WM Systems WM-I3 LTE Cat.M1-NB2 Data Logger Installation Guide

Contents

WM-I3®

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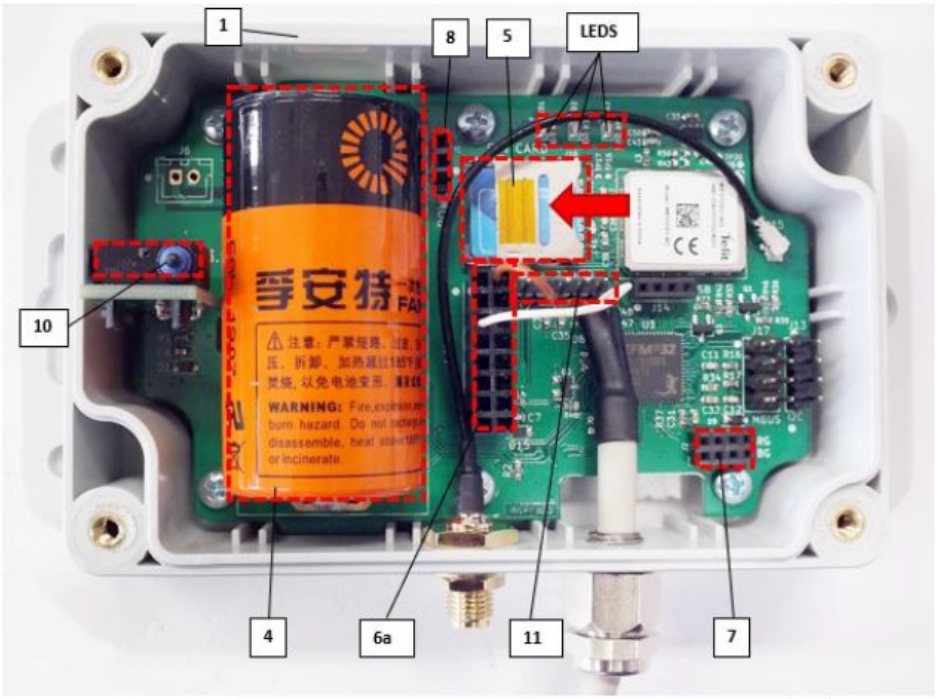
INTERNAL CONNECTORS, INTERFACES



1. Enclosure bottom part (ABS plastic with IP67 protection and 6 holes – where the PCB can be fastened into the enclosure by screws at holes)
2. Enclosure top part (can be fastened by 4 screws)
3. Fixation screws of the enclosure to close and lock the top cover of the enclosure
4. Special filled, longlife battery (Lithium-Thyonyl-Chloride, 3.6V DC, CR14250 type)
5. SIM card slot (for micro SIM, 3FF type)
6. Pulse input cable connector (to J11) – for meter pulse output (S0 type)
    - Sealed cable outfit
7. Connection interface for MBus additional board (5-pins, marked by J17)
8. Power ON pins (2-pin connection, make short to start the device, allows the battery marked by J5)
9. External SMA antenna connection
10. Tamper switch (for sense the cover top removal)* – this feature is currently inactive
11. Configuration port (5-pins, for local configuration and firmware update, J12)
12. MBUS addon board (order option)
13. MBUS port to can connect any MBUS-capable meter
14. Hole for enclosure fastening (screws)
15. Outfit for enclosure fastening (for metal strip, etc.)
16. USB UART Converter
17. Configuration cable

    LEDS – Operation LEDs

POWER SUPPLY AND ENVIRONMENTAL CONDITIONS

- Power supply: 3.6 VDC
- Inputs: pulse input (for meter S0-type output) / M-Bus (optional)
- Configuration port: serial link

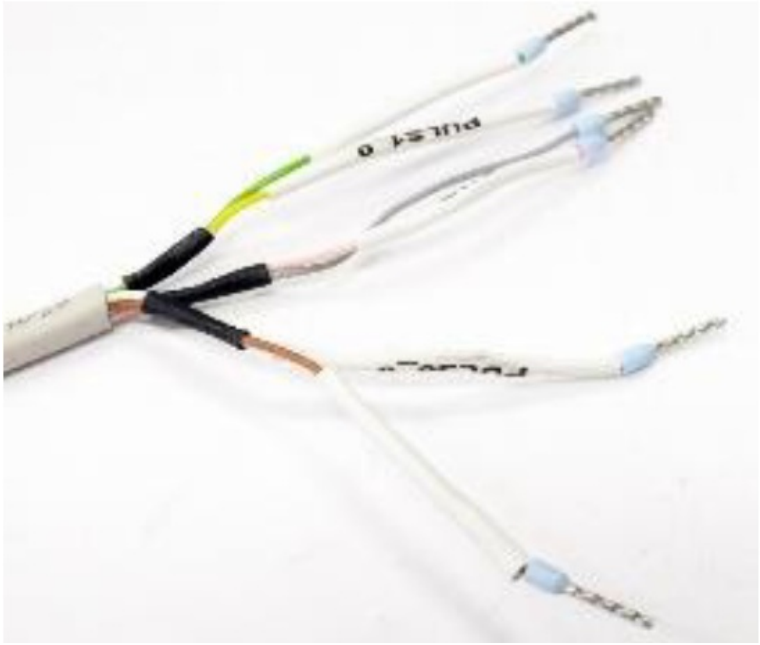
- Operation: -25°C to +55°C / storage: -40°C to +80°C, at 0-95% rel. humidity
- Dimensions: 130x70x40mm (with sole) / 105x70x40mm (upper part), Weight: 245gr
- ABS plastic enclosure with transparent plastic cover, IP67 protection

INSTALLATION STEPS

- Step #1: Remove the enclosure's plastic top cover (2) by releasing and removing the four 14 screws (3) with a screwdriver.
- Step #2: Remove the short of the Power ON connection (8) if it was connected and the 15 operation of the device will be stopped (battery will be disconnected).
- Step #3: Open up the SIM holder (5) from right-to-left and insert an activate SIM card (which uses APN). Take care to the direction, the SIM card must be inserted from right side to the direction of the battery, and the SIM chip looks down, the cutted edge of the SIM is oriented to the Telit internet module. Close back the SIM holder's cover.
- Step #4: The J12 interface connection can be used for local configuration and firmware refresh by using the configuration cable (17).
- Step #5: The configuration cable's (17) black connector must be placed to the WM-I3 mainboard's J17 Connection interface (5-pins), according to the next photos. The black connector's 1st pin is signed by a white mark, this side of the connector must be placed closer to the battery (oriented left on the photo).
- Step #6: For making the serial connection to a computer, you have to connect the USB UART Converter adapter (16) of the configuration cable to a PC.
- Step #7: Prepare for the configuration. Make a short pf the Power ON pins (nr. 8). This will add battery power for the device. Then the modem will be starting its operation according to the configured settings. The device will be available to configure through the local serial connection.
- Step #8: Configure the device operation parameters on the local USB port by the WM-E Term.
- Step #9: After the successful configuration disconnect the USB adapter (16) from your computer

and disconnect the configuration cable (17) from the J12 connector (nr. 7).

- Step #10: Check that you already attached / mount the antenna to the external antenna connector (9) of the device.
- Step #11: Install the device and fasten / mount to wall – near to the meter – or mount to the wall of the water pit or the water pipe/pipeline in a
  fixed position by pipe clamps.
- Step #12: Fasten the external antenna's magnetic mount to a metal part to fixate on the drain cover – to ensure that it has undisturbed conditions and enough cellular network signal reception for the antenna. The current signal value can be checked by the WM-E Term.
- Step #13: The opposite side of the pulse input cable (nr. 17 and 6b) must be wired to the pulse output of the meter, according to the cable pinout – e.g. PULSE0_0 to the 1st meter's pulse signal output and the GND to the grounding of the input).



Step #14: Power ON the device by the nr. 8 pins (make a short) as it was already described before.

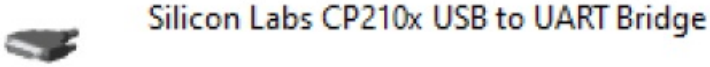
- Step #15: Place back the enclosure's top cover (2) and fasten by four screws (3).

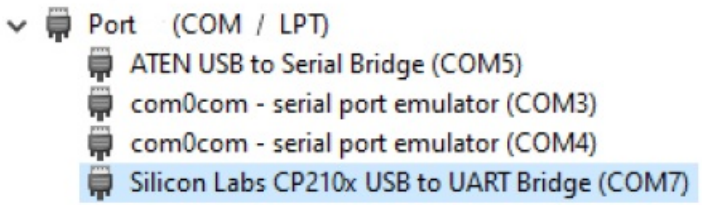
- Step #16: Later, when the cellular module will be started and the SIM seems to be okay and the APN settings are properly configured, the device will be able to connect to the Cat.M/Cat.M (NB-IoT) network and send the counted consumption data (pulse count or MBUS data).

IMPORTANT! It is also necessary to have appropriate signal strength of the cellular network at the operating location/site. You can change the position of the antenna on the location for a better signal coverage. For the successful communication of the device, you have to configure the APN settings of the active micro-SIM card (as PIN code, APN, APN username and password) and the data storage periods, NB-IoT data transmitting interval and mode of data sending (mode, protocol, server port, server IP address) and some measurement/meter related settings. Follow the next configuration steps.

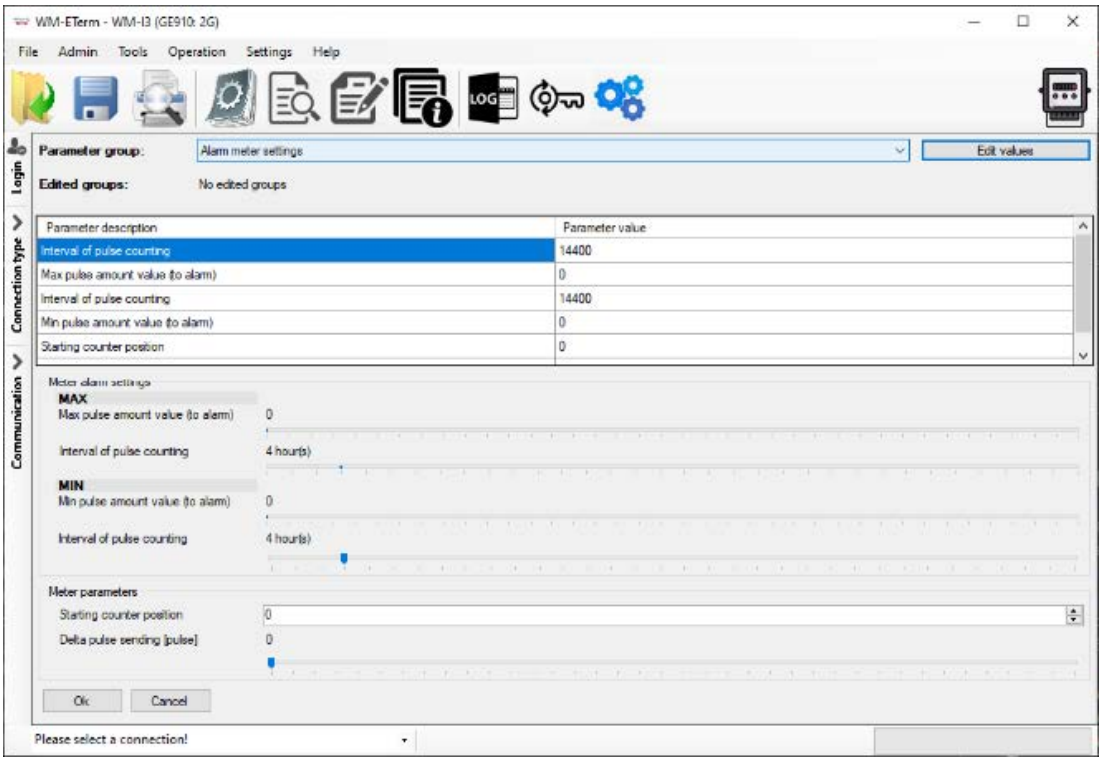
PARAMETER SETTINGS

- Step #1: The modem can be configured on the local serial port with the WM-E Term® software which should be performed before the normal operation and usage. (The remote configuration of the device is also possible through MQTT messages. You need to configure MQTT server for data exchange.)
- Step #2: For the configuration and testing of the WM-I3 device you will need an APN enabled, active SIM card.
- Step #3: Microsoft® .Net Framework v4 must be installed on your computer. In case of missing this component, you have to download it and install from the manufacturer's website: **https://www.microsoft.com/en-us/download/details.aspx?id=30653**
- Step #4: Connect the USB dongle and download the driver from the manufacturer's website: **https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers** Choose the CP210x Universal Windows Driver from the page and download the .ZIP extension file. Extract compressed the file to a location on your PC's hard drive.
- Step #5: Open the Windows Control Panel and the Device Manager. There at the Other devices section you will found a CP210x USB to UART Bridge controller or similar entry.
  Push a right mouse click on the entry and choose the Refresh driver option. Browse the directory of the extracted driver (.zip file) and choose the directory and push to the OK. Then the driver will be installed.





- Step #6: The Control Panel / Device Manager will be listing the USB to UART bridge. Check the COM port number! Note that you need to use this COM port number during the configuration in the WM-E Term software!
- Step #7: Now download the WM-E Term configuration software from this link: **https://m2mserver.com/m2mdownloads/WM_ETerm_v1_3_78.zip** You have to own administrator privileges for the directory where you are using the program.



- Step #8: Unpack the .zip file into a directory and execute the WM-ETerm.exe file. You have to own administrator privileges for the directory where you were installed.
- Step #9: The configuration software will be started. Push to the Login button (leave the Username and Password fields as they are filled). Then choose the WM-I3 by pushing the Select button.
- Step #10: Choose the Connection type at the left side of the screen, then choose the Serial tab. (In case of LwM2M connection, choose LwM2M tab.)
  Then add a New connection name for the profile then push to the Create button.
- Step #11: In the next window the connection settings will be listed. Here choose the right COM port according to the available USB (serial) port number. (For LwM2M connection set the IP address, Port and Endpoint name.) Then click on the Save button to save the connection profile.
- Step #12: On the main screen, at bottom left side, choose the saved connection profile at the Please select a connection!
- Step #13: Open the Parameters read icon from the menu of the screen to read out operation parameters of the device.
- Step #14: The progress of the device parameter readout can be checked by at right bottom side of the screen at the progress bar. The program will load the listed and read out parameter values to the screen.
- Step #15: Select the Cellular network settings parameter group. Push the Edit values button on the right side, then all parameter fields with the values will be loaded to the screen. Configure the modem parameters

according to the needs: APN – SIM card's APN for connecting to the Narrow Band network, APN username and APN user password – if it is necessary, SIM PIN – (if it is using a PIN code). Click to the Save button.

- Step #16: Select the Data sending settings parameter group. Push the Edit values button on the right side, and configure: Server IP address – Destination server IP address, Server port, Data sending interval, Destination protocol (choose from GRF (Grafana), TCP, LwM2M or MQTT), Data storage frequency, Data storage cycle counted by (base of the time adjustment – Device runtime or GMT). Important to define an NTP server IP address and Port for getting the time for the incoming data. Then click to the Save button.
- Step #17: Select the Alarm meter settings parameter group and configure the parameters according to the meter you've connected. Then click to the Save button.
- Step #18: If you are using M-Bus connection, then select the MBUS settings parameter group and configure the parameters. Then click to the Save button.
- Step #19: If you want to use alarm notification, then select the Alarm report settings parameter group and configure the parameters. Then click to the Save.
- Step #20: When you have been finished the parameter modifications, push to the Parameters write icon in the menu. Then the whole parameter list and its values will be sent to the WM-I3® device. The right bottom progress indicator will show the status of the process.
- Step #21: For certification or CA certification upload, please read the User Manual.

For the further configuration options, read the manuals, please:

- User Manual: **https://www.m2mserver.com/m2m-downloads/User_Manual_for_WM-I3_v1_90_EN.pdf**
- MQTT configuration description can be found here: **https://www.m2mserver.com/m2m-downloads/MQTT_Protocol_Description_for_WM-I3_v1_80_EN.pdf**
- LwM2M configuration description: **https://www.m2mserver.com/m2m-downloads/User_Manual_for_WMI3_LwM2M_Settings_v1_80_EN.pdf**

You can also download sample configuration files:

- Sample WM-I3 configuration file (TCP, LwM2M and MQTT compatible): **https://www.m2mserver.com/m2m-downloads/WM-I3_Sample_Config.zip**

DOCUMENTATION & SUPPORT
The manuals can be found on our website: **https://m2mserver.com/en/product/wm-i3/**
Product support can be requested by email: **iotsupport@wmsystems.hu**
This product is marked with the CE symbol according to the European regulations.

The crossed out wheeled bin symbol means that the product at the end of its life cycle should be disposed of with general household waste within the European Union. Only discard electrical/electronic items in separate collection schemes, which cater for the recovery and recycling of materials contained within. This refers not only to the product, but also to all other accessories marked with the same symbol.

Documents / Resources

	WM Systems WM-I3 LTE Cat.M1-NB2 Data Logger [pdf] Installation Guide WM-I3 LTE Cat.M1-NB2 Data Logger, WM-I3, LTE Cat.M1-NB2 Data Logger, Data Logger, Logger

References

- M2M LTE Cat.M1/NB2 Data Logger for Smart Water Metering - WM Systems LLC - M2M / IoT Communication Solutions
- Download Microsoft .NET Framework 4.5 from Official Microsoft Download Center
- CP210x USB to UART Bridge VCP Drivers - Silicon Labs