



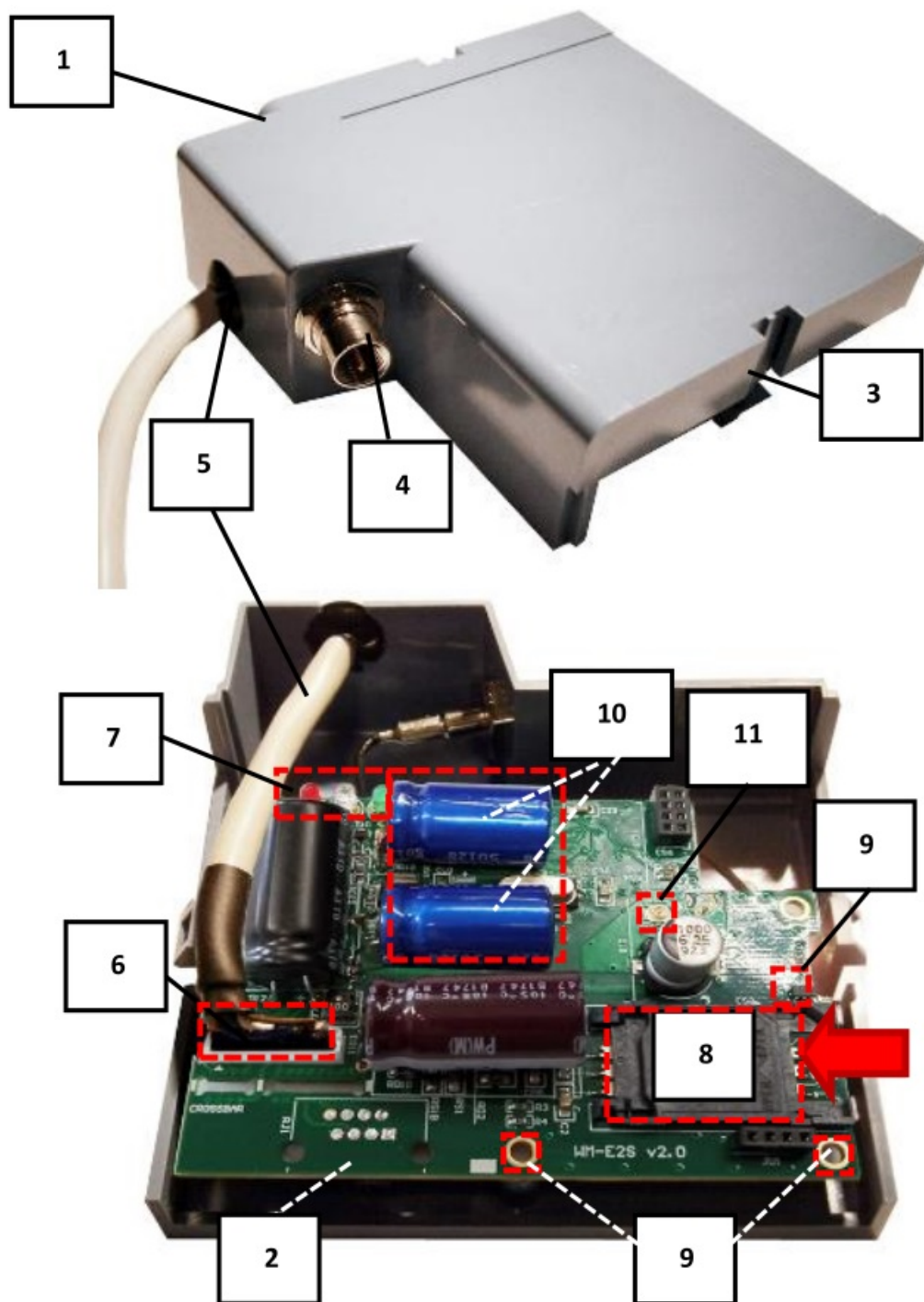
WM SYSTEMS WM-E2SL Modem User Guide

[Home](#) » [WM SYSTEMS](#) » WM SYSTEMS WM-E2SL Modem User Guide 

WM SYSTEMS WM-E2SL
Modem User Guide

WM-E2SL[®] modem – Quick Reference Guide for Landis+Gyr[®] E350, E450, E550 electricity meters (Zxx3xx, Zxx4xx type)

CONNECTION



1. – Plastic enclosure and its top cover
2. – PCB (mainboard)
3. – Fastener points (fixation lags)
4. – FME antenna connector (50 Ohm) – optionally: SMA antenna connector
5. – RJ45 connector (data connection and DC power supply)
6. – Data connection cable interface
7. – Status LEDs: from left-to-right: LED2 (red), LED1 (blue), LED3 (green)
8. – Mini SIM-card holder (pull it to left and open up)
9. – PCB fastener screws
10. – Super-capacitors
11. – Internal antenna connector (U.FL – FME)

POWER SUPPLY AND ENVIRONMENTAL CONDITIONS

- Power supply: 8-12V DC (10V DC nominal)
 - Current: 200mA, Consumption: 2W @ 10VDC
 - Power input: can be supplied from DC power by the meter through the RJ45 port
 - Wireless communication: according to the selected module (order options)
 - Ports: RJ45 connection: RS232 (300/1200/2400/4800/9600 baud)
 - Operation temperature: from -30°C* to +60°C, rel. 0-95% rel. humidity (*TLS: from 25°C) / Storage temperature: from -30°C to +85°C, rel. 0-95% rel. humidity
- *In case of using TLS: from -25°C

MECHANICAL DATA / DESIGN

- Dimensions: 86 x 85 x 30mm, Weight: 106 gr,
 - Outfit: The modem has a non-conductive, IP21 protected plastic housing.
- The enclosure can be fastened by the fixing ears under the meter's terminal cover.

INSTALLATION STEPS



- Step #1: Remove the meter terminal cover by its screws (with a screwdriver).
- Step #2: Ensure that the modem is NOT under power supply, remove the RJ45 connection from the meter. (The power source will be removed.)
- Step #3: Push the ears (3) and open up the enclosure's top cover (1) at the antenna connector. The PCB will be free to touch.
- Step #4: Push the plastic SIM holder's cover (8) from right to left direction, and open it up.
- Step #5: Insert an active SIM card into the holder (8). Take care to the right position (the chip looks down, the card's cut edge looks outside to the antenna. Push the SIM into the guiding rail, close the SIM holder, and push back the SIM holder (8) from left to right direction, and close it back.
- Step #6: Ensure that the antenna's internal black cable is connected onto the U.FL connector (11)!
- Step #7: Check that the internal data cable (5) is connected to the PCB (2), to the data connector interface (6).
- Step #8: Mount an antenna to the FME antenna connector (5). (If you're using an SMA antenna, then use SMA-FME converter).

- Step #9: Connect the modem to the computer by the RJ45 cable and the RJ45-USB converter, and set up the jumper's position into RS232 mode. (the modem can be configured only in RS232 mode through cable!)
- Step #10: Configure the modem by the WM-E Term® software.
- Step #11: After the configuration remove the RJ45-USB adapter from the cable and the modem's power supply will be ceased.
- Step #12: Close back the modem enclosure cover (1) by its fastener ears (3) to the meter enclosure. You will hear a click sound when closed.
- Step #13: Put and install the modem to the meter's fastener/fixation points and fasten the modem into the meter house/enclosure.
- Step #14: The modem-Landis+Gyr® meter connection can be initiated via RS232 port by a 1:1 cable connection. Therefore use the beige RJ45 cable (5) of the modem to connect to the RJ45 port of the meter.
- Step #15: The modem will be powered by the meter immediately and its operation will be started. The device activity can be checked with the LEDs.

OPERATION LED SIGNALS – IN CASE OF CHARGING

Attention! The modem must be charged before the first use – or if it was not been powered for of long time. The charge takes about ~2 minutes if the supercapacitor was exhausted / discharged.

LED	Legend	Sign
LED3	At first statup, during the charging of the exhausted supercapacitors, only green LED will flashing quickly. Only this LED is active during the charge. Wait until the device will be fully charged.	•

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 **General Meter settings** parameter group. The free to choose further LED options can be found in the WM-E2SL ® modem's Installation Manual.

LED	Events
LED3 SIM status / SIM or PIN failure	<ul style="list-style-type: none"> • Continuously lighting, until the device is not on the cellular network and RSSI cannot be detected (SIM okay) • When the SIM PIN is okay: led is active • If there is no SIM detected or SIM PIN is wrong: blinking once per second (slow flashing) • The RSSI (signal strength) value is signed also by this led. 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: 1 flashing: RSSI >= -98 / 2 flashings: RSSI between -97 and -91 / 3 flashings: RSSI -90 to -65 / 4 flashings: RSSI > -64 ○ on 3G network: 1 flashing: RSSI >= -103 / 2 flashings: RSSI between -102 and -92 / 3 flashings: RSSI -91 to -65 / 4 flashings: RSSI > -64 ○ on 4G LTE network: 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: 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: 1 flashing: RSSI >= -122 / 2 flashings: RSSI between -121 and -107 / 3 flashings: RSSI between -106 and -85 / 4 flashings: RSSI > -84

LED1 GSM / GPRS status	<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: 2G → 2 flashing per second / 3G → 3 flashing per second / 4G → 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
LED2 E-meter status	<ul style="list-style-type: none"> • By general: the led is inactive • During communiacion: the led is active (flashing)

Important! Note, that during the firmware uploading the LEDs are operating as it is normal – there is no significal LED signal for the FW refresh progress. After the Firmware installation, the 3 LEDS will be lighting for 5 seconds and all will blank, then the modem restarting by the new firmware. Then all LED signals will be used as it was listed

here above.

CONFIGURATION OF THE MODEM

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:

- During the configuration process, the RJ45 (5) connector must be removed from the meter connector and should be connected to the PC. During the PC connection the meter data cannot be received by the modem.
- Connect the modem to the computer by the RJ45 cable and the RJ45-USB converter. The jumpers must be in RS232 position!

Important! During the configuration, the power supply of the modem is assured by this converter board, on USB connection.

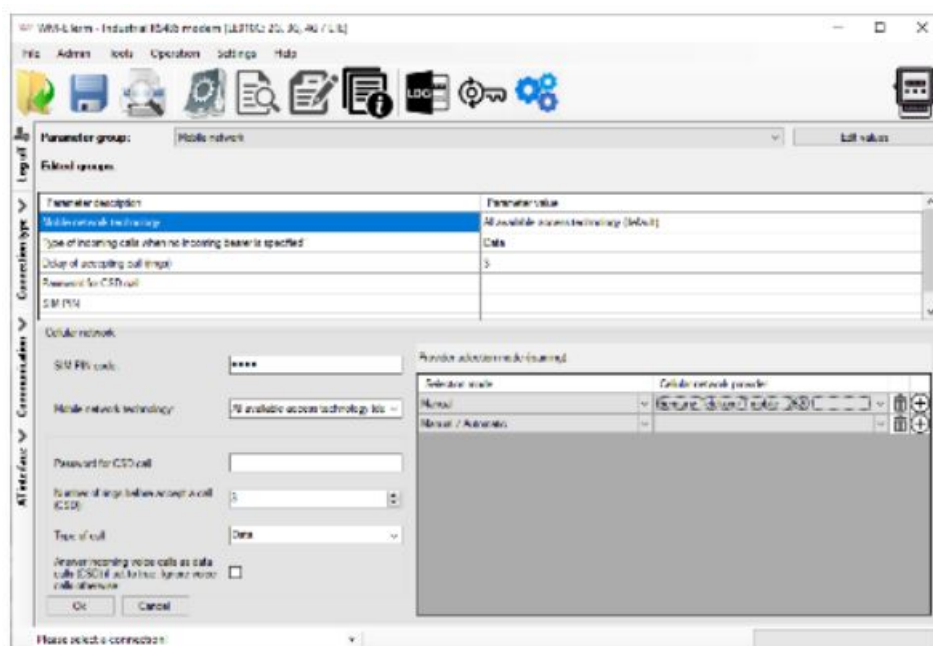
Some computers can sensitive for USB current changes. In this case you should use an external power supply with special connection.

- After the configuration reconnect the RJ45 cable to the meter!
- For the serial cable connection configure COM port settings of the connected computer according to the modem serial port properties in the Windows at the a **Start menu / Control panel / Device Manager / Ports (COM and LTP)** at the **Properties: Bit/sec: 9600, Data bits: 8, Parity: None, Stopbits: 1, Bandwith control: No**
- The configuration can be performed via CSDData call or TCP connection if the APN is already configured.

MODEM CONFIGURATION BY THE WM-E TERM®

The Microsoft .NET framework runtime environment is required on your computer. For modem configuration and testing you will need an APN/data package enabled, an active SIM-card. The configuration is possible without a SIM card, but in this case the modem is performing restart periodically, and some modem features will be not available until the SIM card is inserted (e.g. remote access).

Connection to the modem (via RS232 port*)



- Step #1: Download the https://www.m2mserver.com/m2m-downloads/WM-ETerm_v1_3_63.zip file. **Uncompress** and **start** the **wm-term.exe** file.
- Step #2: Push the **Login** button and choose the **WM-E2S** device by it's **Select** button.
- Step #3: At left on the screen, at the **Connection type** tab, choose the **Serial** tab, and fill the **New connection** field (new connection profile name) and push the **Create** button.
- Step #4: Choose the proper **COM port** and the configure the **Data transmission speed** to 9600 baud (in Windows® you have to configure the same speed). The **Data format** value should be 8,N,1. Then push the **Save** button to create the serial connection profile.
- Step #5: At the bottom left side of the screen **choose a connection** type (serial).
- Step #6: Choose the **Device information** icon from the menu and check the **RSSI** value, that the signal strength is enough and the antenna position is right or not. (The indicator should be at least yellow (average signal) or green (good signal quality). If you have weak values, change the antenna position while you will not receive better dBm value. (check the status again).
- Step #7: Choose the **Parameter readout** icon for the modem connection. The modem will be connected and its parameter values, identifiers will be read out.

*If you are using data call (CSD) or TCP/IP connection remotely for the modem connection – check the Installation manual for the connection parameters!

Parameter configuration

- Step #1: **Download** a WM-E Term sample configuration file. Choose the **File / Load** menu to load the file: <https://m2mserver.com/m2m-downloads/WM-E2SL-STD-DEFAULT-CONFIG.zip>
- Step #2: At the **Parameter group** choose the **APN** group, then push to the **Edit values** button. Define the **APN server** and in case of neccassary the **APN Username** and **APN password** fields, and push to the **OK** button.
- Step #3: Choose the **M2M** parameter group, then push to the **Edit values** button. Give the **PORT number** to the **Transparent (IEC) meter readout port** field – which will be used for the remote meter readout. Give the configuration **PORT NUMBER** to the **Configuration and firmware download port**.
- Step #4: If the SIM is using a SIM PIN, then you have to define it to the **Mobile network** parameter group, and give it into the **SIM PIN** field. Choose a **Mobile network technology** (e.g. **All available network technology** – which is recommended to select) or choose the **LTE to 2G** (for „fallback“).
You can also select a mobile operator and network– as automatic or manual. Then push to the **OK** button.
- Step #5: The RS232 serial port and transparent settings can be found in the **Trans. / NTA** parameter group. The default settings are the following: at **Multi utility mode**: transzparent mode, **Meter port baud rate**: 9600, **Data format**: Fixed 8N1). Then push to the **OK** button.
- Step #6: In the **RS485 meter interface** parameter group, you should **disable the RS485 mode**. Then push to the **OK** button.
- Step #7: After the settings you have to choose the **Parameter write** icon to send the settings to the modem. You can see the progress of the upload at the bottom status's progress bar. At the end of the progress the modem will be restarted and will be starting with the new settings.
- Step #8: If you want to use the modem via RS485 for meter readout, then you have to modify the jumpers to RS485 mode!

Further setting options

- The modem handling can be refined at the **Watchdog** parameter group.
- The configured parameters should be save to your computer also by the **File/Save** menu.
- **Firmware upgrade**: select the **Devices** menu, and the **Single Firmware upload** item (where you can upload the proper.DWL extension file). After the progress of the upload, the modem will be rebooting and operating with the **new firmware and the previous settlings!**

SUPPORT

The product has CE sign according to the European regulations.

The product documentation, software can be found on the product's website:

<https://www.m2mserver.com/en/product/wm-e2sl/>



Contents

[1 Documents / Resources](#)

[1.1 References](#)

[2 Related Posts](#)

Documents / Resources

	WM SYSTEMS WM-E2SL Modem [pdf] User Guide WM-E2SL Modem, WM-E2SL, Modem
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References

- ^{M2M} [WM-E2SL Modem for Landis+Gyr Meters - WM Systems LLC - Innovation in Smart IoT systems](#)