Elvaco Sense

Wireless M-Bus indoor sensors

APPLICATION DESCRIPTION

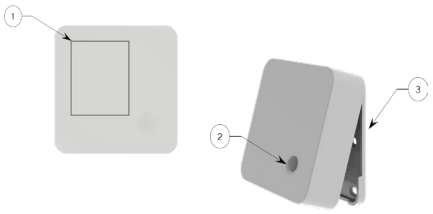
The Elvaco Sense is a smart wireless M-Bus sensor solution with the ability to precisely measure CO2, temperature and humidity. It's equipped with replaceable batteries and made for indoor use. The Scandinavian minimalist design makes it suitable in homes, offices and public spaces.

The sensor automatically starts to transmit wireless M-Bus telegrams as soon as the replaceable batteries are installed. Using the Elvaco OTC smartphone app, the sensor can be commissioned to suite various wireless M-Bus installations following the OMS standard. The user has the ability to change different settings such as transmit interval, encryption mode and wireless m-bus mode. The Elvaco OTC app can also be used to verify that the sensor is operational before leaving the installation site.

For more information, visit www.elvaco.com

OVERVIEW

1. NFC antenna placement
2. LED light
3. Serial number

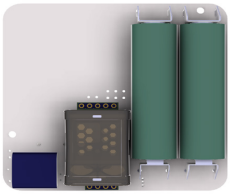


MOUNTING

1. Remove the back panel of the sensor with a small screwdriver.

2. Install the 3.6V Lithium Battery/Batteries (ER14505) and check that the plus and minus poles are facing the right direction. Upon installation the sensor will be activated and flash a long red flash followed by a long green flash.

Caution: Using batteries other than the ones provided may result in loss of performance, reduced battery life time and also damage to the device.



3. Mount the back panel securely to the wall with at least two appropriate screws, using any of the four mounting holes. Alternatively, attach the sensor with double sided adhesive tape.

4. Attach the sensor part to the back panel.

IMPORTANT

- Avoid mounting the product near any heat or cold sources, such as kitchen stoves, in direct sunlight or in a spotlight beam.
- Make sure to mount the product at least 1.5 meters from the floor and at least 1 meter from the nearest radiator.
- Do not mount the product on an external wall or near a door. If mounted over a conduit pipe, make sure that the pipe is filled to prevent air flow.
- Do not mount the sensor in a steel cabinet. Doing so will dramatically decrease the signal coverage.

OPERATION

Upon installation of the batteries, the sensor will begin to transmit wireless M-Bus telegrams. The telegrams contain sensor data as well as various information about the product status. The Elvaco Sense are equipped with an NFC antenna, which can be used to configure settings or to read data using a smartphone. To read the current sensor values in the Elvaco OTC app, scan the sensor twice within 30 seconds. The first scan will wake up the sensor and collect the current sensor values.

CONFIGURATION USING THE OTC APP

Download the Elvaco OTC app from Google Play or App Store to a smartphone. The smartphone must support NFC.

OTC app on Android

OTC app on Iphone

Configuration settings
For configuration settings on the Elvaco Sense, press SCAN in the OTC app and hold the smartphone on top of the NFC antenna of the sensor. Select APPLY in the OTC app and change the settings for a customized sensor experience.

LED flash
For successful configuration settings the LED will flash blue.
For Automatic Baseline Calibration On / Off the LED will begin to flash red and then continue to flash green.
For Fresh Air Calibration the LED will flash green.

Transmit interval
The transmit interval of the wireless M-Bus telegram can be set between one and fifteen minutes.
Note: Change of transmit interval will affect the battery lifetime.

Wireless M-Bus mode
Elvaco Sense has three different wireless M-Bus modes; C1a, C1b and T1.

Encryption mode
The Elvaco Sense wireless M-Bus telegram can be encrypted using mode 5 by selecting Yes in the line wM-Bus encryption enabled.

Configuration lock
The Elvaco Sense can be secured by disabling the possibility of applying configuration without having access to the Product Access Key (PAK). By enabling setup lock the sensor can only be configured or unlocked by a user having access to the PAK. Elvaco recommend enabling the setup lock during installation to secure the device for unwanted re-configuration.
To unable setup lock use the sensor key found in elvaco.evo portal. Upon delivery the customer will receive an invitation to the elvaco.evo portal via email, triggered by Elvaco.

CO_2 Calibration
Elvaco Sense has a self-correcting calibration algorithm, Automatic Baseline Calibration (ABC). The ABC uses the lowest sensor value over the last eight days and uses it as a baseline value corresponding to 400 ppm. For this to work correctly, the sensor must be exposed to well-ventilated air at least once every eight days. The ABC needs approximately one month to calibrate the sensor before being able to provide correct values.

The ABC is activated by default, and it can show incorrect values due to mechanical stress from transportation. Calibration can be done manually which will instantly calibrate the sensor. This process can be triggered using the Elvaco OTC app and placing the sensor in well-ventilated air for at least 10 minutes.
If the sensor is placed in a location where there are people constantly present, the recommendation is to turn the ABC calibration off and instead use the Elvaco OTC app and manually calibrate the sensor once a year.

TROUBLESHOOTING

The WM-Bus receiver does not receive any telegram from the sensor

Please verify that:
- The sensor has been activated.
- The receiver is connected to a power source and is correctly configured.
- The receiver is within range of the radio signal.
- The receiver antenna is mounted properly.
- The receiver and the sensor use the same wireless M-Bus mode (C1a).
- The sensor is not mounted inside a metallic cabinet.
- The sensor is not disturbed by other radio equipment.
- The sensor battery voltage is in operating condition. Use Elvaco OTC app (NFC) to verify.
- If the meter value does not show up in the Elvaco OTC App after a second scanning the sensor is not powered.

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Temperature value is inaccurate

Although the temperature sensor is normally very accurate, an incorrect positioning of the product can sometimes result in unintended temperature variations. When mounting the sensor, please verify that:

- The sensor is not mounted near any heat or cold sources.
- The sensor is not mounted in direct sunlight.
- The sensor is not mounted in a spotlight beam.

TECHNICAL SPECIFICATIONS

Mechanics	
Casing material	ABS UL94-V0 (White)
Protection class	IP20
Dimensions (w x h x d)	76.2 x 76.2 x 22.5 mm
Weight	60 g excluding batteries
Mounting	Wall-mount
Electrical	
Power supply	Lithium Battery (Removable)
Battery type	ER14505
Battery size	AA
Operating voltage	3.6 V
Environmental	
Operating temperature	0 – 50 °C
Operating humidity	0 – 85 %R No condensation
Operating altitude	0-2000 m
Pollution degree	Degree 2
Usage environment	Indoor
Storage temperature	-40 – 85 °C
Sensor characteristics	
Temperature range	0 – 50 °C
Temperature accuracy	± 0.2 °C
Humidity range	0 - 85 %RH
Humidity accuracy	± 2 %RH
CO2 range	400 – 10 000 ppm
CO2 accuracy	± 30 ppm At 400-5000 ppm, ± 3% of reading (15-35 °C, 0-80% RH)
CO2 accuracy	± 10 ppm At 5001-10000 ppm, ± 10% of reading (15-35 °C, 0-80% RH)
User interface	
LED	Activation
App support	Elvaco OTC (Using NFC)
Wireless M-Bus	
Frequency	868.95 MHz
Transmit power	25 MW
Transmit interval	According to tabel Factory default settings
Encryption	Yes/No (Mode 5)
Wireless M-Bus modes	C1a (default) / C1b / T1
Wireless M-Bus Standard	EN13757:2018
OMS Standard	4.0

FACTORY DEFAULT SETTINGS

Sensor	Function	Value
Elvaco Sense 100W	Transmit interval	3 min
Elvaco Sense 200W	Transmit interval	6 min
Elvaco Sense 300W	Transmit interval	15 min
Elvaco Sense 300W	Automatic Baseline Calibration	Yes
Elvaco Sense serie	Encryption mode	Off
Elvaco Sense serie	Setup lock	No
Elvaco Sense serie	Wireless M-Bus mode	C1a

If the sensor has been locked, it can be unlocked with the sensor key found in elvaco.evo

Conformity	
EMC	2014/30/EU
RED	2014/53/EU
LVD	2014/35/EU
RoHS	2011/65/EU + 2015/863
OMS	Compliance

ORDERING INFORMATION

Art No.	Description 1	Description 2
1050080	Elvaco Sense 100W	WM-Bus indoor Temp sensor
1050081	Elvaco Sense 200W	WM-Bus indoor Temp & Humidity sensor
1050082	Elvaco Sense 300W	WM-Bus indoor CO_2 multi sensor
9950855	3.6V Litiumbatteri AA	ER14505

PRODUCT INFORMATION

Function \ Art No.	1050080 Elvaco Sense 100W	1050081 Elvaco Sense 200W	1050082 Elvaco Sense 300W
Temperature	✓	✓	✓
Humidity		✓	✓
CO_2			✓
App support (NFC)	✓	✓	✓
Transmit interval	3min	6min	15min
Expected battery life time at 15 °C to 25 °C	16 years*	16 years*	10 years*
Number of batteries (9950855)	1	1	2

* The expected battery lifetime is based on theoretical calculation and measurements. Configuration and environmental conditions may affect the lifetime of the battery.

SIMPLIFIED DECLARATION OF CONFORMITY

Hereby, Elvaco declares that the product is in compliance with the following directives:

EU	UK
2014/53/EU (RED)	2017 No. 1206
2014/30/EU (EMC)	2016 No. 1091
2014/35/EU (LVD)	2016 No. 1101
2011/65/EU + 2015/863 (RoHS)	2012 No. 3032

The complete Declaration of Conformity can be found at www.elvaco. se/en > Search on product.

SAFETY

The warranty does not cover damage to the product caused by usage in any other way than described in this manual. Elvaco AB is not be liable for personal injury or property damage caused by usage in any other way than described in this manual.

CONTACT INFORMATION

Elvaco AB Technical support:

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