

# SL300 CO2 Sensor(E-paper)



## LoRaWAN CO2 Sensor (E-Paper)

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## 1. General Information

SL300 series is long range low power CO2 sensor based on Semtech SX1262/SX1268, which is standard LoRaWAN Class A compatible and is widely adopted in Environment Monitoring, Green House, Smart Agriculture etc.

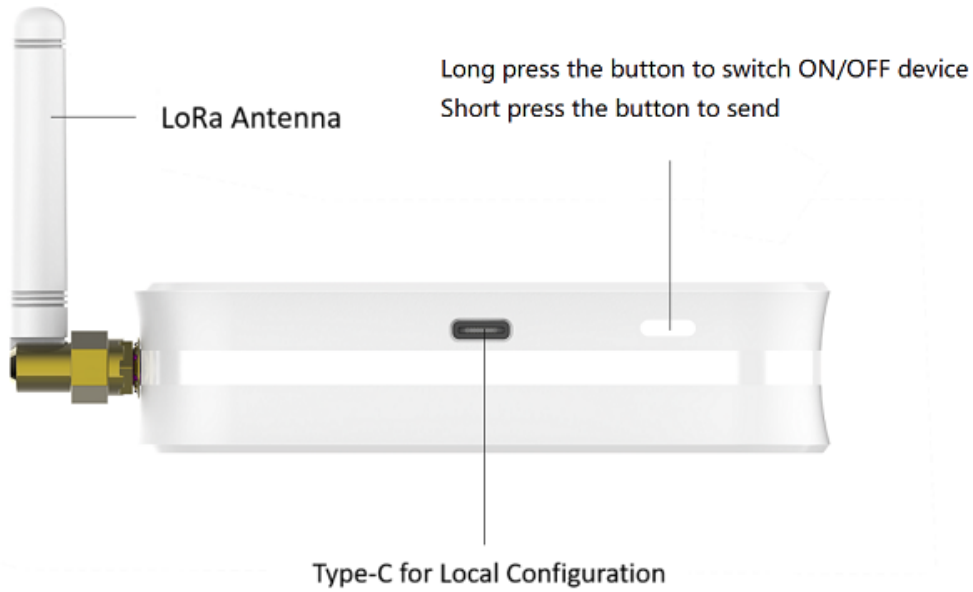
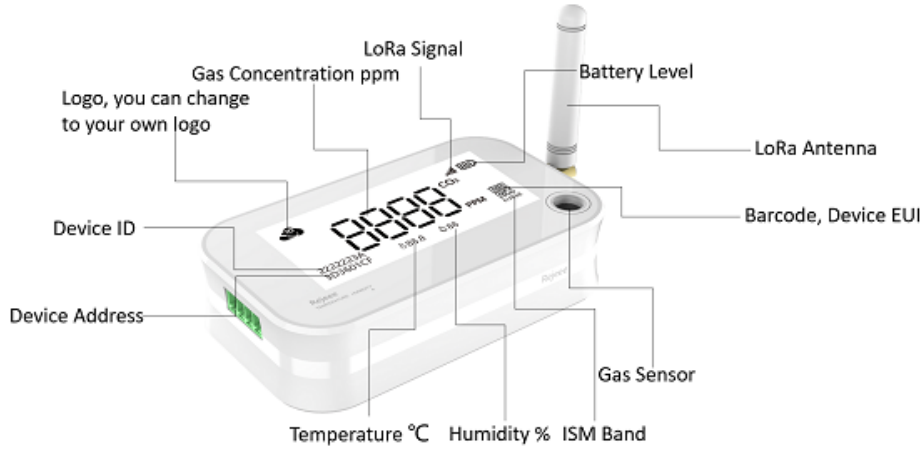
Sensor Type	Product Number
CO2 Sensor, 2.9-inch E-Paper	SL311CN, SL311EU,SL311US,SL311AS

### 1.1 Main features:

- NDIR Tech for CO2 Sensor
- 2.9 inch screen local display
- Type-C for Local Configuration
- Internal Battery Up to 1 Years
- LoRa SX1262/SX1268, Long Range Low Power
- LoRaWAN Class A and Class C Compatible

### 1.2 Details

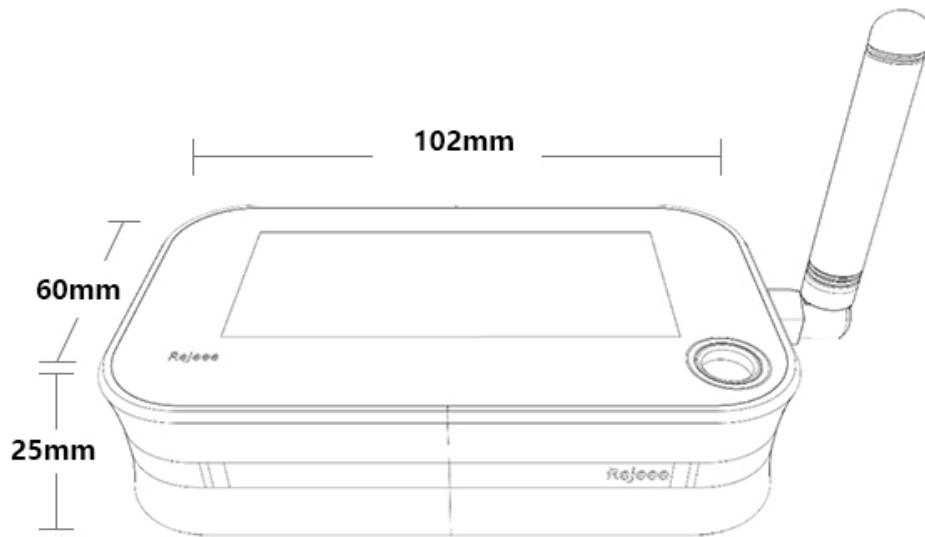




Parameters	Feature
CPU	STM32L151
Wireless	LoRaWAN(SX1262/SX1268)
Encryption	AES128 Optional
Battery	Built-in Li-battery (Changeable, and No Recharge)
Battery Capacity	5400mAh
Working Temperature	-45°C~+ 85°C
Working Humidity	0-100%RH
Communication	Half duplex
Response Time	Less than 15 Seconds
CO2 Measuring Range	400ppm-5000ppm
CO2 Accuracy	±(40ppm+5%)
<b>E-Paper Temperature</b>	0°C~+ 50°C
Lifespan	1 Year, Data Uploading for Every 10 mins
Data Speed	300bps-62.5k bps

Parameters	Feature
Size	102mm*60mm*25mm
TX Power	22dBm Max
RX Sensitivity	-140 dBm
Frequency	SX1268: CN470 SX1262: EU868 / US915 / AS923

## 1.3 Size



## 1.4 Installation:

Lay the product flat on the table Hang on the wall

## 2. User Guide

Make sure antenna is installed before turn on the device.

### 2.1 Turn on/off the device

When you get the device, it is off, and on the screen, you can find the device EUI as below, the QR on the screen is Rejeee website. Just press the button for more than 5 seconds, then you can turn on the device. If you want to turn off the device, just press the button 5 seconds. The QR code is Rejeee company website, you can also ▲

change to your own website following this:[SensorTool Manual](#).



## 2.2 Information display on screen

The device screen is 2.9-inch low power e-paper, and the CO2 sensor is embedded with temp and humi sensor, when turn on the device, you can find information displaying on the screen as below.

You can also change the logo, just follow this: [SensorTool Manual](#).

## 2.3 USB-C Port

There is one USB-C port as below, which is for power on and config, connect device to laptop with a USB-C cable, and you can config the device, make sure to install USB driver and here is the link for driver: [Serial Port Driver](#)

## 3.Data Uploading

When turn on the device, it will send data immediately, also you can press the button for 1 seconds, then the device will also send data. Normally when you get the device from factory, the reset time for data sending is every 10 mins, and if you want to change the time, you can connect the device to computer for config, here there is instruction about the time configuration. [SensorTool Manual](#).

## 4.Connect to LoRaWAN Network

SL300 CO2 sensor is based on standard LoRaWAN Class A, so you can connect to any LoRaWAN network through OTAA.

On the back of device, you can find information as below, with this information, you can connect to any LoRaWAN server.



Here below take TTN as an example about how to connect the device to TTN server:

And here is the data decoder for TTN platform, just copy the information as below:

```
function decodeUplink(input) {
  var obj = {};
  var warnings = [];
  var len = input.bytes?input.bytes.length:0;
  var offset = 0;
  var dtype;
  offset++;
  /* Obtain the voltage level: the voltage is 0 ~ 31, where the value of 31 represents 100%
  power */
  obj.battery = (input.bytes[offset++]&0x1F);
  /* This field is reserved. Generally, the voltage value of the memory chip is 0.1V. For
  example, the value of 33 is 3.3V */
  obj.vol = (input.bytes[offset++]);
  do {
    dtype = input.bytes[offset++]; /* dtype: Sensor Type */
    if(0x30 == dtype) {
      /**
       * dtype 30 : Mixed gas sensor, Like CO2, H2S
       * volume : Gas concentration detection , Unit: 0.01
       */
      var l = input.bytes[offset++];
      var gastype = input.bytes[offset++];
      obj.volume = ((input.bytes[offset] << 24) + (input.bytes[offset+1] << 16) +
      (input.bytes[offset+2] << 8) + input.bytes[offset+3])/100;
      offset += 4;
      if (obj.volume < 0) {
        warnings.push("it's invalid");
      }
    }
  }
  len = len - offset;
} while(len > 0)
return {
  data: obj,
  warnings: warnings
};
}
```

## 5. Wireless LoraWAN Sensor Data Format

Picture as below, FRMPayload is sensor data.



## 6. Sensor Data Definition

## 6.1 Device Information(0x00)

Type	Value	Value	Value
1 Byte	3 bit	5bit	1 Byte
0x00	Version	Battery Level	Reserve

## 6.2 Temperature(0x04)

Type 1 Byte	Value 2 Bytes	Comments
0x04	Temperature	2-byte signed integer with negative value below zero The default unit is 0.1 degrees, that is 201 means 20.1 degrees

e.g. 0xFF88 is -120 (-12°C), Network byte order mode is {04 FF 88}

## 6.3 Humidity(0x05)

Type 1 Byte	Value 1 Byte	Comments
0x05	Humidity	Unsigned integer of 1 byte. The default unit is 1%RH, that is 10 means 10%RH


## 6.4 CO2/CH4/CO etc.(0x30)

### For Example:

FRM Payload is 00 3F24 30 05 04 00010BF8

00 Device Information type  
 3F (binary is 0011 1111b ), so version is 1 and level is 31(0x1F)  
 24 for reserve  
 30 is Gas  
 05 is length of gas data.  
 04 is Gas Type is CO2  
 00010BF8 is the content of 686.00ppm

## 7. Local Configuration:

Note: Factory reset data uploading is every 10 mins, customers can change data uploading frequency as below:   
 Connect sensor with a USB-C cable to computer for local configuration, through local configuration, you can change the packet frequency. Refer [SensorTool Manual](#).

**Parameters interpretation****LFT:** Data uplink period**LCP:** Sensor sample period**RXW:** Preheat period for Gas Sensor, unit is seconds**Calibration:** Gas Sensor calibration value

## 8. Shipping list

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LoRaWAN gas sensor 1 pcs

Mounting brackets 1 pcs

LoRaWAN antenna 1 pcs

