PB01 -- LoRaWAN Button User Manual

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on 2024/07/05 09:53

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1. Introduction

1.1 What is PB01 LoRaWAN Push Button

PB01 LoRaWAN Button is a LoRaWAN wireless device with one **push button**. Once user push the button, PB01 will transfer the signal to IoT server via Long Range LoRaWAN wireless protocol. PB01 also senses the **environment temperature & humidity** and will also uplink these data to IoT Server.

PB01 supports **2 x AAA batteries** and works for a long time up to several years*. User can replace the batteries easily after they are finished.

PB01 has a built-in speaker, it can pronouns different sound when press button and get reply from server. The speaker can by disable if user want it.

PB01 is fully compatible with LoRaWAN v1.0.3 protocol, it can work with standard LoRaWAN gateway.

*Battery life depends how often to send data, please see battery analyzer.

1.2 Features

- Wall Attachable.
- LoRaWAN v1.0.3 Class A protocol.
- 1 x push button. Different Color available.
- Built-in Temperature & Humidity sensor
- Built-in speaker
- Frequency Bands: CN470/EU433/KR920/US915/EU868/AS923/AU915
- AT Commands to change parameters
- Remote configure parameters via LoRaWAN Downlink
- Firmware upgradable via program port
- Support 2 x AAA LR03 batteries.
- IP Rating: IP52

1.3 Specification

Built-in Temperature Sensor:

- Resolution: 0.01 °C
- Accuracy Tolerance: Typ ±0.2 °C
- Long Term Drift: < 0.03 °C/yr

- Operating Range: -10 ~ 50 °C or -40 ~ 60 °C (depends on battery type, see FAQ)

Built-in Humidity Sensor:

- Resolution: 0.01 %RH
- Accuracy Tolerance: Typ ±1.8 %RH
- Long Term Drift: < 0.2% RH/yr
- Operating Range: 0 ~ 99.0 %RH(no Dew)

1.4 Power Consumption

PB01 : Idle: 5uA, Transmit: max 110mA

1.5 Storage & Operation Temperature

-10 ~ 50 °C or -40 ~ 60 °C (depends on battery type, see FAQ)

1.6 Applications

- Smart Buildings & Home Automation
- Logistics and Supply Chain Management
- Smart Metering
- Smart Agriculture
- Smart Cities
- Smart Factory

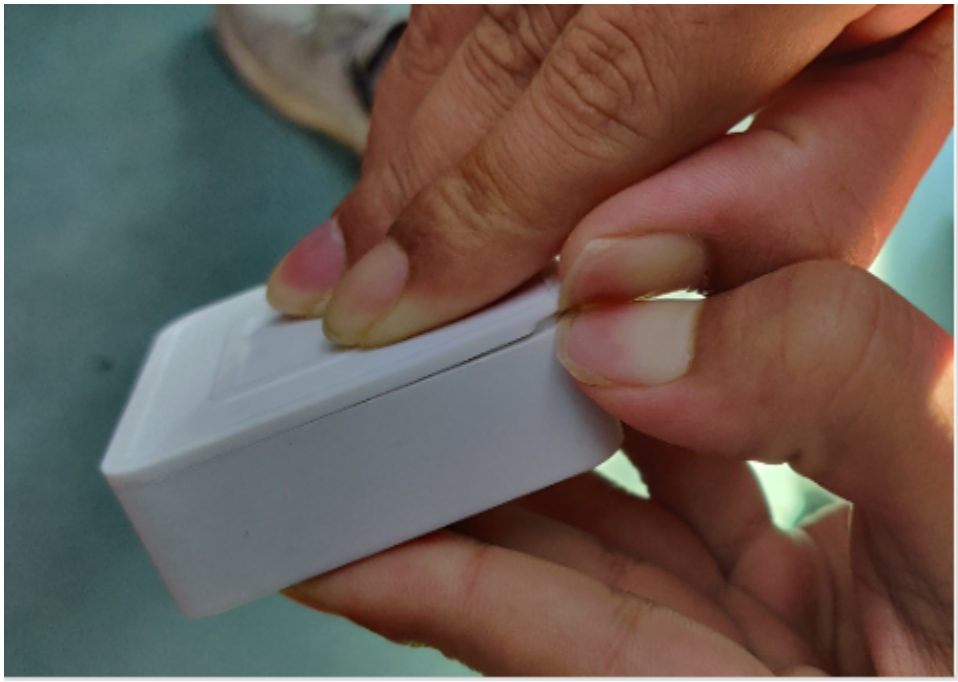
2. Operation Mode

2.1 How it work?

Each PB01 is shipped with a worldwide unique set of LoRaWAN OTAA keys. To use PB01 in a LoRaWAN network, user needs to input the OTAA keys in LoRaWAN network server. After this, if PB01 is under this LoRaWAN network coverage, PB01 can join the LoRaWAN network and start to transmit sensor data. The default period for each uplink is **20 minutes**.

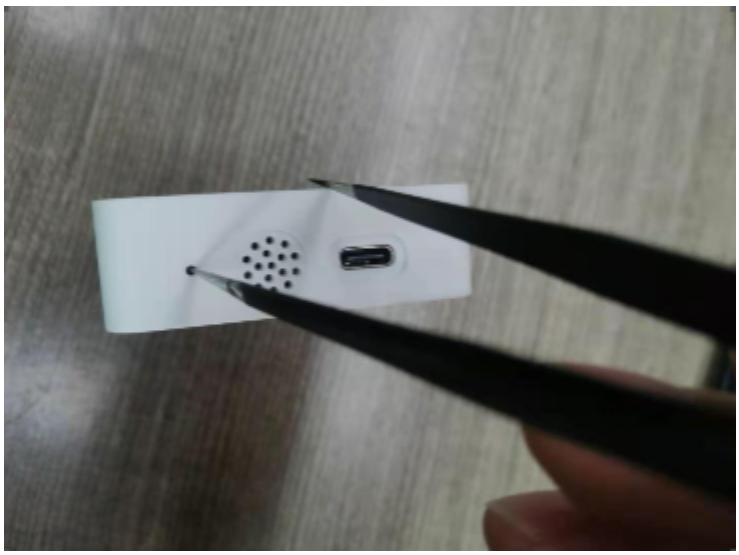
2.2 How to Activate PB01?

1. **Open enclosure from below position.**



2. Insert 2 x AAA LR03 batteries and the node is activated.

3. Under the above conditions, users can also reactivate the node by long pressing the ACT button.

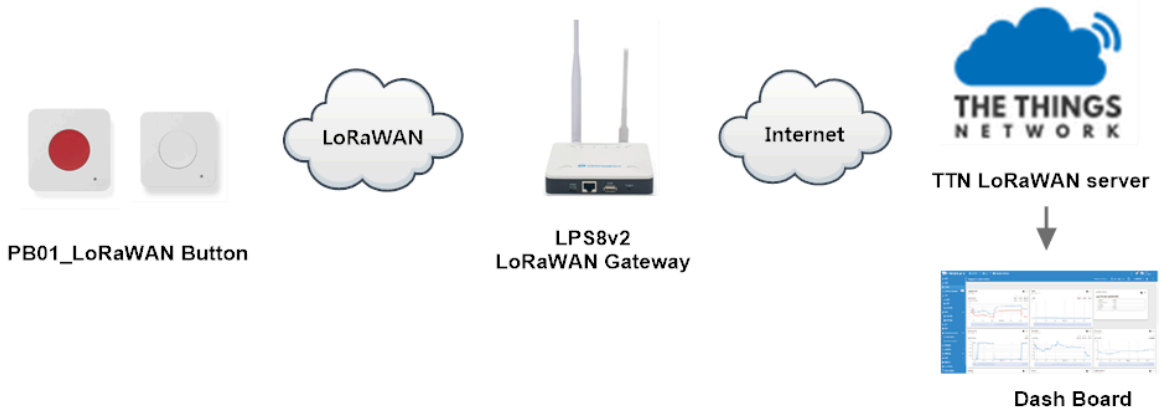


User can check LED Status to know the working state of PB01.

2.3 Example to join LoRaWAN network

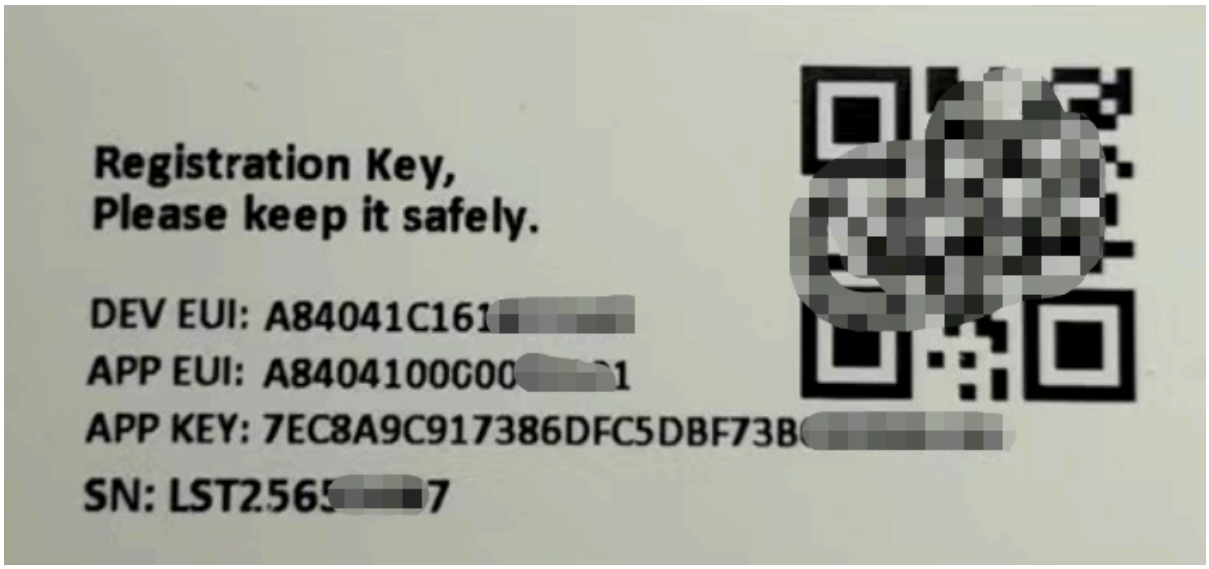
This section shows an example for how to join the TheThingsNetwork LoRaWAN IoT server. Usages with other LoRaWAN IoT servers are of similar procedure.

Assume the LPS8v2 is already set to connect to TTN V3 network . We need to add the PB01 device in TTN V3 portal.



Step 1: Create a device in TTN V3 with the OTAA keys from PB01.

Each PB01 is shipped with a sticker with the default DEV EUI as below:

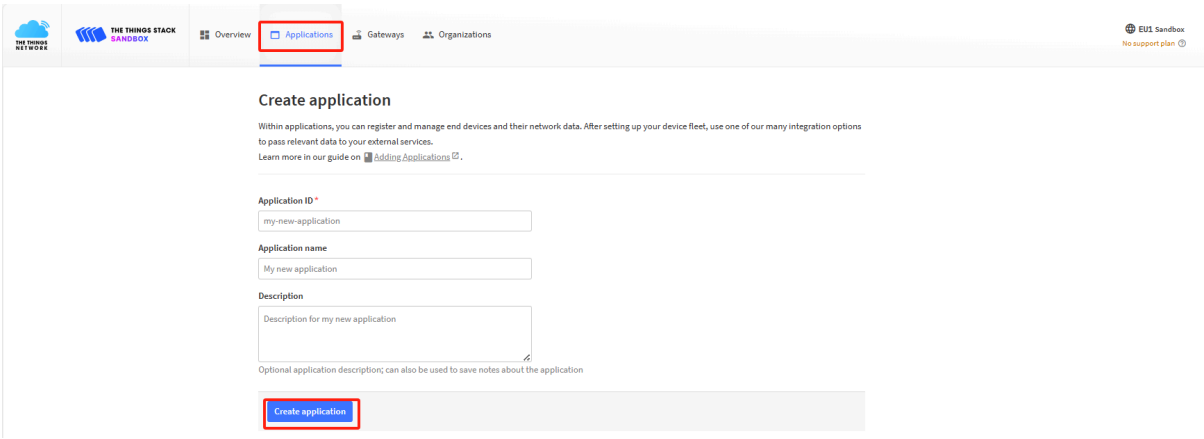


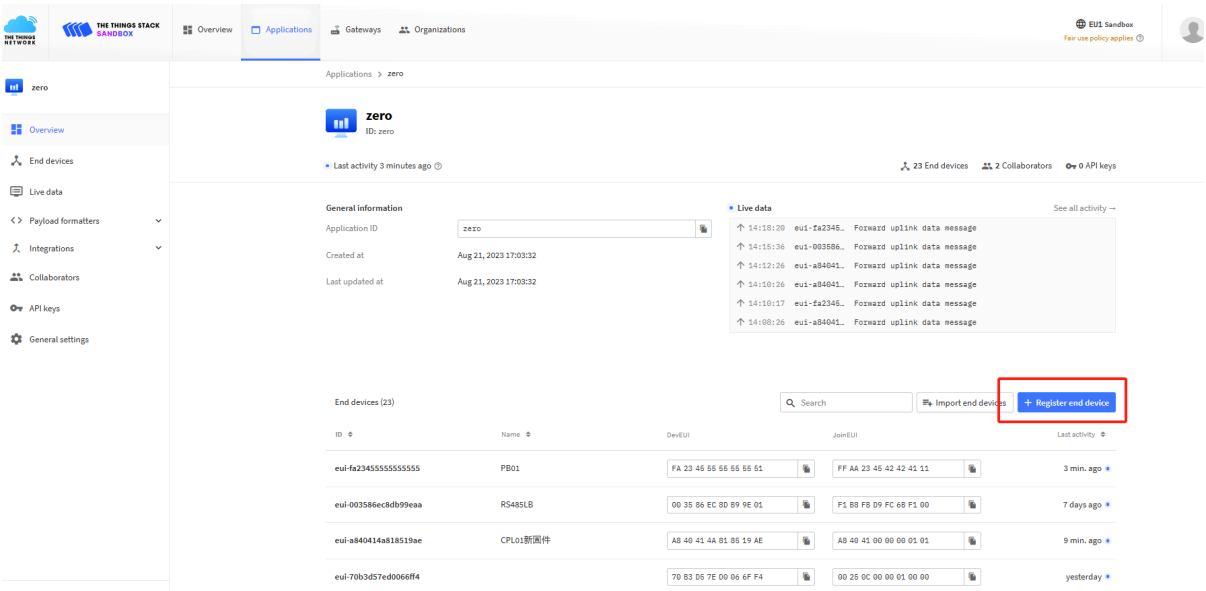
Enter these keys in the LoRaWAN Server portal. Below is TTN V3 screen shot:

Create application.

choose to create the device manually.

Add JoinEUI(AppEUI), DevEUI, AppKey.


THE THINGS NETWORK
THE THINGS STACK SANDBOX
Overview
Applications
Gateways
Organizations
EU1 Sandbox
No support plan
Create application
Within applications, you can register and manage end devices and their network data. After setting up your device fleet, use one of our many integration options to pass relevant data to your 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
Create application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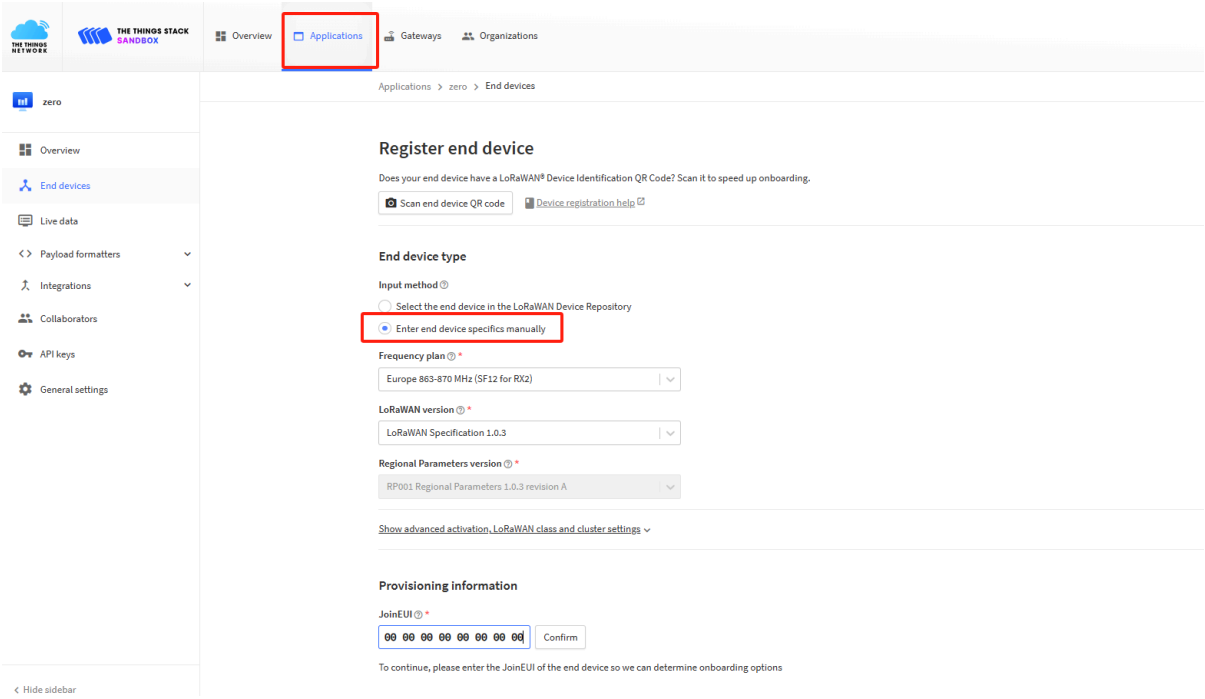
General settings
Applications > zero
zero
ID: zero
Last activity 3 minutes ago
23 End devices
2 Collaborators
0 API keys
General information
Application ID
zero
Created at
Aug 21, 2023 17:03:32
Last updated at
Aug 21, 2023 17:03:32
Live data
See all activity →
14:18:20 eui-fa2345.. Forward uplink data message
14:15:36 eui-003586.. Forward uplink data message
14:12:26 eui-a84041.. Forward uplink data message
14:10:26 eui-a84041.. Forward uplink data message
14:10:17 eui-fa2345.. Forward uplink data message
14:08:26 eui-a84041.. Forward uplink data message
End devices (23)
Search
Import end devices
Register end device
ID
Name
DevEUI
JoinEUI
Last activity
eui-fa23455555555555 PB01 FA 23 45 55 55 55 55 51 FF AA 23 45 42 42 41 11 3 min. ago
eui-003586ec8db99eaa RS485LB 00 35 86 EC 8D B9 9E 01 F1 B8 F8 D9 FC 6B F1 00 7 days ago
eui-a840414a818519ae CPL01新固件 A8 40 41 4A 81 85 19 AE A8 40 41 00 00 00 01 01 9 min. ago
eui-70b3d57ed0066ff4 70 B3 D5 7E D0 06 6F F4 00 25 0C 00 00 01 00 00 yesterday


THE THINGS NETWORK
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Overview
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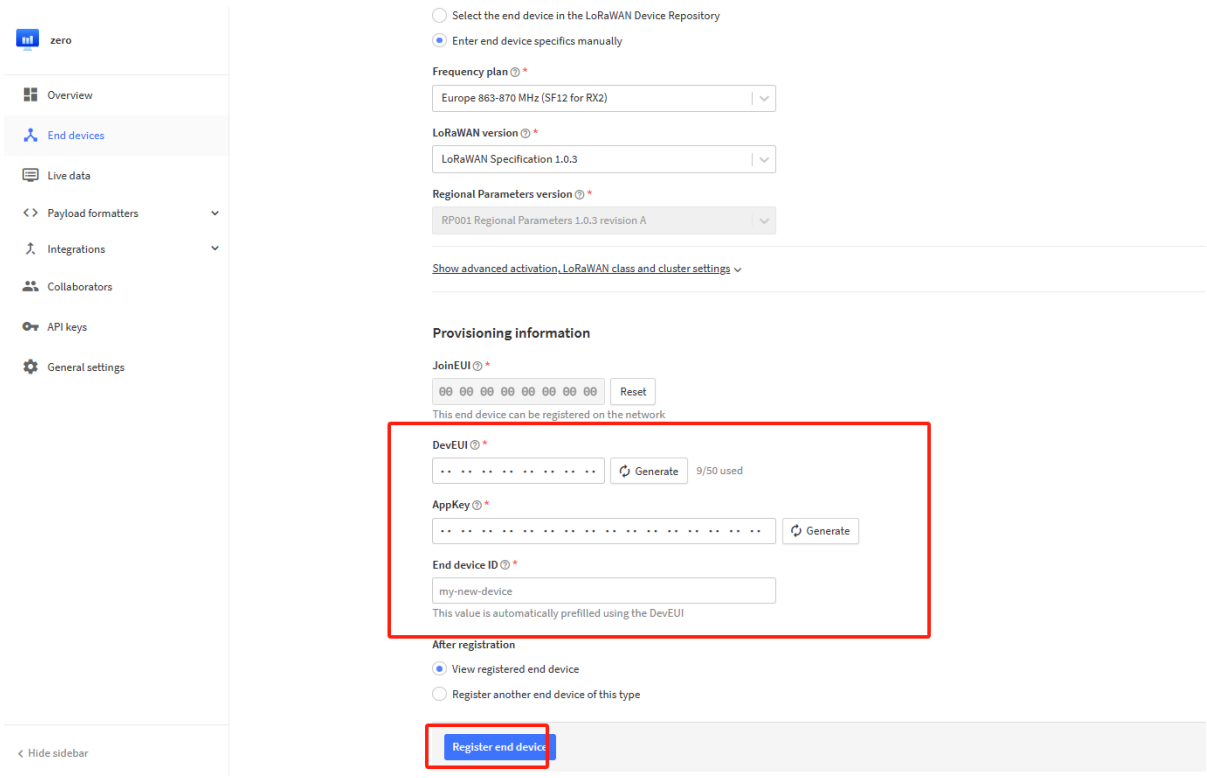
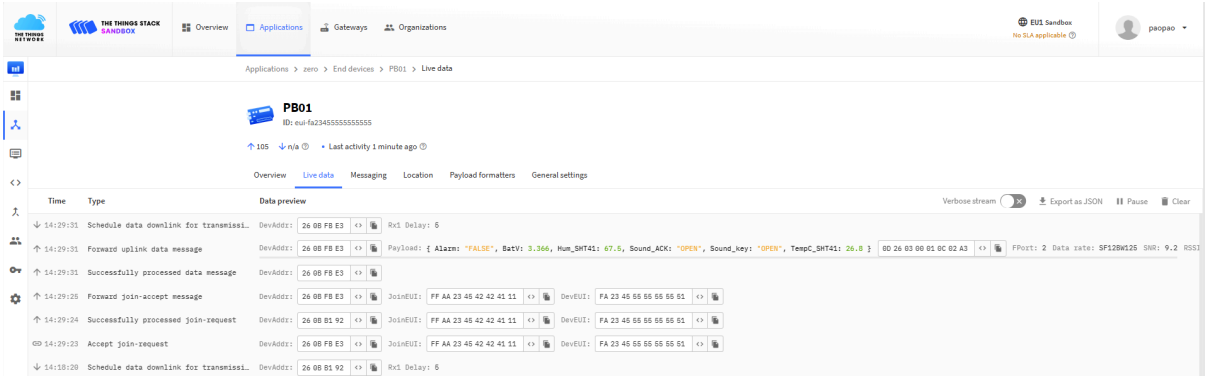
General settings
Hide sidebar
Applications > zero > End devices
Register end device
Does your end device have a LoRaWAN® Device Identification QR Code? Scan it to speed up onboarding.
Scan end device QR code
Device registration help
End device type
Input method
Select the end device in the LoRaWAN Device Repository
Enter end device specifics manually
Frequency plan *
Europe 863-870 MHz (SF12 for RX2)
LoRaWAN version *
LoRaWAN Specification 1.0.3
Regional Parameters version *
RP001 Regional Parameters 1.0.3 revision A
Show advanced activation, LoRaWAN class and cluster settings
Provisioning information
JoinEUI *
00 00 00 00 00 00 00 00
Confirm
To continue, please enter the JoinEUI of the end device so we can determine onboarding options



Default mode OTAA

Step 2: Use ACT button to activate PB01 and it will auto join to the TTN V3 network. After join success, it will start to upload sensor data to TTN V3 and user can see in the panel.



2.4 Uplink Payload

Uplink payloads include two types: Valid Sensor Value and other status / control command.

- Valid Sensor Value: Use FPORT=2
- Other control command: Use FPORT other than 2.

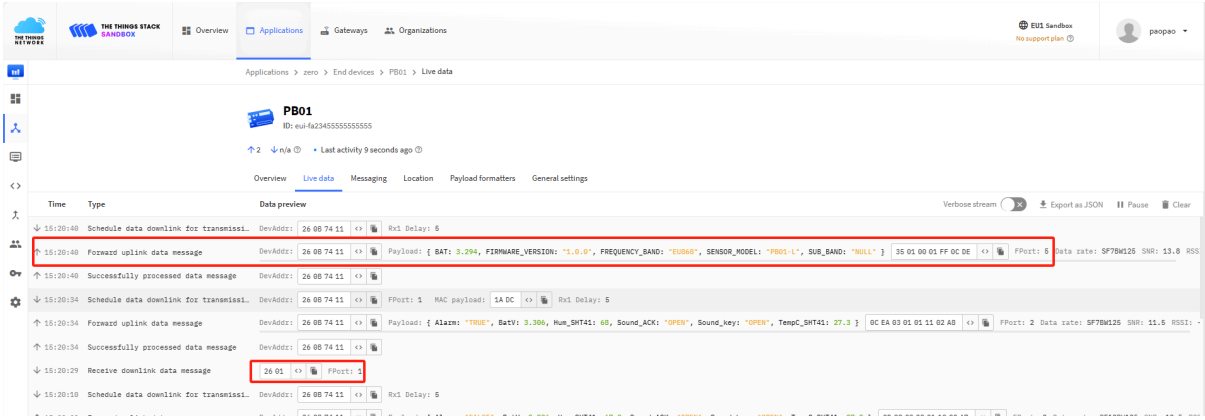
2.4.1 Uplink FPORT=5, Device Status

Users can get the Device Status uplink through the downlink command:

Downlink: 0x2601

Uplink the device configures with FPORT=5.

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



Example Payload (FPort=5): 35 01 00 01 FF 0C DE

Sensor Model: For PB01, this value is 0x35.

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

Sub-Band: value 0x00 ~ 0x08(only for CN470, AU915,US915. Others are0x00)

BAT: shows the battery voltage for PB01.

Ex1: 0x0C DE = 3294mV

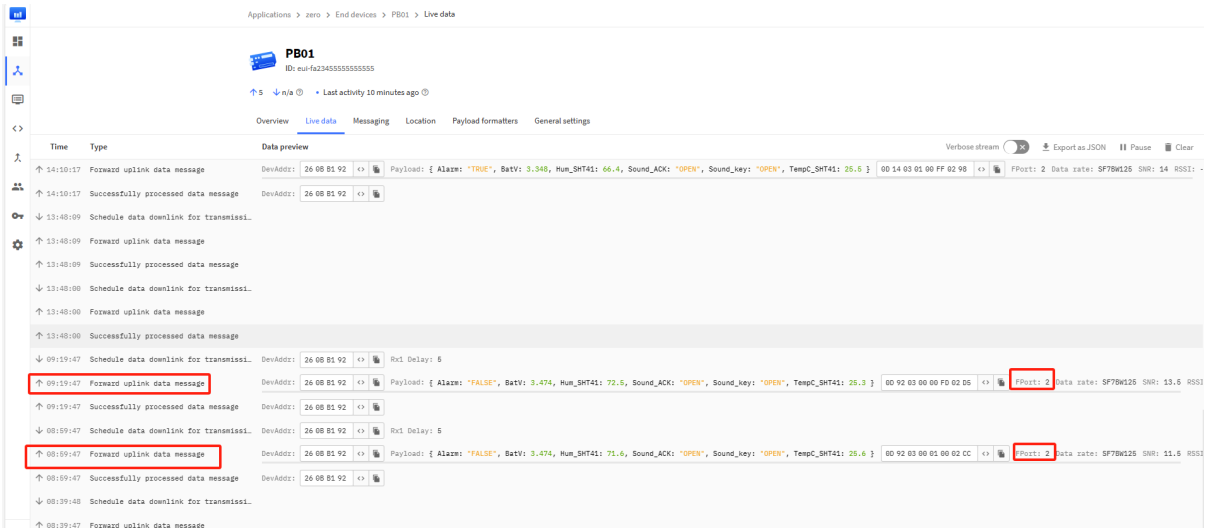
2.4.2 Uplink FPORT=2, Real time sensor value

PB01 will send this uplink after Device Status uplink once join LoRaWAN network successfully. And it will periodically send this uplink. Default interval is 20 minutes and can be changed.

Uplink uses FPORT=2 and every 20 minutes send one uplink by default.

Size(bytes)	2	1	1	2	2
Value	Battery	Sound_ACK &Sound_key	Alarm	Temperature	Humidity

Example in TTN.



Example Payload (FPort=2): **0C EA 03 01 01 11 02 A8**

Battery:

Check the battery voltage.

- Ex1: 0x0CEA = 3306mV
- Ex2: 0x0D08 = 3336mV

Sound_ACK & Sound_key:

Key sound and ACK sound are enabled by default.

- Example1: 0x03

  Sound_ACK: (03>>1) & 0x01=1, OPEN.

  Sound_key: 03 & 0x01=1, OPEN.

- Example2: 0x01

  Sound_ACK: (01>>1) & 0x01=0, CLOSE.

  Sound_key: 01 & 0x01=1, OPEN.

Alarm:

Key alarm.

- Ex1: 0x01 & 0x01=1, TRUE.
- Ex2: 0x00 & 0x01=0, FALSE.

Temperature:

- Example1: 0x0111/10=27.3℃
- Example2: (0xFF0D-65536)/10=-24.3℃

If payload is: FF0D : (FF0D & 8000 == 1) , temp = (FF0D - 65536)/100 =-24.3℃

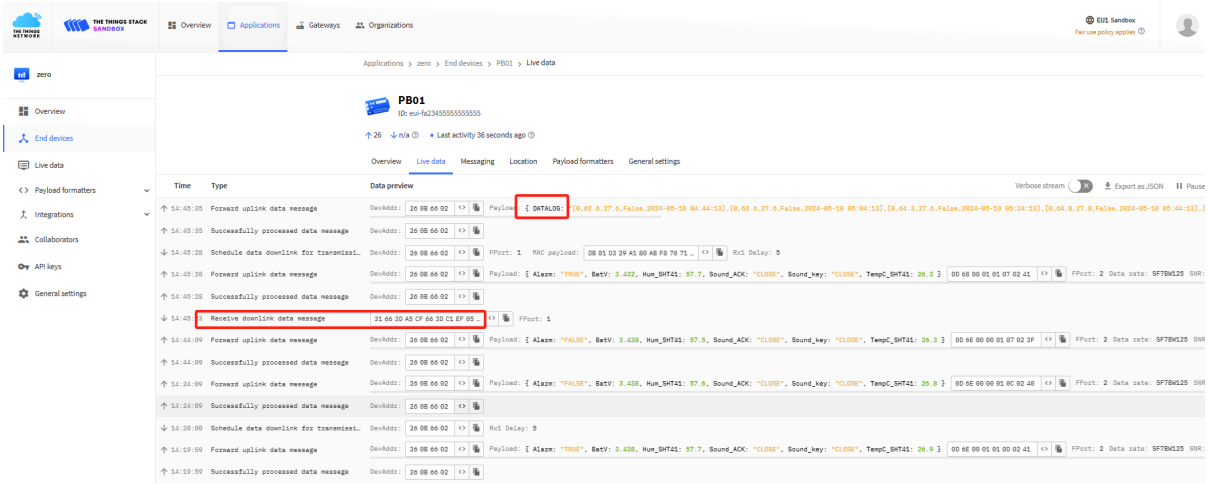
(FF0D & 8000: Judge whether the highest bit is 1, when the highest bit is 1, it is negative)

Humidity:

- Humidity: 0x02A8/10=68.0%

2.4.3 Uplink FPORT=3, Datalog sensor value

PB01 stores sensor value and user can retrieve these history value via downlink command. The Datalog sensor value are sent via FPORT=3.



- Each data entry is 11 bytes, to save airtime and battery, PB01 will send max bytes according to the current DR and Frequency bands.

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

1. **DR0**: max is 11 bytes so one entry of data
2. **DR1**: max is 53 bytes so devices will upload 4 entries of data (total 44 bytes)
3. **DR2**: total payload includes 11 entries of data
4. **DR3**: total payload includes 22 entries of data.

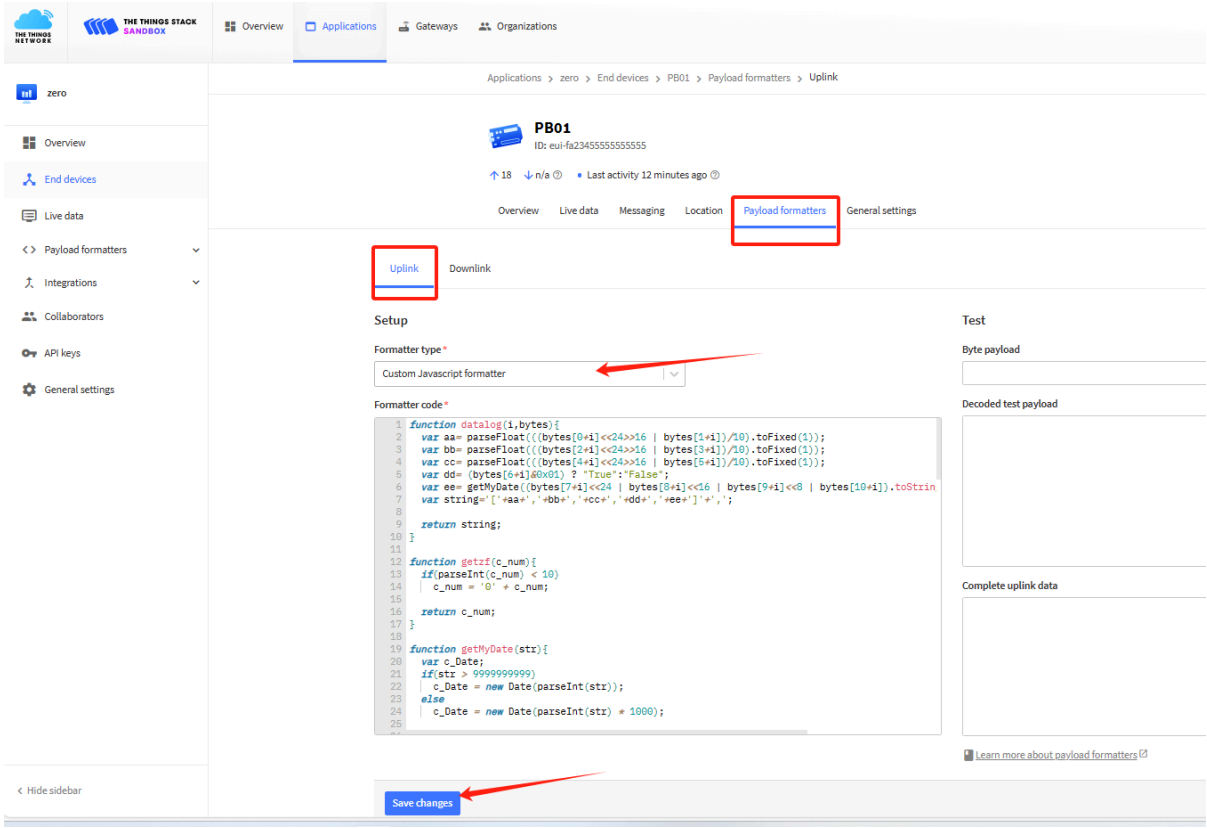
Notice: PB01 will save 178 set of history data, If device doesn't have any data in the polling time. Device will uplink 11 bytes of 0.

See more info about the Datalog feature.

2.4.4 Decoder in TTN V3

In LoRaWAN protocol, the uplink payload is HEX format, user need to add a payload formatter/decoder in LoRaWAN Server to get human friendly string.

In TTN , add formatter as below:



Please check the decoder from this link: https://github.com/dragino/dragino-end-node-decoder

2.5 Show data on Datacake

Datacake IoT platform provides a human friendly interface to show the sensor data in charts, once we have sensor data in TTN V3, we can use Datacake to connect to TTN V3 and see the data in Datacake. Below are the steps:

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

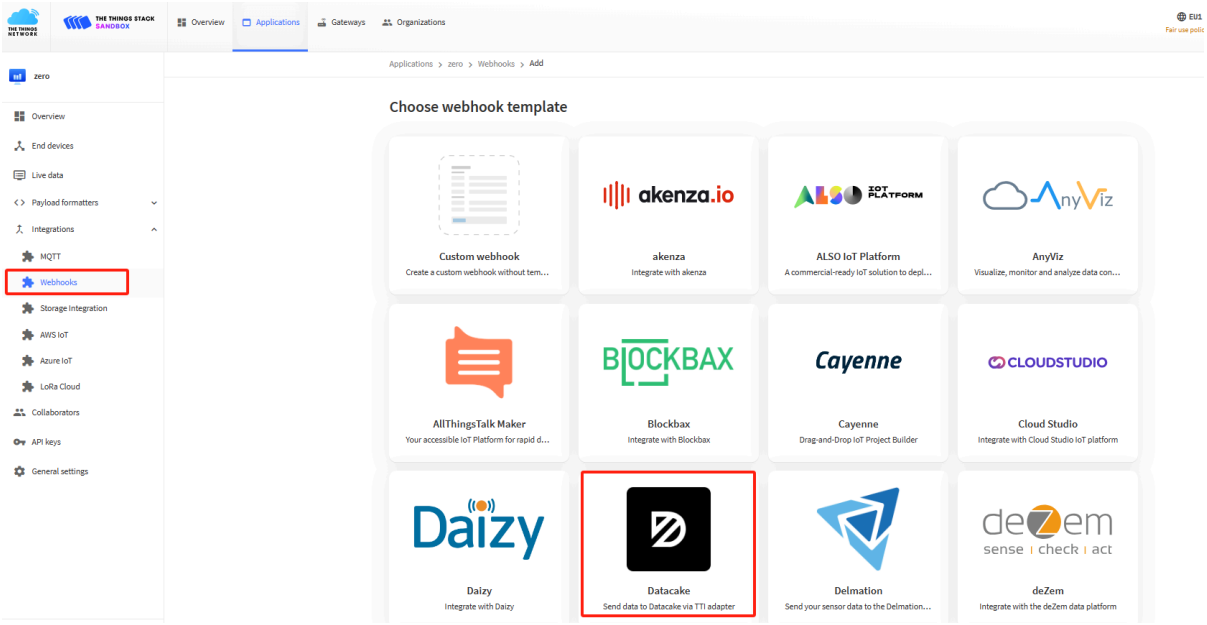
Step 2: Configure your Application to forward data to Datacake you will need to add integration. Go to TTN V3 Console --> Applications --> Integrations --> Add Integrations.

1. Add Datacake:

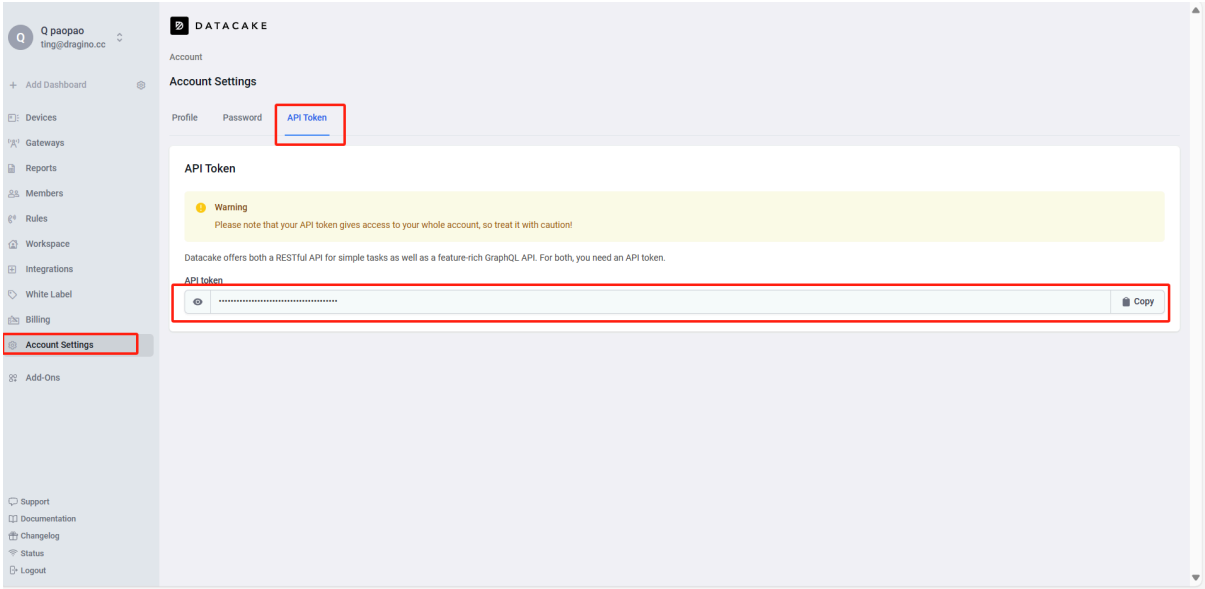
2. Select default key as Access Key:

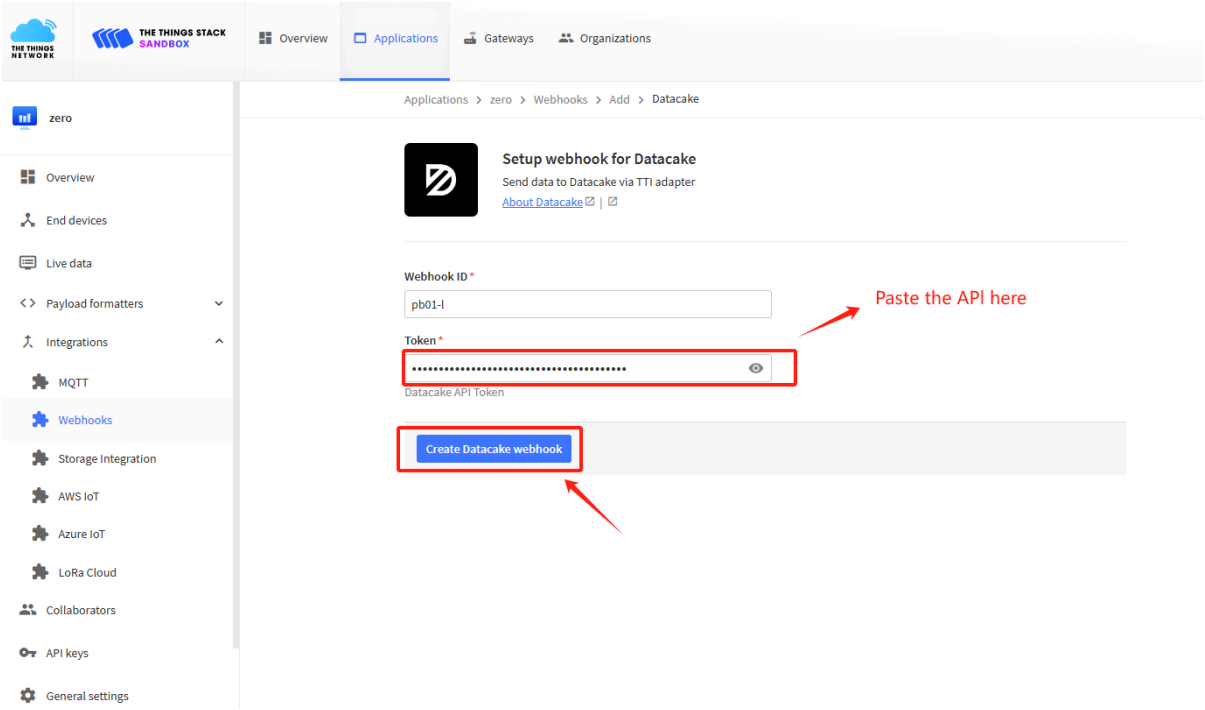
3. In Datacake console (https://datacake.co/) , add PB01:

Please refer to the figure below.



Log in to DATACAKE, copy the API under the account.


Q paopao
ting@dragino.cc
Add Dashboard
Devices
Gateways
Reports
Members
Rules
Workspace
Integrations
White Label
Billing
Account Settings
Add-Ons
Support
Documentation
Changelog
Status
Logout
DATACAKE
Account
Account Settings
Profile
Password
API Token
API Token
Warning
Please note that your API token gives access to your whole account, so treat it with caution!
Datacake offers both a RESTful API for simple tasks as well as a feature-rich GraphQL API. For both, you need an API token.
API token
Copy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LoRa Cloud
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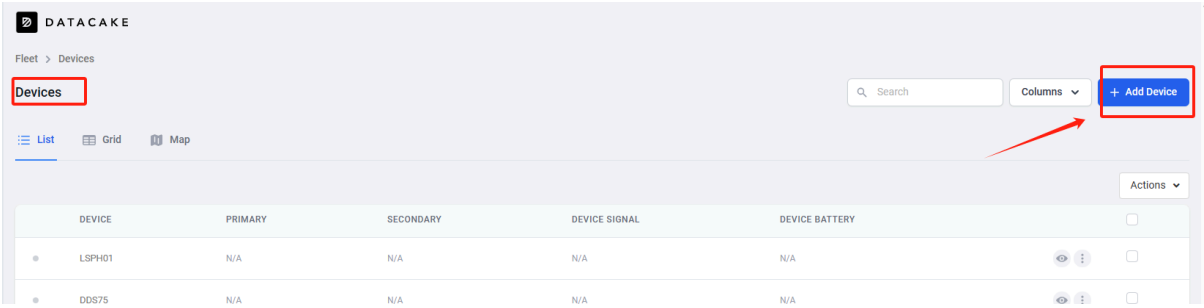
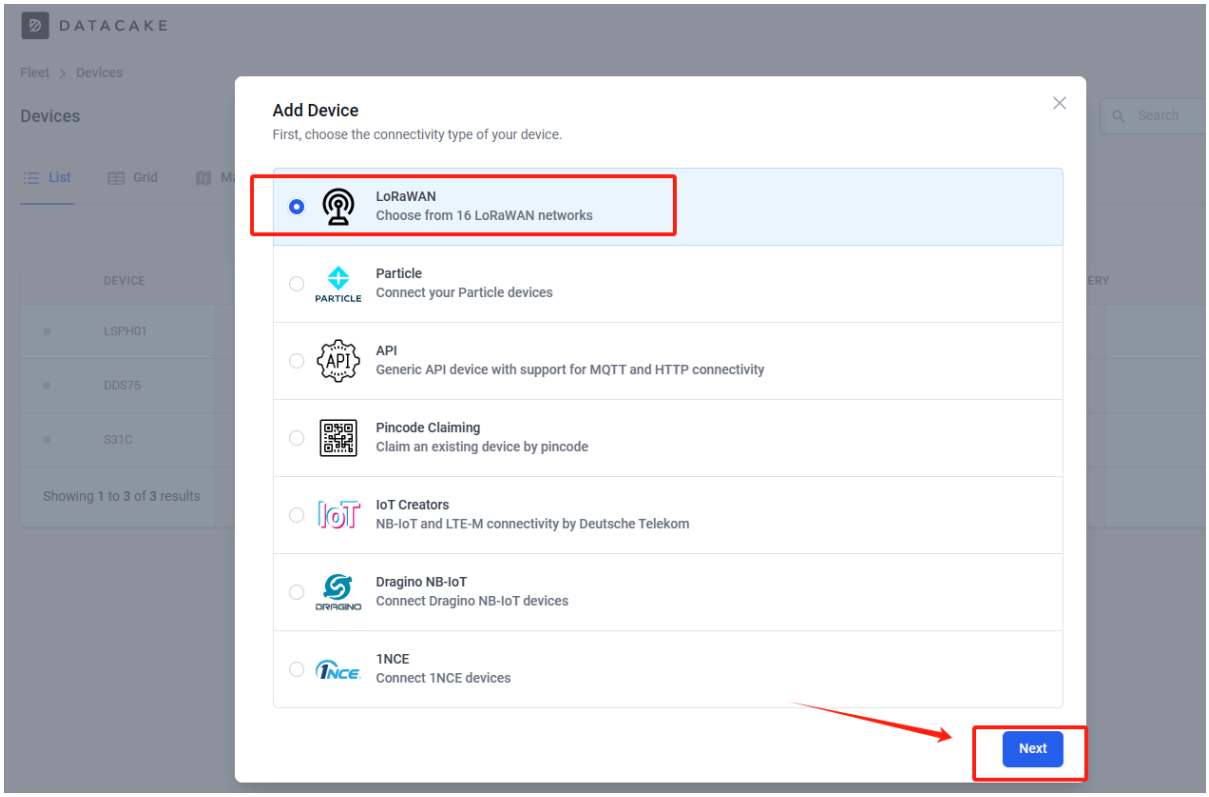
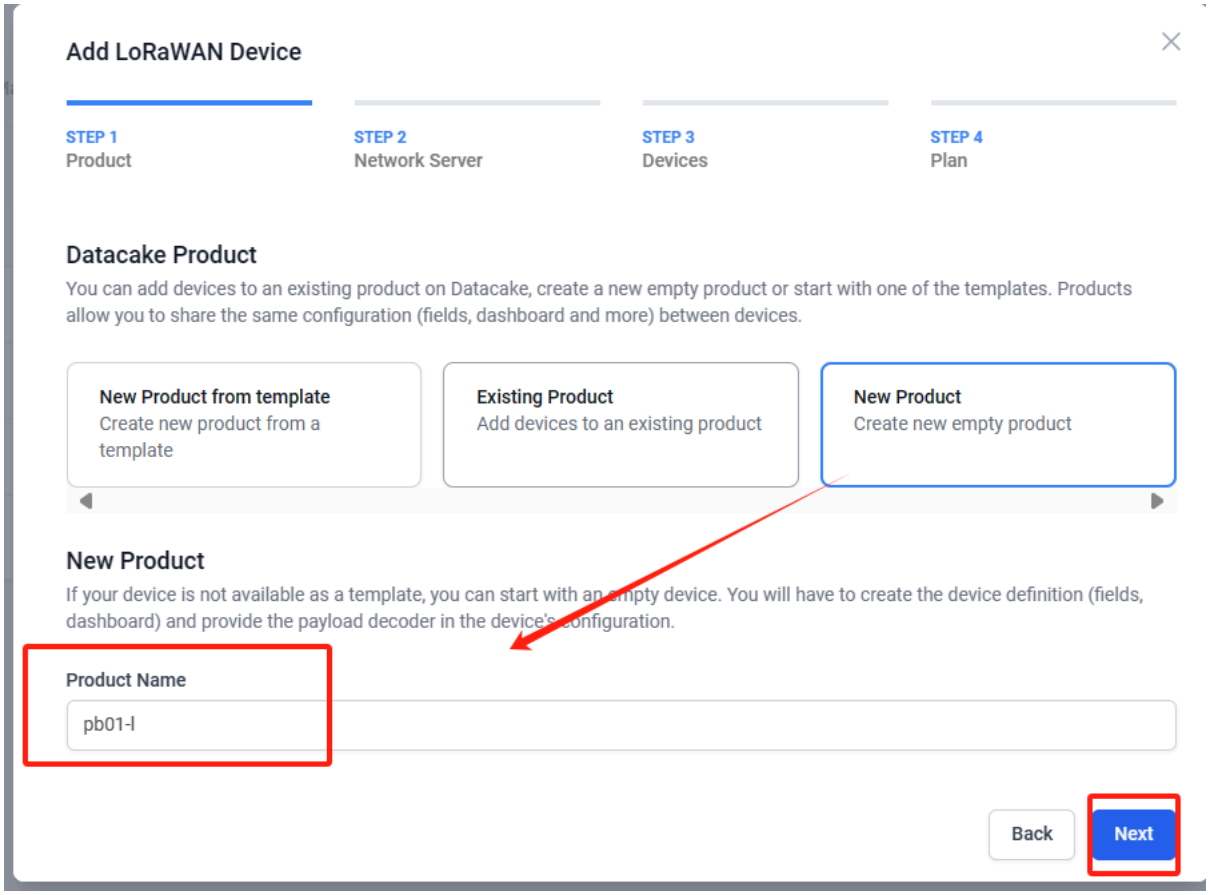
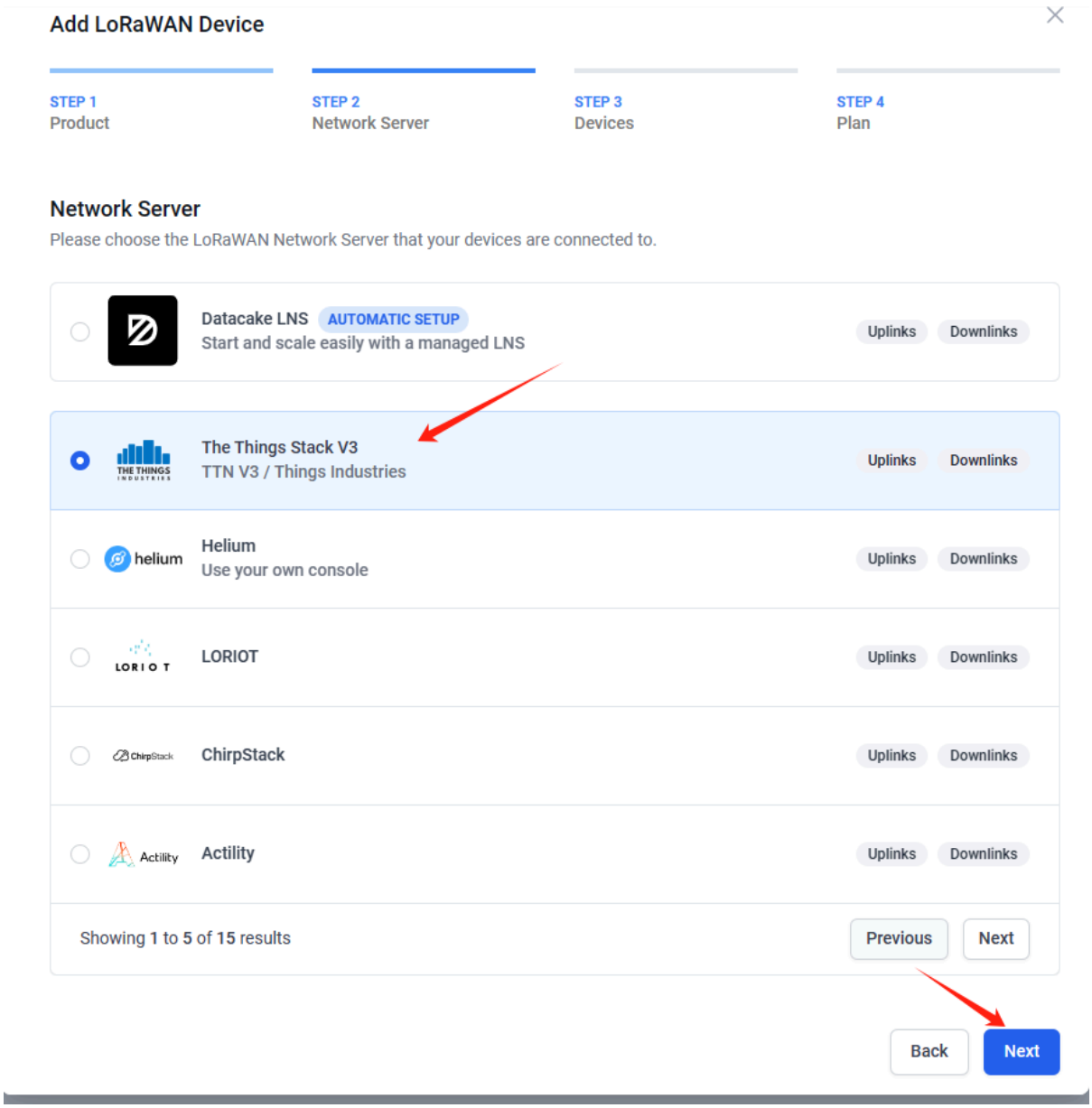
General settings
Applications > zero > Webhooks > Add > Datacake
Setup webhook for Datacake
Send data to Datacake via TTI adapter
About Datacake
Webhook ID *
pb01-l
Token *
Datacake API Token
Paste the API here
Create Datacake webhook


DATACAKE
Fleet > Devices
Devices
Search
Columns
+ Add Device
List
Grid
Map
Actions
DEVICE
PRIMARY
SECONDARY
DEVICE SIGNAL
DEVICE BATTERY
LSPH01
N/A
N/A
N/A
N/A
DDS75
N/A
N/A
N/A
N/A


DATACAKE
Fleet > Devices
Devices
List
Grid
DEVICE
LSPH01
DDS75
S31C
Showing 1 to 3 of 3 results
Search
Add Device
First, choose the connectivity type of your device.
LoRaWAN
Choose from 16 LoRaWAN networks
Particle
Connect your Particle devices
API
Generic API device with support for MQTT and HTTP connectivity
Pincode Claiming
Claim an existing device by pincode
IoT Creators
NB-IoT and LTE-M connectivity by Deutsche Telekom
Dragino NB-IoT
Connect Dragino NB-IoT devices
1NCE
Connect 1NCE devices
Next


Add LoRaWAN Device
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Datacake Product
You can add devices to an existing product on Datacake, create a new empty product or start with one of the templates. Products allow you to share the same configuration (fields, dashboard and more) between devices.
New Product from template
Create new product from a template
Existing Product
Add devices to an existing product
New Product
Create new empty product
New Product
If your device is not available as a template, you can start with an empty device. You will have to create the device definition (fields, dashboard) and provide the payload decoder in the device's configuration.
Product Name
pb01-l
Back
Next


Add LoRaWAN Device
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.
Datacake LNS
AUTOMATIC SETUP
Start and scale easily with a managed LNS
Uplinks
Downlinks
The Things Stack V3
TTN V3 / Things Industries
Uplinks
Downlinks
helium
Helium
Use your own console
Uplinks
Downlinks
LORIOT
LORIOT
Uplinks
Downlinks
ChirpStack
ChirpStack
Uplinks
Downlinks
Actility
Actility
Uplinks
Downlinks
Showing 1 to 5 of 15 results
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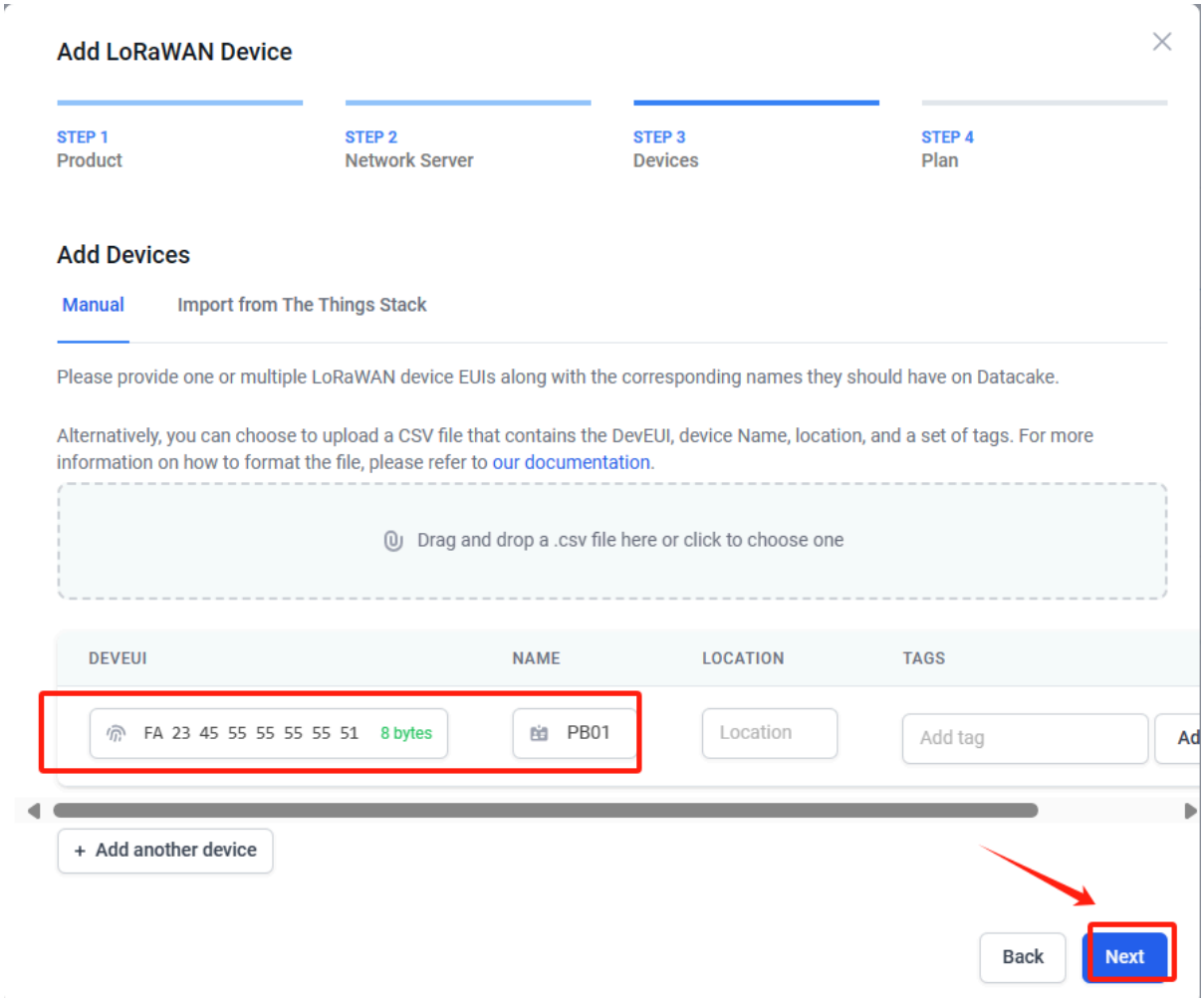
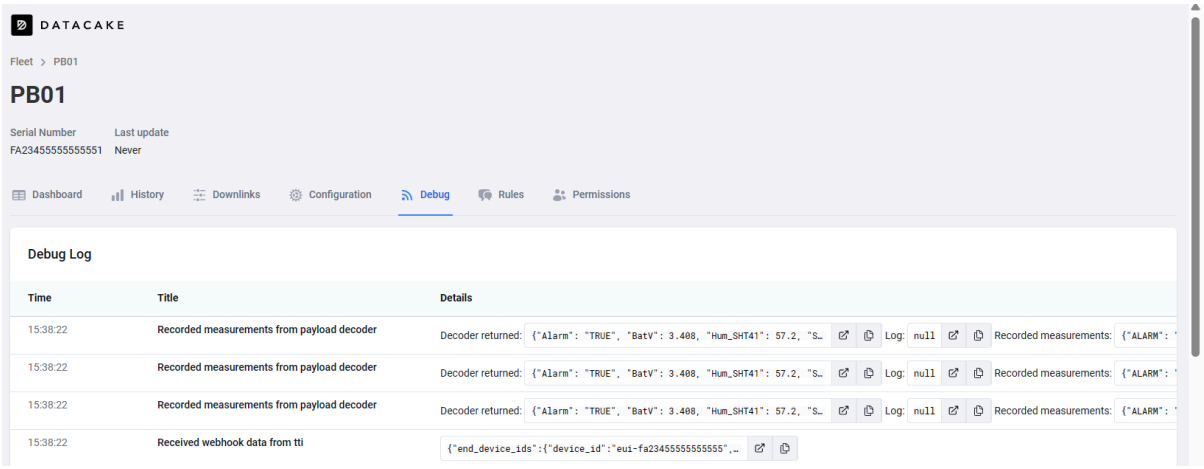
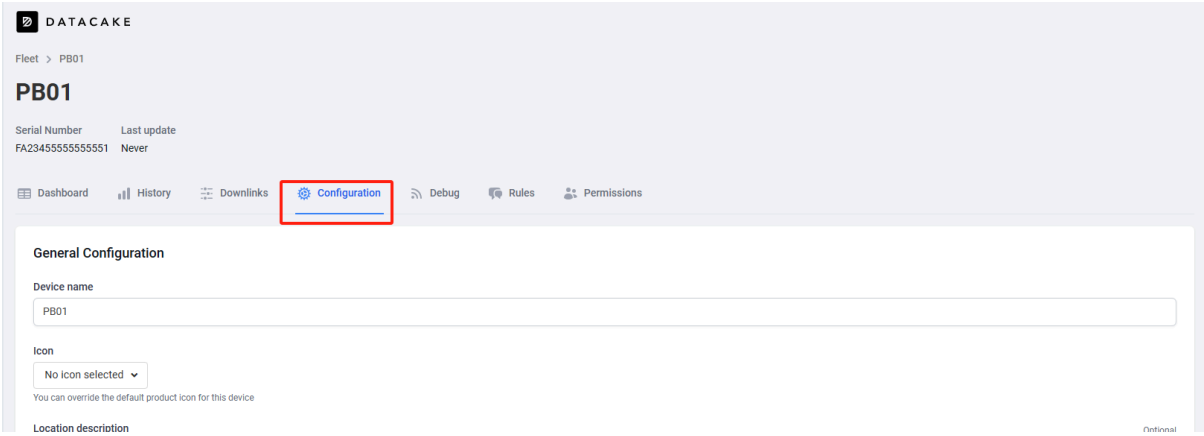
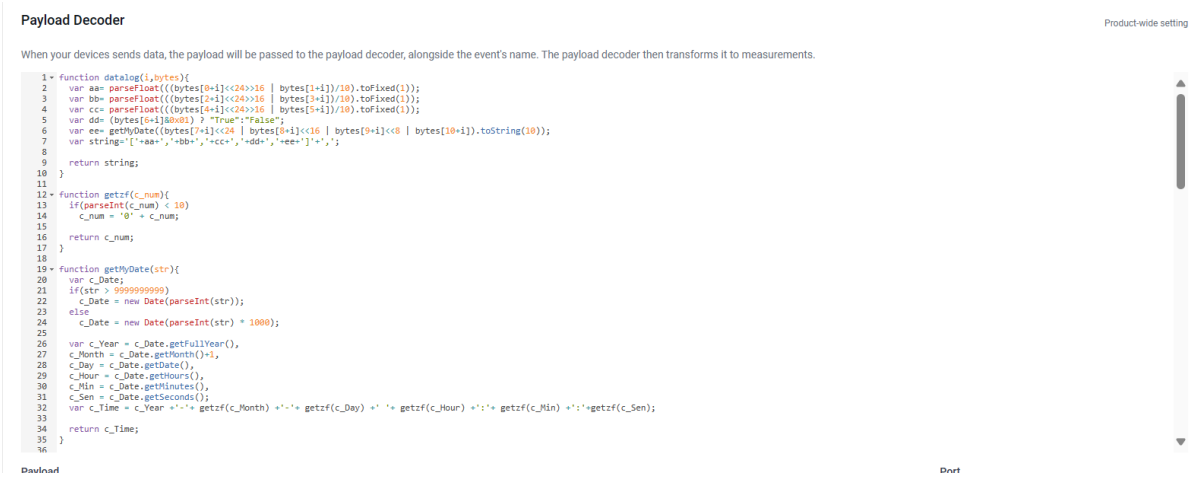
Next
Back
Next


Add LoRaWAN Device
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Add Devices
Manual
Import from The Things Stack
Please provide one or multiple LoRaWAN device EUIs along with the corresponding names they should have on Datacake.
Alternatively, you can choose to upload a CSV file that contains the DevEUI, device Name, location, and a set of tags. For more information on how to format the file, please refer to our documentation.
Drag and drop a .csv file here or click to choose one
DEVEUI
NAME
LOCATION
TAGS
FA 23 45 55 55 55 55 51
8 bytes
PB01
Location
Add tag
+ Add another device
Back
Next


DATACAKE
Fleet > PB01
PB01
Serial Number
FA23455555555551
Last update
Never
Dashboard
History
Downlinks
Configuration
Debug
Rules
Permissions
Debug Log
Time
Title
Details
15:38:22
Recorded measurements from payload decoder
Decoder returned:
Log:
null
Recorded measurements:
15:38:22
Recorded measurements from payload decoder
Decoder returned:
Log:
null
Recorded measurements:
15:38:22
Recorded measurements from payload decoder
Decoder returned:
Log:
null
Recorded measurements:
15:38:22
Received webhook data from tti



Copy and paste the TTN decoder here and save.



Visual widgets please read the DATACAKE documentation.

2.6 Datalog Feature

When user want to retrieve sensor value, he can send a poll command from the IoT platform to ask sensor to send value in the required time slot.

2.6.1 Unix TimeStamp

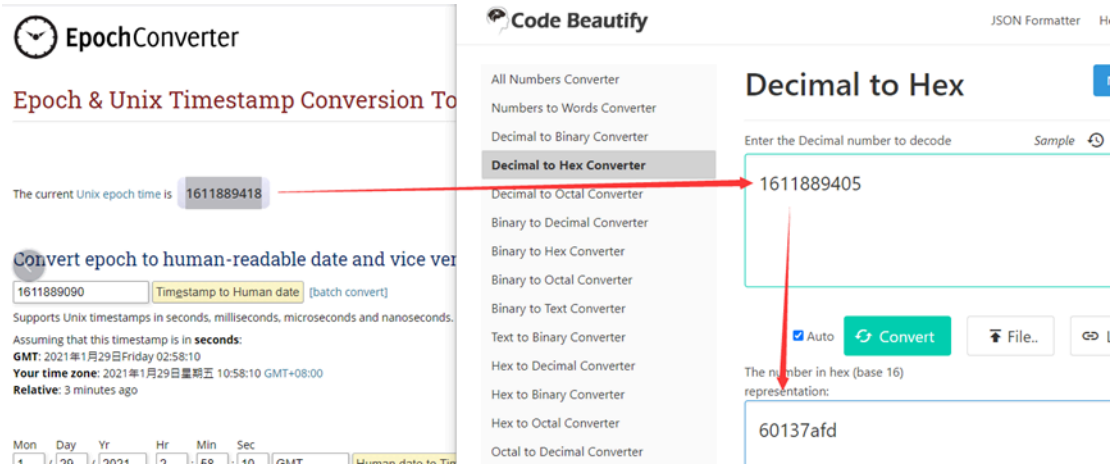
Unix TimeStamp shows the sampling time of uplink payload. format base on

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/ :

For example: if the Unix Timestamp we got is hex 0x60137afd, we can convert it to Decimal: 1611889405. and then convert to the time: 2021 – Jan -- 29 Friday 03:03:25 (GMT)



2.6.2 Poll sensor value

User can poll sensor value based on timestamps from the server. Below is the downlink command.

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

For example, downlink command 31 5FC5F350 5FC6 0160 05

Is to check 2020/12/1 07:40:00 to 2020/12/1 08:40:00's data

Uplink Internal =5s, means PB01 will send one packet every 5s. range 5~255s.

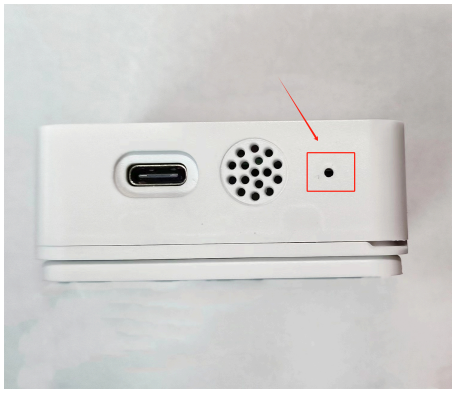
2.6.3 Datalog Uplink payload

See Uplink FPORT=3, Datalog sensor value

2.7 Button

- ACT button

Long press this button PB01 will reset and join network again.



- Alarm button

Press the button PB01 will immediately uplink data, and alarm is "TRUE".

2.8 LED Indicator

The PB01 has a triple color LED which for easy showing different stage.

Hold the ACT green light to rest, then the green flashing node restarts, the blue flashing once upon request for network access, and the green constant light for 5 seconds after successful network access

In a normal working state:

- When the node is restarted, hold the ACT **GREEN** lights up , then the **GREEN** flashing node restarts.The **BLUE** flashing once upon request for network access, and the **GREEN** constant light for 5 seconds after successful network access.
- During OTAA Join:
  - **For each Join Request uplink:** the **GREEN LED** will blink once.
  - **Once Join Successful:** the **GREEN LED** will be solid on for 5 seconds.
- After joined, for each uplink, the **BLUE LED** or **GREEN LED** will blink once.
- Press the alarm `button, The` **RED** flashes until the node receives the ACK from the platform and the **BLUE** light stays 5s.

2.9 Buzzer

The PB01 has **button sound** and **ACK sound** and users can turn on or off both sounds by using AT+SOUND.

- **Button sound** is the music produced by the node after the alarm button is pressed.

  Users can useAT+OPTION to set different button sounds.

- **ACK sound** is the notification tone that the node receives ACK.

3. Configure PB01 via AT command or LoRaWAN downlink

Users can configure PB01 via AT Command or LoRaWAN Downlink.

- AT Command Connection: See FAQ.
- LoRaWAN Downlink instruction for different platforms: IoT LoRaWAN Server

There are two kinds of commands to configure PB01, they are:

- **General Commands:**

These commands are to configure:

- General system settings like: uplink interval.

- LoRaWAN protocol & radio-related commands.

They are the same for all Dragino Devices which supports DLWS-005 LoRaWAN Stack(Note**). These commands can be found on the wiki: End Device Downlink Command

- **Commands special design for PB01**

These commands are only valid for PB01, as below:

3.1 Downlink Command Set

Command Example	Function	Response	Downlink
AT+TDC=?	View current TDC time	1200000 OK	Default 1200000(ms)
AT+TDC=300000	Set TDC time	OK	0X0100012C: 01: fixed command 00012C: 0X00012C= 300(seconds)
ATZ	Reset node		0x04FF
AT+FDR	Restore factory settings		0X04FE
AT+CFM=?	View the current confirmation mode status	0,7,0 OK	Default 0,7,0
AT+CFM=1,7,1	Confirmed uplink mode, the maximum number of retries is seven, and uplink fcnt increase by 1 for each retry	OK	05010701 05: fixed command 01:confirmed uplink 07: retry 7 times 01: fcnt count plus 1
AT+NJM=?	Check the current network connection method	1 OK	Default 1
AT+NJM=0	Change the network connection method to ABP	Attention:Take effect after ATZ OK	0X2000: ABP 0x2001: OTAA 20: fixed command
AT+RPL=?	View current RPL settings	0 OK	Default 0
AT+RPL=1	set RPL=1	OK	0x2101: 21: fixed command 01: for details, check wiki
AT+ADR=?	View current ADR status	1 OK	Default 0
AT+ADR=0	Set the ADR state to off	OK	0x2200: close 0x2201: open 22: fixed command
AT+DR=?	View the current DR settings	OK	
AT+DR=1	set DR to 1 It takes effect only when ADR=0	OK	0X22000101: 00: ADR=0 01: DR=1 01: TXP=1 22: fixed command
AT+TXP=?	View the current TXP	OK	

AT+TXP=1	set TXP to 1 It takes effect only when ADR=0	OK	0X22000101: 00: ADR=0 01: DR=1 01: TXP=1 22: fixed command
AT+RJTDC=10	Set RJTDC time interval	OK	0X26000A: 26: fixed command 000A: 0X000A=10(min) for details, check wiki
	_____ Retrieve stored data for a specified period of time		0X3161DE7C7061DE8A800A: 31: fixed command 61DE7C70:0X61DE7C70=2022/1/12 15:0 61DE8A80:0X61DE8A80=2022/1/12 16:0 0A: 0X0A=10(second) View details 2.6.2
AT+DDETECT=?	View the current DDETECT setting status and time	1,1440,2880 OK	Default 1,1440,2880(min)
AT+DDETECT= 1,1440,2880	Set DDETECT setting status and time (When the node does not receive the downlink packet within the set time, it will re-enter the network)	OK	0X320005A0: close 0X320105A0: open 32: fixed command 05A0: 0X05A0=1440(min)

3.2 Set Password

Feature: Set device password, max 9 digits.

AT Command: AT+PWORD

Command Example	Function	Response
AT+PWORD=?	Show password	123456 OK
AT+PWORD=999999	Set password	OK

Downlink Command:

No downlink command for this feature.

3.3 Set button sound and ACK sound

Feature: Turn on/off button sound and ACK alarm.

AT Command: AT+SOUND

Command Example	Function	Response
AT+SOUND=?	Get the current status of button sound and ACK sound	1,1 OK
AT+SOUND=0,1	Turn off the button sound and turn on ACK sound	OK

Downlink Command: 0xA1

Format: Command Code (0xA1) followed by 2 bytes mode value.

The first byte after 0XA1 sets the button sound, and the second byte after 0XA1 sets the ACK sound. **(0: off, 1: on)**

- **Example:** Downlink Payload: A10001 // Set AT+SOUND=0,1 Turn off the button sound and turn on ACK sound.

3.4 Set buzzer music type(0~4)

Feature: Set different alarm key response sounds.There are five different types of button music.

AT Command: AT+OPTION

Command Example	Function	Response
AT+OPTION=?	Get the buzzer music type	3 OK
AT+OPTION=1	Set the buzzer music to type 1	OK

Downlink Command: 0xA3

Format: Command Code (0xA3) followed by 1 byte mode value.

- **Example:** Downlink Payload: A300 // Set AT+OPTION=0 Set the buzzer music to type 0.

3.5 Set Valid Push Time

Feature: Set the holding time for pressing the alarm button to avoid miscontact. Values range from **0 ~1000ms**.

AT Command: AT+STIME

Command Example	Function	Response
AT+STIME=?	Get the button sound time	0 OK
AT+STIME=1000	Set the button sound time to 1000**ms**	OK

Downlink Command: 0xA2

Format: Command Code (0xA2) followed by 2 bytes mode value.

- **Example:** Downlink Payload: A203E8 // Set AT+STIME=1000

  Explain: Hold the alarm button for 10 seconds before the node will send the alarm packet.

4. Battery & How to replace

4.1 Battery Type and replace

PB01 uses 2 x AAA LR03(1.5v) batteries. If the batteries running low (shows 2.1v in the platform). Users can buy generic AAA battery and replace it.

Note:

1. The PB01 doesn't have any screw, users can use nail to open it by the middle.

2. Make sure the direction is correct when install the AAA batteries.

4.2 Power Consumption Analyze

Dragino battery powered product are all runs in Low Power mode. We have an update battery calculator which base on the measurement of the real device. User can use this calculator to check the battery life and calculate the battery life if want to use different transmit interval.

Instruction to use as below:

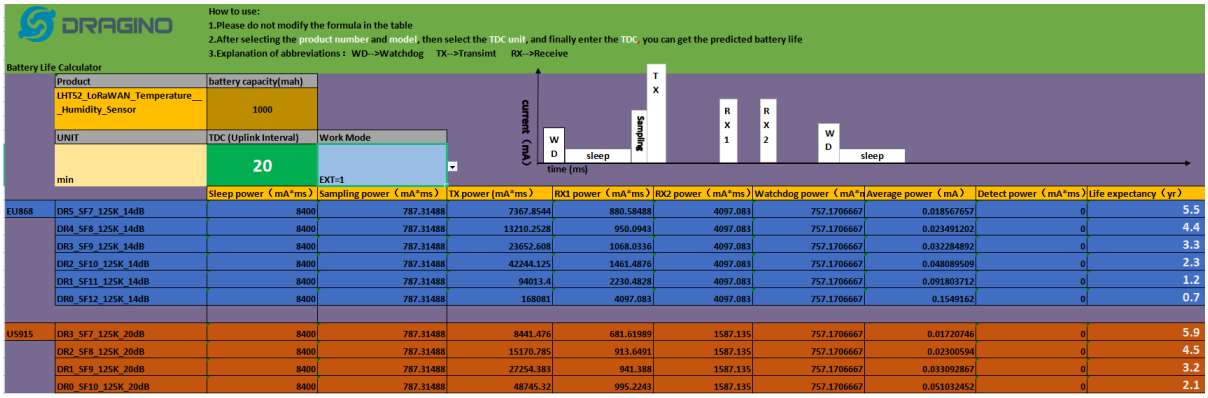
Step 1: Downlink the up-to-date DRAGINO_Battery_Life_Prediction_Table.xlsx from:

battery calculator

Step 2: Open it and choose

- Product Model
- Uplink Interval
- Working Mode

And the Life expectation in difference case will be shown on the right.



DRAGINO

How to use:
1.Please do not modify the formula in the table
2.After selecting the product number and model, then select the TDC unit, and finally enter the TDC, you can get the predicted battery life
3.Explanation of abbreviations： WD-->Watchdog TX-->Transimt RX-->Receive

Battery Life Calculator

Product	battery capacity(mah)
LHT52_LoRaWAN_Temperature__ _Humidity_Sensor	1000

UNIT	TDC (Uplink Interval)	Work Mode
min	20	EXT=1

		Sleep power （mA*ms）	Sampling power （mA*ms）	TX power (mA*ms）	RX1 power （mA*ms）	RX2 power （mA*ms）	Watchdog power （mA*n	Average power （mA）	Detect power （mA*ms）	Life expectancy （yr）
EU868	DR5_SF7_125K_14dB	8400	787.31488	7367.8544	880.58488	4097.083	757.1706667	0.018567657	0	5.5
	DR4_SF8_125K_14dB	8400	787.31488	13210.2528	950.0943	4097.083	757.1706667	0.023491202	0	4.4
	DR3_SF9_125K_14dB	8400	787.31488	23652.608	1068.0336	4097.083	757.1706667	0.032284892	0	3.3
	DR2_SF10_125K_14dB	8400	787.31488	42244.125	1461.4876	4097.083	757.1706667	0.048089509	0	2.3
	DR1_SF11_125K_14dB	8400	787.31488	94013.4	2230.4828	4097.083	757.1706667	0.091803712	0	1.2
	DR0_SF12_125K_14dB	8400	787.31488	168081	4097.083	4097.083	757.1706667	0.1549162	0	0.7
US915	DR3_SF7_125K_20dB	8400	787.31488	8441.476	681.61989	1587.135	757.1706667	0.01720746	0	5.9
	DR2_SF8_125K_20dB	8400	787.31488	15170.785	913.6491	1587.135	757.1706667	0.02300594	0	4.5
	DR1_SF9_125K_20dB	8400	787.31488	27254.383	941.388	1587.135	757.1706667	0.033092867	0	3.2
	DR0_SF10_125K_20dB	8400	787.31488	48745.32	995.2243	1587.135	757.1706667	0.051032452	0	2.1

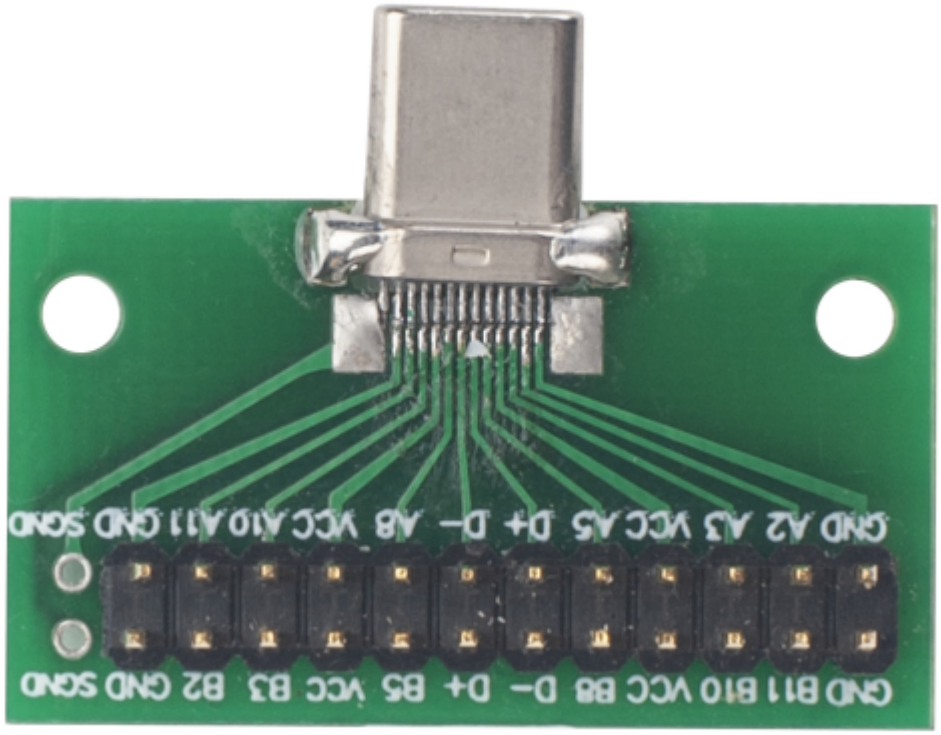
5. Accessories

- **Program Converter (AS-02)**

AS-02 is an optional accessory, it is USB Type-C converter. AS-02 provide below feature:

1. Access AT console of PB01 when used with USB-TTL adapter. See this link.

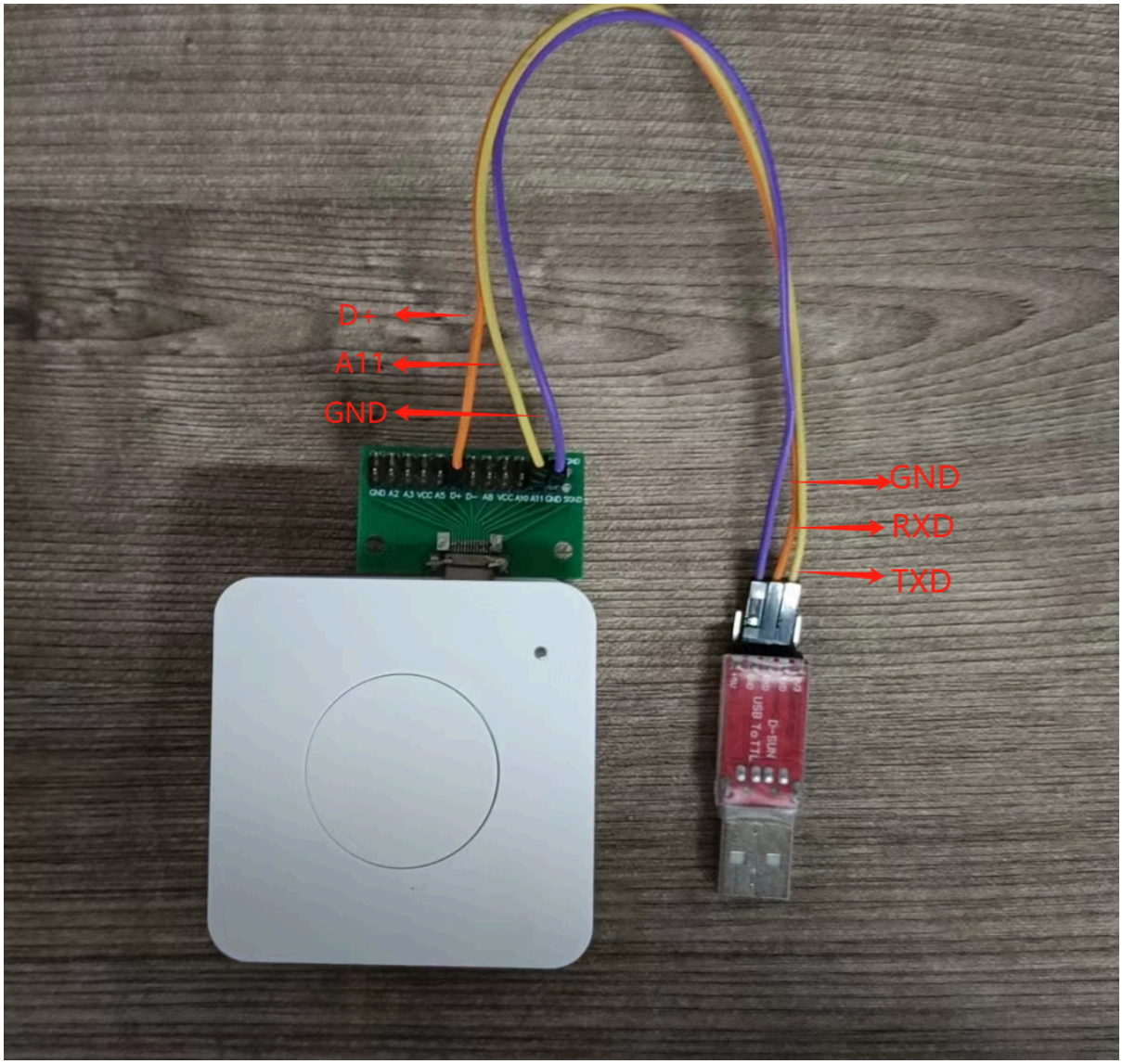
AS-02 USB Type-C Converter



6. FAQ

6.1 How to use AT Command to configure PB01

PB01 supports AT Command set. Users can use a USB to TTL adapter plus the Program Cable to connect to PB01 for using AT command, as below.

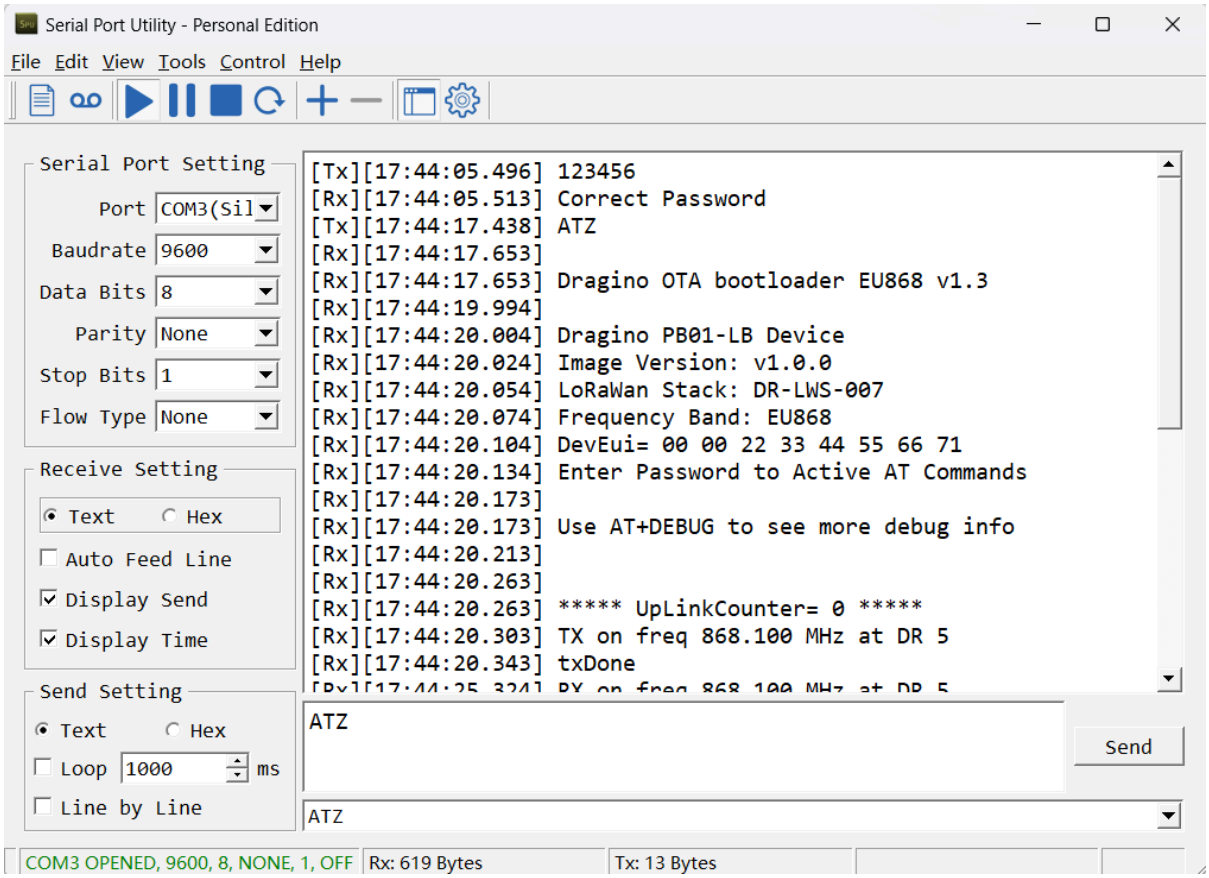


Connection:

- USB to TTL GND <--> Program Converter GND pin
- USB to TTL RXD <--> Program Converter D+ pin
- USB to TTL TXD <--> Program Converter A11 pin

In PC, User needs to set **serial tool**(such as putty, SecureCRT) baud rate to **9600** to access to access serial console for PB01. The AT commands are disable by default and need to enter password (default:**123456**) to active it. Timeout to input AT Command is 5 min, after 5-minute, user need to input password again.

Input password and ATZ to activate PB01, as shown below:



6.2 AT Command and Downlink

Sending ATZ will reboot the node

Sending AT+FDR will restore the node to factory settings

Get the node's AT command setting by sending AT+CFG

Example:

AT+DEUI=FA 23 45 55 55 55 55 51

AT+APPEUI=FF AA 23 45 42 42 41 11

AT+APPKEY=AC D7 35 81 63 3C B6 05 F5 69 44 99 C1 12 BA 95

AT+DADDR=FFFFFFFF

AT+APPSKEY=FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

AT+NWKSKEY=FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

AT+ADR=1

AT+TXP=7

AT+DR=5

AT+DCS=0

AT+PNM=1

AT+RX2FQ=869525000

AT+RX2DR=0

AT+RX1DL=5000

AT+RX2DL=6000

AT+JN1DL=5000

AT+JN2DL=6000

AT+NJM=1

AT+NWKID=00 00 00 13

AT+FCU=61

AT+FCD=11

AT+CLASS=A

AT+NJS=1

AT+RECVB=0:

AT+RECV=

AT+VER=EU868 v1.0.0

AT+CFM=0,7,0

AT+SNR=0

AT+RSSI=0

AT+TDC=1200000

AT+PORT=2

AT+PWORD=123456

AT+CHS=0

AT+RX1WTO=24

AT+RX2WTO=6

AT+DECRYPT=0

AT+RJTDC=20

AT+RPL=0

AT+TIMESTAMP=systime= 2024/5/11 01:10:58 (1715389858)

AT+LEAPSEC=18

AT+SYNCMOD=1

AT+SYNCTDC=10

AT+SLEEP=0

AT+ATDC=1

AT+UUID=003C0C53013259E0

AT+DDETECT=1,1440,2880

AT+SETMAXNBTRANS=1,0

AT+DISFCNTCHECK=0

AT+DISMACANS=0

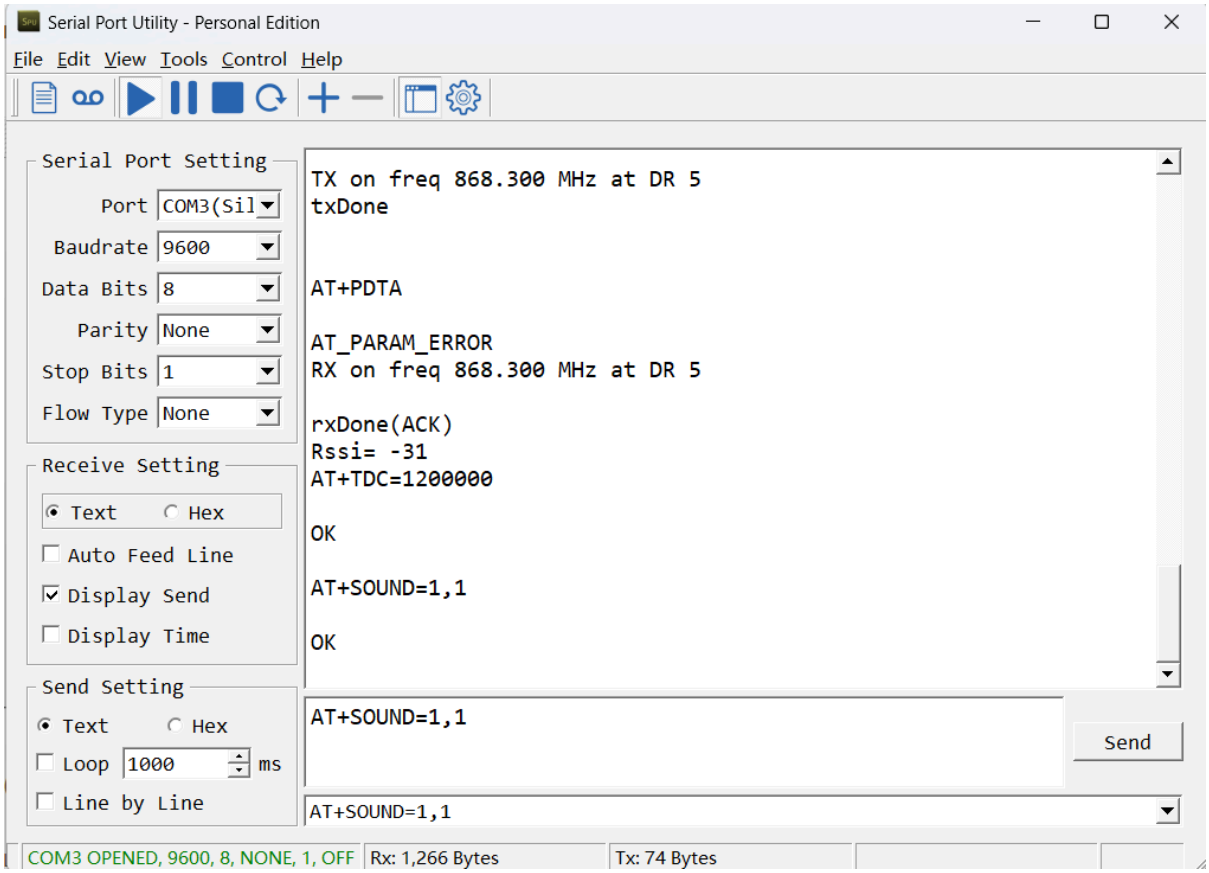
AT+PNACKMD=0

AT+SOUND=0,0

AT+STIME=0

AT+OPTION=3

Example:



6.3 How to upgrade the firmware?

PB01 requires a program converter to upload images to PB01, which is used to upload image to PB01 for:

- Support new features
- For bug fix
- Change LoRaWAN bands.

PB01 internal program is divided into bootloader and work program, shipping is included bootloader, the user can choose to directly update the work program.

If the bootloader is erased for some reason, users will need to download the boot program and the work program.

6.3.1 Update firmware (Assume device have bootloader)

Step 1: Connect UART as per FAQ 6.1

Step 2: **Update follow Instruction for update via DraginoSensorManagerUtility.exe.**

6.3.2 Update firmware (Assume device doesn't have bootloader)

Download both the boot program and the worker program **.** After update , device will have bootloader so can use above 6.3.1 method to update woke program.

Step 1: Install TremoProgrammer first.

Step 2: Hardware Connection

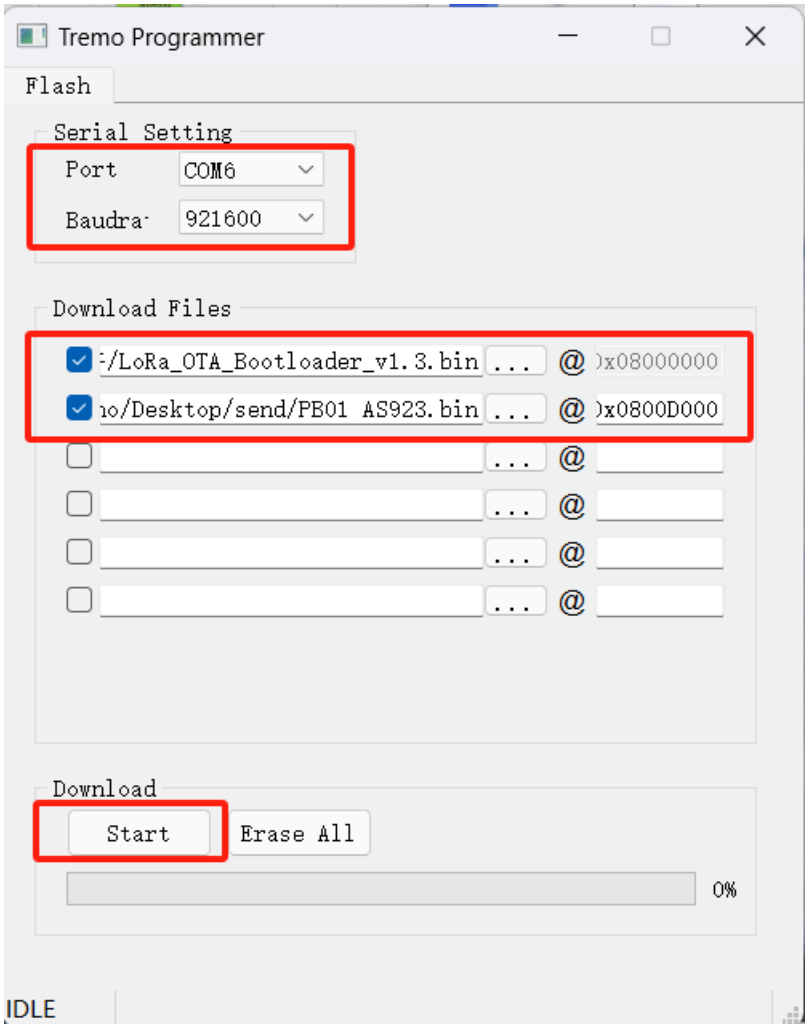
Connect PC and PB01 via USB-TTL adapter .

Note: To download firmware in this way, you need to pull the boot pin(Program Converter D- pin) high to enter the burn mode. After burning, disconnect the boot pin of the node and the 3V3 pin of the USB-TTL adapter, and reset the node to exit the burning mode.

Connection:

- USB-TTL GND <--> Program Converter GND pin
- USB-TTL RXD <--> Program Converter D+ pin
- USB-TTL TXD <--> Program Converter A11 pin
- USB-TTL 3V3 <--> Program Converter D- pin

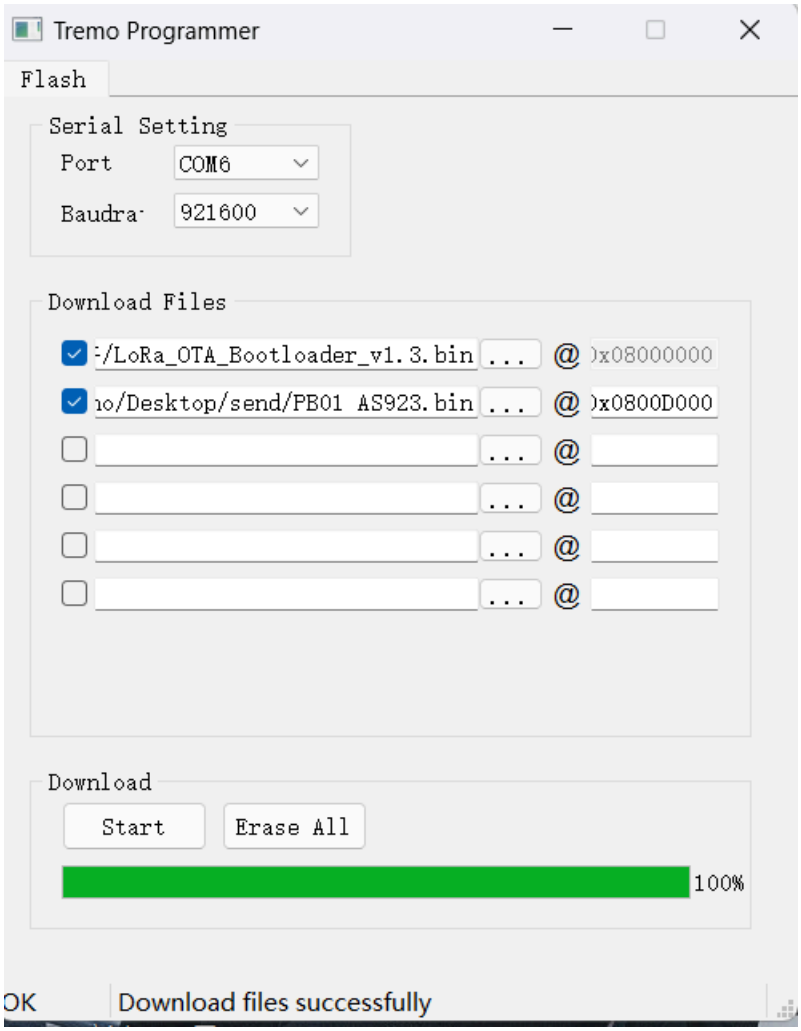
Step 3: Select the device port to be connected, baud rate and bin file to be downloaded.



Users need to reset the node to start downloading the program.

1. Reinstall the battery to reset the node
2. Hold down the ACT button to reset the node (see 2.7).

When this interface appears, it indicates that the download has been completed.



Finally, Disconnect Program Converter D- pin, reset the node again , and the node exits burning mode.

6.4 How to change the LoRa Frequency Bands/Region?

User can follow the introduction for how to upgrade image. When download the images, choose the required image file for download.

6.5 Why i see different working temperature for the device?

The working temperature range of device depends on the battery user choose.

- Normal AAA Battery can support -10 ~ 50°C working range.
- Special AAA battery can support -40 ~ 60 °C working range. For example: Energizer L92

7. Order Info

7.1 Main Device

Part Number: PB01-LW-XX (white button) / PB01-LR-XX(Red Button)

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

7. Packing Info

Package Includes:

- PB01 LoRaWAN Push Button x 1

8. 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 answered as 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.com.

9. Reference material

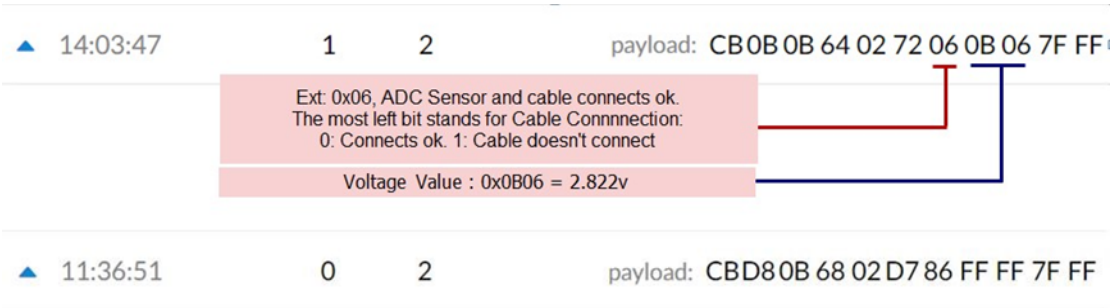
- Datasheet, photos, decoder, firmware

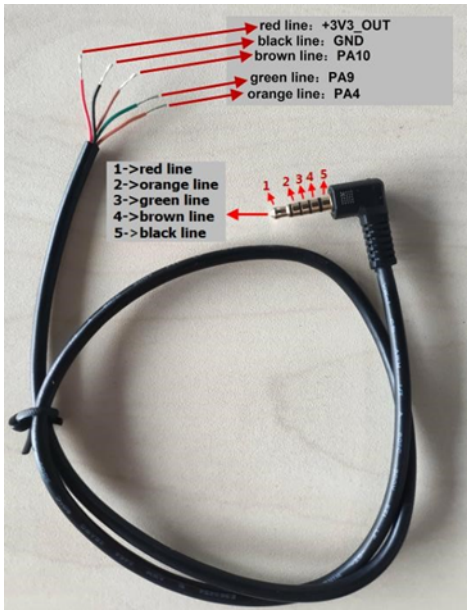
10. FCC Warning

This device complies with part 15 of the FCC Rules.Operation is subject to the following two conditions:

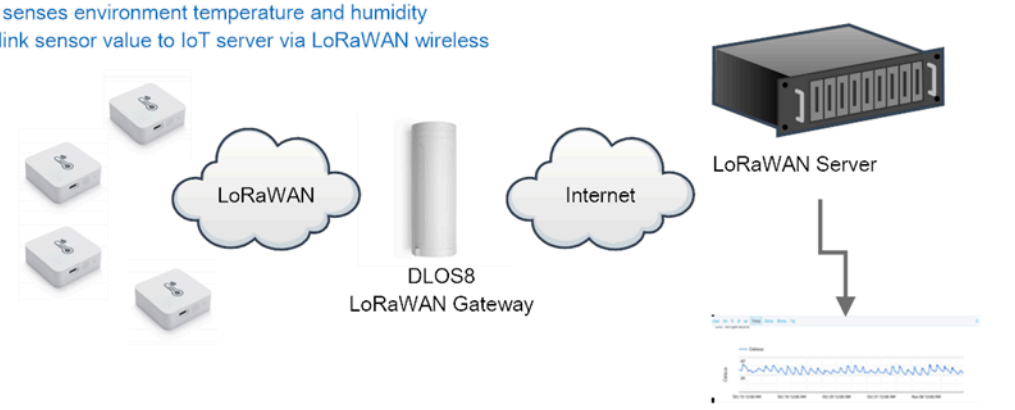
(1) This device may not cause harmful interference;

(2) this device must accept any interference received,including interference that may cause undesired operation.



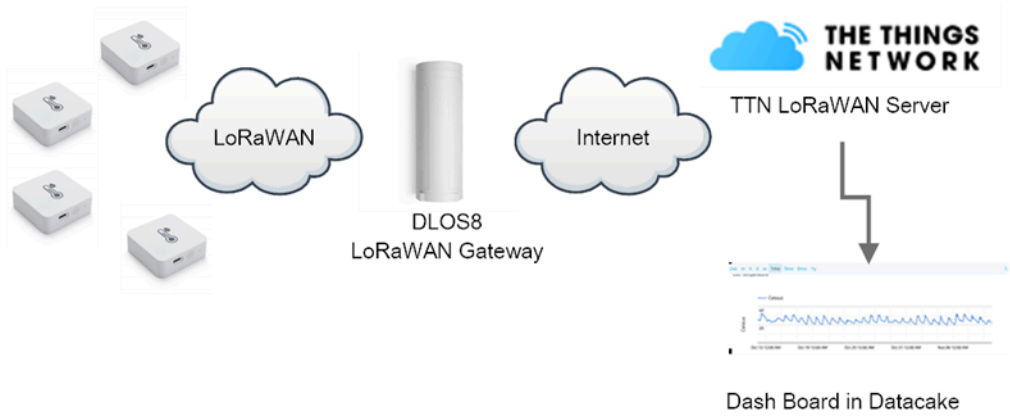


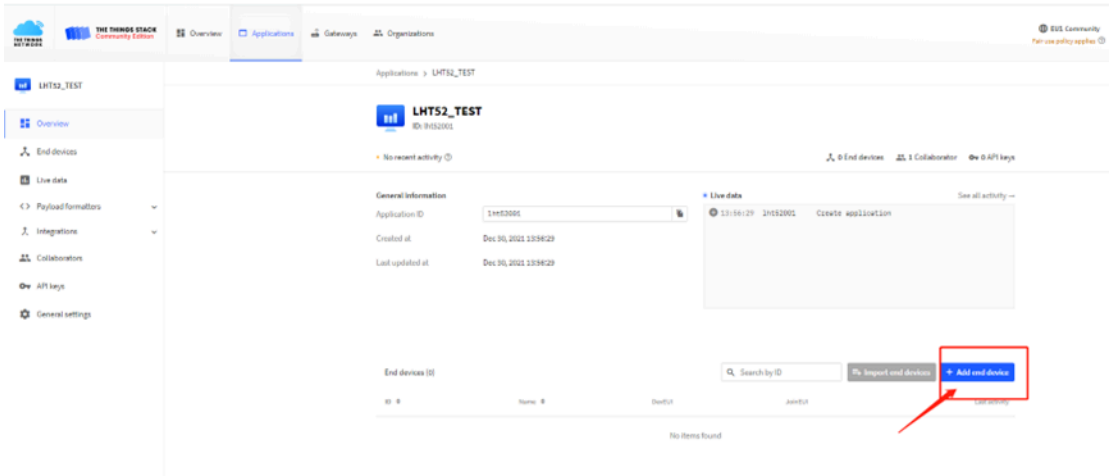
LHT52 senses environment temperature and humidity
and uplink sensor value to IoT server via LoRaWAN wireless

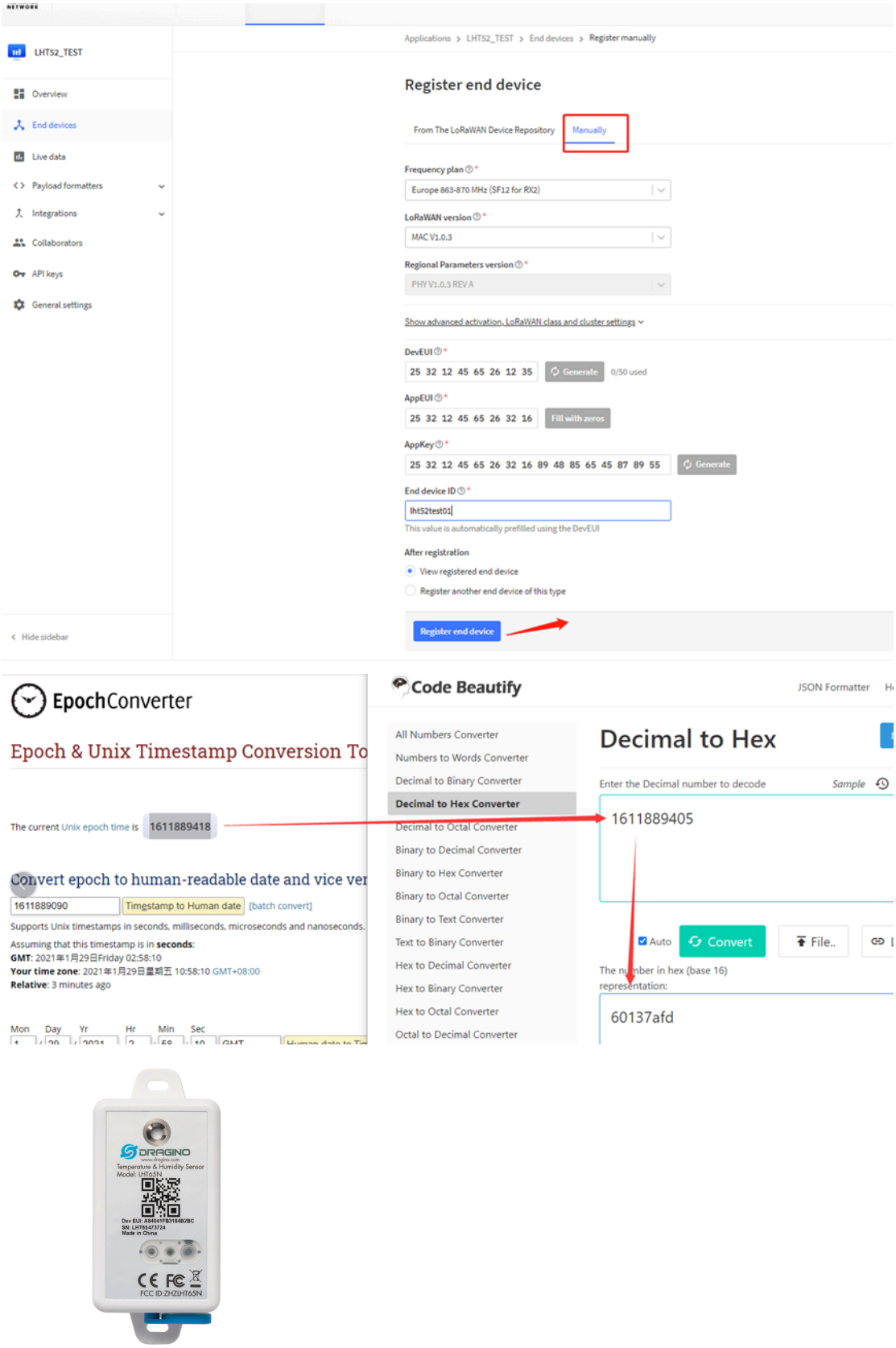


Dash Board in Application Server

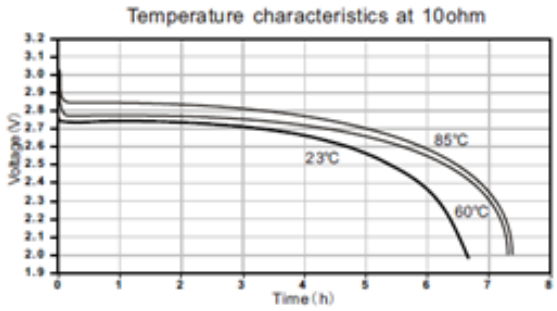
Use LHT52 in TTN and Datacake

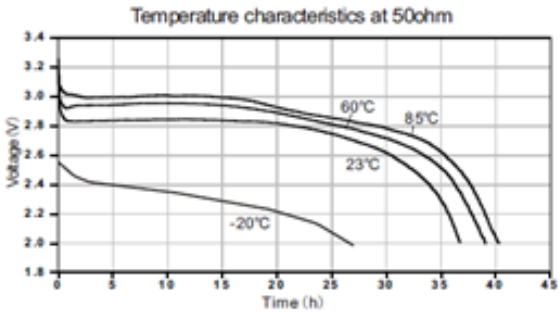


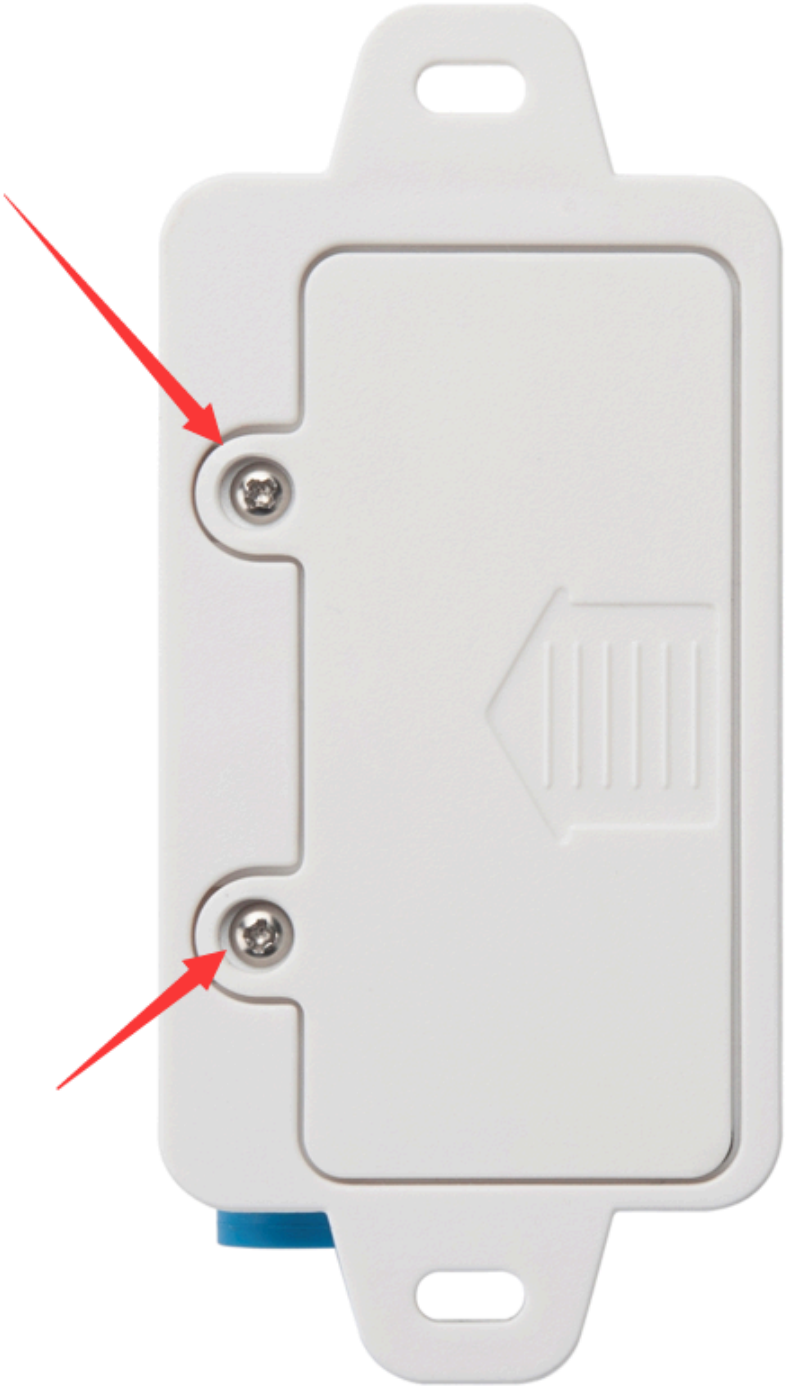



LHT52_TEST
Overview
End devices
Live data
Payload formatters
Integrations
Collaborators
API keys
General settings
Hide sidebar
Applications > LHT52_TEST > End devices > Register manually
Register end device
From The LoRaWAN Device Repository
Manually
Frequency plan *
Europe 863-870 MHz (SF12 for RX2)
LoRaWAN version *
MAC V1.0.3
Regional Parameters version *
PHY V1.0.3 REV A
Show advanced activation, LoRaWAN class and cluster settings
DevEUI *
25 32 12 45 65 26 12 35
Generate
0/50 used
AppEUI *
25 32 12 45 65 26 32 16
Fill with zeros
AppKey *
25 32 12 45 65 26 32 16 89 48 85 65 45 87 89 55
Generate
End device ID *
lht52test01
This value is automatically prefilled using the DevEUI
After registration
View registered end device
Register another end device of this type
Register end device
EpochConverter
Epoch & Unix Timestamp Conversion To
The current Unix epoch time is 1611889418
Convert epoch to human-readable date and vice ver
1611889090
Timestamp to Human date
[batch convert]
Supports Unix timestamps in seconds, milliseconds, microseconds and nanoseconds.
Assuming that this timestamp is in seconds:
GMT: 2021年1月29日Friday 02:58:10
Your time zone: 2021年1月29日星期五 10:58:10 GMT+08:00
Relative: 3 minutes ago
Mon Day Yr Hr Min Sec
Code Beautify
JSON Formatter
All Numbers Converter
Numbers to Words Converter
Decimal to Binary Converter
Decimal to Hex Converter
Decimal to Octal Converter
Binary to Decimal Converter
Binary to Hex Converter
Binary to Octal Converter
Binary to Text Converter
Text to Binary Converter
Hex to Decimal Converter
Hex to Binary Converter
Hex to Octal Converter
Octal to Decimal Converter
Decimal to Hex
Enter the Decimal number to decode
Sample
1611889405
Auto
Convert
File..
The number in hex (base 16) representation:
60137afd
DRAGINO
Temperature & Humidity Sensor
Model: LHT65N
FCC ID:ZHZLHT65N

Performance








WARNING
Fire, explosion,
and severe burn
hazard. Do not recharge,
crush, disassemble, heat above
100°C(212°F), incinerate or expose
contents to water.
Lithium Battery
EVE
ENERGY VERY ENDURE
CR17450 3V
DO NOT RECHARGE
CR17450 3V
DO NOT RECHARGE
EVE ENERGY CO., LTD
MADE IN CHINA
Lithium Battery


DRAGINO
www.dragino.com
Temperature & Humidity Sensor
Model: LHT65N
Dev EUI: A84041FB3184B2BC
SN: LHT65473724
Made in China
FCC ID:ZHZLHT65N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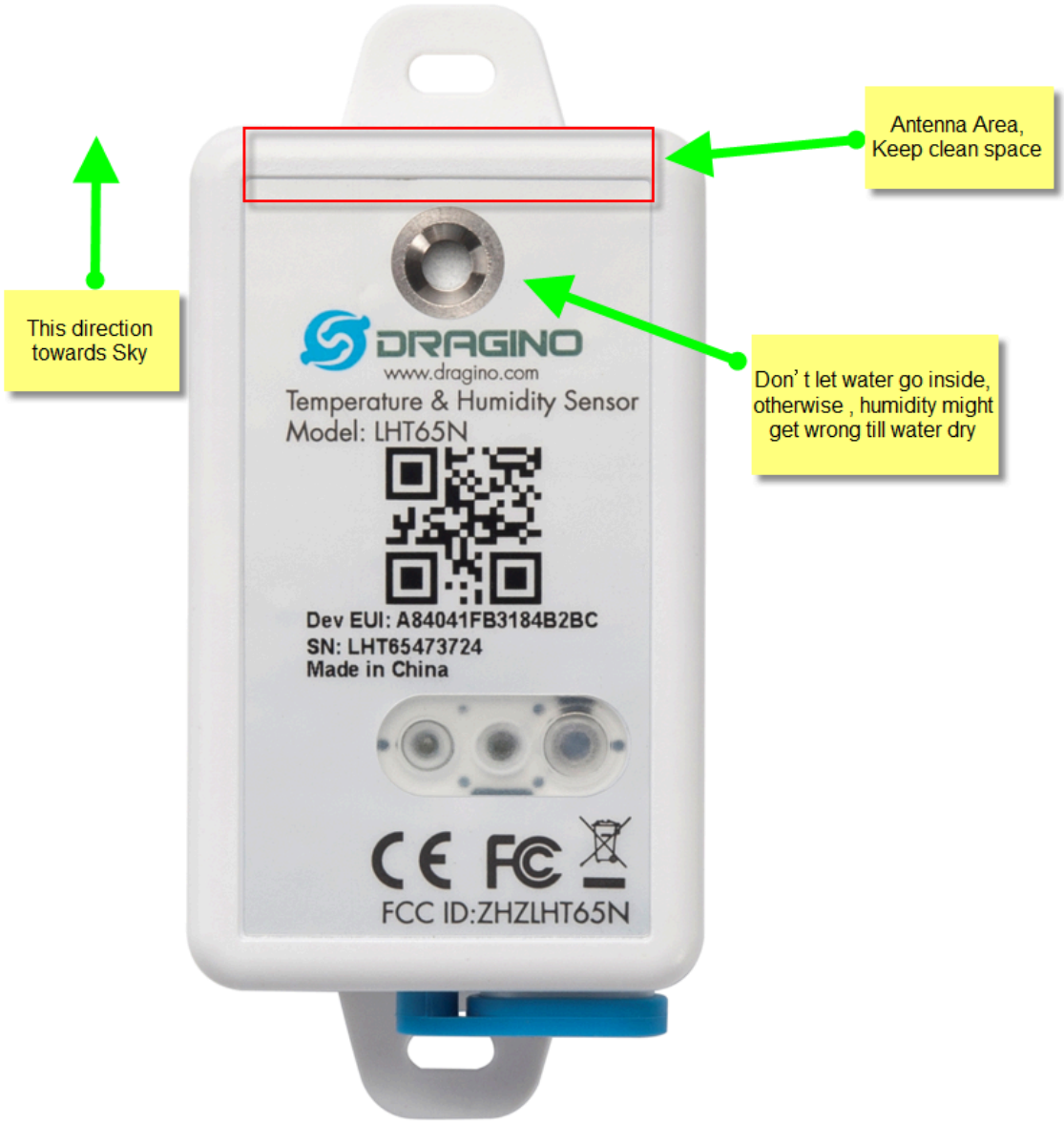
ACT
FCC ID:ZHZLHT65N


This direction towards Sky
Antenna Area, Keep clean space
Don' t let water go inside, otherwise , humidity might get wrong till water dry
DRAGINO
www.dragino.com
Temperature & Humidity Sensor
Model: LHT65N
Dev EUI: A84041FB3184B2BC
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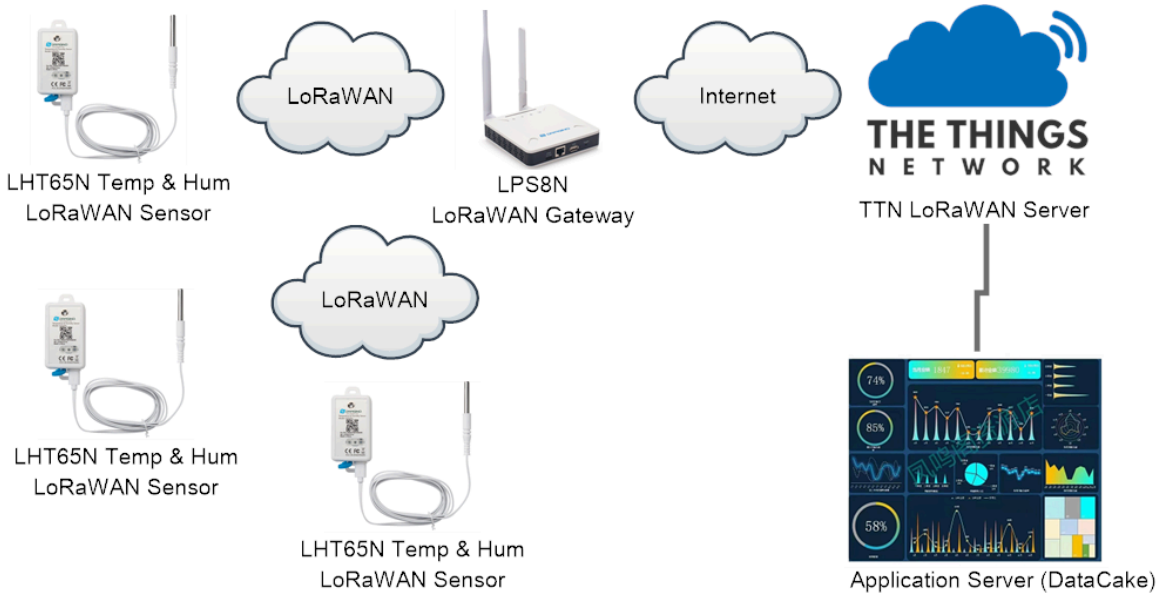
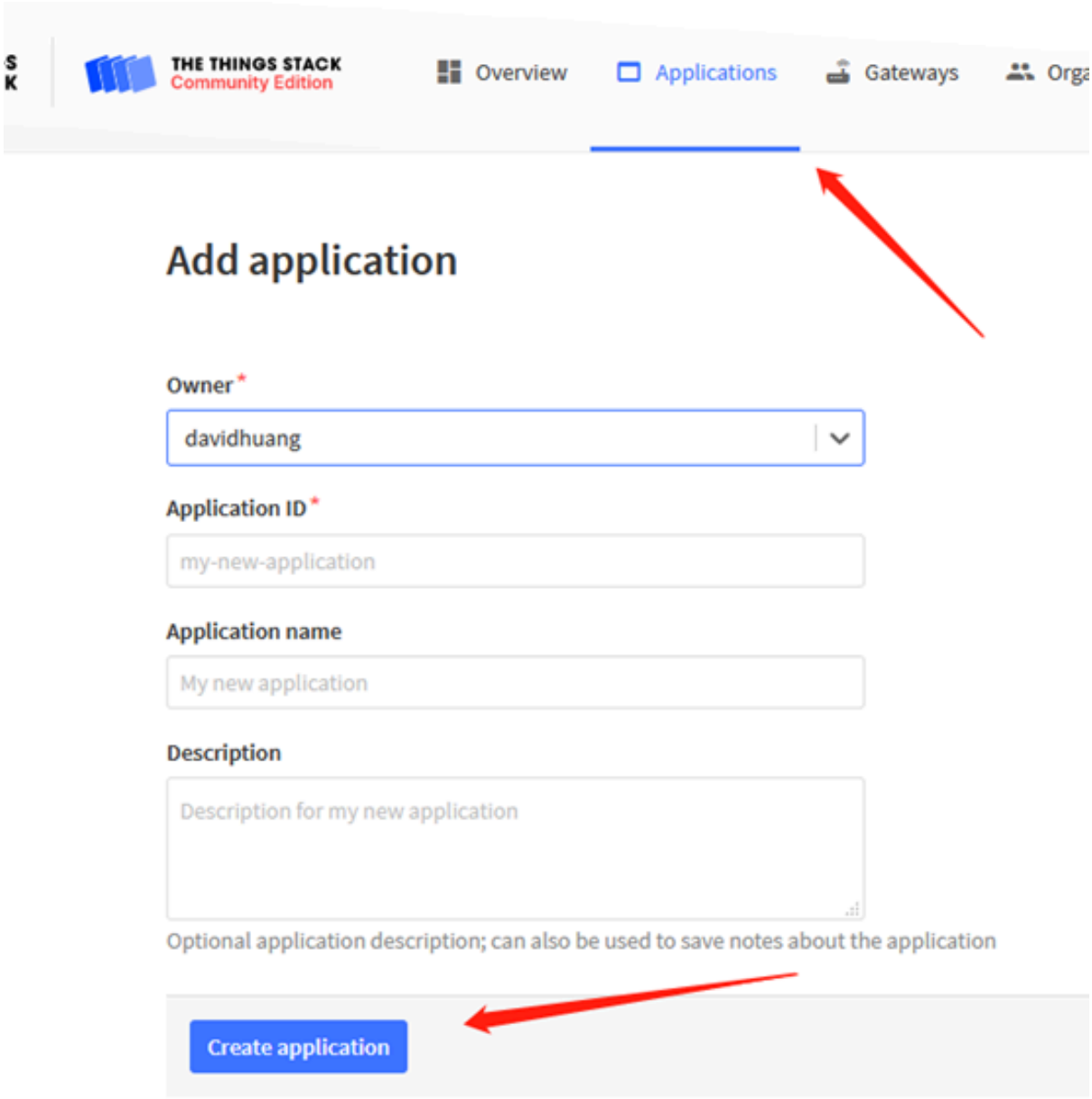
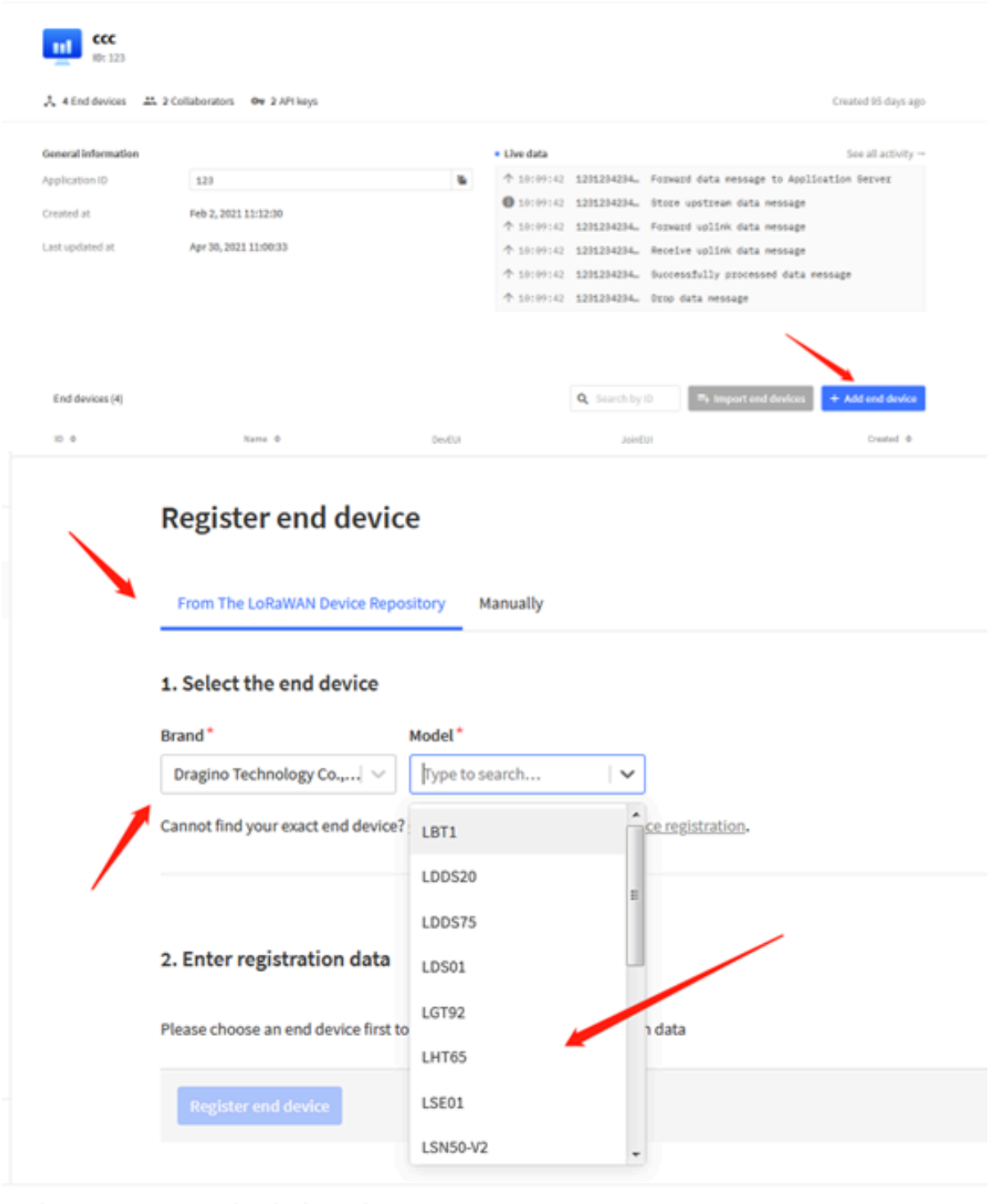
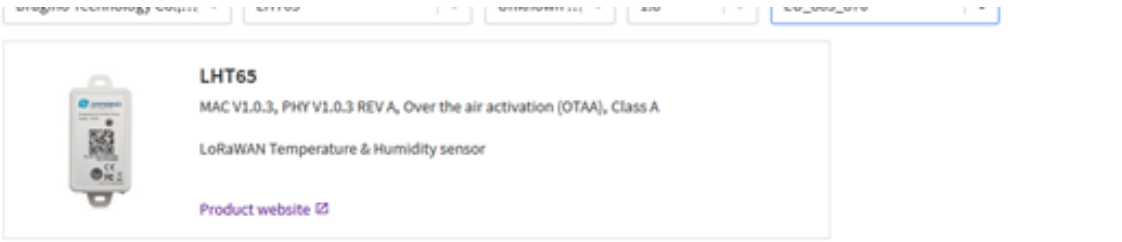
FCC ID:ZHZLHT65N

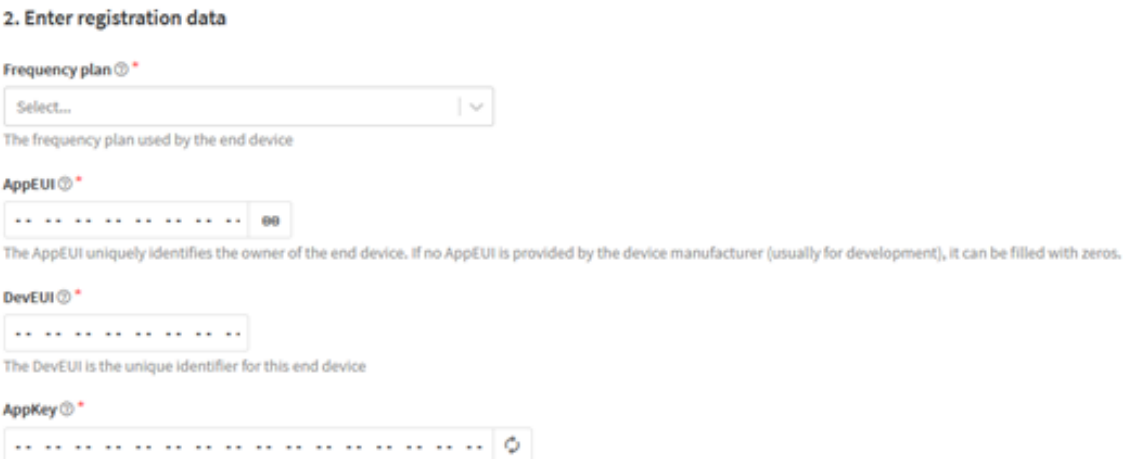
LHT65N in a LoRaWAN Network



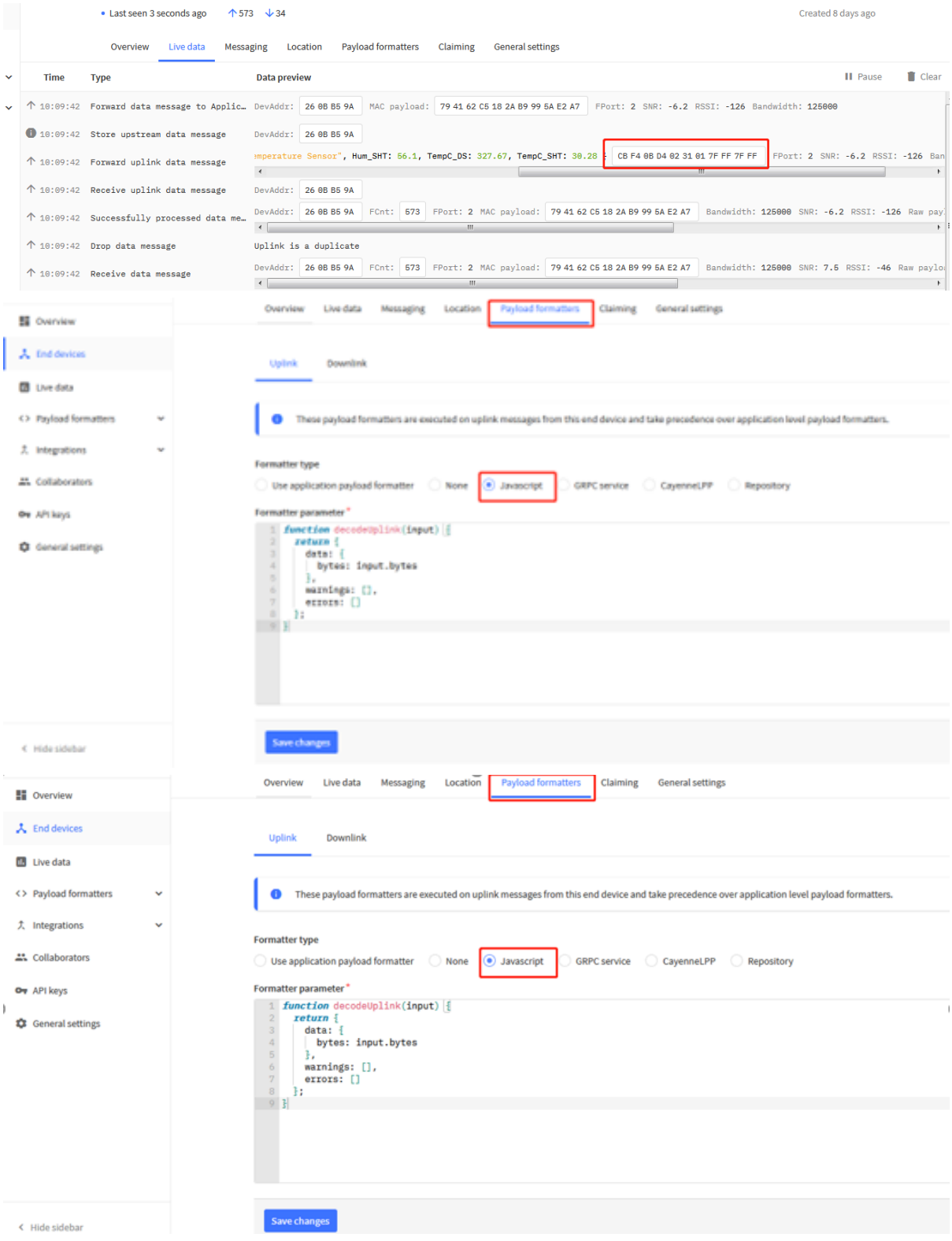

THE THINGS STACK
Community Edition
Overview
Applications
Gateways
Add application
Owner *
davidhuang
Application ID *
my-new-application
Application name
My new application
Description
Description for my new application
Optional application description; can also be used to save notes about the application
Create application

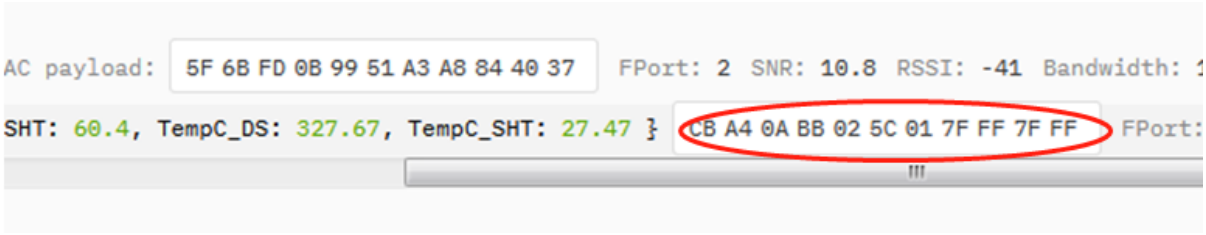

ccc
4 End devices
2 Collaborators
2 API keys
General information
Application ID
123
Created at
Feb 2, 2021 11:12:30
Last updated at
Apr 30, 2021 11:00:33
Live data
End devices (4)
Import end devices
+ Add end device
Register end device
From The LoRaWAN Device Repository
Manually
1. Select the end device
Brand *
Dragino Technology Co.,...
Model *
Type to search...
Cannot find your exact end device?
LBT1
LDDS20
LDDS75
LDS01
LGT92
LHT65
LSE01
LSN50-V2
2. Enter registration data
Please choose an end device first to
Register end device

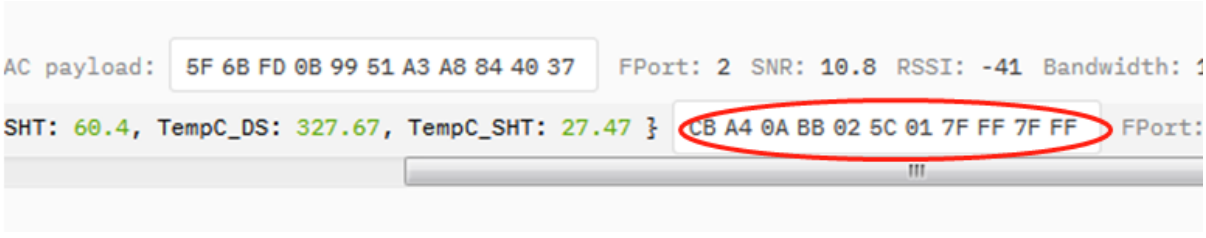

LHT65
MAC V1.0.3, PHY V1.0.3 REV A, Over the air activation (OTAA), Class A
LoRaWAN Temperature & Humidity sensor
Product website

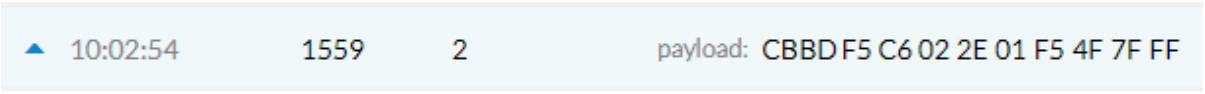

2. Enter registration data
Frequency plan *
Select...
The frequency plan used by the end device
AppEUI *
00
The AppEUI uniquely identifies the owner of the end device. If no AppEUI is provided by the device manufacturer (usually for development), it can be filled with zeros.
DevEUI *
The DevEUI is the unique identifier for this end device
AppKey *

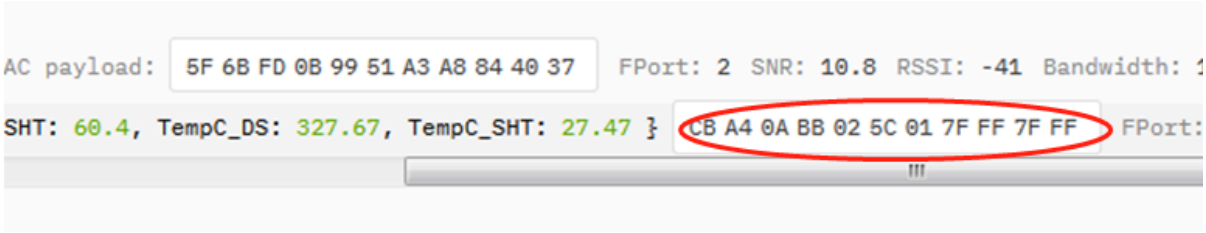

2. Enter registration data
Frequency plan *
Europe 863-870 MHz (SF12 for RX2)
The frequency plan used by the end device
AppEUI *
00
The AppEUI uniquely identifies the owner of the end device. If no AppEUI is provided by the device manufacturer (usually for dev
DevEUI *
The DevEUI is the unique identifier for this end device
AppKey *
End device ID *
my-new-device
After registration

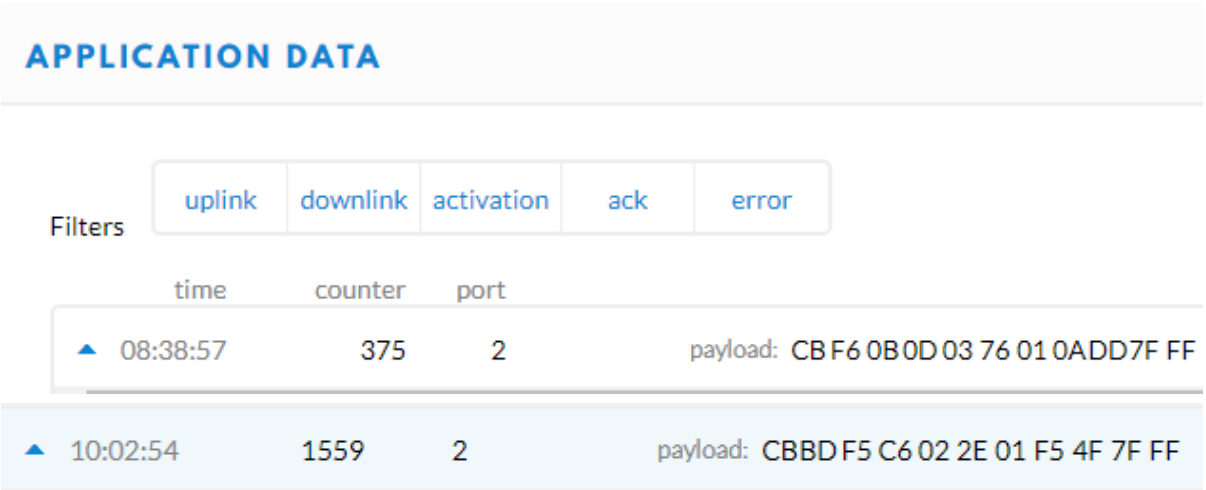

Last seen 3 seconds ago
573
34
Created 8 days ago
Overview
Live data
Messaging
Location
Payload formatters
Claiming
General settings
Time
Type
Data preview
Pause
Clear
10:09:42 Forward data message to Applic…
10:09:42 Store upstream data message
10:09:42 Forward uplink data message
10:09:42 Receive uplink data message
10:09:42 Successfully processed data me…
10:09:42 Drop data message
10:09:42 Receive data message
Uplink is a duplicate
Uplink
Downlink
Formatter type
Use application payload formatter
None
Javascript
GRPC service
CayenneLPP
Repository
Formatter parameter
function decodeUplink(input) {
return {
data: {
bytes: input.bytes
},
warnings: [],
errors: []
};
}
Save changes
Overview
End devices
Live data
Payload formatters
Integrations
Collaborators
API keys
General settings
Hide sidebar

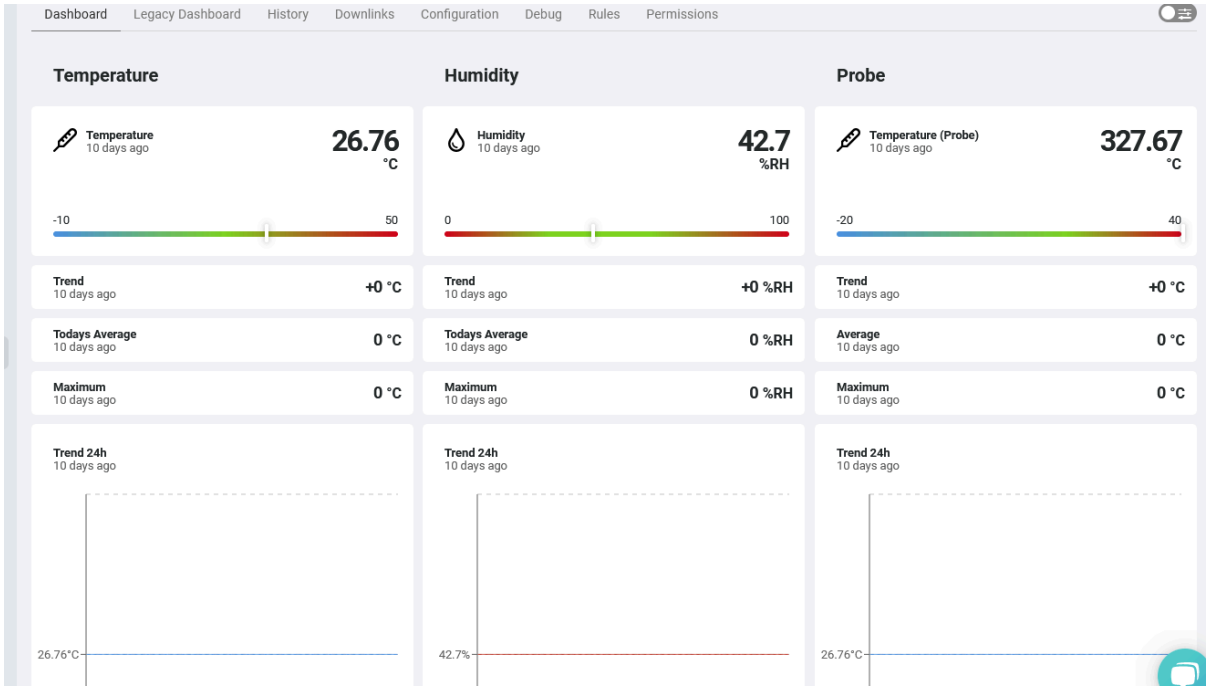

AC payload: 5F 6B FD 0B 99 51 A3 A8 84 40 37 FPort: 2 SNR: 10.8 RSSI: -41 Bandwidth:
SHT: 60.4, TempC_DS: 327.67, TempC_SHT: 27.47 } CB A4 0A BB 02 5C 01 7F FF 7F FF FPort:

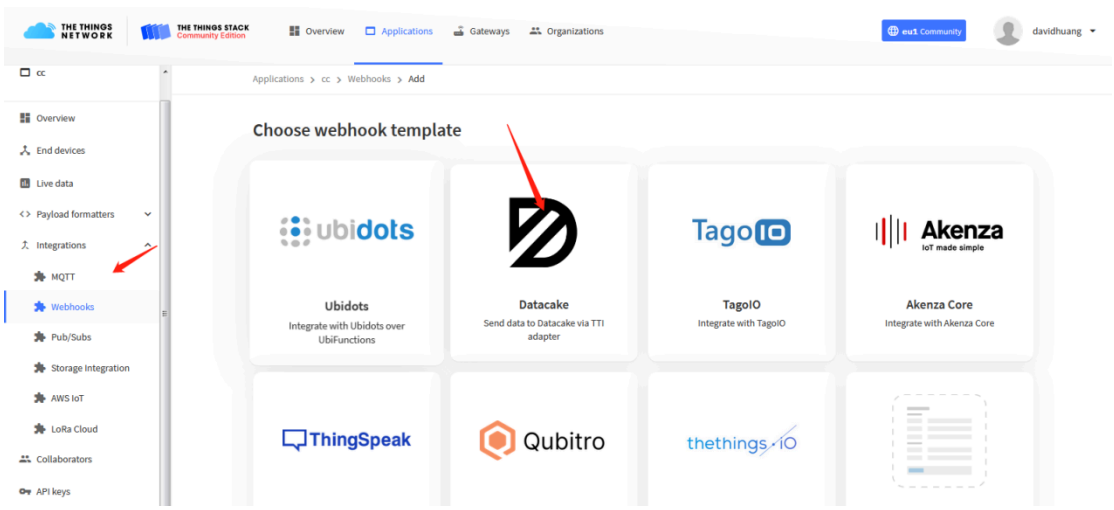

AC payload: 5F 6B FD 0B 99 51 A3 A8 84 40 37 FPort: 2 SNR: 10.8 RSSI: -41 Bandwidth:
SHT: 60.4, TempC_DS: 327.67, TempC_SHT: 27.47 } CB A4 0A BB 02 5C 01 7F FF 7F FF FPort:

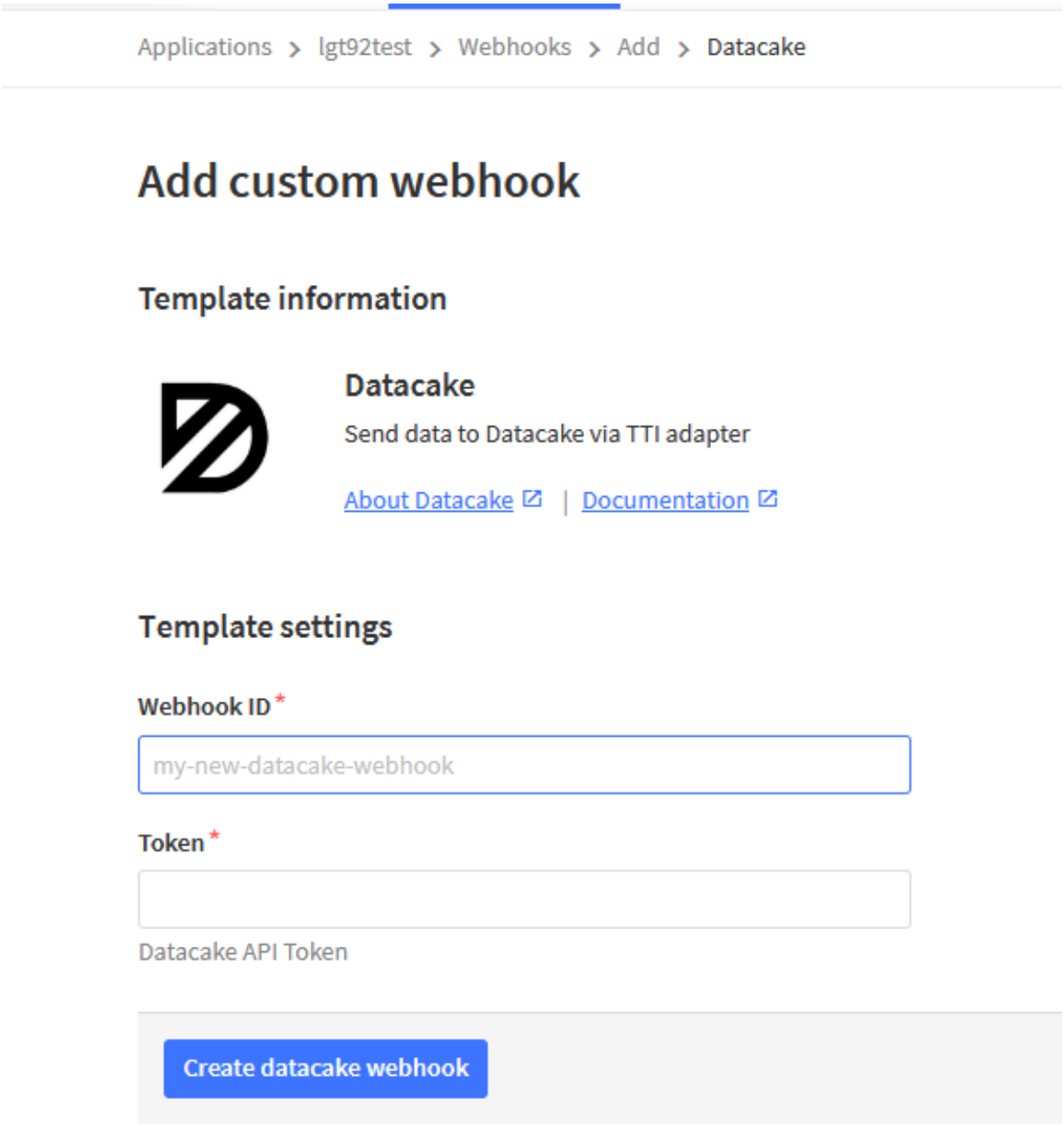

10:02:54 1559 2 payload: CBBD F5 C6 02 2E 01 F5 4F 7F FF

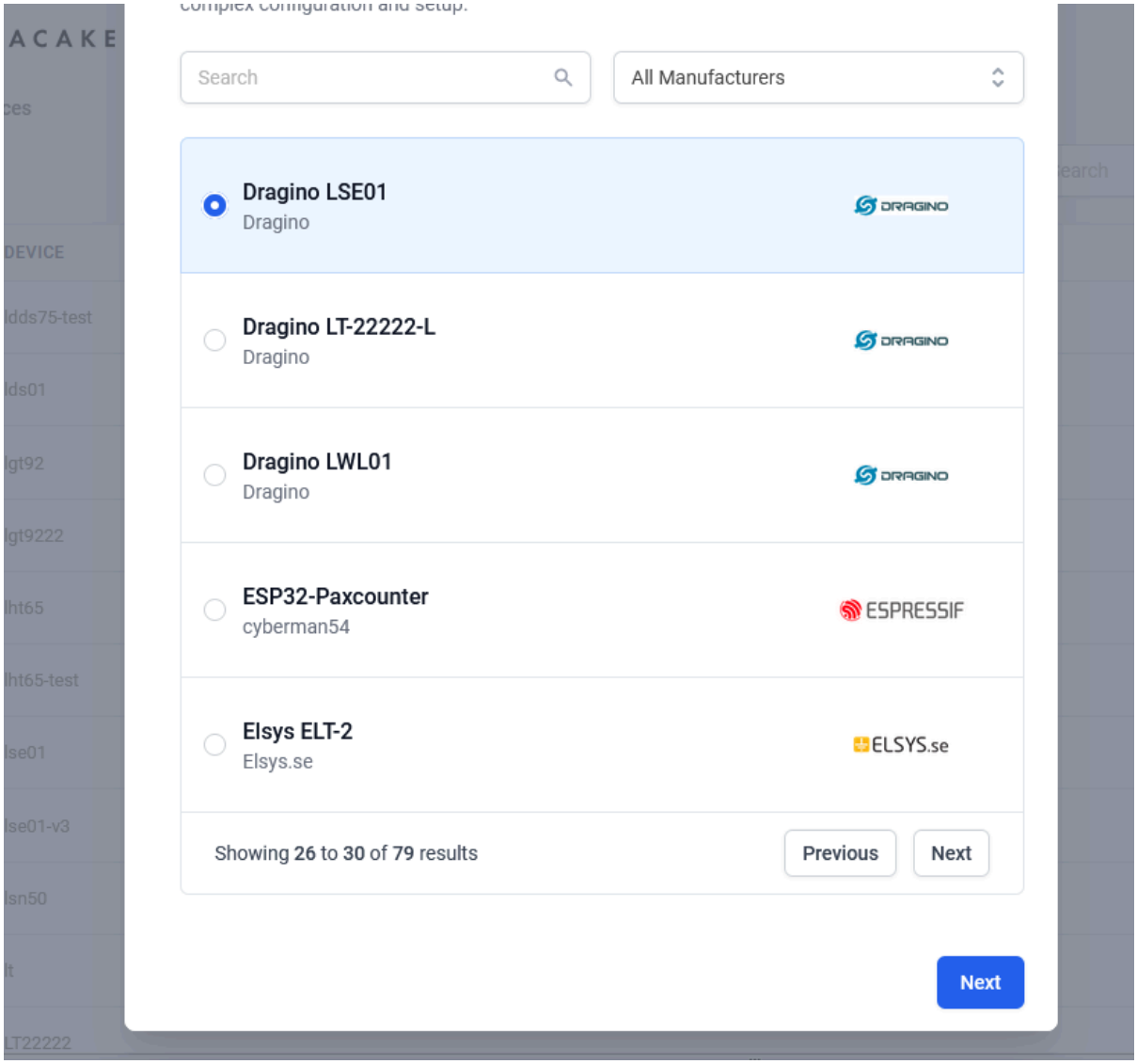

AC payload: 5F 6B FD 0B 99 51 A3 A8 84 40 37 FPort: 2 SNR: 10.8 RSSI: -41 Bandwidth:
SHT: 60.4, TempC_DS: 327.67, TempC_SHT: 27.47 } CB A4 0A BB 02 5C 01 7F FF 7F FF FPort:


APPLICATION DATA
Filters
uplink
downlink
activation
ack
error
time
counter
port
08:38:57 375 2 payload: CB F6 0B 0D 03 76 01 0A DD 7F FF
10:02:54 1559 2 payload: CBBD F5 C6 02 2E 01 F5 4F 7F FF


Dashboard
Legacy Dashboard
History
Downlinks
Configuration
Debug
Rules
Permissions
Temperature
Humidity
Probe
Temperature
10 days ago
26.76
°C
-10
50
Humidity
10 days ago
42.7
%RH
0
100
Temperature (Probe)
10 days ago
327.67
°C
-20
40
Trend
10 days ago
+0 °C
+0 %RH
+0 °C
Todays Average
10 days ago
0 °C
0 %RH
Average
10 days ago
0 °C
Maximum
10 days ago
0 °C
0 %RH
0 °C
Trend 24h
10 days ago
26.76°C
42.7%
26.76°C

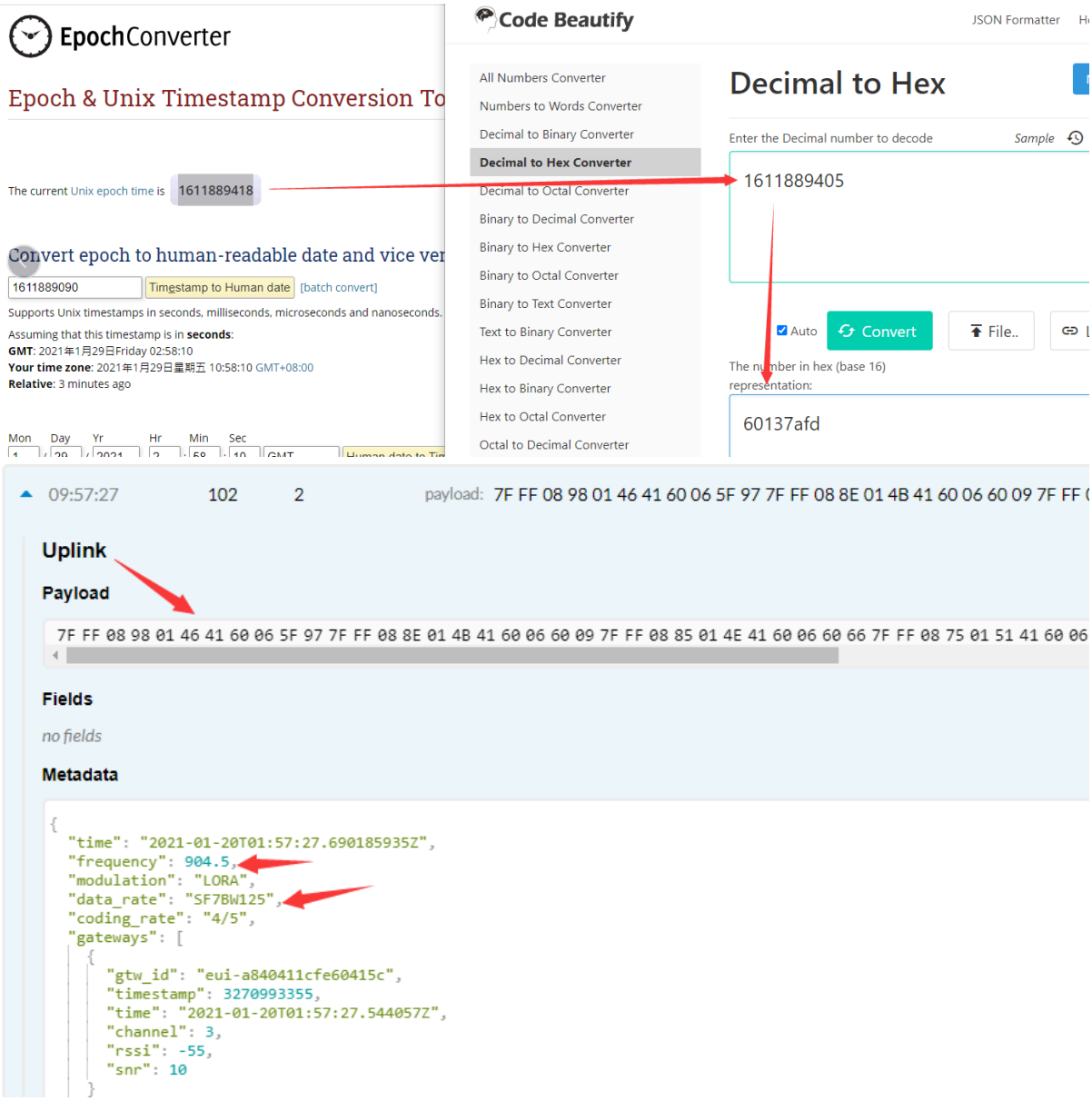

THE THINGS NETWORK
THE THINGS STACK
Community Edition
Overview
Applications
Gateways
Organizations
eu1 Community
davidhuang
cc
Applications > cc > Webhooks > Add
Overview
End devices
Live data
Payload formatters
Integrations
MQTT
Webhooks
Pub/Subs
Storage Integration
AWS IoT
LoRa Cloud
Collaborators
API keys
Choose webhook template
ubidots
Ubidots
Integrate with Ubidots over UbiFunctions
Datacake
Send data to Datacake via TTI adapter
TagoIO
Integrate with TagoIO
Akenza
IoT made simple
Akenza Core
Integrate with Akenza Core
ThingSpeak
Qubitro
thethings.iO


Applications > lgt92test > Webhooks > Add > Datacake
Add custom webhook
Template information
Datacake
Send data to Datacake via TTI adapter
About Datacake
Documentation
Template settings
Webhook ID *
my-new-datacake-webhook
Token *
Datacake API Token
Create datacake webhook



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


EpochConverter
Epoch & Unix Timestamp Conversion To
The current Unix epoch time is 1611889418
Convert epoch to human-readable date and vice ver
1611889090
Timestamp to Human date
[batch convert]
Supports Unix timestamps in seconds, milliseconds, microseconds and nanoseconds.
Assuming that this timestamp is in seconds:
GMT: 2021年1月29日Friday 02:58:10
Your time zone: 2021年1月29日星期五 10:58:10 GMT+08:00
Relative: 3 minutes ago
Mon Day Yr Hr Min Sec
Code Beautify
JSON Formatter
All Numbers Converter
Numbers to Words Converter
Decimal to Binary Converter
Decimal to Hex Converter
Decimal to Octal Converter
Binary to Decimal Converter
Binary to Hex Converter
Binary to Octal Converter
Binary to Text Converter
Text to Binary Converter
Hex to Decimal Converter
Hex to Binary Converter
Hex to Octal Converter
Octal to Decimal Converter
Decimal to Hex
Enter the Decimal number to decode
Sample
1611889405
Auto
Convert
File..
The number in hex (base 16) representation:
60137afd
09:57:27 102 2 payload: 7F FF 08 98 01 46 41 60 06 5F 97 7F FF 08 8E 01 4B 41 60 06 60 09 7F FF
Uplink
Payload
7F FF 08 98 01 46 41 60 06 5F 97 7F FF 08 8E 01 4B 41 60 06 60 09 7F FF 08 85 01 4E 41 60 06 60 66 7F FF 08 75 01 51 41 60 06
Fields
no fields
Metadata
{
"time": "2021-01-20T01:57:27.690185935Z",
"frequency": 904.5,
"modulation": "LORA",
"data_rate": "SF7BW125",
"coding_rate": "4/5",
"gateways": [
{
"gtw_id": "eui-a840411cfe60415c",
"timestamp": 3270993355,
"time": "2021-01-20T01:57:27.544057Z",
"channel": 3,
"rssi": -55,
"snr": 10
}

Behavior on ACT	Function	Action
Pressing ACT between 1s < time < 3s	Test uplink status	If LHT65N is already Joined to the LoRaWAN network, LHT65N will send an uplink packet, if LHT65N has an external sensor connected, blue led will blink once. If LHT65N has no external sensor, red led will blink once.
Pressing ACT for more than 3s	Active Device	green led will fast blink 5 times, LHT65N will enter working mode and start to JOIN LoRaWAN network. green led will solid turn on for 5 seconds after join in network.
Fast press ACT 5 times	Deactivate Device	red led will solid on for 5 seconds. This means LHT65N is in Deep Sleep Mode.


DRAGINO
www.dragino.com
Temperature & Humidity Sensor
Model: LHT65N
Dev EUI: A84041FB3184B2BC
SN: LHT65473724
Made in China
FCC ID:ZHZLHT65N

Flash Addr	Unix Time	Ext	BAT voltage	Value
80196E0	21/1/19 04:27:03	1	3145	sht_temp=22.00 sht_hum=32.6 ds_temp=327.67
80196F0	21/1/19 04:28:57	1	3145	sht_temp=21.90 sht_hum=33.1 ds_temp=327.67
8019700	21/1/19 04:30:30	1	3145	sht_temp=21.81 sht_hum=33.4 ds_temp=327.67
8019710	21/1/19 04:40:30	1	3145	sht_temp=21.65 sht_hum=33.7 ds_temp=327.67
8019720	21/1/19 04:50:30	1	3147	sht_temp=21.55 sht_hum=34.1 ds_temp=327.67
8019730	21/1/19 05:00:30	1	3149	sht_temp=21.50 sht_hum=34.1 ds_temp=327.67
8019740	21/1/19 05:10:30	1	3149	sht_temp=21.43 sht_hum=34.6 ds_temp=327.67
8019750	21/1/19 05:20:30	1	3151	sht_temp=21.35 sht_hum=34.9 ds_temp=327.67

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

Command Example	Function	Response
AT+EXT?	Get current external sensor mode	1 OK External Sensor mode =1
AT+EXT=1	Set external sensor mode to 1	
AT+EXT=9	Set to external DS18B20 with timestamp	

Command Example	Function	Response
AT+PID=1	Enable PID uplink	OK

Command Example	Function	Response
AT+PWORD=?	Show password	123456 OK
AT+PWORD=999999	Set password	OK

Command Example	Function	Response
AT+DISAT	Quit AT Commands mode	OK

Command Example	Function	Response
AT+SLEEP	Set to sleep mode	Clear all stored sensor data... OK

Command Example	Function
AT+TIMESTAMP=1611104352	OK Set System time to 2021-01-20 00:59:12

Command Example	Function
AT+SYNCMOD=1	Enable Sync system time via LoRaWAN MAC Command (DeviceTimeReq)

Command Example	Function
AT+SYNCTDC=0x0A	Set SYNCTDC to 10 (0x0A), so the sync time is 10 days.

Command Example	Response
AT+PDTA=1,3 Print page 1 to 3	8019500 19/6/26 16:48 1 2992 sht_temp=28.21 sht_hum=71.5 ds_temp=27.31 8019510 19/6/26 16:53 1 2994 sht_temp=27.64 sht_hum=69.3 ds_temp=26.93 8019520 19/6/26 16:58 1 2996 sht_temp=28.39 sht_hum=72.0 ds_temp=27.06 8019530 19/6/26 17:03 1 2996 sht_temp=27.97 sht_hum=70.4 ds_temp=27.12 8019540 19/6/26 17:08 1 2996 sht_temp=27.80 sht_hum=72.9 ds_temp=27.06 8019550 19/6/26 17:13 1 2998 sht_temp=27.30 sht_hum=72.4 ds_temp=26.68 8019560 19/6/26 17:22 1 2992 sht_temp=26.27 sht_hum=62.3 ds_temp=26.56 8019570 8019580 8019590 80195A0 80195B0 80195C0 80195D0 80195E0 80195F0 OK

Command Example	Response
AT+PLDTA=5 Print last 5 entries	Stop Tx and RTP events when read sensor data 1 19/6/26 13:59 1 3005 sht_temp=27.09 sht_hum=79.5 ds_temp=26.75 2 19/6/26 14:04 1 3007 sht_temp=26.65 sht_hum=74.8 ds_temp=26.43 3 19/6/26 14:09 1 3007 sht_temp=26.91 sht_hum=77.9 ds_temp=26.56 4 19/6/26 14:15 1 3007 sht_temp=26.93 sht_hum=76.7 ds_temp=26.75 5 19/6/26 14:20 1 3007 sht_temp=26.78 sht_hum=76.6 ds_temp=26.43 Start Tx and RTP events OK

Command Example	Function	Response
AT+CLRDTA	Clear date record	Clear all stored sensor data... OK

Bits	7	6	5	4	[3:0]
Status & Ext	Not Defined	Poll Message Flag	Sync time OK	Unix TimeRequest	Ext:0b(1001)

1byte	4bytes	4bytes	1byte
31	Timestamp start	Timestamp end	Uplink Interval

Bits	7	6	5	4	[3:0]
Status & Ext	Not Defined	Poll Message Flag	Sync time OK	Unix Time Request	Ext:0b(1001)

EXT # Value	External Sensor Type
0x01	Sensor E3, Temperature Sensor
0x09	Sensor E3, Temperature Sensor, Datalog Mod

Bit(bit)	[15:14]	[13:0]
Value	BAT Status 00(b): Ultra Low (BAT <= 2.50v) 01(b): Low (2.50v <=BAT <= 2.55v) 10(b): OK (2.55v <= BAT <=2.65v) 11(b): Good (BAT >= 2.65v)	Actually BAT voltage

Behavior on ACT	Function	Action
Pressing ACT between 1s < time < 3s	Test uplink status	If LHT65N is already Joined to the LoRaWAN network, LHT65N will send an uplink packet, if LHT65N has an external sensor connected, blue led will blink once. If LHT65N has no external sensor, red led will blink once.
Pressing ACT for more than 3s	Active Device	green led will fast blink 5 times, LHT65N will enter working mode and start to JOIN LoRaWAN network. green led will solid turn on for 5 seconds after join in network.
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Behavior on ACT	Function	Action
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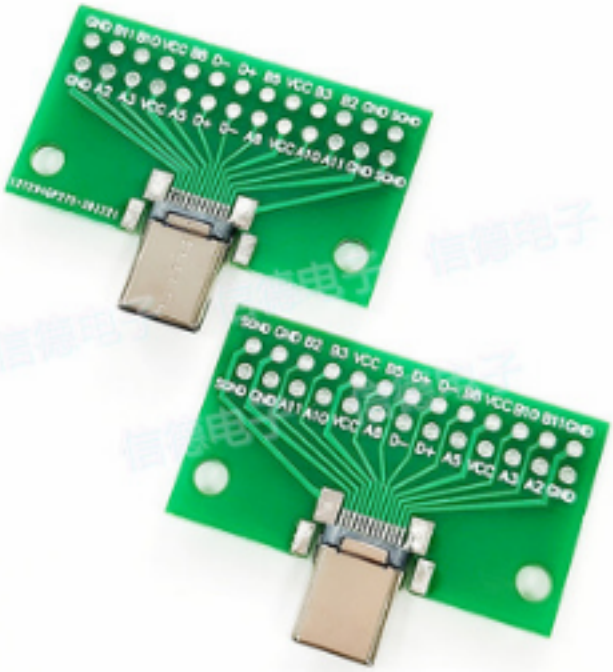
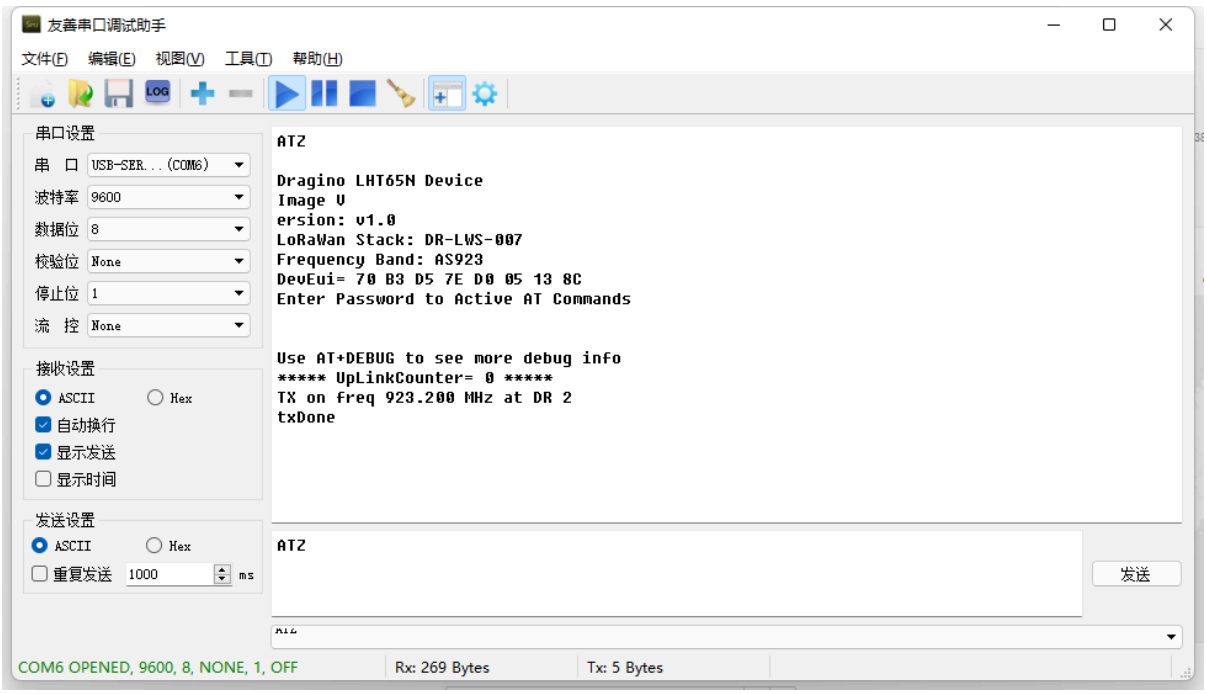
Fast press ACT 5 times	Deactivate Device	red led will solid on for 5 seconds. This means LHT65N is in Deep Sleep Mode.

Command Example	Function	Response
AT+PNACKMD=1	Poll None-ACK message	OK



TYPE-CBeta(Male)

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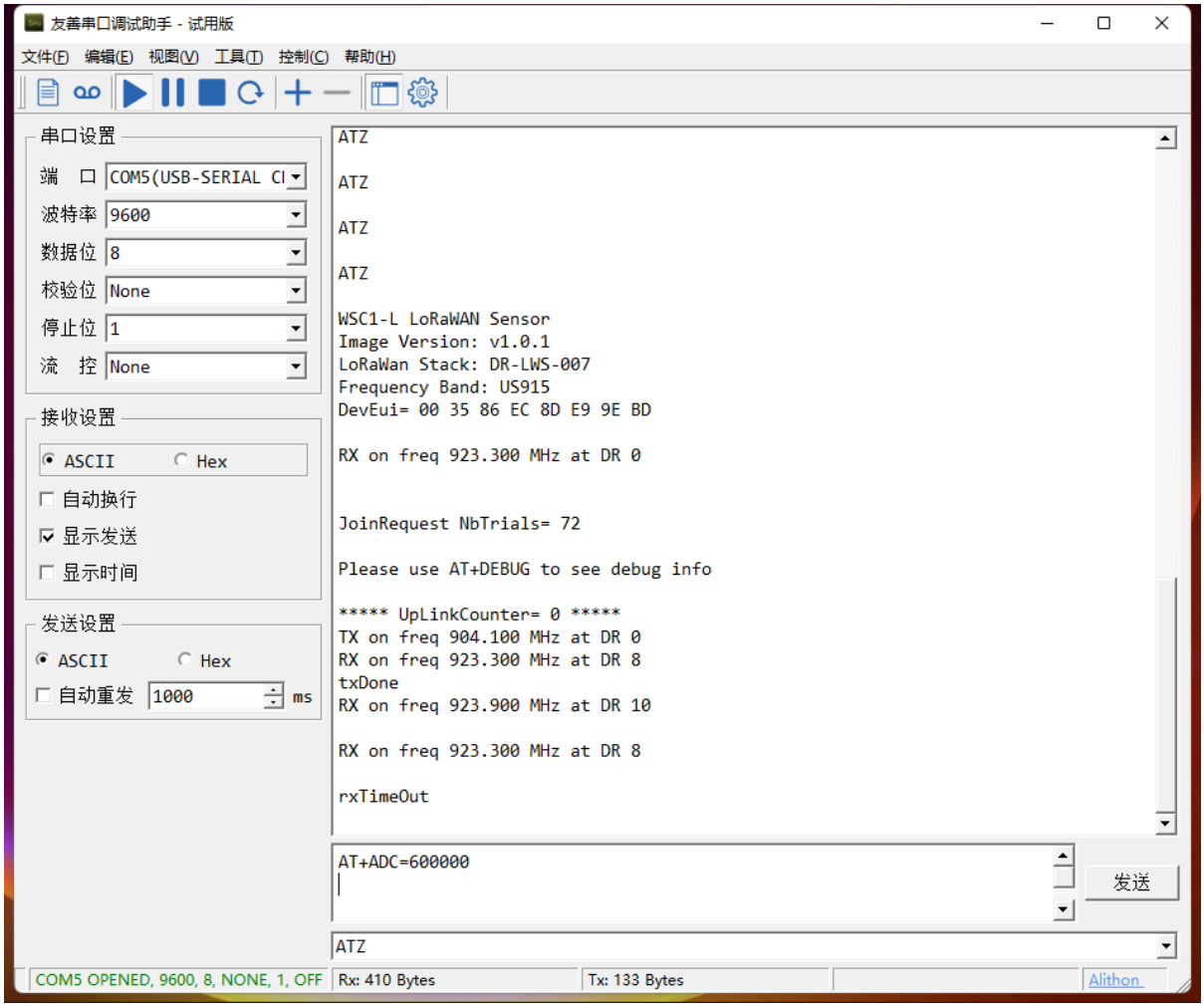
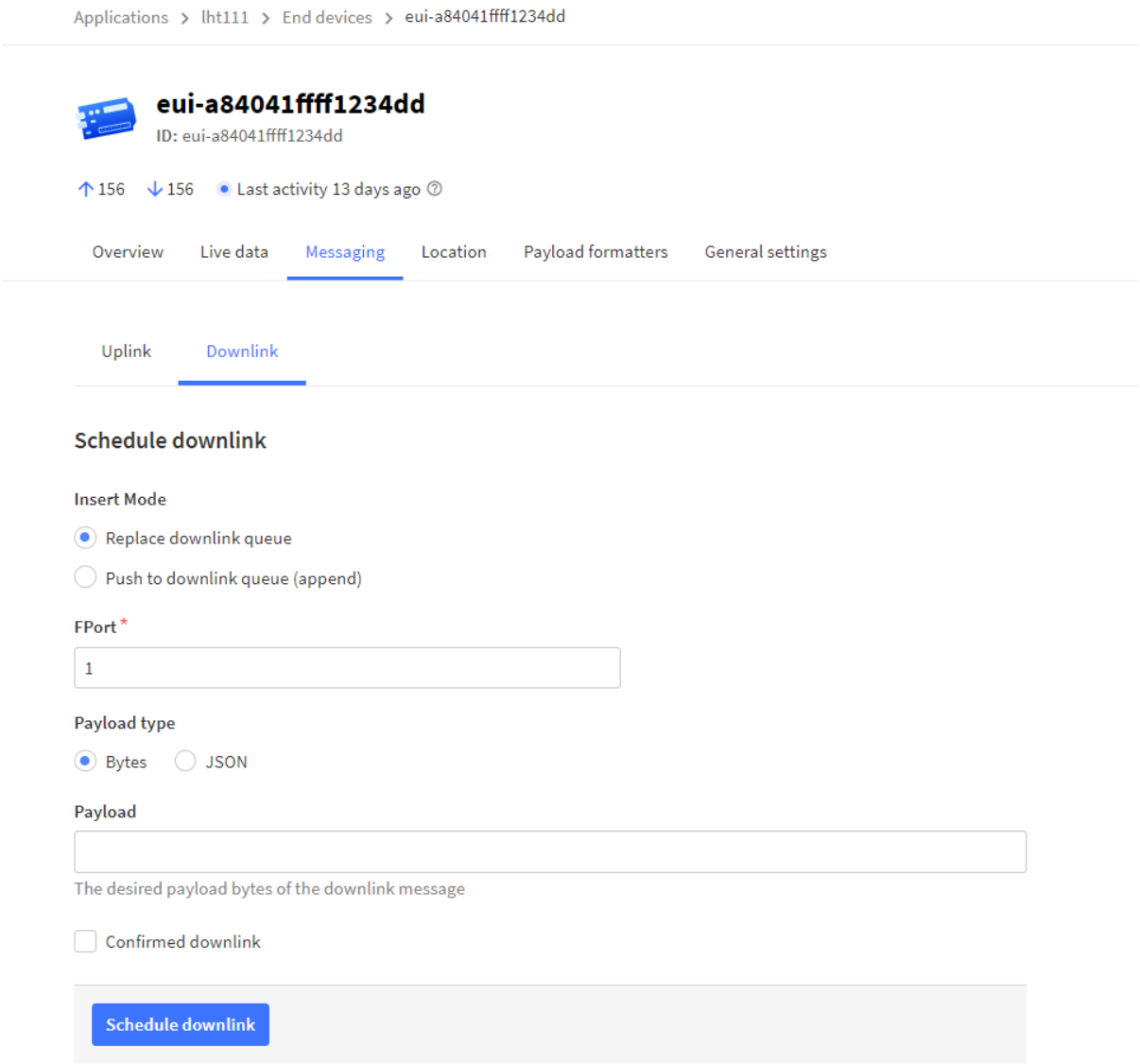
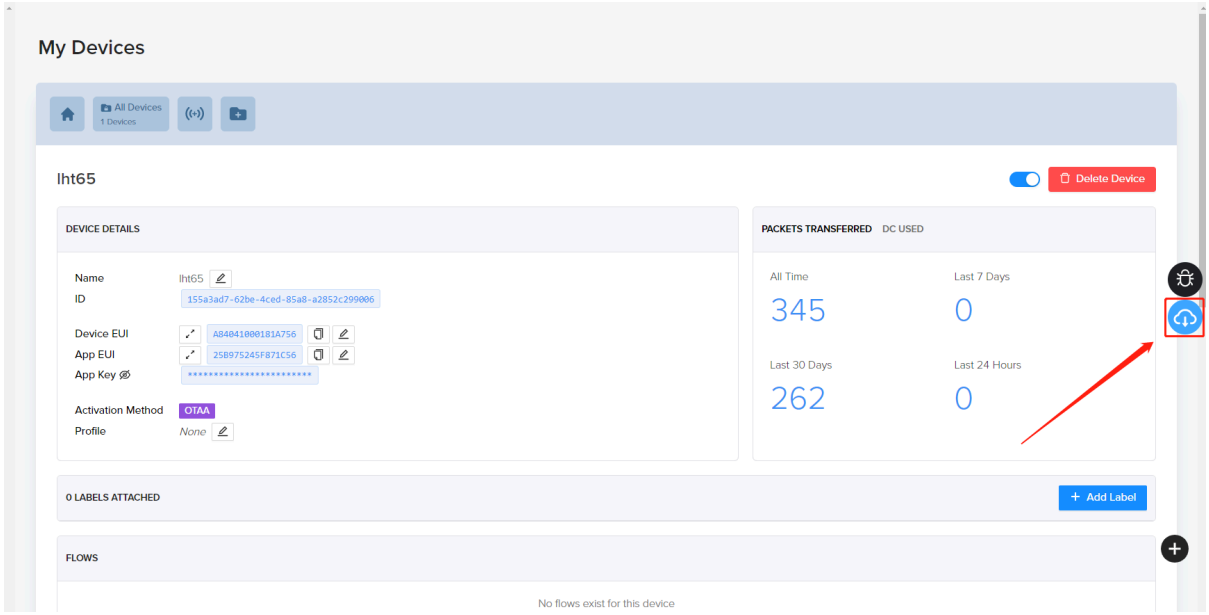
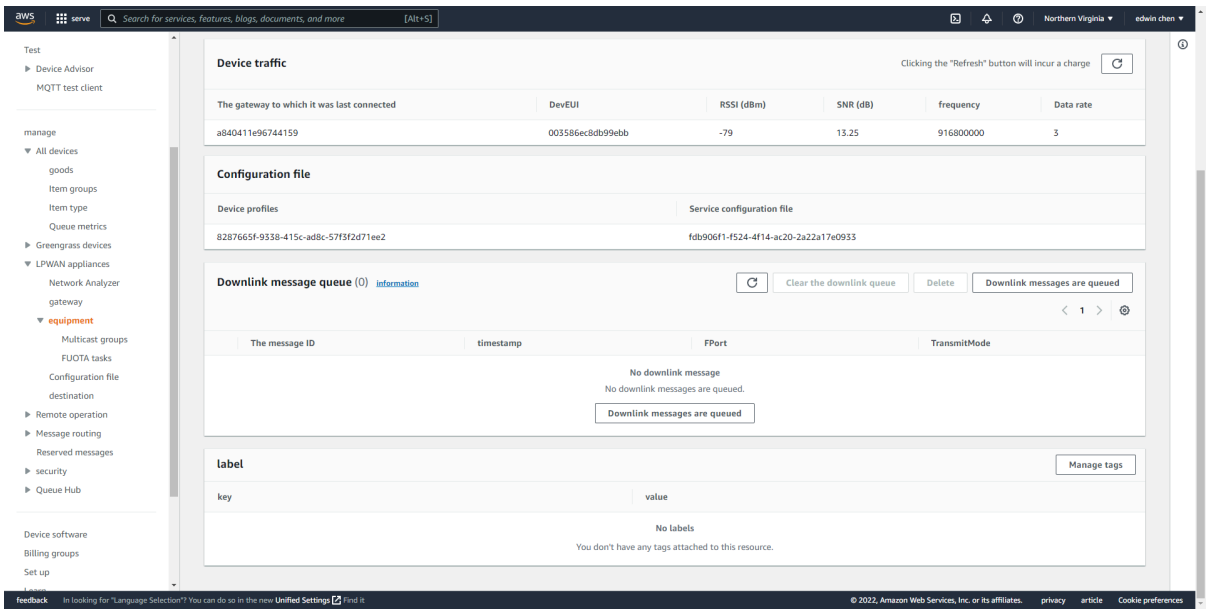
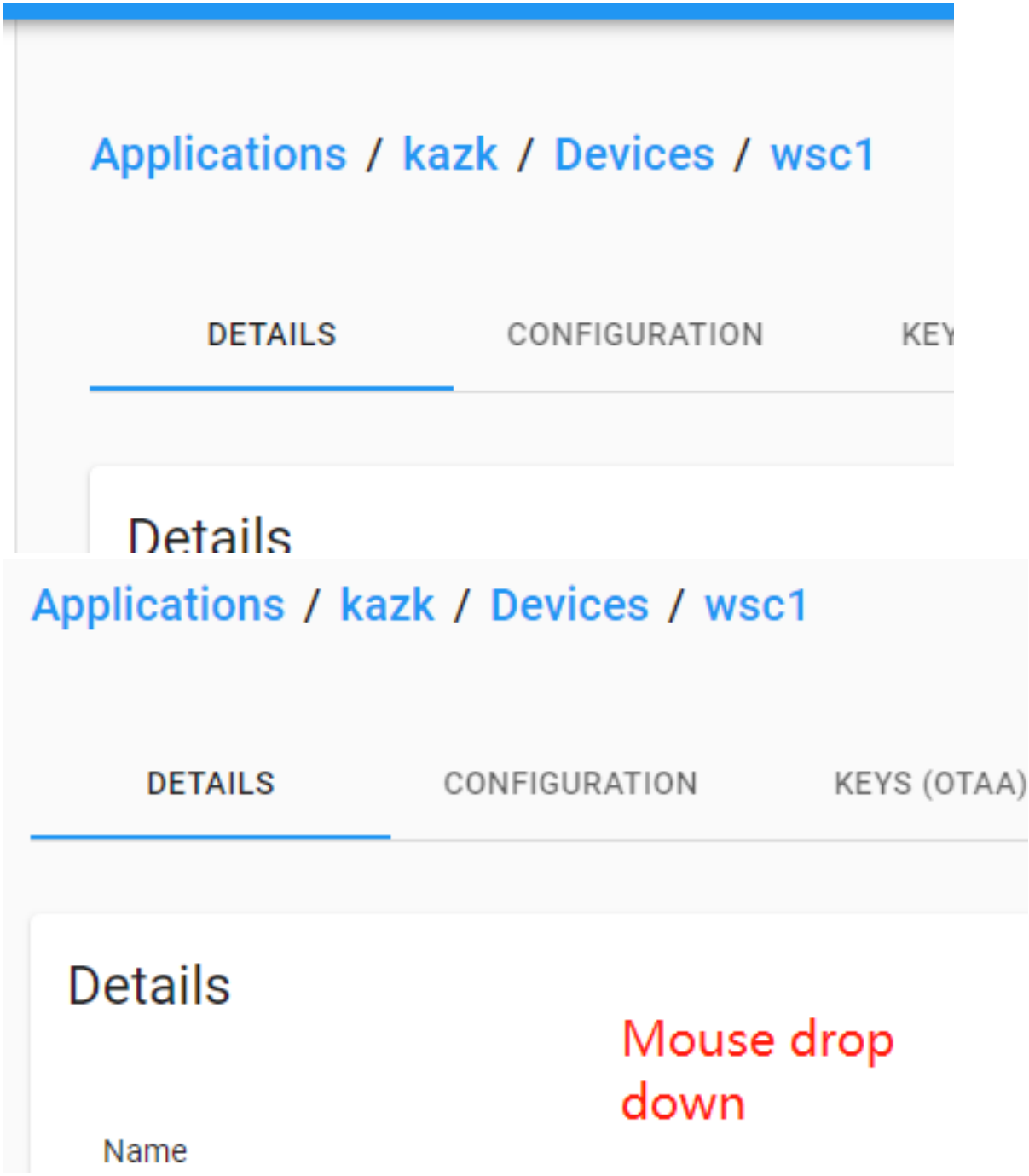
Made in China
FCC ID:ZHZLHT65N

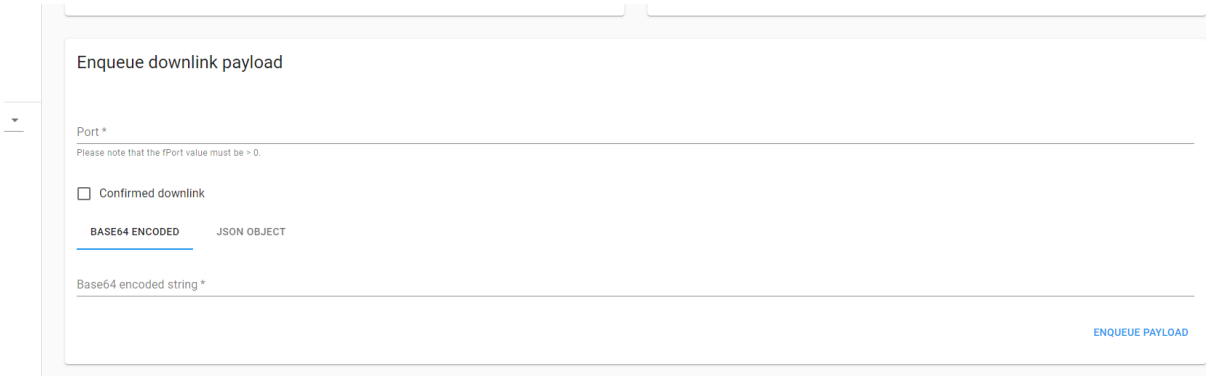

友善串口调试助手 - 试用版
文件(F) 编辑(E) 视图(V) 工具(T) 控制(C) 帮助(H)
串口设置
端 口 COM5(USB-SERIAL CI
波特率 9600
数据位 8
校验位 None
停止位 1
流 控 None
接收设置
ASCII Hex
自动换行
显示发送
显示时间
发送设置
ASCII Hex
自动重发 1000 ms
ATZ
ATZ
ATZ
ATZ
WSC1-L LoRaWAN Sensor
Image Version: v1.0.1
LoRaWan Stack: DR-LWS-007
Frequency Band: US915
DevEui= 00 35 86 EC 8D E9 9E BD
RX on freq 923.300 MHz at DR 0
JoinRequest NbTrials= 72
Please use AT+DEBUG to see debug info
***** UpLinkCounter= 0 *****
TX on freq 904.100 MHz at DR 0
RX on freq 923.300 MHz at DR 8
txDone
RX on freq 923.900 MHz at DR 10
RX on freq 923.300 MHz at DR 8
rxTimeOut
AT+ADC=600000
发送
ATZ
COM5 OPENED, 9600, 8, NONE, 1, OFF
Rx: 410 Bytes
Tx: 133 Bytes
Alithon

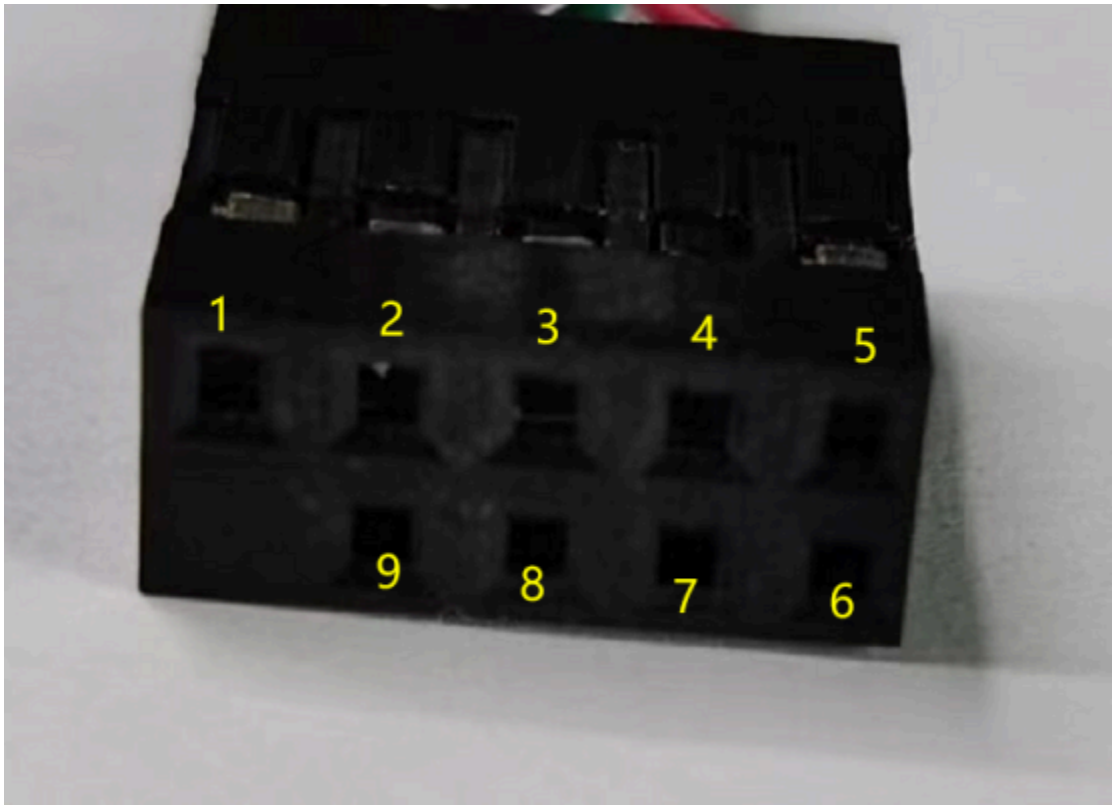

Applications > lht111 > End devices > eui-a84041ffff1234dd
eui-a84041ffff1234dd
ID: eui-a84041ffff1234dd
156 156 Last activity 13 days ago
Overview Live data Messaging Location Payload formatters General settings
Uplink Downlink
Schedule downlink
Insert Mode
Replace downlink queue
Push to downlink queue (append)
FPort *
1
Payload type
Bytes JSON
Payload
The desired payload bytes of the downlink message
Confirmed downlink
Schedule downlink

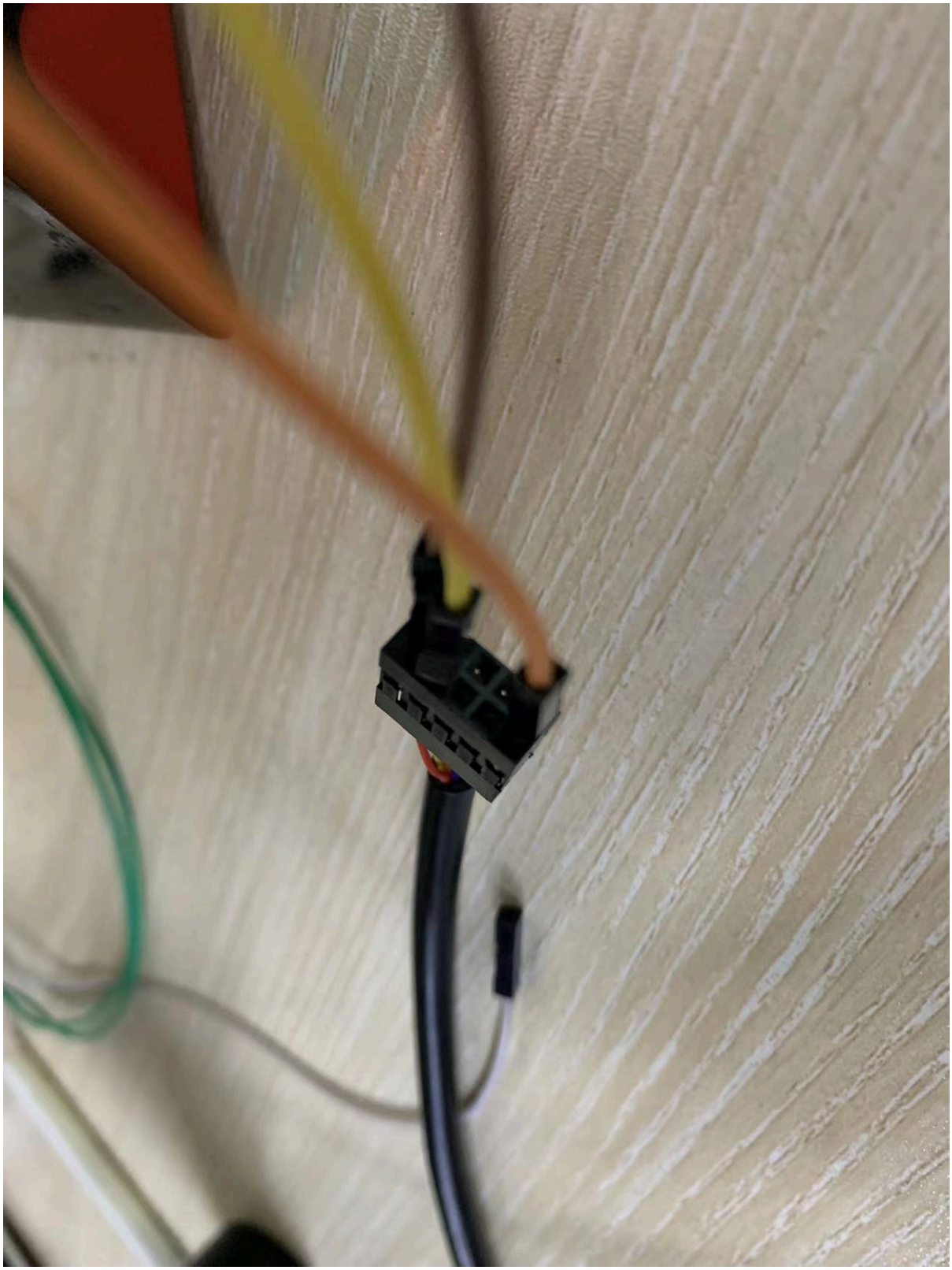

My Devices
All Devices
1 Devices
lht65
Delete Device
DEVICE DETAILS
Name
lht65
ID
155a3ad7-62be-4ced-85a8-a2852c299006
Device EUI
A840410001B1A756
App EUI
25B975245F871C56
App Key
Activation Method
OTAA
Profile
None
PACKETS TRANSFERRED
DC USED
All Time
345
Last 7 Days
0
Last 30 Days
262
Last 24 Hours
0
0 LABELS ATTACHED
Add Label
FLOWS
No flows exist for this device

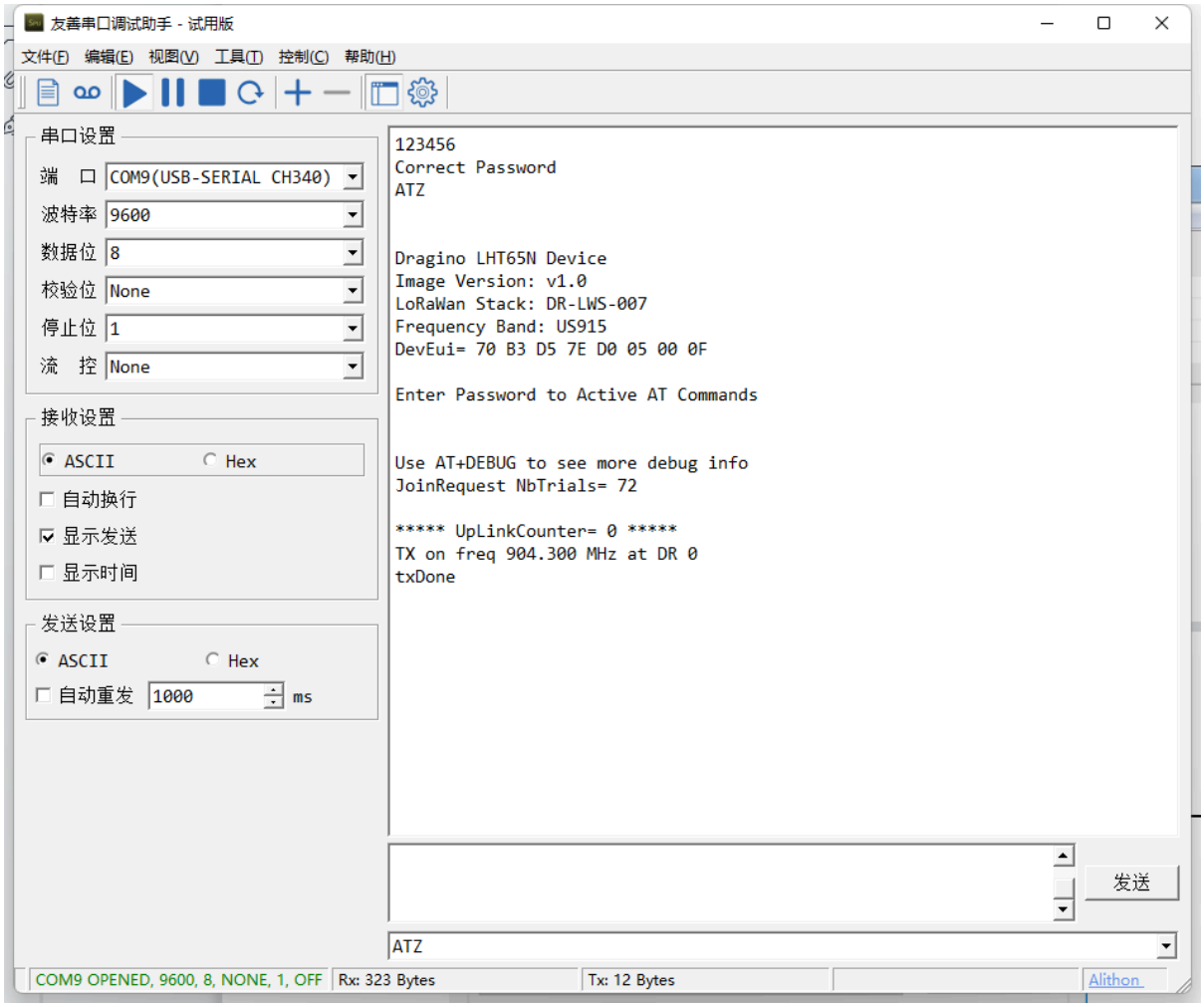

Device traffic
Clicking the "Refresh" button will incur a charge
The gateway to which it was last connected
DevEUI
RSSI (dBm)
SNR (dB)
frequency
Data rate
a840411e96744159
003586ec8db99ebb
-79
13.25
916800000
3
Configuration file
Device profiles
Service configuration file
8287665f-9338-415c-ad8c-57f3f2d71ee2
fdb906f1-f524-4f14-ac20-2a22a17e0933
Downlink message queue (0)
information
Clear the downlink queue
Delete
Downlink messages are queued
The message ID
timestamp
FPort
TransmitMode
No downlink message
No downlink messages are queued.
Downlink messages are queued
label
Manage tags
key
value
No labels
You don't have any tags attached to this resource.


Applications / kazk / Devices / wsc1
DETAILS
CONFIGURATION
KEY
Details
Applications / kazk / Devices / wsc1
DETAILS
CONFIGURATION
KEYS (OTAA)
Details
Mouse drop down
Name


Enqueue downlink payload
Port *
Please note that the fPort value must be > 0.
Confirmed downlink
BASE64 ENCODED
JSON OBJECT
Base64 encoded string *
ENQUEUE PAYLOAD

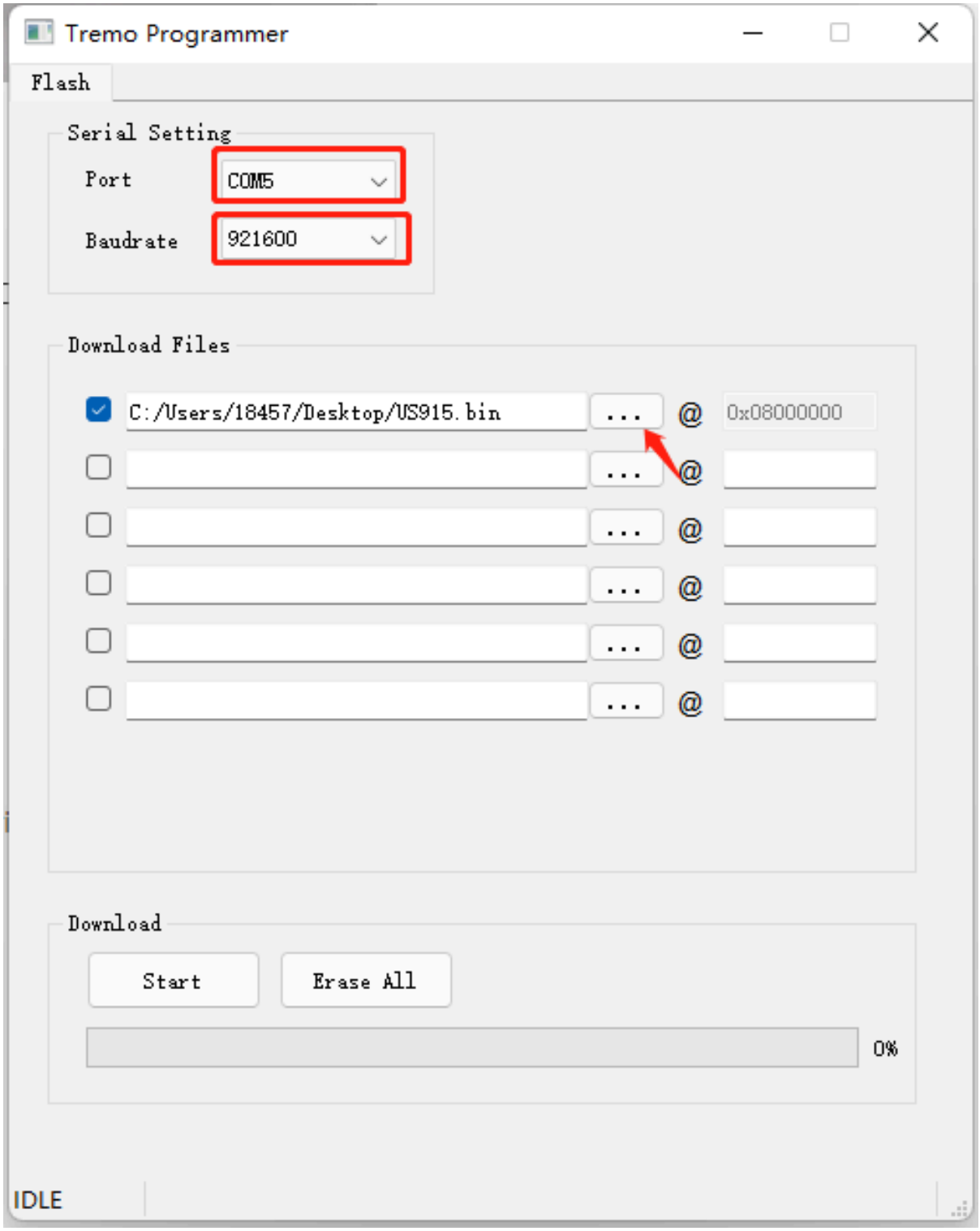

1
2
3
4
5
9
8
7
6




友善串口调试助手 - 试用版
文件(F) 编辑(E) 视图(V) 工具(T) 控制(C) 帮助(H)
串口设置
端 口 COM9(USB-SERIAL CH340)
波特率 9600
数据位 8
校验位 None
停止位 1
流 控 None
接收设置
ASCII Hex
自动换行
显示发送
显示时间
发送设置
ASCII Hex
自动重发 1000 ms
123456
Correct Password
ATZ
Dragino LHT65N Device
Image Version: v1.0
LoRaWan Stack: DR-LWS-007
Frequency Band: US915
DevEui= 70 B3 D5 7E D0 05 00 0F
Enter Password to Active AT Commands
Use AT+DEBUG to see more debug info
JoinRequest NbTrials= 72
***** UpLinkCounter= 0 *****
TX on freq 904.300 MHz at DR 0
txDone
发送
ATZ
COM9 OPENED, 9600, 8, NONE, 1, OFF
Rx: 323 Bytes
Tx: 12 Bytes
Alithon


TremoProgr
ammer_v0.8.
exe


TremoProgr
ammer_v0.8.
exe


Tremo Programmer
Flash
Serial Setting
Port
COM5
Baudrate
921600
Download Files
C:/Users/18457/Desktop/US915.bin
...
@
0x08000000
Download
Start
Erase All
0%
IDLE

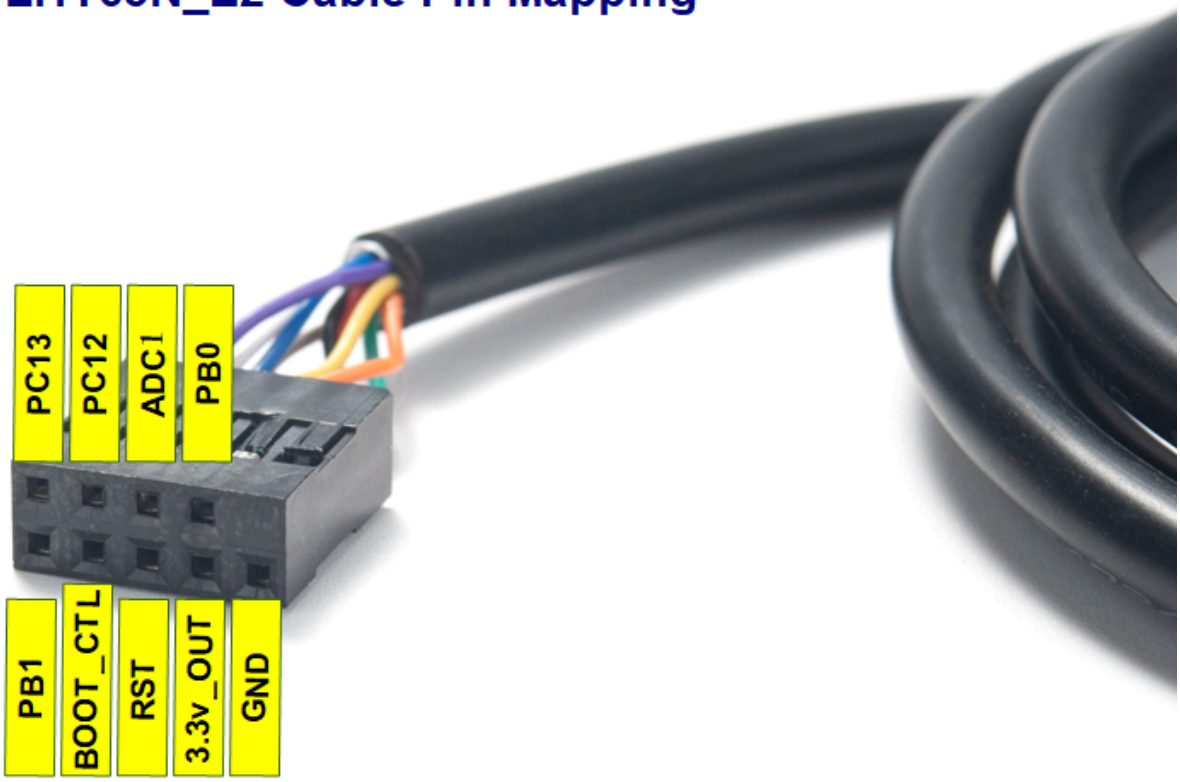

DRAGINO
DEV ADDR: 01818548
DEV EUI: A840410001818548
APP EUI: 3F77ADE36BCAAB65
APP KEY: 574E37E68AECFCCDB3B93D87A93B4B2C
APPSKEY: C948A56F21258524BE2ED27FA8BCC8C9
NETSKEY: FFA2F546BFFF65DD62FB26685A9B94F3
SN:LST25265480

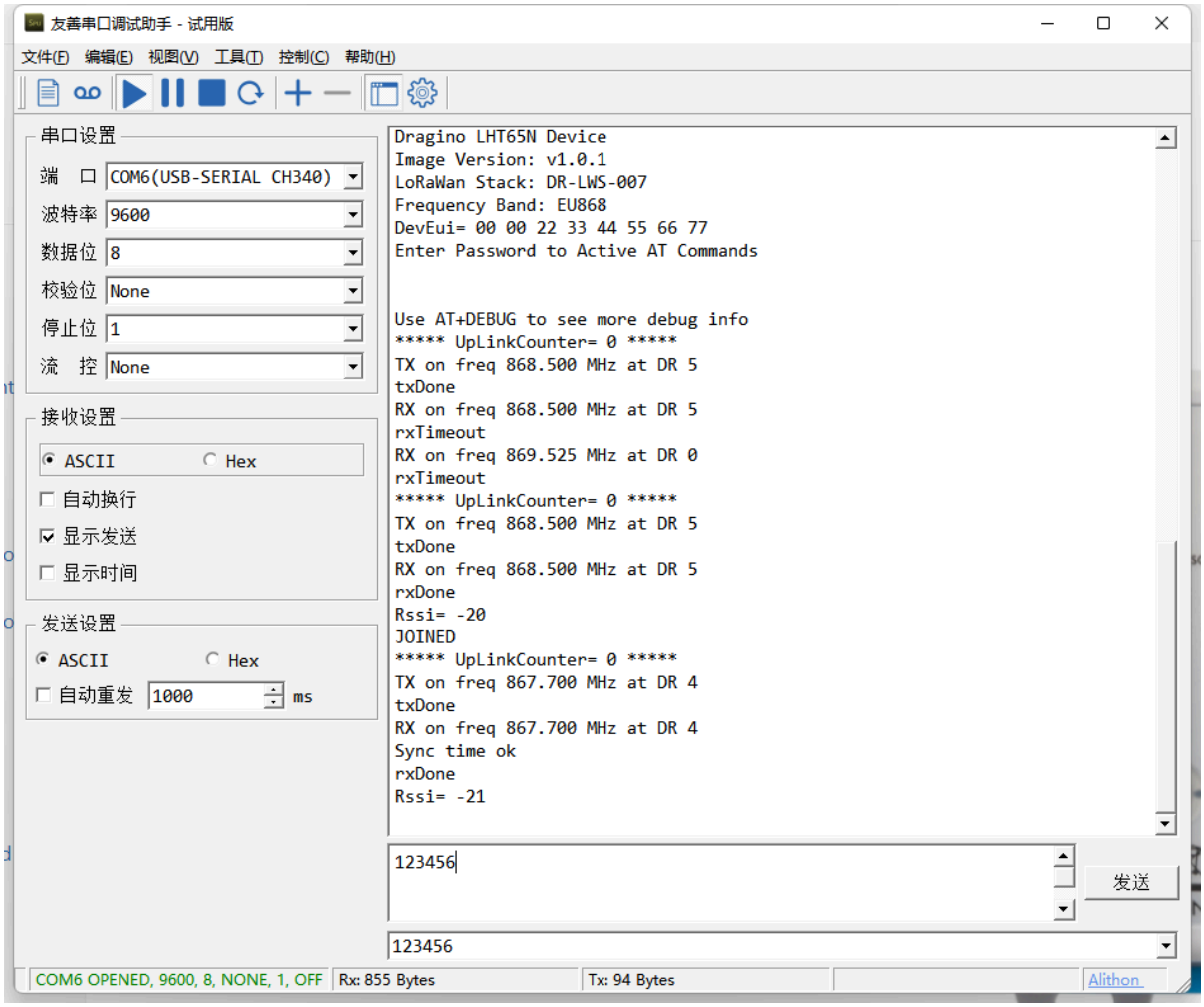

28AWG 80°C 300V VW-1 ZHIDE

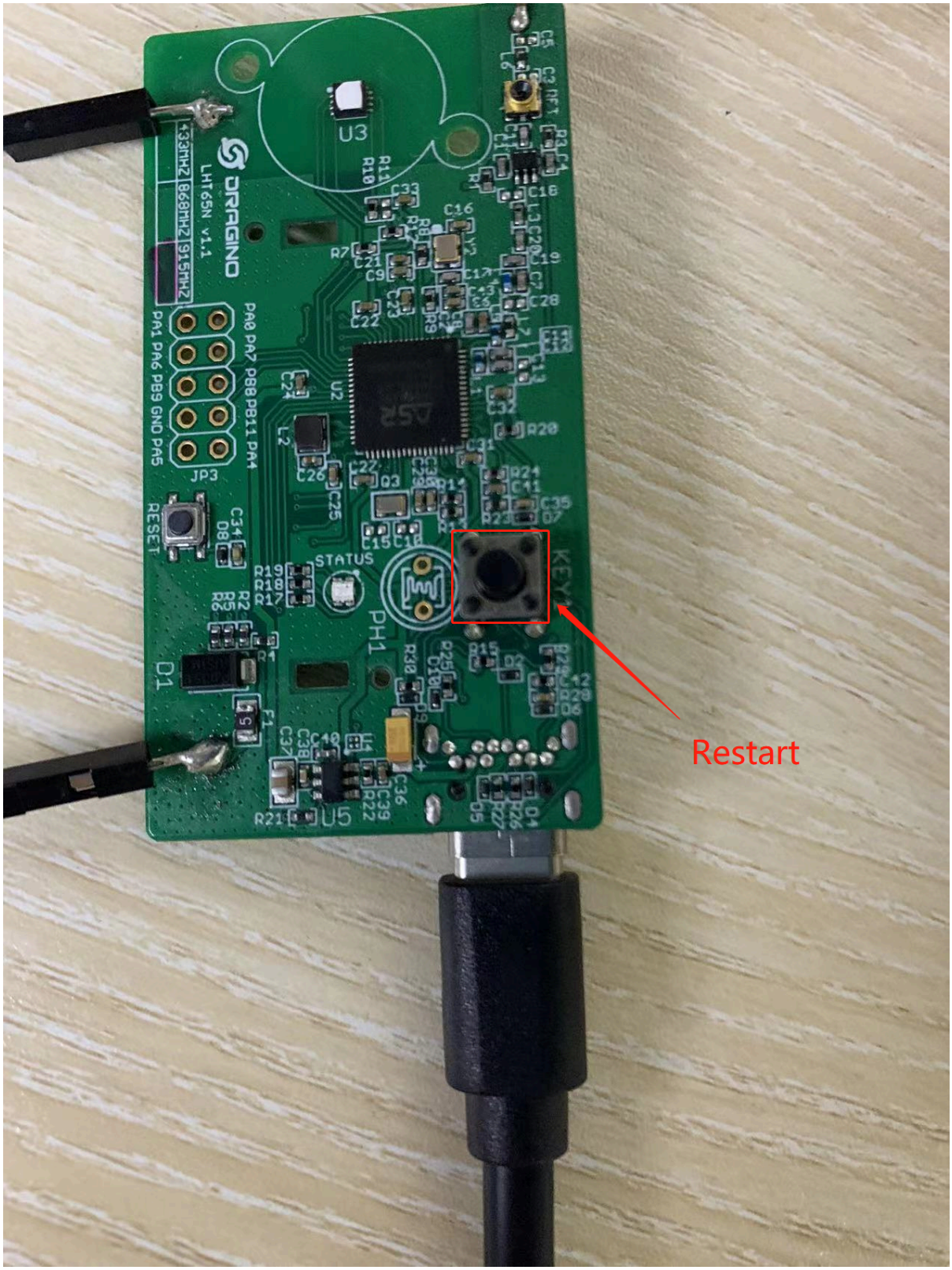
LHT65N-E2

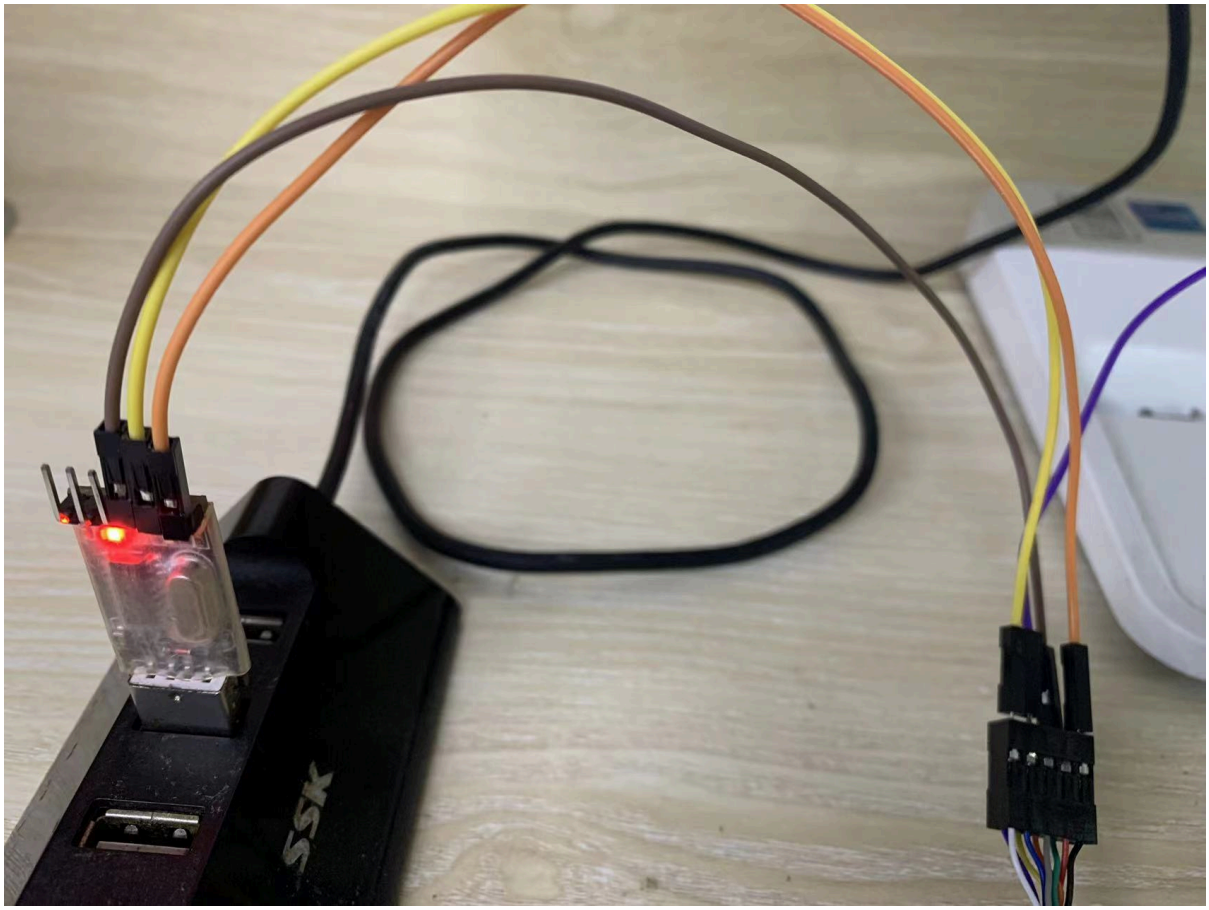

DRAGINO
www.dragino.com
Temperature & Humidity Sensor
Model: LHT65N
Dev EUI: A84041764184F25D
SN: HT65N490013
Made in China
FCC ID:ZHZLHT65N

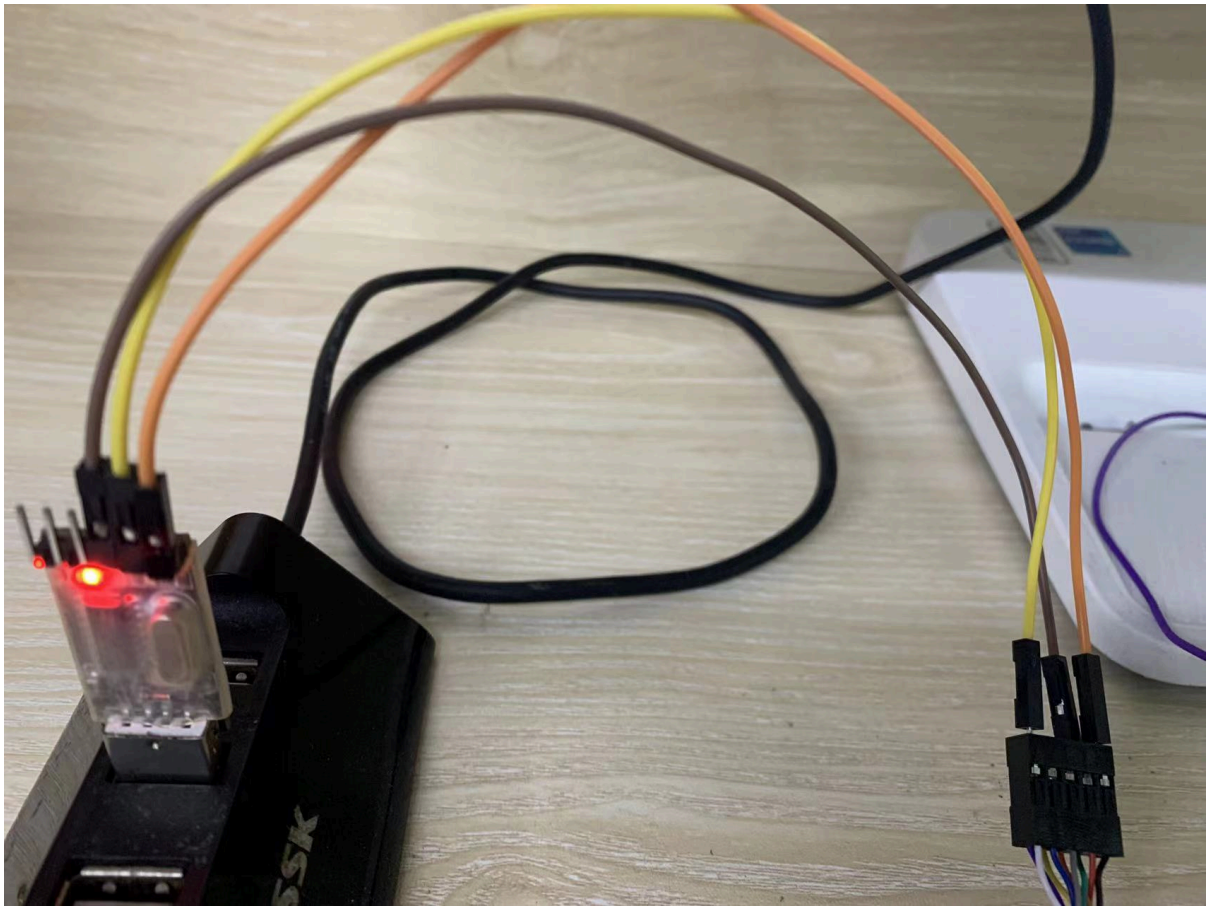
LHT65N_E2 Cable Pin Mapping

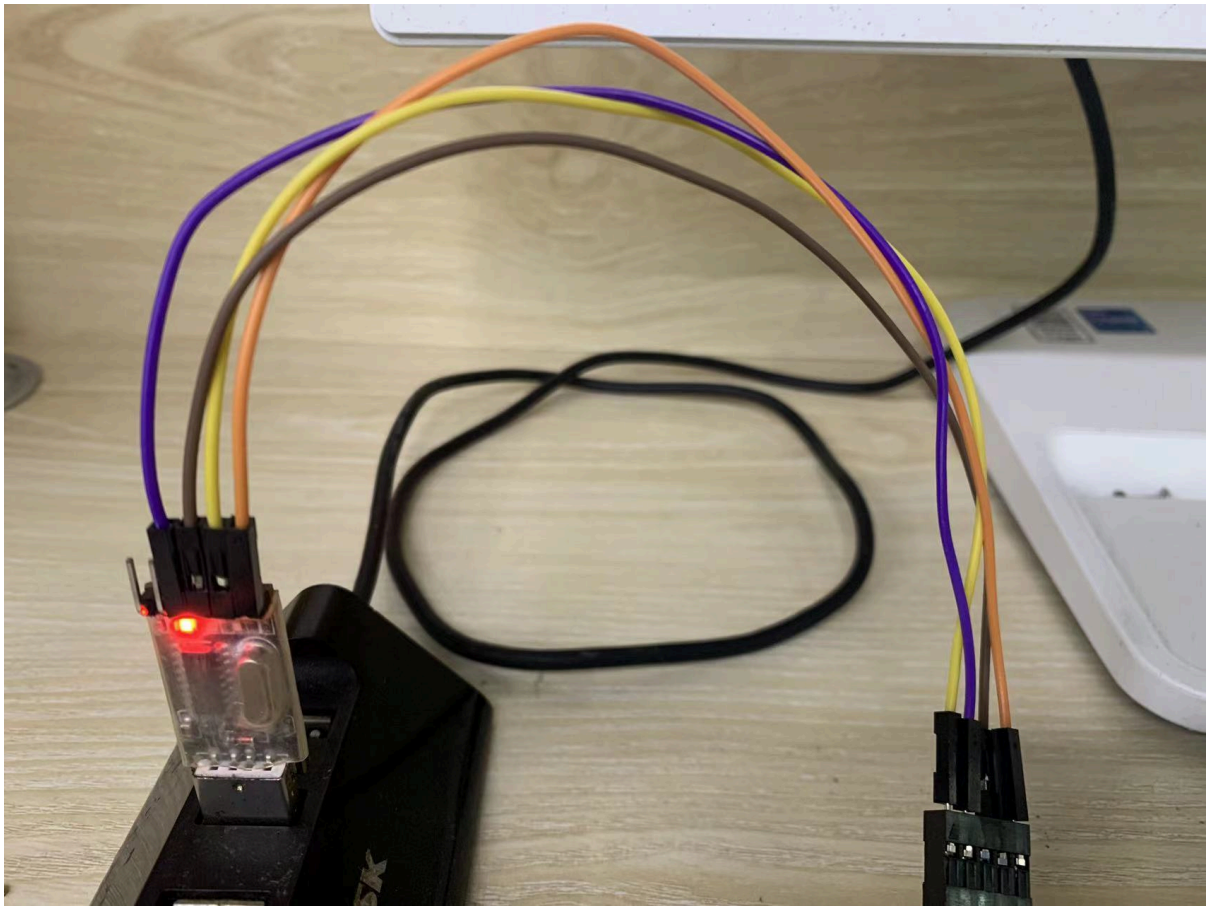


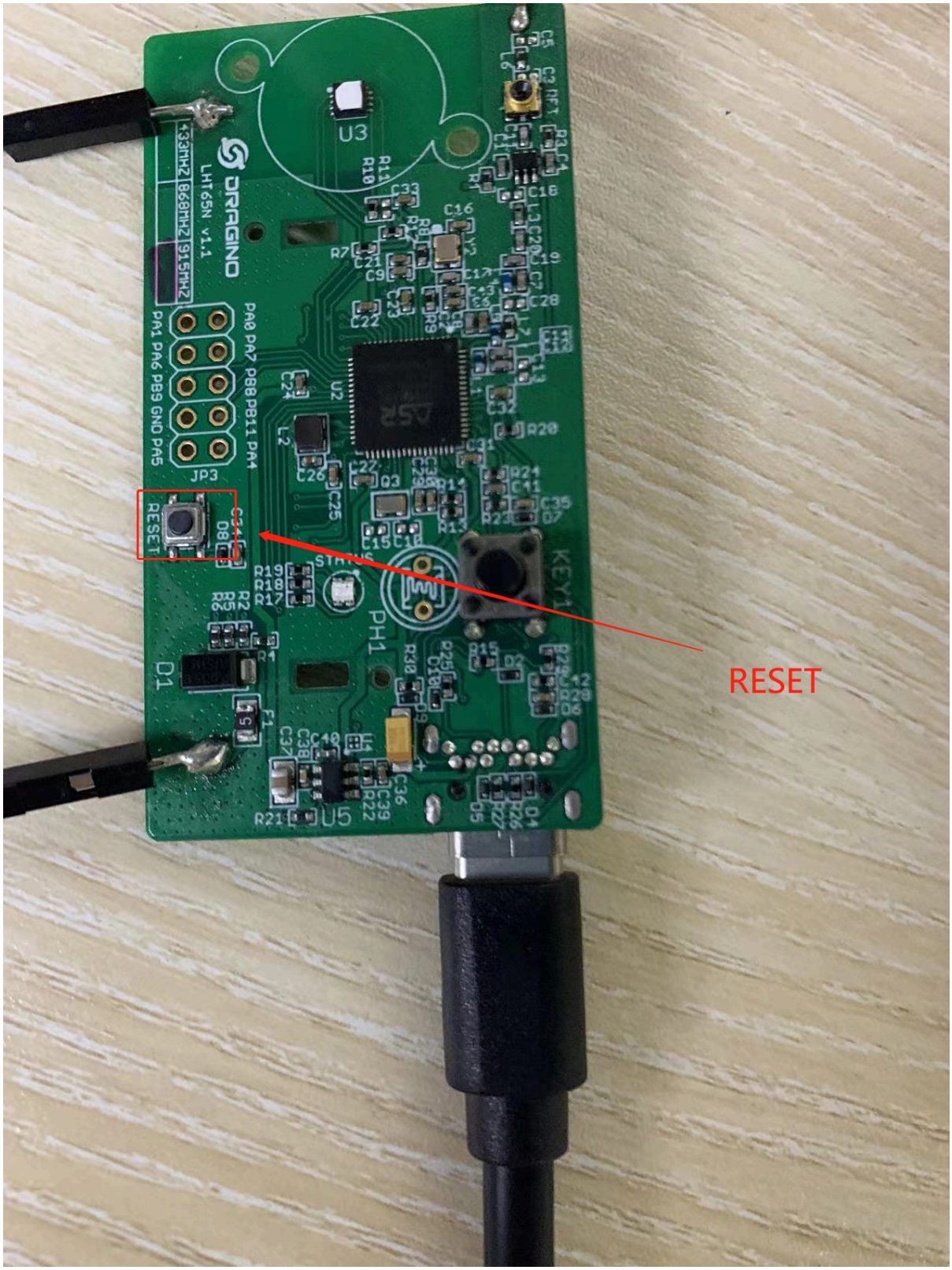

友善串口调试助手 - 试用版
文件(F) 编辑(E) 视图(V) 工具(T) 控制(C) 帮助(H)
串口设置
端 口 COM6(USB-SERIAL CH340)
波特率 9600
数据位 8
校验位 None
停止位 1
流 控 None
接收设置
ASCII Hex
自动换行
显示发送
显示时间
发送设置
ASCII Hex
自动重发 1000 ms
Dragino LHT65N Device
Image Version: v1.0.1
LoRaWan Stack: DR-LWS-007
Frequency Band: EU868
DevEui= 00 00 22 33 44 55 66 77
Enter Password to Active AT Commands
Use AT+DEBUG to see more debug info
***** UpLinkCounter= 0 *****
TX on freq 868.500 MHz at DR 5
txDone
RX on freq 868.500 MHz at DR 5
rxTimeout
RX on freq 869.525 MHz at DR 0
rxTimeout
***** UpLinkCounter= 0 *****
TX on freq 868.500 MHz at DR 5
txDone
RX on freq 868.500 MHz at DR 5
rxDone
Rssi= -20
JOINED
***** UpLinkCounter= 0 *****
TX on freq 867.700 MHz at DR 4
txDone
RX on freq 867.700 MHz at DR 4
Sync time ok
rxDone
Rssi= -21
123456
发送
123456
COM6 OPENED, 9600, 8, NONE, 1, OFF
Rx: 855 Bytes
Tx: 94 Bytes
Alithon

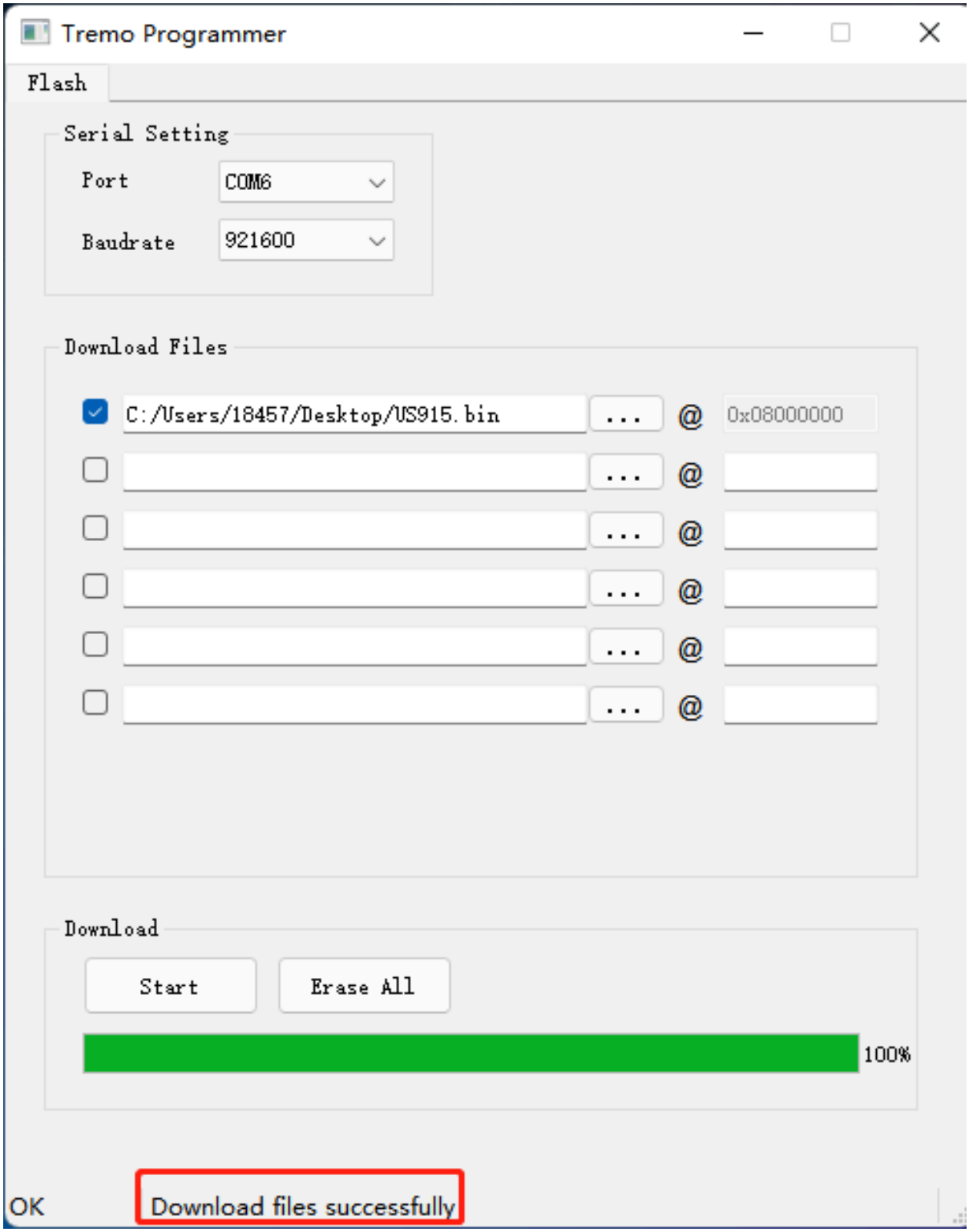

Restart

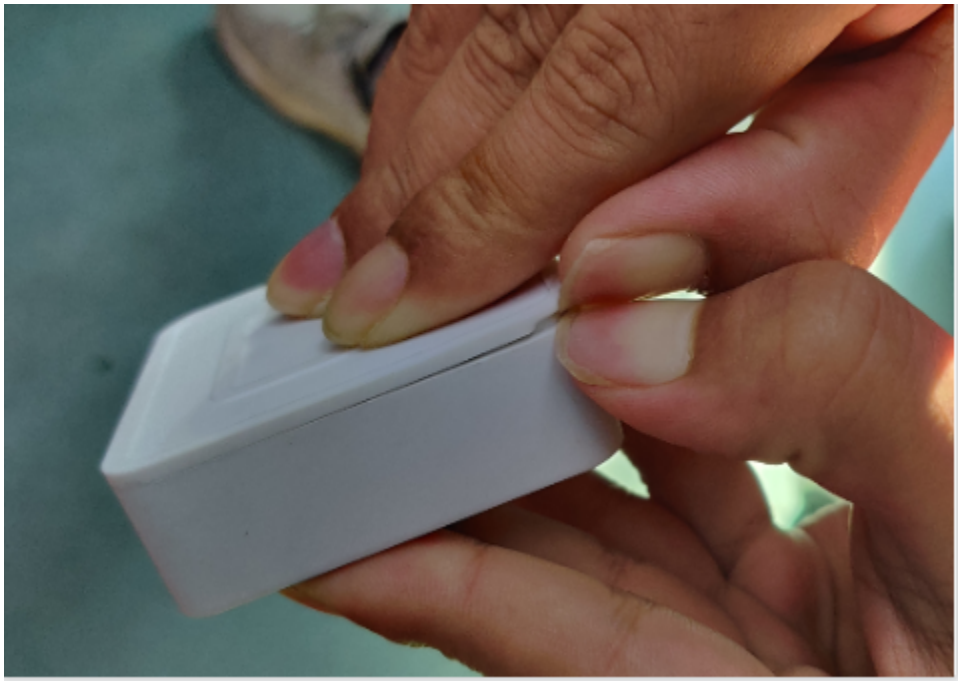

SSK



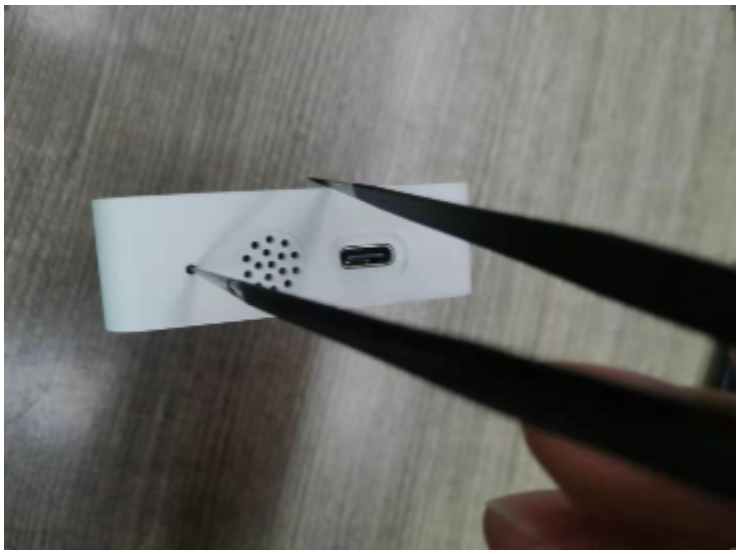


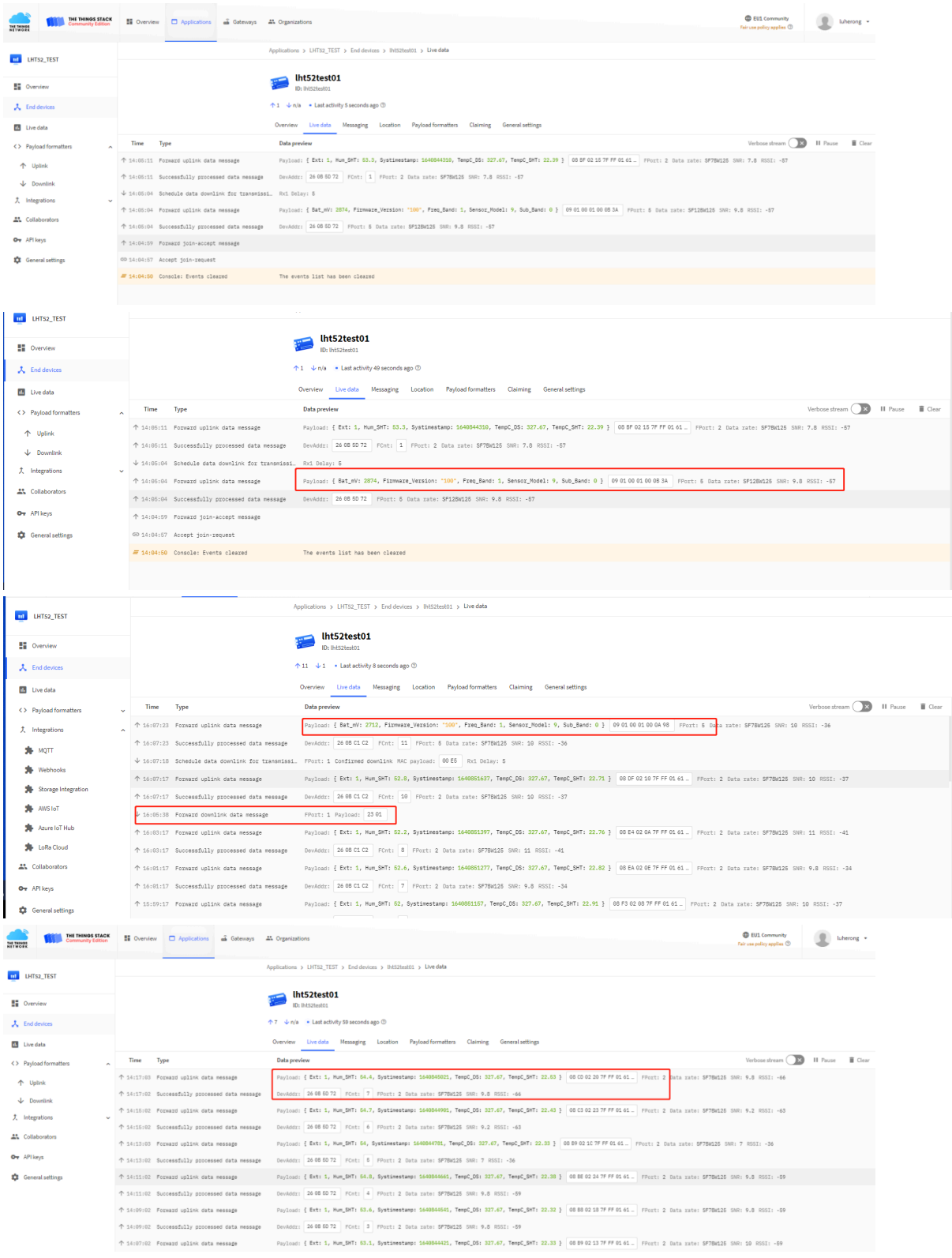

RESET

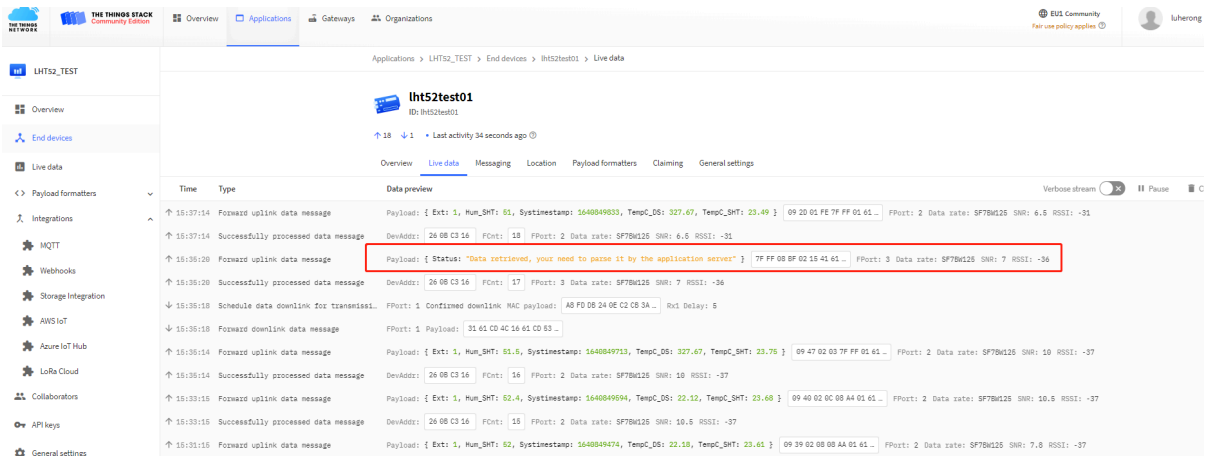

Tremo Programmer
Flash
Serial Setting
Port
COM6
Baudrate
921600
Download Files
C:/Users/18457/Desktop/US915.bin
...
@
0x08000000
Download
Start
Erase All
100%
OK
Download files successfully

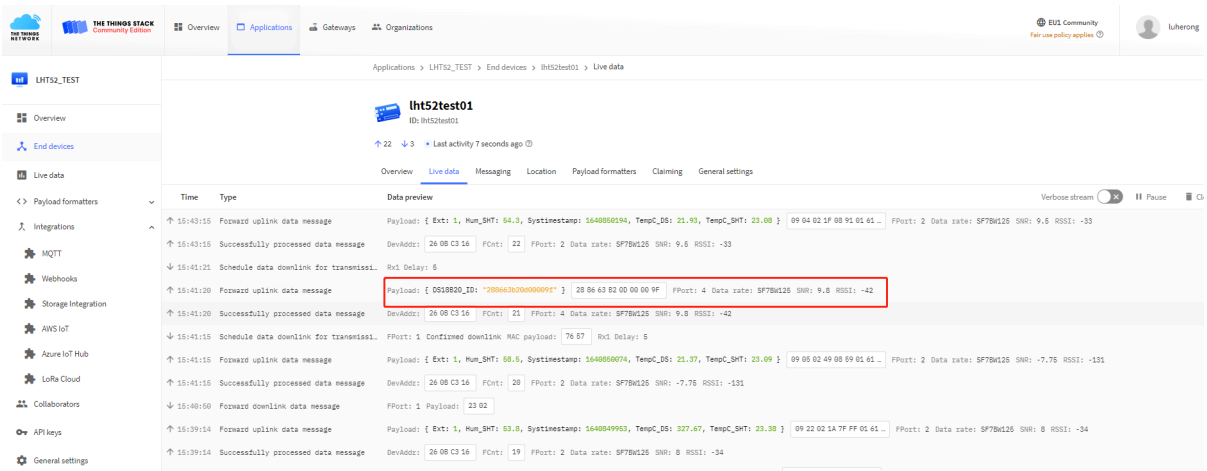


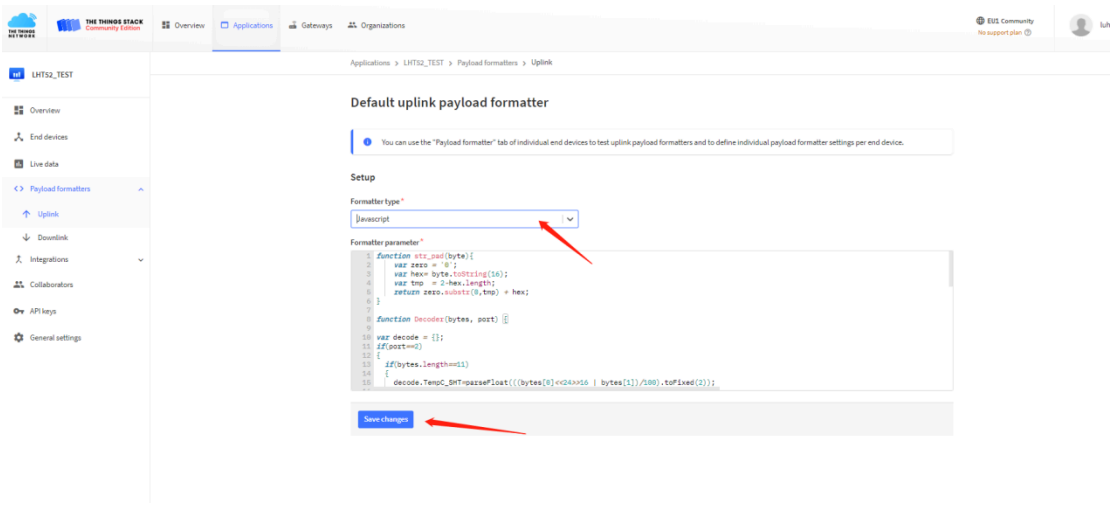

LoRaWAN Indoor Temperature & Humidity Sensor



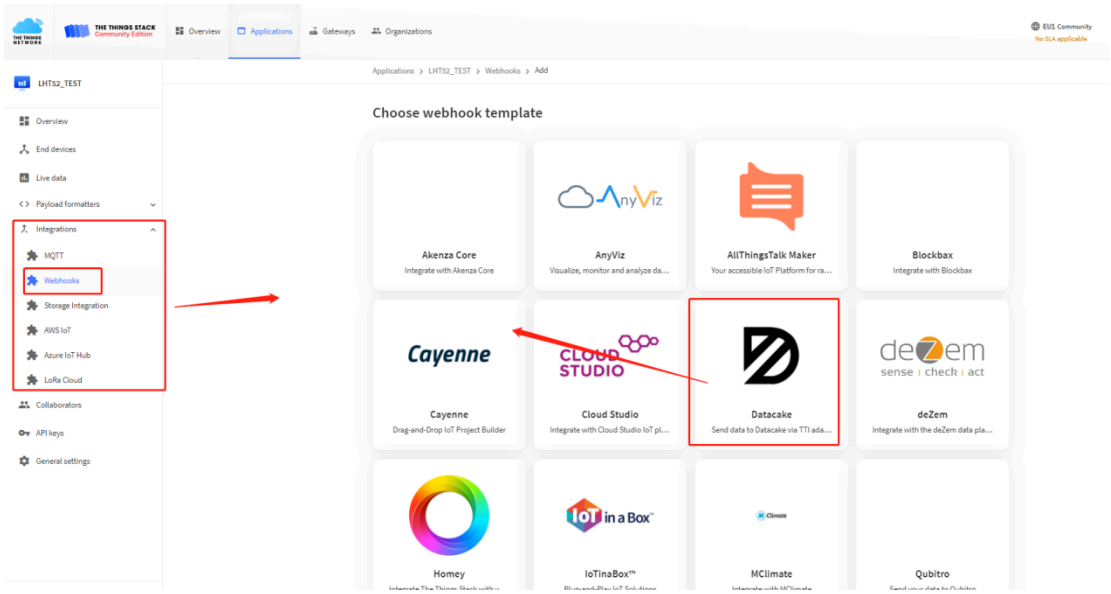

LHT52_TEST
lht52test01
Overview
End devices
Live data
Payload formatters
Uplink
Downlink
Integrations
Collaborators
API keys
General settings
Time
Type
Data preview
Forward uplink data message
Successfully processed data message
Schedule data downlink for transmissi...
Forward join-accept message
Accept join-request
Console: Events cleared
The events list has been cleared
MQTT
Webhooks
Storage Integration
AWS IoT
Azure IoT Hub
LoRa Cloud

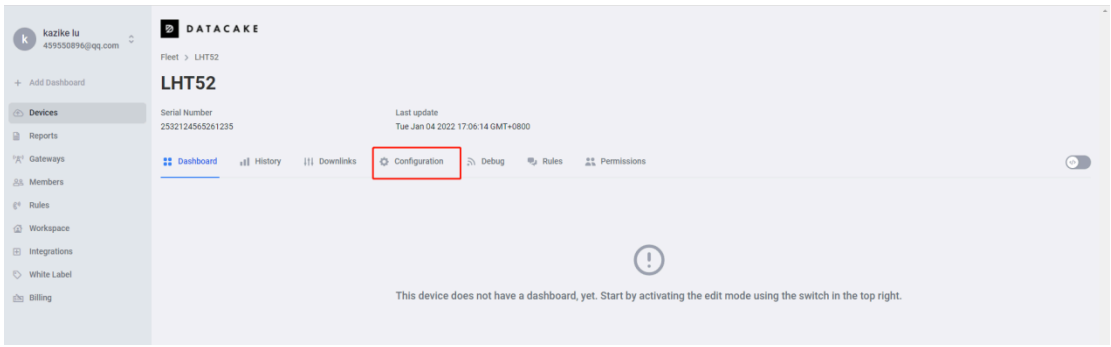


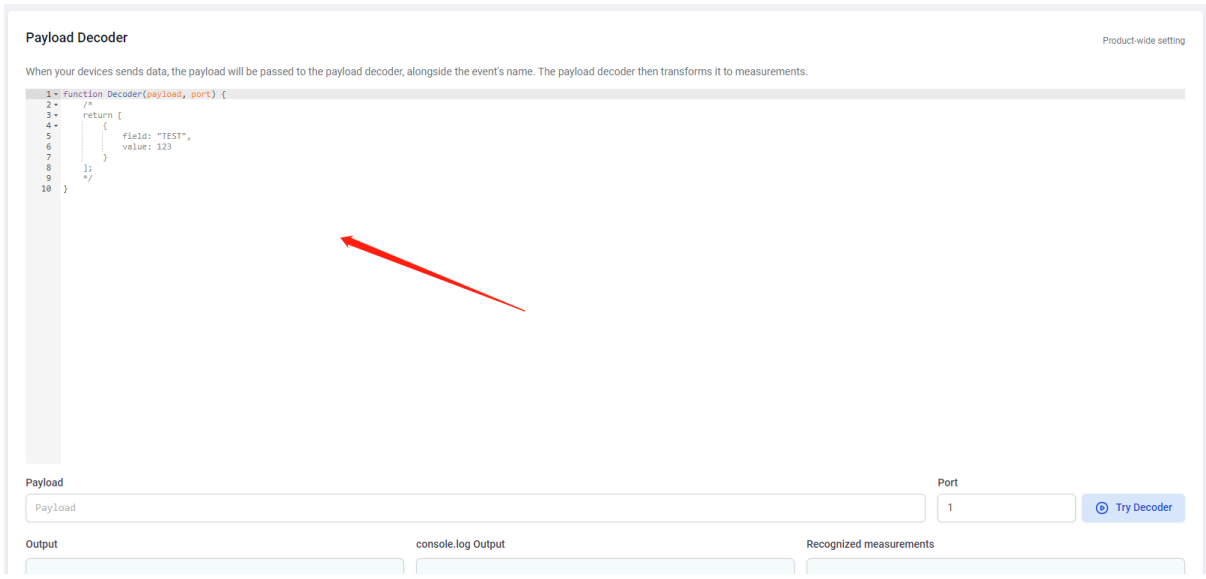


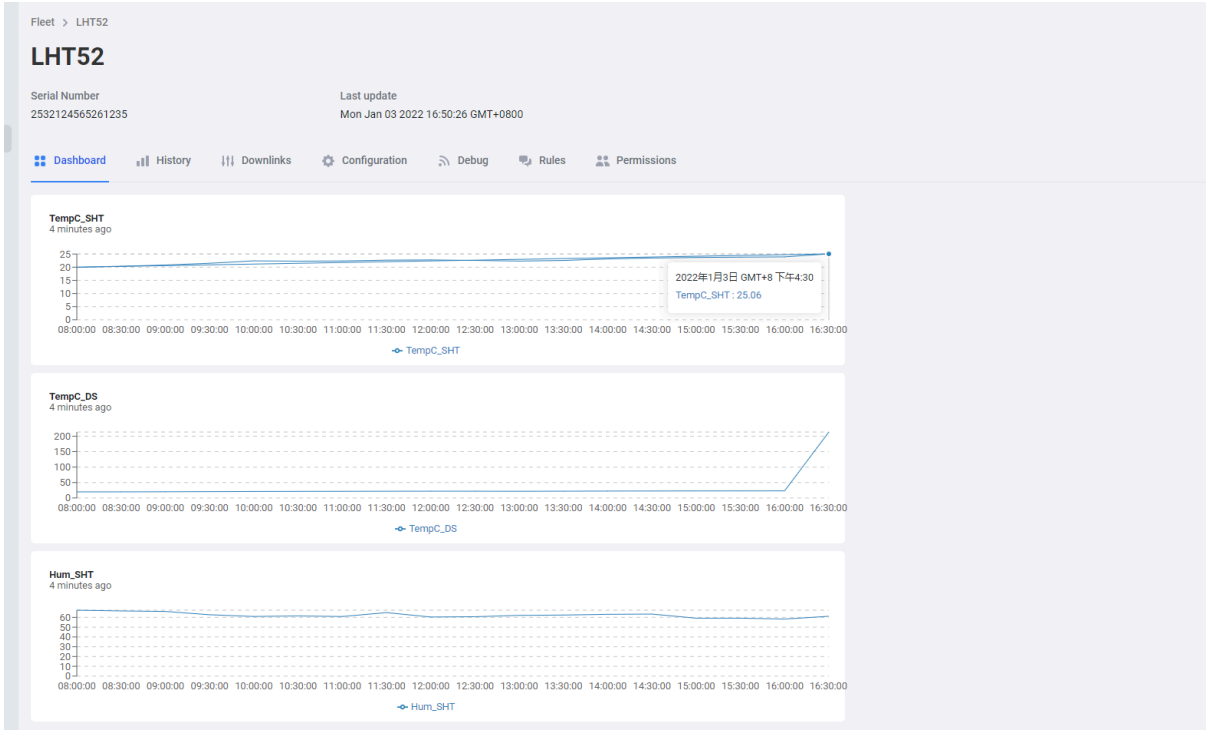


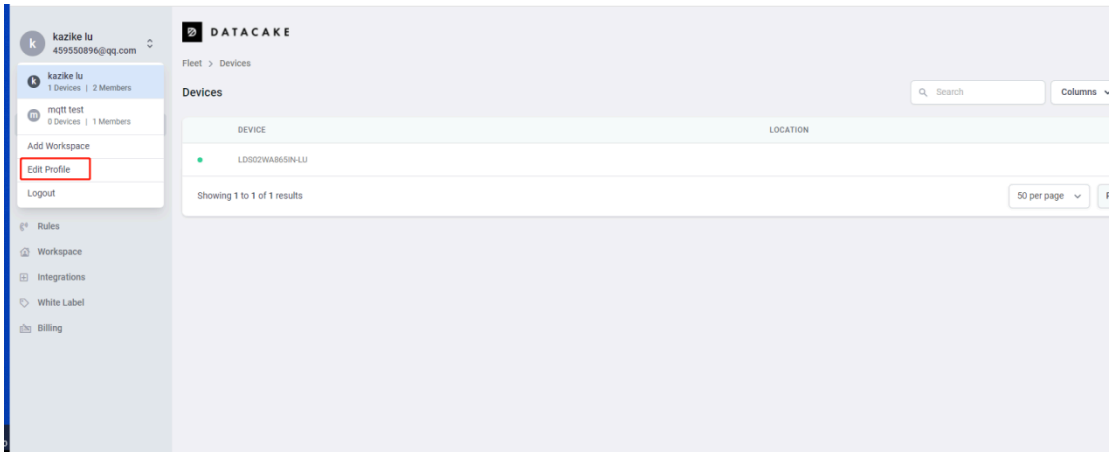
09 01 00 01 00 0B 3A

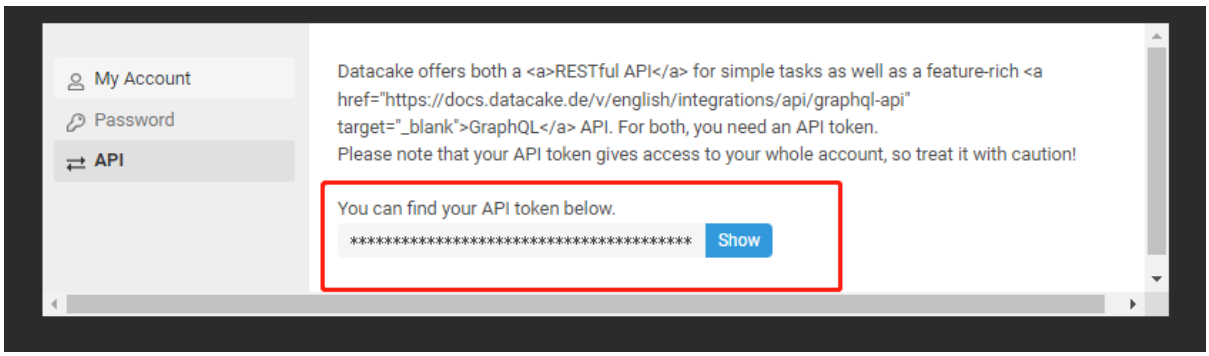

Choose webhook template
Akenza Core
AnyViz
AllThingsTalk Maker
Blockbax
Cayenne
Cloud Studio
Datacake
deZem
Homey
IoTinaBox™
MClimate
Qubitro
Webhooks

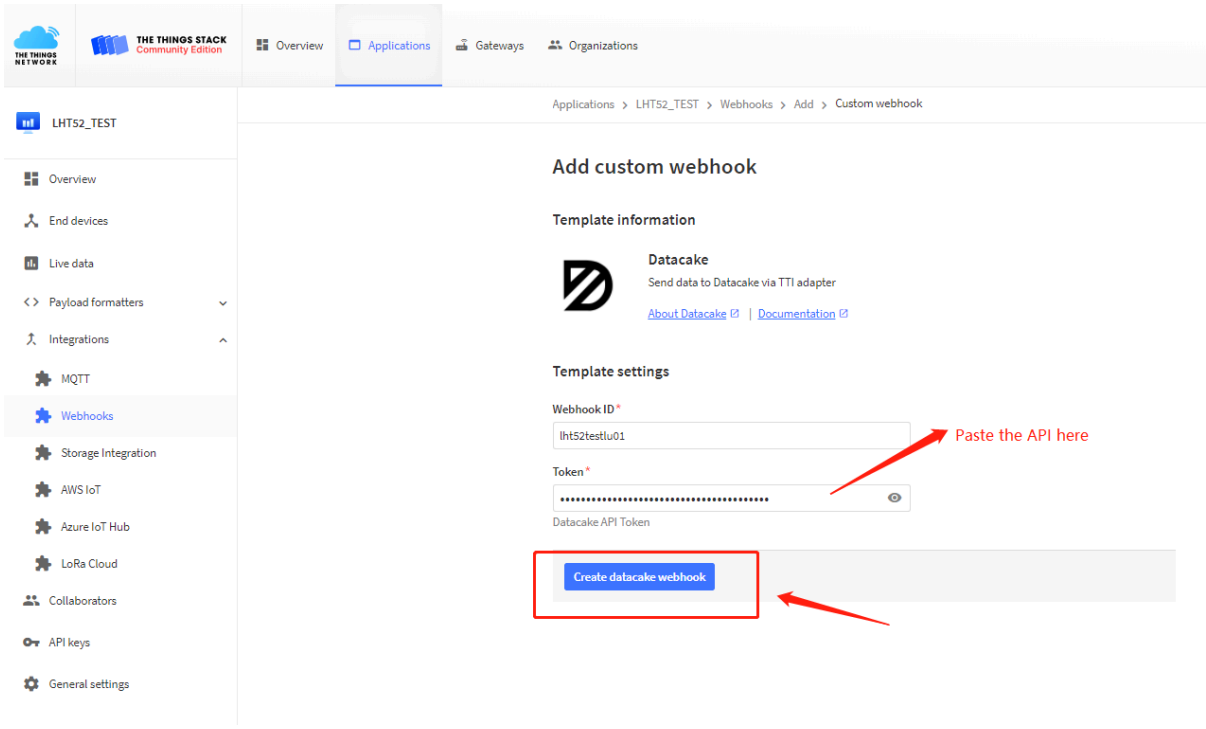

DATACAKE
LHT52
Serial Number
2532124565261235
Last update
Tue Jan 04 2022 17:06:14 GMT+0800
Dashboard
History
Downlinks
Configuration
Debug
Rules
Permissions
This device does not have a dashboard, yet. Start by activating the edit mode using the switch in the top right.

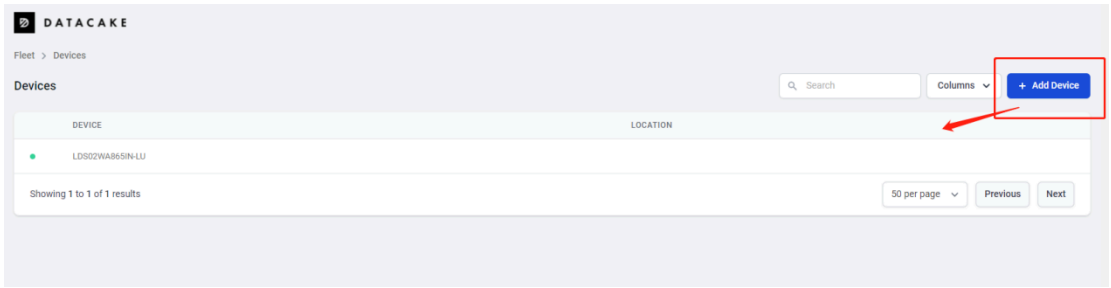

Payload Decoder
Product-wide setting
When your devices sends data, the payload will be passed to the payload decoder, alongside the event's name. The payload decoder then transforms it to measurements.
function Decoder(payload, port) {
/*
return [
{
field: "TEST",
value: 123
}
];
*/
}
Payload
Port
Try Decoder
Output
console.log Output
Recognized measurements

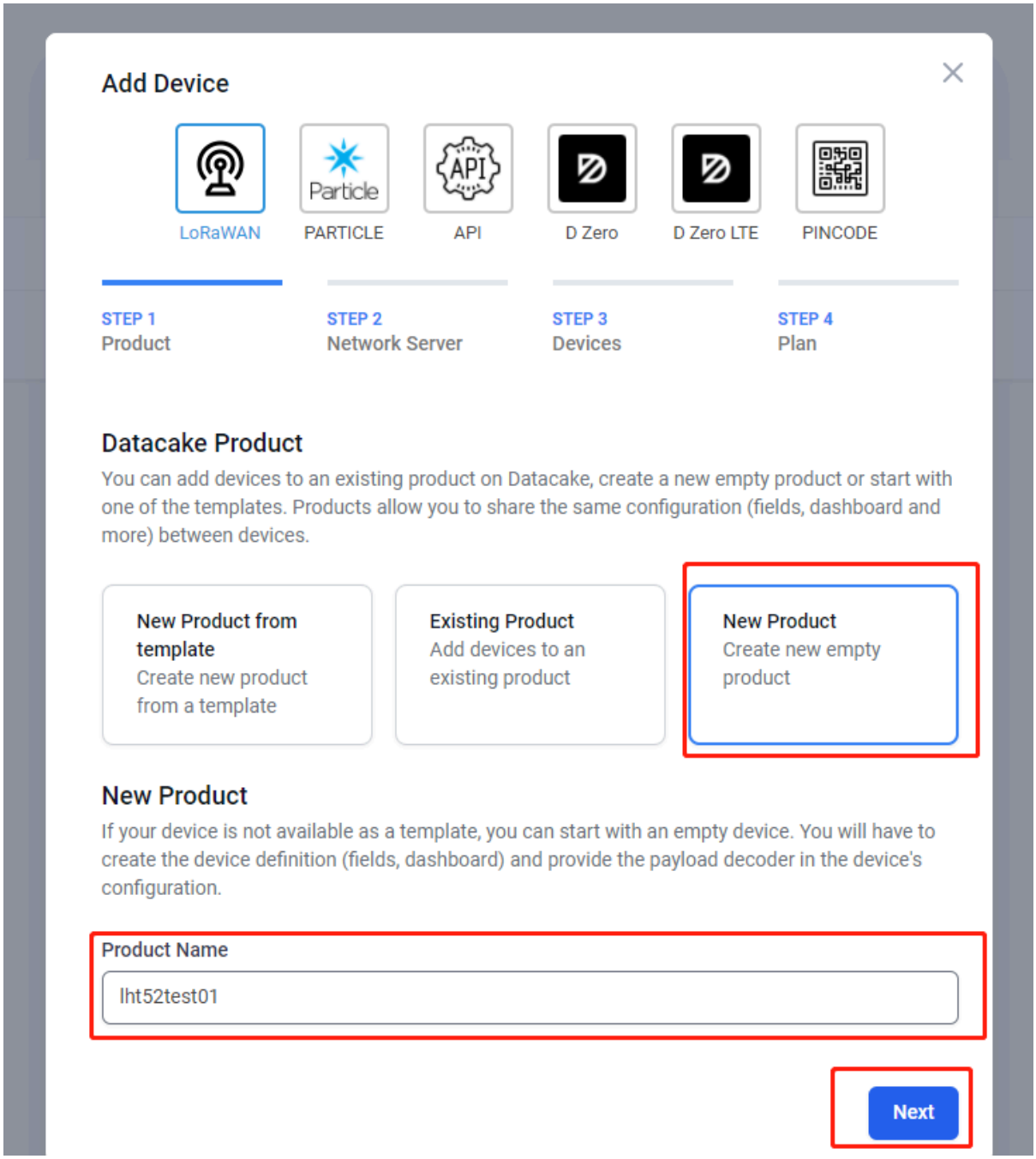

Fleet > LHT52
LHT52
Serial Number
2532124565261235
Last update
Mon Jan 03 2022 16:50:26 GMT+0800
Dashboard
History
Downlinks
Configuration
Debug
Rules
Permissions
TempC_SHT
4 minutes ago
2022年1月3日 GMT+8 下午4:30
TempC_SHT : 25.06
TempC_SHT
TempC_DS
4 minutes ago
TempC_DS
Hum_SHT
4 minutes ago
Hum_SHT

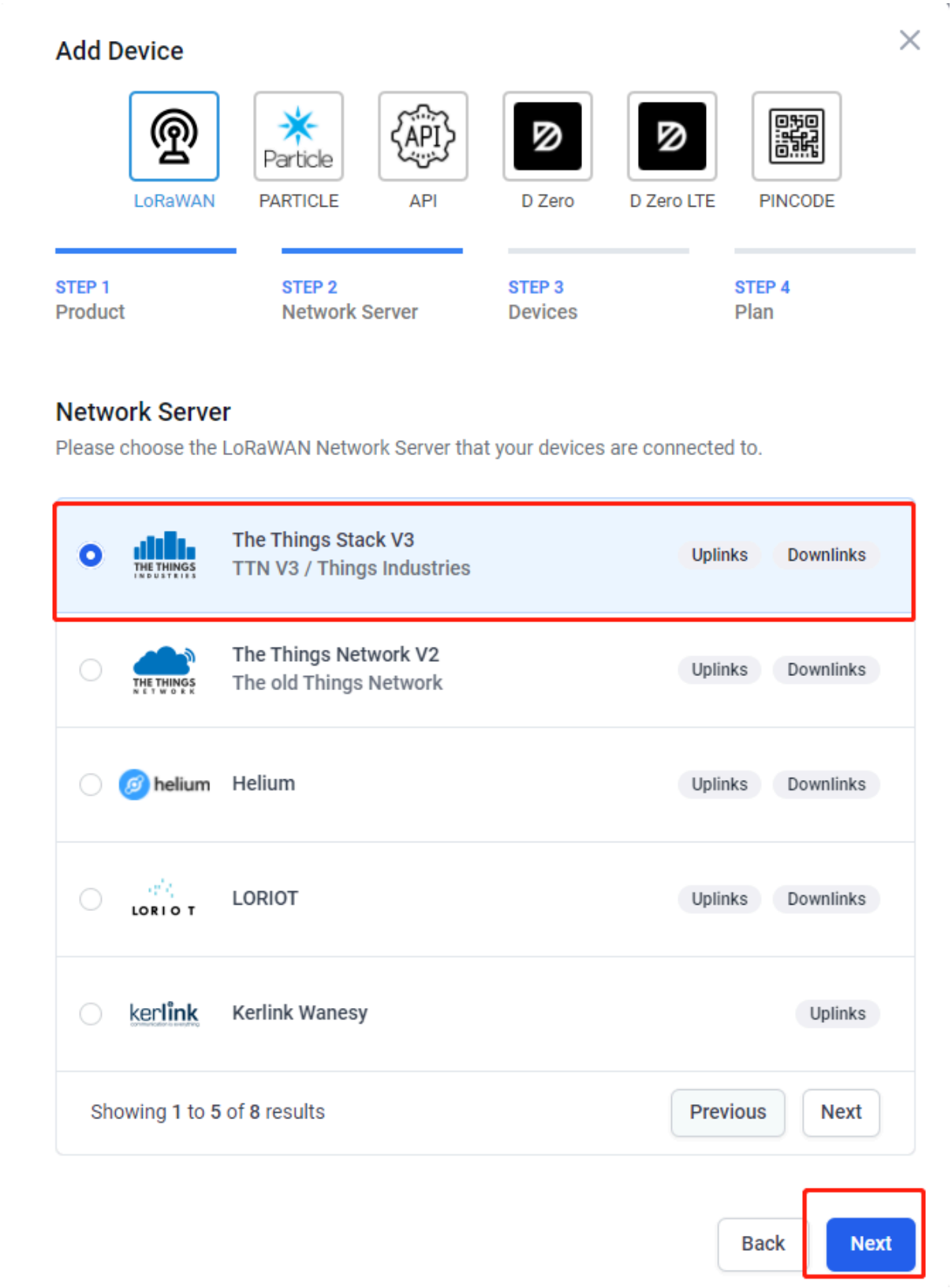

kazike lu
459550896@qq.com
kazike lu
1 Devices | 2 Members
mqtt test
0 Devices | 1 Members
Add Workspace
Edit Profile
Logout
Rules
Workspace
Integrations
White Label
Billing
DATACAKE
Fleet > Devices
Devices
Search
Columns
DEVICE
LOCATION
LDS02WA865IN-LU
Showing 1 to 1 of 1 results
50 per page

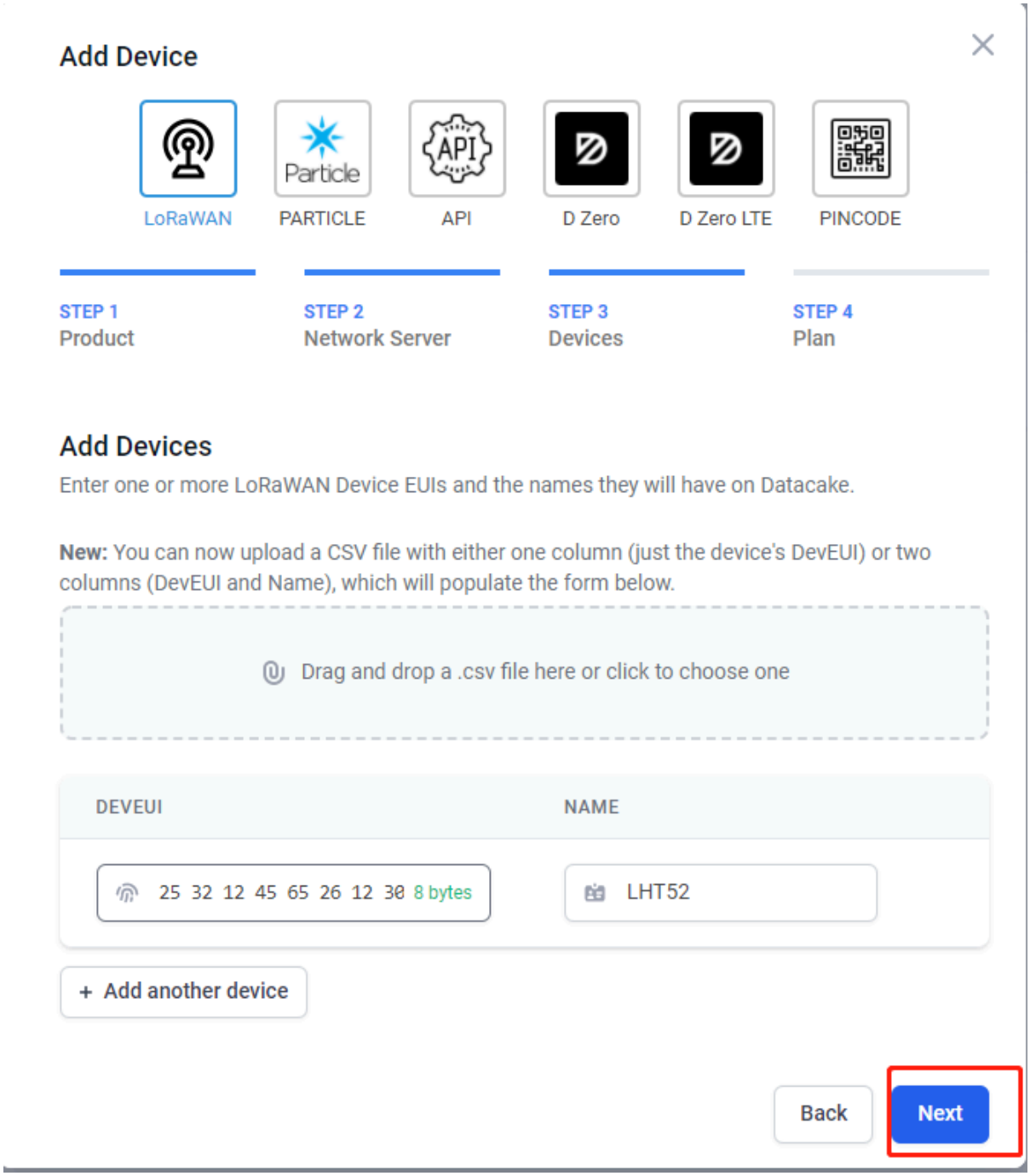

My Account
Password
API
Datacake offers both a <a>RESTful API for simple tasks as well as a feature-rich GraphQL API. For both, you need an API token.
Please note that your API token gives access to your whole account, so treat it with caution!
You can find your API token below.
Show

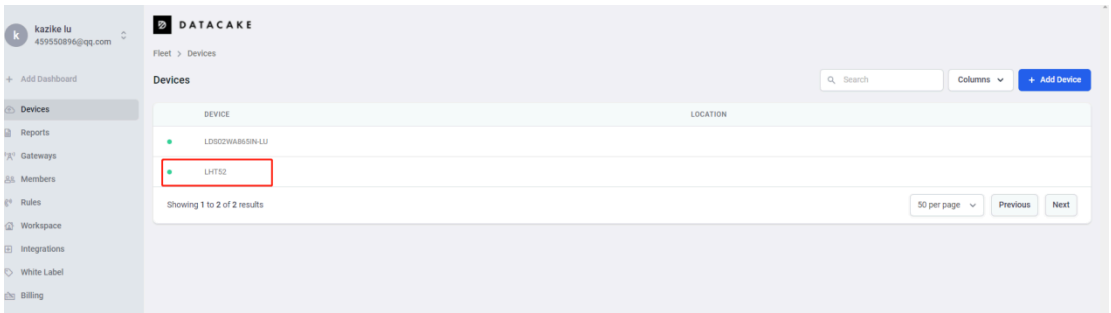

THE THINGS NETWORK
THE THINGS STACK
Community Edition
Overview
Applications
Gateways
Organizations
LHT52_TEST
Overview
End devices
Live data
Payload formatters
Integrations
MQTT
Webhooks
Storage Integration
AWS IoT
Azure IoT Hub
LoRa Cloud
Collaborators
API keys
General settings
Applications > LHT52_TEST > Webhooks > Add > Custom webhook
Add custom webhook
Template information
Datacake
Send data to Datacake via TTI adapter
About Datacake | Documentation
Template settings
Webhook ID *
lht52testlu01
Token *
Datacake API Token
Paste the API here
Create datacake webhook


DATACAKE
Fleet > Devices
Devices
Search
Columns
+ Add Device
DEVICE
LOCATION
LDS02WA865IN-LU
Showing 1 to 1 of 1 results
50 per page
Previous
Next

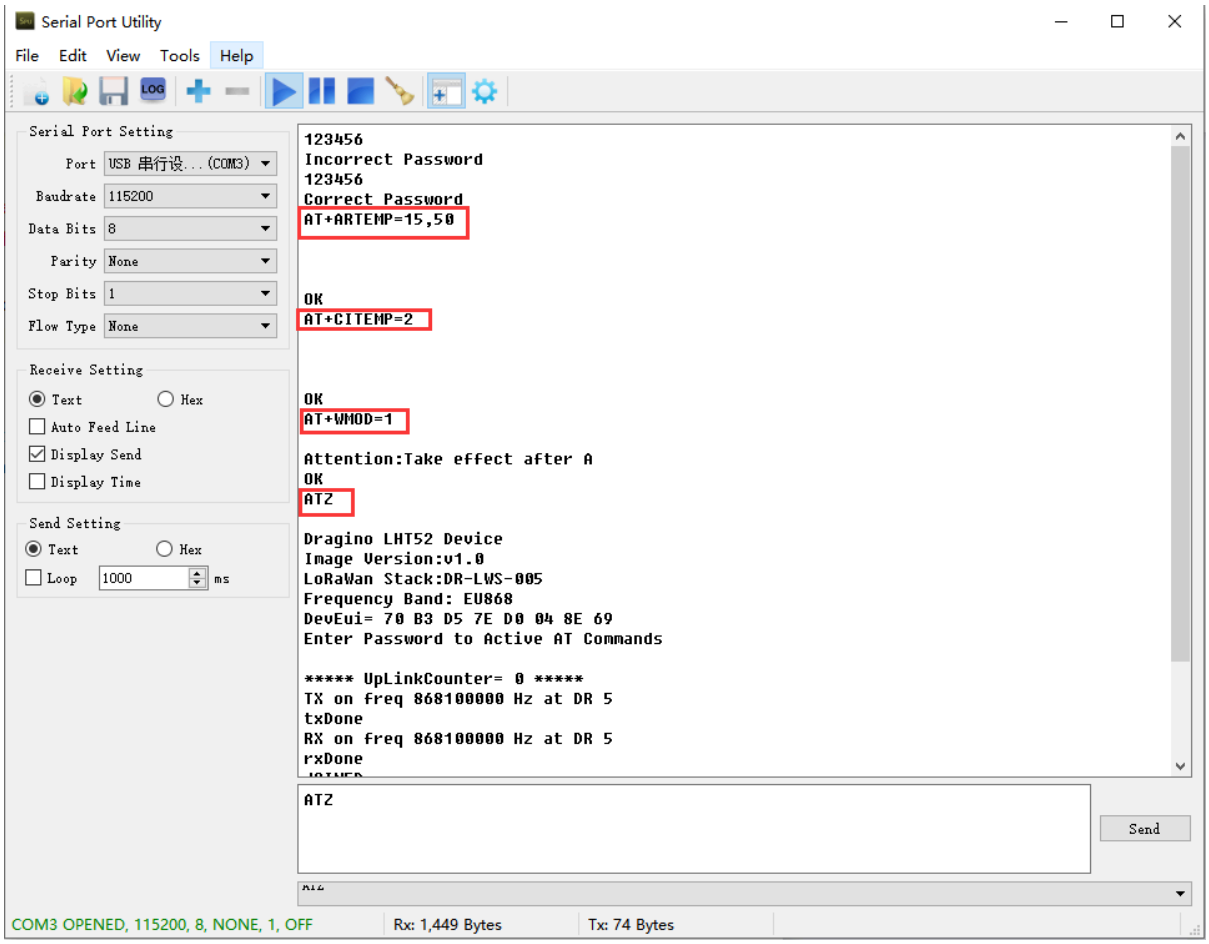

Add Device
LoRaWAN
PARTICLE
API
D Zero
D Zero LTE
PINCODE
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Datacake Product
You can add devices to an existing product on Datacake, create a new empty product or start with one of the templates. Products allow you to share the same configuration (fields, dashboard and more) between devices.
New Product from template
Create new product from a template
Existing Product
Add devices to an existing product
New Product
Create new empty product
New Product
If your device is not available as a template, you can start with an empty device. You will have to create the device definition (fields, dashboard) and provide the payload decoder in the device's configuration.
Product Name
lht52test01
Next

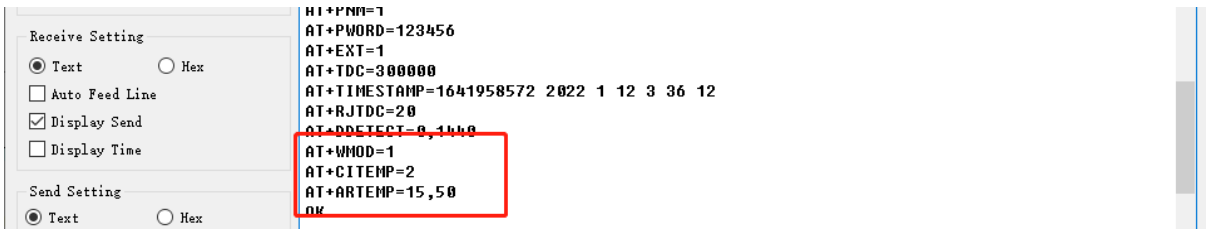

Add Device
LoRaWAN
PARTICLE
API
D Zero
D Zero LTE
PINCODE
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Network Server
Please choose the LoRaWAN Network Server that your devices are connected to.
The Things Stack V3
TTN V3 / Things Industries
Uplinks
Downlinks
The Things Network V2
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

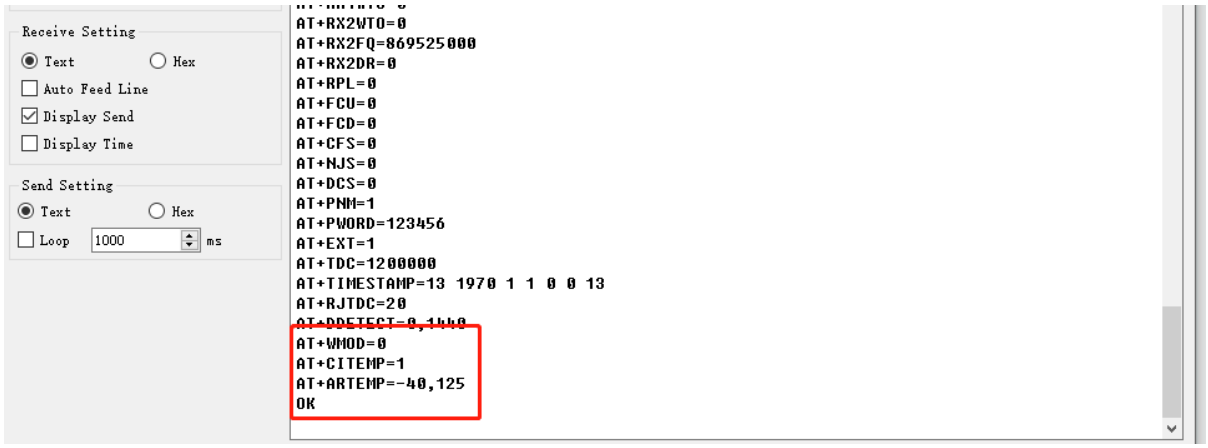

Add Device
LoRaWAN
PARTICLE
API
D Zero
D Zero LTE
PINCODE
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Add Devices
Enter one or more LoRaWAN Device EUIs and the names they will have on Datacake.
New: You can now upload a CSV file with either one column (just the device's DevEUI) or two columns (DevEUI and Name), which will populate the form below.
Drag and drop a .csv file here or click to choose one
DEVEUI
NAME
25 32 12 45 65 26 12 30 8 bytes
LHT52
+ Add another device
Back
Next

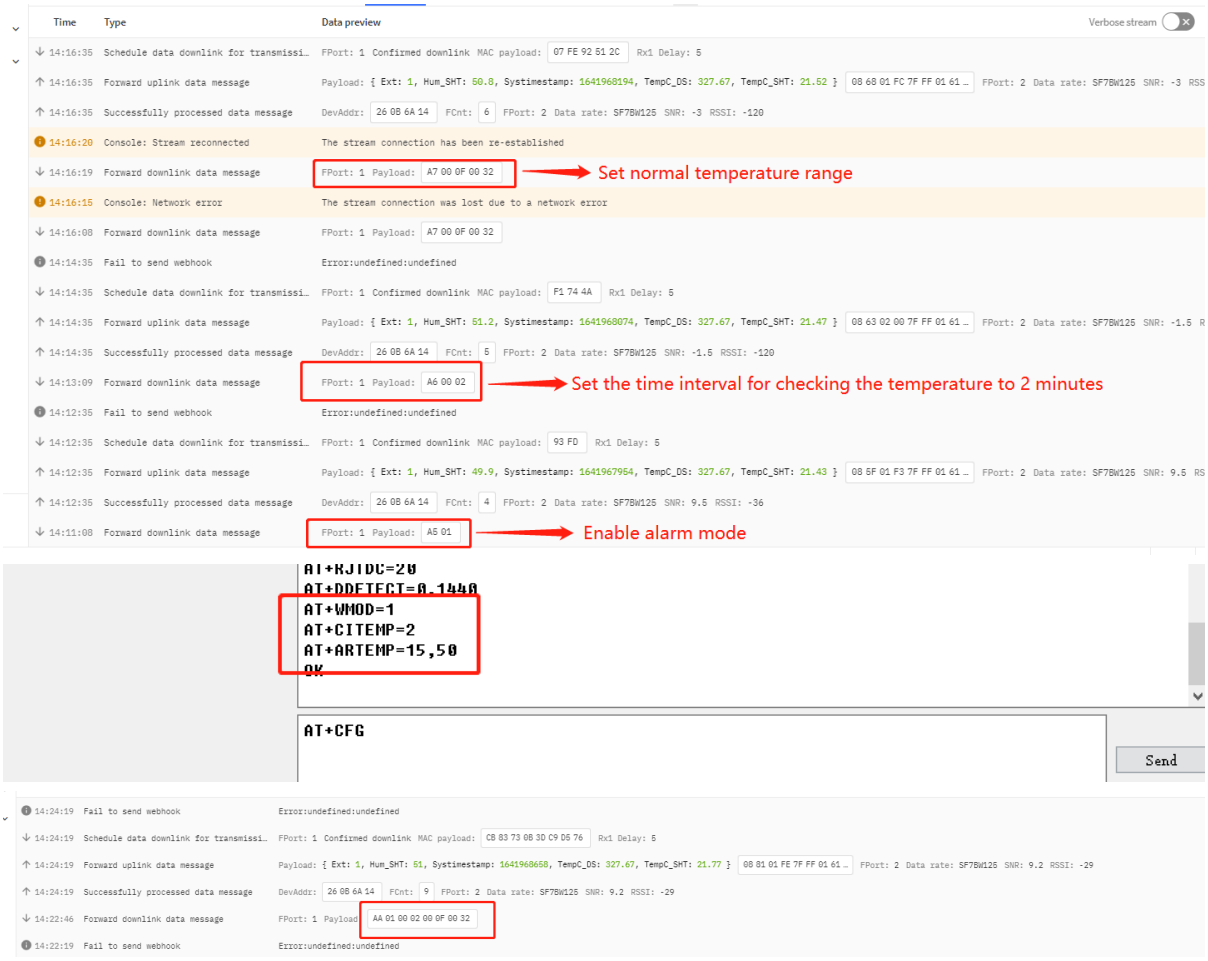

DATACAKE
Devices
Add Device
DEVICE
LOCATION
LHT52
Previous
Next

```
31 5FC5F350 5FC6 0160 05
```







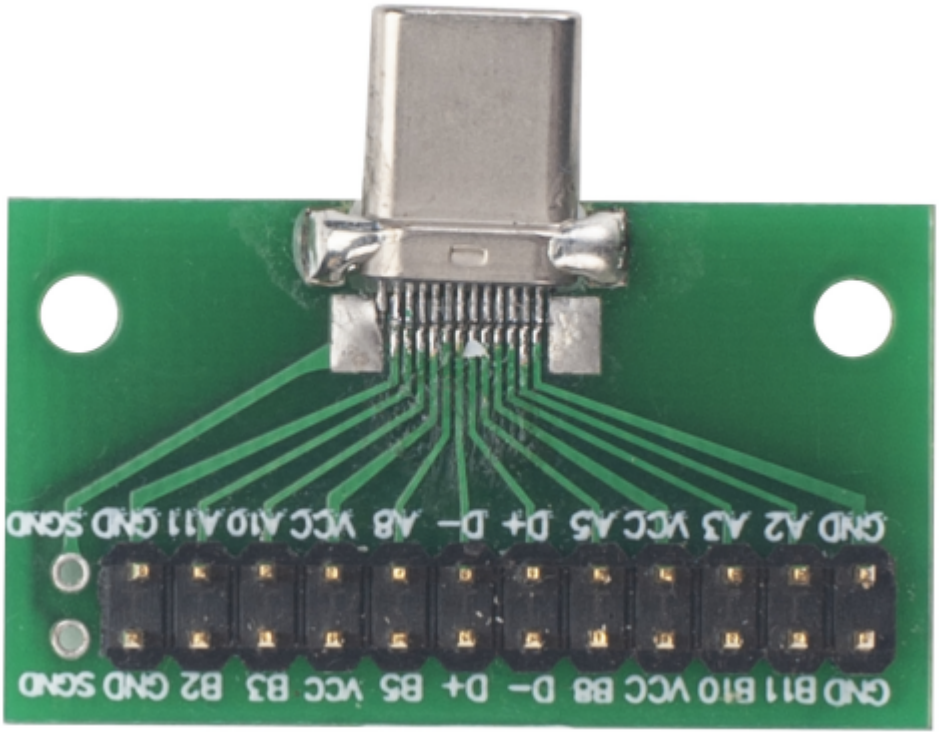

Time
Type
Data preview
Verbose stream
14:16:35 Schedule data downlink for transmissi… FPort: 1 Confirmed downlink MAC payload: 07 FE 92 51 2C Rx1 Delay: 5
14:16:35 Forward uplink data message Payload: { Ext: 1, Hum_SHT: 50.8, Systimestamp: 1641960194, TempC_DS: 327.67, TempC_SHT: 21.52 } 08 68 01 FC 7F FF 01 61 … FPort: 2 Data rate: SF7BW125 SNR: -3 RSS
14:16:35 Successfully processed data message DevAddr: 26 0B 6A 14 FCnt: 6 FPort: 2 Data rate: SF7BW125 SNR: -3 RSSI: -120
14:16:20 Console: Stream reconnected The stream connection has been re-established
14:16:19 Forward downlink data message FPort: 1 Payload: A7 00 0F 00 32
Set normal temperature range
14:16:15 Console: Network error The stream connection was lost due to a network error
14:16:08 Forward downlink data message FPort: 1 Payload: A7 00 0F 00 32
14:14:35 Fail to send webhook Error:undefined:undefined
14:14:35 Schedule data downlink for transmissi… FPort: 1 Confirmed downlink MAC payload: F1 74 4A Rx1 Delay: 5
14:14:35 Forward uplink data message Payload: { Ext: 1, Hum_SHT: 51.2, Systimestamp: 1641968074, TempC_DS: 327.67, TempC_SHT: 21.47 } 08 63 02 00 7F FF 01 61 … FPort: 2 Data rate: SF7BW125 SNR: -1.5 R
14:14:35 Successfully processed data message DevAddr: 26 0B 6A 14 FCnt: 5 FPort: 2 Data rate: SF7BW125 SNR: -1.5 RSSI: -120
14:13:09 Forward downlink data message FPort: 1 Payload: A6 00 02
Set the time interval for checking the temperature to 2 minutes
14:12:35 Fail to send webhook Error:undefined:undefined
14:12:35 Schedule data downlink for transmissi… FPort: 1 Confirmed downlink MAC payload: 93 FD Rx1 Delay: 5
14:12:35 Forward uplink data message Payload: { Ext: 1, Hum_SHT: 49.9, Systimestamp: 1641967964, TempC_DS: 327.67, TempC_SHT: 21.43 } 08 5F 01 F3 7F FF 01 61 … FPort: 2 Data rate: SF7BW125 SNR: 9.5 RS
14:12:35 Successfully processed data message DevAddr: 26 0B 6A 14 FCnt: 4 FPort: 2 Data rate: SF7BW125 SNR: 9.5 RSSI: -36
14:11:08 Forward downlink data message FPort: 1 Payload: A5 01
Enable alarm mode

AT+RJTDC=20
AT+DDETECT=0,1440
AT+WMOD=1
AT+CITEMP=2
AT+ARTEMP=15,50
OK
AT+CFG
Send

14:24:19 Fail to send webhook Error:undefined:undefined
14:24:19 Schedule data downlink for transmissi… FPort: 1 Confirmed downlink MAC payload: CB 83 73 0B 3D C9 D5 76 Rx1 Delay: 5
14:24:19 Forward uplink data message Payload: { Ext: 1, Hum_SHT: 51, Systimestamp: 1641968658, TempC_DS: 327.67, TempC_SHT: 21.77 } 08 81 01 FE 7F FF 01 61 … FPort: 2 Data rate: SF7BW125 SNR: 9.2 RSSI: -29
14:24:19 Successfully processed data message DevAddr: 26 0B 6A 14 FCnt: 9 FPort: 2 Data rate: SF7BW125 SNR: 9.2 RSSI: -29
14:22:46 Forward downlink data message FPort: 1 Payload AA 01 00 02 00 0F 00 32
14:22:19 Fail to send webhook Error:undefined:undefined

AS-01 Temperature Probe

AS-02 USB Type-C Converter



AS-01 Temperature Probe

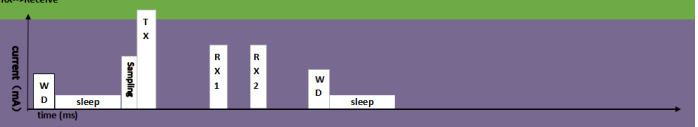
DRAGINO

How to use:
1.Please do not modify the formula in the table
2.After selecting the product number and model, then select the TDC unit, and finally enter the TDC, you can get the predicted battery life
3.Explanation of abbreviations : WD-->Watchdog TX-->Transimt RX-->Receive

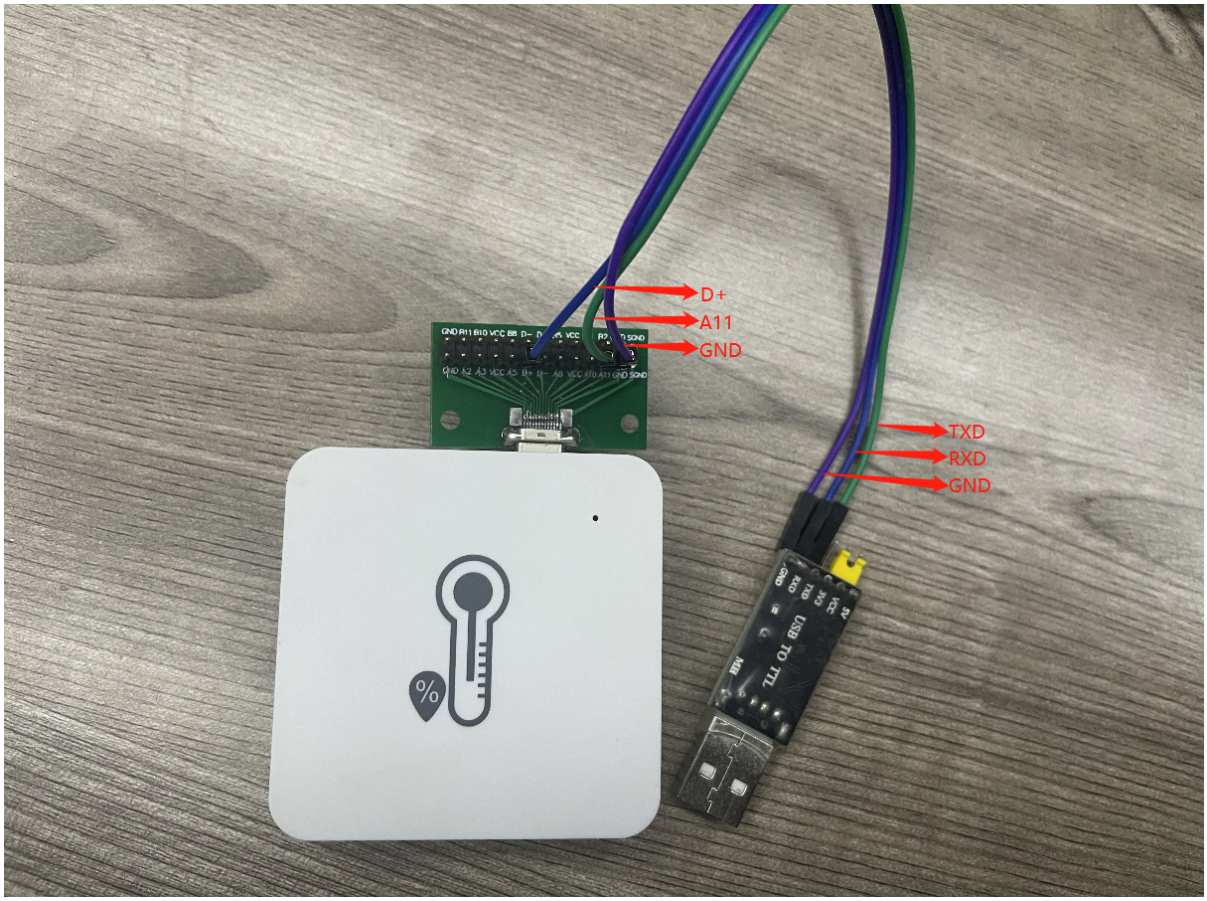
Battery Life Calculator

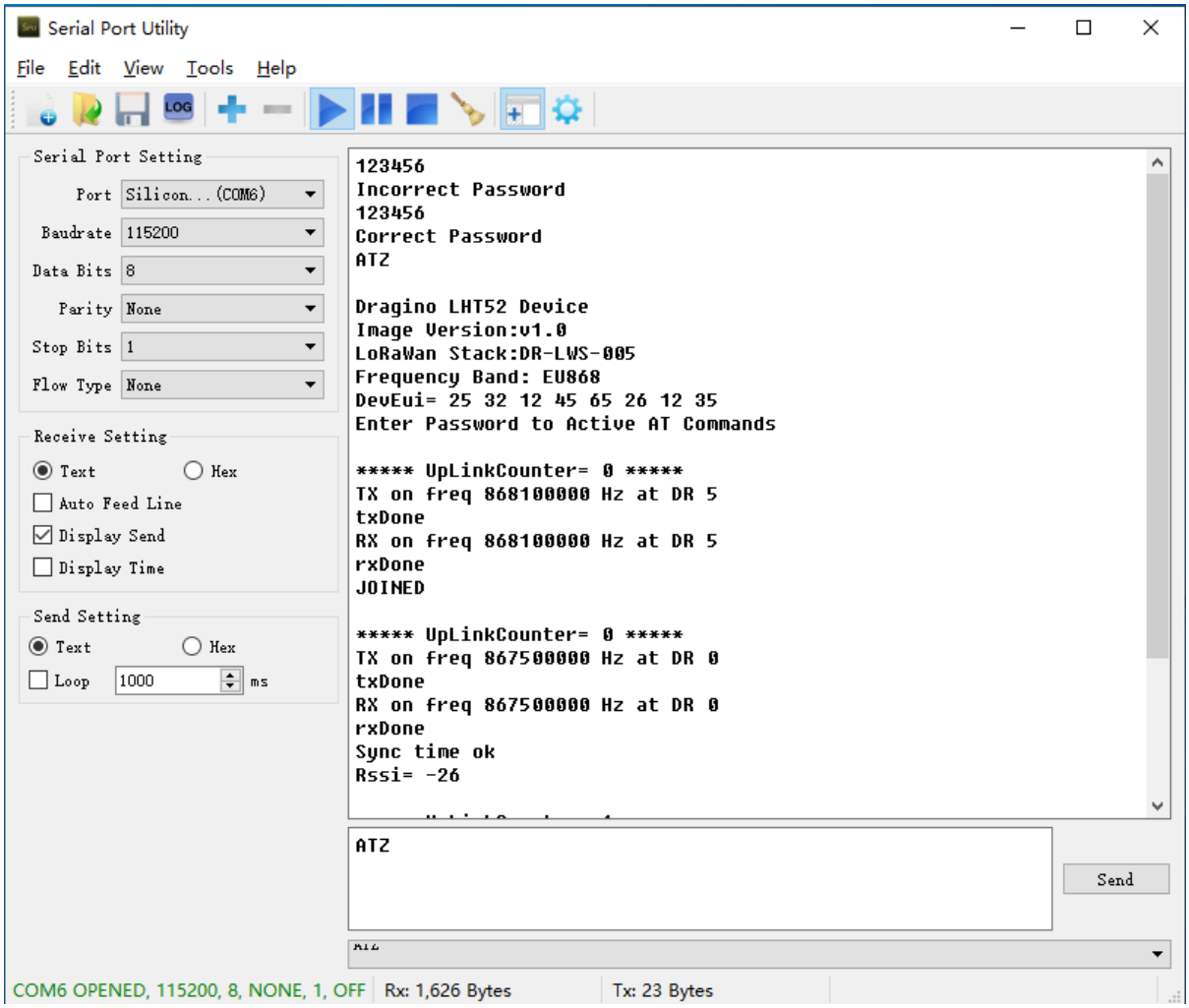
Product	battery capacity(mah)
LHT52_LoRaWAN_Temperature__Humidity_Sensor	1000

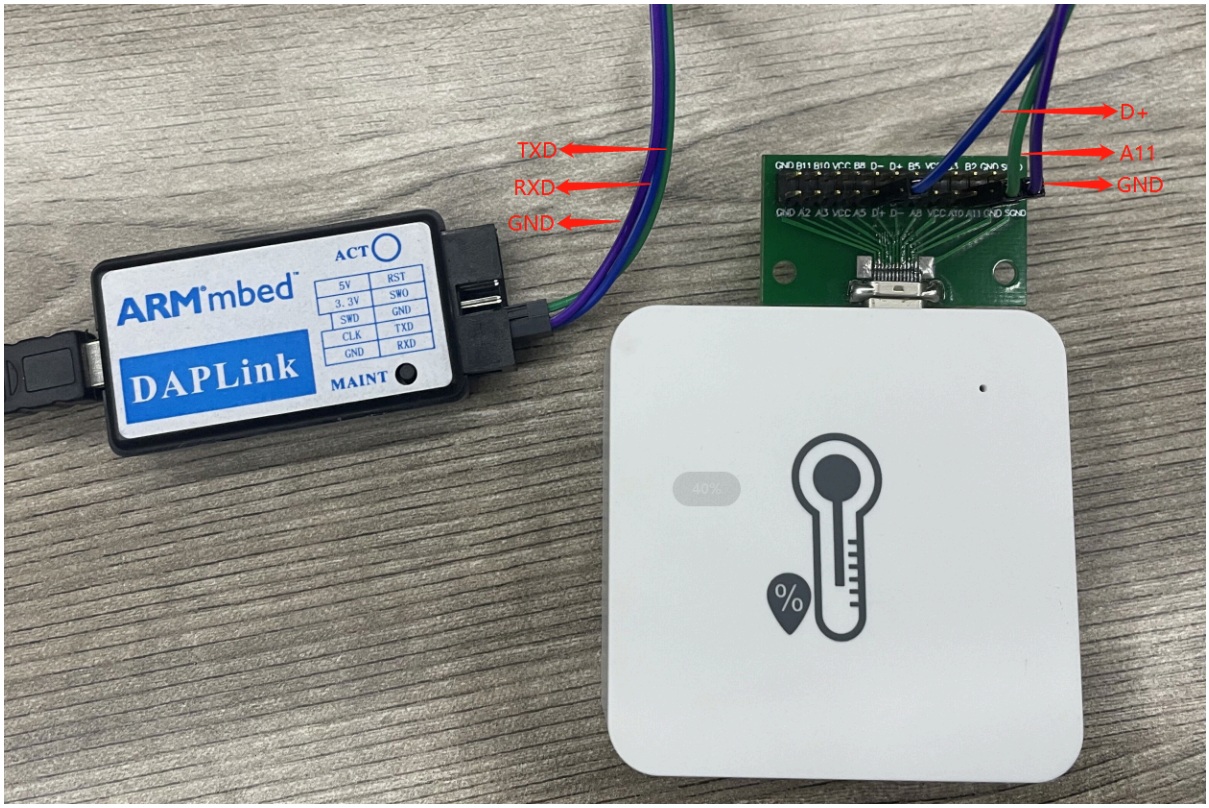
UNIT	TDC (Uplink Interval)	Work Mode
min	20	EXT=1

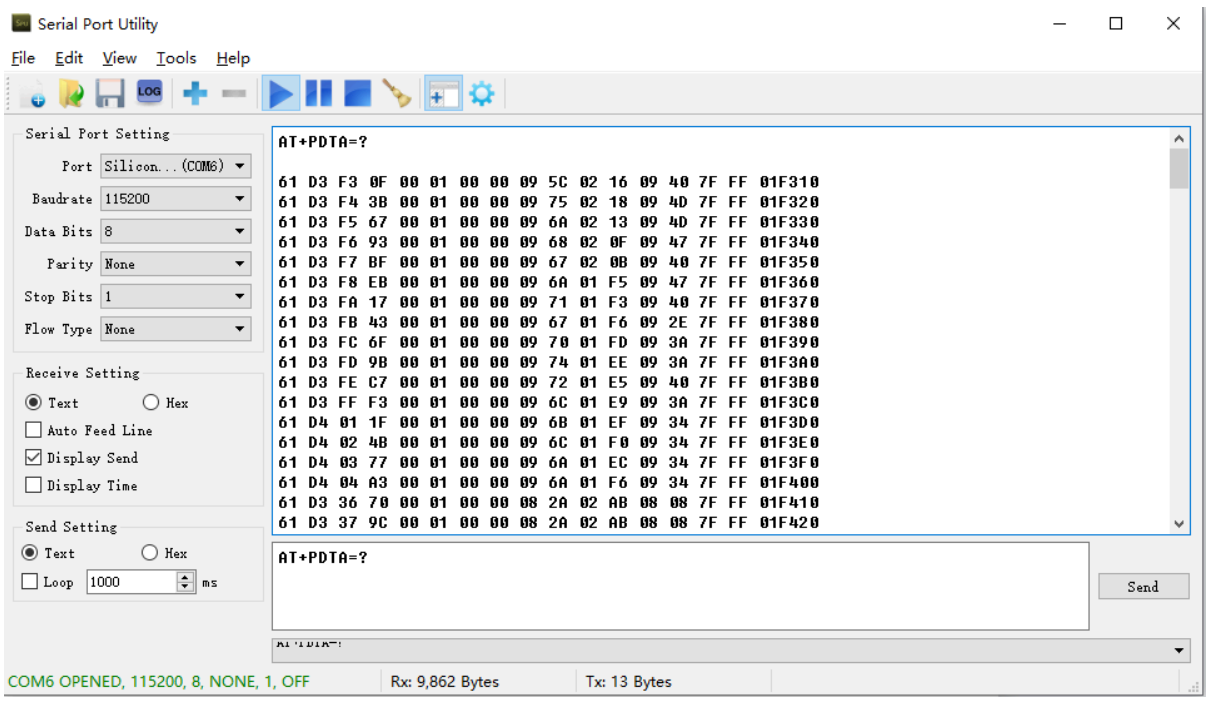


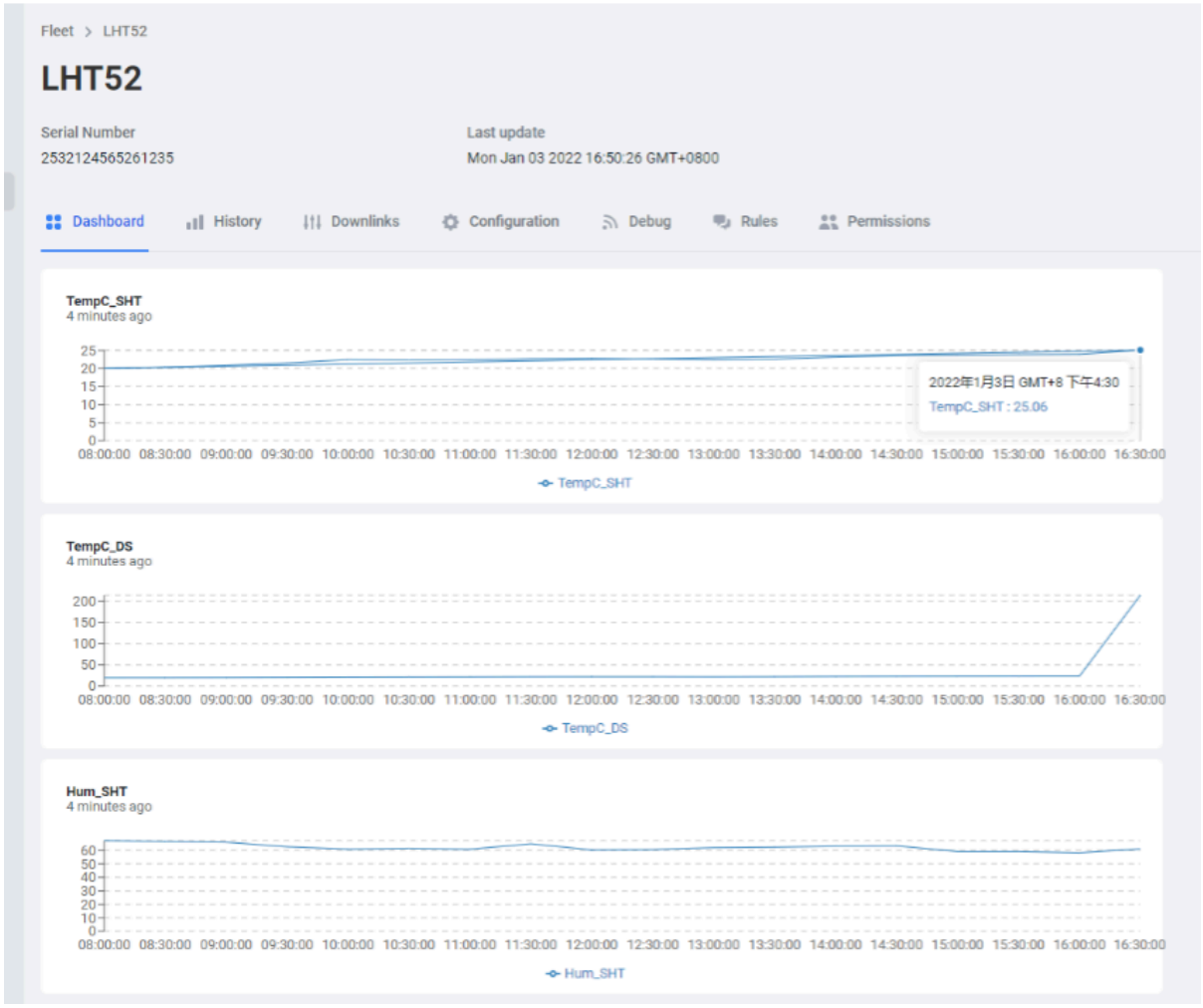
		Sleep power（mA*ms）	Sampling power（mA*ms）	TX power (mA*ms）	RX1 power（mA*ms）	RX2 power（mA*ms）	Watchdog power（mA*n	Average power（mA）	Detect power（mA*ms）	Life expectancy（yr）
EU868	DR5_SF7_125K_14dB	8400	787.31488	7367.8544	880.58488	4097.083	757.1706667	0.018567657	0	5.5
	DR4_SF8_125K_14dB	8400	787.31488	13210.2528	950.0943	4097.083	757.1706667	0.023491202	0	4.4
	DR3_SF9_125K_14dB	8400	787.31488	23652.608	1068.0336	4097.083	757.1706667	0.032284892	0	3.3
	DR2_SF10_125K_14dB	8400	787.31488	42244.125	1461.4876	4097.083	757.1706667	0.048089509	0	2.3
	DR1_SF11_125K_14dB	8400	787.31488	94013.4	2230.4828	4097.083	757.1706667	0.091803712	0	1.2
	DR0_SF12_125K_14dB	8400	787.31488	168081	4097.083	4097.083	757.1706667	0.1549162	0	0.7
US915	DR3_SF7_125K_20dB	8400	787.31488	8441.476	681.61989	1587.135	757.1706667	0.01720746	0	5.9
	DR2_SF8_125K_20dB	8400	787.31488	15170.785	913.6491	1587.135	757.1706667	0.02300594	0	4.5
	DR1_SF9_125K_20dB	8400	787.31488	27254.383	941.388	1587.135	757.1706667	0.033092867	0	3.2
	DR0_SF10_125K_20dB	8400	787.31488	48745.32	995.2243	1587.135	757.1706667	0.051032452	0	2.1

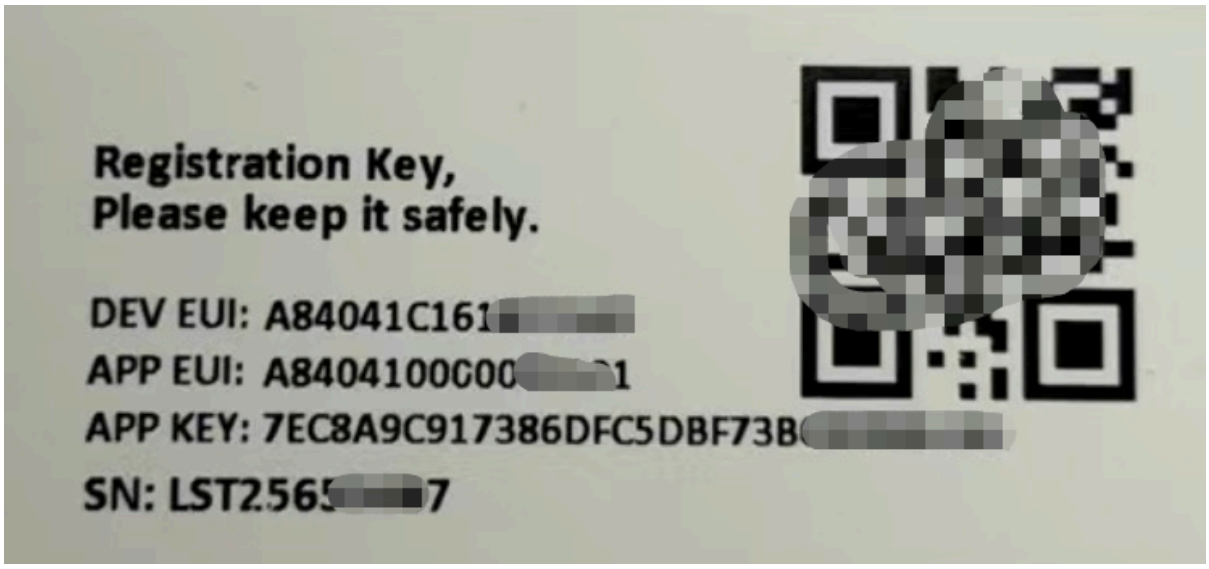

D+
A11
GND
TXD
RXD
GND
USB TO TTL


Serial Port Utility
File Edit View Tools Help
Serial Port Setting
Port Silicon...(COM6)
Baudrate 115200
Data Bits 8
Parity None
Stop Bits 1
Flow Type None
Receive Setting
Text Hex
Auto Feed Line
Display Send
Display Time
Send Setting
Text Hex
Loop 1000 ms
123456
Incorrect Password
123456
Correct Password
ATZ
Dragino LHT52 Device
Image Version:v1.0
LoRaWan Stack:DR-LWS-005
Frequency Band: EU868
DevEui= 25 32 12 45 65 26 12 35
Enter Password to Active AT Commands
***** UpLinkCounter= 0 *****
TX on freq 868100000 Hz at DR 5
txDone
RX on freq 868100000 Hz at DR 5
rxDone
JOINED
***** UpLinkCounter= 0 *****
TX on freq 867500000 Hz at DR 0
txDone
RX on freq 867500000 Hz at DR 0
rxDone
Sync time ok
Rssi= -26
ATZ
Send
COM6 OPENED, 115200, 8, NONE, 1, OFF
Rx: 1,626 Bytes
Tx: 23 Bytes


TXD
RXD
GND
D+
A11
GND
ARM mbed
DAPLink
ACT
MAINT


Serial Port Utility
File Edit View Tools Help
Serial Port Setting
Port Silicon... (COM6)
Baudrate 115200
Data Bits 8
Parity None
Stop Bits 1
Flow Type None
Receive Setting
Text Hex
Auto Feed Line
Display Send
Display Time
Send Setting
Text Hex
Loop 1000 ms
AT+PDTA=?
61 D3 F3 0F 00 01 00 00 09 5C 02 16 09 40 7F FF 01F310
61 D3 F4 3B 00 01 00 00 09 75 02 18 09 4D 7F FF 01F320
61 D3 F5 67 00 01 00 00 09 6A 02 13 09 4D 7F FF 01F330
61 D3 F6 93 00 01 00 00 09 68 02 0F 09 47 7F FF 01F340
61 D3 F7 BF 00 01 00 00 09 67 02 0B 09 40 7F FF 01F350
61 D3 F8 EB 00 01 00 00 09 6A 01 F5 09 47 7F FF 01F360
61 D3 FA 17 00 01 00 00 09 71 01 F3 09 40 7F FF 01F370
61 D3 FB 43 00 01 00 00 09 67 01 F6 09 2E 7F FF 01F380
61 D3 FC 6F 00 01 00 00 09 70 01 FD 09 3A 7F FF 01F390
61 D3 FD 9B 00 01 00 00 09 74 01 EE 09 3A 7F FF 01F3A0
61 D3 FE C7 00 01 00 00 09 72 01 E5 09 40 7F FF 01F3B0
61 D3 FF F3 00 01 00 00 09 6C 01 E9 09 3A 7F FF 01F3C0
61 D4 01 1F 00 01 00 00 09 6B 01 EF 09 34 7F FF 01F3D0
61 D4 02 4B 00 01 00 00 09 6C 01 F0 09 34 7F FF 01F3E0
61 D4 03 77 00 01 00 00 09 6A 01 EC 09 34 7F FF 01F3F0
61 D4 04 A3 00 01 00 00 09 6A 01 F6 09 34 7F FF 01F400
61 D3 36 70 00 01 00 00 08 2A 02 AB 08 08 7F FF 01F410
61 D3 37 9C 00 01 00 00 08 2A 02 AB 08 08 7F FF 01F420
AT+PDTA=?
Send
COM6 OPENED, 115200, 8, NONE, 1, OFF
Rx: 9,862 Bytes
Tx: 13 Bytes

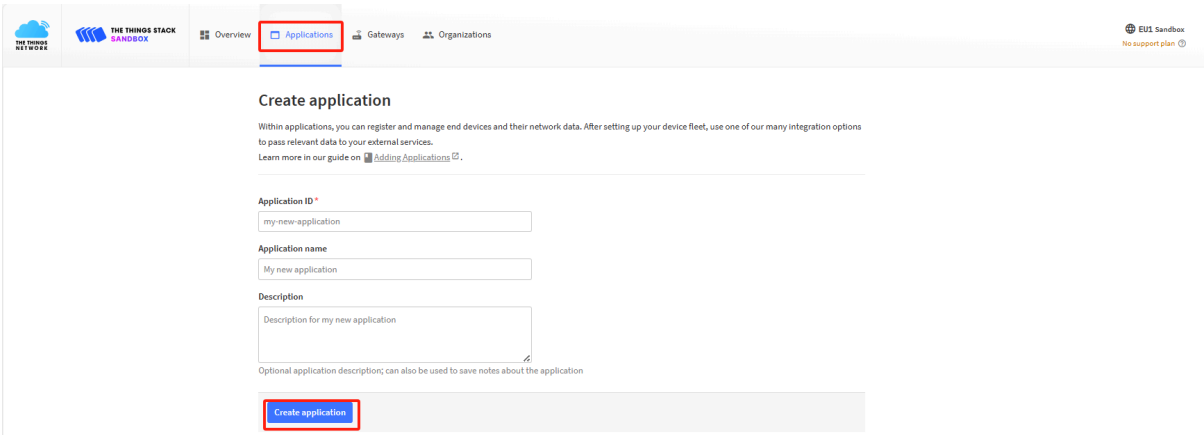

Fleet > LHT52
LHT52
Serial Number
2532124565261235
Last update
Mon Jan 03 2022 16:50:26 GMT+0800
Dashboard
History
Downlinks
Configuration
Debug
Rules
Permissions
TempC_SHT
4 minutes ago
2022年1月3日 GMT+8 下午4:30
TempC_SHT : 25.06
TempC_SHT
TempC_DS
4 minutes ago
TempC_DS
Hum_SHT
4 minutes ago
Hum_SHT

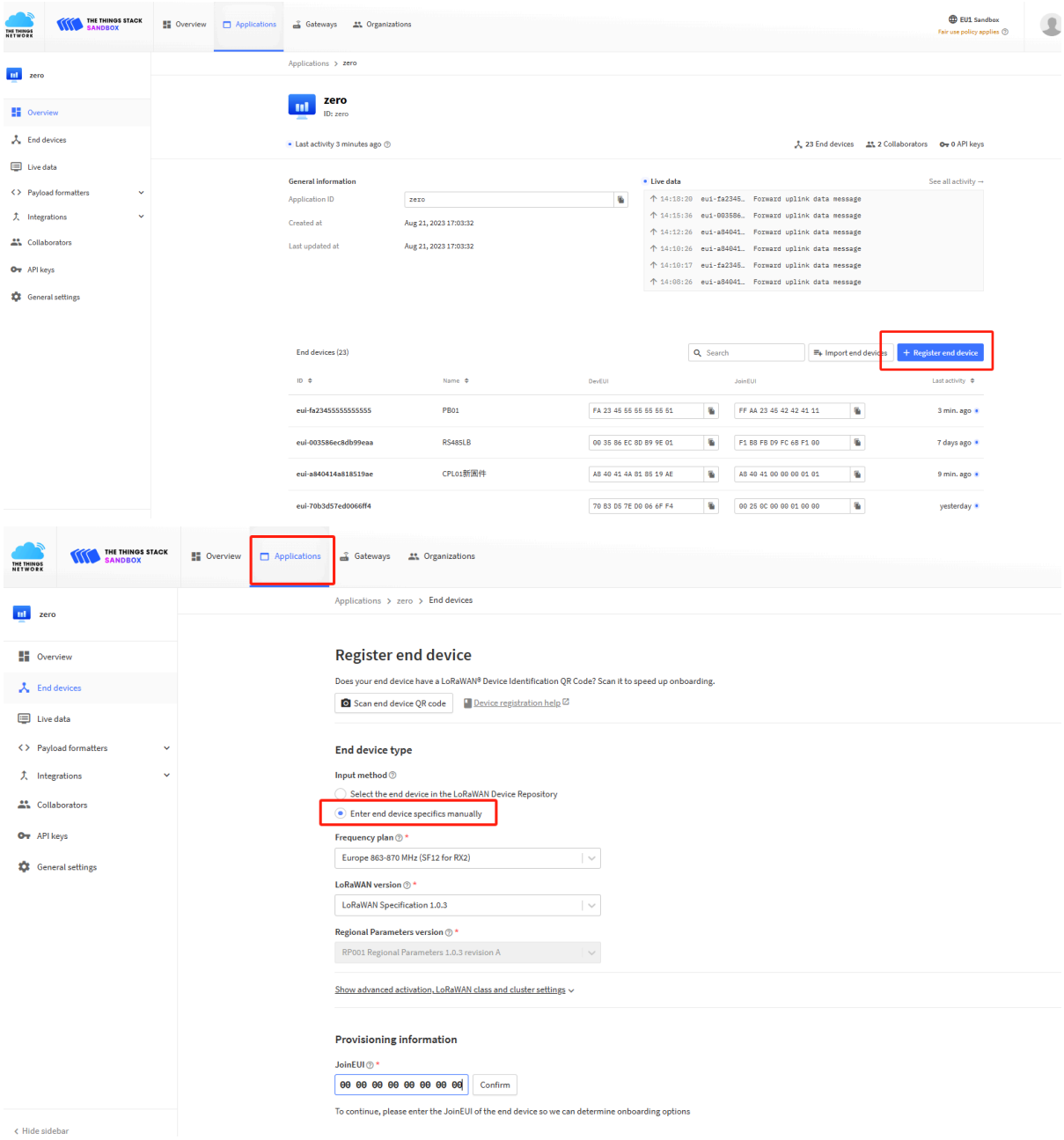

Registration Key,
Please keep it safely.
DEV EUI: A84041C161
APP EUI: A8404100C00
APP KEY: 7EC8A9C917386DFC5DBF73B
SN: LST2565

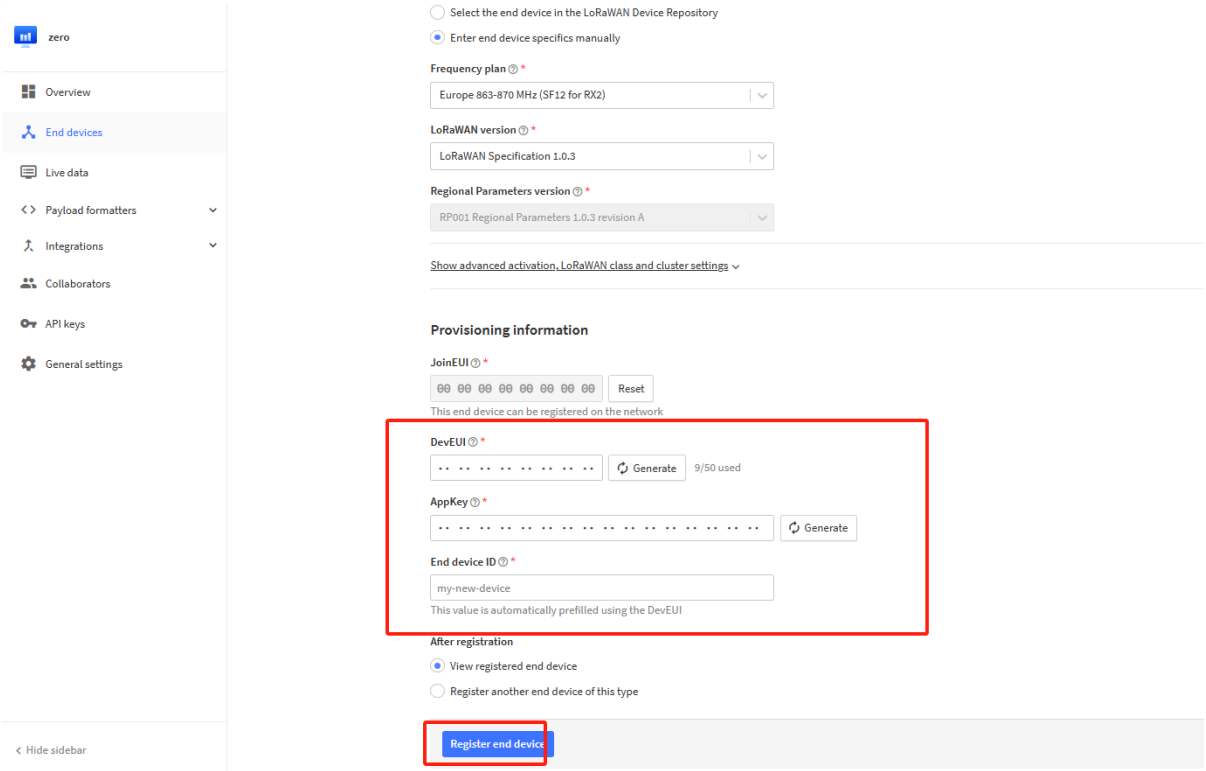

SOS

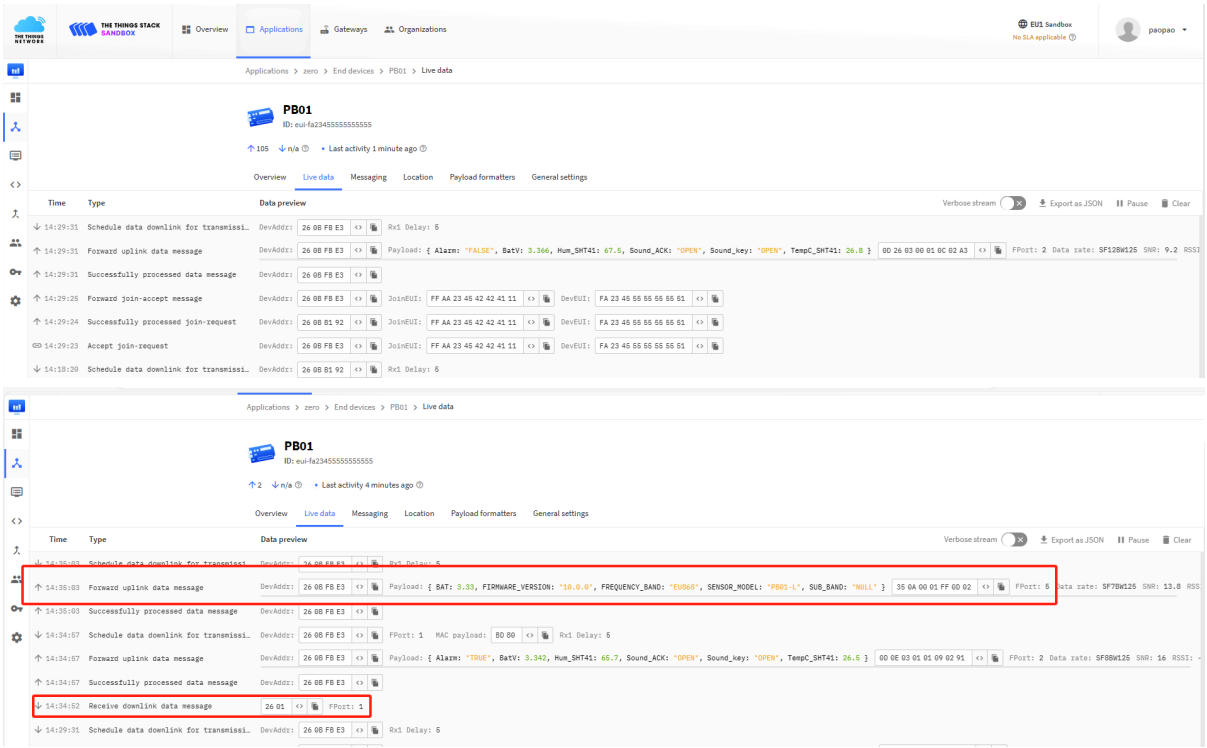

SOS


SOS

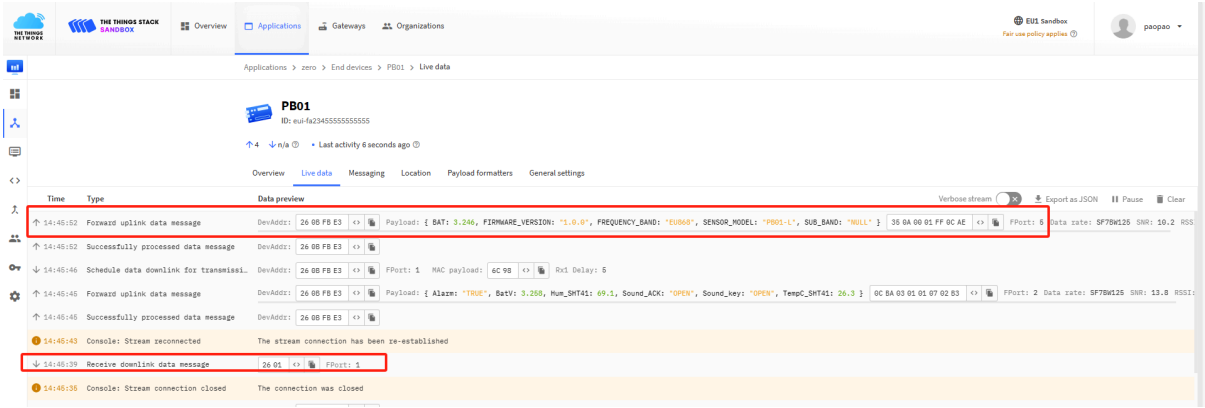

THE THINGS NETWORK
THE THINGS STACK SANDBOX
Overview
Applications
Gateways
Organizations
EU1 Sandbox
No support plan
Create application
Within applications, you can register and manage end devices and their network data. After setting up your device fleet, use one of our many integration options to pass relevant data to your 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
Create application


THE THINGS STACK SANDBOX
Overview
Applications
Gateways
Organizations
EU1 Sandbox
zero
Overview
End devices
Live data
Payload formatters
Integrations
Collaborators
API keys
General settings
Applications > zero
zero
ID: zero
Last activity 3 minutes ago
23 End devices
2 Collaborators
0 API keys
General information
Application ID
zero
Created at
Aug 21, 2023 17:03:32
Last updated at
Aug 21, 2023 17:03:32
Live data
See all activity
14:18:20 eui-fa2345... Forward uplink data message
14:15:36 eui-003586... Forward uplink data message
14:12:26 eui-a84041... Forward uplink data message
14:10:26 eui-a84041... Forward uplink data message
14:10:17 eui-fa2345... Forward uplink data message
14:08:26 eui-a84041... Forward uplink data message
End devices (23)
Search
Import end devices
Register end device
ID
Name
DevEUI
JoinEUI
Last activity
eui-fa23455555555555 PB01 FA 23 45 55 55 55 55 51 FF AA 23 45 42 42 41 11 3 min. ago
eui-003586ec8db99eaa RS485LB 00 35 86 EC 8D B9 9E 01 F1 B8 FB D9 FC 6B F1 00 7 days ago
eui-a840414a818519ae CPL01新固件 A8 40 41 4A 81 85 19 AE A8 40 41 00 00 00 01 01 9 min. ago
eui-70b3d57ed0066ff4 70 B3 D5 7E D0 06 6F F4 00 25 0C 00 00 01 00 00 yesterday
Applications > zero > End devices
Register end device
Does your end device have a LoRaWAN® Device Identification QR Code? Scan it to speed up onboarding.
Scan end device QR code
Device registration help
End device type
Input method
Select the end device in the LoRaWAN Device Repository
Enter end device specifics manually
Frequency plan *
Europe 863-870 MHz (SF12 for RX2)
LoRaWAN version *
LoRaWAN Specification 1.0.3
Regional Parameters version *
RP001 Regional Parameters 1.0.3 revision A
Show advanced activation, LoRaWAN class and cluster settings
Provisioning information
JoinEUI *
00 00 00 00 00 00 00 00
Confirm
To continue, please enter the JoinEUI of the end device so we can determine onboarding options
Hide sidebar


zero
Overview
End devices
Live data
Payload formatters
Integrations
Collaborators
API keys
General settings
Hide sidebar
Select the end device in the LoRaWAN Device Repository
Enter end device specifics manually
Frequency plan *
Europe 863-870 MHz (SF12 for RX2)
LoRaWAN version *
LoRaWAN Specification 1.0.3
Regional Parameters version *
RP001 Regional Parameters 1.0.3 revision A
Show advanced activation, LoRaWAN class and cluster settings
Provisioning information
JoinEUI *
00 00 00 00 00 00 00 00
Reset
This end device can be registered on the network
DevEUI *
Generate
9/50 used
AppKey *
Generate
End device ID *
my-new-device
This value is automatically prefilled using the DevEUI
After registration
View registered end device
Register another end device of this type
Register end device


Overview
Applications
Gateways
Organizations
PB01
Overview
Live data
Messaging
Location
Payload formatters
General settings
Time
Type
Data preview

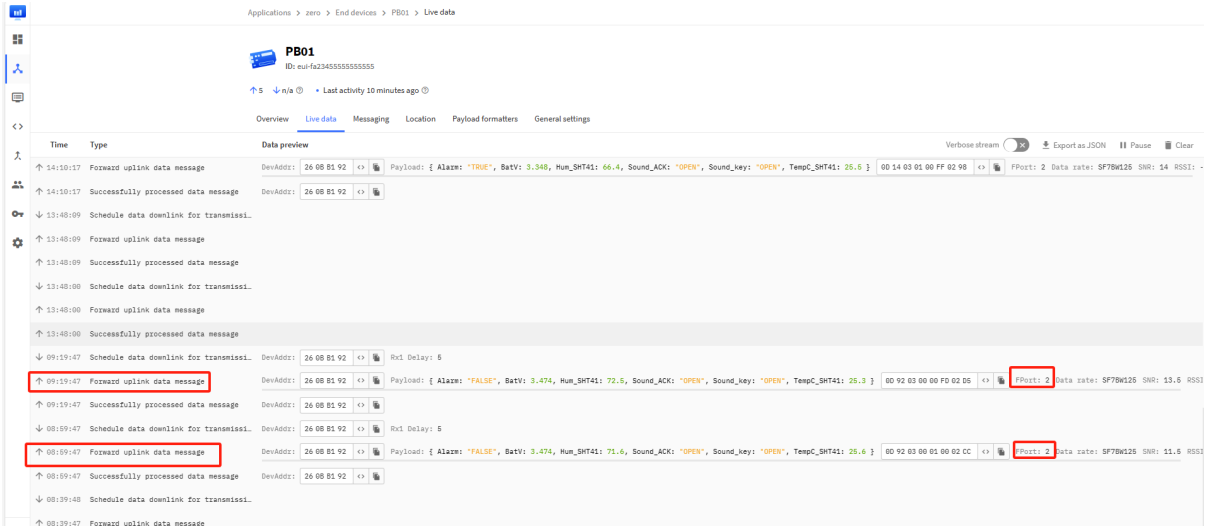
PB01
Overview
Live data
Messaging
Location
Payload formatters
General settings
Time
Type
Data preview
Forward uplink data message
Successfully processed data message
Schedule data downlink for transmissi…
Receive downlink data message

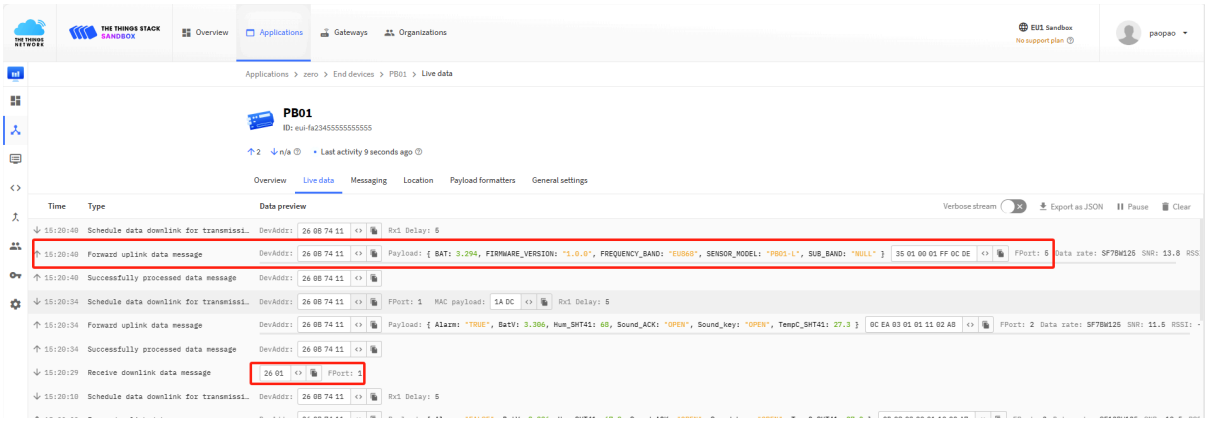


35 0A 00 01 FF 0C AE

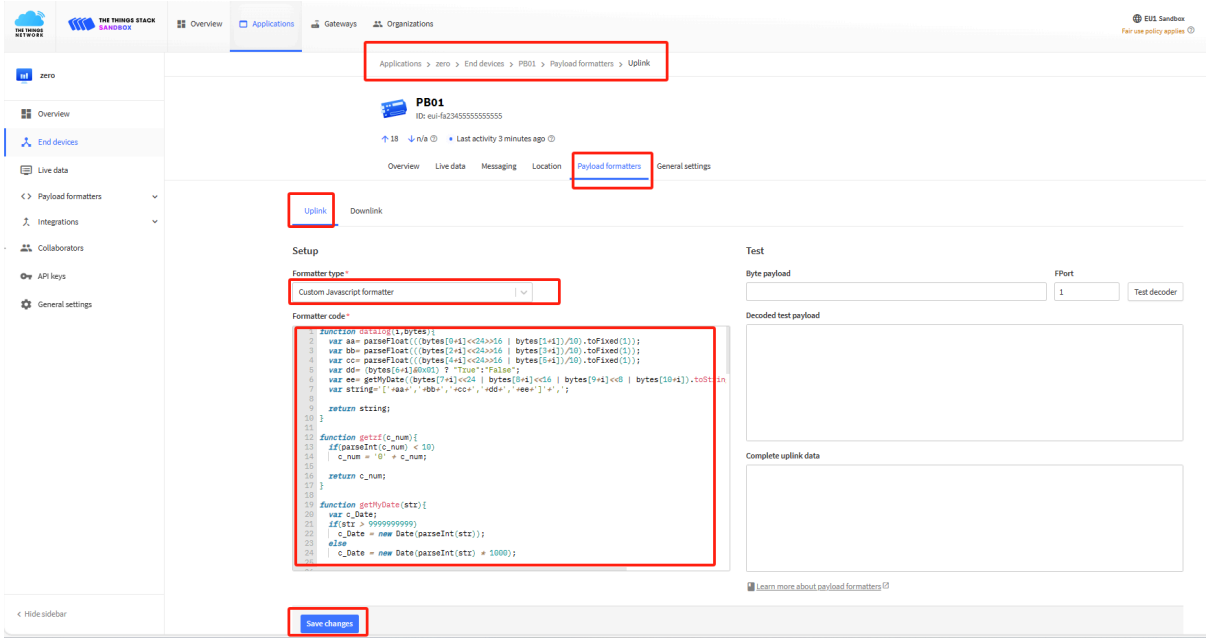
35 0A 00 01 FF 0C AE

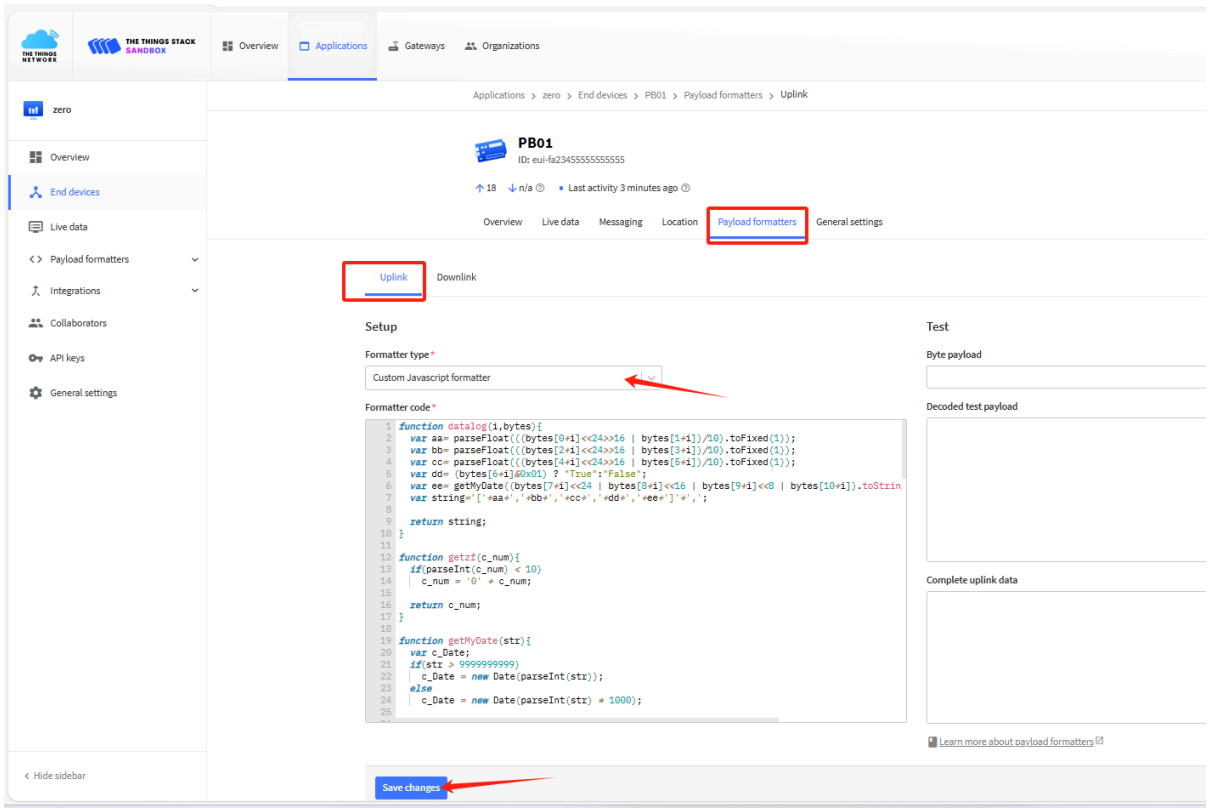
35 0A 00 01 FF 0C AE

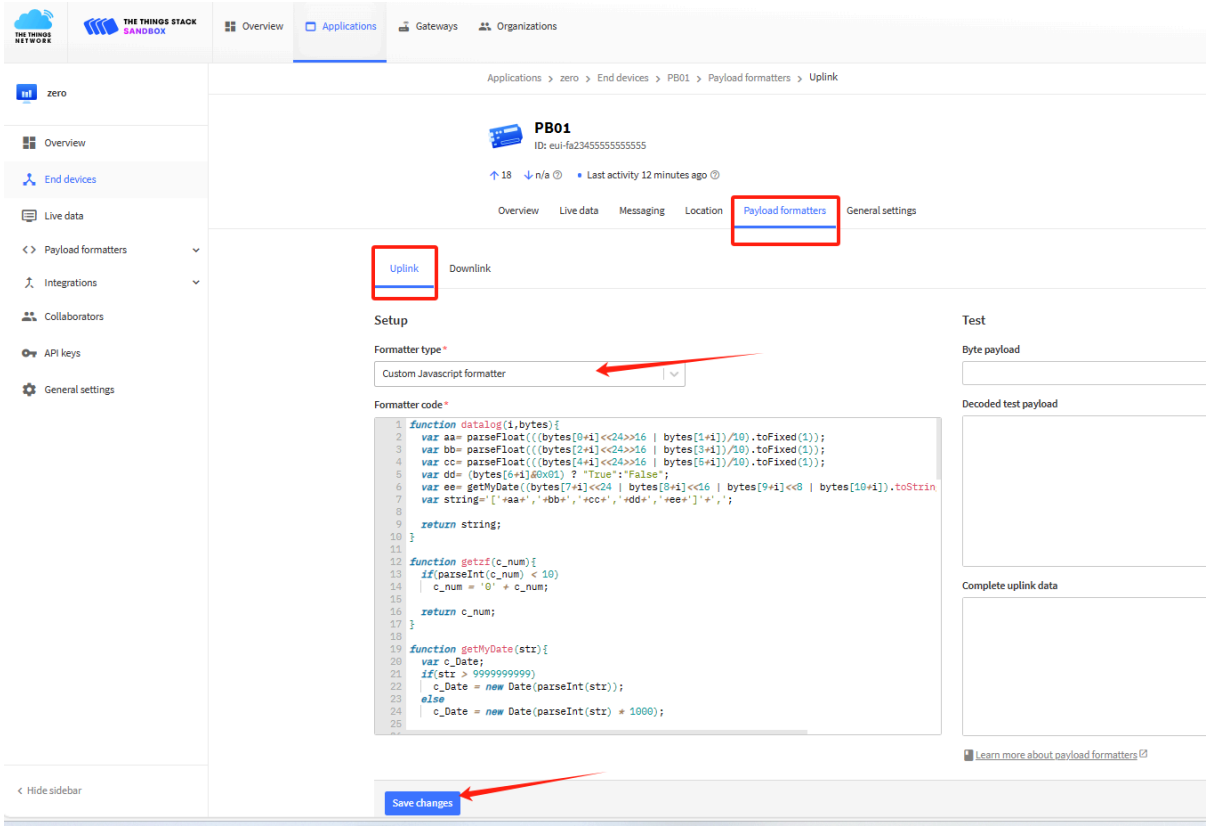


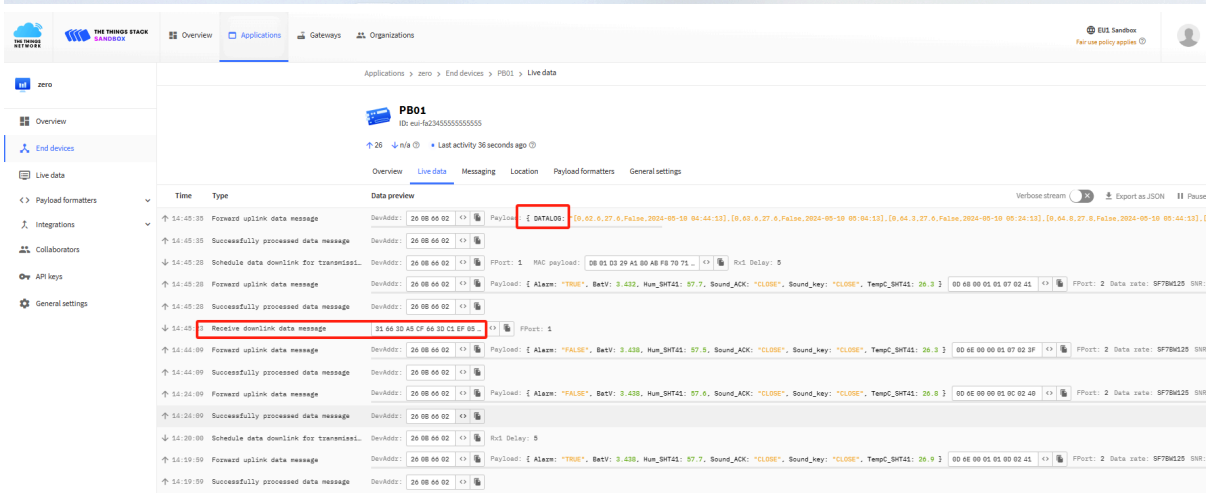


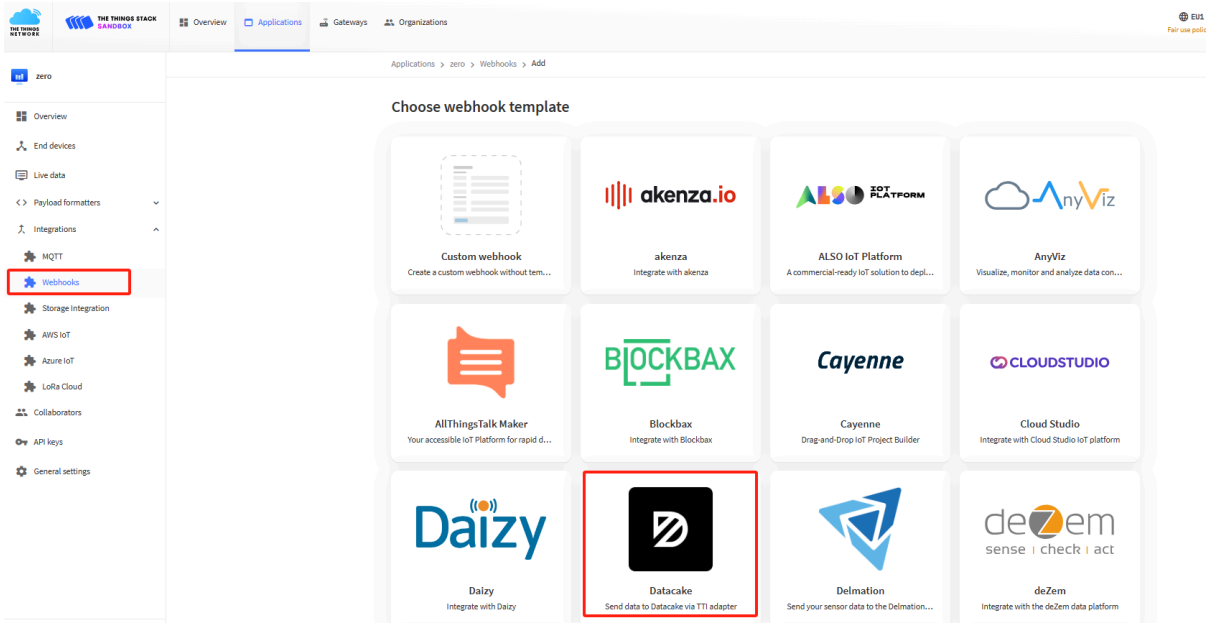
35 01 00 01 FF 0C DE

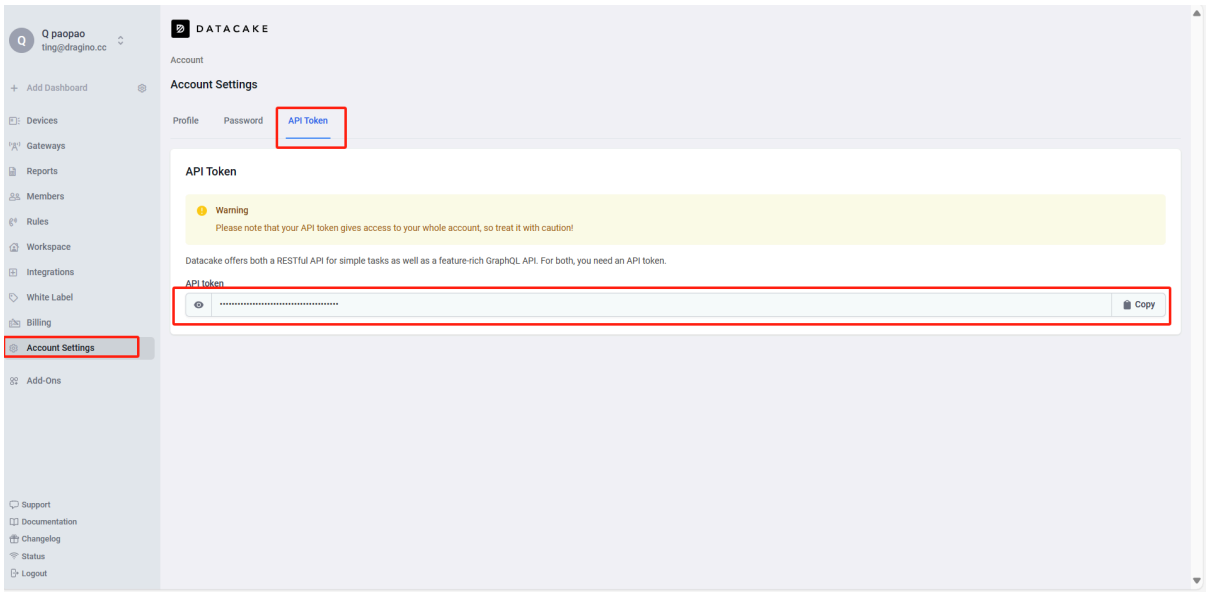


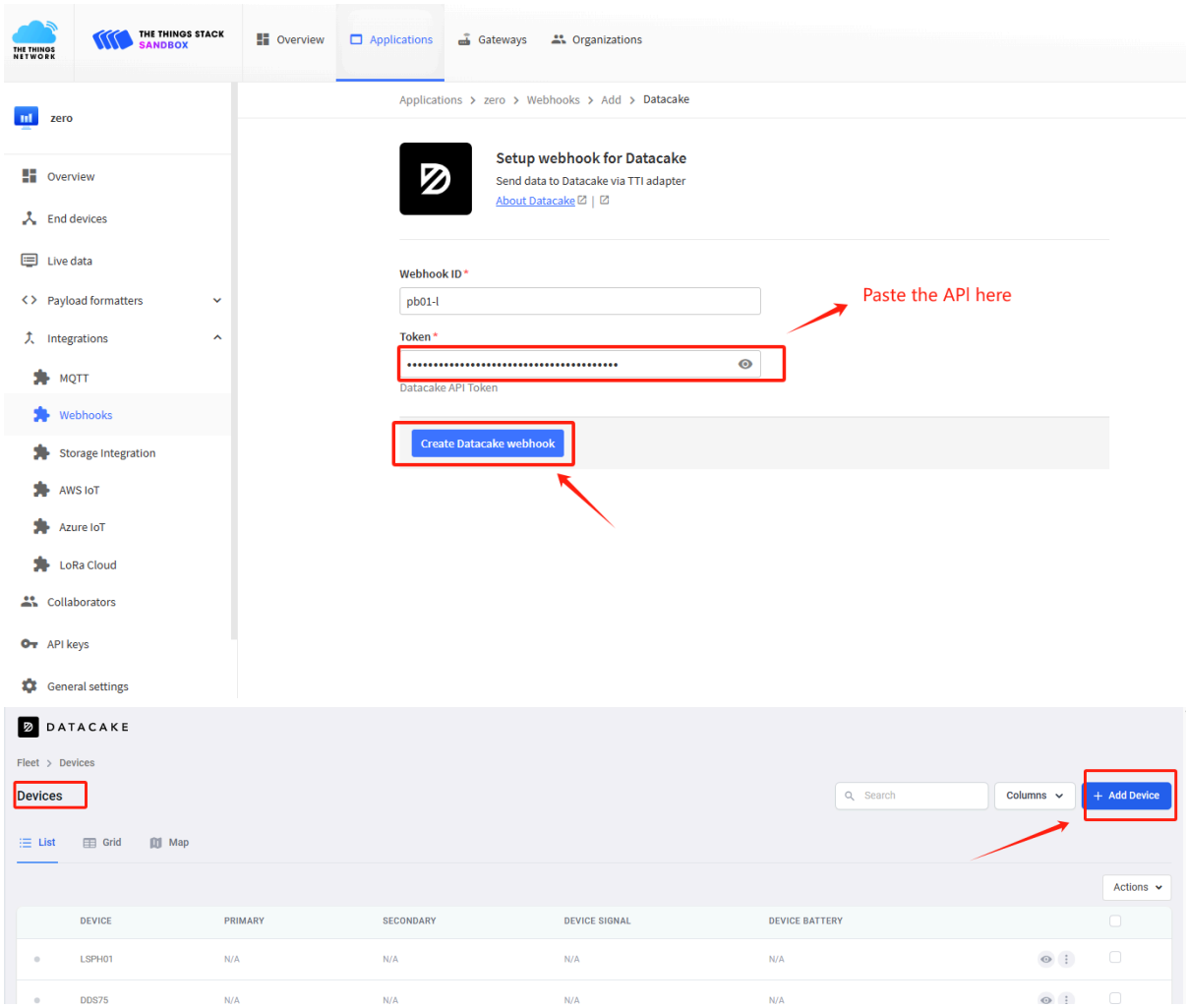



THE THINGS STACK SANDBOX
Overview
Applications
Gateways
Organizations
zero
Overview
End devices
Live data
Payload formatters
Integrations
Collaborators
API keys
General settings
Hide sidebar
Applications > zero > End devices > PB01 > Payload formatters > Uplink
PB01
ID: eui-fa23455555555555
18
n/a
Last activity 12 minutes ago
Overview
Live data
Messaging
Location
Payload formatters
General settings
Uplink
Downlink
Setup
Formatter type *
Custom Javascript formatter
Formatter code *
function datalog(i,bytes){
var aa= parseFloat(((bytes[0+i]<<24>>16 | bytes[1+i])/10).toFixed(1));
var bb= parseFloat(((bytes[2+i]<<24>>16 | bytes[3+i])/10).toFixed(1));
var cc= parseFloat(((bytes[4+i]<<24>>16 | bytes[5+i])/10).toFixed(1));
var dd= (bytes[6+i]&0x01) ? "True":"False";
var ee= getMyDate((bytes[7+i]<<24 | bytes[8+i]<<16 | bytes[9+i]<<8 | bytes[10+i]).toStrin
var string='['+aa+','+bb+','+cc+','+dd+','+ee+']'+',';
return string;
}
function getzf(c_num){
if(parseInt(c_num) < 10)
c_num = '0' + c_num;
return c_num;
}
function getMyDate(str){
var c_Date;
if(str > 9999999999)
c_Date = new Date(parseInt(str));
else
c_Date = new Date(parseInt(str) * 1000);
Test
Byte payload
Decoded test payload
Complete uplink data
Learn more about payload formatters
Save changes

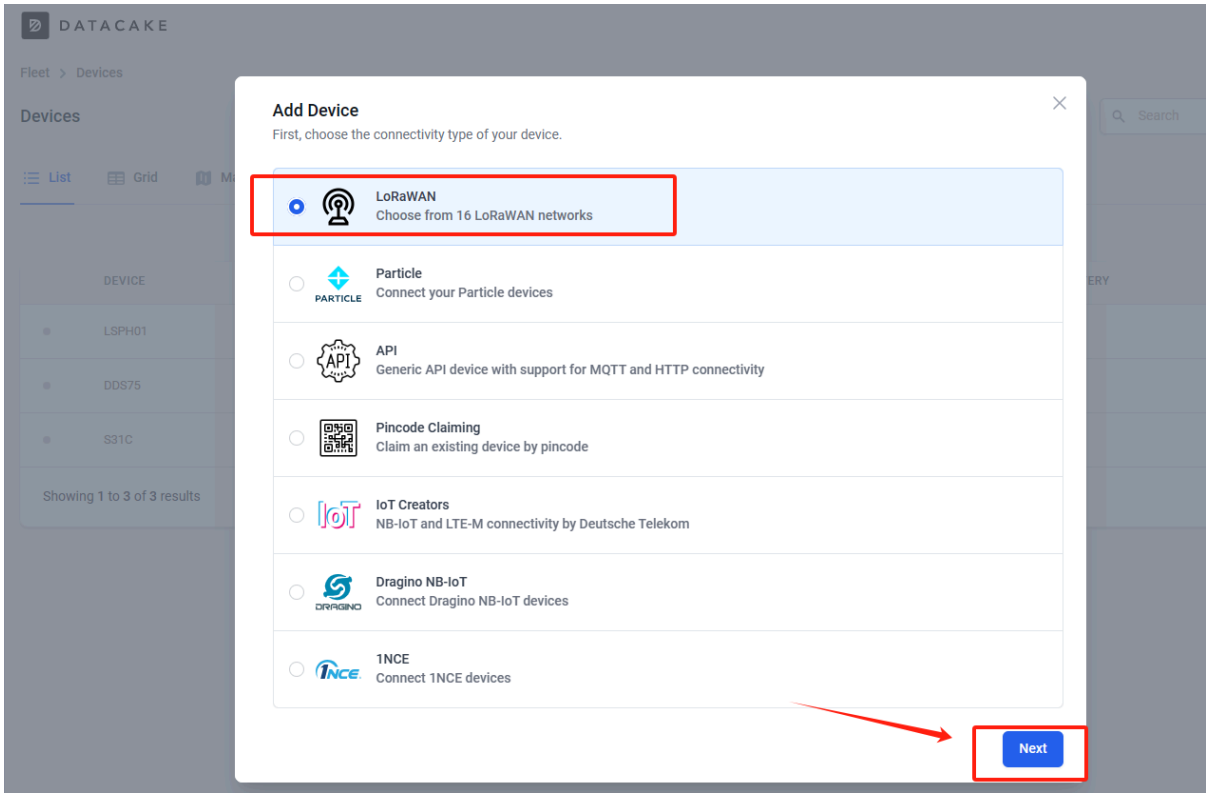

THE THINGS STACK SANDBOX
Overview
Applications
Gateways
Organizations
EU1 Sandbox
zero
Overview
End devices
Live data
Payload formatters
Integrations
Collaborators
API keys
General settings
Applications > zero > End devices > PB01 > Live data
PB01
ID: eui-fa23455555555555
26
n/a
Last activity 36 seconds ago
Overview
Live data
Messaging
Location
Payload formatters
General settings
Time
Type
Data preview
Verbose stream
Export as JSON
Pause
Forward uplink data message
Successfully processed data message
Schedule data downlink for transmissi…
Receive downlink data message
Forward uplink data message
Successfully processed data message
Forward uplink data message
Successfully processed data message
Schedule data downlink for transmissi…
Forward uplink data message
Successfully processed data message

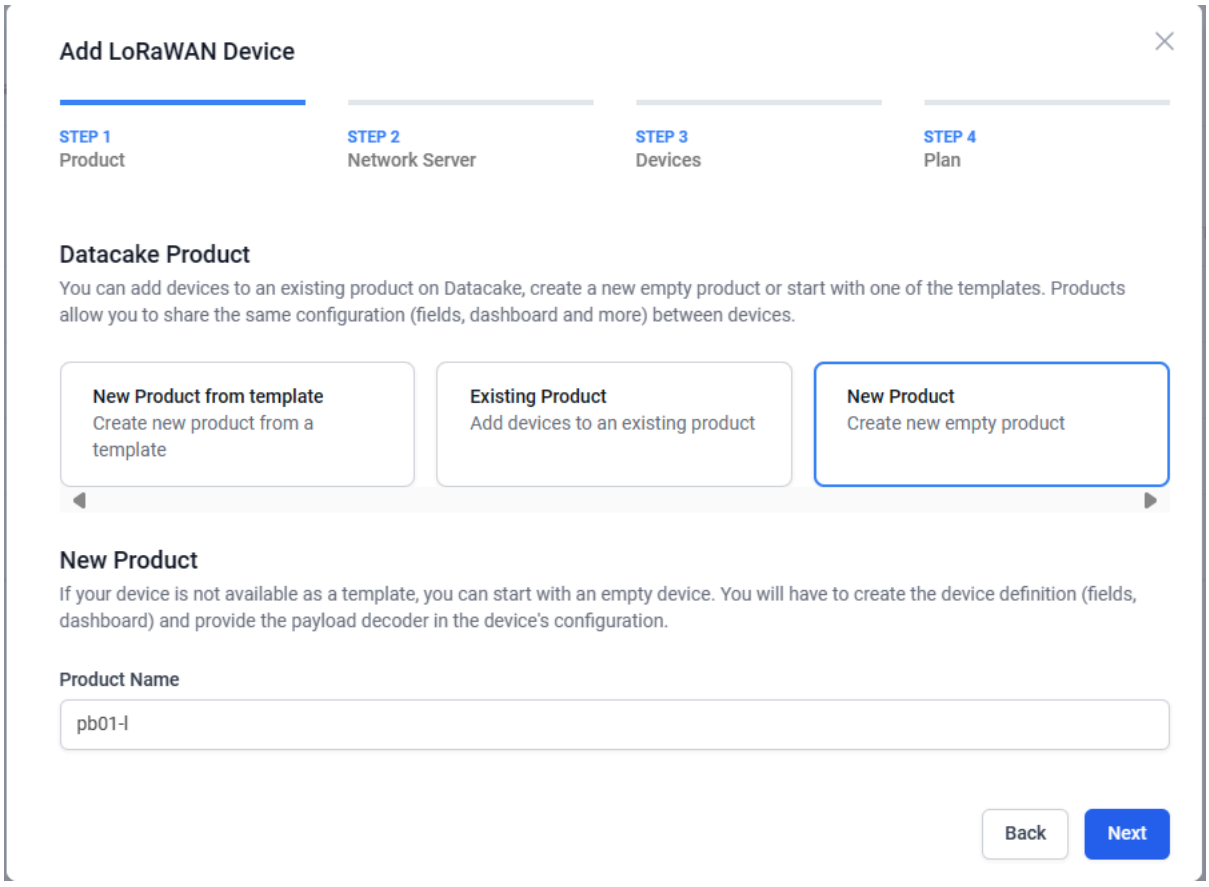

THE THINGS STACK SANDBOX
Overview
Applications
Gateways
Organizations
EU1
Applications > zero > Webhooks > Add
zero
Overview
End devices
Live data
Payload formatters
Integrations
MQTT
Webhooks
Storage Integration
AWS IoT
Azure IoT
LoRa Cloud
Collaborators
API keys
General settings
Choose webhook template
Custom webhook
Create a custom webhook without tem...
akenza
Integrate with akenza
ALSO IoT Platform
A commercial-ready IoT solution to depl...
AnyViz
Visualize, monitor and analyze data con...
AllThingsTalk Maker
Your accessible IoT Platform for rapid d...
Blockbax
Integrate with Blockbax
Cayenne
Drag-and-Drop IoT Project Builder
Cloud Studio
Integrate with Cloud Studio IoT platform
Daizy
Integrate with Daizy
Datacake
Send data to Datacake via TTI adapter
Delmation
Send your sensor data to the Delmation...
deZem
Integrate with the deZem data platform

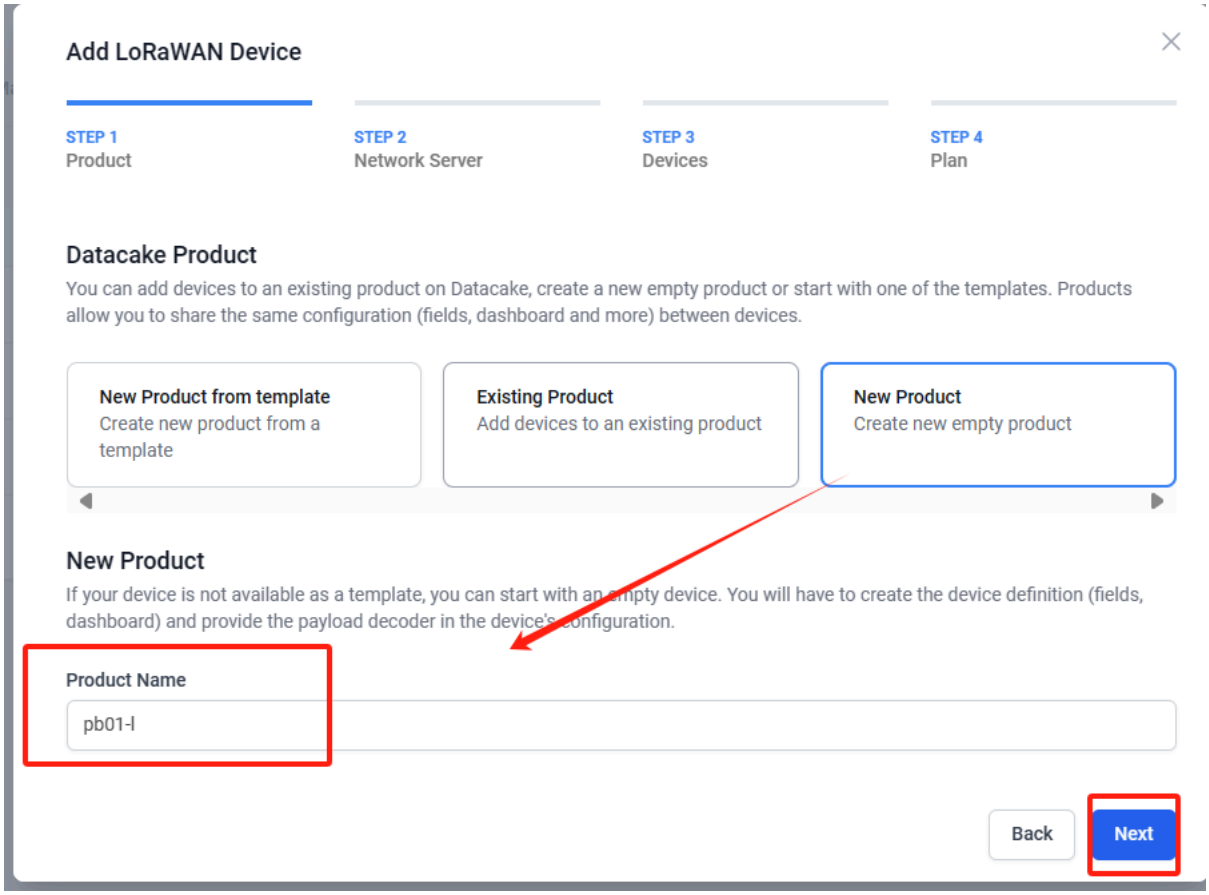

Q paopao
ting@dragino.cc
Add Dashboard
Devices
Gateways
Reports
Members
Rules
Workspace
Integrations
White Label
Billing
Account Settings
Add-Ons
Support
Documentation
Changelog
Status
Logout
DATACAKE
Account
Account Settings
Profile
Password
API Token
API Token
Warning
Please note that your API token gives access to your whole account, so treat it with caution!
Datacake offers both a RESTful API for simple tasks as well as a feature-rich GraphQL API. For both, you need an API token.
API token
Copy

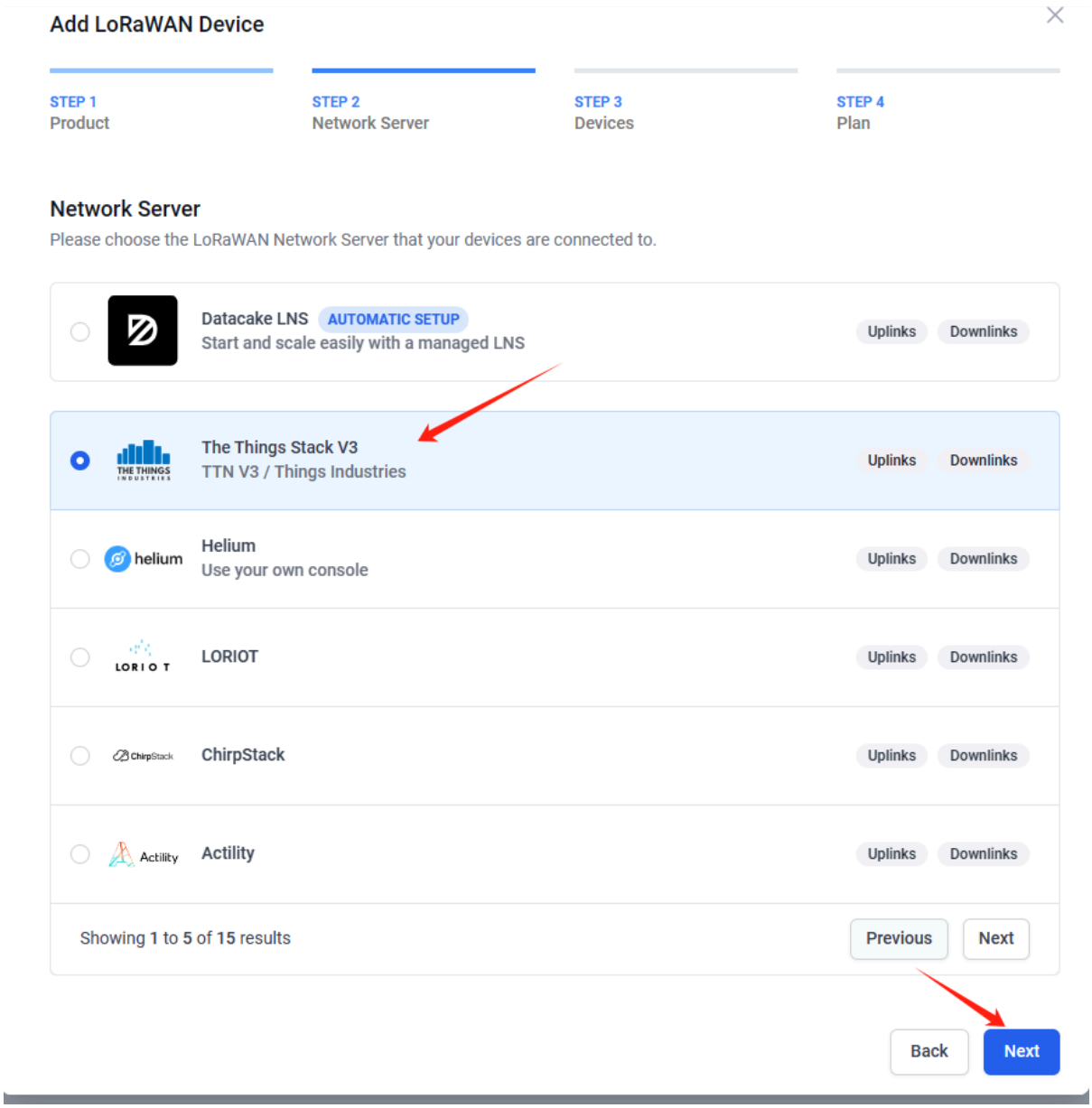

THE THINGS NETWORK
THE THINGS STACK SANDBOX
Overview
Applications
Gateways
Organizations
zero
Overview
End devices
Live data
Payload formatters
Integrations
MQTT
Webhooks
Storage Integration
AWS IoT
Azure IoT
LoRa Cloud
Collaborators
API keys
General settings
Applications > zero > Webhooks > Add > Datacake
Setup webhook for Datacake
Send data to Datacake via TTI adapter
About Datacake
Webhook ID *
pb01-l
Token *
Datacake API Token
Paste the API here
Create Datacake webhook

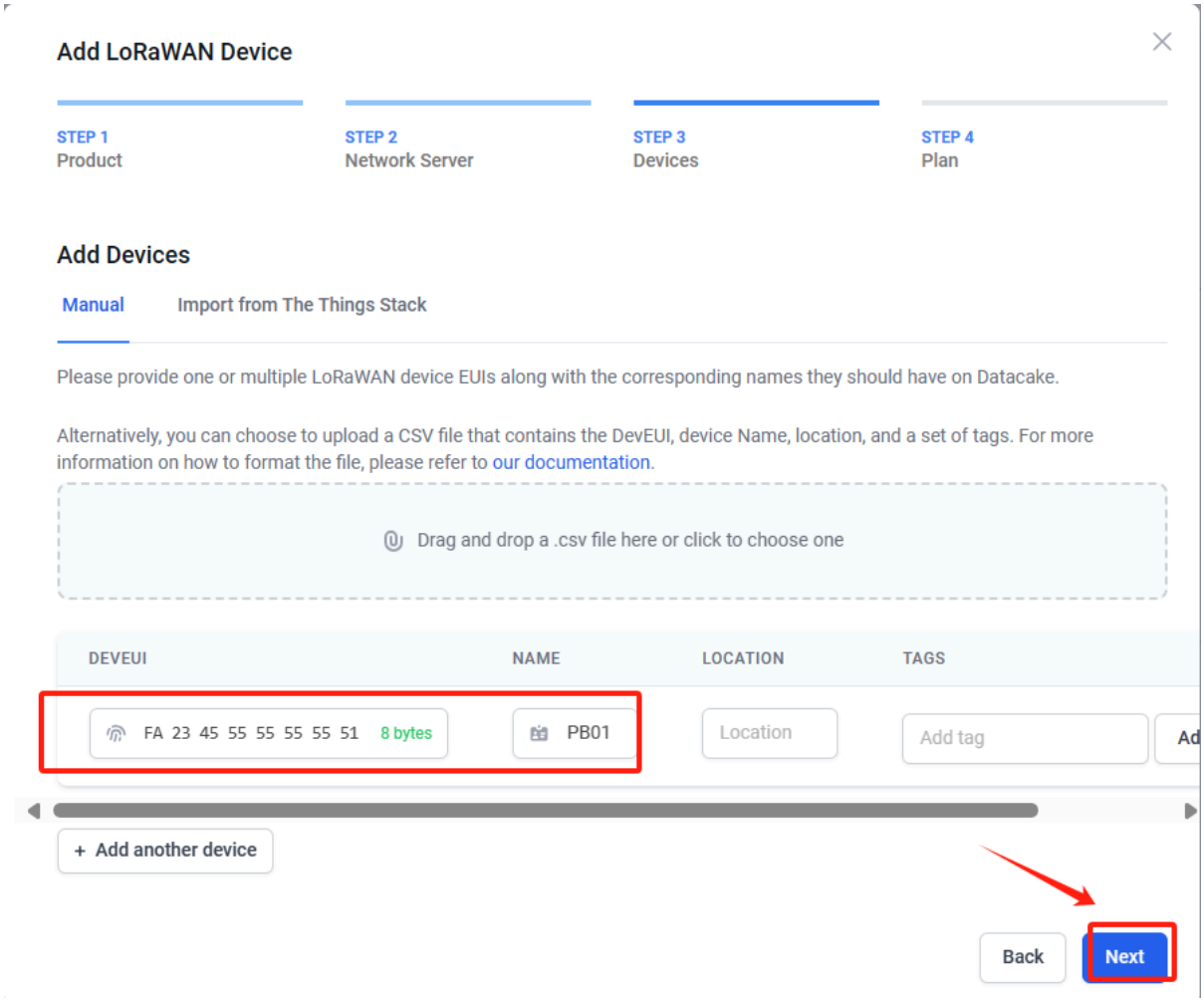
DATACAKE
Fleet > Devices
Devices
Search
Columns
Add Device
List
Grid
Map
Actions
DEVICE
PRIMARY
SECONDARY
DEVICE SIGNAL
DEVICE BATTERY
LSPH01
N/A
DDS75

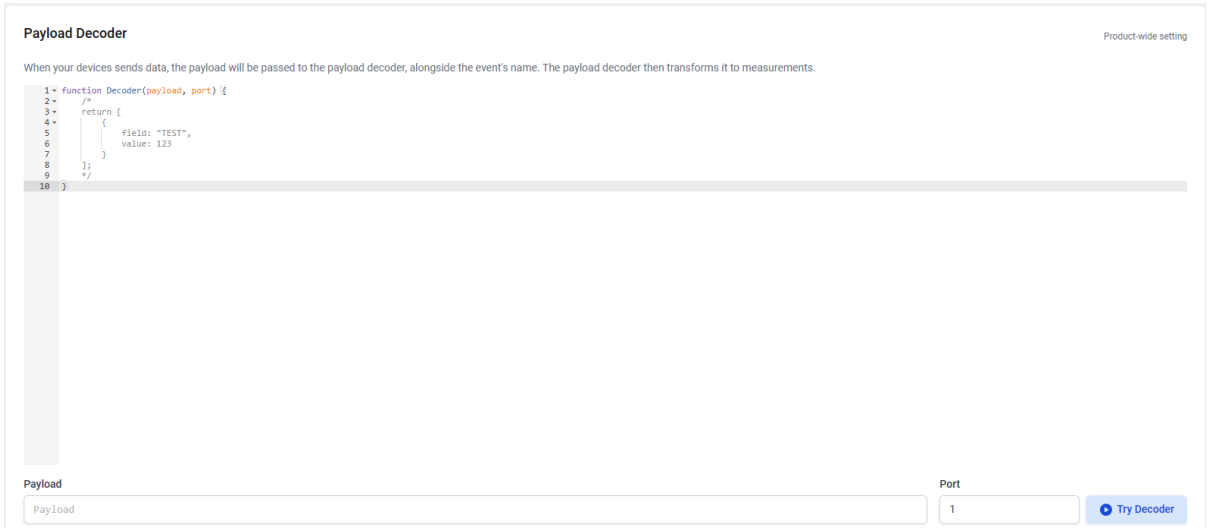

DATACAKE
Fleet > Devices
Devices
List
Grid
Add Device
First, choose the connectivity type of your device.
LoRaWAN
Choose from 16 LoRaWAN networks
Particle
Connect your Particle devices
API
Generic API device with support for MQTT and HTTP connectivity
Pincode Claiming
Claim an existing device by pincode
IoT Creators
NB-IoT and LTE-M connectivity by Deutsche Telekom
Dragino NB-IoT
Connect Dragino NB-IoT devices
1NCE
Connect 1NCE devices
Next

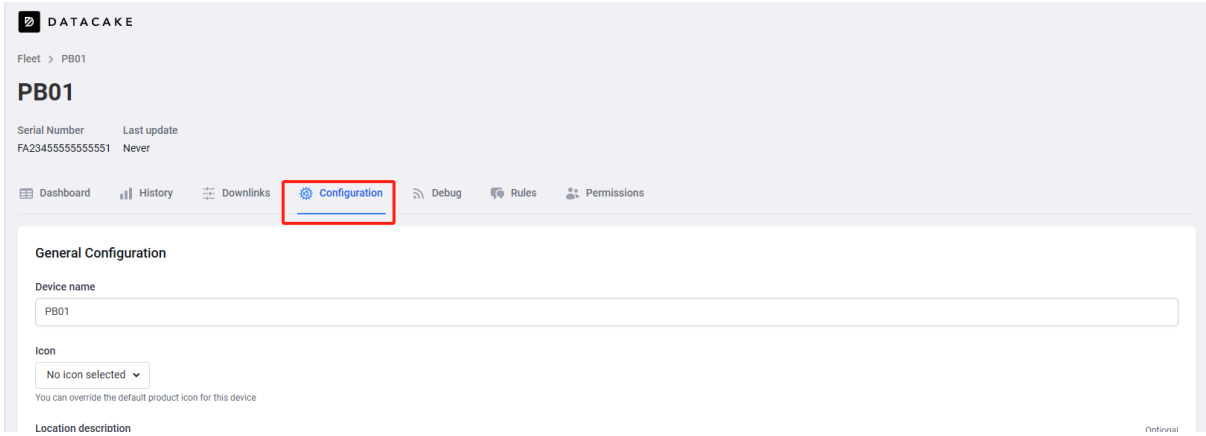

Add LoRaWAN Device
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Datacake Product
You can add devices to an existing product on Datacake, create a new empty product or start with one of the templates. Products allow you to share the same configuration (fields, dashboard and more) between devices.
New Product from template
Create new product from a template
Existing Product
Add devices to an existing product
New Product
Create new empty product
New Product
If your device is not available as a template, you can start with an empty device. You will have to create the device definition (fields, dashboard) and provide the payload decoder in the device's configuration.
Product Name
pb01-l
Back
Next

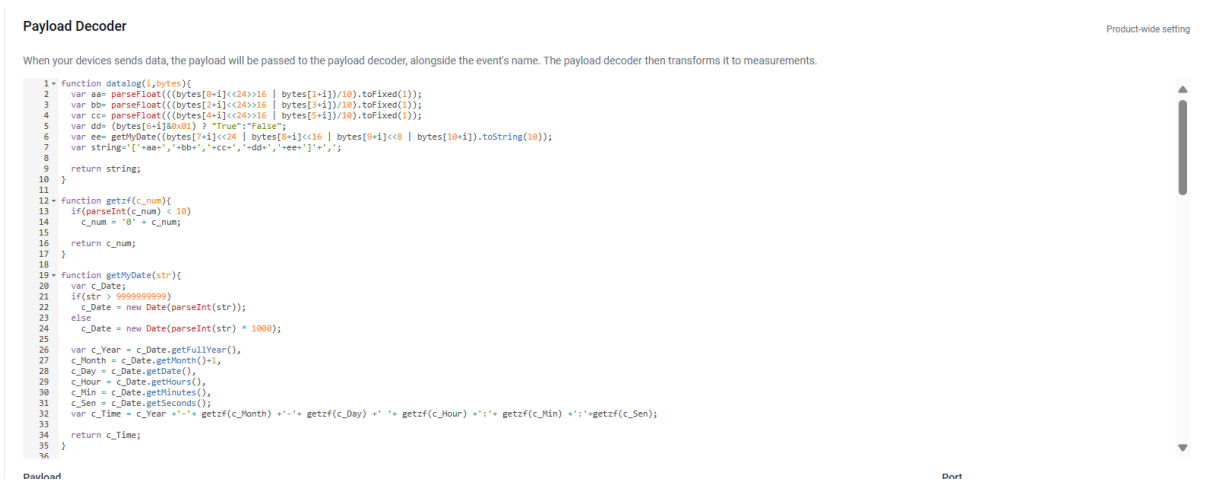

Add LoRaWAN Device
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Datacake Product
You can add devices to an existing product on Datacake, create a new empty product or start with one of the templates. Products allow you to share the same configuration (fields, dashboard and more) between devices.
New Product from template
Create new product from a template
Existing Product
Add devices to an existing product
New Product
Create new empty product
New Product
If your device is not available as a template, you can start with an empty device. You will have to create the device definition (fields, dashboard) and provide the payload decoder in the device's configuration.
Product Name
pb01-l
Back
Next

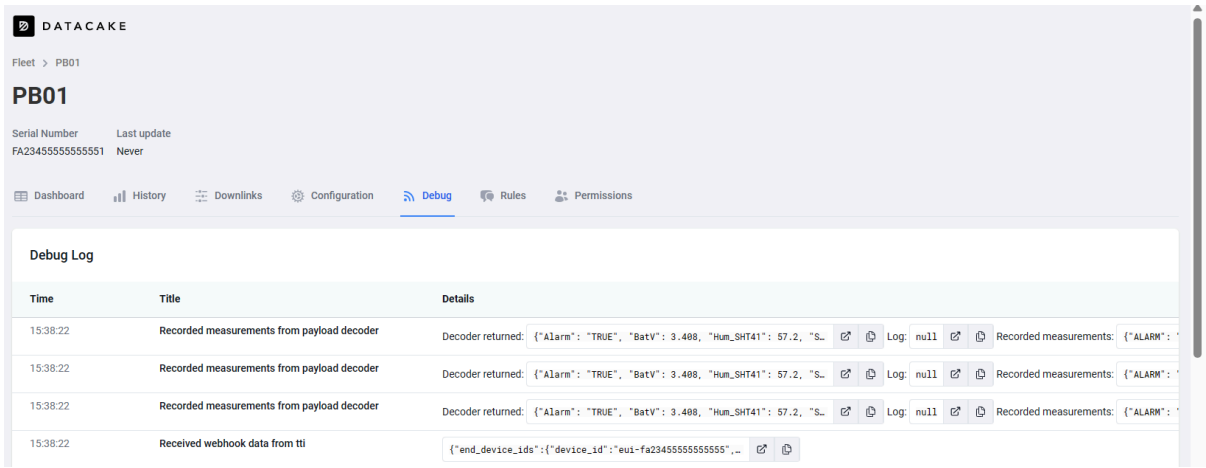

Add LoRaWAN Device
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Network Server
Please choose the LoRaWAN Network Server that your devices are connected to.
Datacake LNS
AUTOMATIC SETUP
Start and scale easily with a managed LNS
Uplinks
Downlinks
The Things Stack V3
TTN V3 / Things Industries
Uplinks
Downlinks
Helium
Use your own console
Uplinks
Downlinks
LORIOT
Uplinks
Downlinks
ChirpStack
Uplinks
Downlinks
Actility
Uplinks
Downlinks
Showing 1 to 5 of 15 results
Previous
Next
Back
Next


Add LoRaWAN Device
STEP 1
Product
STEP 2
Network Server
STEP 3
Devices
STEP 4
Plan
Add Devices
Manual
Import from The Things Stack
Please provide one or multiple LoRaWAN device EUIs along with the corresponding names they should have on Datacake.
Alternatively, you can choose to upload a CSV file that contains the DevEUI, device Name, location, and a set of tags. For more information on how to format the file, please refer to our documentation.
Drag and drop a .csv file here or click to choose one
DEVEUI
NAME
LOCATION
TAGS
FA 23 45 55 55 55 55 51
8 bytes
PB01
Location
Add tag
+ Add another device
Back
Next

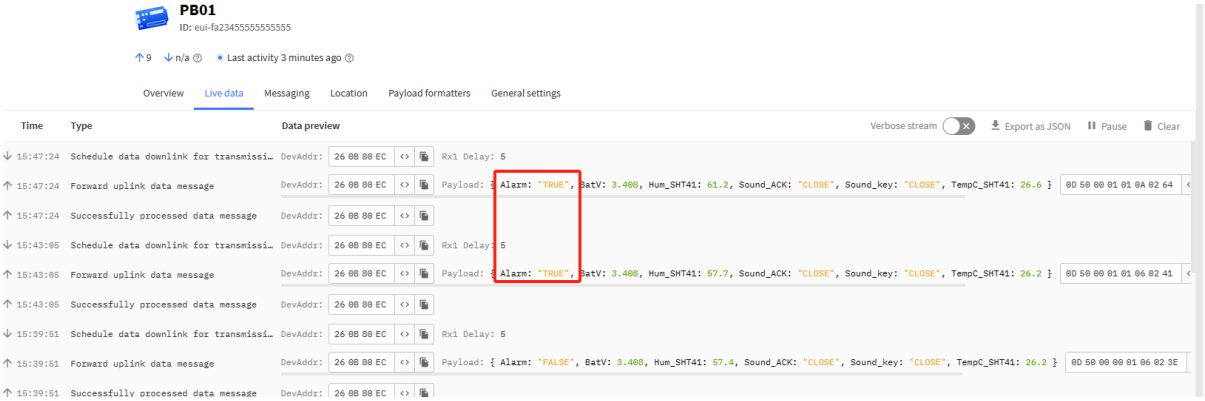

Payload Decoder
Product-wide setting
When your devices sends data, the payload will be passed to the payload decoder, alongside the event's name. The payload decoder then transforms it to measurements.
function Decoder(payload, port) {
/*
return [
{
field: "TEST",
value: 123
}
];
*/
}
Payload
Payload
Port
1
Try Decoder

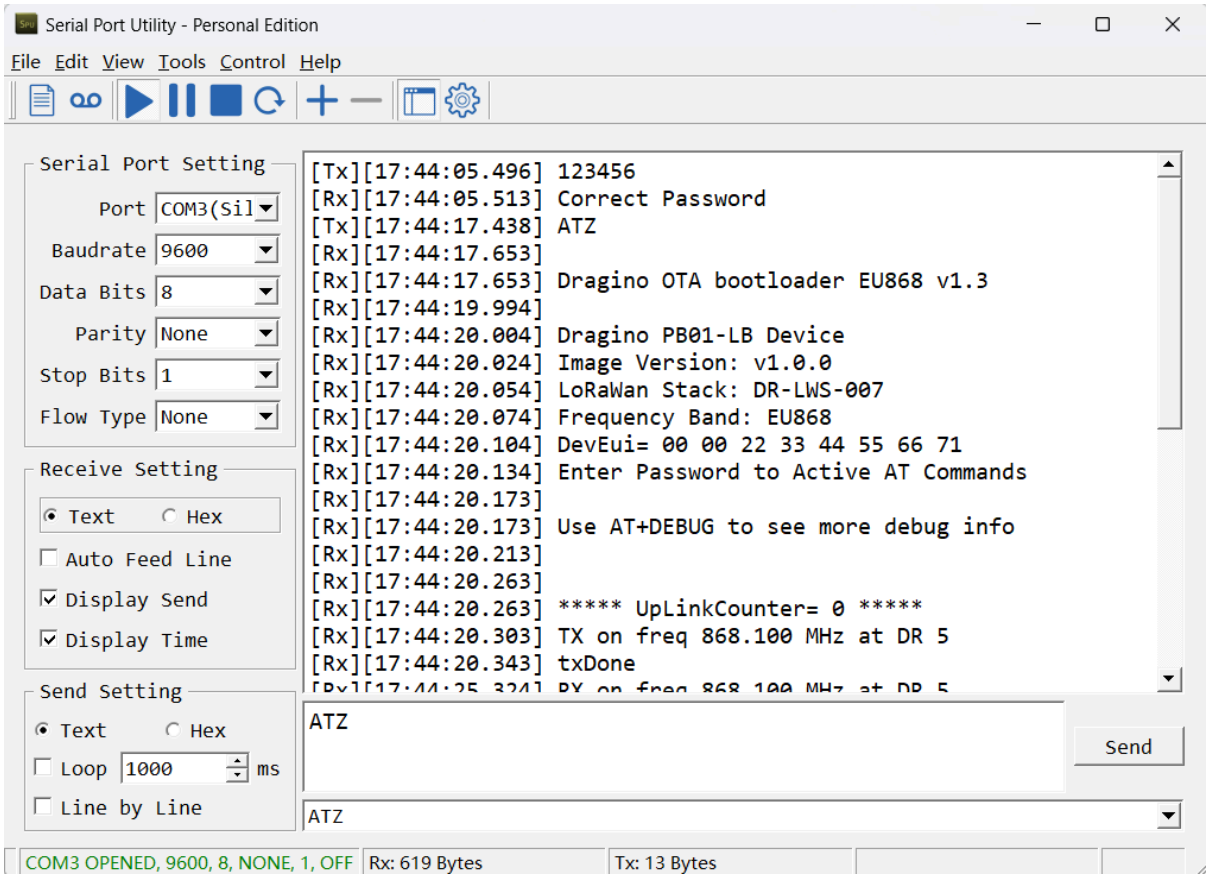

DATACAKE
Fleet > PB01
PB01
Serial Number
FA23455555555551
Last update
Never
Dashboard
History
Downlinks
Configuration
Debug
Rules
Permissions
General Configuration
Device name
PB01
Icon
No icon selected
You can override the default product icon for this device
Location description
Optional

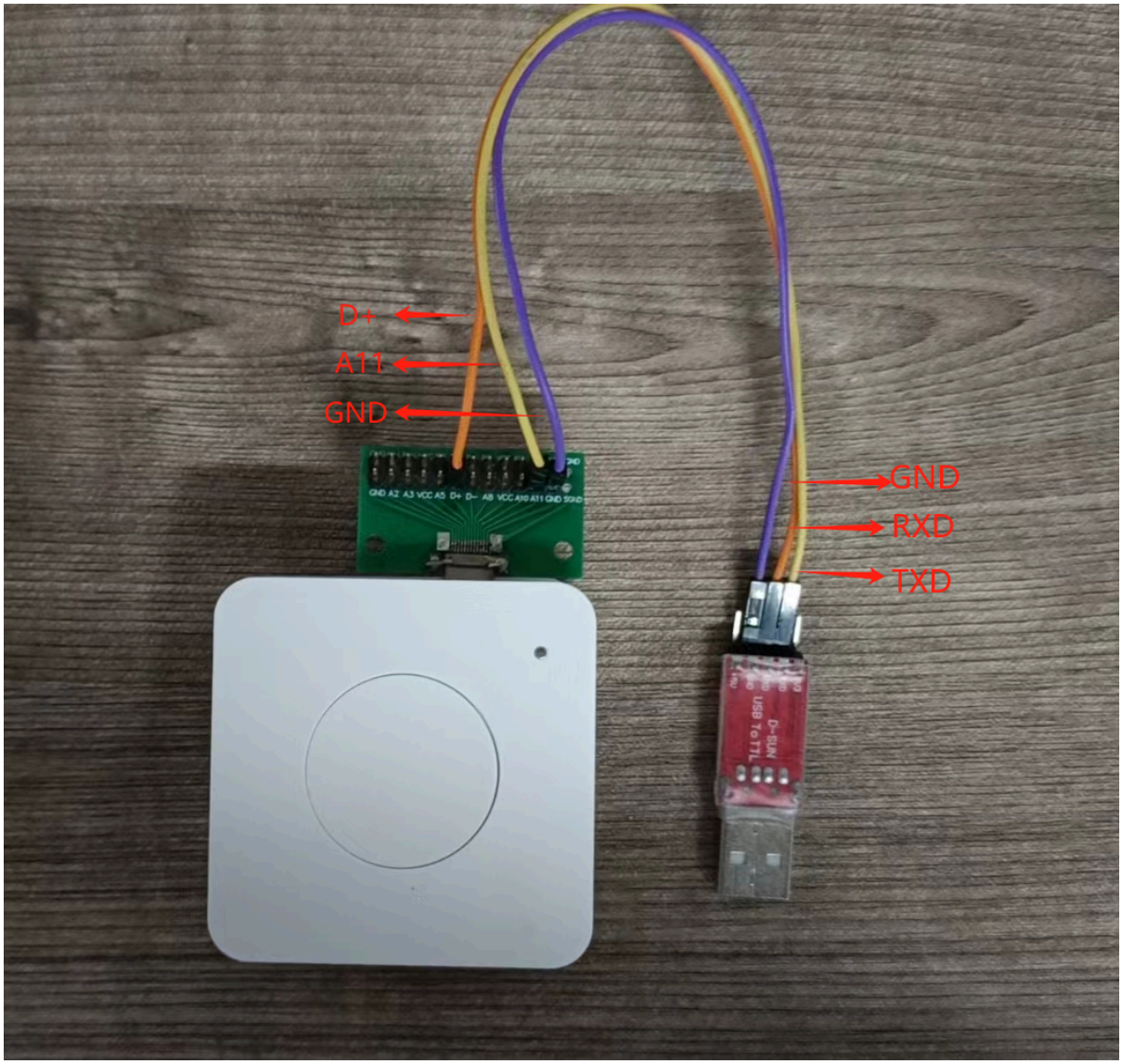

Payload Decoder
Product-wide setting
When your devices sends data, the payload will be passed to the payload decoder, alongside the event's name. The payload decoder then transforms it to measurements.
function datalog(i,bytes){
var aa= parseFloat(((bytes[0+i]<<24>>16 | bytes[1+i])/10).toFixed(1));
var bb= parseFloat(((bytes[2+i]<<24>>16 | bytes[3+i])/10).toFixed(1));
var cc= parseFloat(((bytes[4+i]<<24>>16 | bytes[5+i])/10).toFixed(1));
var dd= (bytes[6+i]&0x01) ? "True":"False";
var ee= getMyDate((bytes[7+i]<<24 | bytes[8+i]<<16 | bytes[9+i]<<8 | bytes[10+i]).toString(10));
var string='['+aa+','+bb+','+cc+','+dd+','+ee+']'+',';
return string;
}
function getzf(c_num){
if(parseInt(c_num) < 10)
c_num = '0' + c_num;
return c_num;
}
function getMyDate(str){
var c_Date;
if(str > 9999999999)
c_Date = new Date(parseInt(str));
else
c_Date = new Date(parseInt(str) * 1000);
var c_Year = c_Date.getFullYear(),
c_Month = c_Date.getMonth()+1,
c_Day = c_Date.getDate(),
c_Hour = c_Date.getHours(),
c_Min = c_Date.getMinutes(),
c_Sen = c_Date.getSeconds();
var c_Time = c_Year +'-'+ getzf(c_Month) +'-'+ getzf(c_Day) +' '+ getzf(c_Hour) +':'+ getzf(c_Min) +':'+getzf(c_Sen);
return c_Time;
}
Payload
Port

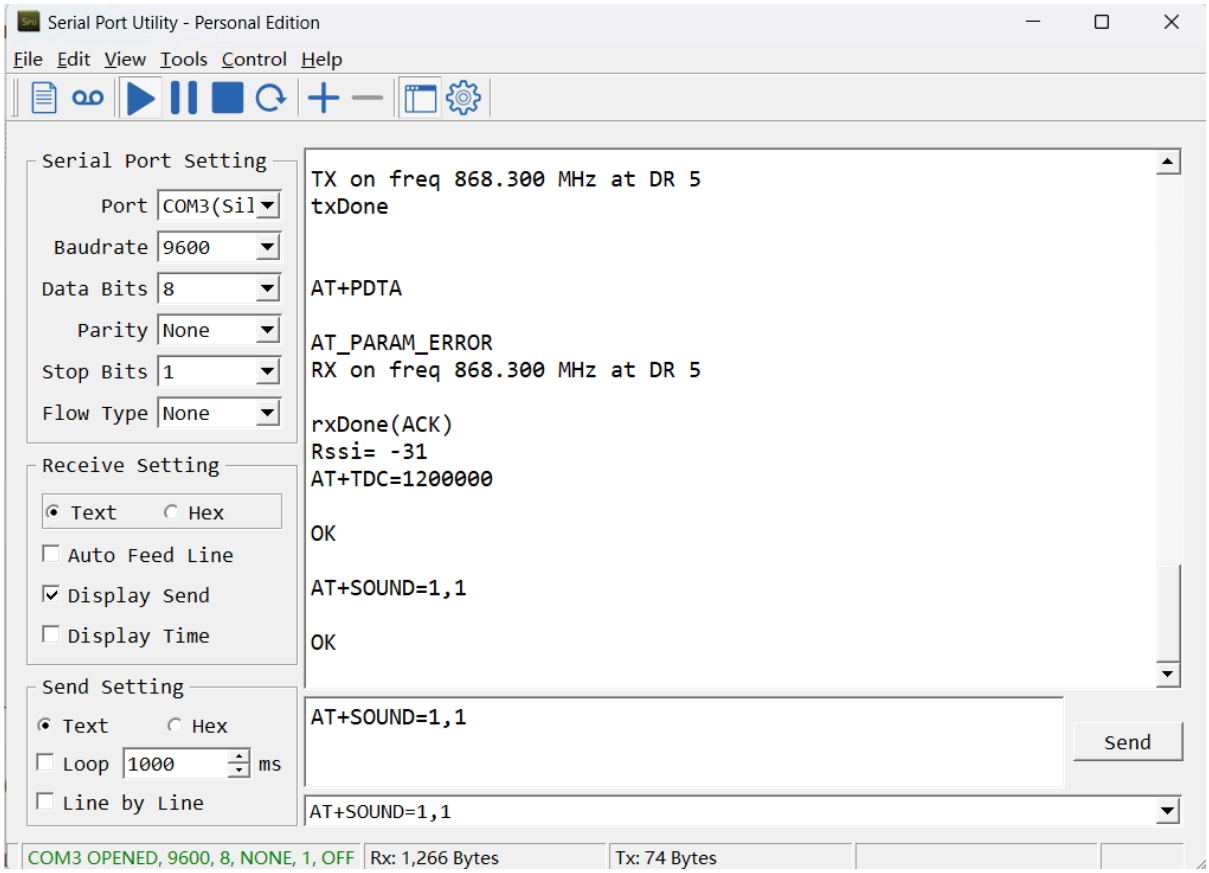

DATACAKE
Fleet > PB01
PB01
Serial Number
FA23455555555551
Last update
Never
Dashboard
History
Downlinks
Configuration
Debug
Rules
Permissions
Debug Log
Time
Title
Details
15:38:22
Recorded measurements from payload decoder
Decoder returned:
{"Alarm": "TRUE", "BatV": 3.408, "Hum_SHT41": 57.2, "S…
Log:
null
Recorded measurements:
15:38:22
Recorded measurements from payload decoder
Decoder returned:
{"Alarm": "TRUE", "BatV": 3.408, "Hum_SHT41": 57.2, "S…
Log:
null
Recorded measurements:
15:38:22
Recorded measurements from payload decoder
Decoder returned:
{"Alarm": "TRUE", "BatV": 3.408, "Hum_SHT41": 57.2, "S…
Log:
null
Recorded measurements:
15:38:22
Received webhook data from tti
{"end_device_ids":{"device_id":"eui-fa23455555555555",…

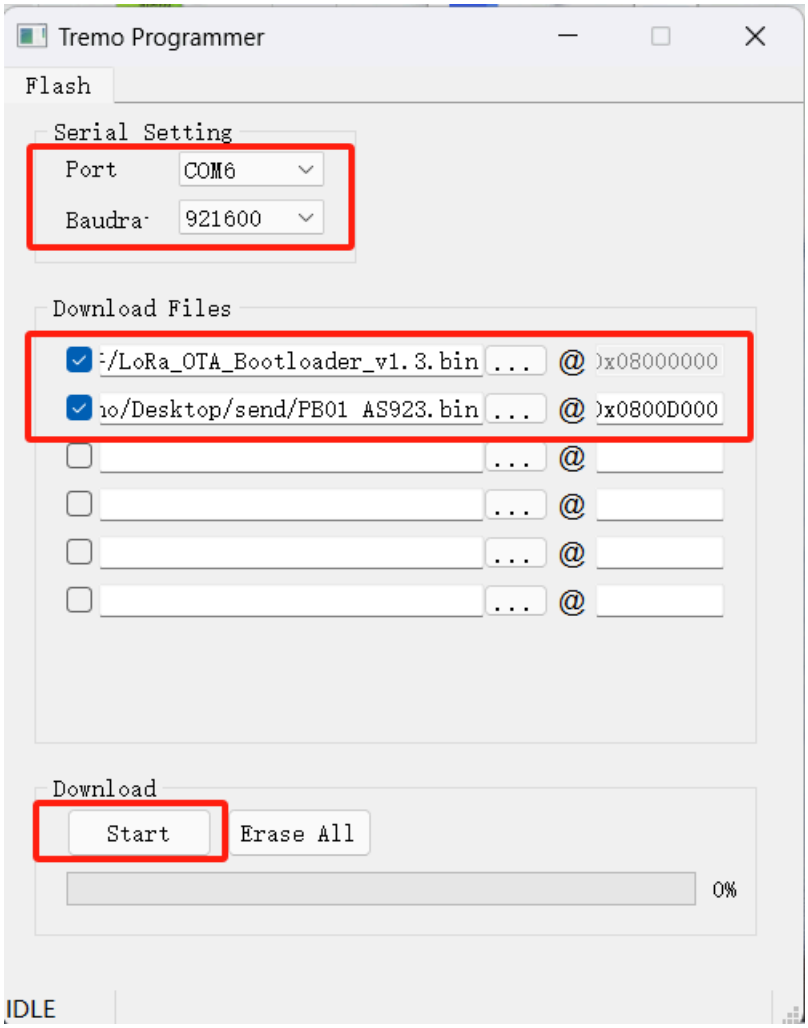

SOS

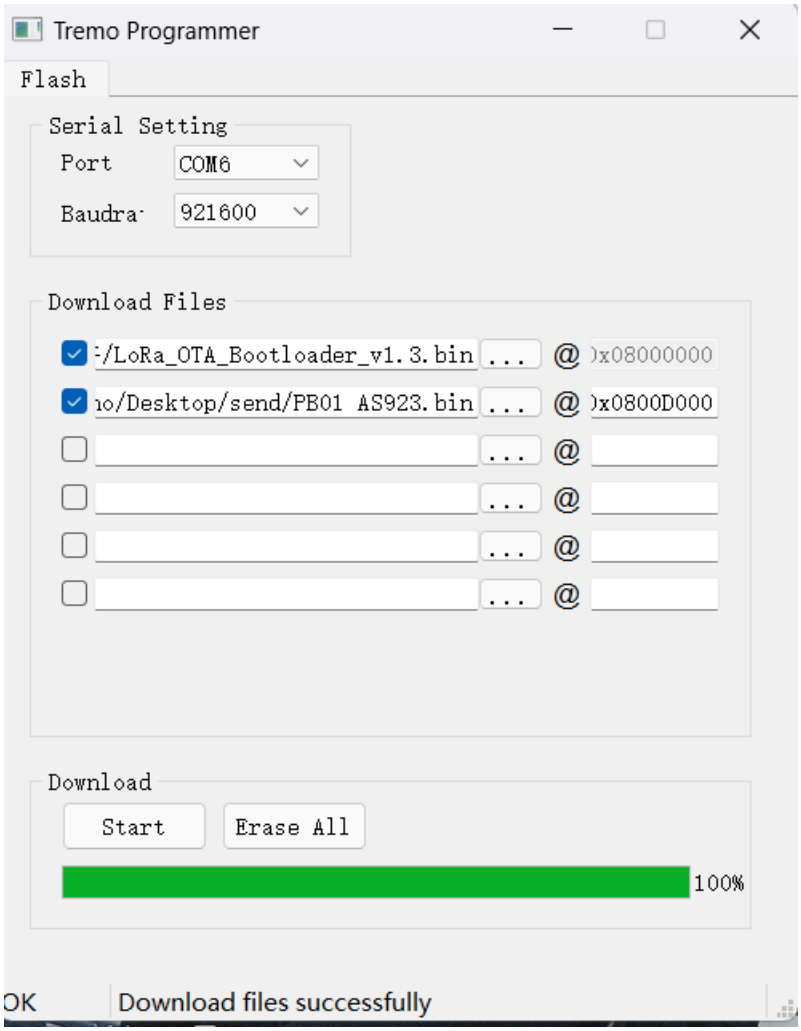

PB01
ID: eui-fa23455555555555
9 n/a Last activity 3 minutes ago
Overview Live data Messaging Location Payload formatters General settings
Time Type Data preview
Verbose stream Export as JSON Pause Clear
15:47:24 Schedule data downlink for transmissi… DevAddr: 26 0B 80 EC Rx1 Delay: 5
15:47:24 Forward uplink data message DevAddr: 26 0B 80 EC Payload: { Alarm: "TRUE", BatV: 3.408, Hum_SHT41: 61.2, Sound_ACK: "CLOSE", Sound_key: "CLOSE", TempC_SHT41: 26.6 } 0D 50 00 01 01 0A 02 64
15:47:24 Successfully processed data message DevAddr: 26 0B 80 EC
15:43:05 Schedule data downlink for transmissi… DevAddr: 26 0B 80 EC Rx1 Delay: 5
15:43:05 Forward uplink data message DevAddr: 26 0B 80 EC Payload: { Alarm: "TRUE", BatV: 3.408, Hum_SHT41: 57.7, Sound_ACK: "CLOSE", Sound_key: "CLOSE", TempC_SHT41: 26.2 } 0D 50 00 01 01 06 02 41
15:43:05 Successfully processed data message DevAddr: 26 0B 80 EC
15:39:51 Schedule data downlink for transmissi… DevAddr: 26 0B 80 EC Rx1 Delay: 5
15:39:51 Forward uplink data message DevAddr: 26 0B 80 EC Payload: { Alarm: "FALSE", BatV: 3.408, Hum_SHT41: 57.4, Sound_ACK: "CLOSE", Sound_key: "CLOSE", TempC_SHT41: 26.2 } 0D 50 00 00 01 06 02 3E
15:39:51 Successfully processed data message DevAddr: 26 0B 80 EC

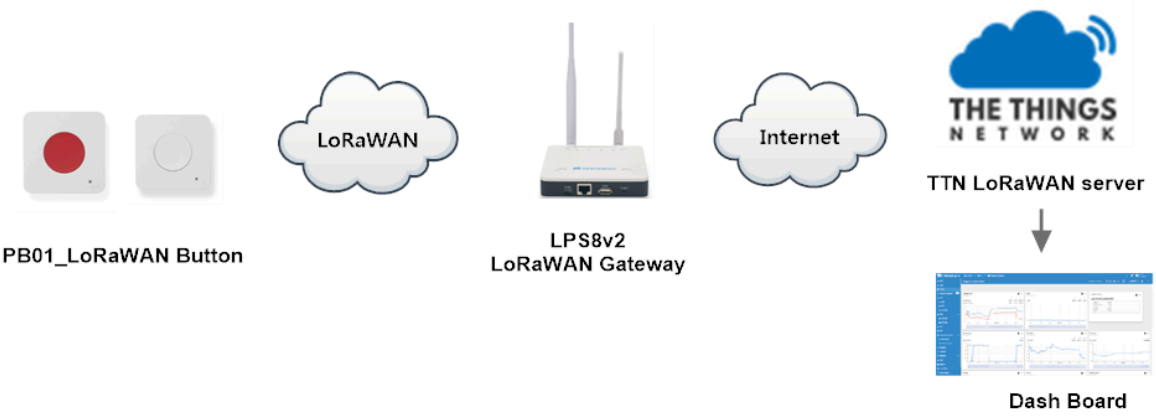

Serial Port Utility - Personal Edition
File Edit View Tools Control Help
Serial Port Setting
Port COM3(Sil
Baudrate 9600
Data Bits 8
Parity None
Stop Bits 1
Flow Type None
Receive Setting
Text Hex
Auto Feed Line
Display Send
Display Time
Send Setting
Text Hex
Loop 1000 ms
Line by Line
[Tx][17:44:05.496] 123456
[Rx][17:44:05.513] Correct Password
[Tx][17:44:17.438] ATZ
[Rx][17:44:17.653]
[Rx][17:44:17.653] Dragino OTA bootloader EU868 v1.3
[Rx][17:44:19.994]
[Rx][17:44:20.004] Dragino PB01-LB Device
[Rx][17:44:20.024] Image Version: v1.0.0
[Rx][17:44:20.054] LoRaWan Stack: DR-LWS-007
[Rx][17:44:20.074] Frequency Band: EU868
[Rx][17:44:20.104] DevEui= 00 00 22 33 44 55 66 71
[Rx][17:44:20.134] Enter Password to Active AT Commands
[Rx][17:44:20.173]
[Rx][17:44:20.173] Use AT+DEBUG to see more debug info
[Rx][17:44:20.213]
[Rx][17:44:20.263]
[Rx][17:44:20.263] ***** UpLinkCounter= 0 *****
[Rx][17:44:20.303] TX on freq 868.100 MHz at DR 5
[Rx][17:44:20.343] txDone
ATZ
Send
ATZ
COM3 OPENED, 9600, 8, NONE, 1, OFF
Rx: 619 Bytes
Tx: 13 Bytes


D+
A11
GND
GND
RXD
TXD


Serial Port Utility - Personal Edition
File Edit View Tools Control Help
Serial Port Setting
Port COM3(Sil
Baudrate 9600
Data Bits 8
Parity None
Stop Bits 1
Flow Type None
Receive Setting
Text Hex
Auto Feed Line
Display Send
Display Time
Send Setting
Text Hex
Loop 1000 ms
Line by Line
TX on freq 868.300 MHz at DR 5
txDone
AT+PDTA
AT_PARAM_ERROR
RX on freq 868.300 MHz at DR 5
rxDone(ACK)
Rssi= -31
AT+TDC=1200000
OK
AT+SOUND=1,1
OK
AT+SOUND=1,1
Send
AT+SOUND=1,1
COM3 OPENED, 9600, 8, NONE, 1, OFF
Rx: 1,266 Bytes
Tx: 74 Bytes


Tremo Programmer
Flash
Serial Setting
Port
COM6
Baudra
921600
Download Files
:/LoRa_OTA_Bootloader_v1.3.bin
...
@
)x08000000
io/Desktop/send/PB01_AS923.bin
...
@
)x0800D000
Download
Start
Erase All
0%
IDLE


Tremo Programmer
Flash
Serial Setting
Port
COM6
Baudra
921600
Download Files
:/LoRa_OTA_Bootloader_v1.3.bin
...
@
)x08000000
io/Desktop/send/PB01_AS923.bin
...
@
)x0800D000
Download
Start
Erase All
100%
OK
Download files successfully


LoRaWAN
Internet
THE THINGS
NETWORK
TTN LoRaWAN server
PB01_LoRaWAN Button
LPS8v2
LoRaWAN Gateway
Dash Board