



## IoT System WM-E1S Modem User Guide

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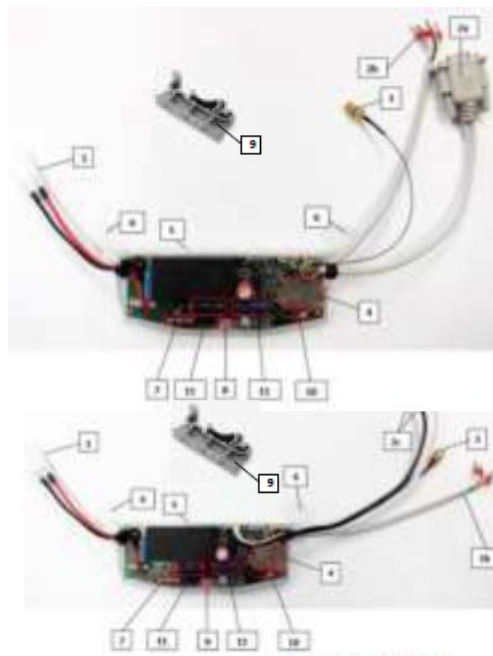
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**IoT System WM-E1S Modem**



## CONNECTION



1. Mains connector (pigtail connector, for the AC power of the meter)
2. RS232 connector (DSUB-9 or DSUB-25 / RJ12 / RJ45) 2b – RS485 connector (2-pin or 4-pin – order option, wire with sleeve – by option: RJ12 / RJ45) 2 digital input connector (4-pins)
3. Antenna connector (SMA-M, 50 Ohm)
4. SIM card slot (push-insert, 2FF type)
5. Plastic holder (lower plastic case fixation to the upper plastic case)
6. Plastic hooks (for mounting the modem, into the electricity meter, under the terminal cover)
7. Status LEDs
8. Fixation screw of top modem enclosure
9. DIN-rail adapter (order option)
10. U.FL antenna connector
11. Supercapacitors (order option)

## POWER SUPPLY AND ENVIRONMENTAL CONDITIONS



- Power voltage: ~100-230V AC +15%/-15% , 50-60Hz +/- 5%
- AC power supplied by the meter (pigtail connector or ferrule connector / 2-pins) / Optional DC power (order option) can be connected: 8...28VDC
- Surge withstand: 4kV (peak), 1,2/50µs, line to line 2Ω / 6kV (peak), 1,2/50µs, line to earth (ground) 2Ω / 12kV, Rsource = 40Ω (1,2/50µs, Impulse 1 min) / Dielectric test: 4kV, 1 min, 50Hz
- Supercapacitor option (for LastGASP notification of power outages)
- Power consumption: Max: 0.15A@230V / DC max 5W (peak)
- Wireless communication: according to the selected cellular module (order options)
- Ports:
  - 2a: RS232 (DSUB-9 / DSUB-25 / RJ12 / RJ45 connector) – order options
  - 2b: RS485 (2-wire/4-wire connectors or RJ12 / RJ45) – order options
  - 2c: 2 digital input connector (for input monitoring, sabotage detection)
- Operation temperature: from -25°C to +70°C at 95% rel.humidity(in case of TLS: from -20°C to +70°C) / Storage temperature: from -40°C to +80°C at 95% rel.humidity

## MECHANICAL DATA / DESIGN

- Dimensions / Weight: 162 x 66 x 30mm / 98-130gr (according to expansion board and cable outfit)
- Outfit: IP21 plastic transparent casing, mountable into the meter enclosure
- Optional DIN-rail mounting clips
- You can use the modem with 2 data cables at the same time from these order options: RS232 / RS485 / 2 Digital Inputs

## 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 AC connector from the meter. (The power source will be removed.)
- 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 it is necessary, the SIM card can be easily removed by pressing the card again, causing the card to be ejected from the tray.
- Step #4: Install the modem enclosure (5) and fasten near to the meter – or mount to the wall in a fixed position. You can insert the device into the internal mounting points of the meter – under the meter terminal cover – and attach it to the meter terminal cover according to the meter's user guide. For an outdoor installation, install the modem on a 35mm DIN rail (K)by using a DIN rail adapter (9) – order option) or fixing/glue the DIN adapter on the modem casing back / bottom side and place near to the meter.

- Step #5: Mount an external magnetic base or stick LTE antenna to the antenna connector (3).
- Step #6: Connect the modem to your computer with the RS232 cable (2/2a) and use an RS232-USB converter (for RJ12 connector outfit use an RJ12-USB adapter).
- Step #7: Connect the modem's AC power connector (1) – 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 via RS232 port PC connection. (For further details see the next chapter).
- Step #9: After completing the configuration, remove the RS232 cable (or RJ12 cable) – labeled with „2” or „2a” – from USB adapter.
- Step #10: Disconnect the modem AC power connector (1) from the meter (or power source). The modem will be shutting down.
- Step #11: Make a data connection between the modem meter on the interface you want to use (port nr. „2” or „2a” – RS232 data connection). If the modem has RS485 port, then make data connection between the modem meter by RS485 (2b) connected cable.
- Step #12: If the modem has 2 digital input wires, then connect external devices – to be monitored – to the 2 digital input interface (2c) cables. You can also use it for sabotage. The black wires are related for input nr. #1, white wires are related for input nr. #2.
- Step #13: Connect back the modem's AC power connector (1) – wire socket connection or “pigtail” connector depending on the version – to the meter's power input (for 100-230V AC). The modem will be powered by the meter and the modem will starting its operation and the LED signals are signing the current activity. Place back the terminal cover of the meter and secure with the screws.

## **OPERATION LED SIGNALS**

LED identifier	Events
<b>LED1</b> <b>GSM / GPS status</b>	<ul style="list-style-type: none"> <li>· If there is a SIM and PIN code ok, the LED will turn on</li> <li>· If there is no SIM or the SIM PIN is incorrect, the LED flashes every 1 second.</li> <li>· If there is no SIM, the LED flashes every 1 second.</li> <li>· RSSI flashes the LED according to the field strength value (1 flash lasts for 1 second, followed by a pause):  ■ RSSI ≤ -98 1 flashing ■ RSSI &gt; -98 and ≤ -83 2 flashing ■ RSSI &gt; -83 and ≤ -68 3 flashes ■ RSSI &gt; -68 4 flashes </li> </ul>
<b>LED 3</b> <b>SIM status / SIM failure or PIN failure</b>	<ul style="list-style-type: none"> <li>· During network registration: led is active</li> <li>· During network search: blinking once per second</li> <li>· When connected to the network and the IP connection is okay: blinking twice per second</li> <li>· When the mobile network access technology was changed: quick flashing will be relied:  ■ 2G 2 flashing per second ■ 3G 3 flashing per second ■ 4G LTE 4 flashing per second </li> <li>· If no network is detected: the led will be blank</li> <li>· During the CSD call and IP data transmitting the LED is lighting continuously</li> </ul>
<b>LED2</b> <b>E-meter status</b>	<ul style="list-style-type: none"> <li>· During the transparent meter communication: twice per second.</li> <li>· At finish of the transparent communication: led is blank.</li> <li>· According the IEC meter status: the LED will be active.</li> <li>· In case of configuring the Multi Utility mode: led will be active or blank.</li> </ul>



Color	Adaptation status	Step	Meaning	Modem RS485 port connector code
Black	Black	00	Receiving data	Change 100
Red	Red	01	Receiving data	Power 20
Yellow	Yellow	10	Receiving data	Power 40
Green	Green	11	Receiving data	Power 60

Note, that 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-E1S® modem's Installation Manual.

## 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.

- Connect the modem to the computer by its RS232 cable and the RS232-USB converter.
- 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, Bandwidth control: No

The configuration can be performed via CSD data call or TCP connection if the APN is already configured. Read Installation manual for CSD settings.)

## 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\\_71.zip](https://www.m2mserver.com/m2m-downloads/WM-ETerm_v1_3_71.zip) file. Uncompress and start the wm eterm.exe file.
- Step #2: Push the Login button and choose the WM-E1S 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 Save button to make a 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. (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.

## Parameter configuration

- Step #1: Download a WM-E Term sample configuration file [https://www.m2mserver.com/m2m-downloads/WM-E1S\\_STD\\_v2422\\_default.zip](https://www.m2mserver.com/m2m-downloads/WM-E1S_STD_v2422_default.zip) and uncompress the file. Then choose the File / Load menu to load the sample configuration file. Edit parameter settings by following these steps.
- 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 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.
- 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.

## Further setting options

- The modem handling can be refined at the Watchdog parameter group. Configured parameters can be saved to your PC in 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-e1s/>

## Documents / Resources



[IoT System WM-E1S Modem](#) [pdf] User Guide  
WM-E1S Modem, WM-E1S, Modem

## References

- <sup>M2M</sup> [WM-E1S Modem for Honeywell, Elster Meters - WM Systems LLC - M2M / IoT Communication Solutions](#)

Manuals+,