SENSO8 LoRa Temperature Humidity Sensor User Guide

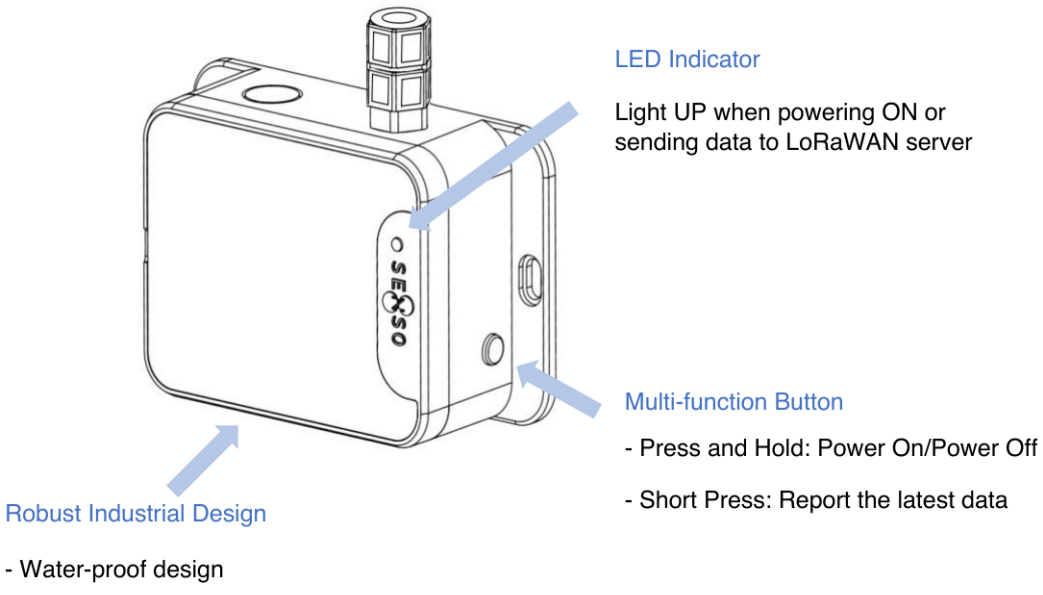
Table of Contents

1. Introduction . . . 1
2. Sensor Configuration . . . 2
3. Sensor Installation . . . 3
4. Installation and Connection . . . 4
5. Operating Instruction . . . 5
6. LED Indicator . . . 5
6.1. Device Status . . . 5
6.2. Error Status . . . 5
7. Sensor Operation . . . 6
7.1. OTAA Re-joining . . . 6
8. Configurable Sensor Settings . . . 6
9. Troubleshooting Guide . . . 7
10. Important Safety Instruction . . . 7
11. Warning and Personal Injury . . . 8
12. Revision History . . . 8

1. Introduction

Applicable Model:

- LRS20100

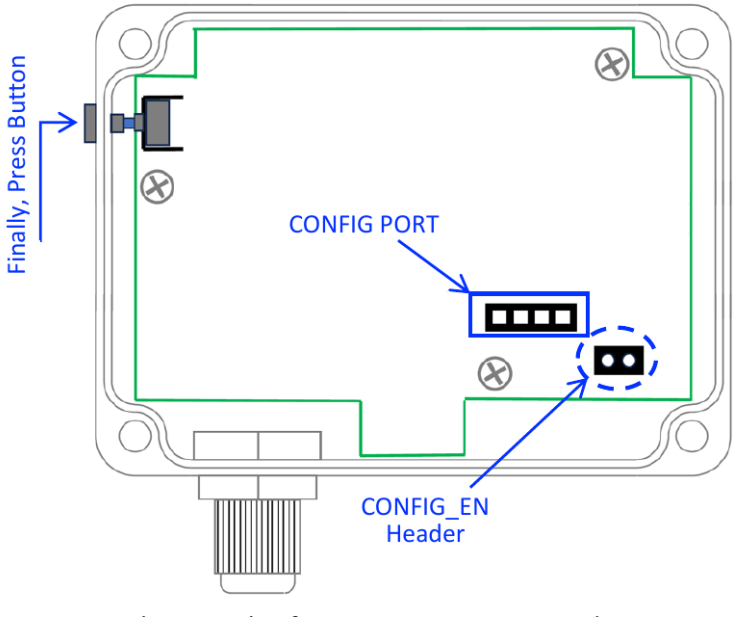


The LRS20100 temperature/humidity sensor provides a simple and efficient solution for monitoring temperature and humidity.

2. Sensor Configuration

1. Unfasten the screws on the corners and open the top cover.
2. Short the CONFIG_EN header with a jumper.
3. Connect a USB-to-UART converter to CONFIG PORT.

UART-to-USB	SENSO8
VCCIO	+3.0V
TXD	CONFIG_RX
RXD	CONFIG_TX
GND	GND



4. Open a serial terminal software on a computer and connect it to the USB-to-UART converter.
5. Insert an ER26500 battery to the battery holder and press the user button to power up the device.
6. Type the password when it prompts for it. Please contact your sales representative for the device password.

```
============================================================
Device ID | 0123456789012345
Device EUI | 9876543210987654
Hardware Ver | 01
Firmware Ver | XX.YY.ZZZ
```

```
Build Date | DD:MM:YYYY HH:MM:SS
============================================================
Password: _
```

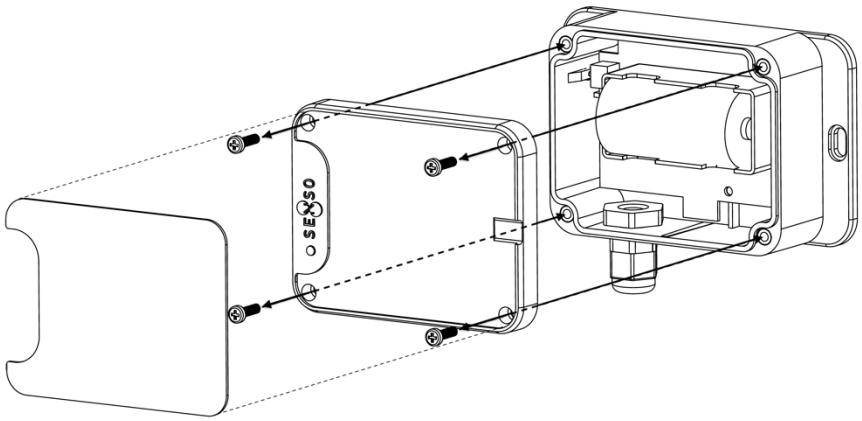
7. Then the configuration can be taken according to the requirements.

```
============================================================
Main Menu
1. Network Settings
2. Device Settings
3. Sensor Settings
4. Advance Settings
5. Change Password
6. Test Hardware
7. Test LoRa
x. Exit
_
```

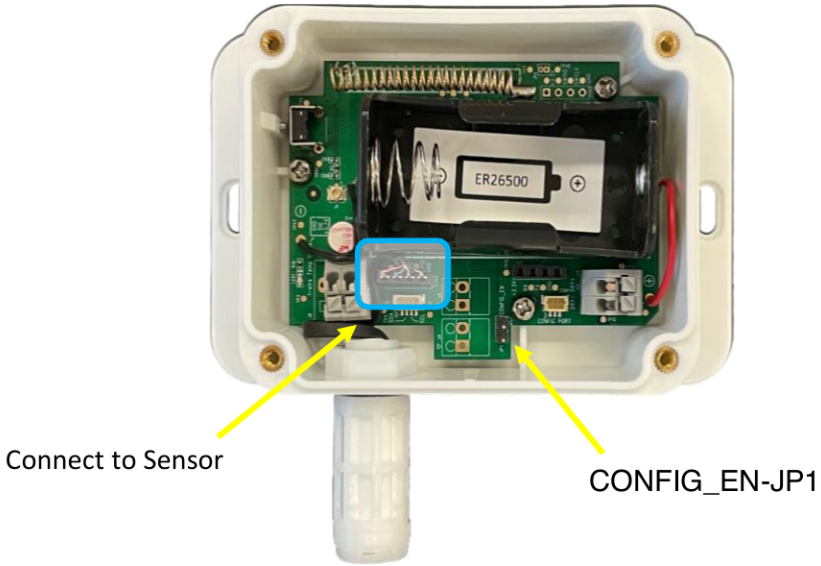
1. You can ask for the document of “SENSO8 LoRa UART Configuration Guide” from your sales representative for more information.

3. Sensor Installation

1. Unfasten the screws on the corners and open the top cover.



2. Insert an ER26500 battery to the battery holder. **Make sure the polarity of the battery is correct as shown on the label on the battery holder**.
3. Make sure the CONFIG_EN jumper (JP1) is not shorted.
4. Check the connection of the sensor.

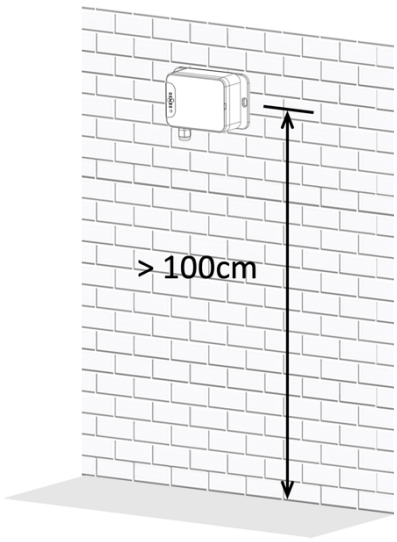


5. Put on the top cover and tighten the screws at the corners.
6. Press and hold the multi-function button until the LED indicator on the top cover lights up. (Remark: If it is configurated for the OTAA activation mode and it cannot join the LoRaWAN network in 3 minutes, the LED indicator will be flashed for 2 minutes.)
7. After powering up, the sensor will publish a sensor data report to the LoRaWAN network server. About the detail of the reports, please refer to “SENSO8 LoRaWAN Sensor Data Payload Format Document”.

4. Installation and Connection

The sensor is intended for installation on interior walls of buildings. Avoid exposing the sensor to direct sunlight.

It should be installed with the cable gland facing the floor as shown below. There are wires inside the body extension, and make sure the body extension is well fastened.



To ensure a good radio reception, it is suggested to install the gateway at a height of at least 100 cm from the floor. In addition, avoid installing the gateway near metal objects.

5. Operating Instruction

Power On

- Press and hold the multi-function button until the LED indicator turns on.
- The sensor will upload the sensor data report to the LoRaWAN network server.

Power Off

- Press and hold the multi-function button for 5 seconds. The LED indicator will flash 3 times indicating the sensor has been shut down.

Report Latest Data

- Press the multi-function button briefly, the LED indicator will flash once. The sensor will send a data report to the LoRaWAN network server.
- The sensor will listen to any downlink command queued up on the LoRaWAN network server after sending the data. After receiving the downlink command, the sensor will send a response for the command.
- The sensor also sends data periodically according to the heartbeat setting.

6. LED Indicator

6.1. Device Status

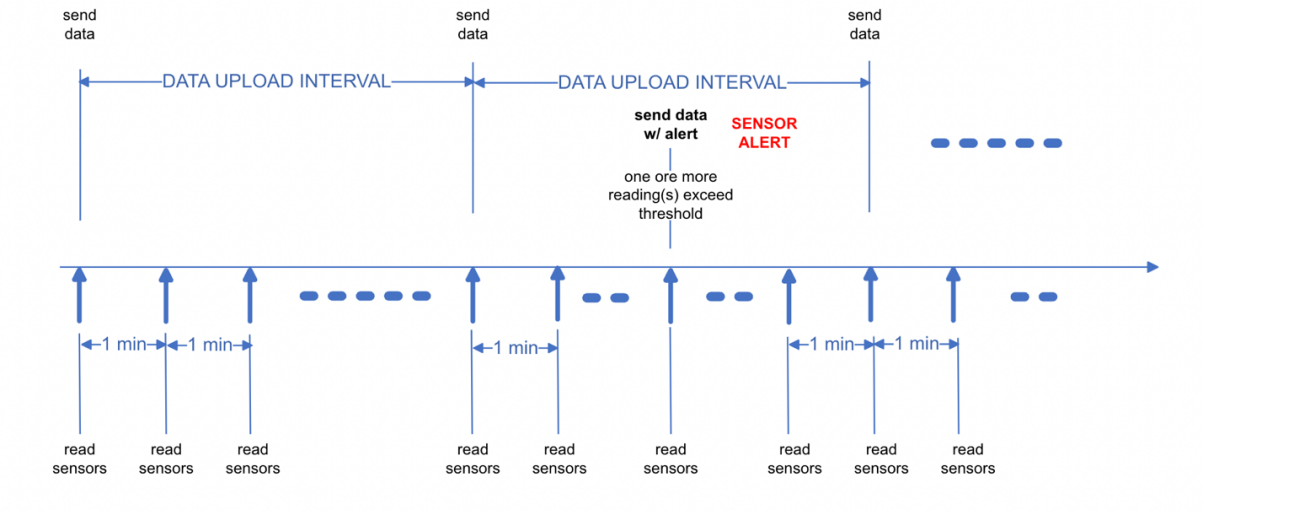
Event	LED Pattern	Description
Powered Up	LED is turned on for a while	Device Powered Up
Report Latest Data	Single LED flash	The sensor will upload the sensor data report when the multi-function button is pressed.
Powered Down	LED flashes 3 times	Device Powered Off when the multi-function is pressed and hold for 5 seconds.

6.2. Error Status

If it is configurated for the OTAA activation mode and it cannot join the LoRaWAN network in 3 minutes during powering up, the LED indicator will be flashed for 2 minutes.

7. Sensor Operation

The sensor performs a temperature/humidity measurement every one minute in the background. If the reading exceeds either one of the thresholds, it will send a data report immediately with the corresponding alert bit(s) set in the event field. The sensor will also send a data report if the next data upload interval is reached. Otherwise, the sensor will go back to sleep until the next sampling interval.



7.1. OTAA Re-joining

If the sensor is using OTAA mode, it will check the connection to the network server at least every 24 hours by sending a confirmed message. If the connection is lost, the sensor will start the re-joining mechanism to try establishing the connection again. To avoid draining the battery if the network server cannot be reached for an extended period, the sensor has a back-off mechanism for re-joining as illustrated in the table below.

Stage	Interval between re-join	Number of attempts
1	15 mins	4
2	6 hours	4
3	1 day	until re-joint the network

8. Configurable Sensor Settings

The following sensor settings are configurable via downlink data. The details of the data payload format can be found on the SENSO8 LoRaWAN Sensor Data Payload Format document.

Setting	Default Value	Unit
Data Upload Interval	10	minute
High Temperature Threshold	30	°C

Setting	Default Value	Unit
Low Temperature Threshold	18	°C
High Humidity Threshold	70	%
Low Humidity Threshold	40	%

9. Troubleshooting Guide

Temperature/Humidity

Symptom	Fix
Temperature reading reports –273 and humidity reading report 0.	Check the connection of the temperature and humidity sensor.
The LoRaWAN network server cannot receive data from the sensor.	Check the configuration (activation mode, frequency plan, device info and all security keys) on the LoRaWAN server and the sensor. If there is any mis-match, the data cannot be sent to the LoRaWAN network server.
The sensor cannot be configured via download command.	Check the downlink command is sent as CONFIRMED downlink message.
The alert is not cleared when the reading is returned to the normal level.	For each alert, there is a hysteresis setting to prevent the alert from triggering repetitively when the reading fluctuates around the threshold. *Example*: If the high temperature threshold is 30°C, it will trigger an alert when the temperature rises above 30°C. The alert will be cleared when the temperature falls below 29°C (hysteresis is 1°C) rather than 30°C. If the low humidity threshold is 40%, it will trigger an alert when humidity falls below 40%. The alert will be cleared when the humidity rises above 45% (hysteresis is 5%) rather than 40%.

10. Important Safety Instruction

- Maximum Operating Temperature: +60°C

- CAUTION
  - Risk of fire or explosion if the battery is replaced by an incorrect type.
  - Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion.
  - Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas.
  - A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.

11. Warning and Personal Injury

Do not apply this product to safety protection devices or emergency shutdown devices, nor in any other applications that may result in personal injury due to product malfunction, unless explicitly authorized. Please refer to the product datasheet and user guide before installation, processing, use or maintenance of the product. Failure to comply with the recommendations my result in death and serious bodily harm. The company shall not be held liable for any damages resulting in personal injury or death. All the claims against the company managers and employees, agents, distributor and subsidiaries are hereby disclaimed, including all the costs and compensation costs, legal fees etc.

12. Revision History

Revision	Description	Date
1.0	Initial Release.	Jan 2022
1.01	Added sensor operation and default setting sections.	Jun 2022
1.02	• Added information and drawings for installation. • Added re-joining mechanism description.	Mar 2023
1.03	Add Important Safety Instruction section	Sep 2023
1.04	Add “Warning and Personal Injury” Section	Mar 2024
1.05	Updated Installation and Connection	Sep 2024
2.0	First release on docs.senso8.com	Oct 2026