

Datasheet and User manual for WM-E1SL[®] metering modem



Rev: 2.72.7

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Document specifications

This documentation was made for presenting the installation and configuration steps of the **WM-E ISL**[®] energy metering modem.

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Hardware Type/Version:	WM-EISL[®] modem for the Landis+Gyr[®] electricity meters
Hardware Version:	V 5.x (V 5.10 SIMCOM, V5.11 SIMCOM, V5.21 SIMCOM / V 5.30 TELIT / V 5.42 QUECTEL / V5.52 QUECTEL)
Firmware Version:	for v2 version Telit Modem: V 2.4.51 / V 2.5.64 TLS for v5 version Quectel Modem: V 5.3.46.0 / V 5.3.46.0 TLS
WM-E Term[®] configuration software version:	V 1.4.15
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Chapter 1. Introduction

The **WM-EISL**[®] is a modem, which is suitable for automated remote reading of electricity meters remotely, on the 4G LTE-based cellular network.

You can save money by using our modem, because furthermore there is no need of manual readout of the meter systems.

It can also be used as an external modem - for a universal meter with any standard connector. This solution also means the possibility of future expansion, which is a great help especially in cases where the installation space is scarce.

Using the modem can save you time and money by eliminating the need for on-site manual reading of meters.



Wireless communication

The 4G version has 2G and 3G fallback feature, therefore in case of outage/inaccessibility of the 4G network it is communicating further on the 2G network.

It supports the multi-operator SIM and the roaming feature, and it is compatible with SIM-Toolkit.

The modem has been designed to provide transparent data link from the meter to the server.

It can be used with push data transmission method, thus the modem can initiate the communication with the AMR centre periodically at a pre-programmed time interval or triggered by an alarm (power outage, cover removal, reverse run, etc.)

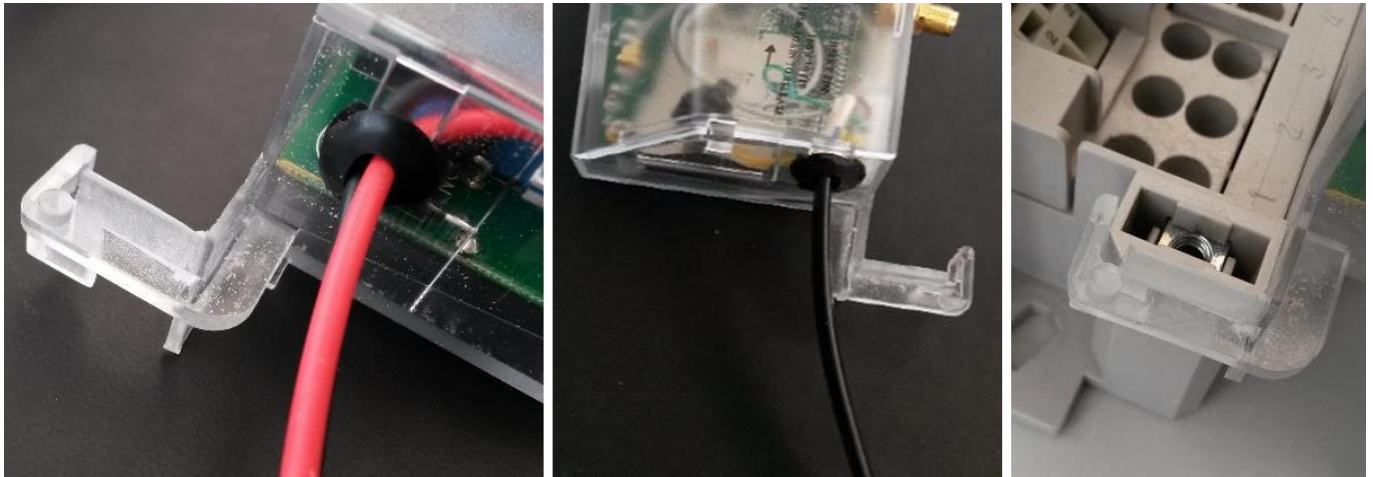
The modem can be configured to GSM-CSD connection also - e.g. when using a 2G module, receive the CSD calls.

The modem is independent of the mobile service provider and includes a removable SIM card.

Your device supports multi-operator SIM cards and roaming.

Design and installation

This modem was especially developed for the **Landis+Gyr® E350 / E450 / E650 electricity meters (ZxD and ZxG type)** energy meters – eg. the ZMD310, ZMD405, ZMD410 models, which can be connected to the meter by its design and its connection interface and can be installed into the meter enclosure's terminal cover. Due to the rectangular ears of the modem enclosure, it can be installed safely.



The modem is connected to the meter via the meter's RS232 or RS485 data connector via RJ12 connector.

Operational characteristics

The device can be accessed remotely via the mobile network and is capable of sending data over the Internet using an APN.

The modem is thus suitable for retrieving current and stored measurement data, reading recorded event log and load curve data, and reading and remotely managing meter parameter files.

The modem is basically prepared for transparent data transmission between the metering server or metering service provider, with CSDData call (only for 2G network setting!) And via mobile internet (TCP) connection ("PULL" mode) suitable for electricity meter registers. and remote reading of load curves, use of standard reading commands, remote reading and modification of the meter / parameters, updating of the meter application firmware.

Over the RS232/RS485 compatible data connection, some models have the 2-Inputs option (for sabotage or relay/tariff switch status). In case of input line presence, the

device is able to detect the input signal changes and generating and transmitting SMS alert notification.

Data connection

The modem has RJ12 connector (with RS232 and RS485 compatible).

Power source and power outage

The device can be powered from the meter's mains connection (by general 100V-240V AC voltage).

The modem can be connected through the following modes:

- a.) the meter is connected to the 57.7/100V AC power network: the modem must be connected to line voltage (100V, L1..L2 or L2..L3 or L1..L3)
- b.) the meter is connected to the 230/400V AC power network: the modem must be connected to the phase voltage (230V, L1..N or L2..N or L3..N)

Supercapacitor

The modem is also available with a power outage protection by an optional supercapacitor component, which allows to continue the modem operation in case of minor power outage(s).

In case of a power outage, the supercapacitors will discharge by time, and the modem will shut down. When the power supply returns, the modem restarts and sends data over the cellular network, and the capacitor components will be charged).

Configuration and firmware refresh

The modem can be configured locally via RS232 port or optical port, remotely with a CSData call (only if you use a setting that also uses a 2G network!) Or via a mobile internet (TCP) connection, and its firmware can be updated. The modem is configurable via TCP port remotely (or via local serial connection) and operating on the wireless network by configuring the APN, username and password (APN information is provided by your local mobile operator).

The modem can be configured to be used with a unique configuration password and an optional communication password during its operation to increase the security to high level.

The TLS protocol protected firmware can be chosed and uploaded (by request) to increase the security to maximum.

Status and notification

The modem is continuously monitoring the mobile network and device communication health, and can send status information (signal strength, QoS).

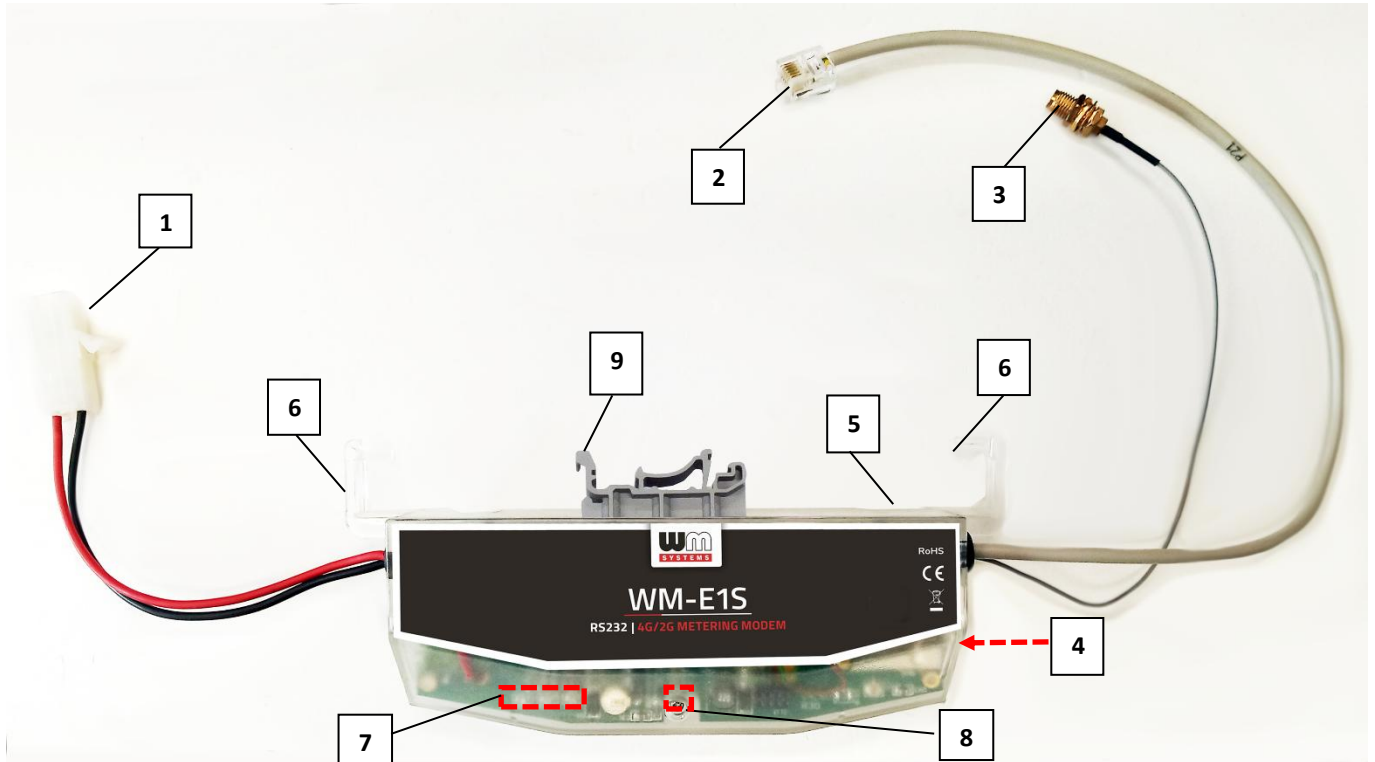
By the configured features, the device is able to send SMS alarm notification, Last Gasp notification – depending on the used cellular network and mobile operators (if the SMS notification is not disallowed on the network, then it can be used).

Certificate

According to the CE certification, the modem complies with the Radio Equipment Directive (ReD) standard 2014/53/EU – part 3.a, 3.b, 3.c and ReD Cybersecurity part 3.d. The product is RoHS and CE certified.

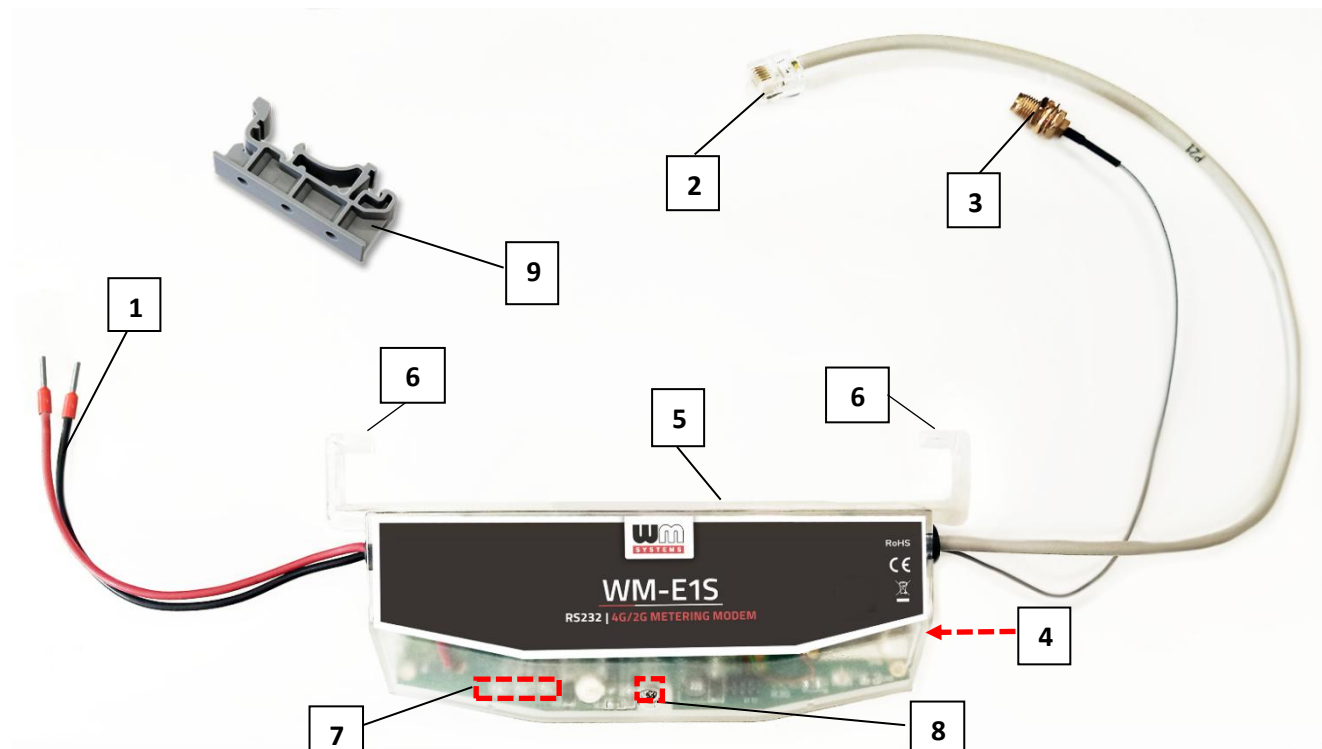
Chapter 2. Connectors, interfaces

2.1 Modem with RJ12 connector (RS232)



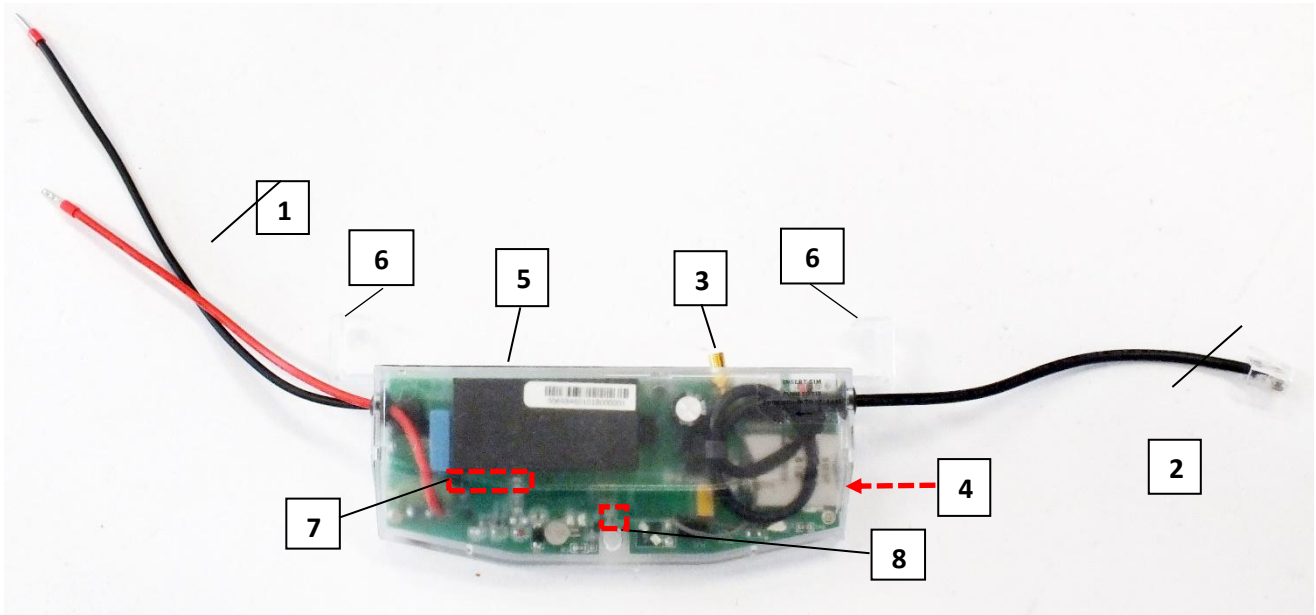
- 1 – Mains connector (100V AC - to the meter)
- 2 – RS232 connector (RJ12 – data connection modem ← → meter)
- 3 – External antenna connector (SMA-M, 50Ω)
- 4 – SIM card slot (mini SIM, insert-push)
- 5 – Plastic holder (lower plastic case fixation to the upper plastic case)
- 6 – Plastic hooks to fix the modem case into the meter coverage – optional
- 7 – Status LEDs
- 8 – Fixation screw of top modem enclosure
- 9 – DIN-rail adapter (order option) to fixate/mount to wall

2.2 Modem with RJ12 connector (RS232) for Landis + Gyr® meters with DIN-rail adapter option



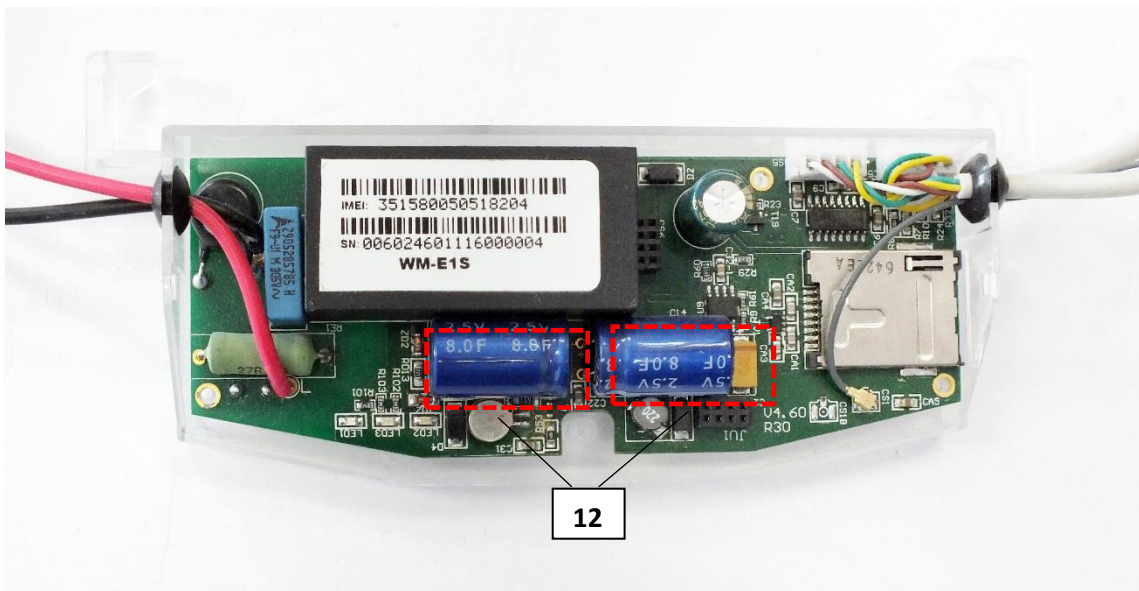
- 1 – Mains connector connector (pigtail connector for the AC power of the meter)
- 2 – RS232 connector (RJ12 – for data connection modem ← → meter and for configuration of the modem)
- 3 – External antenna connector (SMA-M, 50Ω)
- 4 – SIM card slot (mini SIM, insert-push)
- 5 – Plastic holder (lower plastic case fixation to the upper plastic case)
- 6 – Plastic hooks to fix the modem case into the meter coverage – optional
- 7 – Status LEDs
- 8 – Fixation screw of top modem enclosure
- 9 – DIN-rail adapter (order option) to fasten/mount to wall

2.3 Modem RJ12 with connection (RS485)



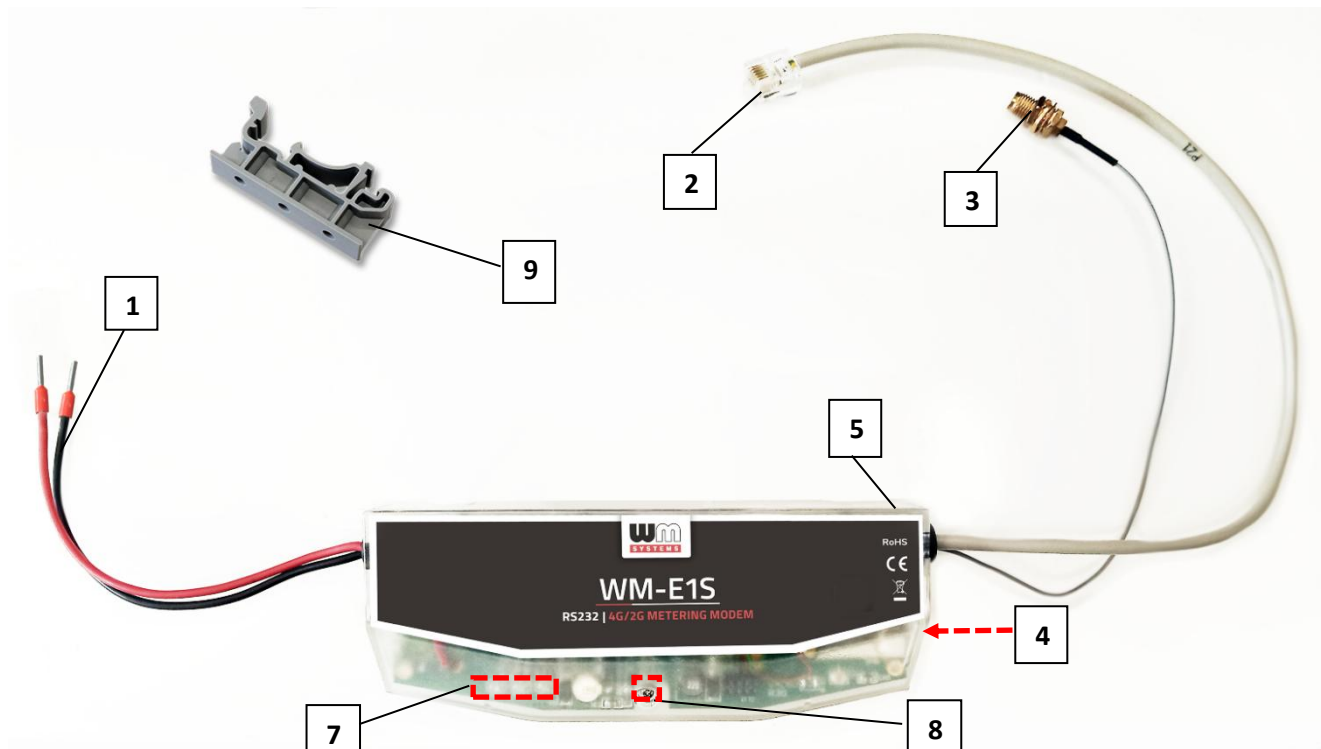
- 1 – Mains connector connector (pigtail connector for the AC power of the meter)
- 2 – RS485 connector (RJ12 – for data connection modem ← → meter)
- 3 – External antenna connector (SMA-M, 50Ω)
- 4 – SIM card slot (mini SIM, insert-push)
- 5 – Plastic holder (lower plastic case fixation to the upper plastic case)
- 6 – Plastic hooks to fix the modem case into the meter coverage – optional
- 7 – Status LEDs
- 8 – Fixation screw of top modem enclosure

2.4 Supercapacitor option – for any modem version



12 – Supercapacitors (order option)

2.5 Universal metering modem with external mounting (with RJ12 connector and DIN-rail adapter mounting)



- 1 – Mains connector connector (pigtail connector for the AC power of the meter)
- 2 – RS232 (gray) or RS485 (black) connector (RJ12 data connection modem ← → meter and for the configuration of the modem)
- 3 – External antenna connector (SMA-M, 50Ω)
- 4 – SIM card slot (mini SIM, insert-push)
- 5 – Plastic holder (lower plastic case fixation to the upper plastic case)
- 6 – Plastic hooks to fix the modem case into the meter coverage – optional
- 7 – Status LEDs
- 8 – Fixation screw of top modem enclosure
- 9 – DIN-rail adapter (order option) to fixate/mount to wall – can be glued/fixed to the bottom side of the modem

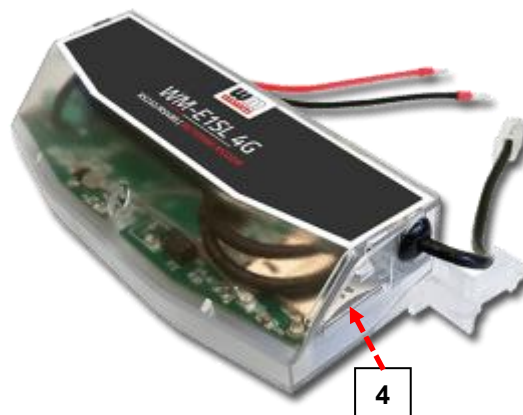
2.6 Installation steps

Step #1: Remove the meter terminal cover (I), loosen the screws (J).

Step #2: Ensure that the device is not powered on, remove the AC connector (I).

Step #3: Insert a replaceable and active SIM card (with APN) into the SIM-holder (4) - the chip looks down, and the cutted edge of the SIM looks to the modem. Push the SIM until it will be fastened (you will hear a click sound).

(If necessary, the SIM card can be easily removed by pressing the card again, causing the card to be ejected from tray.)



Step #4: Insert the modem into the internal mounting points and on the meter terminal cover (I8)

attach it to the meter terminal cover according to the meter user guide.

Step #5: Screw the external magnetic base or breakable antenna (12) corresponding to the communication to the antenna connector (3).

Step #6: Connect the modem to your computer with the RS232 cable (2/2a) and an RS232-USB converter (for RJ12 using the RJ12-USB adapter).

Attention! *The modem can be programmed only through an RS232 cable!*

Step #7: Connect the modem's AC power connector (I) - wire socket connection or "pigtail" connector depending on the version - to the meter power input (for 100-230V AC) or to an external 230V power supply.

Step #8: Configure the modem with the WM-E Term[®] software.

Step #9: After completing the configuration, remove the R232 cable (or RJ12 cable) - labeled 2/2a - from the USB adapter.

Step #10: Disconnect the modem AC power connector (I) from the meter (or power source). The modem will be shutting down.

Step #11: Make a data connection between the modem and the meter on the interface you want to use (port nr. 2 / 2a - RS232 data connection, data connection 2b to the meter RS232 data connector (G), or via RS485 port, or via the RJ12 connector (2) to the modem's RS485 connector (D)) - according to the meter type and according to the factory instructions.



Step #12: Install the modem according to the meter type – e.g. by placing the modem under the the meter's terminal cover.

(For outdoor installation, install the modem on a 35mm DIN rail (K) using a DIN rail adapter (9) by fixing/glue the modem to the bottom or back of the enclosure near the meter.)

Step #13: Connect the modem's AC power connector (I) - wire socket connection or "pigtail" connector depending on the version - to the meter's power input (for 100-230V AC). The modem starts automatically, which is also indicated by LED flashes. You can now set the modem parameters.

Step #14: Replace the terminal cover (I) and secure with the screws (J).

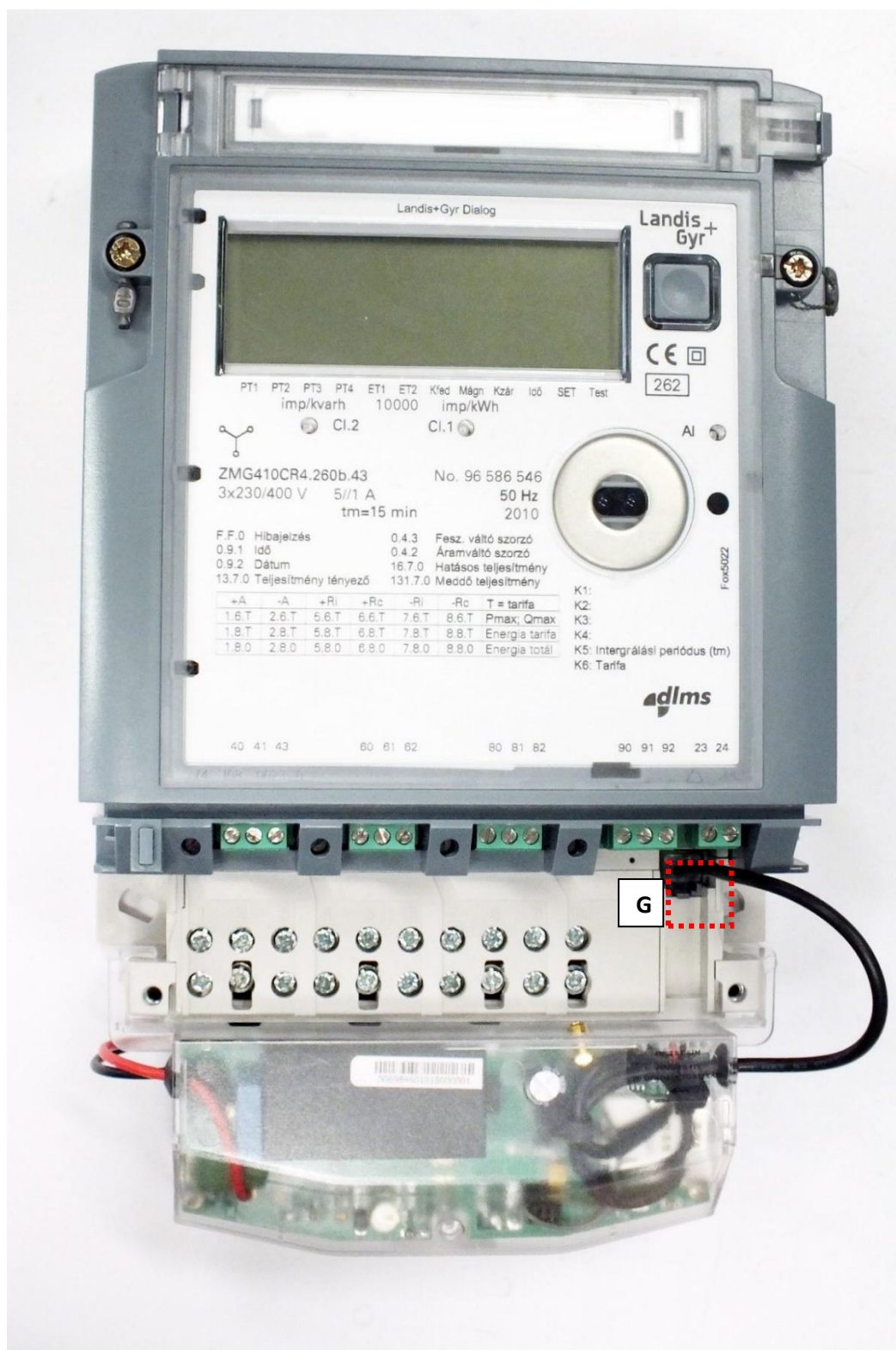
Then the modem will be power supplied by the meter and the modem will start its operation and the LED signals are signing the current activity.

2.7 Connecting the modem to the Landis+Gyr® meter

Step #1: Remove the meter's communication module plastic case by releasing the 2 screws from the top of the housing.

Step #2: Connect to the meter using the data connector.

Step #3: Connect the RJ12 data connector (2) of the modem to the RS232 socket marked "G" on the meter. (The AC power connector here is a ferrule connection).



Wiring to the Landis & Gyr® ZMG/ZMD meter

2.8 Antenna connection

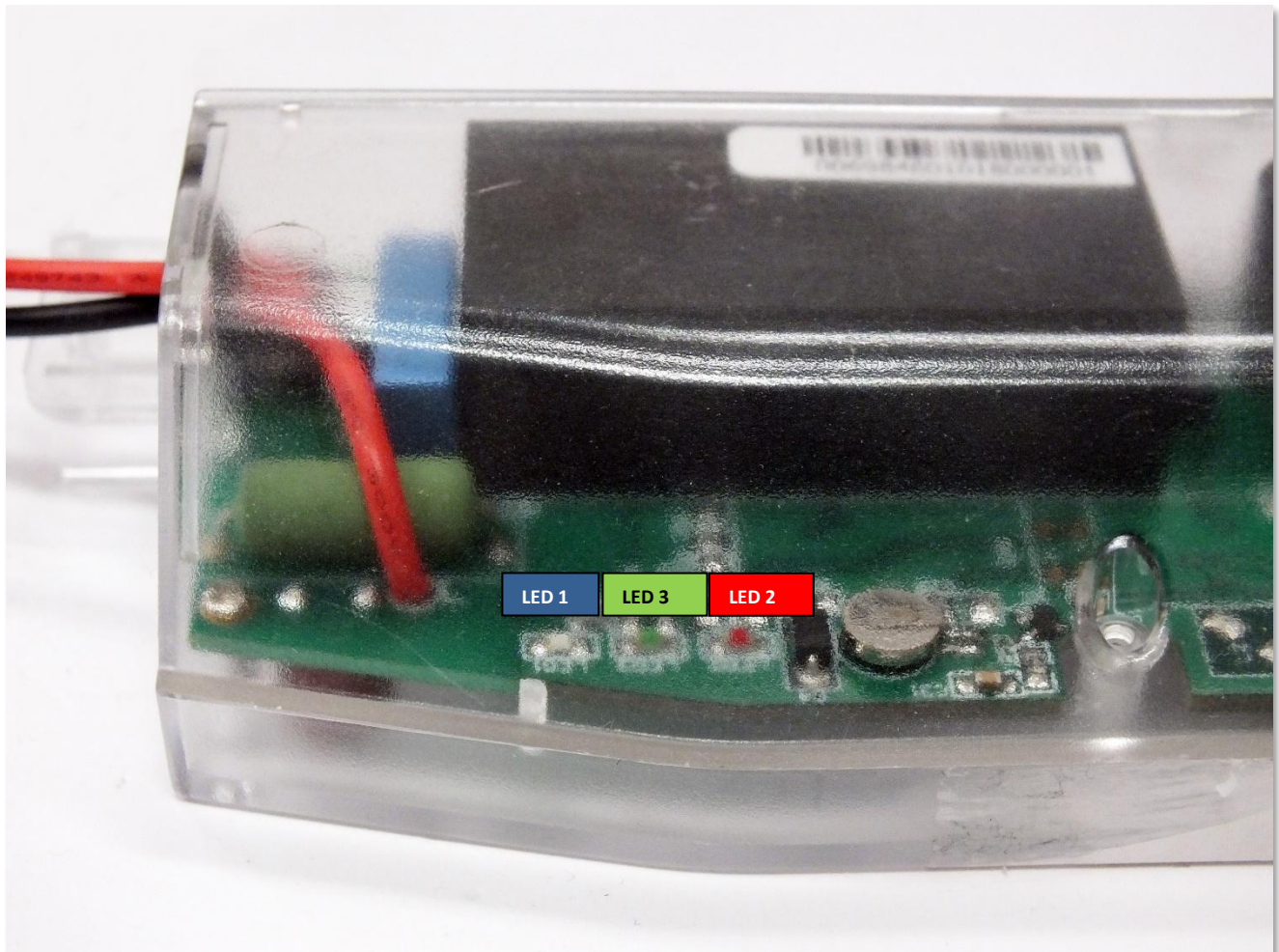
The modem requires enough signal strength of the cellular network and LTE or similar antenna for the proper operation and good communication.

Where the signal strength of the cellular network is sufficiently, there an internal antenna may be enough to use.

However, in places where the signal strength is low or poor, you should use an external antenna (50 Ohm, SMA connector), which can be mounted to the modem – you can place it even inside of the top cover of the meter.

2.9 Operation LEDs

The LED numbering is the same as the LED labels on the modem panel: from left to right in order: LED1 (blue, left), LED3 (green, center), LED2 (red, right).



Factory default LED signals:

LED identifier	Events
<p>LED 1 GSM / GPRS status</p>	<ul style="list-style-type: none"> • During network registration: led is active • During network searching: blinking once per second • When connected to the network and the IP connection is okay: blinking twice per second • When the mobile network access technology was changed: quick flashing will be relied: <ul style="list-style-type: none"> ○ 2G → 2 flashing per second ○ 3G → 3 flashing per second ○ 4G and LTE → 4 flashing per second • If there is no available cellular network detected: the led will be blank • During the CSD call and IP data forwarding, the LED is lighting continuously
<p>LED 3 E-meter status</p>	<ul style="list-style-type: none"> • During the transparent TCP/IP meter communication: twice per second. • At finish of the transparent communication: led is blank. • According the IEC meter status: the LED will be active. • In case of configuring the Multi Utility mode: led will be active.
<p>LED 2 SIM status / SIM failure or PIN failure</p>	<ul style="list-style-type: none"> • Continuously lighting, until the device is not on the cellular network and RSSI cannot be detected (SIM okay) • After SIM initialization, when SIM PIN is okay: led is active • If there is no SIM detected or SIM PIN is wrong: blinking once per second • The RSSI (signal strength) value is signed also by this led. • In case of invalid RSSI value or AT command timeout: LED continuously flashes slowly (lighting for 2 seconds, quick blank and it repeats) • In case of valid RSSI value (Received Signal Strength Indicator) the LED is flashing by "N" times in every 10-15 seconds, depending on the RSSI refresh period. The RSSI value can be 1,2,3 or 4 on the current cellular network. The numbers of RSSI flashing is different on every available network technology, by the following: <ul style="list-style-type: none"> ○ on 2G network: <ul style="list-style-type: none"> ○ 1 flashing: RSSI >= -98 ○ 2 flashings: RSSI between -97 and -91 ○ 3 flashings: RSSI - between 90 and -65 ○ 4 flashings: RSSI > -64 ○ on 3G network: <ul style="list-style-type: none"> ○ 1 flashing: RSSI >= -103 ○ 2 flashings: RSSI between -102 and -92 ○ 3 flashings: RSSI - between 91 and -65 ○ 4 flashings: RSSI > -64 ○ on 4G LTE network: <ul style="list-style-type: none"> ○ 1 flashing: RSSI >= -122 ○ 2 flashings: RSSI between -121 and -107 ○ 3 flashings: RSSI between -106 and -85 ○ 4 flashings: RSSI > -84 ○ on LTE Cat.M1 network: <ul style="list-style-type: none"> ○ 1 flashing: RSSI >= -126 ○ 2 flashings: RSSI between -125 and -116 ○ 3 flashings: RSSI between -115 and -85 ○ 4 flashings: RSSI > -84 ○ on LTE Cat. NB-IoT (Narrow Band) network: <ul style="list-style-type: none"> ○ 1 flashing: RSSI >= -122

	<ul style="list-style-type: none"> ○ 2 flashings: RSSI between -121 and -107 ○ 3 flashings: RSSI between -106 and -85 ○ 4 flashings: RSSI > -84
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Over the factory defaults, the operation and the sequence of the LED signals can be changed by the **WM-E Term**[®] configuration tool, at the **Standard Meter Interface** parameter group, where you can define one of the following functions of the leds (LED1..LED3) according the next list:

Selectable LED status (in WM-E Term)
Not used
GSM / GPRS status (see above)
SIM status (see above)
E-meter status (see above)
Firmware status
Network status and access technology – Network status and accessible technology information
Meter status with IEC polling – Meter status in case of IEC communication

Further configurable LED status signals:

LED identifier	Events
Firmware status	<ul style="list-style-type: none"> • When the modem firmware starts, the LED turns on • When the connection between the meter ↔ modem is established, the LED flashes in every 2 seconds.
Network status and access technology	<ul style="list-style-type: none"> • During network search: flashes once per second • When connected to the cellular network and the IP connection is OK: Blinks twice per second • If mobile network access has changed: flashes quickly: <ul style="list-style-type: none"> ○ 2G → 2 flashes / sec ○ 3G → 3 flashes / sec ○ 4G → 4 flashes / sec • If no network is available: the LED is not active
Meter status with IEC polling	<ul style="list-style-type: none"> • When the modem ↔ meter starts communicating, the LED flashes 1x per second. • If the meter responds to the modem during communication, it turns on the LED. • If the modem ↔ meter cannot communicate with each other for a while, the LED will be turned off.

* The power supply of the e-meter can be controlled with the relay listed here. Cannot be used for tariff change!

** The EI client is a transparent TCP channel outgoing from the modem to the EI server

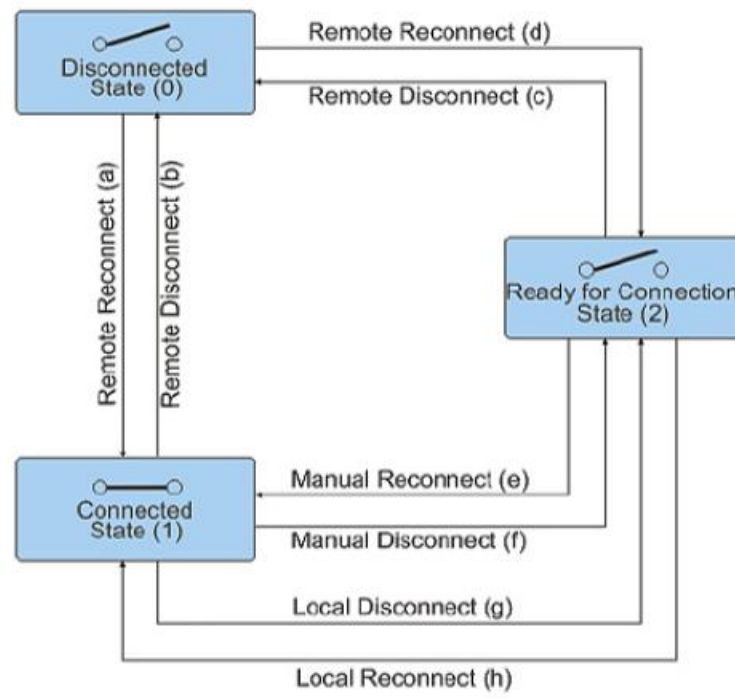
At the relay status, as it is shown in the next figure it is „*Disconnected*“, which is the “active” mode (relay retracted, in which case the **LED is turned on**).

The “*Connected*” is in “normal” mode (relay released), the **LED is turned off**.

In case of “Ready for Connection”, it is in “ready”, when the **LED flashes once in every second.**

Control Mode

Control mode defines the mode of operation for disconnect control object. Possible modes are listed in the Table 66.



During firmware upload, the LEDs indicate normal operation - there is no distinct indication during the FW update. After installing the FW, the three LEDs light up for 5 seconds and then all three light up. The modem will then restart and use the new firmware. Then each LED will continue to flash according to the listed states.

2.10 Power outage management

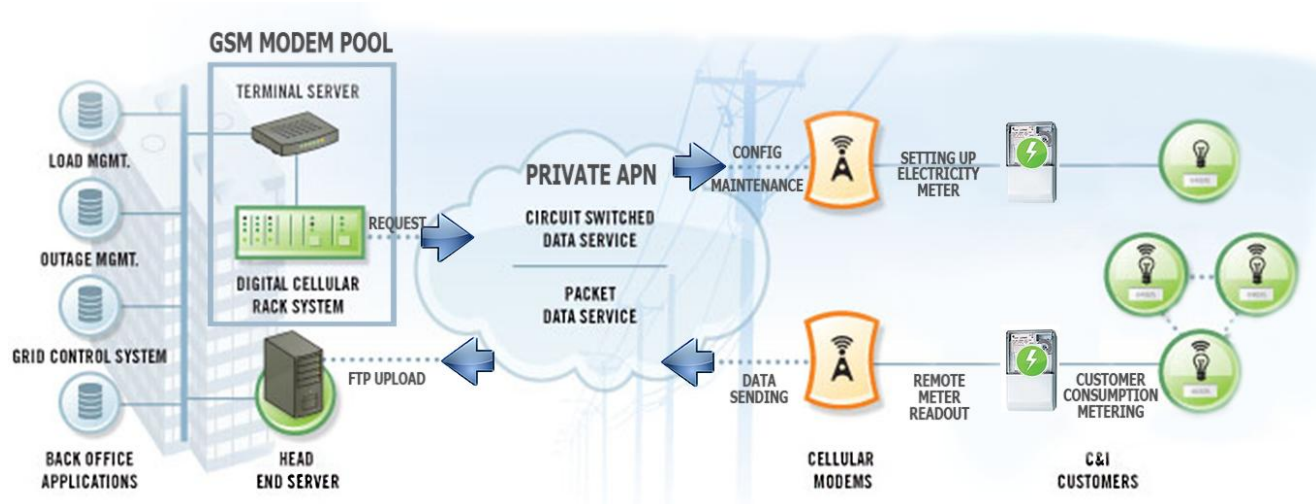
Some firmware versions of the modem support the LastGASP feature, which means that in case of power outage the modem’s supercapacitor allows to operating further the modem for a short time (a couple of minutes). In case of detecting the loss of mains/input power source, the modem generates a “POWER LOST” event and the message will be immediately transmitted as an SMS text to the configured phone number.

In case of recovering the mains/power source the modem generates the “POWER RETURN” message and sending by SMS text.

The LastGASP message settings can be enabled by the WM-E Term® application – in the AMM (IEC) parameter group part.

2.11 Push operation method

The complete readout and data sending mechanism to the centre and the other direction for the configuration and maintenance tasks can be realized on the defined paths.



The modem does not operate continuously on the network.

Therefore, there is another option and meter data sending mode to initiate a remote readout automatically in the pre-defined intervals. Anyway, it is also possible to start the data sending in case of different events (e.g. removal of meter cover, incoming SMS message from the centre).

In this situation the modem is connected to the mobile data network only during the time of the data transmission.

The devices need to be connected to GSM network and ready to connect to GPRS, but without active IP connection.

- Data Push - starting at predefined times

- The Data Push method triggers FTP file upload, plain text or encrypted.
- The unique filename and the file is generated automatically.
- The ftp function also requires an ftp server to receive data that is accessible from the currently used mobile network.
- The ftp must be set to passive mode.

- Unique file names are generated automatically.
- The file always consists of two parts, first a standard register read and then an event log (containing the events of the last 31 days).
- The readings shown as standard IEC format, including some ASCII control characters like STX ETX, etc. also.

- **Alarm Push (sending alarms)** - starting when new event can be read from meter

- Alarm Push method triggers TCP sending of a DLMS WPDU contains the IP address,
- listening port number for transparent service, and the meter ID.

- **Triggering with SMS**

- GPRS connection can be activated remotely with a defined SMS from any call number.
- The SMS text must be left empty.
- After the SMS received, the modem will connect to IP network, and will be accessible as a IP server for a time period defined in the config file.
- Example config file will be provided with a 30 minute setting.

2.12 LED operation during the CSD call

The CSD call consists of two parts:

- a.) We want to read / configure a meter in transparent mode
- b.) We want to perform a modem configuration / firmware update

To read / configure a meter in transparent mode:

- The LED configured for GSM / GPRS status will be lit continuously during the CSD call.

- The LED that is configured for e-meter status will flash according to the CSD call status:

- It will flash every half second from the beginning of the connection to the end of the connection / If the measuring interface is not configured for a baud rate of 9600, the LED will be lit continuously from the beginning to the end of the connection
- After closing the connection, the LED will turn off

IF you want a modem configuration / firmware update:

- The LED configured for GSM / GPRS status will be lit continuously during the CSD call.
- In this case, the other LEDs do not change due to the CSD mode.

2.13 Configuring from CSD connection

If the modem restarts due to an incorrect configuration, it is possible to access it with a CSD call. Its operation can be fine-tuned in the WM-E Term software with a value that can be specified in the **PDP connection delay** field in the **APN** parameter group.

For more information, see Chapter 3.1 of the *WM-E Term User Manual*.

2.14 Data control direction (DCD) feature

On the WM-E1SL[®] modem for Landis & Gyr[®] meters through the RS232 connection, there you can use the **DCD** feature - due to the RS232 data connection – there you can declare the direction of the data control according the following parameter settings as options.

For configuring the **DCD** feature, choose the **RS485 interface settings** parameter group.

Note that it is valid for the RS232 port!

DCD Parameter values:

- **Fix 0** (provides logical 0 value as result for the connected meter)
- **Fix 1** (provides logical 1 value as result for the connected meter)
- **Standard**
- **Inverted** (opposite direction)

Important! This feature needs of using the 2.49B or later firmware version for the modem.

2.15 Two meter readout ports

Every WM-E modem has two ports for meter communication, configuration and FW updates. You can configure all the two to control their operation by its priority.

The first port is, the **Utility communication port for (Primary)**, which you can use for meter readout and configuration. This port has higher priority for meter readout over the secondary port, therefore the operation of this primary port will always override the secondary port's operation (e.g. if you configured these ports and when the meter will be read out via the primary port (**Utility comm. port**), then the secondary port's operation (**Customer comm. port**) will be hanging – e.g. meter reading – until the primary port is not finished with the current read out.

This prioritization at operation is not effecting the firmware updates or configuration processes of the modem.

The second port. the Customer communication port for (Secondary)* can be also used with lower priority for meter communication, configuration and FW updates.

Important! The two ports should be set to different port numbers.

This feature can be configured in the WM-E Term software in **Standard settings** mode, or you can also edit it in **Advanced settings** mode in the **M2M** parameter group.

Important! Note, that this feature is available in modem firmware v5.3.4.1 or in newer firmware versions!

2.16 Automatic protocol detect and switch

The **Data format for meters** value (E-Meter serial port) can be configured in the WM-E Term software in **Standard settings** mode, or you can also edit it in **Advanced settings** mode in the **Transp. / NTA** parameter group.

Over the usual data formats (as *7E1*, *8N1*, *7O1*, *7N2*, *8E1*, *8O1*, *8N2*) you can choose the **'Auto'** mode setting.

In this case, the first data packet of the incoming connection is checked by the firmware. It will automatically decode the incoming communications and if it is detecting that as IEC protocol, then the modem will switch to data mode **7E1** towards the meter. In all other cases, the data mode remains at **8N1** mode.

Note, that in case of WM-EIS type modems, since it is not known which port the meter is connected to, the firmware also changes the data mode of both ports (RS232 and RS485 ports).

In this case, the modem detects the format corresponding to the protocol, so it only sends the necessary communication towards the meter and will automatically know when configuration will occur.

Important! *Note, that this feature is available in modem firmware v5.3.4.1 or in newer firmware versions!*

Chapter 3. Modem Configuration

3.1 Configuration

The modem must be configured by the WM-E Term® software by configuring its parameters which must be performed before the normal operation and usage.

Over the parameter settings of meter, modem and communication, etc., you can also test the modem communication by the configuration program.

Important! *The modem can be configured throu RS232 connection only!*

During the configuration, you have to remove the meter-modem data connection (2/2a) and you have to connect the modem to your computer by the following hints.

Important!

Note that until the configuration the modem is not connected to the meter, therefore it cannot readout the parameter values through the RJ12 interface.

The modem can be connected with the RS232 cable (2a) - or in case of version C by the RJ12 cable (2) and by using the RJ12-USB converter by directly to your computer.

Important! *During the configuration, the power supply of the modem must be assured by its AC plug from an externa power source (from 100-230V AC or by the meter 57-100V AC).*

Use the WM-E Term program for the configuration – use the WM-E Term User manual.

For the proper communication of the modem, you have to configure the APN settings of the SIM – as PIN code, APN, username and password. These all can configured by using the WM-E Term® software through the serial link connection. For the successful operation of the communication module it is necessary to have appropriate signal strength.

In places where the signal strength is strong it is possible to use internal antenna, for areas with poor reception mount an external antenna (50 Ohm SMA connection) to the antenna connector (3) of the device, which you can place inside even inside the meter enclosure (under the plastic housing).

If you want to readout the meter parameter values during the PC-modem connection, after the RJ12-configuration you made, then you should select a different configuration port to the meter as TCP/IP or Optical, etc.

3.2 Configuring the modem by WM-E Term®

The Microsoft .NET framework runtime environment is required on your computer.

Download WM-E Term® to your computer from the following location using a browser:

https://www.m2mserver.com/m2m-downloads/WM_ETerm_v1_4.zip

Then unzip the .zip file to a directory and run WM-ETerm.exe.

The configuration software supports user account management and password change. You can log in to the program with a password! Follow the WM-E Term® Program User's Guide!

Attention! *It is recommended that you use the latest - or later - firmware to use the modem.*

Factory configuration file sample (for WM-E Term):

https://www.m2mserver.com/m2m-downloads/WM-EISL_STD_default.zip

For the operation of the modem cellular network communication and SIM card settings (such as APN, password, and account) are required.

In addition, be sure to review and save the transparent mode data speed functions in the WM-E Term program for the RS232, RS485 settings. In addition, you must send the configured configuration to the modem using the program - according to the configuration software's User Manual document.

WM-E Term User Manual:

https://www.m2mserver.com/m2m-downloads/WM-E-TERM_User_Manual_V1_97.pdf

3.3 Configuring the modem by SMS text messages

Important! Note, that this feature is available since modem firmware version v5.3.46.

It's possible to control the modem by sending SMS text notification commands to the device.

For the configuration, a password authentication is necessary in every SMS command.

Note, that by default the CSD configuration password is not set on the modem. Therefore, the modem is open for remotely configuring by anyone. Only in this case (when no password was set) you don't need to use the "**pw=**" command. But, if you are using a CSD password for configuring, then you have to start every SMS command with the "**pw=**" command tag.

If you want to protect the modem against unauthorized personnel connection, on CSD connection we highly suggest you to configure a CSD password for the modem by security reasons.

A password can be given from the WM-E Term configuration or by sending the following SMS command to the modem:

cmd=csd.password = *password*

Important! Note, that the password length can be max. 31 character long.

Important! If you are using CSD Password parameter (in case of CSD connection), the modem can authenticate on CSD connection only with this password. Without

the CSD password it is not possible to access the modem on CSD. If you already set this, you cannot access the modem via WM-E Term.

Then the device will respond with the result in SMS notification and the new password will be valid.

Important! Later, if you want to access the modem via WM-E Term, you should not use any password on CSD. For this use this command via SMS and leave the password value empty:

cmd=csd.password =

If a password is already configured (by the **csd.password** parameter) on the modem, then at every SMS command the correct password authentication must be used by using the following command syntax.

pw=<password>.<command>

Syntax part	Syntax description
<password>	The password specified in the previously mentioned <i>csd.password</i> parameter must be entered.
<command>	SMS commands - the useable commands are detailed in the rest of this description.

IMPORTANT!

- The SMS command message must start with the “**pw=**” string, then the SMS command message must continue with the password specified in the configuration. If the password specified in the SMS is not the same as the one set in the modem configuration, then the SMS command cannot be processed.
- At value addition there must be placed a *space* character before and after the “=” (quotation mark), so “ = ” must be used), because if the space characters are missing, only the previous value will be interpreted, the complete command will not be interpreted correctly.
- Note, that when using “**pw=**” command, there is no *space* character afterwards

- The password must be followed by the “.” (point character). If the SMS message does not continue with a “.” character, then the SMS command cannot be processed either.
- This “.” string must be followed with a command. If there is no password configured, then the first part can be omitted. Therefore always use it like this:
pw=<password>.<command>
- Note, that when using “**cmd=**” command, there is no *space* character afterwards. Only values must be defined with using “ = ” value additon – so using spaces before and after the quotation mark.
- There should be no enter or space character before an issued command.
- In some commands the “?” (question mark) can be used for readout a parameter.
- Multiply parameters can be executed by a separation string which is “\r\n”. Among these string(s) more commands can be executed in one step (by one SMS command) – so you can use more separator tags in on SMS text. This string can be combined with the question mark („?”) if you want to readout parameters as: **\r\n?**
- An SMS message can be maximum 160 characters long. Beyond this size, the SMS command will be fragmented and its processing will not work completely or partially.

Later, if you want to **change a valid password**, then you should send an SMS command by using at first authentication and then change the current password by using this syntax:

pw=password.cmd=csd.password = new_password

Syntax for command if there is no password:

cmd=command = value

Syntax for command if there is a password used:

pw=password.cmd=command = value

List of SMS commands <command>

Command	Command description
cmd=AT&F	<p>Modem configuration reset.</p> <p>After setting the configuration, the modem sends an SMS response: "Configuration structure reset result: <error_code>"</p> <p>For understanding the result codes, see <i>error_code</i> part below.</p>
cmd=ATR	<p>Modem Restart command. Before restarting the device, it sends the following SMS notification:</p> <p>"Device reset requested after SMS answer"</p>
cmd=mread	<p>IEC register values registers can be read out with this command, as:</p> <ul style="list-style-type: none"> - C.1.0 (IEC meter address), - 0.9.2 (IEC meter current date), - 0.9.1 (IEC meter current time) <p>This command only makes sense if the modem is connected to a meter from which the mentioned registers can be read out properly.</p> <p>The response format will be the following:</p> <p>"(<C.1.0>)\r\n<0.9.2>\r\n<0.9.1>\r\n"</p>
cmd=certreset	<p>With this command, <u>if the modem uses TLS</u>, you can reset TLS parameters to their default values. Then the firmware sets the the following parameter values to 0:</p> <p><u>from Device Manager parameter group:</u></p> <ul style="list-style-type: none"> - dm.tls_enable (Device Manager TLS enable) - dm.cert (Device Manager Certificate bank) - dm.ca_cert (Device Manager CA certificate bank)

	<ul style="list-style-type: none"> - dm.verify (Device Manager certification verification) <p><u>from Transparent / NTA parameter group:</u></p> <ul style="list-style-type: none"> - tm.tls_enable (Transparent mode TLS enable) - tm.cert (Transparent mode certificate bank select) - tm.ca_cert (Transparent CA certificate bank select) - tm.verify (Transparent mode certificate verification) <p>The SMS response is as follows:</p> <p>“Configuration structure reset result: <error_code>”</p> <p>For understanding the result codes, see <i>error_code</i> part below.</p>
<p>cmd=?<config_parameter> >\r\n?<config_parameter> ...</p>	<p>Multiply parameter value query (read out).</p> <p>After the “cmd=?” string, you can specify a modem parameter.</p> <p>If you want to read more parameters, then the “\r\n?” string must follow the parameter name. This string does not need to be present for the last parameter.</p> <p>After processing the command, the firmware will return the values of the parameters to be read line by line in the following format: <config_parameter> = <config_parameter_value>\r\n</p>
<p>cmd=<config_parameter> =<config_parameter_value> >\r\n<config_parameter> =<config_parameter_value> >\r\n...</p>	<p>Multiply parameter value configuration.</p> <p>After the “cmd=” string, new parameter name and values can be configured in the SMS text message with parameter name and value (similarly to a WM-E</p>

	<p>Term configuration file – open a CFG file for better understanding).</p> <p>The “\r\n” string must be at the end of the lines if you want to modify several parameters at once.</p> <p>After processing the command, the firmware gives the following response:</p> <p>"Configuration structure changed result: %d", error_code</p>
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The table above shows that the return value answers include the save/write configuration result:

<error_code> value	<error_code> description
0	Write / save completed successfully.
-1	The CRC checksum stored in SPI flash memory and the CRC checksum stored in RAM memory do not match.

SMS text command examples:

SMS text command content	SMS notification answer
pw=password.cmd=?conn.apn_name	<p>Using password authentication, then query a parameter value with using the question mark before the next command.</p> <p><u>Answer example:</u></p> <p>conn_apn_name = wm2m</p>
pw=password.cmd=conn.apn_name = net	<p>Using password authentication, then confuring a parameter.</p> <p><u>Answer:</u></p> <p>Configuration structure changed result: 0</p>

<p>pw=password.cmd=AT&F</p>	<p>Using password authentication, and requesting a modem configuration reset to default values.</p> <p><u>Answer:</u></p> <p>Configuration structure reset result: 0</p>
<p>cmd=ATR</p>	<p>Using password authentication, and requesting a modem reset.</p> <p><u>Answer:</u></p> <p>Device reset requested after SMS answer</p>
<p>pw=password.cmd=?conn.apn_name\r\n?conn.apn_user\r\n?conn.apn_pass</p>	<p>Using password authentication, and multiply query of parameters by using the \r\n separator tags between question marks „?“ (to read out values) and parameter names:</p> <p><u>Answer example:</u></p> <p>conn.apn_name = wm2m\r\n conn.apn_user = username\r\n conn.apn_pass = password\r\n</p>
<p>pw=password.cmd=conn.apn_name = name\r\nconn.apn_user = user\r\n?conn.apn_pass = pass</p>	<p>Using password authentication, and multiply parameter configuration by using the \r\n separator tags between parameter names:</p> <p><u>Answer:</u></p> <p>"Configuration structure changed result: %d", error_code</p>

For the useable parameter names and values, please see the [Modem Parameter Description](#) document.

3.4 Sending an SMS about the meter

Depending on the meter configuration, by using the modem, the meter can send SMS message corresponding to standard AT commands to the phone number which was configured at the meter side.

It is worth configuring this primarily for alarms and special events, according to the capabilities of the meter. No other settings are required in WM-E Term®.

3.5 Automatic network reconnection

If the mobile network provider drops the modem from the cellular network due to the device's network inactivity, there are available parameters if these are set, then automatic and periodical connection connection rebuild can be caused.

If the network provider sends a message to the modem that the data connection has been lost, the connection will be restored automatically. If you do not send a message, you can choose from these two workarounds to follow:

a.) Active mode - Use periodical ping, set the ping:

1. For setting this, set the **Watchdog** parameter group's ping parameters as **Ping IP-address, Number of ping retries, Ping wait-time (for reply) and Wait-time (for next)**.
2. If there is no ping response, it reconnects to the network after the time interval specified in the **Seconds, gprs connection closed and restored after this time** parameter.

Attention! *In case of frequent ping using, the data traffic will be higher, but the chances are higher that the device will remain on the cellular network.*

b.) Passive mode - If you don't use the ping - set the connection retry:

1. For setting this, use the **Watchdog** parameter group's **Seconds, gprs connection closed and restored after this time** parameter.
2. Here you can define that after the network drops out the modem, how long does the modem wait before trying to reconnect to the mobile network again. Ask your mobile provider about the offered settings.

Attention! *If there is less data traffic and there is no ping configured, the device may not stay on the network for a long time.*

If you set this parameter to a low value that can cause frequent network reconnections.

Therefore under no circumstances should you set this value lower than what your mobile service provider recommends. (e.g. there are mobile network providers that limit the number of times a modem can logon to the network in a given time).

Chapter 4. Support

If you have any questions concerning the use of the device, contact us at the following address:

E-mail: iotsupport@wmsystems.hu

4.1 Contact the support line

For the proper identification of the modem you should use the sticker on the device, which contains important information for the call center.

Attach the modem related important information – marked - of modem identifiers to the problem ticket, which will help resolving the problem! Thank you!

4.2 Product Support

Documentation and released firmware for the product can be accessed via the following link.

<https://www.m2mserver.com/en/product/wm-e1s/>

Online product support can be required here:

<https://wmsystems.atlassian.net/servicedesk/customer/portal/70/user/login?destination=portal%2F70>

Chapter 5. Legal notice

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Warning

Any fault or upcoming error during the software upload/refresh can lead to the device breakdown. When this situation happens call our specialists.