

User manual for WM-i PULSE® data logger



2026-02-10
v1.10.2

Document specifications

This documentation was made for presenting the installation and configuration steps of the **WM-i PULSE®** pulse counter / data concentrator, Cat.M / NB-IoT transmitter device.

| | |
|---|-----------------------------|
| Document Version: | REV 1.10.2 |
| Hardware Type/Version: | User Manual for WM-i PULSE® |
| Hardware Version: | V 2.00 |
| Bootloader Version: | V 0.0.8 |
| Firmware Version: | V 0.1.1.58 (15-01-2026) |
| WM-E Term® configuration software version: | V 1.4.17 |
| Pages: | 58 |
| Status: | Final |
| Created: | 13-06-2024 |
| Last Modified: | 10-02-2026 |

Chapter 1. Introduction

Robust, ultra low-power cellular IoT pulse counter and data logger, which comes with a built-in LTE Cat.M / NB-IoT cellular module ensuring reliable data transfer in any environment.

The device can be connected to any water meter with a pulse output (for water, gas, BTU or any sensor like temperature, optical distance measurement (lidar), etc.).

Easily upgrade existing meters to smart meters with cellular connectivity, safeguarding your investments without the need for costly replacements!

Offering a standalone operation, it performs reliable automated meter readings. The device allows connection of up to 2 meters or sensors through its inputs.

It counts the pulses of connected meters and sensors, stores them locally, then it transfers all data at predetermined intervals to the Microsoft® Azure Cloud IoT platform with MQTT protocol encryption via LTE Cat.M / NB-IoT network.

The easily installable device was designed for long-term, maintenance-free operation, the WM-i PULSE® boasts a high-capacity battery lasting up to 10 years and an IP68 waterproof casing, making it ideal for challenging environments. Optionally, add-on extension possibilities are available to extend capabilities for PoCs, unique orders (e.g. different connections, adding sensors).

MAIN FEATURES

- IP68-protected casing with fastening points
- LTE Cat.M / Cat.NB / 450MHz cellular module with Nano SIM slot
- Replaceable, high-capacity battery with up to 10 years lifetime
- Connections:
 - 2pcs independent Pulse inputs
 - USB-C port (for local configuration and installation)
 - External SMA antenna connector (50 Ohms)
- Tamper protection (security alarm if cover is tampered) – optional
- Cold start (supporting the installation)

- Device displacement sensor – activable for PoC
- Leak detection, excessive flow/consumption detection (exceeding the normal consumption, warning of a failure) – activable for PoC
- Reverse flow detection and measurement – optional, for PoC
- Automatic / configurable mobile operator, bands, access technology
- Automatic data transmission at preconfigured intervals to Microsoft® Azure platform (MQTT protocol, TLS encryption)
- Optional protocol support: LwM2M, etc. (in case of PoC)
- Transfer of meter data (identifier, location, GNSS option)
- Pre-configured settings at manufacturing
- WM-E Term® software for local configuration, FW updates
- Secure remote configuration / firmware updates via Azure (TLS)
- “Deployment mode” supports local installation (status checking)
- External battery pack for 3x life span (order option)
- Local storage space for more than 8 000 measurements
- Watchdog

APPLICATION

- Smart metering (Gas, Water, BTU)
- Smart cities
- Industrial Automation
- IoT Applications

ACCESSORIES

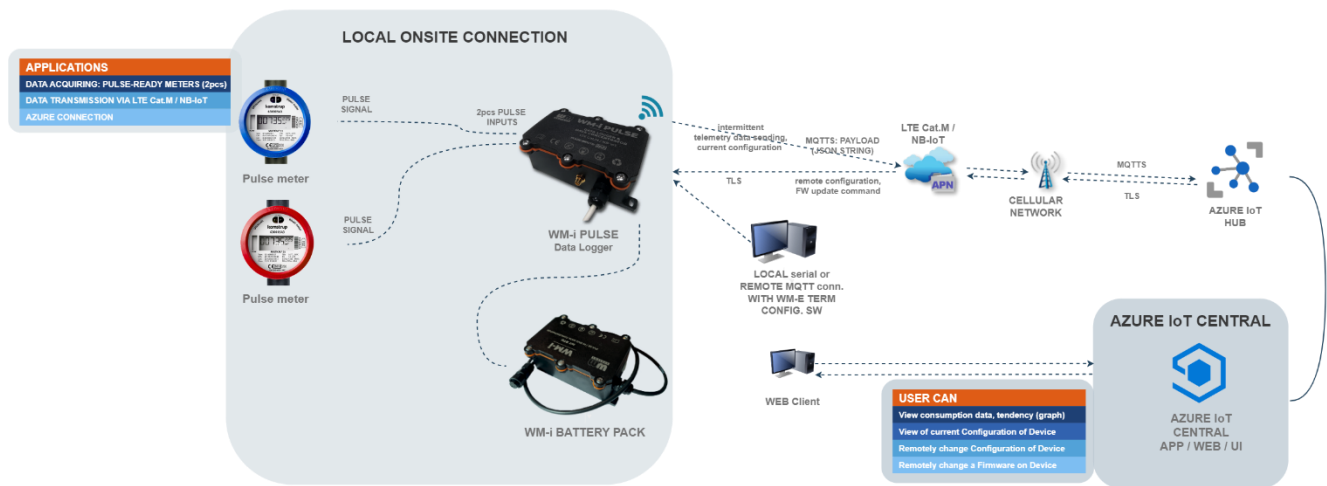
- High-capacity battery (19 000 mAh)
- External battery pack (3 x 19 000 mAh) - order option
- Input cable for Pulse connection
- USB-C cable for configuration (order option)
- Antenna (IP68-protected, SMA 50 Ohm - order option)
- WM-E Term® configuration software (for local configuration, FW updates)

Chapter 2. Operation Architecture

2.1 System architecture

The following figure of the operation is presented with indicating the data collection, data transmitting to Azure®, device reconfiguration and firmware update mechanism.

AUTOMATIC METER READING APPLICATIONS FOR GAS, WATER METERING & IoT APPLICATIONS



2.2 Design and Installation

The data logger was specially developed for metering usage (as water, gas, heat, BTU) - for continuously receiving and counting signals of pulse-signal output capable meters and smart metering devices, intermittently receiving pulse signals of meters and external devices.

The device can be installed to a meter or sensor on the site or location – and can be mounted to a wall by a fastening strip due to the back-side fixation possibility of the enclosure.

The WM-i PULSE® has an IP68 waterproof housing. The installation is easy, which is supported by the status LED lights and WM-E Term® status readout (via USB-C communication) to indicate the proper functioning.

2.3 Operation / Wireless Communication

The smart device has been designed for standalone and intermittent operation. The device is continuously receiving and counting the pulse signals of the connected meters or sensors – while the device is in stand-by operation.

Then it wakes up at the pre-defined intervals to transmit the collected consumption data through the NB-IoT mobile network (LTE Cat.M or Narrow Band) to the Microsoft® Azure® IoT platform or a server IP address to store / to log the consumption data and/or to send the data in a batch. Therefore, the collected and counted signals will be transmitted to the data center as consumption data.

The device is using “push” data transmission method, thus the modem will initiate communication with the Azure® periodically at pre-configured time intervals.

The device provides a SIM card and mobile operator-independent solution.

2.4 Power source

The smart device has a special-filled internal battery, which provides energy for a long lifetime - for up to 10 years (depending on the settings, and data transmitting frequency) – or approximately able to serve up to 4,000 data-sending cycles or more. Due to that our data concentrator is powered by an internal battery, it provides independent operation from any external power source.

2.5 Security

The device has security features, such as data encryption during the data transmission to the Azure® Cloud – which uses TLS encryption and a private key. By security reasons, these are not stored locally on the device.

2.6 Alarm notifications

The device support immediate alarm notifications of the following events:

- Cold start (supporting the installation)
- Tamper switch (sabotage event for detecting and signaling enclosure cover / top removal)
- Device displacement sensor – *activable for PoC*
- Leak detection, excessive flow/consumption detection (exceeding the normal consumption, warning of a failure) – *activable for PoC*

2.7 Configuration

The concentrator is configurable by local – due to USB-C connection - or by remotely through the cellular network via Azure® IoT platform (after configuring the cellular network properties, authentication parameters and the Azure Cloud settings).

All data transmission-related settings (as data store period/frequency, sending frequency), meter counter, and measurement units are all configurable with the WM-E Term® software (Windows® version, which supports several languages) or remotely from Azure® Cloud.

At first, the device must be configured on the serial port with the WM-E Term® configuration software – via USB-C connection (from a PC). This must be performed before the normal operation and usage. During the local configuration, the WM-i device will get power voltage from the USB connection, even if the battery is inserted.

2.8 Firmware updates

With the encrypted and secure over-the-air (OTA) method, the device can be configured and its firmware can be updated via HTTP or HTTPS protocol remotely without having to send personnel to the site or field. You can also update the device locally via USB-C connection.

2.9 First connection

After the local configuration of meter settings and APN settings, NTP time sync and Azure® connection settings, remove the USB-C cable and the device will be cold started to perform by the following operation sequence.

Note, that for successful communication of the device, you have to configure the APN settings of the active Nano SIM card (type 4FF) – as PIN code, APN, APN username, and password – and the data sending settings (sending time interval) and some measurement/meter related settings.

1. The WM-i PULSE® device will be performing operation (e.g. detected consumption data sending to the Azure®) by the predefined configuration setting.
2. If the SIM card is inserted and active and APN settings are configured properly, the device will connect soon to the NB-IoT / Cat.M network and will be trying to perform NTP time sync with the configured (S)NTP servers – max. 3pcs of NTP servers – and will be getting date/time information. This is essential for the operation of the device and the reliability of the data.
3. If it will be unsuccessful, the device will try to get date/time information from the NB-IoT cellular mobile operator.
4. Then the device will try to signal the cold start event to the configured Azure® IoT Cloud platform.
5. All further data (e.g. consumption data of pulse meters) will be transmitted at the configured time intervals to Azure® platform.

Important!

Note, that once the configuration was made in **Telemetry settings**, Azure®, then it will overwrite settings in the modem every time you log in to Azure®.

Therefore, once you've set configuration in the Azure® profile, it will be pointless to set telemetry settings via WM E-Term® configuration software.

If you still want to configure the WM-I PULSE® device locally with WM E-Term®, for that at first on the Azure® user interface at **Manage / Device properties** you should set all related and desired parameter(s) to zero. As a result, the remote Azure® configuration will not be set and overwritten the local WM-i PULSE® settings, and thus the value you have set locally in the WM-E Term® software will remain and the modem will send these and validate the locally modified configuration to Azure®.

Chapter 3. Connections

3.1 Top external view



2 – Enclosure top part

3 – 6pcs of fastening screws (to water-proof close and lock of the housing top cover)

6b – Sealed input cable and wires (Pulse and/or M-Bus*) with end sleeves (*Not available here)

9 – External LTE Cat.M / Cat.NB antenna connector (SMA, 50 Ohm)

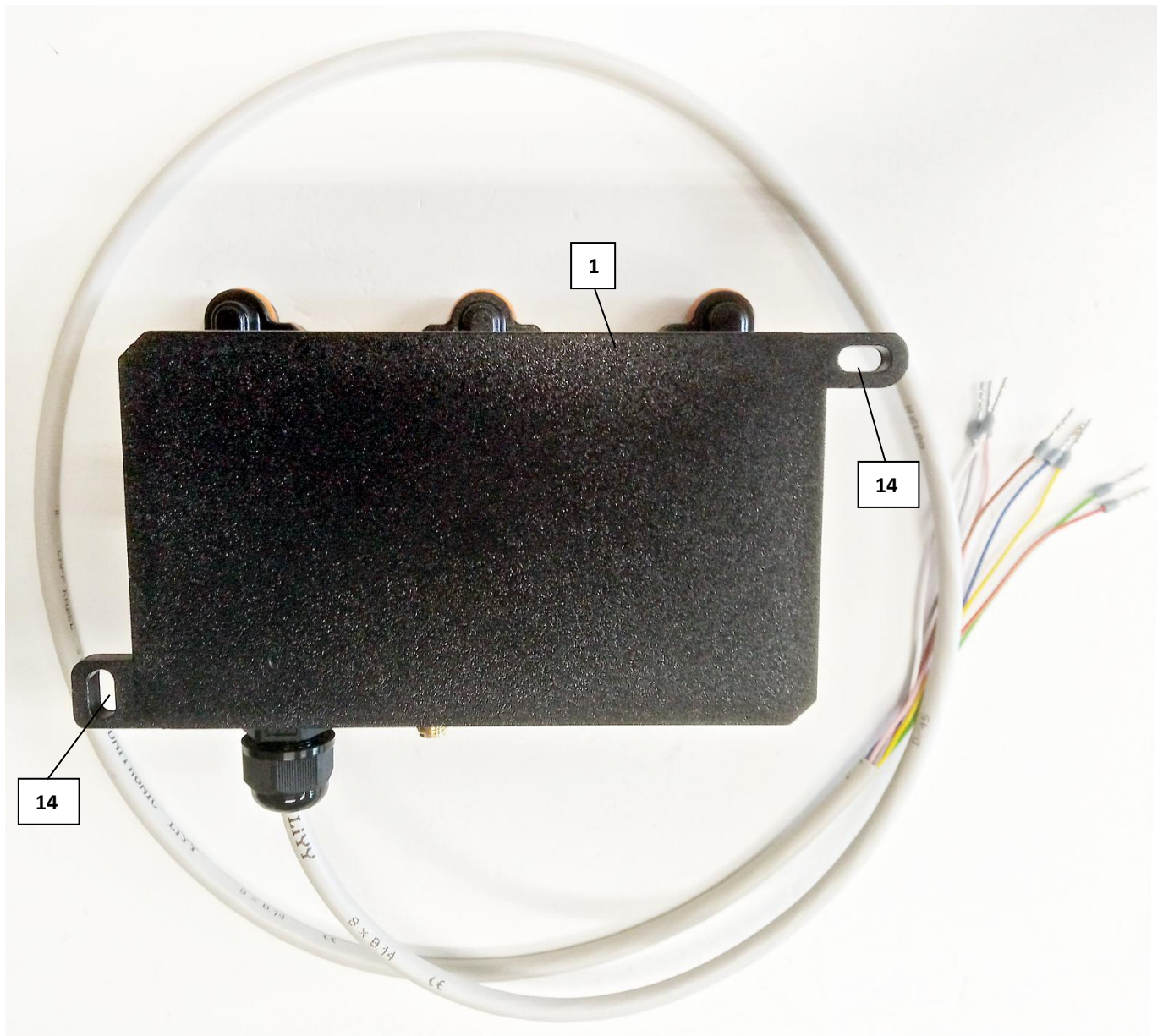
14 – Fastening point - The enclosure can be fastened and fixed by screws here, to be mounted

15 – Silicone seal (against the ingress of moisture)

16 – Cable outlet with gland

The top cover (2) of the casing provides a safe and dehumidified sealing – due to the silicone seal (15) - to lock the electrical parts against external injuries.

3.2 Bottom view

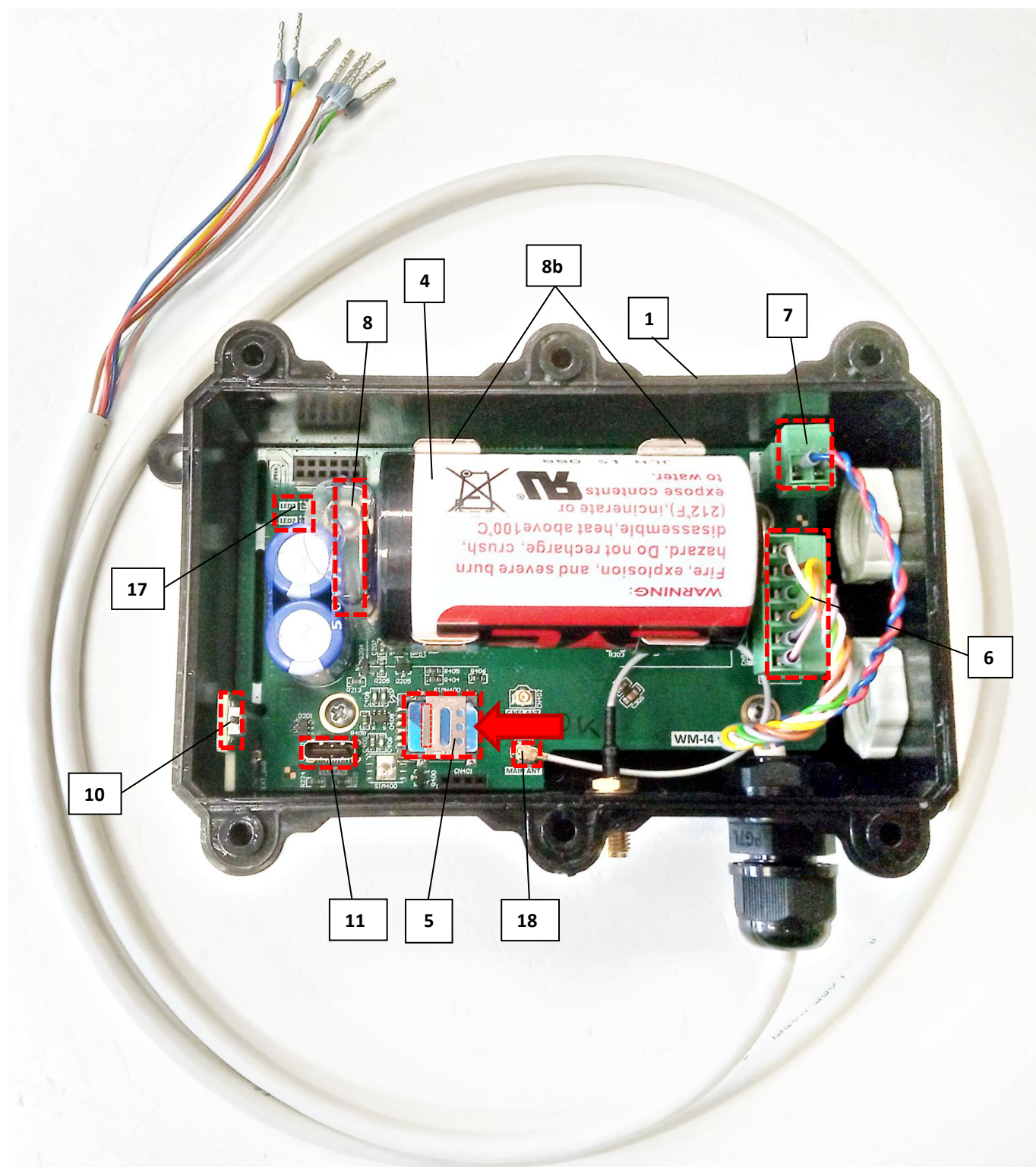


1 – Casing bottom part (ABS plastic with IP68 protection)

14 – Fastening point - The enclosure can be fastened and fixed by screws here, to be mounted

The bottom part (1) of the casing provides a safe mount to wall option by the fastening points (14).

3.3 Internal view



- 1 – Casing bottom part (ABS plastic with IP68 protection – where the PCB is fastened by screws)
- 4 – Special filled, longlife battery (Lithium-Thyonyl-Chloride, Bobbin-type, 3.6V, 19 Ah capacity, size D)
- 5 – Nano-SIM slot (type 4FF)
- 6 – Pulse input cable connector (terminal block, 6 pins) – for 2 meter pulse outputs, dry contact (electromechanical contact)

- 7 – M-Bus input cable connector (terminal block, 2 pins) – for M-Bus devices, sensors (here cannot be used – order option and available for WM-i MBUS and WM-i SERIAL devices)**
- 8 – Battery disconnecter (plastic protective part, which inhibits to supply power from the battery during the delivery/shipping)**
- 8b – Battery socket (holding ears)**
- 10 – Tamper switch (for detection the top removal) – order option**
- 11 – USB-C connector (local configuration port)**
- 17 – 3 operation LEDs**
- 18 – Internal LTE antenna connection**

IMPORTANT!

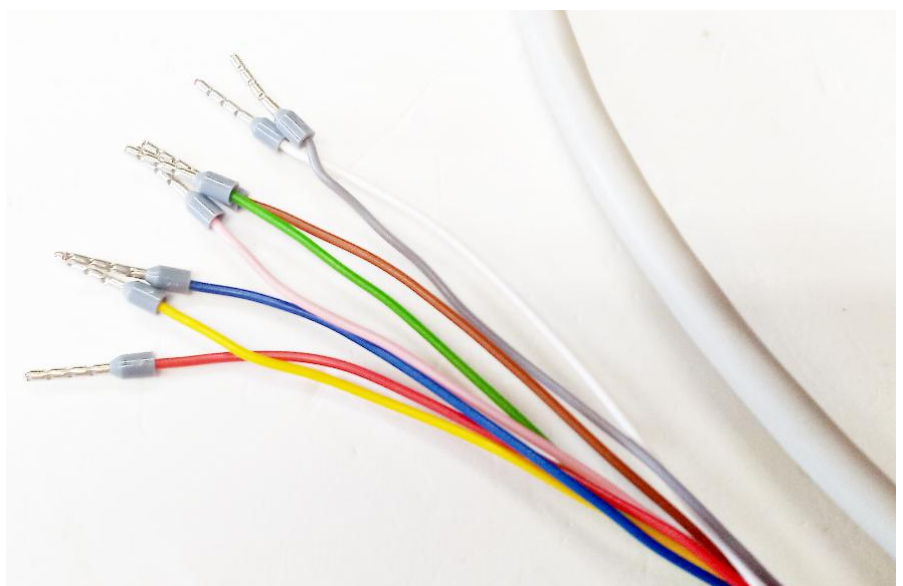
Note, that for the proper device operation, it is essential that the correct battery (4) type would be placed in the battery socket (8b). Use only a battery type, which is perfectly matching and meet the manufacturer's specifications. WM Systems provides different battery options – see Chapter 3.7.

3.4 Input cable connection

The opposite side of the pulse input cable (6) must be wired to the pulse output of the connected meter, according to the wires end of the provided cable (can be ordered).

Pulse meter connections

- White** – GND of Input#1
- Brown** – Input #1, wire A
- Green** – Input #1, wire B
- Yellow** – GND of Input#2
- Grey** – Input #2, wire A
- Pink** – Input #2, wire B



IMPORTANT!

For WM-i PULSE® the provided cable (6b) is capable of connecting two pulse outputs (electromechanical contact).

A custom connection cable can be also used by following this pinout, by respecting waterproof cable gland (16). In this case its necessary to lead the cable through the gland and lock it (twisting).

| Cable identification to DIN 47100 ^[1] | | | |
|--|--------|------------|--------------|
| Number | Color | Short form | |
| 1 | white | WH | GND |
| 2 | brown | BN | IN1A |
| 3 | green | GN | IN1B |
| 4 | yellow | YE | GND |
| 5 | grey | GY | IN2A |
| 6 | pink | PK | IN2B |
| 7 | blue | BU | MBUS- |
| 8 | red | RD | MBUS+ |

3.5 Fastening of the enclosure

The enclosure can be fastened by screws (at points nr. 14 on figure) or with a metal strip. Mount the WM-i PULSE® enclosure to a wall.

3.6 Antenna connection

An external LTE Cat.M / NB antenna (with SMA, 50 Ohm connector) can be mounted to the antenna connector (9). If it is required, the GNSS/GPS feature can be activated and ordered – with a proper GPS antenna.

3.7 Status LEDs

LEDs are presented only for testing purposes (checking the configuration settings, cellular data transmission, etc.). LED indication starts to operate after 5 seconds of booting (as USB-C cable was connected to a 5V power source) – if the device is configured to „**Test operation mode**” – see Chapter 5.5.

During the local (serial) configuration and testing, the device will not use the internal battery source, even if it is presented. During configuration – USB-C connection – the device will getting DC power from its USB connection. The device operation will be indicated on the related LEDs.

After performing local configuration, remove the USB connection, and all LEDs will be turned off, while the device will be restarted and powered further from the internal battery as a power source.

In case of setting the device to „**Normal operation mode**” (when the device is powered from the internal battery), LED signals are inactive due to energy-saving reasons.

LED 1 (BLUE) – STATUS OF USB PORT

- **Lighting:** USB cable is connected
- **Blank/off:** USB cable is disconnected

LED 2 (RED) – COMMUNICATION MODULE’S LAST OPERATION STATUS

- **Lighting:** if last operation was unsuccessful (e.g. in case of could not initialize the SIM card, could not find a network, could not synchronize time, could not log in to the server, etc.)
- **Slow flashing:** data transmission to the configured IP address. Flashing: 1 sec lighting and 1 second blank, which is repeating. It can be also indicated during FW update.
- **Blank/off:** the last operation was successful or the USB cable is disconnected

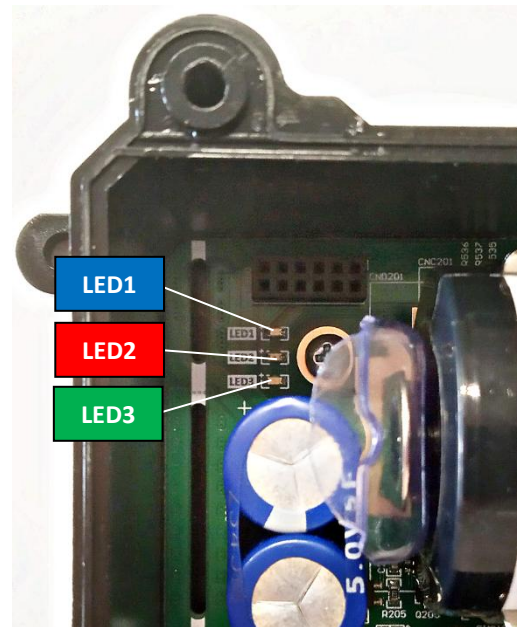
LED 3 (GREEN) – COMMUNICATION MODULE STATUS

- **Lighting:** the cellular module is active (e.g. searching for a network, establishing a PDP connection, synchronizing time, communicating with a server, etc.)
- **Blank/off:** the module is switched off or the USB cable is disconnected

LED INDICATION DURING FIRMWARE UPDATE:

During battery-powered operation, for indicating device startup or a firmware update, distinct LED signals are not presented.

When the firmware was successfully installed, the WM-i PULSE® device will be rebooting automatically.



3.8 Battery Pack

The WM-i PULSE® is supplied by default with a single 19,000 mAh battery. But you can maximize the uptime of the device with an **Extra Battery Pack** – order option. Designed to provide additional power, this accessory extends the operational life of the device by up to 3x, ensuring long-term, maintenance-free data transmission. Ideal for applications that require frequent reading and data transfers, this high-capacity battery pack is the perfect solution for extending performance in the field.



In addition, we offer an external battery pack that contains three more of these batteries.

Standard configuration if ordered with the external pack:

- 1 × 19,000 mAh battery inside the logger
- 3 × 19,000 mAh batteries in the external pack

Total: 4 × 19,000 mAh batteries

The battery pack has IP68 rating with fully sealed protection against dust and water. It's plug-and-play, no additional configuration required

IMPORTANT!

If the logger is ordered without the external battery pack and is later upgraded, the situation is slightly different. By that time, the internal battery will already have been partially discharged. Connecting a new external pack with three fully charged batteries to a logger with used (partly discharged) internal battery can negatively affect the performance and lifespan of the new batteries.

For this reason, when adding an external battery pack later, we strongly recommend replacing the original internal battery with a new one at the same time. This ensures all four batteries start from the same charge level and work together optimally.

Chapter 4. Installation and testing

4.1 Installing the device

You can prepare and pre-configure the device before an onsite installation – also see Chapter 4.3.

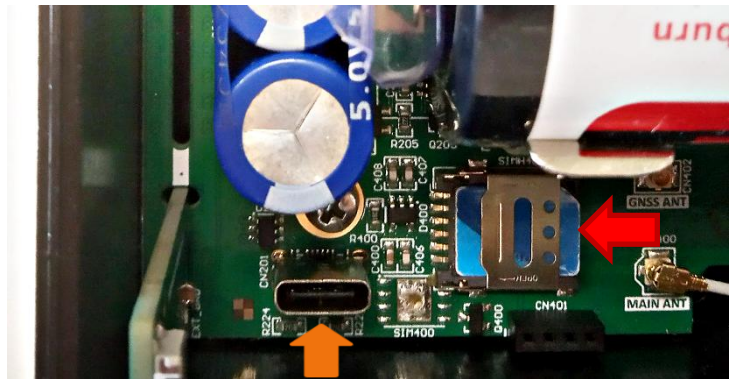
Step #1: Install the device to the location of the meter/sensor, and fasten/mount the casing (1) to a wall.

Step #2: Remove the plastic top cover (2) by release and remove six screws (3) with a screwdriver.

Step #3: Prepare the connection of the pulse output capable meters or sensors. Perform the wiring and fasten wires on the meter's side – which you are attempting to connect: pulse-signal output capable meter(s) to the relevant wires of pulse inputs on cable (6b) regarding requirements.

Step #4: Insert an active Nano SIM into the SIM slot (5):

- Slide the metal SIM holder from the direction of the **red arrow** (from right to left) and open it up.
- Insert the SIM as it can be seen in the photo (the cutted edge of the SIM looks up and right, the SIM chip face looks down, face to the PCB).
- Fold back the metal holder and slide it back from left to right to lock the SIM into the holder.



Step #5: Connect and mount an antenna to the external LTE antenna connector (9). We suggest to order a magnetic mount LTE antenna from our website.

<https://m2mserver.com/en/product-category/accessories/>

4.2 Configure the device

Step #1: Perform the following preconditions to be able to connect a PC to the WM-i PULSE® device.

- Microsoft® .Net Framework v4 should be installed on your computer. In case of missing this component, you have to download and install from manufacturer's website: <https://www.microsoft.com/en-us/download/details.aspx?id=30653>
- Download WM-E Term software (Microsoft Windows® 7 / 8 / 10 / 11 compatible) from this URL: https://m2mserver.com/m2m-downloads/WM-ETerm_v1_4_0.zip
- Unpack the downloaded .ZIP file into a directory.
- Make sure you own administrator privileges to the directory where you will be executing the software from.

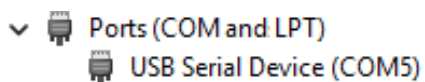
Step #2: Open the **Control Panel / Device Manager** on the PC's Windows® system.

Connect the USB-C cable to the internal USB slot (11) indicated with **orange arrow** in the previous photo.

Now the device is powered. Then on the PC, the Windows® will automatically download the required driver and install it to your computer.

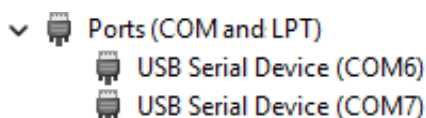
Then at the **Control Panel** in **Device Manager** properties, at **Port** section, Windows® will refresh the list of connected devices:

- a.) **If you are using FW version v0.1.1.43 or an older version**, then you can see here a COM Port, which is listed as „**Serial USB device**“. That's your device.



Note the port identifier – listed as **COM** number.

- b.) **If you are using FW version newer than v0.1.1.43**, then you can see here two COM Ports, which are listed as „**Serial USB device**“.



Open the **last USB Serial Device** entry and choose **Properties** and **Details** tab.

There at **Property**, select **Bus description**. At **Value** field you should see the „**config port**”.

WM-AlamLink config port



If yes, then note this port identifier **COM** number – e.g. **COM 7**.


Take note, that if the port's **Bus description** value is „**debug port**”, then you should close this window and select the other port (e.g. COM6) and repeat this identification query at the that port and find „**config port**”. Then note this port identifier **COM** number – e.g. **COM 6**.

Step #3: In WM-E Term software, make the connection profile settings (**Connection type**) and configure the desired COM port and **[Save]** settings. Then choose the connection profile at left bottom part of the screen.

Step #4: Execute the **WM-ETerm.exe** file to start the configuration software. Allow the **Security Risk** – does not mean any harm.


Step #5: **Login** to WM-E Term software, **choose WM-i** tile and **make a connection profile** to the device with noted COM port.

Step #6: Set the device to **Test Operation mode** in the **Operation Mode settings** menu with the  icon. Then push to the **Parameters write**  icon.


Step #7: Then choose the  icon and the current configuration will be automatically readout from the WM-i PULSE® device.

Step #8: **Change settings and configure** the internet module's cellular settings (APN, etc.) in **Cellular network settings** parameter group.

Step #8: Configure further parameters, according to Chapter 5.

Step #9: Configure pulse-capable meter(s) or sensor(s) by selecting the  icon in WM-E Term.


Step #10: Configure alarm events at **Alarm settings** parameter group in WM-E Term.

Step #11: Send the configuration to the WM-i PULSE® with the **Parameters write**  icon. Then the device will be automatically restarted and operate according the configured settings.

4.3 Testing the device

Step #1: When the cellular module will be started – if SIM and the APN settings were already configured properly – and the device can connect to the NB-IoT network (Cat.M or Cat.NB cellular network) it will be sending data to the Azure® Cloud – based on active settings.

Step #2: Check the connection, operation and data sending behaviour with LEDs (17) and the transmitted data as incoming results in Azure®.

Step #3: Test the device and if you want to modify any parameters, make the changes and write / send again the configuration to the WM-i with **Parameters write**  icon. Then the device will be restarted again. Repeat this step, until the configuration and operation will be exactly which you've been desired.

Step #4: If you are satisfied with settings, remove the USB-C connection from device.

Take note, that due to the battery disconnectors (8) presence – protective plastic part – which is still placed between the battery (4) and the battery holding ear, the device is still turned off and it sleeps. This can be useful for the time of delivery of the device or until the onsite installation.

But, if you want the device to be operated, remove the protective part and the WM-i PULSE® device will starting its operation immediately.

4.4 Installing the device onsite / Important Notes

Step #1: Remove the battery disconnectors (8) – a plastic protective part – which is placed between the battery (4) and the battery holding ear.

Now the device will be getting power from the battery and starting its operation according to pre-configured settings. Note, that LEDs will be inactive during operation – due to energy-saving reasons.

If an active SIM card was inserted and cellular connection settings were configured properly (APN, mobile access technology, etc.), then the cellular module will be started and the device should be connected soon to the NB-IoT – Cat.M or Cat.NB – cellular network.


IMPORTANT!

In WM-E Term software, if configuring the parameter **Technology** to „**NB (preferred) and CatM**” and / or „**CatM (preferred) and NB**” value, these can be used only if both mobile access technologies are supported by the SIM. If you don't use any preferred settings at **Technology** parameter, it does not matter which SIM type you insert, and the WM-i PULSE® device will be using Cat.M with Cat.NB „fallback” based on default operation of the cellular module.

When starting the device, it will signaling a „*Cold Start*” event to the Azure® Cloud and send consumption data (pulse count data) also to the specified address. This will be repeated at pre-configured intervals.

Step #2: Check cabling (6) connection and internal antenna connection. Place the plastic top cover (2) on the top of the casing (1) and fasten the six screws (3) with the screwdriver.


Step #3: Fasten the external antenna's magnetic pedestal to a metal part. Ensure that the device is getting enough cellular network signal – if it's not, then change antenna position/location for a better signal reception.


The signal quality (value) of the cellular communication is be measured and can be checked with the WM-E Term® software by the **Device Information**  icon.

IMPORTANT!

Note, that the device has default valuable parameters only for the Azure® connection. Every other setting is not configured. The device will not store any measurement data, will not signal / transmit any data. Operates from battery or USB-C if its active.

Therefore, we highly recommend after the successful Azure® connection to configure every desired parameter at the choosable parameter groups for the sake of proper and useful operation.

Step #4: When you have been finished the configuration, then set the modem to **Normal Operation mode** in the **Operation Mode settings** menu with the  icon.

Then push to the **Parameters write**  icon. Now the device will be transmitting data at the configured intervals. Between these intervals, the WM-I PULSE® device will be in stand-by mode.

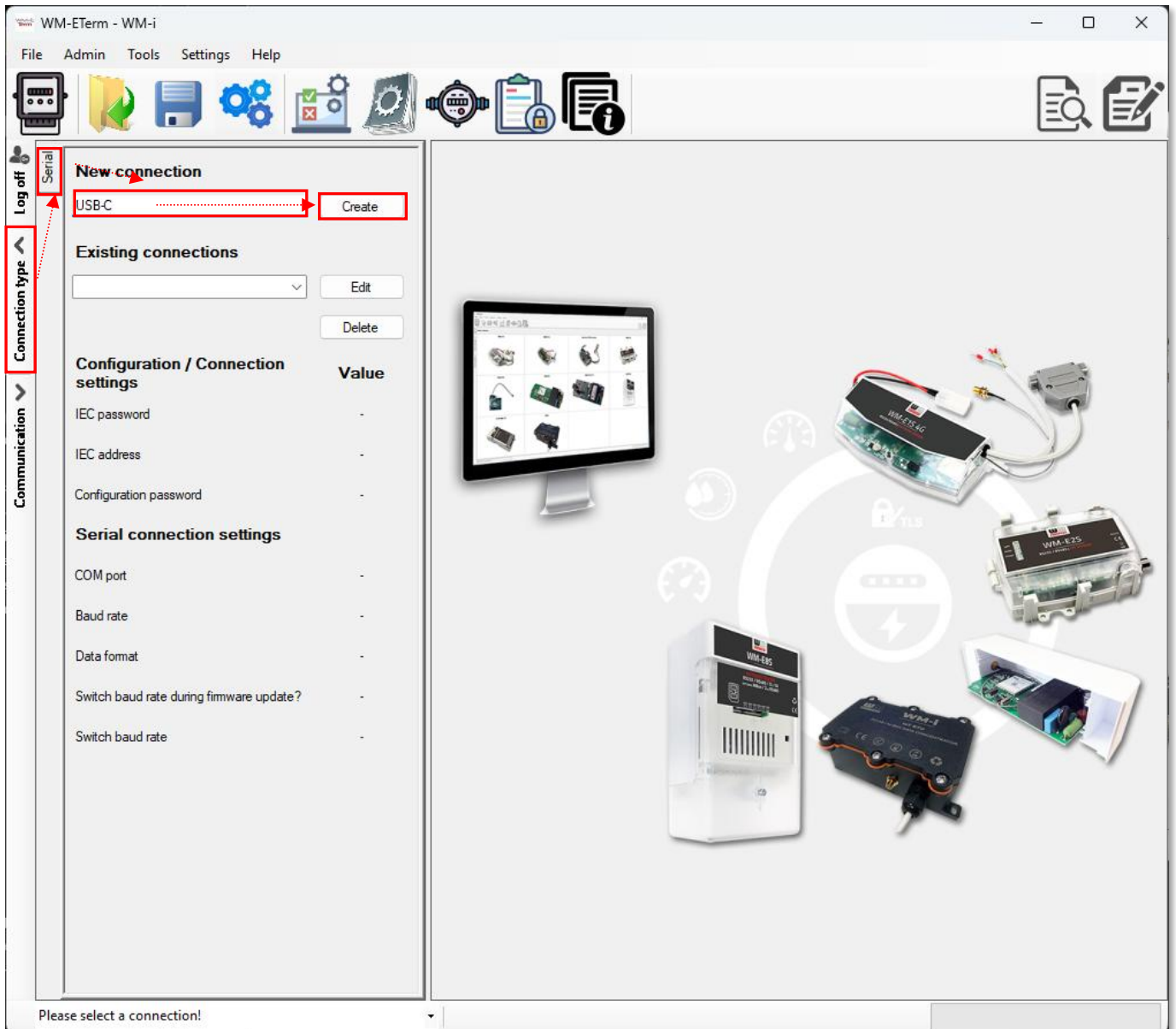
Chapter 5. Modem Configuration with WM-E Term®

5.1 Setup connection

#Step 1: The WM-E Term configuration software will be started.

Leave the **Username** and **Password** fields as they are filled and push to the **[Login]** button. Then choose the **WM-i** tile.



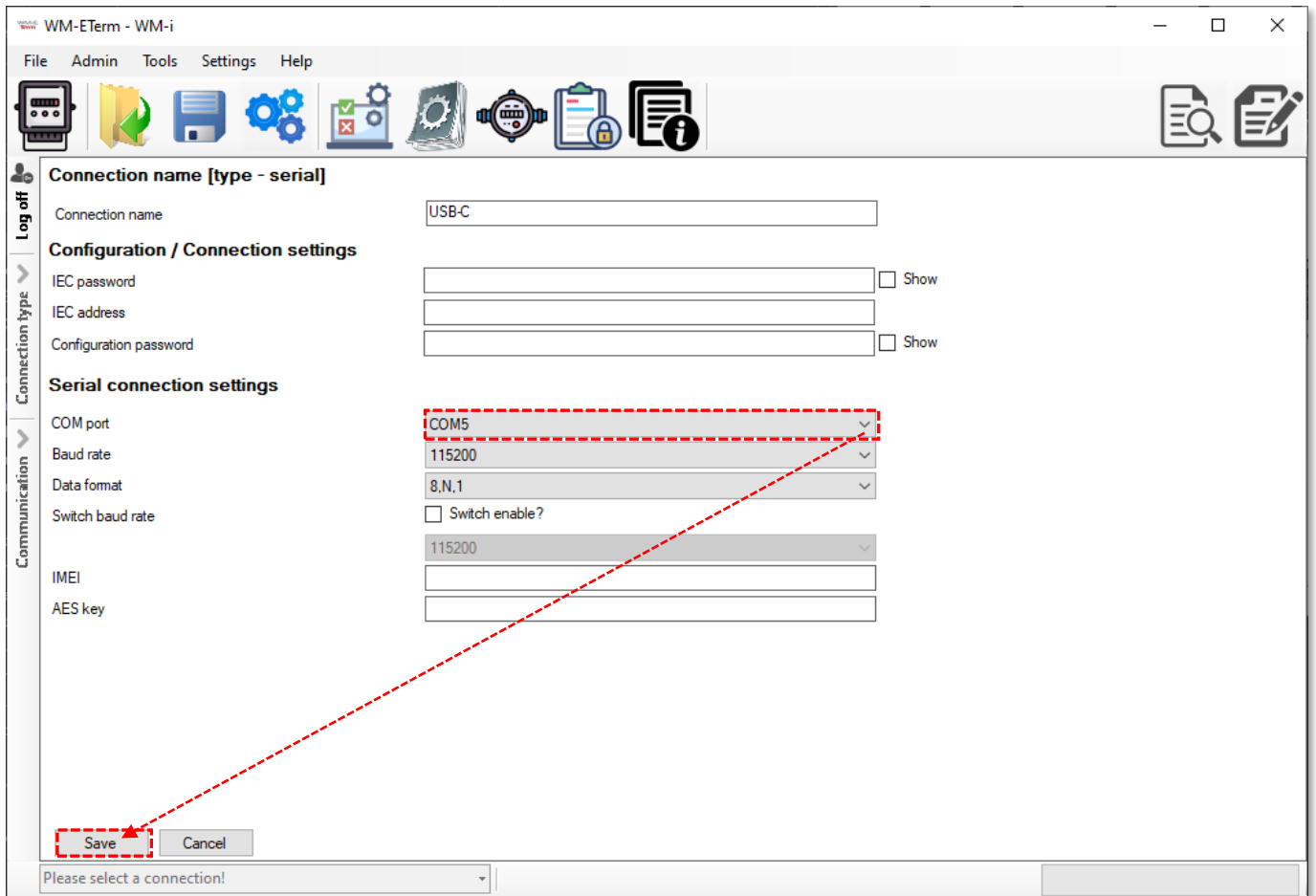


#Step 2: Choose the **Connection type** on the left side of the screen, and choose the „**Serial**” tab for the local USB connection.

#Step 3: At **New connection** enter a name here for the profile then push the **[Create]** button.

#Step 4: In the next window connection settings will appear. There select and choose the **COM port** according to the currently listed USB (serial) port number in Windows.


#Step 5: Leave any other fields as it is, don't change them. Then click on the **[Save]** button to store this connection profile.



#Step 6: At the left bottom part of the screen select and choose the saved connection profile at the „Please select a connection!“ title. Then the PC will connect through the serial USB link to the WM-i PULSE® device.



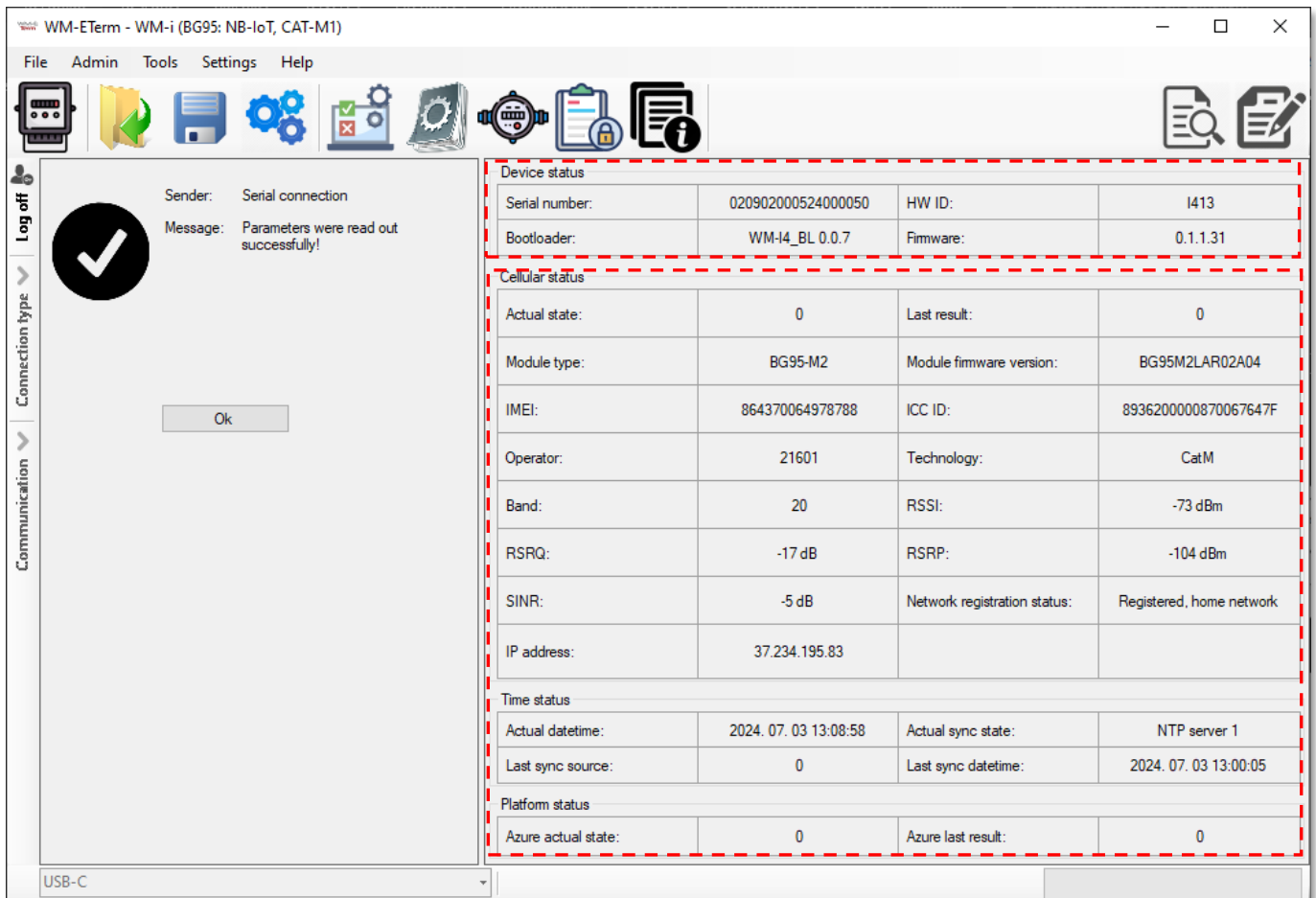
5.2 Device status information

#Step 7: Check the device status by pushing the **Device Information**  icon. All relevant information can be read on the screen.

Important!

Without configuring the SIM settings, here at the **Device Status**, only the first 4 statuses will be queried (as **Serial Number**, **Bootloader**, **HW ID** and **Firmware**).

Note, that if periodical LTE Cat.M/NB data transmitting was not yet configured or if the device was not sent data yet to Azure®, therefore these status information will be missing.



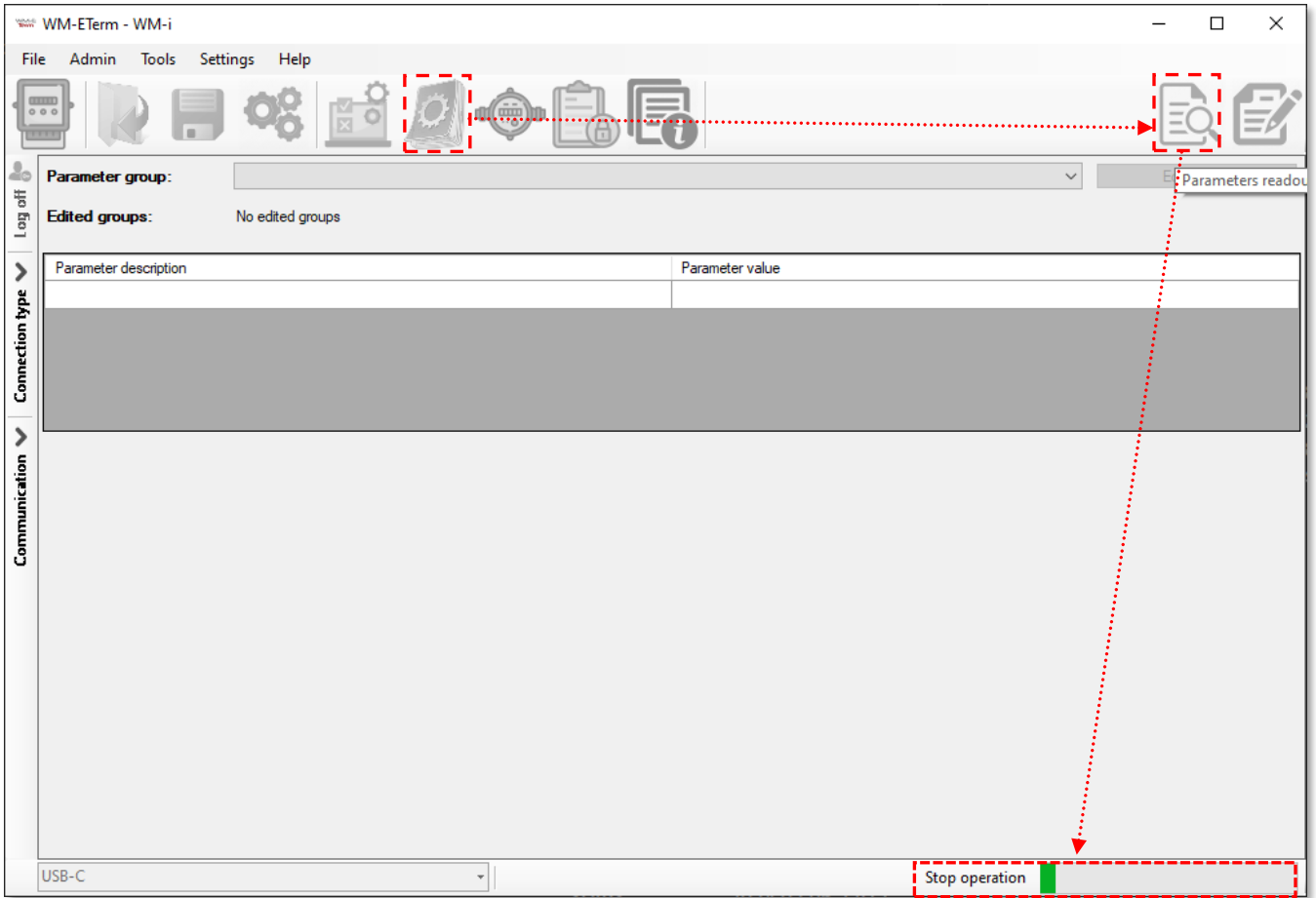
If further information could be readout from the modem via Azure®, then the other important **Cellular status**, **Time status** and **Platform status** information will be also available here.

5.3 Read out the device configuration

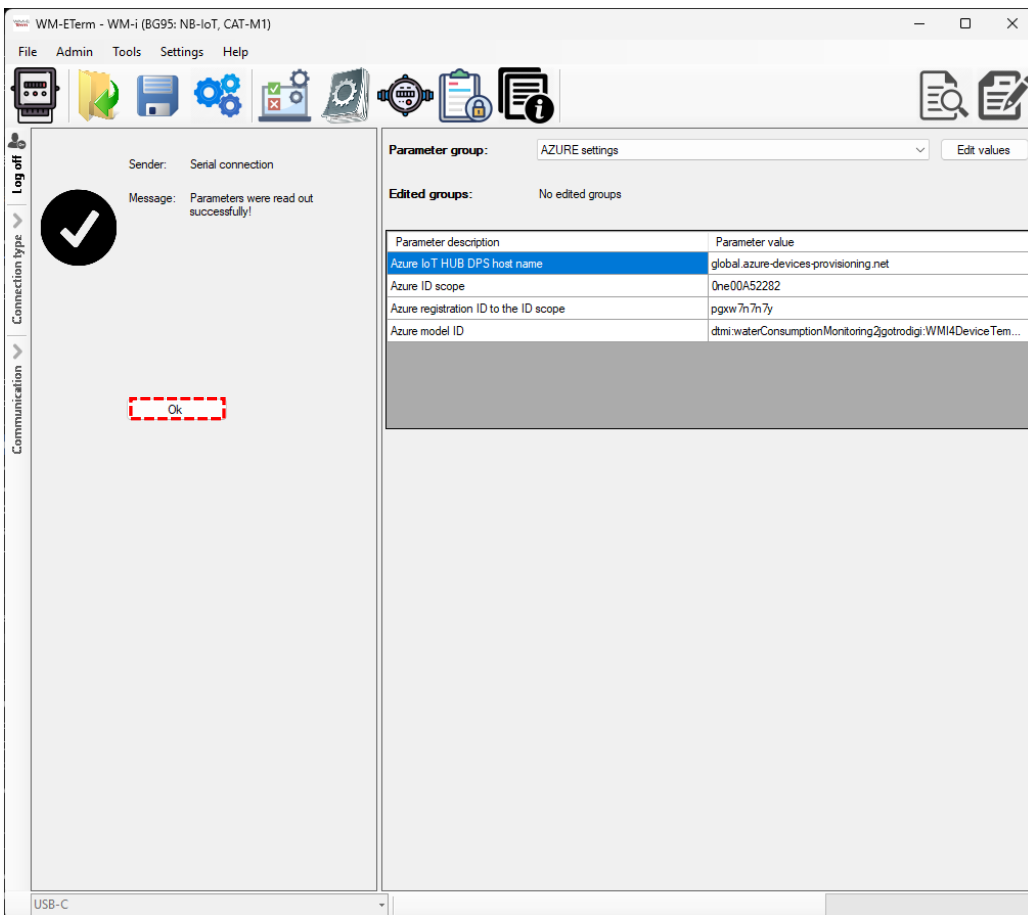
#Step 1: Push to the **Parameters View** icon  from the top menu, then choose the **Parameters read** icon  from the right side of the screen.

The device will read out to the configuration parameters of the WM-i PULSE® device.

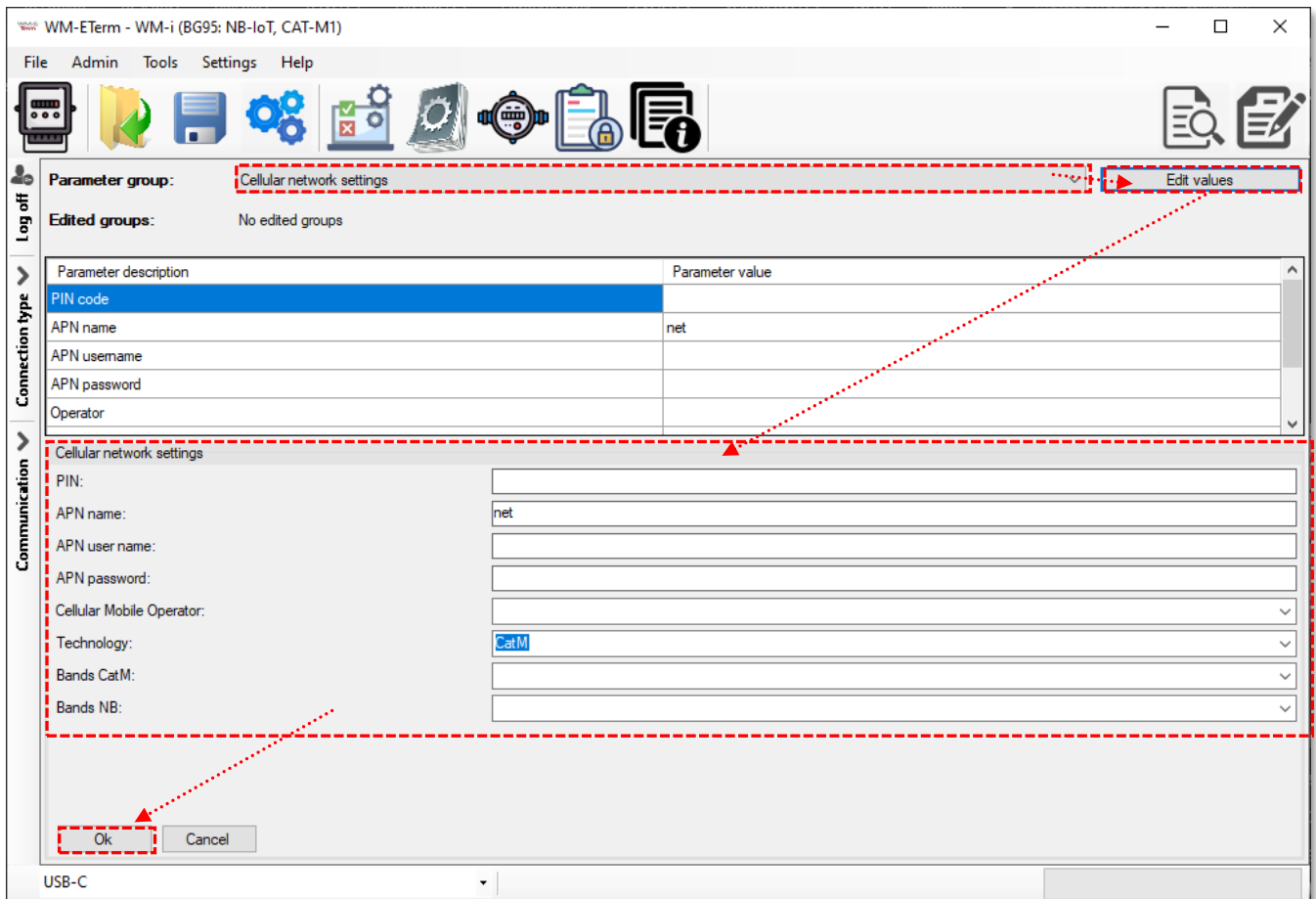
The readout progress can be checked by the progress bar at the right bottom side of the screen. (If you want to cancel the readout and you should push the **[Stop operation]** button.)



Step #2: Confirm the readout process by pushing the **[OK]** button – on the left.



Step #3: Select a **Parameter group** at the middle of the screen from a list, according to the configuration needs, and **WM-E Term** will list read out parameter values to be able to modify.



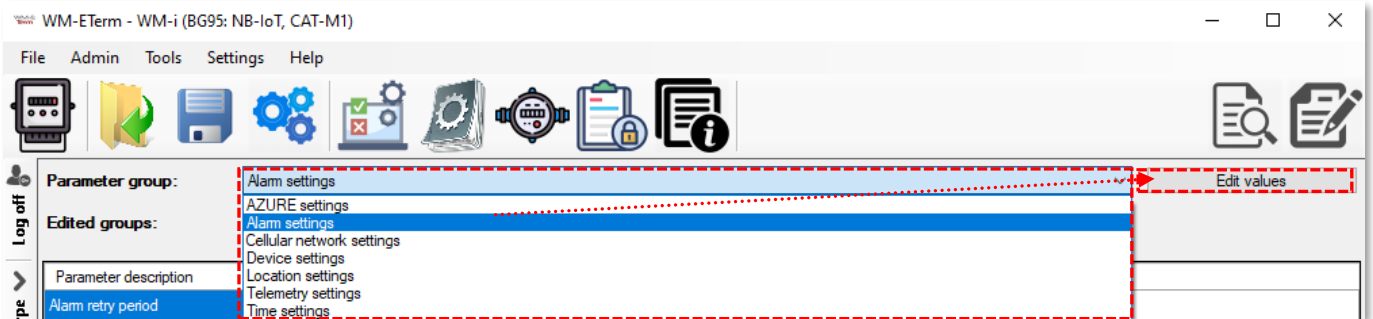
5.4 Modification of settings, parameters

Step #1: Push to the **[Edit values]** button on the right side, then parameter fields with the values will be loaded to the screen.

You can choose from the following Parameter groups here:

- **AZURE settings** – Azure Cloud IoT connection settings
- **Alarm settings** – Alarm signaling settings (tamper event of top cover removal)
- **Cellular network settings** – APN, SIM PIN, cellular mobile operator, mobile access technology, cellular network and band settings
- **Device settings** – set a configuration password, activation of the „**Debug mode**” for testing


- **Location settings** – manual GNSS / GPS information, and address of the installed device (if GNSS / GPS is not provided)
- **Telemetry settings** – Data sending frequency and offset settings
- **Time settings** – for configuring (S)NTP time servers, getting date and time information for data storage and transmission – for data reliability reasons.

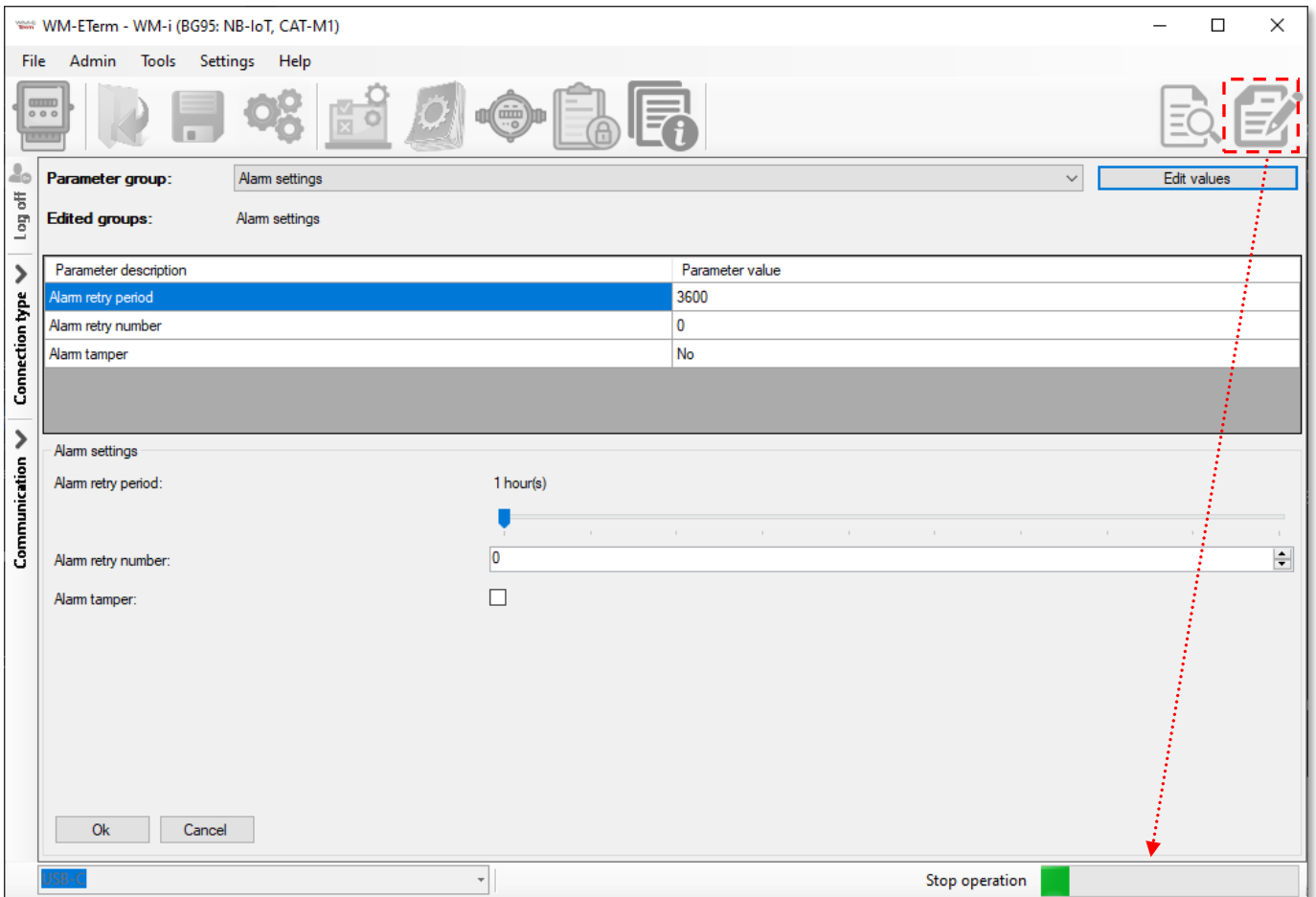


Step #2: Configure required parameters and push to the **[OK]** button. Then if you want, select ahn another **Parameter group**, push to its **[Edit values]**, and configure the parameters. Repeat this, until you are finished with the configuration.

The detailed configuration **Parameter group** settings, **Meter config** (for settings of Pulse output capable devices), and **Security Token keys** parameters (for setup of the Security token keys) are described in the Chapter 6.


Step #3: You can save the settings anytime at **File / Save** menu (into a .CFG extension file). You can load a configuration file from the **File / Load** menu. This is useful when you want to distribute / upload the same configuration basis to several further WM-i devices.

Step #4: When you've finished the parameter modification, push to the **Parameters write**  icon. The whole parameter list and its values will be sent to the WM-i PULSE® device. The right bottom progress indicator will show the status of the configuration sending process.



After a successful parameter sending, the device will be disconnected and it will be rebooting, which takes about 1-2 minutes. Then the WM-i PULSE® will be operating further according to the newly configured settings. Wait, while the device will be accessible in WM-E Term.

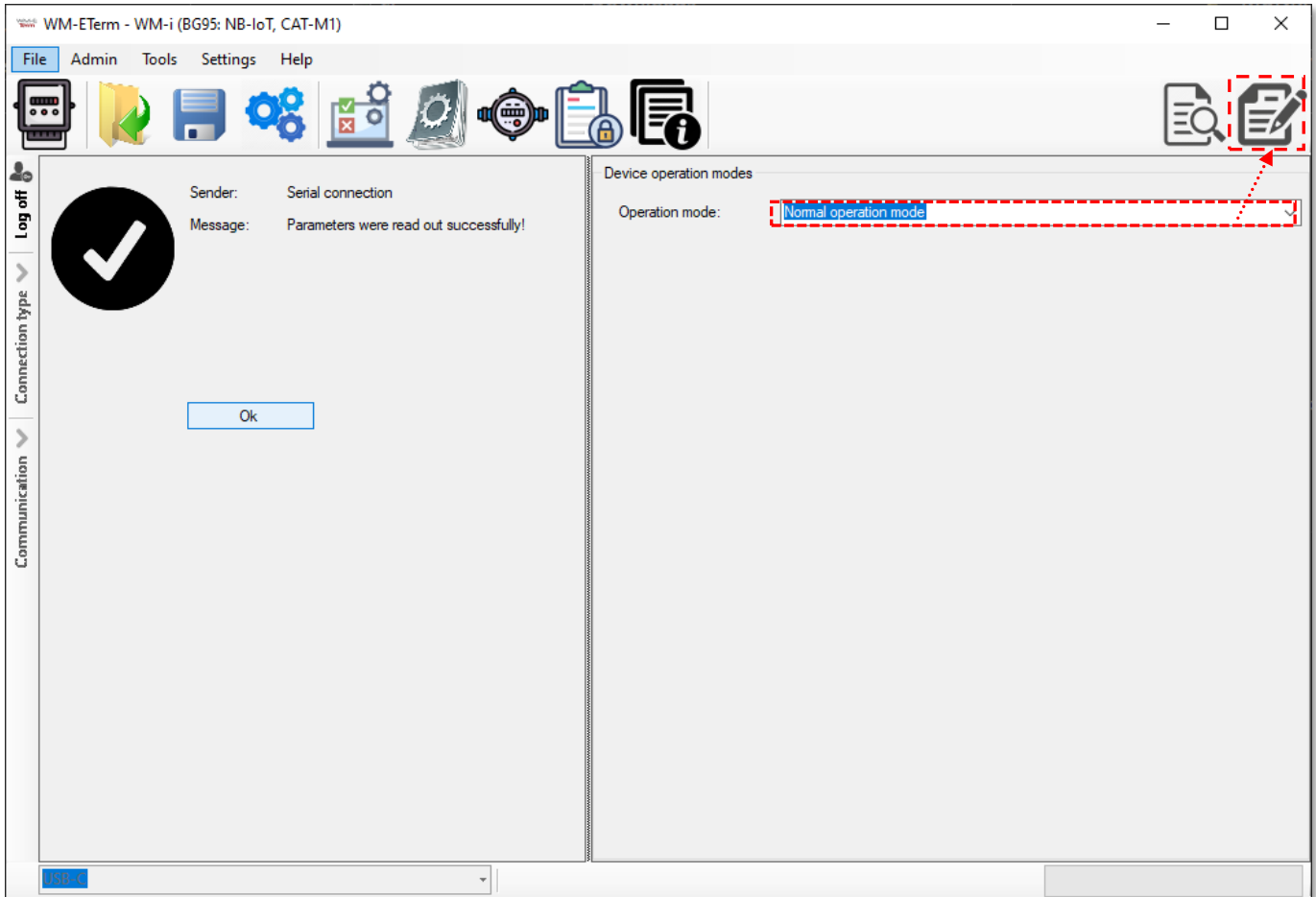
5.5 Operation mode settings

Step# 1: You can configure the required operation mode of the device in the **Operation Mode settings** menu with the  icon. Once it was pushed, the device will be automatically readout current settings.

Step #2: Confirm the readout process by pushing the **[OK]** button – on the left. Then you can change operation mode - if you want as it is described here.

Operation modes

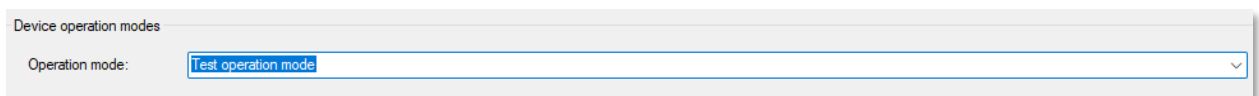
- **Normal Operation mode:** in this mode the WM-i is operating by its normal behaviour, regarding the configured parameters. The device configuration uploaded to the Azure only once a day.



- **Test Operation mode:** this mode is used for testing purposes. It can be initiated by local USB-C connection (which uses USB 5V DC power).

Then WM-i PULSE® will providing longer time to register on the cellular NB-IoT network, and it store / send data in fixed cycle intervals as it follows:


- store data locally: in every 5 Minutes
- sending data via cellular network: in every 5 Minutes to the Azure® Cloud.



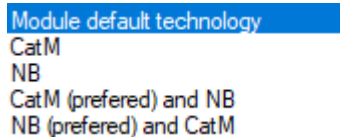
This operation mode also allows remote configuration from the Azure® and configuration uploads to Azure® every time, when the device sending data to the Azure® platform.

We suggest to use the **Testing Operation mode** during configuration and testing. When the testing has been finished, **Normal Operation mode** will be the proper choice for further usage.

Note, when you remove the USB-C cable from the device, the operation mode will be switched automatically to **Normal Operation mode** which is supplied by the internal battery (or an externally connected, optional Battery Pack).

Step #2: Choose a mode option and push to the **Parameters write**  icon. The change will be sent to the WM-i PULSE® device. The right bottom progress indicator will show the status of the process. Afterall, the device will be disconnected and rebooting.

- **Cellular Mobile Operator:** if you don't want to use a dedicated mobile operator (automatic mode), then leave this field empty, as it is by default. Otherwise, you can choose a dedicated mobile operator according to the information of SIM provider.
- **Technology:** You can choose a required network access technology as a dedicated network type to use or you can choose **Mobile default technology** option here, which means the module supported networks.




IMPORTANT! We recommend to use a dedicated network technology (e.g. CatM or NB, preferred, only if the SIM supporting Cat.M and NB networks also.

Technology parameter values „**NB (preferred) and CatM**” and / or „**CatM (preferred) and NB**” should be used if both mobile access technologies are supported by the SIM. If you don't use any preferred settings at **Technology** parameter, it does not matter which SIM type you insert, and the WM-i will be using **Module default technology** value, which means Cat.M / Cat.NB.

- **Bands Cat.M:** If you leave it empty, the device will be automatically detect the available LTE Cat.M bands and will choose randomly from these. If you want to use dedicated band(s), then you can select from the Cat.M band list.

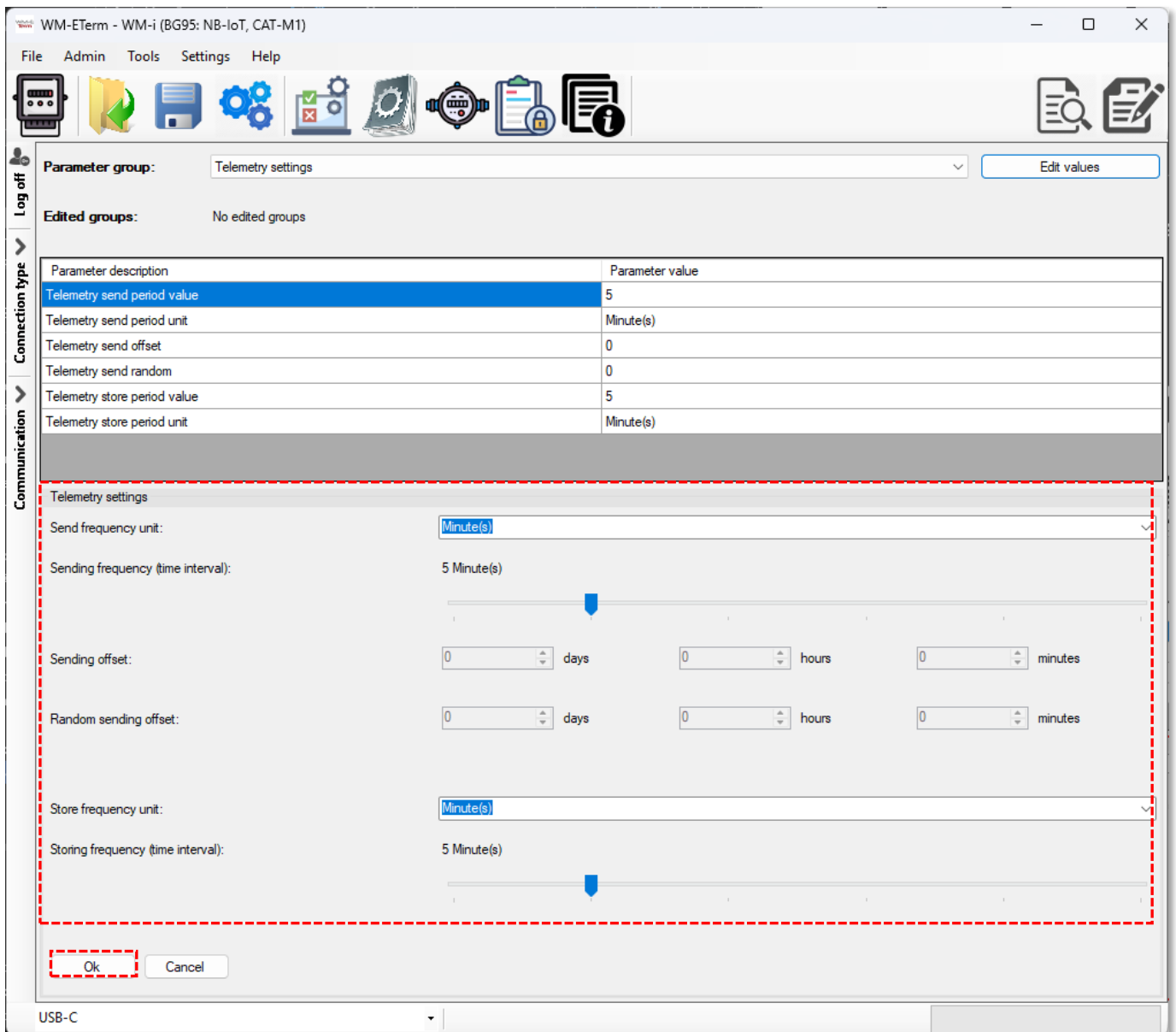


- **Bands NB:** If you leave it empty, the device will automatically detect the available Cat.NB bands and will choose randomly from these. If you want to use dedicated band(s), then you can select from the NB band list.

Press the **[OK]** button and continue the settings with other **Parameter groups**. At the end of settings, don't forget to perform **Parameters write** to the device with  icon.

6.2 Telemetry settings

Configure the data sending and local data storage fields at **Telemetry settings** parameter group.



- **Send frequency unit:** time base of settings – can be selected: **Minute(s)** / **Hourly** / **Daily** / **Weekly** / **Monthly** according to the synchronized time information.

- **Sending frequency (time interval):** choose a sending frequency with the slider.

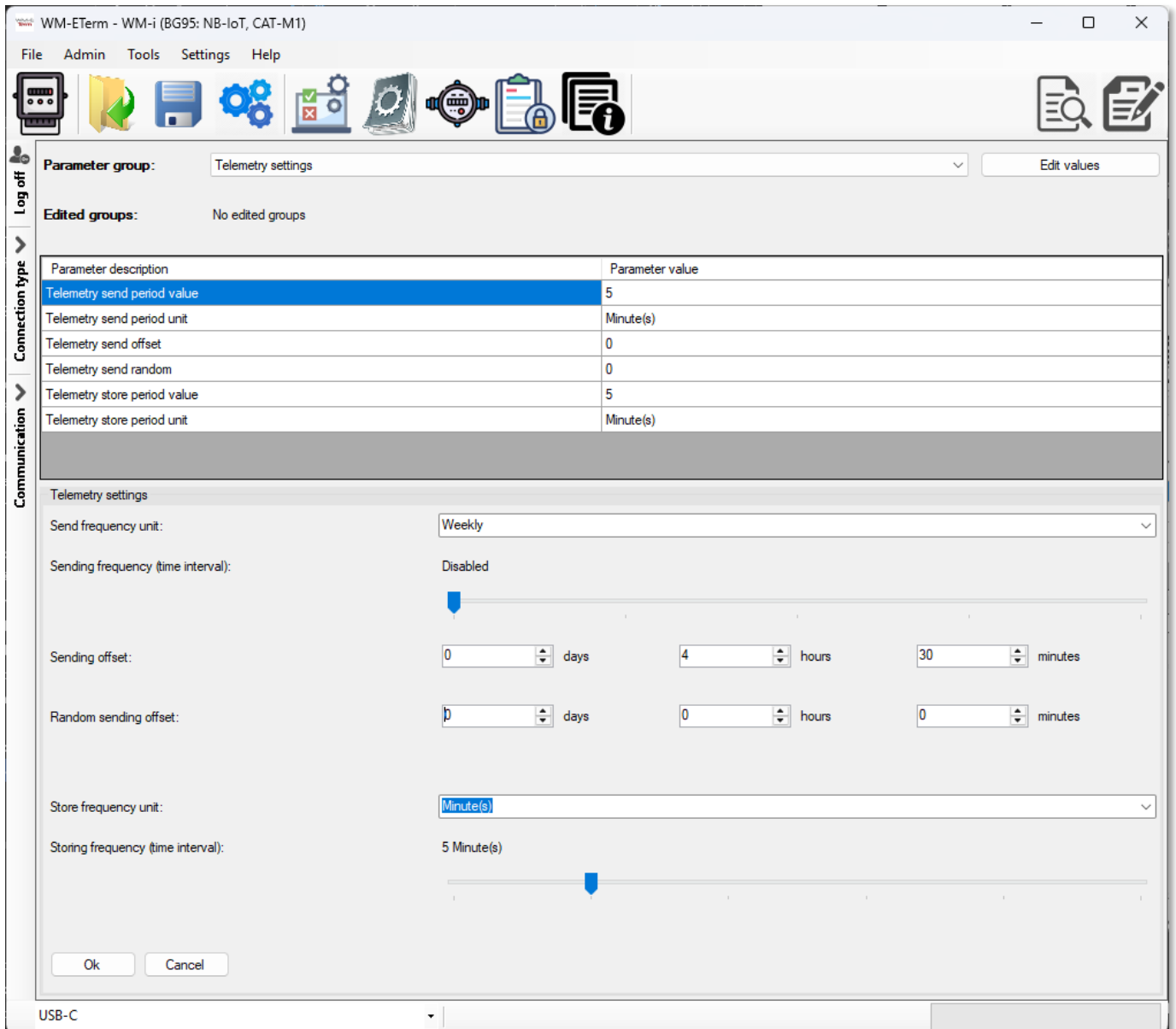
Some examples:

- **Minute(s)** – if **Sending frequency** value is **1**, it means it will send data in every Minutes
- **Minute(s)** – if **Sending frequency** value is **10**, it means it will send data in every HH:10 Minutes (e.g. at 08:00, 08:10, 08:20, etc)
- **Hourly** – if **Sending frequency** value is **1**, it means it will send data in every Hour at :00 Minutes (e.g. at 08:00, 09:00, 10:00, etc)
- **Hourly** – if **Sending frequency** value is **4**, it means it will send data in every 4 Hours at :00 Minutes (e.g. at 0:00, 4:00, 8:00, etc)
- **Daily** – if **Sending frequency** value is **1**, it means it will send data in every 24 Hours and :00 Minutes (e.g. on Monday at 0:00, on Tuesday at 0:00, etc)
- **Daily** – if **Sending frequency** value is **2**, it means it will send data in every 48 Hours and :00 Minutes (e.g. on Monday 0:00, on Wednesday at 0:00, etc)
- **Weekly** – if **Sending frequency** value is **1**, it means it will send data on every Week at 00 Hours and :00 Minutes (e.g. on every Monday at 0:00)
- **Weekly** – if **Sending frequency** value is **2**, it means it will send data in every 2 Weeks at 00 Hours and :00 Minutes (e.g. on week nr. 1 on Monday at 0:00, week nr. 3 on Monday at 0:00, etc)
- **Monthly** – if **Sending frequency** value is **1**, it means it will send data on every Month's first day at 00 Hours and :00 Minutes (e.g. on 1st of January, 1st of February at 0:00, etc)
- **Monthly** – if **Sending frequency** value is **6**, it means it will send data on every Half a year at the first day of the Month, at 00 Hours and and :00 Minutes (e.g. on 1st of January at 0:00, on 1st of July at 0:00)

- **Sending offset:** you can also use offset time comparing with the **Sending frequency** value. Here you can choose **minutes, hours, days** with its value.

Some examples:

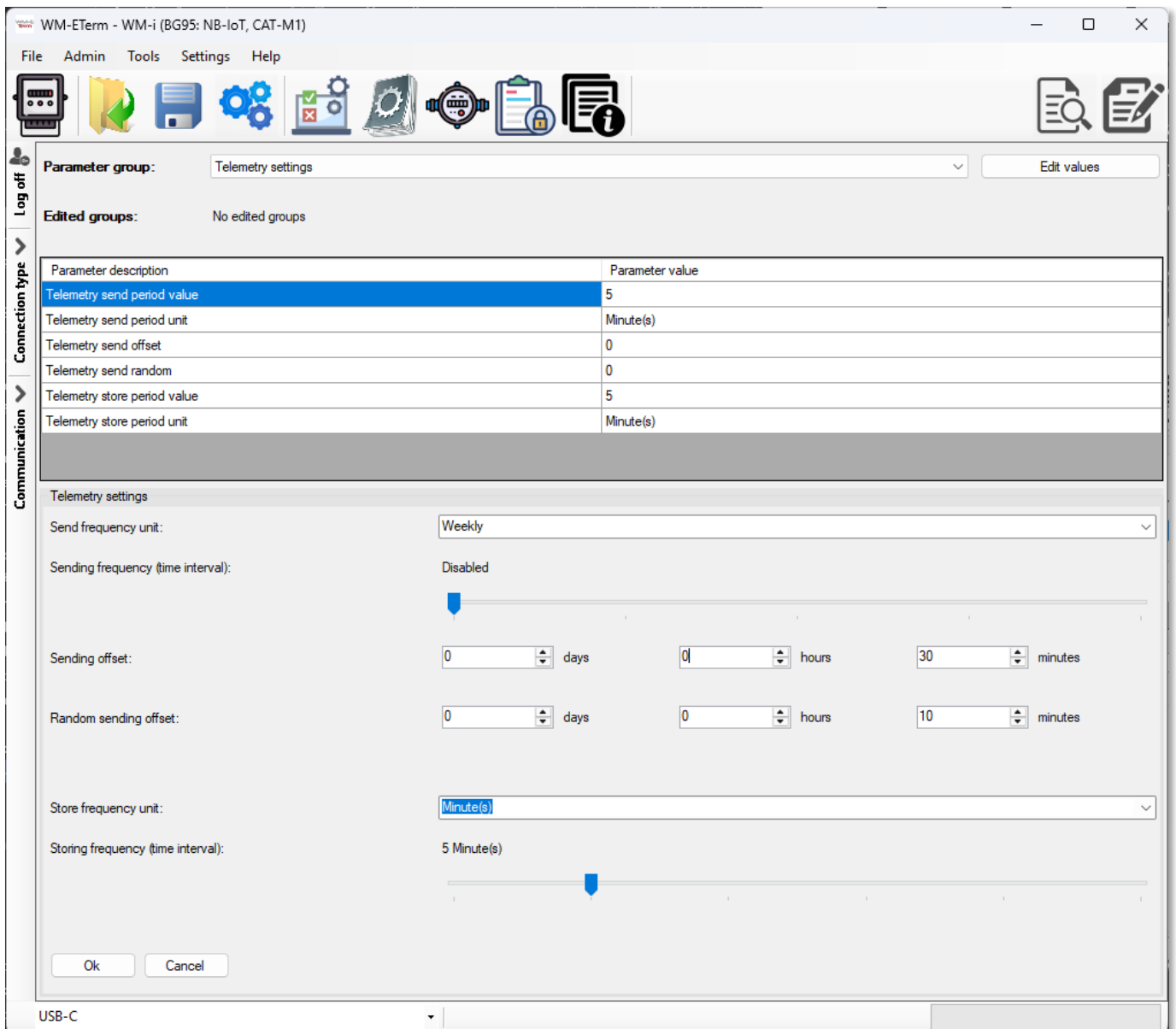
- **Minutes** – if **Sending frequency** value is **10**, and **Sending offset** value is **5 Minutes**, it means it will send data in every HH:15 Minutes (e.g. at 08:00, 08:15, 08:30, 08:45, 09:00, etc)



- **Hourly** – if **Sending frequency** value is **1**, and **Sending offset** value is **30 Minutes**, it means it will send data in every Hours at :30 Minutes (e.g. at 0:30, 1:30, 2:30, etc)
- **Daily** – if **Sending frequency** value is **2**, and **Sending offset** value is **4 Hours** and **30 Minutes**, it means it will send data in every 48 Hours at 04:30 Minutes (e.g. on Monday 04:30, on Wednesday at 4:30, etc)
- **Weekly** – if **Sending frequency** value is **1**, and **Sending offset** value is **4 Hours** and **30 Minutes**, it means it will send data in every week's first day at 4 Hours and :30 Minutes (e.g. on every Monday at 4:30)
- **Weekly** – if **Sending frequency** value is **1**, and **Sending offset** is **2 Days** and **4 Hours** and **30 Minutes**, it means it will send data in every second days at 4

Hours and :30 Minutes (e.g. on every Monday at 4:30, Wednesday at 4:30, Friday at 4:30, etc)

- **Monthly** – if **Sending frequency** value is **1**, and **Sending offset** is **15 Days** and **4 Hours** and **30 Minutes**, it means it will send data on every month's 15th day at 4 Hours and :30 Minutes (e.g. on 15th of January at 4:30, 30th of January at 04:30, 15th of February at 4:30, etc)
- **Random sending offset**: you can use a random time interval, where a delay can be added to the **Sending offset** value. Here you can choose **minutes, hours, days** with their value.



E.g. if you choose **Sending offset** to **30 Minutes** and use **Random sending offset** to **10 Minutes**, that means that the real sending will be scheduled between 30 and

40 minutes in a random time. This randomizing option is vrey useful if you use the same configuration for more WM-i devices, but you don't want to burden the cellular network - so that they don't send data at the same time. Therefore, the same time interval can be used for thousands of devices without any problem.

- **Storage frequency unit:** default value is **Minutes**. Can be selected: None, Minute(s), Hourly, Daily, Weekly, Monthly
- **Storage frequency (time interval):** default value is **Disabled**. You can use the time interval comparing with the **Storage frequency unit** value.

It's important to configure these **Storage frequency** parameters fields, because if the WM-i device will not getting cellular network access, these parameters serve data retention – if you configure it. Then later, when the device will having cellular access at sending frequency time interval, these collected data will be all signaled / transmitted to the Azure®.

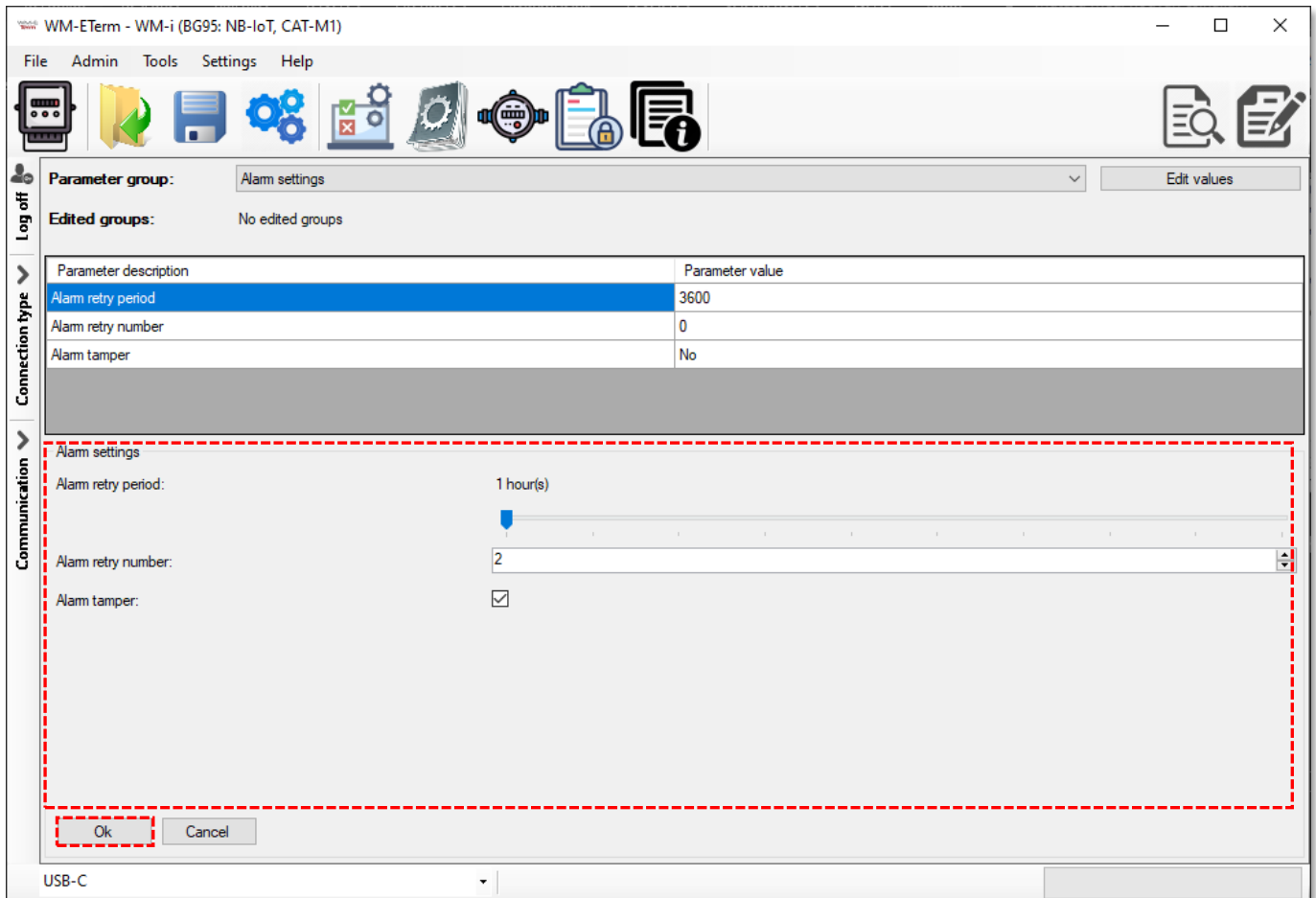
Set the desired parameters and press the **[OK]** button. At the end of the settings, don't forget to perform **Parameters write**  to the device.

6.3 Alarm settings

You can configure the **Alarm settings** in its parameter group.

- **Alarm tamper** – here you can enable the signaling of the device cover removal event. If you **enable** the option in its checkbox, but the **Alarm retry number** is „0”, then the event will be signaled only once, immediately when it was occurred.
- **Alarm retry period** – you can choose an alarm re-sending frequency. The alarm event signaling will be repeated by the setting interval. This field value should be interpreted together with the **Alarm retry number** value. (e.g. If its value is „0”, there no will be no repetition at all. If the value is greater than „0” then the **Alarm retry period** will be multiplied by the **Alarm retry number**'s value).

- **Alarm retry number** – This field value should be interpreted together with the **Alarm retry period** value.



Set the desired parameters and press the **[OK]** button.

At the end of the settings, don't forget to perform **Parameters write**  to the device.

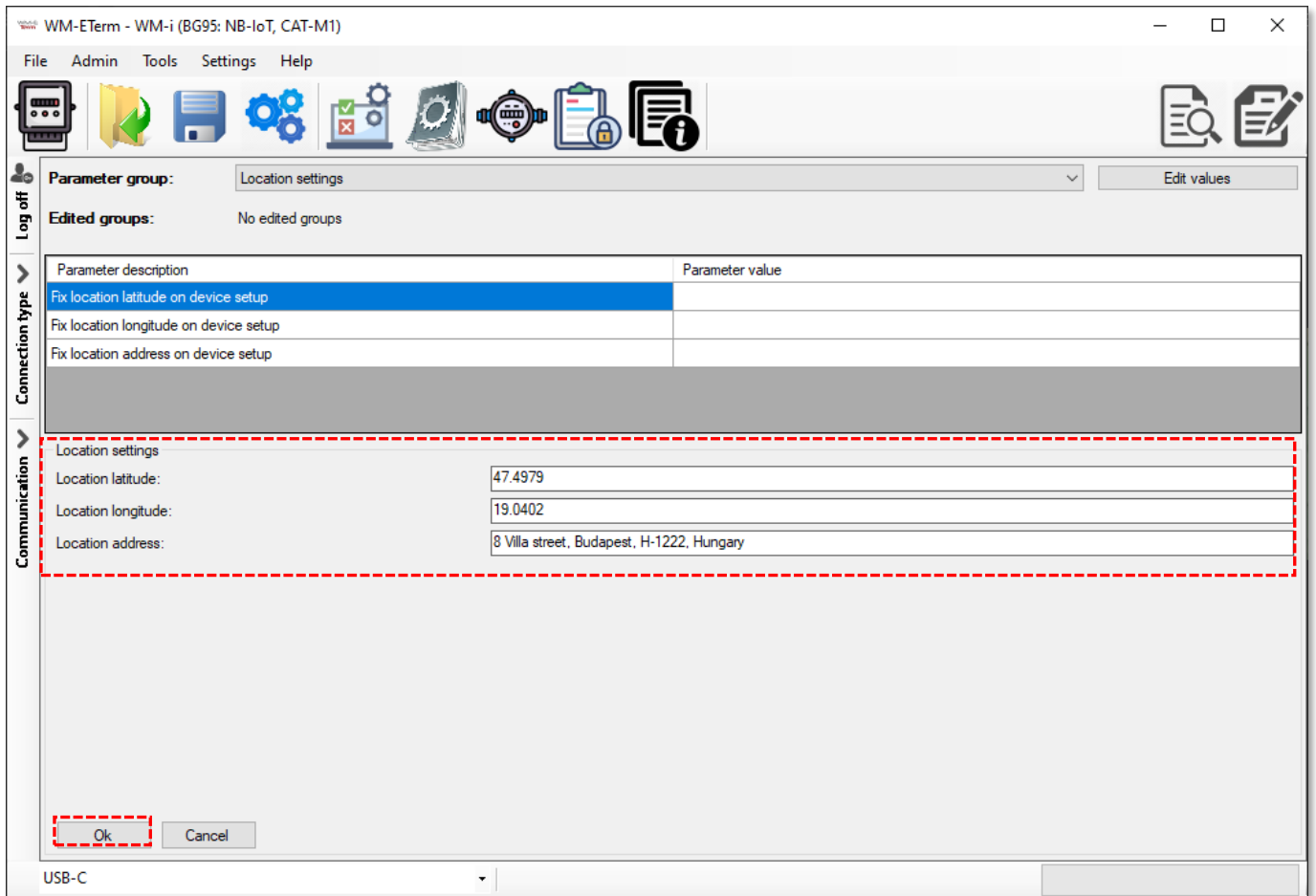
6.4 Location settings

You can configure the **Location settings** in its parameter group.

Location latitude, **Location longitude** and **Location address** fields can be filled for an easier visual identification (on a map in Azure®).

Note, that the GPS / GNSS option is independent from this setting. This is only a manual option to identify a device on a location.

Set the desired parameters and press the **[OK]** button.



At the end of the settings, don't forget to perform **Parameters write**  to the device.

6.5 Time setting

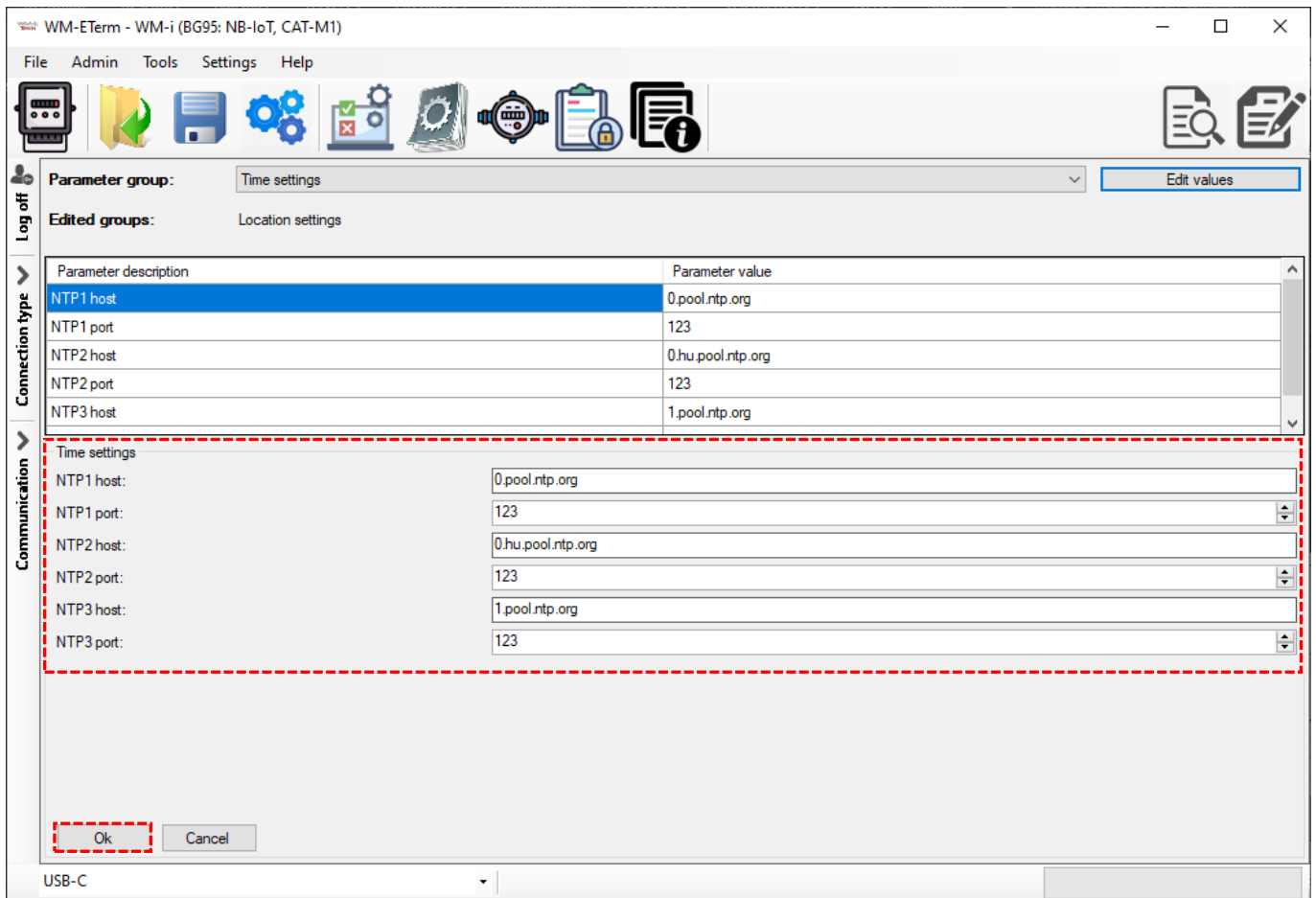
We suggest you to configure (S)NTP servers for getting date/time information at the **Time settings** in its parameter group.

There can be three (S)NTP servers added.

When a valid time will be getting, the next NTP server(s) will be not queried.

- **NTP1 host** (IP address or domain name), **NTP1 port**
- **NTP2 host** (IP address or domain name), **NTP2 port**
- **NTP3 host** (IP address or domain name), **NTP3 port**

If no NTP server address was defined, and there is no available date/time value for the device, then the WM-i device tries to getting current time information from LTE Cat.M or NB-IoT network - if it is available and allowed by the current Mobile Operator.



IMPORTANT! The existence of time value or getting date time info is the most important for data reliability (local data storage, data transmission via cellular network).

Set the desired parameters and press the **[OK]** button.

At the end of the settings, don't forget to perform **Parameters write**  to the device.

6.6 AZURE settings

Here you can configure the data transmitting at the **AZURE settings** parameter group.

Options:

- a.) **If you receive a pre-configured sample or device from WM Systems**, then you will be getting an account and password from WM Systems.

The WM-i PULSE® device serial number (SNO) will be already registered to the Azure with its Serial number as its identifier.

Log in to the Azure interface with the following data and you can search your own sample device (demo) from the list.

Azure IoT HUB / Cloud server settings:

- **Azure IOT Central application URL:**

<https://water-consumption-monitoring-2jgotrodigi.azureiotcentral.com/>

- **Username:** WMSystemsDemo@outlook.com
- **Password:** *ask our Sales!*

After login credentials, choose the **Name** here on the Azure website, according to the WM-i device **Serial number**, which you read out at the **Device Information** menu of WM-E Term software.

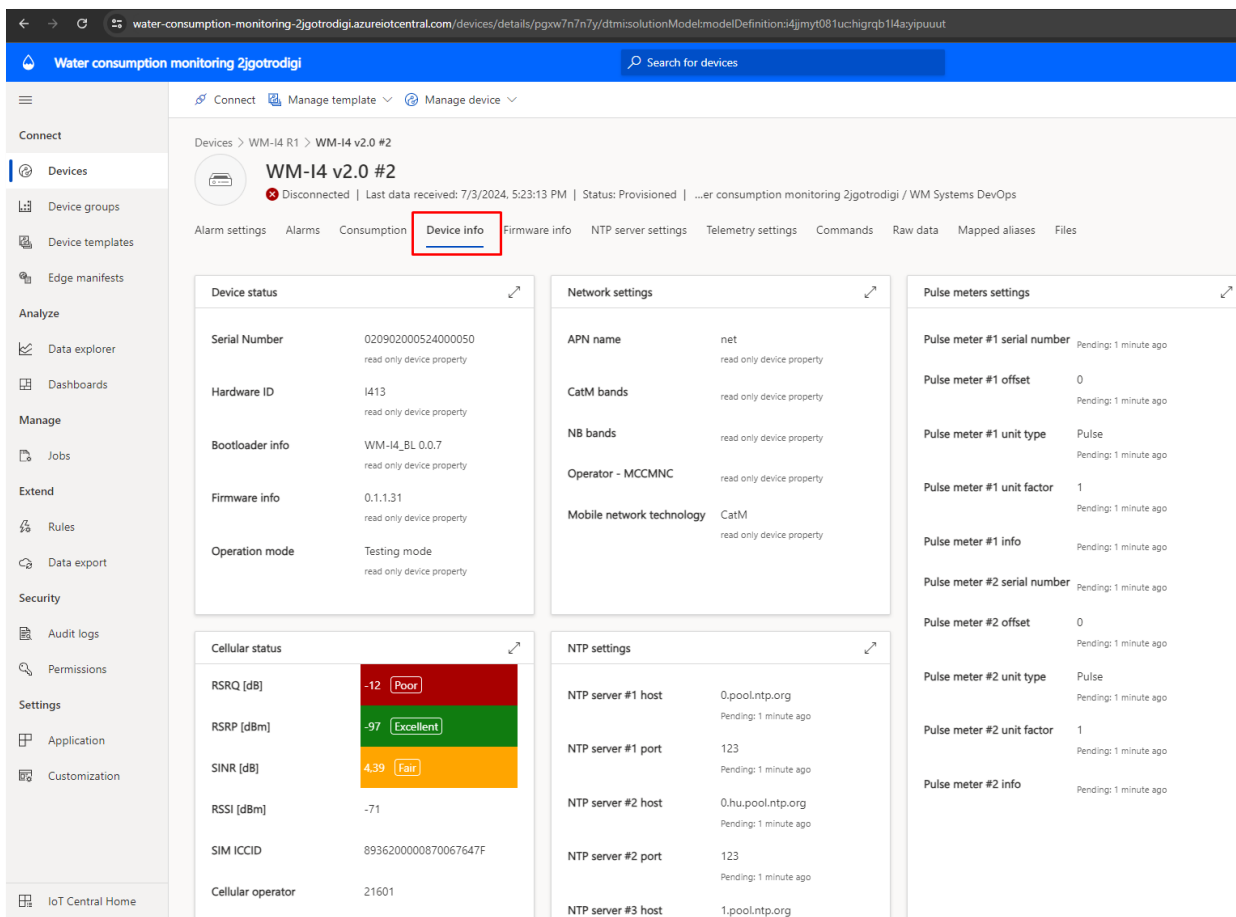
The screenshot displays the Azure IoT Central interface. On the left, there is a navigation menu with options like 'Connect', 'Devices', 'Device groups', 'Edge manifests', 'Analyze', 'Data explorer', 'Dashboards', 'Manage', and 'Jobs'. The main area shows a 'Device group' named 'WM-I4 Samples'. Below this, there is a 'Device group access' section and a 'Create a device query' section. A table of results shows 12 devices. One device, with ID '020902000524000005', is highlighted with a red box. A red arrow points from this device in the table to a detailed 'Device info' window. This window shows various details for the device 'WM-E Term - WM-I (BG95: NB-IoT, CAT-M1)', including its serial number, biotloader, cellular status, module type, IMEI, operator, band, RSSI, SINR, IP address, time status, and platform status.

| Name | Device ID | Simulated | Device status | Organization |
|--------------------|--------------------|-----------|---------------|-----------------------------|
| 020902000524000003 | 020902000524000003 | No | Provisioned | ...gi / WM Sample customers |
| 020902000524000005 | 020902000524000005 | No | Provisioned | ...gi / WM Sample customers |
| 020902000524000006 | 020902000524000006 | No | Provisioned | ...gi / WM Sample customers |
| 020902000524000007 | 020902000524000007 | No | Provisioned | ...gi / WM Sample customers |

| Device status | HW ID: | BIOT | Firmware: |
|-----------------------------------|--------|----------------|-----------|
| Serial number: 020902000524000005 | 1413 | WM-I4_BI_0.0.7 | 0.1.1.31 |

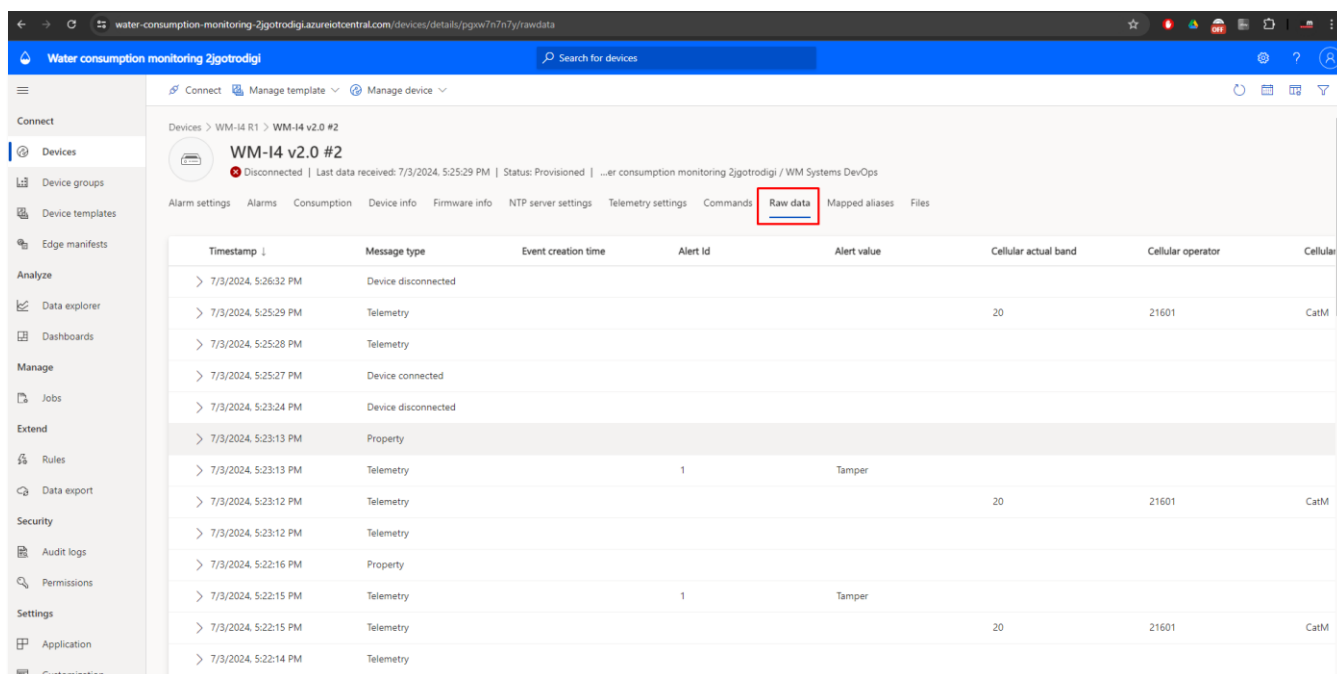
Select the device in Azure, then choose the „**Device info**” tab on the top part. Here you can check the device information, cellular status, network and NTP

settings, signaled meter data – if the device already made a successful data transmission.



Below, on the screen, all important readout device settings can be also seen.

At the **Raw data** tab, you will find all historical transmitted data with the transmitted values.

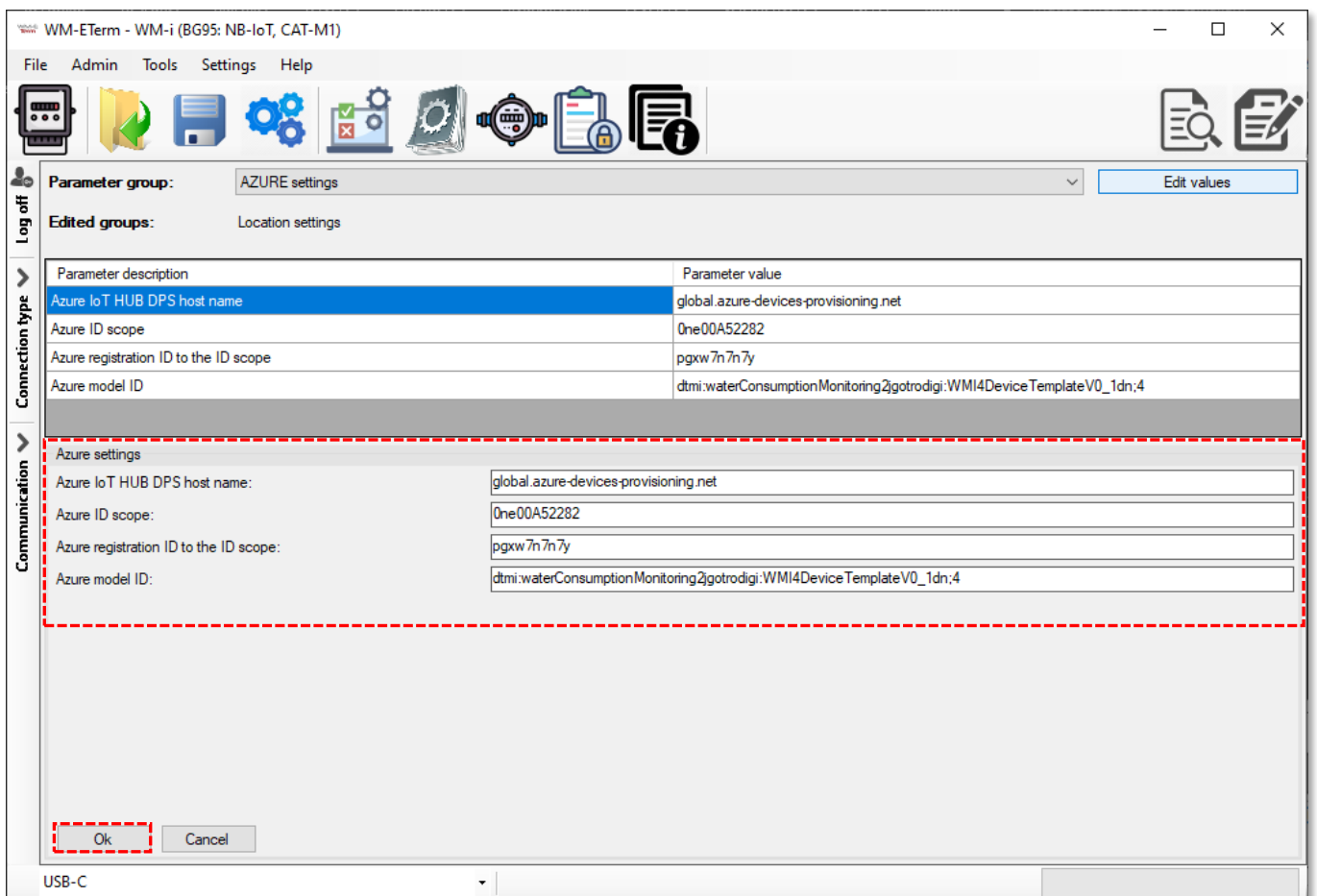


These information are also useful when testing the device in the **Test mode** operational mode of the WM-i PULSE®.

b.) **If you want to configure the product yourself in your own system**, then the following WM-E Term parameters must be configured for your own Azure® IOT Central Application, according to the settings of the Azure® server.

Ask our sales to make the necessary settings!

In this case, before configuring the Azure settings here in WM-E Term, the Azure settings should be already performed.



Then fill following fields if you want to configure Azure yourself:

- **Azure IoT HUB DPS host name** – Azure IoT domain/address
- **Azure ID scope** – DPS server identifier
- **Azure registration ID to the ID scope** – Device identified (Device ID)
- **Azure model ID** – Communication message format identifier model name

Set the desired parameters and press the **[OK]** button. At the end of the settings, don't forget to perform **Parameters write**  to the device.

Important! Note, that the device will not transmitting or signaling any data to the Azure, until the settings are not sent to the device.

Important!

Note, that once the configuration was made in **Telemetry settings**, Azure[®], then it will overwrite settings in the modem every time you log in to Azure[®].

Therefore, once you've set configuration in the Azure[®] profile, it will be pointless to set telemetry settings via WM E-Term[®] configuration software.

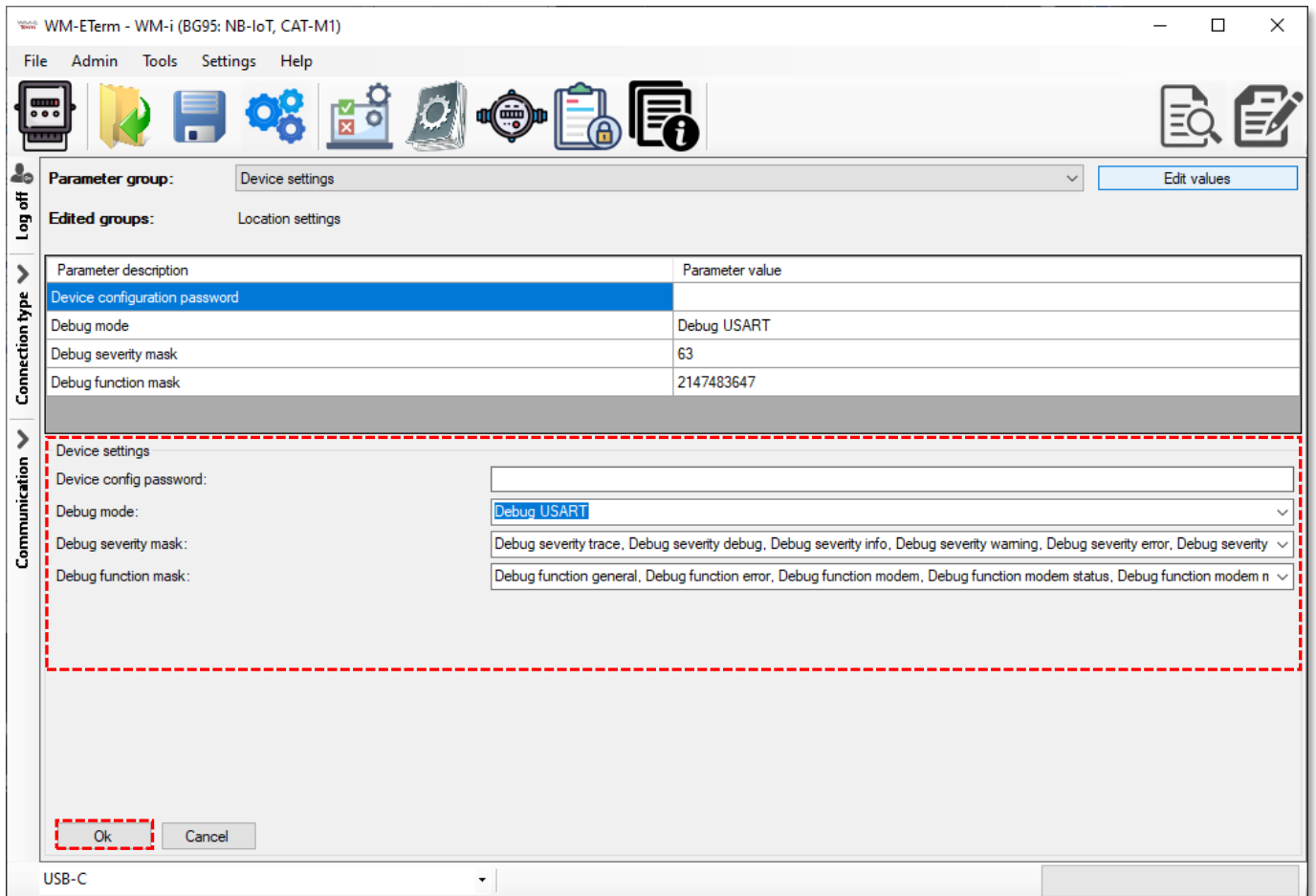
If you still want to configure the WM-I device locally with WM E-Term[®], for that at first on the Azure[®] user interface at **Manage / Device properties** you should all related and desired parameter(s) set to zero. As a result, the remote Azure[®] configuration will not be set and overwritten the local WM-i PULSE[®] settings, and thus the value you have set locally in the WM-E Term[®] software will remain and the modem will send these and validate the locally modified configuration to Azure[®].

6.7 Debug settings

In the **Device settings** parameter group you can configure the device connection and debug options.


- **Device config password** – you can set a configuration password for configuring the WM-i PULSE[®] device.
- **Debug mode** – for debugging, you can choose Debug via **USART** or **USB** connection or you can **Disable** the feature.
- **Debug severity mask** – you can choose, which severity options should be debugged or not.
- **Debug function mask** – you can choose, which functions should be debugged or not

Set the desired parameters and press the **[OK]** button.



At the end of the settings, don't forget to perform **Parameters write**  to the device.

6.8 Meter settings

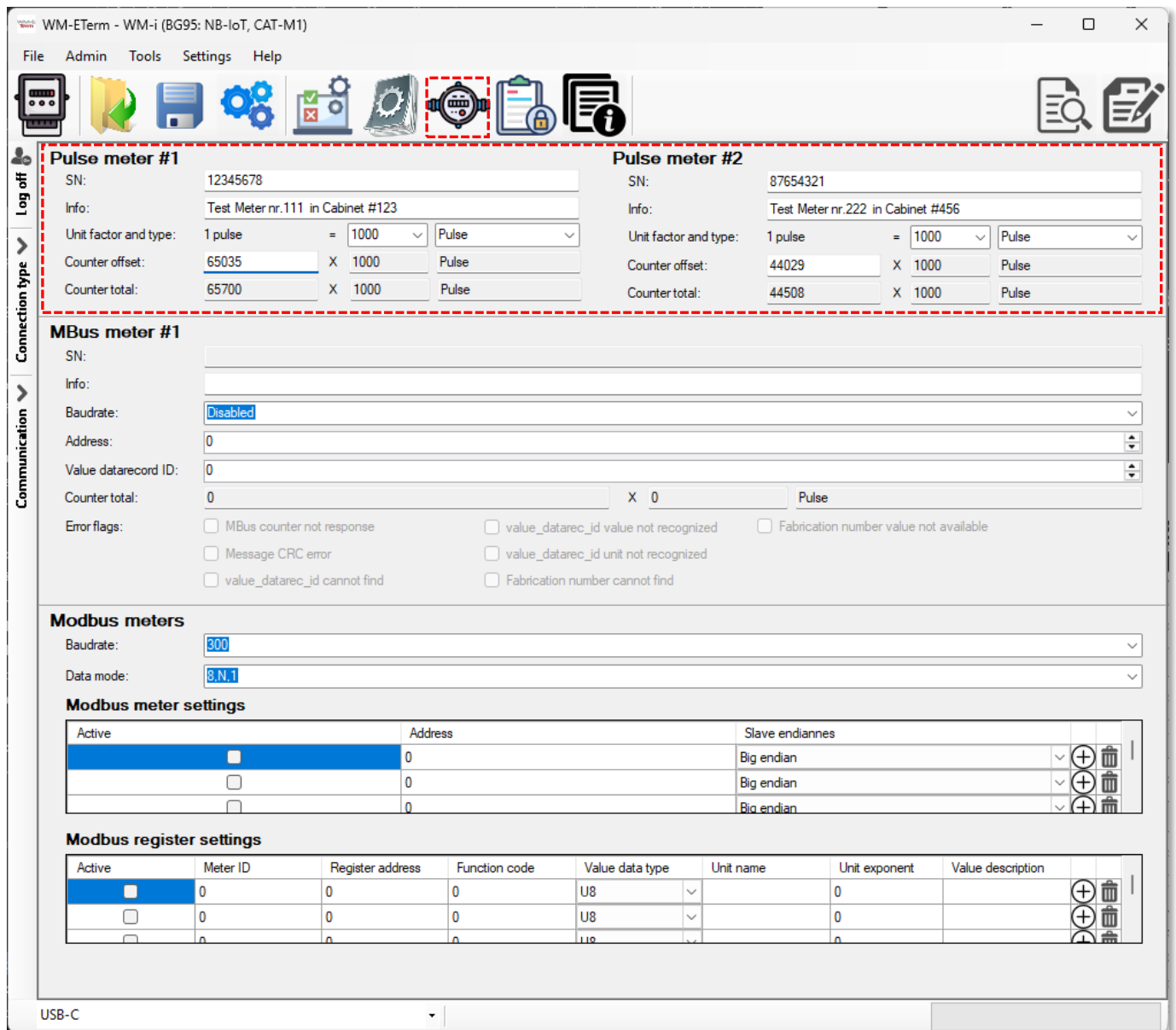
You can configure the connecting meters, sensors and further devices by selecting  the icon from the menu. When you open this, the WM-i PULSE® will automatically read out the configured settings.

Then configured meters/sensors will be listed with their current configured parameters.

Here, you can add or modify pulse-output capable meters or sensors with their identification data, dial and count info locally store and signal / transmit these together with received and counted pulse info.

- **Pulse meter #1** – meter connected to Pulse input number 1
- **Pulse meter #2** – meter connected to Pulse input number 2
- **SN:** Serial number can be found on the meter's counter plate


- **Info:** Description which helps the manual identification (e.g. of installation place, etc.)



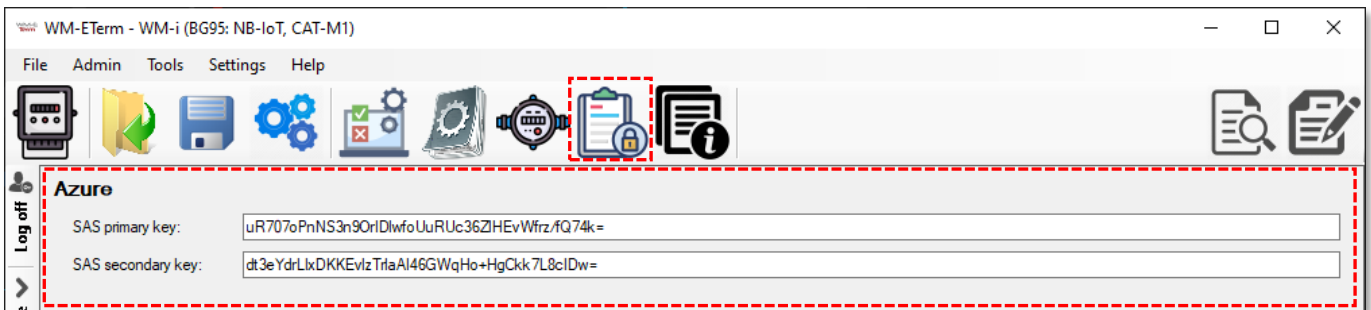
- **Unit factor and type:** you can set the multiplier to 1 pulse and the corresponding Unit factor (such as **pulse, m3, J, Wh, VARh**)
- **Counter offset:** The absolute consumption counter status/value at the moment, when the WM-i was installed to the meter.
- **Counter total:** read-only field to show the current (last known) measurement value, which was detected on the related Pulse input.

At the end of the settings, don't forget to perform **Parameters write**  to the device.

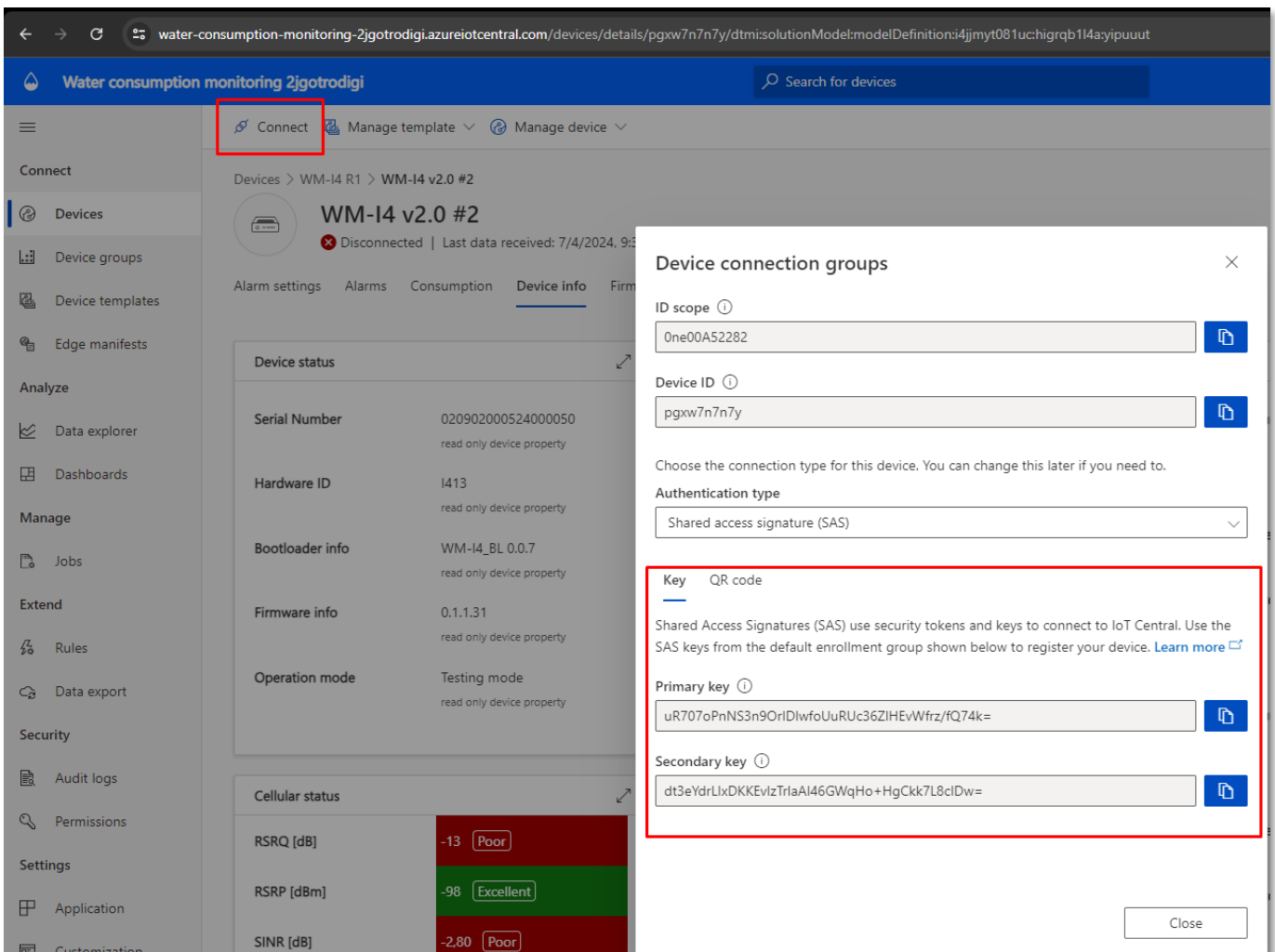
6.9 Security Token key settings

You can configure the encryption keys for a safe communication with Azure by pressing the  icon.


When you open this menu, the WM-i will be automatically read out the configured settings.



Here you will find two SAS keys (**SAS primary key**, **SAS secondary key**), which you can get from Azure, after you had registered a device.



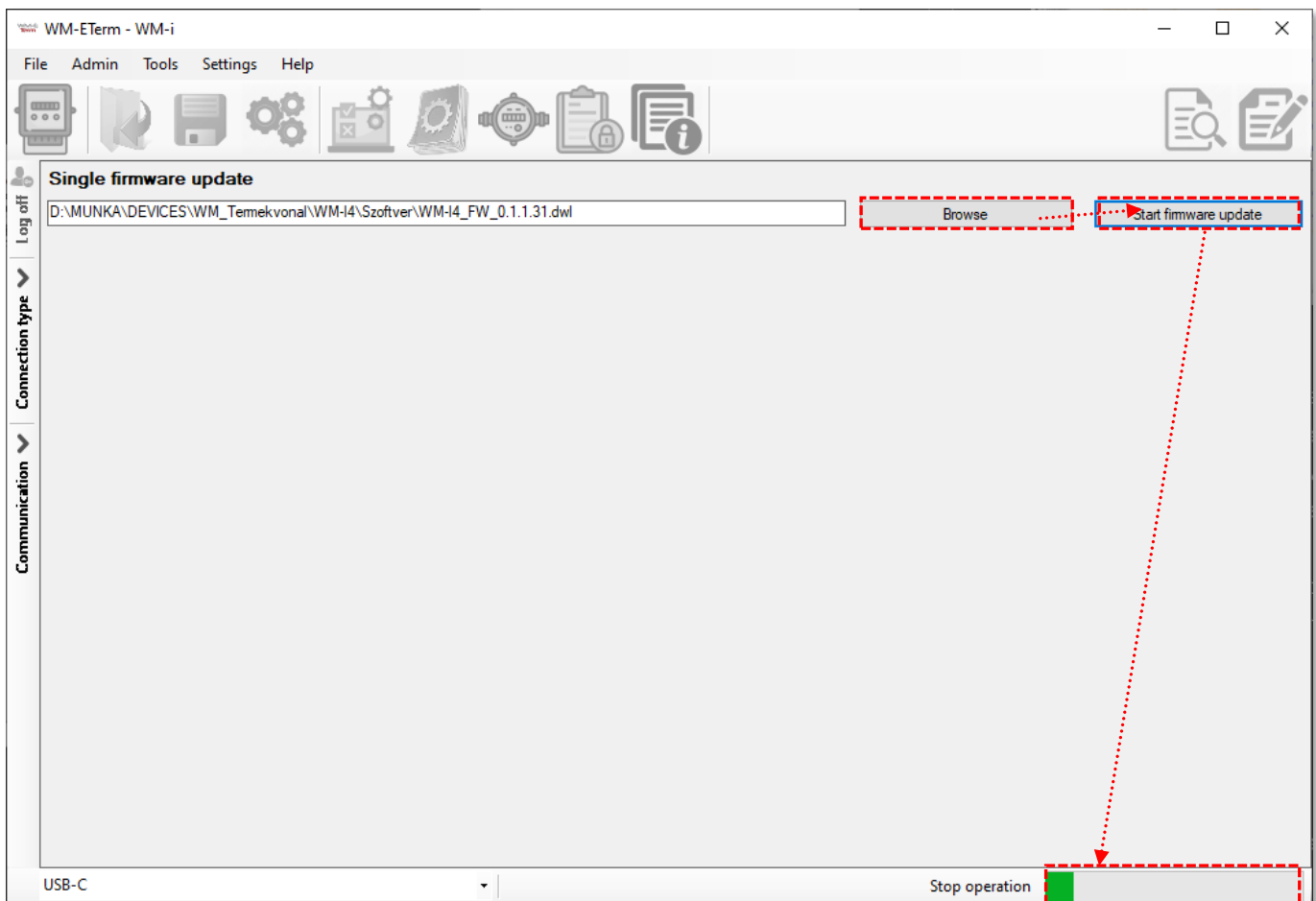
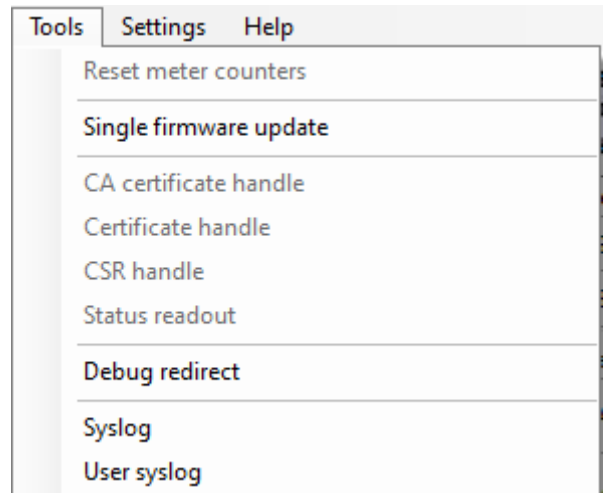
Choose there the **„Connect”** tab and there you will find the generated keys. Copy them into the WM-E Term if you want to configure there the WM-i PULSE®.

Send the configured encryption keys with the **Parameters write**  icon to the device.

Chapter 7. Firmware Update

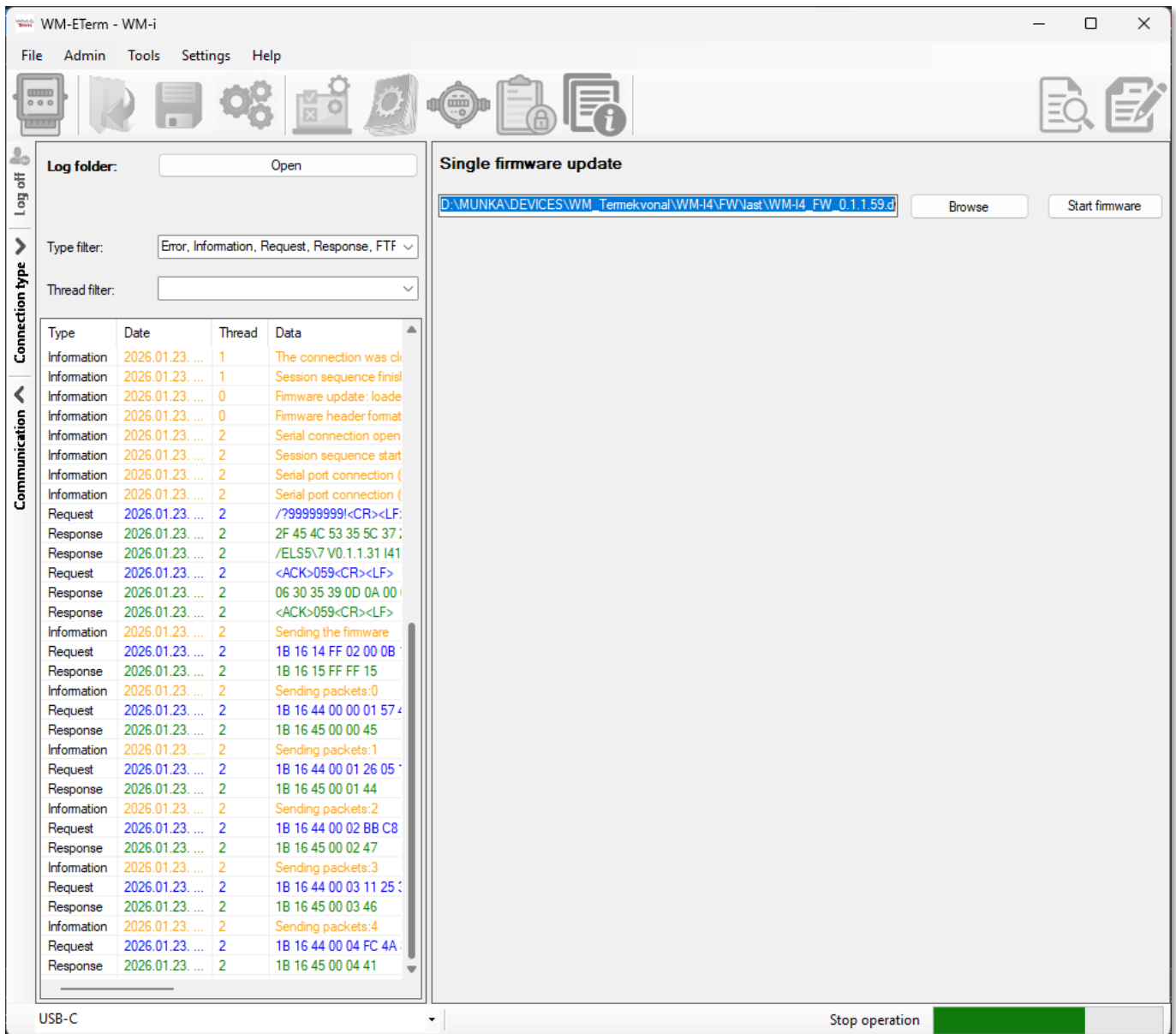
Choose the **Tools / Single Firmware update** menu, where the current firmware can be refreshed.

1. Push then the **[Browse]** button to select the .DWL extension firmware file.
2. Push **[Start firmware update]** button for performing the singular firmware upload.



3. The firmware upload and installation progress will be shown at the right-bottom progress indicator bar. This can take in normal case about 5-10 minutes, but sometimes it requires more time to update the firmware – according to the currently used cellular network.

4. The progress can be also checked in the left „**Communication**” tab. The firmware refresh will be started from „**Firmware sending**” message and continues further with „**Sending packets**” sequence.



5. At the end of the FW update, the a „**New firmware refresh has been started...**” message will appear.

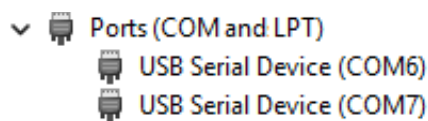
Then soon the device will be automatically restarted with the new firmware – this could take 2-3 minutes to apply.

The LEDs will be also indicating the boot process and the device’s availability.

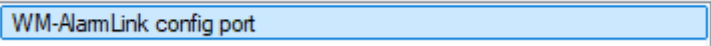
IMPORTANT!

If the updated new FW version is newer than v0.1.1.43, then after the update, WM-i PULSE® device will be disconnecting from the WM-E Term software. The reason for this is that newer firmware versions use two different COM Ports instead of the previous one. Therefore, you should close the WM-E Term software and start it again and make a new connection profile as it is described below.

In **Connection type** settings you have to modify the current connection profile by **[Edit]** button. There you have to choose a new COM port. Now open Windows® **Control Panel**, open **Device Manager** and expand **Ports**. You will see two COM Ports there, which are listed as „**Serial USB device**”.



Open the **last USB Serial Device** entry and choose **Properties** and choose **Details** tab. There at **Property**, select **Bus description**. At **Value** field you should see the „**...config port**”.



WM-AlarmLink config port

If yes, then note this port identifier **COM** number – e.g. **COM 7**.

Take note, that if the port's **Bus description** value is „**debug port**”, then you should close this window and select the other port (e.g. COM6) and repeat this identification query at the that port and find „**...config port**”. Then note this port identifier **COM** number – e.g. **COM 6**.

[Save] settings and choose the connection profile at left bottom part of the screen. Now you will access the updated WM-i device.

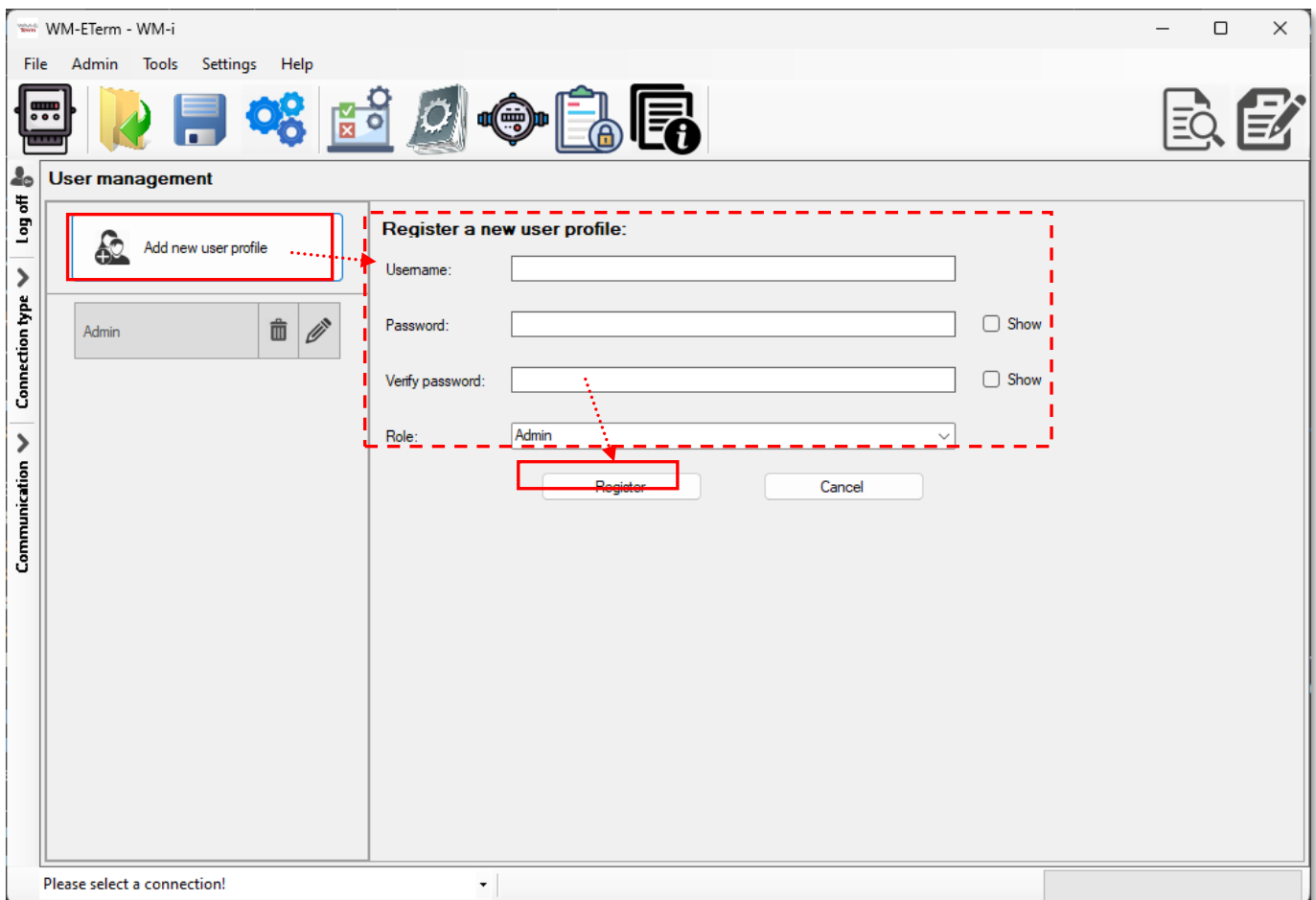
Chapter 8. Other features

8.1 User Management

1. Choose the **Admin / Manage users** menu.

Here you can **Add** a new user or **Modify, Delete** an existing one.

2. Press the **[Add new user profile]** button for creating a new user account.



3. Add a **Username** for the new profile and define a **Password*** for the account. Then fill the password again to the **Verify password*** field.


Note, that you can use the **Show checkbox option to check the filled password.*

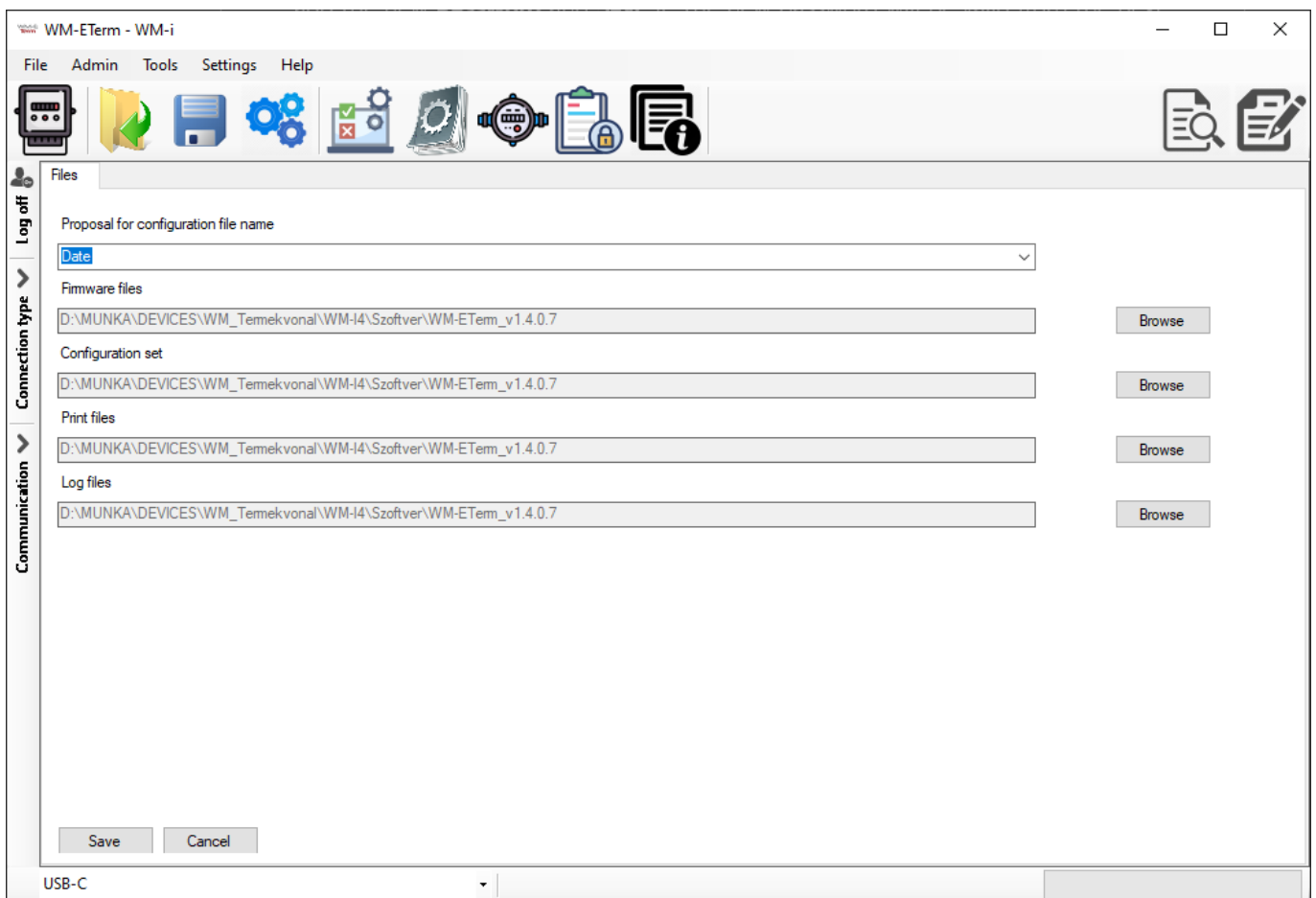
4. Choose a **Role** for the user profile which can be **Admin / Installer / User**.

5. **[Save]** it. The new account will be available from the next log in attempt.
6. To change the currently used / existing password of a profile, press the Edit (pencil) icon and fill the new **Password**, then **[Save]** it.
Note, that the new password will be valid from the next WM-E Term starting when you will attempt to login.

8.2 General settings

The general program settings can be done here.

1. Choose the **Settings**  icon from the menu (or choose the **Settings / Edit settings** menu).



2. If needed, you can change the **“General”** tab settings (as language, Date format, Window size, Print font type or hide the password).

3. **[Save]** your settings when you have modified the configuration.
4. On the **“Files”** tab you can define the path/directory for the configuration files, firmware, log.
5. **[Save]** your settings when you have modified the configuration.

Important! *The WM-E Term software will store the changed settings and when you start the software next time, they will automatically be loaded.*

Chapter 9. Support

If you have any questions concerning the usage of the device, contact us at the following contact:

E-mail: iotsupport@wmsystems.hu

Online product support can be required here:

<https://wmsystems.atlassian.net/servicedesk/customer/portal/70/user/login?destination=portal%2F70>

For the proper identification of your device, use the sticker and its information, which contains important information for the call center.

Due to the support questions, the product identifier is important for resolve your problem. Please, when you are attempting to tell us an incident, please send us the IMEI and SN (serial number) information from the product warranty sticker (located on the front face of the product housing).

The documentation and software release for this product can be accessed by this link:

<https://m2mserver.com/en/product/wm-i-pulse/>

Chapter 10. Legal notice

©2026. WM Systems LLC.

The content of this documentation (all information, pictures, tests, descriptions, guides, logos) is under copyright protection. Copying, using, distributing and publishing is only permitted with the consent of WM Systems LLC., with clear indication of the source.

The pictures in the user guide are only for illustration purposes.

WM Systems LLC. does not confirm or accept responsibility for any mistakes in the information contained in the user guide.

The published information in this document is subject to *change without notice*.

All data contained in the user guide is for information purposes only. For further information, please, contact our colleagues.

Warning

Any errors occurring during the program update process may result in failure of the device.