Compressed Air Energy Management System

CAL – EDGE – 0 DEVICE

User manual

Before installing or starting this unit for the first time, this manual should be studied carefully to obtain a working knowledge of the unit and or the duties to be performed while operating and maintaining the unit.
RETAIN THIS MANUAL WITH UNIT. This Technical manual contains IMPORTANT SAFETY DATA and should be kept with the unit at all times.

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Introduction

Dear Customer,

Thank you for choosing our product.

Before starting up the device please read this short manual and carefully observe instructions stated.
The manufacturer cannot be held liable for any damage which occurs as a result of non-observance or non-compliance with this manual.

The CAL – EDGE – 0 device is a highly sophisticated and affordable remote data logger for compressed air system. Device connects directly to CALMS web application which provides real time access to data from any web browser for any end user and their service partner.

Benefits of using CAL – EDGE – 0 device

- The easiest and cheapest solution for doing air audit online with independent experts
- Shows where to save on energy costs
- Helps improve your energy efficiency
- Save your time and improve the organization
- Calculates costs in relation to actual consumption
- Increases the reliability of your equipment
- Creates forecast of energy consumption
- Increases your environmental image
- Improves the investment process (energy equipment)

Features

- Plug & Play device, remote monitoring/alarming/reporting and air auditing, designed for compressed air systems,
- WEB based application for total air management ties CALMS monitoring together with CALMS leak management,

- Data - logger for compressed air system provides readings for web based detailed analysis and simulation tools,
- Energy management tools – Specific power, M/T, CUSUM analysis
- Detailed analysis of compressed air system with auto generated reporting, warning of poor efficiency with potential savings calculation compared to best in class efficiency from CALMS knowledge database
- SIMULATION module integrated
- Compressed Air Performance Scorecards
- Expandable
- Secure internet connection between device and CALMS web application,
- Multiple data export options (CSV, XML), and easy online printing,
- Automated monthly reports send by email
- Alarms & Warnings email or SMS notification including analysis data.

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 – 0 device
- The CAL – EDGE – 0 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 - 0 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.

Operation

- The CAL – EDGE – 0 must only be operated by competent personnel under qualified supervision.
- Never remove or tamper with safety devices, guards or insulation materials fitted to the CAL – EDGE – 0
- The CAL – EDGE – 0 must only be operated at the supply voltage and frequency for which it is designed.

- When main power is switched on, lethal voltages are present in the electrical circuits and extreme caution must be exercised whenever it is necessary to carry out any work on the unit.
- Do not open access panels or touch electrical components while voltage is applied unless it is necessary for measurements, tests or adjustments. Such work should be carried out only by a qualified electrician equipped with the correct tools and wearing appropriate protection against electrical hazards.

Terminals description

In this section is discussed what are the terminals of the CAL – EDGE – 0 device.

CAL – EDGE – 0 (front side)

Figure 1: CAL - EDGE - 0 (front side)

- **LAN:** LAN port is used to connect EDGE device to any other TCP/IP protocol capable device (MODBUS, ADS, OPC UA…). This port is also used to connect device on internet when communication through mobile network is not working.

NOTE: If we want to connect device on internet through LAN port, a DHCP server must be installed in the network!

- **CAN-BUS / RS485:** Terminal used to connect RS485 fieldbus. To properly connect sensors to RS485, check the electric scheme.

  NOTE: Be careful when wiring sensors to device. Improper connection may lead to device damage!

- **LED RS485:** If communication between the sensor and the MODBUS is established, LED flash rapidly (red color).

  NOTE: If there is no flashing something is wrong and you need to check if connection is proper.

- **LED STATUS:**

LED Status	Module Status
On	Searching Network/Call Connect
200ms On, 200ms Off	Data Transmit
800ms On, 800ms Off	Registered network
Off	Power off / Sleep

Figure 2: Network status indication LED status

- **DC IN:** Power supply terminal. Device accepts voltage 9-28V. To properly connect power supply terminal check the electric scheme.

CAL – EDGE – 0 (rear side)

Figure 3: CAL - EDGE - 0 (rear side)

- **ANT1**: Used for antenna connection with SMA connector.

NOTE: Connect antenna to ANT1 terminal! Mount antenna on the place with best signal reception possible!

- **ANT2**: Used for antenna connection with SMA connector.
- **ANT3, ANT4, ANT5**: Not used
- **PROG**: Not used.
- **SERIAL**: Not used.

Electrical scheme

Power supply connection

CAL – EDGE – 0 device needs 9-28VDC power supply for operation. Power supply voltage also powers connected sensors. Connect power supply to labeled terminals (watch the polarity) on screw-type phoenix connector.

NOTE: Power supply 24VDC/50W is shipped together with CAL – EDGE – 0 device.

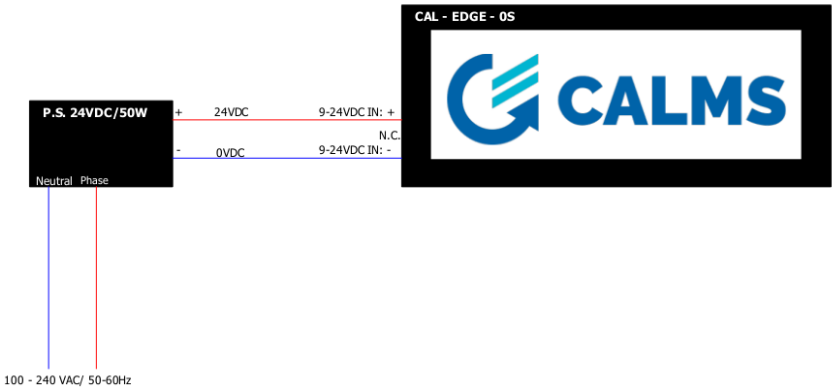

Figure 4: Power supply wiring scheme

Figure 5: Power supply adapter 24VDC/50W

Modbus connection

The CAL – EDGE - 0 unit provides a fully isolated 2-Wire (half duplex) RS485 interface with automatic, transparent hardware flow control.

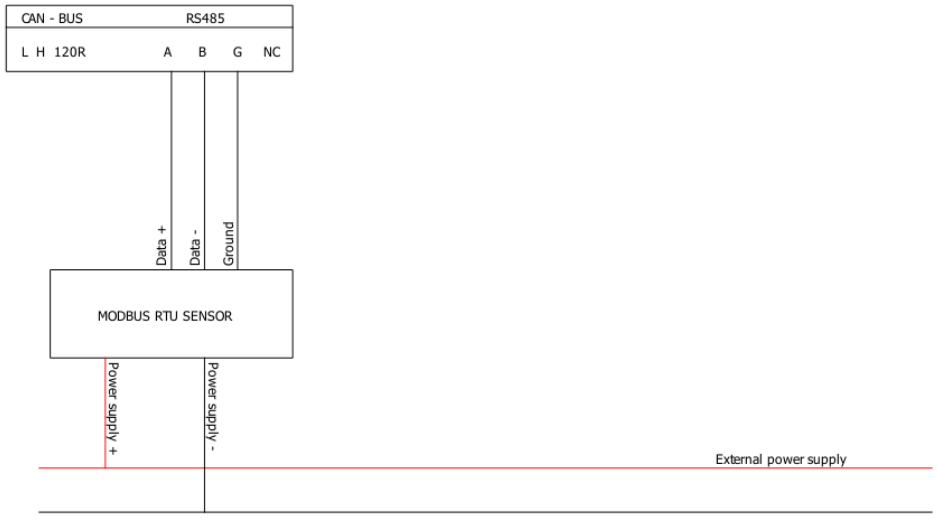

Figure 6: RS485 wiring scheme

Ethernet FIELDBUS connection

CAL – EDGE -0 has one standard RJ45 port used to implement TCP/IP connection. Supported protocols so far are: MODBUS TCP/IP, ADS, OPC/UA. CAL – EDGE – 0 device has configured fixed IP (192.168.0.102) in case there are not any DHCP servers in the network. If DHCP server is present in the network CAL – EDGE – 0 device will obtain IP from DHCP server.
This port can also be used to connect device to the internet in case of 4G modem failure or low signal strength.

Start up procedure

To start using CAL – EDGE – 0 device a proper start-up procedure must be done:

1. Assign (add) device to proper CALMS monitoring system (check the serial number at the bottom of the device);
2. Add all channels on the CALMS monitoring system;
3. Connect antenna to ANT1 connector on the CAL – EDGE - 0 device;
4. Connect all the MODBUS (RTU or TCP/IP) sensors to proper terminals on the CAL – EDGE – 0 device;

5. Plug in the power supply connector and screw the plug into the header in the CAL – EDGE – 0 device;
6. After 10-20 seconds “ON” led (meaning the device is ONLINE) should turn green;
7. After 5-10 minutes “COMM” led (meaning the device has established communication) should turn green;
8. When the “COMM” led is on device downloads the configuration file from the CALMS web application. Device also checks each hour if configuration file has changed;
9. Check the CALMS monitoring system if uploaded data is correct. Test sensors with manual measurements.

Troubleshooting

CAL – EDGE – 0 device went offline

Please reference the below for troubleshooting when your device is offline:

1. Check if the device is powered on
2. Check the Status LED – make sure that LED is rapidly flashing
3. Try restarting the device, wait at least 10sec before the device go online and then observe status of the device.

CAL – EDGE – 0 device doesn`t send data to CALMS after connecting a new Modbus sensor

1. Check the wiring of the Modbus sensor.
2. Check the Modbus parameters set on the CALMS application and the Modbus parameters set on the sensor.
3. Make sure to restart the device after wiring the sensor, or any time a new sensor is added in your system that is connected to the CAL-EDGE-0 device.

If you encounter more difficulties or have any more further questions, please contact support team for further assistance.

Contact: support@calms.com

Support team can help you, if they have a serial number of the device.

Figure 7: Serial number (SN) of the device