

SENSO8 LoRa Water Leak Sensor User Guide

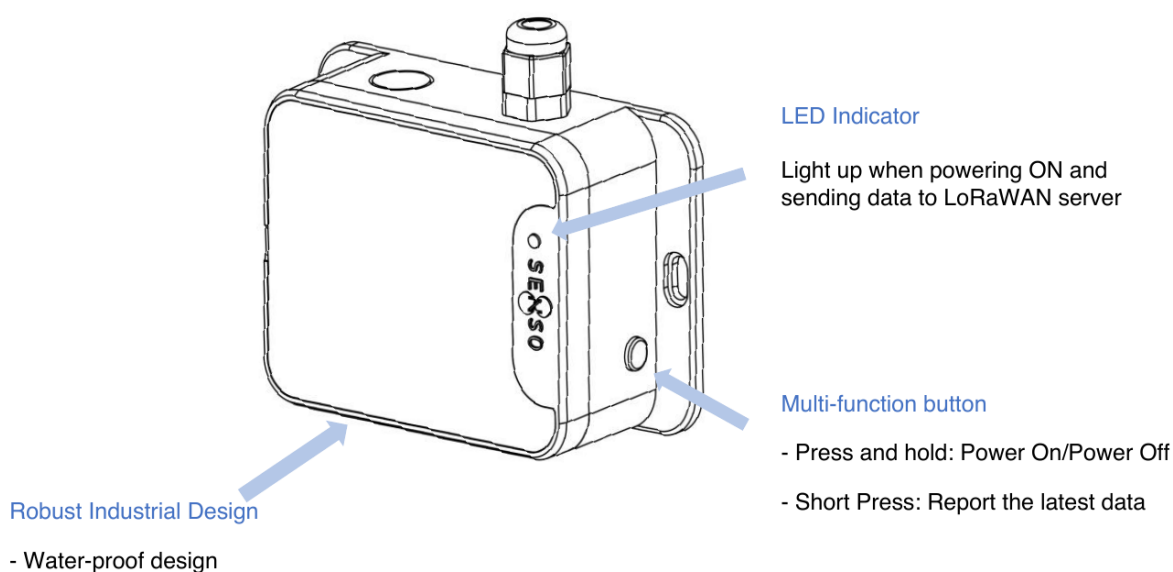
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1. Introduction

Applicable Model:

- LRS20310



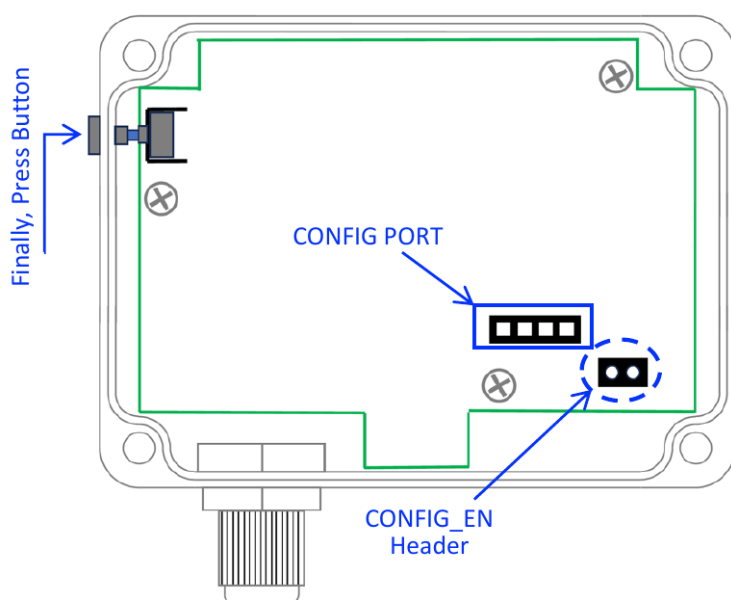
The LRS20310 water leak sensor provides a simple and efficient solution for monitoring water

leakage.

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	SEN80
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:YYYYYY HH:MM:SS
```

```
=====
Password: _
```

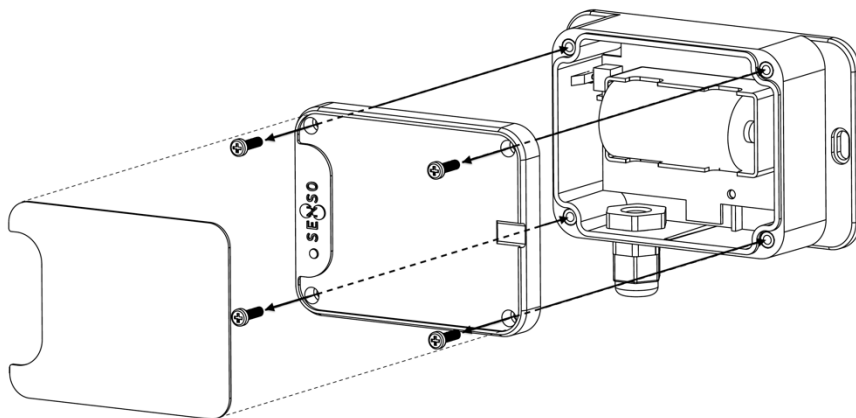
7. Then the configuration can be taken according to the requirements.

```
=====
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.

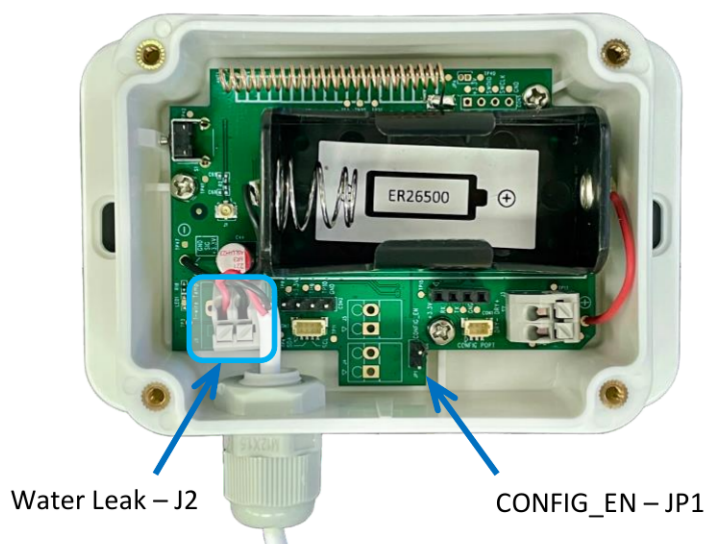
3. Sensor Installation

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.

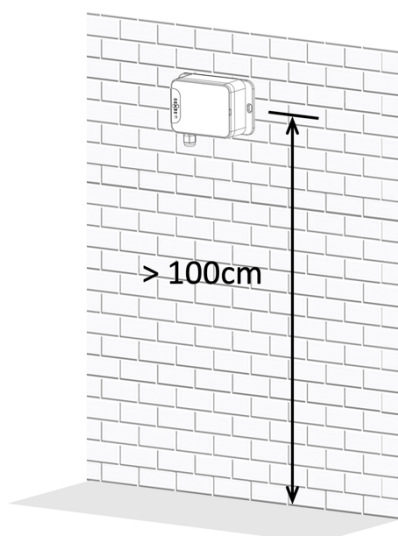


4. Connect the wires for the water leak probe to the terminal block J2.
5. Put on the top cover and tighten the screws at the corners.
6. Press and hold the multi-function button until the LED indicator on the top cover lights up. (Remark: If it is configured for the OTAA activation mode and it cannot 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 follows. The wires should be going through the cable gland, and make sure the cable gland is well fastened.



To ensure a good radio reception, install the sensor at a height of at least 100 cm from the floor. In addition, do not install the sensor near any metal object.

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

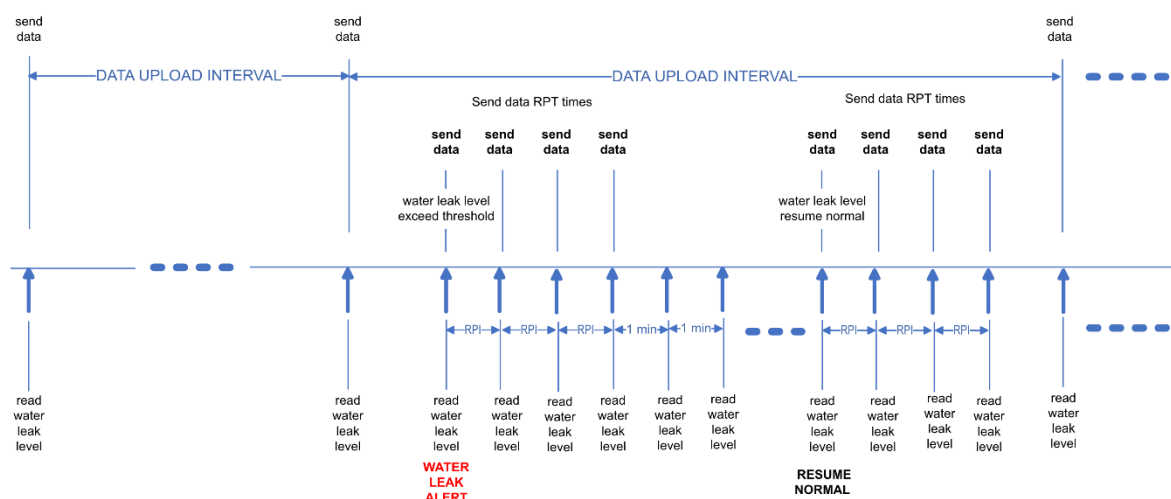
Event	LED Pattern	Description
Powered Up	LED is turned on for a while	Device Powered Up
Report Latest Data	Single LED flash	The sensor will upload the sensor data report when the multi-function button is pressed.
Powered Down	LED flashes 3 times	Device Powered Off when the multi-function is pressed and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

6.2. Error Status

If it is configured 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

Any water leak will trigger an interrupt on the sensor and it will send a data report immediately with the water leak level and water leak alert bit set in the EVT field. After an alert is triggered, there will be 3 additional data reports, each one minute apart (the number of additional data reports and time between the reports are configurable). The water leak level on the additional data report is the value at the time the report is sent. This mechanism helps making sure that the alert can reach the user and filtering out false alerts. Besides, the sensor will also send a data report if the next data upload interval is reached.



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 Data Payload Format document.

Setting	Default Value	Unit
Data upload interval ¹	60	minute

Setting	Default Value	Unit
Number of additional uploads when alert is triggered	3	-
Time between additional uploads when alert is triggered	1	minute
Water leak alert threshold	15	-

Note 1: The default data upload interval is 10 minutes on firmware version 1.01.000.

9. Troubleshooting Guide

Symptom	Fix
Water Leakage Level is always too low or too high.	<p>On one hand, check the connections of the water leak probe.</p> <p>On the other hand, ensure no water is trapped in the probe internally.</p>
The LoRaWAN network server cannot receive data from the sensor.	<p>Check the configuration (activation mode, frequency plan, device info and all security keys) on the LoRaWAN server and the sensor.</p> <p>If there is any mis-match, the data cannot be sent to the LoRaWAN network server.</p>
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.	<p>For each alert, there is a hysteresis setting to prevent the alert from triggering repetitively when the reading fluctuates around the threshold.</p> <p><i>Example:</i></p> <p>If the water leak threshold is 90, it will trigger an alert when analog reading is higher than 90. The alert will be cleared when the reading falls below 80 (hysteresis is 10) rather than 90.</p>

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 may 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	Add sensor operation and default setting sections.	Jun 2022
1.02	<ul style="list-style-type: none">• Add the connection of water leak probe.• Add troubleshooting when the water leakage level is too low/high.• Add information and drawings for installation.• Add re-joining mechanism description.	Mar 2023
1.03	<ul style="list-style-type: none">• Add Important Safety Instruction section.• Updated default Data Upload Interval.	Nov 2023
1.04	Add “Warning and Personal Injury” Section	Mar 2024
1.05	<ul style="list-style-type: none">• Updated Installation and Connection.	Sep 2024
2.0	First release on docs.senso8.com	Oct 2026