CALMS d.o.o.

User manual – CAL-EDGE-8 device

Product:	CALMS CAL-EDGE-8 monitoring device
Release date:	October 2025

Contents:

1. Notices

Read this manual thoroughly and follow all notes and instructions during installation, operation, and maintenance. The manufacturer accepts no responsibility for damage caused by disregarding this manual.

The manual must be read attentively by both qualified personnel and the end user. It should be stored with the product and kept accessible whenever required. **By installing or using the product, you confirm that you have read, understood, and agreed to follow the instructions provided.**

2. Warnings

Ignoring the warnings can lead to serious injury and/or cause damage!

When handling, operating, or maintaining this product, personnel must follow safe working practices and comply with all applicable health and safety regulations. Incorrect operation or maintenance may create dangerous situations and could result in equipment damage or personal injury. The manufacturer cannot foresee every circumstance that may pose a hazard. If users apply procedures, equipment, or methods not specifically recommended by the manufacturer, they are responsible for ensuring that such use does not damage or compromise the product's safety, and that it poses no risk to people or property.

3. CAL-EDGE-8 monitoring device

The **CALMS CAL-EDGE-8 monitoring device** is a highly sophisticated and affordable remote data logger for compressed air systems, designed for experts and auditors. The device connects directly to the CALMS web application which provides real time access to data from any web browser for any end user and their service partner.

It is a plug&play device with the new WIRELESS MESH solution implemented, used to connect even the most distant sensors to the device WITHOUT any cables.

This user manual is focused on helping customers understand the working of the device, avoid common mistakes, and incorporate it into your system as efficiently as possible.

Purchasing the CAL-EDGE-8 includes:

CAL-EDGE-8

CALMS EDGE 8 survey device LTE 4G with 8x AI, Modbus RTU & Modbus TCP/IP and new WIRELESS MESH
Portable measurement device supporting the following protocols: Modbus RTU, Modbus TCP/IP,OPC UA (without sensors)
3G/4G Modem SMA with external antenna (with SIM card provided EU/Global)
W-MODBUS gateway.
8x Analog Input with 4pin connector
1x Ethernet port 10/100 Base-T (LAN)
1x RS485 port
Internal memory Emmc 8GB, optional µSD 256GB
Ambient temperature range: -25°C to 60°C (-13 F – 140 F)
Power supply 24VDC; 2,1 A; 50W;
Approval UL / CE / FCC Class A
USB-C for battery operation.

Optional hardware additions for the new Wireless Modbus protocol:

CAL-WIRELESS-BOX device with MODBUS RTU and W-MODBUS protocol, 2x AI, 2x DI

Device supplied with 24VDC (Power adapter included)

4. Mechanical and electrical installation

Installation work must only be carried out by a competent person under qualified supervision.

A fused isolation switch must be fitted between the main power supply and the CAL – EDGE – 8 device.

The CAL – EDGE – 8 should be mounted in such a location as to allow operational and maintenance access without obstruction or hazard and to allow clear visibility of indicators at all times.

If raised platforms are required to provide access to the CAL – EDGE - 8 they must not interfere with normal operation or obstruct access. Platforms and stairs should be of grid or plate construction with safety rails on all open sides

For starting up the device, it needs to be powered on, connected to a **power supply.** The device **must be operated at the supply voltage and frequency for which it is designed.** It is powered with 9-30VDC. When purchasing the device it comes with a power supply included.

What follows is a description of all the terminals on the device:

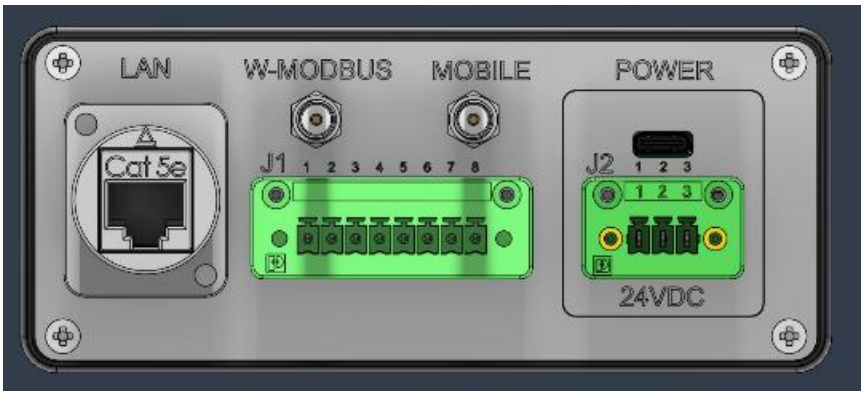


Figure 1 CAL-EDGE-8 (front side)

On *Figure 1* is shown the CAL-EDGE-8 device from its front side where the connectors for power supply, RS-485 fieldbus, sensor power supply and ethernet port are located.

To power on the device connect **24VDC** to the **+ terminal** on the connector and **0VDC** on the **OV terminal** on the device. When successfully powering on the device the **POWER LED** starts blinking green. To ensure proper connection, please check the electrical schematic down below.

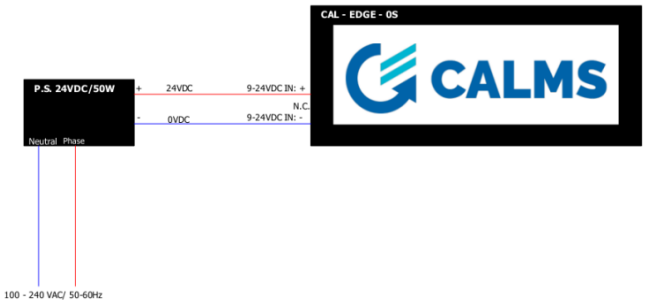
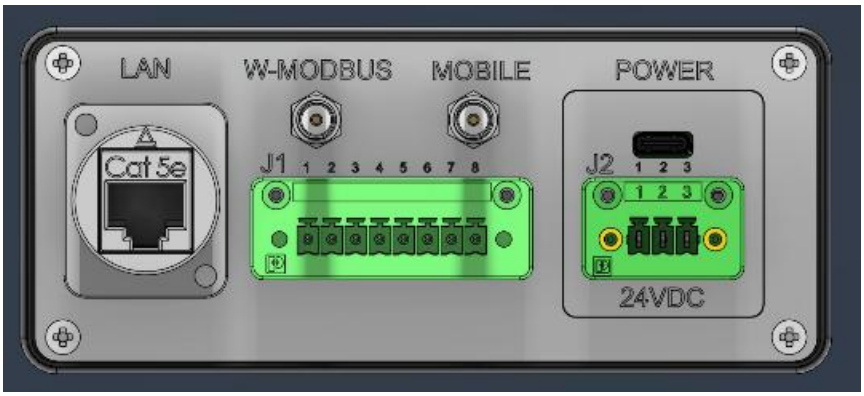


Figure 2 Electrical schematic for the CAL-EDGE-8 device

To ensure the device goes online you must connect an external antenna to the device or connect it to your local network where DHCP server is installed so the device can connect to the internet.

- If you`re connecting an antenna, you need to connect it to **MOBILE** and screw it firmly. For best possible signal reception we recommend you mount it as high as possible, or near a window.
- If you`re connecting it to LAN, plug in the ethernet cable into the ethernet port on the device labeled with **LAN.** The LAN port can also be used to connect the device to other TCP/IP protocol capable devices (MODBUS TCP, ADS, OPC UA…). To connect a MODBUS TCP sensor to the device, use the LAN port. Device receives its static IP address (**192.168.0.102**) after start-up if there is not DHCP server in the network.



The CAL-EDGE-8 also supports the widely used protocol in the industry – MODBUS RTU. The unit provides a fully isolated 2-Wire (half duplex) RS485 interface with automatic, transparent hardware flow control. Its easy implementation and configuration ensures that the customer can have a fully operational and functional monitoring device in no time.

To connect a MODBUS RTU sensor to the CAL-EDGE-8 you must first connect it to (external or directly from the CAL-EDGE-8) power supply and connect **Data + to A** and **Data – to B accordingly,** like shown in the shematic below.

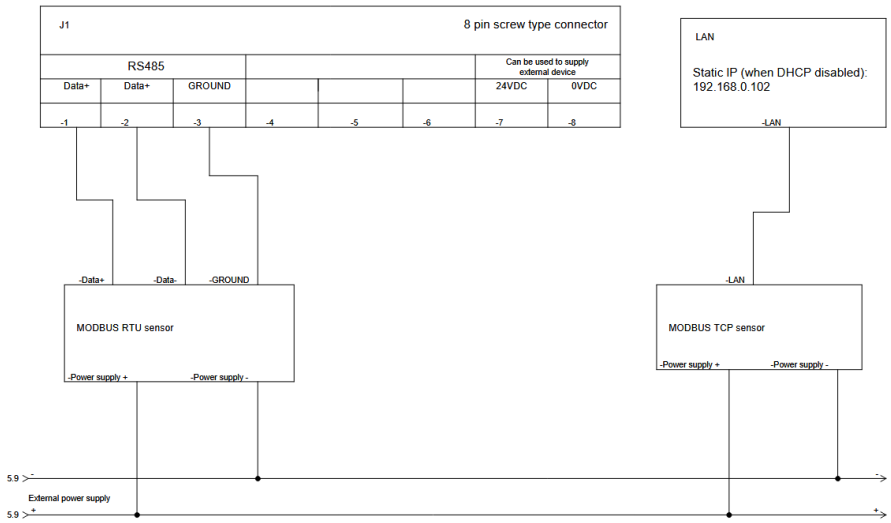


Figure 3 Connection of MODBUS sensors to the CAL-EDGE-8 device

DISCLAIMER: To make sure the data values from the sensors are efficiently send to CALMS web application, contact the CALMS support team to make sure the sensor is added in the CALMS database. A new sensor must be added in the CALMS database.

A correct connection and configuration of the device can be seen on the LED lights in the front side of the device.

State LED	Description
LED POWER	○ LED lights green – device powered on properly ○ LED off – supply voltage less than 9VDC or more than 30VDC
LED STATUS	○ LED lights blue – device is trying to connect to the internet ○ LED lights green - device connected to the internet
LED RS485	○ LED flashes rapidly **red color** – MODBUS communication established; ○ LED flashes **green color** – MODBUS communication searching (devices are not communicating) ○ LED off- Modbus not connected
AI LED	○ LED off – analog input not activated, signal less than 4mA ○ LED lights green – analog input activated, signal more than 4mA

The other ports that are not mentioned are not used!

5. New Wireless Modbus feature

The new wireless Modbus feature on the CAL-EDGE-8 can be implemented on demand. For this option, an additional hardware component has to be purchased, the **CAL-WIRELESS-BOX**. It is a device that acts as a gateway between the CAL-EDGE-8 device and the sensors. On this device the customer can connect the following:

1. Modbus sensors (with the possibility of daisy chaining)
2. 2 x Analog sensors
3. 2 x Digital sensors

The sensors are connected to the CAL-WIRELESS-BOX that communicated with the CAL-EDGE-8 device via Wireless Modbus protocol.

First, the CAL-WIRELESS-BOX has to be powered on. It is powered with 24VDC. To power the device connect **24VDC** to the terminal labeled **1 (on the J1 connector), 0VDC** connect to the terminal labeled **2 (on the J1 connector).** To ensure proper connection, please check the electrical schematic below.

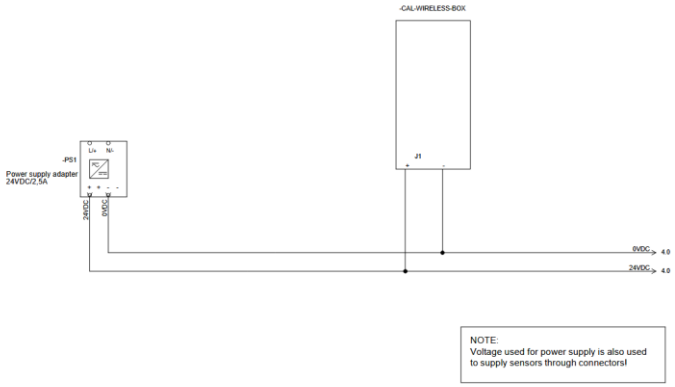


Figure 4 Electrical schematic for the CAL-WIRELESS-BOX

If the device has been properly powered on, the LED **POWER** lights **green.**

Next, for the CAL-EDGE-8 to be able to communicate with the CAL-WIRELESS-BOX, antenna has to be connected on both devices. On the CAL-EDGE-8, you have to connect the antenna provided to the connector labeled **W-MODBUS**.

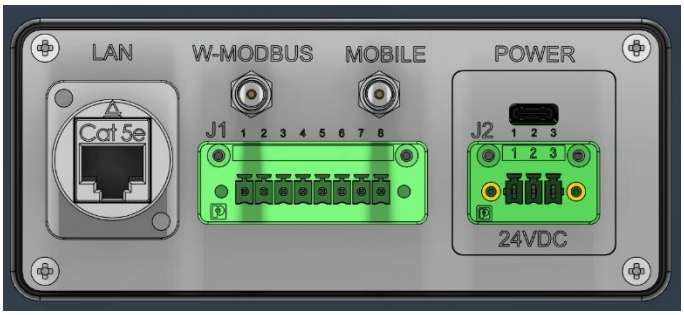


Figure 5 : Front view of the CAL-EDGE-8 device

Also, an antenna has to be connected to the CAL-WIRELESS-BOX on the connector labeled **W-MODBUS.** When communication between the CAL-EDGE-8 and the CAL-WIRELESS-BOX has been established the **STATUS LED** on the CAL-WIRELESS-BOX lights **green.**

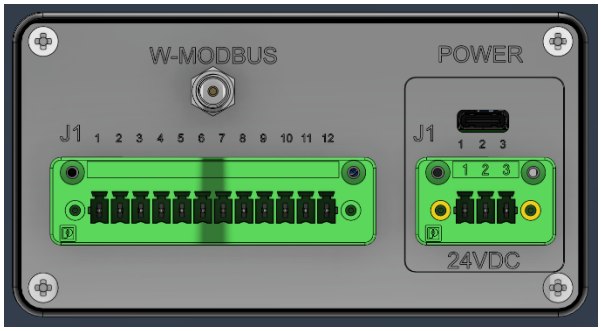


Figure 6 : Front view of the CAL-WIRELESS-BOX

To wire the sensors to the CAL-WIRELESS-BOX, use the **J2 connector with the pinout written on the top plate of the device.**

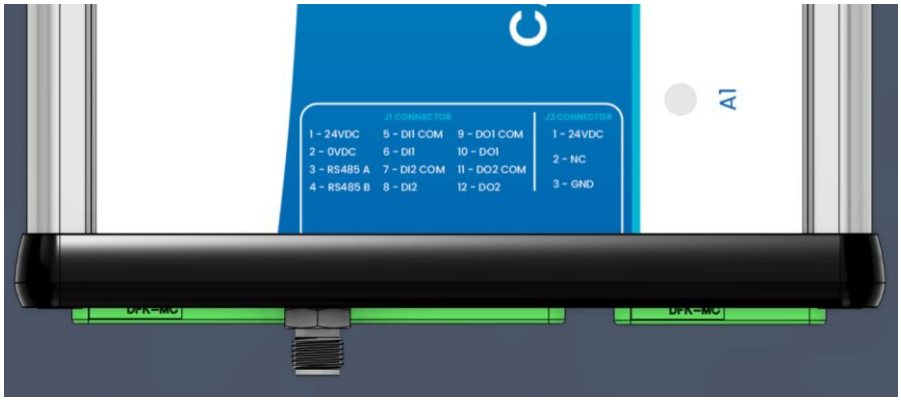


Figure 7 : Pinout of the J2 connector on the CAL-WIRELESS-BOX

To connect a Modbus RTU sensor to the CAL-WIRELESS-BOX, you must first connect it to (external or directly from the CAL-WIRELESS-BOX) power supply and connect **Data + to A** and **Data – to B accordingly,** like shown in the shematic below.

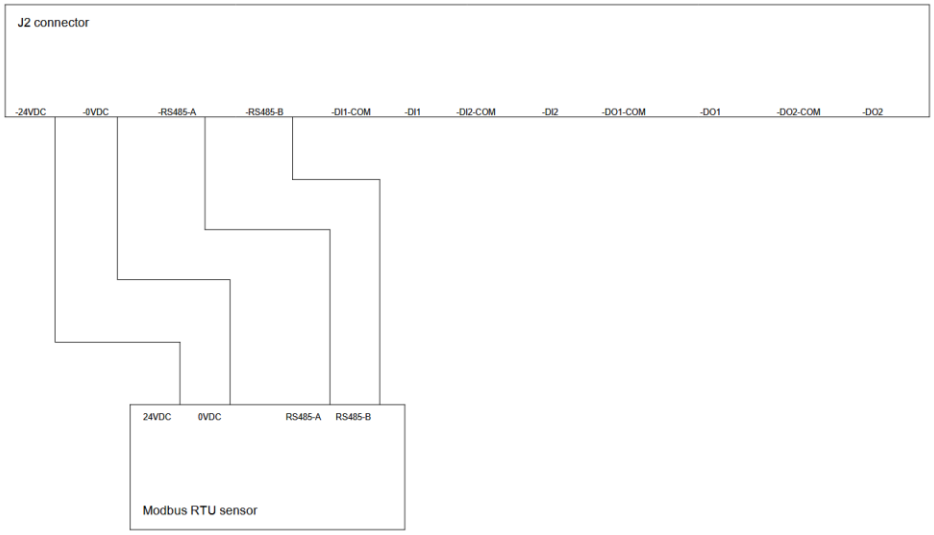


Figure 8 : Connection of a MODBUS RTU sensor to the CAL-WIRELESS-BOX

DISCLAIMER: To make sure the data values from the sensors are efficiently send to CALMS web application, contact the CALMS support team to make sure the Wireless Modbus option has been added to the sensor.

To connect a digital sensor to the CAL-WIRELESS-BOX, you must connect it according to the electrical schematic below.

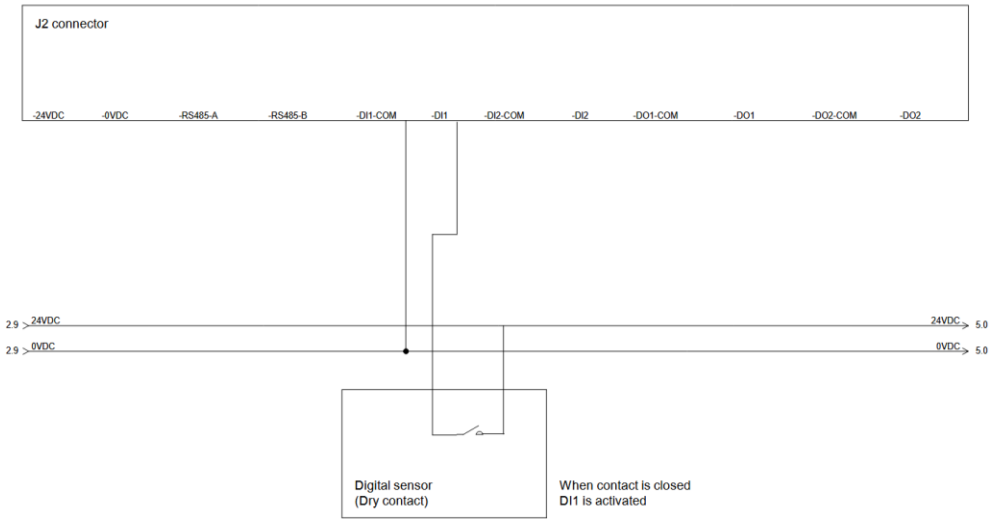


Figure 9 : Connection of digital sensors to the CAL-WIRELESS-BOX

To connect analog sensor to the CAL-WIRELESS-BOX, please follow the electrical schematic provided below.

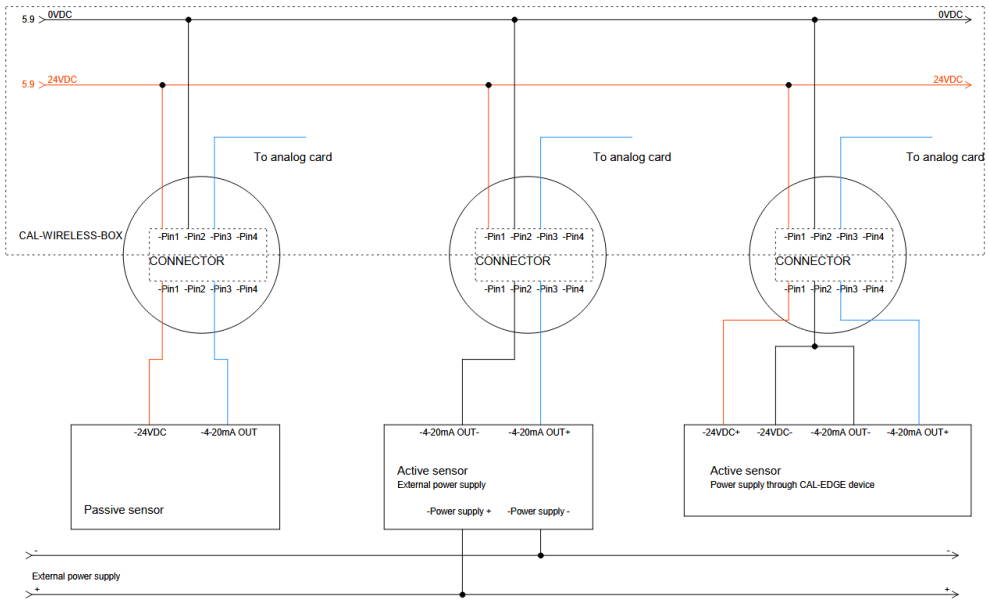


Figure 10 : Connection examples of analog sensors to the CAL-WIRELESS-BOX

A correct connection and configuration of the device can be seen on the LED lights in the front side of the device.

State LED	Description
LED POWER	○ LED lights green – device powered on properly ○ LED off – supply voltage less than 9VDC or more than 30VDC
LED STATUS	○ LED lights blue – device is trying to connect to the CAL-EDGE-8 device ○ LED lights green - device connected to the CAL-EDGE-8
LED RS485	○ LED flashes rapidly **red color** – MODBUS communication established; ○ LED flashes **green color** – MODBUS communication searching (CAL-WIRELESS-BOX and sensors are not communicating) ○ LED off- Modbus not connected
AI LED	○ LED off – analog input not activated, signal less than 4mA ○ LED lights green – analog input activated, signal more than 4mA
DI LED	○ LED off – digital input not activated ○ LED lights green – digital input activated

The **W-MODBUS SIGNAL STRENGTH** LEDs indicate the strength of the connection to the CAL-EDGE-8 via the Wireless Modbus protocol.

6. Start-up procedure on CALMS

After successfully mounting and wiring the device a proper start-up procedure must be done:

1. Every CAL-EDGE-8 device has its own unique serial number, located on the back of the device. On the web application CALMS the device has to be added in your system. First, you open your system and navigate to the **Setup** page. There you click on **»Add device«** and choose your device.

Figure 11 How to add a device on CALMS

2. On the **Equipment page** add a sensor on your scheme. To »connect« the sensor to your device you have to again choose your device (serial number) and the connection type of the sensor, whether it is going to be connected via **wired Modbus or wireless Modbus**.

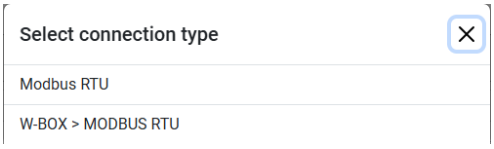


Figure 12 : Choosing the right connection type for the sensors

3. Next, the MODBUS parameters on the CALMS application should be configured. Usually for the Wireless Modbus option they are already set, for the Wired Modbus the customer has the option to change them. The customer is able to change the UnitID of the sensor, the baudrate, parity, data and stop bits so they match with the settings on the sensor.

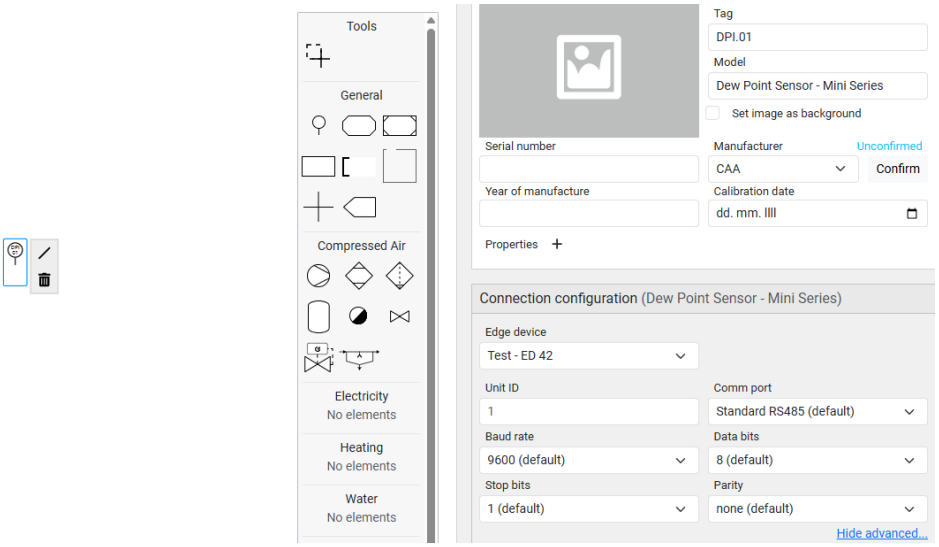


Figure 13 Sensor configuration on CALMS

4. If the device is powered on and the sensor is already connected to it and configured on CALMS, the device immediately establishes connection by flashing the **RS485 LED red rapidly.** Also, the device already starts sending data to the web application. The customer has the option to view the live values from the sensors as they are changing by navigating to the **Device dashboard page** and **clicking the Live button**, to enable the live monitoring of the data.

Figure 14 Device dashboard

5. The data collected from the sensor for periods of time can be checked on the **Monitoring page.** There the customer has the option to choose which channels (inputs) to monitor, view them in a graph, choose the inspect period and aggregation.

Figure 15 Monitoring page on CALMS

6. With this the process of adding, configuring and getting data from the CAL-EDGE-8 is finished.

7. Troubleshooting

In case the wireless MODBUS option is added, there are NO indicatiors on the CAL-EDGE-8 if there are any problems in the communication with the CAL-WIRELESS-BOX.

CAL-EDGE-8 troubleshooting tips:

- **POWER LED is constantly OFF:**

Check the power supply. Device accepts 9-30VDC.

- **STATUS LED is constantly BLUE:**

Check the signal. Connect the antenna firmly on »**MOBILE**« port. Place the antenna near windows and on higher places to get the best possible signal.

Reboot the device.

- **STATUS LED is burning RED:**

Contact the CALMS support team.

- **MODBUS communication is not working:**

Follow the installation quide provided on CALMS (https://docs.calms.com/calms-device-systems-guide/sensor_notes/)

Check the configuration on CALMS (communication parameters)

Restart the CAL-EDGE-8 device.

- **AI LED constantly OFF:**

Check the wiring of the analog sensor, check the sensor if working. Check the configuration on CALMS of the analog sensor.

A MODBUS slave device has been connected to the master, but they are not communicating. Make sure the MODBUS parameters on CALMS are the same as the slave device (check the manual for the slave device), swap the **Data A** and **Data B wires on the CAL-EDGE-8 device.**

- **RS485 LED is constantly OFF:**

  No MODBUS communication is present. Check the power supply for the slave device. They have to be externally powered on. Check the configuration on CALMS: make sure the correct slave device is added and the correct device (serial number) is assigned to the slave device.

CAL-WIRELESS-BOX troubleshooting tips:

- **POWER LED is constantly OFF:**

Check the power supply. Device accepts 9-30VDC.

- **Device does not want to connect to CAL-EDGE-8:**

Check if the antenna on the connector labeled WIRELESS is firmly on the port of both devices: the CAL-EDGE-8 and CAL-WIRELESS-BOX.

- **STATUS LED is burning RED:**

Contact the CALMS support team.

- **Rx-Tx LED is constantly OFF:**

Check if the antenna is firmly on the »**WIRELESS**« port. Place the antenna near windows and on higher places to get the best possible signal.

- **Device doesn`t communicate with the Modbus sensor:**

Check the wiring. Swap data **A and B** if necessary. Check the configuration of the sensor on CALMS (Modbus parameters).

- **AI LED constantly OFF:**

Check the wiring of the analog sensor, check the sensor if working. Check the configuration on CALMS of the analog sensor.

For more instructions and troubleshooting scan the QR code!

8. Contact and support

If you experience any issues that cannot be resolved using this manual, please contact the CALMS support team support@calms.com.

For technical assistance, please, provide the following information when reaching out:

- Serial number (located on the device label)
- Description of the issue
- Steps already taken to resolve the issue

Website:	www.calms.com
E-mail:	support@calms.com
Phone:	info@calms.com (EU): +386-1-563-20-63 (US): +1-864-705-2571