

# .MAP110

User Manual



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# **Revision history**

Version	Date	Comments
а	28.02.2005	First edition
b	31.05.2005	Changes to release 1.1
с	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	<ul> <li>Sections 1 "Overview" and 2 "Installation" updated.</li> <li>All communication surveys new with photos. All communication screenshots adapted to changed software.</li> <li>Designation "meter" generally replaced with "device".</li> <li>Section 5.8 "Command Tree" expanded with user command tree.</li> <li>Section 7.2.5 "Generating Export Files for MAP100" new.</li> <li>Section 7.3.2 "Firmware Update AD-xP/xG" new.</li> <li>Section 7.5.6 "Setting MAP100 File Export" new.</li> <li>Section 7.5.7 "Checking for Updates" new.</li> <li>Section 10 "Short Description of Device Security System" updated</li> <li>Several minor changes (text, layout, screenshots, index).</li> </ul>
k	20.12.2010	Changes to .MAP110 release 4.0
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n	30.05.2011	Changes to .MAP110 release 4.1
р	02.11.2011	Changes to .MAP110 release 4.2
q	02.03.2012	Changes to .MAP110 release 4.3
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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.
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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).

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.
У	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 communica- tion settings, extended access levels, new level authentification using SHA-256, several minor changes (text, screenshots), table "functional range per user group" updated.
Z	18.07.2019	Changes to .MAP110 release 6.1 (see also read-me file); adaptation to changed communi- cation user interfaces. Section 12 "Functional range per user group" removed.
z1	13.01.2020	Changes to .MAP110 release 6.2 (see also read-me file); adaptation to changed communi- cation user interfaces. New screenshots with Windows 10 operating system.

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# Introduction

Scope	The present user manual is designed for the Landis+Gyr .MAP110 Service Tool <b>Version 6.2</b> 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 personn of energy supply companies responsible for service tasks (installation, readout and maintenance) for Landis+Gyr devices.		
Conditions	tem. To unde its terms, as to be familia the Landis+G	Gyr .MAP110 Service Tool runs on PCs with Windows operating sys- erstand this user manual, you need basic knowledge of Windows and well as a general idea of how to operate a PC. Furthermore, you need r with the functional principles of the various devices supported by Gyr .MAP110 Service Tool, which are described in the corresponding s and functional specifications.	
Conventions	The followin	g conventions are used in this manual:	
	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	Ov	/erview	. 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	Ins	stallation and uninstallation	10
	2.1	Installation	10
	2.2	Uninstallation	11
	2.3	Required setting when operating .MAP110 on high resolution displays	11
3	Lic	censing	
-	3.1	Licensing concept	
	3.2	Entering license data	
	3.3	Changing the license	
4		rst steps	
5		escription of user interface	
Э	5.1	Overview	
	5.1	Menu bar	
	5.2 5.3	Toolbars	
	5.5 5.3		
	5.3		
	5.3		
	5.3		
	5.3		
	5.4	Command tree	23
	5.5	Result window	27
	5.6	Command log	28
	5.7	Communication log	29
	5.8	Status bar	30
	5.9	Evaluation window	31
6	Со	ommunication with the devices	32
	6.1	Basic principle	32
	6.1		
	6.1		
	6.1		
	6.2	Communication settings	
	6.2 6.2		
		6.2.2.1 Physical Layer	
		6.2.2.2 dlms Link Layer	
		6.2.2.3 dlms Application Layer	
		6.2.2.4 IEC	
		6.2.2.5 Terminating the communication channel definition	
		2.3 Device data	
		6.2.3.1 Type	
	(	6.2.3.2 Address	49

	6	5.2.3.4	Importing keys	. 55
	6	5.2.3.5	Terminating the device data definition	. 62
	6.2	.4 Addres	s data	. 63
	6	5.2.4.1	Phone numbers	. 63
	6	5.2.4.2	IP addresses	. 65
	6	5.2.4.3	Importing address book	. 67
	6.2	.5 Links b	etween devices and communication channels	. 69
	6	5.2.5.1	Defining link between device and communication channel	. 70
	6	5.2.5.2	Terminating the link definition	
	6.3	Addressing	devices	. 73
	6.4	•	g the communication with devices	
			ation examples	
	6.5 6.5		onnection via the optical interface	
	6.5		onnection to a local bus	
	6.5		n connection	
			r connection via a LAN	
	6.5		k connection via a WLAN and the Internet	
	6.5			
	6.6	Reference	to other documents	. 78
7	Cor	nmands		. 79
	7.1	Read comn	nands	. 79
	7.1	.1 Simple	read commands	. 79
	7.1	•	ed read commands	
	7.1		ommands for profiles	
	7.1		ency readout	
	7.2	•	nands	
	7.2		nmunication inputs	
	7.2		SMS configuration settings	
	7.2	,	communication unit settings	
	7.2	•	time of use	
	7.2	•	values adaptation	
	7.3		mmands	
	7.3		st transmission	
	7.3		re update	
			•	
	7.4	•	commands	
	7.4		diagram	
	7.4		stallation support	
	7.4		le	
	7.4		y system	
8	Aux	kiliary funct	ions	104
	8.1	Changing t	he language of the user interface	104
	8.2	Setting cold	our for disabled commands	105
	8.3	-	ne calendar base for IEC commands	
	8.4	-	orage location of communication settings	
		•		
	8.5	-	orage policy for keys and passwords	
	8.6	•	ay times	
	8.7	-	command confirmation	
	8.8	Enabling .N	1AP100 file export	111
	8.9	Defining th	e key management system	113
	8.10	Displaying	help topics	117
	8.11		release notes	
	~·	5.040.0108		

6.2.3.3

	8.1	L2	Displaying the current program release and checking for updates	119
9	9	Sup	oport	121
1(	)	Sho	ort description of device security system	122
	10	.1	Introduction	122
	10	.2	Security attributes	122
	10	.3	Access levels	123
	10	.4	Access levels and their application	123
1:	L	ОВ	IS identification codes	126
	11.	.1	General description	126
	11.	.2	Examples	128
12	2	List	t of abbreviations	132
13	3	Ind	ex	133

## 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.

Manufacturer		y Central Services	Utility Loca	al Services		
Configuration	Parameter- isation	Test + Verification	nstallation	Readout	Ma	intenance
MAP190/120		N	<b>IAP110</b>			.MAP100
.MAP120						

#### 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").

#### **1.6 Supported devices**

Please refer to the read-me file (see section 8.11 "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 <u>www.landisgyr.eu</u> . 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 installa- tion file "Setup.exe" and follow the instructions of the setup wizard.
	When <b>upgrading a former release 6.2</b> to the latest release 6.2, the former release will be automatically replaced by the newer one. All data including the license and the communication settings is kept.
	When <b>upgrading a former release 4.x, 5.x, 6.0 or 6.1</b> to the latest release 6.2, 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 fullscreen optimizations" checkbox is ticked in the "Compatibility" tab:

🛷 Landis+Gyr .MA	AP 110 - 6.2 Propertie	s	×			
Security	Details	Previous Versi	ons			
General	General Shortcut Compatibility					
try running the comp Run compatibility	working correctly on thi patibility troubleshooter v troubleshooter ompatibility settings man		)WS,			
Compatibility mode	•					
Run this progra	am in compatibility mod	e for:				
Windows 8		$\sim$				
Reduced color	r mode					
	8-bit (256) color 🛛 🗸					
Run in 640 x 4	80 screen resolution					
Disable fullscre	een optimizations					
Run this progra	am as an administrator					
Change high	Change high DPI settings					
Change settir	ngs for all users					
	ОК	Cancel	Apply			

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

Landis+ Gyr .MAP 110 - 6.2 Properties ×
Choose the high DPI settings for this program.
Program DPI Use this setting to fix scaling problems for this program instead of the one in Settings Open Advanced scaling settings
A program might look blurry if the DPI for your main display changes after you sign in to Windows. Windows can try to fix this scaling problem for this program by using the DPI that's set for your main display when you open this program.
Use the DPI that's set for my main display when
I signed in to Windows $$
Learn more
High DPI scaling override
Override high DPI scaling behavior. Scaling performed by:
Application ~
OK Cancel

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.

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.

# $(\mathbf{\hat{l}})$

#### 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.
- Right click on the Landis+Gyr .MAP110 6.2 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.

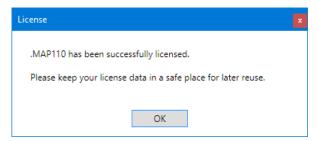
User Name:	Demo User
User Group:	Demo
License Key:	

- 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.

License	
User Name:	Henry Miller
User Group:	Standard $\checkmark$
License Key:	6034-22FC-C860-2293
	OK Cancel

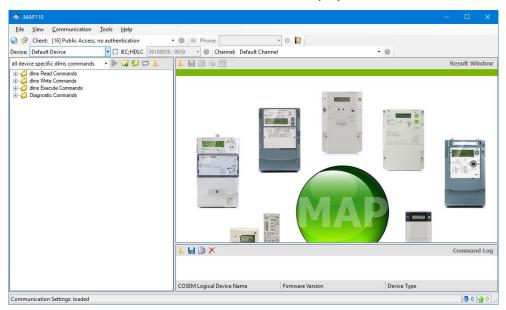
7. Click on OK.

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.

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#### Keep the license key in a safe place

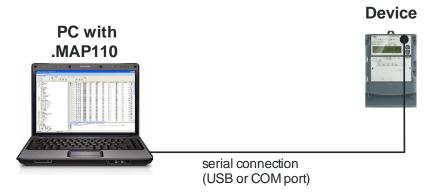
Please note that due to security reasons the license key is not shown anymore if the "License" window is reopened. Keep the license key in a safe place for further use.

#### 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

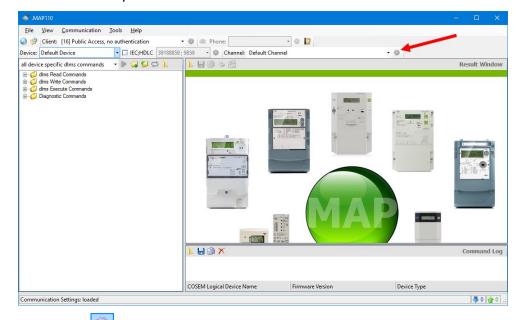
This section gives an introductory example of how a communication connection is made to a device with the Landis+Gyr .MAP110 Service Tool and how data can be read from the device.



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.
- Click on Start and then under All programs in the Landis+Gyr program group select the Landis+Gyr .MAP110 - 6.2 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.

Communication	Channel						×
Name Default C	hannel						
Interface							
Interface Type			Serial	(optica	al head or 3-wire)		v
Physical Interfa	ce		COM1				Ŷ
Template for Lo	wer Layer Settings		select	templa	ate	Ŷ	Apply
Physical Layer	dlms Link Layer	dlms Application	Laver	IEC	]		
<ul> <li>Serial Interfact</li> </ul>			,				
Transmission S			300		✓ bps		
Port Settings	,peeu			3 data	bits / no parity)		Ŷ
Idle time aft	er connection		0		ms		
						OK	<u>C</u> ancel

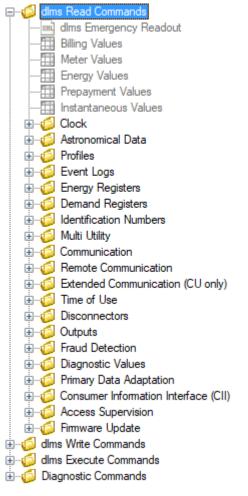
- In the "Interface type" drop down list select the "Serial (optical head or 3-wire)", "Bluetooth optical head (PMR\_1)" or "Bluetooth optical head (PMR\_1A)" type depending on the optical reading head used.
- 5. In the "Physical interface" drop down list select the serial interface to which the optical reading head is connected.
- 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.
- 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 

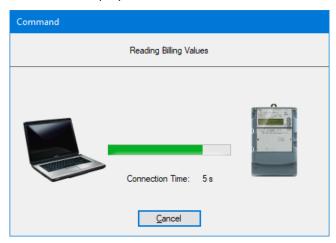
   The available commands for the selected device type are displayed:

D000011475 en z1 – .MAP110 – User Manual



- 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.

Eile <u>V</u> iew <u>C</u> ommunication <u>T</u> ools <u>H</u> elp See Client: [16] Public Access, no authentication	• 🏶 🕾 Phone:	- 4			
evice: Default Device - 🗖 IEC;HDLC 3918	8859;9859 🔹 🏟 C	hannel: Default Channel		- 0	
ll device specific dlms commands 🛛 🝷 🍃 🤪 😂 📜	1. 🔒 🗎 🗞	8			Billing V
	OBIS	Value	Unit	Designation	Group
Biling Values	0-0:42.0.0	LGZ1030739188859		COSEM logical device name	Identification Numbers
Meter Values	0-0:97.97.0	0000001		Error code	Diagnostics
Energy Values	0-0:97.98.0	)		Alarm code 1	Diagnostics
Instantaneous Values	0-0:97.98.1			Alarm code 2	Diagnostics
🗄 🕼 Clock	0-0:97.98.2	2		Alarm code 3	Diagnostics
Profiles	0-0:1.0.0	2018-09-15 16:30:02 (81)		Clock	Clock
Event Logs	0-0:96.1.0	39188859		Device ID 1 (manufacturer serial number)	Identification Numbers
Georgy Registers	0-0:96.1.1	39188859		Device ID 2 (utility serial number 2)	Identification Numbers
	0-0:96.1.2	123456		Device ID 3 (utility serial number 3)	Identification Numbers
Multi Utilty	0-0:96.1.3			Device ID 4 (utility serial number 4)	Identification Numbers
	0-0:96.1.4			Device ID 5 (utility serial number 5)	Identification Numbers
Time of Use	0-0:96.1.5	Device ID 6		Device ID 6 (IDIS certificate number)	Identification Numbers
	1-1:1.8.0	22.956	kWh	Active energy import +A (QI+QIV)	Energy
	1-1:280	29.460	k₩h	Active energy export -A (QII+QIII)	Energy
Garage State     Jiagnostic Values	1-1:3.8.0	11.144	kvarh	Reactive energy import +R (QI+QII)	Energy
Consumer Information Interface (CII)	1-1:4.8.0	9.064	kvarh	Reactive energy export -R (QIII+QIV)	Energy
Access Supervision	1-1:1.8.1	18.344	k₩h	Active energy import +A (QI+QIV) rate 1	Energy
🗄 🧔 Firmware Update	1-1-1.82	4 612	k\∕/h	Active energy import +A (QI+QIV) rate 2	Energy
Image: A state of the state	1-1:1.8.3	0.000	k\//h	Active energy import +A (QI+QIV) rate 3	Energy
dims Execute Commands	1-1:1.8.4	0.000	k\//h	Active energy import +A (QI+QIV) rate 4	Energy
Diagnostic Commands	1-1:2.8.1	28.391	kWh	Active energy export -A (QII+QIII) rate 1	Energy
	LGZ103073	9188859 (V931010) co illing Values	nnected		Comman
	LGZ10307391888	59 V9	31010	ZMXi320CQU	IOL1D3.31 S4

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.

	-				2	
	,			-	illing Valu	ies
	OBIS	Value	Unit	Designation	Group	,
	0-0:42.0.0	LGZ1030739188859		COSEM logical device name	Identifica	at
	0-0:97.97.0	0000001		Error code	Diagnos	ti
	0-0:97.98.0	•		Alarm code 1	Diagnos	ti
	0-0:97.98.1	4		Alarm code 2	Diagnos	ti
	0-0:97.98.2			Alarm code 3	Diagnos	ti
	0-0:1.0.0	2018-09-15 16:36:22 (81)		Clock	Clock	
	0-0:96.1.0	39188859		Device ID 1 (manufacturer serial number)	Identifica	at
	0-0:96.1.1	39188859		Device ID 2 (utility serial number 2)	Identifica	at
	0-0:96.1.2	123456		Device ID 3 (utility serial number 3)	Identifica	at
	0-0:96.1.3			Device ID 4 (utility serial number 4)	Identifica	at
	0-0:96.1.4			Device ID 5 (utility serial number 5)	Identifica	at
	0-0:96.1.5	Device ID 6		Device ID 6 (IDIS certificate number)	Identifica	at
	1-1-180	22.956	k\//h		Energy	-
		29.460	k\//h			
		11 144				
	1 1.0.0.0	11.144	NY GITT	Redetive energy import in (driven)		-
1	H 🗎 🗡			Co	mmand L	.0
	LGZ10307391	88859 (V931010) cor	nected	•		
				5		
		-		-		
LG	Z1030739188859	V931010		ZMXi320CQU0L1D3.31 S4	4	
				,		-
•				Commun	lication L	0
=1 Dest	Adr=32 SendF	rSize=0 RecFrSize=0 H	oll=Tru			
				6		
				_		
						>
		(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		Phone:     Phone	Phone         Phone           39188559;9859         Channel: USB - Optical Head - 9600         Bit           0011         0015         Value         Unit         Designation           0012         0015         Value         Unit         Designation           0013         0015         Value         Unit         Designation           0013         0013739188859         COSEM logical device name         0013739188859           0013         0013739188259         COSEM logical device name         0013739188259           0013         0018239         Alarm code 1         001411           00100         2018-09-15 16:36:22 (81)         Clock           00100         2018-09-15 16:36:22 (81)         Clock         Clock           001010         2018-09-15 16:36:22 (81)         Clock         Clock           00101         21456         Device ID 2 (utility serial number 4)         Device 1D 4 (utility serial number 4)           00112:80         29460         KVh         Active en	Command L      C

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

Q 😵

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

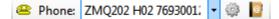
Client:	[0] Public Access, no authentication	Ŧ	\$	
---------	--------------------------------------	---	----	--

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 6.2.3.3 "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 either 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.

🗠 IP Address: E35C Ethernet Module 🔻 🌼 🔯

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 [1] in the address toolbar displays the address book (see section 6.2.4 "Address data").

#### 5.3.4 Device toolbar

Device:	ZMX310G	-	IEC;HDLC	12129973 ; 10973	•	\$
---------	---------	---	----------	------------------	---	----

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.

Device: ZMX310G	-		IEC;HDLC	12129973 ;	10973	-	
-----------------	---	--	----------	------------	-------	---	--

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

#### 5.3.5 Communication channel toolbar

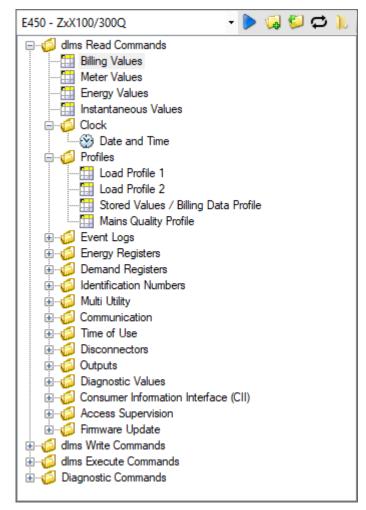
(	Channel:	USB - Optical Head - COM3 - 9600	Ŧ	\$	l
---	----------	----------------------------------	---	----	---

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
- ぢ 🛛 Collapses all folders of the tree
- Continuously executes the selected command
- Loads data from file into the evaluation window

# 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:

E450 - ZxX100/300Q	
all generic dlms commands	
all device specific dlms commands	
all generic IEC commands	
all device specific IEC commands	
E850 - ZxQ200	
E650/S650 - ZxD300/400	
E570 - ZxY400G	
E570 - ZxY400P	
E570 - ZxY400Q	
E550 - ZxG300/400	
E460 - MxA100/300	
E450 - ZMX300G	
E450 - ZxX100/300P	
E450 - ZxX100/300Q	
E350 - ZxF100	
E230 - ZxR100xC	
E230 - ZxR100xR	
E65C - CU A/B/M/G/D/E/P/U/Lx	
E35C - AD-xP/xG	
E35C - AD-xU	
E35C - AD-xE	
ZxD100AR	
ZxD100AP	
L540 - QOA41	

#### **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:

- 6 Folders
- Read commands for values (device values, profiles, etc.)
- Read or write commands for date and time
- 2 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  $\boxdot$ .

Use the buttons or boost 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 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.

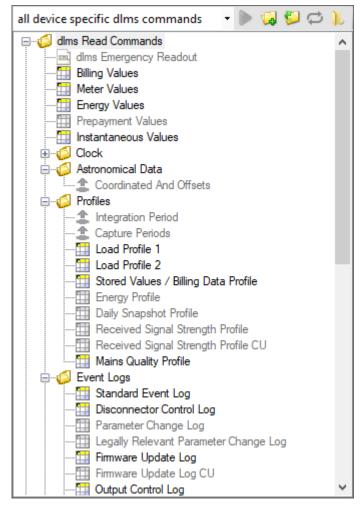
**Command execution** A command can be executed in various ways:

- 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.

Continuous Command execution	To continuously execute a marked command, click on 🔁.
Loading tree from file	To load data from a file into the evaluation window, click on 1 and then select the file in the "Open" dialog which appears.

#### 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.

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.

	OBIS	Value	Unit	Designation	Group	
•	0-0:42.0.0	LGZ1030739188859	Unit	COSEM logical device name	Identification Numbers	-
·	0-0:97.97.0	0000001		Error code	Diagnostics	
	0-0:97.98.0			Alarm code 1	Diagnostics	
	0-0:97.98.1			Alarm code 2	Diagnostics	
	0-0:97.98.2			Alarm code 3	Diagnostics	
	0-0:1.0.0	2018-09-15 19:38:37 (81)		Clock	Clock	-
	0-0:96.1.0	39188859		Device ID 1 (manufacturer serial number)	Identification Numbers	
	0-0:96.1.1	39188859		Device ID 2 (utility serial number 2)	Identification Numbers	
	0-0:96.1.2	123456		Device ID 3 (utility serial number 3)	Identification Numbers	
	0-0:96.1.3			Device ID 4 (utility serial number 4)	Identification Numbers	
	0-0:96.1.4			Device ID 5 (utility serial number 5)	Identification Numbers	
	0-0:96.1.5	Device ID 6		Device ID 6 (IDIS certificate number)	Identification Numbers	
	1-1:1.8.0	22.956	k\//h	Active energy import +A (QI+QIV)	Energy	
	1-1:2.8.0	29.460	k\//h	Active energy export -A (QII+QIII)	Energy	
	1-1:3.8.0	11.144	kvarh	Reactive energy import +R (QI+QII)	Energy	1

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.

). 🖶 🗎 🗡			Command Log
LGZ1030739188859 (V931010) connect	ed		
Read Date and Time	De <sup>-</sup> Cl	8-09-15 20:10:03 riation of Local Time to U ock Status 0] Invalid value	JTC -60 min 0x81
		[7] Daylight saving active	2
Read Billing Values			
Read Load Profile 1		m: 2019-12-07 00:01:00.00 Data in specified period	0 To: 2019-12-08 00:00:00.00
Read Load Profile 2 Command cancelled			
Vector Diagram			
LGZ1030739188859	V931010	ZM	/Xi320CQU0L1D3.31 S4

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.

Communication Tracers	×	
COSEM Trace	on 🗸	
DLMS Trace	medium $\sim$	
GATEWAY Trace	low ~	
LLC Trace	low $\sim$	
WRAPPER Trace	low $\sim$	
HDLC Trace	medium $\sim$	
IEC Trace	medium $\sim$	
	OK Cancel	

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

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

🖶 🗎 🗡 💽 🔅 Searc	h Communicatio	on Log
280960078ms - HDLC	HDLC DATA EXCHANGE	^
280960078ms - HDLC	S-> I-Frame SrcAdr=32 DestAdr=1 RecSeqNr=3 SendSeqNr=3 Segmentation=False Poll:	True
280960109ms - HDLC	S-> 7EA011034176C25CE6E60005010500023F3C7E	
280960312ms - HDLC	R<- 7EA074410396678AE6E7000C010201000361307300090600000D0000FF00090830325F3030	5F303
280960312ms - HDLC	R<- I-Frame SrcAdr=1 DestAdr=32 RecSeqNr=4 SendSeqNr=3 Segmentation=False Poll=	True
280960312ms - LLC	R<- E6E7000C010201000361307300090600000D0000FF00090830325F30305F3030009060000	DOOC
280960312ms - DLMS	R<- 0C010201000361307300090600000D0000FF00090830325F30305F30300090600000D0000	FF01C
280960312ms - DLMS	R<- block: 3 last block: True 307300090600000005F00090830325F30305F303	30000
280960312ms - DLMS	R<- 0C2D01030002020F0016060009060000600803FF01030002020F001606000906000060804	FF010
280960312ms - DLMS	set State: OPEN	
280960421ms - DLMS	set State: CLOSING	
280960421ms - HDLC	Close	
280960421ms - HDLC	S-> DISC-Frame SrcAdr=32 DestAdr=1 Poll=True FrameValid=True	
280960421ms - HDLC	S-> 7EA00703415356A27E	
280960500ms - HDLC	R<- 7EA0094103730EEB470F7E	
280960500ms - HDLC	R<- UA-Frame SrcAdr=1 DestAdr=32 SendFrSize=0 RecFrSize=0 Poll=True FrameValio	i=Tru
280960500ms - DLMS	set State: CLOSED	~
<		>

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

C2D01030002020F0016060009060000600803FF01030002020F0016060	000000000000000000000000000000000000000	4FF01030002020F0	0160600090600
0600805FF01030002020F0016060009060000600806FF01030002020F0			
9060000600808FF01030002020F0016060009060000600809FF0103000	2020F001606000	90600000D0000FF0	01030009060000
00300FF01030009060000600400FF01030009060000600500FF0103000	9060000000200F	F000907563933313	30313000090601
Analvse			
DLMS PDU Gateway LLC HDLC Frame Wrapper Ciphered APDU     with additional field information	Identifier	Length	Value
	Identifier	Congui	Value
DLMS_PDU[12] {** readResponse **}			
ReadResponse ::= SequenceOf 45 Element(s)			
0: ReadResponseElement [1] {** data-access-error			
DataAccessResult = 3 {** read_write_denied	**}		
<pre>1: ReadResponseElement [0] {** data **} Data[2] {** Structure **}</pre>			
SequenceOf 2 Element(s)			
0: [15] Integer8 = 0 (0x00)			
1: [22] Enumerated = 6			
2: ReadResponseElement [0] {** data **}			
[9] OctetString[6] = 0000600803FF			
3: ReadResponseElement [1] {** data-access-error	**}		
DataAccessResult = 3 {** read_write_denied	**}		
4: ReadResponseElement [0] {** data **}			
<pre>Data[2] {** Structure **}</pre>			
SequenceOf 2 Element(s)			
0: [15] Integer8 = 0 (0x00)			
1: [22] Enumerated = 6			
5: ReadResponseElement [0] {** data **} [9] OctetString[6] = 0000600804FF			
<pre>[9] OctetString[6] = 0000000004fr 6: ReadResponseElement [1] {** data-access-error</pre>	**1		
DataAccessResult = 3 {** read_write_denied	**1		
7: ReadResponseElement [0] {** data **}	1		

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: busy (dlms - COM5 - 9600 bps)

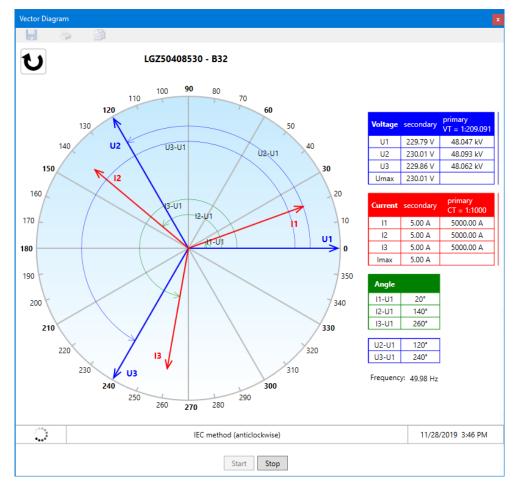
🦫 20 👍 21 📜

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.

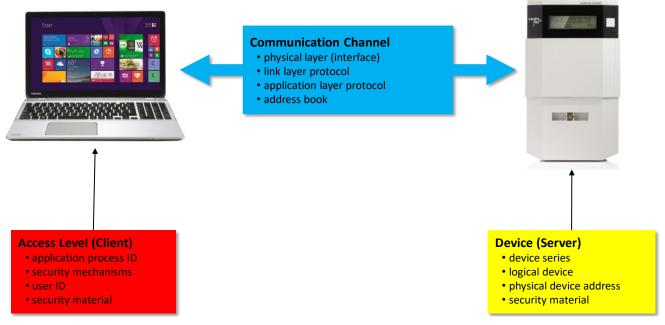


## 6 Communication with the devices

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.

#### 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.

onnections ,	Address Book																	
evices 🕂	×		8		0	Co	ommunication Ch	nann	els 🕂		X			6	2		2	
Device Name	Device Series					0	Channel Name		Interf	ace								
AD-FE11G150	E35C - AD-xE					1	Default Channel		COM1									
Default Device	undefined					N	Nodem		Conex	ant	USB CX93	010 A0	CF M	oden	1			
D-L1	E360 - D/F/M	-L1				T	ICP-IP		Realte	k PC	le GBE Fa	mily Co	ontro	oller -	192.16	8.1.20		
MD402CT	E650/S650 - Z	xD300/400				ι	JSB - Optical Hea	d -				· ·						
MX310P	E450 - ZxX100	)/300P																
ZMXi300Q	E450 - ZxX100																	
	E450 - ZxX100																	
IMXi300Q	E450 - ZxX100		dress		IEC Address		HDLC Address		Network ID		Network	Addre	255					
IMXi300Q	E450 - ZxX100	3)	dress		IEC Address undefined		HDLC Address undefined		Network ID undefined		Network		255					
mks Communic	E450 - ZxX100	3)	dress	-				-				ed	255					
nks Communic Default Ch	E450 - ZxX100	)/300Q B Remote Ad			undefined		undefined		undefined		undefin	ed :d	255					

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

🛷 Communicat	ion Settings															-	×
Connections A	ddress Book																
Devices 🕂	×		e		Communi	cati	on Channels	÷	- ×		1		8				
Device Name	Device Series				Channe	Na	me	Int	terface								
AD-FE11G150	E35C - AD-xE				Default	Char	nnel		M1								
Default Device	undefined				Modem				nexant USB C		010 A	CF M	odem				
D-L1	E360 - D/F/M-L	.1			TCP-IP			Rea	altek PCIe Gl	BE F	amily	Con	roller	- 19	2.168.1	1.20	
ZMD402CT	E650/S650 - Zx	D300/400			USB - O	ptica	al Head - 9600	co	M5								
ZMX310P	E450 - ZxX100/	'300P															
ZMXi300Q	E450 - ZxX100	)/300Q															
Links 🛛 🗡	1																
Communica	tion Channel	Remote /	Address		IEC Address		HDLC Address		Network ID		Netw	ork	Addres	s			
TCP-IP		Distribut	tion West		undefined		undefined		undefined		unde	fine	ł				
* USB - Optica	al Head - 9600			✓	39188859	✓	9859		undefined		unde	fined					
						_					_			_			
Data Version: 1	5   Storage P	olicy: peri	manent		File Location		C:\Users\user\A	ppD	ata\Local\Lar	ndis+	-Gyr\c	IMA					at

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

🧳 Communica	tion Settings														
Connections 4	Address Book														
Devices 🕂	×	8		c	communication (	Char	nnels 🕂 🕂		X			8			
Device Name	Device Series			1	Channel Name		Inte	erfac	te						
AD-FE11G150	E35C - AD-xE			11	Default Channel		CON	М1							
Default Device	undefined			11	Modem		Con	exa	nt USB CX9	3010 A0	CF M	odem			
D-L1	E360 - D/F/M-L1			h	TCP-IP		Rea	ltek	PCIe GBE	Family	Con	troller -	192.168.	1.20	
ZMD402CT	E650/S650 - ZxD300/400			Ľ	USB - Optical H	ead	- 9600 COM	M5							
ZMX310P	E450 - ZxX100/300P														
ZMXi300Q	E450 - ZxX100/300Q			1											
Links X	1														
Device	Remote Address		IEC Address		HDLC Address		Network ID		Network	Address					
* AD-FE11G1	50 Ethernet Module		undefined		undefined		undefined		undefine	d					
Default Dev			undefined		undefined		undefined		undefined						
ZMXi300Q	Distribution West		undefined		undefined		undefined		undefined						
Data Version: 1	5 Storage Policy: perm	anent	F	ile	Location: <u>C:\l</u>	lser	s\user\AppDa	ata∖l	.ocal\Landi	s+Gyr∖d	IMAF	2			

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

#### 6.2.2 Communication channel data

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

- Click on in the application toolbar or select Communication settings from the Communication menu. The "Communication Settings" window appears with selected tab "Connections" (as shown here with the default communication settings or with addi-
- 2. Highlight a communication channel in the communication channel list (default channel or any other communication channel, if already defined).

tional data, if already defined).

Communicat	tion Settings										—		×
Connections A	ddress Book												
Devices 🕂	×		8	Com	munication (	Channe	ls 🕂		X	<b>*</b>	8		
Device Name	Device Series			Cha	nnel Name	Inte	rface						
Default Device	undefined			Def	ault Channe	el COI	/1						
inks 🛛 🗡	1												
Device	Remote A	ddress	IEC Address	H	HDLC Addres	s	Network ID		Network	Address			
Default Dev	rice		undefined	<b>u</b>	ndefined		undefined		undefine	d			
Data Version: 1	S Stores P	elien			File Locat	i.e.e.	CAllegrabia				dia . Curà d	IMAD	
Data version: 1	5 Storage F	oncy: pe	ermanent		File Local	uon:	<u>C:\Users\u</u>	servA	ippData\L	ocarytan	ais+Gyr\d	IWAP	

3. Click on **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.

Communication Channel	2
Name CommunicationChannel	
Interface	
Interface Type	Serial (optical head or 3-wire) ~
Physical Interface	COM1 ~
Template for Lower Layer Settings	select template ~ Apply
Physical Layer dlms Link Layer dlm	s Application Layer IEC
Serial Interface	
Transmission Speed	300
Port Settings	8 Bit (8 data bits / no parity)
Idle time after connection	0 ms
	OK Cancel

- 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.

 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:

Communication Channel						
Name USB - Optical Head - 9600						
Interface						
Interface Type		Serial (optical head or 3-wire) *				
Physical Interface		COM5 ~				
Template for Lower Layer Settings		select template ~ Apply				
Physical Layer dlms Link Layer	dlms Application	Layer IEC				
Serial Interface						
Transmission Speed		9600 × bps				
Port Settings		8 Bit (8 data bits / no parity) ~				
Idle time after connection		0 ms				
		OK Cancel				

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

# If interface type "Network" is selected:

Communication	Channel							×
Name TCP-IP								
Interface								
Interface Type			Netwo	ork				~
Physical Interfa	ce		Realte	k PCle G	BE Family	Controll	er - 192.1	168.1. ~
Template for Lo	ower Layer Settings		select	template	2		Ŷ	Apply
Physical Layer	dlms Link Layer	dlms Application	Layer	IEC				
Network Inter	face							]
Protocol			тср		~			
Source Port			0					
ldle time aft	er connection		0			ms		
							OK	Cancel

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

# If interface type "Modem" is selected:

Communication	Channel							×
Name Modem								
Interface								
Interface Type			Mode	m				v
Physical Interfac	ce		Conex	ant US	B CX93010	ACF Mod	lem	v
Template for Lo	wer Layer Settings		select	templa	te		v	Apply
Physical Layer	dlms Link Layer	dlms Application	Layer	IEC				
🗌 Idle time aft	er connection		0			ms		
							ОК	Cancel

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

### 6.2.2.2 dlms Link Layer

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

Communication Channel	
Name USB - Optical Head - 9600	
Interface	
Interface Type	Serial (optical head or 3-wire)
Physical Interface	COM5
Template for Lower Layer Settings	select template ~ Apply
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	3000 ms
Maximum Number of Retries	3 😴
	OK Cancel
	OK Cancer

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

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

 Transmission Speed Switching: Select the required maximum transmission rate (default = 9600 bps). Untick the checkbox if you don't want to allow transmission rate switching.

Note: In case of modem or network connections no real change is made but only the transmission rate character in the protocol is altered.

- Intercharacter Timeout: After expiration of the set time the transmission is automatically ended if no further data is transmitted. If you untick the checkbox, no automatic termination of the transmission occurs.
- Maximum Number of Retries: Select the number of retries (default value = 3). If you select 0, no retries occur.

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

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

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

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

### 6.2.2.3 dlms Application Layer

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

Communication Channel						
Name USB - Optical Head -	9600					
Interface						
Interface Type		Serial	(optical head o	or 3-wire)	v	
Physical Interface		COM			~	
Template for Lower Layer Se	ettinas	select	template		~ Apply	
Physical Layer dlms Link I	layer dlms Application	n Layer	IEC			
Referencing Method		Short	Name (SN) refe	erencing	Ŷ	
The command set supported unless otherwise instructed.	by logical name referenc	ing is ve	ry limited. Pleas	se use short name	e referencing	
Maximum Number of Ele	ements in <mark>L</mark> ists		45	*		
Single Request Firmware Rel	eases	B08;B09;B10;B11;C06;C07;C08;C09;D41;D42;D43;V0*				
Maximum dlms Buffer Si	ze	0		bytes		
Block transfer with set, w	rite and action services	supporte	ed			
✓ Keep alive Interval		30		s		
✓ Use release service to clo	ose Association Applicati	on				
				OK	Cancel	

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

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

1. Select the "IEC" tab.

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

Communication	Channel						
Name USB - Op	tical Head - 9600						
Interface							
Interface Type			Serial (optic	al head or 3-	wire)		v
Physical Interfa	ce		COM5				÷
Template for Lo	wer Layer Settings		select temp	ate		~ A	pply
Physical Layer	dlms Link Layer	dlms Application	Layer IEC	]			
✓ Transmission	n Speed Switching		9600	2	bps		
✓ Intercharact	er Timeout		3000		ms		
Maximum Numl	ber of Retries			3 🗣			
Password for R5	/W5 Commands				(static)		
Maximum R1/W	1 Command Size		16		bytes		
					(	ок С	ancel

- Select the required maximum transmission rate (default = 9600 bps) in the "Transmission Speed Switching" drop down list. Untick the checkbox if you don't want to allow transmission rate switching. Note: In case of modem or network connections no real change is made but only the transmission rate character in the protocol is altered.
- 3. Intercharacter Timeout: After expiration of the set time the transmission is automatically ended if no further data is transmitted. If you untick the "Intercharacter Timeout" checkbox, no automatic termination of the transmission occurs.
- 4. Select the number of retries (default value = 3) in the "Maximum Number of Retries" entry box. If you select 0, no retries occur.
- 5. Enter the required static password (8 characters) for R5/W5 commands in the "Password for R5/W5 Commands" entry box.
- 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.

🧳 Communio	ation Settings											×
Connections	Address Book											
Devices 📕	• ×	1 and a second	8	Comr	munication Chan	nels	+	×	<b>*</b>	e		
Device Name	Device Series			Cha	nnel Name		Interface					
Default Device	e undefined			Defa	ault Channel	(	COM1					
				USB	- Optical Head	- 9600	COM1					
Links X	1 -											
Device	Remote A	ddress	IEC Address	s F	IDLC Address	Netwo	ork ID	Networ	k Address			
					l en la la							
Data Version:	15 Storage	Policy: pe	ermanent		File Location:	<u>C:\Us</u>	ers\user\	AppData\	Local\Lan	ais+Gyr\d	MAP	

- 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 "Default Device" and a default communication channel named "Default Channel" are defined. These default communication settings are the basis for a local readout of a meter with an optical reading head connected to a serial interface (see section 4 "First steps").

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

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

1. Click on in the application toolbar or select **Communication settings** from the **Communication** menu.

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

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

🛷 Communication Settings						-	o x
Connections Address Book							
Devices 🕂 🗙	8	Communio	cation Channels	+ ×	1 and a second s	8	
Device Name Device Series		Channel	Name	Interface			
Default Device undefined		Default	Channel	COM1			
Links 🛛 🖉							
Communication Channel	Remote Address	IEC Address	HDLC Address	Network ID	Network	Address	
Default Channel		undefined	undefined		undefine	d	
Data Version: 15 Storage	Policy: permanent	Fi	le Location: <u>C:\U</u>	sers\user\AppData	a\Local\Landi	is+Gyr∖dM	AP

3. Click on 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		x
Name Device		
Type Address Clients		
Device Type		
Device Series	undefined ~	
Manufacturer Serial Number		]
Logical Device	Base Meter / Module 🕤 1	
The logical device may be over	rridden by a command in some cases.	
		OK Cancel

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 ZMXi300Q		
Type Address Clients		
Device Type		
Device Series	undefined ~	
Manufacturer Serial Number		
Logical Device	Base Meter / Module ~ 1	
The logical device may be over	ridden by a command in some cases.	
		OK Cancel

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.

- If required, enter the manufacturer serial number with a maximal length of 20 characters and a restricted character set ('0'..'9', 'A'..'Z', 'a'..'z') in the "Manufacturer Serial Number" entry box.
   Please note that this entry has currently no meaning but may be used for extended device management in the future.
- 4. Select the device type in the "Logical Device" drop down list: "Base Meter / Module" (=1) or "Communication Unit" (=17) or "user defined" for devices from third party suppliers (in this case, you must enter the logical device number according to the manufacturer information). Note that this selection is only possible if the device series is set to "undefined". Otherwise it is fix set to "Base Meter / Module" (=1) or "Communication Unit" (=17), depending on the selected device series. Also note that the logical device may be overridden by a command in some cases, if the command is implemented only for a specific logical device (e.g. communication unit).

# 6.2.3.2 Address

- 1. Select the "Address" tab, if a device address shall be used.
- 2. Set a tick to the "IEC address" and/or "HDLC address" checkbox and enter the address(es).

If you enter an IEC address first and then click on the arrow button behind the two entry boxes, the HDLC address is automatically calculated and entered (see section 6.3 "Addressing devices").

Device	X
Name ZMXi300Q	
Type Address Clie	nts
Physical Device Ad	dress
✓ IEC Address	39188859
HDLC Address	9859
The use of an IEC ar	nd/or HDLC address defined here is controlled by the link settings.
	OK Cancel

### 6.2.3.3 Access levels

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

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

Device
Name ZMXi300Q
Type Address Clients
Device Specific Access Levels
[0] Public Access, no authentication
[3] Utility Service, no authentication [F] Manufacturer Access, static password
Settings Import all Credentials (Offline) Import all Credentials (Online)
OK Cancel

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" or with fix set password as "[F] Manufacturer Access" can be used. They are shown in the list of device specific access levels by default. For all other required access levels the credentials have to be entered as described below or imported (see section 6.2.3.4 "Importing keys").

2. Click on Settings.

The "Access Levels" window appears for the specified device.

The device name is displayed in the top left corner.

The window contains a list of all access levels with "Client AP" (User ID, UID), authentication, additional requisites, message security policy, security setup and supported protocols that can be used for any device.

An  $\cancel{1}$  icon is displayed in the first column as long as the access level is not correctly defined (e.g. missing or incomplete password). Accordingly marked access levels will not be shown in the Client toolbar.

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

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

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

Access Level Definition - ZMXi300Q		
[2] Utility Field Service		
Client Application Process ID	48	User ID 0
Access Security		
Authentication	low level authenticati	on using a static password 👋
Additional requisites	-	
Message Security		
Authenticated	Encrypted	Signed
Credentials		
Password (secret)		×
Global Authentication Key (GAK)		$\times$
Global Unicast Encryption Key (GUEK	)	×
Impo	rt Credentials (Offline)	Import Credentials (Online)
Supported protocols	IEC and dlms	
		OK Cancel

a range from 1 to 255 and cannot be changed.

- 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
- 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).

 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.

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

- Only for access levels with high level authentication using GMAC and SHA-256: Tick the "Authenticated" and or "Encrypted" checkboxes for the corresponding message security (for both request and response).
   "Signed" is reserved for future use and can therefore not be selected.
- 8. Only for access levels with low level authentication or with high level authentication using SHA-1:

Click on the edit icon *solution* 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**.

ecret)	
98765432	•
characters 8/16	
	<u>O</u> K <u>C</u> ancel

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.

Access Level Definition - ZMXi300Q	
[2] Utility Field Service	
Client Application Process ID	48 User ID 0
Access Security	
Authentication	low level authentication using a static password $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$
Additional requisites	-
Message Security	
Authenticated	Encrypted Signed
Credentials	
Password (secret)	×
Global Authentication Key (GAK)	
Global Unicast Encryption Key (GUEK)	
Impo	rt Credentials (Offline) Import Credentials (Online)
Supported protocols	IEC and dlms
	OK Cancel

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

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

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

Enter new key		
Global Authenticatio	n Key (GAK)	
<ul> <li>visible string</li> <li>hexadecimal</li> </ul>	0x A9A8A7A6A5A4A3A2A1A0AAABACADAF characters 30/64	0
		<u>O</u> K <u>C</u> ancel

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

Access Level Definition - ZMXi300Q	
[G] Management Access	
Client Application Process ID	1 User ID 0
Access Security	
Authentication	high level authentication using GMAC $^{\vee}$
Additional requisites	-
Message Security	
✓ Authenticated	Encrypted Signed
Credentials	
Password (secret)	
Global Authentication Key (GAK)	×
Global Unicast Encryption Key (GUE	к) 💉 🗙
Import Crede	Import Credentials (Online)
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".

10. Click on **OK**.

The "Access Levels" window appears again.

No  $\triangle$  icons are displayed in the first column of the newly defined access levels.

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

# 11. Click on OK.

On the "Clients" tab of the "Device" window the defined device-specific access levels are displayed.

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

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

豢 .MAP110				- 🗆	×
<u>File View Communication Tools H</u> elp					
Q Client: [0] Public Access, no authentication	🕶 🏟 🕾 Phone:	- 🔅 🔯			
Device: ZMXi30 [0] Public Access, no authentication	1859 - 🐡 Channel: L	JSB - Optical Head - 9600		- 0	
[1] Data Collection, static password E450 - ZxX100/3 [2] Utility Field Service, static password [3] Utility Service, no authentication	0] Public Access, no authent	tication		Result Win	dow
dims Real [3] Utility Service, no autinetrication     dims Real [3] Utility Service, no autinetrication     Billing [G] Management Access, static password     Billing [G] Management Access, static password     Energ [E] Manufacturer Access, static password     Instantaneous Values     Cock     Gock     Gock					
Disconnectors	1. 🖶 🗈 🗙			Command	Log
B-	COSEM Logical Device Name	Firmware Version	Device Type		
Communication Settings: loaded					0 1

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

# 6.2.3.4 Importing keys

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

### Offline key import



### Required key files

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

Device							
Name ZM	Xi300Q						
Type Add	dress Clients	]					
Device S	pecific Access	Levels					
[0] Publ	ic Access, no a	uthenticatio	n				
[3] Utilit	y Service, no a	uthenticatio	on				
[F] Man	ufacturer Acce	ss, static pa	ssword				
Sett	ings		Import all Cr	edentials (Offline)	Import all Ci	redentials (	Online)
						OK	Cancel

Proceed as follows to import keys from key files:

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

Import Keys				
Encryptior	n Keys			
File Name				
Device Sel	ection			
		Key(s) found:		
Utility Key				
File Name				
Password				ОК
			Ok	Cancel

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

🛷 Open					×
← → × ↑ 🔒 → AppData	> Local	> Landis+Gyr > dMAP	<b>∨</b> Ö	earch dMAP	<i>م</i>
Organize 🔻 New folder					
ComponentOne_LLC	^	Name	Date modified	Туре	Size
ConnectedDevicesPI	atfo	🔄 tmp	26.11.2019 10:49	File folder	
CrashDumps		📙 tmp 101126	26.11.2019 10:49	File folder	
CrashRpt		AddressBookV14.xml	29.11.2019 10:31	XML Document	
D3DSCache	- 14	AddressBookV15.xml	02.12.2019 09:44	XML Document	
DBG		DeviceConnectionSettingsV14.xml	29.11.2019 10:31	XML Document	
Diagnostics		DeviceConnectionSettingsV15.xml	02.12.2019 09:44	XML Document	
ElevatedDiagnostics		GB_51300256_18346-10_LANDIS+GYR(PL)	25.06.2014 17:18	XML-Document	
		GULF_V2.0_Example V7.xml	26.11.2019 16:57	XML Document	
GEFEG		PhoneBook.xml	28.07.2005 20:07	XML Document	
Google		SecuritySettingsV14.xml	29.11.2019 10:31	XML Document	
GrapeCity,_Inc		SecuritySettingsV15.xml	02.12.2019 09:44	XML Document	
Information Factory		📄 xPhoneBook.xml	28.07.2005 20:07	XML Document	
install/G	~	<			>
File <u>n</u> ame:	GB_51300	)256_18346-10_LANDIS+GYR(PL)SP.Z.O.Oxml	~ [	Device Description files	(*.xml) ~
			[	Open (	Cancel
			L	-r	

5. Click on **Open**.

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

Import Keys		
Encryption	n Keys	
File Name	C:\Users\user\Ap	pData\Local\Landis+Gyr\dMAP\GB_51300256_18346-10
Device Sel	ection	
14797082		Key(s) found:
14797083		
14797084		
14797085		
14797086		
Utility Key		
File Name		
Password		OK
		OK Cancel

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

🕈 Open				
← → × ↑ 📙 > AppData > Local	> Landis+Gyr > dMAP	✓ <sup>™</sup> Sear	ch dMAP	م
Organize 🔻 New folder			== -	
ComponentOne_LLC	Name	Date modified	Туре	Size
ConnectedDevicesPlatfo	- tmp	26.11.2019 10:49	Dateiordner	
	tmp 101126	26.11.2019 10:49	Dateiordner	
CrashRpt	RWE_privkey.pem	07.01.2014 13:00	PEM-Datei	
D3DSCache				
DBG				
Diagnostics				
ElevatedDiagnostics				
GEFEG				
Google				
GrapeCity,_Inc				
Information Factory				
install/i				>
File <u>n</u> ame: RWE_prive	key.pem	✓ Cer	tificates (*.pfx;*.p1	2;*.pem;*. ~
			<u>O</u> pen	Cancel

9. Click on **Open**.

The utility key is imported from the key file.

Encryption Keys	
File Name C:\Users\u	user\AppData\Local\Landis+Gyr\dMAP\GB_51300256_18346-10
Device Selection	
14797082	Key(s) found:
14797083	Authentication Key
14797084	Unicast Encryption Key
14797085	- Utility Field Service, static password
14797086	- Utility Field Service, SHA-1 authentication - Utility Field Service, SHA-256 authentication Authentication Key
Utility Key	
ile Name C:\Users\u	ser\AppData\Local\Landis+Gyr\dMAP\RWE_privkey.pem
assword	ОК

10. Click on **OK**.

The "Import Keys" window disappears and the associated device-specific access levels are displayed.

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

## Online key import



### **Required prerequisites**

Before you can import keys online from a remote key management system the required credentials must have been entered on tab "Key Management system" in the "Options" window (see section 8.9 "Defining the key management system").

Device	ie		x
Name	2 ZMXi300Q		
Туре	Address Clients		
Dev	vice Specific Access Levels		
[0]	] Public Access, no authentication		1
[3]	] Utility Service, no authentication		
[F]	] Manufacturer Access, static password		
	Settings Import all Credentials (Offline) Import all Cre	edentials (Online)	
	]	OK Cancel	

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

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

÷	om remote system d Key Mangement System: Pro	ductive Sys	stem	
~ ×	<b>(</b>			
Import	Access Level	Client AP	Authentication	Status
✓	[1] Data Collection	32	high level authentication using SHA-256	-
~	[2] Utility Field Service	48	high level authentication using SHA-1	-
~	[2] Utility Field Service	48	high level authentication using GMAC	-
~	[2] Utility Field Service	48	high level authentication using SHA-256	-
~	[G] Management Access	1	high level authentication using SHA-1	-
~	[G] Management Access	1	high level authentication using GMAC	-
~	[G] Management Access	1	high level authentication using SHA-256	-
~	Role: Security Auditor	5	high level authentication using GMAC	-
~	Role: Calibration Lab	6	high level authentication using GMAC	-
~	Role: Communication Module	7	high level authentication using GMAC	-
~	Role: Local Operator	9	high level authentication using GMAC	-
~	[L] Access Administrator	2	high level authentication using SHA-1	-
~	[L] Access Administrator	2	high level authentication using GMAC	-
~	[L] Access Administrator	2	high level authentication using SHA-256	-

Import information	
	OK <u>C</u> ancel

12. In column "Import" set a tick to all access levels for which you want to import keys from the remote key management system.

in the window toolbar selects all checkboxes and

in the window toolbar unselects all checkboxes.

13. Click on in the window toolbar or on **Request keys from remote** system.

If the keys are available on the remote key management system they will be imported. This is indicated with "Success" in column "Status" and with "Import succeeded" in the "Import information" area.

If a key is not available on the remote key management system this is indicated with "Missing" in column "Status" and with "No appropriate data in response" in the "Import information" area (in this case the **OK** button is not released; untick the checkbox for the corresponding access level and repeat the request).

Import	Access Level	Client AP	Authentication	Status
	[1] Data Collection	32	high level authentication using SHA-256	-
<b>v</b>	[2] Utility Field Service	48	high level authentication using SHA-1	Success
<ul> <li>Image: A start of the start of</li></ul>	[2] Utility Field Service	48	high level authentication using GMAC	Success
<ul> <li>Image: A start of the start of</li></ul>	[2] Utility Field Service	48	high level authentication using SHA-256	Success
<ul> <li>Image: A start of the start of</li></ul>	[G] Management Access	1	high level authentication using SHA-1	Missing
	[G] Management Access	1	high level authentication using GMAC	-
$\square$	[G] Management Access	1	high level authentication using SHA-256	-
$\square$	Role: Security Auditor	5	high level authentication using GMAC	-
$\square$	Role: Calibration Lab	6	high level authentication using GMAC	-
	Role: Communication Module	7	high level authentication using GMAC	-
	Role: Local Operator	9	high level authentication using GMAC	-
~	[L] Access Administrator	2	high level authentication using SHA-1	Success
~	[L] Access Administrator	2	high level authentication using GMAC	Success
✓	[L] Access Administrator	2	high level authentication using SHA-256	Success
port in			n remote system	
	Field Service - high level authe	ntication u	sing SHA-1	^
- Impo	rt succeeded r Field Service - high level authe			

14. Click on **OK**.

The "Import Keys" window disappears and the associated device-specific access levels are displayed.

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

# 6.2.3.5 Terminating the device data definition

### 1. Click on **OK**.

The new device definition is saved. A new entry with the defined name appears in the device list.

🛷 Communication Settings	– 🗆 X
Connections Address Book	
Devices 🕂 🗶 🖋 🥜	Communication Channels 🕂 🗡 🧷
Device Name Device Series	Channel Name Interface
Default Device undefined	Default Channel COM1
ZMXi300Q E450 - ZxX100/300Q	
Links X	
	Address HDLC Address Network ID Network Address
Data Version: 15 Storage Policy: permanent	File Location: <u>C:\Users\user\AppData\Local\Landis+Gyr\dMAP</u>

- 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.

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### 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.

# **i**

### 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:

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

🛷 Communication Settings	— D	×
Connections Address Book		
IP Addresses 🖌 🖍 🔀	Phone Numbers 🕂 💉 📔	
Address Description	Number Description	
Data Version: 15 Storage Policy: permanent	File Location: <u>C:\Users\user\AppData\Local\Landis+Gyr\dMAP</u>	з

- 3. Click on 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.

Address Book		
Phone		
Name	ZMX310G 12129973	]
Phone number	0763156762	]
	Use comma to wait for dial tone e.g. 0,01234567	
	OK Cancel	

5. Click on **OK**.

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

🛷 Communication Settings	– 🗆 X
Connections Address Book	
IP Addresses 🕂 💉 📔	Phone Numbers 🕂 💉 🔀 🔯
Addresses Addresses Addresses Addresses Description	Phone Numbers Description 0763156762 ZMX310G 12129973
Data Version: 15 Storage Policy: permanent	File Location: C:\Users\user\AppData\Local\Landis+Gyr\dMAP

- 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:

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

🛷 Communication Settings	– 🗆 X
Connections Address Book	
IP Addresses	Phone Numbers 🕂 💉 📔
Address Description	Number Description
Data Version: 15 Storage Policy: permanent	File Location: C:\Users\user\AppData\Local\Landis+Gyr\dMAP

- 3. Click on 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.

Address Book	
IP	
Name	Ethernet Module
Address	
● IPv4	
O IPv6	192 . 168 . 200 . 20
Port	4049
	OK Cancel

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.

🛷 Communication Settings						×
Connections Address Book						
IP Addresses 🕂 💉 📔	Phone	Numbers 🕂	din .	$\times$	8	
Address Description	Num	ber Description				
192.168.200.20:4049 Ethernet Module						
Data Version: 15 Storage Policy: permanent	File Location:	<u>C:\Users\user\App[</u>	Data\Local\l	.andis+Gyr\dN	AP	

- 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:

 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.

🛷 Communication Settings	– 🗆 X
Connections Address Book	
IP Addresses 🖌 🖍 🔀	Phone Numbers 🕂 💉 🔣 📴
Address Description	Number Description
Data Version: 15 Storage Policy: permanent	File Location: C:\Users\user\AppData\Local\Landis+Gyr\dMAP

- 3. Click on in the window toolbar for IP addresses or phone numbers. The "Open" window appears.
- 4. Select in the "Open" window the phone book file to be imported (the corresponding directory of the latest installed MAP110 release 3.x will be selected by default, to directories of other .MAP releases you must navigate yourself):
  - "PhoneBook.xml" for importing a MAP110 phone book or
  - "AddressBookVxx.xml" (xx = data version) for importing a .MAP phone book.
- 5. Click on **Open**.

All IP addresses and phone numbers are imported from the selected address book if not already existing in the .MAP110 address book. The imported data appear as entries in the IP addresses list and in the phone number list. When a MAP110 phone book "PhoneBook.xml" has been imported, additionally all device addresses are converted into devices.

🛷 Communication	Settings		– 🗆 X
Connections Addr	ess Book		
IP Addresses	/ X 🛛	Phone Numbers 🕂 💉 🗙	<u>a</u>
Address	Description	Number Description	
192.168.1.31:5000	Distribution West	0794438765 ZMD405 B14.2 G21 76926068	
192.168.200.20:4059	Ethernet Module	0419356123 ZMD405 B23.F 87541380	
195.141.94.180:1000	Training SIM Card 4	0419356122 ZMQ202 999999005	
	· · · · · ·	0419356125 ZMQ202 H02 76930012	
		0763156762 ZMX310G	
Data Version: 15	Storage Policy: permanent	File Location: <u>C:\Users\user\AppData\Local\Landis+(</u>	Syr\dMAP

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

# Ĵ

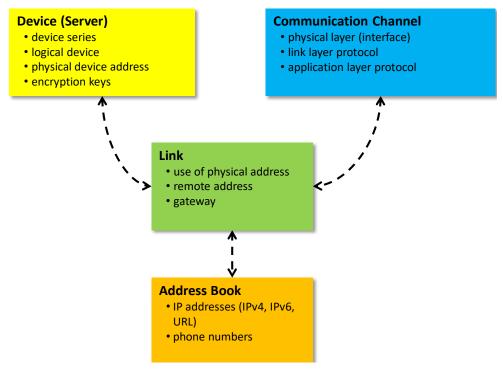
### Modifying or deleting address book entries

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 "Connections". The device list and the communication list are displayed.

🛷 Communica	ation Settings										
Connections	Address Book										
Devices +	X	e			Communication Channe	ls 🕂	×	and the second s	8		
Device Name	Device Series				Channel Name	Interfac	e				
AD-FE11G150	E35C - AD-xE				Default Channel	COM1					
Default Device	undefined				Modem	Conexar	t USB CX9	3010 ACF	Modem		
D-L1	E360 - D/F/M-L1				TCP-IP	Realtek	PCIe GBE F	amily Con	troller - 1	92.168.1.2	
ZMD402CT	E650/S650 - ZxD30	0/400			USB - Optical Head - 9	600 COM5					
ZMX310P	E450 - ZxX100/300	2 C									
ZMXi300Q	E450 - ZxX100/300	2									
Links X											 
	ation Channel Remo	te Address	IEC Address	HDU	C Address Network I	D Netwo	rk Address				 
Default Ch	annel		undefined	unde	efined 🗌 undefined	undefi	ned				
Data Version: 1	15 Storage Policy	: permaner	t	File Locati	on: <u>C:\Users\user\App</u> l	Data\Local\La	ndis+Gyr\o	MAP			

- 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 alterna-tively in the "Communications Channels" area).*

The "Device/Communication Channel Link" window appears with the device fixed and the communication channel selectable:

Device / Communication Channe	l Link
Device	AD-FE11G150 ~
Communication Channel	Default Channel
	Default Channel
Destination Server	Modem
Destination Server	TCP-IP
Physical Address	USB - Optical Head - 9600
Use IEC address	39188859
Use HDLC address	9859
dlms Gateway	
Network ID	0
Network Address 0x	00
Currently very limited support accordingly.	rt in the devices. Only enable this feature if instructed
	OK Cancel

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

Device / Communication Channe	el Link
Device	AD-FE11G150
Communication Channel	AD-FE11G150
	Default Device
	D-L1 ZMD402CT
Destination Server	ZMX310P
Physical Address	ZMXi300Q
Use IEC address	39188859
Use HDLC address	9859
dlms Gateway	
Network ID	0
Network Address 0	¢ 00
Currently very limited suppo accordingly.	rt in the devices. Only enable this feature if instructed
	OK Cancel

- 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.
- 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.

Connections 4	Address Book													
evices 🛉 🕂	×	1	8	C	Comr	munication Chan	nels	+	X		8			
Device Name	Device Series				Cha	nnel Name		Interfac	e					
AD-FE11G150	E35C - AD-xE				Defa	ault Channel								
Default Device	undefined				Mod	lem		Conexar	t USB CX93010 A	ACF Mod	dem			
D-L1	E360 - D/F/M-I	L1			TCP	-IP		Realtek	Cle GBE Family (	Controll	er - 192	.168.1.2	0	
ZMD402CT	E650/S650 - Zx	D300/400			USB	- Optical Head	- 9600	COM5						
ZMX310P	E450 - ZxX100/	/300P												
ZMXi300Q	E450 - ZxX100	)/300Q												
nks X	Ø													
	ation Channel	Remote Ad	ddress	IEC Address		HDLC Address	Net	work ID	Network Add	dress				
	1.º*	Remote Ad		IEC Address undefined		HDLC Address undefined [		work ID efined	Network Add	dress				
Communica TCP-IP	1.º*	Distributio		undefined			und			dress				
Communica TCP-IP	ation Channel	Distributio		undefined		undefined [	und	efined	undefined	dress				
Communica TCP-IP	ation Channel	Distributio		undefined		undefined [	und	efined	undefined	dress				
Communica TCP-IP	ation Channel	Distributio		undefined		undefined [	und	efined	undefined	dress				
Communica TCP-IP	ation Channel	Distributio		undefined		undefined [	und	efined	undefined	dress				
Communica TCP-IP	ation Channel	Distributio		undefined		undefined [	und	efined	undefined	dress				

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



## Modifying or deleting links

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

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

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

# 6.3 Addressing devices

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

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

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

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

# 6.4 Establishing the communication with devices

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

- Select (optional) the required device from the "Device" drop down list or use the setting "any device".
- Select the required communication channel from the "Channel" drop down list.

Only those communication channels linked to the selected device are available. In the case of "any device" all communication channels are available.

- Select the required access level from the "Client" drop down list (for modem connections the predefined access level is used and the drop down list is inhibited until the connection is established, then the selection is possible). Only access levels, which have been defined completely in the communication settings, are displayed for selection (see also section 6.2.3.3 "Access levels"). The device-specific access levels appear with attached device name at the top of the list.
- Only for modem connections: select the required phone number from the "Phone" drop down list.
- Only for modem connections: click on in the address toolbar to establish the connection to the device.
- Only for network connections: select the required IP address number from the "IP Address" drop down list.
- 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.

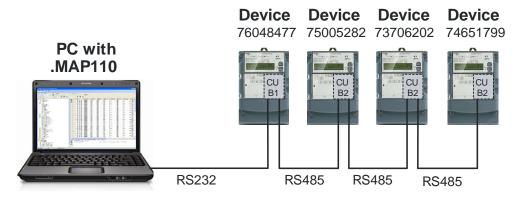


#### **Procedure:**

- 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:

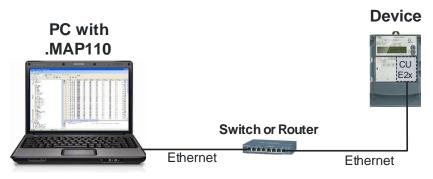
- 1. In the "Device" drop down list select the device you want to communicate with and in the "Channel" drop down list the corresponding channel (if more than one channel is assigned to this device) or create a new device with the following settings (for procedure see section 6.2.2 "Communication channel 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  $\bigcirc$  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.



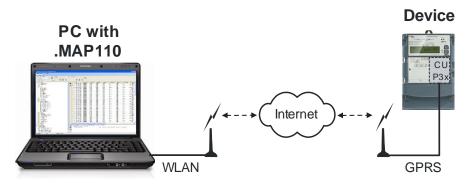
If further devices are connected to the device (multiple connection), their addressing has to be done with the physical device addresses as shown in the example in section 6.5.2 "Serial connection to a local bus".

#### Procedure:

- 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

The following read commands are explained as examples:

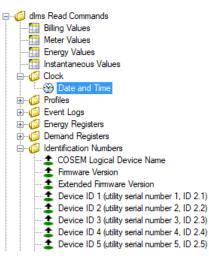
- Simple read commands for parameters and values
- Extended read commands
- Read commands for event logs
- Read commands for load profiles

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  $\clubsuit$  or icon.



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

1. 🖶 🗎 🗡	Command Log
LGZ1030739188859 (V931010) connected	
Read Date and Time	2018-09-15 20:10:03
	Deviation of Local Time to UTC -60 min
	Clock Status 0x81
	[0] Invalid value
	[7] Daylight saving active
Read Device ID 1 (utility serial number	: 1, ID 2.1) 39188859
Read Physical HDLC Device Address	127
Read Relay 1	Relay: connected (closed)
	Control Unit: (1) connected
	Control Mode: (6) locally controlled
LGZ1030739188859 V931010	ZMXi320CQU0L1D3.31 S4

#### 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", "Meter Values", "Energy 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 Billing Values 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.

	OBIS	Value	Unit	Designation	Group	14
•	0-0:42.0.0	LGZ1030739188859		COSEM logical device name	Identification Numbers	
	0-0:97.97.0	0000000		Error code	Diagnostics	
	0-0:97.98.0	00002000		Alarm code 1	Diagnostics	
	0-0:97.98.1	0000000		Alarm code 2	Diagnostics	
	0-0:97.98.2	0000000		Alarm code 3	Diagnostics	
	0-0:1.0.0	2019-12-20 12:06:55 (00)		Clock	Clock	
	0-0:96.1.0	39188859		Device ID 1 (manufacturer serial number)	Identification Numbers	
	0-0:96.1.1	39188859		Device ID 2 (utility serial number 2)	Identification Numbers	
	0-0:96.1.2	123456		Device ID 3 (utility serial number 3)	Identification Numbers	
	0-0:96.1.3			Device ID 4 (utility serial number 4)	Identification Numbers	
	0-0:96.1.4			Device ID 5 (utility serial number 5)	Identification Numbers	
	0-0:96.1.5	Device ID 6		Device ID 6 (IDIS certificate number)	Identification Numbers	
	1-1:1.8.0	22.956	k\//h	Active energy import +A (QI+QIV)	Energy	
	1-1:2.8.0	29.460	k\//h	Active energy export -A (QII+QIII)	Energy	
	1-1:3.8.0	11.144	kvarh	Reactive energy import +R (QI+QII)	Energy	
	1-1:4.8.0	9.064	kvarh	Reactive energy export -R (QIII+QIV)	Energy	
	1-1:1.8.1	18.344	k\//h	Active energy import +A (QI+QIV) rate 1	Energy	

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

LI	<b>,</b> 1 è	8		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

Read Load Profile	1					×
Profile Range						
🔾 all	11772	entries				
Iast	1	day(s)				
🔘 last	1	month(s)				
⊖ from	07.12.2019			00:01:00	*	
to	08.12.2019			00:00:00	*	
			Г	ОК	Cancel	
				UK	Cancer	

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

Read Load Prof	ile 1	×
Profile Range		
🔾 all	11772 entries	s
Iast	1 day(s)	)
🔿 last	1 🌲 month(	n(s)
◯ from	07.12.2019	00:01:00
to	08.12.2019	00:00:00
	Readout (DST considered) nal time (without DST)	OK Cancel

#### 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).

Į,						Lo	bad
	LG	GZ103073918	8859 - Read L	.oad Profile 1	- All		
#	0-0:1.0.0	0-0:96.10.1 [hex]	1-1:1.8.0 [kWh]	1-1:2.8.0 [kWh]	1-1:3.8.0 [kvarh]	1-1:4.8.0 [kvarh]	
0	2019-12-08 14:30:00.00 (0x00)	2 20	22 956	29.460	11.144	9.064	^
1	2019-12-08 15:00.00.00 (0x00)	Statu	s register load pr	ofile 1 29.460	11.144	9.064	
2	2019-12-08 15:30:00.00 (0x00)	80	22.956	29.460	11.144	9.064	
3	2019-12-08 16:00.00.00 (0x00)	20	22.956	29.460	11.144	9.064	
4	2019-12-08 16:30:00.00 (0x00)	A	22.956	29.460	11.144	9.064	
5	2019-12-09 08:30:00.00 (0x00)	20		29.460	11.144	9.064	
6	2019-12-09 09:00:00.00 (0x00)	21	Clock invalid [1] Data not valid [2	20 400	11.144	9.064	
7	2019-12-09 09:30:00.00 (0x00)	21	Clock adjusted [	5] 29.460	11.144	9.064	
8	2019-12-09 10:00:00.00 (0x00)	21	Power down [7]	29.460	11.144	9.064	
9	2019-12-09 10:30:00.00 (0x00)	20	22.956	29.460	11.144	9.064	
10	2019-12-10 14:30:00.00 (0x01)	AE	22.956	29.460	11.144	9.064	
11	2019-12-20 12:15:00.00 (0x00)	20	22.956	29.460	11.144	9.064	~

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).

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).

1.	📜 🖟 🖹 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	00040E0000006	00000000	000000.57	000000.12	000000.65	j	
	2	2014-01-27 15:17:04	8000	010	00020E0000006	00000000	000000.57	000000.12	000000.65	j j	
	3	2014-01-27 14:57:29	0000	049	00000E0000006	00000000	000000.57	000000.12	000000.65	j j	
	4	2014-01-27 14:57:26	0040	024	00008E0000007	00000000	000000.57	000000.12	000000.65	; E	
	5	2014-01-27 14:54:34	0080	023	00004E00000007	00000000	000000.57	000000.12	000000.65	j	
	6	2014-01-27 14:54:34	0000	049	00000E0000007	00000000	000000.57	000000.12	000000.65	j	
	7	2014-01-27 14:53:22	0000	049	00000E0000006	00000000	000000.57	000000.12	000000.65	j	
	8	2014-01-27 14:53:19	0040	024	00008E0000007	00000000	000000.57	000000.12	000000.65	j	
	9	2014-01-27 14:53:15	0080	023	00004E00000007	00000000	000000.57	000000.12	000000.65	j	
	10	2014-01-27 14:53:13	0040	024	00008E0000007	00000000	000000.57	000000.12	000000.65	5	
	11	2014-01-27 14:53:08	0080	023	00004E0000007	00000000	000000.57	000000.12	000000.65	, <b>.</b>	
•					III				۱.		

Example 2: Readout according to IEC of an event log.

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:

Byte 4 Byte 3		Byte 2	Byte 1				
Bit 3130292827262524	2322212019181716	15 14 13 12 11 10 9 8	7 6 5 4 3 2 1 0				

#### 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  $\boxed{m}$  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

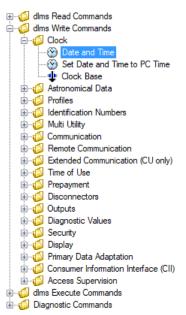
dlms Emerge	ncy Readout	
Load	lection log (1-0:P.98.0) profile 1 (1-0:P.1.0) profile 2 (1-0:P.2.0) d values (0-0:L.1.0.126)	
Profile Ran all Iast Iast from		
to	8. December         2019         100 <t< td=""><td></td></t<>	
Working F	older user\Documents\Landis+Gyr\dMAP110\6.1	

After clicking **OK** 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

For execution, select the corresponding write command in the command tree marked with the  $\psi$  or  $\mathfrak{B}$  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:

Date and Time		
Local Date Time Deviation of Local Time to UTC	8 . December 2019 🛨 🗰	14 : 25 : 25 🗼 🌶
Clock Status = 0x00		
[0] Invalid value	[4] Reserved	
[1] Doubtful value	[5] Reserved	
[2] Different clock base	[6] Reserved	
[3] Invalid clock status	[7] Daylight saving active	
		<u>O</u> K <u>C</u> ancel

or for writing an identification number:

Dev	ice ID 1 (utility serial number 1, ID 2.1)	
	39188859	0
E	inter a string with a maximum of 16 chara	ters
	OK	ancel

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):

📜 🖶 🗎 🗙		Command Log
LGZ1030739188859 (V931010) Write Date and Time	connected	2019-12-08 14:24:39 Deviation of Local Time to UTC -60 min
LGZ1030739188859	V931010	ZMXi320CQU0L1D3.31 S4

Further write commands are explained as examples in the following subsections.

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.

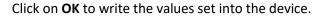
#### 7.2.1 Set communication inputs

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

🖽 í 🎒 🗄 🕀	ead Commands				
🖶 🎁 dlms W	rite Commands				
🗄 🍏 Clo	🗄 🕼 💋 Clock				
🗄 👘 🂋 Ast	🗄 🕼 í 💮 🗄				
🗄 👘 🃁 😥 🗄	files				
🗄 🍏 Ide	ntification Numbers				
🗄 👘 💋 Mu	lti Utility				
🖨 🕼 Cor	mmunication				
••••	Physical IEC Device Address				
••••	Physical HDLC Device Address				
	Ethernet MAC Address				
	CS/S0 Type				
•	Communication Input Settings				
•	Optical Interface				
	RS485 Interface				
	2nd RS485 Interface				
	Electrical Interface 1				
	Meter Interface				
	Electrical Interface 2				
	Wireless M-Bus Setup				
	Wired M-Bus Setup				
	SMS Configuration				
🗄 💮 😥 Rei	mote Communication				

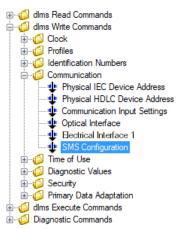
All communication inputs are displayed in the dialogue window. By clicking on a field you can toggle between 0, 1 and X (value remains the same).

Communication Input Settings	
Communication Input 1	1
Communication Input 2	1
Communication Input 3	1
Communication Input 4	X
Communication Input 5	X
Communication Input 6	X
Communication Input 7	0
Communication Input 8	0
<u>о</u> к	<u>C</u> ancel



#### 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.

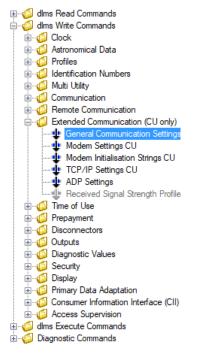
Configuration	
✓ Enable	
Simple Message Format (onl Six Message Format (Prefix )	ly message text below) / DeviceID / Timestamp / Event Nr. / Optional Alarm Text)
2	DeviceD / Timestamp / Event N., / Optional Alarm Texty
Calling AT Message String	
Phone Number (to be called)	0793870963
Message Text	Meter 50114833 Battery low
	Omit "AT" Example: +CMGS=0793904208<0D>74403759<1A>
Calling AT Message String	+CMGS=0793870963<0D>Meter 50114833 Battery low<1A>
	Insert CR Insert ^z
AT Initialisation String	
	Omit "AT" Example: Z<0D>+CMGF=1<0D>
AT Initialisation String	+CMGF=1<0D>
5	Insert CR Insert ^z
	inservery inservery
Transmission	
Number of Messages per Aler	t 1 Number of Messages per Alert
Repetitions	15 Minutes
nepetitoria	
	<u>O</u> K <u>C</u> anc

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).



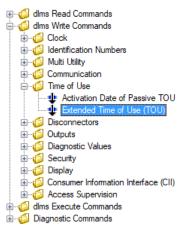
In the dialogue window you can modify the corresponding communication settings, e.g. the modem configuration of a communication unit with GPRS modem, as shown in the following figure.

General Communication Settings		
General Settings Channel 1: Internal GPRS Modem	Channel 2: CS // RS232	
Initial Protocol dlms DLMS Response Delay 0 ms DLMS AccessProtection off		
	Qł	( <u>C</u> ancel

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.

Jse (0-0:13)	ve TOU	Sp	cial D	ays	Em	erger	ncy Se	ettings	1	
DU Passi D2_00_00 n Table		Sp	ecial D	ays		erger	ncy Se	ettinas	1	
02_00_00 n Table	ve 100	sp	ecial D	ays	Em	erger	ncy Se	ettings		
n Table							· ·			
X										
X Reason Nan										
eacon Nan	/	/			Ē					<b>#</b>
cuson nun	ne Mor	nth	Day	We	ek Na	ame				
1	Jan	uary	1		1					
2	A	pril	1		2					
3	Nove	embe	r 1		3					
1 2 3	1 3 1	1 3 1	3	3	3	1	1			
bles D 1	1	Day IE	2			Da	y ID	3		<u>*</u>
Start Time	Action									
00:00	execute	e rate	script	5 ×						
06:00	execute	e rate	script	1 ×						
22:00	execute	e rate	script	5 ×						
	3 Table Veek Name 1 2 3 bles bles 0 1 Start Time 0:00 0:00	3 Nov Table Veek Name Mon 1 1 2 3 3 1 bles 0 1 X I Start Time Action 10:00 execute 16:00 execute	3 Novembe	3         November         1           Fable         Image: Start Time         Action         Image: Start Time         Action           0:00         execute rate script         Image: Start Time         Action         Image: Start Time         Action           0:00         execute rate script         Image: Start Time         Action         Image: Start Time         Action	3         November         1           Fable         Image: Start Time         Action         Image: Start Time         Action           0:00         execute rate script 5         >	3       November       1       3         Fable       Image: Start Time       Action       Image: Start Time       Action         0:00       execute rate script 5       Image: Start Time       Image: Start Time         0:00       execute rate script 1       Image: Start Time	3       November       1       3         Fable       Image: Start Time       Action       Image: Start Time       Action         0:000       execute rate script 5       Image: Start Time       <	3       November       1       3         Fable       Image: Start Time       Action       Image: Start Time       Start Time         0:00       execute rate script 5       Image: Start Time       Image: Start Time       Image: Start Time         0:00       execute rate script 1       Image: Start Time       Image: Start Time       Image: Start Time         0:00       execute rate script 1       Image: Start Time       Image: Start Time       Image: Start Time	3       November       1       3         Fable       Image: Start Time       Action       Image: Start Time       Action         0:000       execute rate script 5       Image: Start Time       Image: Start Time       Image: Start Time         0:000       execute rate script 1       Image: Start Time       Image: Start Time       Image: Start Time         0:000       execute rate script 1       Image: Start Time       Image: Start Time       Image: Start Time         0:000       execute rate script 1       Image: Start Time       Image: Start Time       Image: Start Time	3       November       1       3         Fable       Image: Start Time       Action       Image: Start Time       Image: Start Time         0:00       execute rate script 5       Image: Start Time       Image: Start Time         0:00       execute rate script 1       Image: Start Time

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.

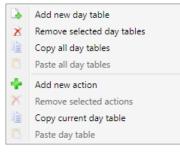
Clicking on copies the active TOU into the passive TOU.

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.

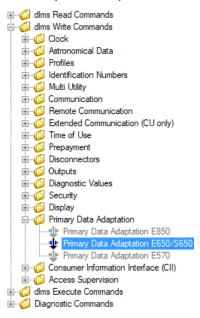


Via the Windows clipboard it is also possible to import an entire TOU from a Landis+Gyr .MAP120 Parameter Editor. The transfer in the opposite direction from .MAP110 to .MAP120 is however not supported.

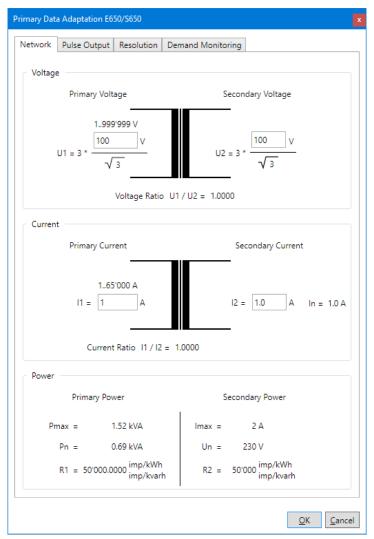
Click on **OK** to write the modified or imported TOU into the device. Afterwards the "Time of use (TOU)" dialogue window disappears again.

#### 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.



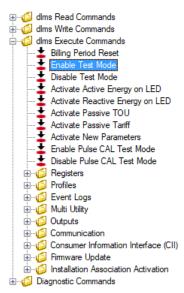
In the dialogue window you can modify the primary value adaptation settings of transformer connected devices.



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

# 7.3 Execute commands

For execution, double click the relevant execution command in the command tree marked with the  $\stackrel{\bullet}{\Rightarrow}$  icon.

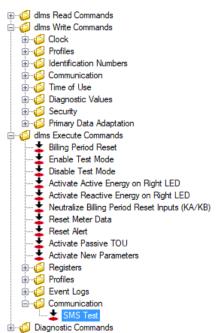


The execute command is normally transmitted to the device without additional dialogue (exception: see 7.3.1 "SMS test transmission") and executed there. The commands executed are recorded in the command log window:

🐌 🖶 🗎 🗡			Command Log
LGZ1030739188859 (V931010) Enable Test Mode Disable Test Mode	connected		
LGZ1030739188859	V931010	ZMXi320CQU0L1D3.31 S4	

#### 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.

SMS Test	×	
Destination Phone Number Message Text	07991234567 Alert Meter 76926068	
Calling AT Message String	Example: +CMGS=0793904208<0D>74403759<1A> +CMGS=07991234567<0D>Alert Meter 76926068<1A>	
SMS Status		
Send Test SMS Read SMS	Status <u>C</u> lose	

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

This execute command is only applicable for meters of the E450, E460, E570 and L540 device series and for E35C V4.x communication modules.

# $(\mathbf{i})$

#### Additional knowledge required

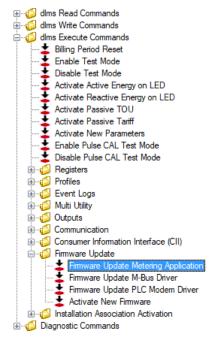
Additional knowledge is required to apply this execute command. The following information provides only an overview about this command. Please contact your sales representative to receive further information about this command.



#### **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 Metering Application" execute command of the command tree.



The Update Wizard "Firmware Update" appears.

Firmware Update Metering Ap	pplication	
<ul> <li>E450 device series</li> <li>E460 device series</li> <li>E570 device series</li> <li>E35C V4.x modules</li> <li>L540 device series</li> </ul>		
		e source e
		LGZ1030739188859
		Next <u>C</u> ancel

This Wizard guides you through the update process:

- Click on Next >. The screen "Step 1: Selection of firmware" appears.
- 2. Click on 4 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.

Firmware Update Meteri	ing Application
Step 1: Selection of im	nage
Image file	
C:\Users\user\Docume	ents\Landis+Gyr\dMAP110\6.2\V93.12.12.18_FixFlex_v2_Release.img
Image version: V2	Image identification: V93.12.10.12.18 Image size: 925048 bytes
Image signature R	= F5A2 76C3 BBC7 E1F4 A724 392F F221 4806 4668 1F9B 7C72 80CD A693 505E 2B0B 4E08 753B 56C3 40C0 BB65 C3D0 E820 5CE7 00B9
S	= CF80 92C6 A98F D620 64AF D1AB 6282 4360 3799 F61E CC72 0EBE 75DE 77B9 579D 944F E699 D69F 0A10 464F 5910 18B4 99F4 0070
Public key X	= 9D43 E085 4FB1 08EA 7F2C A9FE 8988 D727 D552 6E4C C95A 73C8 C949 0CE4 29F4 D7EF 8E1B 2863 4EF4 3566 BCEC 562F AA88 F4E7
Y	= B4DC 98C2 0531 35BE 5628 BF67 C392 9977 828F D707 DD7D 6520 CF11 7B45 B3E8 F44E 4126 F60C 74A5 D6DB EC09 AADD 4554 DBE2
Public key signature R	= D13D 666E 1107 DE00 7AA8 FAED 033A CC1E 8F86 CA8D 0E48 57E3 7D52 5751 68BE 4FAA 8AF1 05D4 4BB1 0A0D C3FF D50C BB28 757E
S	= AE3B 297F 59A2 E272 C202 F952 A682 BFEA 049E A44B 61A6 A7C5 3DC6 4CD1 7B40 83FA 1F0C 6DAB E74B 785E F9FB F209 BA82 CC34
Image type: Legally	relevant and legally non relevant firmware 👋
	LGZ1030739188859
	Next Cancel

3. Click on **Next >**.

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 of the new firmware
- Total size, block size and number of blocks of the new firmware

Firmware Update Metering Application			
Step 2: Initialisation of transfer			
Firmware identification			
Current firmware: V93.10.09.10.12	New fir	mware: V93.12.10.12.18	
Transfer information			
Total size: 925048 bytes	Block size: 254 bytes	Number of blocks: 3642	
Activation			
● immediately			
<ul> <li>manually at a later date</li> </ul>			
○ fixed date			
		LGZ10307	39188859
		Back	<u>C</u> ancel

- 4. 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.
- 5. Click on Next >.

The screen "Step 3: Transfer, verification and activation" appears.

Firmware Update Metering	Application	
Step 3: Transfer, verificat	ion and activation	
Image transfer	Start new transfer (3642 blocks)	
Progress:		
[6] Image activation succes	sful	LGZ1030739188859
		Back Cancel

#### 6. Click on **Start new transfer**.

The new firmware is transferred to the device. The progress is indicated in the "Progress" area.

Firmware Update Metering A	pplication	
Step 3: Transfer, verificatio	on and activation	
Image transfer		
	Start new transfer (3642 blocks)	
_		
Progress:	904 / 3642 (24%)	
[1] Image transfer initiated		LGZ1030739188859
		Back Cancel

## When all blocks are transferred, the verification process is initiated.

Firmware Update Metering Application		
Step 3: Transfer, verification and activat	ion	
Image transfer		
	Start new transfer	
	(3642 blocks)	
Progress:	3642 / 3642 (100%)	
Verifying image	• • • • • • • •	
[2] Image verification initiated		LGZ1030739188859
		Back Cancel

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

Firmware Update Metering Application	
	Activation of new firmware successfully started! To read the currently active firmware version from the device please press <check> after the upgrade process has finished in the device (this can take up to 2 minutes). Press <finish> to leave the wizard without checking the currently active firmware in the device. Check</finish></check>
[5] Image activation initiated	LGZ1030739188859
	Finish

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:

Firmware Update Metering Application		
	Transfer of new firmware successfully terminated! Currently active firmware version: V93.12.10.12.18	
[6] Image activation successful		LGZ1030739188859
		Finish

8. Click on Finish.

This concludes the firmware update.

# 7.4 Diagnostic commands

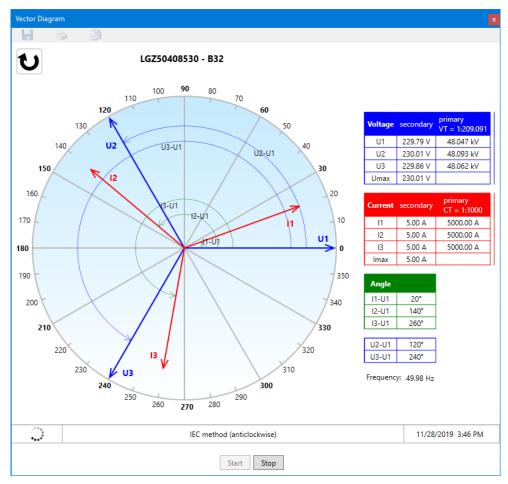
#### 7.4.1 Vector diagram

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.

÷🏹 (	dlms Read Commands dlms Write Commands dlms Execute Commands
ė. 🧔 I	Diagnostic Commands
(	🕥 Vector Diagram
	GSM Installation Support CU
	GSM Installation Support
····	🝿 DIP Table
	Security System (Excel required)
	Wireless M-Bus Devices

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 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.

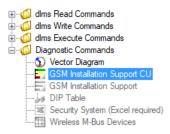
Clicking copies the vector diagram to the Windows clipboard, from where it can be inserted in another application (e.g. in a word processing program).

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.

GSM Installation Su	oport	×
-		
	LGZ50408529-2 - D71	
Logged In Cell		
-51 dBm	Si	unrise Communications AG [22802]
Neighbour Cells		
-91 dBm	Si	unrise Communications AG [22802]
-99 dBm	Si	unrise Communications AG [22802]
-101 dBm	Si	unrise Communications AG [22802]
-111 dBm	Si	unrise Communications AG [22802]
-107 dBm	Si	unrise Communications AG [22802]
-109 dBm	Si	unrise Communications AG [22802]
$\langle \rangle$		11/28/2019 3:13 PM
	Start Stop	

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**.

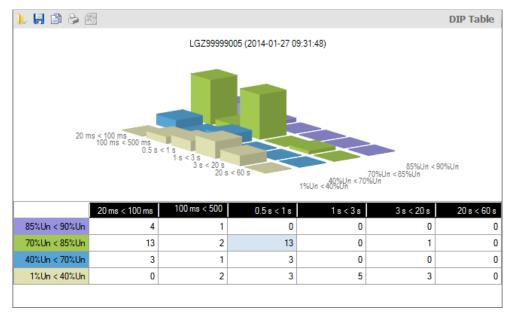
#### 7.4.3 DIP table

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.



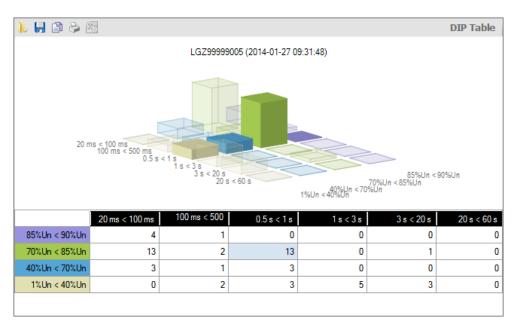
The categories, i.e. the severity of the voltage failures, are shown in colour, e.g. voltage failures of 1 to 40 % of rated voltage in violet. The table contains a line for each category, the diagram a series of bars in the x-direction.

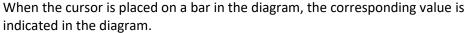
The number of voltage failures occurring is shown in the table as numeral and in the diagram as bar height.

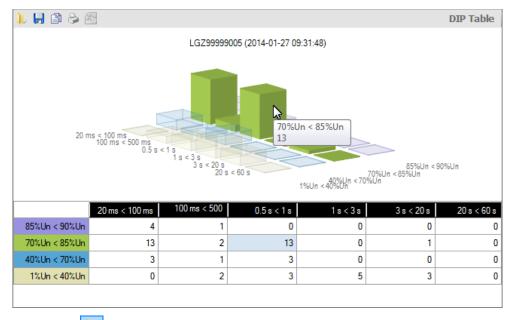
The duration of the voltage failures is divided into four ranges: 20 to 100 ms, 100 to 500 ms, 0.5 to 1 s, 1 to 3 s, 3 to 20 s and 20 to 60 s. The table contains a column for each range, the diagram a series of bars in the y-axis with bars of different colour.

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 highlighted.







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.

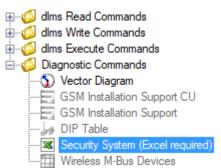
Clicking on in the result window toolbar copies the content of the result window to the Windows clipboard, from where it can be inserted in another application (e.g. in a word processing program).

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:

M 19 - 9 - (=	SecuritySystem_B32+1 [Kompati	bilitätsmodus] - Microsoft Excel	- 🗆 ×
Datei Start Einfügen Seitenlayout Formeln Daten	Überprüfen Ansicht Acrobat		
Ausschneiden Arial Narrow - 10 - A A	= _ >· = Zeilenumbruch	·	Σ AutoSumme ·
Kopieren *	F 喜 喜 律律 国Verbinden und zentrieren · 嬰・% 000	*,0 +0 Bedingte Als Tabelle Zellenformativorlagen Einfügen Lös *,0 +0 Formatierung * formatieren *	
Zwischenablage G Schriftart	Ausrichtung G Zahl	,00 +,0 Formatierung formatieren Zei	
C7 • Access to Data (Registers a		romationagen 22	
C/ Access to Data (negisters a	ind Promes)		
Select a level in order to see the access rights of every group	Password Type	Additional Security Attributes	
		· · · · · · · · · · · · · · · · · · ·	
Utility Field Service (Level 2)	coded password	not required	
L			
Access to Data (Registers and Profiles) (00) Error Code	Access to Parameters (21) Primary Values (Transformer Ratio)	Access to Commands (30) Register Reset	Modification of Passwords (33) Password 1 (=IEC P1)
(00) Error Code (01) Identification Number 1		(30) Register Reset (50) Neutralize Reset Control Inputs KA/KB	
(02) Identification Number 1 (02) Identification Number 2	(19) External Pulse Input Configuration (20) Pulse Output Configuration	(31) Billing Period Reset	(34) Password 2 (=IEC P2) (37) Password 5
(03) Device Addresses (IEC and HDLC)	(20) Pulse Output Configuration (09) Clock (Synchronization, Daylight Saving)	(31) billing Penod Reset	(37) Password 5 (38) Password 6
(04) Parameterisation ID, Timestamp,	(79) TOU and Special Day Table		(36) Password 6 (39) Password 7
(11) Connection ID	(28) Control Table		(39) Password 7 (44) Password C
(08) Time and Date	(28) Control Table (77) Integration / Capture Period		(44) Password C (45) Password D
(06) Energy Total Registers	(25) Energy Register Format		(45) Password D (46) Password E
(00) Energy Total Registers (07) Energy Registers	(25) Energy Register Format (26) Demand Register Format		(46) Password E (12) IEC W5 Password
(70) Maximum Demand Registers	(20) Demand Register Format (22) Power Factor Configuration		(12) IEC W5 Password
(71) Cumulative Maximum Registers	(22) Power Pactor Comiguration		
(13) Power Factor	(72) Stored Value Configuration		
(48) Operating Time Registers	(72) Stoled Value Configuration (78) Load Profile Configuration		
(46) Operating Time Registers (05) Reset Counter and Timestamp	(75) Load Profile Configuration (87) Load Profile 2 Configuration		
(15) Stored Values	(23) Event Log Configuration		
(73) Load Profile	(89) Dedicated Event Logs Configuration		
(86) Load Profile 2	(74) Under / Over Voltage Thresholds		
(14) Event Log	(75) Over Current Thresholds		
(10) Battery (Time, Voltage and Symbol)	(81) Demand Monitor Thresholds		
(88) Dedicated Event Logs	(27) Display and IEC-Readout List		
(16) All other Registers	(80) Communication Parameters		
	(68) Customer Magnitude Adjustment		
	(69) CT / VT Error Correction		
	(82) Electrical Interface / SMS System		
ereit	loch close and monade / Owlo System		147 % - ··· · · · ·

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.

Startup Language	×
English	~
	OK Cancel

- 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.
- Select the "General" tab. The colour currently selected for disabled commands is shown.

Options				×
General	Communication Settings	Commands	Key Management System	
Colours				
Colour o	of disabled commands		\$	
Calenda	ar Base of IEC Commands —			
Greg	orian			
🔿 Jalali	(Persian)			
				OK Cancel

- In the "Colours" area click on the button .
   The "Colour" window appears with a colour palette.
- 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".
- 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.

Options				×
General	Communication Settings	Commands	Key Management System	
- Colours				
Colour	of disabled commands		\$	
Calenda	ar Base of IEC Commands —			
Image: Greger	orian			
🔾 Jalali	(Persian)			
				OK Cancel

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.

Options				
General	Communication Settings	Commands	Key Management System	
- File Loc	ation			
C:\Users	\user\AppData\Local\Landis	+Gyr\dMAP		
Storage	Policy of Keys and Password	ds		
⊖ neve	r			
0 limite	ed until 8 . December	2019 🔺 🔛		
				OK Cancel

#### 4. Click on **OK**.

The "Options" window disappears and the new settings are saved.

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

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

# 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:

**i**)

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

Options					×
General	Communication	Settings Com	mands	Key Management System	
File Loc	ation				
C:\Users	\user\AppData\Lo	cal\Landis+Gyr\o	dMAP		
Storage	Policy of Keys and	Passwords			
<ul> <li>perm</li> </ul>	anent				
⊖ neve	r				
⊖ limite	ed until 8 . De	cember 2019			
					OK Cancel

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.

Options				×				
General	Communication Settings	Commands	Key Management System					
	Command Control Repetition Delay for Diagnostic Commands (e.g. Vector Diagram)							
Delay before Reading SMS Status after Sending a Test SMS 10000 🖨 [ms]								
Comma	Command Confirmation							
Conf	ïrm Write Commands							
Conf	irm Execute Commands							
MAP10	MAP100 File Export							
C:\U	C:\Users\user\Documents\Landis+Gyr\dMAP110\6.2							
				OK Cancel				

### 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.

Options								
General	Communication Settings	Commands	Key Management System					
Comma	and Control							
Repetitio	Repetition Delay for Diagnostic Commands (e.g. Vector Diagram)							
Delay before Reading SMS Status after Sending a Test SMS 10000 🖨 [ms]								
Comma	Command Confirmation							
✓ Conf	irm Write Commands							
Conf	ïrm Execute Commands							
MAP100 File Export								
C:\U	C:\Users\user\Documents\Landis+Gyr\dMAP110\6.2							
			OK Cancel					

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  $\Psi$  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 26<sup>th</sup> 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.

Options				x			
General	Communication Settings	Commands	Key Management System				
	Command Control Repetition Delay for Diagnostic Commands (e.g. Vector Diagram)						
Delay be	Delay before Reading SMS Status after Sending a Test SMS 10000 🖨 [ms]						
Comma	Command Confirmation						
Conf	irm Write Commands						
Conf	irm Execute Commands						
MAP100 File Export							
C:\Users\user\Documents\Landis+Gyr\dMAP110\6.2							
			ОК Са	ancel			

5. Click on **OK**.

The "Options" window disappears and the new settings are saved.

## 8.9 Defining the key management system

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

#### Required credentials

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

#### Procedure:

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

Options				×
General	Communication Settings Commands Key Ma	nagement System		
Reference	d Key Management System Productive System			
Key Mar	nagement System (Productive) Key Management S	System (Test) Re	naming	Logging
Url				
User				
Passwor	d			
Certifica	te			
Key Lab	el WK_LG			
Key E	ncryption Key (KEK)			
KEK Sł	nare 1 KEK S	Share 2		
KEK (H	lash)			
			C	K Cancel

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

The resulting Url is displayed in the corresponding box underneath.

Server	localhost
Port	8081
Resulting Url	https://localhost:8081/ATM-KeyManagement-REST-Service/service/re

6. Click on **OK**.

The "Url" window disappears and the Url is displayed in the corresponding entry box in the "Options" window.

- 7. Enter the user name in the "User" entry box.
- 8. Click on behind the "Password" entry box. The "Enter new password (secret)" window appears.
- 9. Enter the password as visible string in the "Password (secret)" entry box.

Enter new password (s	cret)	
Password (secret)		
visible string	98765432	•
hexadecimal	characters 8/255	
hexadecimal	characters 8/255	
		<u>O</u> K <u>C</u> ance

10. Click on **OK**.

The "Enter new password (secret)" window disappears and the password is displayed with asterisks in the corresponding entry box in the "Options" window.

- 11. Click on behind the "Certificate" entry box. The "Certificate" window appears.
- Enter the certificate name in the "Certificate" entry box.
   Klick on Look-up to decrypt the certificate and display the details of the certificate.

Certificate	Certificate_12345		Look-up
	Certificate information:	lddressBook	
Details	Store:	AddressBook	
	Subject:	E=susanne.s	
	Effective date:	23.10.2015	
	Expiration date:	22.10.2017	
	Issuer:	CN=SIX-Group	
	Key algorithm:	1.2.840.113	
	Certificate hash:	E75B45B1BB41	
	Public key:	3082010A028:	
	Serial number:	052A1F811051	
	Subject:	E=thomas.hil	
	Effective date:	01.04.2015	

13. Click on **OK**.

The "Certificate" window disappears and the certificate name is displayed in the corresponding entry box in the "Options" window.

- 14. Enter an unambiguous key label in the "Key Label" entry box. Default value is "WK\_LG".
- 15. Click on behind the "KEK Share 1" entry box. The "Enter Key Encryption Key" window appears.
- 16. Enter the key encryption key share 1 (part 1) as hexadecimal string in the "KEK Share 1" entry box.

EK Share 1		
visible string	0x FFFEFDFCFBFAF9F8F7F6F5F4F3F2F1F0FFFEFDFCFBFAF9F8F7F6F5F4F3F2F1F0	0
hexadecimal	characters 32/64	

17. Click on **OK**.

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

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

Options						x	
General	Com	munication Settings	Commands	Key Management Syst	tem		
Referenced Key Mangement System Productive System ~							
Key Mar	nagem	ient System (Productiv	e) Key Mana	agement System (Test)	Renaming	Logging	
Url	ht	https://localhost:8081/ATM-KeyManagement-REST-Service/service/rest/crypto/getKeys					
User	He	Henry Miller					
Passwor	d **						
Certifica	te Ce	Certificate_12345					
Key Lab	el W	WK_LG					
Key E	ncrypt	tion Key (KEK)					
KEK Sł	nare 1	********		KEK Share 2	*****		
KEK (H	KEK (Hash) 455B59BC19E4480670E163D26305302B5BFAD9E0						
						OK Cancel	

- 19. In the selection box "Referenced Key Management System" select "Test System" and repeat points 4 to 18.
- 20. Select the "Renaming" tab if the key management system used has to be identified with a client name instead of a COSEM client ID. The relation between the COSEM client ID and the client name is defined in the file "KMSClientIDMapping.xml". This file has to be adapted according to the key management system used.
- 21. Tick the checkbox on the "Renaming" tab and click on to select the folder with the file "KMSClientIDMapping.xml" in the "Open" window which then appears or enter the path to the file in the entry box.

Options					X	
General	Communication Settings	Commands	Key Management Syst	tem		
Reference	ed Key Management System	Productive	System ~			
Key Ma	nagement System (Productiv	e) Key Man	agement System (Test)	Renaming	Logging	
Use Clie	Use Client Name instead of Client ID to query the KMS:					
V	C:\Users\user\Documents	\Landis+Gyr\dl	MAP110\6.2\KMSClientll	DMapping.xm	ıl	
In this c The rela	MS use instead of COSEM Cli ase the .MAP tools have to qu tion between the Client ID au ing is used, adapt this file ac	uery the custon nd the Client N	ner KMS using this text a	s identifier.		
					OK Cancel	

- 22. Select the "Logging" tab if the queries to the key management system shall be logged.
- 23. Tick the checkbox on the "Logging" tab and enter the path and the desired name of the log file in the entry box.

The log file will then be created automatically in the corresponding folder. As default value the file name "KMSLog.txt" and the default folder of the used .MAP110 version is used.

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

Options						x
General	Communication Settings	Commands	Key Management Syst	tem		
Reference	ed Key Management System	Productive	System 🖌			
Key Ma	nagement System (Productiv	e) Key Man	agement System (Test)	Renaming	Logging	
Log F	ile \Users\user\Documents\Lan	dis+Gyr\dMAF	110\6.2\KMSLog.txt			
					OK Can	cel

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

## 8.10 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:

 Press function key [F1] or select Help from the Help menu. The online help for the Landis+Gyr .MAP110 Service Tool appears.

🛃 .MAP110 Help	- 🗆 X
Ausblenden Zurück Drucken	Dif- Qotonen
Inhait Index Suchen	Overview Previous Next
<ul> <li>First steps</li> <li>Description of user interface</li> <li>Communication with the devi</li> <li>Commands</li> <li>Auxiliary functions</li> </ul>	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.
Support Store Short description of device s Generative Store Stor	The following diagram illustrates the various fields of application of the Landis+Gyr .MAP Tools.           Manufacturer         Utility Central Services         Utility Local Services           Configuration         Parameter- isation         Test + Verification         Installation         Readout         Maintenance           MAP190/120         .MAP110         .MAP100
	.MAP120         Further information:         Functions         Communication channels         Communication protocols         dlms security         Editions         Supported devices         Required setting when operating .MAP110 on high resolution displays

- 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  $\times$  to close the online help.

### 8.11 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.

.MAP110 - Release Notes	×
1. Description	^
The Landis+Gyr .MAP110 Service Tool is designed to read and set device data of Landis+Gyr meters via the Additionally, various analysis and diagnostic functions are available.	dlms a
2. Most recent changes, enhancements and bug fixes	
Changes to release 6.0.04 (2018-11-28)	
- Final device support E570 S2 G3 PLC V830505 - Final device support E570 S2 GPRS V840505 - Final device support E460 S1 G3 PLC 1ph BS V770100	
Other relevant changes:	
<ul> <li>E650 Series: Fixed issue where Power Threshold can't be changed with the Primary Data Adaption comman</li> <li>FW update feature licensing extended to the license groups Consumer, Field Inspection, Reader, Installation</li> <li>Vector diagram: Fixed issue where the phase currents are represented wrong in the vector diagram when the</li> </ul>	, Engii
<	>
	Close

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

## 8.12 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.

About			×
	Landis+Gyr .MA	P110 - Service Tool	
	Version Information		
	Version	6.2.07	\infty Update
	Date	2019-12-06	
	Build	6.2.7279.28735 (2019-12-06)	
	<ul> <li>License</li> </ul>		
	User name	Hans Muster	
	User group	Professional	
Landis.			
Landis  Gyr <mark>+</mark>	System Information		
	Operating System	Windows 10 Professional Edition	on (64Bit)
http://www.landisgyr.com	.NET Framework	4.7.3190	
	Copyright © Landis+Gy	rr AG, 2019	
	ОК		

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.

About		x	
	Landis+Gyr .MA	P110 - Service Tool	
	Version Information		
	Version	6.2.07 🐼 Update	
	Date	2019-12-06	
	Build	6.2.7279.28735 (2019-12-06)	
	License		
	User name	Hans Muster	
	User group	Professional	
Landis			
Gyr	System Information	Mindawa 10 Professional Edition (SADia)	
1	Operating System	Windows 10 Professional Edition (64Bit) 4.7.3190	
http://www.landisgyr.com	INET Framework	4.7.5 130	
	Copyright © Landis+G	yr AG, 2019	
	OK		

	$\mathbf{x} \in \mathbf{x}$	
<b>T</b> I	11	the state of the s
ine	•••	icon is displayed while the query is performed.

About			×
	Landis+Gyr .MA	P110 - Service Tool	
	Version Information		
	Version	6.2.07	\infty Update
	Date	2019-12-06	
	Build	6.2.7279.28735 (2019-12-06)	<b>V</b>
	License		
	User name	Hans Muster	
	User group	Professional	
Landis_  Gyr	System Information		
1	Operating System	Windows 10 Professional Edit	ion (64Bit)
http://www.landisgyr.com	.NET Framework	4.7.3190	
	Copyright © Landis+G	yr AG, 2019	
	ОК		

The  $\checkmark$  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 **C** icon is displayed, no information is available or the internet access failed.

 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 8.10 "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:
	<ul> <li>no authentication (access possible without password)</li> </ul>
	low level authentication using a static password
	<ul> <li>high level authentication using a coded password</li> </ul>
	<ul> <li>high level authentication using TEA (Tiny Encryption Algorithm)</li> </ul>
	<ul> <li>high level authentication using MD5 (Message-Digest Algorithm 5)</li> </ul>
	<ul> <li>high level authentication using SHA-1 (Secure Hash Algorithm)</li> </ul>
	<ul> <li>high level authentication using SHA-256 (Secure Hash Algorithm)</li> </ul>
	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 securityTo ensure the message safety, the messages can be authenticated and/or encrypt-<br/>ted, provided a high level authentication using MD5, SHA or GMAC is used for<br/>access authentication. The necessary keys are stored in one or several security<br/>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. de- vice 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.
В		Reserved for future expansion.
C Read Administrator UID = 96	with static password without breaking a seal	Allocation of read access rights All parameter and all billing data are readable. Read access rights for all lower levels (0 to B) can be allocated.
D Utility Administrator UID = 97	with coded password breaking the verification seal necessary local interfaces only Landis+Gyr Tool required because of coded password	Same as level 4. In addition, changes in the utility security system are possible: Read and write access rights can be adapted and all passwords can be changed.

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

# **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.

point, since they are largely specific to either context, country or manufacturer.

Group A	Group A of the OBIS identification can theoretically have values in the range between 0 and 9. Only the values <b>0</b> (abstract objects) and <b>1</b> (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 <b>0</b> (no channel specified) <b>1</b> (channel 1) and <b>2</b> (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

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 of	objects		0						
Active power	import (+A)	ΣLi	1	L1	21	L2	41	L3	61
	export (-A)	ΣLi	2	L1	22	L2	42	L3	62
Reactive power	import (+R)	ΣLi	3	L1	23	L2	43	L3	63
	export (-R)	∑ Li	4	L1	24	L2	44	L3	64
	Quadrant I (+Ri)	∑ Li	5	L1	25	L2	45	L3	65
	Quadrant II (-Rc)	∑ Li	6	L1	26	L2	46	L3	66
	Quadrant III (-Ri)	ΣLi	7	L1	27	L2	47	L3	67
	Quadrant IV (+Rc)	∑ Li	8	L1	28	L2	48	L3	68
Apparent power	import (+VA)	∑ Li	9	L1	29	L2	49	L3	69
	export (-VA)	∑ Li	10	L1	30	L2	50	L3	70
Current		∑ Li	11	L1	31	L2	51	L3	71
Voltage		∑ Li	12	L1	32	L2	52	L3	72
Power factor		∑ Li	13	L1	33	L2	53	L3	73
Frequency			14	L1	34	L2	54	L3	74
Active power qua	drant I+IV+II+III			L1	35	L2	55	L3	75
Active power qua	drant 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	on*		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

	Value	Application
	131	Sum of all phases: reactive power quadrant I+II-III-IV
	132	Sum of all phases: reactive power quadrant I+IV
	133	Sum of all phases: reactive power quadrant II+III
	150	Phase 1: reactive power quadrant I+IV+II+III
	151	Phase 1: reactive power quadrant I+II-III-IV
	152	Phase 1: reactive power quadrant I+IV
	153	Phase 1: reactive power quadrant II+III
	170	Phase 2: reactive power quadrant I+IV+II+III
	171	Phase 2: reactive power quadrant I+II-III-IV
	172	Phase 2: reactive power quadrant I+IV
	173	Phase 2: reactive power quadrant II+III
	190	Phase 3: reactive power quadrant I+IV+II+III
	191	Phase 3: reactive power quadrant I+II-III-IV
	192	Phase 3: reactive power quadrant I+IV
	193	Phase 3: reactive power quadrant II+III
Group D	255. The ii	f the OBIS identification can have values in the range between 0 and ndividual values are differently assigned depending on the value of nd C, but are not described here.
Group E	255. In the items (gro	f the OBIS identification can have values in the range between 0 and e Landis+Gyr .MAP110 Service Tool for group E for electricity-related up A = 1) the values corresponding to the number of tariffs specified bear (0 = total of all tariffs, 1 = tariff 1, 2 = tariff 2, etc.). Other values

**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.

apply for specific values of group C, but these are not described here.

# 11.2 Examples

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

OBIS code	OBIS code (hex)	Description
(decimal)	ABCDEF	
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

OBIS code	OBIS code (hex)	Description
(decimal)	ABCDEF	
0-0:96.2.3	00 00 60 02 03 FF	Date of last RCR program change
0-0:96.240.0	00 00 60 F0 00 FF	EEPROM identification
0-0:96.240.13	00 00 60 F0 0D FF	Hardware ID
0-0:96.3.1	00 00 60 03 01 FF	Input terminal states base meter
0-0:96.3.2	00 00 60 03 02 FF	Output terminal states base meter
0-0:96.4.0	00 00 60 04 00 FF	Internal control signal states
0-0:96.5.0	00 00 60 05 00 FF	Internal operating state
0-0:96.6.0	00 00 60 06 00 FF	Operating time of battery
0-0:96.6.3	00 00 60 06 03 FF	Battery voltage
0-0:96.7.0	00 00 60 07 00 FF	Number of phase fails L1L3
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

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

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

Abbreviation	<b>Definition</b> Description
dlms	<b>Distribution Line Message Specification</b> Messaging system defined originally as part of the application layer of the proto- col stack for distribution line carrier systems (IEC 61334-4-41, 1996). Its universal- ity 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	<b>Energy Data Identification System</b> 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	<b>High Level Data Link Control</b> 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	<b>Meter Application Product</b> 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	<b>Object Identification System</b> Identification number system for clear identification of dlms items.
PSTN	<b>Public Switched Telephone Network</b> 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	<b>Vereinigung Deutscher Elektrizitätswerke</b> 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).

.MAP	
Access authentication	
Access level	. 33, 123
Access levels	
Activating command confirmation	
Address book import	
Address data	
Address toolbar	
Addressing devices	
Application of .MAP110 functions	
Application of access levels	123
Application toolbar	
Auxiliary functions	
Basic principles for communication	
Bit assignment in profile status word	
Calendar base setting	106
Changing	
the language of the user interface	104
the license	
Check for update	119
Client toolbar	
Command confirmation setting	110
Command execution	
Command log window	
Command tree	
Command tree toolbar	
Communication channel	
Communication channel data	
Communication channel toolbar	22
Communication channels	8
Communication examples	74
Communication log window	
Communication protocols	9
Communication settings	
Communication solutions	
Conditions for the use of this user manual	4
Conventions	4
Сору	
command log window content	28, 30
result window	102
vector diagrams	100
Current version of the program	119
Defining	
key management system	113
Defining file locations	107
Defining IP addresses	65
Defining phone numbers	
Defining storage policy for keys and passwo	ords 108
Delay times settings	
Delete command log window	
Delete communication log window	
Device	

Device address	49, 73
Device data	47
Device security system	122
Device toolbar	22
Device type	48
Diagnostic commands	99
DIP table	101
reset	102
Direct connection	32
dlms	132
dlms application layer	43
dlms link layer	
EDIS	
Edit command log window content	
Editions	
Emergency readout	84
Emphasising commands available in the cor	
tree	
Enabling MAP100 file export	
Entering license data	
Establishing communication	
Ethernet connection	
Evaluation window	
Event types	
Examples of OBIS identification codes	
Execute commands	
Firmware update	
SMS test transmission	
Export result window content	
Fields of application of .MAP tools	
File locations setting	
Firmware update	
First installation	
First steps	
Folder handling	
Functions of the .MAP110	
Further documents	
GSM installation support	
HDLC	
IEC	
Import address book	
-	
Importing keys	
Improper data access	
Installation IP address definition	
IP address selection	
Key import	
Key management system	
Keys	
Language	
Licence data	
License key entry	14

Licensing concept	13
Links between devices and communication	
channels	
Loading TOU	90
Local connection	
Menu bar	
Message security	
Modem connection	. 33, 76
Modify	
communication unit settings	
primary value adaptation	
SMS configuration settings	
Time of Use	89
Multiple connection	
Network connection	33
via a LAN	
Network connection via a WLAN and the Inte	
OBIS identification codes	
Object identification system OBIS	
Offline key import	
Online help	
Online key import	
Parameter overwriting protection	
Passwords	
Phone number definition	
Phone number selection	21
Physical device address	
Physical layer	39
Print	
result window	
vector diagrams	
Problem solving	
Profile status word	83
Program version	
PSTN	
Purpose of this user manual	
Read commands	
for current device data	
for emergency readout	
for load profiles	
simple	79

Reading head	
Read-me file	118
Release notes	118
Reset DIP table	102
Result window	27
Save	
command log window content27, 28, 30,	102
communication log window content	
result window content27, 99,	
TOU	
Screen areas	
Security attributes	
Security switches	
Security system	
Selecting the calendar base for IEC commands.	
Serial connection to a local bus	
Serial connection via the optical interface	
Set communication inputs	
Setting colour for disabled commands	
Setting colour for disabled commands	
<b>e</b> ,	
Simple read commands SMS test transmission	
Status bar	
Support	
Supported devices	
System requirements	
Target group of this user manual	
Toolbars	
Tree items	
Tree view	
UnInstallation	
Upgrades	
User groups	
User interface	
VDEW	132
Vector diagram	99
Write commands	85
Modify communication unit settings	88
Modify primary value adaptation	91
Modify SMS configuration settings	87
Modify Time of Use	89
Set communication inputs	86

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