

# User manual for WM-E2S<sup>®</sup> electricity metering modems



Rev: 2.7.5.2

2025-04-16

# Document specifications

This documentation was made for presenting the installation and configuration steps of the **WM-E2S**<sup>®</sup> (Itron<sup>®</sup> meter compatible) energy metering modem.

<b>Document Version:</b>	<b>REV 2.75.2</b>
<b>Hardware Type/Version:</b>	<b>WM-E2S<sup>®</sup> modems for the ITRON ACE6000, ACE8000, EM600 (E620), SL7000 electricity meters</b>
<b>Hardware Version:</b>	<b>V 2.xx / V 3.xx / V 5.xx</b>
<b>Firmware Version:</b>	<b>for v2 version Telit Modem: V 2.4.43.11 / V 2.5.60 TLS for v5 version Quectel Modem: V 5.1.58 / V 5.1.58 TLS</b>
<b>WM-E Term<sup>®</sup> config. software version:</b>	<b>V 1.4</b>
<b>Pages:</b>	<b>36</b>
<b>Status:</b>	<b>Final</b>
<b>Created:</b>	<b>12-09-2019</b>
<b>Last Modified:</b>	<b>16-04-2025</b>

# Chapter 1. Introduction

The **WM-E2S**<sup>®</sup> modem is suitable for remote reading of electricity meters on LTE-based cellular networks.

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

## Wireless communication

The 4G LTE version has 2G fallback feature (or 3G/2G fallback for request). Therefore, in case of outage or inaccessibility of the 4G network it is communicating further on the 2G (or 3G) network.

Some LTE Cat.M / Cat.NB versions also having 2G “fallback” feature.

The modem can be also configured to GSM-CSD connection to initiate the CSD data calls.

The modem includes a removable SIM card and it has independent operation from mobile service providers.

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

The communication module is a part of the Smart Metering concept. The device provides a SIM-card independent- and mobile operator independent solution.

## Design and installation

This modem was especially developed for 3-phase **Itrón**<sup>®</sup> **ACE6000**, **ACE8000**, **EM600 (E620)** and **SL7000** energy meters, 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. The modem can be snapped into the terminal cover of the meter.

The device can be also installed as an external modem – due an optional 35mm DIN-rail adapter (order option) - which allows to fix/mount the device.

## Operation properties, features

The modem is suitable for reading the meter’s actual and stored consumption values, access the recorded event log, read the load profile data, and read or modify the



parameter set of the meter - remotely. The date readout from the meter takes place in "PULL" mode, when the modem provides transparent communication between the meter and the electricity provider's measurement center (HES).

Data is sent via the mobile network corresponding to the selected module.

The modem can be accessed remotely through the cellular network (by the Telit® module) and it is able to send data on the Internet by using an APN.

### **Connection options**

The interface connection can be via:

- Serial RS232 port (RJ45)
- or
- RS485 port (RJ45)

### **Power source**

The device can be powered from DC power (8-16V DC) of the meter's RJ45 cable connection (10V DC).

### **Supercapacitor**

The device can be equipped with internal supercapacitor part (order option), which prevent the intermittent power cuts also help decrease power peaks. This enables to keep the module in operation during small power outages.

After a few minutes of charging, the supercapacitor becomes capable of normal operation and even frequent data transmission of a few minutes.

After the supercapacitor exhausting, it must be charged and the modem can be automatically started after this and able to send data again.

The modem can also be ordered in a version without supercapacitor.

### **Configuration**

The modem is configurable via TCP/UDP 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).

All settings can be configured with our WM-E Term® administration software. The configuration is possible by one device or for a group of devices.

The WM-E Term® tool is password protected and user management is also possible. The configuration tool requires Windows® platform to be executed, and it is available in English, German, French, Spain, Czech and Hungarian language as well.

### **Firmware refresh**

The WM-E Term® also provides safe firmware change for one or group of devices – by locally or remotely.

### **Security**

The product's firmware is encrypted and prevented against to upload firmware or data from other devices. The modem cannot be upgraded by any other 3rd party firmware – its safe.

The control port of the modem is encrypted by AES - optional. TLS protocol firmware is also available (request must be indicated before ordering).

The external flash- and the internal flash content of the device are encrypted.

### **Status and notification**

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

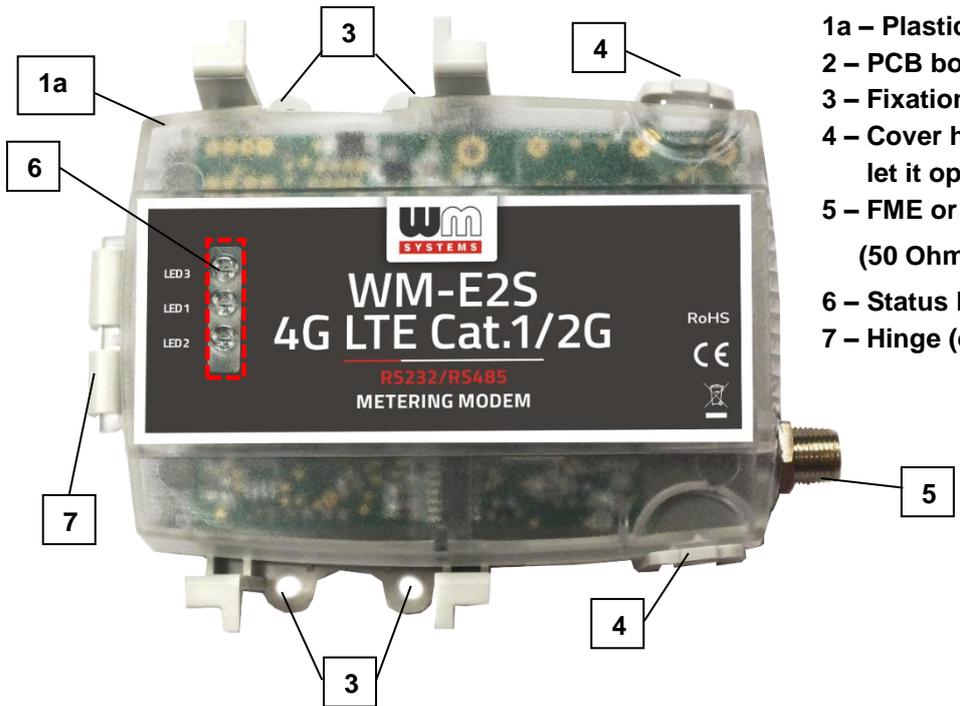
By the configured features, the device is able to send SMS alarm notification, Last Gasp notification – depending on the used cellular network and mobile operators (if the SMS notification is not disallowed on the network, then it can be used).

### **Certificate**

According to the CE certification, the modem complies with the Radio Equipment Directive - ReD – standard 2014/53/EU. The product is RoHS and CE certified.

# Chapter 2. Connections

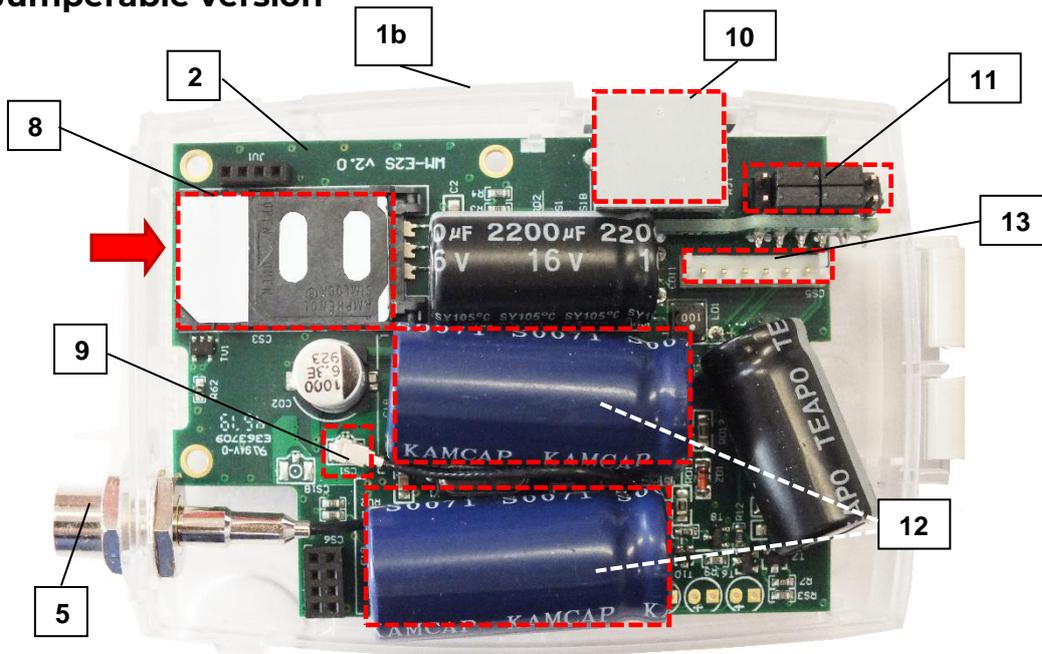
## 2.1 External outfit



- 1a – Plastic transparent top cover
- 2 – PCB board
- 3 – Fixation holes
- 4 – Cover holders (loosen them to let it open up the cover)
- 5 – FME or SMA antenna connector (50 Ohm) – order option
- 6 – Status LEDs
- 7 – Hinge (of top cover)

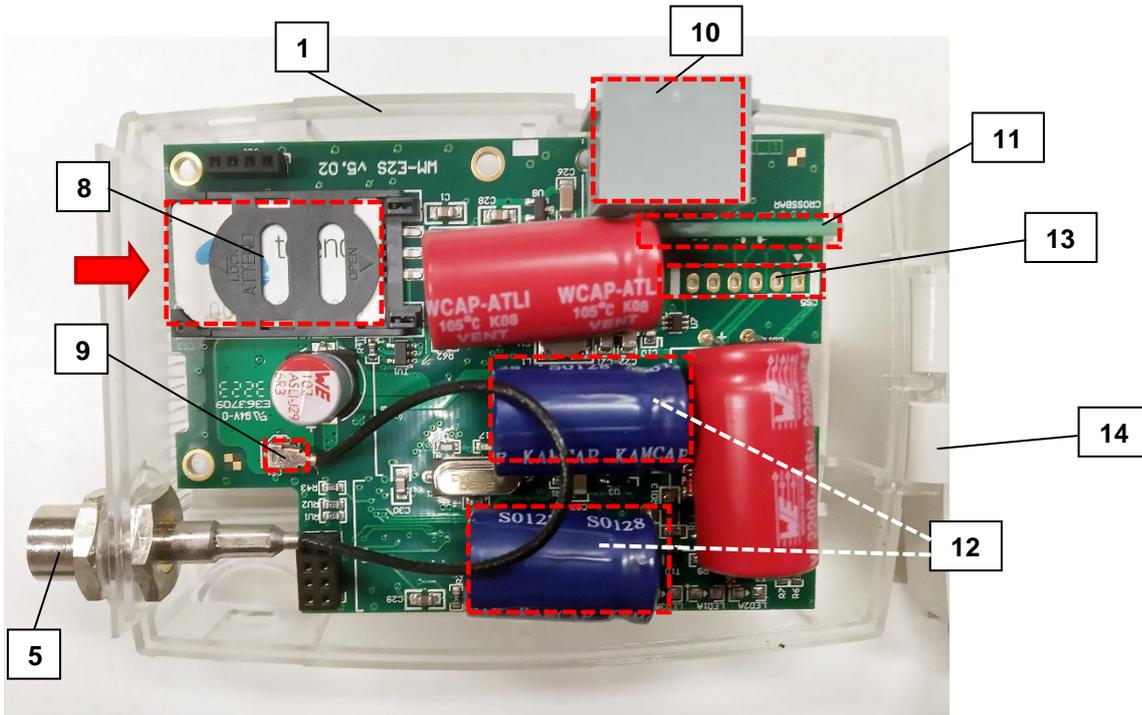
## 2.2 Internal connections

### 2.2.1 Jumperable version



- 1b – Plastic transparent bottom cover part (white)
- 8 – SIM card slot (push right & spin up)
- 9 – Internal antenna wire (with U.LF – FME or SMA connection)
- 10 – RJ45 connector (data and DC power)
- 11 – Jumper board (for RS232 or RS485 mode selection – with jumpers - according to the meter / cable connection)
- 12 – Supercapacitors (presence is order option)
- 13 – External connector (do not use!)

## 2.2.2 Jumperless version



1b – Plastic transparent bottom cover part (white)

8 – SIM card slot (push left and spin up)

9 – Internal antenna wire (with U.LF – SMA / FME connection)

10 – RJ45 connector (data and DC power)

11 – Jumper crossboard (for the proper meter communication / compatible cable pinout)

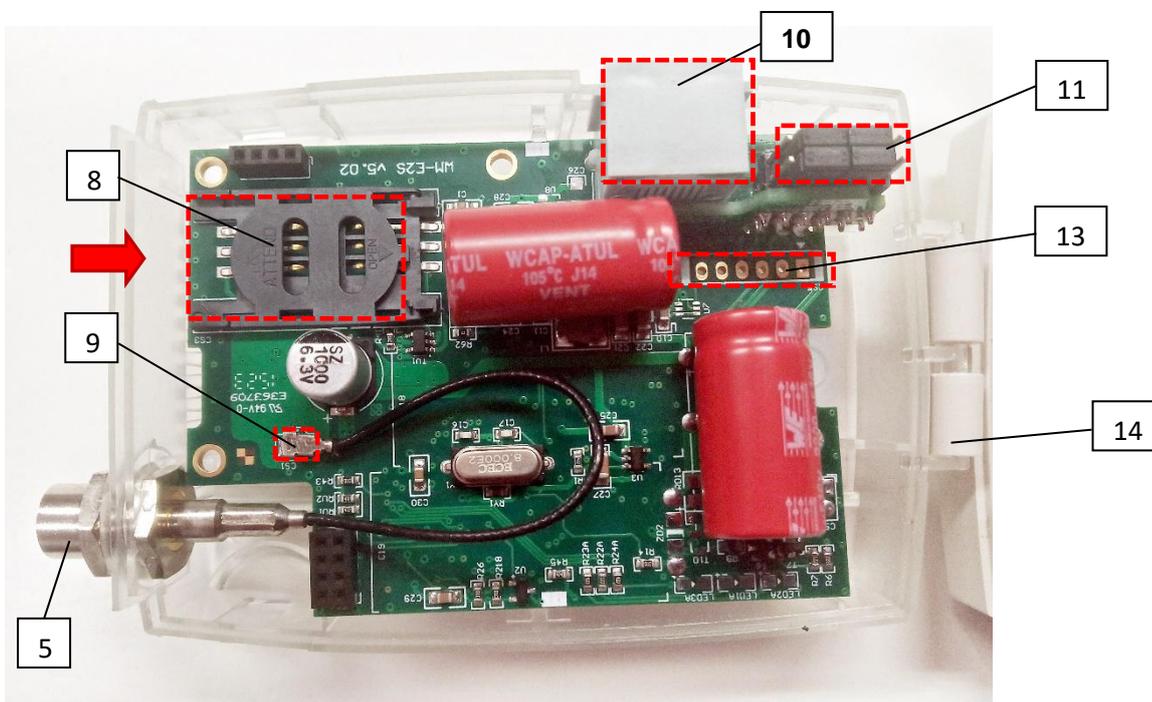
12 – Supercapacitor parts

13 – External connector (do not use!)

14 – Holder of the top cover

(part of modem enclosure)

## 2.2.3 Modem without supercapacitor



## 2.3 Jumper version – port mode choose

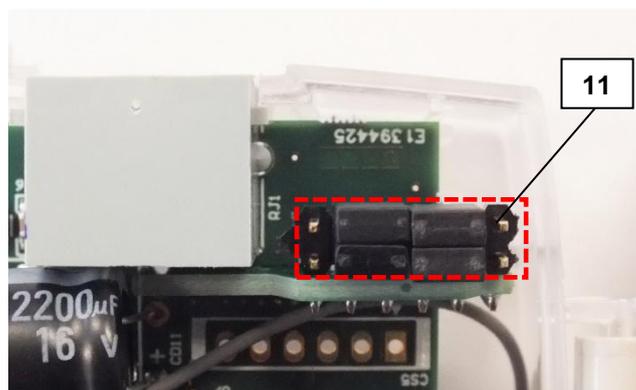
The modem can be ordered in a version with or without a jumper. The advantage of the jumperable version is that the RS232 or RS485 mode can be free to set by the requirements. While the jumpreless version provides a fixed / non-changeable connection – which must be selected at ordering - according to the required meter type - i.e. a fixed RS232 or RS485 connection should be chosen for the exact meter type. (To choose the right model and pinout, contact our Sales!)

The jumperable version is delivered pre-jumpered, but it may be necessary to use another method to connect the electric consumption meter. Therefore, the RS232/RS485 data connection settings of the modem must be checked and, if necessary, jumpered before use, by short-circuiting the corresponding pins of the jumper panel (11) next to the RJ45 connector (using the help shown on the jumper panel) - perform the jumpering.

### RS232 mode selection

All the 4 jumpers are located on the inner two lines of pins and the bottom line pins are free (as it can be seen in the photo).

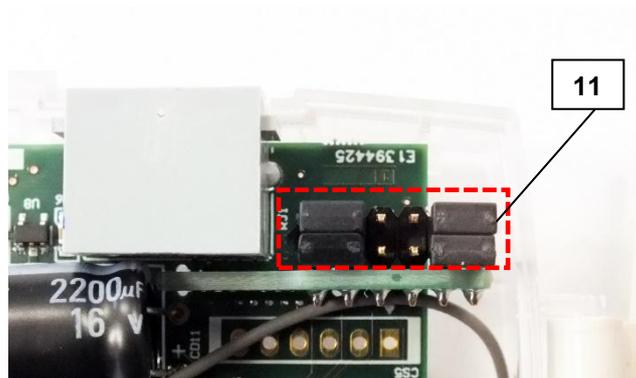
The modem is configured to RS232 mode.  
Further data connection settings can be initiated by the WM-E Term® software.



### RS485 mode selection

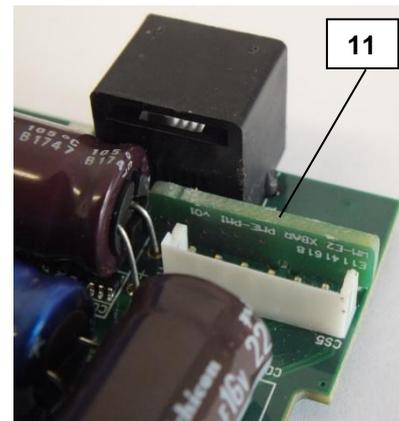
All the 4 jumpers are located on the two sides, in two lines of pins and the top line pins are free. The jumpers must be used as it is shown in the picture.

The modem is configured to RS485 mode.  
Further data connection settings can be initiated by the WM-E Term® software.



## 2.4 Jumperless (crossboard) version

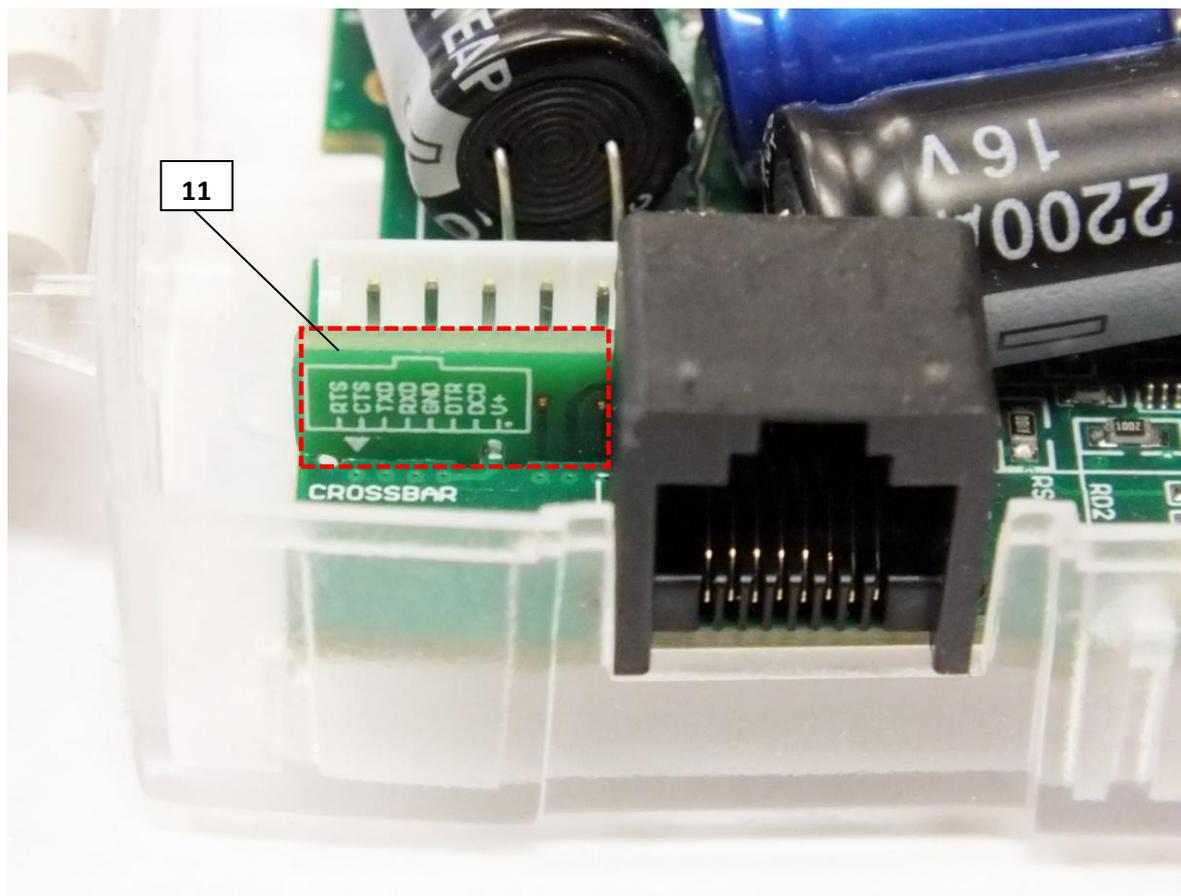
The modem can be ordered in jumperless version (crossboard soldered to the PCB, instead of a jumper board). It has a pre-defined connection according to the meter type. Therefore, there is no need for manual jumpering of the device, all settings can be done by the WM-E Term® configuration software directly – or even by remotely.



We can provide crossboard version in the modem for the following meter types:

- ITRON® ACE6000, ACE8000 meters
- ITROL® EM600 (E620) meters
- ITROL® SL7000 meters
- Landis+Gyr® ZMG416 meters
- PME-PMI® meters

or we can make for any other meter (ask our sales)



***Jumperless, crossboard version***

## Itron® meter - RS232 Connector pinout

RJ45	Pin 1	+ 10 V	Pin 5	TX-RS232
	Pin 2	RTS-RS232	Pin 6	GND
	Pin 3	CTS-RS232	Pin 7	DTR-RS232
	Pin 4	RX-RS232	Pin 8	DSR-RS232
Power Supply	10 Volt Power Supply			

## Itron® meter – RS485 Connector pinout

RJ45	Pin 1	+ 10 V	Pin 5	TxD_P-RS485
	Pin 2	RxD_N-RS485	Pin 6	GND
	Pin 3		Pin 7	TxD_N-RS485
	Pin 4	RxD_P-RS485	Pin 8	
Power Supply	10 Volt Power Supply			

## RS485 interface description

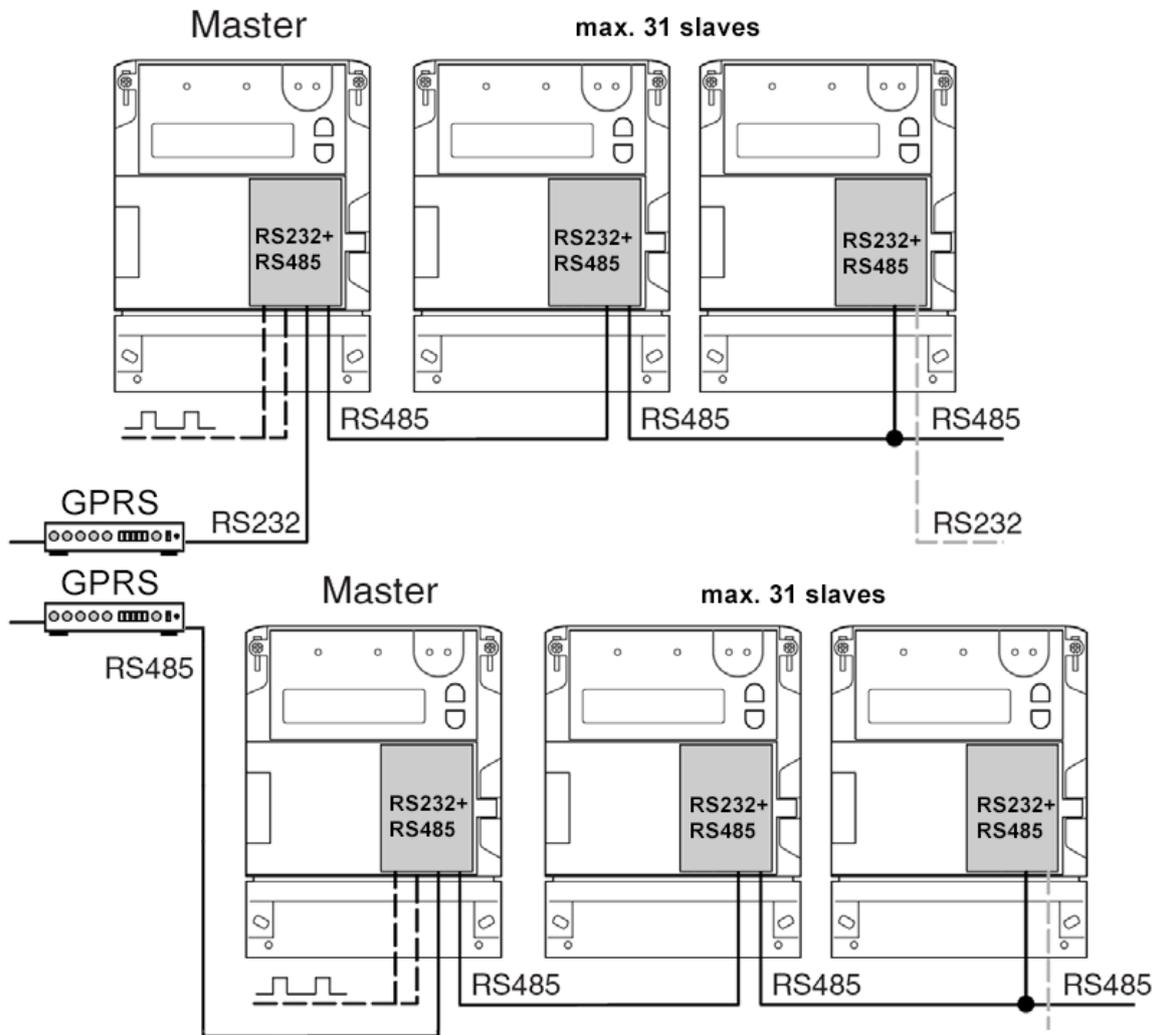
Symmetric, serial and asynchron 4-wired cable connection. The master in 2-wire cable mode, which can be configured by configuration software (provided) - Standard ISO-8482. Maximal 31 meter can be connected.

The maximal data transmitting speed rate is 9 600 bps. Maximal wire length:

<=550 m, max. 9,600 bps, max. 31 meter

<=1000 m, max. 9,600 bps, max. 15 meter

**Attention!** External power surge protection is needed to apply in case of using longer cabling. If the RS485 bus is not properly closed, this can disturb the normal/proper operation.



## 2.5 Installation steps

*Step #1:* Remove the top cover or the meter (18) by loosening its screws.

*Step #2:* Ensure that the modem is not powered – remove the RJ45 connection cable (14) from the meter side.

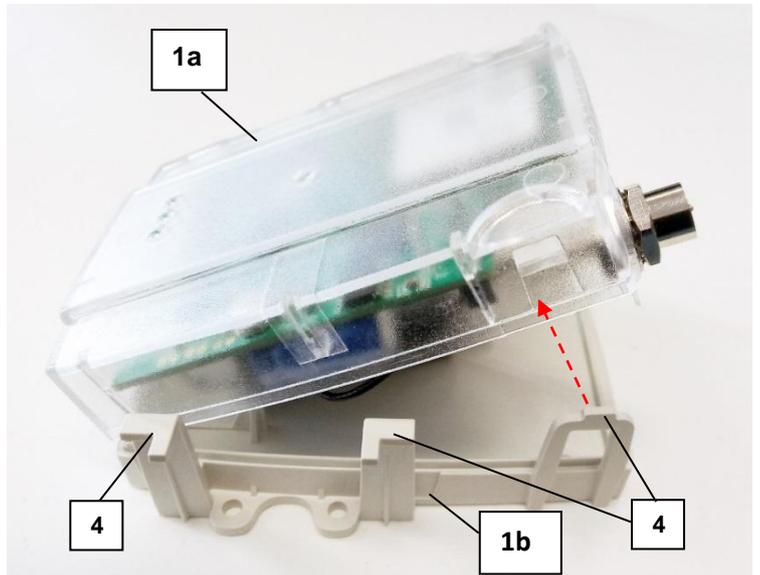
*Step #3:* Loosen the cover holders (4) of the plastic enclosure's white part (1b) at the edges, while pulling the plastic top cover (1a) - from right-down to left-up direction - from the antenna connector side, and open the cover, until the PCB (2) will be free to touch.



Step #4: Now the PCB (2) will be on the left side – see the photo.

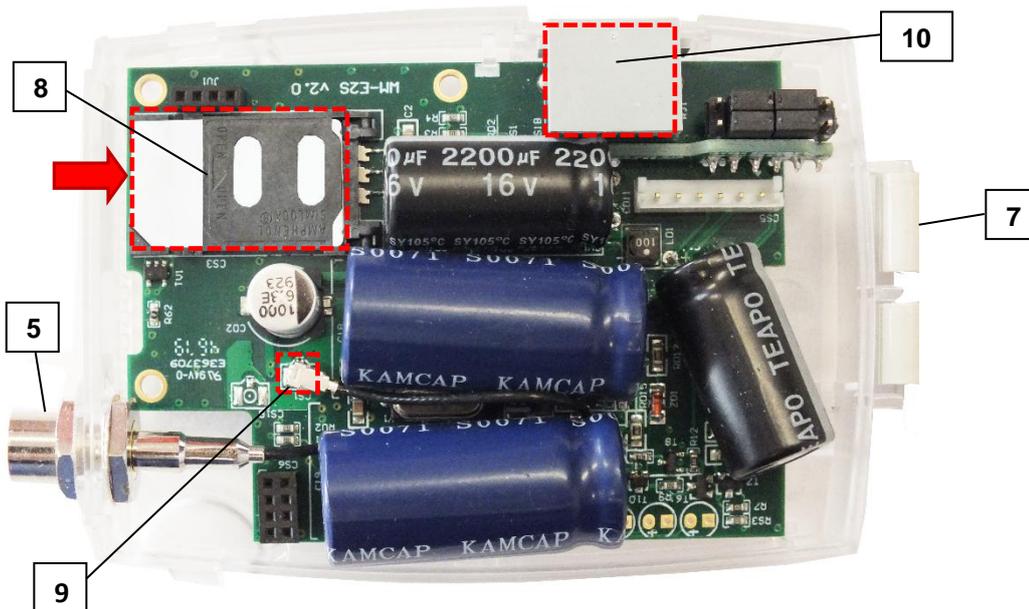
Step #5: Slide and open up the plastic SIM card holder (8) - push from left to right, and spin it up until release.

Step #6: Insert a replaceable and active SIM card (with APN) into the SIM-holder (8) - the chip looks down, the cutted edge of the SIM is oriented to outside – to the antenna connector).



Step #7: Close down the SIM holder (8) and push it from right to left until it is fastened.

Step #8: Ensure that the internal antenna U.FL - black - cable is connected to the U.FL connector (9)!



Step #9: Close back the PCB-side of the enclosure (transparent plastic) part (1a) to the white plastic part (1b) from left to right - according and taking patient of the proper closure at the ears (4) - until the cover will be fastened (you will hear a click sound when it is closed).

*Step #10:* The data connection between the modem and Itrón® meter is assured by the RS232/RS485 interface (RJ45, signed with nr. 10 on the figure), then it can be used with the grey RJ45 cable - provided.

*Step #11:* Place and insert the modem into the meter (under the meter's terminal cover) and fix the device to the meter – according to the meter's installation manual.

*(By optionally the modem can be ordered with DIN-rail adapter (which is fixed to the bottom side of the modem enclosure), therefore you can also use the modem as an external device).*

*Step #12:* Mount the FME (or SMA) antenna (15) to the antenna connector (5) and the communication antenna (15). (If you are using an SMA antenna, then you can use a SMA-FME converter adapter (17) to mount the SMA antenna to the FME connector).

*Step #13:* For configuring the modem, connect the device to the computer by an RJ45 cable and the USB/RS232 DONGLE adapter, and configure the jumper positions to RS232 modem.

***Important!*** *Note, that the modem directly can be configured only in RS232 mode. For RS485 mode configuration you should use an RS485 USB-Dongle (order option).*

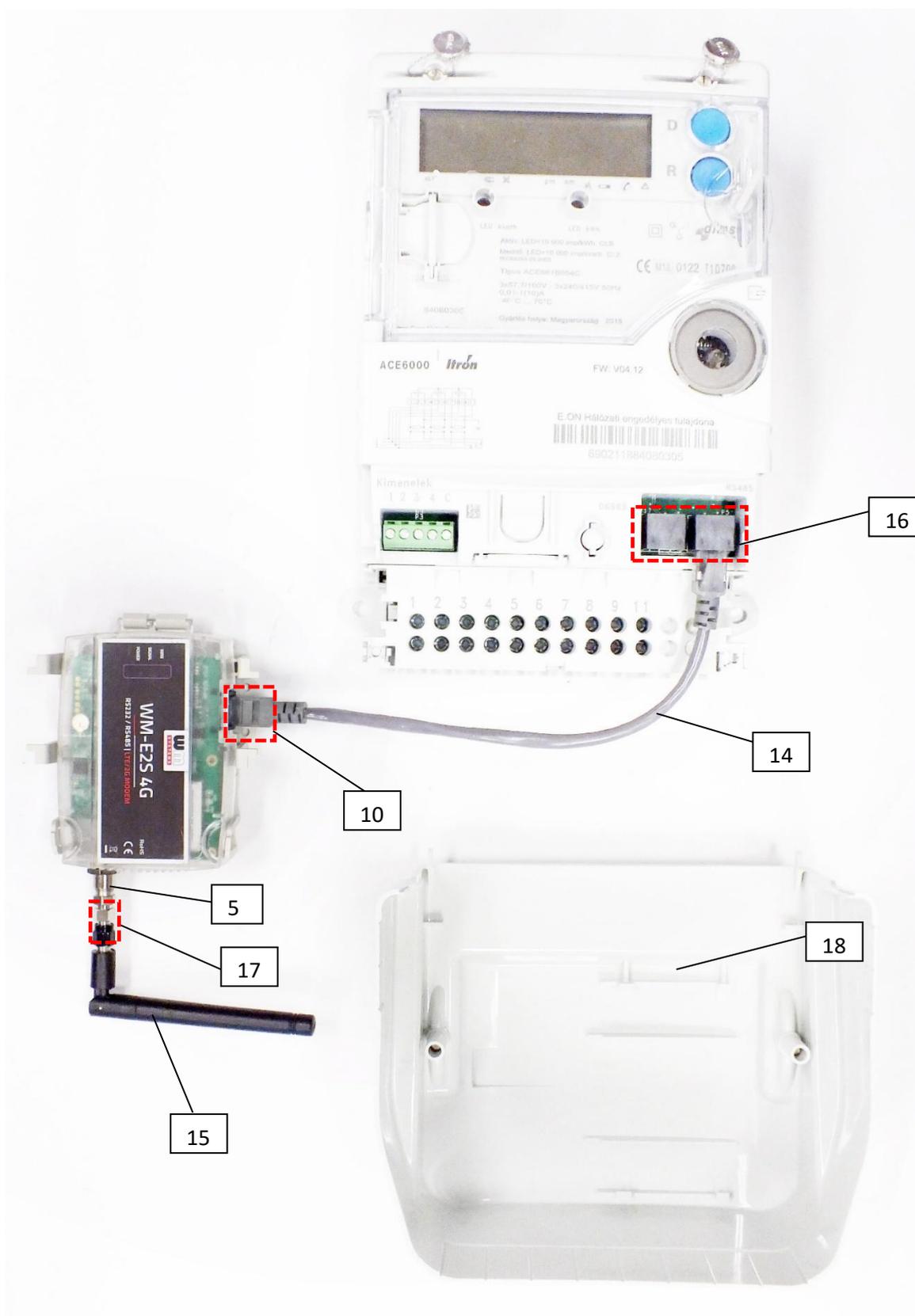
*Step #14:* Configure the modem with the WM-E Term® software.

*Step #15:* After the configuration, do the jumpering (11) according to the meter requirements. (Close the jumper pairs according the hints of the PCB):

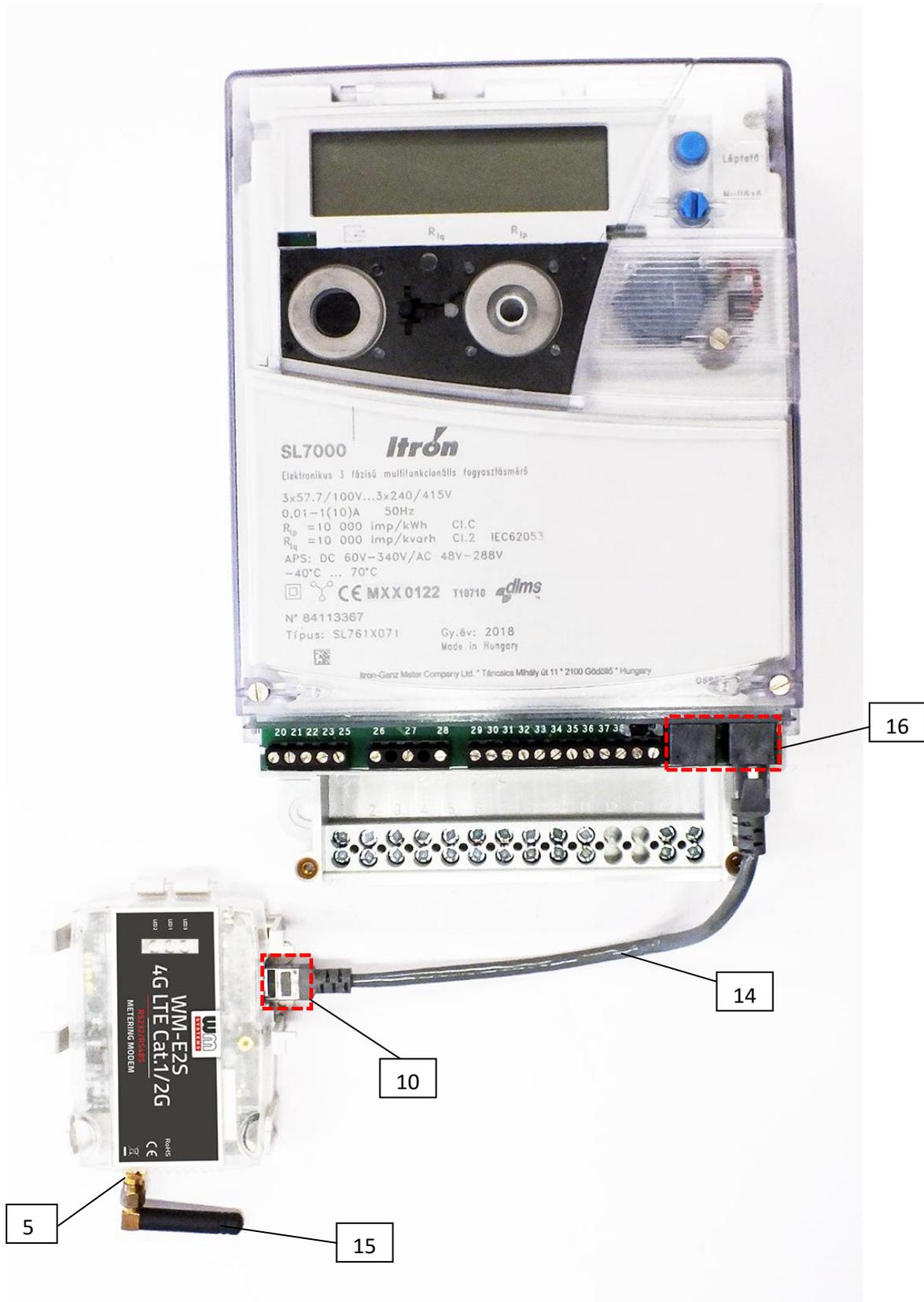
- RS232 mode: the jumpers are closed on the internal pin pairs, the edge pins are free
- RS485 mode: the edge pin pairs are closed by jumpers, the internal pins are free

*(If you are using a crossboard version instead of a jumper board, then the jumpering is not necessary to make.)*

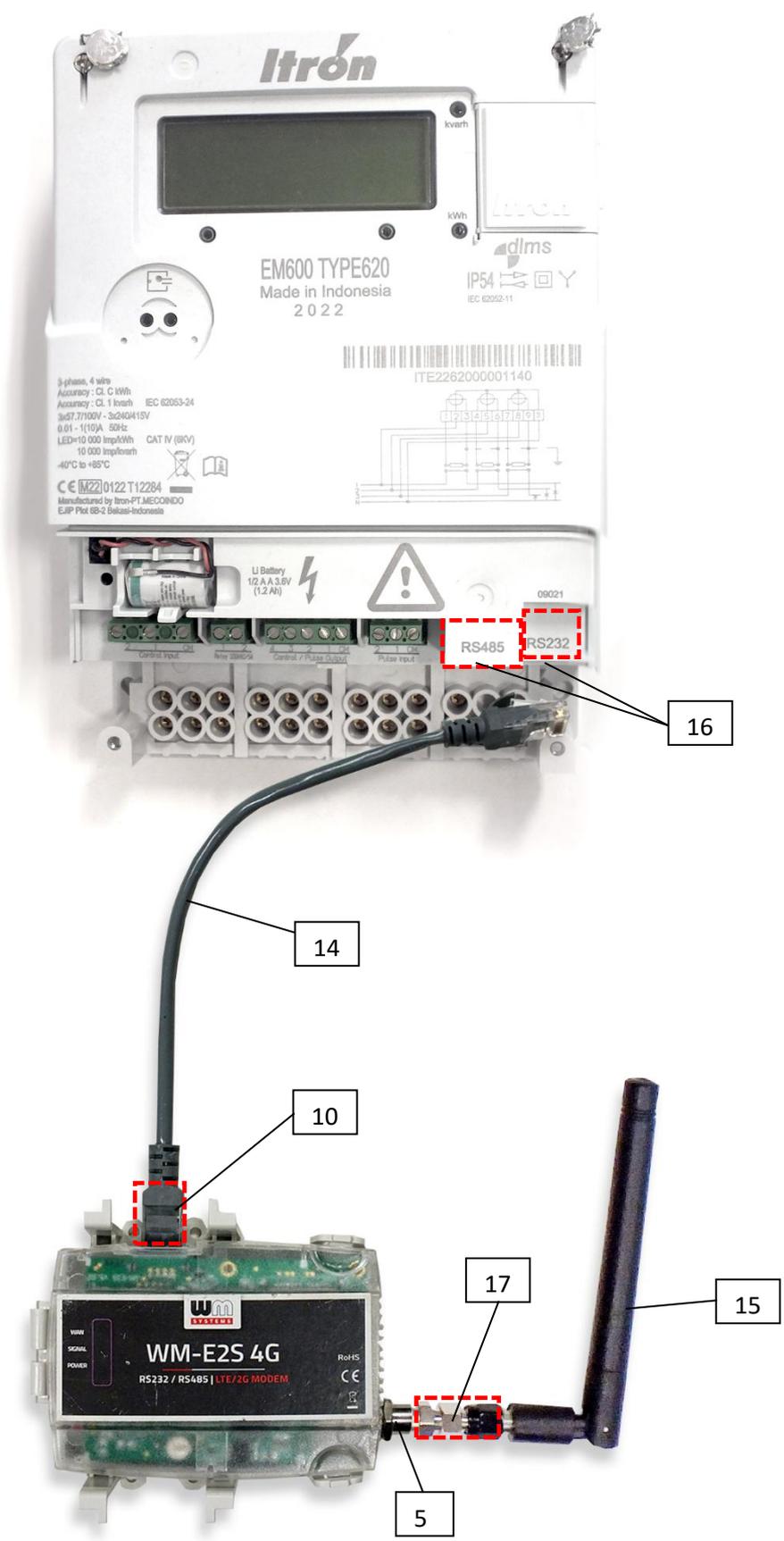
Step #16: Reconnect the RJ45 cable to the meter. (If the modem will be connected on RS485 port with the meter, then the jumper settings must be modified to RS485 mode!)



**ITRON ACE6000 ↔ WM-E2S modem connection**



**ITRON SL7000 ↔ WM-E2S modem connection**



**ITRON EM600 (E620) meter ↔ WM-E2S modem connection**

Step #17: The data connection between the modem and the Itron® meter can be initiated on the RS232 or RS485 interface by using 1:1 cable connection, which can be made by using grey RJ45 cable (14) of the modem – connect it to the RJ45 port (10).

Step #18: Connect the other side of the RJ45 cable to the meter’s RJ45 connector (16) according to the meter type, and readout port of the meter (RS232 or RS485). Then the modem will be powered by the meter. It begins its operation, check LED signals.

Step #19: Place back the meter’s terminal cover (18).

## 2.5 Status LED signals

If the WM-E2S® modem was not supplied by power source since a long time, it needs to be charged before the usage/installation. The charge takes about ~2-5 minutes if the supercapacitor was exhausted / discharged.

### **OPERATION LED SIGNALS - IN CASE OF CHARGING SUPERCAPACITORS**

LED	Description
<b>LED 3</b>	During the charging of the exhausted supercapacitors, only <b>green</b> upper LED will flashing quickly. Only this LED is active during the charge. Wait until the device will be fully charged.

**Important!** The LED number we’ve listed here are the same as can be found on the PCB LED title (as LED3 (**green**, top), LED1 (**blue**, middle), LED2 (**red**, bottom)).



At the first power on - during the charge – the **green** LED is flashing quickly. After a few minutes the LED will be blank, then will be flashing quickly again. When the **green** LED will be flashing slowly and the other LEDs will be lighting according to the NORMAL operation, then the modem will be charged completely and it will be ready for configuring and to operate.

## OPERATION LED SIGNALS – IN CASE OF NORMAL OPERATION

### Factory default LED signals:

In the case of charged supercapacitors, the following LED operation applies.

LED identifier	Events
<b>LED 3</b> E-METER status	<ul style="list-style-type: none"> <li>• <b>By general:</b> the <i>led is inactive</i></li> <li>• <b>During communication:</b> the <i>led is active (flashing)</i></li> </ul>
<b>LED 1</b> GSM / GPRS status	<ul style="list-style-type: none"> <li>• <b>During network registration:</b> led is <i>active</i></li> <li>• <b>During network searching:</b> <i>blinking once per second</i></li> <li>• When <b>connected to the network</b> and the <b>IP connection</b> is okay: <i>blinking twice per second</i></li> <li>• When the mobile <b>network</b> access technology was <b>changed:</b> <i>quick flashing will be relied:</i> <ul style="list-style-type: none"> <li>○ 2G → <b>2 flashing per second</b></li> <li>○ 3G → <b>3 flashing per second</b></li> <li>○ 4G LTE → <b>4 flashing per second</b></li> </ul> </li> <li>• If <b>there is no available cellular network</b> detected: the led will be <b>blank</b></li> <li>• <b>During the CSD call and IP data forwarding, the LED is lighting continuously</b></li> </ul>
<b>LED 2</b> SIM status / SIM or PIN failure)	<ul style="list-style-type: none"> <li>• Continuously lighting, until the device is not on the cellular network and RSSI cannot be detected (SIM okay)</li> <li>• When the <b>SIM PIN is okay:</b> led is <b>active</b></li> <li>• If there is <b>no SIM</b> detected or <b>SIM PIN is wrong:</b> <i>blinking once per second (slow flashing)</i></li> <li>• <b>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:</b> <ul style="list-style-type: none"> <li>○ <b>on 2G network:</b> <ul style="list-style-type: none"> <li>○ 1 flashing: RSSI &gt;= -98</li> <li>○ 2 flashings: RSSI between -97 and -91</li> <li>○ 3 flashings: RSSI - between 90 and -65</li> <li>○ 4 flashings: RSSI &gt; -64</li> </ul> </li> <li>○ <b>on 3G network:</b> <ul style="list-style-type: none"> <li>○ 1 flashing: RSSI &gt;= -103</li> <li>○ 2 flashings: RSSI between -102 and -92</li> <li>○ 3 flashings: RSSI - between 91 and -65</li> <li>○ 4 flashings: RSSI &gt; -64</li> </ul> </li> <li>○ <b>on 4G LTE network:</b> <ul style="list-style-type: none"> <li>○ 1 flashing: RSSI &gt;= -122</li> <li>○ 2 flashings: RSSI between -121 and -107</li> <li>○ 3 flashings: RSSI between -106 and -85</li> <li>○ 4 flashings: RSSI &gt; -84</li> </ul> </li> <li>○ <b>on LTE Cat.M1 network:</b> <ul style="list-style-type: none"> <li>○ 1 flashing: RSSI &gt;= -126</li> <li>○ 2 flashings: RSSI between -125 and -116</li> <li>○ 3 flashings: RSSI between -115 and -85</li> <li>○ 4 flashings: RSSI &gt; -84</li> </ul> </li> <li>○ <b>on LTE Cat. NB-IoT (Narrow Band) network:</b> <ul style="list-style-type: none"> <li>○ 1 flashing: RSSI &gt;= -122</li> <li>○ 2 flashings: RSSI between -121 and -107</li> <li>○ 3 flashings: RSSI between -106 and -85</li> <li>○ 4 flashings: RSSI &gt; -84</li> </ul> </li> </ul> </li> </ul>

Over the factory defaults, the operation and the sequence of the LED signals can be changed by the **WM-E Term**<sup>®</sup> configuration tool, in **Standard Meter Interface** parameter group.

There you can define one of the following functions of the leds (LED1..LED3) according the next list:

Selectable LED status (in the WM-E Term program)
Not used
GSM / GPRS status
SIM status (wrong PIN flashing slow or without SIM )
E-meter status
E-meter relay status (not usable here)
M-Bus status (not usable here)
Firmware status
Network status and access technology
Meter status with IEC polling
AMM (IEC) client state (not usable here)

LED status	Events
<b>E-meter relay status</b> – Status of the E-meter relay output (available only in case of WM-E3S CIR modem type)	<ul style="list-style-type: none"> <li>• General: “Ready” / stand-by – the led is flashing 1x per seconds.</li> <li>• In “Active” mode – at *relay switching it turns on the led (lighting). In “Normal” mode – by releasing the *relay it turns off the led (blank).</li> </ul>
<b>Firmware status</b>	<ul style="list-style-type: none"> <li>• When the modem firmware was started, the led will be turned on (lighting).</li> <li>• When the meter <math>\leftrightarrow</math> modem connection was built up then the led will be flashing 2x per seconds.</li> </ul>
<b>Network status and access technology</b>	<ul style="list-style-type: none"> <li>• Network registration: <i>the led is active (lighting).</i></li> <li>• During network searching: <i>the led is flashing 1x per seconds.</i></li> <li>• When it was connected to the network and the IP connection is okay: <i>the led is flashing 2x per seconds.</i></li> <li>• If the mobile access technology was changed – it will be signed by quick flashing: <ul style="list-style-type: none"> <li>○ 2G <math>\rightarrow</math> 2 flashing / seconds</li> <li>○ 3G <math>\rightarrow</math> 3 flashing / seconds</li> <li>○ 4G <math>\rightarrow</math> 4 flashing / seconds</li> </ul> </li> <li>• If there is no available network: <i>the led is inactive (blank)</i></li> </ul>
<b>Meter status with IEC polling</b> – Meter status during the IEC communication	<ul style="list-style-type: none"> <li>• When the modem <math>\leftrightarrow</math> meter starting the communication, <i>the led will be flashing 1x per seconds.</i></li> <li>• When the meter is answering to the modem during the communication, it will <i>turns on the led.</i></li> <li>• When the modem <math>\leftrightarrow</math> meter cannot communicate with each other, <i>the led will be turned off.</i></li> </ul>
<b>AMM (IEC) client state</b>	<ul style="list-style-type: none"> <li>• By general or in case of closing the modem <math>\leftrightarrow</math> EI client communication the <i>LED is turned off.</i></li> <li>• In case of building up the modem <math>\leftrightarrow</math> EI client** connection the <i>led is flashing shorty 1x per seconds (then 1 second of pause will be progressed between the flashings)</i></li> <li>• In case of EI client** login request attempt– <i>the led is flashung 1x per seconds.</i></li> <li>• When the connection was built up successfully between the EI client** <math>\leftrightarrow</math> modem– <i>the led is active (lighting).</i></li> </ul>

*\*The listed relay can switch the power source of the e-meter. it cannot be used for tariff switch!*

*\*\*The EI client is the transparent output TCP channel from the modem to the EI server*

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

In *Ready for Connection “ready” (stand-by) mode*, **the led is flashing once per seconds.**

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 three 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.

## **LED SIGNALING DURING FIRMWARE UPDATE**

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 FW installation all LEDs will be blank. Then the modem will be restarted automatically, and will be operating by the new firmware.

At starting the **LED3** will be flashing quickly by **green** for 15 seconds. The starting requires 2-3 minutes while the modem will be available on its interfaces.

Afterall, the LED will be operating ordinary as it is listed in the LED operation behaviour description.

## **2.6 LED operation during CSD call**

During the CSD call two operation option types can be used:

- a.) When the meter would be read out / configured in transparent mode
- b.) When modem configuration / firmware refresh is attempted to make

When the meter would be read out / configured in transparent mode:

- The GSM / GPRS status configured LED will be continuously lighting during the CSD call.
- The e-Meter status configured LED will be operating according the CSD call status by the following:
  - Will be flashing twice per seconds from the connection attempt until closing the connection
  - If the meter interface is not configured to 9600 baudrate, then it will be lighting continuously from the connection attempt until closing the connection
  - After the connection close the LED will be switched off

When modem configuration / firmware refresh is attempted to make

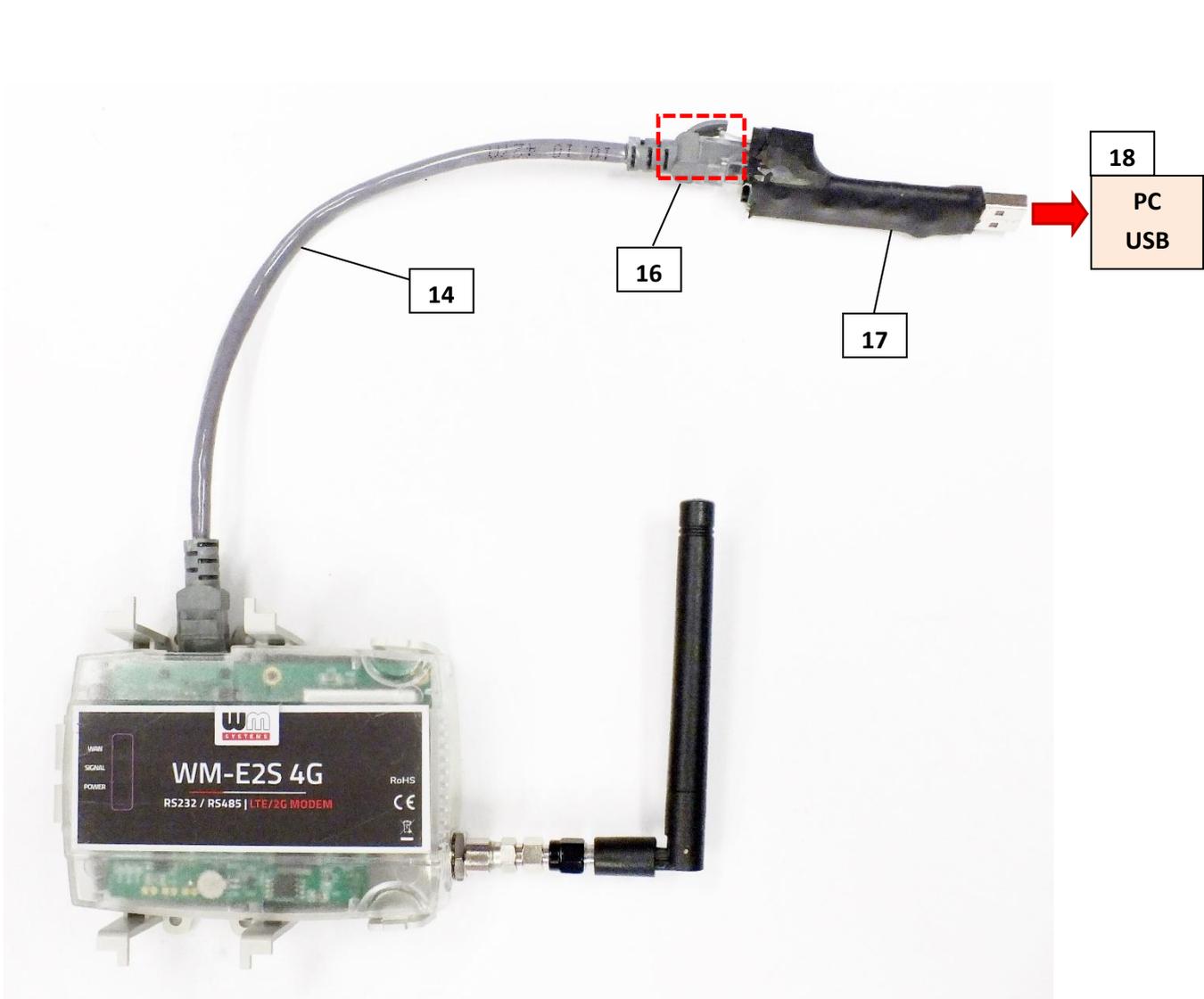
- The GSM / GPRS status configured LED will be continuously lighting during the CSD call.
- The other LEDs will not change their operation because of the CSD mode

# Chapter 3. Modem Configuration

## 3.1 Configuration

The modem is uploaded with default configuration, but before the first usage the current settings should be checked and the configuration should be updated (e.g. APN name, etc.). The WM-E Term<sup>®</sup> software is usable to perform the modem settings.

Before the configuration, you have to remove the meter ↔ modem RJ45 connection cable's (14) meter side (16) from the RS232/RS485 port of the meter. Connect the modem by the USB/RS232 DONGLE<sup>®</sup> adapter (17) to your computer's USB port by following the next hints.



**Important!** Note that until the configuration the modem is not connecting to the meter, therefore it cannot readout parameter values through the RJ45 interface during the configuration.

The configuration can be made by CSData call (by selecting a mobile access technology which uses 2G network). Or you can do it through mobile internet (TCP) connection – therefore you don't need to connect the modem to your PC.

**Important!** *During the configuration, the power supply of the modem is assured by this converter board, on USB connection. Some computers can be sensitive for USB current changes. In this case you should use an external power supply with special connection.*

For the serial cable connection configure COM port settings of the connected computer according to the modem serial port properties. In the Windows® it can be found in the **Start / Control Panel / Device Manager / Ports (COM and LTP)** menu Properties:

- *Baud: 9600*
- *Databits: 8*
- *Parity: No*
- *Stopbits: 1*
- *Bandwidth control: no*

### **Warning!**

If the COM port will not be visible after connecting the device to the computer, and you cannot find the COM port number in the Windows Device Manager, then you need to install the proper driver - *FTDI VCP* – to your computer, which can be downloaded from here:

<http://www.ftdichip.com/Drivers/VCP.htm>

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 be configured by using the WM-E Term® software through the RJ45 connection. For the successful operation of the communication module it is necessary to have appropriate signal strength.

If you want to readout the meter parameter values during the PC-modem connection, after the RJ45-configuration you made, then you should select a different configuration port to the meter as TCP/IP or Optical, etc.

For newer modem firmware versions it is mandatory to use the **Communication password** for the modem configuration. Ask your sales about the default password of your modem type! You can check the written password by the Show option at right. (Note that you can change the communication password of the modem anytime by

choosing the  icon from the menu.)

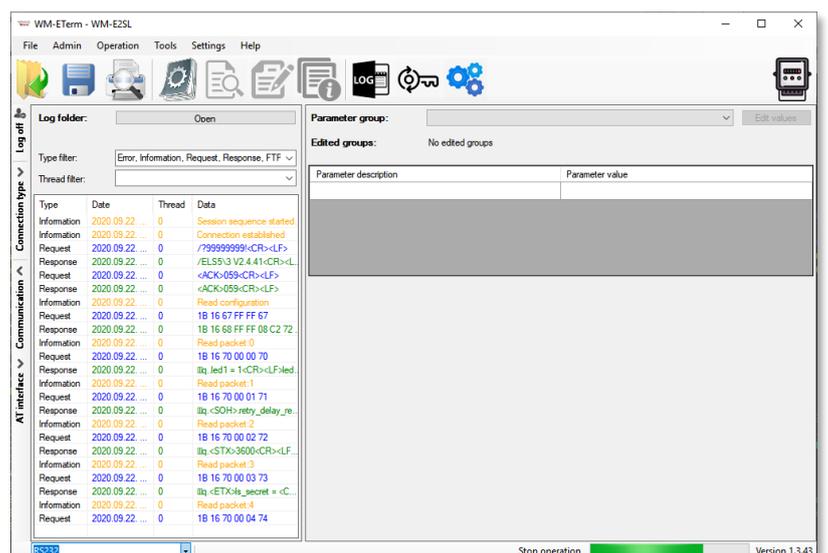
Over the parameter settings of meter, modem and communication, etc., you can also test the modem communication and execute AT-commands on the modem by the WM-E Term<sup>®</sup> configuration program - see *AT commands* description for the description useful commands.

### 3.2 Configuring the modem by WM-E Term<sup>®</sup>

The Microsoft .NET framework runtime environment is required on your computer. For modem configuration and testing you will need an APN/data package enabled, 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).

If the WM-E2S<sup>®</sup> modem was not supplied by power for a long time, it needs to be charged before usage. It takes about ~2-5 minutes to charge if it the supercapacitor was exhausted / discharged.



Download the WM-E Term® software to your computer by a browser from the following link: [https://www.m2mserver.com/m2m-downloads/WM\\_ETerm\\_v1\\_4.zip](https://www.m2mserver.com/m2m-downloads/WM_ETerm_v1_4.zip)

Extract the .zip file to e directory and execute the **WM-ETerm.exe** file.

The configuration software is supporting the usage of user accounts and the password change feature.

You can login to the software by a password. Read the **WM-E Term® User Manual** for further details!

WM-E term User Manual:

[https://www.m2mserver.com/m2m-downloads/WM-E-TERM\\_User\\_Manual\\_V1\\_97.pdf](https://www.m2mserver.com/m2m-downloads/WM-E-TERM_User_Manual_V1_97.pdf)

Basic configuration file for Itron meters – with RS232 or RS485 mode:

<https://m2mserver.com/m2m-downloads/WM-E2S-STD-DEFAULT-CONFIG.zip>

### 3.3 Parameter configuration

For first load the sample configuration file in the WM-E Term® software.

Then reconfigure the devices parameters – as cellular communication settings (APN, APN username, password and PIN code, network usage method, communication port - RS485 settings).

Afterall, you have to send the settings by the WM-E Term® software to upload to the modem.

Read the **WM-E Term® User Manual** for parameter description details!

Main settings:

1. Choose the **Parameter read**  icon to connect to readout the current settings of the modem.
2. Choose the **APN parameter group**, and push the **Edit settings** button. Add the *APN server name* value, if necessary give the *APN username* and *APN password* values and push the **OK** button.

3. Choose Then the **M2M parameter group**, and push the **Edit settings** button. At the *Transparent (IEC) meter readout port*, give the *PORT number*, by which you try to readout the meter. Add this *PORT number* to the *Configuration and firmware download*, which you want to use for remote parameterization of the modem / for the further firmware exchange.

4. If you have to use *SIM PIN* then choose the **Mobile network parameter group**, and add the **SIM PIN** to the field. Here you can change a **Frequency band** to **4G only** or **LTE to 2G** (for fallback feature), etc. You can also select here a dedicated mobile network provider (auto or manual). Push then the **OK** button.

5. For configuring the RS232 serial port and transparent settings, open the **Trans. / NTA** parameter group. Basic device settings are the **Multi utility mode: transparent mode**, **Meter port baud rate: from 300 to 115200 (or use the standard 9600)**, **Fixed 8N1** data format (by checking the box at the meter). Confirm the setting with the **OK** button.

6. For configuring the RS485 parameters, open the **RS485 meter interface parameter group**, configure the **RS485 mode** to the right value:

- **2-wire** – means half duplex 2-wire pinout
- **4-wire** – means full duplex 4-wire pinout
- **Disable** – RS485 will be used automatically (for modem versions which are having only RS232 cable, it is recommended to configure this mode).

*\*In case of firmware v2 this parameter is used automatically - controlled by the current firmware. Only in case of firmware v5 can be used the configured parameter setting.*

7. When you have finished, choose the **Parameter write**  icon to send the changed settings to the modem. The status of the configuration process can be seen at the bottom of the screen. At the end of the upload, the modem will be restarted and operating according to the new settings.

#### Further options

- To refine the module handling choose the **Watchdog parameter group**.
- Save the current last good configuration at the *File/Save* menu item. Later you

can distribute this setting (file) to another modem device by one click.

- Firmware refresh: choose the **Devices** menu, **Single Firmware refresh** item by choosing the appropriate firmware file (with **.dwl** file extension).

*Attention! Ask our sales about the available newest firmware!*

### 3.4 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*.

### 3.5 Data control direction (DCD) feature

In case of using the Itrón® SL7000 meters or other Itrón® meters (through RS232 connection), you can use the **DCD** feature to declare the direction of the data control – according the following parameter setting.

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)

### 3.6 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.*

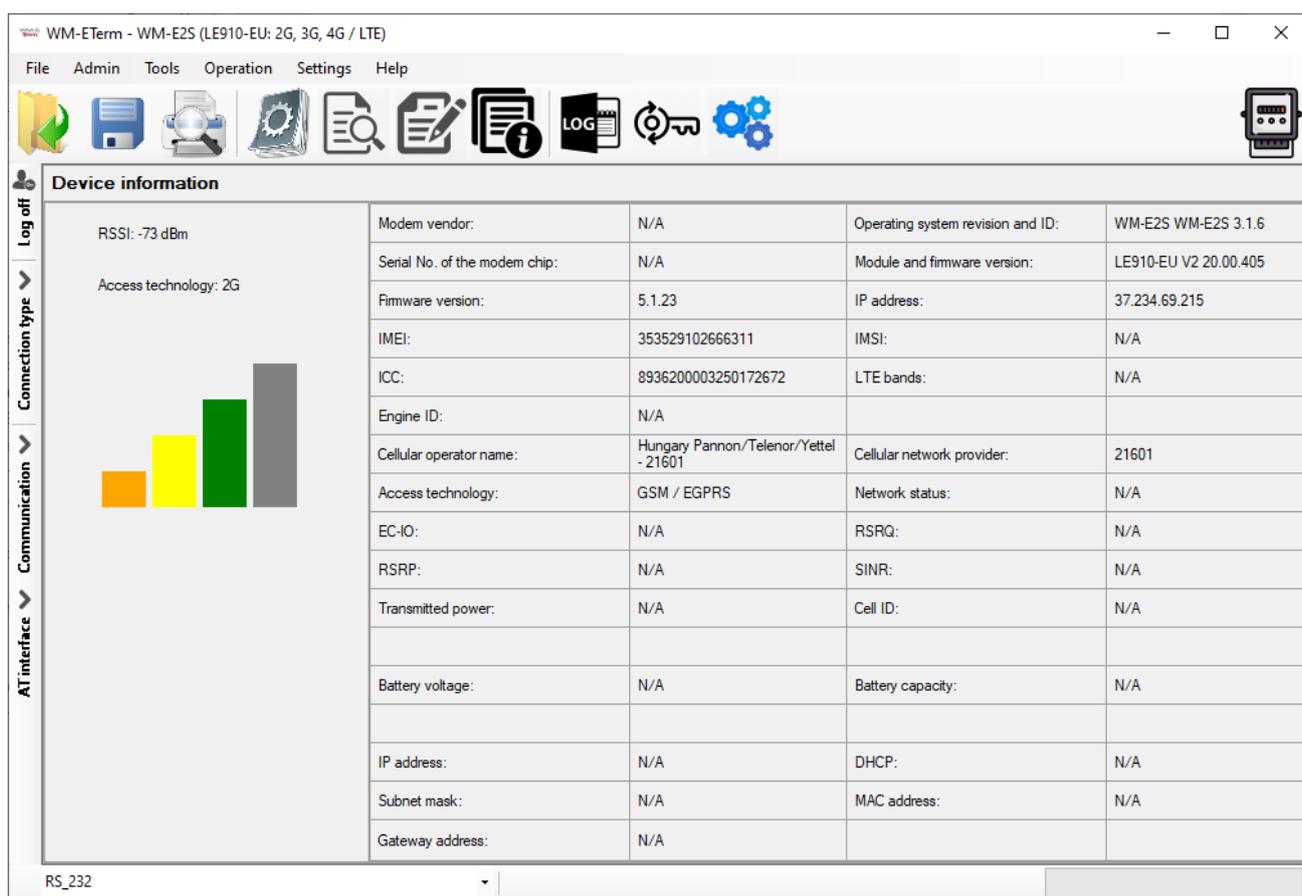
*Therefore under no circumstances should you set this value lower than what your mobile service provider recommends. (e.g. there are mobile network providers that limit the number of times a modem can logon to the network in a given time).*

### 3.7 Signal strength

Check signal strength of the cellular network in the *WM-E Term*<sup>®</sup> software **Device Information** menu or by using the  icon. At the end of the process, the current status information will be updated.

Check RSSI value (at least it should be yellow – which means average signal strength – or better if it is green).

You can change the antenna position while you will not receive better dBm values (the status must be readout again for refresh).



Modem vendor:	N/A	Operating system revision and ID:	WM-E2S WM-E2S 3.1.6
Serial No. of the modem chip:	N/A	Module and firmware version:	LE910-EU V2 20.00.405
Firmware version:	5.1.23	IP address:	37.234.69.215
IMEI:	353529102666311	IMSI:	N/A
ICC:	8936200003250172672	LTE bands:	N/A
Engine ID:	N/A		
Cellular operator name:	Hungary Pannon/Telenor/Yettel - 21601	Cellular network provider:	21601
Access technology:	GSM / EGPRS	Network status:	N/A
EC-IO:	N/A	RSRQ:	N/A
RSRP:	N/A	SINR:	N/A
Transmitted power:	N/A	Cell ID:	N/A
Battery voltage:	N/A	Battery capacity:	N/A
IP address:	N/A	DHCP:	N/A
Subnet mask:	N/A	MAC address:	N/A
Gateway address:	N/A		

### 3.8 Power outage management

The firmware version of the modem is supporting 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<sup>®</sup> application – in the AMM (IEC) parameter group part.

### 3.9 Restart the modem

There cannot be found a direct option for modem restart in WM-E Term. But it is very easy to push the modem to be restarted.

1. Choose any parameter from the read out values.
2. Change a parameter value
3. Push to the **Save** button.
4. Send the settings by **Parameters Write** icon to the modem.
5. At the end of the writing process, the modem will be restarted.
6. The restart of the device is signed by the **LED3**, which will be flashing quickly by **green** for 15 seconds. The starting requires 2-3 minutes while the modem will be available on its interfaces.
7. Afterall, the LED will be operating ordinary as it is listed in the LED operation behaviour description.

# Chapter 4. AT command settings - description

## (Configuring the Modem by AT commands)

### 4.1 General information about the commands

In this part of the documentation we have collected the standard Hayes™ AT commands which you can use for programming the modem manually with any terminal application.

During the configuration the modem accepts commands with upper or lower case characters. The modem accepting commands in N81 or E71 format.

When you are attempted to use AT commands for the modem, first you have to declare the modem interface and GPRS settings.

For the GPRS communication settings you can use the AT command syntax at table – Chapter 3. The AT commands and parameter values must be divided with semicomma: e.g. Command;answer;timeout(msec)

The minimal modem configuration settings for connecting an Itrón® meter:

- AT+0                    enabling the 9600,8,n,1 operation for the modem
- AT&W                    saving the settings

### 4.2 AT command set

The AT+ command can be used individually, these cannot be chained!

AT+ command	Description
ATA	The modem is receiving the incoming call – <i>local interface only</i> The modem answers for the call after ther third ringing.
ATD	Dial command – <i>local interface only</i> The modem connects to the network and performing a call to the defined phone number, e.g.: ATDT 12345 123456^m "D" = dial, "T" = tone (compatible mode), ^m = carrier return.

ATE	ATE0 ATE1	Commmand local Echo Local Echo off Local Echo on (echo)
ATH		Hang up command – <i>local interface only</i> The modem is disconnecting the dial connection.
ATI		Module identification (example for the answer: WM-E2 2G V2.44)
ATO		Return to online state command - <i>local interface only</i> The modem switches back from command mode to data mode
ATQ	ATQ0 ATQ1	Silent mode You can allow to the modem that it doesn't send the results Silent mode off – it does NOT send the results Silent modem on – it sends the results
ATV	ATV0 ATV1	Verbose mode (Turned off) means a number Text or numeric format. Verbose mode disabled: number Verbose mode enabled: text
ATX	ATX0 ATX1 ATX2.3.4	Connection (CONNECT) result codes Generated code by the modem when connecting or hanging up the connection. Selects the basic code set Selects the extended code set Same as ATX1
ATZ		Modem Reset Resets the modem without changing any parameters.
AT&C	AT&C0 AT&C1 AT&C2	Carrier control This parameter defines the operation of pin 1 (DCD) of the 9-pin RS232C interface. Always ON Fixed to this settings – DCD turning on, when online in command mode is OFF – DCD is turned on only when the modem is online
AT&D	AT&D0 AT&D1 AT&D2	Determines how the ME responds if the pin 4 (DTR) is changed from ON to OFF state during data connection (the firmware is supporting, but it is not wired by default) Ignores the status of the DTR line – eg. not connected DTR ON→OFF: Change to command mode while retaining the data connection. (like +++ escape sequence) DTR ON→OFF: Disconnect the data connection (only for CSD)

AT&K AT&K0 AT&K3	Flow-control selection (hardware configuration must matche with settings) DCD and DTR line can be used for signaling RTS and CTS line can be used
AT+I	Reports modem type, firmware version number, local settings E.g. WM-E2S v2.48
AT+IP?	Reports current GPRS Listen mode address E.g. IP: 192.168.0.100
AT+R	Resets modem and causes the modem to execute a 10 second power cycle
AT+S	Displays Signal Strength Toggles on / off (default off).
Remote AT+S	Reports the last known signal strength

### 4.3 Commands which can be used only for the local interface

AT+ parancs	Leírás
AT+CBST?	Signaling format This command gives information regarding the cellular network bearer channel. Response: 7,0,1 (9600 bps rate, Asynchronous, Non transparent).
AT+CBST=n,0,1 n=0 n=4 n=6 n=7 n=70 n=71	CBST change analog auto baud (automatic baud rate selection) V.22bis V.32 V.32 V.110 or X.31 V.110 or X.31
AT+CPIN?	SIM card PIN-code status report
AT+CLCC	Reports the current CSD call list
AT+COPS	Reports the mobile operator and network registration status
AT+CIMI	Delivers the International Mobile Subscriber Identity (IMS)
AT+CGSN	Delivers the International Mobile Equipment Identity (IMEI)

## 4.4 Modem result codes

Number (VO)	Answer (VI)	Legend
1	OK	Command line executed without errors.
2	CONNECT	Connection.
3	RING	Ringing signal detected.
4	NO CARRIER	Carrier lost or never present.
5	ERROR	Invalid Command.
6	NO DIAL TONE	No dial tone detected.
7	BUSY	Busy signal detected.
8	NO ANSWER	No answer from remote modem.

## 4.5 Configure the TCP/IP (GPRS) connection

Check the modem answer by executing the AT+I command and listen for the answer!

The execution of the following commands are necessary for the TCP/IP (GPRS) connection settings:

AT+ command	Legend
AT+CGDCONT=1,"IP","APNNAME"	Change the APNNAME part to the APN name you are attempted to use
AT+CGDCONT?	Checking the current APN settings

## Chapter 5. Support

If you have a technical question regarding the usage You can find us on the following contact possibilities:

Email: [support@m2mserver.com](mailto:support@m2mserver.com)

Phone: +36 20 333-1111

### 5.1 Support

The product has a identification void which has important product related information for the support line.

**Warning!** *Damaging or removing the void sticker means the loss of product guarantee.*

Online product support available here: <https://www.m2mserver.com/en/support/>

### 5.2 Product Support

The documents and information related on the product are available here. <https://www.m2mserver.com/en/product/wm-e2s/>

## Chapter 6. Legal notice

©2025. WM Systems LLC.

The text of and illustrations presented in this document are under copyright. Copying, usage, replication or publication of the original document or its' parts are possible with the agreement and permission of the *WM Systems LLC*. only.

The figures in this document are illustrations, those can be different from the real appearance.

The *WM Systems LLC* doesn't take any responsibility for text inaccuracy in this document.

The presented information can be changed without any notice.

The printed information in this document are informative only. For further details contact us.

### **Warning**

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