CMa11L

*Indoor sensor for temperature / humidity, LoRaWAN*

INTRODUCTION

CMa11L is a sensor that measures temperature and humidity in an indoor environments and deliver the data to a receiving application (server) via a LoRaWAN network. For a complete description of the product or for information in other languages, visit the Elvaco AB website, http://www.elvaco.com.
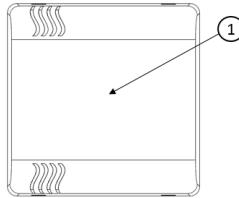
1. NFC antenna
2. Green LED
3. Red LED
4. Product label
5. Push button
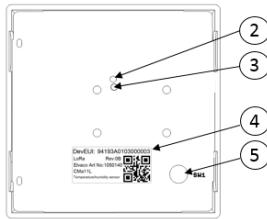
MOUNTING

CMa11L is mounted on a wall using the holes on its back cover. Note that you should never mount the sensor near any supplementary heat sources, in direct sun or LED light and at least 1.5 meters above the floor.

ACTIVATION

Upon delivery, CMa11L is set to passive mode, which means no messages will be transmitted from the sensor. There are two ways to activate the product:

1. Press and hold down the push button (5) for at least 5 seconds and release it once the green LED lights up.
2. By using the Elvaco OTC App. Set the **Power mode** to "Active", place your phone right next to the NFC antenna (1) and click **Apply settings**.

Upon start-up the module will attempt to join the LoRaWAN network. A successful join attempt is indicated by an 8-second light up of the green LED (2).

If the sensor fails to join the LoRaWAN network 6 times, it will wait for one hour before a new join attempt is performed in order to conserve battery. A new join attempt cycle can be initiated manually anytime by pressing the push button (2) for at least 5 seconds and release it once the green LED lights up, i.e. same procedure as normal activation.
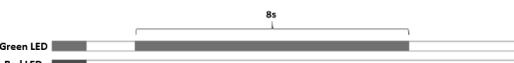
INITIAL DATA RATE CALIBRATION

When activated, CMa11L will initially transmit data every minute in order to let the LoRaWAN network adjust to an optimal data rate. After 10 minutes, the sensor will start using its normal settings where the message transmit interval is determined by the EcoMode settings or, if EcoMode has been disabled, the Tx interval parameter.

SERVER CONFIGURATION

Before CMa11L is able to transmit messages on the LoRaWAN network, device information needs to be added to the network server. More specifically, the following parameters needs to be registered in order to enable the network server to deliver and decrypt messages from the sensor:

- Device EUI (16-digit number printed on the device label)
- Application key
- Join EUI

DEVICE CONFIGURATION

Before activating the sensor, you should make sure to apply the correct configuration profile by using the Elvaco OTC App. Settings are transferred to the sensor using NFC.

Join EUI - The Join EUI is the ID of your application server where data from the sensor will be be delivered. The JoinEUI is by default set to 0x00 00 00 00 00 00 00 00.

Activation type - There are two different activation types for CMa11L - Over-the-air activation (OTAA) and Activation by personalization (ABP). Elvaco strongly recommends using OTAA, where all session keys automatically generated each time the sensor joins the LoRaWAN network. In contrast, for ABP, all keys are set manually and stay constant over time.

Application key - The application key of each device is generated by Elvaco and used in OTAA mode to generate session keys each time the sensor joins the LoRaWAN network. Keys are managed in a secure way using Elvaco's OTC* Solution which includes the Elvaco OTC App for configuration.

Message format - CMa11L supports three different message formats: *standard, compact* and *JSON*. Please refer to the CMa11L user's manual for more information about the structure and payload of each message format.

Maximum daily transmissions - The MaxDTx parameter can be used to set a maximum limit for how often the sensor is allowed to transmits messages on the LoRaWAN network.

Configuration lock - CMa11L has a configuration lock feature which can be used to prevent unauthorized users to access the sensor. When configuration lock has been enabled, a user needs the device-specific Product Access Key in order to access the device.

After you have set all configuration parameters, place the phone next to the NFC antenna of the sensor (1) and click **Apply settings**. Hold the phone still. New settings will be transferred to the device using NFC.

NOTE

If activation mode is set to "ABP", the application key does not need to be added to the network server. Instead, the following information will be needed: network session key, application session key and device address.

SAFETY

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

*OTC - One-touch commissioning

TECHNICAL SPECIFICATIONS

Mechanics

Casing material	ABS UL94-V0 (white)
Protection class	IP30
Dimensions (w x h x d)	80 x 80 x 25 mm
Weight	75 g
Mounting	Wall-mount

Electrical connections

Supply voltage	Battery, 3.6V

Electrical characteristics

Battery-life	12 years in EcoMode (in normal indoor temperatures)

Environmental specifications

Operating temperature	-20 - 60 ℃
Operating humidity	0 - 100 % RH, no condensation
Operating altitude	0-2000 m
Pollution degree	Degree 1
Usage environment	Indoors
Storage temperature	-40 - 85 ℃

Radio characteristics

Frequency	868 MHz
Output power	14 dBm
Receiver sensitivity	-135 dBm

LoRaWAN characteristics

Device class	Class A, bi-directional
LoRaWAN version	1.0.2
Activation	OTAA or ABP
Data rate	DR0-DR5 (250 bit/s - 5470 bit/s)

User interface

Green LED	Activation
Red LED	Super-cap indicator
Push button	Activation / reboot / deactivation
Configuration	NFC via Elvaco OTC App or downlink data

CONTACT INFORMATION

Technical support:
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Order:
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ORDERING INFORMATION

Item number	Description
1050140	CMa11L Indoor temperature/humidity sensor, LoRaWAN

elvaco

EU DECLARATION OF CONFORMITY

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Elvaco AB, Kabelgatan 2T, S-434 37 Kungsbacka, Sweden.

Product   Year of CE-marking
CMa11L   2019

The object(s) of the declaration listed above is in conformity with the relevant Community harmonization legislation:
EMC Directive 2014/30/EU
Radio Equipment Directive 2014/53/EU
RoHS 2011/65/EU

And are in conformity with the following harmonization standards or other normative documents:
CISPR32/CISPR11 class B (Radiated emission)
EN 62368-1 (Low Voltage Directive)
EN 61000-4-2 (Immunity to ESD)
EN 61000-4-3 (Immunity to RF-field)
EN 61000-4-4 (Immunity to burst)
EN 61000-4-5 (Immunity to surge)
EN 61000-4-6 (Immunity to HF-injection)
EN 61000-4-8 (immunity to magnetic fields)
EN 61000-4-11 (Immunity to voltage variation)
EN 300 220-1 (SRD Low power radio equipment)
EN 300 220-2 (SRD Low power radio equipment)

Kungsbacka, Sweden, 2019-04-24

David Vonasek, CEO