

# WM-E2S® modem – Quick Reference Guide

for Itron® ACE6000, ACE8000, SL7000 electricity meters

## CONNECTION

- 1 – Plastic enclosure and its top cover
- 2 – PCB (mainboard)
- 3 – Fastener points (fixation lugs)
- 4 – Cover holder ear (loose to open the top cover)
- 5 – Antenna connector (50 Ohm) – SMA / FME antenna connector (by order)
- 6 – Status LEDs: from top-to-bottom: LED3 (green), LED1 (blue), LED2 (red)
- 7 – Cover hinge
- 8 – Mini SIM-card holder (pull it to right and open up)
- 9 – Internal antenna connector (U.F.L. to SMA / FME)
- 10 – RJ45 connector (data connection and DC power supply)
- 11 – Jumper board (for RS232/RS485 mode selection with jumpers) / Crossboard for direct meter connection (by order)
- 12 – Supercapacitors (order option)
- 13 – External connector



## POWER SUPPLY AND ENVIRONMENTAL CONDITIONS

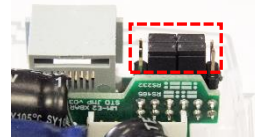
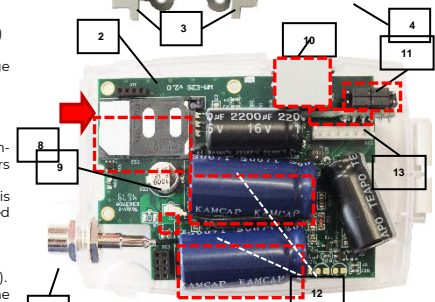
- Power supply: 8-16V DC (10V DC nominal), Consumption: max. 2W / 3.3W
- Power input: can be supplied by the meter, through the RJ45 connector
- Wireless communication: according to the selected module (order options)
- Ports: RJ45 connection: RS232 (300-115200 baud) / RS485
- Operation temperature: -40°C\* to +70°C, rel. 0-95% rel. humidity / Storage temperature: from -40°C to +85°C, rel. 0-95% rel. humidity

## MECHANICAL DATA / DESIGN

- Dimensions: 108 x 88 x 30mm, Weight: 73 gr
- Outfit: The modem has a transparent, IP21 protected, antistatic, non-conductive plastic housing. The enclosure can be fastened by the fixing ears under the meter's terminal cover.
- Optional DIN-rail fixation can be ordered (the fastener adapter unit is assembled to the back side of the enclosure by screws) therefore can be used as an external modem.

## 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 white ears of the enclosure's sides (4), and open up the top cover (1) at the antenna connector. The PCB will be free to touch.
- Step #4: Now the PCB will be positioned to left as it can be seen on the photo. Push the plastic SIM holder's cover (8) from left to right 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 cutted edge looks outside to the antenna. Push the SIM into the guiding rail, close the SIM holder, and push it back (8) from right to left direction, and close back.
- Step #6: Ensure that the antenna's internal black cable is connected onto the U.F.L. connector (9).
- Step #7: Close back the enclosure's top cover (1) by the fastener ears (4). You will hear a click sound.
- 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 USB/RS232 DONGLE adapter, and set up the jumper's position into RS232 mode. (The modem can be configured directly only in RS232 mode through cable, for RS485 mode configuration you should use an RS485 USB-Dongle adapter – order option.)
- Step #10: Configure the modem by the WM-E Term® software.
- Step #11: After the configuration set up the jumpers (11) again, close the required jumper pairs (hints can be found on the jumper crossboard) - RS232 mode: the internal jumpers are closed / RS485 mode: the winger pins are closed by the jumpers.
- Step #12: Connect the RJ45 cable back to the meter. (If the modem will be used through RS485 port, then you have to modify the jumpers to RS485 mode!)
- Step #13: The modem ← → Itron® meter connection can be initiated via RS232 or RS485 port. Therefore connect the grey RJ45 cable (14) to the RJ45 port (10).
- Step #14: The RJ45 cable's other side should be connected to the meter's RJ45 connector according to the meter type, and the readout port (RS232 or RS485). The modem will be powered by the meter immediately and it's operation will be started – which can be checked with LEDs.



## LED2

SIM status / SIM failure or PIN code failure

- Continuously lighting, until the device is not on the cellular network and RSSI cannot be detected (SIM is 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 current cellular network. The numbers of RSSI flashings are different on every network technology, according to the following:
  - on 2G: 1 flashing: RSSI >= -98 / 2 flashings: RSSI between -97 and -91 / 3 flashings: RSSI -90 to -65 / 4 flashings: RSSI > -64
  - on 3G: 1 flashing: RSSI >= -103 / 2 flashings: RSSI between -102 and -92 / 3 flashings: RSSI -91 to -65 / 4 flashings: RSSI > -64
  - on 4G LTE: 1 flashing: RSSI >= -122 / 2 flashings: RSSI between -121 to -107 / 3 flashings: RSSI -106 to -85 / 4 flashings: RSSI > -84
  - on LTE Cat.M1: 1 flashing: RSSI >= -126 / 2 flashings: RSSI between -125 and -116 / 3 flashings: RSSI -115 to -85 / 4 flashings: RSSI > -84
  - on LTE Cat. NB-IoT (Narrow Band): 1 flashing: RSSI >= -122 / 2 flashings: RSSI -121 to -107 / 3 flashings: RSSI between -106 and -85 / 4 flashings: RSSI > -84

Note, that during the firmware uploading the LEDs are operating as it is normal – there is no significant 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 operating as it was listed above.

## CONFIGURATION OF THE MODEM

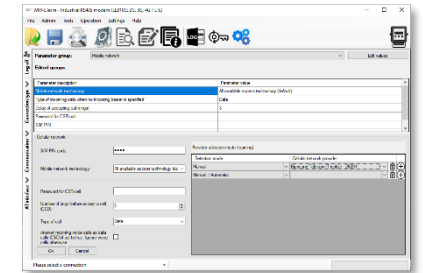
- The modem can be configured with the **WM-E Term®** software by setup of its parameters. This must be done before the operation and usage.
- During the configuration process, the RJ45 (5) connector must be removed from the meter connector and should be connected to the PC. During the PC connection the meter data cannot be received by the modem.
- Connect the modem to the computer by the RJ45 cable and the USB/RS232 DONGLE adapter. 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 a **Start menu / Control panel / Device Manager / Ports (COM and LTP)** at the **Properties: Bit/sec: 9600, Data bits: 8, Parity: None, Stopbits: 1, Bandwidth control: No**
- The configuration can be performed via CSData 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\\_80.zip](https://www.m2mserver.com/m2m-downloads/WM_ETerm_v1.3_80.zip) file. **Uncompress and start the wm-eterm.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 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. Push the **Save** button to make the connection profile.
- Step #5: At bottom left side of screen **choose the „Serial port“ connection type**.
- 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. (you have to request the status again by the icon).
- 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 with the modem – check the **Installation manual** for connection parameters!

## Parameter configuration

- Step #1: **Download** a WM-E Term sample configuration file, according to the Itron meter type. Choose the **File / Load** menu to load the file.
- RS232 or RS485 mode: <https://m2mserver.com/m2m-downloads/WM-E2S-STD-DEFAULT-CONFIG.zip>
- Step #2: On the screen at bottom, choose the **Advanced settings** button and choose the **Parameter group: APN**, then push to the **Edit values** button. Define the **APN server** and in case of necessary the **APN Username** and **APN password** fields, and push to the **OK** button.
- Step #3: Choose **M2M parameter group**, then push **Edit values** button. Add **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. Here you can choose the **Mobile technology** (e.g. **All available network technology** - which is recommended to select) or choose the **LTE to 2G (fallback)** for network connection. 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: transparent mode, Meter port baud rate: 9600, Data format: Fixed 8N1**. Then push to the **OK** button.
- Step #6: The RS485 settings can be performed in the **RS485 meter interface** parameter group. The **RS485 mode** can be setup here. **If you are using RS232 port then you have to disable this option at the settings!** 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 on RS485 port for meter readout, therefore after the configuration, 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 settings!

## 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-e2s/>



## 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 startup, 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 **General Meter Settings** parameter group. Further possible LED options can be found in the WM-E2S® modem's Installation Manual.

## OPERATION LED SIGNALS - IN CASE OF NORMAL OPERATION

LED	Events
LED3 E-meter status	<ul style="list-style-type: none"> <li>By general: the led is <b>inactive</b></li> <li>During communication: the led is <b>active (flashing)</b></li> </ul>
LED1 GSM / GPRS status	<ul style="list-style-type: none"> <li>During network registration: led is <b>active</b></li> <li>During network searching: <b>blinking once per second</b></li> <li>When connected to the network and the IP connection is okay: <b>blinking twice per second</b></li> <li>When the mobile network access technology was changed: <b>quick flashing will be released: 2G → 2 flashing per second / 3G → 3 flashing per second / 4G → 4 flashing per second</b></li> <li>If there is no available cellular network detected: the led will be <b>blank</b></li> <li>During the CSD call and IP data forwarding, the LED is <b>lighting continuously</b></li> </ul>