User manual
for WM-i 4-20mA®

Document specifications

This documentation was made for presenting the installation and configuration steps of the **WM-i**® version data concentrator, transmitter device – analog sensor input version (0..10V / 4..20mA compatible).

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Chapter 1. Introduction

Robust, ultra low-power cellular IoT data logger and data concentrator (DCU), 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 two sensors due to its analog inputs (4..20mA or 0-10V).

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

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

The WM-i receives and collects signals of connected sensors, then it transfers all data at predetermined intervals with MQTT protocol to the Microsoft® Azure Cloud IoT platform with TLS encryption through the LTE Cat.M / NB-IoT network.

The easily installable device was designed for long-term, maintenance-free operation, the WM-i 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 analog inputs, which supports 0..20mA / 4..20mA current loop output sensors or 0..10V / 1..10V voltage output sensors
    - USB-C port (for local configuration and installation)
- Internal antenna (mounted inside of casing)

- Tamper protection (security alarm if cover is tampered) – optional
- Cold start (supporting the installation)
- Automatic / configurable mobile operator, bands, access technology
- Automatic data transmission at preconfigured intervals to the Microsoft® Azure Cloud IoT platform
- Transfer of meter data (identifier, location, GNSS option)
- WM-E Term® software for local configuration, FW updates
- Secure remote configuration / firmware updates via Azure platform (TLS)
- "Deployment mode" supports local installation (status checking)
- Watchdog

ACCESSORIES

- Replaceable, high-capacity battery with up to 10 years lifetime (19'000 mAh)
- Cable for sensor connections (2 sensors, USB connection, wire end sleeves, internal connector to the device PCB) for tests, POCs, pilots
- USB-C cable for configuration (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 the Microsoft® Azure Cloud IoT platform, device reconfiguration and firmware update mechanism.
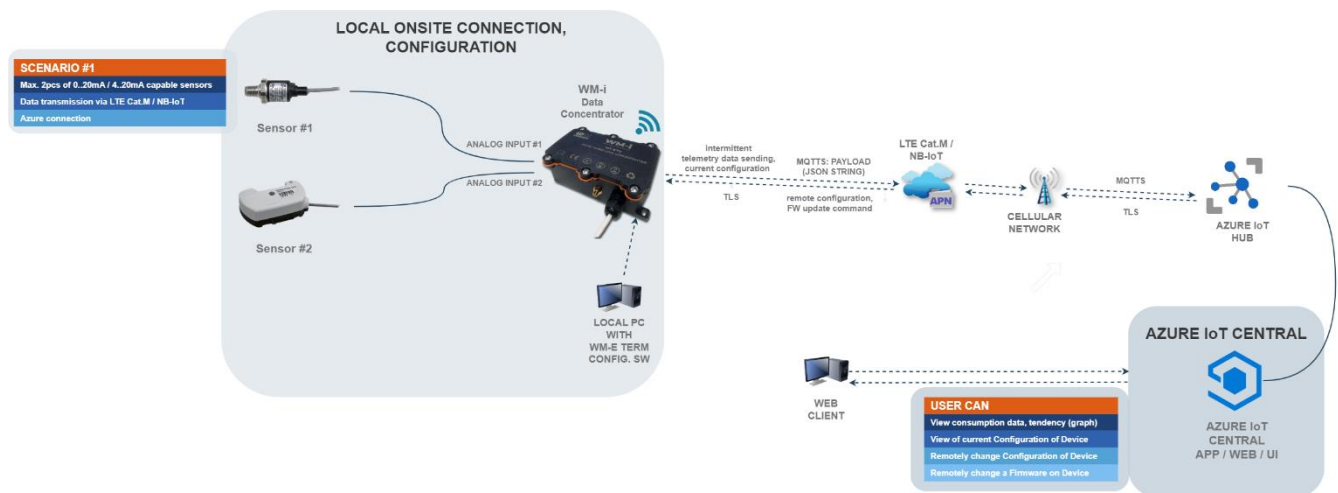
2.2 Design and Installation

The concentrator was specially developed for sensor, metering usage - for receiving and collecting signals of meters and sensors. These all can be connected to the concentrator by its design and connection interface.

It can be installed to sensors 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 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 modem is receiving and collecting the data 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 data through the NB-IoT cellular network (LTE Cat.M or Narrow Band) to the address of the Microsoft® Azure Cloud IoT Platform.

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

It can be used by "push" data transmission method, thus the modem can initiate communication with the AMR center periodically at pre-configured time intervals.

2.4 Power source

The modem has a special internal battery, which provides energy for up to 10 years* (*depending on the settings, and data transmitting frequency).

The device is powered by an internal battery, therefore it provides independent operation from any external power source. The special-filled battery provides a long lifetime (up to 10 years) – or approximately able to serve up to 4,000 data-sending cycles or more.

2.5 Security

The device has security features, such as data encryption during the data transmission to the Microsoft® Azure Cloud IoT platform – using TLS encryption and a private key which are not accessible locally.

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)

2.7 Configuration

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

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

The modem can be configured on the local serial port with the WM-E Term® configuration software – via USB-C connection from a PC – which should be performed before normal operation and usage. During the local configuration, the WM-i device will getting power 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 the firmware can be updated via HTTP or HTTPS remotely without the need to send experts to the field.

2.9 First connection

After the local configuration of meter settings and APN, NTP time sync and IoT / Cloud connection settings, and removing the USB-C cable, the device will be cold started and perform the following operation sequence.

Note, that for sucessful 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 sending settings (sending time interval, protocol, server port, server IP address) and some measurement/meter related settings.

1. The device will be performing operation (e.g. 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 getting date/time information while trying to perform NTP time sync with the configured (S)NTP servers – max. 3pcs of NTP servers.

3. If it will be unsuccessful, the device will try to get date/time information from the NB-IoT cellular mobile operator.

4. The device will attempt to rely on the cold start event to the configured Microsoft® Azure Cloud IoT platform.

5. All further data (e.g. consumption/measurement data of sensors) will be transmitted at the configured time intervals to the specified IP address.

# Chapter 3. Connections

3.1 Top external view

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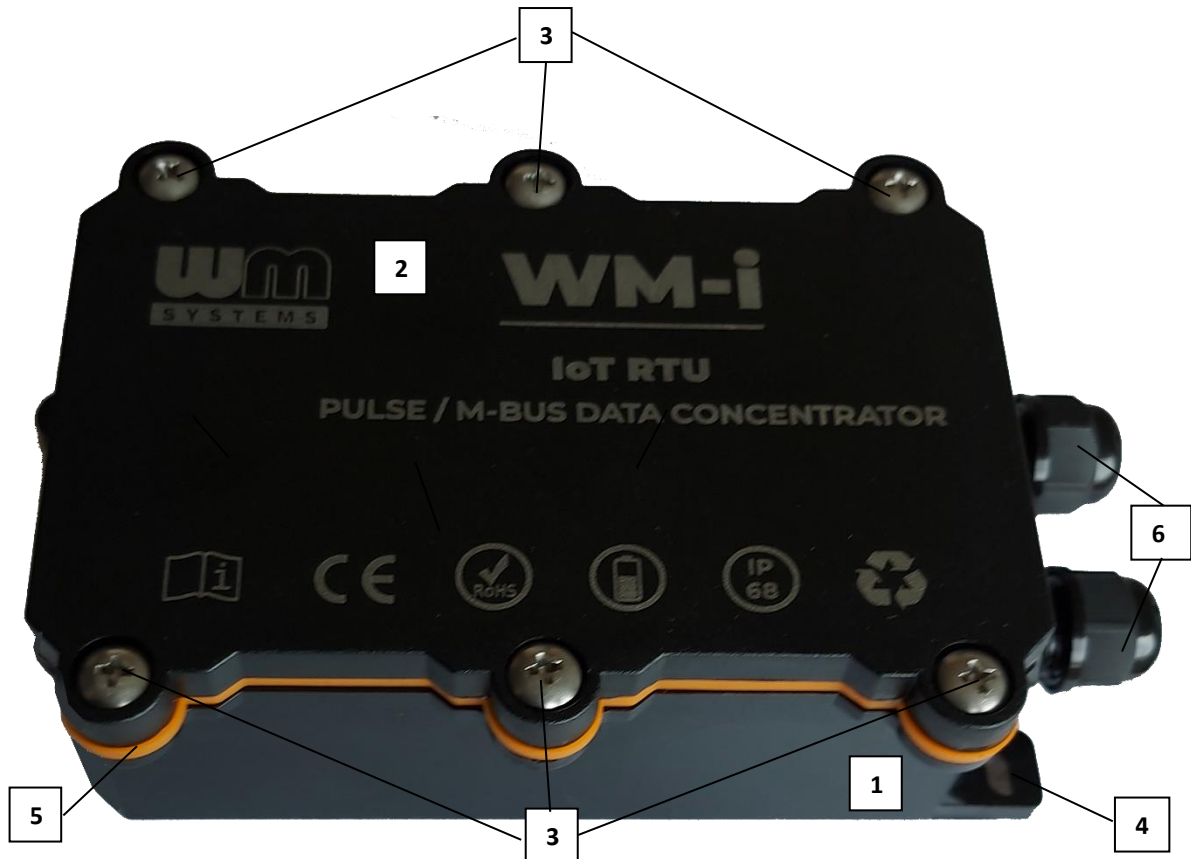
1 – **Casing bottom part (ABS plastic, IP68 protected) – where the PCB is fastened by screws**

2 – **Enclosure top part**

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

4 – **Fastening points (2pcs) - enclosure can be fastened and fixed by screws here and to be mounted**

5 – **Silicone seal (against the ingress of moisture)**

6 – **Sealed input for cables/wires**

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

The bottom part (1) of the casing provides a safe mount to wall option by the fastening points (4).

3.2 Internal view
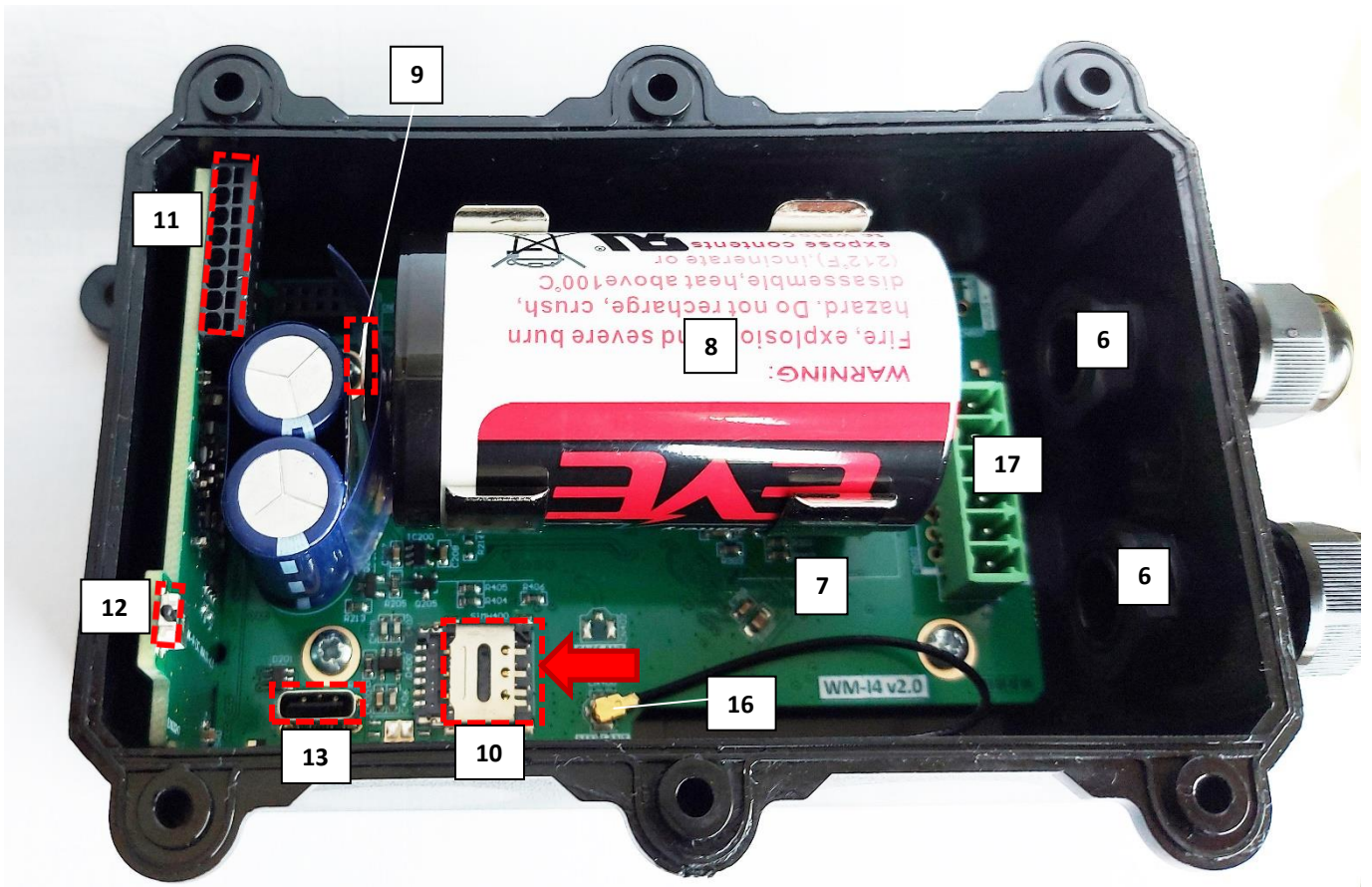
6 – Sealed input for cables/wires

7 – PCB Mainboard

8 – Longlife battery (Lithium-Thyonyl-Chloride, Bobbin-type, 3.6V, with 19 000mAh capacity, type D) inserted in battery socket (holding ears)

9 – Battery disconnector (plastic protective part, which inhibits to supply power from the battery during the delivery/shipping)

10 – Nano-SIM slot (type 4FF) – it can be slide from right-to-left to insert a SIM and slide back to close/fastening

11 – Sensor input cable connector (terminal block, 8 pins) – for 2 sensor output(s), which supports 0..20mA / 4..20mA current loop output sensors or 0..10V / 1..10V voltage output sensors

12 – Tamper switch (for detection the top removal) – order option

13 – USB-C connector (local configuration port)

16 – Internal antenna U.FL cable (connected to the mainboard PCB)

17 – Connectors Not used
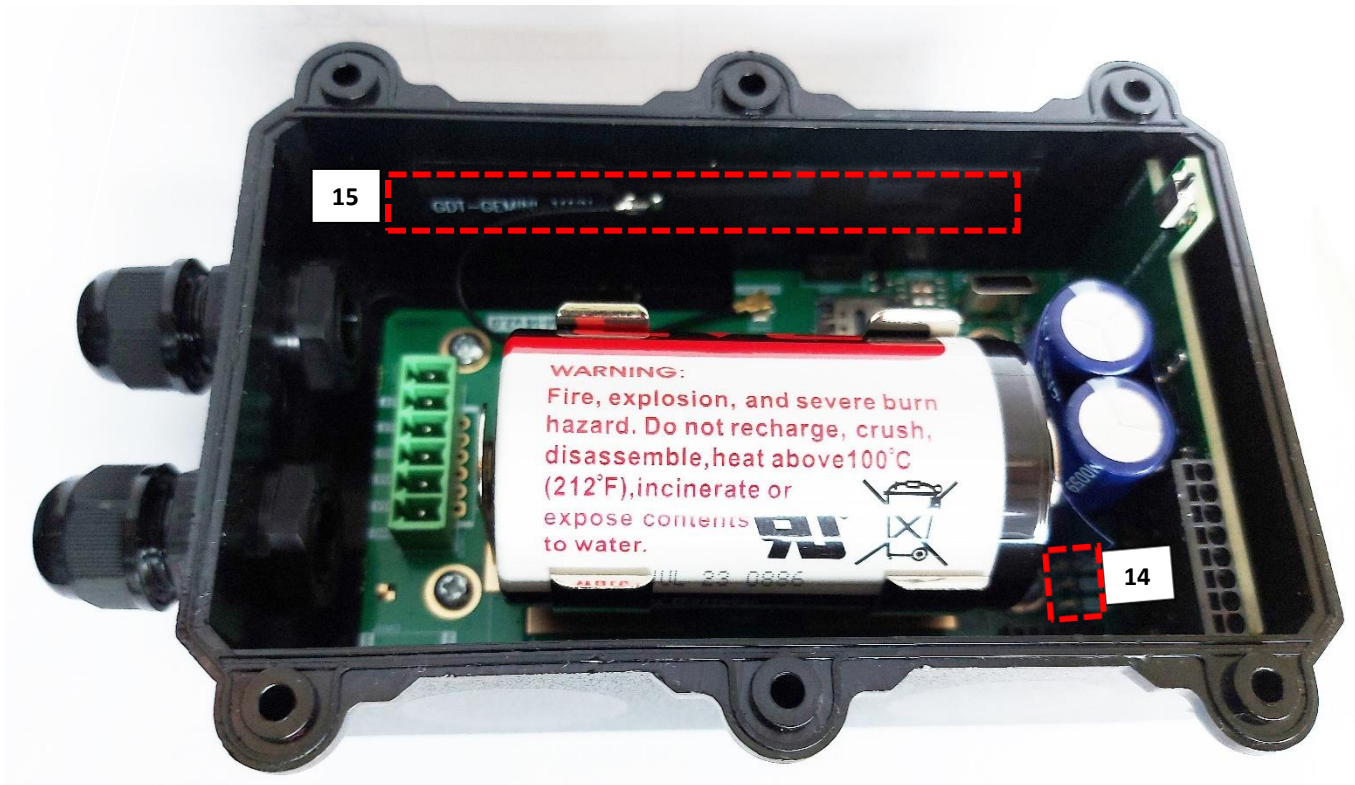
14 – 3 operation LEDs
15 – Internal LTE antenna (surface mount) – GDT-GEMINI type

Important!

Note, that for the proper device operation, it is essential that the correct battery (8) type would be placed in the battery socket. Use only a battery type, which is perfectly matching and meet the manufacturer's specifications.

WM Systems can provide different battery options – ask our sales!

3.3 Input cable connection

The sensor's input cable should be leaded via nr. 6 seales and must be wired to terminal block connector (nr. 11) to receive the connected sensors' output, according to the used wire or the provided cable (can be ordered).

Hereby, the pinout of the input connector (11) can be seen, where the pin #1 is marked. On figure at right, you can see the standard colour wiring pinout.
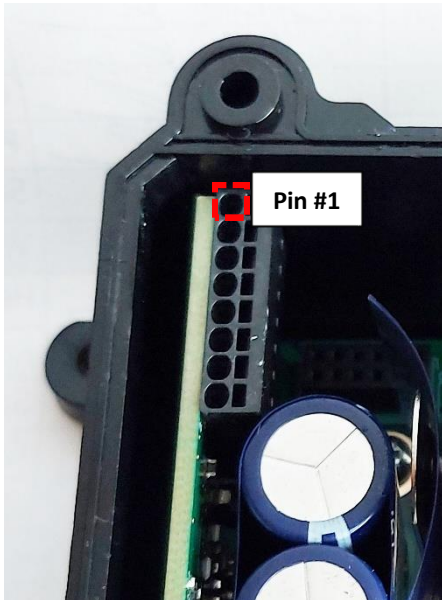
Analog sensor connections for Input nr. #1

Pin Nr.	Wire color	0-10VDC	4-20mA
1	Red	V+	V+
2	Black	Com	Output
3	White	Output of sensor	None
4	Bare	Shield drain wire	Shield drain wire

Analog sensor connections for Input nr. #2

Pin Nr.	Wire color	0-10VDC	4-20mA
5	Red	V+	V+
6	Black	Com	Output
7	White	Output of sensor	None
8	Bare	Shield drain wire	Shield drain wire

3.4 Fastening of the enclosure

The enclosure can be fastened by screws (at points nr. 4) or a metal strip and mount the WM-i enclosure to a wall.

3.5 Antenna connection

The internal LTE Cat.M / NB antenna (15) should be connected to the antenna cable's U.FL connector (16). Check that the cable is connected.

3.6 Status LEDs

LEDs are indicating only for testing purposes and these are only operating, after ca. 5 seconds as the USB-C cable was connected. During this – for the local configuration and testing – the device will not use the battery source, even if it is connected. The device is getting DC power from the USB connection. The current operation will be indicated on the related LEDs.

After the local configuration, when removing the USB connection, all LEDs will be turned off and the device will be powered from the internal battery.

In this case (normal operation) the LED signals are inactive due to energy- saving reasons when the device is powered from the battery.
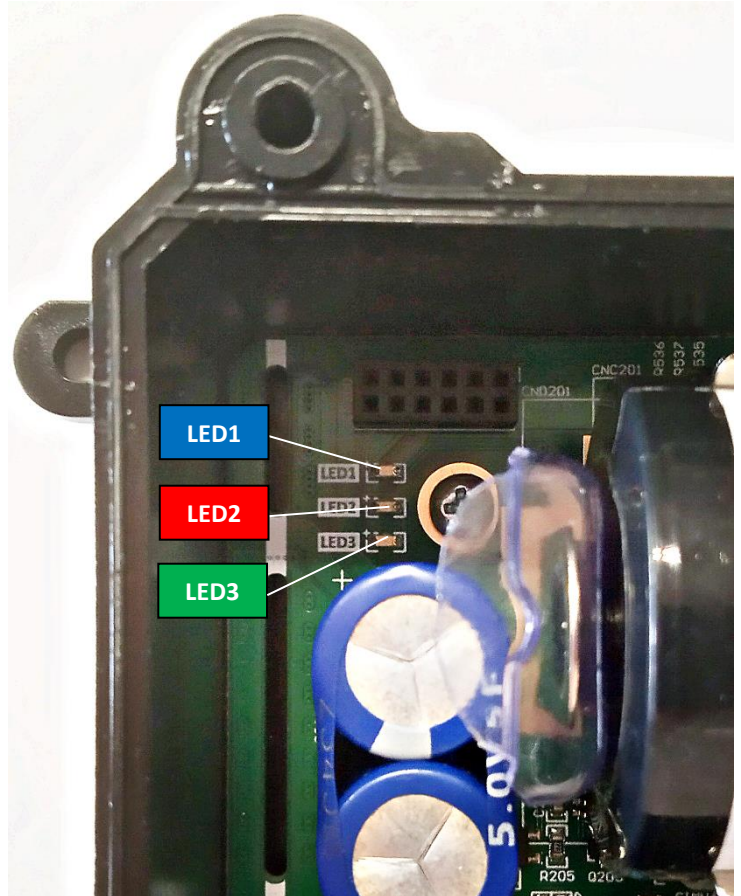
LED 1 (BLUE) – STATUS OF USB PORT

- **light**: USB cable is connected
- **blank/off**: USB cable is disconnected

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

- **light**: if the 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.)
- **flashing**: no result yet (current operation is in progress). Slow flashing means 1-second long LED flashes with short breaks, which are followed by a 1-second pause and repeated.
- **blank/off**: the last operation was successful or the USB cable is disconnected

LED 3 (GREEN) – COMMUNICATION MODULE STATUS

- **light**: 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 BEHAVIOUR DURING FIRMWARE UPDATE:

During battery-powered operation, in case of a Firmware update only **LED 1** is lighting continuously to indicate the installation of the new Firmware – all other LEDs are inactive during the firmware installation.

When the Firmware is successfully installed, the device will be rebooting. During this, all LEDs will be inactive, until the WM-i will be accessible again. Then the LED operation will be the same as it used to be.

Chapter 4. Installation and testing

4.1 Installing the device

Important! Note, that you can prepare and preconfigure the device before the onsite installation.

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 releasing and removing the six screws (3) with a screwdriver.

Step #3: Prepare the wires of the sensor(s) you are attempting to connect – with the help of a screwdriver loosen the input terminal block's (11) wire input pin(s). Perform the insertion of wire(s) then remove screwdriver from the current pin and the wire will be fastened. Repeat this step with the next sensor's wires to connect.

Step #4: Insert the Nano SIM into the SIM slot (10):
- 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 (cutted edge of the SIM looks up and right, the SIM chip face looks down to the PCB).
- Fold back the metal holder and slide it from left to right to lock the SIM.
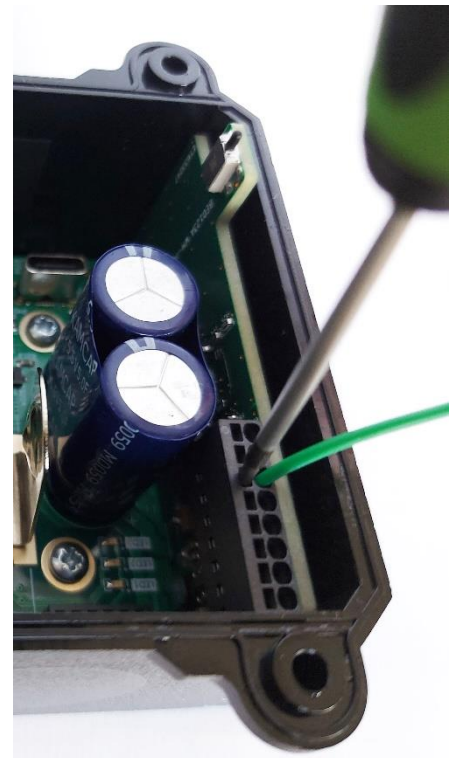
Step #5: The internal LTE Cat.M / NB antenna (15) should be connected to the antenna cable's internal U.FL connector (16). Check that it is connected.

4.2 Configure the device

Step #1: Perform the following preconditions to able to connect your PC to the device.

- Microsoft® .Net Framework v4 should 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

- Download WM-E Term configuration 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 program from.

Step #2: Open *t*he **Control Panel** / **Device Manager** on the PC's Windows system.

Connect the USB-C cable to the internal USB slot (13) indicated with orange arrow in the previous photo.

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

Soon, the Windows will refresh the **Control Panel** properties at the **Port** entry and the current COM Port identifier will be listed as **„Serial USB device"**. Note the **COM** number identifier of the port.

Step #3: Execute the **WM-ETerm.exe** file to start the WM-E Term software. Allow the Security Risk – does not mean any harm.

Step #4: Login in the software and connect to the COM port in the WM-E Term software. Configure the device according to Chapter 5.

Step #5: Configure the cellular settings of the module (APN, etc.).

Step #6: Configure alarm events if you want in WM-E Term.

Step #7: Write the configuration to the WM-i device with the **Parameters write** icon. Then the device will be automatically restarted.

Step #8: Now it will operate by the configured settings. When the cellular module will be started – if SIM and the APN settings were 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 Microsoft® Azure Cloud IoT platform.

Step #9: Check the operation, connection, and data sending with the LEDs (14) and the results in the Azure.

Test the settings.

If you want to modify any parameters, make the changes and **Write configuration** again to the WM-i with the **Parameters write** icon. Then the device will be restarted again. Repeat this step, until the configuration and operation will be the same as it was desired.

Step #10: When you are satisfied with the settings, remove the USB-C connection from the device.

Note, that due to the presence of the battery disconnector (9) – protective part – which is still placed between the battery and the holding ear, the device is still turned off and sleeps. This can be useful for the time of delivery of the device or until the onsite installation.

4.3 Finishing steps

ONLY IN CASE OF INSTALLING THE DEVICE ONSITE

Step #1: Remove the battery disconnector (9) – a plastic protective part, which is placed between the battery and the battery holding ear. Now the device will be getting power from the battery.

Now the device will be starting its operation according to the configured settings. LEDs (14) will be inactive due to energy-saving reasons.

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

The device will signaling a Cold Start event to the Azure and send the consumption / measurement data at the configured intervals to the specified IP address.

*Step #2:* Place the plastic top cover (2) on the top of the casing (1) and fasten the six screws (3) with the screwdriver.

Step #3: Ensure that the device is getting enough celular network signal – if it's not, then change device's position/location for a better signal reception. The signal quality (value) of the cellular communication can be measured and checked with the WM-E Term software by the **Device Information** icon.

Chapter 5. 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.
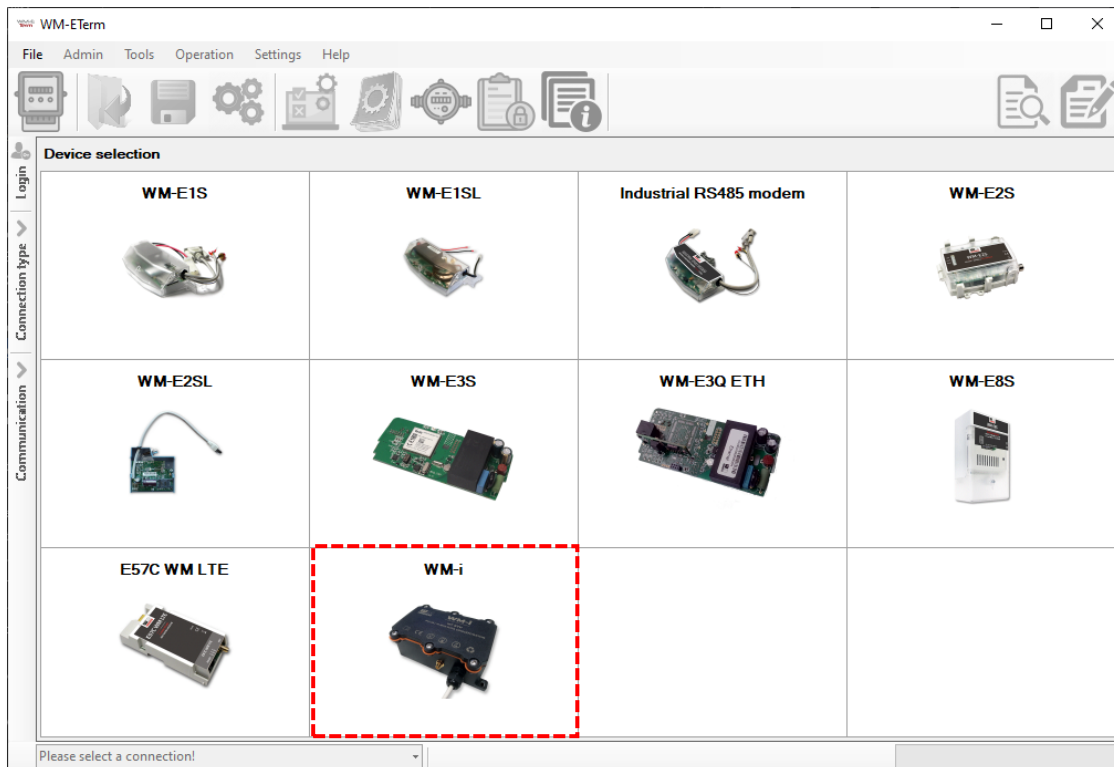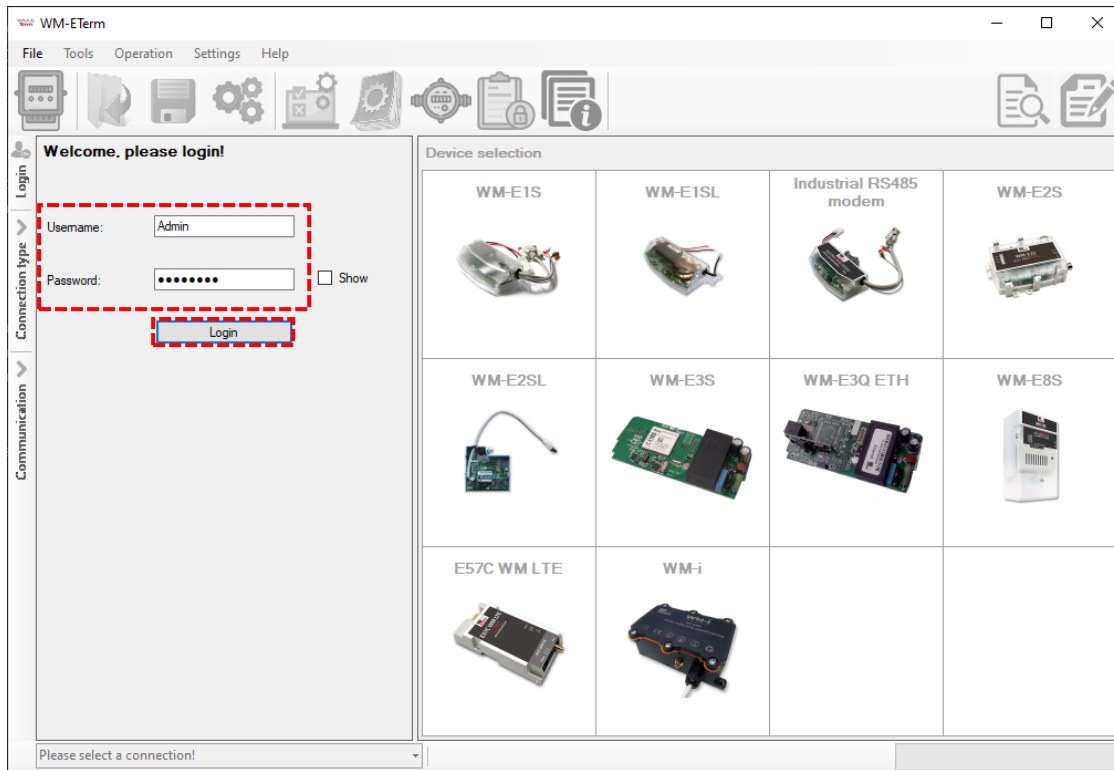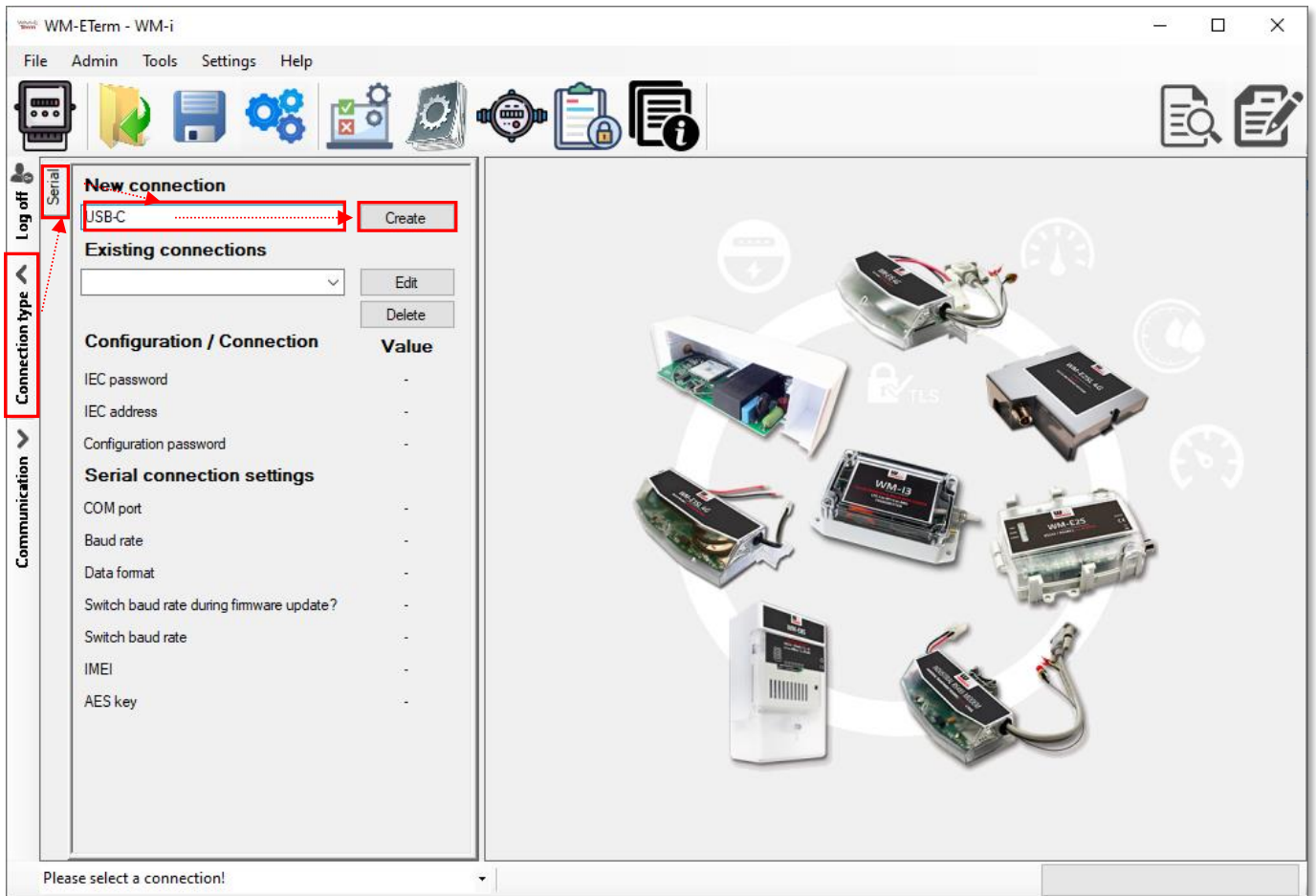
#Step 2: Choose the **Connection type** on the left side of the screen, and choose the **„Serial"** tab for the local USB connection.

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

#Step 4: In the next window the connection settings will appear. There select and choose the noted **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.
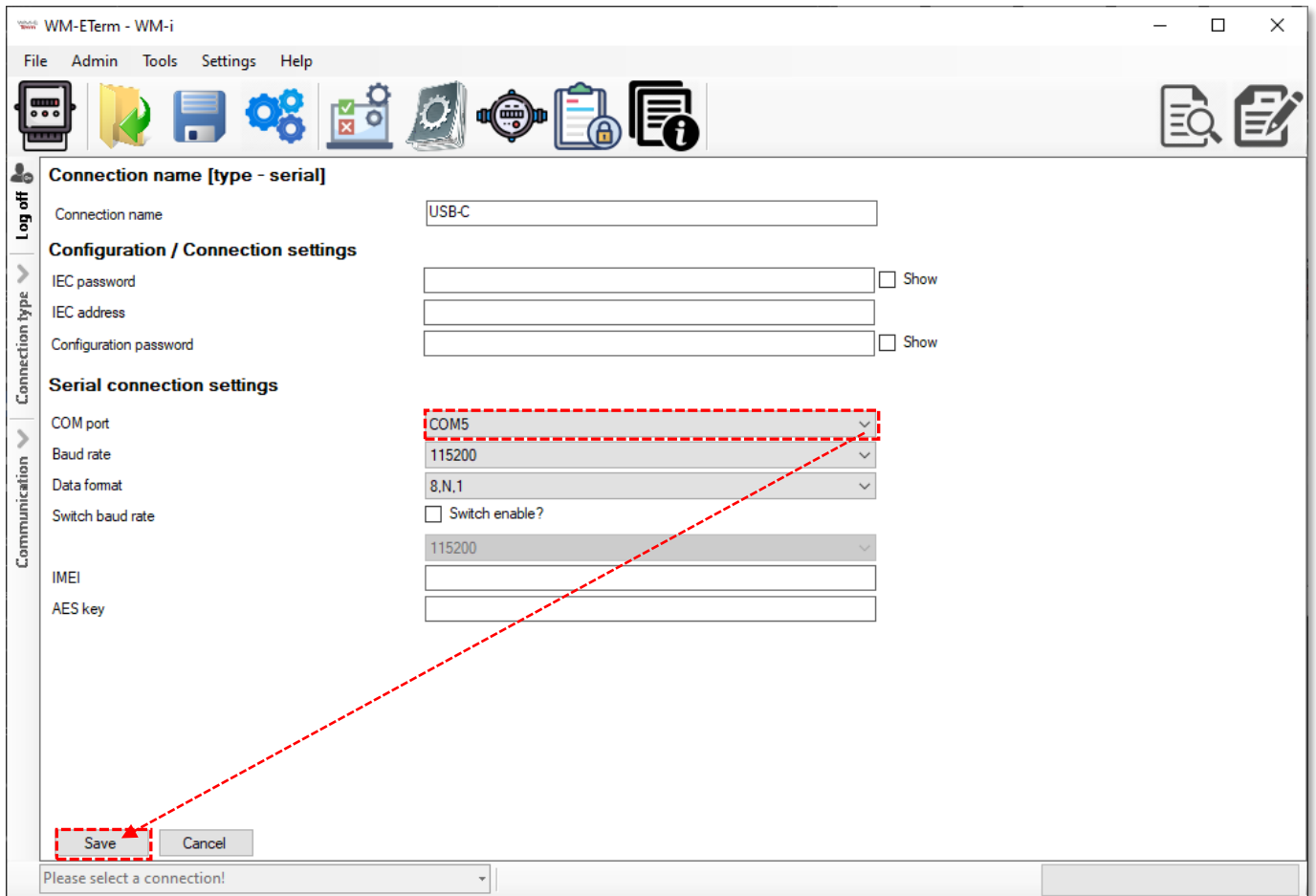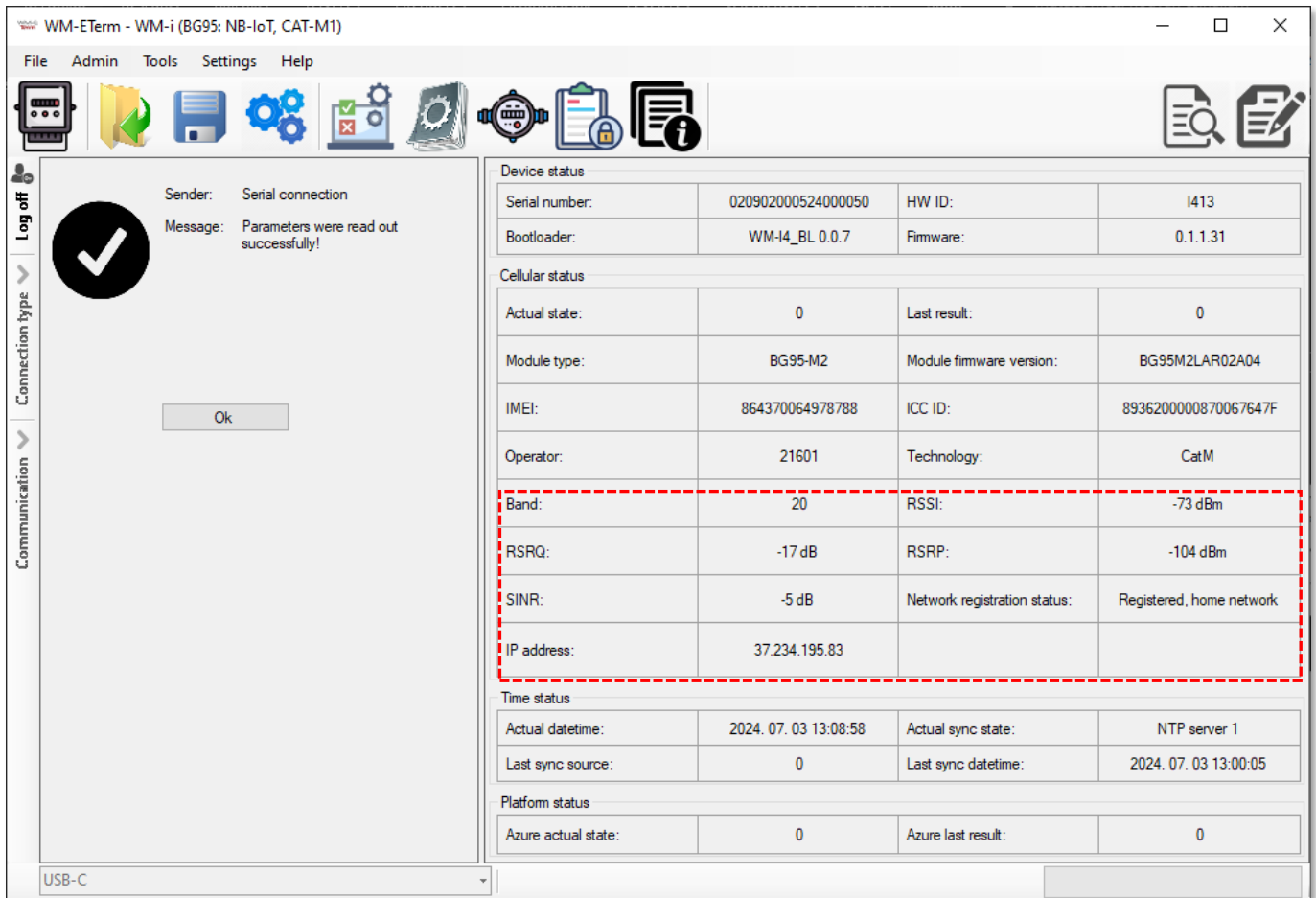
#Step 6: At the left bottom part of the screen select and choose the saved connection profile at the „*Please select a connection!*" title. Then the PC will connect through the serial USB link to the WM-i® device.

5.2 Device status information

#Step 1: Check the device status by pushing the **Device Information** icon. All relevant information can be read on the screen.

Note, that without configuring the SIM settings, here only the first 4 parameters at the **Device Status** part will be queried.

Device status			
Serial number:	020902000524000050	HW ID:	I413
Bootloader:	WM-I4_BL 0.0.7	Firmware:	0.1.1.31

Cellular status			
Actual state:	0	Last result:	0
Module type:	BG95-M2	Module firmware version:	BG95M2LAR02A04
IMEI:	864370064978788	ICC ID:	8936200000870067647F
Operator:	21601	Technology:	CatM
Band:	20	RSSI:	-73 dBm
RSRQ:	-17 dB	RSRP:	-104 dBm
SINR:	-5 dB	Network registration status:	Registered, home network
IP address:	37.234.195.83		

Time status			
Actual datetime:	2024. 07. 03 13:08:58	Actual sync state:	NTP server 1
Last sync source:	0	Last sync datetime:	2024. 07. 03 13:00:05

Platform status			
Azure actual state:	0	Azure last result:	0

USB-C

5.3 Read out the device configuration

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

The device will read out to the configuration parameters of the 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: You can also check the connection by the **„Communication"** tab on the left-side. Then the current modem communication messages, commands and answers will be listed on the left side of the screen.

Step #3: Confirm the readout process by pushing the **[OK]** button – on the left.

Step #4: Select a ***Parameter group*** at the middle of the screen according to the parameter modification needs, and **WM-E Term** will list read out parameter values.
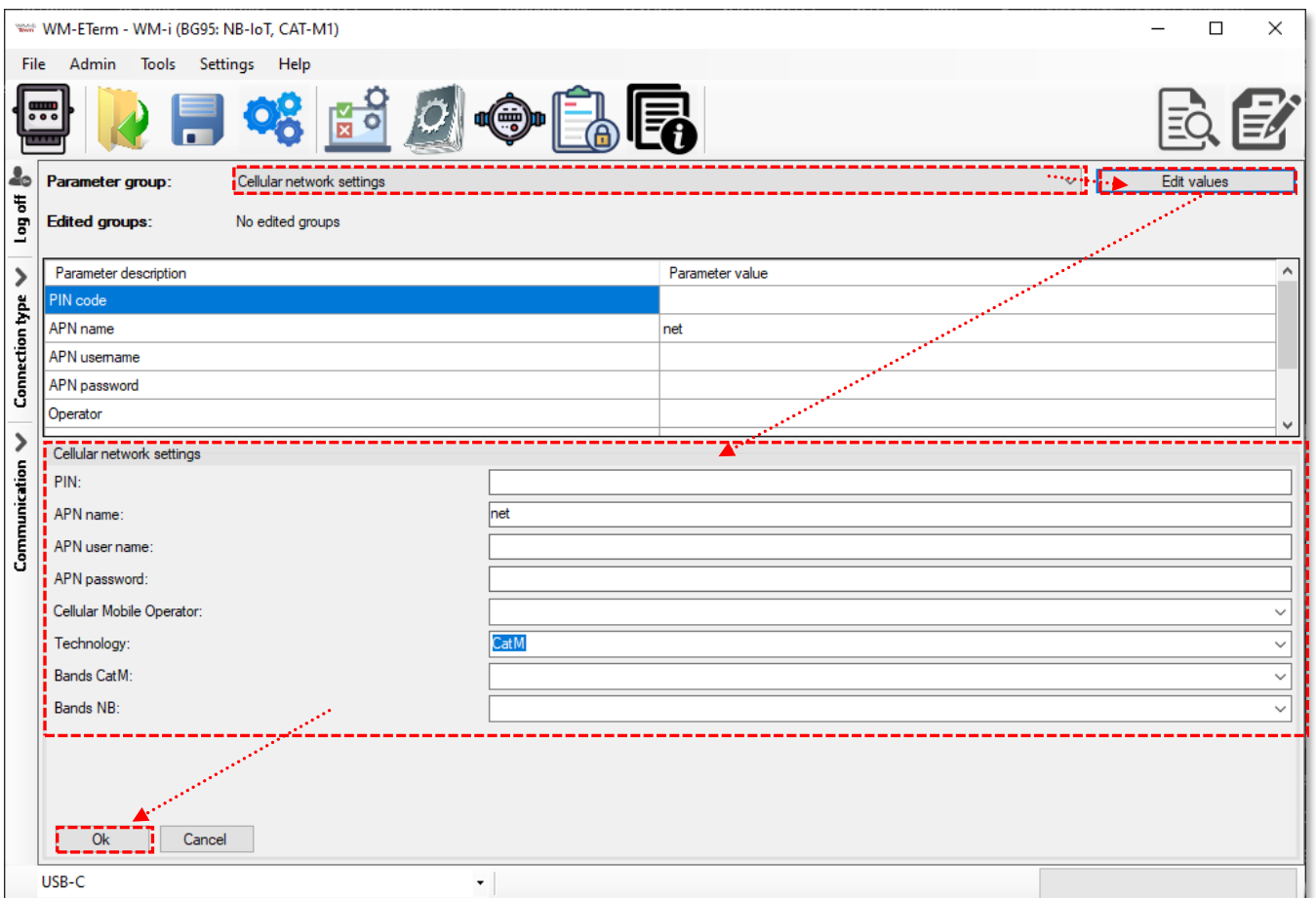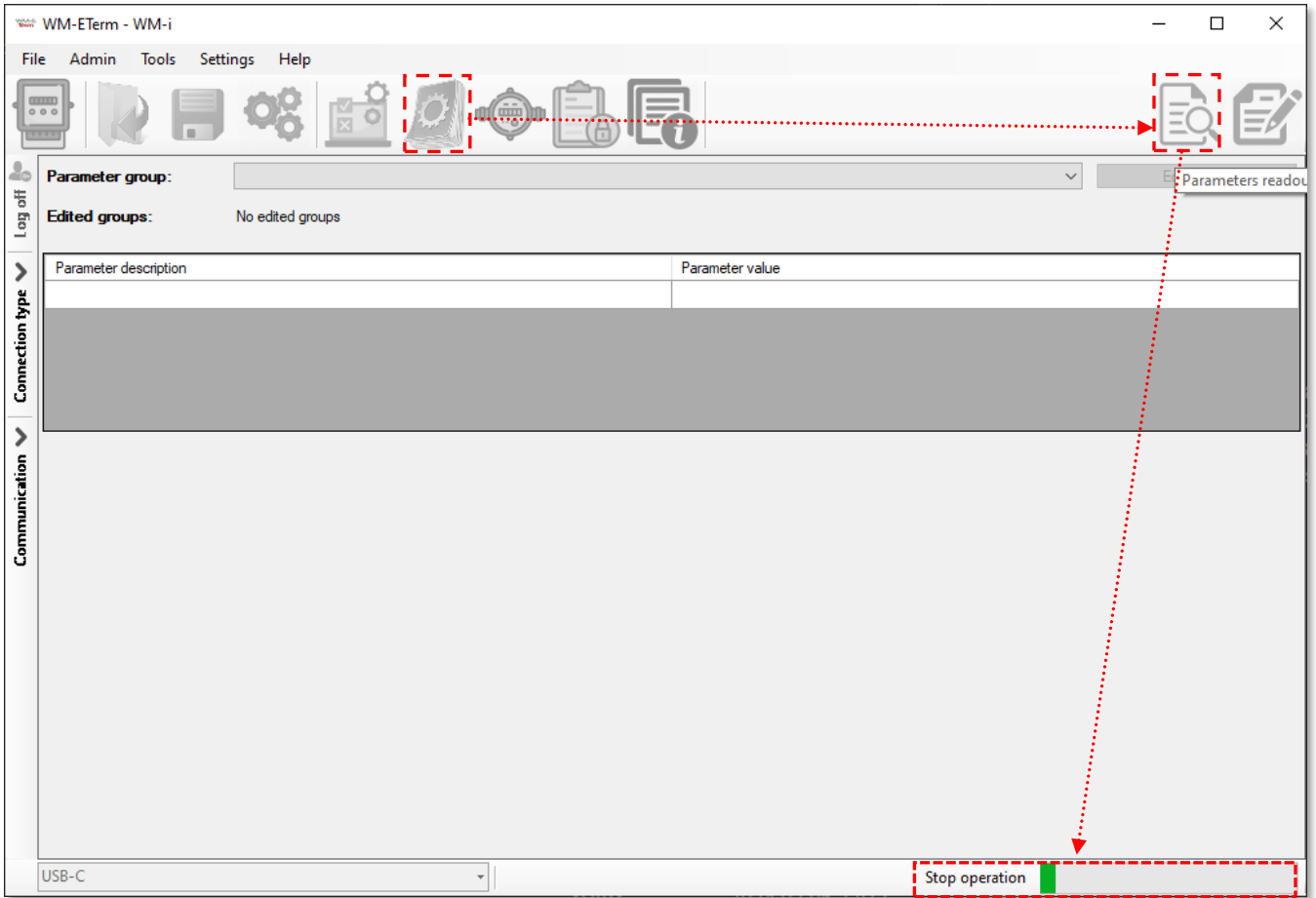
5.4 Modification of settings, parameters

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

The following Parameter groups are listed here:

- **Alarm settings** – Alarm signaling settings (tamper event of top cover removal)
- **Cellular network settings** – APN, SIM PIN, cellular network operator/ technology/network/band(s) settings
- **Device settings** – set a configuration password, activation of the Debug mode for testing
- **Location settings** – manual GPS information, and address of the installed device
- **Telemetry settings** – Data sending frequency and offset settings
- **Time settings** – for (S) configuring NTP time servers
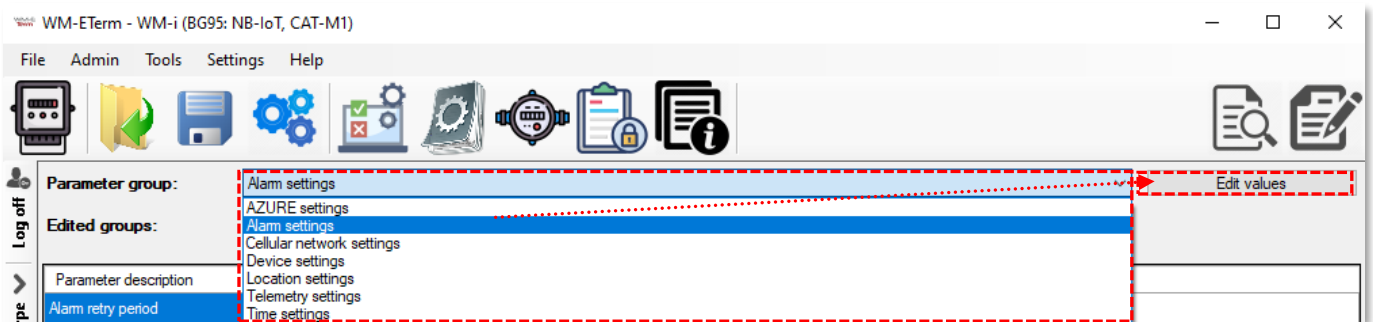
Step #2: Configure the required parameters and push the **[OK]** button. Then select another **Parameter group**, push to its **[Edit values]**, and configure the parameters. Repeat it until you are finished with the configuration.

The detailed configuration of the further **Parameter group** settings *are* described in Chapter 6.

Step #3: You can save the settings anytime at **File** / **Save** menu (into a .CFG extension file). You can also load a configuration file from the **File** / **Load** menu.

This is really useful when you want to distribute / upload the same configuration basis to several 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® device. The right bottom progress indicator will show the status of the process.
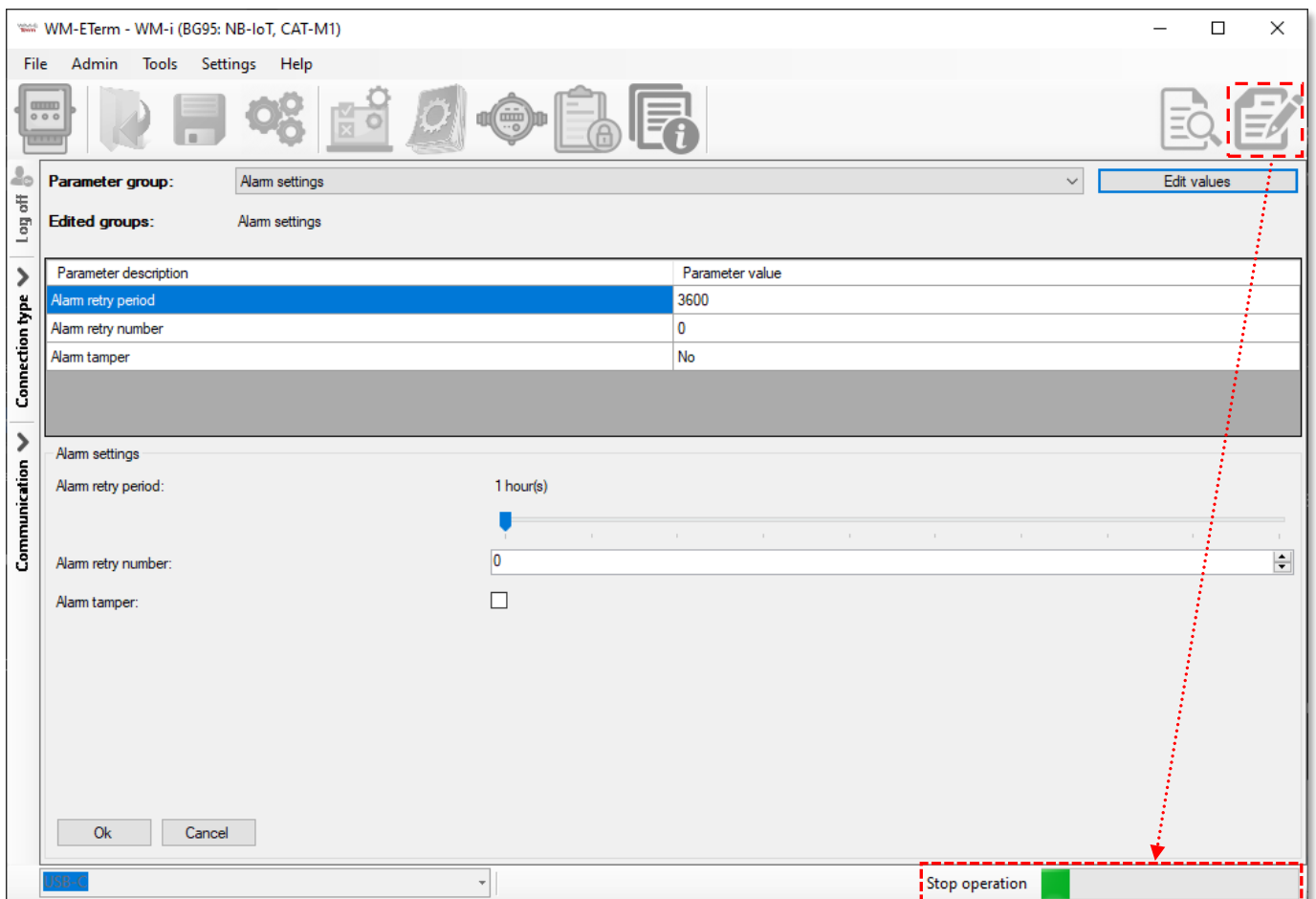

After the successful parameter sending, the WM-i will be disconnected and it will be rebooting, which takes about 1-2 minutes. Then it will be operating according to the new settings. Wait until the device will be available again in the WM-E Term.

5.5 Operation mode settings

Step# 1: You can configure the required operation mode of the device in the menu. Here, the device will be automatically readout the current setting. Then you can change operation mode - if you want:

- **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 Microsoft® Azure Cloud IoT platform only once a day.
- **Test Operation mode**: this mode is used for testing purposes. The WM-i will getting a longer time to register on the cellular NB-IoT network, and it sends data in every 5 Minutes to the Azure in every fixed 5 minutes. This mode also allows remote configuration from Azure and and configuration uploads every time when the device sends data to the Microsoft® Azure Cloud IoT platform.
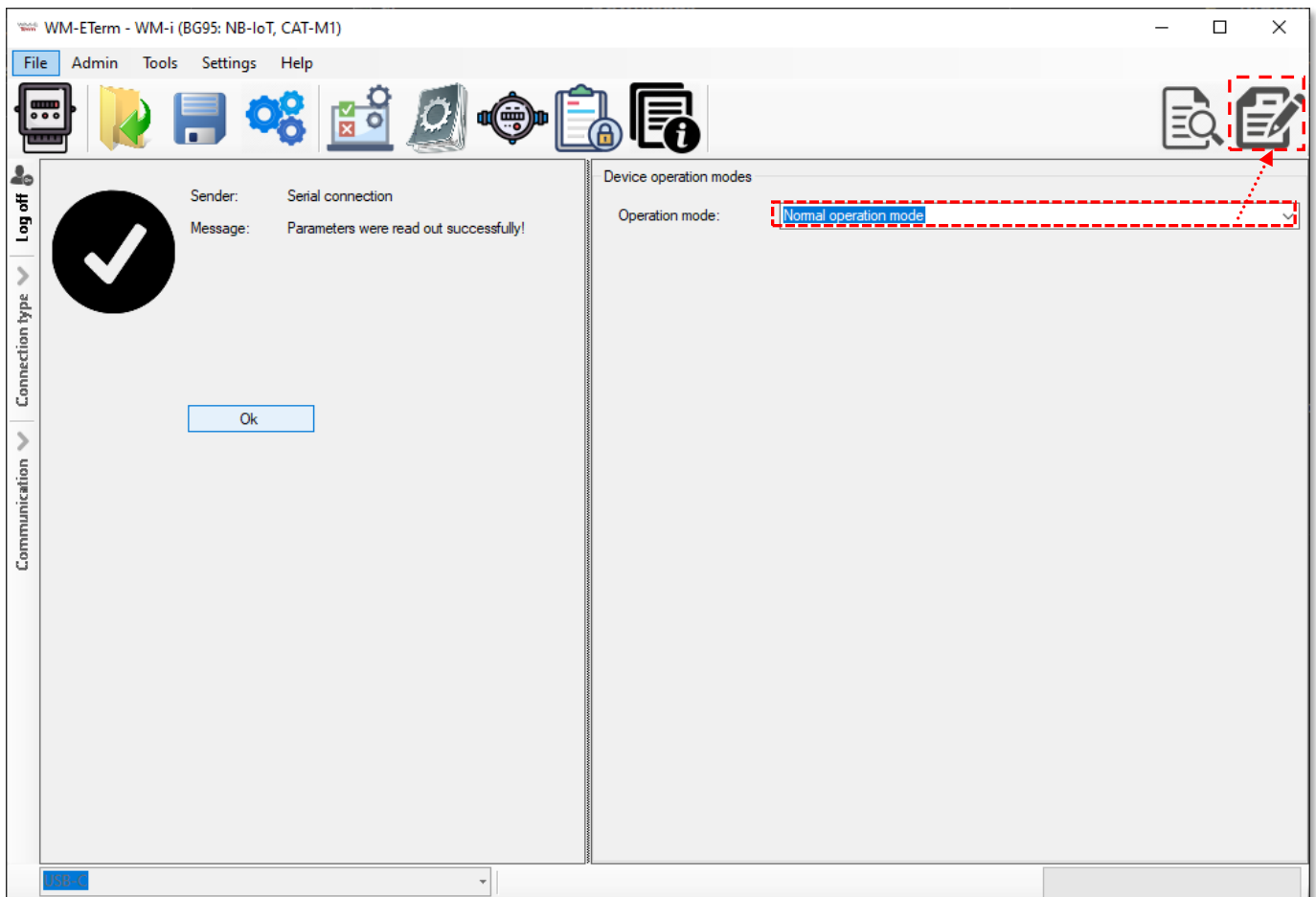

We suggest to use the **Testing Operation mode** during the configuration and testing. After all, the **Normal Operation mode** should be the best choice.

Step #2: Choose an option and push to the **Parameters write** icon. The change will be sent to the WM-i® device. The right bottom progress indicator will show the status of the process. Then WM-i will be disconnected and rebooted as it used to be after sending the modified configuration.

Chapter 6. Settings

6.1 Cellular network settings

You must configure the following fields for the proper operation at the **Cellular network settings** parameter group.
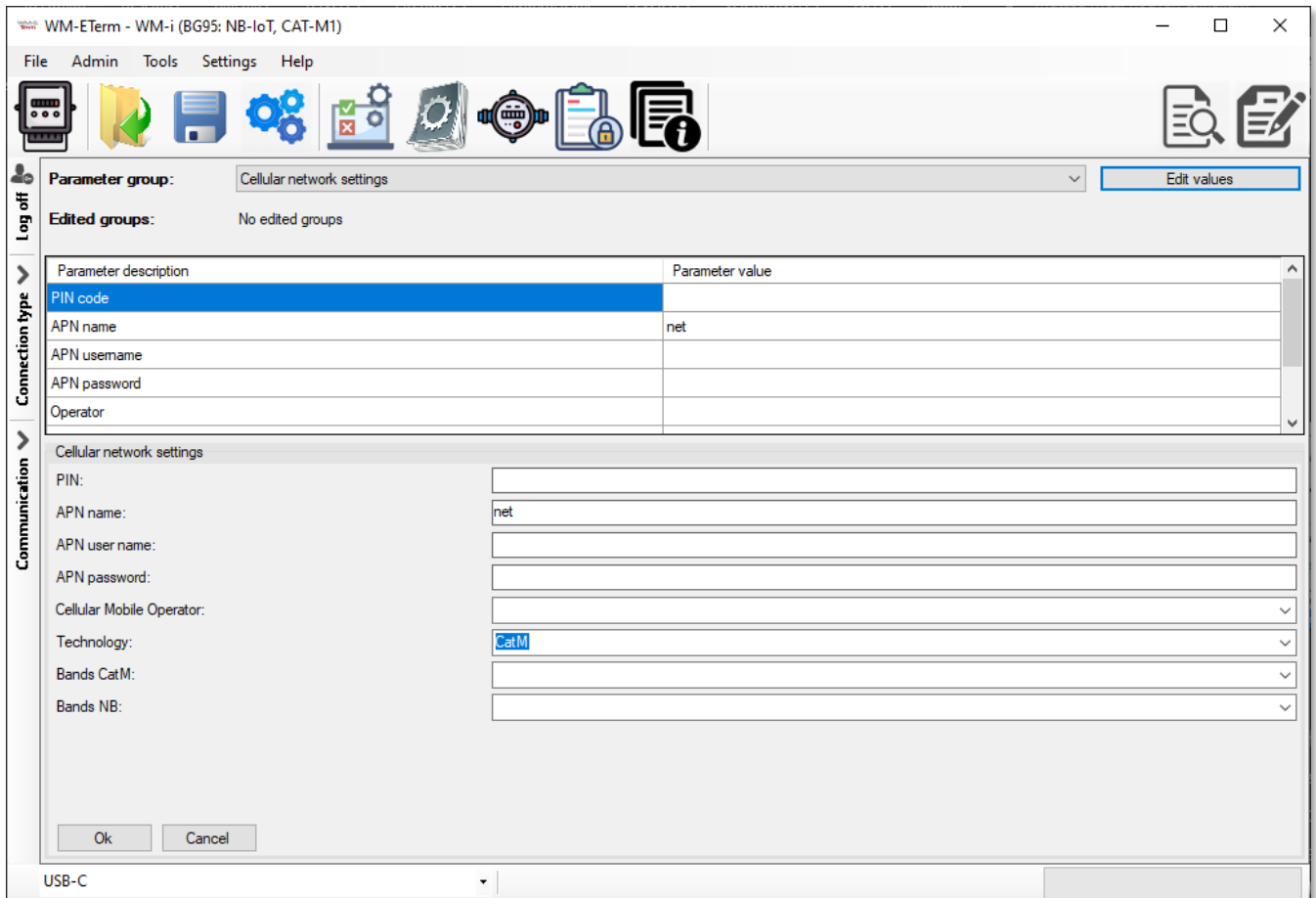
- **PIN**: if the SIM uses a PIN code - ask the mobile operator of the SIM.
- **APN name**: ask the mobile operator of the SIM.
- **APN user name**: if the SIM is using this. Ask the mobile operator of the SIM.
- **APN password:** if the SIM is using this. Ask the mobile operator of the SIM.
- **Cellular Mobile Operator**: if you don't want to use a dedicated mobile operator (auto mode), then leave it empty as it is by default. Otherwise, you can choose a mobile operator according to the SIM properties.
- **Technology**: Choose the network technology by the requirements.

- **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 a dedicated band or more bands, then you can select from a list.


- **Bands Cat.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 a dedicated band or more bands, then you can select from a 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 following fields at the **Data sending settings** parameter group.
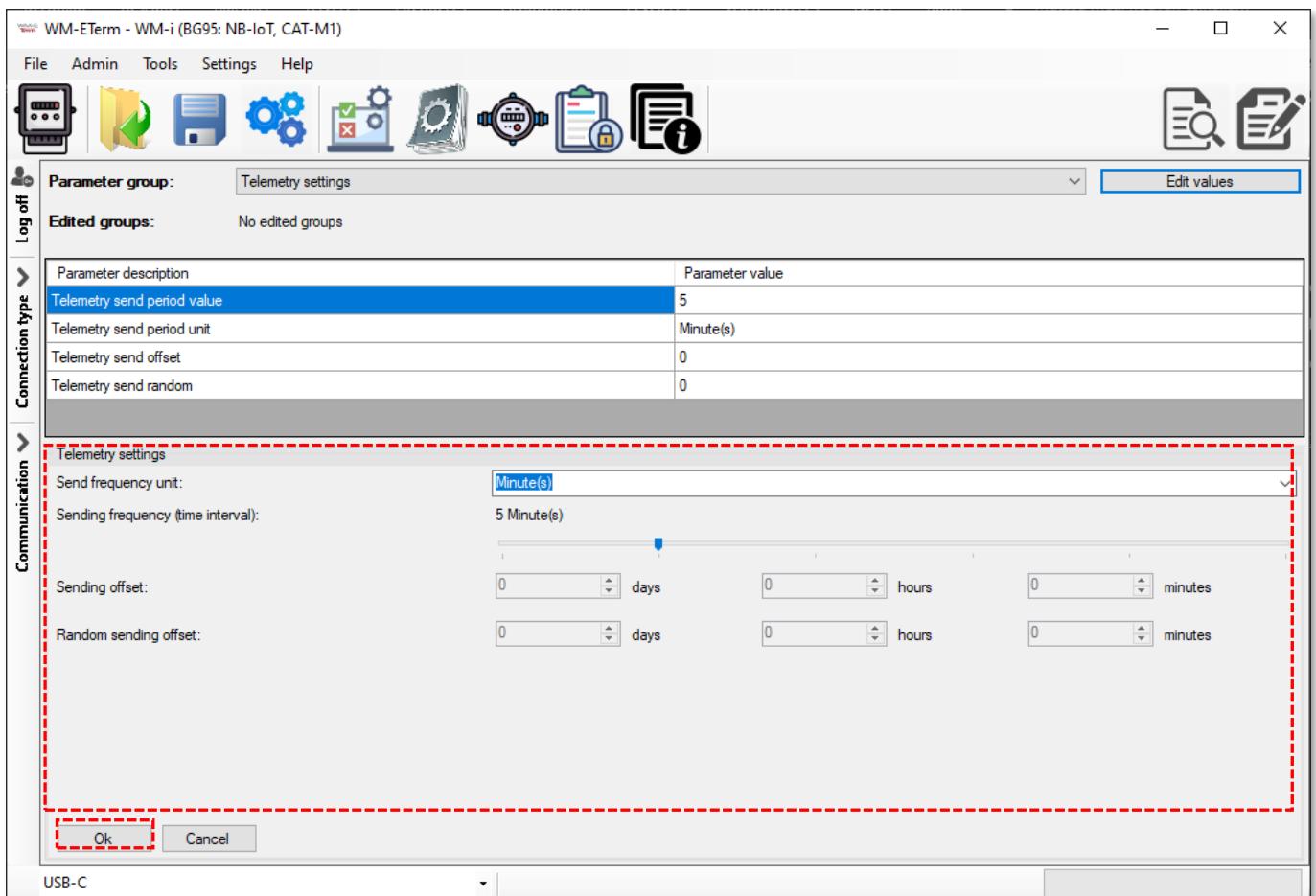
- **Send frequency unit**: time base of settings – can be selected: **Minute(s)** / **Hourly** / **Daily** / **Weekly**/ **Monthly** according to the synchronized time information.
- **Sending frequency (time interval)**: choose a frequency with the slider
 **Examples:**
  - **Minute(s)** – if **Sending 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 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 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.
  Examples:
  - **Minutes** – if **Sending frequency** value is **10**, and **Sending offset** is **5 Minutes**, it means 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** 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** is *4 Hours* and *30 Minutes*, it means in every 48 Hours at 04:30 Minutes (e.g. on Monday 04:300, on Wednesday at 4:30, etc)
- **Weekly** – if **Sending frequency** value is *1*, and **Sending offset** is *4 Hours* and *30 Minutes*, it means in every Week's first day at 4 Hours and :30 Minutes (e.g. on every Monday at 4:30)
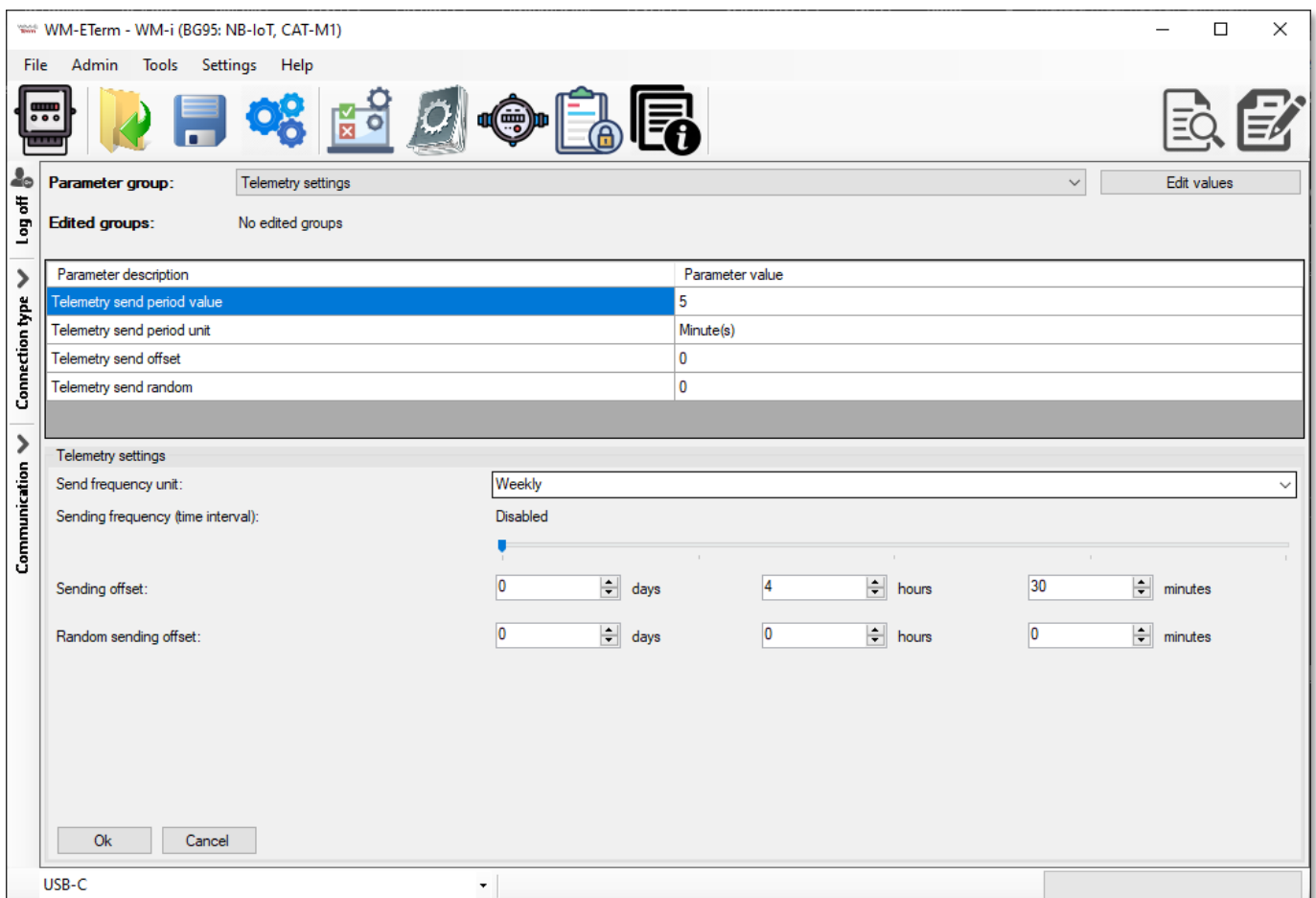
- **Weekly** – if **Sending frequency** value is *1*, and **Sending offset** is *2 Days* and *4 Hours* and *30 Minutes*, it means in every second days at 4 Hours and :30 Minutes (e.g. on every Monday at 4:30, Wednesday at 4:30, Friday at 4:30, etc)
- **Monthly** – if **Sending frequency** value is *1*, and **Sending offset** is *15 Days* and *4 Hours* and *30 Minutes*, it means on every Month's 15th day at 4 Hours and

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. Therefore, the same time interval can be used for thousands of devices without any problem.
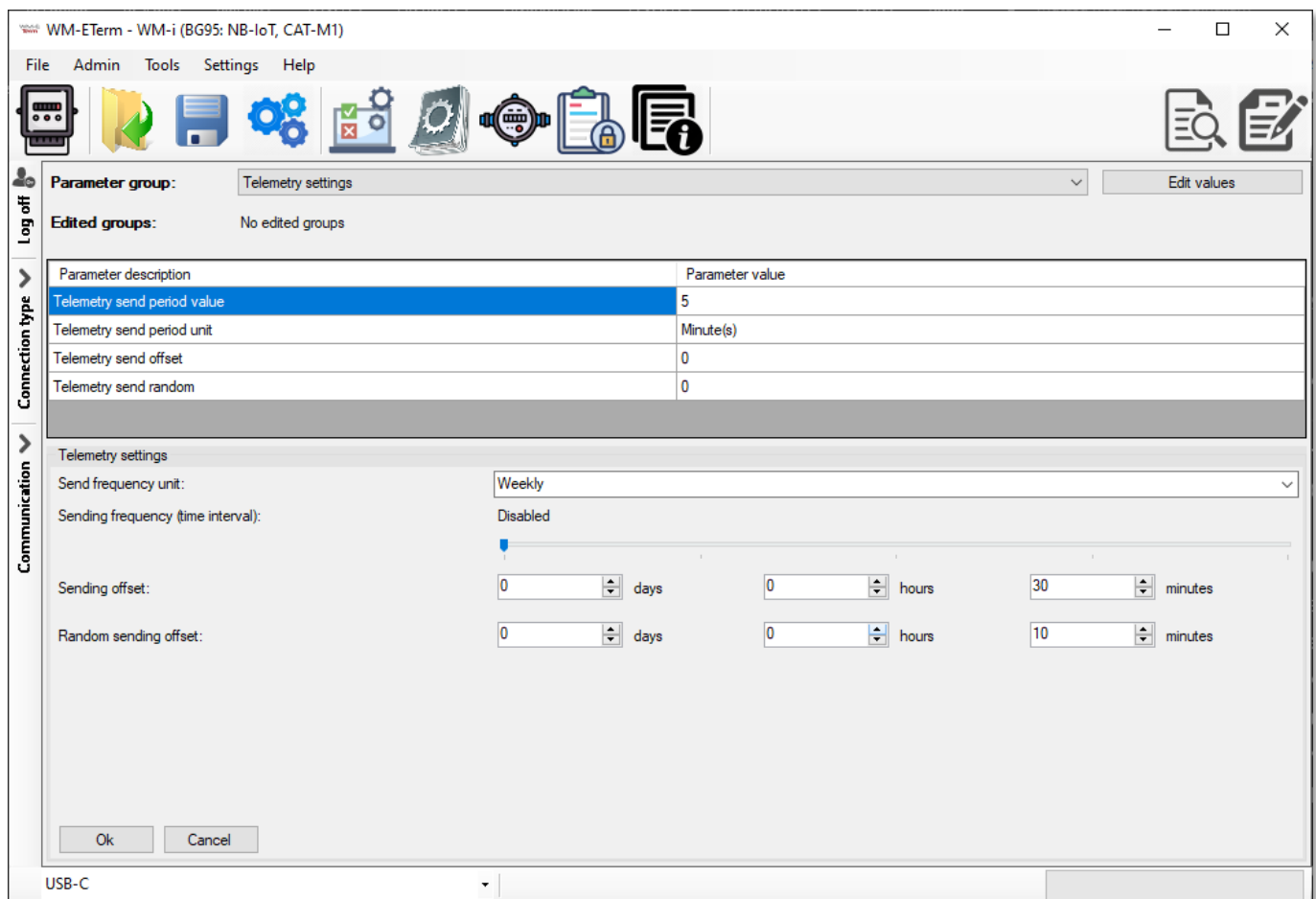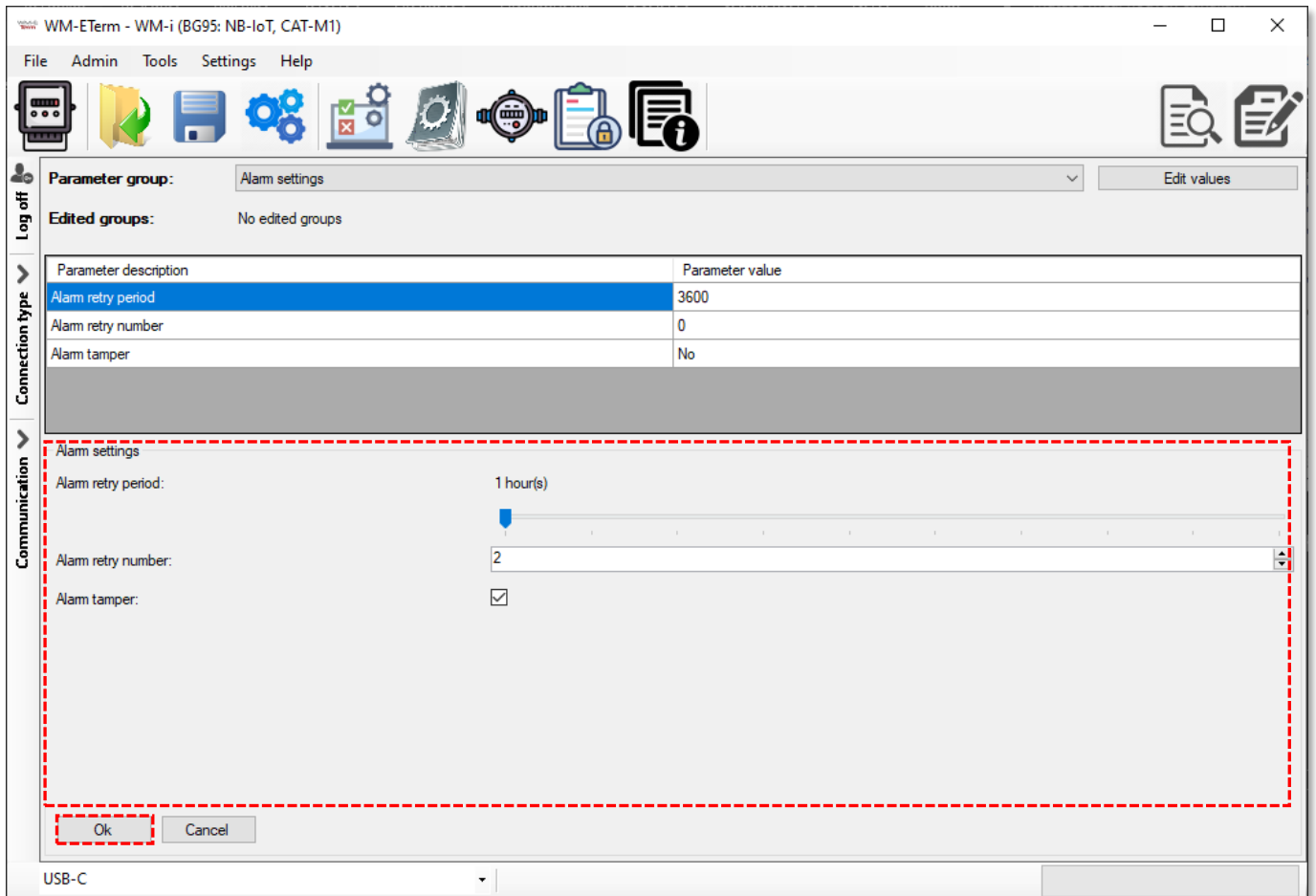

Set the desired parameters and press the **[OK]** button.

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 transmitted only once, immediately when it is occurring.
- **Alarm retry period** – you can choose an alarm re-sending frequency. The alarm event 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. See above.

  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.
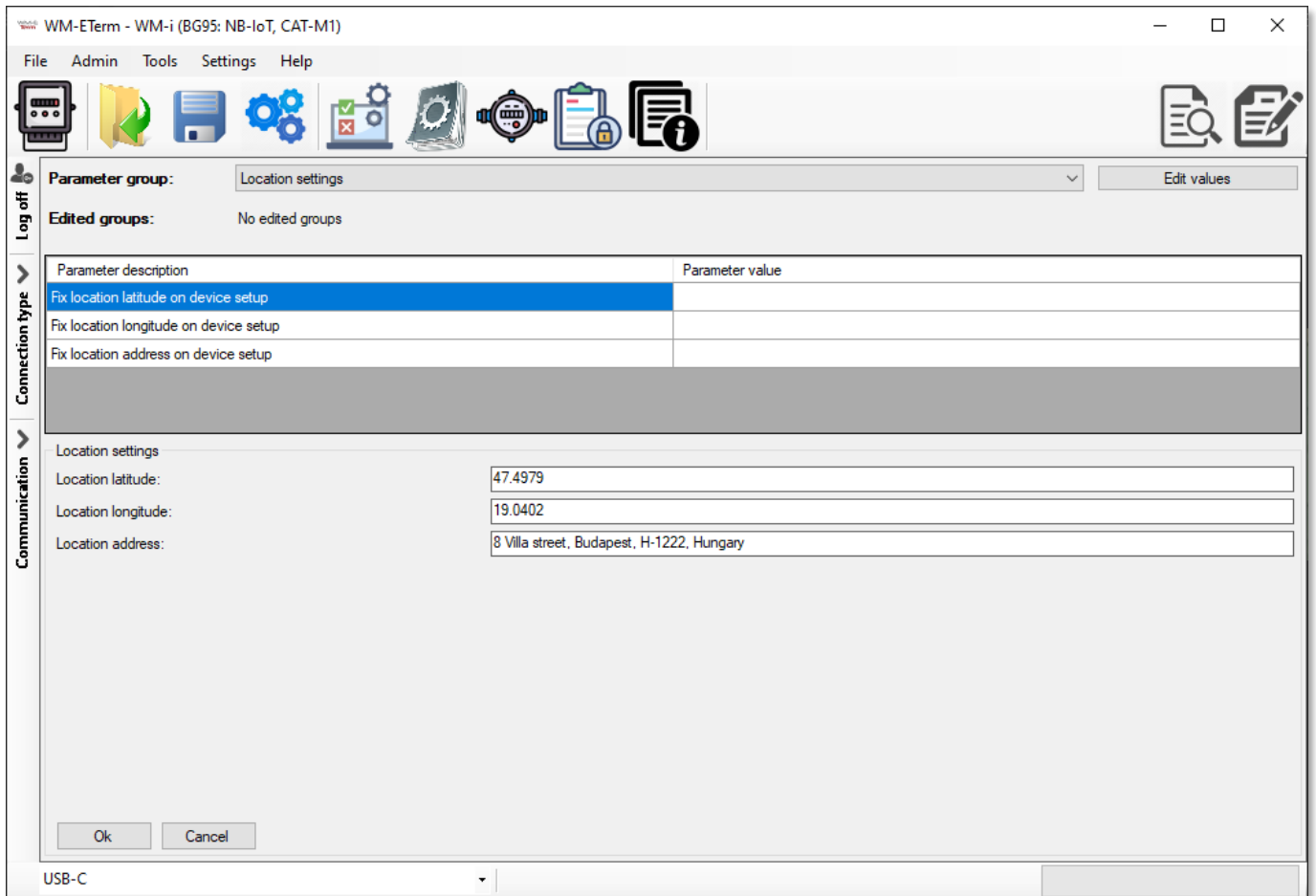
Location latitude, **Location longitude** and **Location address** fields can be filled for the easier visual identification on a map.

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 settings

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

There can be 3 (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), **NTP3 port**

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

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

IMPORTANT! Therefore, time getting is one of the most important settings from the data reliability point of view.
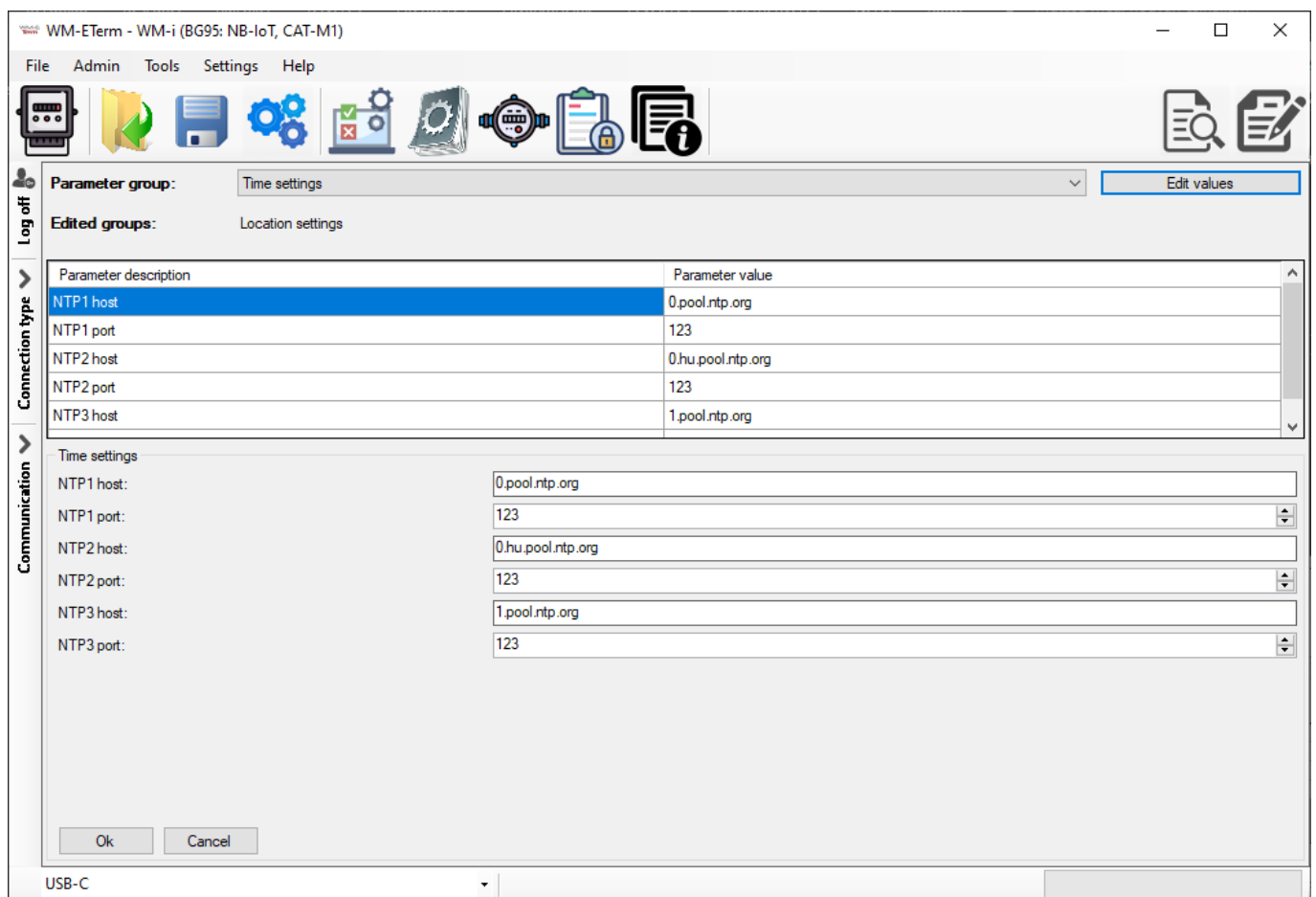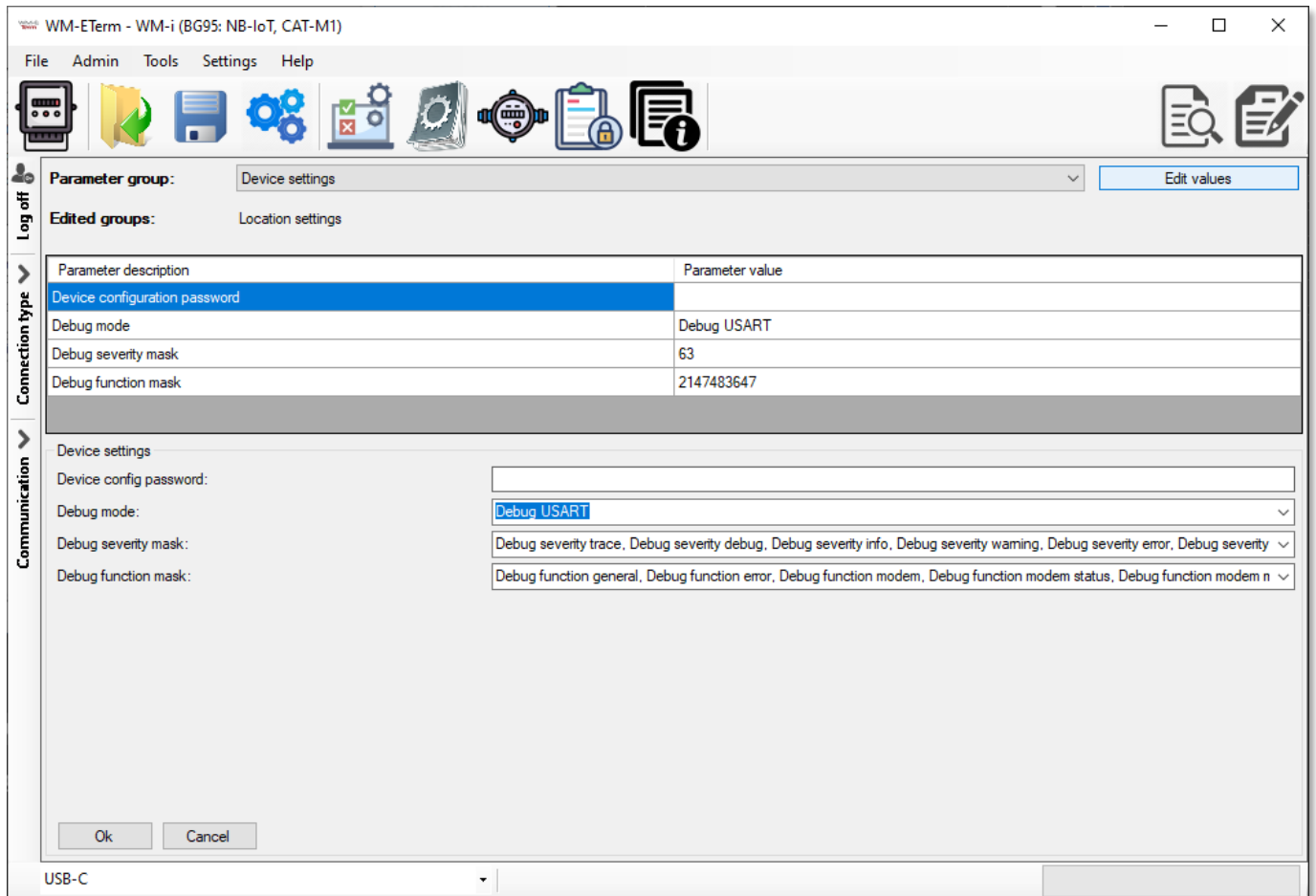

Set the desired parameters and press the **[OK]** button. At the end of the settings, don't forget to perform **Parameters write** to the device.

6.6 Microsoft® Azure Cloud IoT settings

WM Systems will provide the settings. The Client will receive sensor data through MQTT protocol in the Azure platform. For further information ask our sales!

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 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.

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.
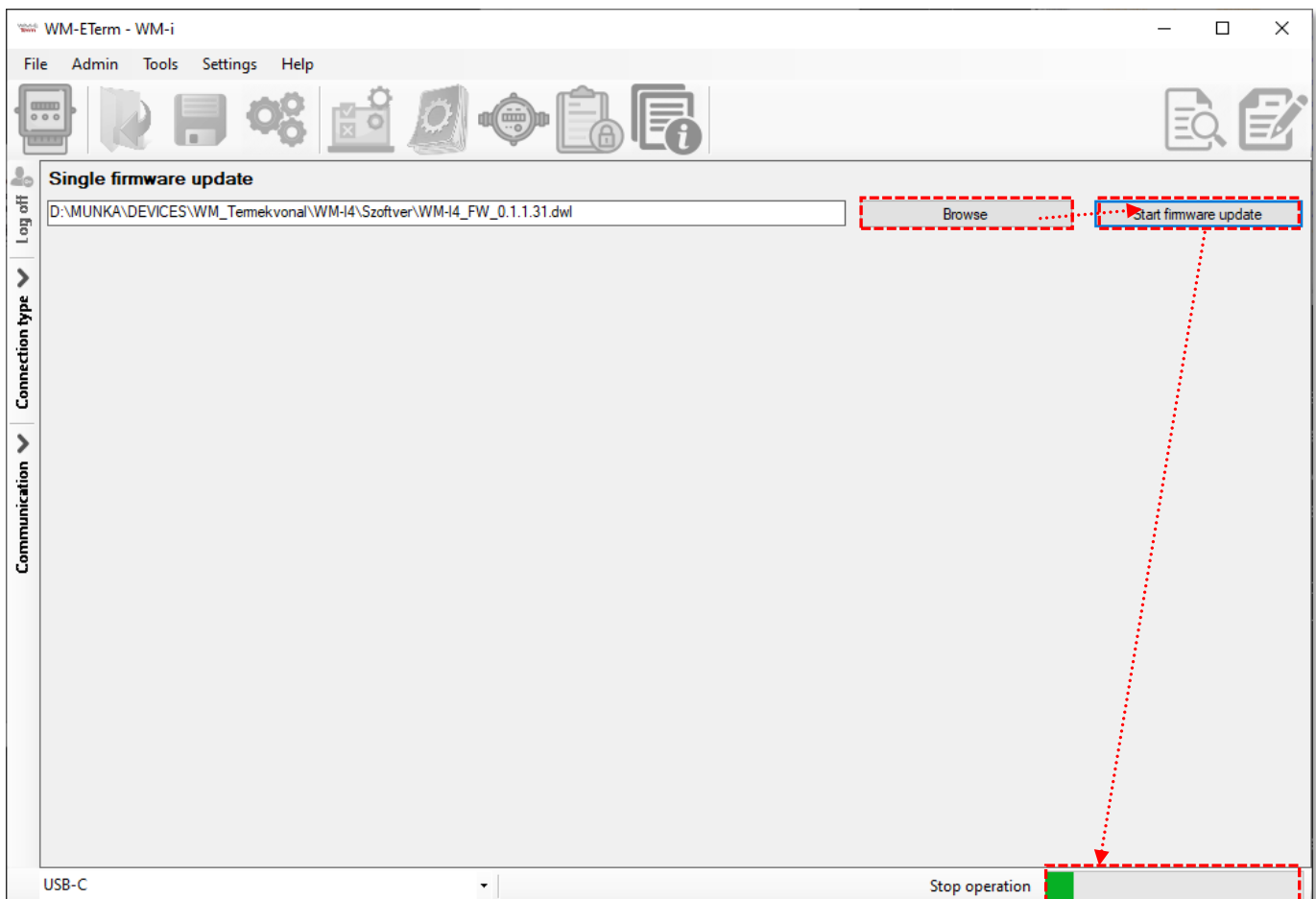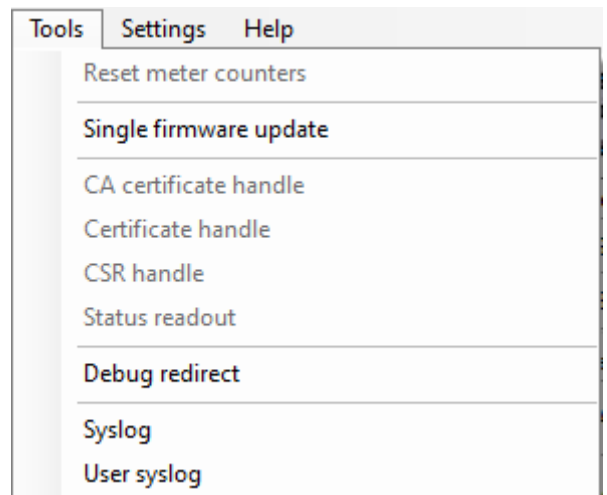
3. The progress of upload will be shown at the right-bottom progress indicator bar. This can take in normal case about 5-10 minutes, but sometimes it requires more time to update the firmware.

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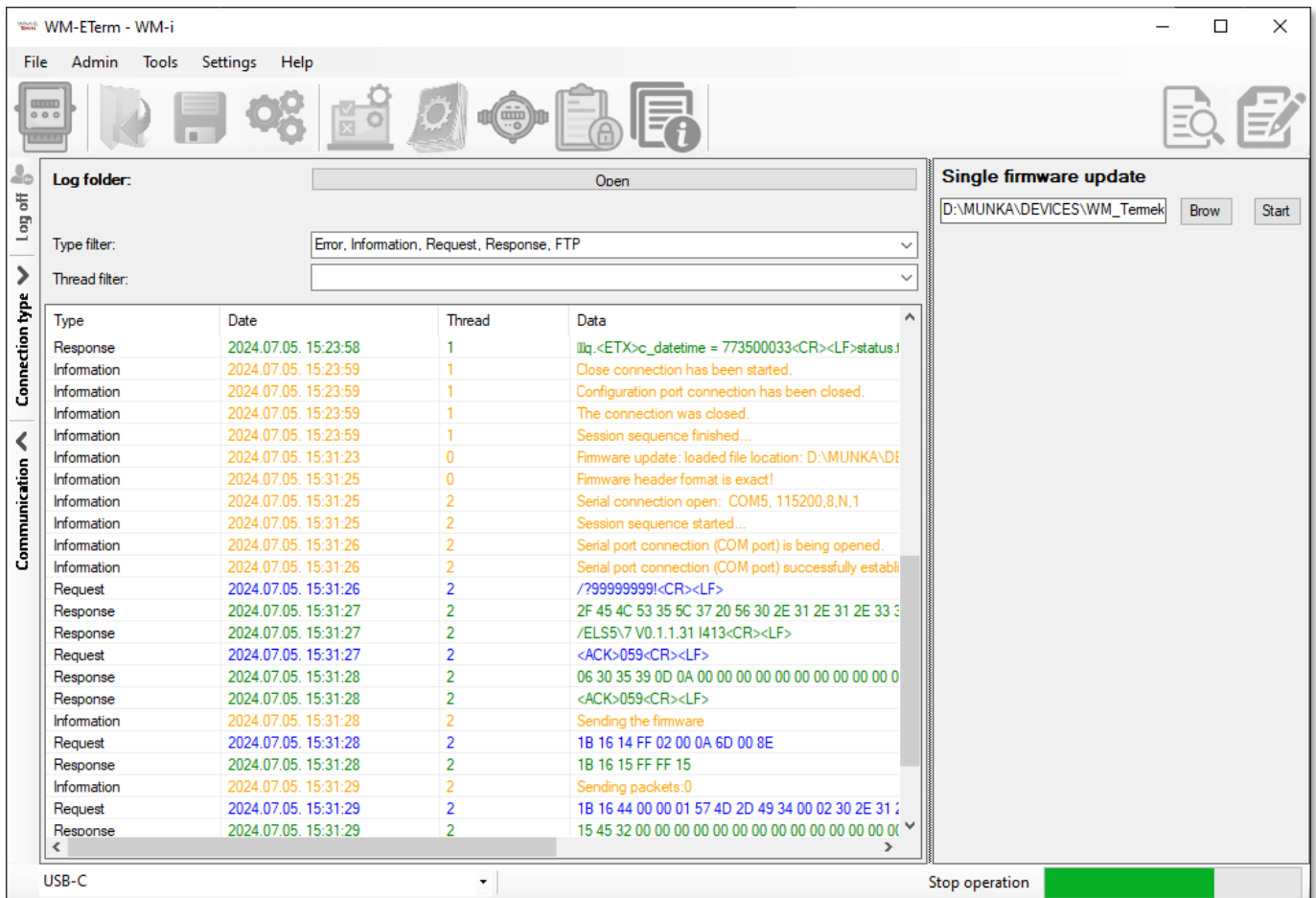
5. At the end of the FW update, the a „*New firmware refresh has been started...*" message will appear.

   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.

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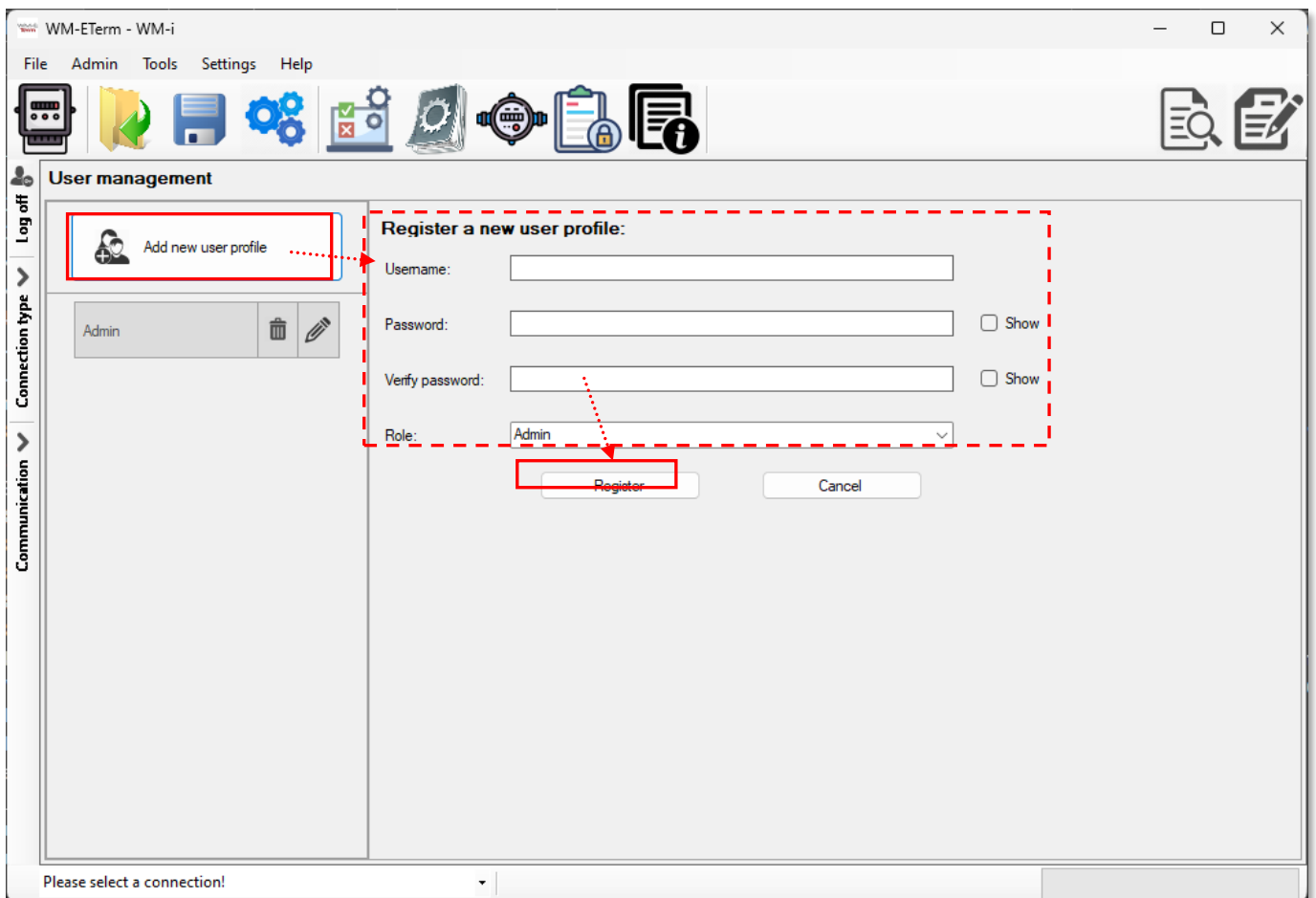
3. Add a **Username** for the new profile and define a **Password*** for the account. Then fill the password again to the **Verify password*** field.

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

4. Choose a Role for the user profile: ***Admin*** / ***Installer*** / ***User***.

5. **[Save]** it. The new account will be available from the nex 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).
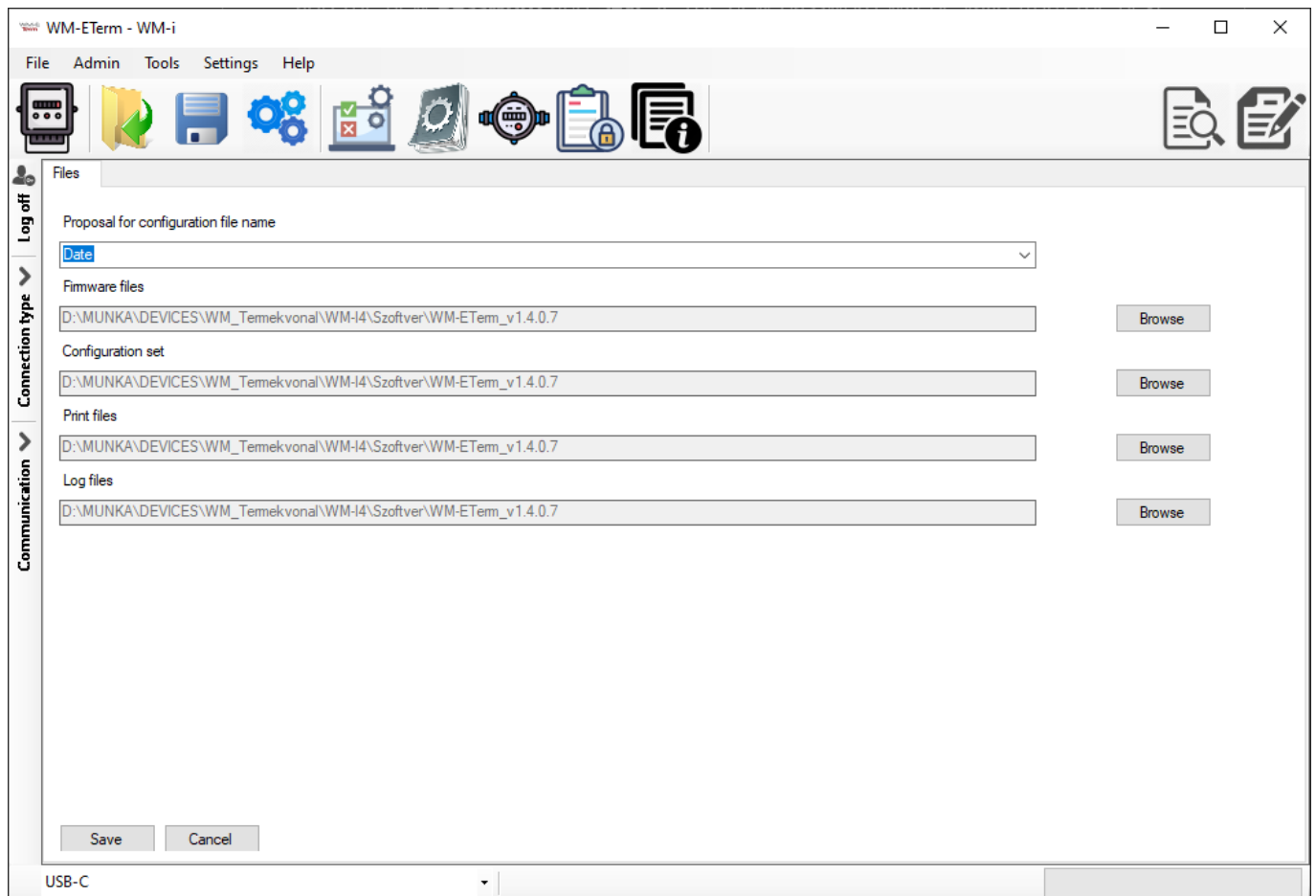
2. If needed, you can change the "**General**" tab settings (as language, Date format, Window size, Print font type or hide the password).

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
Phone: +36 20 3331111

Online product support can be required here at our website:
https://www.m2mserver.com/en/support/

For the proper identification of your device, use router 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-4-20ma/

Chapter 10. Legal notice

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