LS100 User Manual

Version: v1.0

Date: July 2025

Status: Released

Revision History

Date	Version	Release Notes
July 2025	v1.0	First Release

YOGEJAY

content

1. Introduction

The LS100 is a LoRaWAN end device.

The LS100 has a built-in magnetic switch and a Sensirion SHT40 temperature and humidity sensor. After joining the network, it reports a group of data every 15 minutes by default. The reporting interval can be changed via LoRaWAN downlink or NFC.

It will immediately send a group of data when the magnet approaches or leaves the magnetic switch.

You need to install the battery and ensure the device is within the LoRaWAN network range. Additionally, the device must be registered on the LoRaWAN server. Once these conditions are met, the device will automatically send a join request to join the network.

2. Key Features

- STM32WLE5CCU6 LoRa MCUs
- LoRaWAN 1.0.3 CLASS A fully compliant
- Standby current less than 4 uA
- Offline detection
- Equipped with an NFC tag for upgrading firmware and changing configurations
- Change configurations by LoRaWAN downlink or NFC
- Battery life of more than 1 year (14dBm, SF7@125KHz data rate, and 15-minute data transmission interval)
- Power by 2 x AAA/LR03 batteries
- Small size
- Easy install

3. Application

- Home and Building Automation

4. Sensor Characteristics

4.1 Built-in SHT40 temperature and humidity sensor Performance Graphs

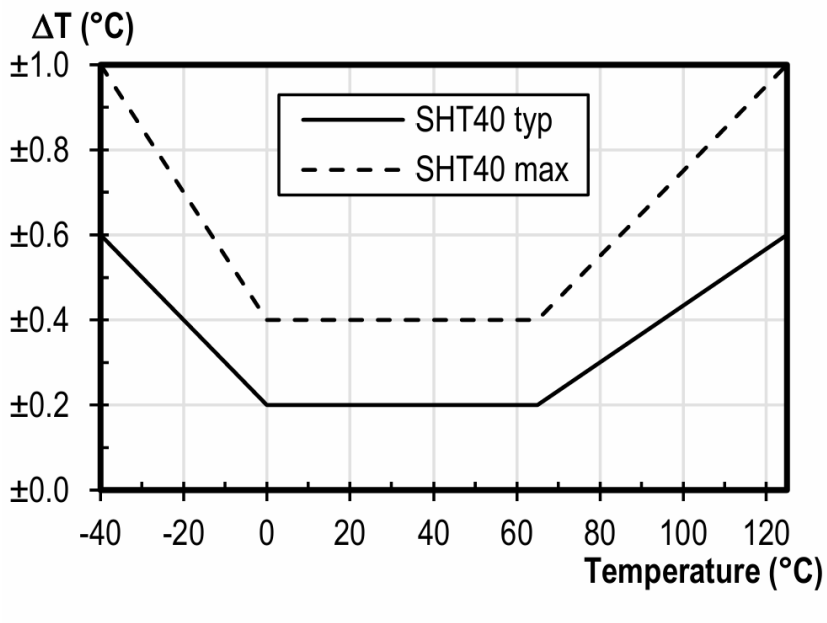


Figure 6: SHT40 typical and maximal temperature accuracy.

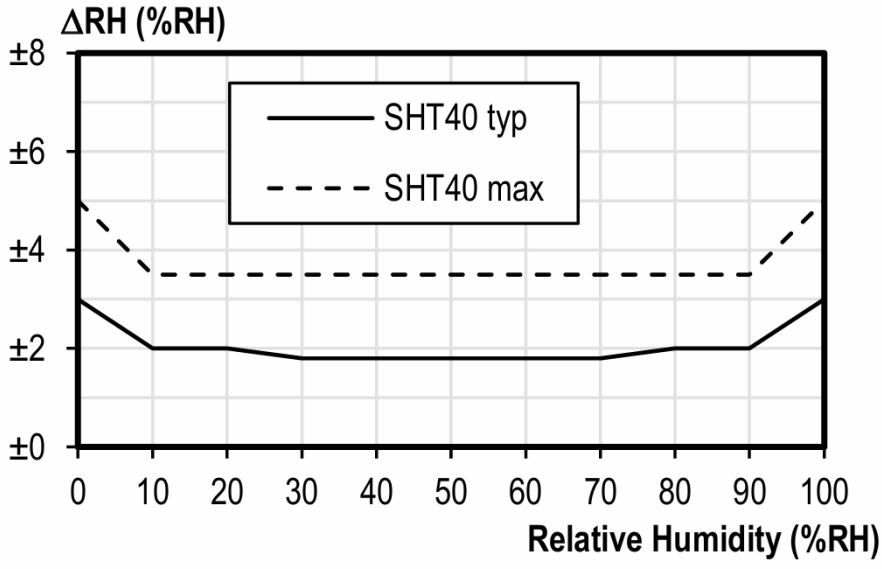


Figure 2: SHT40 typical and maximal relative humidity accuracy at 25 °C.

4.2 Magnetic switch

Note that during installation, the distance between the magnet and the magnetic switch needs to be less than 15 mm for accurate triggering.

WARNING

Recommended device operating temperature is -20 to 60°C, and humidity is 20 to 80%.

5. LED status

The green LED blinks once every time a packet is sent.

Successfully connected to the LoRaWAN network, the green LED is always on for 3s.

The green LED blinks 3 times to indicate that the device has been reset successfully.

6. Uplink payload formats

Size(bytes)	1	2	1	1	3
Payload	Battery voltage	Temperature	Humidity	Door open/close status	Door opened times since the last power on

An example uplink payload is 9D 0C 5E 85 01 00 00 00 (HEX), uplink fport is 10.


```
"decoded_payload": {
    "BAT_Voltage": 3.07,
    "Door_Opened_Times": 0,
    "Door_Status": "open",
    "Humidity": 66.5,
    "Temperature": 31.66
}
```


7. How to connect The Things Network v3

7.1 What do you need to prepare?

√ 1 x LS100

√ 2 x AAA/LR03 batteries

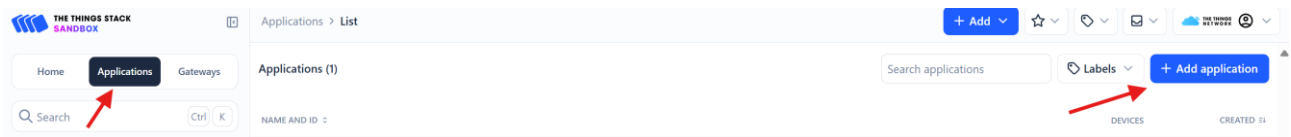
√ LoRaWAN gateway in range and connect to TTN v3

√ Register the end device

7.2 Adding Device

First, please contact us to get LoRaWAN keys.

Open The Things Network and login, write device information.



Applications > Create application

Create application

Within applications, you can register and manage end devices and their network data. After setting up you external services.
Learn more in our guide on Adding Applications.

Application ID *

my-new-application

Application name

My new application

Description

Description for my new application

Optional application description; can also be used to save notes about the application

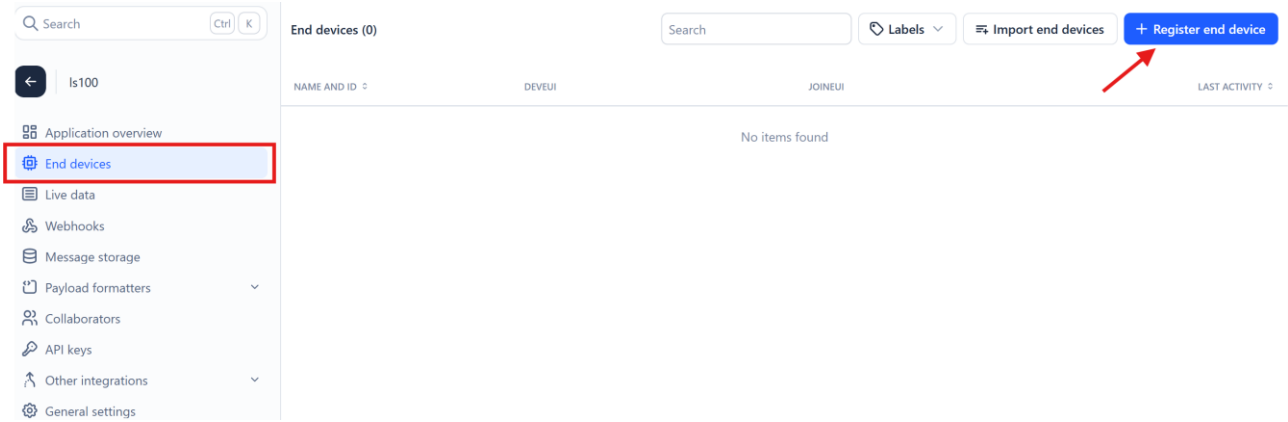
Application properties

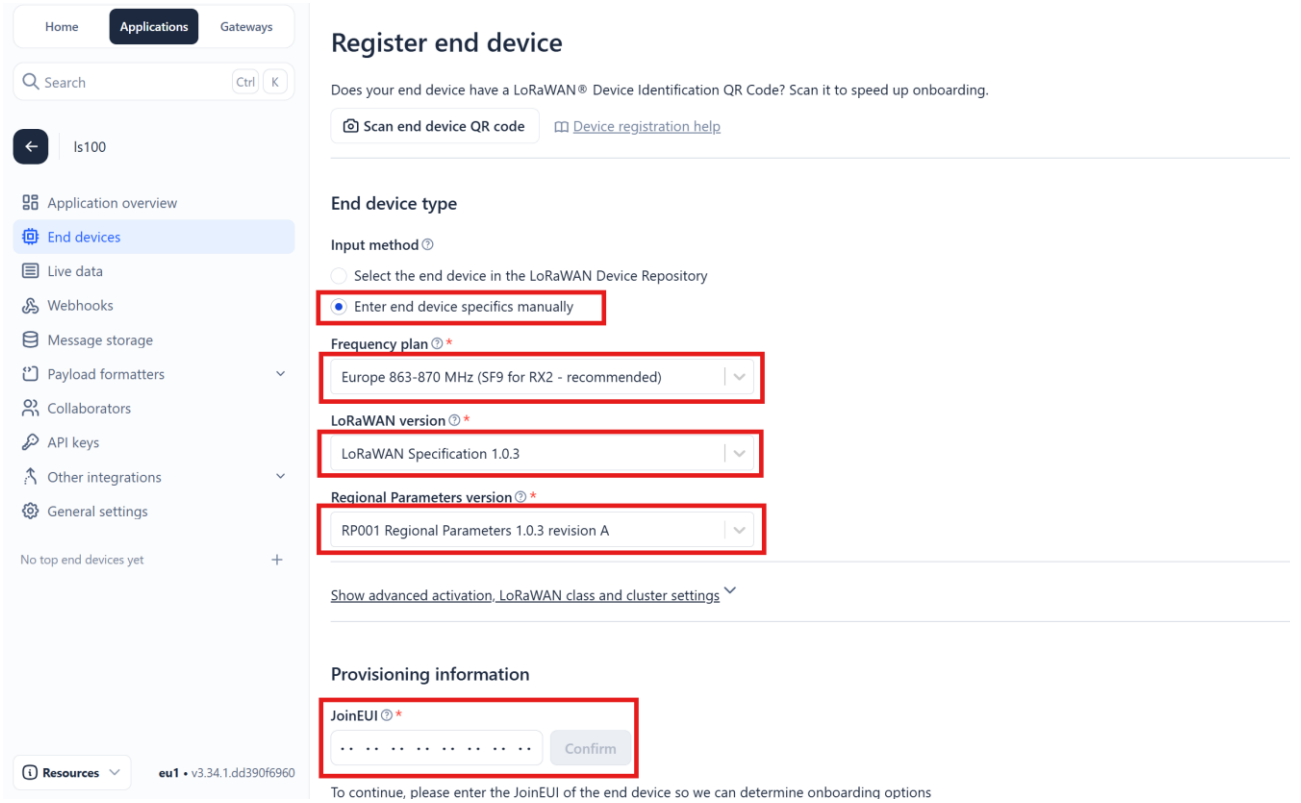
Labels

Select...

Add a label or create one to categorize your applications

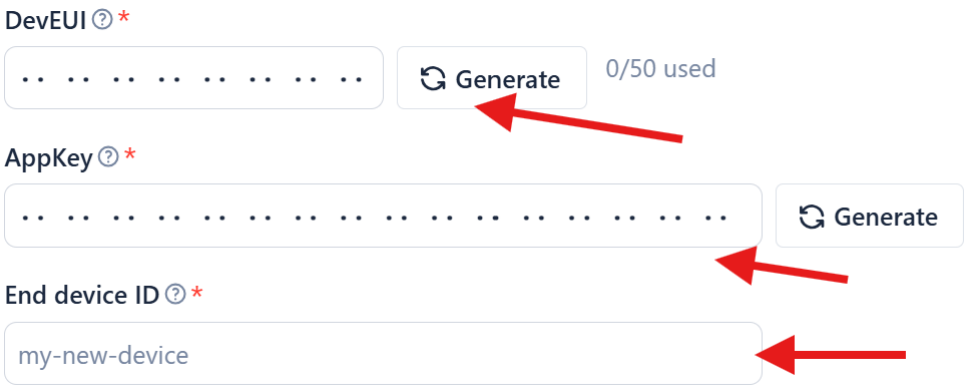
Create application

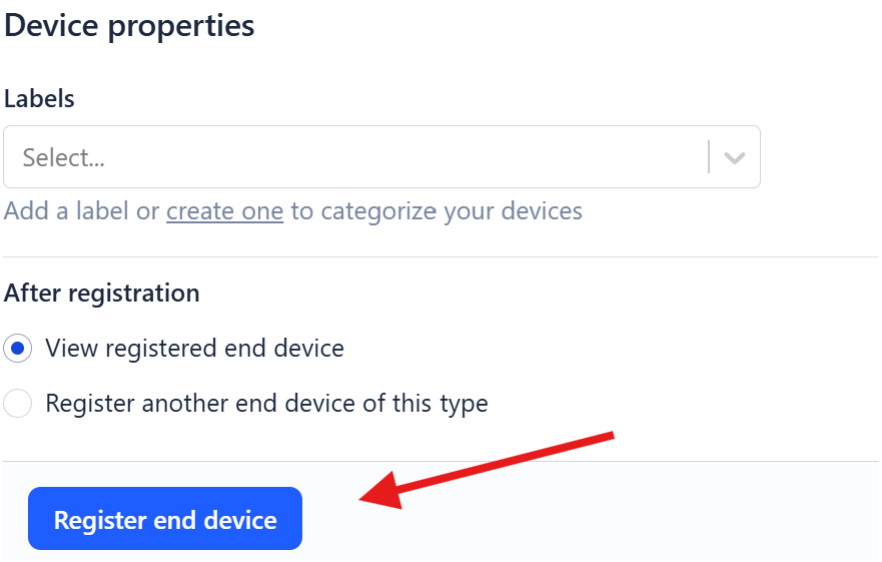




Make sure that the gateway and end devices use the same frequency plan.

JoinEUI is the same as APPEUI.





7.3 Add uplink payload decoder

The uplink payload decoder download link is as follows:

LoRaWAN/LS100/LS100 uplink payload decoder/LS100_uplink_payload_decoder_for_The_Things_Network.js at main · huangdove/LoRaWAN · GitHub

Copy the source to the formatter code and save changes.

Finally, install the battery, and the device will automatically send a join request.

8. Change configuration via LoRaWAN server downlink

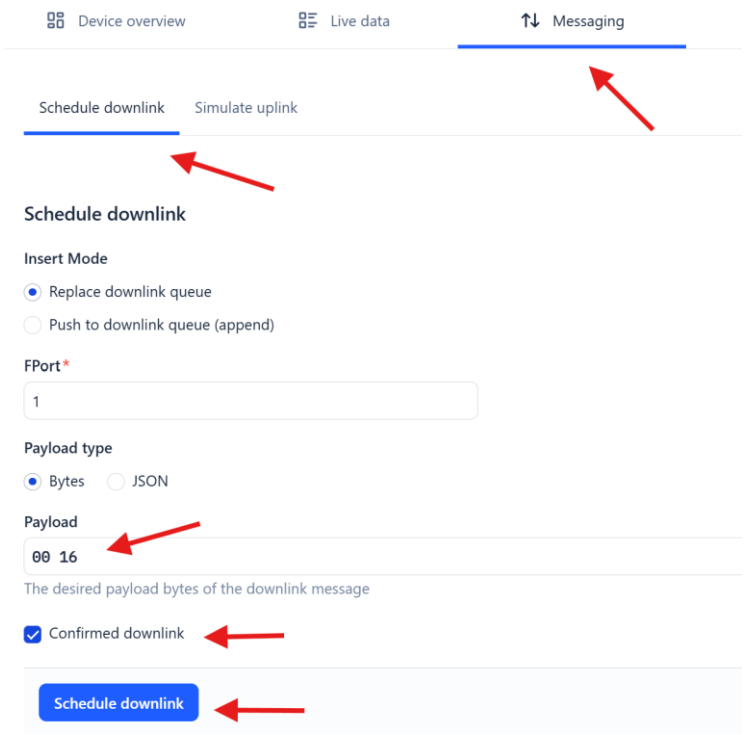
8.1 Reset the device

Size(bytes)	1	1
data	0x00	0x16

The command identifier is 0x00

Example:

Downlink 0016(HEX) to reset the device



8.2 Sent once again

Size(bytes)	1	1
data	0x01	0x00

The command identifier is 0x01

Example:

The device will send data once again when it receives 0100(HEX).

8.3 Change data report interval

Size(bytes)	1	3
data	0x02	Interval in seconds

The command identifier is 0x02

Example:

Downlink 02000384(HEX) to change data report interval to 0x000384=900s.

8.4 Change ADR and DataRate

Size(bytes)	1	1	1
data	0x03	ADR	DataRate

The command identifier is 0x03

Example:

Downlink 030100(HEX) to enable ADR.

Downlink 030004 (HEX) to disable ADR, and set data rate to 4.

DataRate	Configuration	Indicative physical bit rate [bit/s]
0	LoRa: SF12 / 125 kHz	250
1	LoRa: SF11 / 125 kHz	440
2	LoRa: SF10 / 125 kHz	980
3	LoRa: SF9 / 125 kHz	1760
4	LoRa: SF8 / 125 kHz	3125
5	LoRa: SF7 / 125 kHz	5470
6	LoRa: SF7 / 250 kHz	11000
7	FSK: 50 kbps	50000
8..15	RFU	

Table 5: EU863-870 TX Data rate table

For more information, see the details of LoRaWAN 1.0.3 Regional Parameters.

8.5 Change the uplink confirmed params

Size(bytes)	1	1	1
data	0x04	Uplink confirm mode	Max retries

The command identifier is 0x04

Example:

Downlink 040106 (HEX) to enable uplink confirm mode, max retries set to 6.

Downlink 040005 (HEX) to disable uplink confirm mode, max retries set to 5.

8.6 Change the offline detection params

Size(bytes)	1	1	1	
data	0x05	switch	Min threshold	Max threshold

The command identifier is 0x05

Example:

Downlink 05016496 (HEX) to enable offline detection, min threshold set to 100, and max threshold set to 100.

Downlink 05006496 (HEX) to disable offline detection, min threshold set to 100, and max threshold set to 100.

8.7 Change channel mask for US915, AU915, and CN470

Size(bytes)	1	1
data	0x06	value

The command identifier is 0x06

Example:

Downlink 0600(HEX) to enable all uplink channels.

Downlink 0601(HEX) to enable channels 0 to 7 and channel 64.

Downlink 0602(HEX) to enable channels 8 to 15 and channel 65.

Downlink 0608(HEX) to enable channels 56 to 63 and channel 71.

9. How to use the NFC Reader 3911 to communicate with the LS100

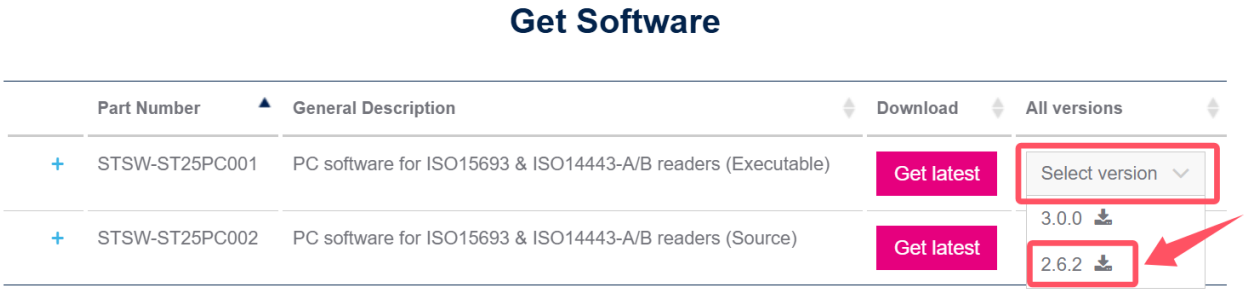
9.1 What do you need to prepare?

√ Power on the LS100

√ Connect the NFC Reader 3911 to your PC via Micro USB

√ Download and install [STSW-ST25PC001 - Windows® PC software for ISO15693, ISO14443-A/B, NFC and industrial readers - STMicroelectronics]

The recommended version is 2.6.2

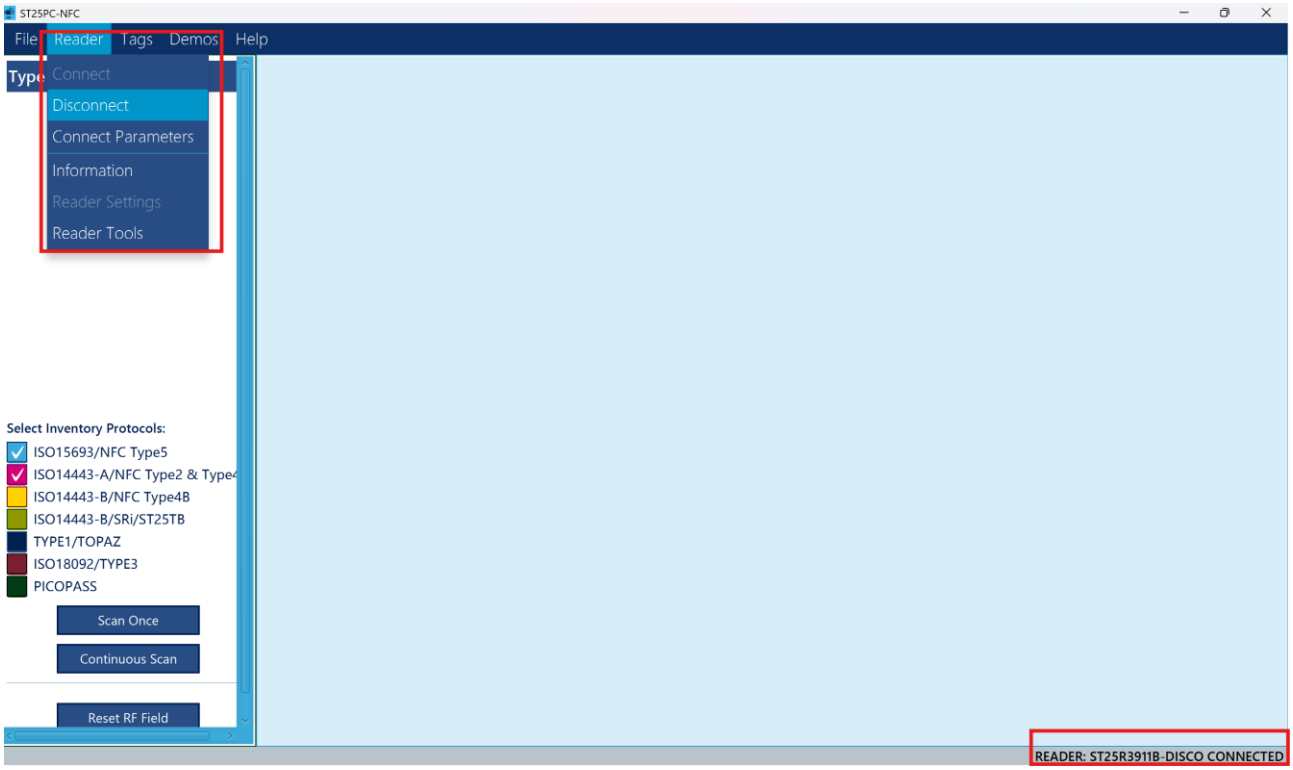


9.2 Scan the NFC tags

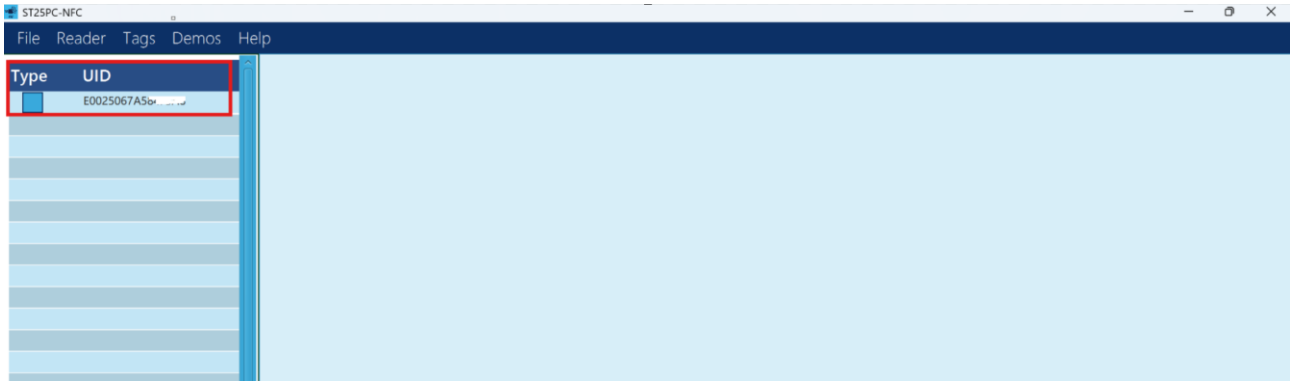
Step 1: Open the ST25PC-NFC software 

Step 2: Press the NFC Reader 3911 S1 button once to reset the device. The 6 LEDs are fully lit to indicate that the reset is successful.

Step 3: Click Reader → Disconnect → Connect. When ST25R3911B-DISCO CONNECTED is displayed, it means that the NFC reader 3911 is connected to the PC successfully.



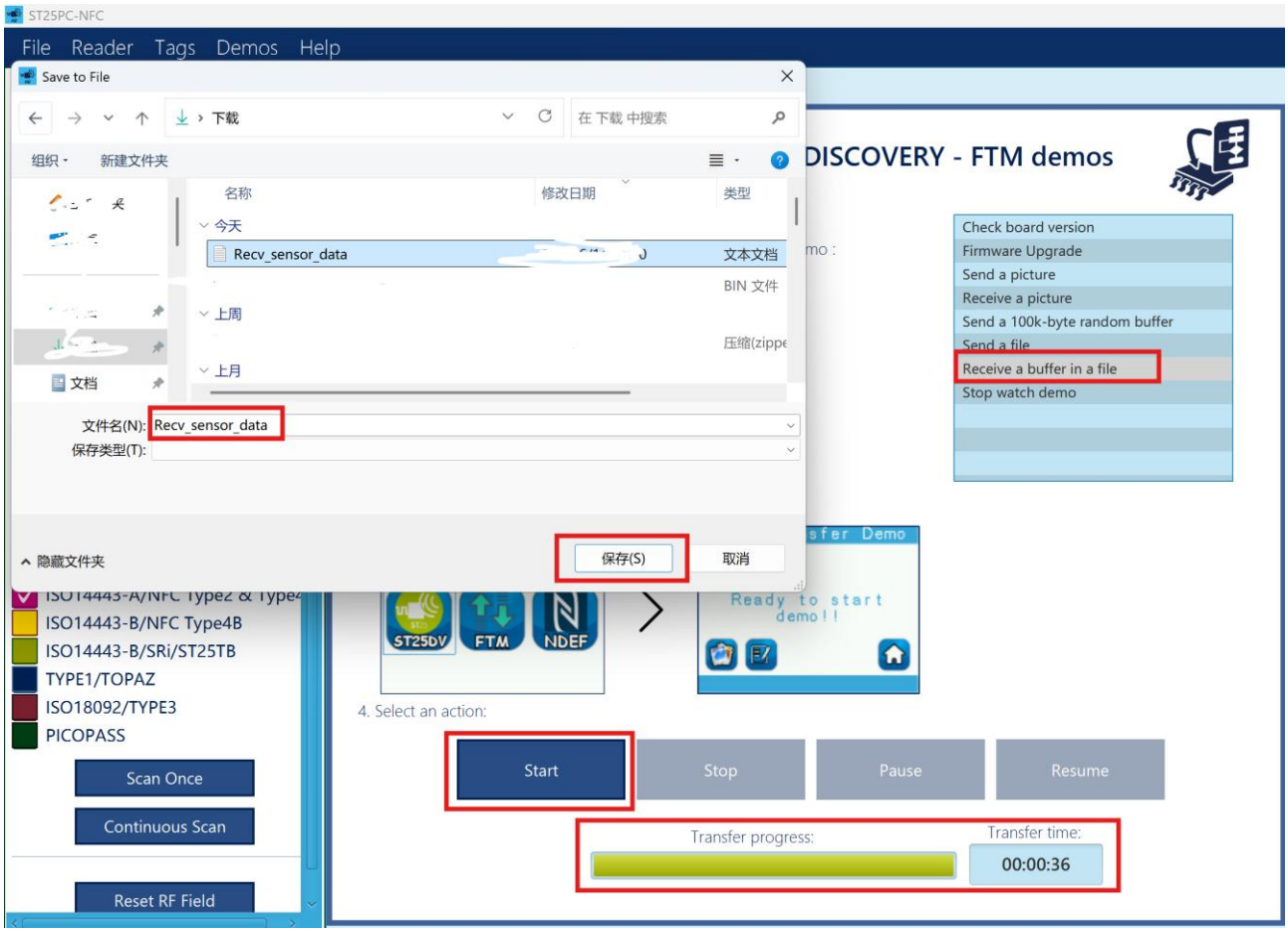
Step 4: Hold the NFC reader 3911 close to the NFC area of the LS100 and click Scan Once.



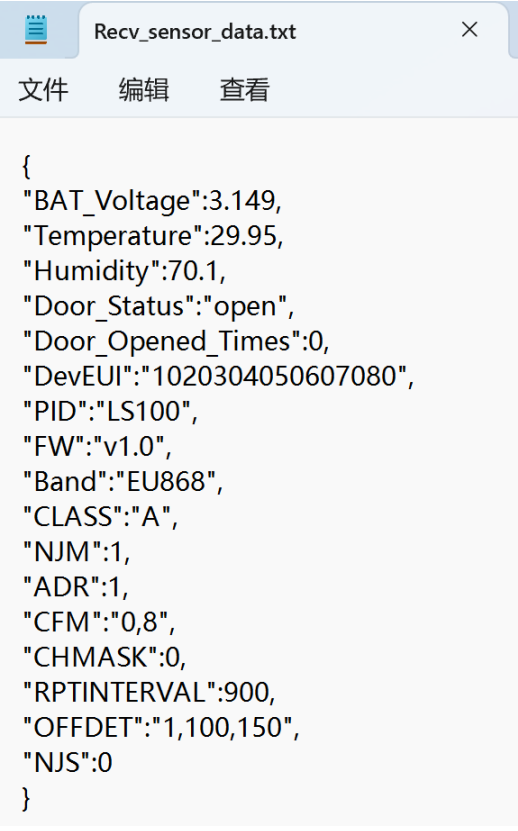
Step 5: View the UID of the scanned device.

9.3 Get the LS100 sensor data

Click on the Receive a buffer in a file option, click the start button, wait for the device to collect sensor data, and then save the content as a Recv_sensor_data.txt.

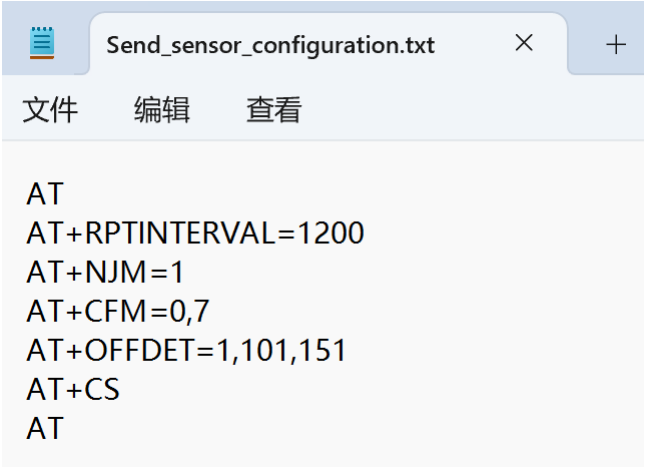


View the Recv_sensor_data.txt file content.

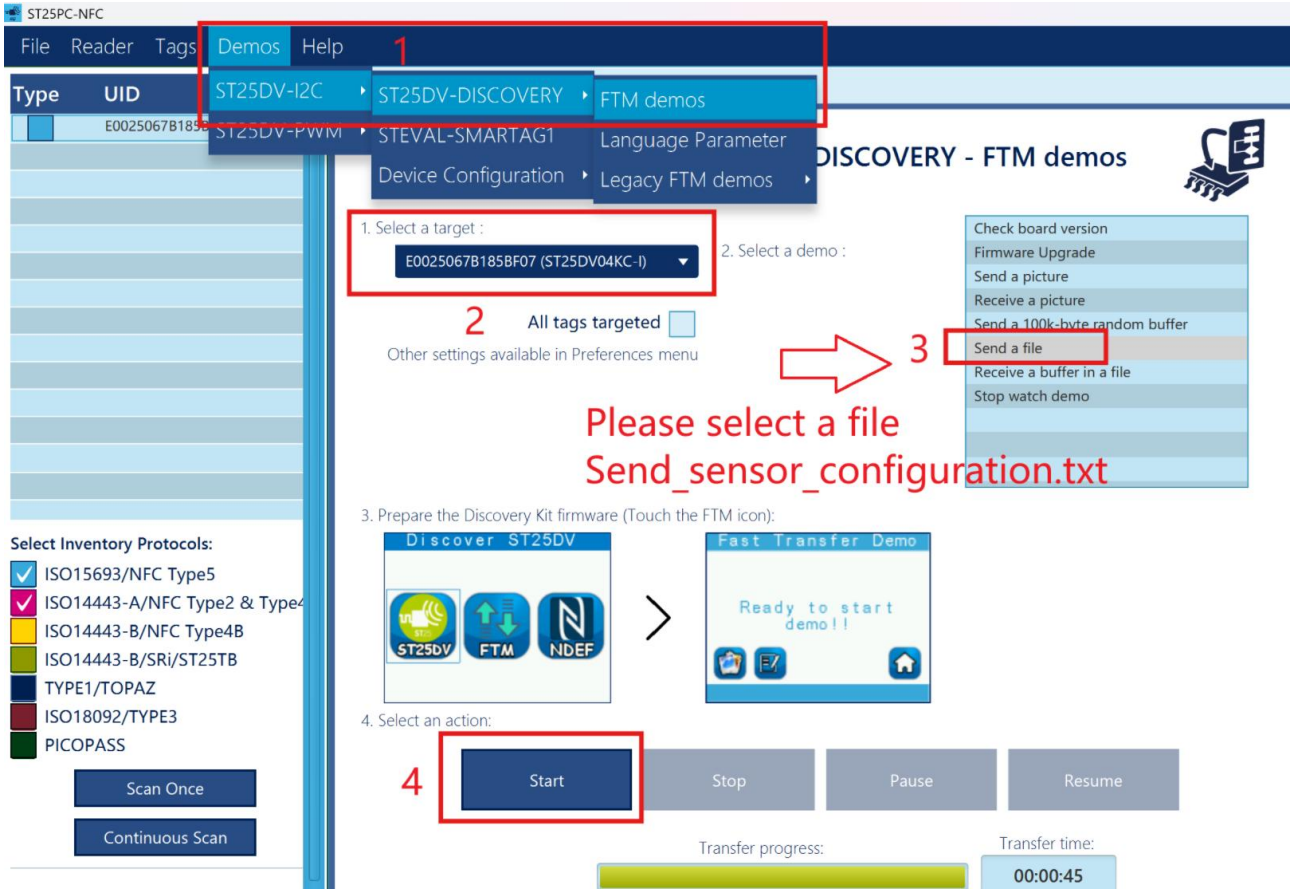


9.4 Set the LS100 configurations

Suppose the following configurations need to be changed.



Use the NFC reader 3911 to approach the NFC area of the LS100.



Finally, move the NFC Reader 3911 away from the NFC area.

9.5 Upgrade the firmware of the LS100

The firmware download link is as follows:

LoRaWAN/LS100/Firmware at main · huangdove/LoRaWAN · GitHub

Use the NFC reader 3911 to approach the NFC area of the LS100.

Click on the Firmware Upgrade option and select a firmware.

When the firmware download is complete, the device will reboot, and the green LED will blink 3 times.

Finally, move the NFC Reader 3911 away from the NFC area.

10. Offline detection

For the YOGEJAY LoRaWAN end device, after joining the network, for every packet sent by the node, the offline detection counter will add 1.

The uplink data automatically carries the LinkCheckReq when the counter is between offline_detection_counter_min_threshold and offline_detection_counter_max_threshold.

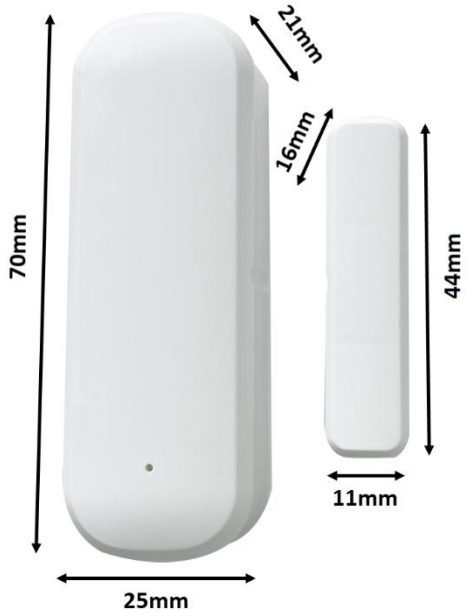
If the counter exceeds offline_detection_counter_max_threshold and has not yet received a downlink, it will begin to rejoin the network.

After receiving any downlink during listening, the counter will automatically clear to 0.

11. How to upgrade the LS100 firmware

Please refer to Section 4.5.

12. Dimension



13. Sleep current

After the device sends uplink data or processes a task, it will enter sleep mode.

The sleep current is about 3uA.

14. Package information

1 x LS100(Without battery)

1 x Double-sided tape

15. Support

Please send an email to dove.huang@aliyun.com.