

# SENSO8 LoRa Dry Contact Input User Guide

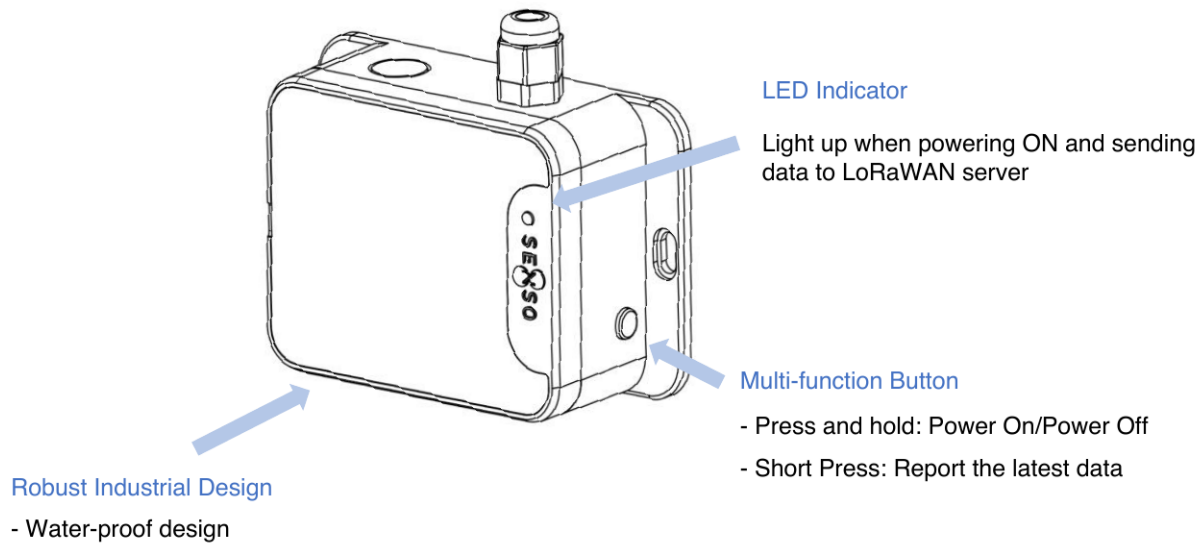
## Table of Contents

|                                        |    |
|----------------------------------------|----|
| 1. Introduction .....                  | 1  |
| 2. Sensor Configuration .....          | 2  |
| 3. Sensor Installation .....           | 4  |
| 4. Installation and Connection .....   | 5  |
| 5. Operating Instruction .....         | 6  |
| 6. LED Indicator .....                 | 6  |
| 6.1. Device Status .....               | 6  |
| 6.2. Error Status .....                | 7  |
| 7. Sensor Operation .....              | 7  |
| 7.1. Dry Contact Input Mode .....      | 7  |
| 7.2. Counting Mode .....               | 8  |
| 7.3. Meter Pulse Counter Mode .....    | 8  |
| 7.4. OTAA Re-joining .....             | 8  |
| 8. Configurable Sensor Settings .....  | 9  |
| 9. Troubleshooting Guide .....         | 9  |
| 10. Important Safety Instruction ..... | 9  |
| 11. Warning and Personal Injury .....  | 10 |
| 12. Revision History .....             | 10 |

## 1. Introduction

Applicable Model:

- LRS20600

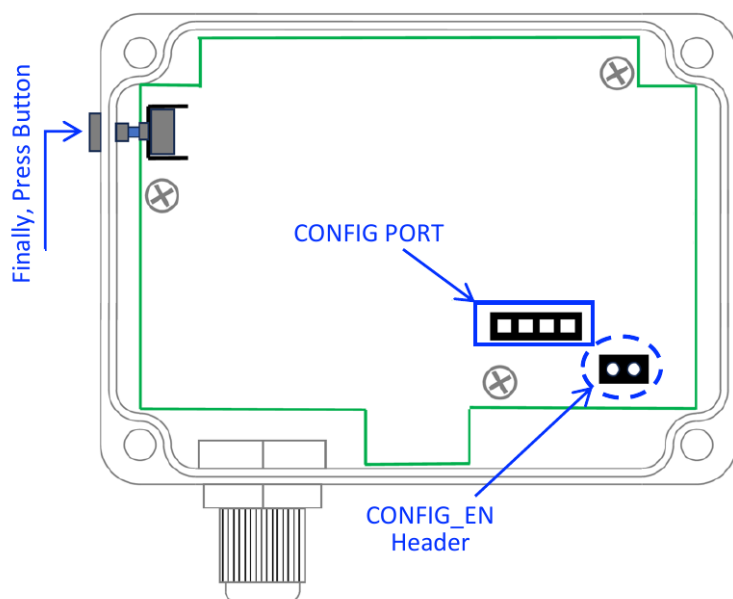


The LRS20600 dry contact in sensor provides a simple and efficient solution for monitoring door security, motion detection or logic and interfacing meters with pulse counter output.

## 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:YYYYY HH:MM:SS
=====
Password: _
```

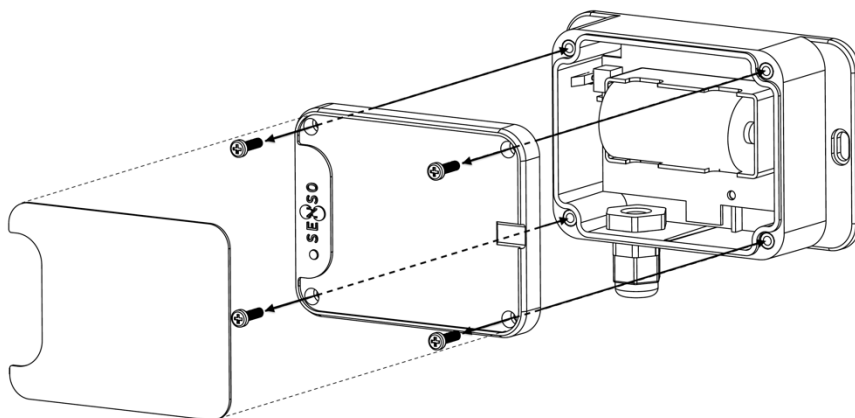
7. Then the configuration can be taken according to the requirements.

```
=====
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
-
```

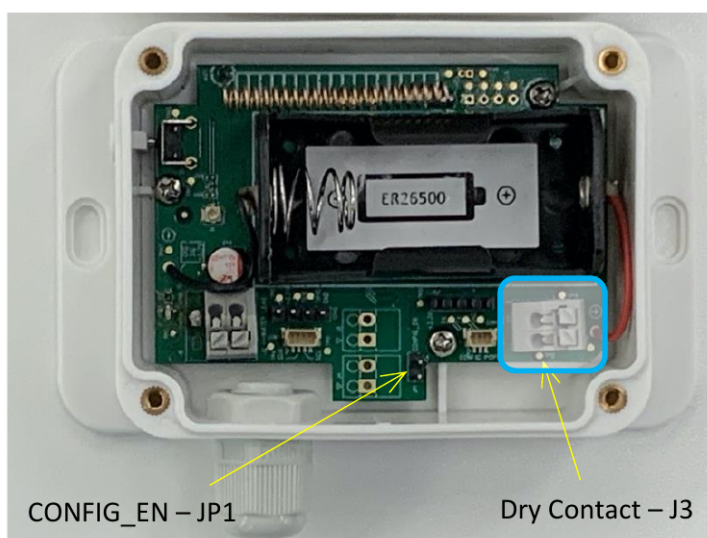
1. You can ask for the document of “SENSO8 LoRa UART Configuration Guide” from your sales representative for more information.

### 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 dry contact input to the terminal block J3.
5. Put on the top cover and tighten the screws at the corners.

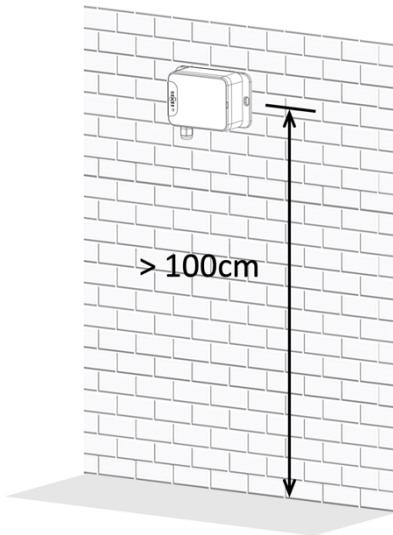


6. Press and hold the multi-function button until the LED indicator on the top cover lights up. (Remark: If it is configured for the OTAA activation mode and it cannot join the LoRaWAN network in 3 minutes, the LED indicator will be flashed for 2 minutes.)
7. After powering up, the sensor will publish 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.

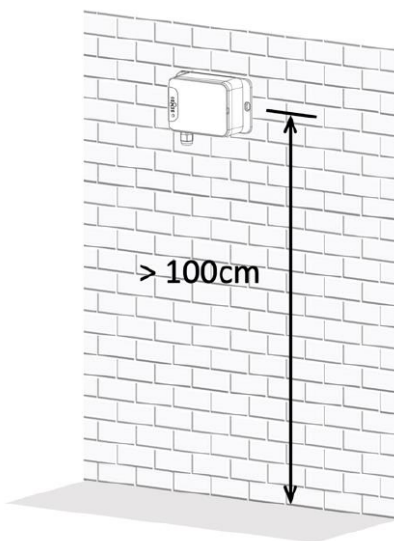
It should be installed with the cable gland facing the floor as follows. The wire for the dry contact is going through the cable gland that should be well tightened.



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.

For pulse meter counter mode applications, record the reading on the meter and set the initial meter reading and meter resolution (no. of decimal places) with downlink command or CONFIG\_PORT.

Here is an example of meter pulse counter settings with a meter as shown.





| Field           | Value |
|-----------------|-------|
| MAX_DIG         | 5     |
| RES             | 3     |
| INIT_MTR_RD_INT | 4525  |
| INIT_MTR_RD_DEC | 378   |

## 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

The dry contact input sensor supports 3 modes of operations:

- Dry Contact Input Mode
- Counting Mode
- Pulse Meter Counter Mode

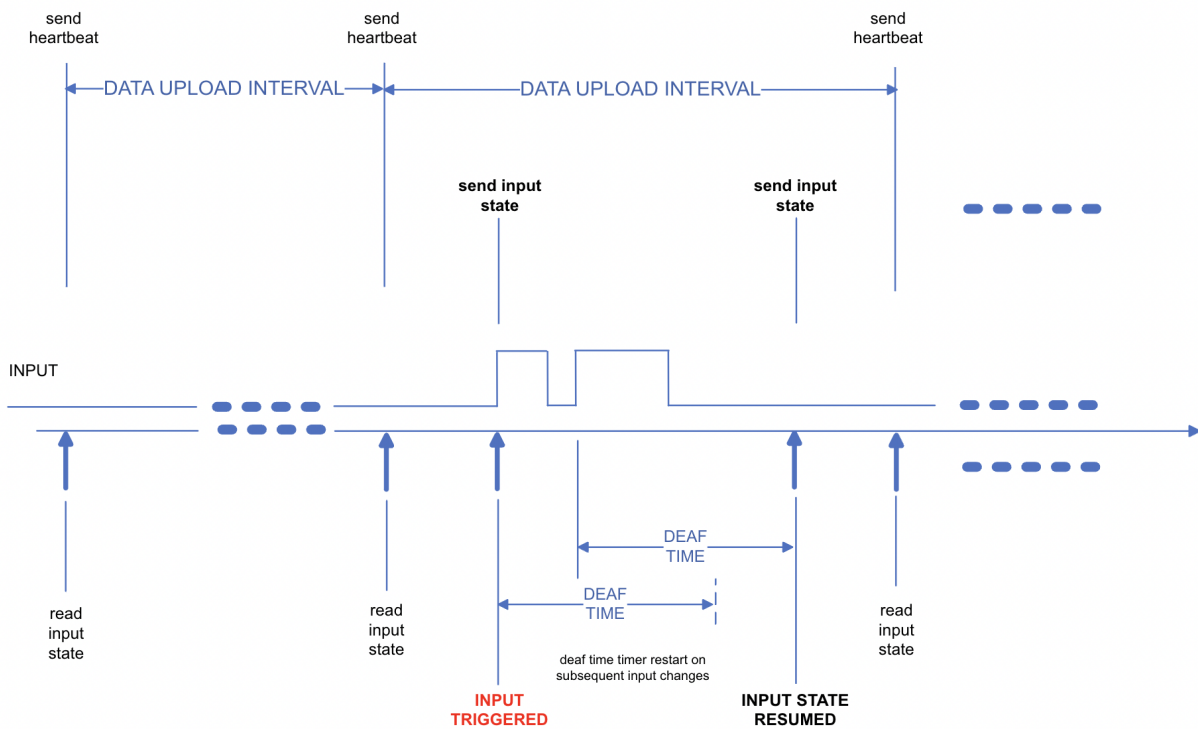
The Meter Pulse Counter Mode can only be enabled with the CONFIG PORT. It cannot be enabled or disabled through downlink command.

Dry Contact Input/Counting mode can be configured via CONFIG PORT or downlink command (for detail, please refer to the SENSO8 LoRaWAN Sensor Data Payload Format Document).

| Mode                     | DRY_IN_EN | P_CNTR_EN | Description                      |
|--------------------------|-----------|-----------|----------------------------------|
| Dry Contact Input Mode   | 1         | 0         | Report instant state change      |
| Counting Mode            | 0         | 0         | Report state changes in a period |
| Meter Pulse Counter Mode | 0         | 1         | Report meter pulse counts        |

### 7.1. Dry Contact Input Mode

This mode is used in applications that need to monitor the real-time status of the input. The state change on the dry contact input will trigger an interrupt on the sensor and it will send a data report immediately with the state of the dry contact input. Within the 'trigger deaf time' the sensor will ignore any changes on the dry contact input. The sensor will report any state change on the dry contact input after the trigger deaf time is expired. Besides, the sensor will also send a data report if the next data upload interval is reached.



## 7.2. Counting Mode

This mode is used in applications that require information on the state changes over a period of time. The state change on the dry contact will not trigger a data report immediately. Instead, the sensor counts the state changes on the input and sends the data report when the next data upload interval is reached. The counter is reported in EVT\_CNT field on the data reported on port 10. The count is reset to 0 after sending the data report. The 'deaf time' works the same as it is in State Change Mode.

## 7.3. Meter Pulse Counter Mode

This mode is used for interfacing meters with pulse counter output. It counts the pulses on the input from a meter and sends a data report when the next data upload interval is reached. During the installation, the sensor can be configured to store the value of the meter reading so that the meter reading reported on port 10 can reflect the reading on the meter. In addition, the resolution (number of counts for one unit) is configurable so that the sensor can work with different meters.

## 7.4. 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                  | 24                        |
| 2     | 30 mins                  | 672                       |
| 3     | 1 day                    | until re-join 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/Mode                             |
|-----------------------------------|---------------|---------------------------------------|
| Data Upload Interval <sup>1</sup> | 60            | minute                                |
| Trigger Mode                      | 3             | NC input, rising/falling edge trigger |
| Trigger Deaf Time                 | 2             | second                                |

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

## 9. Troubleshooting Guide

| Symptom                                                         | Fix                                                                                                                                                                                                                                |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                  |

## 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"><li>• Add information and drawings for installation.</li><li>• Add re-joining mechanism description.</li></ul> | Mar 2023 |
| 1.03     | <ul style="list-style-type: none"><li>• Add Important Safety Instruction section.</li><li>• Updated default Data Upload Interval.</li></ul>      | Nov 2023 |
| 1.04     | Add “Warning and Personal Injury” Section                                                                                                        | Mar 2024 |
| 1.05     | Updated Installation and Connection                                                                                                              | Sep 2024 |
| 1.06     | Added description of counting mode and meter pulse counter mode                                                                                  | May 2025 |
| 2.0      | First release on docs.senso8.com                                                                                                                 | Oct 2026 |