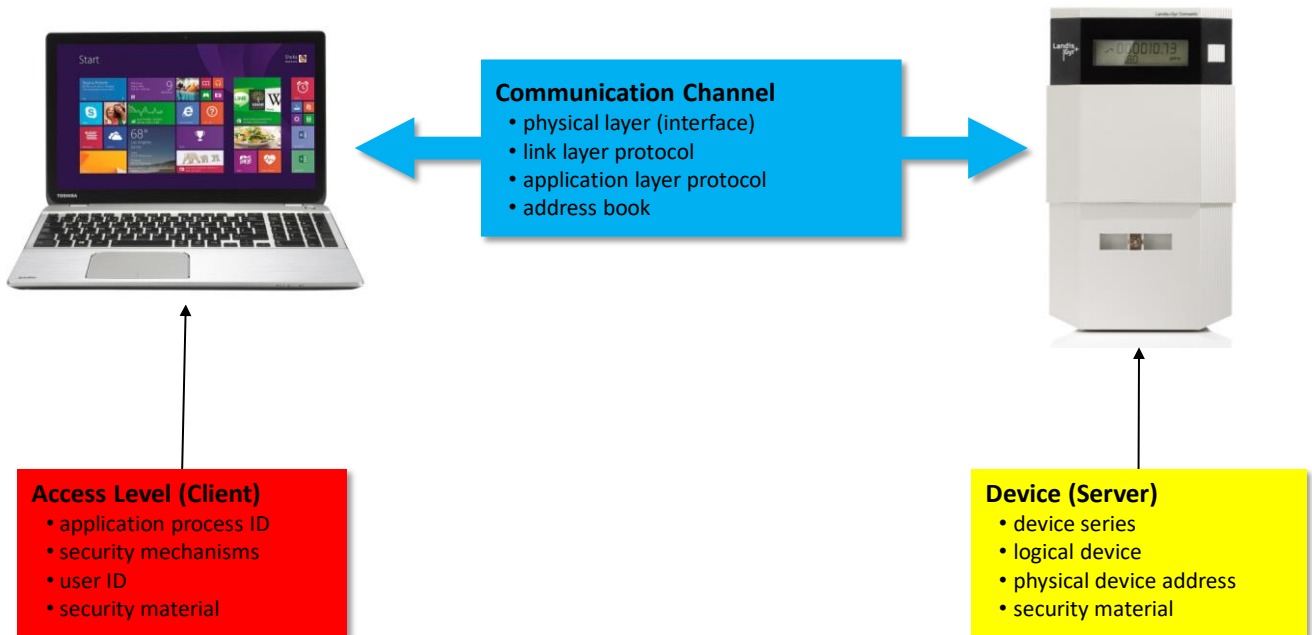


6 Communication with the devices

This section describes all aspects of communication with devices, in particular the communication settings in the Landis+Gyr .MAP110 Service Tool for various applications.

6.1 Basic principle

The communication between the Landis+Gyr .MAP110 Service Tool and a device via a communication channel is strictly client/server based. The client is part of the .MAP110 Service Tool, the server is located in the end device (e.g. the meter).



The required settings in the Landis+Gyr .MAP110 Service Tool 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 .MAP110 Service Tool 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.

From release 5.0 an individual set of keys and passwords can be defined for a device, which is then available for the communication with this device.

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.

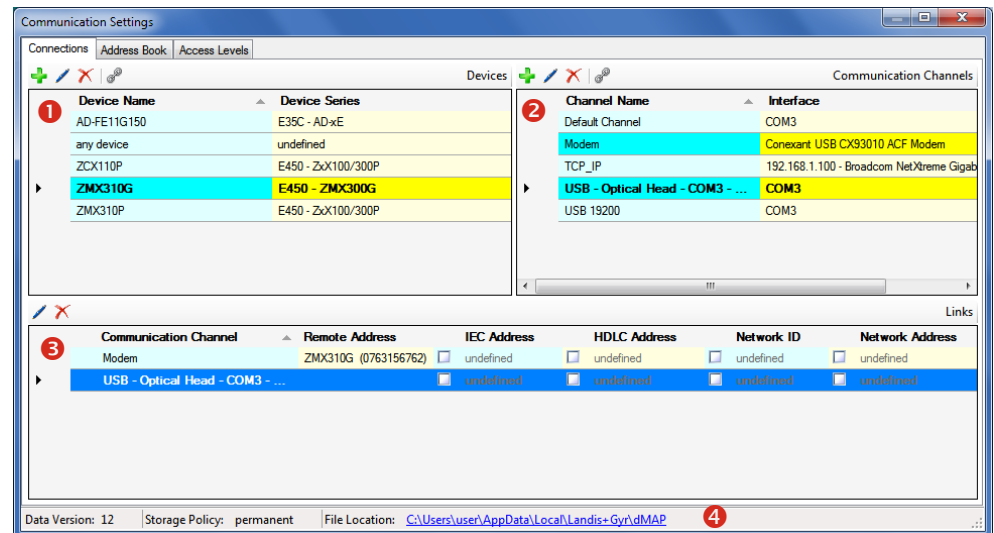
From release 5.0 also device-specific access levels can be specified in addition to the access levels available for all devices.

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.

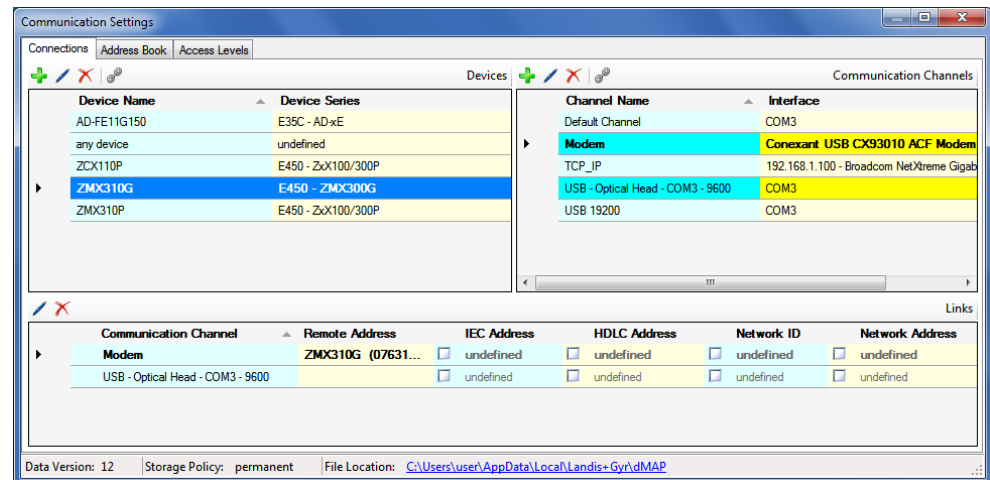
The "Communication Settings" window appears with selected "Connections" tab.



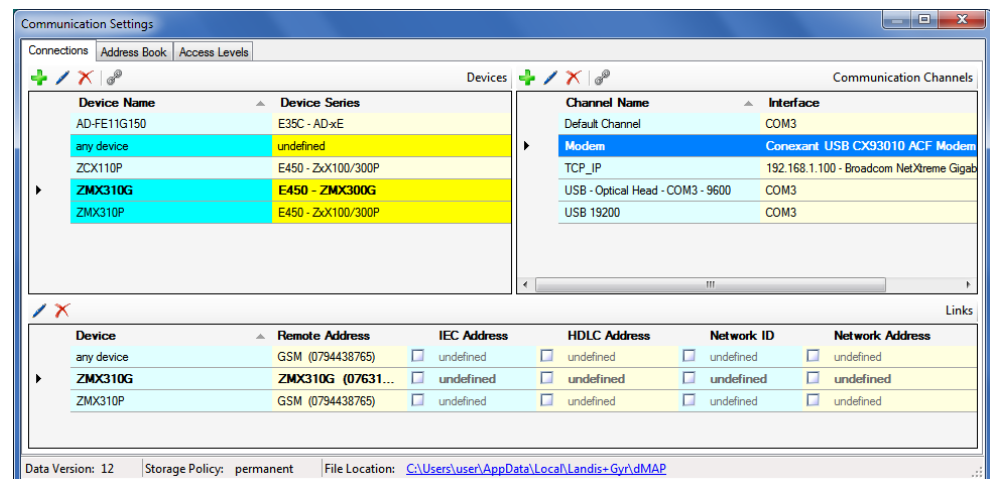
The "Communication Settings" window is subdivided into the following areas:

- 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 8.4 "Defining storage location of communication settings") can be seen as well as the current storage policy of passwords and keys (see section 8.5 "Defining storage policy for keys and passwords").

In the following figure a device is selected in the "Devices" area. The device is highlighted (blue). All the linked communication channels are also highlighted in the "Communication Channels" area (light blue/yellow) and the links with their attributes are shown in the "Links" area.



In the figure below a communication channel is selected in the "Communication Channels" area (highlighted blue). All the linked devices are also highlighted in the "Devices" area (light blue/yellow) and the links with their attributes are shown in the "Links" area.



6.2.1 Recommended input sequence

Landis+Gyr recommends to define the required data in the following sequence:

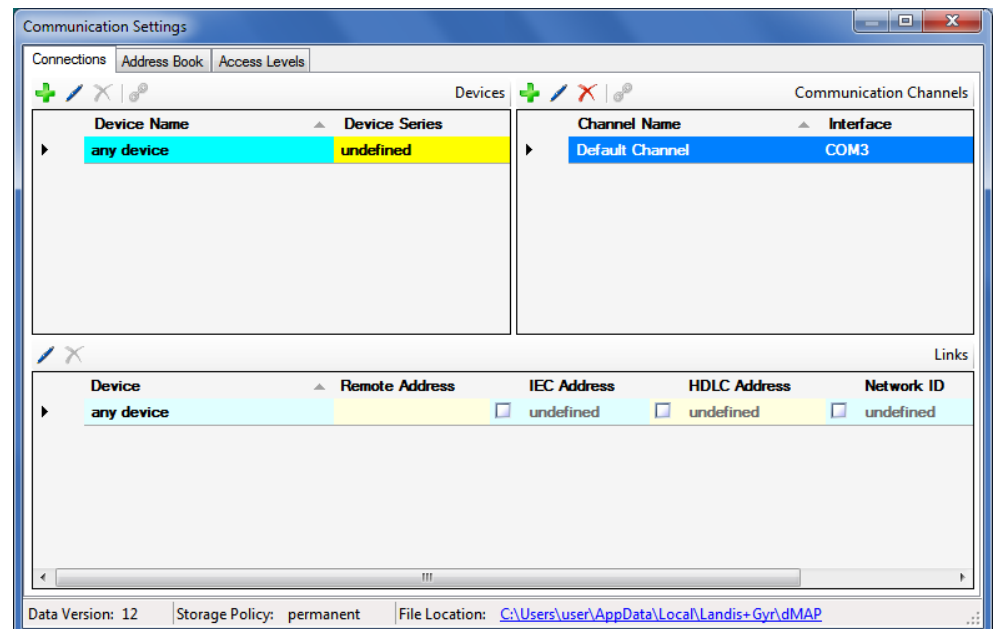
1. Communication channels (see section 6.2.2 "Communication channel data")
2. Devices (see section 6.2.3 "Device data")*
3. Addresses (see section 6.2.4 "Address data")
4. Links between devices and communication channels including the relevant attributes (see section 6.2.5 "Links between devices and communication channels")
5. Access levels (see section 6.2.6 "Access levels").

6.2.2 Communication channel data

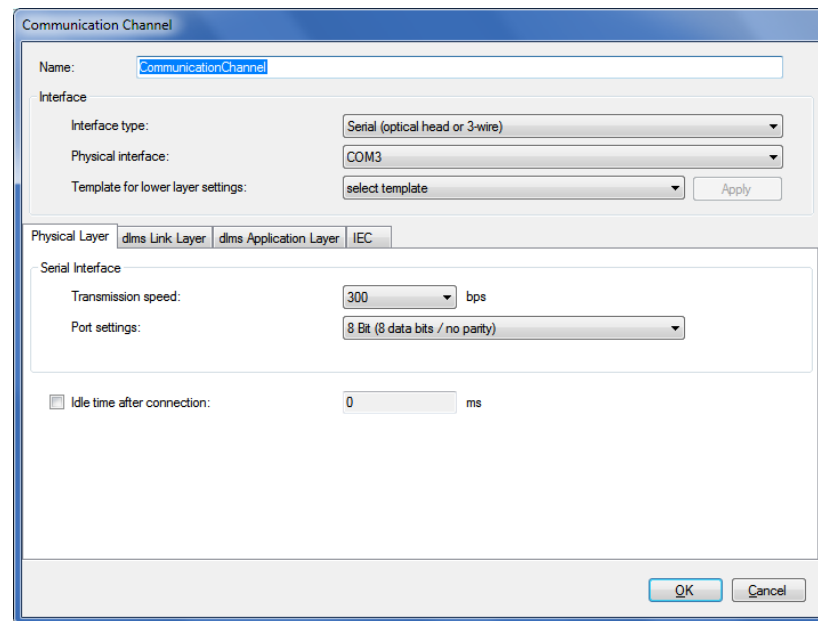
After the installation of the .MAP110 Service Tool only a default device named "any device" and a default communication channel named "Default Channel" are defined. These default communication settings are the basis for a local readout of a meter with an optical reading head connected to the serial interface. At least the serial interface (COM port) has to be adapted in most cases (see section 4 "First steps").

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 "Links" (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:

The screenshot shows the 'Communication Channel' dialog box. The 'Name' field contains 'USB - Optical Head - COM3 - 9600'. Under the 'Interface' section, 'Interface type' is set to 'Serial (optical head or 3-wire)', 'Physical interface' is 'COM3', and 'Template for lower layer settings' is 'select template'. The 'Physical Layer' tab is active, displaying 'Serial Interface' settings. 'Transmission speed' is set to '9600 bps' and 'Port settings' is '8 Bit (8 data bits / no parity)'. There is also an 'Idle time after connection' field set to '0 ms'. 'OK' and 'Cancel' buttons are at the bottom right.

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). Then enter the required value in the "Idle time after connection" entry box.

If interface type "Network" is selected:

The screenshot shows the 'Communication Channel' dialog box. The 'Name' field contains 'Zeta optical head'. Under the 'Interface' section, 'Interface type' is set to 'Network', 'Physical interface' is 'Broadcom NetXtreme Gigabit Ethernet - 192.168.1.101', and 'Template for lower layer settings' is 'select template'. Below this, there are tabs for 'Physical Layer', 'Link Layer', 'Application Layer', and 'IEC'. The 'Network Interface' section shows 'Protocol' as 'UDP' and 'Source Port' as '0'. At the bottom, there is a checkbox for 'Idle time after connection' which is unchecked, with a value of '0' and 'ms'.

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). Then enter the required value in the "Idle time after connection" entry box.

If interface type "Modem" is selected:

Communication Channel

Name: Modem

Interface

Interface type: Modem

Physical interface: Standard 56000 bps Modem

Template for lower layer settings: select template Apply

Physical Layer dlm Link Layer dlm Application Layer IEC

☒ Idle time after connection: 1000 ms

OK Cancel

5. Tick the "Idle time after connection" checkbox if you want to modify the default initial delay (IEC standard value = 0), 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.

Communication Channel

Name: USB - Optical Head - COM3 - 9600

Interface

Interface type: Serial (optical head or 3-wire)

Physical interface: COM3

Template for lower layer settings: select template

Physical Layer | **dlms Link Layer** | dlms Application Layer | IEC

dlms link layer protocol: HDLC via IEC mode E

IEC Mode E

☒ Transmission speed switching: 9600 bps

☒ Intercharacter timeout: 3000 ms

Maximum number of retries: 3

HDLC

☒ Maximum HDLC buffer size: 248 bytes

☒ Message timeout: 5000 ms

Maximum number of retries: 1

OK Cancel

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 (248 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.

The screenshot shows the 'Communication Channel' dialog box with the 'dlms Application Layer' tab selected. The 'Name' field is 'USB - Optical Head - COM3 - 9600'. Under 'Interface', 'Interface type' is 'Serial (optical head or 3-wire)', 'Physical interface' is 'COM3', and 'Template for lower layer settings' is 'select template'. The 'Referencing method' is 'Short Name (SN) referencing'. Below this, there is a note: 'The command set supported by logical name referencing is very limited. Please use short name referencing unless otherwise instructed.' The 'Maximum number of elements in lists' checkbox is checked with a value of 1. The 'Single request firmware releases' field contains 'B08:B09:B10:B11:C06:C07:C08:C09:D41:D42:D43'. The 'Maximum dlms buffer size' checkbox is unchecked with a value of 0 bytes. The 'Block transfer with set, write and action services supported' checkbox is unchecked. The 'Keep alive interval' is 0 seconds. The 'Use release service to close Association Application' checkbox is unchecked. 'OK' and 'Cancel' buttons are at the bottom right.

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 list" checkbox to activate the use of lists for read and write operations. Enter the "Maximum number of elements in list". 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. 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.

The screenshot shows the 'Communication Channel' dialog box with the 'IEC' tab selected. The 'Name' field is 'USB - Optical Head - COM3 - 9600'. Under 'Interface', 'Interface type' is 'Serial (optical head or 3-wire)', 'Physical interface' is 'COM3', and 'Template for lower layer settings' is 'select template'. The 'IEC' tab is active, showing the following settings:

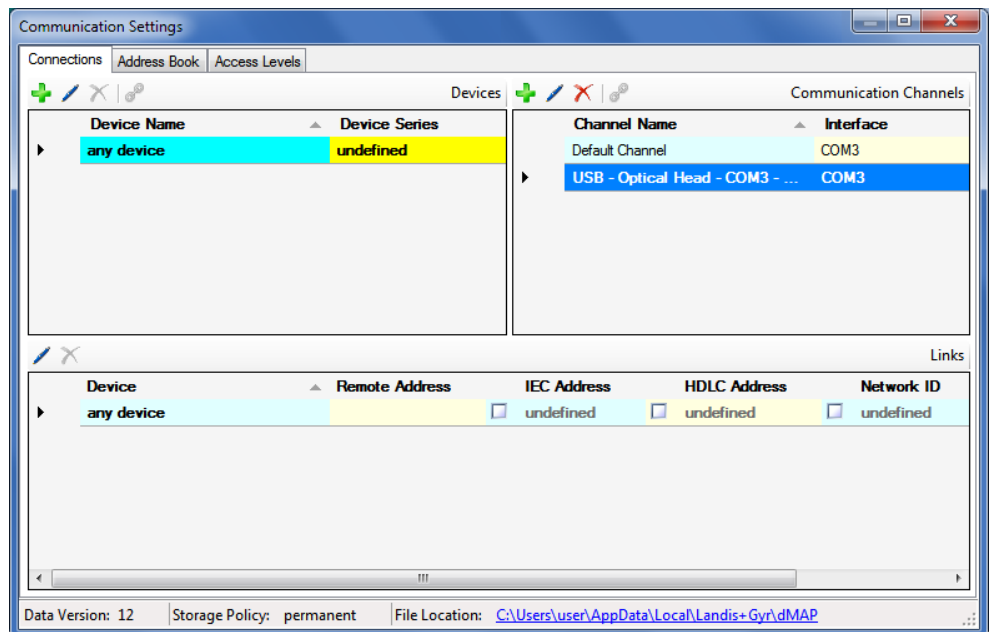
- ☒ Transmission speed switching: 9600 bps
- ☒ Intercharacter timeout: 15000 ms
- Maximum number of retries: 1
- Password for R5/W5 commands: (static)
- Maximum R1/W1 command size: 16 bytes

Buttons for 'OK' and 'Cancel' are at the bottom right.

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" drop down list. 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).

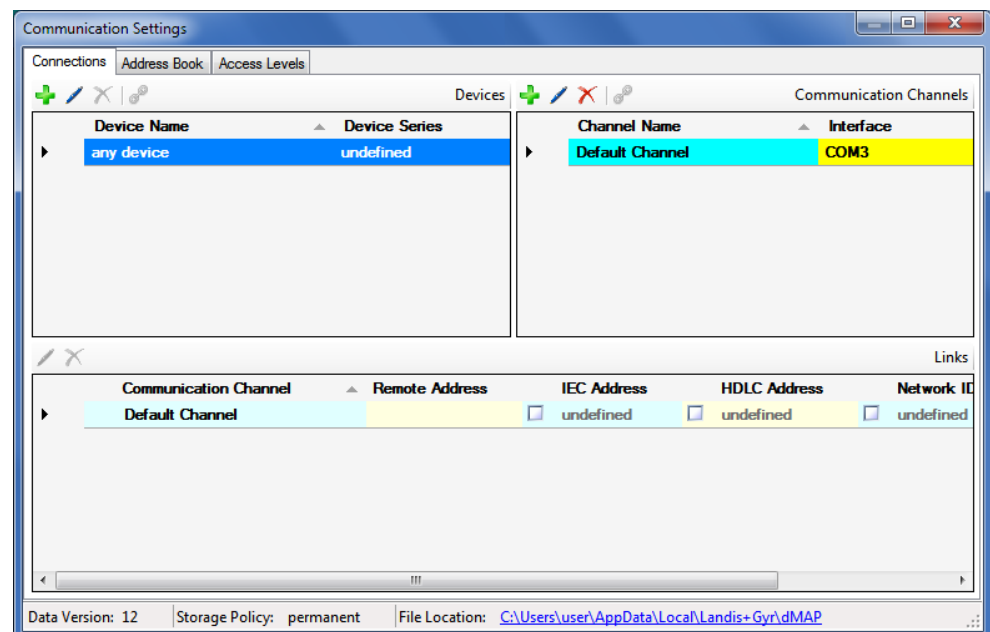
6.2.3 Device data

After the installation of the .MAP110 Service Tool, only a default device named "any 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 (see section 4 "First steps").

Additionally, other device-specific properties can be defined here, if required. From release 5.0 this includes also device-specific access levels with individual keys and passwords for a device. This allows the setup of a simple device management.

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 placeholder name "Device", all other boxes contain the data of the selected device and can now be modified.

Device

Name:

Type Address Access Levels Keys

Device Type

Device Series:

Manufacturer Serial Number:

Logical Device: 1

The logical device may be overridden by a command in some cases.

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

6.2.3.1 Type

1. Select the "Type" tab.

Device

Name:

Type Address Access Levels Keys

Device Type

Device Series:

Manufacturer Serial Number:

Logical Device: 1

The logical device may be overridden by a command in some cases.

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 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").

Device

Name: ZMX300G

Type Address Access Levels Keys

Physical Device Address

☒ IEC Address: 12129973

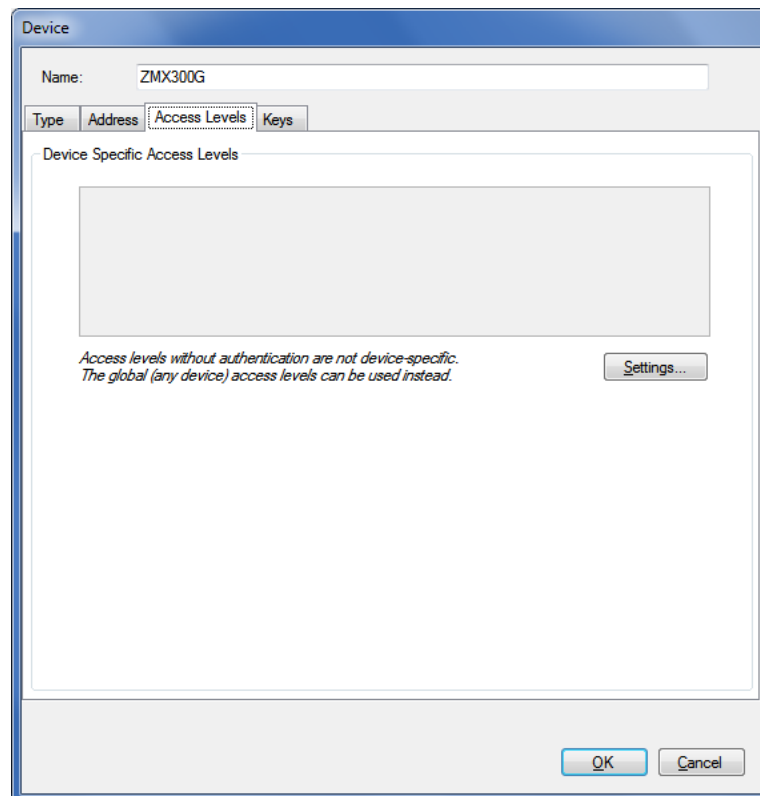
☒ HDLC Address: 10973

The use of an IEC and/or HDLC address defined here is controlled by the link settings.

OK Cancel

6.2.3.3 Access levels

1. Select the "Access levels" tab to define device-specific features for access.



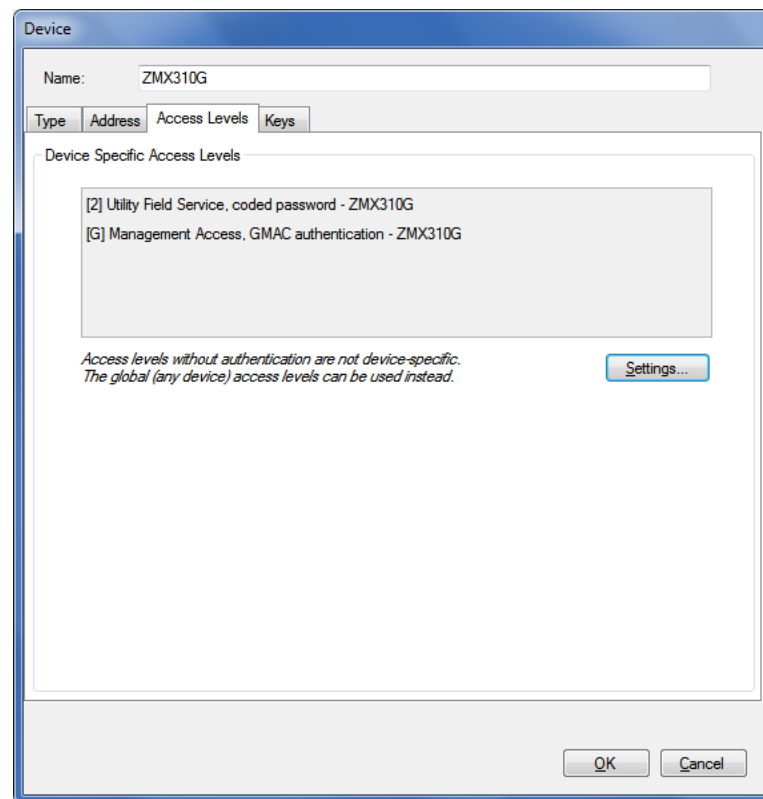
From release 5.0 individual device-specific access levels can be defined for a device, which are then only available for use with this device.

2. Click on **Settings**.
The "Access Levels" window appears for the specified device.
The device name is displayed in the top right corner.

Access Level	Client AP	Authentication	Additional Requisites	Message Security Policy	Security Setup	Supported Protocols
[0] Public Access	16	no authentication		no ciphering	n/a	IEC and dms
[1] Data Collection	32	low level authentication using a static password		no ciphering	n/a	IEC and dms
[1] Data Collection	32	high level authentication using SHA-256		no ciphering	local	dms only
[2] Utility Field Service	48	low level authentication using a static password		no ciphering	n/a	IEC and dms
[2] Utility Field Service	48	high level authentication using a coded password		no ciphering	n/a	IEC and dms
[2] Utility Field Service	48	high level authentication using TEA		no ciphering	n/a	IEC only
[2] Utility Field Service	48	high level authentication using SHA-1		no ciphering	n/a	dms only
[2] Utility Field Service	48	high level authentication using GMAC		no ciphering	local	dms only
[2] Utility Field Service	48	high level authentication using SHA-256		no ciphering	local	dms only
[3] Utility Service	64	no authentication	service menu required	no ciphering	n/a	IEC and dms
[4] Extended Utility Service	80	no authentication	hardware switch required	no ciphering	n/a	IEC and dms
[5] Extended Consumer	17	low level authentication using a static password		no ciphering	n/a	dms only
[6] Remote Data Collection	18	low level authentication using a static password		no ciphering	n/a	dms only
[7] Remote Service	19	no authentication		no ciphering	n/a	dms only
[7] Remote Service	19	low level authentication using a static password		no ciphering	n/a	dms only
[7] Remote Service	19	high level authentication using a coded password		no ciphering	n/a	dms only
[5] Management Access	1	low level authentication using a static password		no ciphering	n/a	dms only
[5] Management Access	1	high level authentication using SHA-1		no ciphering	n/a	dms only
[5] Management Access	1	high level authentication using GMAC		authentication and encryption	global	dms only
[5] Management Access	1	high level authentication using SHA-256		no ciphering	global	dms only
[A] Utility Defined	22	no authentication		no ciphering	n/a	dms only
[A] Utility Defined	22	low level authentication using a static password		no ciphering	n/a	dms only
[A] Utility Defined	22	high level authentication using a coded password		no ciphering	n/a	dms only

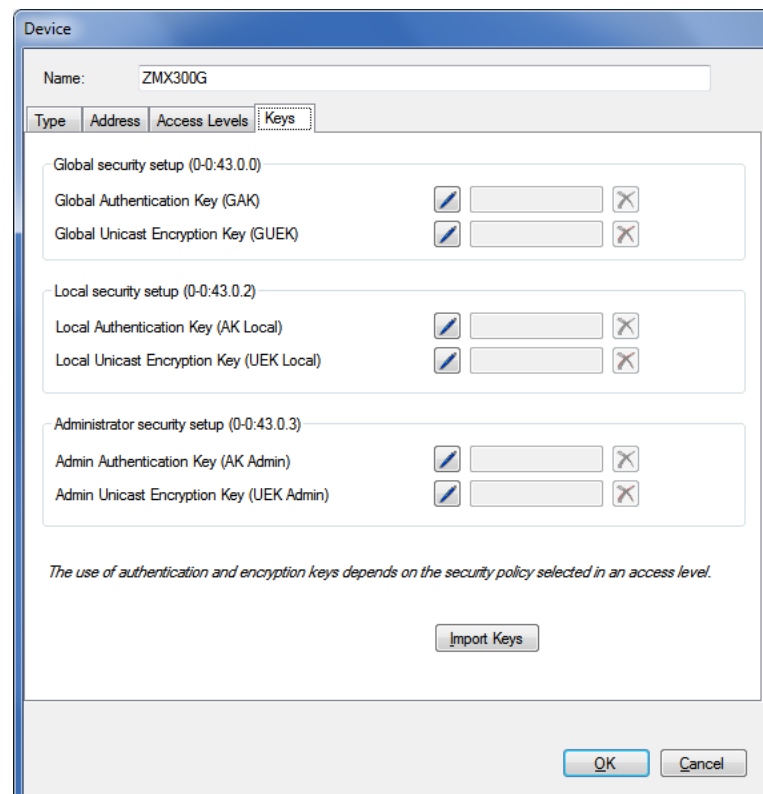
3. Check whether the access levels you want to use are defined correctly (an  icon in the "Authentication" column indicates for instance a missing or incomplete password). If necessary, make the required settings, as described in 6.2.6 "Access levels".

- Click on **OK**.
The "Access Levels" window disappears again and the defined device-specific access levels are displayed.

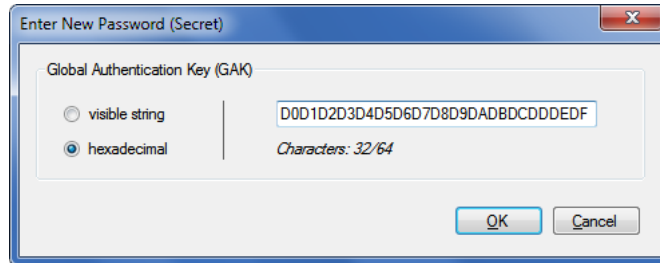


6.2.3.4 Keys

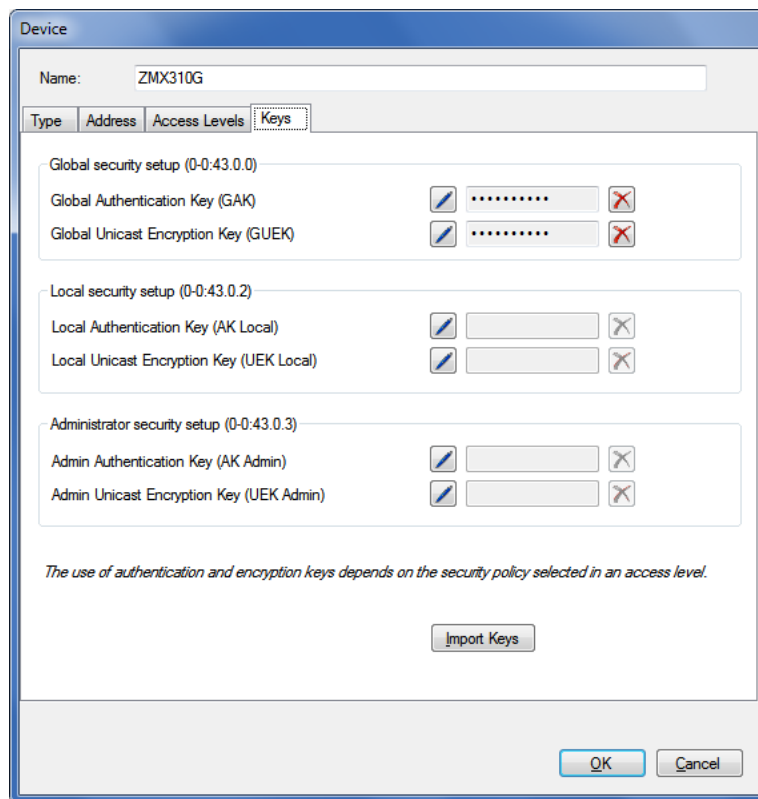
- Select the "Keys" tab to define device-specific features for message security (e.g. keys and passwords).



2. If you intend to use access levels with message security, you must enter the required authentication and/or encryption keys (GAK and GUEK) for this device. The keys are not defined per access level, but only once for a device. You can either import these keys from a received key file (see section 6.2.3.5 "Importing keys") or click on the corresponding edit icon  and type in the key in the "Enter New Password (Secret)" window as hexadecimal value or as visible string.



3. Click on **OK**.
The key is stored and the associated device-specific access levels are indicated additionally.



The keys are displayed in the GAK and GUEK entry boxes as placeholders with 10 asterisks, regardless of the effective length of the key.

Note: Clicking on the  icon behind the key entry box allows deleting defined keys again.

4. If you intend to use local (level 1 and 2) and/or administrator (level L) access levels with message security, you must enter the required authentication and/or encryption keys (AK Local/UEK Local and or AK Admin/UEK Admin) for this device. You can either import these keys from a received key file (see section 6.2.3.5 "Importing keys") or click on the corresponding edit icon  and type in the key in the "Enter New Password (Secret)" window as hexadecimal value or as visible string.

5. Continue as described in section 6.2.3.6 "Terminating the device data definition" after the manual key entry.

6.2.3.5 Importing keys

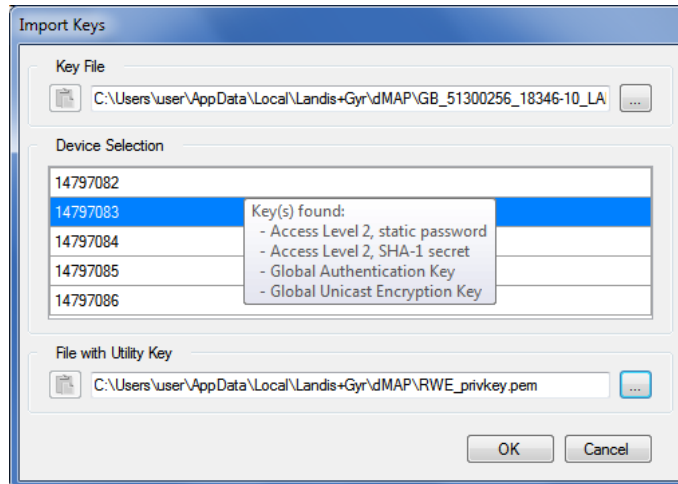
If the authentication and/or encryption keys are not available in a legible form, you can import them from a key file.

Proceed as follows

1. Click on **Import**.
The "Import Keys" window appears.

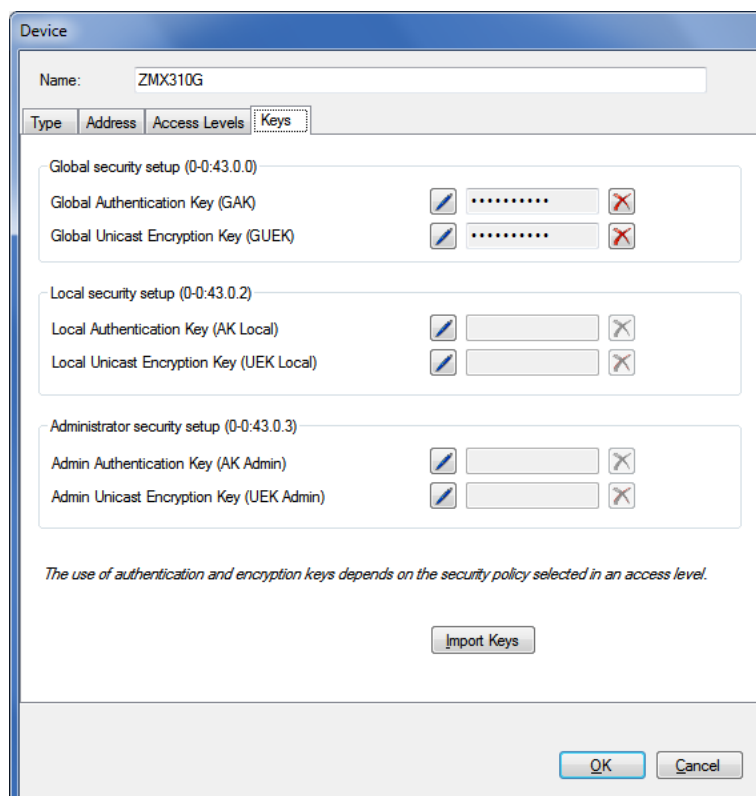
2. Click on [...] in the "Key File" area and select the directory where the key file is stored in the displayed tree or enter the path to this directory. The available device serial numbers will be listed in the "Device Selection" area.

3. Click on  in the "File with Utility Key" area and select the directory where the key file with the utility key is stored in the displayed tree or enter the path to this directory (this file is required to decrypt the key file).



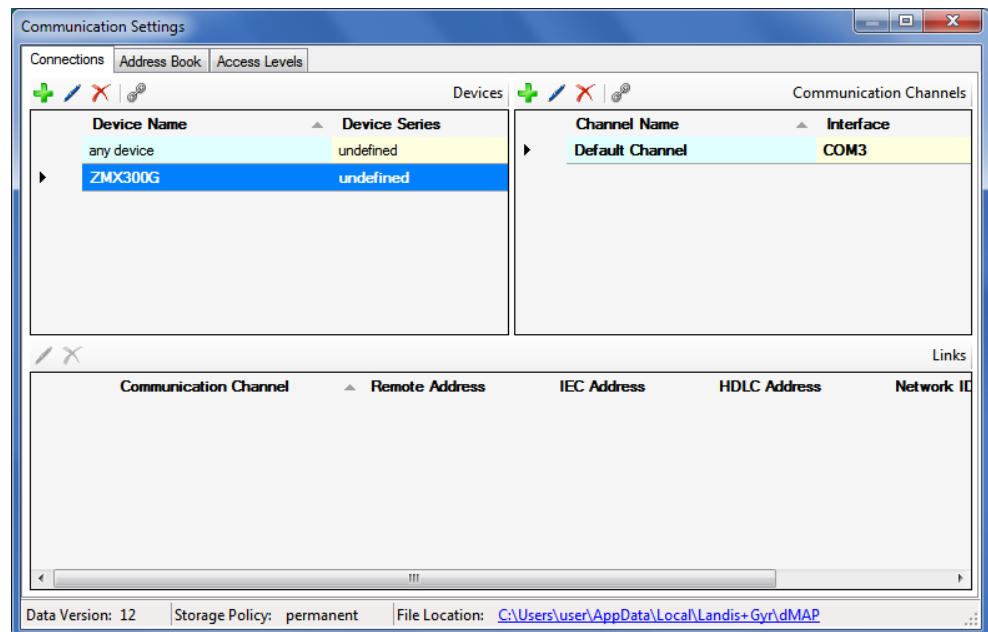
If you position the mouse pointer on a line of the device selection, a tooltip with a list of keys found is displayed.

4. Click on **OK**.
The keys are imported from the key file and assigned to the appropriate fields. The associated device-specific access levels are displayed.



6.2.3.6 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

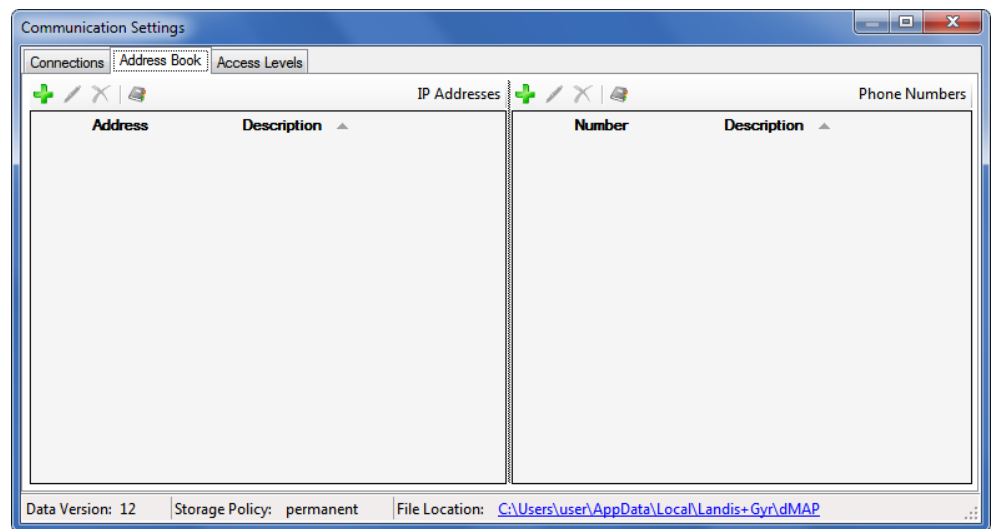
After the installation of the .MAP110 Service Tool, no address data (IP addresses and phone numbers) are defined.

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

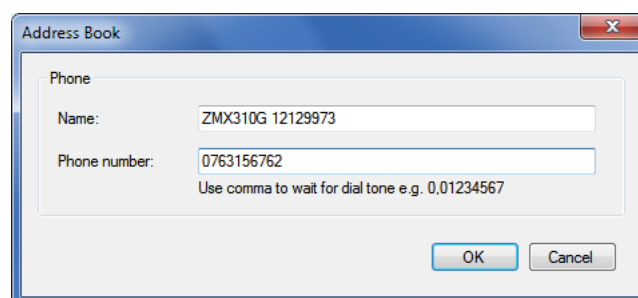
6.2.4.1 Phone numbers

Define the phone numbers required for modem connections as follows:

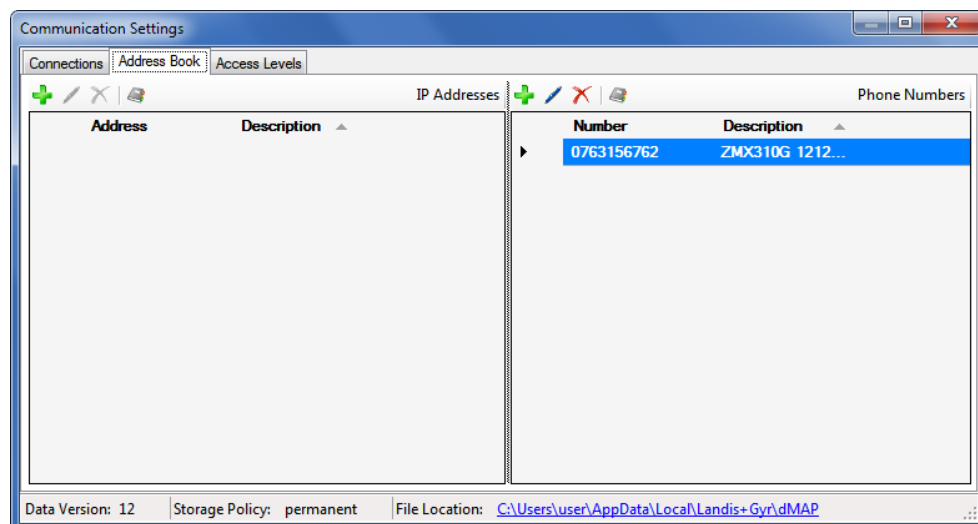
1. Click on  in the application toolbar or select **Communication settings** from the **Communication** menu.
The "Communication Settings" window appears with selected tab "Links".
2. Select the "Address Book" tab.



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

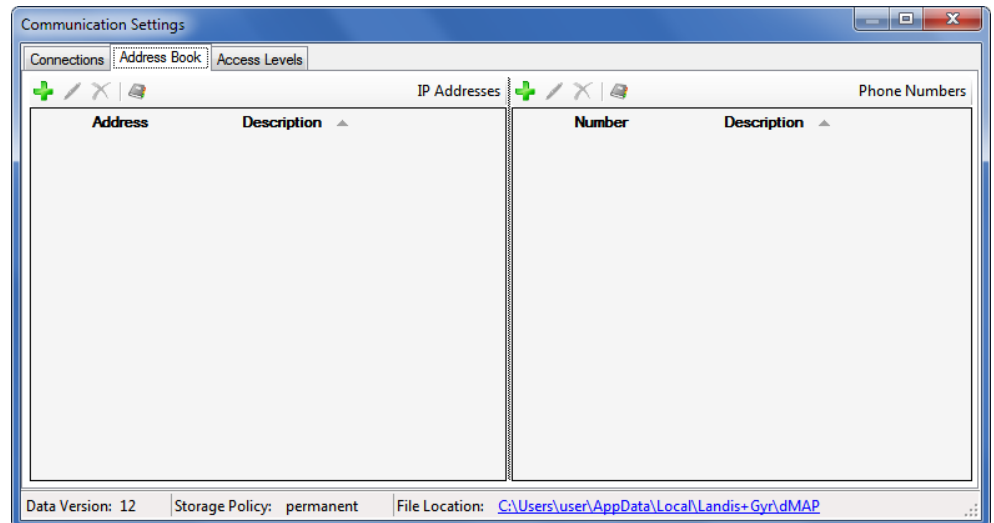
If you intend to modify or delete a phone number, select the corresponding entry in the phone number list and then then

- 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).

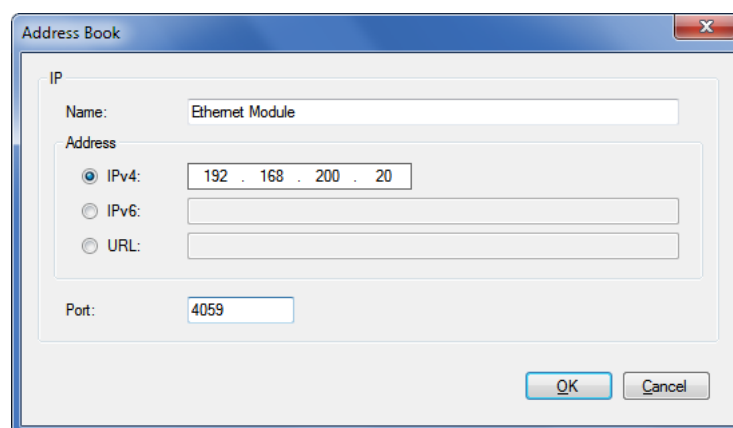
6.2.4.2 IP addresses

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 "Links".
2. Select the "Address Book" tab.

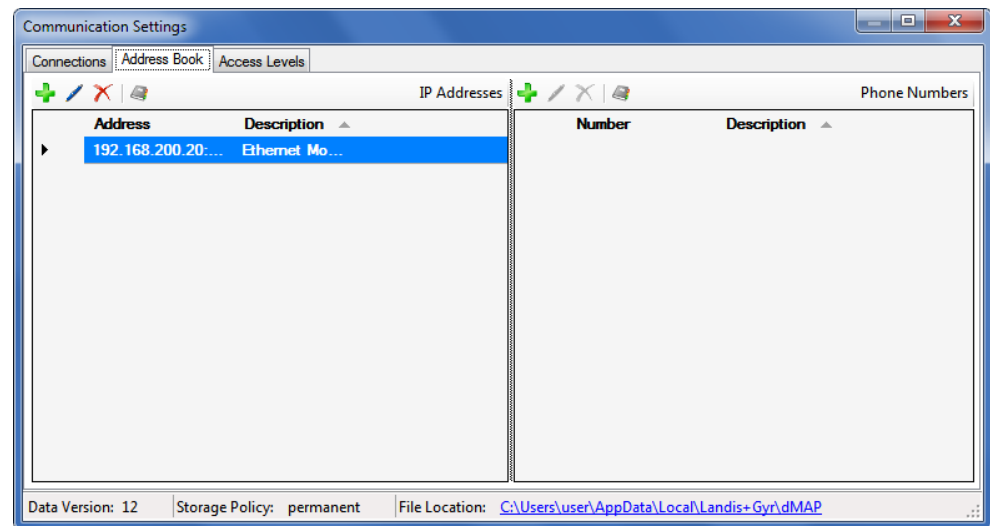


3. Click on  in the window toolbar for IP addresses (left window).
The "Address Book" window appears.
4. Enter a clear designation of the device location in the "Name" entry box.
5. Select with the corresponding radio button whether an IPv4 address or an IPv6 address or an URL shall be entered. Enter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

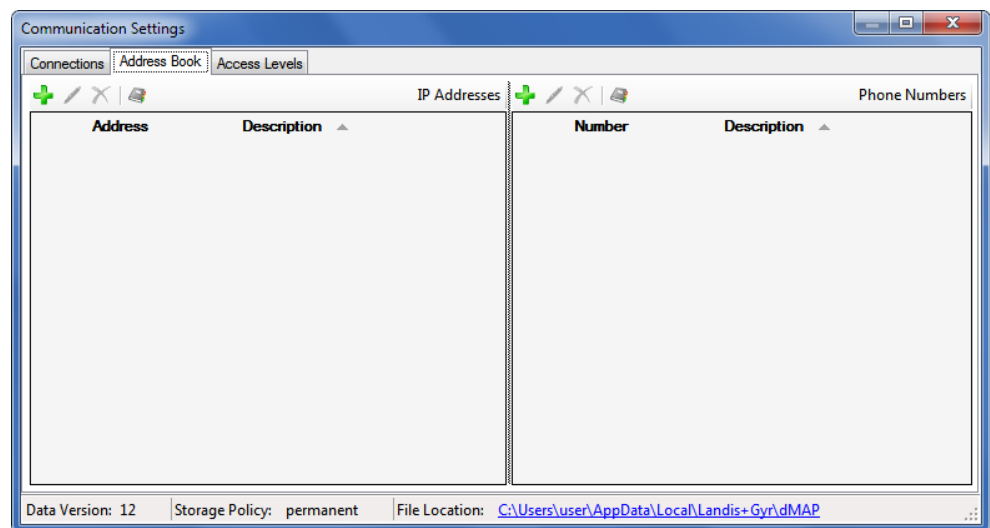
- click on  in the window toolbar in the "IP Addresses" area to modify the marked entry of the address book or double click on the entry.
- click on  in the window toolbar in the "IP Addresses" area to delete the marked entry of the address book (deletions must be confirmed).

6.2.4.3 Importing address book

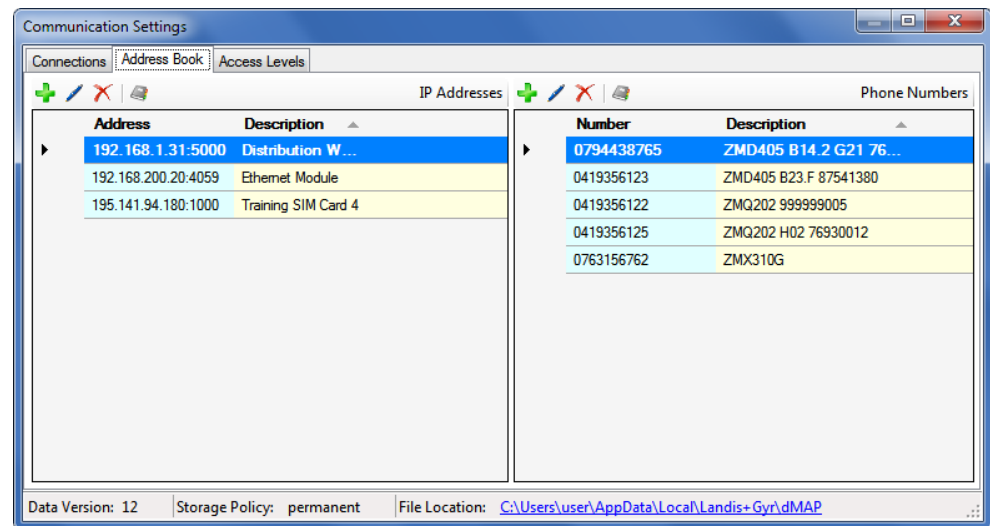
If the Landis+Gyr MAP110 Service Tool is already installed on the PC, its phone book can be imported. Likewise, the address book of a Landis+Gyr .MAP tool from another source (e.g. from another PC or another directory) can be imported.

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 "Import Address Book" window (open dialog) appears.
4. Select in the open dialog 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 6.2.2 "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").



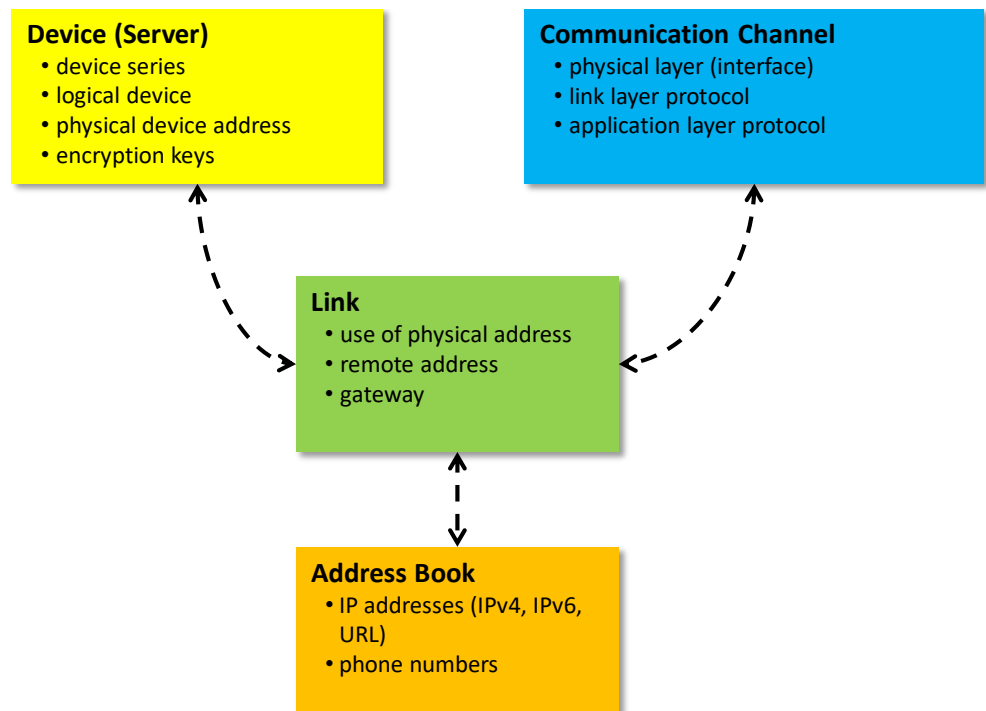
Modifying or deleting address book entries

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 5.3.5 "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

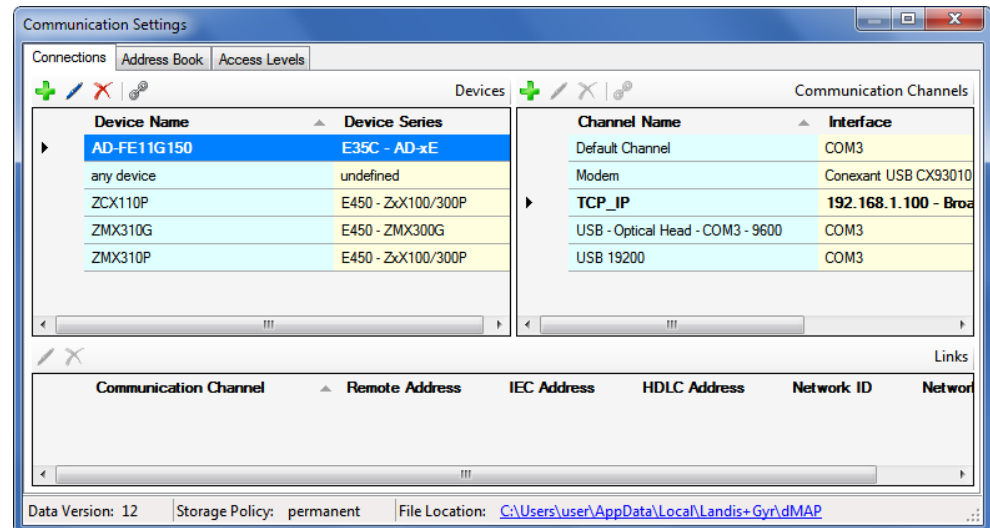
If a dlms device in a local network is not directly accessible, a dlms gateway must be used (e.g. Zigbee device via Ethernet gateway). The dlms gateway requires additional information in order to forward dlms requests to the correct device in the local network.

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

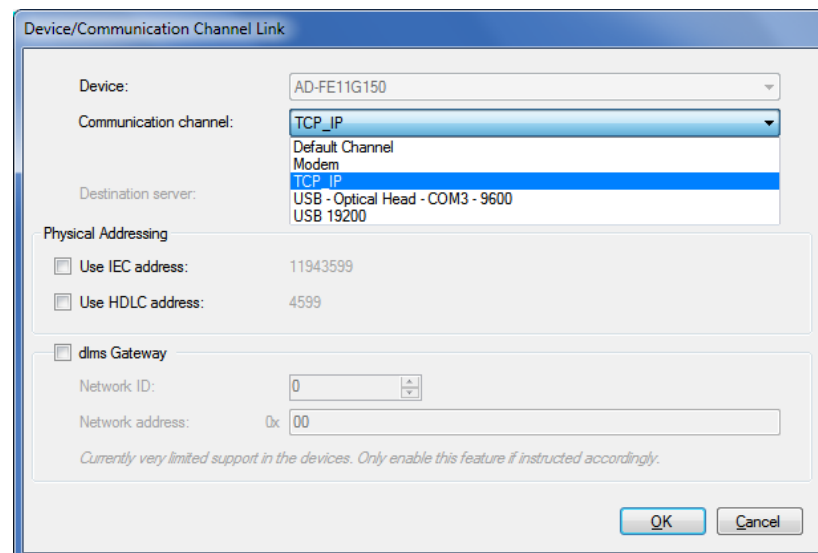
6.2.5.1 Defining link between device and communication channel

Procedure:

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

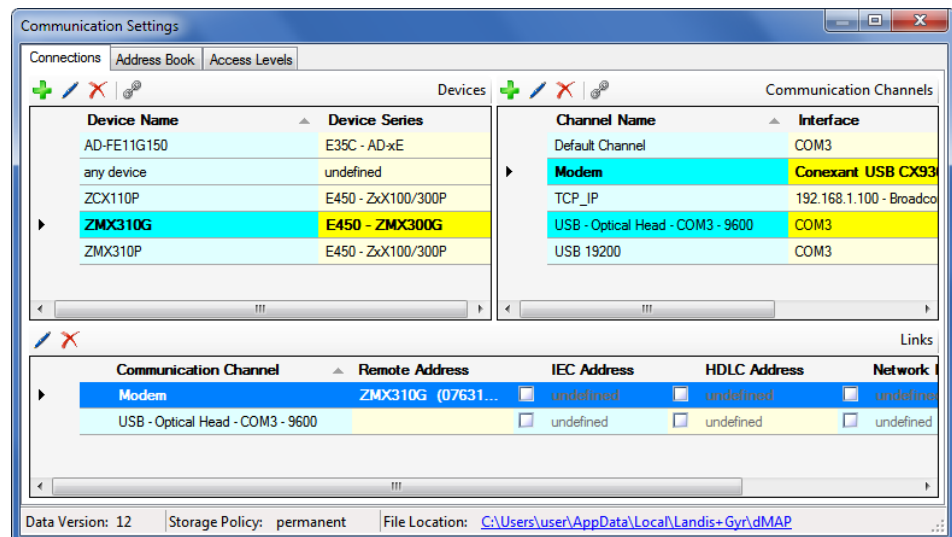


dlms Gateway feature not yet supported by Landis+gyr devices

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 "any device" can't be deleted, they only can be edited.

6.2.6 Access levels

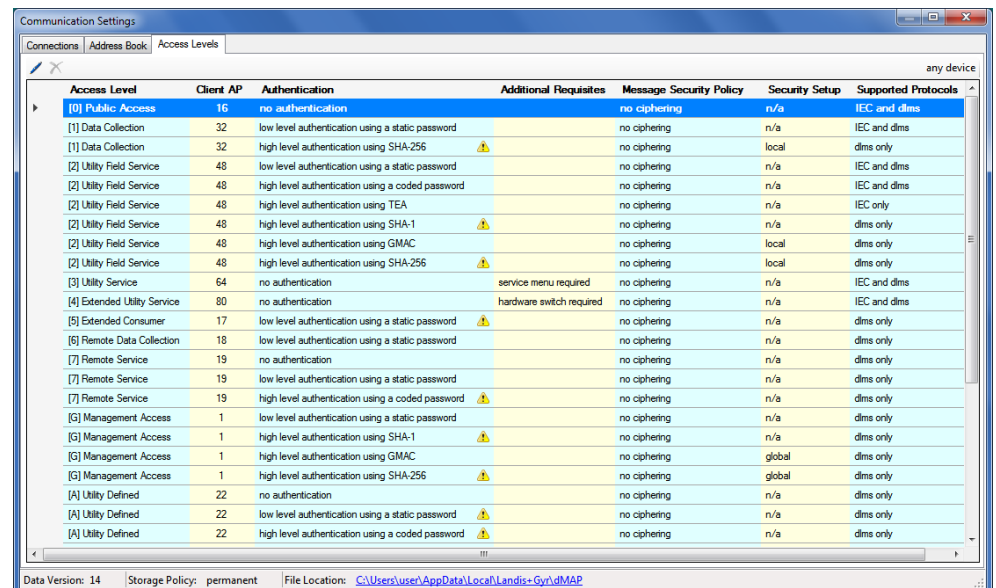
After the installation of the .MAP110 Service Tool no passwords for the different access levels are defined. Therefore only the access levels without password protection, e.g. "[0] Public Access" can be used (see example in section 4 "First steps").

The various access levels and their fields of application are described in section 10 "Short description of device security system".

From release 5.0 an individual set of keys and passwords can be defined for a device, which is then available for the communication with this device.

Define the passwords or keys used by the .MAP110 Service Tool for all required access levels according to the passwords or keys set in the devices 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 "Access Levels" tab.

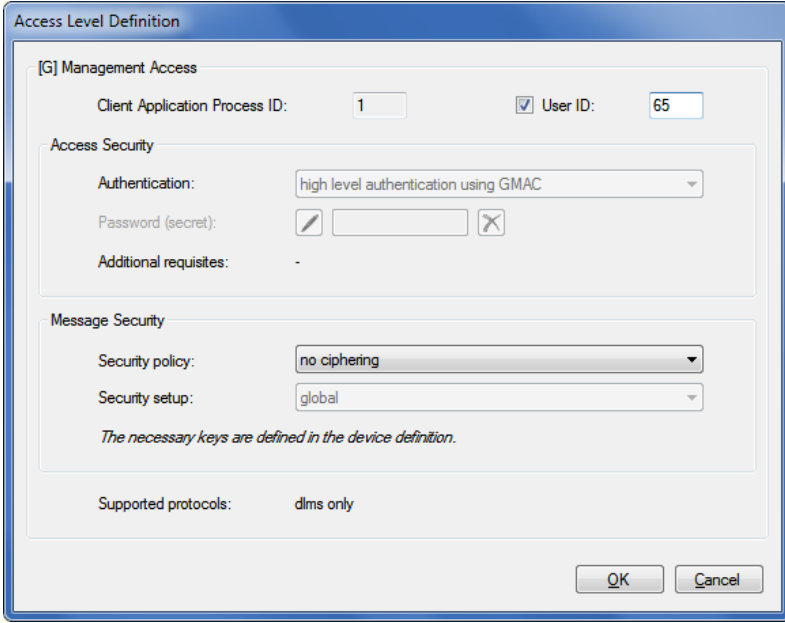


Access Level	Client AP	Authentication	Additional Requisites	Message Security Policy	Security Setup	Supported Protocols
[0] Public Access	16	no authentication		no ciphering	n/a	IEC and dms
[1] Data Collection	32	low level authentication using a static password		no ciphering	n/a	IEC and dms
[1] Data Collection	32	high level authentication using SHA-256		no ciphering	local	dms only
[2] Utility Field Service	48	low level authentication using a static password		no ciphering	n/a	IEC and dms
[2] Utility Field Service	48	high level authentication using a coded password		no ciphering	n/a	IEC and dms
[2] Utility Field Service	48	high level authentication using TEA		no ciphering	n/a	IEC only
[2] Utility Field Service	48	high level authentication using SHA-1		no ciphering	n/a	dms only
[2] Utility Field Service	48	high level authentication using GMAC		no ciphering	local	dms only
[2] Utility Field Service	48	high level authentication using SHA-256		no ciphering	local	dms only
[3] Utility Service	64	no authentication	service menu required	no ciphering	n/a	IEC and dms
[4] Extended Utility Service	80	no authentication	hardware switch required	no ciphering	n/a	IEC and dms
[5] Extended Consumer	17	low level authentication using a static password		no ciphering	n/a	dms only
[6] Remote Data Collection	18	low level authentication using a static password		no ciphering	n/a	dms only
[7] Remote Service	19	no authentication		no ciphering	n/a	dms only
[7] Remote Service	19	low level authentication using a static password		no ciphering	n/a	dms only
[7] Remote Service	19	high level authentication using a coded password		no ciphering	n/a	dms only
[G] Management Access	1	low level authentication using a static password		no ciphering	n/a	dms only
[G] Management Access	1	high level authentication using SHA-1		no ciphering	n/a	dms only
[G] Management Access	1	high level authentication using GMAC		no ciphering	global	dms only
[G] Management Access	1	high level authentication using SHA-256		no ciphering	global	dms only
[A] Utility Defined	22	no authentication		no ciphering	n/a	dms only
[A] Utility Defined	22	low level authentication using a static password		no ciphering	n/a	dms only
[A] Utility Defined	22	high level authentication using a coded password		no ciphering	n/a	dms only

The tab 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 column "Authentication", 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.

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.



Access Level Definition

[G] Management Access

Client Application Process ID: 1 ☒ User ID: 65

Access Security

Authentication: high level authentication using GMAC

Password (secret):

Additional requisites: -

Message Security

Security policy: no ciphering

Security setup: global

The necessary keys are defined in the device definition.

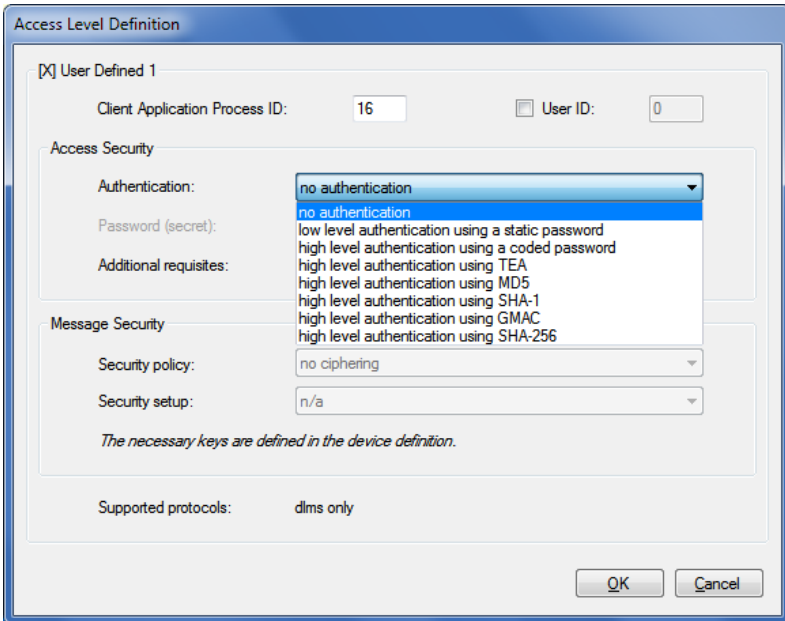
Supported protocols: dlms only

OK Cancel

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).

6.2.6.1 Access security

1. Only for user defined access levels: Select the type of authentication in the "Authentication" drop down list.
The selection is described in section 10.2 "Security attributes" under "Access authentication".
For all other access levels the authentication is fix assigned and cannot be changed.



Access Level Definition

[X] User Defined 1

Client Application Process ID: 16 ☐ User ID: 0

Access Security

Authentication: no authentication

Password (secret): no authentication

Additional requisites: low level authentication using a static password
high level authentication using a coded password
high level authentication using TEA
high level authentication using MD5
high level authentication using SHA-1
high level authentication using GMAC
high level authentication using SHA-256

Message Security

Security policy: no ciphering

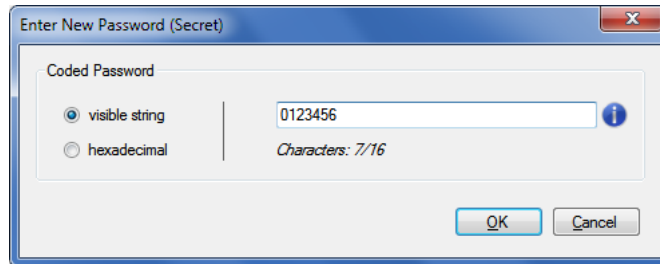
Security setup: n/a

The necessary keys are defined in the device definition.

Supported protocols: dlms only

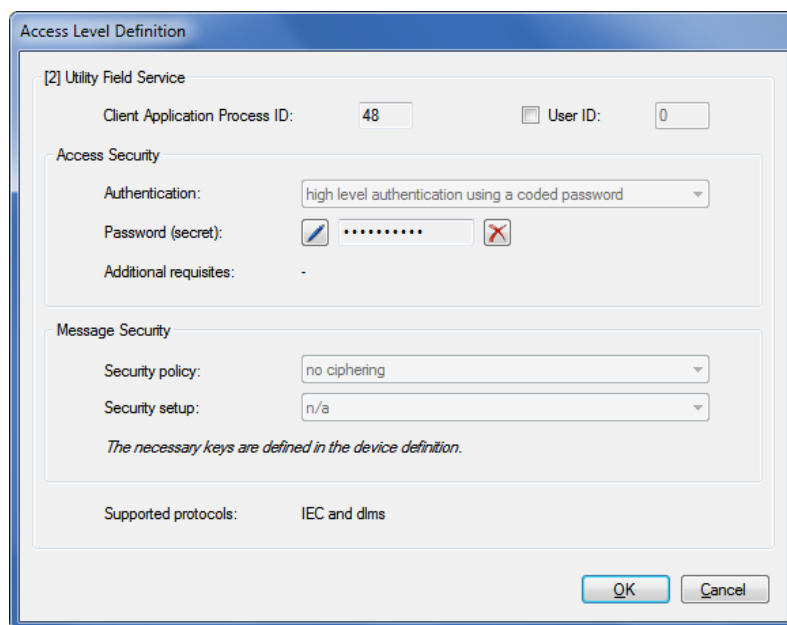
OK Cancel

- Only for access levels with authentication: 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**.



The dialog box titled "Enter New Password (Secret)" has a close button (X) in the top right corner. It contains a section labeled "Coded Password" with two radio buttons: "visible string" (selected) and "hexadecimal". To the right of these buttons is a text input field containing "0123456" and a character count "Characters: 7/16". An information icon (i) is to the right of the input field. At the bottom right are "OK" and "Cancel" buttons.

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.



The "Access Level Definition" dialog box shows configuration for "[2] Utility Field Service". It includes fields for "Client Application Process ID" (48) and "User ID" (0). The "Access Security" section has a dropdown for "Authentication" set to "high level authentication using a coded password", a "Password (secret)" field with a placeholder of asterisks and an edit/delete icon, and an "Additional requisites" field with a hyphen. The "Message Security" section has dropdowns for "Security policy" (no ciphering) and "Security setup" (n/a), with a note "The necessary keys are defined in the device definition." Below this is "Supported protocols" set to "IEC and dlms". "OK" and "Cancel" buttons are at the bottom right.

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

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

6.2.6.2 Message security

1. Only for access levels with high level authentication using GMAC and SHA-256: Select the applicable security policy in the "Security policy" drop down list. Possible settings are "no ciphering", "authentication only", "encryption only" and "authentication and encryption". For all other access levels the security policy is set and cannot be changed.

Access Level Definition

[L] Access Administrator

Client Application Process ID: 2 User ID: 0

Access Security

Authentication: high level authentication using GMAC

Password (secret): [icon] [input] [X]

Additional requisites: -

Message Security

Security policy: no ciphering

Security setup: no ciphering
authentication only
encryption only
The necessary keys are define authentication and encryption

Supported protocols: dlms only

OK Cancel

The fixed display "Security setup" shows the name of the used set of keys for the access level. Possible values are "local", "global", "admin" and "n/a". For backwards compatibility reasons all existing access levels don't change and "n/a" is shown for the security setup.

Access Level Definition

[L] Access Administrator

Client Application Process ID: 2 User ID: 0

Access Security

Authentication: high level authentication using GMAC

Password (secret): [icon] [input] [X]

Additional requisites: -

Message Security

Security policy: no ciphering

Security setup: admin

The necessary keys are defined in the device definition.

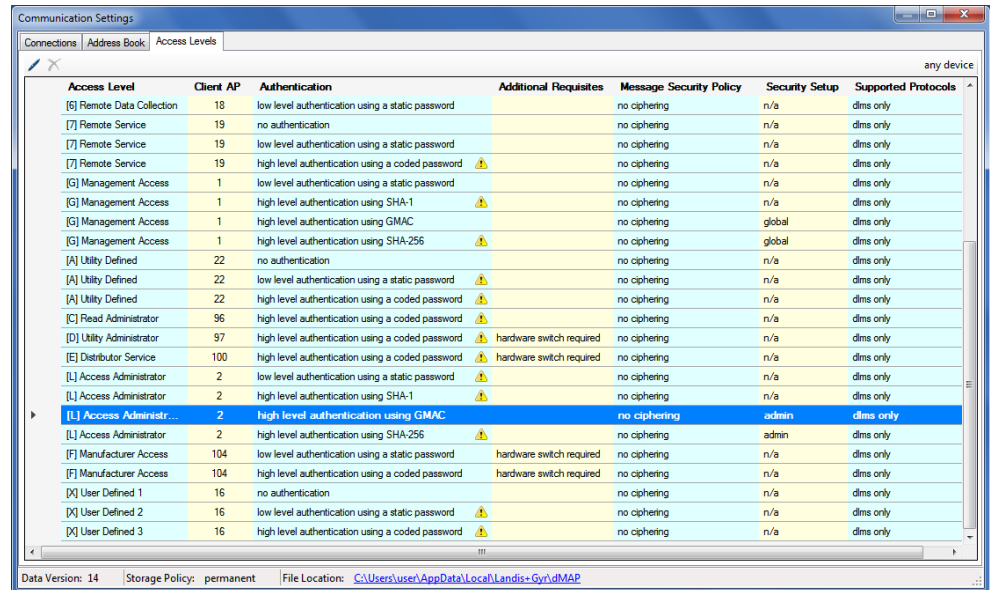
Supported protocols: dlms only

OK Cancel

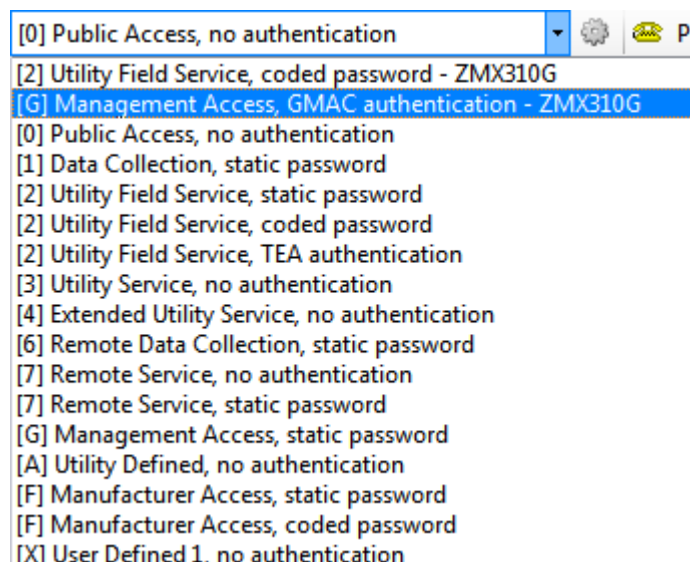
The fixed display "Supported protocols" shows the supported protocols for the access level. Possible values are "IEC and dlms" and "dlms only".

6.2.6.3 Terminating the access level definition

1. Click on **OK**.
The access level definition is saved and the "Communication settings" window with tab "Access Levels" appears again for the specified device.



2. If required, define additional access levels that you want to use in the same way.
All fully defined access levels can be selected in the "Client" drop down list in the client toolbar. The device-specific access levels appear with attached device name at the top of the list.



3. Close the "Communications settings" window.

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 6.2.6 "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.
- Execute the required command from the command tree.

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)
- Serial connection to a local bus (see section 6.5.2)
- Modem connection (see section 6.5.3)
- Network connection via a LAN (see section 6.5.4)
- Network connection via a WLAN and the Internet (see section 6.5.5)

It is assumed in all examples that the physical connections (e.g. cable or modem connections) have already been made and the Landis+Gyr .MAP110 Service Tool 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.

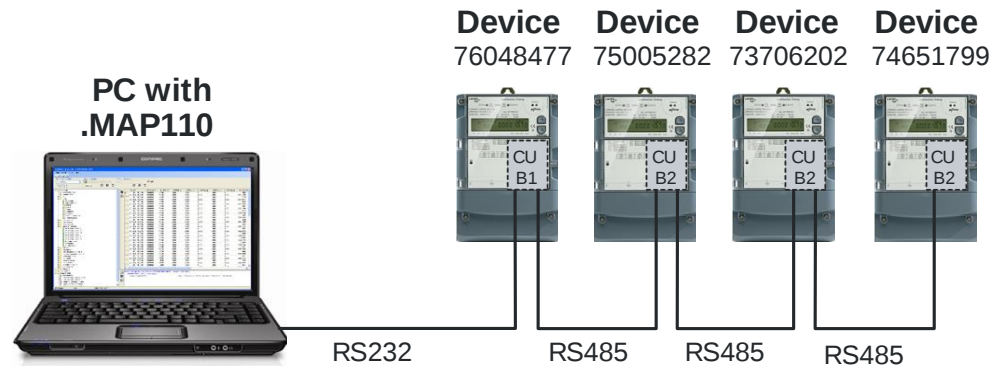


Procedure:

1. In the "Device" drop down list select the device you want to communicate with 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 with the following settings (for 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 "Seriell – IEC" according to the device used.
2. In the "Client" drop down list select the required access level for the intended activity e.g. "[1] Data Collection".
3. Select the required command in the command tree.
The command is executed.

6.5.2 Serial connection to a local bus

This example shows how a multiple connection is made to several devices mutually connected via RS485 interfaces. dlms is used as communication protocol. In the layout diagram below, the device numbers are given for addressing.

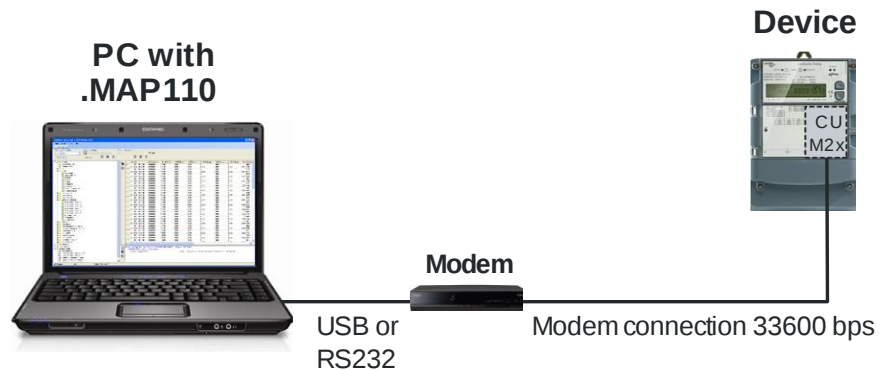


Procedure:

1. In the "Device" drop down list select the device you want to communicate with 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 with the following settings (for procedure see section 6.2.2 "Communication channel data" and section 6.2.3 "Device data"):
 - Physical interface = COM-Port assigned to the RS232 interface
 - Interface type = Serial (optical head or 3-wire)
 - Template for lower layer settings = Serial - dlms
 - Activated HDLC address = 9477 (this is calculated from the last 4 digits of the serial number 76048477 plus 1000 (see section 6.3 "Addressing devices"). Note: to address another meter change the device address accordingly in the device definition.
2. In the "Client" drop down list select the required access level for the intended activity e.g. "[2] Utility Field Service".
3. Select the required command in the command tree.
The command is executed.

6.5.3 Modem connection

This example shows how a point-to-point connection is made for remote communication with a single device fitted with a communication unit with PSTN modem (CU-M2x) or with GSM modem (CU-G3x). dlms is used as communication protocol.



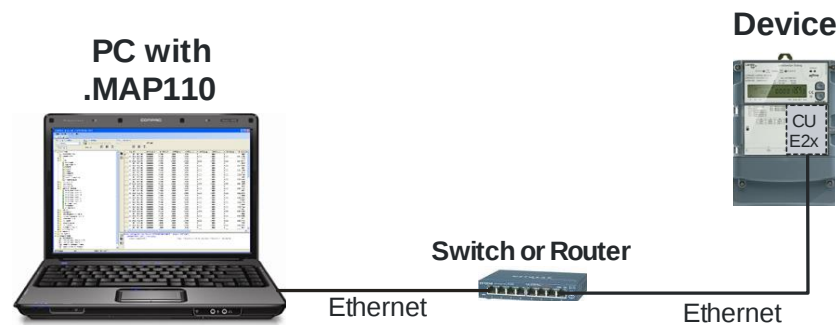
If further devices are connected to the device (multiple connection), their addressing has to be done with the physical device addresses as shown in the example in section 6.5.2 "Serial connection to a local bus".

Procedure:

1. In the "Device" drop down list select the device you want to communicate with 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 with the following settings (for 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. "[6] Remote Data Colection".
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 command log window and in the status bar.
5. Select the required command in the command tree. The command is executed.
6. Click on  in the address toolbar to conclude the modem connection.

6.5.4 Network connection via a LAN

This example shows how a point-to-point connection is made via a LAN to a single device equipped with a communication unit CU-E2x.



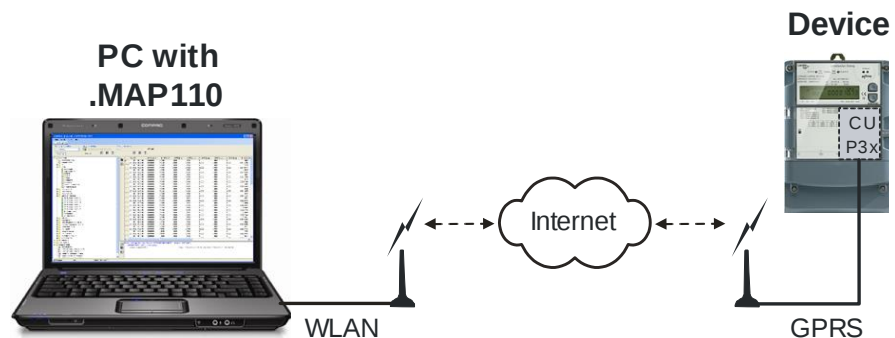
If further devices are connected to the device (multiple connection), their addressing has to be done with the physical device addresses as shown in the example in section 6.5.2 "Serial connection to a local bus".

Procedure:

1. In the "Device" drop down list select the device you want to communicate with 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 with the following settings (for 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
2. In the "Client" drop down list select the required access level for the intended activity 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 "Address data").
4. Select the required command in the command tree.
Communication is started and the command executed.

6.5.5 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 device equipped with a communication unit CU-P3x.



If further devices are connected to the device (multiple connection), their addressing has to be done with the physical device addresses as shown in the example in section 6.5.2 "Serial connection to a local bus".

Procedure:

1. In the "Device" drop down list select the device you want to communicate with 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 with the following settings (for 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. Select the required command in the command tree.
Communication is started and the command executed.

6.6 Reference to other documents

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

- **Data sheets** for the various communication units or modules
- **User manuals** for the various communication units or modules
- **Functional descriptions** of communication units or modules
- Detailed **application notes** for numerous reference applications with various communication units or modules for different transmission media

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

7 Commands

This section contains instructions for the use of commands (functions of the Landis+Gyr .MAP110 Service Tool) and for interpretation or further processing of results.

The selection of commands and their execution is described in section 5.4 "Command tree" under "Command execution".

7.1 Read commands

Section 12 "Functional range per user group" describes which read commands are available to the individual user groups. The following read commands are explained as examples:

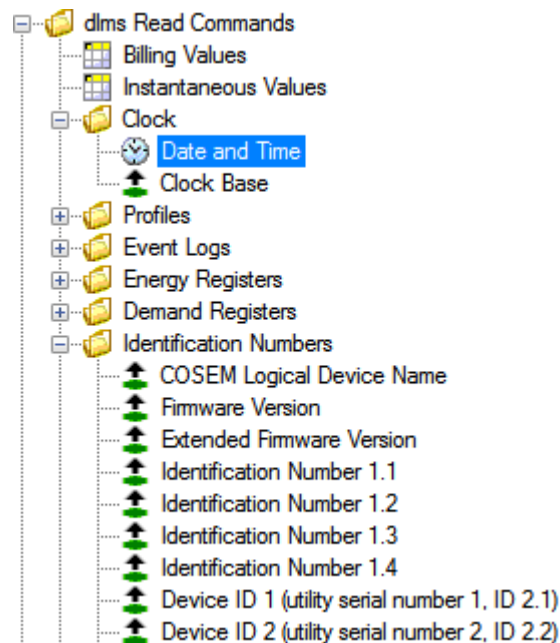
- Simple read commands for parameters and values
- Extended read commands
- Read commands for event logs
- Read commands for load profiles

Other read commands can be used in a similar way.

7.1.1 Simple read commands

Simple read commands read out an individual parameter or value from the device which is displayed in the trace window.

For execution, select the corresponding read command in the command tree marked with the  or  icon.



The parameters or values read out each appear in a line in the command log window (command left, result right):

Command Log		
LGZ96096439 (B30) connected		
Read Date and Time		2014-01-30 07:15:29 Deviation of local time to UTC = 0 min Clock status = 0x00
Read Identification Number 1.1		96096439
Read Battery Voltage		6.3 V
Read Battery Use Time		2430369 min (1687d 18h 9min)
LGZ96096439	B30	ZMD402CT44.4207 S3

7.1.2 Extended read commands

For extended read commands, a table of values and parameters is read out from the device and displayed in the result window.

To execute, select the "Billing Values" or "Instantaneous Values" read command (dlms devices) or "Data Readout" (IEC devices) in the command tree.

The table read out is shown in the result window. The designation of the command used is shown in the top row of the result window (also if a saved file is displayed). Each column of the table can be sorted in increasing or decreasing order by clicking on the relevant column heading. The table is sorted alphanumerically and the selected sorting sequence indicated in the column heading with an arrow pointing upwards for increasing or downwards for decreasing sequence.

For readout according to dlms, the table contains the OBIS code for every value or parameter (see section 11 "OBIS identification codes"), the display value, the unit, exact designation and the group.

Billing Values				
OBIS	Value	Unit	Designation	Group
0-0:42.0.0	LGZ96096439		COSEM logical device name	Identification Numbers
0-0:97.97.0	00000000		Error code	Diagnostics
0-0:1.0.0	2014-01-30 07:20:32 (00)		Clock	Clock
1-0:0.0.0	96096439		Identification number 1.1	Identification Numbers
1-0:0.0.1			Identification number 1.2	Identification Numbers
1-0:0.0.2			Identification number 1.3	Identification Numbers
1-0:0.0.3			Identification number 1.4	Identification Numbers
0-0:96.1.0			Device ID 1 (utility serial number 1, ID 2.1)	Identification Numbers
0-0:96.1.1			Device ID 2 (utility serial number 2, ID 2.2)	Identification Numbers
1-1:1.8.0	0.5791	kWh	Energy +A	Energy
1-1:2.8.0	0.1296	kWh	Energy -A	Energy
1-1:5.8.0	0.4823	kvarh	Energy +Ri	Energy
1-1:6.8.0	0.1696	kvarh	Energy +Rc	Energy
1-1:7.8.0	0.0011	kvarh	Energy -Ri	Energy
1-1:8.8.0	0.0835	kvarh	Energy -Rc	Energy
1-1:3.8.0	0.6520	kvarh	Energy +R	Energy

With readout according to IEC the table contains the code (identification value) for every value or parameter, the main value and where present an auxiliary value (e.g. date and time for demand values).

Data Readout			
	Code	Main Value	Auxiliary Value
▶	F.F	00000000	
	0.0.0	96096439	
	1.2.0	0001.007 kW	
	1.4.0	04	00.000 kW
	1.6.0	00.000 kW	
	1.6.0*01	00.000 kW	
	1.6.0*10	00.000 kW	
	1.6.0*10	00.000 kW	
	1.8.0	000000.57 kWh	
	2.2.0	0000.717 kW	
	2.4.0	04	00.000 kW
	2.6.0	00.000 kW	
	2.6.0*01	00.000 kW	
	2.6.0*10	00.000 kW	
	2.6.0*10	00.000 kW	
	2.8.0	000000.12 kWh	

The table can be saved as XML or text file for further processing or exported directly to the Excel table calculation program (see section 5.5 "Result window").

7.1.3 Read commands for profiles

With read commands for profiles (event logs, load profiles etc.) the profile memory is read from the device and shown in the result window.

For execution, select a "Profiles" or "Event Logs" read command in the command tree.

The profile range to be read out can be specified in a dialogue window:

- all
- last x days (with x entered)
- last x months (with x entered)
- from a specific starting date to a specific final date

For devices that support this feature, the desired time base (with or without daylight saving time) can be chosen additionally:



Shortening readout time by data selection

It is highly recommended to perform a data selection before readout of load profiles, since readout of the entire profile can take a considerable time (above all if the device has a short integrating period).

The profile data read out is shown as a table in the result window. With readout by dlms, the table contains for instance for a load profile the date

and time-of-day, profile status word and the register status recorded for every integrating period. An explanatory text is displayed by positioning the mouse pointer on a column heading or cell. For example the significance of the coded profile status word are decoded directly and all individual events displayed.

Example 1: Readout according to dlms of a load profile (time base: local normal time without DST).

Load Profile 1						
	0-0:1.0.0	0-0:96.10.1 [hex]	1-0:1.8.0 [kWh]	1-0:2.8.0 [kWh]	1-0:3.8.0 [kvarh]	
1	2014-01-27 01:00:00 (01)	36	0.954	0.000	0.000	
2	2014-01-27 02:00:00 (01)	36	0.954	0.000	0.000	
3	2014-01-27 03:00:00 (01)	36	0.954	0.000	0.000	
4	2014-01-27 04:00:00 (01)	Invalid time [0]	0.954	0.000	0.000	
5	2014-01-27 05:00:00 (01)	Daylight savings inactive [7]	0.954	0.000	0.000	
6	2014-01-27 06:00:00 (01)	36	0.954	0.000	0.000	
7	2014-01-27 07:00:00 (01)	36	0.954	0.000	0.000	
8	2014-01-27 08:00:00 (01)	36	0.954	0.000	0.000	
9	2014-01-27 09:00:00 (01)	Clock invalid [1]	0.954	0.000	0.000	
10	2014-01-27 10:00:00 (01)	Data not valid [2]	0.954	0.000	0.000	
11	2014-01-27 11:00:00 (01)	No data [4]	0.954	0.000	0.000	
		Clock adjusted [5]	0.954	0.000	0.000	

For devices that do not transfer all the data in order to save communication time, the missing values are supplemented by the Landis+Gyr .MAP110 Service Tool (shown in italics in the readout).

Example 2: Readout according to dlms of a load profile from a device that does not transmit all data.

Load Profile 1					
	0-0:1.0.0	0-0:96.10.1 [hex]	1-0:1.8.0 [kWh]	1-0:2.8.0 [kWh]	1-0:3.8.0 [kvarh]
1	2000-01-01 00:15:00 (01)	06	0.000	0.000	0.000
2	2000-01-01 00:30:00 (01)	06	0.000	0.000	0.000
3	2000-01-01 00:45:00 (01)	86	0.000	0.000	0.000
4	2000-01-01 01:30:00 (01)	86	0.000	0.000	0.000
5	2000-01-01 01:45:00 (01)	06	0.000	0.000	0.000
6	2000-01-01 02:00:00 (01)	06	0.000	0.000	0.000
7	2000-01-01 02:15:00 (01)	06	0.000	0.000	0.000
8	2000-01-01 02:30:00 (01)	06	0.000	0.000	0.000
9	2000-01-01 02:45:00 (01)	06	0.000	0.000	0.000
10	2000-01-01 03:00:00 (01)	06	0.000	0.000	0.000
11	2000-01-01 03:15:00 (01)	06	0.000	0.000	0.000

With readout according to IEC the table contains the same data for every profile entry as for readout under dlms, although they are shown slightly differently (e.g. preceding zeros).

Example 3: Readout according to IEC of an event log.

Event Log (R5/R6 P.98)							
	Time	EDIS Status		F.F	1.8.0 [kWh]	2.8.0 [kWh]	3.8.0 [kvarh]
1	2014-01-27 15:16:48	0020	011	00040E00000006...	00000000	000000.57	000000.12
2	2014-01-27 15:17:04	8000	010	00020E00000006...	00000000	000000.57	000000.12
3	2014-01-27 14:57:29	0000	049	00000E00000006...	00000000	000000.57	000000.12
4	2014-01-27 14:57:26	0040	024	00008E00000007...	00000000	000000.57	000000.12
5	2014-01-27 14:54:34	0080	023	00004E00000007...	00000000	000000.57	000000.12
6	2014-01-27 14:54:34	0000	049	00000E00000007...	00000000	000000.57	000000.12
7	2014-01-27 14:53:22	0000	049	00000E00000006...	00000000	000000.57	000000.12
8	2014-01-27 14:53:19	0040	024	00008E00000007...	00000000	000000.57	000000.12
9	2014-01-27 14:53:15	0080	023	00004E00000007...	00000000	000000.57	000000.12
10	2014-01-27 14:53:13	0040	024	00008E00000007...	00000000	000000.57	000000.12
11	2014-01-27 14:53:08	0080	023	00004E00000007...	00000000	000000.57	000000.12

The table can be saved as XML or text file for further processing or exported directly to the Excel table calculation program (see section 5.5 "Result window").

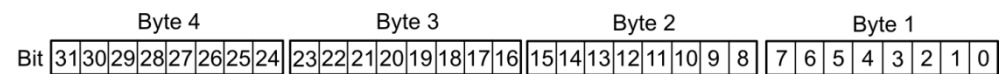
Event types and event numbers A complete list with details, which event types can be recorded under which event number in the event log, is contained in the functional descriptions of the devices.

Profile status word A complete list with details, which individual events are displayed under what numbers (corresponding to the bit of the status word) is also contained in the functional descriptions of the devices.

The profile status word indicates the current status of the device and the network it is connected to.

The profile status word has a size of 4 bytes and can be restricted to 2 bytes by parameterisation with the Landis+Gyr MAP120. In this case only the bytes 1 and 2 (bits 0 to 15) are available. In the IEC readout only the bytes 1 and 2 will be included no matter the parameterisation.

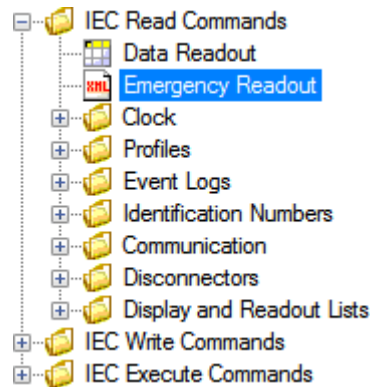
Bit assignment in profile status word:



7.1.4 Emergency readout

With the read command for emergency readout the device data can be read out into a XML file, e.g. if communication between the central system and the device fails (for IEC protocol only). This XML file can be imported later on into the Landis+Gyr automatic device reading system "Converge".

For execution, select the read command for emergency readout in the command tree marked with the  icon.



The following data can be specified in a dialogue window:

- read out only billing data or billing data and load profile in the range specified
- device identification automatically by OBIS code contained in the billing data or manually
- working folder, where the XML file shall be saved

Emergency Readout

Data

☒ Billing Data

☐ Billing Data and Load Profile

☒ last day

☐ from to

Calendar Base

Meter Identification

☒ automatically by OBIS Code

☒ standard

☐ user defined

☐ manually

Working Folder

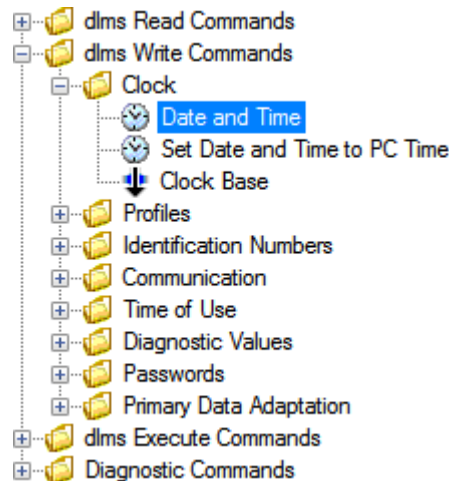
After clicking **Read** the selected data will be saved into a XML file in the working folder specified.

The file name corresponds to the device identification, the extension is xml, e.g. "77708190.xml". If the same device is read out several times, the previous file is overwritten without warning.

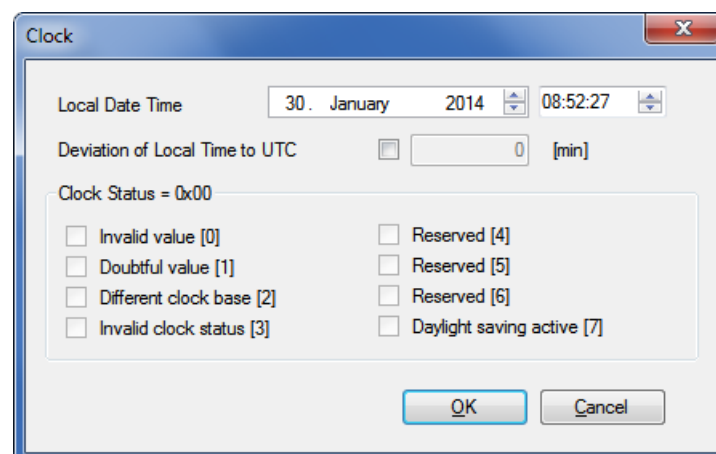
7.2 Write commands

Section 12 "Functional range per user group" describes which write commands are available to the individual user groups.

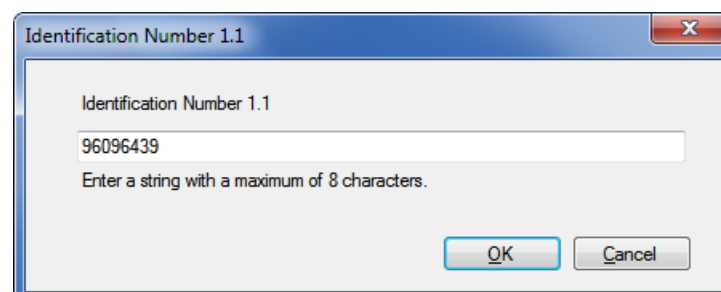
For execution, select the corresponding write command in the command tree marked with the  or  icon.



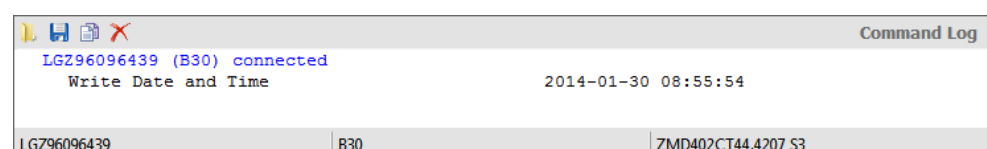
With write commands, the current parameter or value is always read out first from the device and displayed in a dialogue window for modification, e.g. for setting time and date:



or for writing an identification number:



Modify the data displayed and then click on **Ok**. The modified data is written in the device and recorded in the command log window (command left, value right):



Further write commands are explained as examples in the following sub-sections.

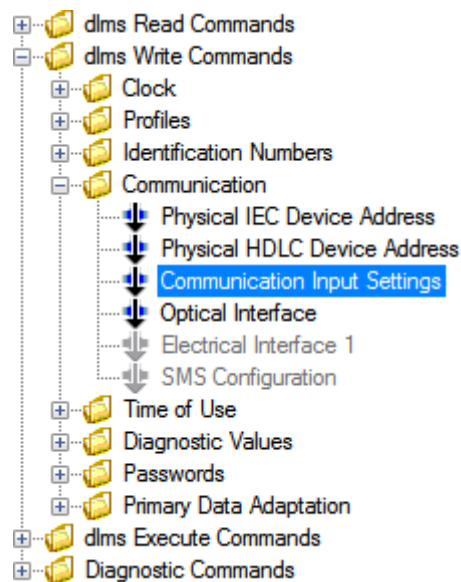
With the execution of the following write commands, a MAP100 export file in MAP100 V2.0 format is generated and saved in the directory defined in the .MAP110 option settings (see section 8.8 "Enabling .MAP100 file export"), if the function is activated:

- Parameterisation ID
- Passwords level 1, 2 and E
- Time of use (TOU)
- Billing period reset.

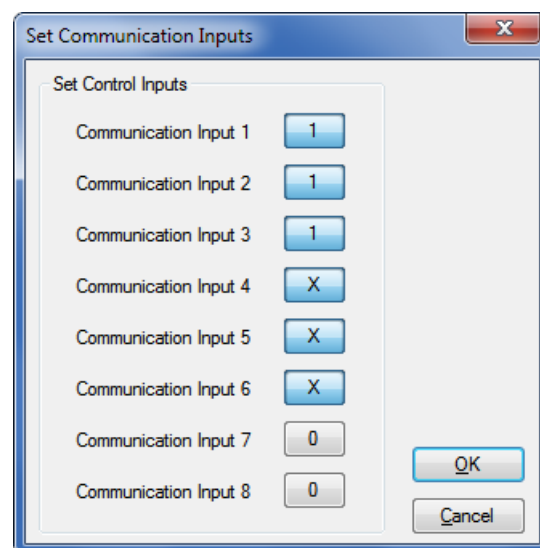
These write commands are recognisable in the command tree from the green plus sign added to the icon, e.g.  Parameterisation ID.

7.2.1 Set communication inputs

For execution, select the "Communication Input Settings" write command in the "Communication" folder of the command tree.



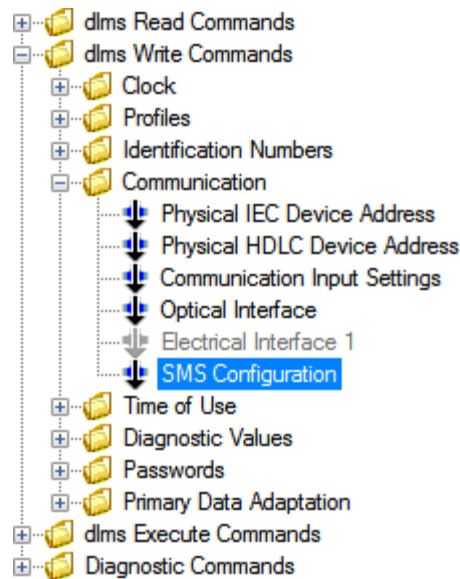
All communication inputs are displayed in the dialogue window. By clicking on a field you can toggle between 0, 1 and X (value remains the same).



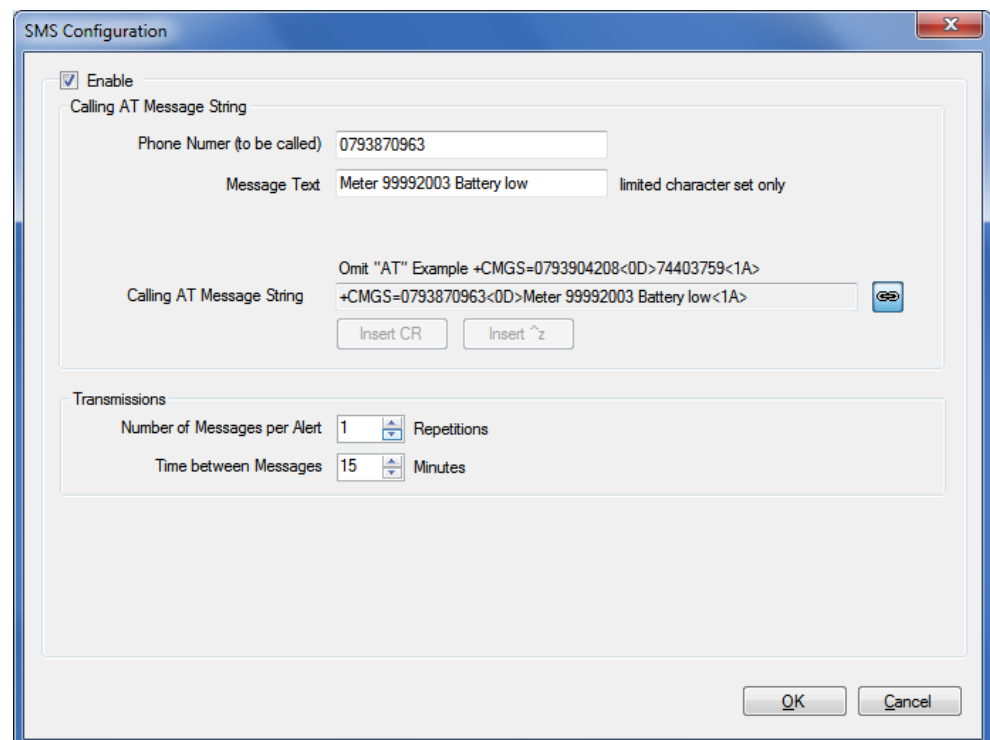
Click on **OK** to write the values set into the device.

7.2.2 Modify SMS configuration settings

For execution, select the "SMS Configuration" write command in the "Communication" folder of the command tree.



The SMS configuration data is displayed in the dialogue window. You can modify the phone number, the message text, the initialisation string and the transmission parameters.

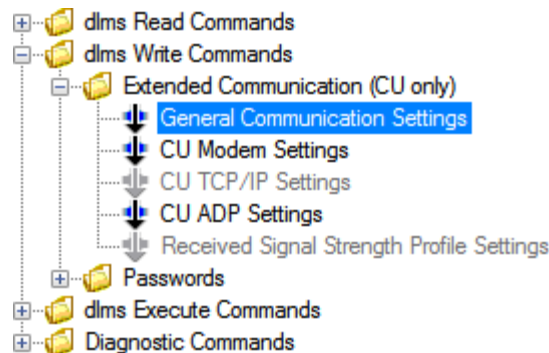


Click on **OK** to write the values set into the device.

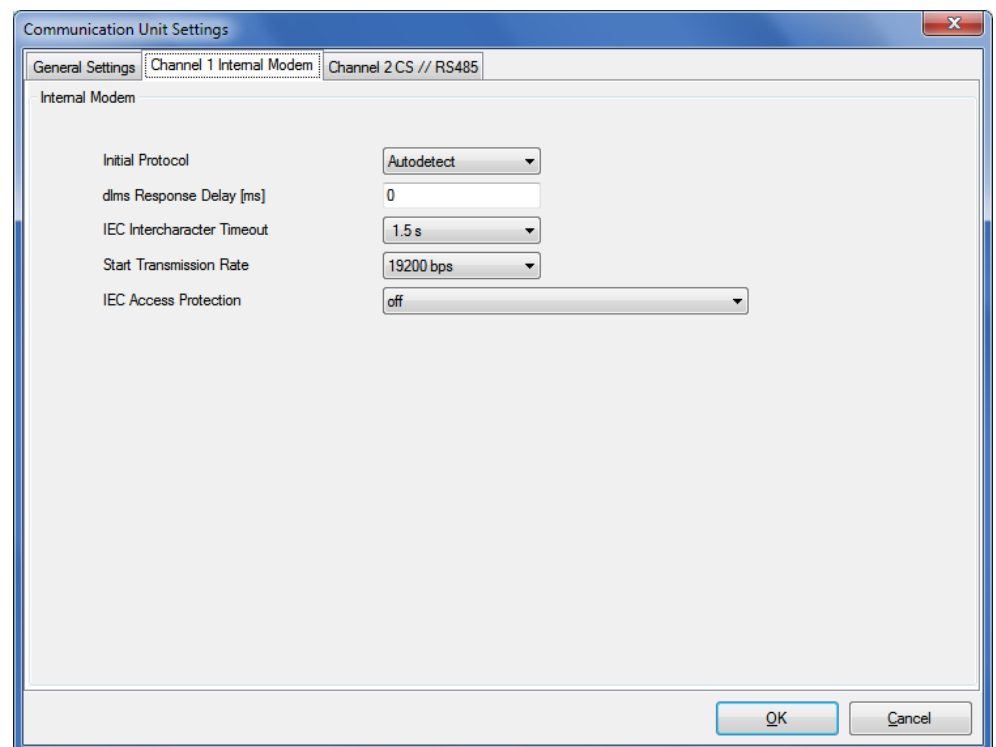
You can check the settings with the execute command "SMS Test" (see 7.3.1 "SMS test transmission").

7.2.3 Modify communication unit settings

The write commands in the folder "Extended Communication (CU only)" of the command tree allow you to modify the settings of communication units and communication unit adapters (ADP).



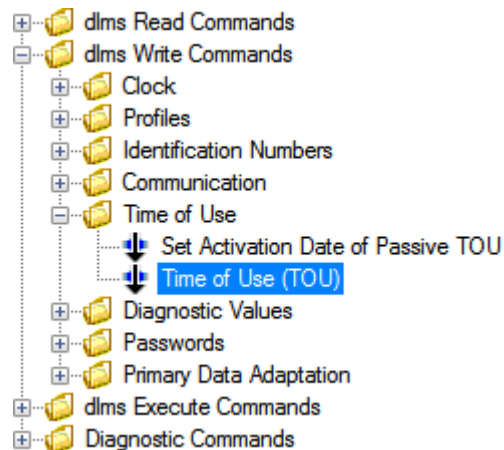
In the dialogue window you can modify the corresponding communication settings, e.g. the modem configuration of a communication unit with GSM/ GPRS modem, as shown in the following figure.



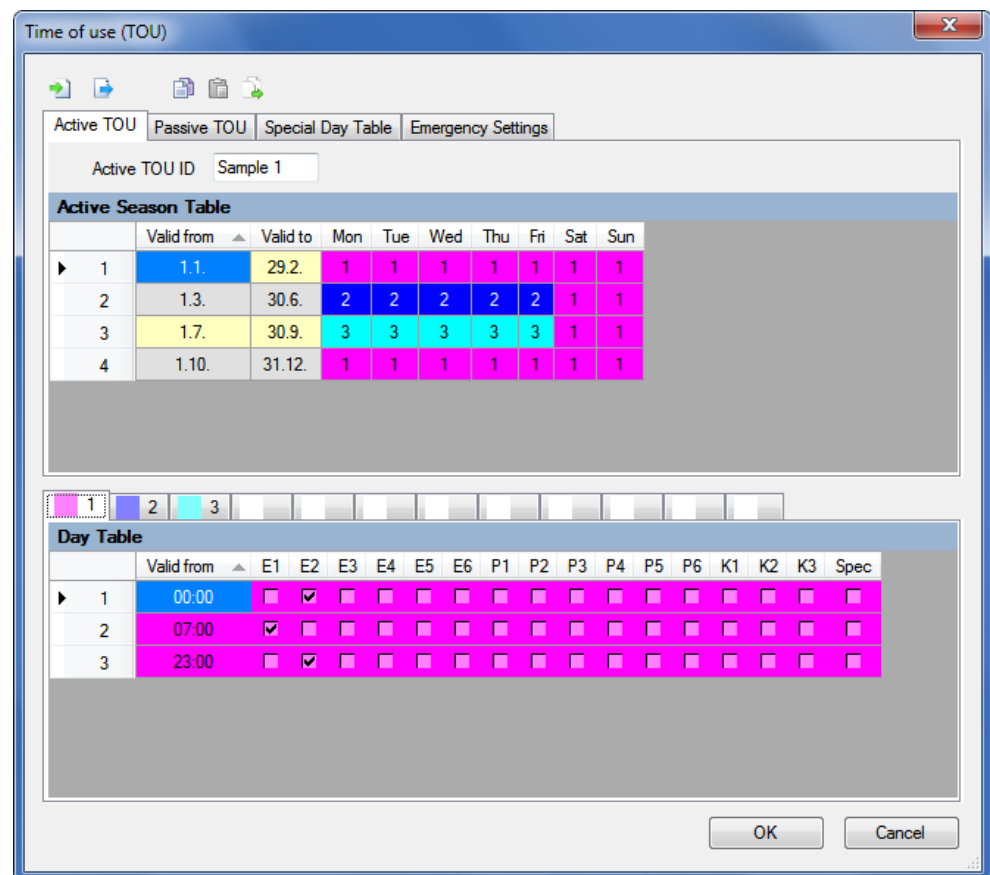
Click on **OK** to write the values set into the communication unit.

7.2.4 Modify time of use

For execution, select the "Time of use (TOU)" write command in the "Time of Use" folder of the command tree.



In the dialogue window "Time of use (TOU)" you can modify the TOU read out from the device and write it back again into the device. You can also save a read out TOU in a XML file or load a saved XML file into the .MAP110 to write it into the device.



Clicking on  opens the "Save as" dialogue window to save the TOU in a freely selected directory as XML file.

Clicking on  opens the "Open File" dialogue window to load a TOU saved in a XML file.

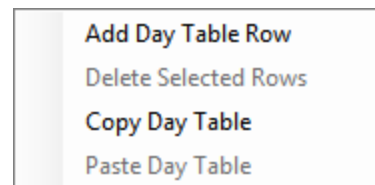
Clicking on  copies the active TOU into the passive TOU.

You can also copy the entire TOU or an individual table to the Windows clipboard to paste it afterwards into the TOU of another device connected to the .MAP110 and write it into this device. The TOU of the different device families are thereby exchangeable among themselves.

Clicking on  copies the entire TOU from the .MAP110 to the Windows clipboard.

Clicking on  copies an individual table from the Windows clipboard into the .MAP110.

To copy an individual table to the Windows clipboard or to paste it from the Windows clipboard, click in the "Time of use (TOU)" dialogue window on a table and then select the corresponding copy or paste command in the pop-up menu appearing.

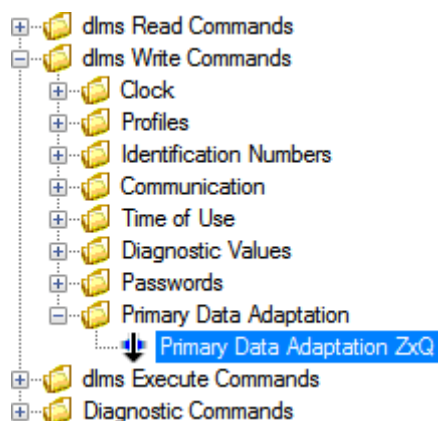


Via the Windows clipboard it is also possible to import an entire TOU from a Landis+Gyr .MAP120 Parameter Editor. The transfer in the opposite direction from .MAP110 to .MAP120 is however not supported.

Click on **OK** to write the modified or imported TOU into the device. Afterwards the "Time of use (TOU)" dialogue window disappears again.

7.2.5 Primary values adaptation

For execution, select the "Primary Data Adaptation" write command in the "Primary Data Adaptation" folder of the command tree.



In the dialogue window you can modify the primary value adaptation settings of transformer connected devices.

The dialog box 'Primary Data Adaptation ZxQ' has three tabs: 'Network', 'Output Pulses', and 'Resolution'. The 'Network' tab is active. It contains three main sections: 'Primary Voltage', 'Primary Current', and 'Primary Power'. Each section has a corresponding 'Secondary' section. The 'Primary Voltage' section shows a transformer symbol with 'U1 = 3x' on the left and 'U2 = 3x' on the right. The 'Primary Current' section shows a transformer symbol with 'I1 =' on the left and 'I2 =' on the right. The 'Primary Power' section shows 'Pmax =', 'Pn =', and 'R1 =' on the left, and 'R2 =' on the right. At the bottom, there are 'Cancel' and 'Send to Meter' buttons.

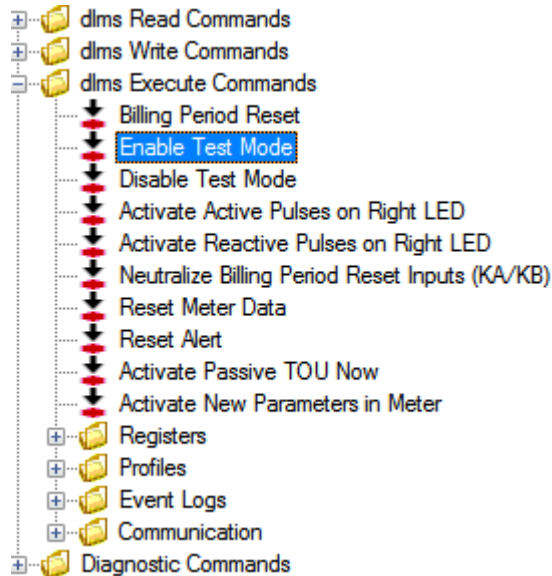
Parameter	Primary Value	Secondary Value
Voltage Ratio	$U1 = 3x \frac{400 \text{ V}..1200'000 \text{ V}}{\sqrt{3}}$	$U2 = 3x \frac{100 \text{ V}}{\sqrt{3}}$
Current Ratio	$I1 = \frac{20 \text{ A}..40'000 \text{ A}}{100}$	$I2 = 5 (6) \text{ A}$
Power	$P_{max} = 20.785 \text{ kVA}$ $P_n = 17.321 \text{ kVA}$ $R1 = 1000.0000 \text{ imp / kVAh}$	$R2 = 20000 \text{ imp / kVAh}$

Click on **Send to Meter** to write the values set into the device.

7.3 Execute commands

Section 12 "Functional range per user group" describes which execute commands are available to the individual user groups.

For execution, double click the relevant execution command in the command tree marked with the  icon.

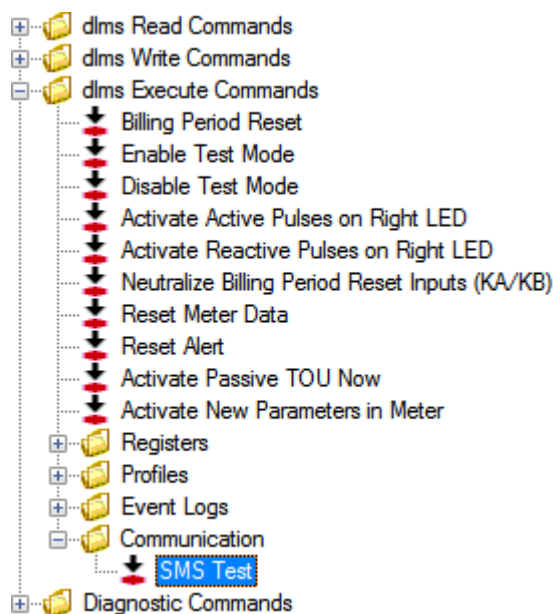


The execute command is normally transmitted to the device without additional dialogue (exception: see 7.3.1 "SMS test transmission") and executed there. The commands executed are recorded in the command log window:



7.3.1 SMS test transmission

For execution, select the "SMS Test" execute command of the command tree.



The "SMS Test" dialogue window appears. In this window you can enter the phone number to be called and the message text of the test SMS.

The 'SMS Test' dialogue window has a title bar with a close button. It contains the following fields and controls:

- Destination Phone Number:** A text box containing '07991234567'.
- Message Text:** A text box containing 'Alert meter 76926068'.
- Example:** A text box containing '+CMGS=0793904208<0D>74403759<1A>'.
- Calling AT Message String:** A text box containing '+CMGS=07991234567<0D>Alert meter 76926068<1A>'. To the right of this field is a small icon of a mobile phone.
- Insert CR:** A button.
- Insert ^z:** A button.
- SMS Status:** A large text area for displaying the status.
- Buttons at the bottom:** 'Send Test SMS', 'Read SMS Status', and 'Close'.

Click on **Send Test SMS** to send the Test SMS.

By clicking on **Read SMS Status** you can display the SMS status.

7.3.2 Firmware update AD-xP/xG 3.x

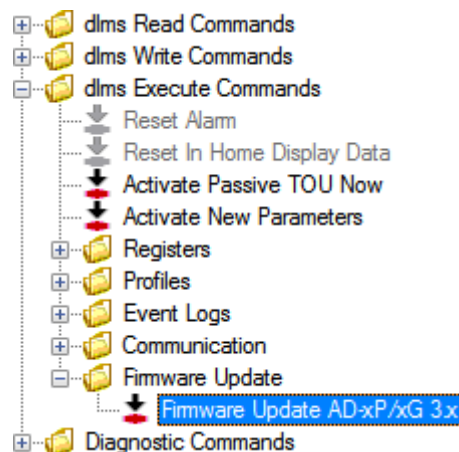
This execute command is only applicable for communication modules AD-xP/xG version 3.x.



Additional knowledge required

Additional knowledge is required to apply this execute command. The following information provides only an overview about this command. Please contact your sales representative to receive further information about this command.

For execution, select the "Firmware Update AD-xP/xG 3.x" execute command of the command tree.



The "Firmware Update" window appears.

.MAP110 - Firmware Update AD-xP/xG 3.x - LGZ11004691

New Download Continue Download Cancel Data Upload MSP List PDU Export Close Window

Device Code (Tx*.mot File Name)
Device Code

Device Data (Tx*.dat File Name)
☒ Keep Current Parameter
☐ Factory Data
☐ Customer Data

Operation Type	Operation State
Upload data	
Initiate download	
Download code	
Download data	
Send Missing Segments	
Meter Specific Parameter List	
Verify code	
Verify data	
Activate download	

Information	Value
Firmware Update State	Activation Completed
Stored Btld Swul Error	0
Active Application Index	1
Group Index	255
Accurate Code Length	0
Total Number Of Code Segments	0
Missing Code Segments	0
Code Consistency State	True
Code Verify Progress State	0
Accurate Data Length	0
Total Number Of Data Segments	0
Missing Data Segments	0
Data Consistency State	True
Data Verify Progress State	0
Short Name List State	True

T04.K 09-10-21 Session: connected (dlms - COM6 - 9600 bps) 7 8 00:00:23

Enter the name of the MOT file with the new firmware release in the entry field "Device Code" or select a file in the "Select Device Code File" window, which appears after clicking on .

In the "Device Data" area, select whether the current parameters shall be kept or whether a factory parameterisation shall be executed. Enter the name of the DAT file in the entry field "Factory Data" for the factory parameterisation or select a file in the "Select Factory Data File" window, which appears after clicking on .



Afterwards the button **New Download** is activated and can be used to download the new firmware release into the device.



Clicking on **Data Upload** reads the data from the device and saves the data in a DAT file.



Clicking on **MSP List** reads a device specific parameter list from the device and displays this in a window.

Meter Specific Parameter List - 147 Elements

	Short Name	Device Model ID
▶	11008	Psr_ProtocolSelector.Current.Value
	11208	SystemTimeCts.TimeData
	11224	SystemTimeCts.Clockstatus
	11248	SystemTimeCts.DaylightSavingsDeviation
	11256	SystemTimeCts.DaylightSavingsEnabled
	11384	SystemTimeCts.SynchLockout
	11392	SystemTimeCts.SynchWindow
	11400	SystemTimeCts.SynchLimit
	12408	HDLCsetupDataCh2.CommSpeed
	14208	StringRegisterASWHardwareInfo.Current.Value
	14408	StringRegisterConfigId.Current.Value
	14808	StringRegisterParamId.Current.Value
	18008	StringRegisterUtilitySerialNumber.Current.Value
	18408	StringRegisterManufacturerSerialNumberModule.Current.V...
	18808	StringRegisterUtilitySerialNumber21.Current.Value
	19032	ObjectOfRubbishRegister.LongPowerDownTime
	19040	ObjectOfRubbishRegister.OutputConfig

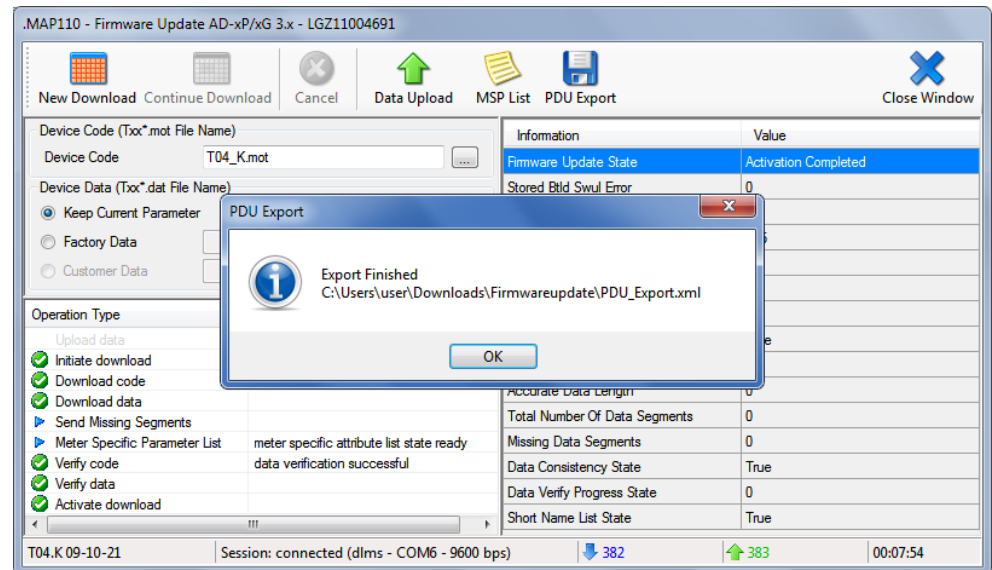
Save Load OK Cancel

The list can be edited by deleting entries or by adding new entries at the end of the list. Click on **Save** to save the list as XML file.



Clicking on **PDU Export** exports the device data as Protocol Data Unit (PDU) in an XML file.

The operation types and operation states are displayed in the "Firmware Update" window.



The icons in column "Operation Type" have the following signification:

-  indicates a process not yet executed.
-  indicates a running process.
-  indicates a process successfully terminated.
-  indicates a failed process.

7.3.3 Firmware update E450, E460, E570 and E35C 4.x

This execute command is only applicable for meters of the E450, E460 and E570 device series and for E35C V4.x communication modules.



Additional knowledge required

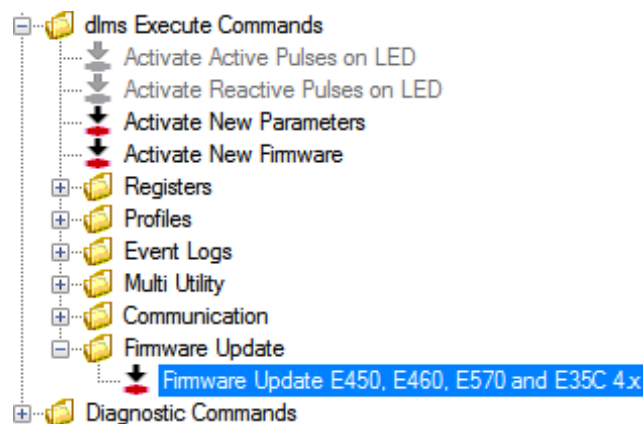
Additional knowledge is required to apply this execute command. The following information provides only an overview about this command. Please contact your sales representative to receive further information about this command.



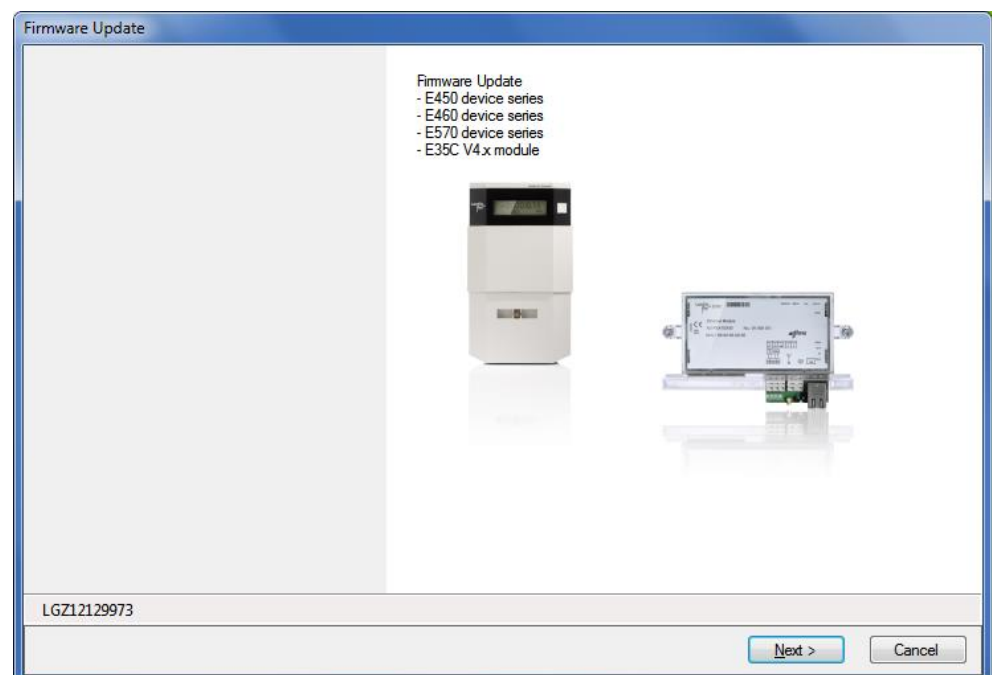
Required firmware file

An image file with the new firmware release of the device is required for the firmware update. This image file provided by Landis+Gyr has to be stored in any directory of your computer.

For execution, select the "Firmware Update E450, E460, E570 and E35C 4.x" execute command of the command tree.

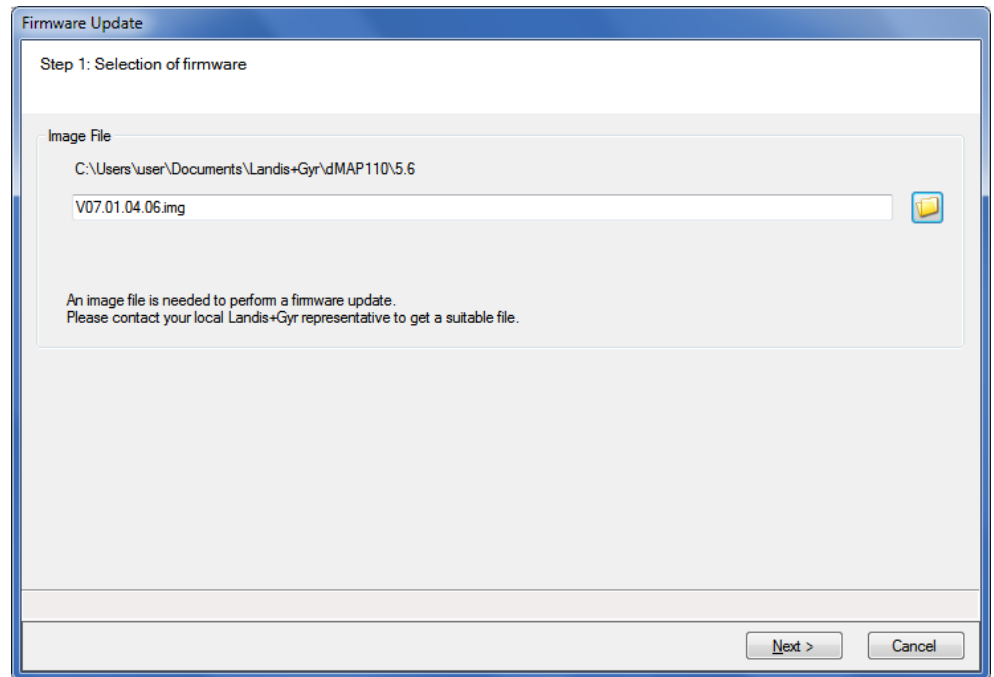


The Update Wizard "Firmware Update" appears.

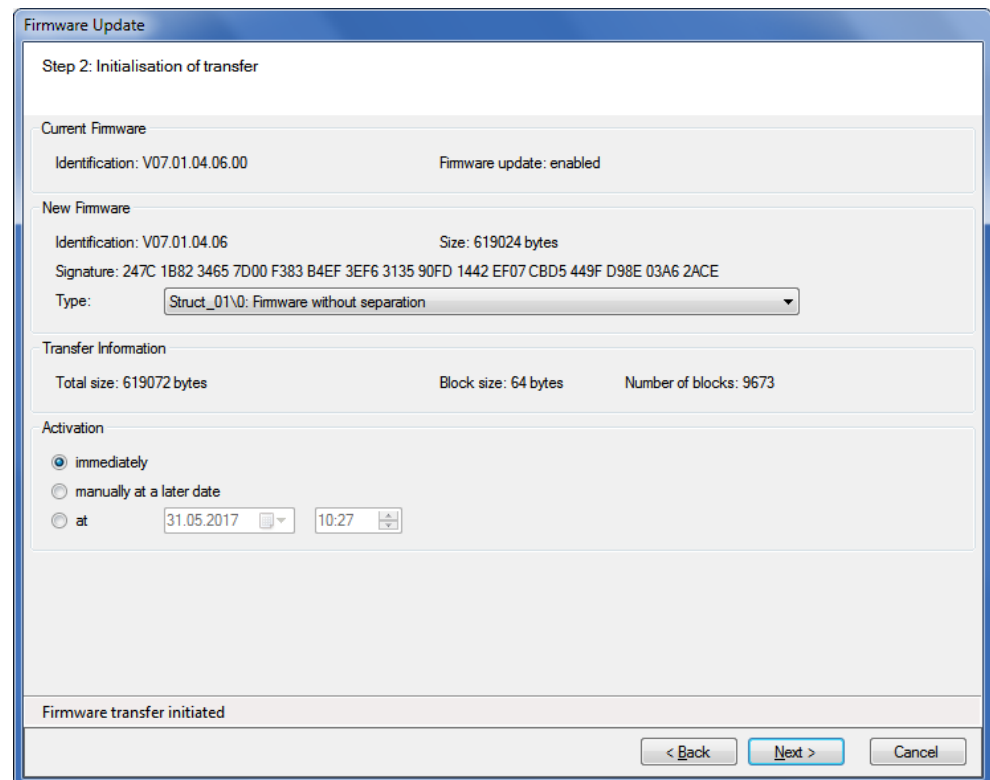


This Wizard guides you through the update process:

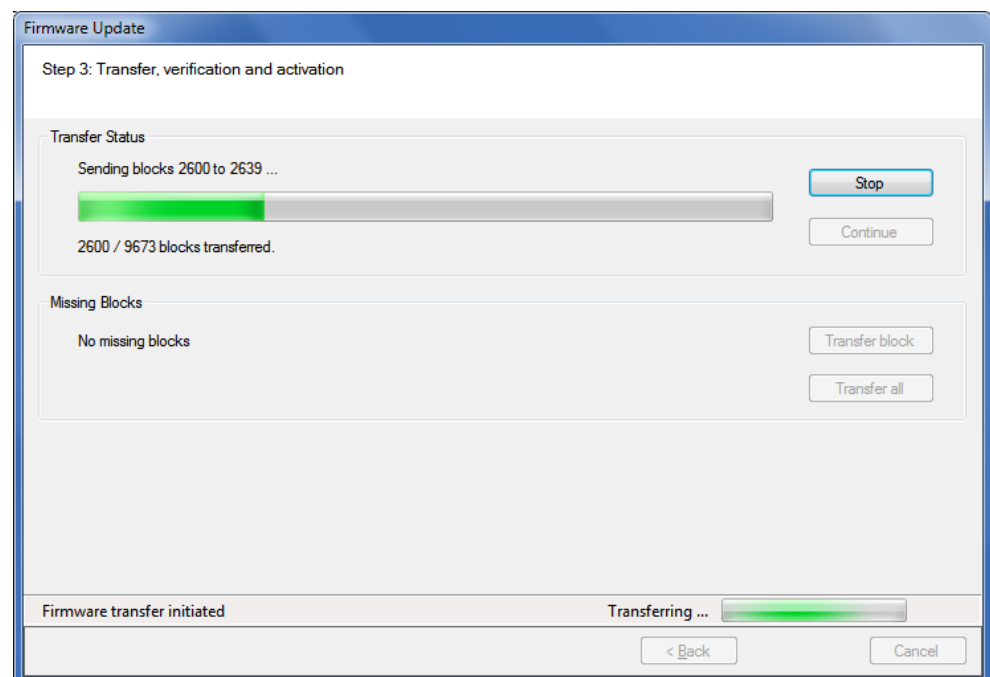
1. Click on **Next >**.
The screen "Step 1: Selection of firmware" appears.
2. Click on  in the "Image File" area and in the appearing "Open" window select the image file received from Landis+Gyr and stored on your computer.
The path and name of the selected file will be displayed.



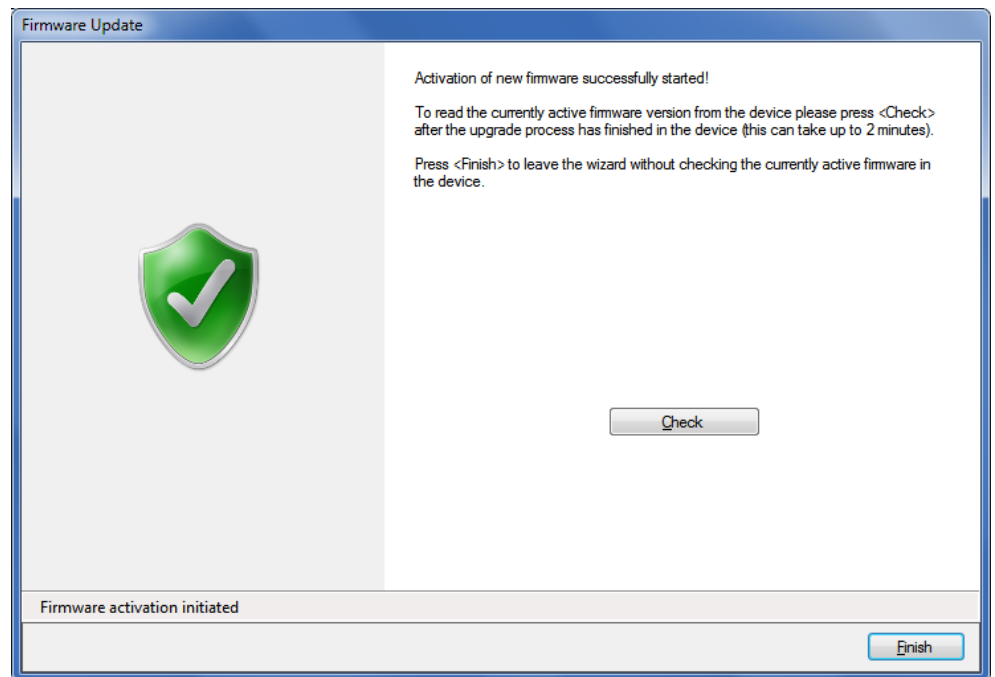
3. Click on **Next >**.
An image file is generated from the binary file and signed with the selected key.
The screen "Step 2: Initialisation of transfer" appears.
The following data about the firmware will be displayed:
 - Identification of the currently loaded firmware in the device
 - Identification, size and signature of the new firmware
 - Total size, block size and number of blocks of the new firmware
4. In the "New Firmware" area select the type of firmware you want to download, e.g.:
 - complete firmware without software separation
 - complete firmware including legally relevant and legally non relevant part
 - only legally non relevant firmware
 - wireless M-Bus driver
5. In the "Activation" area select whether the firmware shall be activated immediately after the transfer or at a later point in time to be entered.



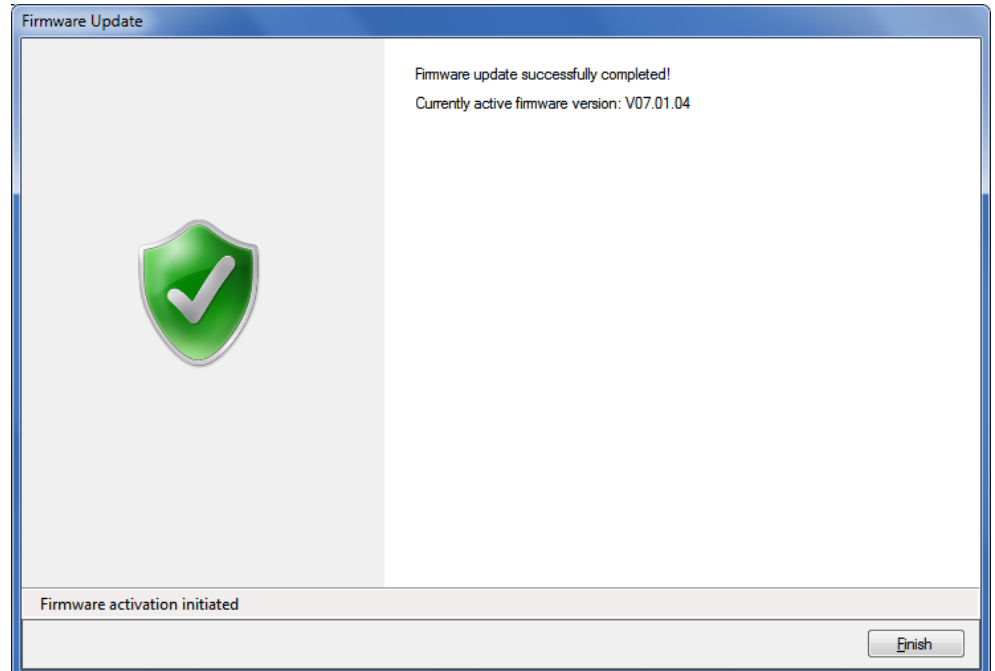
6. Click on **Next >**.
The screen "Step 3: Transfer, verification and activation" appears and the new firmware is transferred to the device. The progress is indicated in the "Transfer Status" area.



Wait until all blocks are transferred and verified and the subsequent firmware activation is started. Then the following display appears:



7. Click on **Check**.
The wizard starts polling the device every 5 seconds and as soon the communication is possible the currently active firmware release is read from the device. The designation of button **Check** changes to **Stop**. With this button the check can be aborted. Please note that the activation of a new firmware can take several minutes. During this time no communication with the device is possible. After the check the following display appears:



8. Click on **Finish**.
This concludes the firmware update.

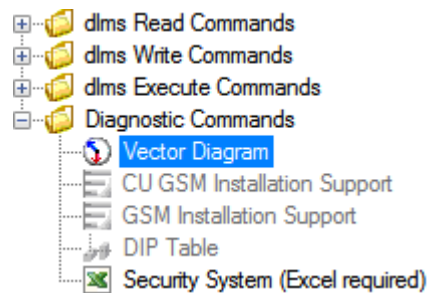
7.4 Diagnostic commands

Section 12 "Functional range per user group" describes which diagnostic commands are available to the individual user groups.

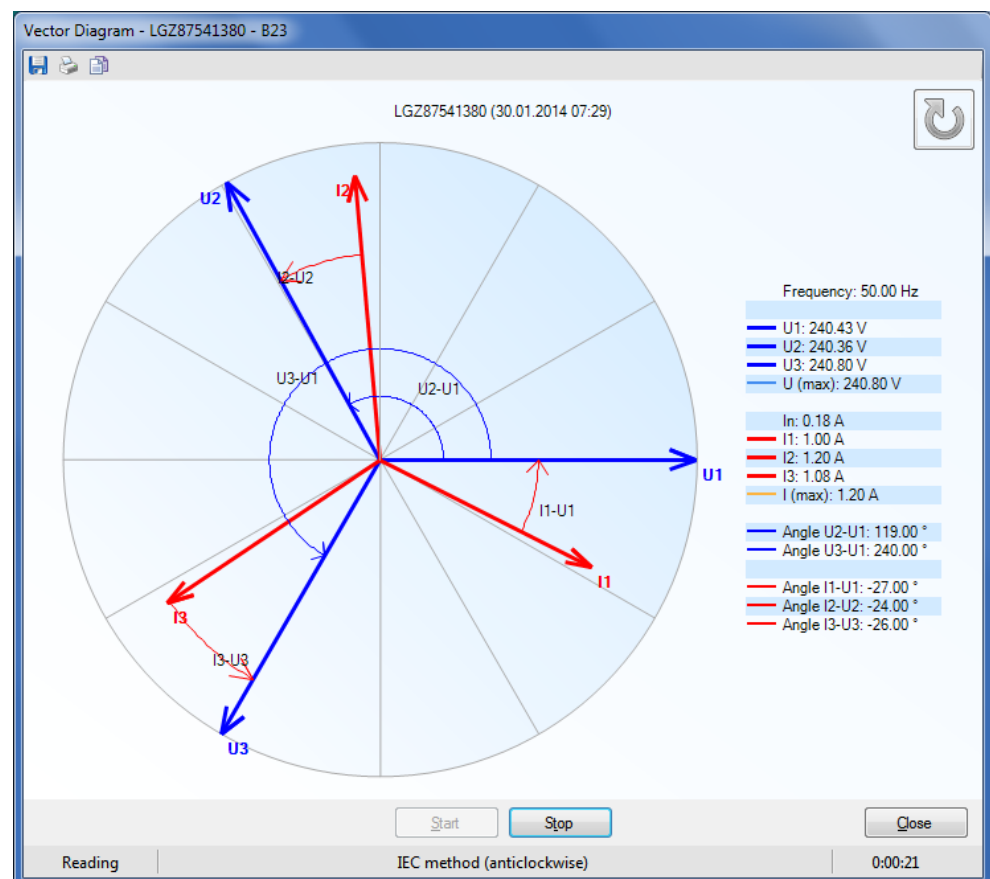
7.4.1 Vector diagram

A vector diagram of the currents and voltages of the device connected can be displayed with this diagnostic command.

For execution, select the "Vector Diagram" diagnostic command in the command tree.



A vector diagram is shown in the "Vector Diagram" window, which is calculated from the continuously read instantaneous values of voltages, currents and phase angles. The individual instantaneous values measured by the meter are displayed next to the diagram.



Clicking **Stop** interrupts a current readout of the instantaneous values.

Clicking  or  respectively, switches between the anticlockwise view to the clockwise view.

Clicking  opens the "Save as" dialogue window to save the data displayed in a freely selected directory as XML file.

Clicking  displays a print preview, from which the vector diagram can be printed on the standard printer.

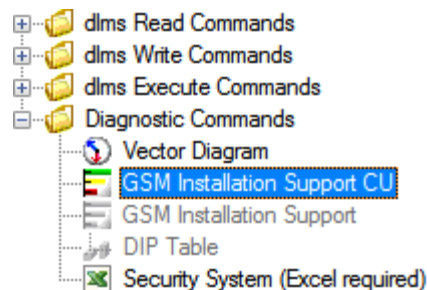
Clicking  copies the vector diagram to the Windows clipboard, from where it can be inserted in another application (e.g. in a word processing program).

The diagnostic command is ended with **Close**.

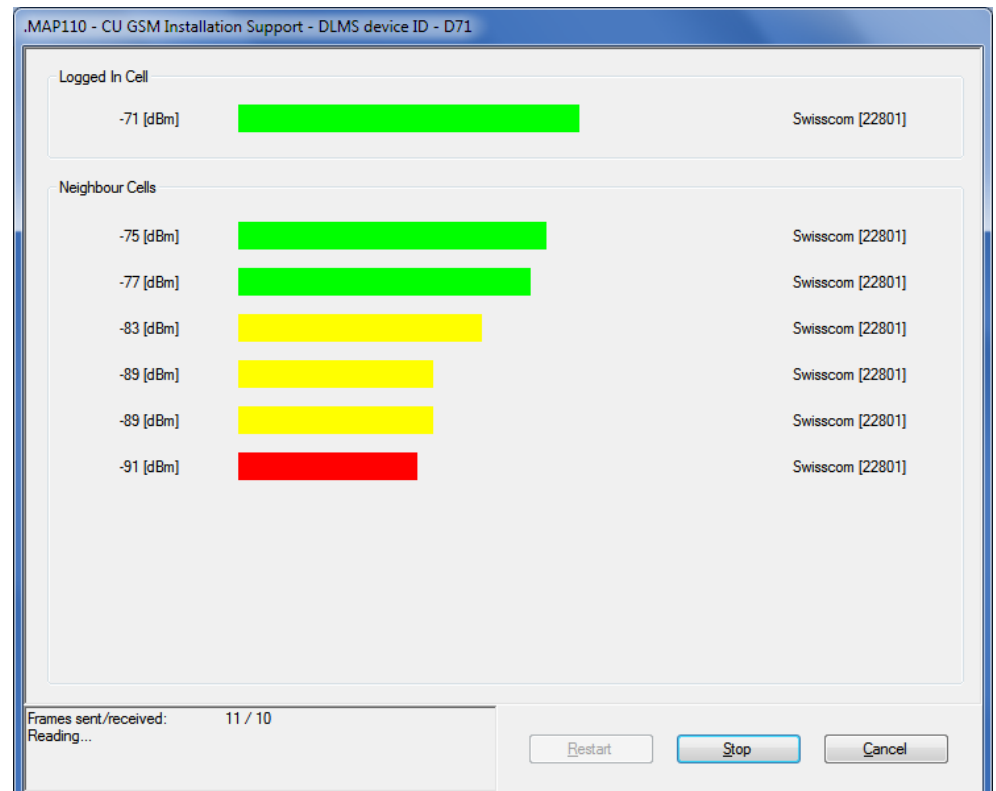
7.4.2 GSM installation support

This diagnostic command can only be used if the device connected has a communication unit with GSM modem or if an AD-FG/CG communication module is to be addressed.

For execution, select the "CU GSM Installation Support" or "GSM Installation Support" diagnostic command in the command tree.



The field strengths of the cell logged in and all neighbouring cells are displayed in the "GSM Installation Support" window. When used on the spot this allows the optimum antenna position to be determined or a check of the received field strength.



Measurement of field strength is

- continuously updated if the values are read out via device and optical head and no communication takes place simultaneously via the GSM channel, or
- not continuously updated if the values are read out via the GSM channel (in this case the values measured immediately after making the connection are displayed).

Clicking **Stop** interrupts a current measurement of field strength.

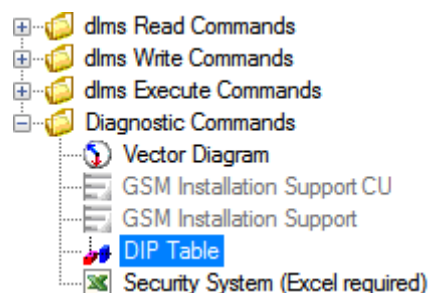
Clicking **Restart** repeats the interrupted measurement of field strength.

The diagnostic command is ended with **Cancel**.

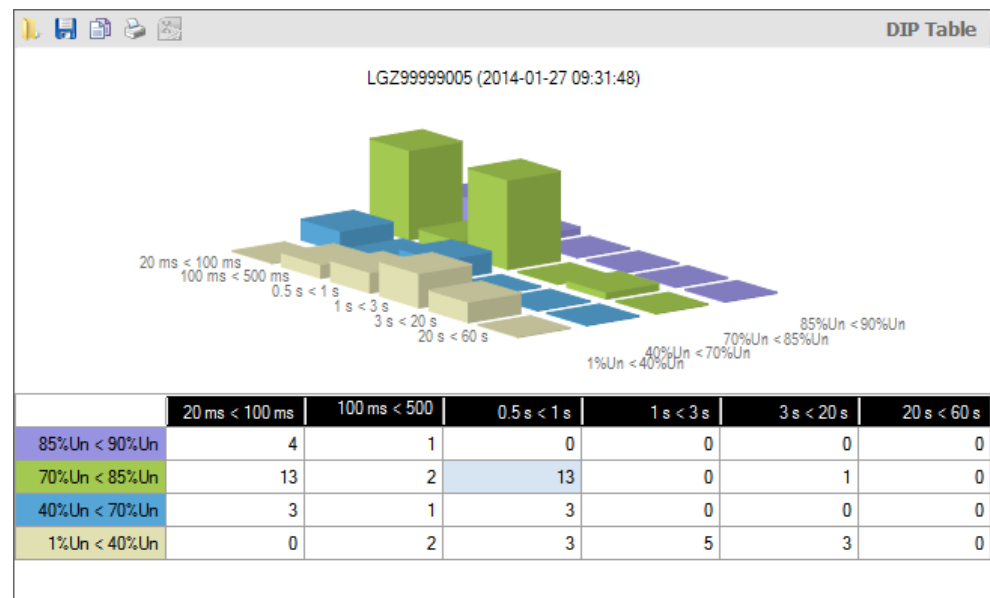
7.4.3 DIP table

A graphic evaluation of all voltage failures occurring since the last deletion of the DIP table can be performed with this diagnostic command.

For execution, select the "DIP Table" diagnostic command in the command tree.



A diagram and a table with number, duration and category of voltage failures are shown in the result window.



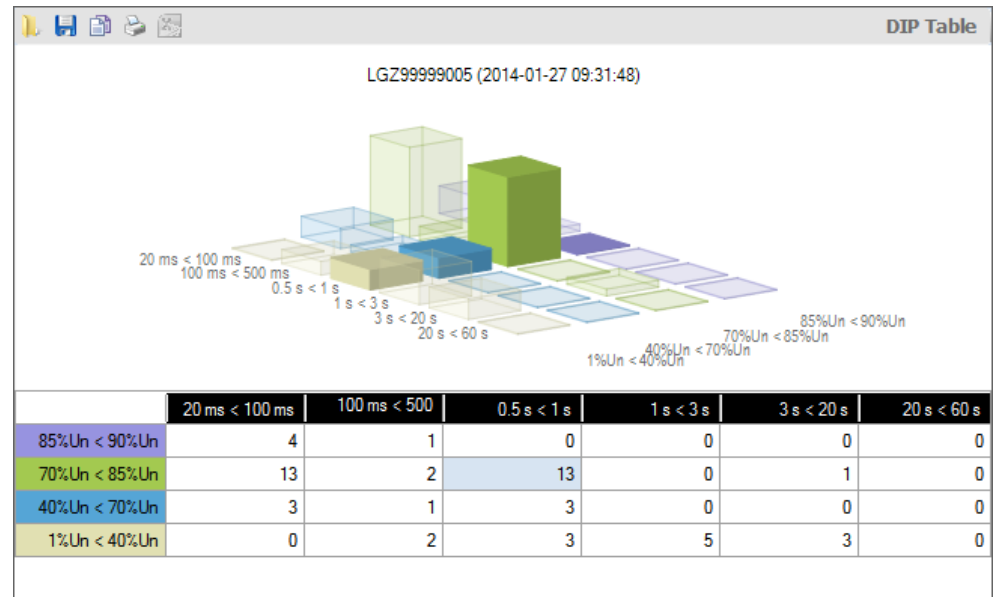
The categories, i.e. the severity of the voltage failures, are shown in colour, e.g. voltage failures of 1 to 40 % of rated voltage in violet. The table contains a line for each category, the diagram a series of bars in the x-direction.

The number of voltage failures occurring is shown in the table as numeral and in the diagram as bar height.

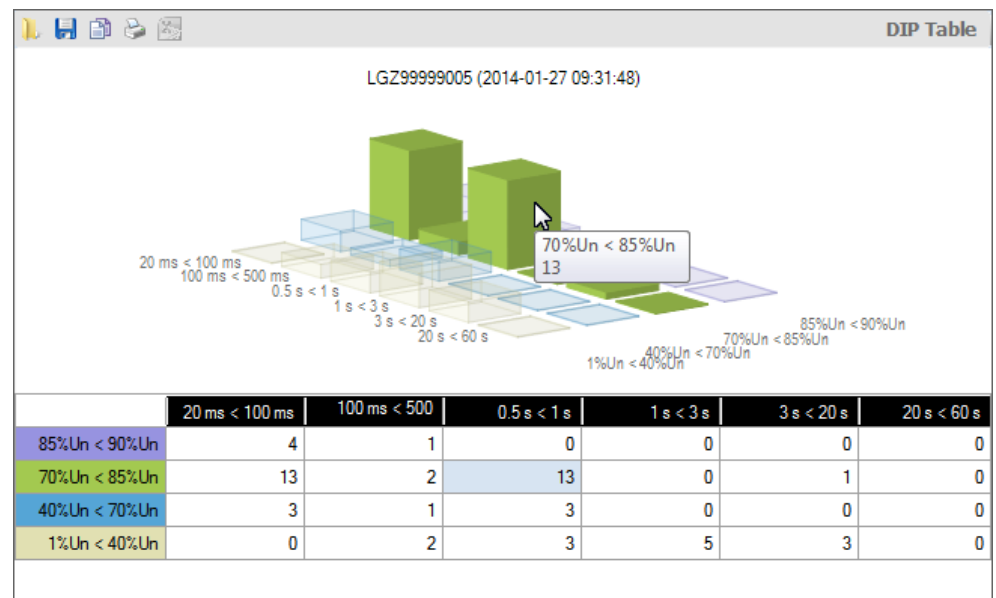
The duration of the voltage failures is divided into four ranges: 20 to 100 ms, 100 to 500 ms, 0.5 to 1 s, 1 to 3 s, 3 to 20 s and 20 to 60 s. The table contains a column for each range, the diagram a series of bars in the y-axis with bars of different colour.

If a change has occurred since the last readout, the relevant bar is shown in red.

When a column or line heading or cell in the table is clicked, the corresponding bar series in the x or y axis or the relevant individual bar is shown high-lighted.



When the cursor is placed on a bar in the diagram, the corresponding value is indicated in the diagram.



Clicking on  in the result window toolbar opens the "Open Result File" dialogue window to display result files previously saved again in the result window.

Clicking on  in the result window toolbar opens the "Save as" dialogue window to save the data displayed in a freely selected directory as XML file.

Clicking on  in the result window toolbar displays a printing preview, from which the contents of the result window can be printed with the standard printer specified.

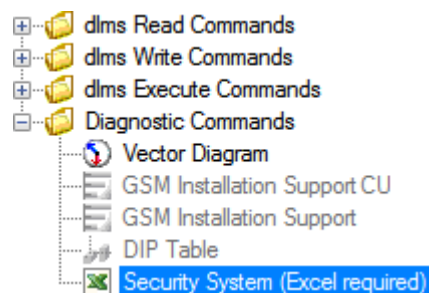
Clicking on  in the result window toolbar copies the content of the result window to the Windows clipboard, from where it can be inserted in another application (e.g. in a word processing program).

Deletion of the DIP table can be performed with the "Reset DIP Table" diagnostic command.

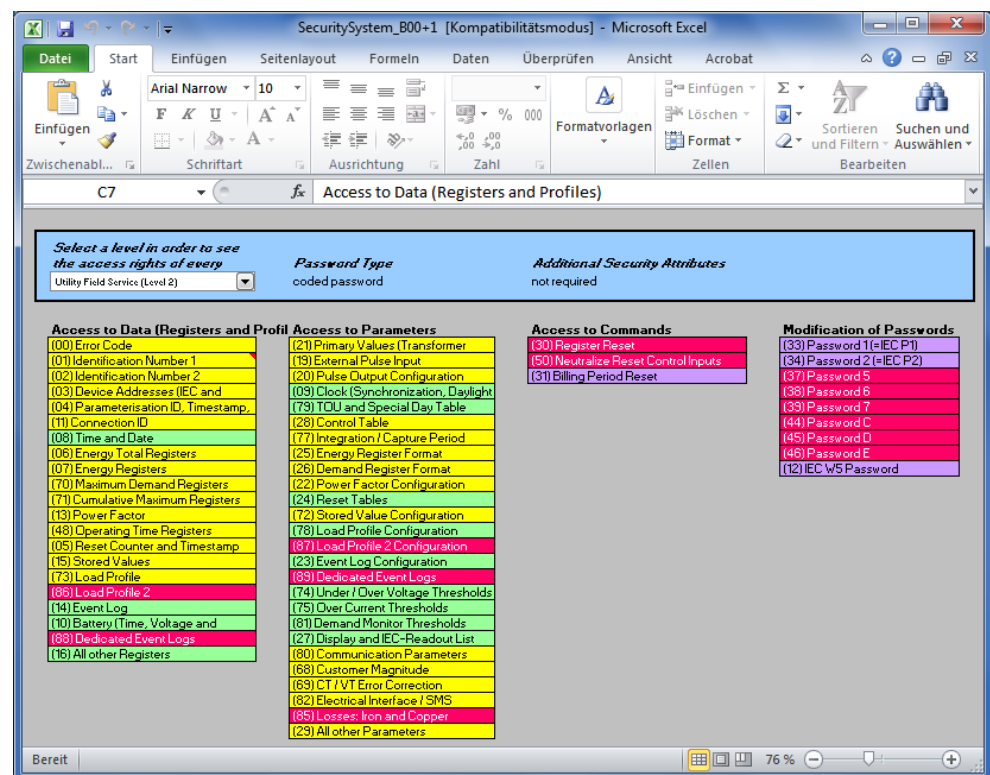
7.4.4 Security system

With this diagnostic command the device security system data can be displayed with the Excel table calculation program.

For execution, select the "Security System" diagnostic command in the command tree.



The security system data is read from the device connected and displayed as follows in the Excel table calculation program:



The desired security level can be selected in the drop down list at top left. The access rights for the level selected for individual data, parameters, commands and passwords are then displayed by means of colours according to the colour code.

8 Auxiliary functions

This section describes auxiliary functions of the Landis+Gyr .MAP110 Service Tool:

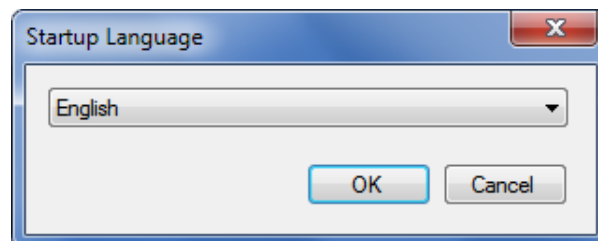
- Changing the language of the user interface
- Setting colour for disabled commands
- Selecting the calendar base for IEC commands
- Defining storage location of communication settings
- Defining storage policy for keys and passwords
- Setting delay times
- Activating command confirmation
- Enabling .MAP100 file export
- Displaying help topics
- Displaying release notes
- Displaying the current program release and checking for updates

8.1 Changing the language of the user interface

This function allows changing the language of the .MAP110 Service Tool user interface.

Procedure:

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



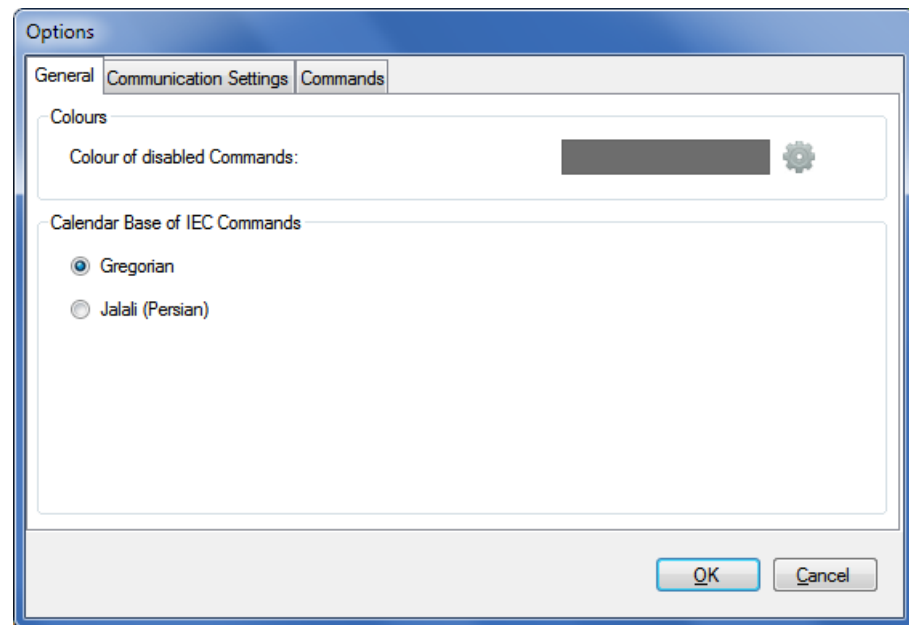
2. Select the desired language.
3. Click on **OK**.
The "Startup Language" window disappears.
The selected language will be used upon the next startup of the .MAP110 Service Tool.

8.2 Setting colour for disabled commands

The colour for emphasising disabled commands can be set individually with this setting (see also 5.4 "Command tree").

Procedure:

1. Select **Options** from the **Tools** menu.
The "Options" window appears.
2. Select the "General" tab.
The colour currently selected for disabled commands is shown.

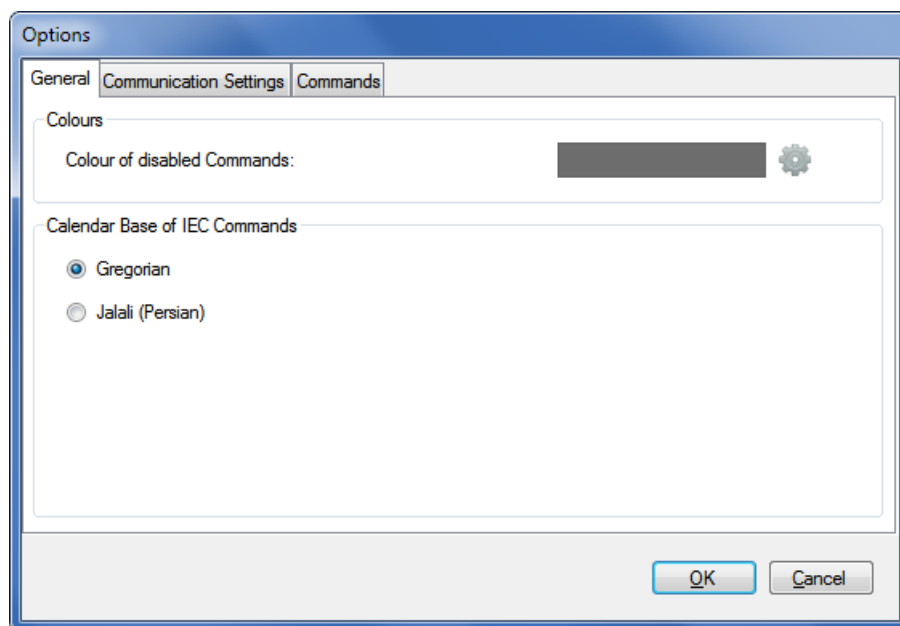


3. In the "Colours" area click on the button .
The "Colour" window appears with a colour palette.
4. Select the desired colour and click on **OK**.
The "Colour" window disappears and the selected colour is shown in the field "Colour of disabled Commands".
5. Click on **OK**.
The "Options" window disappears and the disabled commands are emphasised in the new colour in the command tree.

8.3 Selecting the calendar base for IEC commands

Procedure:

1. Select **Options** from the **Tools** menu.
The "Options" window appears.
2. Select the "General" tab.
3. Select the required calendar base in the "Calendar Base for IEC Commands" area.
The entry of date values occurs in the selected format for IEC commands.



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

8.4 Defining storage location of communication settings

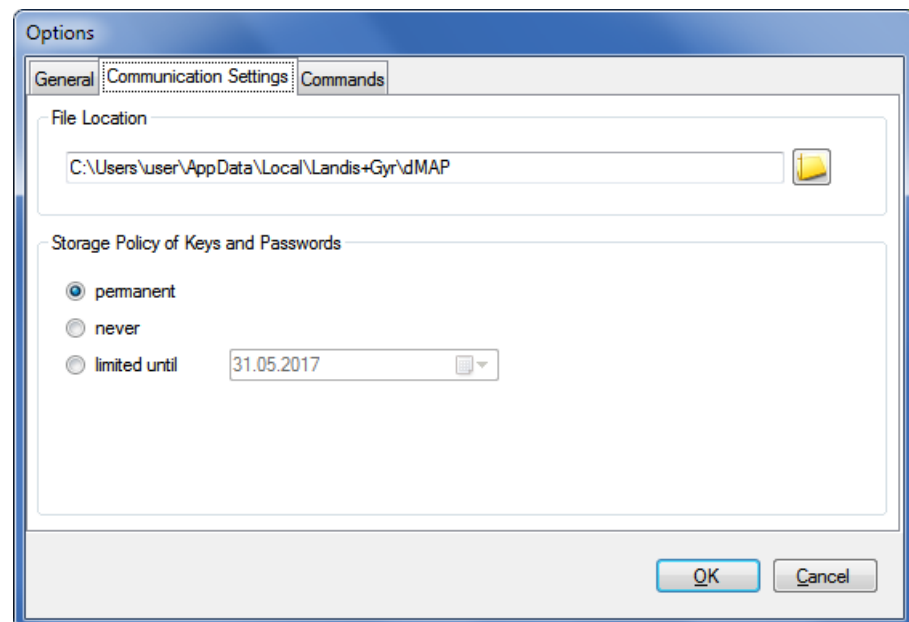
The path where communication settings are stored can be set with this setting.

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.
2. Select the "Communication Settings" tab.
3. In the "File Location" 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 "DeviceConnectionSettingsVxx.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".

8.5 Defining storage policy for keys and passwords

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

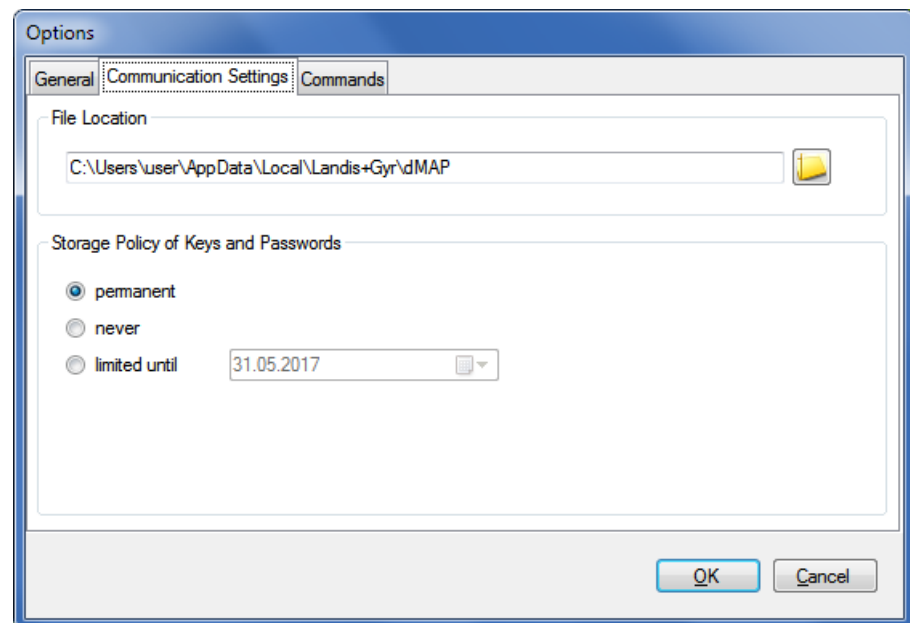


Data deletion with each modification

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.



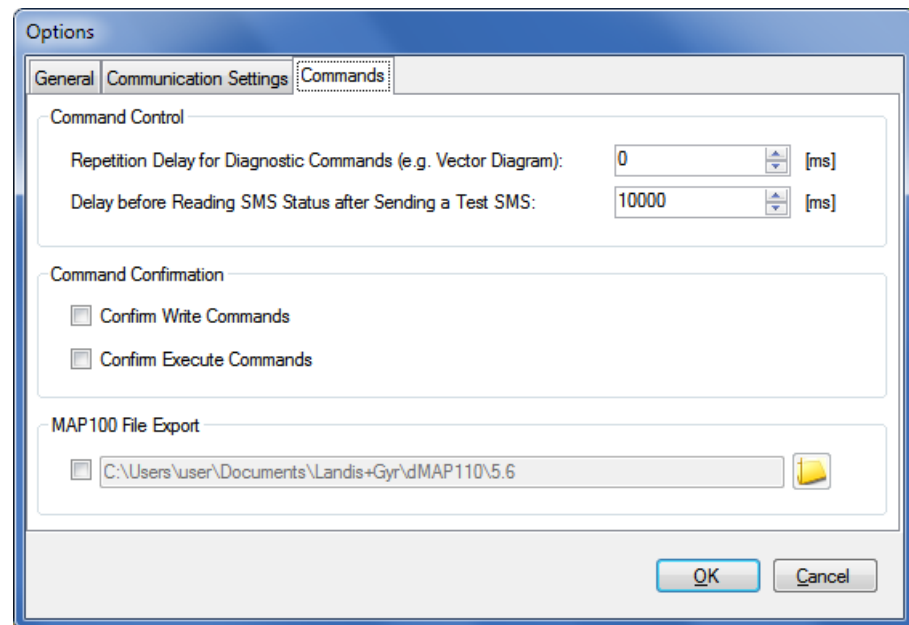
3. Select the desired storage policy.
permanent: The passwords and keys are permanently stored on the PC.
never: The passwords and keys are not stored, i.e. they will be lost when you exit the .MAP tool.
limited until: The passwords and keys are stored on the PC until the specified expiration date is reached on the PC, and then deleted.
4. Click on **OK**.
The "Options" window disappears and the new settings are saved.

8.6 Setting delay times

The repetition delay for diagnostic commands and the repetition delay before reading the status of sent test SMS messages can be set individually with this setting.

Procedure:

1. Select **Options** from the **Tools** menu.
The "Options" window appears.
2. Select the "Commands" tab.
3. Enter the desired delay times in the corresponding entry fields in the "Command Control" area.

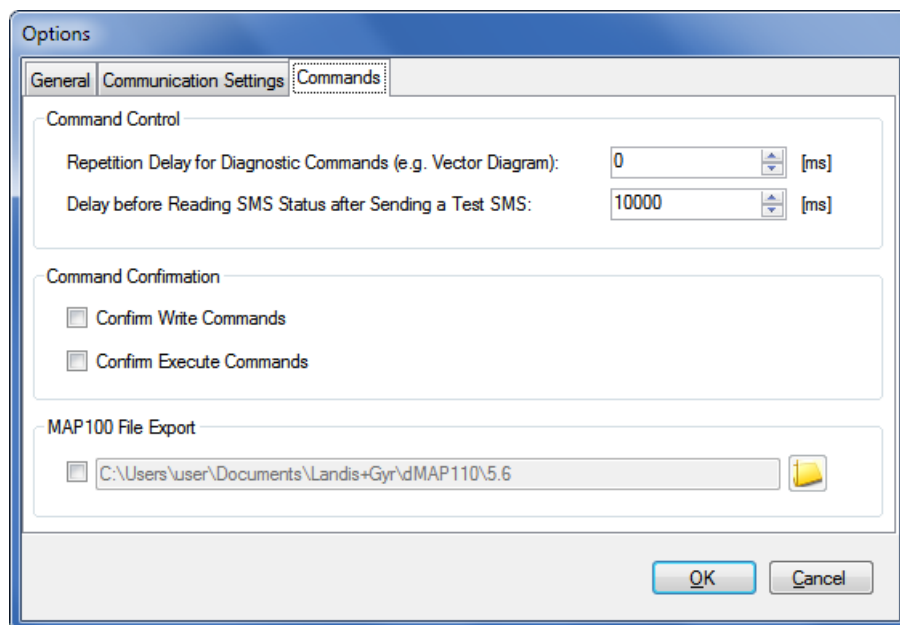


4. Click on **OK**.
The "Options" window disappears and the new settings are saved.

8.7 Activating command confirmation

Procedure:

1. Select **Options** from the **Tools** menu.
The "Options" window appears.
2. Select the "Commands" tab.
3. Set a tick in the checkboxes of the "Command Confirmation" area for the command(s) which shall be confirmed prior to execution.



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

8.8 Enabling .MAP100 file export

.MAP100 export files (scripts) for mass parameterisation of devices with the .MAP100 Download Tool can be generated and stored in a designated directory during execution of the following write commands (marked with  in the command tree):

- Parameterisation ID
- Passwords level 1, 2 and E
- Time of use (TOU)
- Billing period reset



Only version 3.0 supported

Note that only version 3.0 is supported, i.e. the data is exported in the V3.0 format.

The export file names have the following format: vvv_name_date_time.rep

where

vvv = Firmware release of the device

name = Designation of the write command

date = Generation date in the format YYYYMMDD (year, month, day)

time = Generation time in the format hhmmss (hour, minute, second)

rep = File extension for all .MAP100 files (repair)

Example of the file name for a TOU exported into a ZMD405CT with firmware release B30 on 26th February 2010 at 16:45 hours:

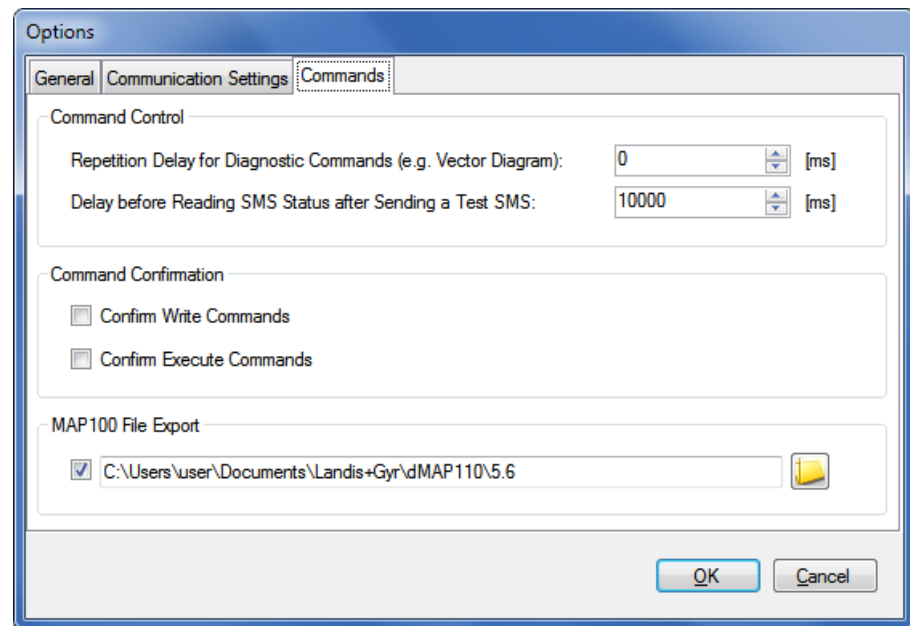
B30_TimeOfUseDS_20100226_164500.rep

The generation of .MAP100 files can be activated and the definition, where these files are saved, can be set with the following procedure.

To avoid unintentional creation of files, please make sure to disable the feature again after successful creation of the needed data files.

Procedure:

1. Select **Options** from the **Tools** menu.
The "Options" window appears.
2. Select the "Commands" tab.
3. Tick the checkbox "MAP100 file export" to activate or remove the tick to deactivate the function.
4. In the "MAP100 File Export" area click on  and select a directory in the tree appearing or enter the path to the desired directory.



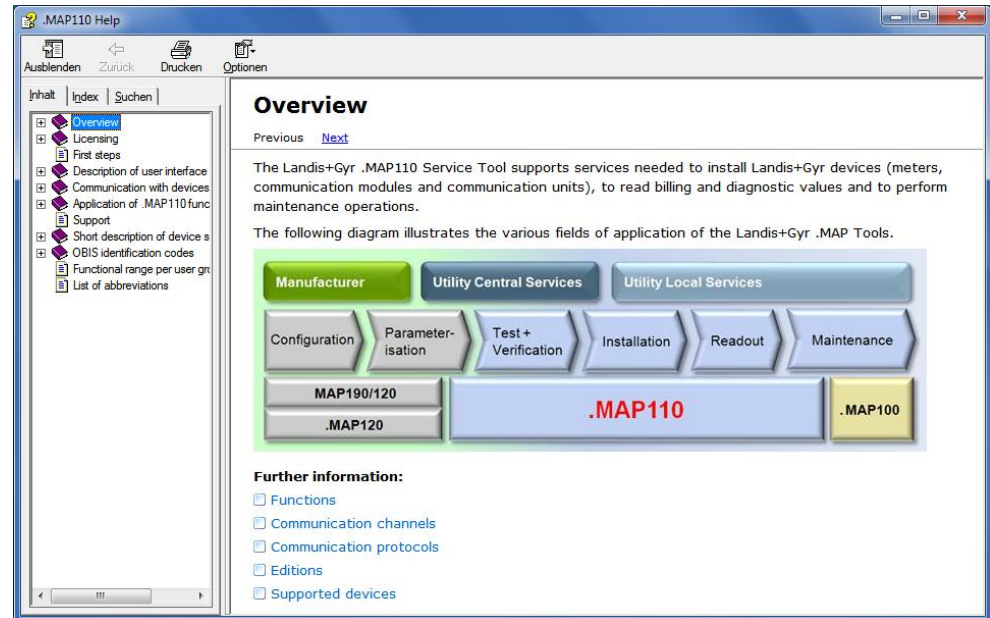
5. Click on **OK**.
The "Options" window disappears and the new settings are saved.

8.9 Displaying help topics

This function permits access to the help texts for the Landis+Gyr .MAP110 Service Tool. 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 .MAP110 Service Tool appears.



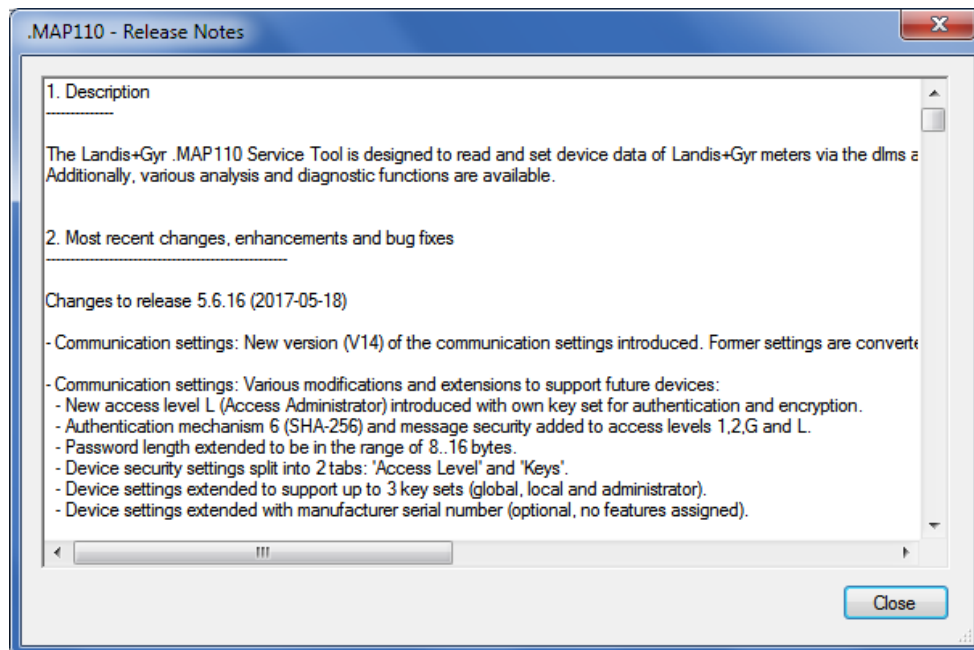
2. Find the desired information.
Since the help function is a standard Windows function, it will not be explained at this point. More details are found in the Windows manual belonging to your PC.
3. Click on  to close the online help.

8.10 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.

8.11 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 .MAP110 release is up to date.



Internet access required

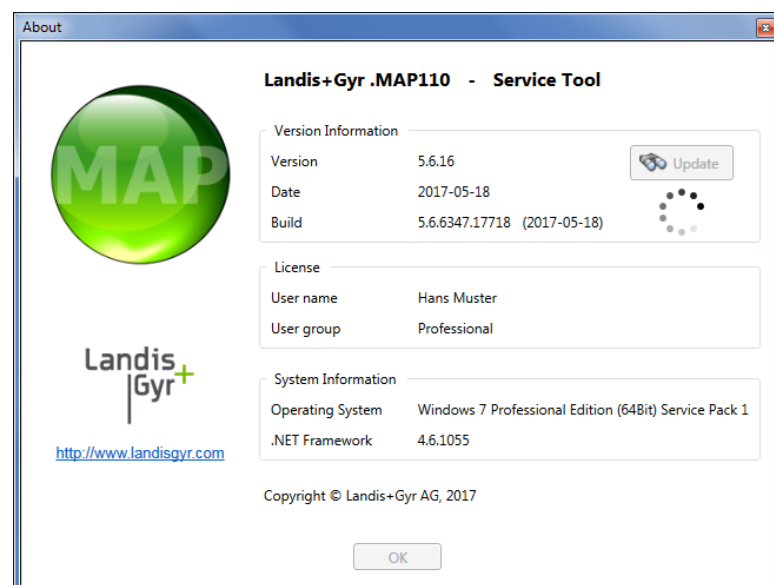
To perform a check for updates the PC must have access to the Internet, since the .MAP Home Page must be contacted for this.

Procedure:

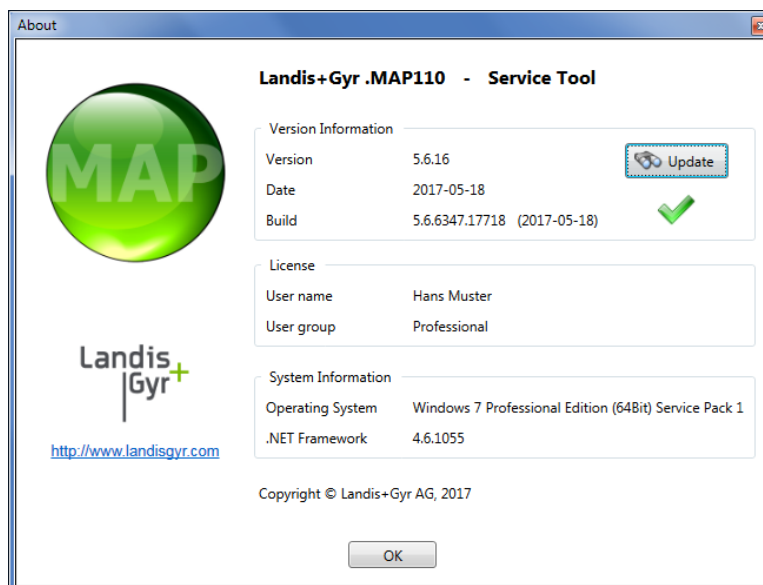
1. Select **About .MAP110** from the **Help** menu.
The "About" window appears. It contains information about the current version, the license and the operating system and .NET Framework installed on this computer.



2. Click on **Check for Update** if you want to check whether the installed .MAP110 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 .MAP110 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.

9 Support

The following is designed to help you take the right measure to tackle any problems you may experience when using the Landis+Gyr .MAP110 Service Tools.

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

- Consult the appropriate section of this manual.
- Invoke the help function as described in section 8.9 "Displaying help topics".
- Read the content of the Readme.txt file, supplied with the software.

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

10 Short description of device security system

10.1 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.

10.2 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.

10.3 Access levels

The Landis+Gyr devices feature up to 15 different access levels (level 0 to 9 and A to E) with different access rights each. For groups of registers and parameters, it can be defined which level is required to read and which level is required to write.

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.

10.4 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 or coded 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 pass- word	Service access of the distributor. Identical to level D. In addition, changing the access rights and the pass- word of the utility administrator is possible.

11 OBIS identification codes

11.1 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 .MAP110 Service Tool.

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 .MAP110 Service Tool.

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 import (+A)	$\sum Li$ 1	L1 21	L2 41	L3 61
export (-A)	$\sum Li$ 2	L1 22	L2 42	L3 62
Reactive power import (+R)	$\sum Li$ 3	L1 23	L2 43	L3 63
export (-R)	$\sum Li$ 4	L1 24	L2 44	L3 64
Quadrant I (+Ri)	$\sum Li$ 5	L1 25	L2 45	L3 65
Quadrant II (-Rc)	$\sum Li$ 6	L1 26	L2 46	L3 66
Quadrant III (-Ri)	$\sum Li$ 7	L1 27	L2 47	L3 67
Quadrant IV (+Rc)	$\sum Li$ 8	L1 28	L2 48	L3 68
Apparent power import (+VA)	$\sum Li$ 9	L1 29	L2 49	L3 69
export (-VA)	$\sum Li$ 10	L1 30	L2 50	L3 70
Current	$\sum Li$ 11	L1 31	L2 51	L3 71
Voltage	$\sum Li$ 12	L1 32	L2 52	L3 72
Power factor	$\sum Li$ 13	L1 33	L2 53	L3 73
Frequency	14	L1 34	L2 54	L3 74
Active power quadrant I+IV+II+III		L1 35	L2 55	L3 75
Active power quadrant I+IV-II-III		L1 36	L2 56	L3 76
Quadrant I		L1 37	L2 57	L3 77
Quadrant II		L1 38	L2 58	L3 78
Quadrant III		L1 39	L2 59	L3 79
Quadrant IV		L1 40	L2 60	L3 80
Phase angles	81			
Neutral current	91			
Neutral voltage	92			
Service information*	96			
Error message*	97			
Log data*	98			
Profile data*	99			

* In all data readouts the OBIS code is shown in .MAP110 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

Value	Application
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 .MAP110 Service Tool 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 .MAP110 Service Tool group F is not used and is therefore always set to 255.

11.2 Examples

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

OBIS code (decimal)	OBIS code (hex)	Description
	A B C D E F	
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
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

OBIS code (decimal)	OBIS code (hex)						Description
	A	B	C	D	E	F	
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
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

OBIS code (decimal)	OBIS code (hex)						Description
	A	B	C	D	E	F	
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
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)

OBIS code (decimal)	OBIS code (hex)						Description
	A	B	C	D	E	F	
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)

12 Functional range per user group

The following tables show the functions which can be performed for the different user groups (note right-hand columns for dlms and IEC).

Read commands

User Group								
Consumer (final customer)								
Field Inspection								
Reader								
Installation (field use)								
Engineering (laboratory use)								
Certification								
							Read Commands	
							dlms	IEC
•	•	•	•	•	•	•	Billing Values	•
•	•	•	•	•	•	•	Data Readout	•
		•	•	•	•	•	Short Data Readout	•
•	•	•	•	•	•	•	Prepayment Values	•
•	•	•	•	•	•	•	Instantaneous Values	•
		•	•	•	•	•	dlms Emergency Readout	•
		•	•	•	•	•	Emergency Readout	•
Clock								
•	•	•	•	•	•	•	Date and Time	•
•	•	•	•	•	•	•	DST Settings	•
•	•	•	•	•	•	•	Date, Time and DST Flag	•
•	•	•	•	•	•	•	Clock Base	•
•	•	•	•	•	•	•	0-0:1.0.0 Clock	•
Profiles								
•	•	•	•	•	•	•	Integration Period	•
•	•	•	•	•	•	•	Capture Periods	•
•	•	•	•	•	•	•	Load Profile 1	•
•	•	•	•	•	•	•	Load Profile 2	•
•	•	•	•	•	•	•	Stored Values/Billing Data Profile	•
•	•	•	•	•	•	•	Energy Profile	•
•	•	•	•	•	•	•	Daily Snapshot Profile	•
•	•	•	•	•	•	•	Received Signal Strength Profile	•
•	•	•	•	•	•	•	Received Signal Strength Profile CU	•
•	•	•	•	•	•	•	Mains Quality Profile	•
Event Logs								
		•	•	•	•	•	(Standard) Event Log	•
		•	•	•	•	•	Disconnect Control Log	•
•	•	•	•	•	•	•	Parameter Change Log	•
•	•	•	•	•	•	•	Legally Relevant Parameter Change Log	•
•	•	•	•	•	•	•	Firmware Update Log	•
•	•	•	•	•	•	•	Firmware Update Log CU	•

User Group								
Consumer (final customer)								
Field Inspection								
Reader								
Installation (field use)								
Engineering (laboratory use)								
Certification								
Read Commands							dlms	IEC
•	•	•	•	•	•	•	Watchdog Event Log	•
Communication Monitoring								
•	•	•	•	•	•	•	M-Bus Event Log	•
•	•	•	•	•	•	•	Remote Communication Log	•
•	•	•	•	•	•	•	Metering Point Access Log	•
Demand Monitoring								
•	•	•	•	•	•	•	Overcurrent Log	•
•	•	•	•	•	•	•	Current 10 Highest Maximum Demands Log	•
•	•	•	•	•	•	•	Last 10 Highest Maximum Demands Log	•
•	•	•	•	•	•	•	Before Last 10 Highest Maximum Demands Log	•
•	•	•	•	•	•	•	Demand Monitor 1 to 4 Log	•
Power Quality Monitoring								
	•	•	•	•	•	•	Power Quality Log	•
	•	•	•	•	•	•	Voltage Quality Log	•
•	•	•	•	•	•	•	Overvoltage Log	•
•	•	•	•	•	•	•	Undervoltage Log	•
•	•	•	•	•	•	•	Phase Failure Log	•
•	•	•	•	•	•	•	Power Failure Log	•
•	•	•	•	•	•	•	Current Voltage Quality Losses Log	•
•	•	•	•	•	•	•	Last Voltage Quality Losses Log	•
•	•	•	•	•	•	•	Before Last Voltage Quality Losses Log	•
Fraud Monitoring								
	•	•	•	•	•	•	Fraud Detection Log	•
	•	•	•	•	•	•	Strong DC Field Detection Log	•
	•	•	•	•	•	•	Front Cover Removal Log	•
	•	•	•	•	•	•	Terminal Cover Removal Log	•
	•	•	•	•	•	•	Phase Sequence Reversal Log	•
	•	•	•	•	•	•	Negative Active Energy Flow Log	•
	•	•	•	•	•	•	Current with Undervoltage Log	•
	•	•	•	•	•	•	Open/Shortened CT Log	•
	•	•	•	•	•	•	Undercurrent Log	•
	•	•	•	•	•	•	Overcurrent in Neutral Log	•
Prepayment								
•	•	•	•	•	•	•	Prepayment Event Log	•
•	•	•	•	•	•	•	Token Transfer Log	•

User Group								
Consumer (final customer)								
Field Inspection								
Reader								
Installation (field use)								
Engineering (laboratory use)								
Certification								
Read Commands							dIms	IEC
Energy Registers								
						Energy Total Registers		
						Energy Registers		
						Current Hour Registers		
Demand Registers								
						Last Average Demand Registers		
						Maximum Demand Registers		
Identification Numbers								
						COSEM Logical Device Name		
						COSEM Logical Device Name CU		
						0-0:42.0.0 - COSEM Logical Device Name		
						Firmware Version		
						Firmware Version CU		
						1-0:0.2.0 - Firmware Version		
						Extended Firmware Version		
						Extended Firmware Version CU		
						Identification Numbers 1.1 to 1.4		
						Device ID 1 to 5 (utility serial number 1 to 5, ID 2.1 to 2.5)		
						Device ID 6		
						Device ID 9 (STS device reference number)		
						Device ID 10 (manufacturer serial number module)		
						Connection ID		
						Parameterisation ID		
						Configuration ID		
						Remote Communication ID		
						Last Configuration Change ID		
Multi Utility								
						Multi Utility Registers		
						M-Bus Device n (n= 1 to 4)		
						Multi Utility Profile n		
						Identification Numbers M-Bus Device n		
						Status M-Bus Device n		
						Extended Configuration M-Bus Device n		

© Landis+Gyr D000011475 en y – .MAP110 – User Manual

User Group								
Consumer (final customer)								
Field Inspection								
Reader								
Installation (field use)								
Engineering (laboratory use)								
Certification								
Read Commands							dlms	IEC
			•	•	•	Active TOU ID and Activation Date	•	
Disconnectors								
•	•	•	•	•	•	Electricity Disconnector	•	•
•	•	•	•	•	•	M-Bus Disconnector 1 to 4	•	
Outputs								
•	•	•	•	•	•	Relay 1 and 2	•	
Fraud Detection								
	•	•	•	•	•	Terminal Cover Counter	•	
	•	•	•	•	•	Strong DC Field Counter	•	
	•	•	•	•	•	Antitampering Event Log	•	
Diagnostic Values								
		•	•	•	•	Operating Time Registers	•	
	•	•	•	•	•	Power Factor Registers	•	
		•	•	•	•	Power Factor Monitor Thresholds 1 and 2	•	
		•	•	•	•	Demand Monitor Thresholds	•	
		•	•	•	•	Battery Use Time 1 and 2	•	
		•	•	•	•	Battery Voltage	•	
•	•	•	•	•	•	Billing Period Counter	•	
•	•	•	•	•	•	Date and Time of Last Billing Period Reset	•	
•	•	•	•	•	•	Billing Period Reset Settings	•	•
•	•	•	•	•	•	Energy Snapshot Counter	•	
•	•	•	•	•	•	Date and Time of Last Energy Snapshot	•	
•	•	•	•	•	•	Energy Snapshot Settings	•	
			•	•	•	Date and Time of Last Parameterisation	•	
			•	•	•	Date and Time of Last Parameterisation of CU	•	
			•	•	•	Number of Parameterisations	•	
			•	•	•	Number of Parameterisations in CU	•	
			•	•	•	Date and Time of Last Calibration	•	
•	•	•	•	•	•	Pulse Output Constant		•
			•	•	•	Power Quality Functions	•	
			•	•	•	Maximum Demand Supervision	•	
			•	•	•	Current Supervision	•	
			•	•	•	Demand Supervision	•	
			•	•	•	Fuse Supervision	•	

User Group									
Consumer (final customer)									
Field Inspection									
Reader									
Installation (field use)									
Engineering (laboratory use)									
Certification									
</									

Write commands

User Group						
Consumer (final customer)						
Field Inspection						
Reader						
Installation (field use)						
Engineering (laboratory use)						
Verification						
					Write Commands	dlms IEC
					Clock	
			•	•	Date and Time	• •
			•	•	Set Date and Time to PC Time	•
			•	•	Clock Base	•
				•	DST Settings	•
			•	•	Date, Time and DST Flag	•
			•	•	Set Date and Time to PC Time	•
			•	•	Set Date and Time to PC Time (Jalaali)	•
			•	•	Day Counter and Season Number	•
					Profiles	
			•	•	Integration Period	•
				•	Caption Periods	•
					Identification Numbers	
			•	•	Identification Numbers 1.1 to 1.4	• •
			•	•	Device ID 1 to 5 (utility serial number 1 to 5, ID 2.1 to 2.5)	•
			•	•	Connection ID	•
			•	•	Customer ID	•
			•	•	Meter ID	•
			•	•	Manufacturer ID	•
			•	•	Parameterisation ID	• •
			•	•	Last Configuration Change ID	•
					Multi Utility	
	•	•	•	•	M-Bus Device n (n= 1 to 4)	•
		•	•	•	Utility Serial Number 2 M-Bus Device n	•
		•	•	•	Configuration M-Bus Device n	•
		•	•	•	Extended Configuration M-Bus Device n	•
		•	•	•	Encryption Key for M-Bus Device n	•
					Communication	
		•	•	•	Physical IEC Device Address	• •
		•	•	•	Physical HDLC Device Address	•
		•	•	•	Ethernet MAC Address	•
			•	•	CS/S0 Type	•
		•	•	•	Communication Input Settings	• •

User Group						
Consumer (final customer)						
Field Inspection						
Reader						
Installation (field use)						
Engineering (laboratory use)						
Verification						
				Write Commands	dlms	IEC
•	•	•		Optical Port Lock		•
	•	•	•	Optical Interface	•	•
	•	•	•	RS485 Interface	•	
	•	•	•	Electrical Interface 1 and 2	•	
	•	•	•	Electrical Interface		•
	•	•	•	Meter Interface	•	
	•	•	•	Wireless M-Bus Setup	•	
	•	•	•	SMS Configuration	•	
				Remote Communication		
	•	•	•	General Settings	•	
	•	•	•	GSM Modem Settings	•	
	•	•	•	GPRS Modem Settings	•	
	•	•	•	TCP/IP Settings	•	
	•	•	•	PLC Settings	•	
	•	•	•	GPRS Modem Setup	•	
	•	•	•	PPP Setup	•	
				Extended Communication (CU only)		
	•	•	•	General Communication Settings	•	
	•	•	•	Modem Settings CU	•	
	•	•	•	Modem initialisation Strings CU	•	
	•	•	•	TCP/IP Settings CU	•	
	•	•	•	ADP Settings	•	
	•	•	•	Received Signal Strength Profile Settings	•	
				Time of Use		
		•	•	Set Activation Time of Passive TOU	•	
		•	•	Time of Use (TOU)	•	•
		•	•	Extended Time of Use (TOU)	•	
				Tariff Control		
	•	•	•	Rate Control by Electrical Signal		•
	•	•	•	Rate Control by Electrical Signal (inverted)		•
	•	•	•	Rate Control by Command		•
	•	•	•	Rate Switching		•
				Prepayment		
		•	•	Set Activation Date of Passive Account	•	

User Group							
Consumer (final customer)							
Field Inspection							
Reader							
Installation (field use)							
Engineering (laboratory use)							
Verification							
Write Commands						dlms	IEC
Disconnectors							
					Electricity Disconnector		
					M-Bus Disconnector 1 to 4		
Outputs							
					Relay 1 and 2		
Diagnostic Values							
					Billing Period Reset Settings		
					Energy Snapshot Settings		
					Power Factor Monitor Thresholds 1 and 2		
					Demand Monitor Thresholds		
					Single Reset Settings		
					Pulse Output Constant		
					Pulse Output		
					Power Quality Functions		
					Maximum Demand Supervision		
					Current Supervision		
					Demand Supervision		
					Fuse Supervision		
					Smart Street Lighting		
Security							
					Password Data Collection (Level 1)		
					Password Utility Field Service (Level 2)		
					Password IEC W5		
					Password Extended Consumer (Level 5)		
					Password Management Access (Level G)		
					Password Remote Data Collection (Level 6)		
					Password Remote Service (Level 7)		
					Password User Defined (Level A)		
					Password Read Administrator (Level C)		
					Password Utility Administrator (Level D)		
					Password Distributor Service (Level E)		
					Password Level 1 Communication Unit		
					Password Level 2 Communication Unit		
					Password Level A Communication Unit		
					Global Message Security Policy		

User Group							
Consumer (final customer)							
Field Inspection							
Reader							
Installation (field use)							
Engineering (laboratory use)							
Verification							
Write Commands						dlms	IEC
				•	•	Encryption Key M-Bus Device 1 to 4	•
					•	Password Optical Interface	•
					•	Password Engineering Menu	•
				•	•	Password P1	•
				•	•	Password P2	•
				•	•	Encryption Key P2	•
Display							
				•	•	Operating Display List	•
				•	•	Standard Display List E350	•
				•	•	Service List E350	•
•	•	•	•	•	•	Consumer Message	•
Display and Readout Lists							
				•	•	Recall List	•
				•	•	Service List	•
				•	•	Readout List	•
				•	•	No Power Display List	•
				•	•	Register Resolution	•
				•	•	EDL21 Displays	•
Primary Data Adaptation							
			•	•	•	Primary Data Adaptation ZxQ	•
			•	•	•	Primary Data Adaptation ZxD400	•
			•	•	•	Primary Data Adaptation E570	•
Consumer Information Interface (CII)							
			•	•	•	Consumer Message Text	•
			•	•	•	In Home Display RF Address	•
			•	•	•	In Home Display Parameters AD-xG/xP	•
			•	•	•	In Home Display Parameters E450	•
			•	•	•	CII Message Security Policy	•

Execute commands

User Group						
Consumer (final customer)						
Field Inspection						
Reader						
Installation (field use)						
Engineering (laboratory use)						
Verification						
Execute Commands						
					dlms	IEC
	•	•	•	•	Billing Period Reset	• •
	•	•	•	•	Take Energy Snapshot	•
		•	•	•	Enable/Disable Testmode	• •
		•	•	•	Enable/Disable Transm. Contacts Testmode	•
		•	•	•	Activate Active Pulses on Right LED	•
		•	•	•	Activate Reactive Pulses on Right LED	•
		•	•	•	Activate 1 Hz Signal on Test Output	•
		•	•	•	Activate Pulse on Test Output at Tariff Switching	•
		•	•	•	Activate Pulse on Test Output at EOI (End of Interval)	•
			•	•	Enable/Disable Energy Registers in Display	•
		•	•	•	Neutralize Billing Period Reset Inputs (KA/KB)	• •
		•	•	•	Reset Meter Data	•
		•	•	•	Reset Alert	•
		•	•	•	Reset Alert LED	•
		•	•	•	Reset Alarm	•
		•	•	•	Reset DIP Table	•
		•	•	•	Activate Passive TOU Now	•
		•	•	•	Activate New Parameters	•
		•	•	•	Activate New Parameters in CU	•
Registers						
			•	•	Reset Billing Period Counter	• •
			•	•	Reset Energy Snapshot Counter	•
		•	•	•	Reset Battery Use Time 1 and 2	•
			•	•	Reset Battery Use Time	•
			•	•	Reset all Registers and Profiles	•
			•	•	Reset all Energy Registers	•
			•	•	Reset all Energy Total Registers	•
			•	•	Reset Energy and Demand Registers	•
			•	•	Reset Operating Time Registers	•
			•	•	Reset all Multi Utility Registers	•
			•	•	Reset Error Register	• •

User Group						
Consumer (final customer)						
Field Inspection						
Reader						
Installation (field use)						
Engineering (laboratory use)						
Verification						
					Execute Commands	dlms IEC
			•	•	Reset EDL21 Registers	•
			•	•	Reset Alarm Register	•
			•	•	Reset Diagnostic Registers	•
			•	•	Reset Event Counters	•
			•	•	Reset Event Counters in CU	•
		•	•	•	Reset all Over and Undervoltage Counters	•
		•	•	•	Reset all Over and Undercurrent Counters	•
			•	•	Reset Demand Registers	•
					Profiles	
			•	•	Reset Stored Values/Billing Data Profile	•
			•	•	Reset Stored Values Profile	•
			•	•	Reset Energy Profiles	•
			•	•	Reset Daily Snapshot Profile	•
			•	•	Reset Load Profile 1	•
			•	•	Reset Load Profile 2	•
			•	•	Reset Multi Utility Profiles	•
•		•	•	•	Reset Received Signal Strength Profile	•
•		•	•	•	Reset Received Signal Strength Profile in CU	•
		•	•	•	Reset Mains Quality Profile	•
			•	•	Reset all Profiles	•
					Event Logs	
			•	•	Reset (Standard) Event Log	• W5
•		•	•	•	Reset all Dedicated Event Logs	•
			•	•	Reset Disconnecter Control Log	•
•		•	•	•	Reset Parameter Change Log	•
					Demand Monitoring	
•		•	•	•	Reset Overcurrent Log	•
•		•	•	•	Reset Maximum Demand Logs (all 3)	•
•		•	•	•	Reset Demand Monitor 1 to 4 Log	•
					Power Quality Monitoring	
•		•	•	•	Reset Power Quality Log	•
•		•	•	•	Reset Overvoltage Log	•
•		•	•	•	Reset Undervoltage Log	•
•		•	•	•	Reset Phase Failure Log	•

User Group							
Consumer (final customer)							
Field Inspection							
Reader							
Installation (field use)							
Engineering (laboratory use)							
Verification							
					Execute Commands	dlms	IEC
•		•	•	•	Reset Voltage Quality Log	•	
•		•	•	•	Reset Power Failure Log	•	
•		•	•	•	Reset Voltage Quality Losses Logs (all 3)	•	
					Fraud Monitoring		
•		•	•	•	Reset Fraud Detection Log	•	
•		•	•	•	Reset Strong DC Field Detection Log	•	
•		•	•	•	Reset Front Cover Removal Log	•	
•		•	•	•	Reset Terminal Cover Removal Log	•	
•		•	•	•	Reset Phase Sequence Reversal Log	•	
•		•	•	•	Reset Negative Active Energy Flow Log	•	
•		•	•	•	Reset Current with Undervoltage Log	•	
•		•	•	•	Reset Open/Shortened CT Log	•	
•		•	•	•	Reset Undercurrent Log	•	
•		•	•	•	Reset Overcurrent in Neutral Log	•	
					Communication Monitoring		
•		•	•	•	Reset M-Bus Event Log	•	
•		•	•	•	Reset Remote Communication Event Log	•	
•		•	•	•	Reset Metering Point Access Log	•	
					Prepayment		
		•	•	•	Reset Prepayment Event Log	•	
		•	•	•	Reset Token Transfer Log	•	
					Multi Utility		
•	•	•	•	•	Enable Wireless M-Bus Installation Mode	•	
•	•	•	•	•	Disable Wireless M-Bus Installation Mode	•	
					M-Bus Device n (n = 1 to 4)		
		•	•	•	Install Wired M-Bus Device n	•	
		•	•	•	Install Wireless M-Bus Device n	•	
		•	•	•	Deinstall M-Bus Device n	•	
		•	•	•	Transfer Encryption Key to M-Bus Device n	•	
					Communication		
		•	•	•	SMS Test	•	
•	•	•	•	•	Enable/Disable Field Strength Indication	•	
•	•	•	•	•	Activate GPRS Communication	•	
•	•	•	•	•	Close Current GPRS Window	•	

User Group								
Consumer (final customer)								
Field Inspection								
Reader								
Installation (field use)								
Engineering (laboratory use)								
Verification								
Execute Commands							dlms	IEC
•	•	•	•	•	•	•	•	
	•	•	•	•	•	•	•	
	•	•	•	•	•	•	•	
Fraud Detection								
	•		•	•	•	•	•	
	•		•	•	•	•	•	
	•		•	•	•	•	•	
Prepayment								
•	•	•	•	•	•	•	•	
			•	•	•	•	•	
				•	•	•	•	
Consumer Information Interface (CII)								
			•	•	•	•	•	
			•	•	•	•	•	
			•	•	•	•	•	
Firmware Update								
					•	•	•	
					•	•	•	
					•	•	•	
					•	•	•	
					•	•	•	

Diagnostic commands

User Group							
Consumer (final customer)							
Field Inspection							
Reader							
Installation (field use)							
Engineering (laboratory use)							
Verification							
Diagnostic Commands						dlms	IEC
•	•	•	•	•	Vector Diagram	•	
•	•	•	•	•	GSM Installation Support CU	•	
•	•	•	•	•	GSM Installation Support	•	
	•	•	•	•	DIP Table	•	
		•	•	•	Security System *	•	
•	•	•	•	•	Wireless M-Bus Devices	•	

* MS Excel is required to perform this diagnostic function.

13 List of abbreviations

This section explains some abbreviations used in this user manual or on dialogue windows of the Landis+Gyr .MAP110 application in alphabetical order.

Please consult also the metering glossary published on the Landis+Gyr homepage www.landisgyr.eu under "Support" → "Metering Glossary".

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 Service Tool 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).

14 Index

.MAP	138	Device toolbar	20
Access authentication	113	Device type	43
Access level	30, 114	Diagnostic commands	94, 137
Access level data	61	DIP table	96
Access security	62	reset	98
Activating command confirmation	105	Direct connection	29
Address book import	55	dlms	138
Address data	51	dlms application layer	39
Address toolbar	19	dlms link layer	38
Addressing devices	66	EDIS	138
Application of .MAP110 functions	72	Edit command log window content	25
Application of access levels	114	Editions	9
Application toolbar	19	Emergency readout	77
Auxiliary functions	99	Emphasising commands available in the	
Basic principles for communication	29	command tree	23
Bit assignment in profile status word	76	Enabling MAP100 file export	106
Calendar base setting	101	Entering license data	13
Changing		Establishing communication	66
the language of the user interface	99	Ethernet connection	70
the license	14	Evaluation window	28
Check for update	110	Event types	76
Client toolbar	19	Examples of OBIS identification codes	119
Command confirmation setting	105	Execute commands	85, 133
Command execution	23	Firmware update AD-xG	87
Command log window	25	Firmware update E450, E570 and E35C 4.x	
Command tree	21		90
Command tree toolbar	21	SMS test transmission	86
Communication channel	29	Export result window content	24
Communication channel data	33	Fields of application of .MAP tools	8
Communication channel toolbar	20	File locations setting	102
Communication channels	8	Firmware update AD-xG	87
Communication examples	67	Firmware update E450, E570 and E35C 4.x	90
Communication log window	26	First installation	10
Communication protocols	9	First steps	15
Communication settings	31	Folder handling	22
Communication solutions	71	Functional range	
Conditions for the use of this user manual	4	for dlms devices	123
Conventions	4	for IEC devices	123
Copy		per user group	123
command log window content	25, 28	Functions of the .MAP110	8
result window	98	Further documents	71
vector diagrams	95	GSM installation support	95
Current version of the program	110	HDLC	138
Defining file locations	102	IEC	40, 138
Defining IP addresses	53	Import address book	55
Defining phone numbers	51	Importing passwords and keys	48
Defining storage policy for keys and passwords		Improper data access	113
.....	103	Installation	10
Delay times settings	104	IP address definition	53
Delete command log window	25	IP address selection	19
Delete communication log window	28	Key import	48
Device	30	Keys	113
Device address	44, 66	Language	10, 99
Device data	42	Licence data	13
Device security	45, 46	License key entry	13
Device security system	113	Licensing concept	12

Links between devices and communication channels.....	57	Read-me file.....	109
List of abbreviations.....	138	Release notes	109
Loading TOU	82	Reset DIP table	98
Local connection	29	Result window	24
Menu bar	19	Save	
Message security	64, 114	command log window content. 24, 25, 27, 97	
Modem connection	30, 69	communication log window content	27
Modify		result window content	24, 95, 97
communication unit settings.....	81	TOU.....	82
primary value adaptation.....	84	Screen areas.....	18
SMS configuration settings	80	Security attributes	113
Time of Use	82	Security switches	113
Multiple connection.....	68	Security system.....	98, 113
Network connection.....	30	Selecting the calendar base for IEC commands	
via a LAN	70		101
Network connection via a WLAN and the Internet.....	71	Serial connection to a local bus.....	68
OBIS identification codes	117	Serial connection via the optical interface	67
Object identification system OBIS.....	117	Set communication inputs	79
Online help	108	Setting colour for disabled commands.....	100
Parameter overwriting protection	113	Setting delay times.....	104
Password import.....	48	Simple read commands.....	72
Passwords.....	113	SMS test transmission.....	86
Phone number definition.....	51	Status bar.....	28
Phone number selection.....	19	Support	112
Physical device address	66	Supported devices	9
Physical layer	35	System requirements	10
Print		Target group of this user manual.....	4
result window	98	Toolbars.....	19
vector diagrams	95	Tree items	22
Problem solving.....	112	Tree view	22
Profile status word.....	76	UnInstallation	11
Program version	110	Upgrades	10
PSTN	138	User groups	9
Purpose of this user manual	4	User interface.....	18
Read commands	72, 123	VDEW	138
for current device data	73	Vector diagram.....	94
for emergency readout.....	77	Write commands	78, 129
for load profiles	74	Modify communication unit settings	81
simple	72	Modify primary value adaptation	84
Reading head	29	Modify SMS configuration settings.....	80
		Modify Time of Use.....	82
		Set communication inputs.....	79

Contact:

Landis+Gyr AG
Theilerstrasse 1
CH-6301 Zug
Switzerland
Phone: +41 41 935 6000
www.landisgyr.com

