DDS04-LB -- LoRaWAN 4-Channels Distance Detection Sensor User Manual

Last modified by Xiaoling (/xwiki/bin/view/XWiki/Xiaoling) on 2023/11/21 11:54

Table of Contents:

1. Introduction

1.1 What is LoRaWAN 4-Channels Distance Sensor

The Dragino DDS04-LB is a **LoRaWAN 4-Channels Distance Sensor** for Internet of Things solution. It is capable to add up to four Ultrasonic Sensors to measure four distances at the same time.

The DDS04-LB can be applied to scenarios such as horizontal distance measurement, parking management system, object proximity and presence detection, intelligent t can management system, robot obstacle avoidance, automatic control, sewer, etc.

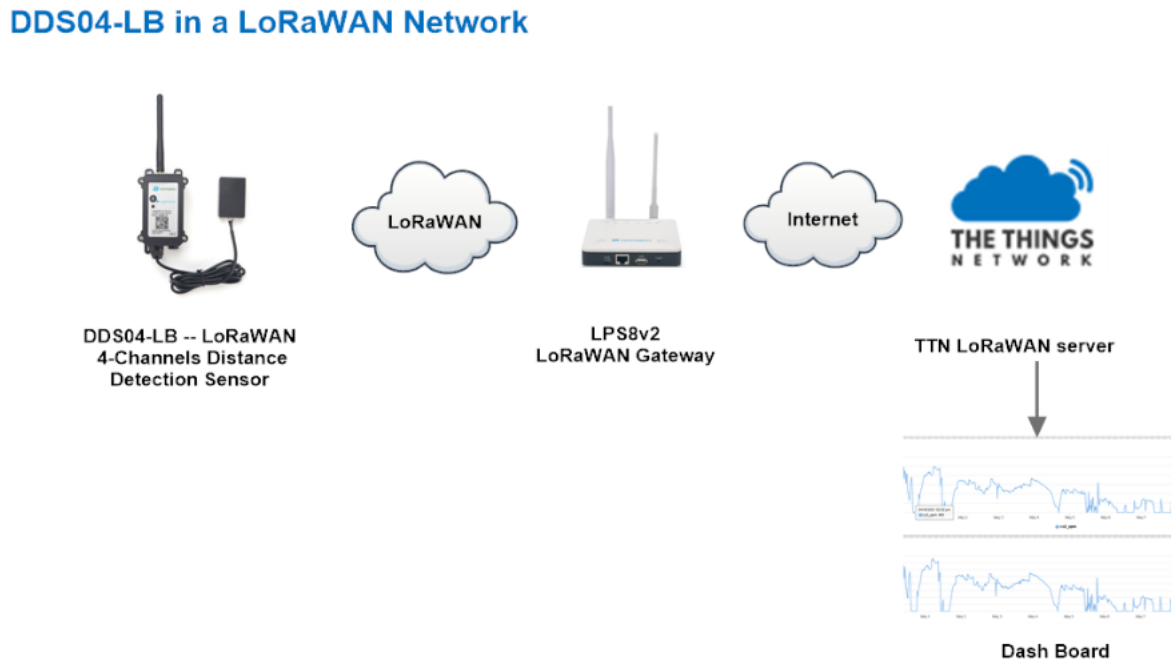
It detects the **distance between the measured object and the sensor**, and uploads the value via wireless to LoRaWAN IoT Server.

The LoRa wireless technology used in DDS04-LB allows device to send data and reach extremely long ranges at low data-rates. It provides ultra-long range spread spect communication and high interference immunity whilst minimizing current consumption.

DDS04-LB **supports BLE configure** and **wireless OTA update** which make user easy to use.

DDS04-LB is powered by **8500mAh Li-SOCI2 battery**, it is designed for long term use up to 5 years.

Each DDS04-LB is pre-load with a set of unique keys for LoRaWAN registrations, register these keys to local LoRaWAN server and it will auto connect after power on.



1.2 Features

- LoRaWAN 1.0.3 Class A
- Bands: CN470/EU433/KR920/US915/EU868/AS923/AU915/IN865
- Ultra-low power consumption
- Detect Range: Base on External Probe
- Monitor Battery Level
- Support Bluetooth v5.1 and LoRaWAN remote configure
- Support wireless OTA update firmware
- AT Commands to change parameters
- Downlink to change configure
- 8500mAh Battery for long term use

1.3 Specification

Common DC Characteristics:

- Supply Voltage: built in 8500mAh Li-SOCI2 battery , 2.5v ~ 3.6v
- Operating Temperature: -40 ~ 85°C

LoRa Spec:

- Frequency Range, Band 1 (HF): 862 ~ 1020 Mhz
- Max +22 dBm constant RF output vs.
- RX sensitivity: down to -139 dBm.
- Excellent blocking immunity

Battery:

- Li/SOCI2 un-chargeable battery
- Capacity: 8500mAh
- Self-Discharge: <1% / Year @ 25°C
- Max continuously current: 130mA
- Max boost current: 2A, 1 second

Power Consumption

- Sleep Mode: 5uA @ 3.3v
- LoRa Transmit Mode: 125mA @ 20dBm, 82mA @ 14dBm

1.4 Probe Options

1.4.1 Probes Comparation

Model	Photo	Description

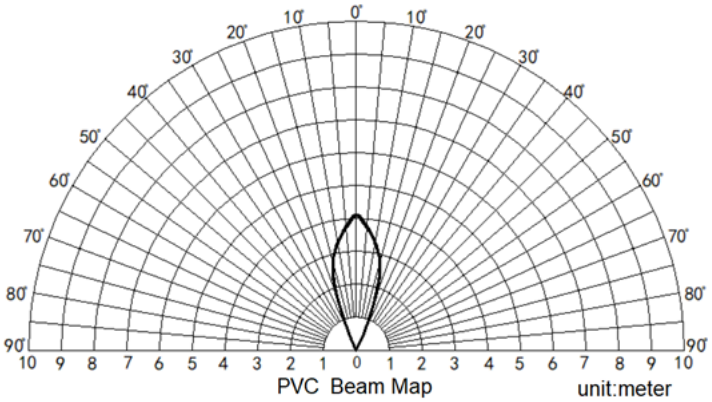
A01A-15		Detect Distance: 28 cm ~ 750 cm Bling Spot Distance: 0 ~ 28cm Accuracy: ±(1cm+S*0.3%) (S: Distance) Measure Angle: ~ 40° Cable Length: 1.5 meter Temperature Compensation Suitable for Flat Object Detect IP67 Water Proof
A02-15		Detect Distance: 3cm ~ 450cm Bling Spot Distance: 0 ~ 3cm Accuracy: ±(1cm+S*0.3%) (S: Distance) Measure Angle: ~ 60° Cable Length: 1.5 meter Temperature Compensation Suitable for Flat Object Detect, Rubbish Bin IP67 Water Proof
A13-15		Detect Distance: 25cm ~ 200cm Bling Spot Distance: 0 ~ 25cm Accuracy: ±(1cm+S*0.3%) (S: Distance) Measure Angle: ~ 20° Cable Length: 1.5 meter Temperature Compensation Suitable for Flat Object Detect, Rubbish Bin IP67 Water Proof
A16-15		Detect Distance: 50cm ~ 1500cm Bling Spot Distance: 0 ~ 50cm Accuracy: ±(1cm+S*0.3%) (S: Distance) Measure Angle: ~ 40° Cable Length: 1.5 meter Temperature Compensation Suitable for Long Distance Detect IP67 Water Proof

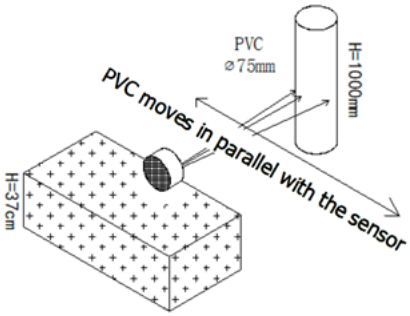
1.4.2 A01A-15 probe

A01A-15 is mainly used for plane distance measurement; it can carry out targeted measurement on plane objects and can measure long distances and high accuracy.

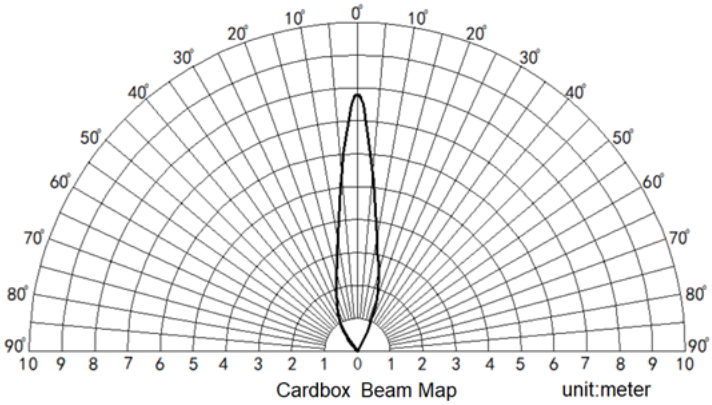
Beam Chart:

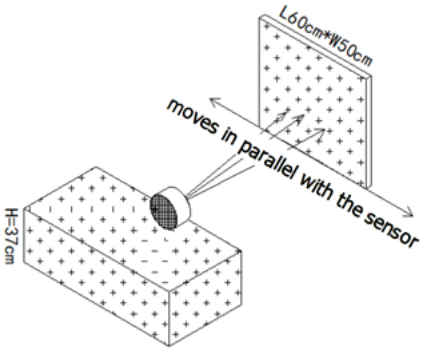
(1) The tested object is a white cylindrical tube made of PVC, with a height of 100cm and a diameter of 7.5cm.



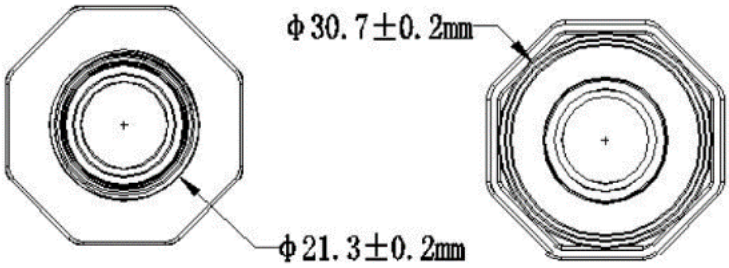


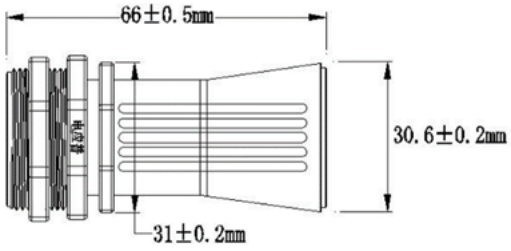
(2) The object to be tested is a "corrugated cardboard box" perpendicular to the central axis of 0 °, and the length * width is 60cm * 50cm.

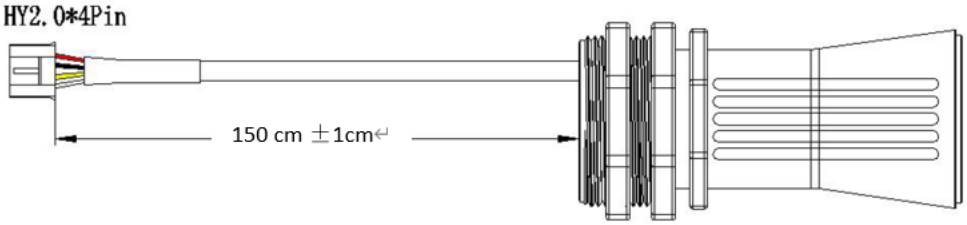




Mechanical:





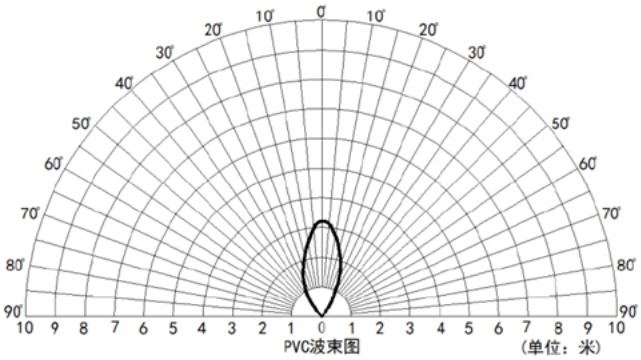


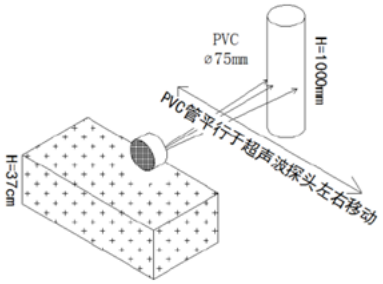
Application:

1.4.3 A02-15 probe

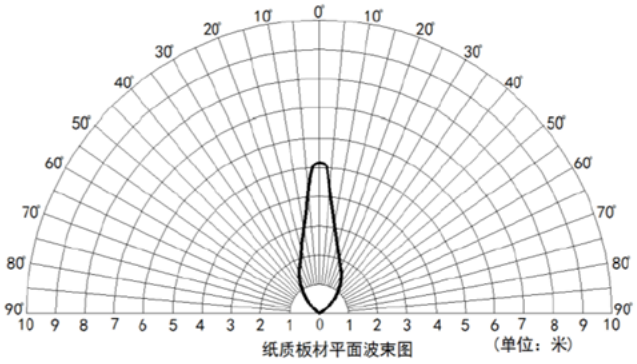
Beam Chart:

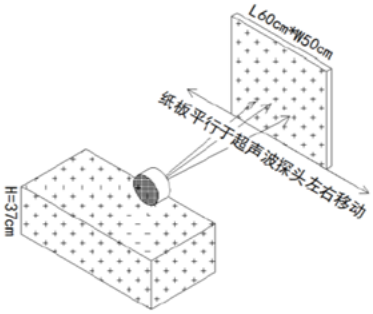
(1) The tested object is a white cylindrical tube made of PVC, with a height of 100cm and a diameter of 7.5cm.



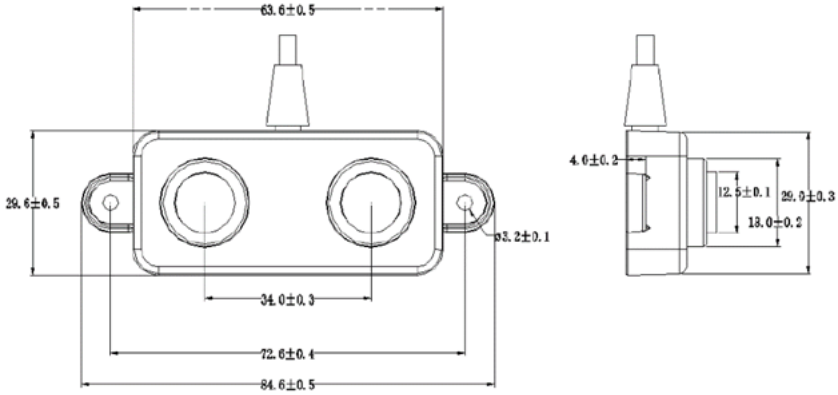


(2) The object to be tested is a "corrugated cardboard box" perpendicular to the central axis of 0 °, and the length * width is 60cm * 50cm.





Mechanical:

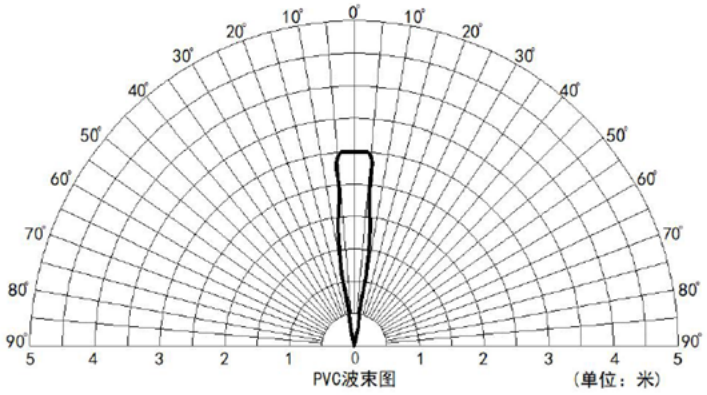


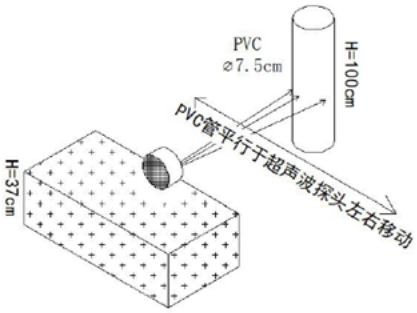
Application:

1.4.4 A13-15 probe

Beam Chart:

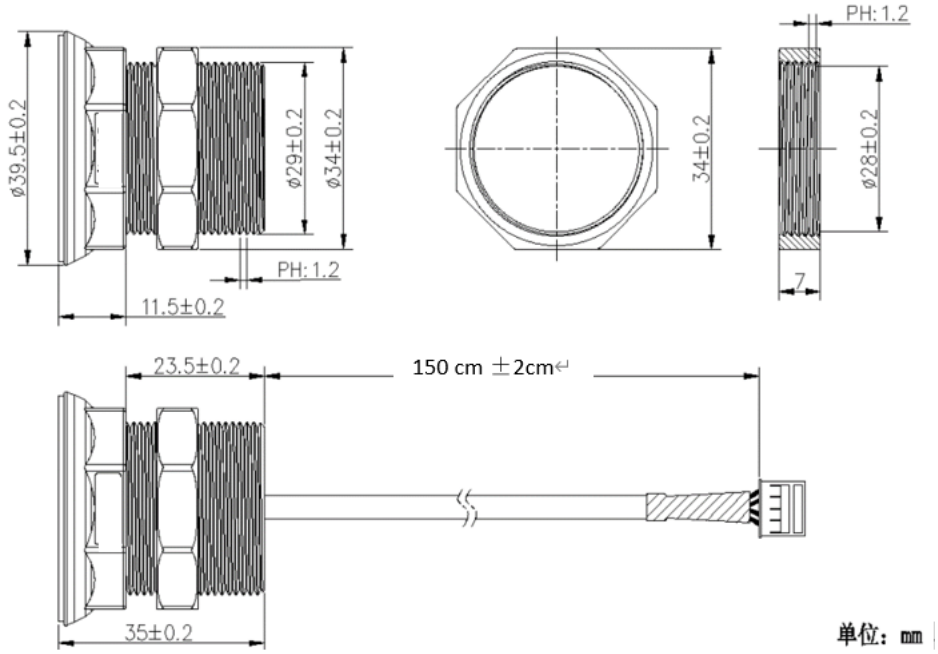
(1) The tested object is a white cylindrical tube made of PVC, with a height of 100cm and a diameter of 7.5cm.





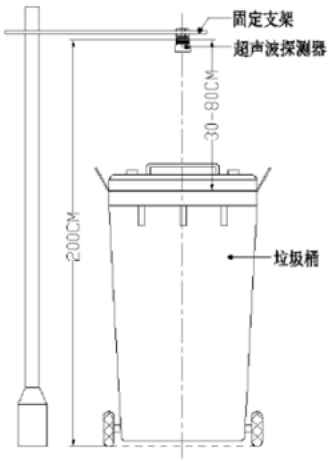
(2) The object to be tested is a "corrugated cardboard box" perpendicular to the central axis of 0 °, and the length * width is 60cm * 50cm.

Mechanical:



Installation Requirement:

1) The effective detection range of the product is 25cm-200cm, so the vertical distance between the installation position of the module and the bottom of the trash bin is required to be less than 200cm.
2) The installation position of the product should be perpendicular to the trash bin to maintain a good horizontal plane, and be located at the center of the trash bin diameter;
3) In order to effectively filter out the reflection echo from the diameter of the trash bin and baffle, the distance between the installation position of the module and the edge of the diameter of the trash bin (non-vertical horizontal distance) is required to be 30cm
For trash bins between 80cm and 25cm in diameter, it is recommended that the installation position of the module and the height of the trash bin (the vertical and horizontal distance) be 30cm. For trash bins with a diameter of about 60cm, it is recommended that the installation position of the module and the height of the trash bin (vertical horizontal distance) be between 30cm-50cm. There is no such restriction on large-diameter (>60cm) trash bins.



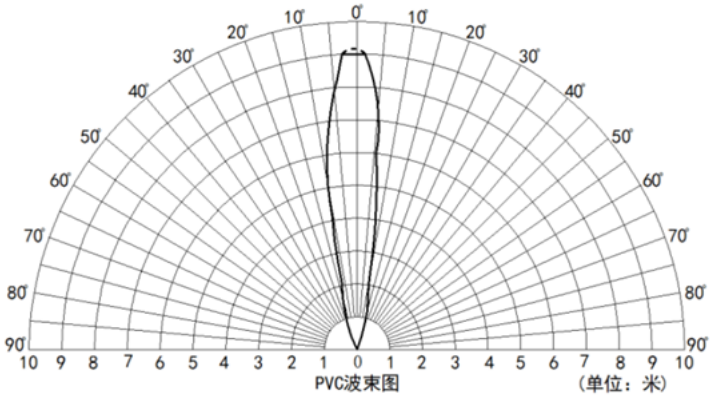
超声波探测器安装示意图

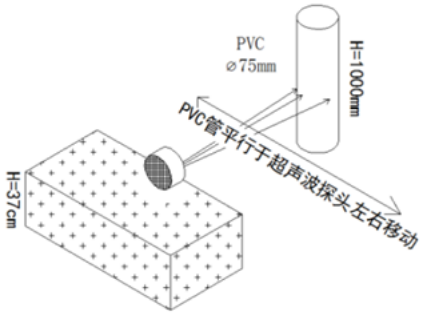
Application:


1.4.5 A13-16 probe

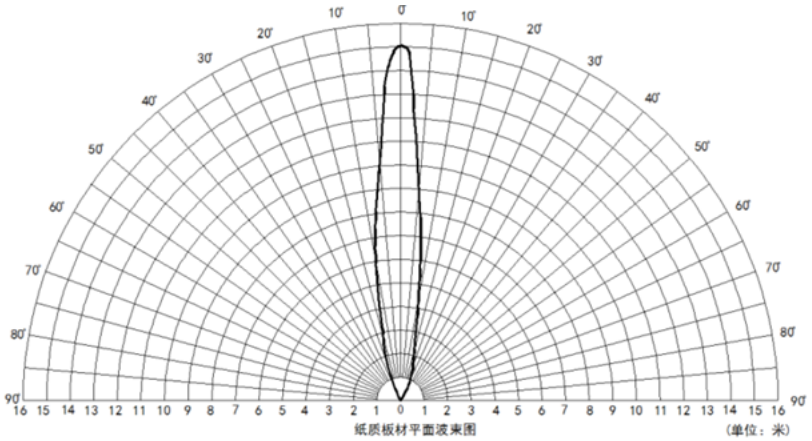
Beam Chart:

(1) The tested object is a white cylindrical tube made of PVC, with a height of 100cm and a diameter of 7.5cm.

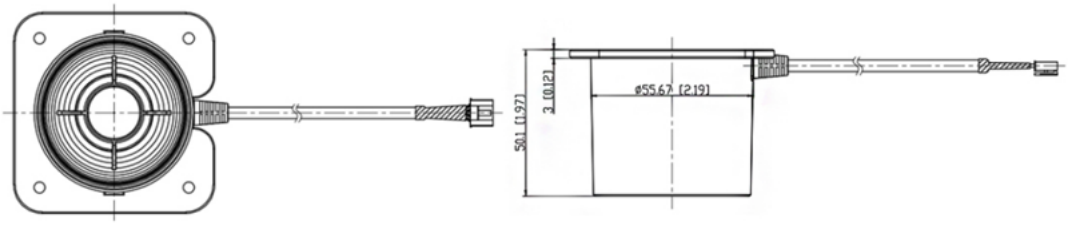


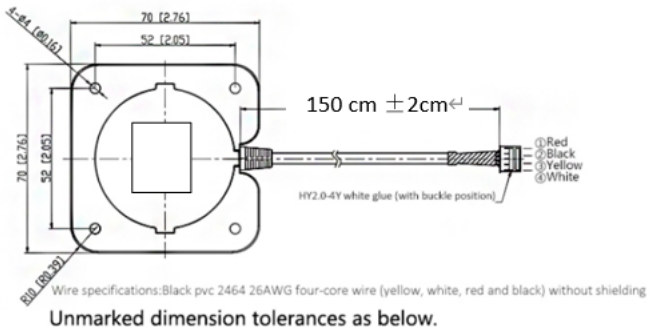


(2) The object to be tested is a "corrugated cardboard box" perpendicular to the central axis of 0 °, and the length * width is 60cm * 50cm.



Mechanical:





Unmarked dimension tolerances as below.

TOLERANCE (mm)	0~10	≥10~30	≥30~50	≥50~100	≥100~200
	±0.1	±0.15	±0.2	±0.3	±0.5

Application:




1.5 Applications

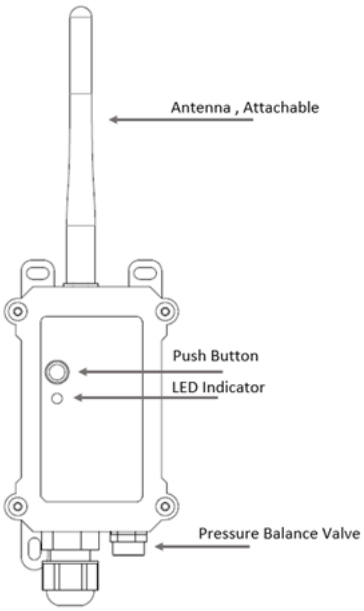
- Horizontal distance measurement
- Parking management system
- Object proximity and presence detection
- Intelligent trash can management system
- Robot obstacle avoidance
- Automatic control
- Sewer

1.6 Sleep mode and working mode

Deep Sleep Mode: Sensor doesn't have any LoRaWAN activate. This mode is used for storage and shipping to save battery life.

Working Mode: In this mode, Sensor will work as LoRaWAN Sensor to Join LoRaWAN network and send out sensor data to server. Between each sampling/tx/rx periodi sensor will be in IDLE mode), in IDLE mode, sensor has the same power consumption as Deep Sleep mode.

1.7 Button & LEDs



Behavior on ACT	Function	Action
Pressing ACT between 1s < time < 3s	Send an uplink	If sensor is already Joined to LoRaWAN network, sensor will send an uplink packet, **blue led** will blink once. Meanwhile, BLE module will be active and user can connect via BLE to configure device.
Pressing ACT for more than 3s	Active Device	**Green led** will fast blink 5 times, device will enter **OTA mode** for 3 seconds. And then start to JOIN LoRaWAN network. **Green led** will solidly turn on for 5 seconds after joined in network. Once sensor is active, BLE module will be active and user can connect via BLE to configure device, no matter if device join or not join LoRaWAN network.
Fast press ACT 5 times.	Deactivate Device	**Red led** will solid on for 5 seconds. Means device is in Deep Sleep Mode.

1.8 BLE connection

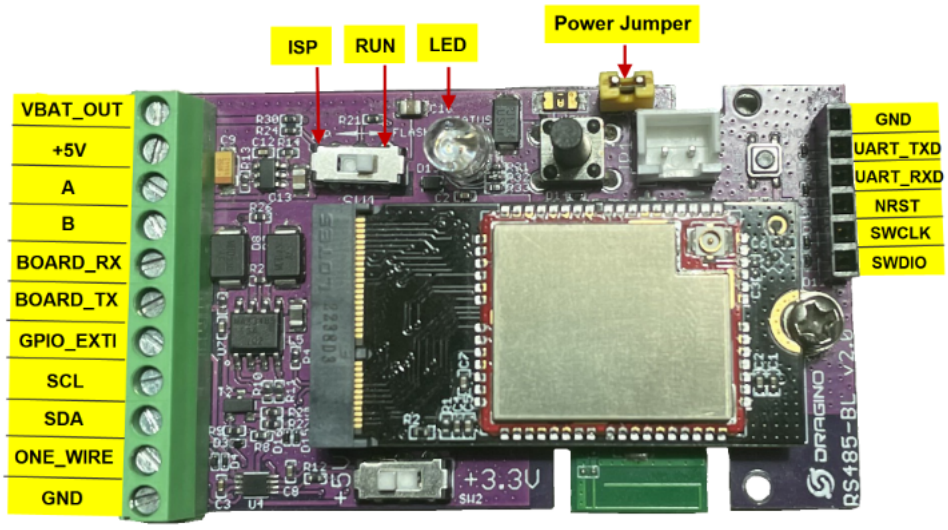
DDS04-LB support BLE remote configure.

BLE can be used to configure the parameter of sensor or see the console output from sensor. BLE will be only activate on below case:

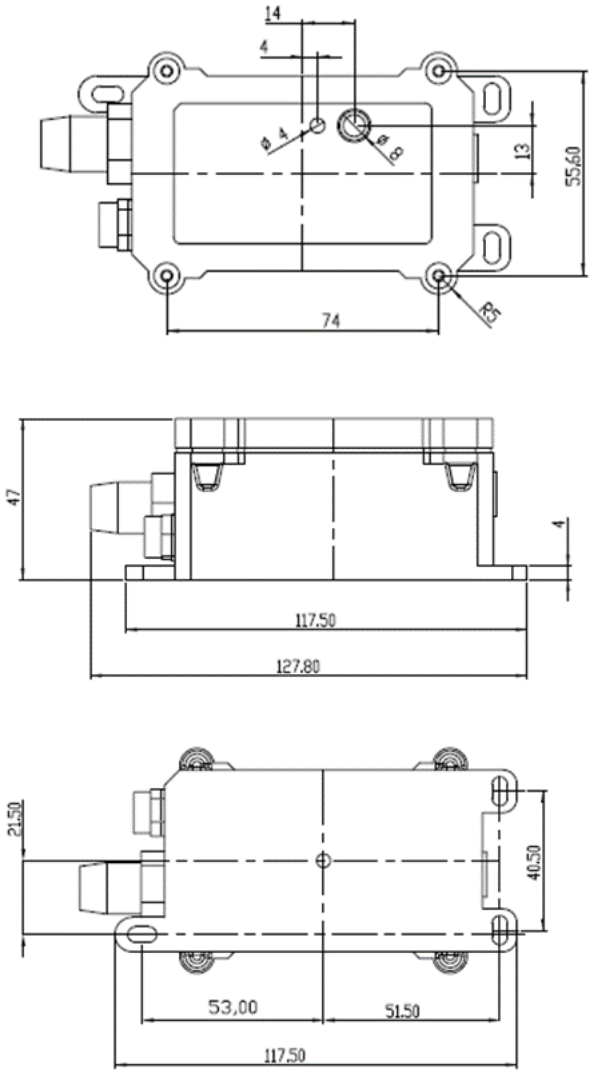
- Press button to send an uplink
- Press button to active device.
- Device Power on or reset.

If there is no activity connection on BLE in 60 seconds, sensor will shut down BLE module to enter low power mode.

1.9 Pin Definitions



1.10 Mechanical



2. Configure DDS04-LB to connect to LoRaWAN network

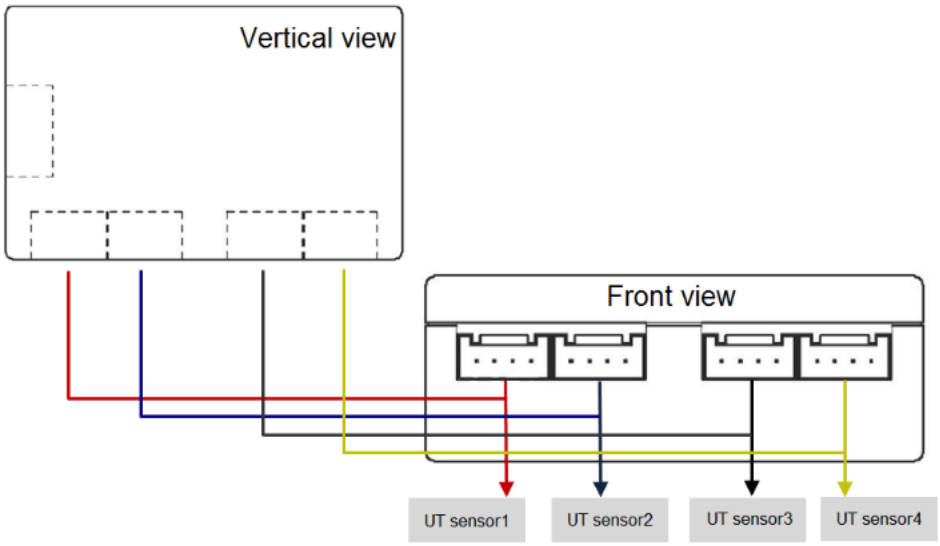
2.1 How it works

The DDS04-LB is configured as **LoRaWAN OTAA Class A** mode by default. It has OTAA keys to join LoRaWAN network. To connect a local LoRaWAN network, you nee input the OTAA keys in the LoRaWAN IoT server and press the button to activate the DDS04-LB. It will automatically join the network via OTAA and start to send the sens value. The default uplink interval is 20 minutes.

2.2 Connect Probe

DDS04-LB has a converter, User need to connect the Ultrasonic Probes to the convert as below. Different probes are supported, please see this link for the probe options

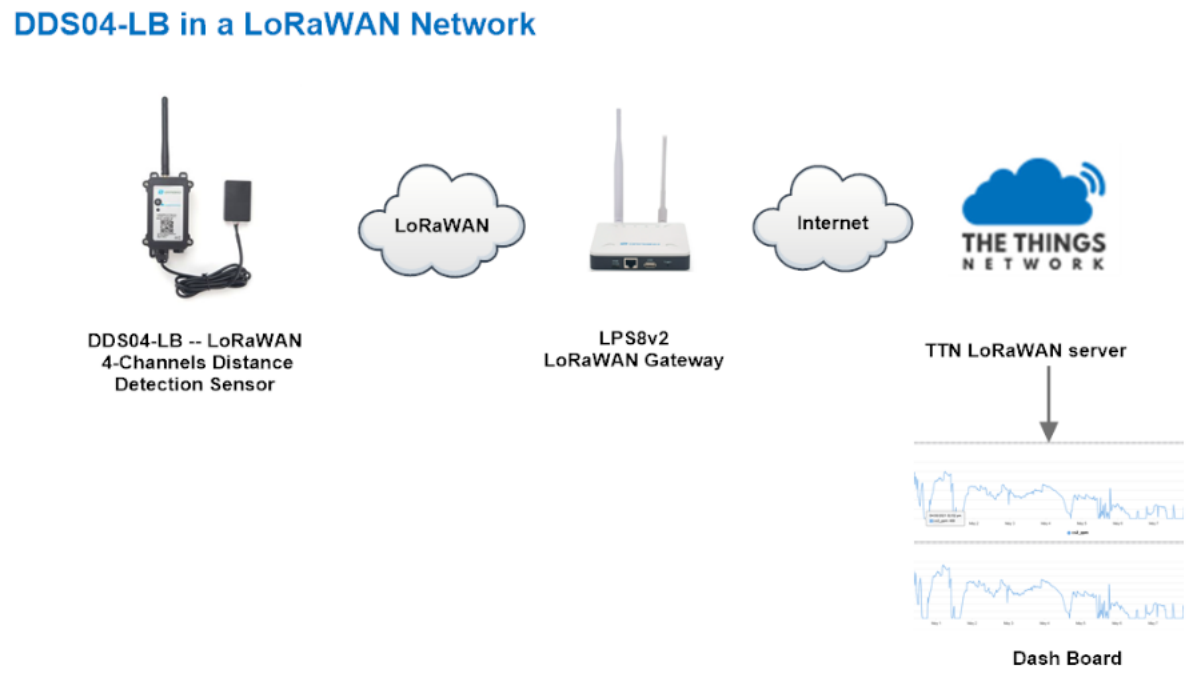
Probe mapping as below.



2.3 Quick guide to connect to LoRaWAN server (OTAA)

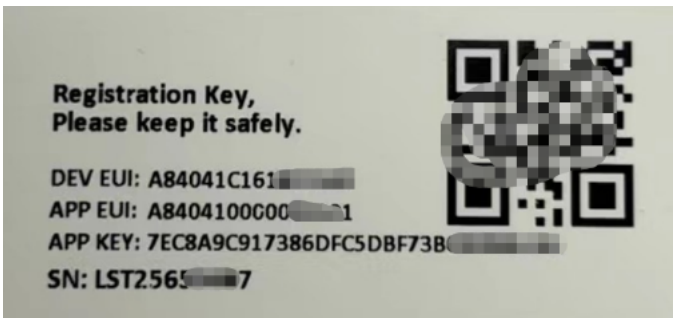
Following is an example for how to join the TTN v3 LoRaWAN Network (https://console.cloud.thethings.network/) . Below is the network structure; we use the LPS8v2 (https://www.dragino.com/products/lora-lorawan-gateway/item/228-lps8v2.html) as a LoRaWAN gateway in this example.

The LPS8v2 is already set to connected to TTN network (https://console.cloud.thethings.network/) , so what we need to now is configure the TTN server.



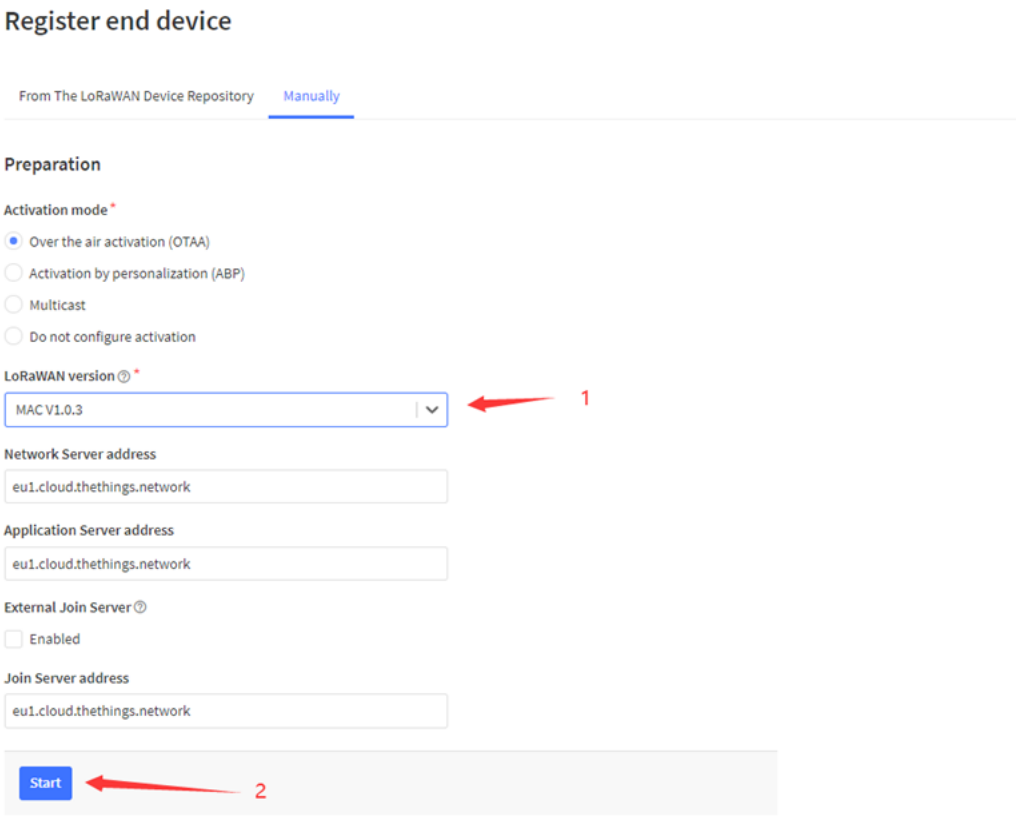
Step 1: Create a device in TTN with the OTAA keys from DDS04-LB.

Each DDS04-LB is shipped with a sticker with the default device EUI as below:

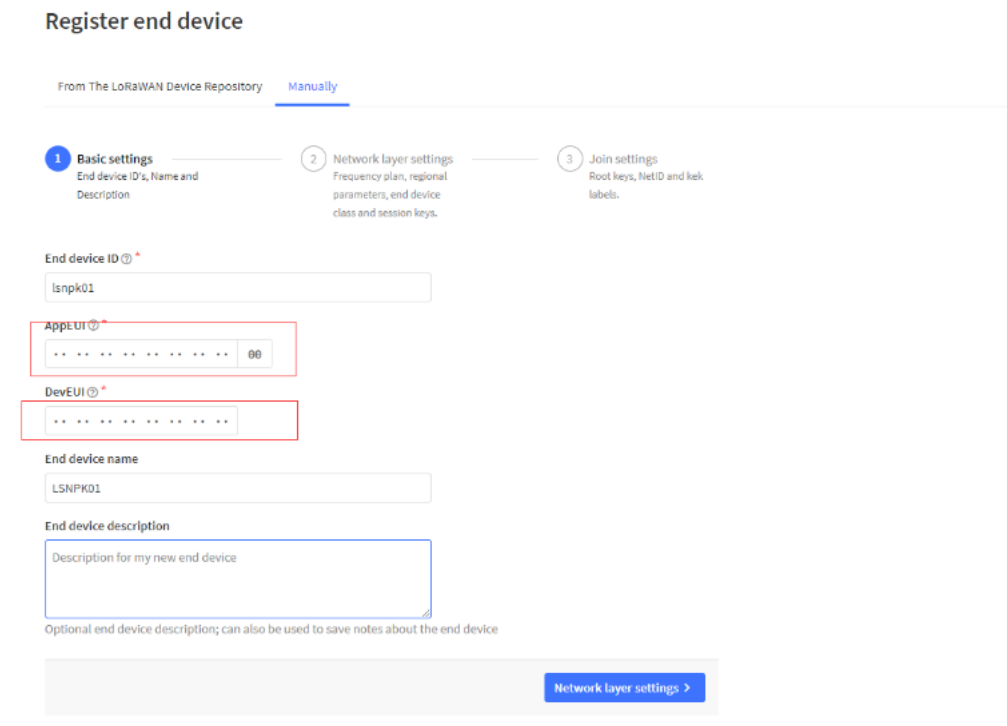


You can enter this key in the LoRaWAN Server portal. Below is TTN screen shot:

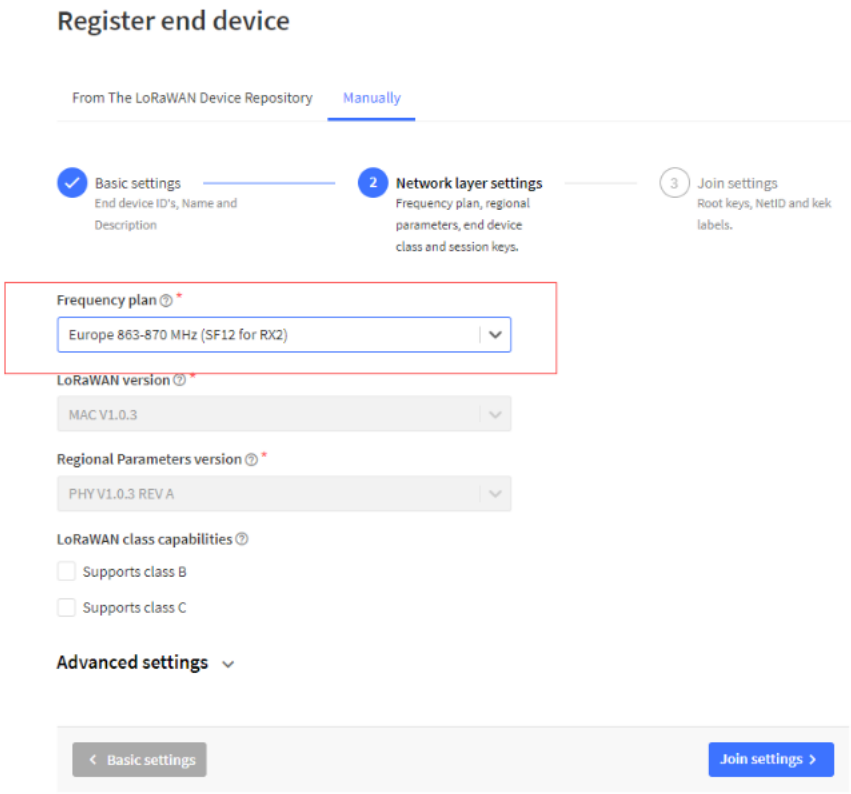
Register the device



Add APP EUI and DEV EUI



Add APP EUI in the application



Add APP KEY

Step 2: Activate on DDS04-LB

Press the button for 5 seconds to activate the DDS04-LB.

Green led will fast blink 5 times, device will enter **OTA mode** for 3 seconds. And then start to JOIN LoRaWAN network. **Green led** will solidly turn on for 5 seconds after jo in network.

After join success, it will start to upload messages to TTN and you can see the messages in the panel.

2.4 Uplink Payload

2.4.1 Device Status, FPORT=5

Users can use the downlink command(**0x26 01**) to ask DDS04-LB to send device configure detail, include device configure status. DDS04-LB will uplink a payload via FP to server.

The Payload format is as below.

Size(bytes)	**1**	**2**	**1**	**1**	**2**
Value	Sensor Model	Firmware Version	Frequency Band	Sub-band	BAT

Example parse in TTNv3

Sensor Model: For DDS04-LB, this value is 0x23

Firmware Version: 0x0100, Means: v1.0.0 version

Frequency Band:

0x01: EU868

0x02: US915

0x03: IN865

0x04: AU915

0x05: KZ865

0x06: RU864

0x07: AS923

0x08: AS923-1

0x09: AS923-2

0x0a: AS923-3

0x0b: CN470

0x0c: EU433

0x0d: KR920

0x0e: MA869

Sub-Band:

AU915 and US915:value 0x00 ~ 0x08

CN470: value 0x0B ~ 0x0C

Other Bands: Always 0x00

Battery Info:

Check the battery voltage.

Ex1: 0x0B45 = 2885mV

Ex2: 0x0B49 = 2889mV

2.4.2 Uplink Payload, FPORT=2

DDS04-LB will send this uplink **after** Device Status once join the LoRaWAN network successfully. And DDS04-LB will:

periodically send this uplink every 20 minutes, this interval can be changed.

Uplink payload includes in total 11 bytes.

Size(bytes)	**2**	**2**	**2**	**2**	**2**	**1**
Value	BAT & Interrupt flag & Interrupt level	Distance of UT sensor1	Distance of UT sensor2	Distance of UT sensor3	Distance of UT sensor4	Message Type

Battery Info

Check the battery voltage for DDS04-LB.

Ex1: 0x0B45 & 0x3FFF = 2885mV

Ex2: 0x0B49 & 0x3FFF = 2889mV

Interrupt flag & Interrupt level

This data field shows if this packet is generated by interrupt or not. Click here for the hardware and software set up.

Note: The Internet Pin is a separate pin in the screw terminal. See pin mapping of GPIO_EXTI.

Example:

(0x0D4A & 0x4000) >>14 = 0: Normal uplink packet.

(0x4D41 & 0x4000) >>14 = 1: Interrupt Uplink Packet.

(0x0D4A & 0x8000) >>15 = 0: Pin of GPIO_EXTI is low level.

(0x8D41 & 0x8000) >>15 = 1: Pin of GPIO_EXTI is high level.

Distance

The measuring distance of the four distance measuring modules, the default unit is cm.

Example:

Uplink Payload: 0D 4A 03 16 03 18 03 1A 03 15 01

Data analysis:

Distance of UT sensor1 : 0316(H) = 790 (D)/10 = 79cm.

Distance of UT sensor2 : 0318(H) = 792 (D)/10 = 79.2cm.

Distance of UT sensor3 : 031A(H) = 794 (D)/10 = 79.4cm.

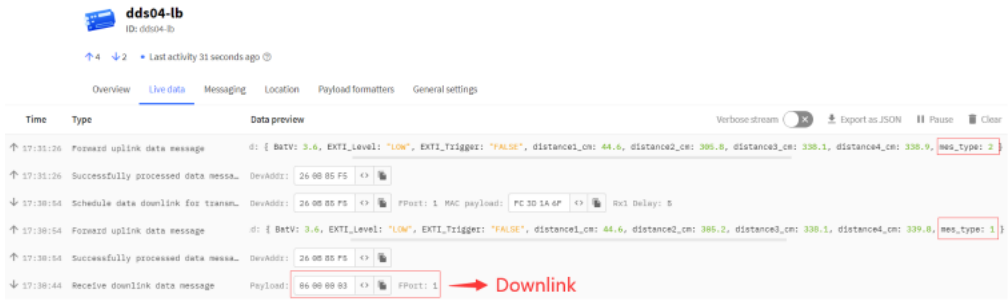
Distance of UT sensor4 : 0315(H) = 789 (D)/10 = 78.9cm.

Message Type

For a normal uplink payload, the message type is always 0x01.

Valid Message Type:

Message Type Code	Description	Payload
0x01	Normal Uplink	Normal Uplink Payload
0x02	Reply configures info	Configure Info Payload



2.4.3 Historical measuring distance, FPORT=3

DDS04-LB stores sensor values and users can retrieve these history values via the downlink command.

The historical payload includes one or multiplies entries and every entry has the same payload as Real-Time measuring distance.

Note: Due to the byte limit, the history record can only save the data of the first, second, third measurement distance channels.

Size(bytes)	**1**	**2**	**2**	**2**	**4**
Value	Interrupt flag & Interrupt_level	Distance1	Distance2	Distance3	Unix TimeStamp

Interrupt flag & Interrupt level:

Size(bit)	**bit7**	**bit7**	**[bit5:bit2]**	**bit1**	**bit0**
Value	No ACK message	Poll Message Flag	Reserve	Interrupt level	Interrupt flag

- Each data entry is 11 bytes and has the same structure as Uplink Payload, to save airtime and battery, DDS04-LB will send max bytes according to the current DR Frequency bands.

For example, in the US915 band, the max payload for different DR is:

a) DR0: max is 11 bytes so one entry of data

b) DR1: max is 53 bytes so devices will upload 4 entries of data (total 44 bytes)

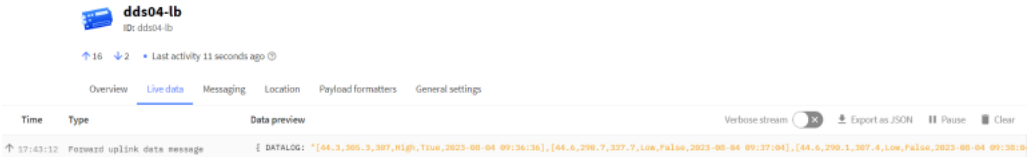
c) DR2: total payload includes 11 entries of data

d) DR3: total payload includes 22 entries of data.

If DDS04-LB doesn't have any data in the polling time. It will uplink 11 bytes of 0

Downlink:

0x31 64 CC C6 9E 64 CC C7 70 05



Uplink:

43 01 BB 0B ED 0B FE 64 CC C6 A4 40 01 BE 0B 5B 0D 31 64 CC C6 C0 40 01 BE 0B 55 0C 02 64 CC C6 FC 41 01 BE 0B 4E 0B FD 64 CC C7 17 40 01 BE 0B F4 0B 64 CC C7 61

Parsed Value:

[DISTANCE1 , DISTANCE2，DISTANCE3，EXTI_STATUS , EXTI_FLAG , TIME]

[44.3,305.3,307,High,True,2023-08-04 09:36:36],

[44.6,290.7,337.7,Low,False,2023-08-04 09:37:04],

[44.6,290.1,307.4,Low,False,2023-08-04 09:38:04],

[44.6,289.4,306.9,Low,True,2023-08-04 09:38:31],

[44.6,306,306.3,Low,False,2023-08-04 09:39:45],

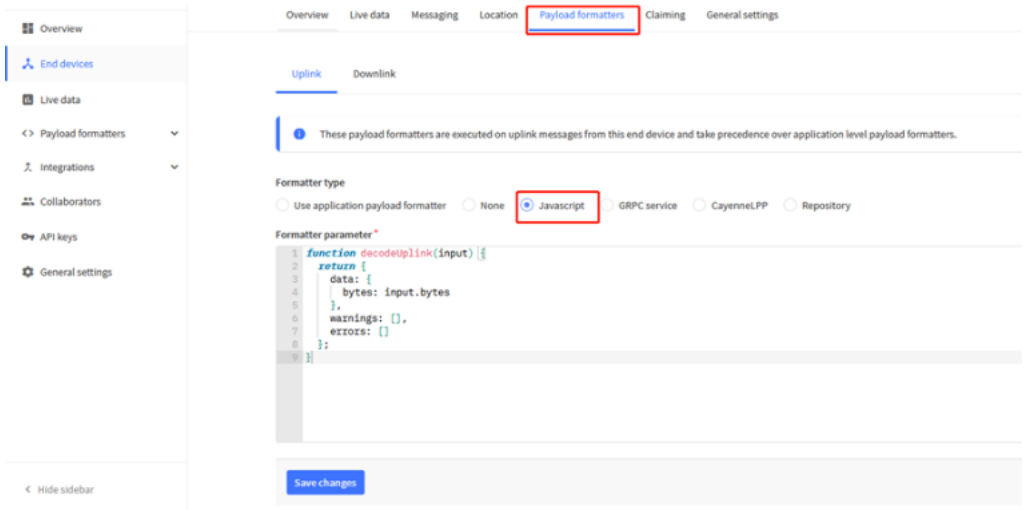
History read from serial port:

```
AT+PLDTA=5
Stop Tx events when read sensor data
0001 2023/8/4 09:36:36 bat:3600 distance1:44.3 distance2:305.3 distance3:307.0 distance4:302.6
level:high status:true
0002 2023/8/4 09:37:04 bat:3600 distance1:44.6 distance2:290.7 distance3:337.7 distance4:358.9
level:low status:false
0003 2023/8/4 09:38:04 bat:3630 distance1:44.6 distance2:290.1 distance3:307.4 distance4:340.3
level:low status:false
0004 2023/8/4 09:38:31 bat:3630 distance1:44.6 distance2:289.4 distance3:306.9 distance4:339.8
level:low status:true
0005 2023/8/4 09:39:45 bat:3630 distance1:44.6 distance2:306.0 distance3:306.3 distance4:302.5
level:low status:false
Start Tx events

OK
```

2.4.4 Decode payload in The Things Network

While using TTN network, you can add the payload format to decode the payload.



The payload decoder function for TTN is here:

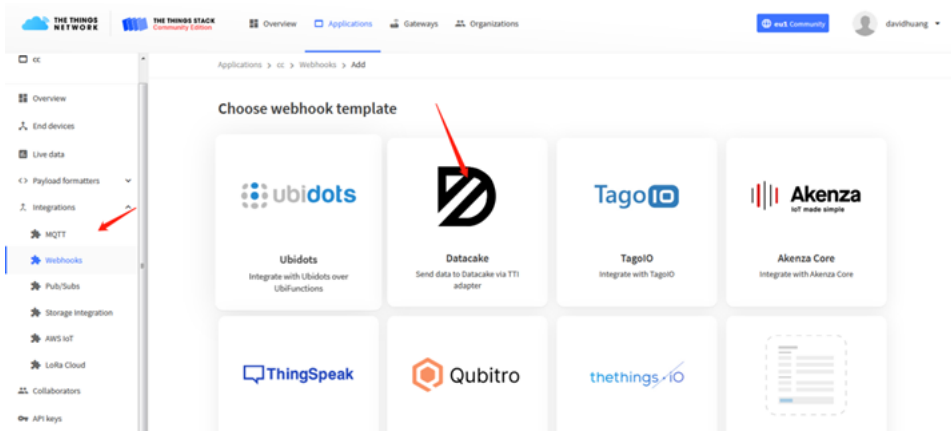
DDS04-LB TTN Payload Decoder: ttps://github.com/dragino/dragino-end-node-decoder (https://github.com/dragino/dragino-end-node-decoder)

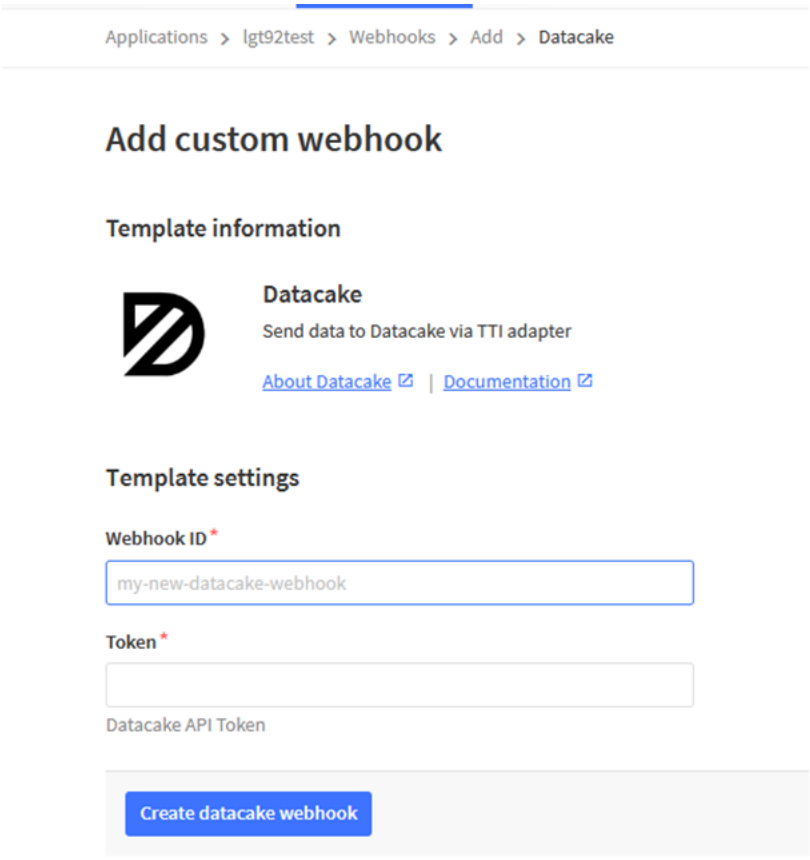
2.5 Show Data in DataCake IoT Server

DATACAKE (https://datacake.co/) provides a human friendly interface to show the sensor data, once we have data in TTN, we can use DATACAKE (https://datacake.co/ connect to TTN and see the data in DATACAKE. Below are the steps:

Step 1: Be sure that your device is programmed and properly connected to the network at this time.

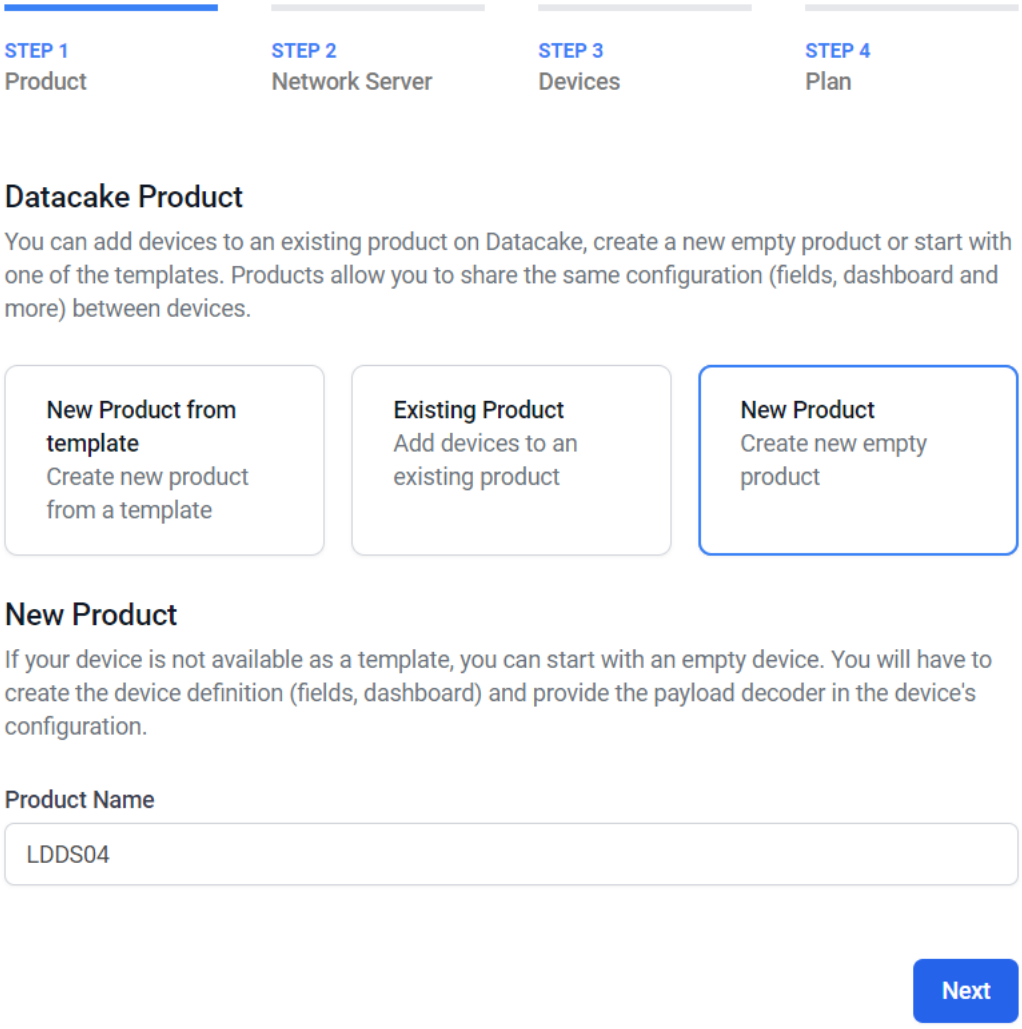
Step 2: To configure the Application to forward data to DATACAKE you will need to add integration. To add the DATACAKE integration, perform the following s

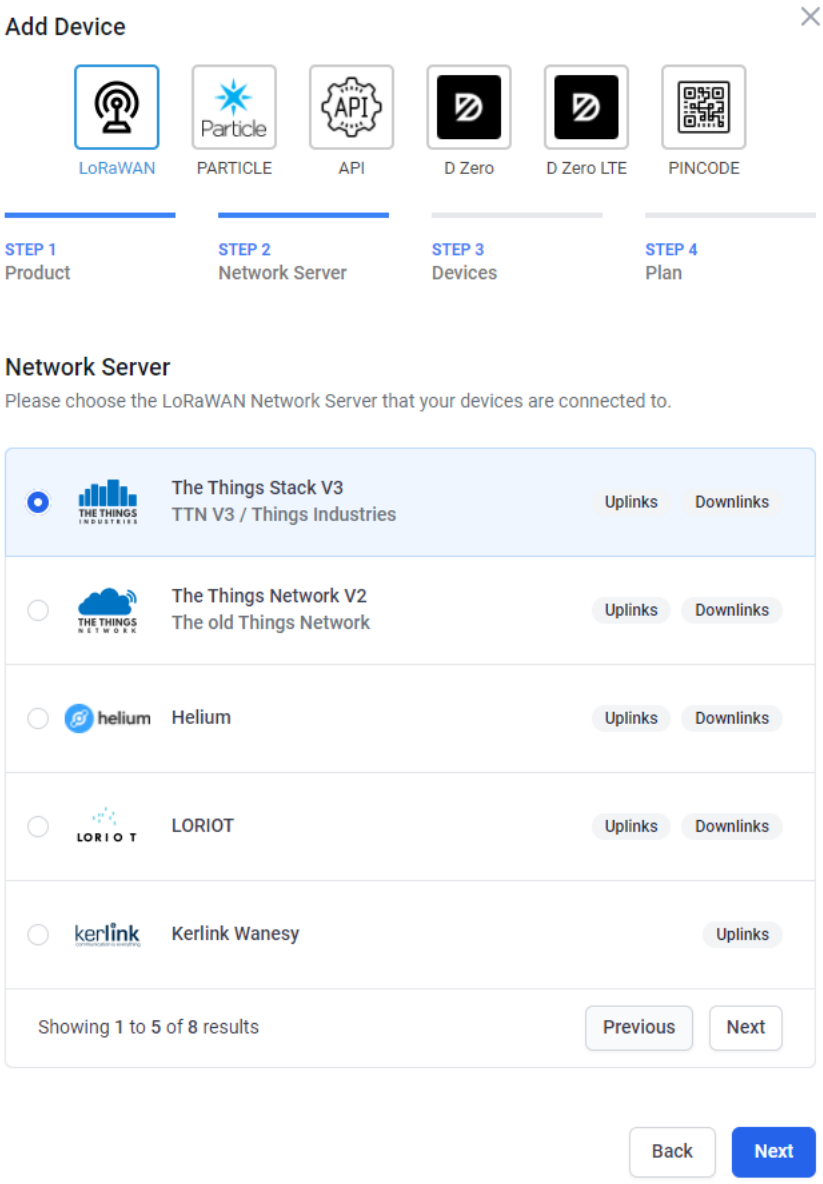


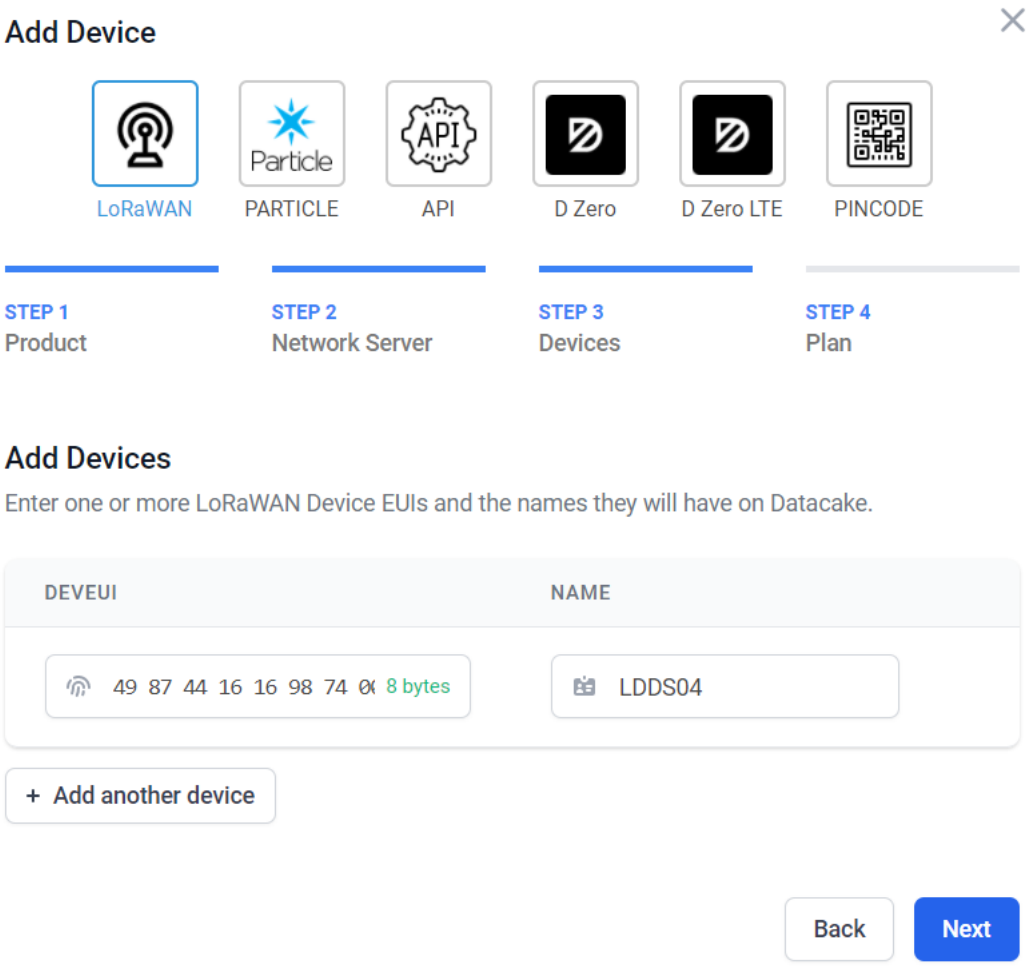


Step 3: Create an account or log in Datacake.

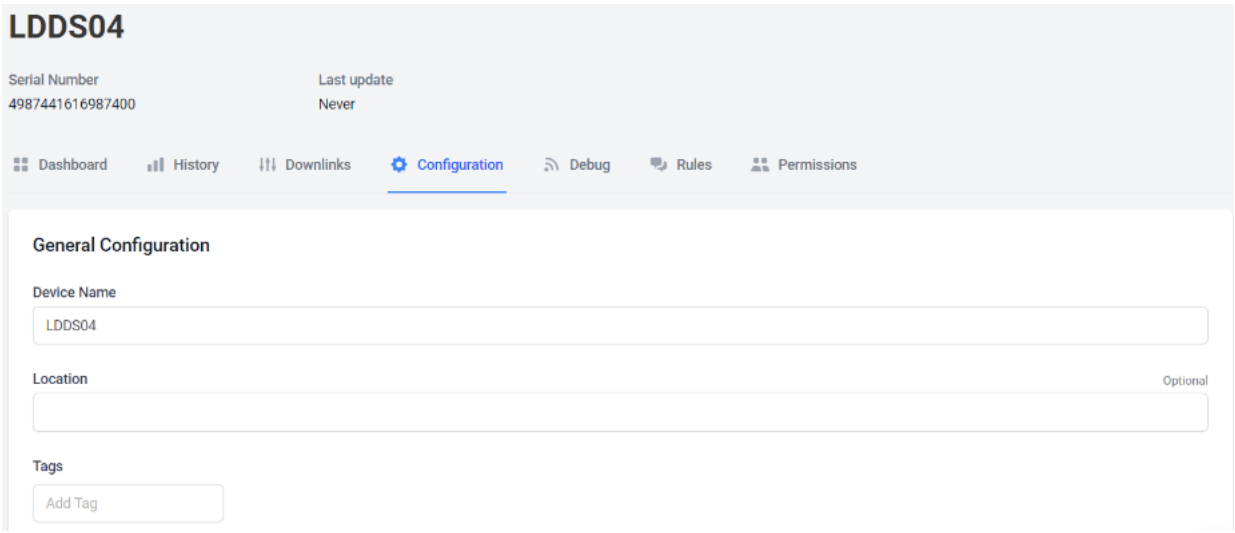
Step 4: Search the DDS04-LB and add DevEUI.

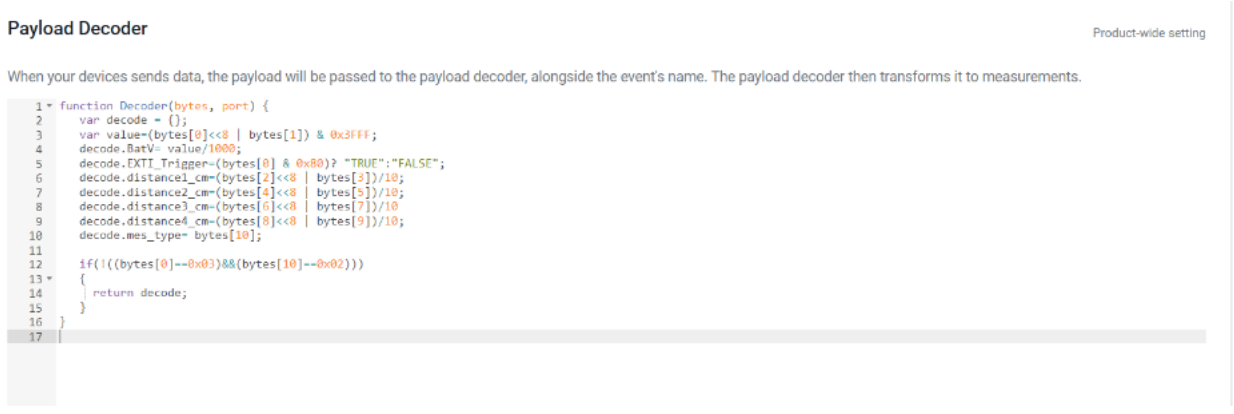


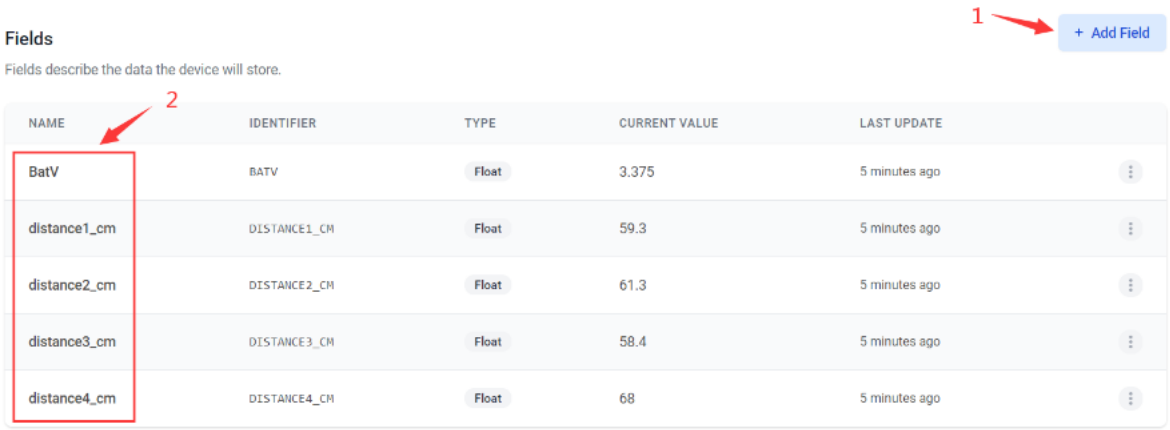

Add Device
LoRaWAN
PARTICLE
API
D Zero
D Zero LTE
PINCODE
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Network Server
Please choose the LoRaWAN Network Server that your devices are connected to.
The Things Stack V3
TTN V3 / Things Industries
Uplinks
Downlinks
The Things Network V2
The old Things Network
Uplinks
Downlinks
Helium
Uplinks
Downlinks
LORIOT
Uplinks
Downlinks
Kerlink Wanesy
Uplinks
Showing 1 to 5 of 8 results
Previous
Next
Back
Next



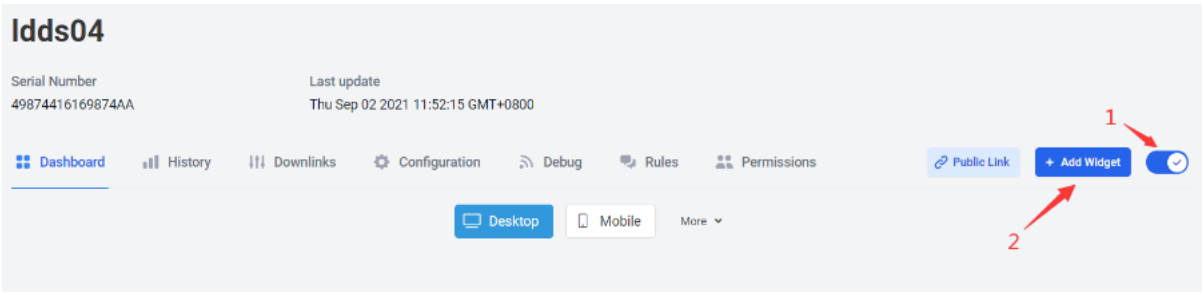
Step 5: Add payload decode

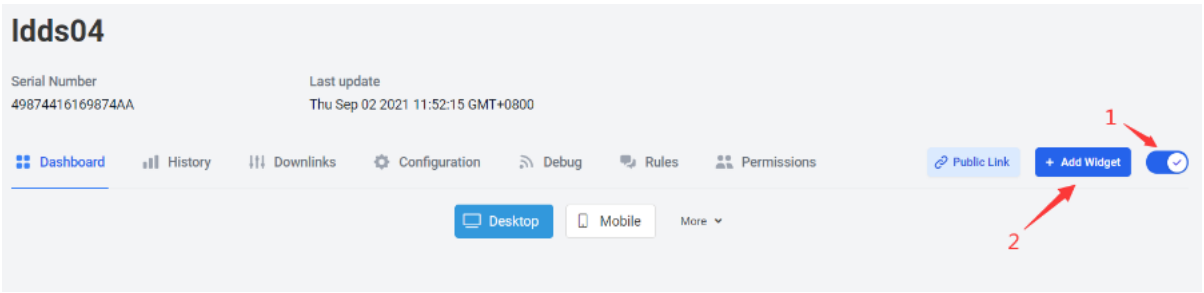


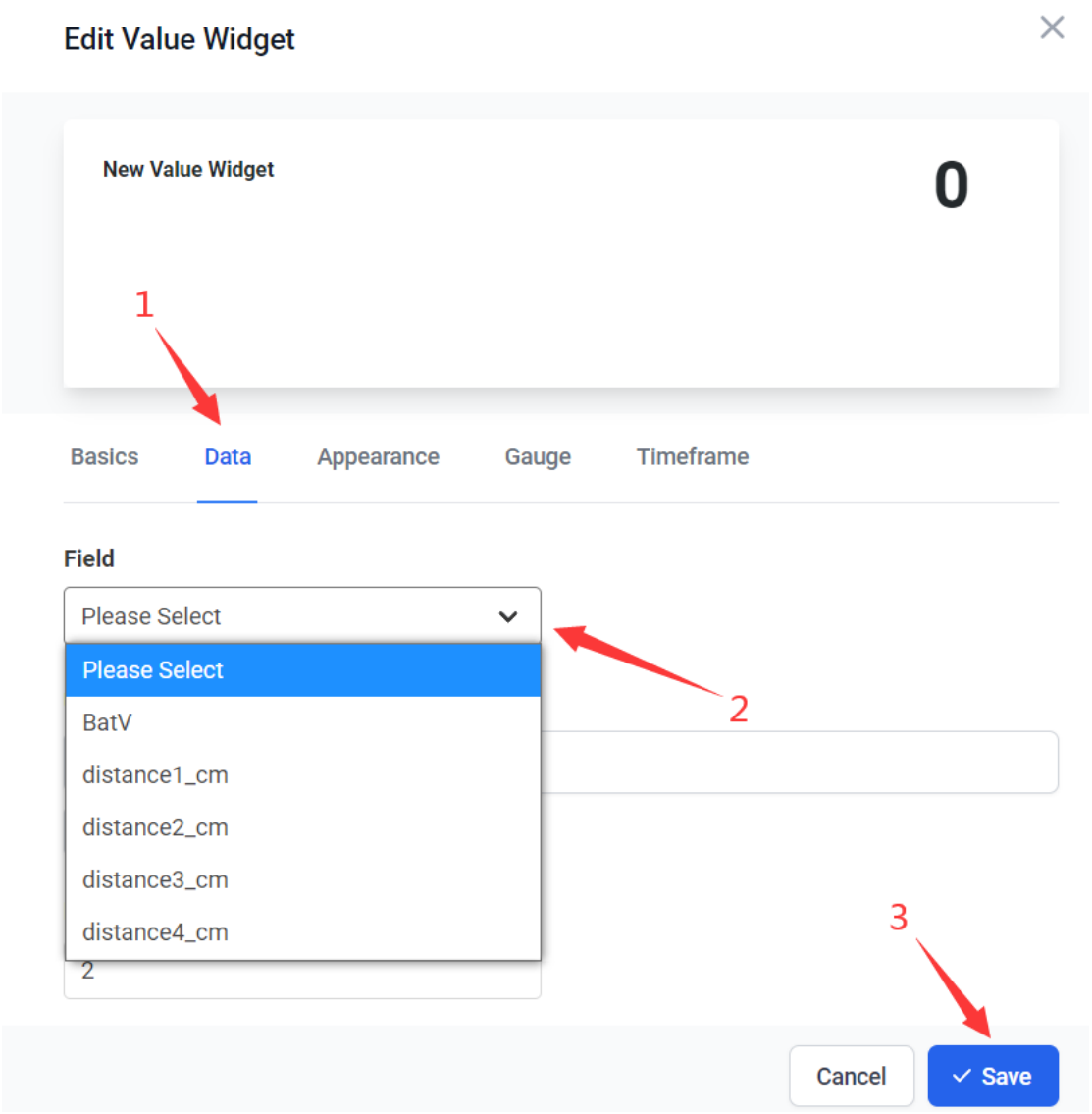


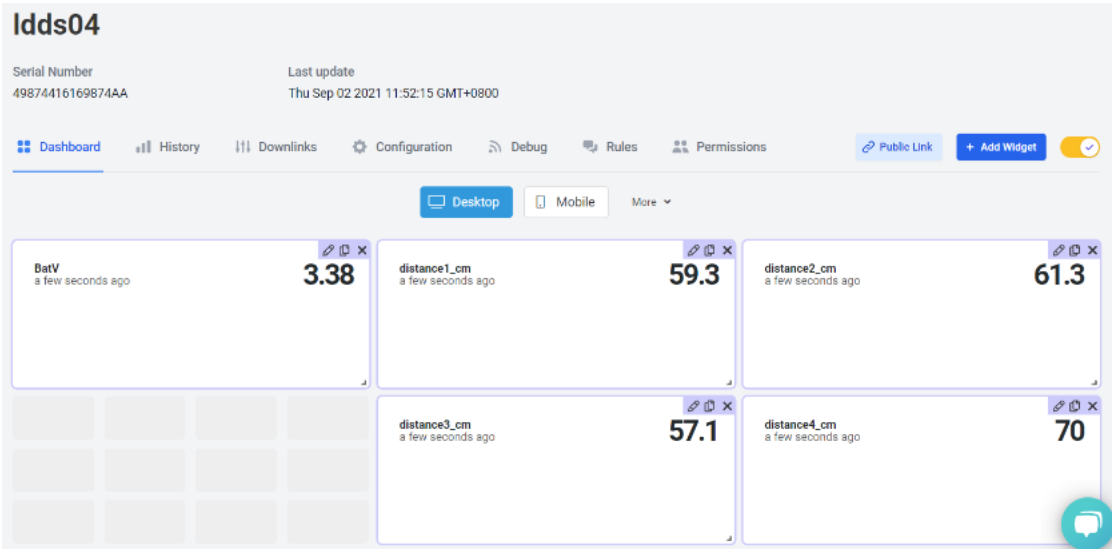


After added, the sensor data arrive TTN, it will also arrive and show in Datacake.









2.6 Datalog Feature

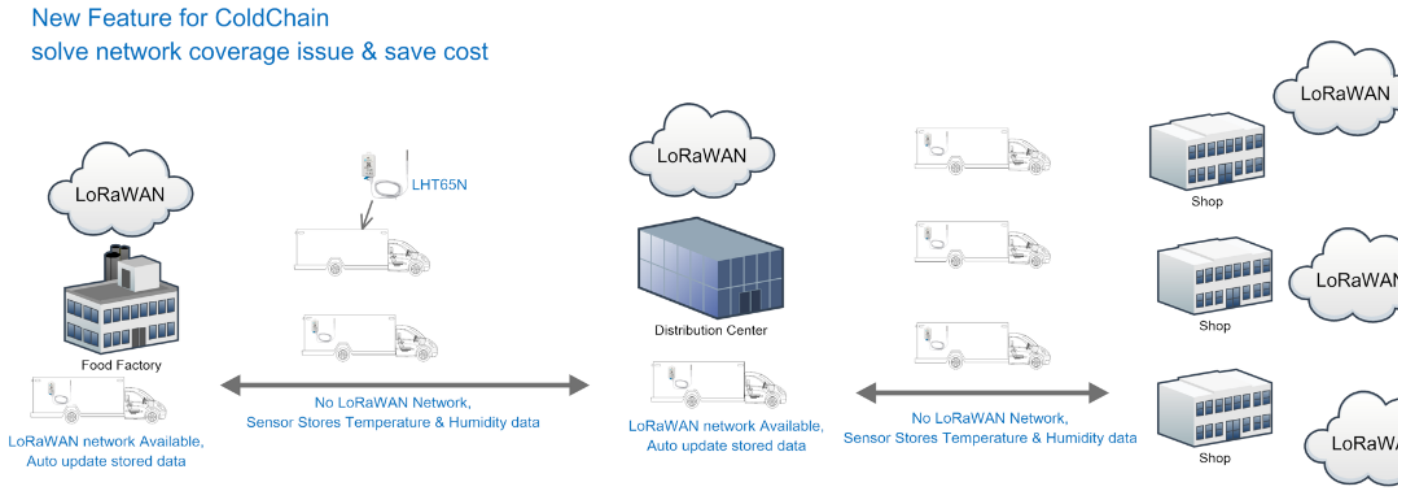
Datalog Feature is to ensure IoT Server can get all sampling data from Sensor even if the LoRaWAN network is down. For each sampling, DDS04-LB will store the readin future retrieving purposes.

2.6.1 Ways to get datalog via LoRaWAN

Set PNACKMD=1, DDS04-LB will wait for ACK for every uplink, when there is no LoRaWAN network,DDS04-LB will mark these records with non-ack messages and store sensor data, and it will send all messages (10s interval) after the network recovery.

- a) DDS04-LB will do an ACK check for data records sending to make sure every data arrive server.
- b) DDS04-LB will send data in **CONFIRMED Mode** when PNACKMD=1, but DDS04-LB won't re-transmit the packet if it doesn't get ACK, it will just mark it as a NO ACK message. In a future uplink if DDS04-LB gets a ACK, DDS04-LB will consider there is a network connection and resend all NONE-ACK messages.

Below is the typical case for the auto-update datalog feature (Set PNACKMD=1)



2.6.2 Unix TimeStamp

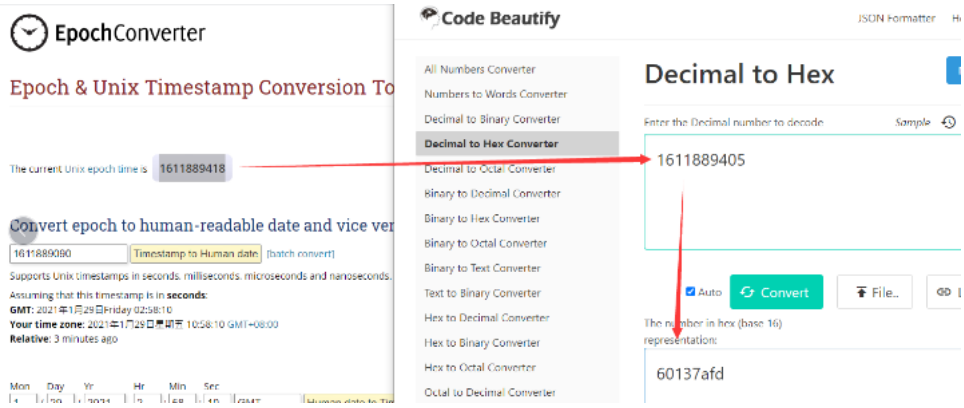
DDS04-LB uses Unix TimeStamp format based on

Size (bytes)	4	1
DeviceTimeAns Payload	32-bit unsigned integer : Seconds since epoch*	8bits unsigned integer: fractional-second in ½^8 second steps

Figure 10 : DeviceTimeAns payload format

User can get this time from link: https://www.epochconverter.com/ (https://www.epochconverter.com/) :

Below is the converter example



So, we can use AT+TIMESTAMP=1611889405 or downlink 3060137afd00 to set the current time 2021 – Jan -- 29 Friday 03:03:25

2.6.3 Set Device Time

User need to set **SYNCMOD=1** to enable sync time via MAC command.

Once DDS04-LB Joined LoRaWAN network, it will send the MAC command (DeviceTimeReq) and the server will reply with (DeviceTimeAns) to send the current time to DDS04-LB. If DDS04-LB fails to get the time from the server, DDS04-LB will use the internal time and wait for next time request (AT+SYNCTDC to set the time request pe default is 10 days).

Note: LoRaWAN Server need to support LoRaWAN v1.0.3(MAC v1.0.3) or higher to support this MAC command feature, Chirpstack,TTN V3 v3 and loriot suppo TTN V3 v2 doesn't support. If server doesn't support this command, it will through away uplink packet with this command, so user will lose the packet with tin request for TTN V3 v2 if SYNCMOD=1.

2.6.4 Poll sensor value

Users can poll sensor values based on timestamps. Below is the downlink command.

Downlink Command to poll Open/Close status (0x31)			
1byte	**4bytes**	**4bytes**	**1byte**

31	Timestamp start	Timestamp end	Uplink Interval

Timestamp start and Timestamp end-use Unix TimeStamp format as mentioned above. Devices will reply with all data logs during this period, using the uplink interval.

For example, downlink command 31 618E5740 618E8170 05

Is to check 2021/11/12 12:00:00 to 2021/11/12 15:00:00's data

Uplink Internal =5s，means DDS04-LB will send one packet every 5s. range 5~255s.

2.7 Frequency Plans

The DDS04-LB uses OTAA mode and below frequency plans by default. If user want to use it with different frequency plan, please refer the AT command sets.

http://wiki.dragino.com/xwiki/bin/view/Main/End%20Device%20Frequency%20Band/ (http://wiki.dragino.com/xwiki/bin/view/Main/End%20Device%20Frequency%20Band/

3. Configure DDS04-LB

3.1 Configure Methods

DDS04-LB supports below configure method:

- AT Command via Bluetooth Connection (**Recommended**): BLE Configure Instruction (http://wiki.dragino.com/xwiki/bin/view/Main/BLE%20Bluetooth%20Remote%20Configure/) .
- AT Command via UART Connection : See UART Connection (http://wiki.dragino.com/xwiki/bin/view/Main/UART%20Access%20for%20LoRa%20ST%20v4%20base%20model/#H2.3UARTConnectionforSN50v3basemotherboa
- LoRaWAN Downlink. Instruction for different platforms: See IoT LoRaWAN Server (http://wiki.dragino.com/xwiki/bin/view/Main/) section.

3.2 General Commands

These commands are to configure:

- General system settings like: uplink interval.
- LoRaWAN protocol & radio related command.

They are same for all Dragino Devices which support DLWS-005 LoRaWAN Stack. These commands can be found on the wiki:

http://wiki.dragino.com/xwiki/bin/view/Main/End%20Device%20AT%20Commands%20and%20Downlink%20Command/
(http://wiki.dragino.com/xwiki/bin/view/Main/End%20Device%20AT%20Commands%20and%20Downlink%20Command/)

3.3 Commands special design for DDS04-LB

These commands only valid for DDS04-LB, as below:

3.3.1 Set Transmit Interval Time

Feature: Change LoRaWAN End Node Transmit Interval.

AT Command: AT+TDC

Command Example	Function	Response
AT+TDC=?	Show current transmit Interval	30000 OK the interval is 30000ms = 30s
AT+TDC=60000	Set Transmit Interval	OK Set transmit interval to 60000ms = 60 seconds

Downlink Command: 0x01

Format: Command Code (0x01) followed by 3 bytes time value.

If the downlink payload=0100003C, it means set the END Node's Transmit Interval to 0x00003C=60(S), while type code is 01.

- Example 1: Downlink Payload: 0100001E // Set Transmit Interval (TDC) = 30 seconds
- Example 2: Downlink Payload: 0100003C // Set Transmit Interval (TDC) = 60 seconds

3.3.2 Set Interrupt Mode

Feature, Set Interrupt mode for pin of GPIO_EXTI.

When AT+INTMOD=0 is set, GPIO_EXTI is used as a digital input port.

AT Command: AT+INTMOD

Command Example	Function	Response
AT+INTMOD=?	Show current interrupt mode	0 OK the mode is 0 =Disable Interrupt
AT+INTMOD=2 (default)	Set Transmit Interval 0. (Disable Interrupt), 1. (Trigger by rising and falling edge) 2. (Trigger by falling edge) 3. (Trigger by rising edge)	OK

Downlink Command: 0x06

Format: Command Code (0x06) followed by 3 bytes.

This means that the interrupt mode of the end node is set to 0x000003=3 (rising edge trigger), and the type code is 06.

- Example 1: Downlink Payload: 06000000 // Turn off interrupt mode
- Example 2: Downlink Payload: 06000003 // Set the interrupt mode to rising edge trigger

3.3.3 Set Power Output Duration

Control the output duration 3V3 (pin of VBAT_OUT). Before each sampling, device will

1. first enable the power output to external sensor,

2. keep it on as per duration, read sensor value and construct uplink payload

3. final, close the power output.

AT Command: AT+3V3T

Command Example	Function	Response
AT+3V3T=?	Show 3V3 open time.	0 (default) OK
AT+3V3T=1000	Close after a delay of 1000 milliseconds.	OK
AT+3V3T=0	Always turn on the power supply of 3V3 pin.	OK
AT+3V3T=65535	Always turn off the power supply of 3V3 pin.	OK

Downlink Command: 0x07

Format: Command Code (0x07) followed by 3 bytes.

The first byte is 01,the second and third bytes are the time to turn on.

- Example 1: Downlink Payload: 07 01 00 00 **--->** AT+3V3T=0
- Example 2: Downlink Payload: 07 01 01 F4 **--->** AT+3V3T=500
- Example 3: Downlink Payload: 07 01 FF FF **--->** AT+3V3T=65535

3.3.4 Set enable or disable of the measurement channel

This command can be used when user connects **less than four distance sensors**. This command can turn off unused measurement channels to **save battery life**.

AT Command: AT+ENCHANNEL

Command Example	Function	Response
AT+ENCHANNEL=?	Get enabled channels.	1,1,1,1 (default) OK
AT+ENCHANNEL=1,1,1,0	Channel 4 disabled.	OK

AT+ENCHANNEL=1,1,0,0	Channel 3 and 4 disabled.	OK

Downlink Command: 0x08

Format: Command Code (0x08) followed by 4 bytes.

The first byte means the first channel, the second byte means the second channel, the third byte means the third channel, and the fourth byte means the fourth channel.A means enable channel, 0 means disable channel.

- Example 1: Downlink Payload: 08 01 01 01 01 **--->** AT+ENCHANNEL=1,1,1,1 //All channels are enabled
- Example 2: Downlink Payload: 08 01 01 01 00 **--->** AT+ENCHANNEL=1,1,1,0 //Channel 4 disabled
- Example 3: Downlink Payload: 08 01 01 00 00 **--->** AT+ENCHANNEL=1,1,0,0 //Channel 3 and 4 disabled

4. Battery & Power Consumption

DDS04-LB use ER26500 + SPC1520 battery pack. See below link for detail information about the battery info and how to replace.

Battery Info & Power Consumption Analyze
(http://wiki.dragino.com/xwiki/bin/view/Main/How%20to%20calculate%20the%20battery%20life%20of%20Dragino%20sensors%3F/) .

5. OTA Firmware update

User can change firmware DDS04-LB to:

- Change Frequency band/ region.
- Update with new features.
- Fix bugs.

Firmware and changelog can be downloaded from : **Firmware download link (https://www.dropbox.com/sh/z4y0v06hajv6omk/AAAgddLEpwawt9uLw6PR-_X1a?dl**

Methods to Update Firmware:

- (Recommanded way) OTA firmware update via wireless: **http://wiki.dragino.com/xwiki/bin/view/Main/Firmware%20OTA%20Update%20for%20Sensors/ (http://wiki.dragino.com/xwiki/bin/view/Main/Firmware%20OTA%20Update%20for%20Sensors/)**
- Update through UART TTL interface: **Instruction (http://wiki.dragino.com/xwiki/bin/view/Main/UART%20Access%20for%20LoRa%20ST%20v4%20base%20model/#H1.LoRaSTv4baseHardware)** .

6. FAQ

6.1 What is the frequency plan for DDS04-LB?

DDS04-LB use the same frequency as other Dragino products. User can see the detail from this link: Introduction (/xwiki/bin/view/Main/End%20Device%20Frequency%20Band/#H1.Introduction)

7. Trouble Shooting

7.1 Why I can't join TTN V3 in US915 / AU915 bands?

It is due to channel mapping. Please see below link: Frequency band (/xwiki/bin/view/Main/LoRaWAN%20Communication%20Debug/#H2.NoticeofUS9152FCN4702FAU915Frequencyband)

7.2 AT Command input doesn't work

In the case if user can see the console output but can't type input to the device. Please check if you already include the **ENTER** while sending out the command. Some se tool doesn't send **ENTER** while press the send key, user need to add ENTER in their string.

7.3 Why does the sensor reading show 0 or "No sensor"

1. The measurement object is very close to the sensor, but in the blind spot of the sensor.

2. Sensor wiring is disconnected

3. Not using the correct decoder

8. Order Info

8.1 Main Device DDS04-LB

Part Number **: DDS04-LB-XX**

XX: The default frequency band

- **AS923 :** LoRaWAN AS923 band
- **AU915 :** LoRaWAN AU915 band
- **EU433 :** LoRaWAN EU433 band
- **EU868 :** LoRaWAN EU868 band
- **KR920 :** LoRaWAN KR920 band
- **US915 :** LoRaWAN US915 band
- **IN865 :** LoRaWAN IN865 band
- **CN470 :** LoRaWAN CN470 band

8.2 Probe Model

Detail See Probe Option Section

- A01A-15
- A02-15
- A13-15
- A16-15

9. Packing Info

Package Includes:

- DDS04-LB LoRaWAN 4-Channels Distance Detection Sensor x 1

Dimension and weight:

- Device Size: cm
- Device Weight: g
- Package Size / pcs : cm
- Weight / pcs : g

10. Support

- Support is provided Monday to Friday, from 09:00 to 18:00 GMT+8. Due to different timezones we cannot offer live support. However, your questions will be answer soon as possible in the before-mentioned schedule.
- Provide as much information as possible regarding your enquiry (product models, accurately describe your problem and steps to replicate it etc) and send a mail to Support@dragino.cc (mailto:Support@dragino.cc) .

0 Tags: Created by Xiaoling (/xwiki/bin/view/XWiki/Xiaoling) on 2023/07/02 10:40

No comments for this page