

SERVICE TOOL

Landis+Gyr

MAP110

USER MANUAL



Revision History

Index	Date	Comments
a	28.02.2005	First edition
b	31.05.2005	Changes to release 1.1
c	22.09.2005	Changes to release 1.2
d	05.12.2006	Changes to release 2.2
e	14.12.2006	Field strength indication for GSM installation support changed

subject to technical changes

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Introduction

Scope	The present user manual is designed for the Landis+Gyr MAP110 Service Tool Version 2.2 .
Purpose	This user manual contains all information required for the use of the Landis+Gyr MAP110 Service Tool. It not only provides explanations concerning functionality and general procedures, but also gives detailed, illustrated instructions on how to use the software.
Target group	The contents of this user manual are intended for technically qualified personnel of energy supply companies responsible for the system planning, parameter setting and installation of meters.
Conditions	The Landis+Gyr MAP110 Service Tool runs on personal computers with the Windows operating system. To understand this user manual, you need basic knowledge of Windows and its terms, as well as a general idea of how to operate a personal computer. Furthermore, you need to be familiar with the functional principles of the various meters supported by the Landis+Gyr MAP110 Service Tool, which are described in the corresponding user manuals.
Conventions	<p>The following conventions are used in this manual:</p> <ul style="list-style-type: none">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.

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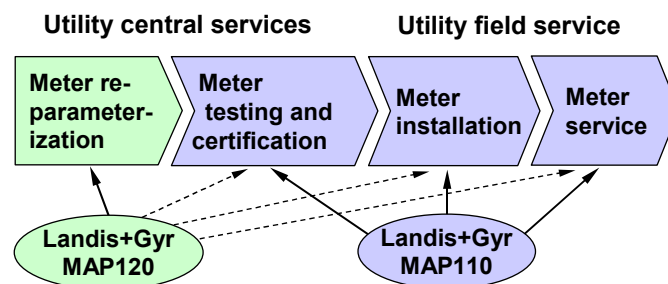
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1 Overview

The Landis+Gyr MAP110 Service Tool is used for reading out billing data and profiles and for changing the most important device parameters. It is able to communicate with all modern electronic meters from Landis+Gyr, which comply with the standards under dlms or IEC 62056-21 (formerly IEC 1107). The Landis+Gyr MAP110 Service Tool is therefore the ideal tool for the service technician.

The following diagram illustrates the various fields of application of the Landis+Gyr MAP110 Service Tool for power supply companies. The field of application of the Landis+Gyr MAP120 Parameterization Tool is also shown.



Most functions of the Landis+Gyr MAP110 Service Tool can also be performed with the Landis+Gyr MAP120 Parameterization Tool. The ease of operation of the Landis+Gyr MAP110 Service Tool is significantly simpler, however, so that its use is recommended.

1.1 Functions

The range of functions of the Landis+Gyr MAP110 Service Tool covers all the following applications normally required for meter installation and in the service sector:

- Billing data readout
- Readout and export of profiles (load profile, stored values and event log)
- TOU (Time of Use) readout and modification
- Billing period reset
- Register and profile resets
- Parameter readout and modification
- Communication input settings
- Communication settings for Landis+Gyr communication units readout and modification
- GSM installation aid for Landis+Gyr communication units (field strength indicators, telephone number information, pin-code handling)
- Test SMS transmission
- Analysis and diagnostic functions

1.2 User Groups

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:

- Certification (verification authority)
- Engineering (laboratory use)
- Installation (field use)
- Reader (local and remote)
- Field Inspection
- Consumer (final customer)

The user group is determined by the licence data (see chapter 3 "Licensing"). Each license exclusively applies to an individual user group.

1.3 Functional Range

Only the time and date can be read from the meter with the unlicensed demo version.

The following functions can be performed with all licensed versions depending on the meter type connected:

- With Landis+Gyr **dlms** meters (use of dlms protocol)
 - read commands
 - write commands
 - execution commands and
 - diagnostic commands.
- With Landis+Gyr **IEC** meters (use of IEC protocol)
 - read commands
 - write commands * and
 - execution commands *.

* Restriction: User groups Field Inspection and Consumer are not able to perform write and execution commands with IEC meters.

The meter connected must support the relevant function for successful application of a function.

The supported meters are listed in the "Readme.txt" file.

Detailed information on the functions which can be performed for all user groups can be found in chapter 12 "Functional Range per User Group").

2 Installation

This chapter describes the installation of the Landis+Gyr MAP110 Service Tool on the hard disk of your personal computer.

System requirements To be able to run the Landis+Gyr MAP110 Service Tool, your personal computer must meet the following minimum requirements:

- Pentium processor with > 400 MHz
- 128 MB of RAM
- 40 MB of free space on the hard disk
- 256 color VGA graphics card and monitor
- CD drive (if software delivered on CD)
- Pointing device (mouse)
- Operating system Windows Server 2003, Windows XP, Windows 2000, Windows 98SE, Windows ME or Windows NT with Service Pack 6a
- Internet Explorer 5.01 or higher must be installed
- .NET Framework is required. If this is not already installed, it is added by the MAP110 installation program.
- MS Excel 2000 or higher must be installed for enhanced diagnostic functions.

Installation software The corresponding installation software is required to install the Landis+Gyr MAP110 Service Tool. This can either be found on the installation CD "Landis+Gyr MAP110" or it can be downloaded to your PC via the Internet from the homepage www.landisgyr.com.

Notes Administration rights are required for the installation, if the Windows NT, 2000 or XP operating system is used on your PC.

If a version of the Landis+Gyr MAP110 Service Tool is already installed on your computer, this must be removed before installation.

Language The required language must be entered when installing. Please note that this can no longer be changed later in the application. A new installation is necessary for any later change of language.

All open Windows applications must be closed before installation.

Procedure Please read the file "Readme.txt" with current information about the present version of the Landis+Gyr MAP110 Service Tool.

Start the installation file "Setup.exe" and then follow the instructions on the screen.

3 Licensing

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

3.1 Licensing Concept

Following installation of the Landis+Gyr MAP110 Service Tool the application is in the unlicensed state, i.e. it can only be used as demo version with reduced range of functions. In order to permit use of the Landis+Gyr MAP110 Service Tool without restrictions, it must be licensed for the intended use. 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 chapter 3.2 "Entering License Data".

The user group determines the functional range of the Landis+Gyr MAP110 Service Tool. The following user groups exist:

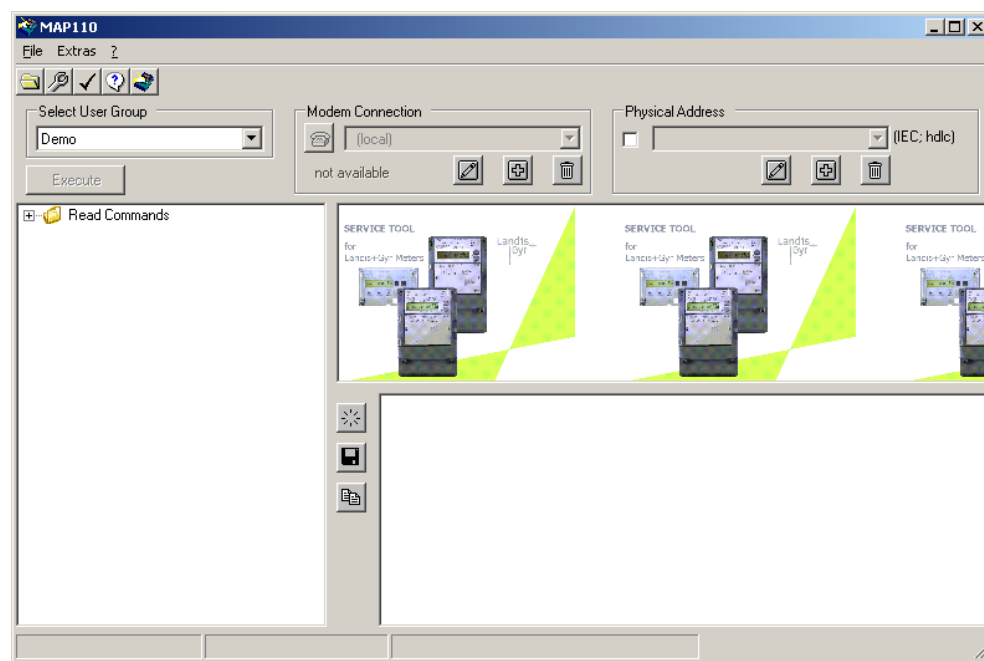
- Demo
- Certification
- Engineering
- Installation
- Reader
- Field Inspection
- Consumer

3.2 Entering License Data

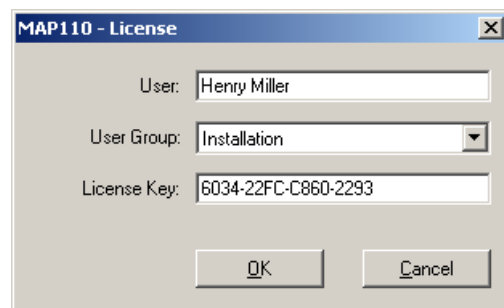
This chapter describes the licensing procedure required for unrestricted use of the Landis+Gyr MAP110 Service Tool. The license data received from Landis+Gyr following your order is required for this purpose.

Procedure:

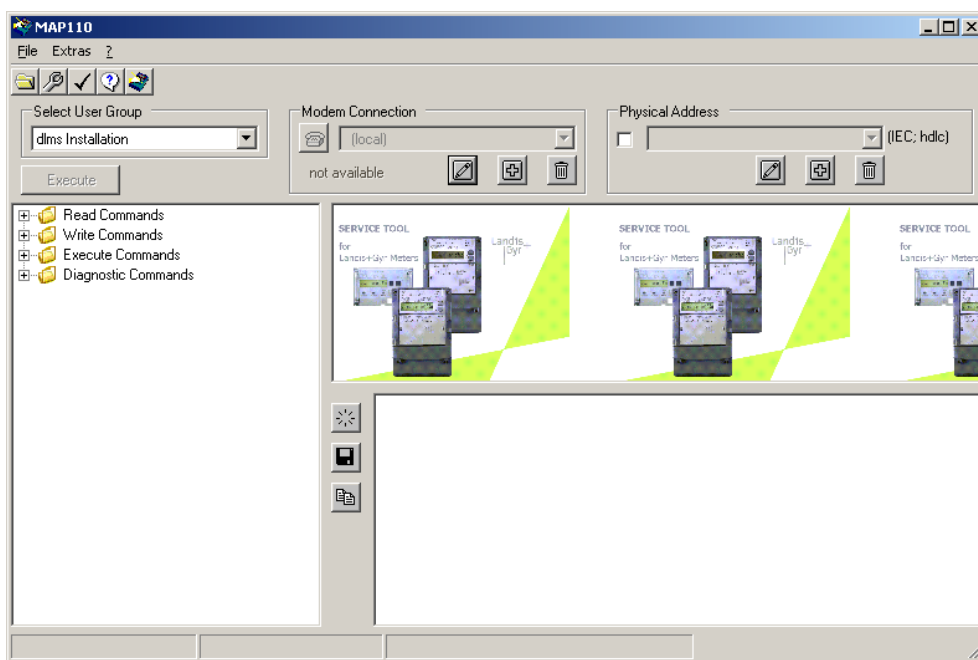
1. Click on **Start** and then select the **Landis+Gyr MAP110** command from the menu **Programs, Landis+Gyr MAP110**.
The Landis+Gyr MAP110 Service Tool is started.



2. Select **License...** from the **Extras** menu.
The "MAP110 - License" window appears.
3. Enter the user name provided by Landis+Gyr in the "User" entry box.
4. Select the user group provided by Landis+Gyr in the "User Group" selection field.
5. Enter the licence key provided by Landis+Gyr in the "License Key" entry box.



6. Click on **OK**.
The licensing procedure is terminated. The accessible user groups can be selected in the "Select User Group" box and the commands available are displayed in the command tree.



The Landis+Gyr MAP110 Service Tool is now ready for use according to the instructions given in chapters 4 "First Steps" or 7 "Application of MAP110 Functions", respectively.



Keep the license key in a safe place

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

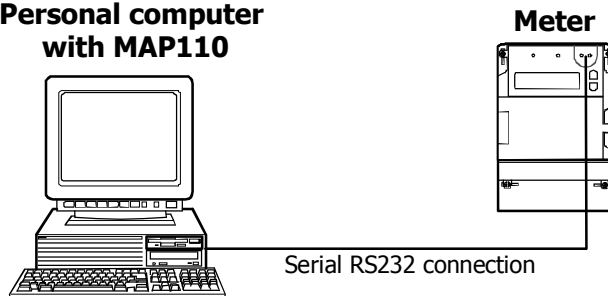
3.3 Changing the License

The license can be changed by requesting new license data from Landis+Gyr and entering these in the "MAP110 - License" window (see chapter 3.2 "Entering License Data").

4 First Steps

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

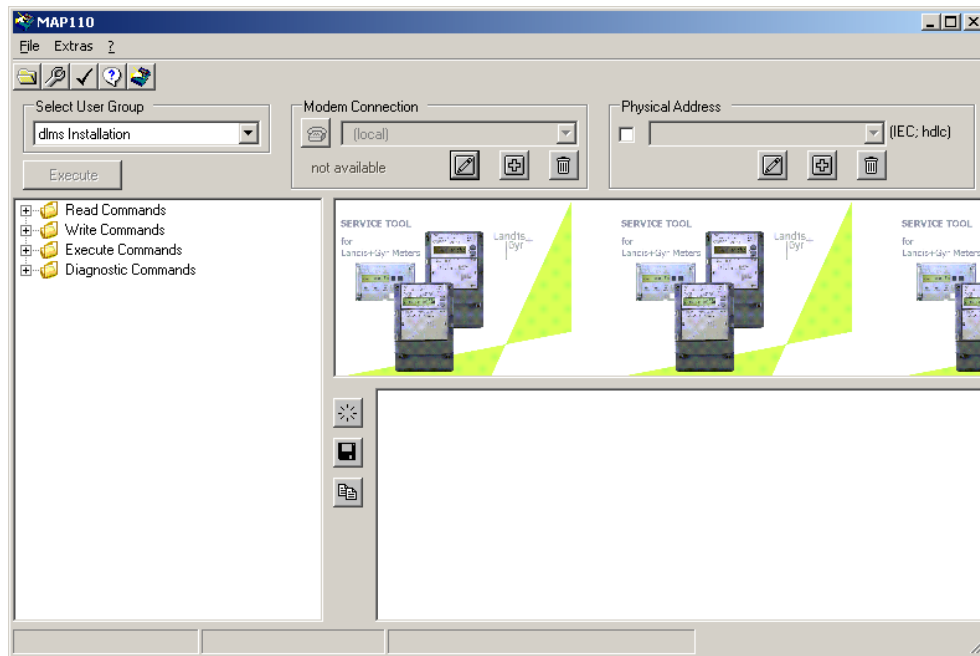
Personal computer with MAP110





A meter ready for operation and an optical reading head for connection to a serial interface are required for this purpose. The Landis+Gyr MAP110 Service Tool must also be installed on the PC.

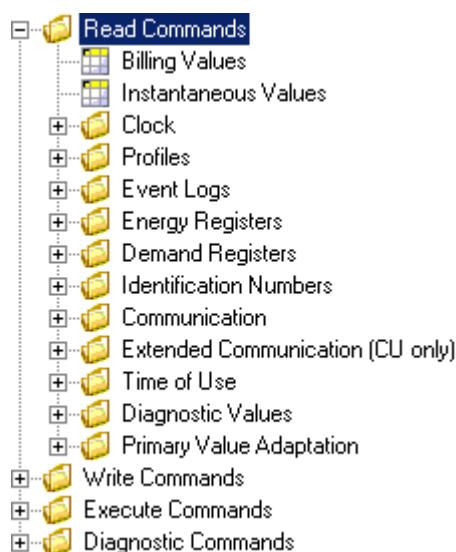
Procedure:

1. Connect the cable of the optical reading head fitted on the meter to the serial interface of the PC.
2. Click on **Start** and then select the **Landis+Gyr MAP110** command from the menu **Programs, Landis+Gyr MAP110**.
The Landis+Gyr MAP110 Service Tool is started.



3. In the selection box "Select User Group" select the entry "dlms Installation".

4. Open the "Read Commands" folder in the command tree.
For this purpose click the symbol  before the "Read Commands" folder or double-click on the folder symbol .
- The commands available are displayed, e.g. for the "dlms Installation" user group the read commands for dlms meters:

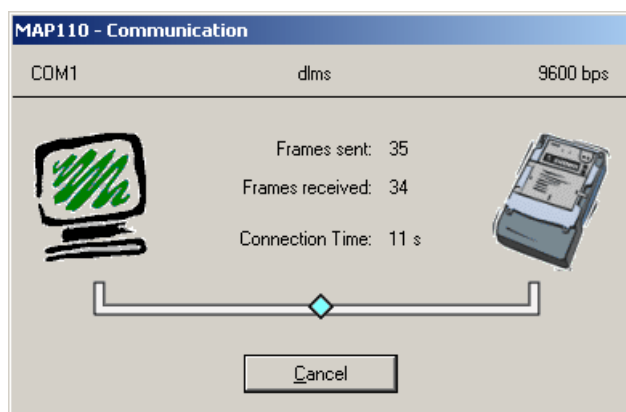


5. Select the "Billing Values" command in the command tree under "Read Commands".

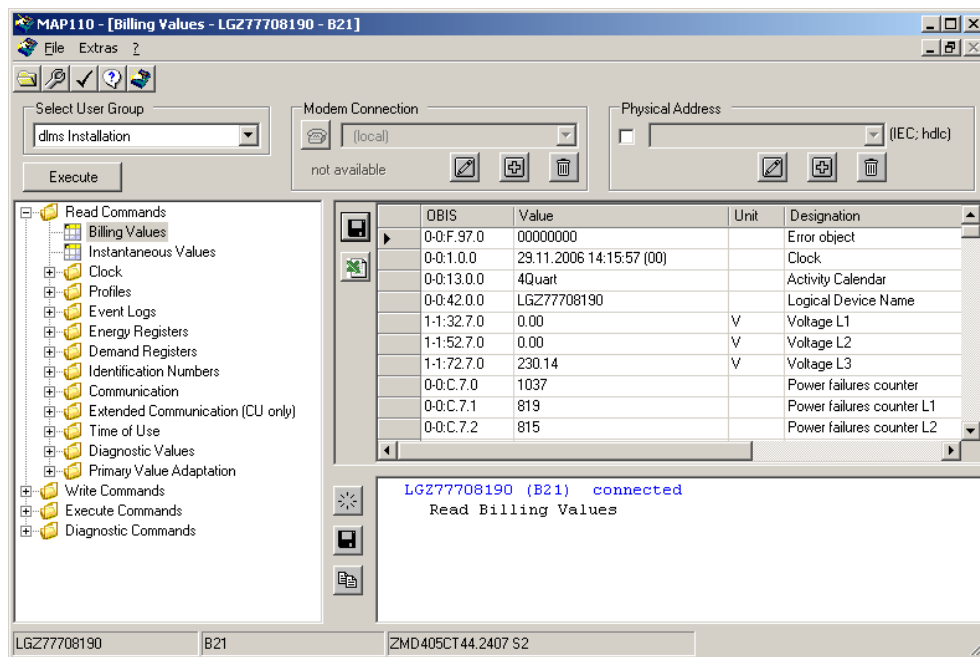
A command can be selected in various ways:

- double-click on the command or
- mark the command by clicking it and then click on the "Execute" button above the command tree or
- click on the command with the right mouse button and then select the item "Execute..." in the pop-up menu appearing.


Communication begins after selecting the command and the meter data are read from the meter connected. During this process, which can take several minutes depending on the number of items to be read, the "MAP110 - Communication" window is displayed.




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



6. 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 chapters.

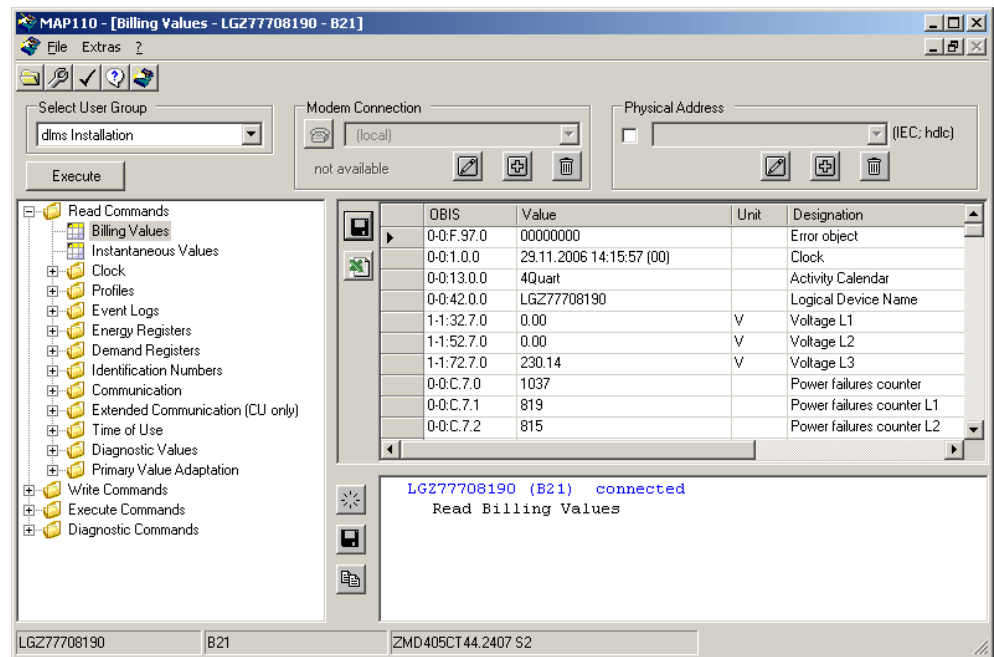
5 Description of User Interface

This chapter 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 with the "File", "Extras" and "?" menus to call up functions.
- Tool bar with buttons for direct call-up of functions frequently used.
- Selection box "Select User Group" for selecting the user group and the communication protocol (dlms or IEC)
- Either selection box "Modem Connection" or selection box "IP Address" for recording, deleting and selecting modem connections or IP addresses (dependent from the selected interface in the communication settings).
- Selection box "Physical Address" for recording, deleting and selecting physical device addresses.
- Command tree (left-hand half of window)
- Display window for results (right-hand half of window, top)
- Trace window (log) for recording events, results, error messages, etc. (right-hand half of window, bottom)
- Status bar for displaying characteristic data of the meter connected.
- Evaluation windows, shown with diagnostic commands.



The sizes of the areas for the command tree, display window and trace window can be set individually with the movable separating bars situated in between (click separating bar and move with mouse button pressed).






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 display or trace window data, for opening data saved in the display or trace windows and for ending the application.
- **Extras** menu to call up functions for licensing, communication setting, option setting and emphasising commands available in the command tree.
- **?** menu to call up online help and version display.

5.3 Tool Bar

The tool bar of the Landis+Gyr MAP110 Service Tool contains the following buttons for direct call-up of functions frequently required:

-  calls up the function to open data saved in the display or trace window
-  calls up the function for communication settings
-  switches emphasis of commands available in the command tree on or off
-  calls up online help
-  calls up the version display

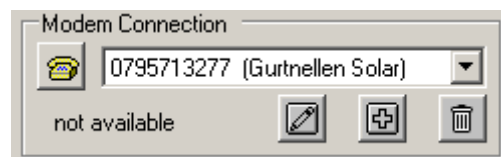
5.4 Selection Box "Select User Group"



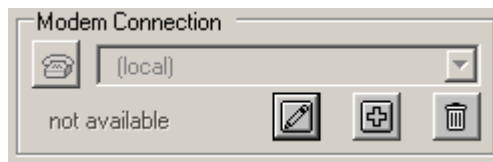
Selection can be made between communication protocols "dlms" and "IEC" in the "Select User Group" box for each user group.


Various commands are offered in the command tree corresponding to the selection made (see also chapter 12 "Functional Range per User Group").

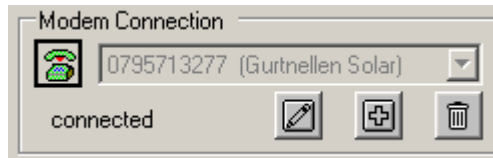
5.5 Selection Box "Modem Connection"





The call number of the required modem can be selected in the "Modem Connection" selection box, if a modem is selected as interface in the communication settings. Otherwise the area is deactivated, i.e. set for a local connection or not displayed (if Ethernet interface is selected in the communication settings).




Clicking  makes the connection to the call number selected. When the connection is made, the selection box is blocked and the symbol on the button changes its appearance.



Clicking  interrupts the modem connection.

Clicking  opens the "MAP110 - Add Modem Connection" window, in which a new call number and associated designation can be recorded.

Clicking  opens the "MAP110 - Edit Modem Connection" window, in which the entry selected in the selection field can be modified.

Clicking  deletes the entry selected in the selection box.


5.6 Selection Box "Physical Address"




The physical device addresses for the required meter can be selected in the "Physical Address" selection box, provided the check box is marked.

The physical device address is required for addressing meters with multiple connection. It is also used as device access protection.

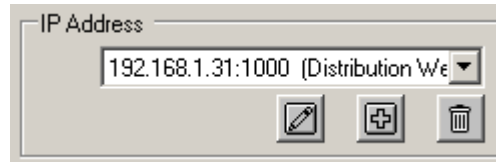
The selection available is assigned to a specific communication connection, e.g. to the local connection or a modem connection selected. This ensures that only the addresses recorded for this connection can be selected.

Clicking  opens the "MAP110 - Add Physical Address" window, in which a new physical IEC and HDLC device address and an associated designation can be recorded.


Clicking  opens the "MAP110 - Edit Physical Address" window, in which the entry selected in the selection field can be modified.


Clicking  deletes the entry selected in the selection box.

5.7 Selection Box "IP Address"



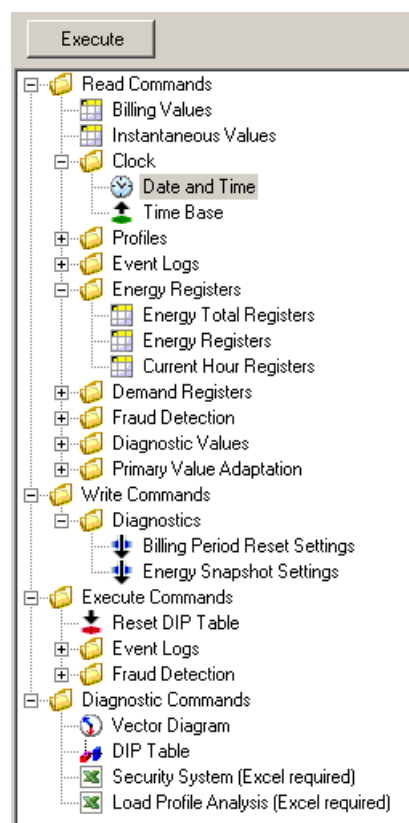
The IP address and port number of the communication unit of the required meter can be selected in the "IP Address" selection box, provided the interface "Ethernet" is selected in the communication profile settings. Otherwise the area is not displayed (instead the selection box "Modem Connection" appears).

Clicking  opens the "MAP110 - Add IP Address" window, in which a new IP address and port number and an associated designation can be recorded.

Clicking  opens the "MAP110 - Edit IP Address" window, in which the entry selected in the selection field can be modified.

Clicking  deletes the entry selected in the selection box.

5.8 Command Tree














All commands available for the user group and communication protocol set (see also chapter 5.4 "Selection Box "Select User Group") are displayed in a tree representation.



Tree representation A tree representation, e.g. as generally familiar from the file system tree of Windows Explorer, is ideally suited for clear presentation of ordered structures (e.g. of files placed in folders and sub-folders).

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 represented as follows:






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

Folder handling Each folder can be expanded and collapsed individually.

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

To expand or collapse folders there are the following possibilities:


Using the mouse:

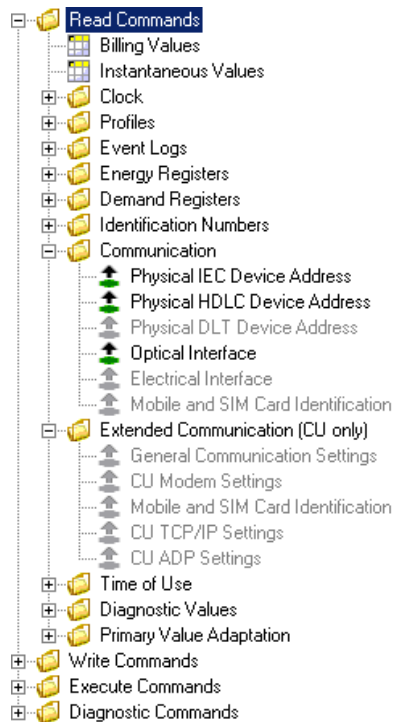
- Clicking on the expansion sign  of a folder expands this folder (the expansion sign changes to a collapse sign .
- Clicking on the collapse sign  of a folder collapses this folder (the collapse sign changes to an expansion sign .
- The relevant folder is opened or closed by double-clicking  or the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


Using the keyboard:

- Pressing the **"*" key** of the numerical keyboard expands the whole tree below the selected folder (i.e. all subfolders and commands will be visible).
- Pressing the **"/" key** of the numerical keyboard collapses the whole tree below the selected folder (i.e. all subfolders and commands will no longer be visible).
- Pressing the **"+" or "-" key** of the numerical keyboard toggles between the expanded and collapsed tree representation.

Emphasising commands available in the command tree

The commands available are emphasised by clicking  or by selecting the relevant menu item in the **Extras** menu. All commands not available in the meter are then marked in color (grey in the example below). The identification color can be set under **Options...** in the **Extras** menu (see chapter 7.5.3 "Setting Color for Inactive Commands").



All commands are displayed again normally by clicking  again or by selecting the relevant menu item again in the **Extras** menu.

If there is no connection to a meter, all commands are shown unavailable for local connections when this function is selected. The commands can be selected, however, e.g. read out a value. The commands not available are then correctly displayed corresponding to the meter connected.

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 "Execute" button above the command tree or
- clicking with the right mouse button on the command and then selecting the "Execute..." entry in the pop-up menu appearing.


5.9 Display Window


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

OBIS	Value	Unit	Designation	Group
0-0.F.97.0	00000000		Error object	Meter Diagnostics
0-0.1.0.0	21.09.2005 08:15:13 (00)		Clock	Meter Diagnostics
0-0.13.0.0			Activity Calendar	Identification Numbers
0-0.42.0.0	LGZ77708190		Logical Device Name	Identification Numbers
1-1.32.7.0	0.00	V	Voltage L1	Installation Control
1-1.52.7.0	0.00	V	Voltage L2	Installation Control
1-1.72.7.0	230.41	V	Voltage L3	Installation Control
0-0.C.7.0	968		Power failures counter	Installation Control
0-0.C.7.1	819		Power failures counter L1	Installation Control
0-0.C.7.2	815		Power failures counter L2	Installation Control
0-0.C.7.3	964		Power failures counter L3	Installation Control
0-0.C.6.0	866d 17h 31min		Battery use time counter	Meter Diagnostics
0-0.C.2.0	30		Number of configuration program changes	Meter Diagnostics
1-1.1.6.1	0.0000 (01.01.1990 00:00:00)	kW	Maximum Demand +A rate 1	Demand
1-1.1.6.2	0.0000 (01.01.1990 00:00:00)	kW	Maximum Demand +A rate 2	Demand
1-1.1.6.3	0.0000 (01.01.1990 00:00:00)	kW	Maximum Demand +A rate 3	Demand

The data can either be displayed by readout from a meter 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 key).

Clicking on  or with the right mouse key in the display window and then selecting the **Save as...** menu item in the pop-up menu appearing 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.

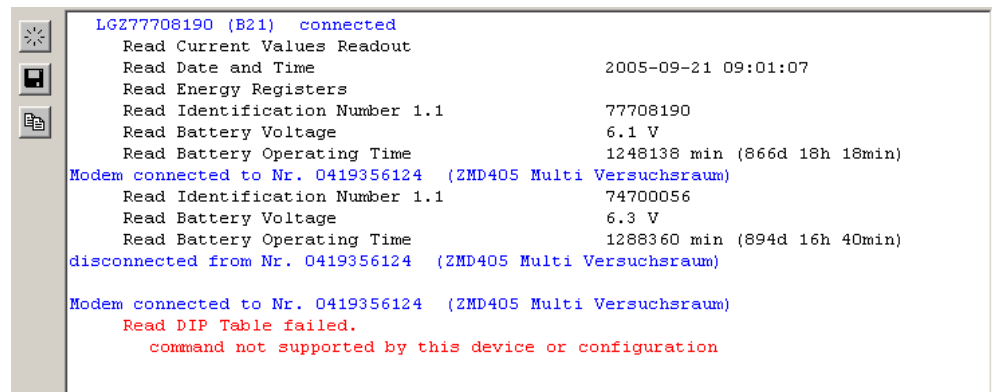
Clicking on  or clicking with the right mouse key in the display window and then selecting the **Open with Excel** menu item in the pop-up menu appearing exports the data displayed for any desired further processing in the Excel table calculation program.

Provided no data are yet shown in the display window, e.g. after starting the Landis+Gyr MAP110 Service Tool, the following background picture can be seen in the display window and the two buttons are not displayed.




5.10 Trace Window


In the trace window all activities are logged.




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


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

Clicking on  or clicking with the right mouse button in the trace window followed by selection of the **Clear** menu item in the pop-up menu appearing deletes the contents of the trace window.

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

Clicking on  or clicking with the right mouse button in the trace window followed by selection of the **Copy** menu item in the pop-up menu appearing copies the contents of the trace window to the Windows clipboard, from where it can be inserted in another application (e.g. in a word processing program).

The contents of the trace 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 clicking on  in the symbol bar or by selecting the **Open...** entry in the **File** menu protocols previously saved can be displayed again in the trace window.

5.11 Status Bar

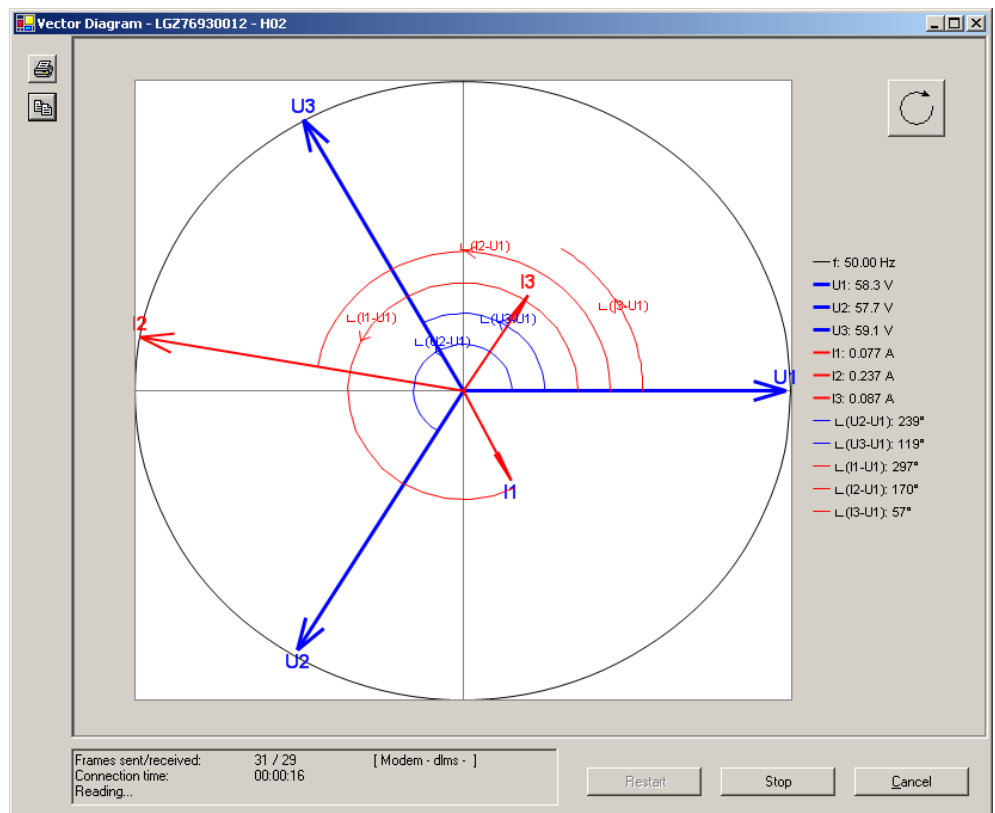
LGZ77708190	B21	ZMD405CT44.2407 S2
-------------	-----	--------------------

The following meter data are displayed in the status bar as soon as connection is made to the meter, i.e. as soon as the modem connection has been made or at least one command has been executed via local connection:

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

5.12 Evaluation Window

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



6 Communication with Meters

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

6.1 Interface to Meter

The communication connection from the Landis+Gyr MAP110 Service Tool to one or more meters can be made in various ways:

- With an optical **reading head** placed at the optical interface of the meter (only point-to-point connection to a meter possible).
- With a **direct connection** to a meter, e.g. via an RS232 or Ethernet interface as used in various communication units. If the communication unit has a second interface, multiple connections are possible to further meters.
- With a **modem connection** to a meter or several meters, 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 **TCP/IP connection** over the Internet via iMEGA server to a meter or several meters, if these are connected together by a multiple connection by RS485, CS or M-bus. Note: For TCP/IP connections over the Internet via iMEGA server a virtual COM port and a corresponding standard modem driver must have been installed.

The connection to a PC with the MAP110 software is made either via a serial interface (e.g. COM-port or USB) or via a modem connected.

6.2 Communication Settings

The communication settings in the Landis+Gyr MAP110 Service Tool comprise the following points:

- Selection of a communication profile with connection specifications such as:
 - interface used
 - type of interface
 - transmission rate
 - start protocol
 - network delay times
- Selection of access levels for read and write access
- Selection of calendar base (Gregorian or Jalaali)
- Specification of passwords for the various access levels


Connection profiles must also be specified for modem and multiple connections. These contain the telephone dialing numbers for modem connections and the physical device addresses for multiple connections.

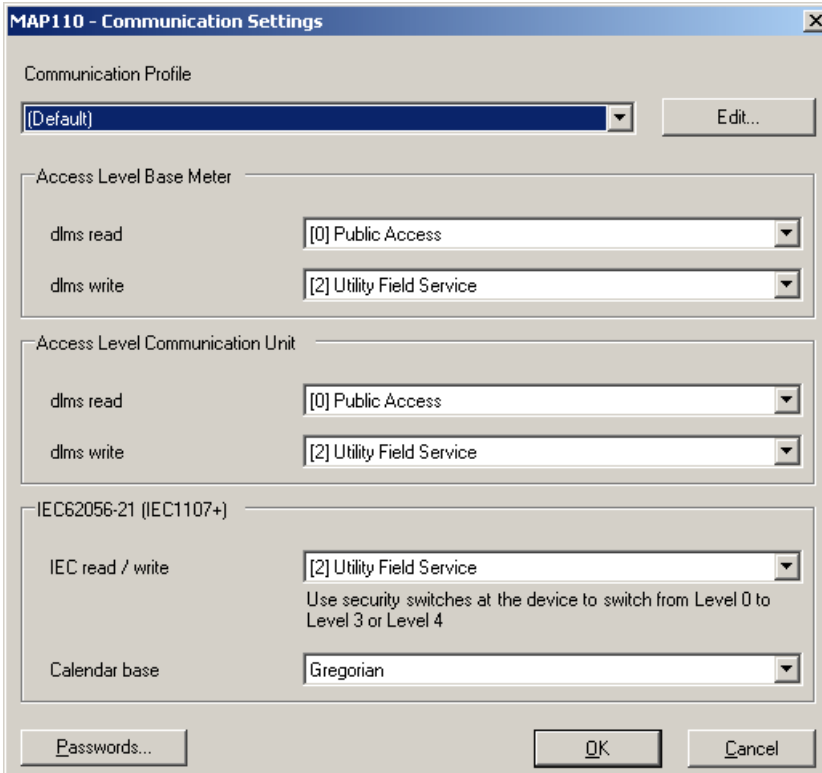
For a better understanding of the possible settings in the Landis+Gyr MAP110 Service Tool some important terms and communication parameters are explained below, before the completion of various communication connections is shown by means of examples in chapter 6.3 "Communication Examples".

6.2.1 Communication Profiles

A communication profile must be determined or selected in the MAP110 Service Tool for every communication connection to a meter. With the choice of a stored communication profile all settings no longer have to be made separately each time. Any desired number of communication profiles can be specified and stored.

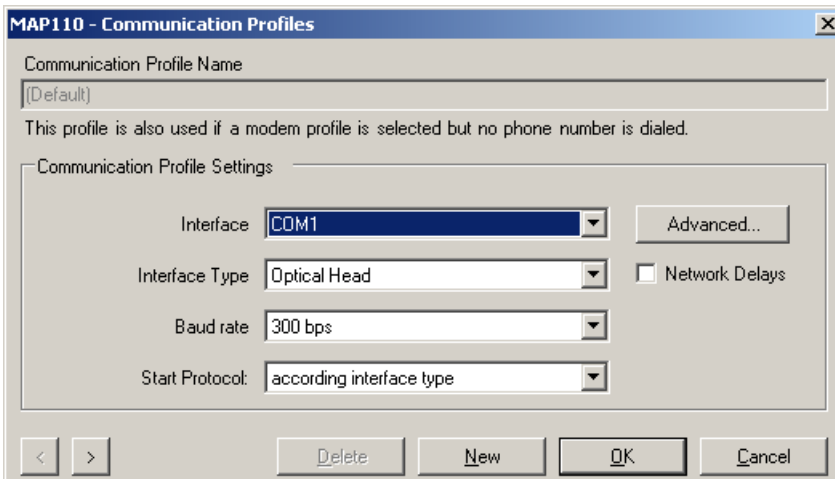
Preparation example The following basic procedure should be adopted to produce and store a new communication profile (specific examples are given in chapter 6.3 "Communication Examples"):

1. Click on  in the tool bar or select **Communication Settings...** from the **Extras** menu.
The "MAP110 - Communication Settings" window appears.



The screenshot shows the "MAP110 - Communication Settings" dialog box. It has a title bar with a close button. Inside, there's a "Communication Profile" section with a dropdown menu showing "(Default)" and an "Edit..." button. Below this are three sections: "Access Level Base Meter", "Access Level Communication Unit", and "IEC62056-21 (IEC1107+)". Each section contains two dropdown menus for "dlms read" and "dlms write". The "IEC62056-21" section also has an "IEC read / write" dropdown and a "Calendar base" dropdown. At the bottom, there are buttons for "Passwords...", "OK", and "Cancel".

2. Click on **Edit...**.
The "MAP110 - Communication Profiles" window appears.



The screenshot shows the "MAP110 - Communication Profiles" dialog box. It has a title bar with a close button. Inside, there's a "Communication Profile Name" section with a text field containing "(Default)". Below this is a note: "This profile is also used if a modem profile is selected but no phone number is dialed." The "Communication Profile Settings" section contains four dropdown menus: "Interface" (set to "COM1"), "Interface Type" (set to "Optical Head"), "Baud rate" (set to "300 bps"), and "Start Protocol" (set to "according interface type"). There is an "Advanced..." button next to the "Interface" dropdown and a "Network Delays" checkbox. At the bottom, there are buttons for "<", ">", "Delete", "New", "OK", and "Cancel".

3. Click on **New**.
The window is ready for determining a new communication profile.
4. Enter a name for the new communication profile in the entry box "Communication Profile Name".
5. Select the serial interface to be used in the "Interface" selection box or the modem used for remote communication and for Ethernet connections the entry "Ethernet".
6. Select the "Optical Head", "3-wire connection without echo" or "Blue-tooth Optical head" type used in the "Interface Type" selection box for local communication, depending on how the meter is connected. The selection box is not displayed for modem and Ethernet connections. This is necessary because an echo signal is often produced when using an optical reading head, which can be suppressed by suitable means in the MAP110, while this effect does not occur with a direct connection.
7. Select the transmission rate corresponding to the meter in the "Baud Rate" selection box for local communication. The selection box is not displayed for modem and Ethernet connections.
8. Select the necessary start protocol for the planned activity in the "Start Protocol" selection box. Possible settings:
 - **according interface type** (default), i.e. IEC protocol, if an optical reader is used or HDLC protocol if a direct connection is used
 - **IEC**, if the IEC protocol must be used without fail
 - **HDLC**, if the HDLC protocol must be used without fail
9. If the network delay time set to 1500 ms as standard is to be changed, activate the "Network Delays" check box. The required delay times must then be entered as advanced communication settings.
10. If advanced communication settings are necessary, click on **Advanced....** The "MAP110 - Advanced Settings" window appears.

MAP110 - Advanced Settings

Echo Handling of Interface: automatically, according to interface type

Own Logical Device Address:

Maximum Baud Rate: 9600 bps (for IEC communication only)

Ignore Baud Rate Switching: ☐ (for IEC communication only)

Network Delays (e.g. GSM/GPRS, Ethernet)

Initial Delay: 4000 ms

IEC and HDLC Timeout: 4000 ms (IEC Standard value 1500 ms)

Communication delays and timeouts defined in standards may be defined too short for some phone networks (especially GSM networks). The communication may abort due to additional delays in the network. Therefore, it is highly suggested to increase timeout and delay for GSM network connections.

OK Cancel

11. Perform the required advanced communication settings.

Possible settings in the "Echo Handling of Interface" selection box:

- **automatically, according to interface type** (default), i.e. with echo, if an optical reading head is used or without echo, if a direct connection is made
- **with echo (e.g. optical head)**, if a direct connection is used, which causes an echo
- **without echo (e.g. electrical interface)**, if an optical reader is used, which causes no echo

This address can be entered in the "Own Logical Device Address" entry box, if it must be notified to the opposite station, e.g. for identification purposes.

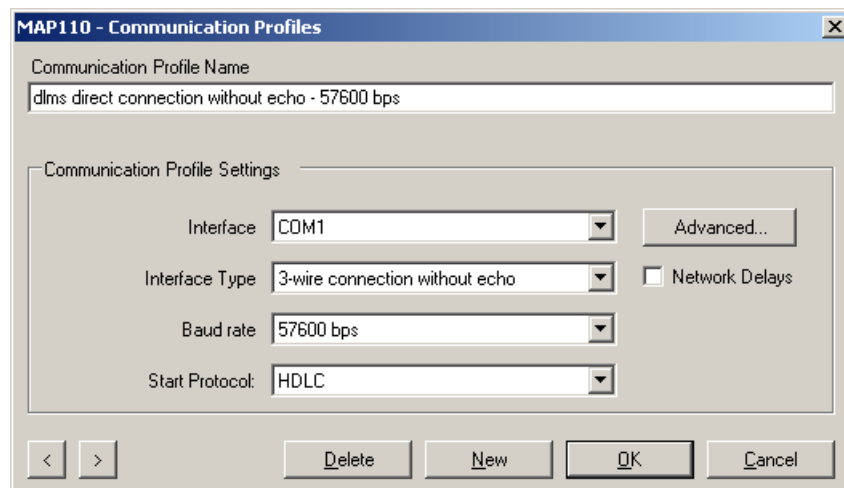
The maximum transmission rate can be selected in the "Maximum Baud Rate" selection box for the IEC protocol (default = 9600).

If the check box "Ignore Baud Rate Switching" is activated with IEC protocol selected, the starting baud rate selected is permanently retained. This is necessary, for example, for communication with meters, which must be contacted via a multiple connection with a lower transmission rate than required by the modem circuit.

The initial delay and timeout time for problems in making connection, e.g. with GSM networks, can be set in the "Initial Delay" and "IEC and HDLC Timeout" entry boxes. Note that the "Network Delays" check box in the "MAP110 - Communication Profiles" window must also be activated for this setting to be effective (otherwise the standard values of 1500 ms remain effective).

12. Click on **OK**.

The "MAP110 - Advanced Settings" window disappears again.



13. Click on **OK**.

The new communication profile is stored and then appears as entry in the "Communication Profile" selection box in the "MAP110 - Communication Settings" window.

6.2.2 Access Levels

The access levels to a meter should be selected in the "MAP110 - Communication Settings" window for each communication setting (one each for read and write via dlms for the base meter and for the communication unit and one each for read and write via IEC) as well as the calendar base (Gregorian or Jalaali).

MAP110 - Communication Settings

Communication Profile

dlms direct connection without echo - 57600 bps Edit...

Access Level Base Meter

dlms read [0] Public Access

dlms write [2] Utility Field Service

Access Level Communication Unit

dlms read [0] Public Access

dlms write [2] Utility Field Service

IEC62056-21 (IEC1107+)

IEC read / write [0] Public Access
Use security switches at the device to switch from Level 0 to Level 3 or Level 4

Calendar base Gregorian

Passwords... OK Cancel

The various access levels and their fields of application are described in chapter 10 "Short Description of Meter Security System".

Any passwords necessary can be changed in the "MAP110 - Passwords" window, which appears after clicking **Passwords....**

The following default passwords are defined (not displayed):

- **00000000** as static password for access level 1
- **1234567** as coded password for access level 2



Changing default passwords

Landis+Gyr recommends that the generally known default passwords in the meter should be changed.

MAP110 - Passwords

Access Levels for IEC and dlms			
	UID	Password	Comment
[0] Public access	16		
[1] Datacollection	32	xxxxxxx	static
[2] Utility Field Service	48	xxxxxxx	coded
[3] Utility Service	64		Service Menu required
[4] Extended Utility Service	80		Hardware Switch required

Access Level for dlms only			
[5] Extended Consumer	17		static
[6] Remote DataCollection	18	xxxxxxx	static
[7] Remote Service	19	xxxxxxx	static

Access Level for Security System Modification (dlms only)			
[A] Utility Defined	22		no password
[C] Read Administrator	96		coded
[D] Utility Administrator	97		coded - Hardware Switch required
[E] Distributor Service	100		coded - Hardware Switch required

User Defined Access Level			
[X] User Defined	16		no password

IEC W5 commands	
W5 / R5 commands	static

Ok Cancel

6.2.3 Addressing Meters

For point-to-point connections the meter need not be specially addressed. But with multi-drop all meters connected to the bus system (RS485, CS or M-Bus) 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 meter), 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 stored as parameters of the basic meter and not in the communication unit. A change of communication unit does not therefore affect the addressing. These parameters can be found under "Identification numbers". With the Landis+Gyr MAP110 Service Tool the physical device addresses of the meters can be modified with the write commands under "Communication Settings".

6.3 Communication Examples

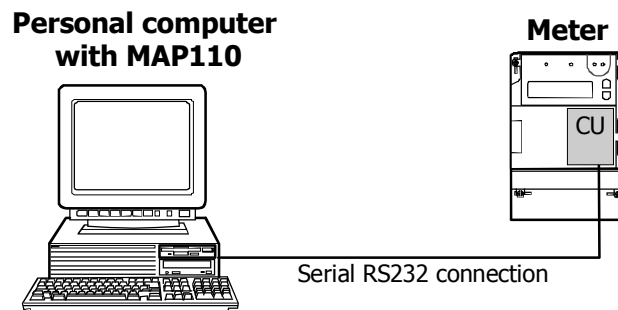
This chapter provides some examples to show how communication connections are made to meters via various communication paths and for various applications. It is assumed in all examples that the physical connections (e.g. cable or modem connections) have already been made and the Landis+Gyr MAP110 Service Tool has already been started.

6.3.1 Local Point-to-Point Connection via Optical Reading Head


An example of a point-to-point connection to a single meter via an optical reading head is given in chapter 4 "First Steps".

6.3.2 Local Point-to-Point Connection via RS232 Interface

This example shows how a point-to-point connection is made to a single meter.



Procedure:

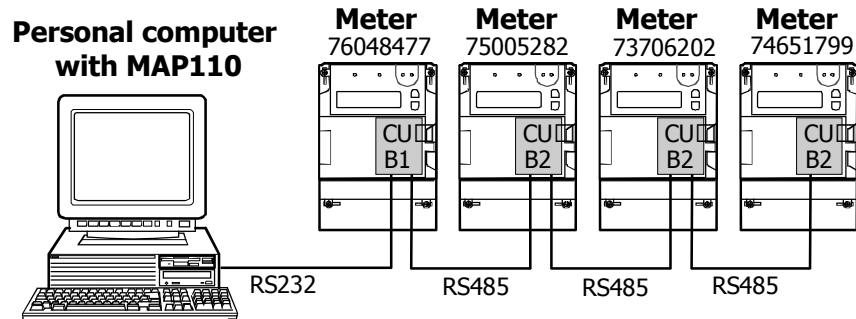
1. Click on  in the tool bar or select **Communication Settings...** from the **Extras** menu.
The "MAP110 - Communication Settings" window appears showing the settings last used.
2. Select or create a communication profile with the following settings (for procedure see chapter 6.2.1 "Communication Profiles"):
 - Selection box "Interface": serial interface, to which the connection cable to the RS232 interface of the meter is connected, e.g. COM1.
 - Selection box "Interface Type": 3-wire connection without echo.
 - Selection box "Baud Rate": Transmission rate according to the parameter settings of the communication unit in the meter, e.g. 9600.
 - Selection box "Start Protocol": According interface type.

3. Select the required access levels for the intended activity in the relevant selection boxes of the "MAP110 - Communication Settings" window.


4. Click on **OK**.
The communication settings are applied and the "MAP110 - Communication Settings" window disappears again.
5. Select the communication protocol "dlms" or "IEC" in the "Select User Group" selection box corresponding to the characteristics of the meter connected.
6. Select the required command in the command tree.
Communication is started and the command executed.

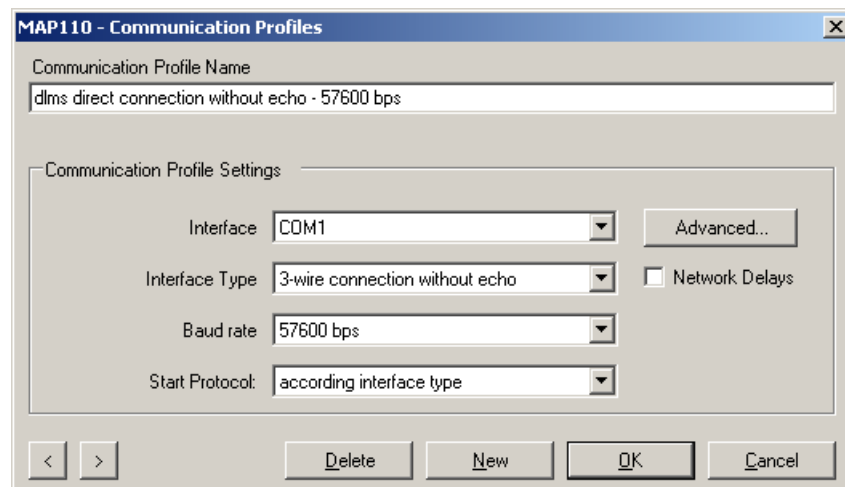
6.3.3 Local Multiple Connections via RS232/RS485 Interfaces

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




Procedure:

1. Click on  in the tool bar or select **Communication Settings...** from the **Extras** menu.
The "MAP110 - Communication Settings" window appears showing the settings last used.
2. Select or create a communication profile with the following settings (for procedure see chapter 6.2.1 "Communication Profiles"):
 - Selection box "Interface": serial interface, to which the connection cable to the RS232 interface of the first meter (in this example no. 76048477) is connected, e.g. COM1.
 - Selection box "Interface Type": 3-wire connection without echo.
 - Selection box "Baud Rate": Transmission rate according to the parameter setting of the communication unit in the meter, e.g. 57600.
 - Selection box "Start Protocol": According to interface type or HDLC, since access is to take place via the dlms protocol.



3. Select the required access levels for the intended activity in the relevant selection boxes of the "MAP110 - Communication Settings" window, e.g. [1] Data Collection for read commands and [2] Utility Field Service for write commands.

4. In the "MAP110 - Communication Settings" window click on **OK**.
The communication settings are applied and the "MAP110 - Communication Settings" window disappears again.
5. Select the communication protocol "dlms" in the "Select User Group" selection box.
6. Activate the check box in the "Physical Address" area.
Since a multiple connection is to be made, it must be possible to specify the device address of the desired meter.
7. If the physical address of the desired meter for multiple connection is already recorded, continuation can be made directly from point 13.
8. Click in the "Physical Address" area on  to enter the device address of the meter.
The "MAP110 - Add Physical Address" window appears.
9. Enter the HDLC device address of the desired meter in the "Physical dlms Device Address" entry box, since the dlms protocol is to be used.
This is calculated from the last 4 digits of the serial number plus 1000, e.g. 9477 for the meter with the serial number 76048477 (see also chapter 6.2.3 "Addressing Meters").
10. Enter a clear designation of the meter in the "Description" entry box.

MAP110 - Add Physical Address

Phone Nr: (local)

Physical IEC Device Address

Physical dlms Device Address: 9477

The physical dlms device address is derived from the physical IEC device address based on the rule "Last four digits + 1000" as delivered by the factory, by default.

Description: Meter 7648477

OK Cancel

11. Click on **OK**.
The device address added is displayed in the "Physical Address" selection box.
12. The remaining device addresses for multiple connection should be entered in the same way (points 8 to 11).
13. Select the entry with the device address of the desired meter in the "Physical Address" selection box.

Physical Address

☒ ,9477 (Meter 7648477) (IEC; hdlc)

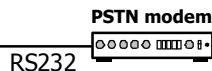
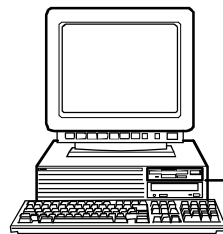
[Edit] [Add] [Delete]

14. Select the required command in the command tree.
The command is executed.
15. If it is desired to communicate with another meter in the multiple connection, select its address while connection continues in the "Physical Address" selection box and then select the desired command in the command tree (the multiple connection must not be interrupted and re-connected for the changeover).

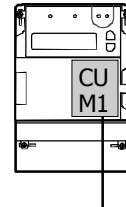
6.3.4 Remote Point-to-Point Connection via V34b PSTN Modem

This example shows how a point-to-point connection is made for remote communication with a single meter fitted with a CU-M1/V34b communication unit via a V34b PSTN modem. dlms is used as communication protocol.

Personal computer with MAP110




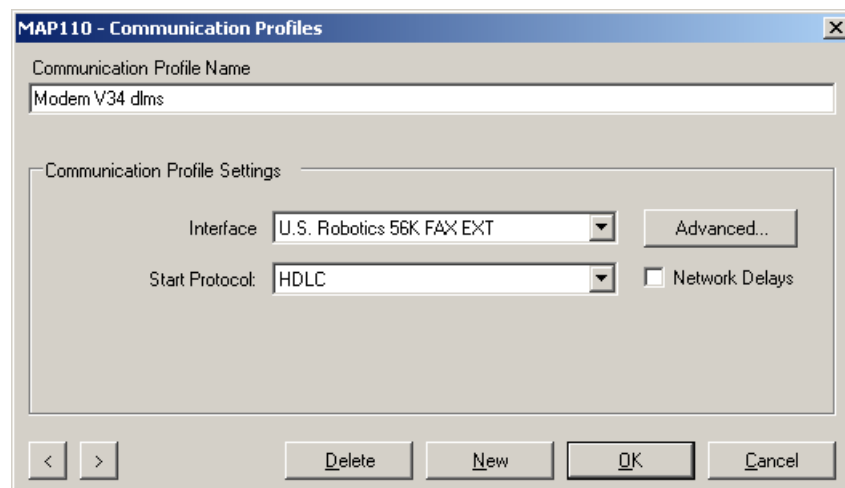
Meter



Modem connection 33'600 bps

Procedure:

1. Click on  in the tool bar or select **Communication Settings...** from the **Extras** menu.
The "MAP110 - Communication Settings" window appears showing the settings last used.
2. Select or create a communication profile with the following settings (for procedure see chapter 6.2.1 "Communication Profiles"):
 - Selection box "Interface": any available V34b PSTN modem.
 - Selection box "Start Protocol": HDLC, since access is to be made via the dlms protocol.



3. Select the required access levels for the intended activity in the relevant selection boxes of the "MAP110 - Communication Settings" window, e.g. [6] Remote Data Collection for read commands and [7] Remote Service for write commands. If the access level to be used is not known, refer to chapter 10.4 "Access Levels and their Application".

MAP110 - Communication Settings

Communication Profile
 Modern V34 dlms Edit...

Access Level Base Meter

dlms read [6] Remote Data Collection

dlms write [7] Remote Servicer

Access Level Communication Unit

dlms read [1] Data Collection

dlms write [2] Utility Field Service

IEC62056-21 (IEC1107+)

IEC read / write [0] Public Access
 Use security switches at the device to switch from Level 0 to Level 3 or Level 4

Calendar base Gregorian

Passwords... OK Cancel

- Click on **Passwords...**
 The "MAP110 - Passwords" window appears.

MAP110 - Passwords

Access Levels for IEC and dlms

	UID	Password	Comment
[0] Public access	16		
[1] Datacollection	32	xxxxxxx	static
[2] Utility Field Service	48	xxxxxxx	coded
[3] Utility Service	64		Service Menu required
[4] Extended Utility Service	80		Hardware Switch required

Access Level for dlms only

[5] Extended Consumer	17		static
[6] Remote DataCollection	18	xxxxxxx	static
[7] Remote Service	19	xxxxxxx	static

Access Level for Security System Modification (dlms only)

[A] Utility Defined	22		no password
[C] Read Administrator	96		coded
[D] Utility Administrator	97		coded - Hardware Switch required
[E] Distributor Service	100		coded - Hardware Switch required


User Defined Access Level

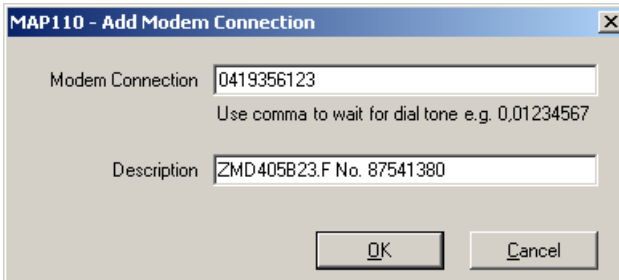
[X] User Defined	16		no password
------------------	----	--	-------------

IEC W5 commands

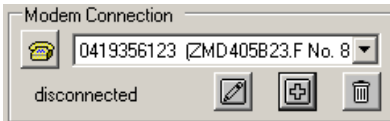
W5 / R5 commands		static
------------------	--	--------


OK Cancel

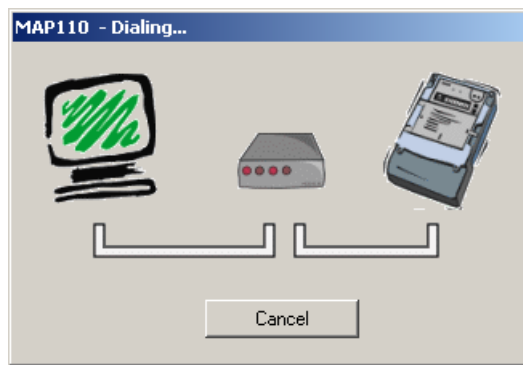
5. Enter the valid passwords for the access levels used.
For test installations at Landis+Gyr "66666666" is programmed as default password for access level 6 and "77777777" for access level 7.
6. In the "MAP110 - Passwords" window click on **OK**.
The passwords entered are stored and the "MAP110 - Passwords" window disappears again.
7. In the "MAP110 - Communication Settings" window click on **OK**.
The communication settings are applied and the "MAP110 - Communication Settings" window disappears again.
8. Select the communication protocol "dlms" in the "Select User Group" selection box.
9. If the call number of the meter modem is already entered, continue directly from point 13.
10. Click on  in the "Modem Connection" area to enter the call number of the meter modem.
The "MAP110 - Add Modem Connection" window appears.
11. Enter the telephone number of the modem to be called in the "Modem Connection" entry box and in the "Description" entry box for example a clear designation of the meter location.



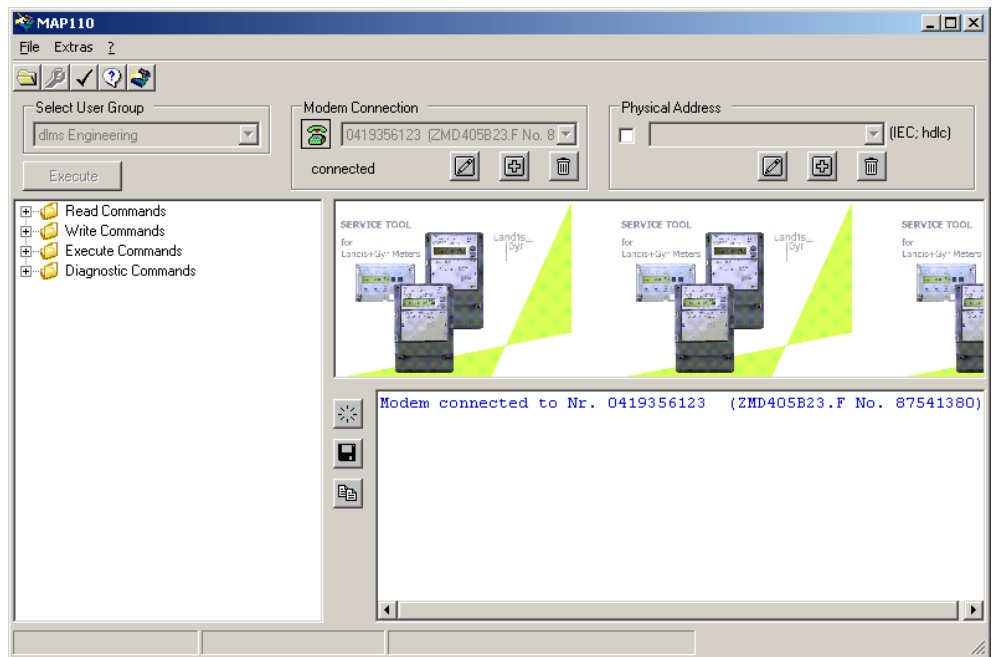
12. Click on **OK**.
The call number added is displayed in the "Modem Connection" selection box.
13. Select the entry with the call number of the meter modem in the "Modem Connection" selection box.
If the call number has just been entered, it is already selected.




14. Click on  in the "Modem Connection" area to make connection to the modem.
The "MAP110 - Dialing..." window is displayed while making the connection.



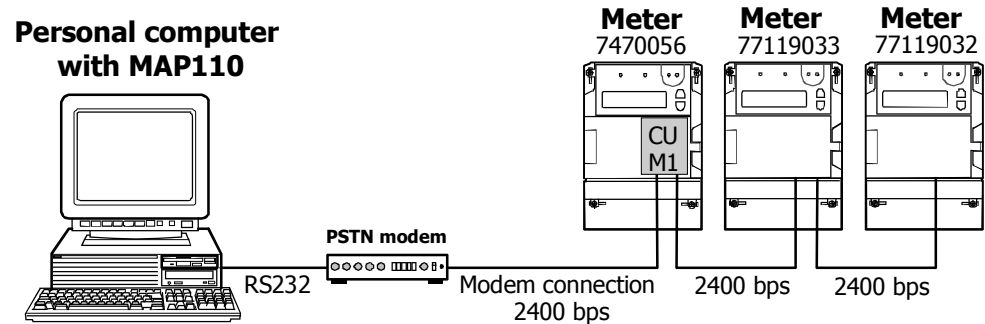
When the connection is made, it is indicated in the log area and the command tree is released.




15. Select the required command in the command tree.
The command is executed.
16. Click on  in the "Modem Connection" area to conclude the modem connection.

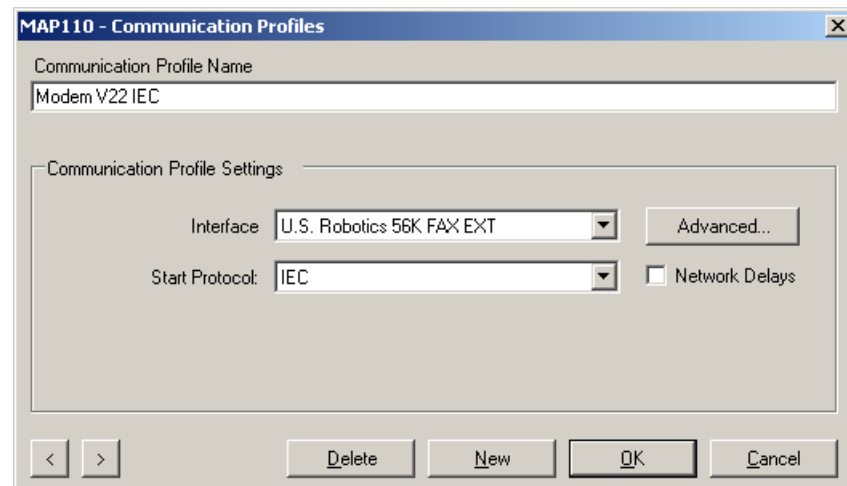
6.3.5 Remote Multiple Connection via V22b PSTN Modem

This example shows how a multiple connection is made for remote reading of several interconnected meters via a V22b PSTN modem. IEC is used as communication protocol. In the layout diagram below the meter numbers are given for addressing.



Procedure:

1. Click on  in the tool bar or select **Communication Settings...** from the **Extras** menu.
The "MAP110 - Communication Settings" window appears showing the settings last used.
2. Select or create a communication profile with the following settings (for procedure see chapter 6.2.1 "Communication Profiles"):
 - Selection box "Interface": any available V22b PSTN Modem.
 - Selection box "Start Protocol": IEC, since access is to take place via the IEC protocol.



3. Click on **Advanced....**
The "MAP110 - Advanced Settings" window appears.

MAP110 - Advanced Settings

Echo Handling of Interface: automatically, according to interface type

Own Logical Device Address:

Maximum Baud Rate: 2400 bps (for IEC communication only)

Ignore Baud Rate Switching: ☒ (for IEC communication only)

Network Delays (e.g. GSM/GPRS, Ethernet)

Initial Delay: 4000 ms

IEC and HDLC Timeout: 4000 ms (IEC Standard value 1500 ms)

Communication delays and timeouts defined in standards may be defined too short for some phone networks (especially GSM networks). The communication may abort due to additional delays in the network. Therefore, it is highly suggested to increase timeout and delay for GSM network connections.

OK Cancel

4. Select the item "2400 Baud" in the "Maximum Baud Rate" box. This is necessary because a V22bis modem is used on the meter side and the multiple connection is also set to 2400 bps.
5. Activate the check box "Ignore Baud Rate Switching".
6. Click on **OK** in the "MAP110 - Advanced Settings" window and in the "MAP110 - Communication Profiles" window. The windows disappear again.
7. Select the required access level for the planned action, e.g. [1] Data Collection in the "IEC read / write" selection box of the "MAP110 - Communication Settings" window.

MAP110 - Communication Settings

Communication Profile: Modem V22 IEC Edit...

Access Level Base Meter

dlms read: [1] Data Collection

dlms write: [3] Utility Service

Access Level Communication Unit

dlms read: [1] Data Collection


dlms write: [2] Utility Field Service

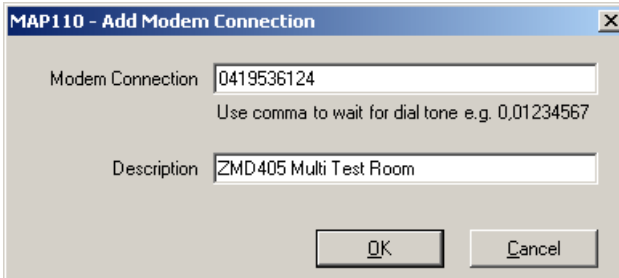
IEC62056-21 (IEC1107+)

IEC read / write: [1] Data Collection
Use security switches at the device to switch from Level 0 to Level 3 or Level 4

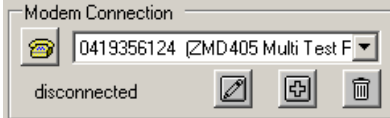
Calendar base: Gregorian


Passwords... OK Cancel

8. In the "MAP110 - Communication Settings" window click on **OK**.
The communication settings are applied and the "MAP110 - Communication Settings" window disappears again.
9. Select the communication protocol "IEC" in the "Select User Group" selection box.
10. If the call number of the meter modem is already entered, continue directly from point 14.
11. Click on  in the "Modem Connection" area to enter the call number of the meter modem.
The "MAP110 - Add Modem Connection" window appears.
12. Enter the telephone number of the modem to be called in the "Modem Connection" entry box and in the "Description" entry box for example a clear designation of the meter location.

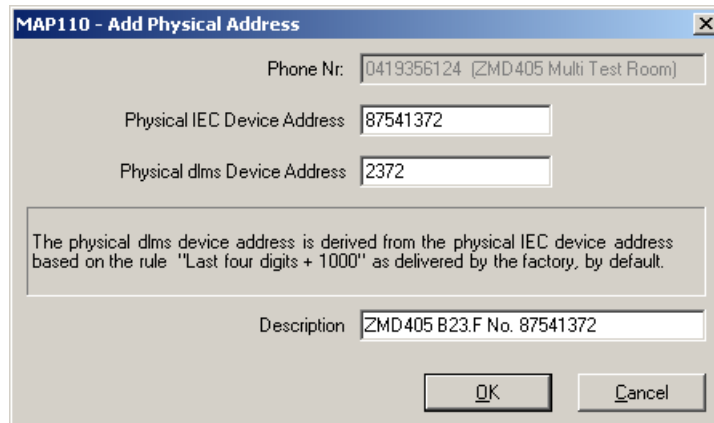


13. Click on **OK**.
The call number added is displayed in the "Modem Connection" selection box.
14. Select the entry with the call number of the meter modem in the "Modem Connection" selection box.
If the call number has just been entered, it is already selected.



15. Activate the check box in the "Physical Address" area.
Since a multiple connection is to be made, it must be possible to specify the device address of the desired meter.
16. If the physical address of the desired meter for multiple connection is already recorded, continuation can be made directly from point 21.
17. Click in the "Physical Address" area on  to enter the device address of the meter.
The "MAP110 - Physical Address" window appears.
18. Enter the IEC device address of the desired meter in the "Physical IEC Device Address" entry box. This corresponds to the meter serial number (see also chapter 6.2.3 "Addressing Meters").
The dlms device address is calculated automatically and displayed in the "Physical dlms Device Address" entry box.

19. Enter a clear designation of the meter in the "Description" entry box.

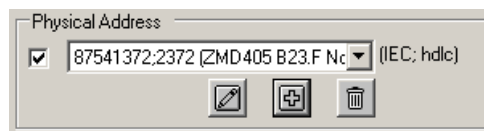



20. Click on **OK**.

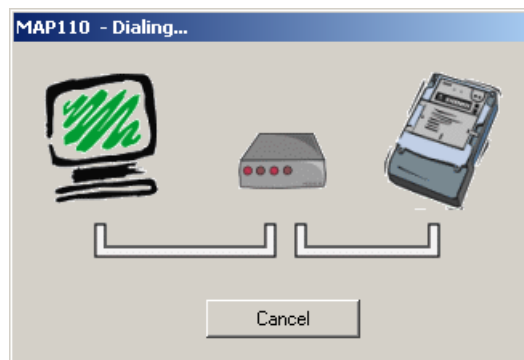
The device address added is displayed in the "Physical Address" selection box. It is assigned to the selected modem connection.

21. The remaining device addresses for multiple connection should be entered in the same way (points 17 to 20).

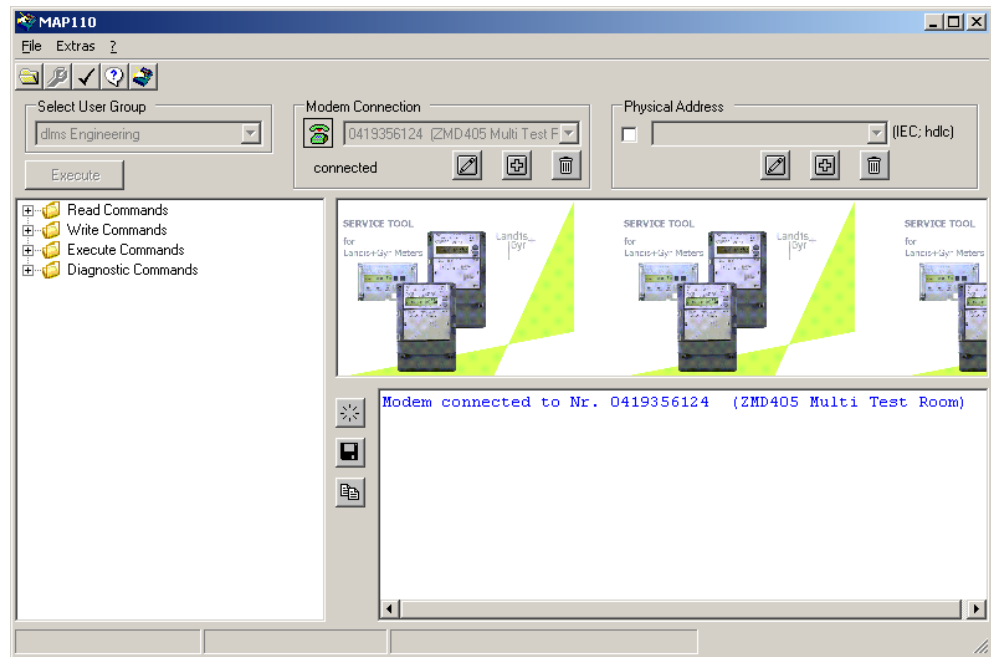
22. Select the entry with the device address of the desired meter in the "Physical Address" selection box.




23. Click on  in the "Modem Connection" area to make connection to the modem.
The "MAP110 - Dialing..." window is displayed while making the connection.



When the connection is made, it is indicated in the log area and the command tree is released.

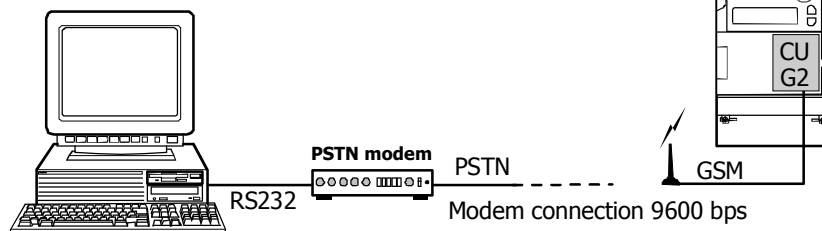


24. Select the required command in the command tree.
The command is executed.
25. If it is desired to communicate with another meter in the multiple connection, select its address while connection continues in the "Physical Address" selection box and then select the desired command in the command tree (the multiple connection must not be interrupted and re-connected for the changeover).
26. Click on  in the "Modem Connection" area to conclude the modem connection.


6.3.6 Remote Point-to-Point Connection via GSM Modem

This example shows how a modem point-to-point connection is made to a meter with GSM modem (CU-G2 communication unit) in order, for example, to check the existing field strength at the meter.

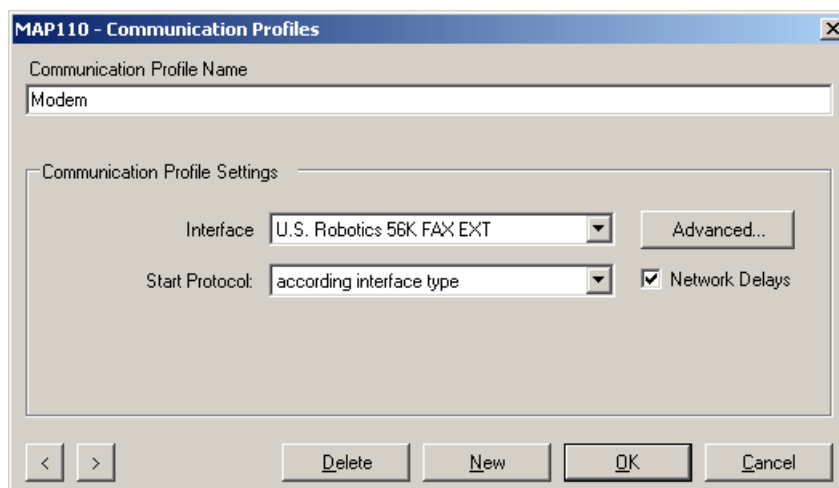
Personal computer with MAP110



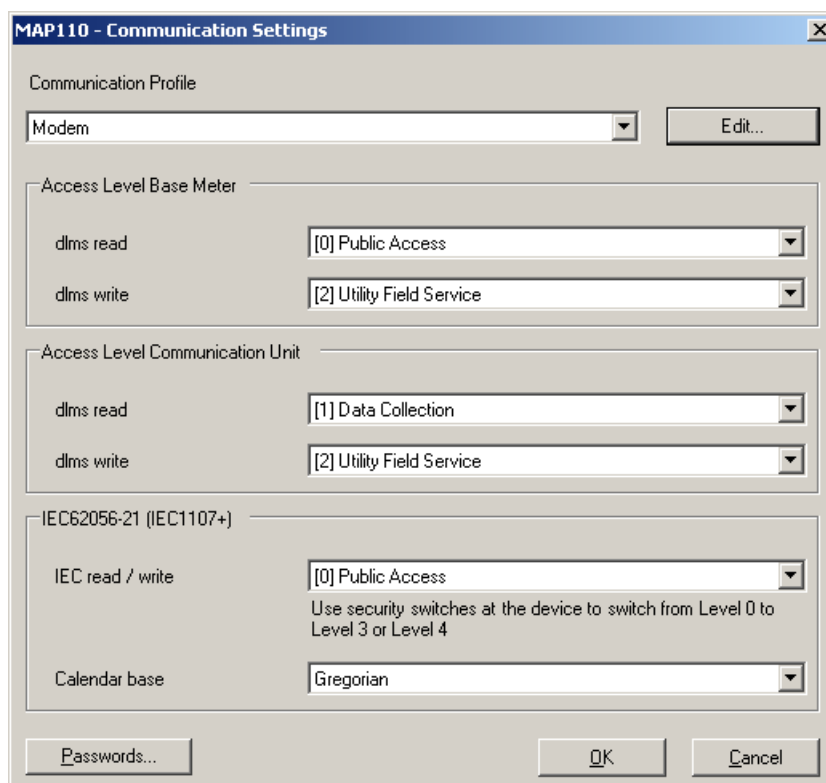
Procedure:

1. Click on  in the tool bar or select **Communication Settings...** from the **Extras** menu.
The "MAP110 - Communication Settings" window appears showing the settings last used.
2. Select or create a communication profile with the following settings (for procedure see chapter 6.2.1 "Communication Profiles"):


- Selection box "Interface": any available modem.
- Selection box "Start Protocol": according interface type or HDLC. Diagnostic commands are not available with the "IEC" setting.
- Check box "Network Delays" activated.
This increases the time delays with respect to the standard value of 1500 ms to the value set under "Advanced Communication Settings" (default value = 4000 ms). Increasing the time delays prevents the occurrence of interruptions during data transmission and is urgently recommended for GSM networks.



3. Select the required access levels for the intended activity in the relevant selection boxes of the "MAP110 - Communication Settings" window, e.g. [0] Public Access.

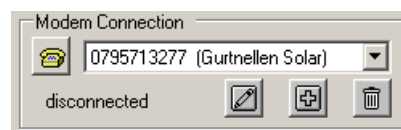



4. Select the communication protocol "dlms" in the "Select User Group" selection box.
Diagnostic commands are not available with the communication protocol setting "IEC".

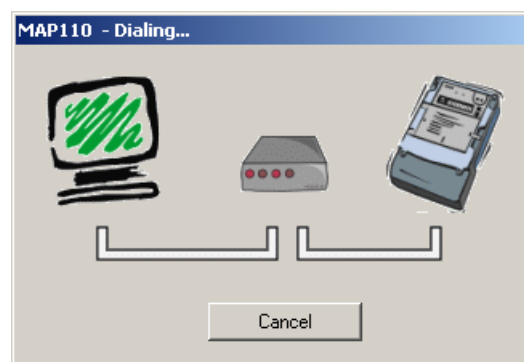
5. If the call number of the meter modem is already entered, continue directly from point 9.
6. Click on  in the "Modem Connection" area to enter the call number of the meter modem.
The "MAP110 - Add Modem Connection" window appears.
7. Enter the telephone number of the modem to be called in the "Modem Connection" entry box and in the "Description" entry box for example a clear designation of the meter location.



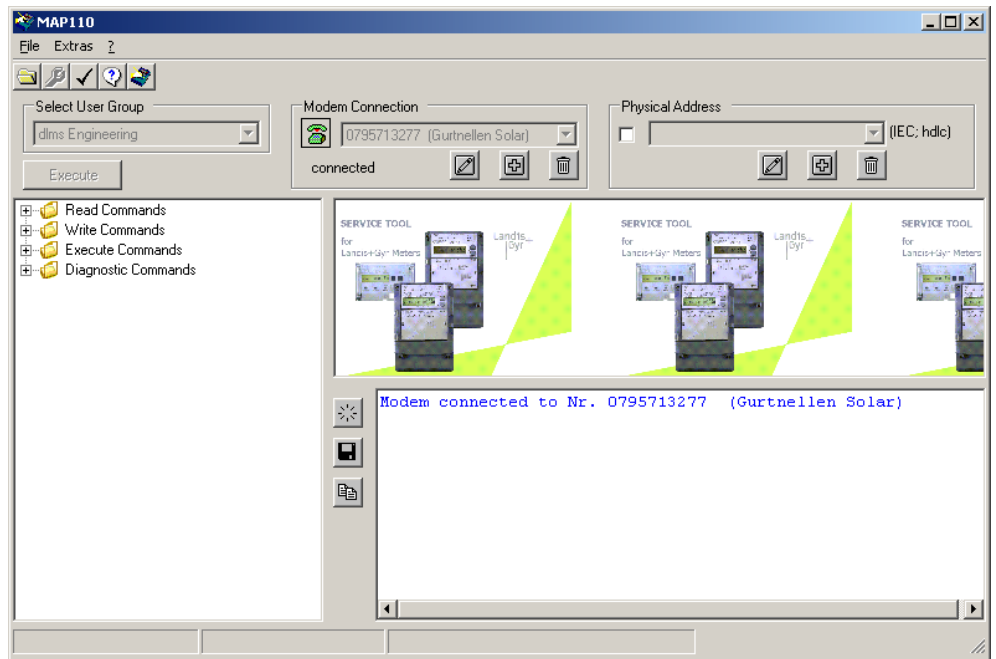
8. Click on **OK**.
The call number added is displayed in the "Modem Connection" selection box.
9. Select the entry with the call number of the meter modem in the "Modem Connection" selection box.
If the call number has just been entered, it is already selected.



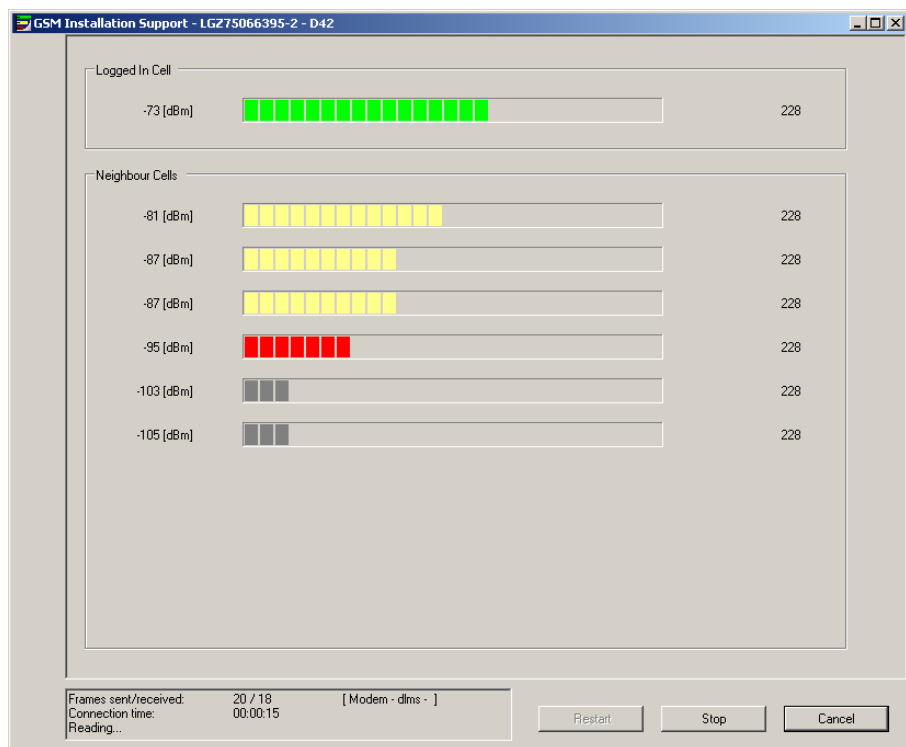
10. Click on  in the "Modem Connection" area to make connection to the modem.
The "MAP110 - Dialing..." window is displayed while making the connection.




When the connection is made, it is indicated in the log area and the command tree is released.



11. Select the "GSM Installation Support" command in the command tree under "Diagnostic".
The field strength at the location of the meter is measured for the cell logged in and for the neighbouring cells available and displayed as bar and value.



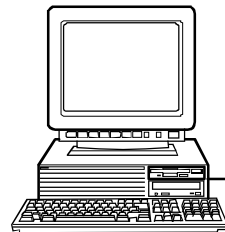
The field strength measurement is not continuously updated with a remote connection via GSM channel, but the values immediately after making the connection are displayed.

12. Click on **Stop**.
Measurement is stopped, but can be repeated by clicking **Restart**.
13. Click on  in the "Modem Connection" area to conclude the modem connection.

6.3.7 Local Point-to-Point Connection via Ethernet

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

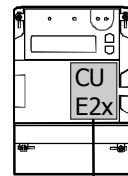
Personal computer with MAP110



Switch or Router


Ethernet

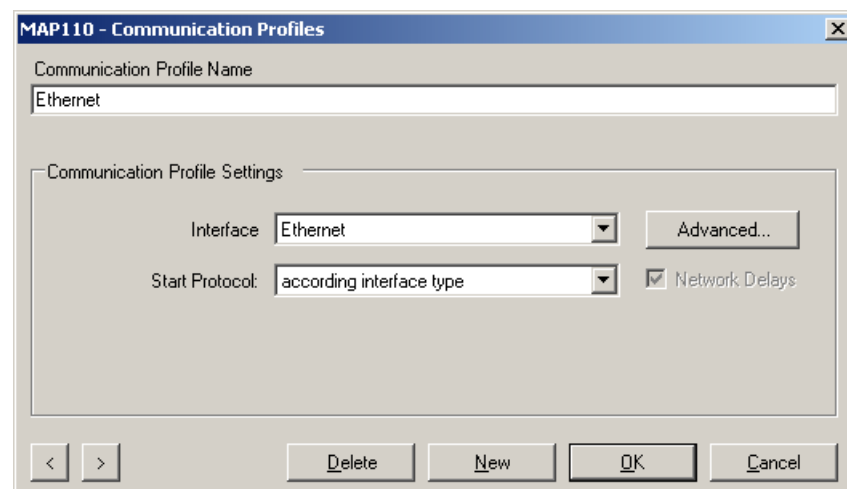
Meter



Ethernet

Procedure:

1. Click on  in the tool bar or select **Communication Settings...** from the **Extras** menu
The "MAP110 - Communication Settings" window appears showing the settings last used.
2. Select or create a communication profile with the following settings (for procedure see chapter 6.2.1 "Communication Profiles"):
 - Selection box "Interface": Ethernet
 - Selection box "Start Protocol": According interface type.
 - Check box "Network Delays" activated.
This setting occurs automatically if Ethernet is selected as interface. This increases the time delays with respect to the standard value of 1500 ms to the value set under "Advanced Communication Settings" (default value = 4000 ms). Increasing the time delays prevents the occurrence of interruptions during data transmission.



3. Click on **Advanced....**
The "MAP110 - Advanced Settings" window appears.

MAP110 - Advanced Settings

Echo Handling of Interface: automatically, according to interface type

Own Logical Device Address:

Maximum Baud Rate: 9600 bps (for IEC communication only)

Ignore Baud Rate Switching: ☐ (for IEC communication only)

Network Delays (e.g. GSM/GPRS, Ethernet)

Initial Delay: 500 ms

IEC and HDLC Timeout: 10000 ms (IEC Standard value 1500 ms)

Communication delays and timeouts defined in standards may be defined too short for some phone networks (especially GSM networks). The communication may abort due to additional delays in the network. Therefore, it is highly suggested to increase timeout and delay for GSM network connections.

OK Cancel

4. Enter an "Initial Delay" of 500 ms and an "IEC and HDLC Timeout" of 10000 ms.
5. Click on **OK** in the "MAP110 - Advanced Settings" window and in the "MAP110 - Communication Profiles" window. The windows disappear again.
6. Select the required access levels for the intended activity in the relevant selection boxes of the "MAP110 - Communication Settings" window.

MAP110 - Communication Settings

Communication Profile: Ethernet Edit...

Access Level Base Meter

dlms read: [0] Public Access

dlms write: [2] Utility Field Service

Access Level Communication Unit

dlms read: [1] Data Collection

dlms write: [2] Utility Field Service


IEC62056-21 (IEC1107+)

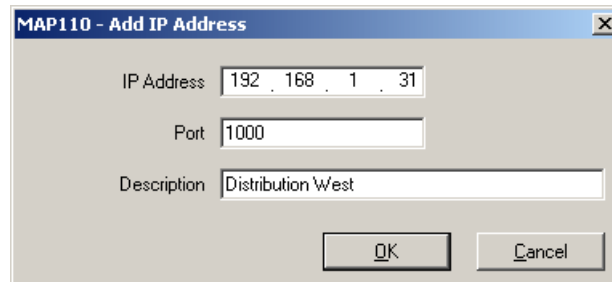
IEC read / write: [0] Public Access
Use security switches at the device to switch from Level 0 to Level 3 or Level 4

Calendar base: Gregorian

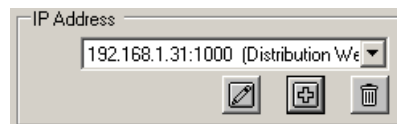
Passwords... OK Cancel

7. Click on **OK**. The communication settings are applied and the "MAP110 - Communication Settings" window disappears again.

8. If the IP address and port number of the meter is already recorded, continuation can be made directly from point 12.
9. Click in the "IP Address" area on  to enter the IP address and port number of the meter.
The "MAP110 - Add IP Address" window appears.
10. Enter the IP address and the port number of the desired meter in the corresponding entry boxes and for example a clear designation of the meter location in the "Description" entry box .



11. Click on **OK**.
The IP address and port number added are displayed in the "IP Address" selection box.
12. Select the entry with the IP address and port number of the meter in the "IP Address" selection box.
If the IP address and port number have just been entered, it is already selected.

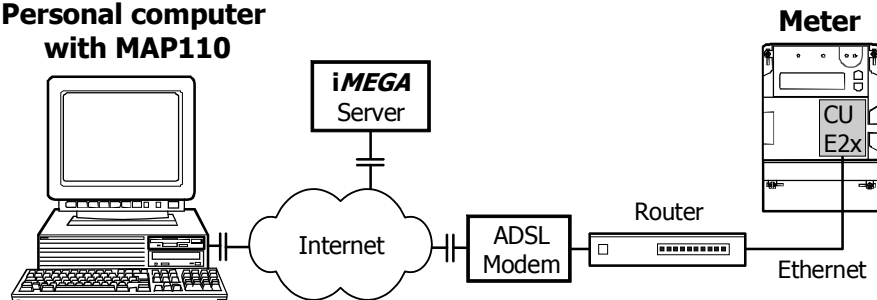


13. Select the communication protocol "dlms" or "IEC" in the "Select User Group" selection box corresponding to the characteristics of the meter connected.
14. Select the required command in the command tree.
Communication is started and the command executed.


6.3.8 Remote Point-to-Point Connection via the Internet

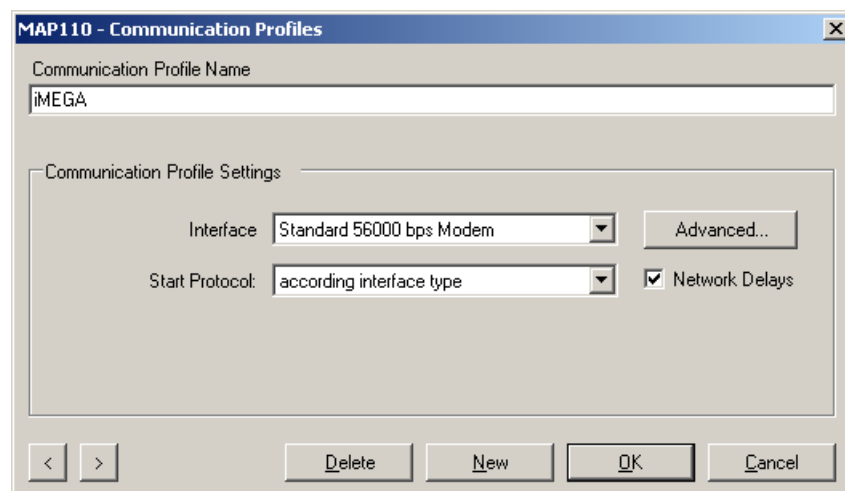
This example shows how a point-to-point connection via the Internet is made to a single meter equipped with a communication unit CU-E2x.

Personal computer with MAP110



Procedure:

1. Click on  in the tool bar or select **Communication Settings...** from the **Extras** menu
The "MAP110 - Communication Settings" window appears showing the settings last used.
2. Select or create a communication profile with the following settings (for procedure see chapter 6.2.1 "Communication Profiles"):
 - Selection box "Interface": Modem, which has been defined for the virtual COM port to the iMEGA server
 - Selection box "Start Protocol": According interface type.
 - Check box "Network Delays" activated.
This increases the time delays with respect to the standard value of 1500 ms to the value set under "Advanced Communication Settings" (default value = 4000 ms). Increasing the time delays prevents the occurrence of interruptions during data transmission.



3. Click on **Advanced...**
The "MAP110 - Advanced Settings" window appears.

MAP110 - Advanced Settings

Echo Handling of Interface: automatically, according to interface type

Own Logical Device Address:

Maximum Baud Rate: 9600 bps (for IEC communication only)

Ignore Baud Rate Switching: ☐ (for IEC communication only)

Network Delays (e.g. GSM/GPRS, Ethernet)

Initial Delay: 500 ms

IEC and HDLC Timeout: 10000 ms (IEC Standard value 1500 ms)

Communication delays and timeouts defined in standards may be defined too short for some phone networks (especially GSM networks). The communication may abort due to additional delays in the network. Therefore, it is highly suggested to increase timeout and delay for GSM network connections.

OK Cancel

4. Enter an "Initial Delay" of 500 ms and an "IEC and HDLC Timeout" of 10000 ms.
5. Click on **OK** in the "MAP110 - Advanced Settings" window and in the "MAP110 - Communication Profiles" window.
The windows disappear again.
6. Select the required access levels for the intended activity in the relevant selection boxes of the "MAP110 - Communication Settings" window.

MAP110 - Communication Settings

Communication Profile: iMEGA Edit...

Access Level Base Meter

dlms read: [0] Public Access

dlms write: [2] Utility Field Service

Access Level Communication Unit

dlms read: [0] Public Access

dlms write: [2] Utility Field Service


IEC62056-21 (IEC1107+)

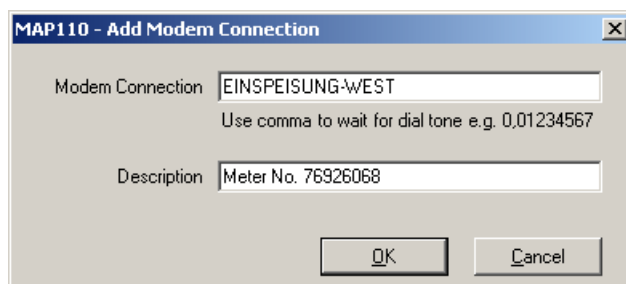
IEC read / write: [0] Public Access
Use security switches at the device to switch from Level 0 to Level 3 or Level 4

Calendar base: Gregorian

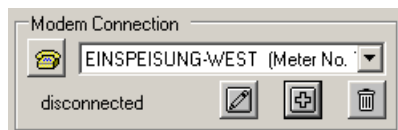
Passwords... OK Cancel


7. Click on **OK**.
The communication settings are applied and the "MAP110 - Communication Settings" window disappears again.

8. If the network ID of the meter is already recorded, continuation can be made directly from point 14.
9. Click on  in the "Modem Connection" area to enter the call number of the meter modem.
The "MAP110 - Add Modem Connection" window appears.
10. Enter the network ID of the meter in the "Modem Connection" entry box and in the "Description" entry box for example a clear designation of the meter location.



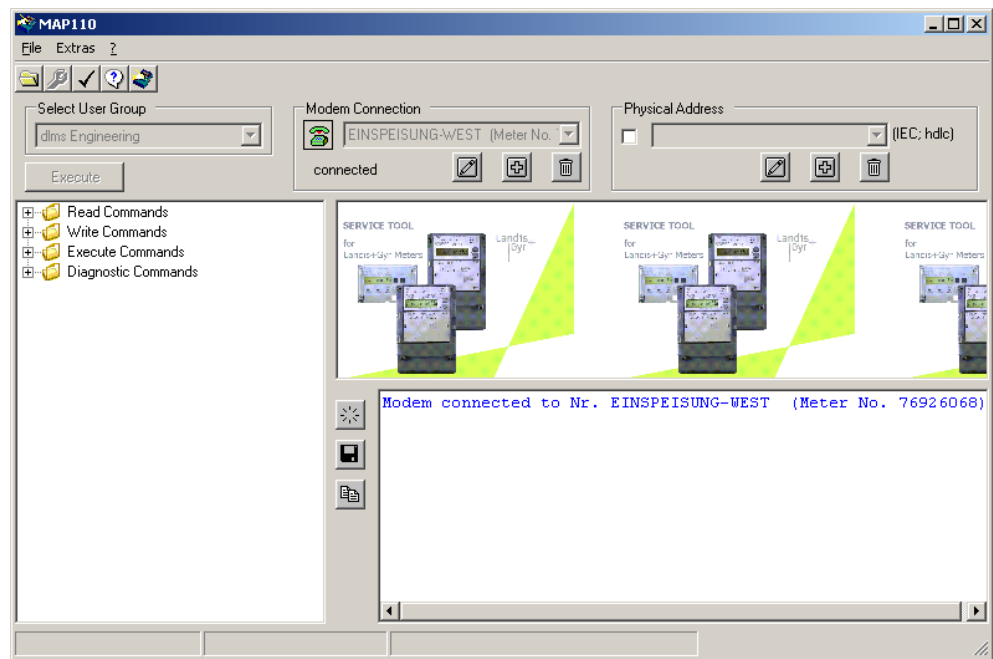
11. Click on **OK**.
The network ID added is displayed in the "Modem Connection" selection box.
12. Select the entry with the network ID of the meter in the "Modem Connection" selection box (this is treated for the call via the virtual COM port like a telephone number).
If the network ID has just been entered, it is already selected.




13. Select the communication protocol "dlms" or "IEC" in the "Select User Group" selection box corresponding to the characteristics of the meter connected.
14. Click on  in the "Modem Connection" area to make connection to the iMEGA server.
The "MAP110 - Dialing..." window is displayed while making the connection.



When the connection is made, it is indicated in the log area and the command tree is released.



15. Select the required command in the command tree.
Communication is started and the command executed.
16. Click on  in the "Modem Connection" area to conclude the connection to iMEGA server.

6.4 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
- **User manuals** for the various communication units
- **Functional description** of communication units
- Detailed **application notes** for numerous reference applications with various communication units for different transmission media

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

7 Application of MAP110 Functions

This chapter contains instructions for the use of 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 chapter 5.8 "Command Tree", Command execution" section.

7.1 Read Commands



Chapter 12 "Functional Range per User Group" describes which read commands are available to the individual user groups. The following read commands are explained as examples:

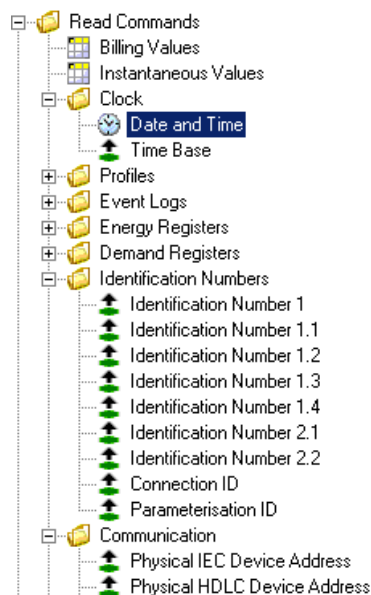
- Simple read commands for parameters and values
- Read commands for current meter data
- Read commands for event logs
- Read commands for load profiles

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 meter which is displayed in the trace window.

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



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



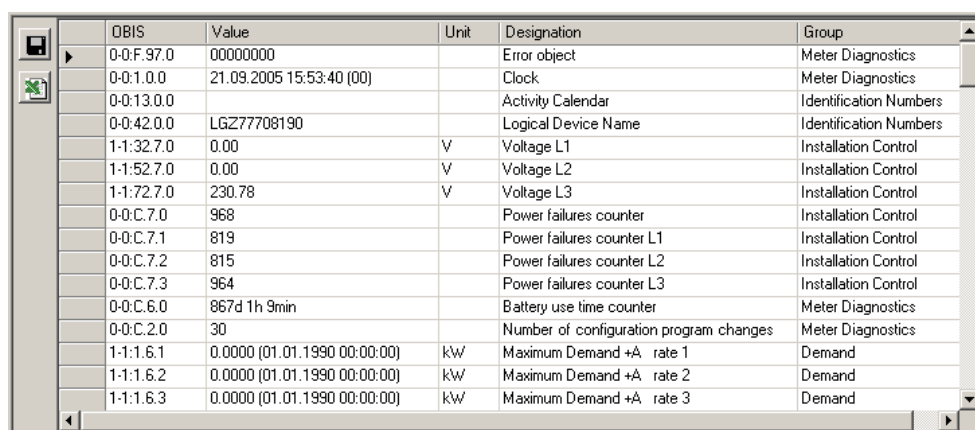
7.1.2 Read Commands for Current Meter Data

For read commands for current meter data a table of values and parameters is read out from the meter and displayed in the display window.

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

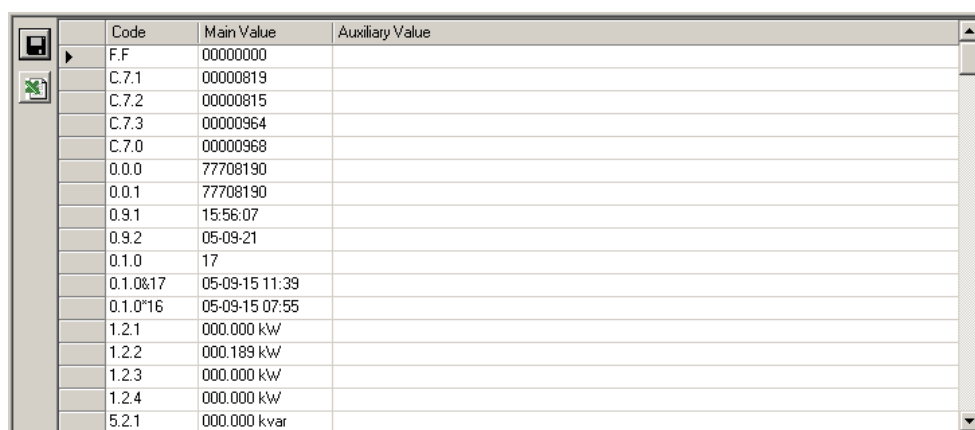
The table read out is shown in the display window. Each column of the table can be sorted in increasing or decreasing order by clicking on the relevant column heading. The table is sorted alphanumerically and the selected sorting sequence indicated in the column heading with an arrow pointing upwards for increasing or downwards for decreasing sequence.

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



OBIS	Value	Unit	Designation	Group
0-0.F.97.0	00000000		Error object	Meter Diagnostics
0-0.1.0.0	21.09.2005 15:53:40 (00)		Clock	Meter Diagnostics
0-0.13.0.0			Activity Calendar	Identification Numbers
0-0.42.0.0	LGZ77708190		Logical Device Name	Identification Numbers
1-1:32.7.0	0.00	V	Voltage L1	Installation Control
1-1:52.7.0	0.00	V	Voltage L2	Installation Control
1-1:72.7.0	230.78	V	Voltage L3	Installation Control
0-0.C.7.0	968		Power failures counter	Installation Control
0-0.C.7.1	819		Power failures counter L1	Installation Control
0-0.C.7.2	815		Power failures counter L2	Installation Control
0-0.C.7.3	964		Power failures counter L3	Installation Control
0-0.C.6.0	867d 1h 9min		Battery use time counter	Meter Diagnostics
0-0.C.2.0	30		Number of configuration program changes	Meter Diagnostics
1-1:1.6.1	0.0000 (01.01.1990 00:00:00)	kW	Maximum Demand +A rate 1	Demand
1-1:1.6.2	0.0000 (01.01.1990 00:00:00)	kW	Maximum Demand +A rate 2	Demand
1-1:1.6.3	0.0000 (01.01.1990 00:00:00)	kW	Maximum Demand +A rate 3	Demand

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



Code	Main Value	Auxiliary Value
F.F	00000000	
C.7.1	00000819	
C.7.2	00000815	
C.7.3	00000964	
C.7.0	00000968	
0.0.0	77708190	
0.0.1	77708190	
0.9.1	15:56:07	
0.9.2	05-09-21	
0.1.0	17	
0.1.0&17	05-09-15 11:39	
0.1.0*16	05-09-15 07:55	
1.2.1	000.000 kW	
1.2.2	000.189 kW	
1.2.3	000.000 kW	
1.2.4	000.000 kW	
5.2.1	000.000 kvar	

The table can be saved as XML or text file for further processing or exported directly to the Excel table calculation program (see chapter 5.9 "Display Window").

7.1.3 Read Commands for Event Logs

With read commands for event logs a table of events occurring is read from the meter and shown in the display window.

For execution, select the "Event Log" (dlms protocol) or "Event Log R5" (IEC protocol) read command in the command tree.

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

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



Shortening readout time by data selection

It is highly recommended to perform a data selection before readout, since readout of the entire event log can take a considerable time.

The event log data read out are shown as a table in the display window. With readout under dlms the table contains the date and time, EDIS status word, event number and register statuses for every event. An explanatory text is displayed by placing the mouse pointer on a column heading or a cell. In the case of a coded EDIS status word, this is directly decoded and all individual events are displayed (e.g. the EDIS status word 00880080 contains the individual events 8, 20 and 24).

	0-0:1.0.0	0-0:C.240.12	0-0:C.240.12	1-1:1.8.0 [kWh]	1-1:2.8.0 [kWh]	1-1:3.8.0 [kvarh]
	2006-11-24 10:02:01	00000040	24	0.0000	14114.1224	8744.1227
	2006-11-23 09:56:21	00880080	23	0.0000	14114.1224	8744.1227
	2006-11-23 09:45:34	00000040	24	0.0000	14113.9601	8743.9915
	2006-11-22 09:45:27	00880080	23	0.0000	14113.9601	8743.9915
	2006-11-22 09:43:25	00000040	24	0.0000	14113.9418	8743.9666
	2006-11-22 09:43:18	00880080	23	0.0000	14113.9418	8743.9666
	2006-11-21 09:36:16	00000040	24	0.0000	14113.8596	8743.8545
	2006-11-21 09:36:06	00880080	23	0.0000	14113.8596	8743.8545
	2006-11-20 09:36:03	00000040	24	0.0000	14113.8596	8743.8545
	2006-11-19 08:09:32	00880080	23	0.0000	14113.8596	8743.8545
	2006-11-19 00:00:00	00880010	8	0.0000	14071.6420	8686.5432
	2006-11-19 10:04:37	00000040	24	0.0000	13989.4377	8574.8101
	2006-11-18 08:09:41	00880080	23	0.0000	13989.4377	8574.8101

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

	Time	Status Word		1.8.0 [kWh]	2.8.0 [kWh]	3.8.0 [kvarh]	4.8.0 [kvarh]	
	2006-11-24 10:02:01	00000040	24	000000.00	014114.12	008744.12	000000.00	
	2006-11-23 09:56:21	00080080	23	000000.00	014114.12	008744.12	000000.00	
	2006-11-23 09:45:34	00000040	24	000000.00	014113.96	008743.99	000000.00	
	2006-11-22 09:45:27	00880080	23	000000.00	014113.96	008743.99	000000.00	
	2006-11-22 09:43:25	00000040	24	000000.00	014113.94	008743.96	000000.00	
	2006-11-22 09:43:18	00080080	23	000000.00	014113.94	008743.96	000000.00	
	2006-11-21 09:36:16	00000040	24	000000.00	014113.85	008743.85	000000.00	
	2006-11-21 09:36:06	00080080	23	000000.00	014113.85	008743.85	000000.00	
	2006-11-20 09:36:03	00000040	24	000000.00	014113.85	008743.85	000000.00	
	2006-11-19 08:09:32	00880080	23	000000.00	014113.85	008743.85	000000.00	
	2006-11-19 00:00:00	00880010	08	000000.00	014071.64	008686.54	000000.00	
	2006-11-19 10:04:37	00000040	24	000000.00	013989.43	008574.81	000000.00	
	2006-11-18 08:09:41	00880080	23	000000.00	013989.43	008574.81	000000.00	

The table can be saved as XML or text file for further processing or exported directly to the Excel table calculation program (see chapter 5.9 "Display Window").

Event types

The following table shows which event types can be recorded under which event number in the event log:

Event type	Number
All energy registers cleared	2
Stored values and/or load profile cleared	3
Eventlog cleared	4
Battery voltage low	5
Battery voltage ok	7
Meter reset performed	8
Daylight saving time enabled or disabled	9
Clock adjusted (old values)	10
Clock adjusted (new values)	11
Control inputs status changed	13
Undervoltage phase L1	17
Undervoltage phase L2	18
Undervoltage phase L3	19
Overvoltage phase L1	20
Overvoltage phase L2	21
Overvoltage phase L3	22
Voltage failure	23
Voltage return	24
Overcurrent phase L1	25
Overcurrent phase L2	26
Overcurrent phase L3	27
Overcurrent neutral	28

Event type	Number
Power factors fallen below (4)	29 to 32
Power factors exceeded (8)	33 to 40
Error register cleared	45
Missing voltage phase 1	49
Missing voltage phase 2	50
Missing voltage phase 3	51
Current with undervoltage phase 1	55
Current with undervoltage phase 2	56
Current with undervoltage phase 3	57
All registers cleared	59
Phase sequence reversal	63
Overcurrent in neutral	64
Error "Clock invalid"	66
Error "Access backup memory"	74
Error "Access measuring system memory"	75
Error "Access time device "	76
Error "Access load profile"	77
Error "Access ripple control receiver"	78
Error "Access communication unit"	79
Error "Access display board"	80
Error "Backup data checksum"	82
Error "Parameter checksum"	83
Error "Load profile checksum"	84
Error "Stored values checksum"	85
Error "Invalid power down"	89
Error "Measuring system failed"	90
Error "Re-programming failed"	91
Error "Setting mode failed"	92
Error "Expired watchdog "	93
Error "Communication locked"	94
Error "Wrong extension board identification "	96
Failure of an SMS message transmission to GSM modem	104
Failure of an SMS message transmission to GSM modem	105
Alert occurred	106
SMS delivery to GSM initiated	107
Undercurrent phase L1	121
Undercurrent phase L2	122
Undercurrent phase L3	123

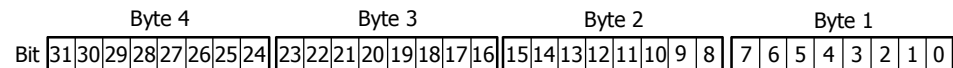
Event type	Number
Energy and total energy registers cleared	128
Phase sequence reversed	131
Front cover opened	135

EDIS status word

The following table shows which individual events are displayed under what numbers (corresponding to the bit of the status word). The status code is a 4 byte code according to EDIS whose bits indicate the current status of the meter and the network it is connected to.

The EDIS 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 EDIS status word:



Number	Error description
0	Serious (fatal or critical) error occurred
1	Power reserve of calendar clock exhausted (time invalid)
2	Invalid measurement owing to integrating period too short or a critical error has occurred
3	Summer or winter time Depending on the parameterisation this bit is static (1 = summer, 0 = winter) or dynamic, i.e. only active during the first recording period following the change from summer to winter time and vice-versa.
4	Alert occurred
5	Clock adjusted (time stamp of new time)
6	Voltages returned (power up)
7	Voltages (3 phases) failed (power down)
8	not used
9	not used
10	not used
11	not used
12	not used
13	Event log completely deleted
14	Load profile memory completely deleted
15	Status word recorded before setting last time (time stamp of old time)
16	reserved
17	reserved
18	reserved

Number	Error description
19	Capture period started (SOI - start of interval)
20	Capture period ended by tariff changeover (EOI - end of interval)
21	Capture period ended prematurely (e.g. by time setting)
22	Capture period ended normally by external control
23	Capture period ended normally by internal control
24 to 31	reserved for future extensions

7.1.4 Read Commands for Load Profiles

With read commands for load profiles the load profile memory is read from the meter and shown in the display window.

For execution, select the "Load Profile" (dlms protocol) or "Load Profile R5" (IEC protocol) read command in the command tree.

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

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



Shortening readout time by data selection

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

The load profile data read out are shown as a table in the display window. With readout by dlms the table contains the date and time-of-day, EDIS status word and the register statuses 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 EDIS status word (see also table in chapter 7.1.3 "Read Commands for Event Logs") are decoded directly and all individual events displayed.

0-0:1.0.0	0-0:C.240.12	1-1:1.5.0 [kW]	1-1:2.5.0 [kW]	1-1:3.5.0 [kvar]	1-1:4.5.0 [kvar]
2006-11-23 00:15:00	00800000	0.0000	0.7570	1.0280	0.0000
2006-11-23 00:30:00	00800000	EDIS Status	0.7730	1.0450	0.0000
2006-11-23 00:45:00	00800000	0.0000	0.7530	1.0220	0.0000
2006-11-23 01:00:00	00800000	0.0000	0.7590	1.0260	0.0000
2006-11-23 01:15:00	00800000	0.0000	0.7510	1.0190	0.0000
2006-11-23 01:30:00	00800000	End of period (internally controlled) [24]	0.7460	1.0140	0.0000
2006-11-23 01:45:00	00800004	0.0000	0.7450	1.0100	0.0000
2006-11-23 02:00:00	00800000	Disturbed measurement [3]	0.7450	1.0130	0.0000
2006-11-23 02:15:00	00800000	End of period (internally controlled) [24]	0.7450	1.0120	0.0000
2006-11-23 02:30:00	00800000	0.0000	0.7450	1.0120	0.0000
2006-11-23 02:45:00	00800000	0.0000	0.7460	1.0110	0.0000
2006-11-23 03:00:00	00800000	0.0000	0.7480	1.0150	0.0000
2006-11-23 03:15:00	00800000	0.0000	0.7450	1.0120	0.0000

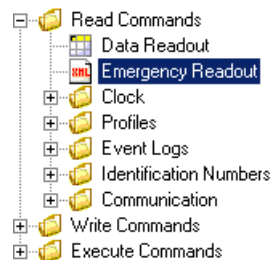
With readout according to IEC the table contains the same data for every load profile entry as for readout under dlms, although they are shown slightly differently (e.g. preceding zeros).

The table can be saved as XML or text file for further processing or exported directly to the Excel table calculation program (see chapter 5.9 "Display Window").

7.1.5 Read Command for Emergency Readout

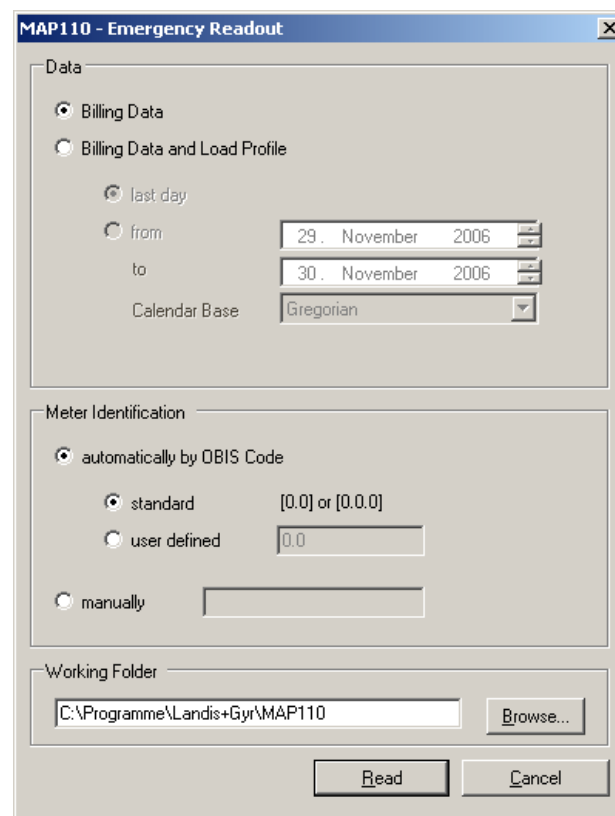
With the read command for emergency readout the meter data can be read out into a XML file, e.g. if communication between the central station and the meter fails (for IEC protocol only). This XML file can be imported later on into the meter2cash automatic meter reading system "Converge".

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



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
- meter identification automatically by OBIS code contained in the billing data or manually
- working folder, where the XML file shall be stored





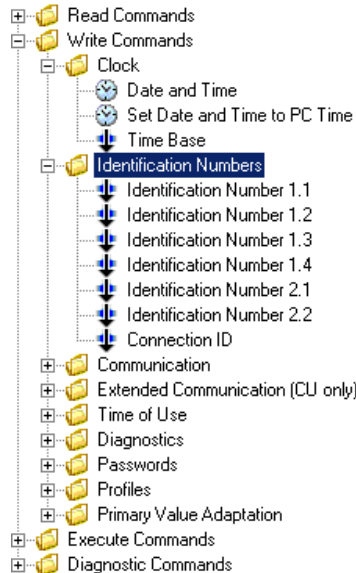
After clicking **Read** the selected data will be stored into a XML file in the working folder specified.

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

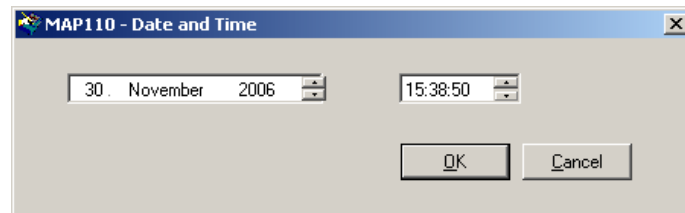
7.2 Write Commands

Chapter 12 "Functional Range per User Group" describes which write commands are available to the individual user groups.

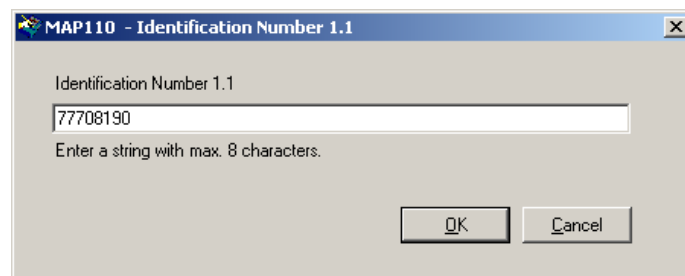
For execution, select the corresponding write command in the command tree marked with the symbol  or .



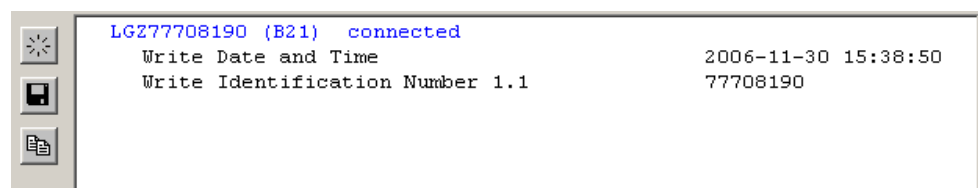
With write commands the current parameter or value is always read out first from the meter and displayed in a dialogue window for modification, e.g. for setting time and date:



or for writing an identification number:



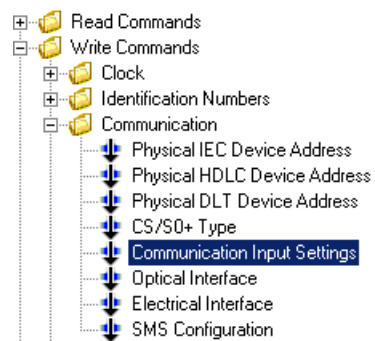
Modify the data displayed and then click on **Ok**. The modified data are written in the meter and recorded in the trace window (command left, value right):



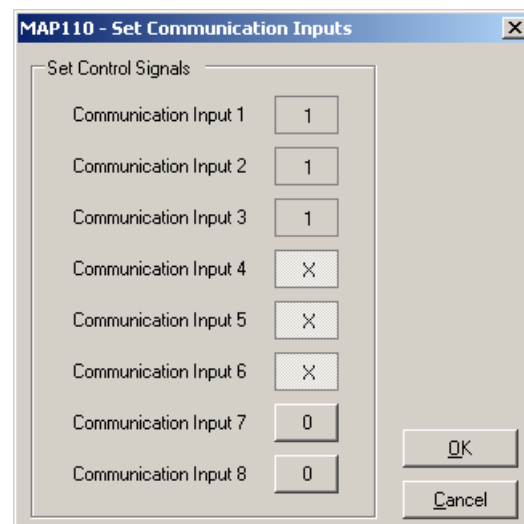
Further write commands are explained as examples in the following sub-sections.

7.2.1 Set Communication Inputs

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



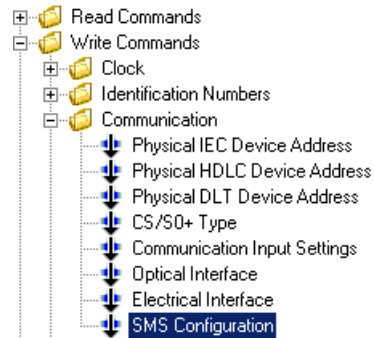
All communication inputs are displayed in the dialogue window. By clicking on a field you can toggle between 0, 1 and X (value remains the same).



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

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 are displayed in the dialogue window. You can modify the phone number, the message text, the initialisation string and the transmission parameters.

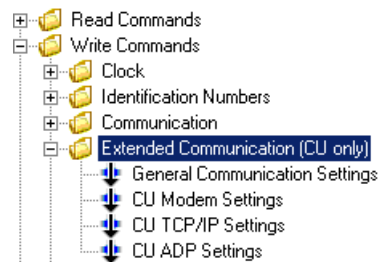
A screenshot of a dialog box titled 'MAP110 - SMS Configuration'. The dialog has three main sections. The first section, 'Calling AT Message String', contains a 'Phone Number (to be called)' field with the value '0793904208', a 'Message Text' field with the value '74403759', and a 'Calling AT Message String' field showing the constructed string '+CMGS=0793904208<0D>74403759<1A>'. There are 'Insert CR' and 'Insert ^z' buttons. The second section, 'AT Initialisation String', contains an 'AT Initialisation String' field with the value 'Z+CMGF=1<0D>' and similar 'Insert CR' and 'Insert ^z' buttons. The third section, 'Transmissions', contains a 'Number of Messages per Alert' spinner set to '1' and a 'Time between Messages' spinner set to '1' with a 'Minutes' label. At the bottom right are 'OK' and 'Cancel' buttons.

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

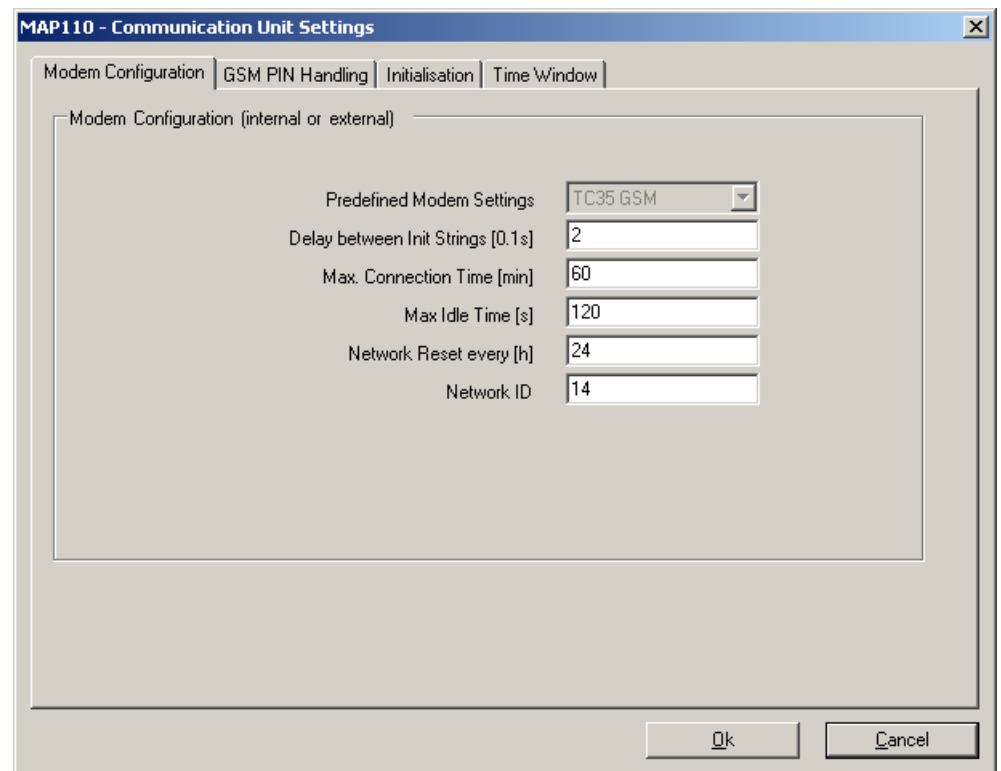
You can check the settings with the execute command "SMS Test" (see 7.3.1 "SMS Test Transmission").

7.2.3 Modify Communication Unit Settings

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



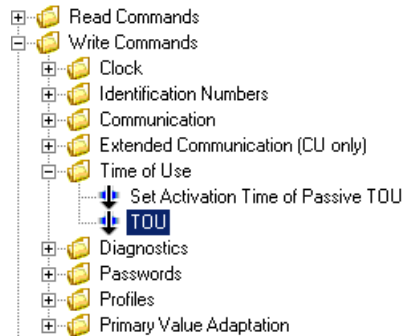
In the dialogue window you can modify the corresponding communication settings, e.g. the modem configuration of a communication unit with GSM/GPRS modem, as shown in the following figure.



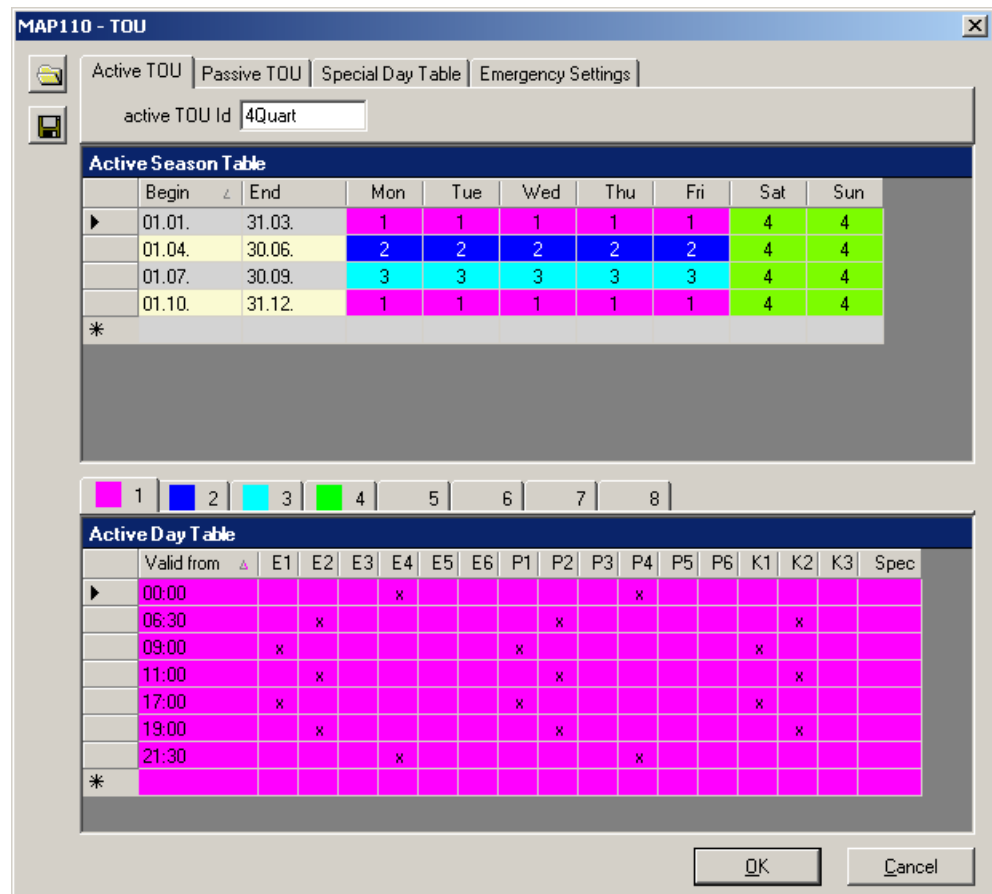
Click on **OK** to write the values set into the communication unit.


7.2.4 Modify Time of Use

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



In the dialogue window "MAP110 - TOU" you can modify the TOU read out from the meter and write it back again into the meter. You can also save a read out TOU in a XML file or load a stored XML file into the MAP110 to write it into the meter.

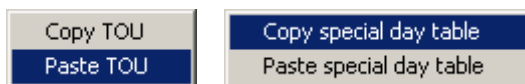


Clicking on  opens the "Save as" dialogue window to save the TOU in a freely selected directory as XML file.

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

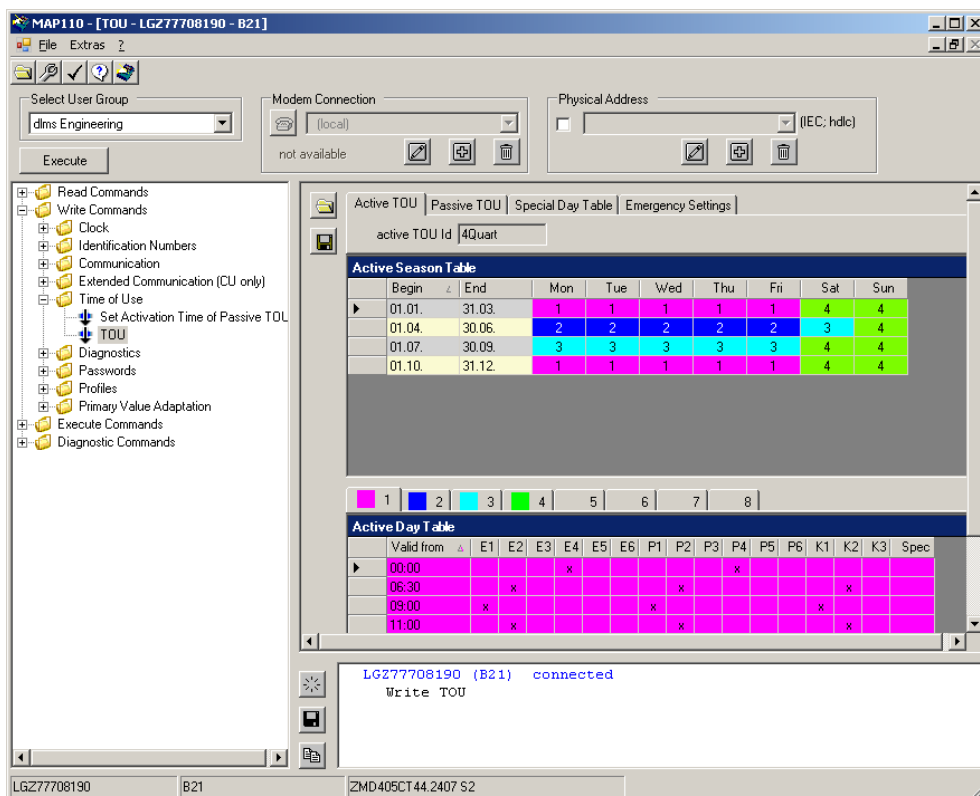
You can also copy the entire TOU or an individual table into the Windows clipboard to paste it afterwards into the TOU of another meter connected to the MAP110 and write it into this meter. The TOU of the meter families ZxD, ZxQ and ZMG are thereby freely exchangeable among themselves.

To do so, click in the "MAP110 - TOU" dialogue window either on the window frame or on a table and then select the corresponding copy or paste command in the popup menu appearing.



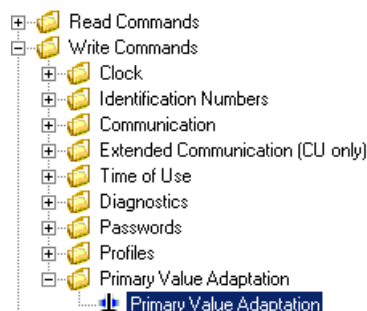
Via the clipboard it is also possible to import an entire TOU from a Landis+Gyr MAP120 parameterisation tool. The transfer in the opposite direction from MAP110 to MAP120 is however not supported.

Click on **OK** to write the modified or imported TOU into the meter. Afterwards the TOU is represented in the display window.



7.2.5 Modify Primary Value Adaptation

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



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

The dialog box is titled 'Primary Values Adaption'. It has three tabs: 'Network', 'Output Pulses', and 'Resolution'. The 'Output Pulses' tab is selected. The dialog contains four sections for different meter types, each with a 'min' value, a 'Pulse Value' field, a 'Maximum Output Frequency' field, and a unit dropdown menu.


Meter Type	min	Pulse Value	Maximum Output Frequency	Unit
T3-1..3 Output Pulse Active Energy	0.009623	0.02	2.9	Wh / imp
T3-4..6 Output Pulse Active Energy	0.009623	0.02	2.9	Wh / imp
T3-7..9 Output Pulse Reactive Energy	0.004811	0.02	2.9	varh / imp
T3-10..12 Output Pulse Reactive Energy	0.004811	0.02	2.9	varh / imp

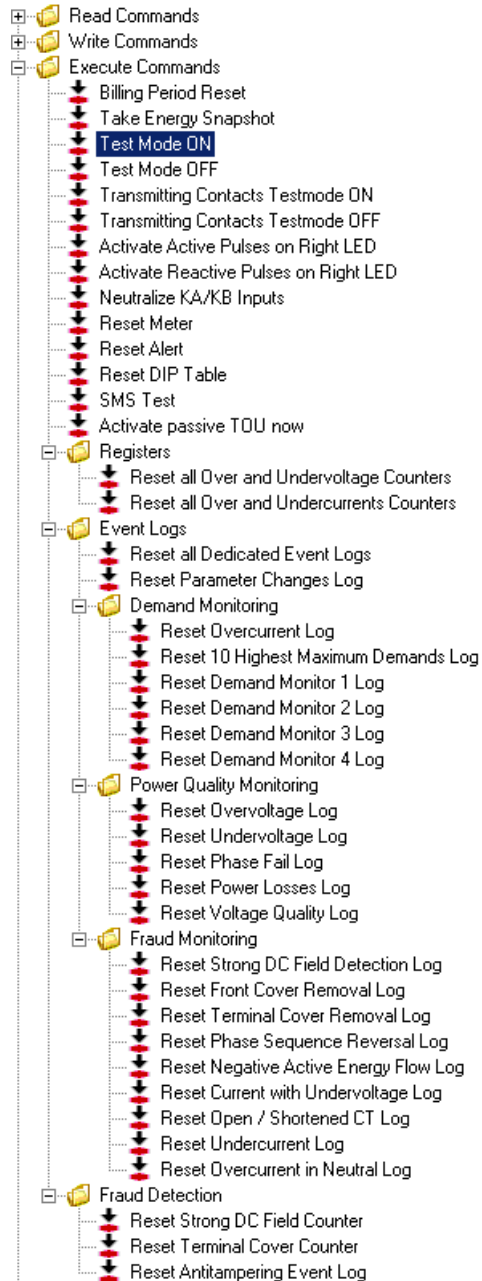
At the bottom of the dialog are two buttons: 'Cancel' and 'Send to Meter'.

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

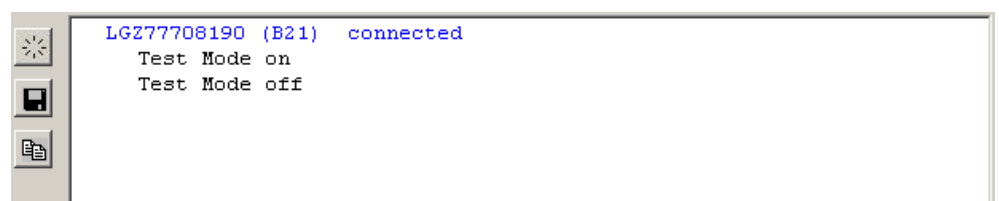
7.3 Execute Commands

Chapter 12 "Functional Range per User Group" describes which execute commands are available to the individual user groups.

For execution, select the relevant execution command in the command tree marked with the symbol .

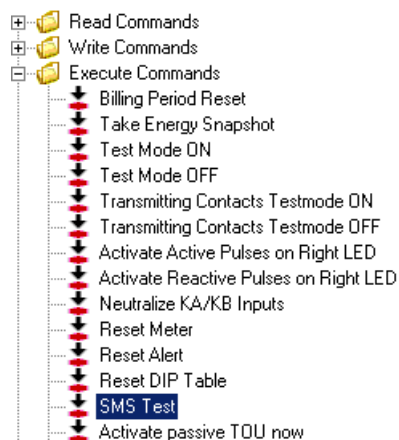


The execute command is normally transmitted to the meter without additional dialogue (exception: see 7.3.1 "SMS Test Transmission") and executed there. The commands executed are recorded in the trace window:



7.3.1 SMS Test Transmission

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



The "MAP110 - 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.

A screenshot of the 'MAP110 - SMS Test' dialogue window. The window has a title bar with the text 'MAP110 - SMS Test'. It contains two main sections. The first section, 'Calling AT Message String', has three input fields: 'Phone Number (to be called)' with the value '0791234567', 'Message Text' with the value 'Alert No. 77708190', and 'Calling AT Message String' with the value '+CMGS=0791234567<0D>Alert No. 77708190<1A>'. There is an example text 'Omit "AT" Example +CMGS=0793904208<0D>74403759<1A>' above the third field. Below the input fields are two buttons: 'Insert CR' and 'Insert ^z'. The second section, 'SMS Status', is a large empty text area. At the bottom of the window are three buttons: 'Send Test SMS', 'Read SMS Status', and 'Close'.

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

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

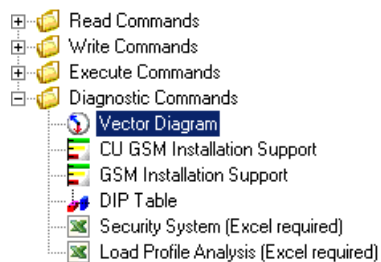
7.4 Diagnostic Commands

Chapter 12 "Functional Range per User Group" describes which diagnostic commands are available to the individual user groups.

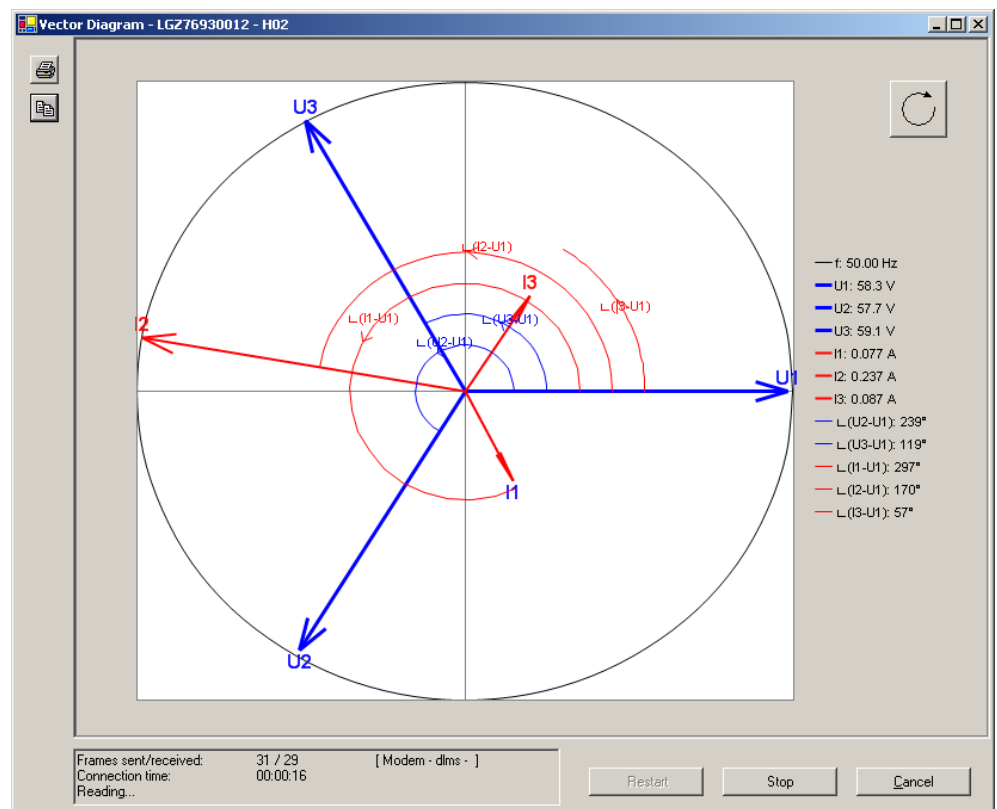
7.4.1 Vector Diagram

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


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





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



Clicking **Stop** interrupts a current measurement.

Clicking  changes from the representation according to ANSI (clockwise) to the representation according to IEC (counter clockwise).

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

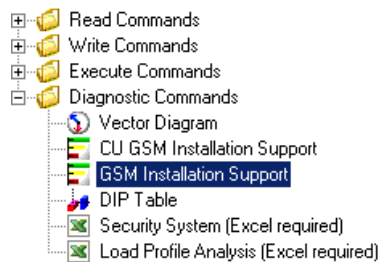
Clicking  copies the vector diagram to the Windows clipboard, from where it can be inserted in another application (e.g. in a word processing program).

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

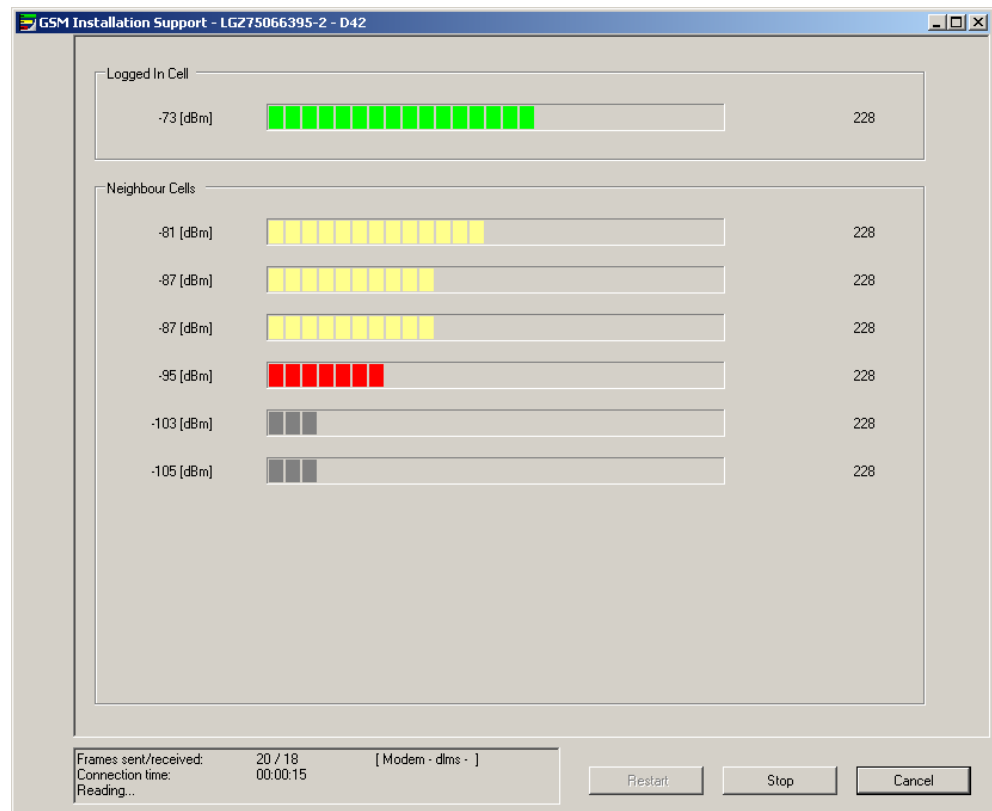
7.4.2 GSM Installation Support

This diagnostic command can only be used if the meter connected has a communication unit with GSM modem or if a AD-xG Advantis GSM/GPRS 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 made of received field strength with remote connection.



Measurement of field strength is

- continuously updated if the values are read out via meter 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.

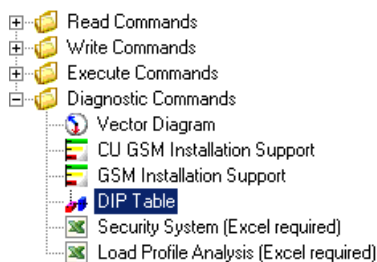
Clicking **Restart** repeats the interrupted measurement of field strength.

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

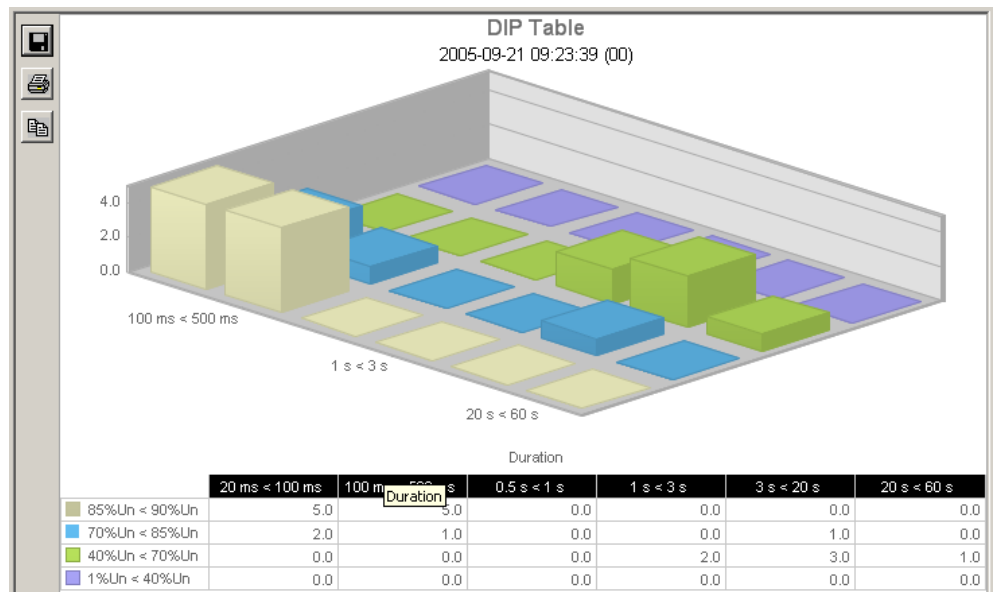
7.4.3 DIP Table

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 display window.



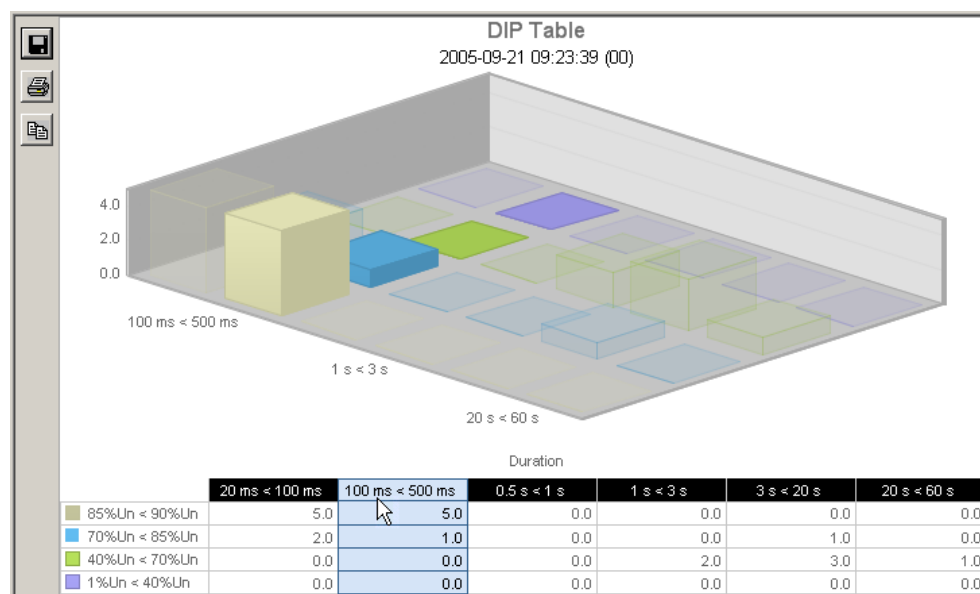
The categories, i.e. the severity of the voltage failures, is represented in color, e.g. voltage failures of 1 to 40 % of rated voltage in violet. The table contains a line for each category, the diagram a series of bars in the x-direction.

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

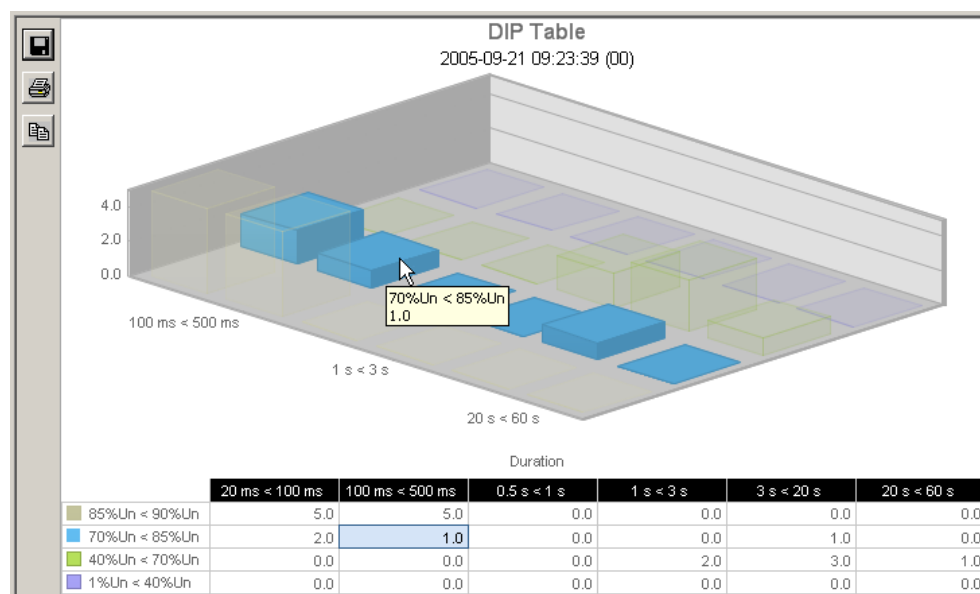
The duration of the voltage failures is divided into four ranges: 20 to 100 ms, 100 to 500 ms, 0.5 to 1 s and 1 to 3 s. The table contains a column for each range, the diagram a series of bars in the y-axis with bars of different color.


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


If the cursor is placed on a column or line heading or cell in the table, the corresponding bar series in the x or y axis or the relevant individual bar is shown highlighted.




Conversely if the cursor is placed on a bar in the diagram, the corresponding cell in the table is shown highlighted and the value also indicated in the diagram.



Clicking on  or with the right mouse key in the display window and then selecting the **Save as...** menu item in the pop-up menu appearing 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  displays a printing preview, from which the contents of the display window can be printed with the standard printer specified.

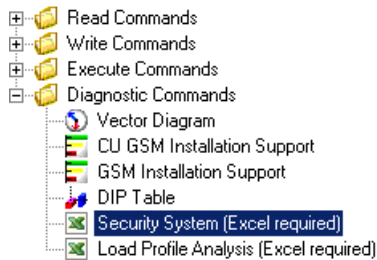
Clicking  copies the contents of the display window to the Windows clipboard, from where they can be inserted in another application (e.g. in a word processing program).

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

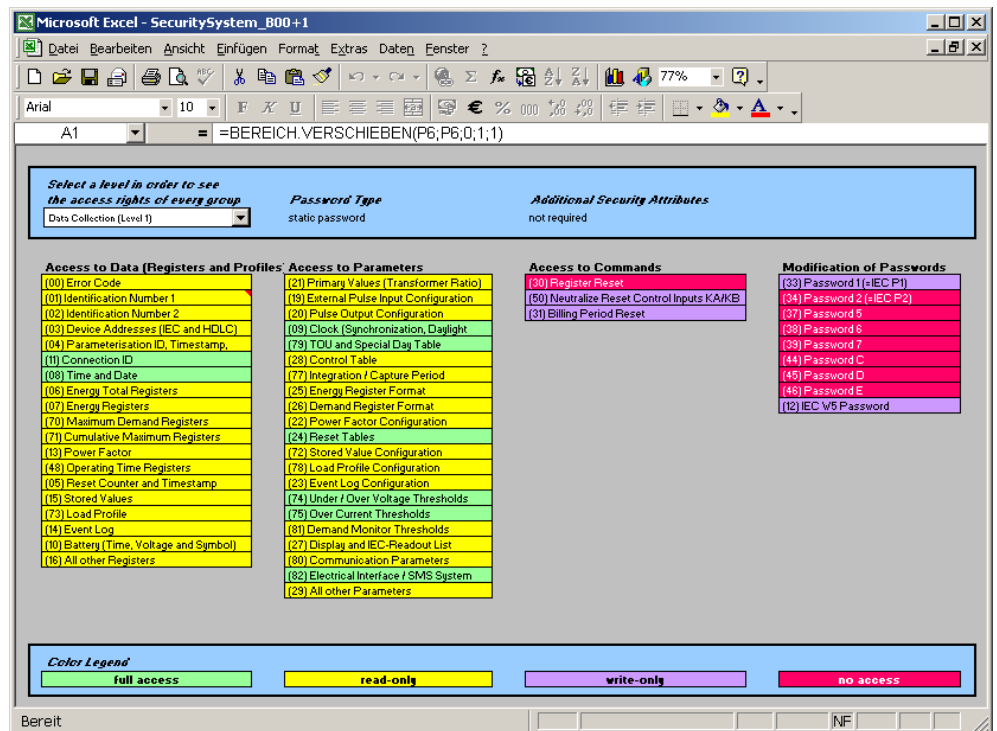
7.4.4 Security System

With this diagnostic command the meter 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 are read from the meter connected and displayed as follows in the Excel table calculation program:



The desired security level can be selected in the selection box at top left. The access rights for the level selected for individual data, parameters, commands and passwords are then displayed by means of colors according to the color code.

7.4.5 Load Profile Analysis

With this diagnostic command an evaluation of the meter load profile can be displayed with the Excel table calculation program.

For execution, select the "Load Profile Analysis" diagnostic command in the command tree.



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

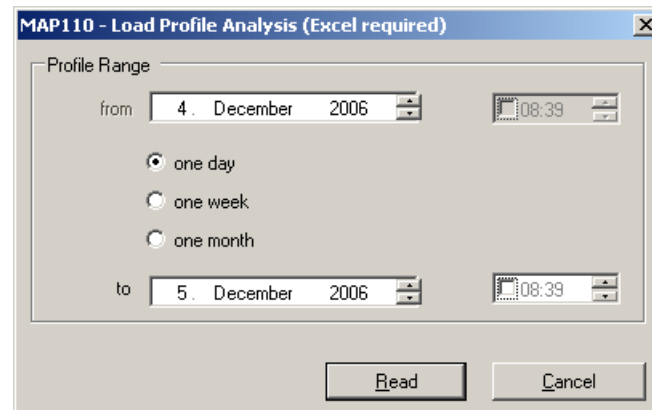
- one day (default)
- one week
- one month

before the likewise selectable final date (the starting date is calculated automatically).



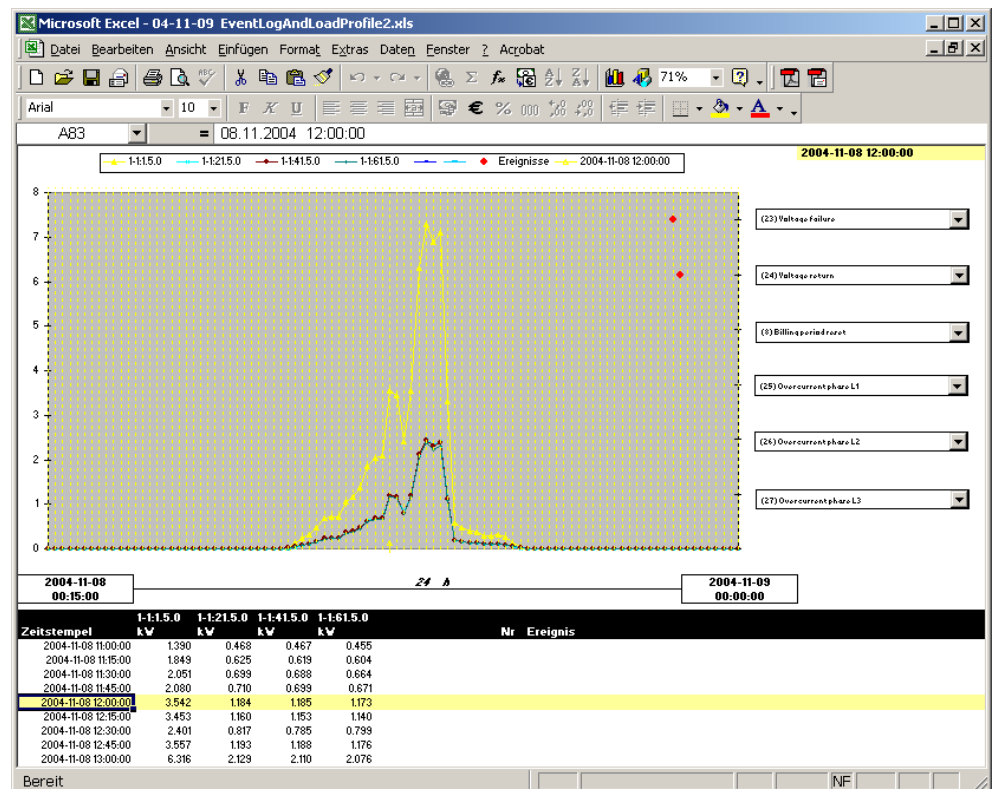
Shortening readout time by data selection

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



The load profile data are read from the meter connected.

The load profile data read out are shown as follows with the Excel table calculation program:



The various mean demand values per integrating period are displayed in a diagram in the upper section by means of colors according to the color code.

The events to be shown can be selected in the selection boxes on the right. If a corresponding event has occurred in the period under review, it is shown in the diagram with a red dot at the level of the selection box.

The individual load profile values and events can be seen in the table below the diagram. Navigation is possible in the table with the arrow keys or the wheel of a roller mouse. A vertical dotted line in the diagram indicates on which data in the table the cursor is currently placed.

7.5 Auxiliary Functions


This chapter describes some auxiliary functions of the Landis+Gyr MAP110 Service Tool:

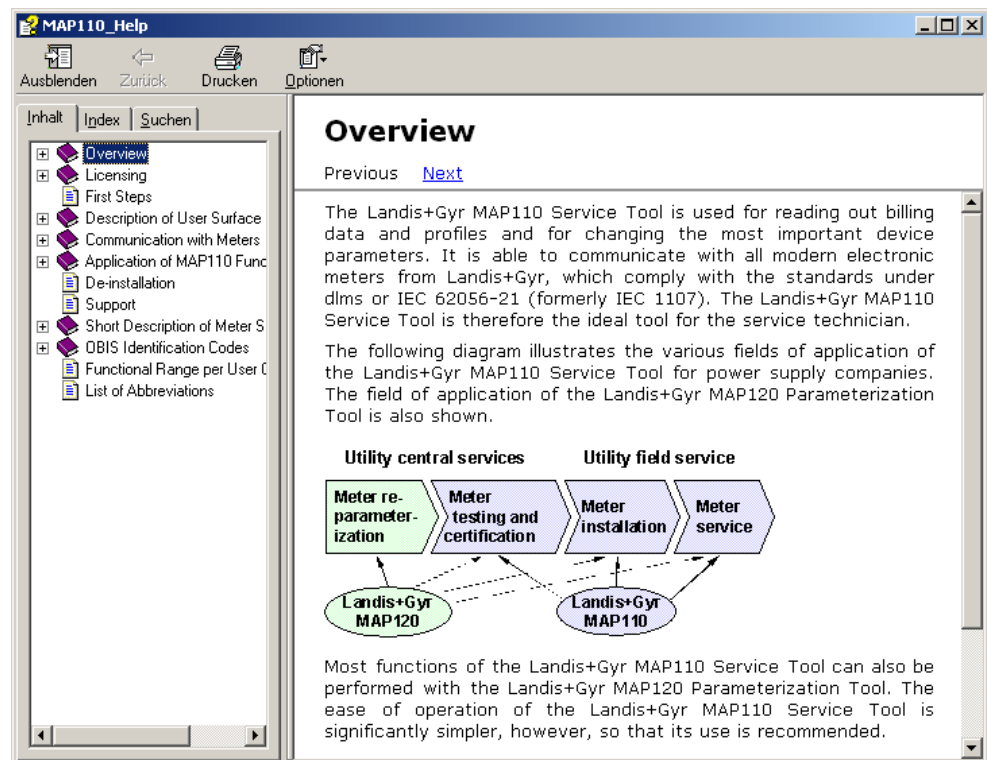
- displaying help topics
- displaying the current version of the program
- setting the color for inactive commands


7.5.1 Displaying Help Topics

This function permits access to the help texts for the Landis+Gyr MAP110 Service Tool. These help texts correspond to the contents of this user manual.

Procedure:

1. Click on  in the tool bar or select **Help** from the **?** menu.
The online help for the Landis+Gyr MAP110 Service Tool appears.



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

7.5.2 Displaying the Current Version of the Program


This function permits the display of information on the current program version.

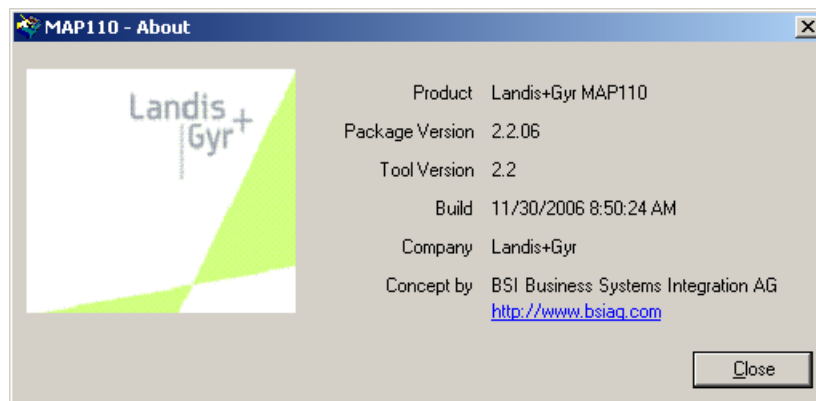


Clear version description is the package release

The current program version is specified as package Version (second line of information).

Procedure:

1. Click on  in the tool bar or select **About** from the ? menu.
The "MAP110 - About" window appears. It contains information about the current version of the program.



2. Read the information displayed.
3. Click on **OK**.
The "MAP110 - About" window disappears.

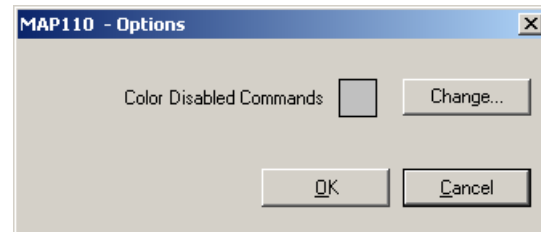
7.5.3 Setting Color for Inactive Commands

The color for emphasising inactive commands can be set individually with this setting (see also 5.8 "Command Tree").

Procedure:

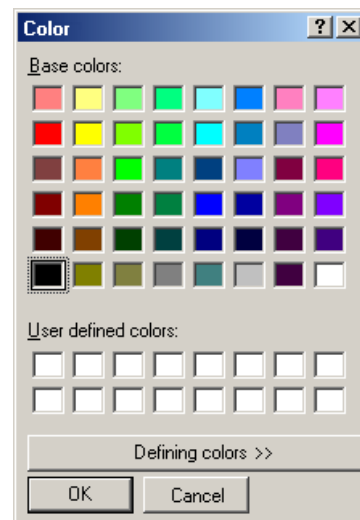
1. Select **Options...** from the **Extras** menu.

The "MAP110 - Options" window appears with the color currently selected for inactive commands.



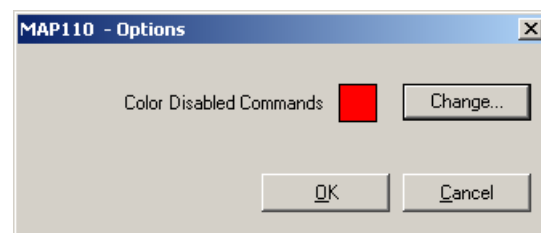
2. Click on **Change....**

The "Color" window appears with a color pallet.



3. Select the desired color and then click on **OK**.

The newly selected color for inactive commands is displayed in the "MAP110 - Options" window.



4. Click on **OK**.

The "MAP110 - Options" window disappears and the inactive commands are emphasised in the new color in the command tree, provided this function is switched on.

8 De-installation

This chapter describes how to de-install the Landis+Gyr MAP110 Service Tool from the hard disk of your personal computer.

If the Landis+Gyr MAP110 Service Tool is no longer needed, it should be de-installed. To do so, use the de-installation program delivered and installed together with the Landis+Gyr MAP110 Service Tool. Simply deleting the files and directories by means of the Window explorer delete functions does not remove all elements of the program (i.e. entries in the registry and in system files).

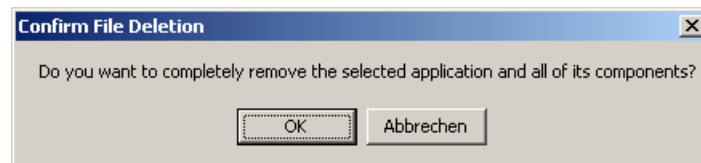


Automatic de-installation of old versions

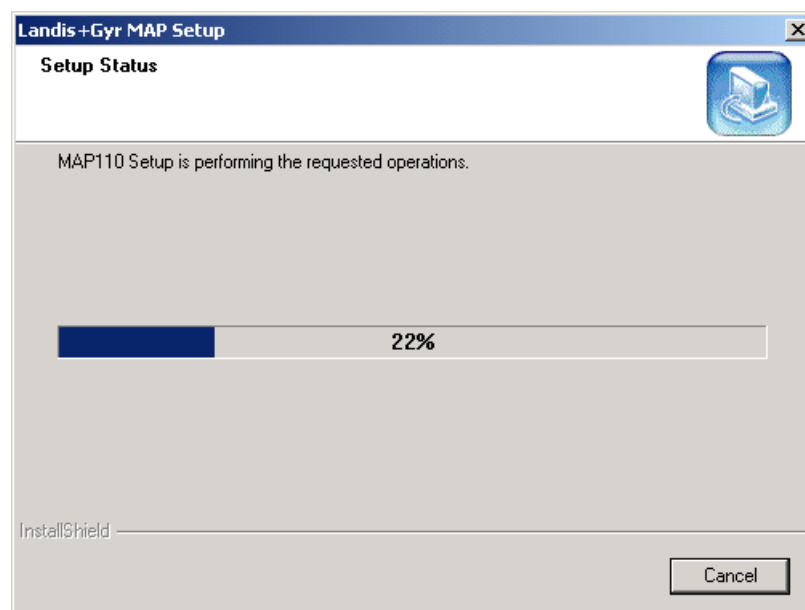
If the Landis+Gyr MAP110 Service Tool is to be updated with a later version, the old version is de-installed automatically by the installation program.

Procedure:

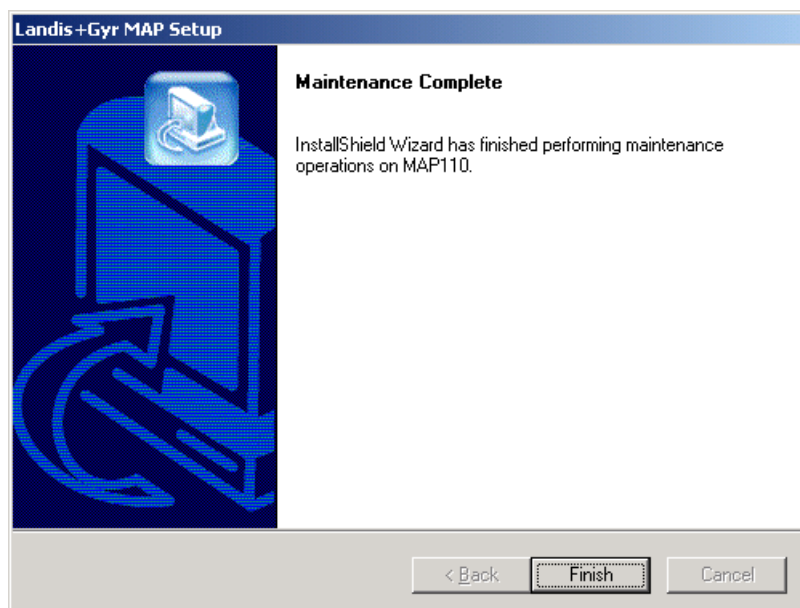
1. Click on **Start** and then select the **MAP110 Uninstall** command from the menu **Programs, Landis+Gyr MAP110**.
The install shield starts running and asks you first whether you really want to completely remove the program and all of its components.



2. Click on **OK**.
The de-installation is carried out and the progress is reported on the screen.



The successful completion is indicated with the following message.



3. Click on **Finish**.
The de-installation process is completed.

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 chapter of this manual.
- Call up the help function as described in chapter 7.5.1 "Displaying Help Topics".
- Read the content of the file README.TXT, supplied with the software.

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

10 Short Description of Meter Security System

10.1 Introduction

The data and parameters of Landis+Gyr meters are protected against inadvertent or improper overwriting by a multistage security system.

Detailed information on the security system for the relevant meters is provided in the associated functional descriptions.

10.2 Security Attributes

The meter and the communication unit feature several access levels with different security attributes. For each access level, the security attributes can be defined that must be fulfilled for a successful data access.

Switches protected by the certification seal

Under the main face plate, protected by the certification seal, there is a block of security switches. 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 opened.

Passwords

A password may be defined for some access levels. The utility may choose whether a static 8-character password or a coded 7-character password should be used.

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.

10.3 Access Levels

The Landis+Gyr meters feature 15 different access levels (level 0 to 9 and A to E) with different access rights each. A distinction is also made between read access and write access. For each register and each parameter, it can be defined which level is required to read and which level is required to write.

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

It should be noted when using the dims protocol that access is possible at all levels. If the IEC protocol is used exclusively for communication, only the lower 5 levels are available (level 0 to level 4).

The following security elements can still be selected for some levels:

- Password (if it is used)
- Access via the different communication channels can be enabled or disabled.

10.4 Access Levels and their Application

The table below describes all access levels with their security attributes and their typical application. For levels 0 to 4 access is possible via the dlms and IEC protocol, for levels 5 to F only via the dlms protocol.

Level	Security attributes	Access rights / application examples
0 Public Access (IEC and dlms)	without password without breaking a seal	This access level is always available. All dlms meters can be accessed on this level. All data can be read but there is no write access.
1 Data Collection (IEC and dlms)	with static password without breaking a seal	Readout of billing data by means of a handheld terminal or possibly by a central station. All billing data are readable. Limited write access possible, e.g. time/date.
2 Utility Field Service (IEC and dlms)	with coded password without breaking a seal Landis+Gyr Tool required because of coded password	Installation or maintenance tasks in the field. All parameters and all billing data are readable. Limited write access to settable data is possible, e.g. device addresses, identification numbers, phone numbers etc.
3 Utility Service (IEC and dlms)	without password breaking the utility seal necessary	Installation or maintenance work in the utility. All parameters and all billing data are readable. Write access to settable data is granted, e.g. battery operating time, switching tables etc.
4 Extended Utility Service (IEC and dlms)	without password breaking the verification seal necessary	Re-parameterisation in the utility. All parameters and all billing data are readable. Write access to settable and parameterisable data is granted, e.g. register clearing, password setting etc. After the access, a verification is required.
5 Extended Consumer (dlms only)	with static password without breaking a seal	Write access for the end user. All parameters and most billing data are readable. Write access to most user data is granted, e.g. monitor thresholds.
6 Remote Data Collection (dlms only)	with static password without breaking a seal no access via the optical interface	Readout of billing data by a central station. All billing data are readable. Limited write access is possible, e.g. time/date.
7 Remote Service (dlms only)	with static password without breaking a seal no access via the optical interface	Installation or maintenance work in connection with a central station. All parameters and all billing data are readable. Write access to a limited number of settable data is granted, e.g. switching tables, device addresses, identification numbers, phone numbers etc.
8, 9, A, B (dlms only)		Reserved for future expansion.

Level	Security attributes	Access rights / application examples
C Read Administrator (dlms only)	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 (dlms only)	with coded password breaking the verification seal necessary access via optical interface only Landis+Gyr Tool required because of coded password	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. No access is granted via telemetering systems. After the access, a verification is required.
E Distributor Service (dlms only)	with coded password breaking the verification seal necessary access via optical interface 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. No access is granted via telemetering systems. After the access, a verification is required.

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, $\cos\varphi$, 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 meters are explained below with a collection of examples.

Group A

Group A of the OBIS identification can theoretically have values in the range between 0 and 15. Only the values

0 (abstract objects) and

1 (electricity related objects)

appear in the Landis+Gyr MAP120 Parameterization Tool.

Group B

Group B of the OBIS identification can theoretically have values in the range between 0 and 255. Only the values

0 (no channel specified)

1 (channel 1) and

2 (channel 2)

appear in the Landis+Gyr MAP120 Parameterization Tool.

Group C

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

Value	Application
0	General purpose objects
1	Sum of all phases: active energy import (+A)
2	Sum of all phases: active energy export (-A)
3	Sum of all phases: reactive energy import (+R)
4	Sum of all phases: reactive energy export (-R)
5	Sum of all phases: reactive energy quadrant I (+Ri)
6	Sum of all phases: reactive energy quadrant II (-Rc)
7	Sum of all phases: reactive energy quadrant III (-Ri)
8	Sum of all phases: reactive energy quadrant IV (+Rc)
9	Sum of all phases: apparent energy import (+S)
10	Sum of all phases: apparent energy export (-S)
11	Any phase: current
12	Any phase: voltage
13	Average power factor ($\cos\varphi$)
14	Mains frequency (f_n)
15	Sum of all phases: active energy quadrant I+IV+II+III
16	Sum of all phases: active energy quadrant I+IV-II-III
17	Sum of all phases: active energy quadrant I
18	Sum of all phases: active energy quadrant II
19	Sum of all phases: active energy quadrant III
20	Sum of all phases: active energy quadrant IV
21	Phase 1: active energy import
22	Phase 1: active energy export
23	Phase 1: reactive energy import
24	Phase 1: reactive energy export
25	Phase 1: reactive energy quadrant I
26	Phase 1: reactive energy quadrant II
27	Phase 1: reactive energy quadrant III
28	Phase 1: reactive energy quadrant IV
29	Phase 1: apparent energy import
30	Phase 1: apparent energy export
31	Phase 1: current
32	Phase 1: voltage

Value	Application
33	Phase 1: power factor
34	Phase 1: frequency
35	Phase 1: active energy quadrant I+IV+II+III
36	Phase 1: active energy quadrant I+IV-II-III
37	Phase 1: quadrant I
38	Phase 1: quadrant II
39	Phase 1: quadrant III
40	Phase 1: quadrant IV
41...60	Phase 2: same as 21...40
61...80	Phase 3: same as 21...40
81	Phase angles
82	Unitless quantity (pulses or pieces)
83...90	Not used
91	Neutral: current
92	Neutral: voltage
93...95	Not used
96	Electricity-related service entries
97	Electricity-related error messages
98	Electricity-related list objects
99	Data profiles
100...127	Reserved
128...254	<p>Manufacturer-specific definitions</p> <p>Landis+Gyr:</p> <p>130 = Sum of all phases: reactive energy quadrant I+IV+II+III 131 = Sum of all phases: reactive energy quadrant I+II-III-IV 132 = Sum of all phases: reactive energy quadrant I+IV 133 = Sum of all phases: reactive energy quadrant II+III</p> <p>150 = Phase 1: reactive energy quadrant I+IV+II+III 151 = Phase 1: reactive energy quadrant I+II-III-IV 152 = Phase 1: reactive energy quadrant I+IV 153 = Phase 1: reactive energy quadrant II+III</p> <p>170 = Phase 2: reactive energy quadrant I+IV+II+III 171 = Phase 2: reactive energy quadrant I+II-III-IV 172 = Phase 2: reactive energy quadrant I+IV 173 = Phase 2: reactive energy quadrant II+III</p> <p>190 = Phase 3: reactive energy quadrant I+IV+II+III 191 = Phase 3: reactive energy quadrant I+II-III-IV 192 = Phase 3: reactive energy quadrant I+IV 193 = Phase 3: reactive energy quadrant II+III</p>
255	Reserved

Group D

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

Group E

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

Group F

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

11.2 Examples

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

OBIS code (decimal)	OBIS code (hex)	Description
	A B C D E F	
0-0:1.0.0	00 00 01 00 00 FF	Clock
0-0:42.0.0	00 00 2A 00 00 FF	dlms device identification
0-0:C.1.0	00 00 60 01 00 FF	Identification number 2.1
0-0:C.1.1	00 00 60 01 01 FF	Identification number 2.2
0-0:C.2.0	00 00 60 02 00 FF	Number of parameterisations
0-0:C.2.1	00 00 60 02 01 FF	Date and time of last parameterisation
0-0:C.2.2	00 00 60 02 02 FF	Activation date TOU
0-0:C.2.3	00 00 60 02 03 FF	Date of last RCR program change
0-0:C.240.0	00 00 60 F0 00 FF	EEPROM identification
0-0:C.240.13	00 00 60 F0 0D FF	Hardware ID
0-0:C.3.1	00 00 60 03 01 FF	Input terminal states base meter
0-0:C.3.2	00 00 60 03 02 FF	Output terminal states base meter
0-0:C.4.0	00 00 60 04 00 FF	Internal control signal states
0-0:C.5.0	00 00 60 05 00 FF	Internal operating state
0-0:C.6.0	00 00 60 06 00 FF	Operating time of battery
0-0:C.6.3	00 00 60 06 03 FF	Battery voltage
0-0:C.7.0	00 00 60 07 00 FF	Number of phase fails L1..L3
0-0:C.7.1	00 00 60 07 01 FF	Number of phase fails L1
0-0:C.7.2	00 00 60 07 02 FF	Number of phase fails L2
0-0:C.7.3	00 00 60 07 03 FF	Number of phase fails L3
0-0:C.8.0	00 00 60 08 00 FF	Total operating time
0-0:C.8.t	00 00 60 08 t FF	Operating time (t = tariff number)

OBIS code (decimal)	OBIS code (hex)	Description
	A B C D E F	
0-0:C.90	00 00 60 5A FF FF	Configuration ID
0-0:C.90.1	00 00 60 5A 01 FF	Physical IEC device address
0-0:C.90.2	00 00 60 5A 02 FF	Physical HDLC device address
1-0:C.2.7	00 00 60 02 07 FF	Activation date passive TOU
0-0:F.F.0	00 00 61 61 00 FF	Error code register
0-0:L.1.0*126	00 00 62 01 00 7E	Stored values
0-0:240.1.0	00 00 F0 01 00 FF	Meter functions
0-1:C.2.5	00 01 60 02 05 FF	Date and time of last calibration
0-1:C.240.8	00 01 60 F0 08 FF	Hardware ID of base meter
0-1:C.3.1	00 01 60 03 01 FF	Input terminal states extension board
0-1:C.3.2	00 01 60 03 02 FF	Output terminal states extension board
0-2:C.240.8	00 02 60 F0 08 FF	Hardware ID of extension board
0-2:C.240.9	00 02 60 F0 09 FF	Reference hardware ID of extension board
1-0:0.0.1	01 00 00 00 00 FF	Identification number 1.1
1-0:0.0.2	01 00 00 00 01 FF	Identification number 1.2
1-0:0.0.3	01 00 00 00 02 FF	Identification number 1.3
1-0:0.0.4	01 00 00 00 03 FF	Identification number 1.4
1-0:0.1.0	01 00 00 01 00 FF	Reset counter
1-0:0.1.2	01 00 00 01 02 FF	Time and date of last billing period reset
1-0:0.2.0	01 00 00 02 00 FF	Software ID
1-0:0.2.1	01 00 00 02 01 FF	Parameterisation ID
1-0:0.2.3	01 00 00 02 03 FF	Ripple control receiver ID
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:C.99.8	01 00 60 69 08 FF	Display and IEC readout ID
1-0:P.1.0	01 00 63 01 00 FF	Load profile
1-0:P.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

OBIS code (decimal)	OBIS code (hex)						Description
	A	B	C	D	E	F	
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
1-1:16.7.0	01	01	10	07	00	FF	Active energy
1-1:31.7.0	01	01	1F	07	00	FF	Current L1
1-1:31.35.0	01	01	1F	23	00	FF	Overcurrent threshold L1
1-1:32.7.0	01	01	20	07	00	FF	Voltage L1
1-1:32.31.0	01	01	20	1F	00	FF	Undervoltage threshold L1
1-1:32.35.0	01	01	20	23	00	FF	Overvoltage threshold L1
1-1:33.7.0	01	01	21	07	00	FF	Power factor L1
1-1:51.7.0	01	01	33	07	00	FF	Current L2
1-1:51.35.0	01	01	33	23	00	FF	Overcurrent threshold L2
1-1:52.7.0	01	01	34	07	00	FF	Voltage L2
1-1:52.31.0	01	01	34	1F	00	FF	Undervoltage threshold L2
1-1:52.35.0	01	01	34	23	00	FF	Overvoltage threshold L2
1-1:53.7.0	01	01	35	07	00	FF	Power Factor L2
1-1:71.7.0	01	01	47	07	00	FF	Current L3
1-1:71.35.0	01	01	47	23	00	FF	Overcurrent threshold L3
1-1:72.7.0	01	01	48	07	00	FF	Voltage L3
1-1:72.31.0	01	01	48	1F	00	FF	Undervoltage threshold L3
1-1:72.35.0	01	01	48	23	00	FF	Overvoltage threshold L3
1-1:73.7.0	01	01	49	07	00	FF	Power Factor L3
1-1:81.7.0	01	01	51	07	00	FF	Angle U(L1) to U(L1)
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
1-1:131.7.0	01	01	83	07	00	FF	Reactive energy
1-1:m.2.0	01	01	m	02	00	FF	Cumulative maximum demand (m = measured quantity)

OBIS code (decimal)	OBIS code (hex)	Description
	A B C D E F	
1-1:m.4.0	01 01 m 04 00 FF	Current average demand (m = measured quantity)
1-1:m.6.t	01 01 m 06 t FF	Maximum demand register (m = measured quantity, t = tariff number)
1-1:m.8.0	01 01 m 08 00 FF	Total energy register (m = measured quantity)
1-1:m.8.t	01 01 m 08 t FF	Energy register (cumulative) (m = measured quantity, t = tariff number)
1-1:m.9.t	01 01 m 09 t FF	Energy register (billing period delta value) (m = measured quantity, t = tariff number)
1-1:m.29.t	01 01 m 1D t FF	Energy register (registration period delta value) (m = measured quantity, t = tariff number)
1-1:m.35.n	01 01 m 23 n FF	Demand register monitor threshold (m = measured quantity, n = number)
1-2:82.8.0	01 02 52 08 00 FF	Counter S0 pulses input 1
1-3:82.8.0	01 03 52 08 00 FF	Counter S0 pulses input 2
a-2:m.8.0	a 02 m 08 00 FF	External pulse input 1 (a = medium, m = measured quantity)
a-3:m.8.0	a 03 m 08 00 FF	External pulse input 2 (a = medium, m = measured quantity)

12 Functional Range per User Group

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

Read Commands

User Group									
							Consumer (final customer)		
							Field Inspection		
							Reader		
							Installation (field use)		
							Engineering (laboratory use)		
							Certification		
							Read Commands	dlms	IEC
•	•	•	•	•	•	•	Data Readout (Billing Values)	•	•
•	•	•	•	•	•	•	Instantaneous Values	•	
•	•	•	•	•	•	•	Emergency Readout		•
•	•	•	•	•	•	•	Time and Date	•	•
•	•	•	•	•	•	•	Time Base	•	
•	•	•	•	•	•	•	Integration Period	•	
•	•	•	•	•	•	•	Load Profile	•	R5
•	•	•	•	•	•	•	Stored Values	•	
•	•	•	•	•	•	•	Energy Profile	•	
•	•	•	•	•	•	•	Daily Snapshot Profile	•	
•	•	•	•	•	•	•	Billing Values Profile	•	
•	•	•	•	•	•	•	Energy Values Profile	•	
	•	•	•	•	•	•	Standard Event Log	•	R5
•	•	•	•	•	•	•	Event Logs: Parameter Changes	•	
•	•	•	•	•	•	•	Event Logs: Demand Monitoring	•	
•	•	•	•	•	•	•	Event Logs: Power Quality Monitoring	•	
	•	•	•	•	•	•	Event Logs: Fraud Monitoring	•	
	•	•	•	•	•	•	Energy and Total Energy Registers	•	
	•	•	•	•	•	•	Current Hour Registers	•	
	•	•	•	•	•	•	Demand and Power Factor Registers	•	
		•	•	•	•	•	Identification Numbers	•	•
		•	•	•	•	•	Connection ID	•	
		•	•	•	•	•	Parameterisation ID	•	
		•	•	•	•	•	Physical Device Addresses	•	IEC
			•	•	•	•	CS/S0+ Type	•	
			•	•	•	•	Optical and Electrical Interfaces	•	
			•	•	•	•	SMS Configuration	•	
			•	•	•	•	Mobile and SIM Card Identification	•	
			•	•	•	•	CU: General Communication Settings	•	
			•	•	•	•	CU: Modem Settings	•	

User Group									
Consumer (final customer)									
Field Inspection									
Reader									
Installation (field use)									
Engineering (laboratory use)									
Certification									
Read Commands							dlms	IEC	
			•	•	•	CU: Mobile and SIM Card Identification	•		
			•	•	•	CU: TCP/IP Settings	•		
			•	•	•	CU: ADP Settings	•		
			•	•	•	TOU	•		
			•	•	•	Passive TOU ID and Activation Time	•		
			•	•	•	Active TOU ID and Activation Time	•		
•	•	•	•	•	•	Terminal Cover Counter	•		
•	•	•	•	•	•	Strong DC Field Counter	•		
•	•	•	•	•	•	Antitampering Event Log	•		
			•	•	•	Operating Time Registers	•		
		•	•	•	•	Power Factor Monitor Thresholds	•		
		•	•	•	•	Battery Operating Times	•		
		•	•	•	•	Battery Voltage	•		
•	•	•	•	•	•	Billing Reset Counter	•		
•	•	•	•	•	•	Date and Time of Last Billing Period Reset	•		
•	•	•	•	•	•	Billing Period Reset Settings	•		
•	•	•	•	•	•	Energy Snapshot Counter	•		
•	•	•	•	•	•	Date and Time of Last Energy Snapshot	•		
•	•	•	•	•	•	Energy Snapshot Settings	•		
			•	•	•	Date and Time of Last Parameterisation	•		
			•	•	•	Number of Parameterisations	•		
			•	•	•	Date and Time of Last Calibration	•		
•			•	•	•	Primary Value Adaption	•		

Write Commands

User Group						
Consumer (final customer)						
Field Inspection						
Reader						
Installation (field use)						
Engineering (laboratory use)						
Certification						
Write Commands						
						dlms IEC
			•	•	Date and Time	• •
		•	•	•	Set Date and Time to PC Time	• •
		•	•	•	Time Base	• •
	•	•	•	•	Identification Numbers	• •
	•	•	•	•	Connection ID	• •
	•	•	•	•	Physical Device Addresses	• IEC
			•	•	CS/S0+ Type	• •
		•	•	•	Communication Input Settings	• •
		•	•	•	Optical and Electrical Interfaces	• •
		•	•	•	SMS Configuration	• •
		•	•	•	CU: General Communication Settings	• •
		•	•	•	CU: Modem Settings	• •
		•	•	•	CU: TCP/IP Settings	• •
		•	•	•	CU: ADP Settings	• •
		•	•	•	Set Activation Time of Passive TOU	• •
			•	•	TOU	• •
•	•		•	•	Billing Period Reset Settings	• •
•	•		•	•	Energy Snapshot Settings	• •
		•	•	•	Power Factor Monitor Thresholds	• •
		•	•	•	Single Reset Settings	• •
			•	•	Passwords	• •
			•	•	Integration Period	• •
		•	•	•	Primary Value Adaptation	• •

Execute Commands

User Group									
Consumer (final customer)									
Field Inspection									
Reader									
Installation (field use)									
Engineering (laboratory use)									
Certification									
Execute Commands							dlms	IEC	
			•	•	•	•	Billing Period Reset	•	•
			•	•	•	•	Take Energy Snapshot	•	
				•	•	•	Test Mode on/off	•	•
				•	•	•	Transmitting Contacts Test Mode on/off	•	
				•	•	•	Activate Active Pulses on Right LED	•	
				•	•	•	Activate Reactive Pulses on Right LED	•	
					•	•	Enable/Disable Energy Registers in Display		•
			•	•	•	•	Neutralize KA/KB Inputs	•	
				•	•	•	Reset Meter	•	
					•	•	Reset Alert	•	
					•	•	Reset Alarm	•	
•	•	•	•	•	•	•	Reset DIP Table	•	
				•	•	•	SMS Test	•	
				•	•	•	Activate Passive TOU now	•	
					•	•	Activate new Parameters in Meter	•	
						•	Activate new Parameters in CU	•	
						•	Reset Billing Period Counter	•	
						•	Reset Energy Snapshot Counter	•	
						•	Reset Battery Operating Time	•	
						•	Reset all Registers	•	
						•	Reset Energy Registers	•	•
						•	Reset Energy Total Registers	•	
						•	Reset Error Register	•	
				•	•	•	Reset Error Register		•
					•	•	Reset Diagnostic Registers	•	
					•	•	Reset Counters	•	
				•	•	•	Reset all Over and Undervoltage Counters	•	
				•	•	•	Reset all Over and Undercurrent Counters	•	
					•	•	Reset Demand Registers	•	•
					•	•	Reset Stored Values Profile	•	•
					•	•	Reset Energy Profile	•	
					•	•	Reset Daily Snapshot Profile	•	

User Group									
Consumer (final customer)									
Field Inspection									
Reader									
Installation (field use)									
Engineering (laboratory use)									
Certification									
Execute Commands								dlms	IEC
							•	Reset Load Profile	•
							•	Reset Energy Values Profile	
							•	Reset Billing Values Profile	
							•	Reset all Profiles	
							•	Reset Standard Event Log	W5
•							•	Reset all Dedicated Event Logs	
•							•	Reset Parameter Changes Log	
•							•	Reset Demand Monitoring Logs	
•							•	Reset Power Quality Monitoring Logs	
•							•	Reset Fraud Monitoring Logs	
•	•						•	Reset Fraud Monitoring Counters	
•	•						•	Reset Antitampering Event Log	

Diagnostic Commands

User Group									
Consumer (final customer)									
Field Inspection									
Reader									
Installation (field use)									
Engineering (laboratory use)									
Certification									
Diagnostic Commands								dlms	IEC
	•	•	•	•	•		•	Vector Diagram	
		•	•	•	•		•	CU GSM Installation Support	
		•	•	•	•		•	GSM Installation Support	
•	•	•	•	•	•		•	DIP Table	
•	•	•	•	•	•		•	Security System *	
•	•	•	•	•	•		•	Load Profile Analysis *	

* MS Excel is required to perform these diagnostic functions.

13 List of Abbreviations

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

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

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