LoRaWAN Temperature & Humidity Sensor

UC11-T1

V1.2

www.ursalink.com

Welcome

Thank you for choosing Ursalink UC11-T1.

This guide describes how to install the UC11-T1 and how to connect it to Ursalink Cloud. Once you complete the installation, refer to the Ursalink UC11-T1 User Guide for instructions on how to perform configurations on the device.

Related Documents

This Start Guide only explains the installation of Ursalink UC11-T1. For more functionality and advanced settings, please refer to the relevant documents as below.

Document	Description
Ursalink UC11-T1 Datasheet	Datasheet for the Ursalink UC11-T1.
Ursalink UC11-T1 User Guide	Users can refer to the guide for instruction on how to configure all the settings.

The related documents are available on Ursalink website: http://www.ursalink.com.

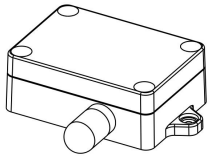
Declaration of Conformity

Ursalink UC11-T1 is in conformity with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.

For assistance, please contact
Ursalink technical support:
Email: support@ursalink.com
Tel: 86-592-5023060
Fax: 86-592-5023065

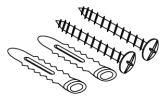
1. Packing List

Before you begin to install the UC11-T1, please check the package contents to verify that you have received the items below.

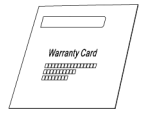


1 × UC11-T1 Device

1 × Magnet



Setscrews



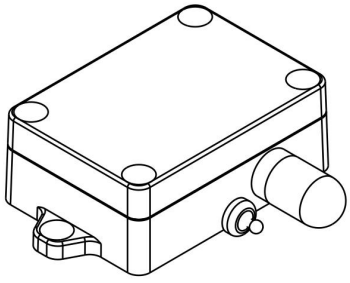
1 × Warranty Card

If any of the above items is missing or damaged, please contact your Ursalink sales representative.

2. Hardware Installation

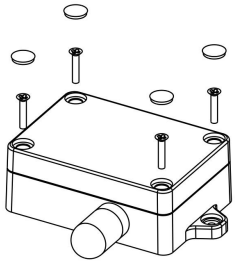
2.1 Turn ON/OFF UC11-T1

Place the magnet on the sign “U” to turn on/off UC11-T1.
Power on: Beep for 2 seconds
Power off: Beep for 6 seconds

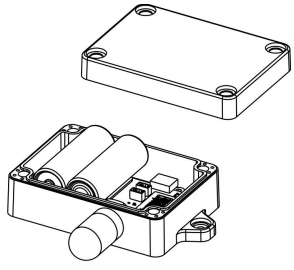


2.2 USB Configuration

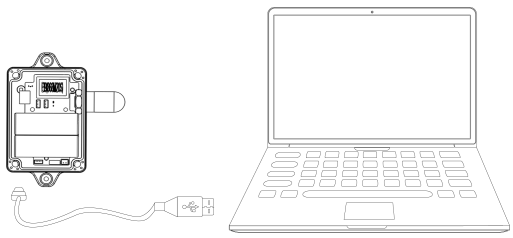
A. Remove the screw caps and unscrew the screws.



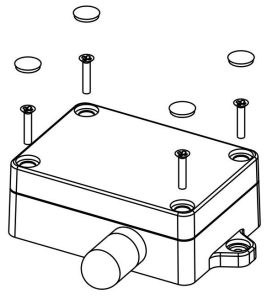
B. Take off the roof cover.



C. Connect UC11-T1 to Laptop with standard USB cable. Configure UC11-T1 via Ursalink Toolbox.

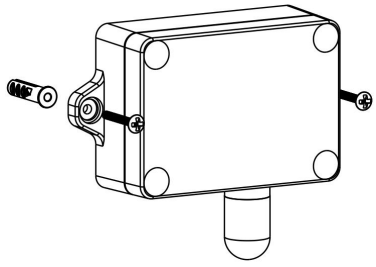


D. After configuration, put back the roof cover and screw the screws.

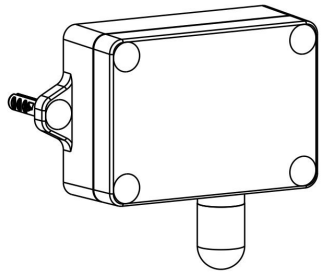


2.3 Mount the UC11-T1

A. Use 2 pcs of flat head Phillips screws to fix the UC11-T1 onto the wall mounting.



B. Cover the screws with two screw caps.



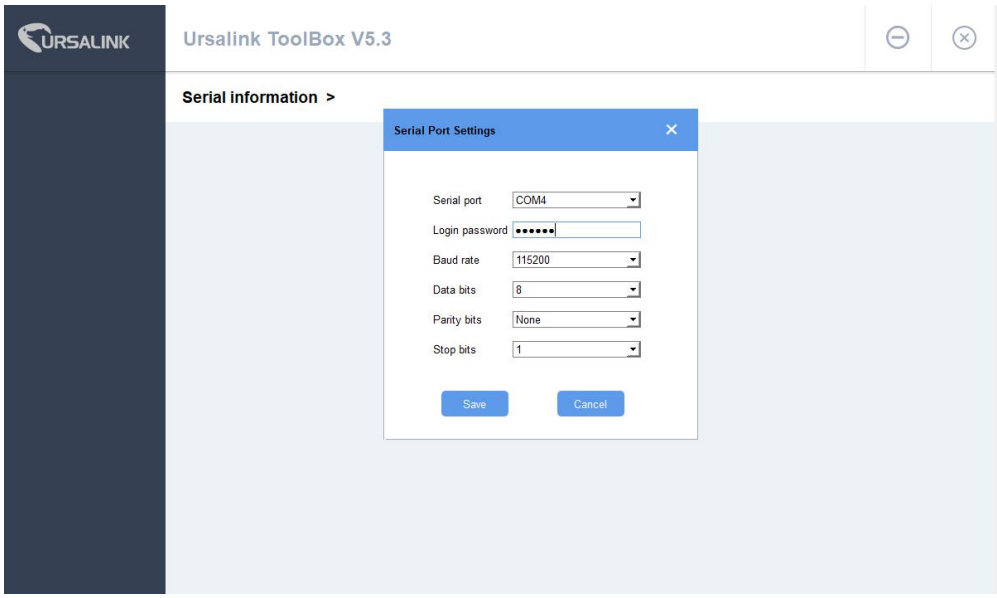
3. Connect UC11-T1 to Ursalink Cloud

3.1 Configure UC11 via Toolbox

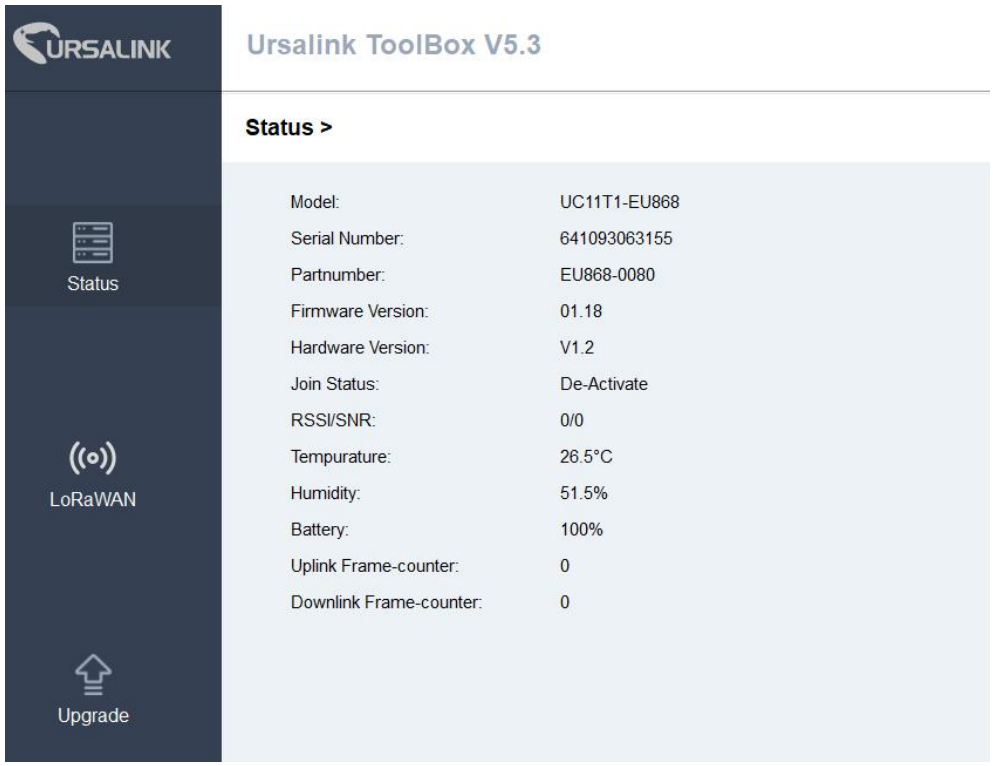
A. Connect PC and UC11-N1 directly via USB port as shown in Section 2.2.

B. Download Toolbox software from Ursalink website and open Toolbox.exe. Select correct Serial Port fill in the password to log in. (Default password: 123456)

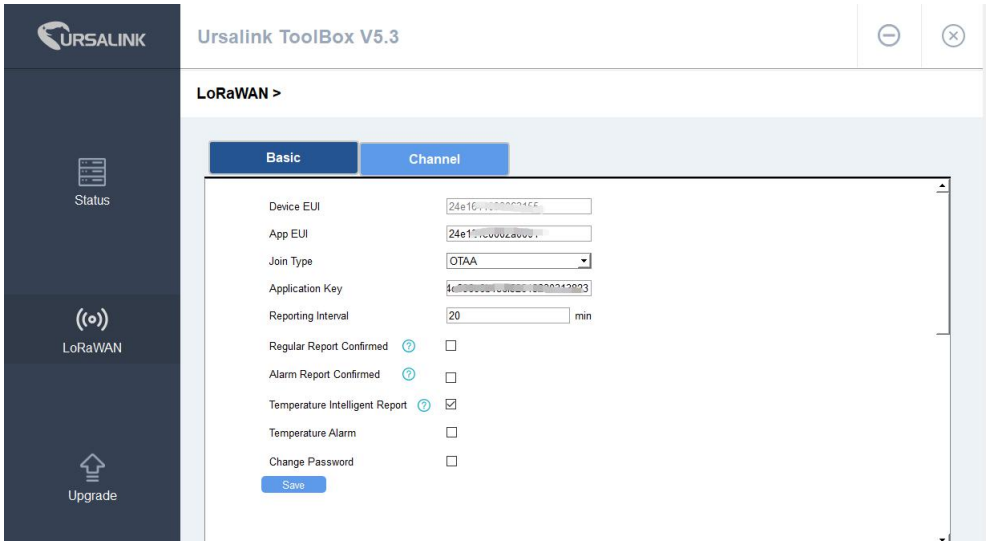
Toolbox Download link: https://www.ursalink.com/en/software-download/



C.Click “Status” to check the status of UC11-T1.



D. Click “LoRaWAN” to configure the related parameters and save configurations. The “Join type” must be OTAA if you connect UC11-T1 to Ursalink Cloud.

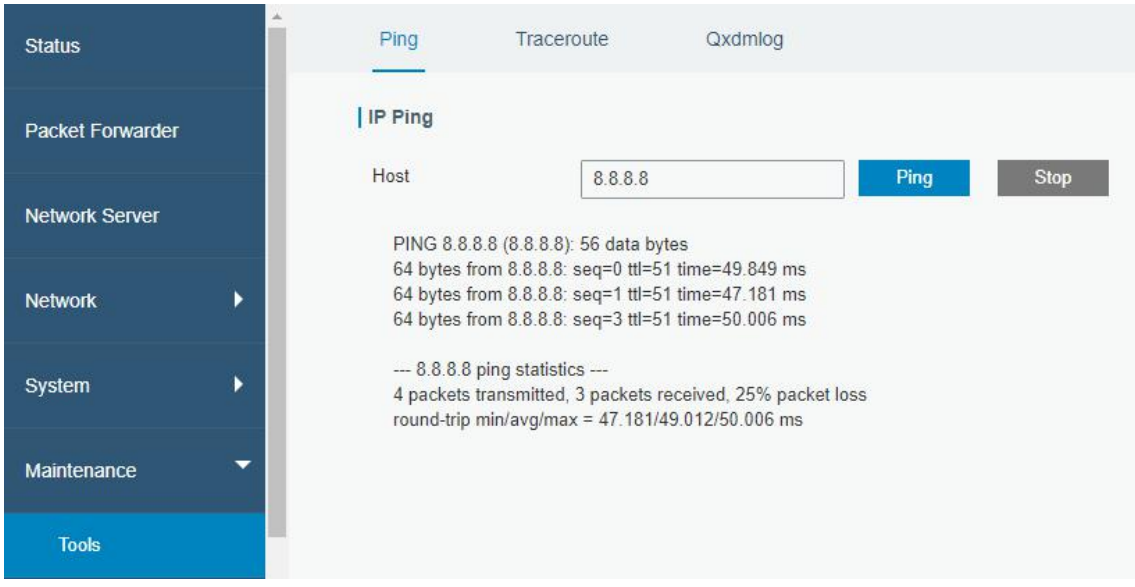


Note: Default LoRaWAN parameters:

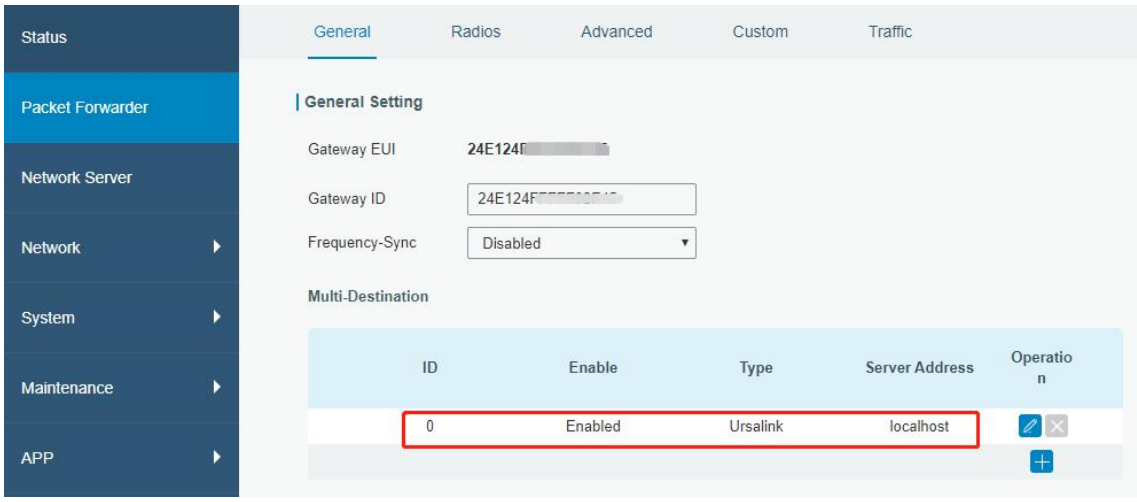
Device EUI	24E1+SN
APP EUI	24E1+24C0002A0001
App Port	0x85
NetID	0x010203
DevAddr	The last 8 digits of SN.
AppKey	5572404c696e6b4c6f52613230313823
NwkSKey	5572404c696e6b4c6f52613230313823
AppSKey	5572404c696e6b4c6f52613230313823

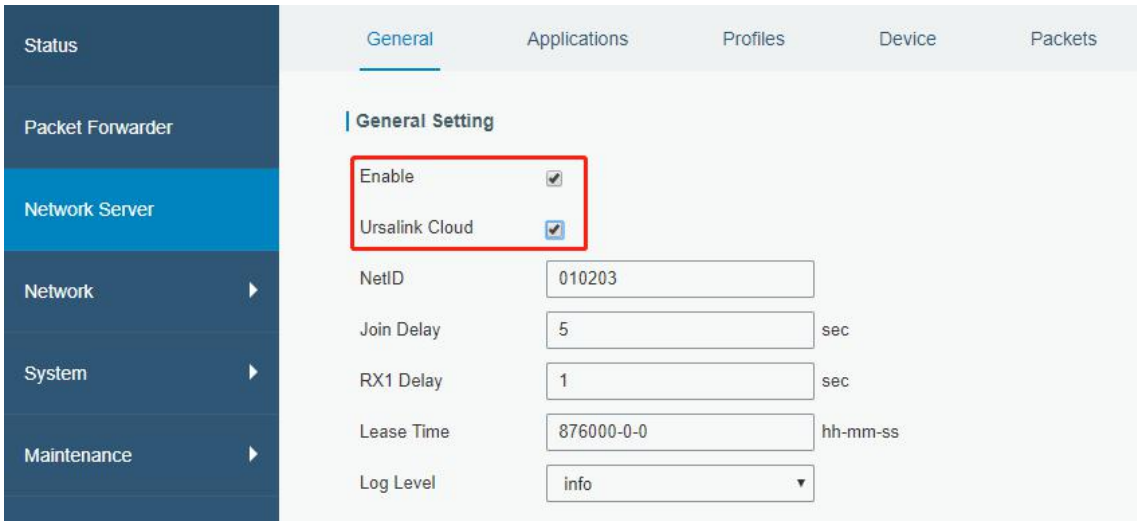
3.2 Ursalink Gateway Configuration

A. Go to “Maintenance->Ping” and use ping tool to check gateway Internet connection.



B. Enable “Ursalink” type network server and “Ursalink Cloud” mode.

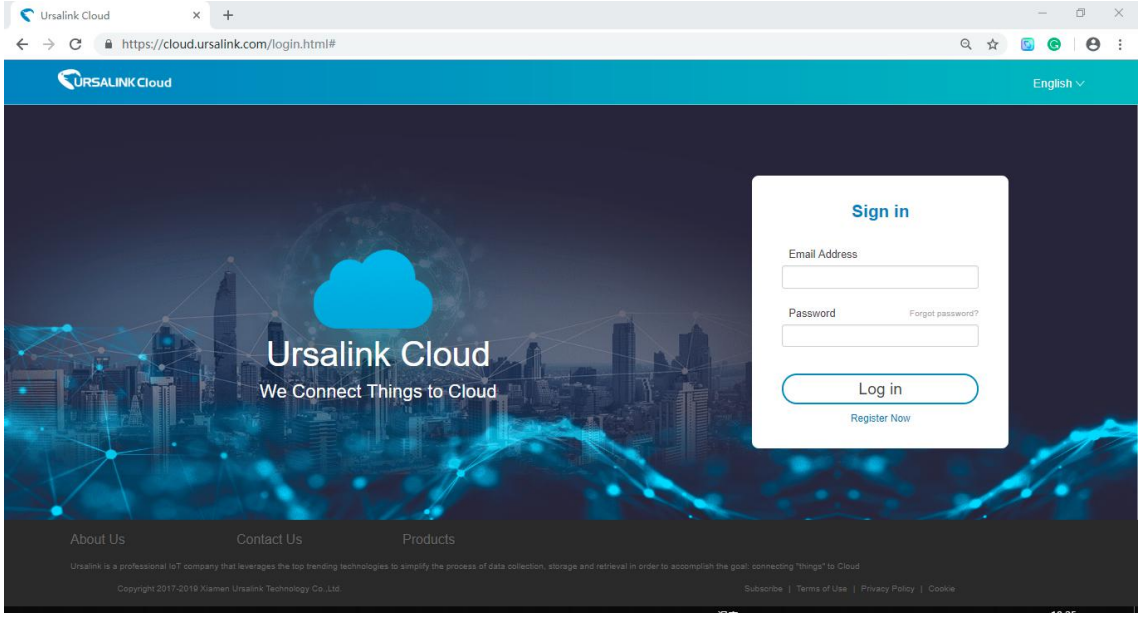




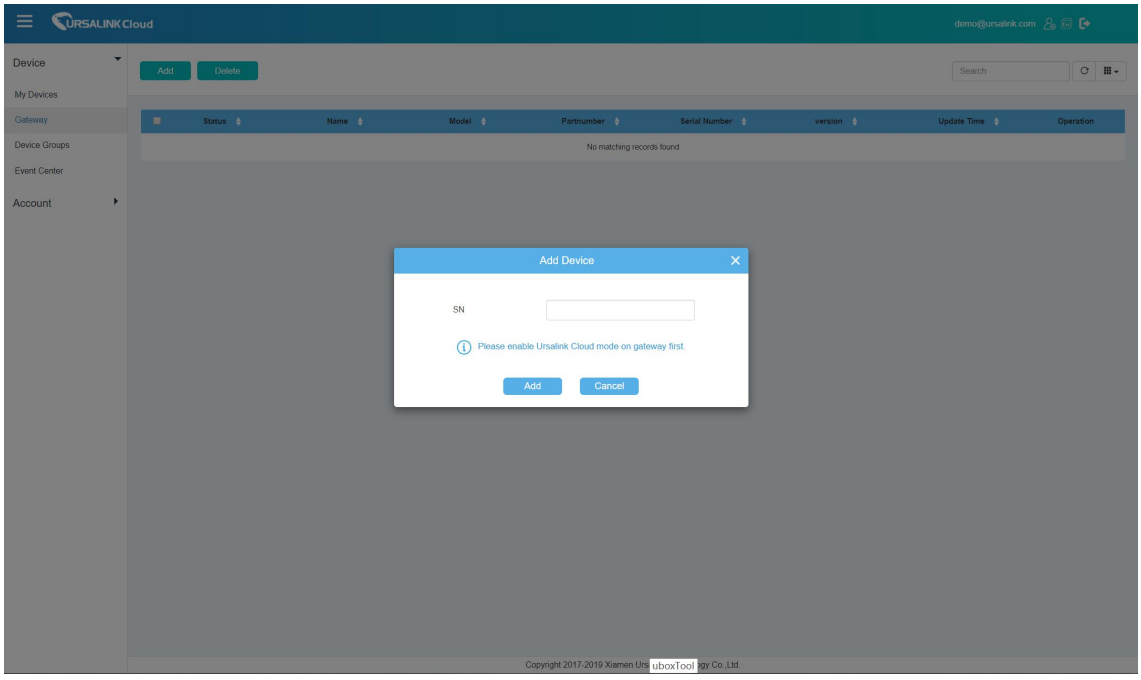
3.3 Ursalink Cloud Configuration

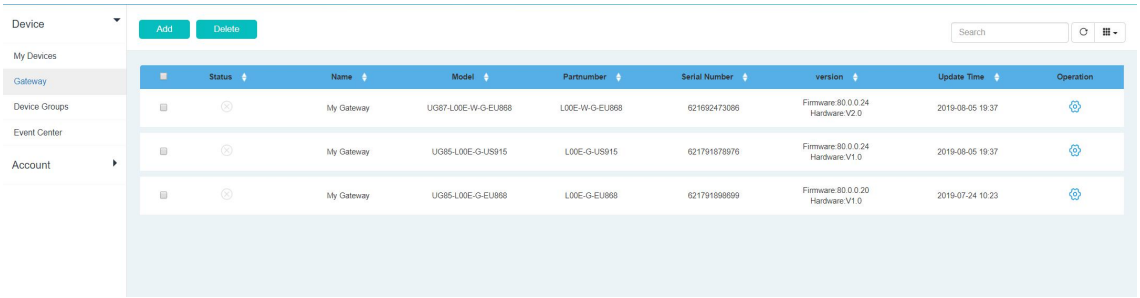
A. Register and log in Ursalink Cloud.

Ursalink Cloud URL: https://cloud.ursalink.com/login.html

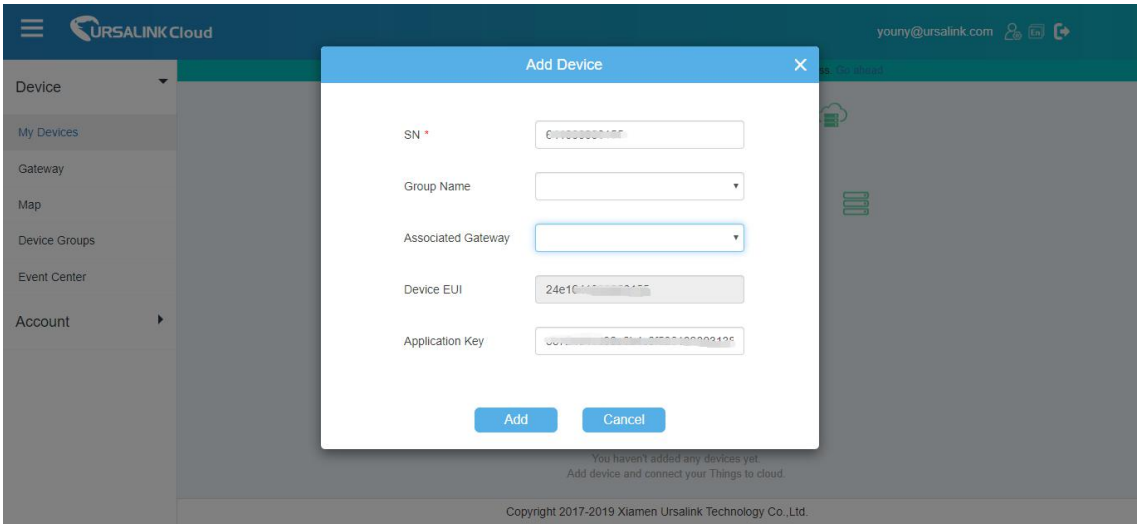


B. Go to “My Devices->Gateway” and click “Add” to add gateway to Ursalink Cloud via SN.





C. Go to “Device->My Devices” and click “Add Device”. Fill in the SN of UC11-N1 and select associated gateway.



D. After T1 is connected to Ursalink Cloud, Click > or “History Data” to check the UC11-T1 data on Ursalink cloud.

Note: For More details, please refer to the [UC11-T1 User Guide](#).

[END]

UC11-T1 Payload Structure V1.5

Contents

1.Uplink Payload Structure

An uplink message can be sent from end node to gateway. Additionally, the UC11-T1 sends different sensor data in different frames. In order to do that, all sensor data must be prefixed with two bytes:

Data Channel: Uniquely identifies each sensor in the UC11-T1 across frames, e.g. “TEMP Sensor”

Data Type: Identifies the data type in the frame, e.g. “Power”.

Note: The device cloud sends multiple sensor data at a time by using following payload structure:

1 Byte	1 Byte	N Bytes	1 Byte	1 Byte	M Bytes	1 Byte	...
Channel1	Type1	Data1	Channel2	Type2	Data2	Channel 3	...

For UC11-T1, if the value of the channel is 1, it refers to the temperature sensor; if the value of the channel is 2, it refers to the humidity sensor; if the value of the channel is 3, it refers to the battery level.

Note: the app port of UC11-T1 is 85.

Uplink Packet Example

Frame N: Regular temperature and humidity uplink.

01 67 13 01 02 68 73					
Channel	Type	Value	Channel	Type	Value
01	67 (Temperature)	13 01 => 01 13 = 275 (27.5° C)	02	68 (Humidity)	73=>115 means 57.5%

Frame N+1: Battery capacity changes uplink.

03 75 5a		
Channel	Type	Value
03	75 (Battery Capacity)	5a = 90 means 90%

Frame N+2: Power on status, SN, hardware version, software version uplink

ff 0b ff ff 01 01					
Channel	Type	Value	Channel	Type	Value
ff=255	0b (Device Restart Notification)	0xff reserved.	ff=255	01 = 1 (Custom Format Version)	01 = 1 (Version 1)

ff 08 61 22 91 36 34 79		
Channel	Type	Value
ff=255	08 (Device SN)	61 22 91 36 34 79

ff 09 01 20 ff 0a 01 10					
Channel	Type	value	Channel	Type	Value
ff = 255	09 (Hardware version)	0120 (V1.2)	ff = 255	0a (Software version)	0110 (V1.10)

Frame N+3: temperature alarm report uplink

ff 0d 0a 0f 27 c8 00 2d 01		
Channel	Type	value
ff = 255	0d (Temperature alarm report)	0a=>10=2 (the mode of this alarm is above) 0f 27 means the lower warning threshold is null c8 00 => 00 c8 = 200 (20.0° C) means the upper warning threshold is 20.0° C 2d 01 => 01 2d = 301(30.1° C) means the current value of the temperature is 30.1° C

2.Downlink Payload Structure

A downlink message can be sent from gateway to end node in order to perform some actions on that device.

Note: the app port of UC11-T1 is 85.

1 Byte	2 Bytes	1 Byte1	1 Byte	2 Bytes	1 Byte
Channel1	Data1	0xff (reserved)	Channel2	Data2	0xff (reserved)

Downlink Packet Example

Devices with temperature and humidity sensors.

Frame N: Set the data reporting interval as 20mins (1200s).

ff 03 b0 04		
Channel	Type	Value
ff = 255	03 (set data collecting interval)	b0 04 => 04 b0 = 1200 (second)

Frame N+1: Set temperature threshold alarm to be triggered as soon as temperature goes above 35° C, and remains above 30° C for 15s. It will then start checking temperature again after 5 minutes and trigger once more if temperature is above 30° C for 15s.

ff 06 02 00 00 5e 01 2c 01 0f 00		
Channel	Type	Value
ff = 255	06 (set temperature threshold alarm)	02 = above 00 00 means the lower warning threshold is null 5e 01 => 01 5e => 350(35° C) 2c 01 => 01 2c = 300 (Lock time 300s) 0f 00 => 00 0f = 15 (Duration 15s)

Frame N+2: Set temperature threshold alarm to be triggered as soon as temperature goes below 20° C, and remains below 20° C for 15s. It will then start checking temperature again after 5 minutes and trigger once more if temperature is below 20° C for 15s.

ff 06 01 c8 00 00 00 2c 01 0f 00		
Channel	Type	Value
ff = 255	06 (Set temperature threshold alarm)	01 = below c8 00 => 00 c8 => 200(20° C) 00 00 means the upper warning threshold is null 2c 01 => 01 2c = 300 (Lock time 300s) 0f 00 => 00 0f = 15 (Duration 15s)

Frame N+3: Set temperature threshold alarm to be triggered as soon as temperature goes within 20° C and 35° C, and remains within 20° C and 30° C for 15s. It will then start checking temperature again after 5 minutes and trigger once more if temperature is within 20° C and 35° C for 15s.

ff 06 03 c8 00 5e 01 2c 01 0f 00		
Channel	Type	Value
ff = 255	06 (set temperature threshold alarm)	03 = within c8 00 => 00 c8 => 200(20° C) 5e 01 => 01 5e => 350(35° C) 2c 01 => 01 2c = 300 (Lock time 300s) 0f 00 => 00 0f = 15 (Duration 15s)

Frame N+4: Set LoRa channel mask, only enable channels with index 0,2,4,18,20.

ff 05 01 15 00 ff 05 02 14 00		
Channel	Type	Value
ff = 255	05 (set LoRa channel mask)	01 means set the channel index within 0-15. 15 00 => 00 15 => 0000000000010101 means enable channels with index 0,2,4.
Channel	Type	Value
ff = 255	05 (set LoRa channel mask)	02 means set the channel index within 16-31. 14 00 => 00 14 => 0000000000010100 means enable channels with index 18,20.

3.Data Types

3.1 IPSO Standard Definition

Data Types conform to the IPSO Alliance Smart Objects Guidelines, which identifies each data type with an “Object ID” . However, as shown below, a conversion is made to fit the Object ID into a single byte.

DATA_TYPE = IPSO_OBJECT_ID - 3200

Type	IPSO	Hex	Data Size	Data Resolution per bit
Temperature Sensor	3303	67	2	0.1 °C Signed MSB
Humidity Sensor	3304	68	1	0.5% Unsigned
Current	3317	75	1%	1%

Example:

Devices with temperature and humidity sensors.

Frame N

01 67 D7 FF		
Channel	Type	Value
01	67 means temperature	D7 FF=>FFD7 = -41 means -4.1° C

Frame N+1

01 68 73		
Channel	Type	Value
02	68 means humidity	73= 115 means 57.5%

3.2 Ursalink Custom Format

Type	Type ID	Data Size	Data Resolution (per bit)
Ursalink Custom Format Version	1	1	0x01
Data Collection Interval	2	2	1s
Data Reporting Interval	3	2	1s
LoRa Channel Mask	5	3	ID (1B) + Value (2B) ID: 1~6
Set Temperature Threshold Alarm	6	9	Mode(1Byte) +Min(2Bytes) +Max(2Bytes)+Lock Time(2Bytes) +Continue Time (2Bytes) Mode(bit0~bit2): 0: disable, 1: below, 2: above, 3: within, 4: above or below Min: the lower warning threshold Max: the upper warning threshold
Temperature Alarm Report	13	7	Mode (1B) +Min(2B) +Max (2B)+Cur(2B) Mode(bit0~bit2): 0: disable, 1: below, 2: above, 3: within 4: above or below Min: the lower warning threshold Max: the upper warning threshold Cur: the current value of the temperature sensor

Debug Level	7	1	Bit0: info Bit1: debug Bit2: warn Bit3: err
Product SN	8	6	641090824375 => 0x641090824375
Hardware Version	9	2	0110 => 0x01 0x10
Software Version	10	2	0110 => 0x01 0x10
Device Power on Notification	11	1	0xff reserved. Contents reported after reboot each time: Ursalink Custom Format Version+SN+Hardware Version +Software Version+the battery level
Device Power Off Notification	12	1	0xff reserved
Temperature Intelligent Report	19	1	00: Disabled 02: When the temperature changes beyond 2℃ (35.6℉), the device will automatically report the latest value.

3.3 LoRaWAN Parameter

Device EUI	24E1+SN
APP EUI	24E1+24C0002A0001
App Port	0x55
NetID	0x010203
DevAddr	The last 8 digits of SN.
AppKey	5572404c696e6b4c6f52613230313823
NwkSKey	5572404c696e6b4c6f52613230313823
AppSKey	5572404c696e6b4c6f52613230313823

4.Decoder Example

```
// T1: Payload Decoder
function Decoder(bytes, port) {
  var decoded={};

  for(i=0;i< bytes.length;){

    //BATTERY
    if(bytes[i]==0x03){
      decoded.battery=bytes[i+2];
      i+=3;
      continue;
    }

    //TEMPERATURE
    if(bytes[i]==0x01){
      decoded.temperature=(readInt16LE(bytes.slice(i+2, i+4)))/10;
      i+=4;
      continue;
    }

    //HUMIDITY
    if(bytes[i]==0x02){
      decoded.humidity=readUInt8LE(bytes[i+2]) / 2;
      i+=3;
      continue;
    }
```

```
    }
    return decoded;
}

function readUInt8LE(bytes) {
    return (bytes & 0xFF);
}

function readInt8LE(bytes) {
    var ref = readUInt8LE(bytes);
    return (ref > 0x7F) ? ref - 0x100 : ref;
}

function readUInt16LE(bytes) {
    var value = (bytes[1] << 8) + bytes[0];
    return (value & 0xFFFF);
}

function readInt16LE(bytes) {
    var ref = readUInt16LE(bytes);
    return (ref > 0x7FFF) ? ref - 0x10000 : ref;
}
```

---End---

Contents

1. Preface

Thank you for choosing Ursalink UC11-T1. This user guide will present in detail all the functions and features of the product. The UC11-T1 is designed for both industrial and commercial applications and helps devices stay connected. The product should be used under the guidance of this user manual, referring to parameters and technical specifications. The UC11-T1 is a compact, high-performance device server that offers LoRaWAN connectivity for remote access and easy management of machines and equipment over the LoRaWAN gateway.
We bear no liability for property loss or physically injury arising from abnormal or incorrect usage of this product.

2. Introduction

UC11-T1 is a smart wireless module, featuring LoRaWAN protocol, equipped with a high-precision temperature and relative humidity sensor. This sensor can measure temperatures from -40° C to + 70° C, as well as air humidity from 0 to 100%.

The sensor is optimized for long battery life and excellent RF performance. It is fully configurable over the air by the user for custom applications, thresholds, trigger events and reports.

This user guide is intended to provide detailed technical specifications and explanations to basic users as well as the technically-minded groups. It is a live document, and will be updated from time to time. Please ensure that you have the latest version, by checking our website at: https://www.ursalink.com/en/documents-download/

2.1 Features

- Customize temperature alert thresholds
- Powered by replaceable Li-ion battery: 8000mA
- Battery life: 4 years of operation for 1 uplink per 20minutes
- LoRaWAN compatible: Class A, uplink rate programmable from 5 minutes to 30 minutes
- Compatible with multiple third-party platforms and Ursalink Cloud
- Support Frequency: CN470 /EU868 / US915 / EU433 / AU915 / AS923 / KR920 / IN865
- LoRa wireless module included, up to 11 km range

2.2 Parameters

Parameter Item	Reference Scope
Measuring Range/Accuracy	Temperature: ±0.3°C from 0°C to + 70°C, ±0.6°C from -40°C to 0°C Humidity: ±3% RH from 10% to 90%, ±5% RH below 10% and above 90%
Frequency Band	EU 433, CN 470-510, EU 863-870, US 902-928, AU 915-928, KR 920-923
Antenna	Embedded Ceramic antenna
Operating Temperature	-40° C to +70° C (-40° F to +158° F)
Relative Humidity	0% to 100% (non-condensing)
Power Supply	Powered by replaceable Li-ion battery: 8000mAh/3.6V
Dimensions	111 x 92 x 33 mm
Waterproof Grade	IP65

2.3 Turn on/off the Sensor

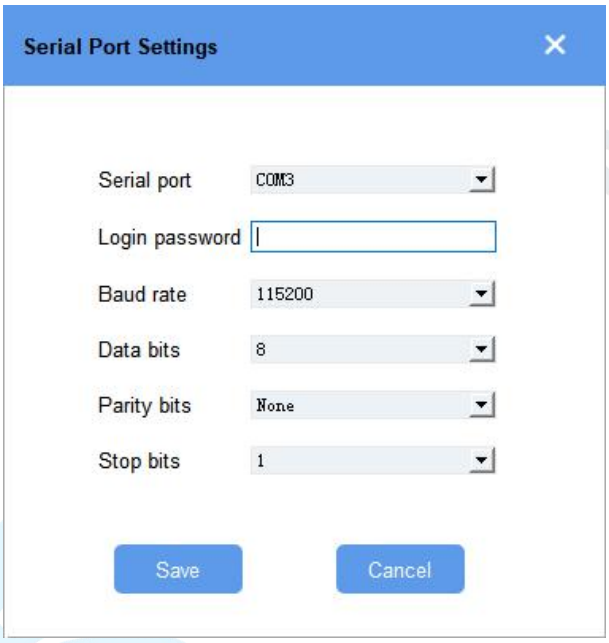
Put a magnet close to the reed switch to turn on or turn off the sensor.
Buzzer rings for 2 seconds: power on.
Buzzer rings for 6 seconds: power off.

3. Configuration via PC

3.1 Configuration via ToolBox

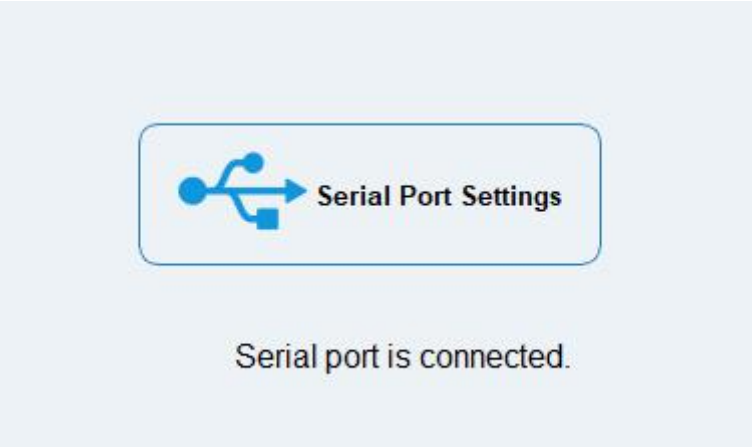
Follow these steps:
Step 1: Connect the Ursalink UC11-T1 to PC via USB port.
Step 2: Power on the Ursalink UC11-T1.
Step 3: Run the Ursalink ToolBox.

When the Ursalink ToolBox displays: **Connecting to device, please wait...**
You can click **Serial Port Settings** to set the correct serial port parameters.



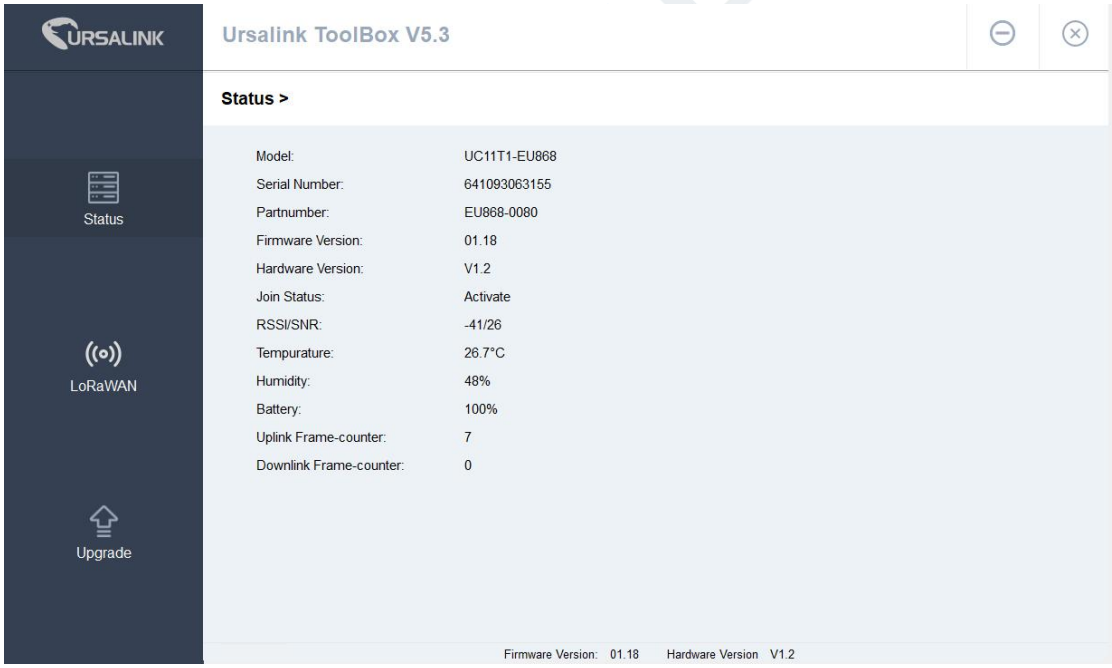
Serial Port Settings		
Item	**Description**	**Default**
Serial Port	Select the serial port for data transmission.	Null
Login Password	Enter the correct password to login.	123456
Baud Rate	Select from "9600", "57600", "115200".	57600
Data Bit	Select from "5", "7", "8".	8
Parity Bit	Select from "Even", "Odd", "None".	None
Stop Bit	Select from "1", "2".	1

If the serial port parameter is correct, it will display: Serial port is connected.



3.2 Status

Click "Status" to see the basic status information of this device:

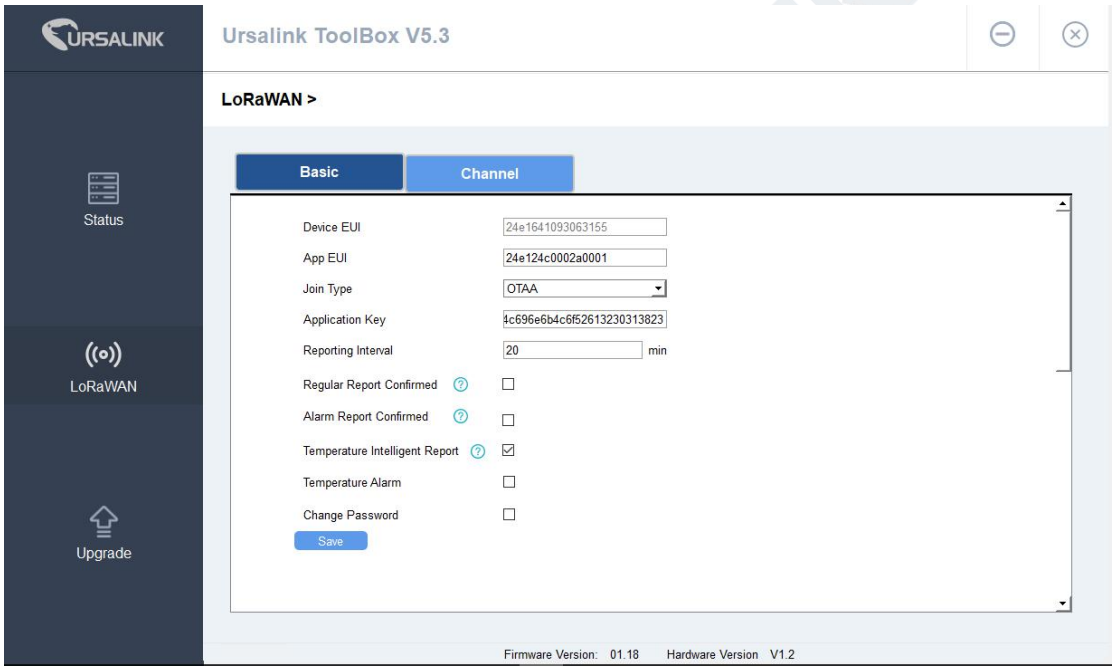


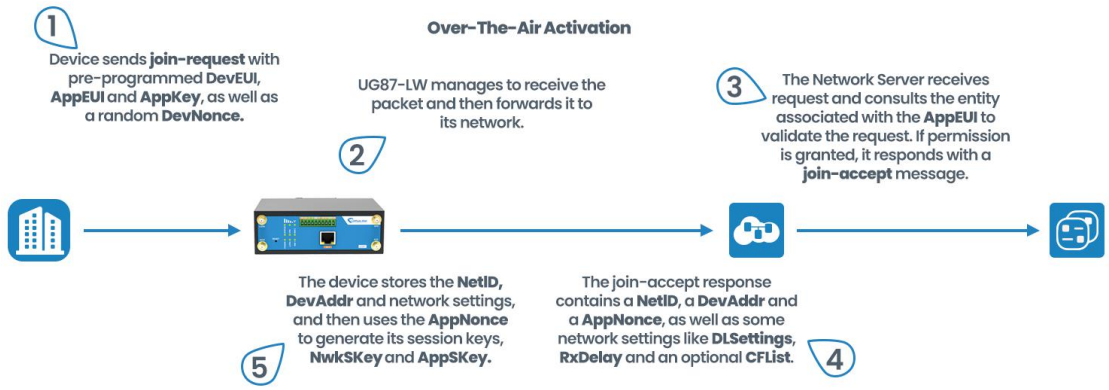
Status	
Item	**Description**
Local Time	Show the time of the device.
Join Status	Show if the device join the network successfully. The "Activate" means the device has joined the network.
RSSI/SNR	Show the RSSI/SNR of received packet.

Temperature	Show the temperature value.
Humidity	Show the humidity value.
Battery	Show the battery level.
Uplink Frame-counter	The number of data frames sends uplink from UC11-T1 to the network server.
Downlink Frame-counter	The number of data frames sends downlink from the network server to UC11-T1.

3.3 LoRaWAN

3.3.1 Basic-OTAA



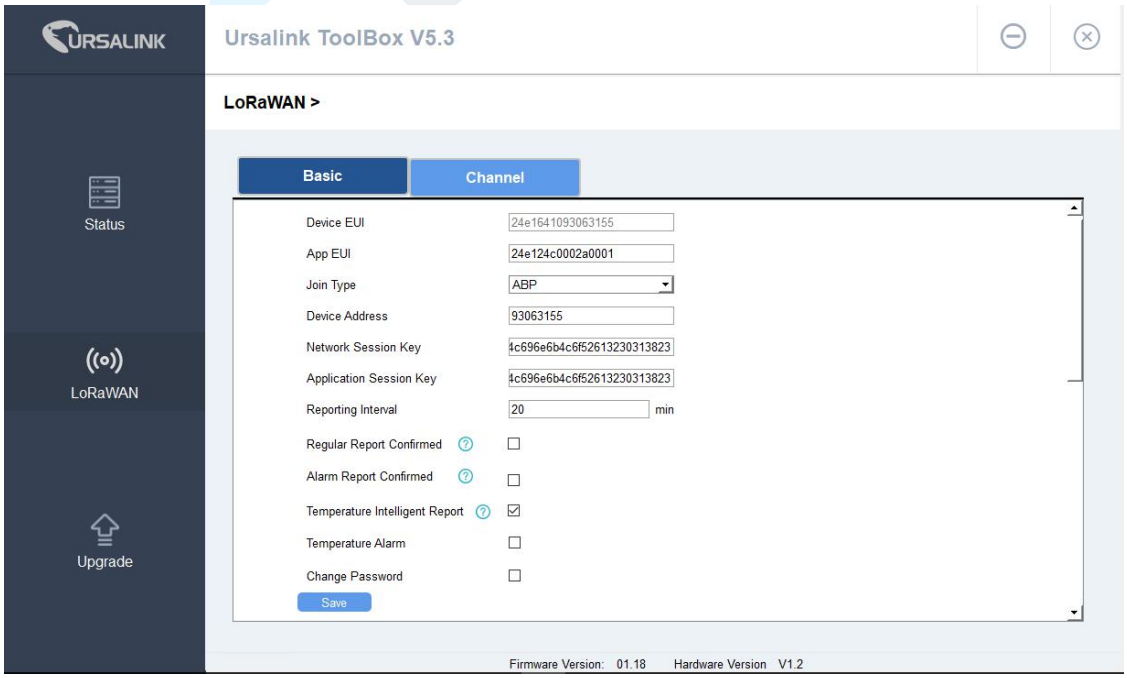


Basic Settings-OTAA		
Item	**Description**	**Default**
Device EUI	Show the identifier of this device.	the identifier of this device.
App EUI	Enter the application EUI.The Network Server receives request and consults the entity associated with the APP EUI to validate the request.If permission is granted, it responds with a join-accept message.	24e124c0002a0001
Join Type	Select from: "OTAA" and "ABP". OTAA:Over-the-Air Activation. For over-the-air activation, end-devices must follow a join procedure prior to participating in data exchanges with the network server. An end-device has to go through a new join procedure every time it has lost the session context information. ABP: Activation by Personalization. Under certain circumstances, end-devices can be activated by personalization. Activation by personalization directly ties an end-device to a specific network by-passing the join request - join accept procedure.	OTAA
Application Key	Enter the application key. Whenever an end-device joins a network via over-the-air activation, the application key is used to derive the Application Session key.	5572404c696e6b4c6f5261323031 3823
Reporting Interval	The UC11-T1 reports the temperature and humidity at regular intervals. Range: 5-30 (mins)	20
Regular Report Confirmed	After sending the regular report packet to the network server, if the device does not receive ACK bit from the network server, then the device will resend the packet. Note: If the device doesn't receive ACK for a long time, the device will resend regular report confirmed packets 3 times at most.	Disabled
Alarm Report Confirmed	After sending the attribute package or alarm packet to the network server, if the device does not receive ACK	Disabled

	bit from the Network Server, then the device will resend the packet. Note: If the device doesn't receive ACK for a long time, the device will resend regular report confirmed packets 3 times at most. However, the device will resend attribute package all the time.	
Temperature Intelligent Report	When the temperature changes beyond 2℃ (35.6℉), the device will automatically report the latest value.	Enabled
Temperature Alarm	Enable: The device will send an alarm notification to Network Server if the temperature goes above/below temperature thresholds.	Disabled
greater than	Enter the maximum temperature threshold.	Null
less than	Enter the minimum temperature threshold.	Null

Note: If you set a "lockout time" of 10s, a "continued time" of 5s, the alarm will be triggered as soon as the temperature goes above the maximum temperature threshold or goes below the minimum temperature threshold for 5s. It will then start checking the temperature again after 10s and be triggered once more if the temperature goes above/below temperature thresholds for 5s.

3.3.2 Basic-ABP

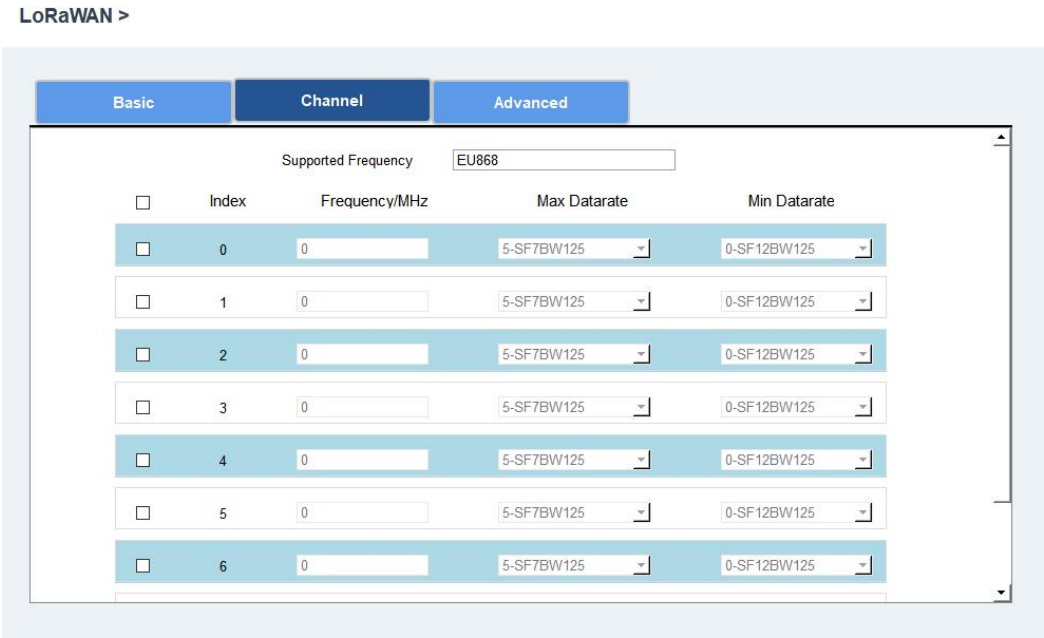


Basic Settings-ABP		
Item	**Description**	**Default**
Device EUI	Show the identifier of this device.	the identifier of this device.
App EUI	Enter the application EUI.The Network Server receives request and consults the entity associated with the APP EUI to validate the request.If permission is granted, it responds with a join-accept message.	24e124c0002a0001
Join Type	Select from: "OTAA" and "ABP". OTAA:Over-the-Air Activation. For over-the-air activation, end-devices must follow a join procedure prior to participating in data exchanges with the network server. An end-device has to go through a new join procedure every time it has lost the session context information. ABP: Activation by Personalization. Under certain circumstances, end-devices can be activated by personalization. Activation by personalization directly ties an end-device to a specific network by-passing the join request - join accept procedure.	OTAA
Device Address	Enter the device address. The device address identifies the end-device within the current network.	The last 8 digits number of SN
Network Session Key	Enter the network session key of the device. The network session key specific for the end-device. It is used by the end-device to calculate the MIC or part of the MIC (message integrity code) of all uplink data messages to ensure data integrity.	5572404c696e6b4c6f5261323031 3823

Application Session Key	Enter the application session key of the device. The AppKey is an application session key specific for the end-device. It is used by both the application server and the end-device to encrypt and decrypt the payload field of application-specific data messages.	5572404c696e6b4c6f5261323031382 3
Reporting Interval	The UC11-T1 reports the temperature and humidity at regular intervals. Range: 5-30 (mins)	20
Regular Report Confirmed	After sending the regular report packet to the network server, if the device does not receive ACK bit from the network server, then the device will resend the packet. Note: If the device doesn't receive ACK for a long time, the device will resend regular report confirmed packets 3 times at most.	Disabled
Alarm Report Confirmed	After sending the attribute package or alarm packet to the network server, if the device does not receive ACK bit from the Network Server, then the device will resend the packet. Note: If the device doesn't receive ACK for a long time, the device will resend regular report confirmed packets 3 times at most. However, the device will resend attribute package all the time.	Disabled
Temperature Intelligent Report	When the temperature changes beyond 2℃ (35.6℉), the device will automatically report the latest value.	Enabled
Temperature Alarm	Enable: The device will send an alarm notification to Network Server if the temperature goes above/below temperature thresholds.	Disabled
greater than	Enter the maximum temperature threshold.	Null
less than	Enter the minimum temperature threshold.	Null

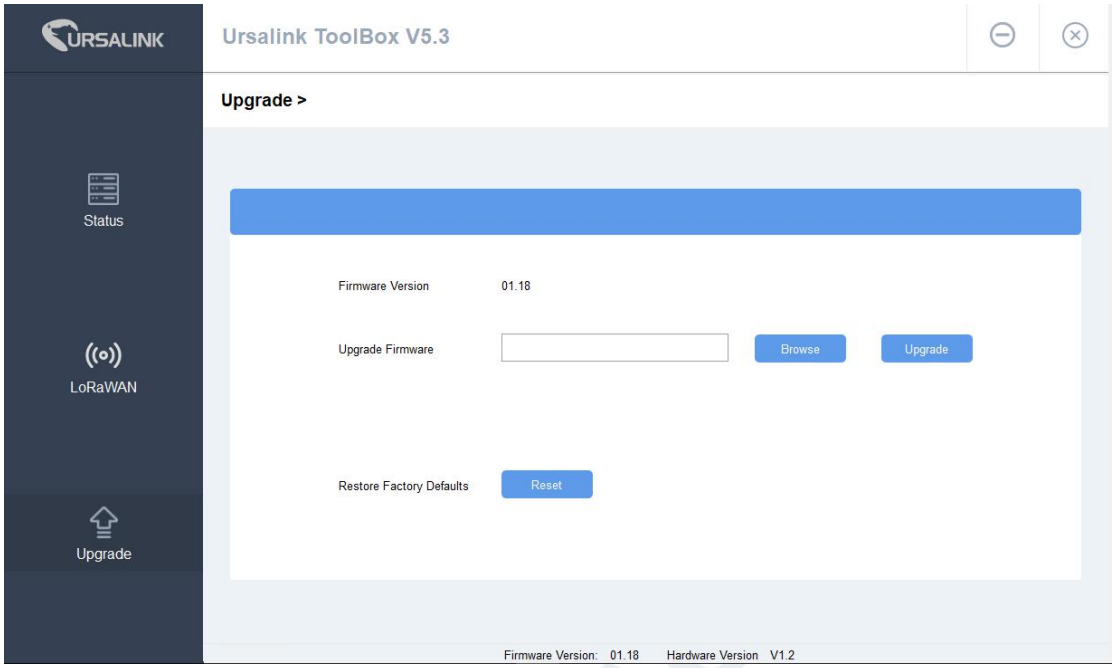
3.3.3 Channel

On this page, you can view all of the supported LoRa frequencies and setup the channel frequency used for receiving and sending data.



Note: Make sure the you have configured the corresponding channel on the gateway.
E.g. If you have configured a 923.2 MHz channel on UC11-T1, then you have to configure a 923.2 MHz channel on gateway as well.

3.4 Upgrade



Step 1: Connect UC11-T1 to PC via the usb port.
Step 2: Install the battery to power on UC11-T1.
Step 3: Run the Ursalink ToolBox and go to "Upgrade".
Step 4: Click "Browse" and select the correct firmware file from the PC.
Step 5: Click "Upgrade" and the device will check if the firmware file is correct. If it's correct, the firmware will be imported to the device, and the device will reboot after upgrading is completed.

Note: Any operation on Ursalink ToolBox is not allowed during upgrading, otherwise the upgrading will be interrupted, or even the device will break down.

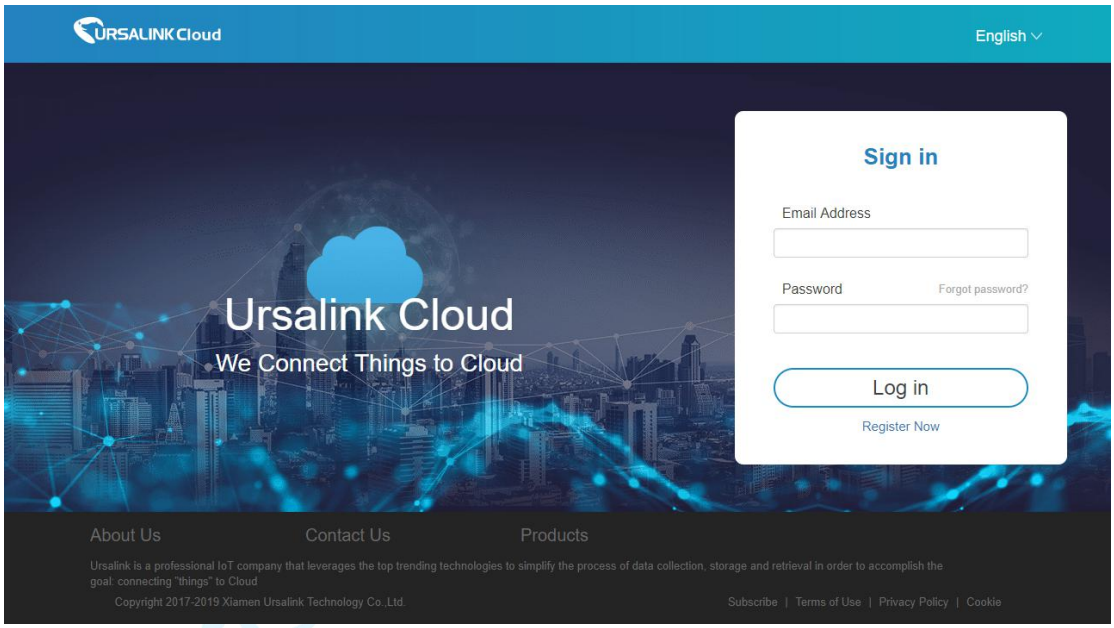
4.Configuration via Ursalink Cloud

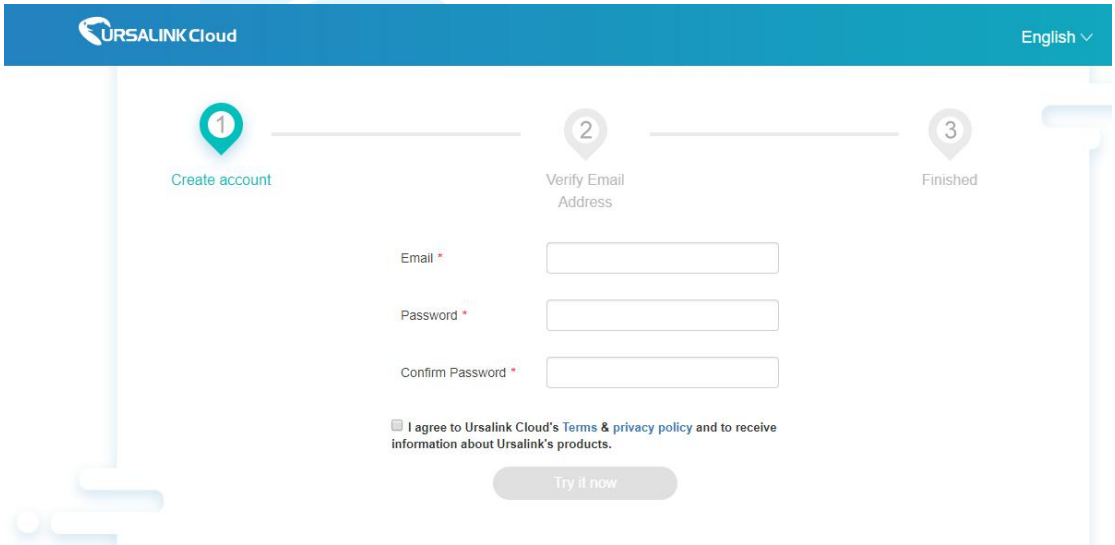
4.1 Account Setup

To set up an account with Ursalink Cloud, follow these steps:

1. Go to : https://cloud.ursalink.com/login.html to register a Ursalink Cloud account.
2. Log in to Ursalink Cloud after the email has been verified.

Note: It is important that you have access to the verified email address before proceeding.

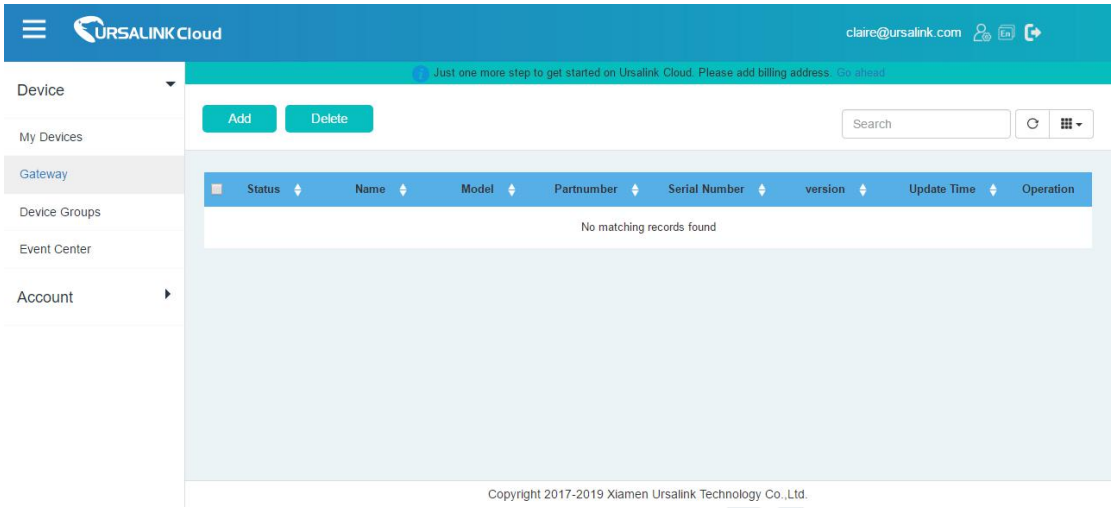




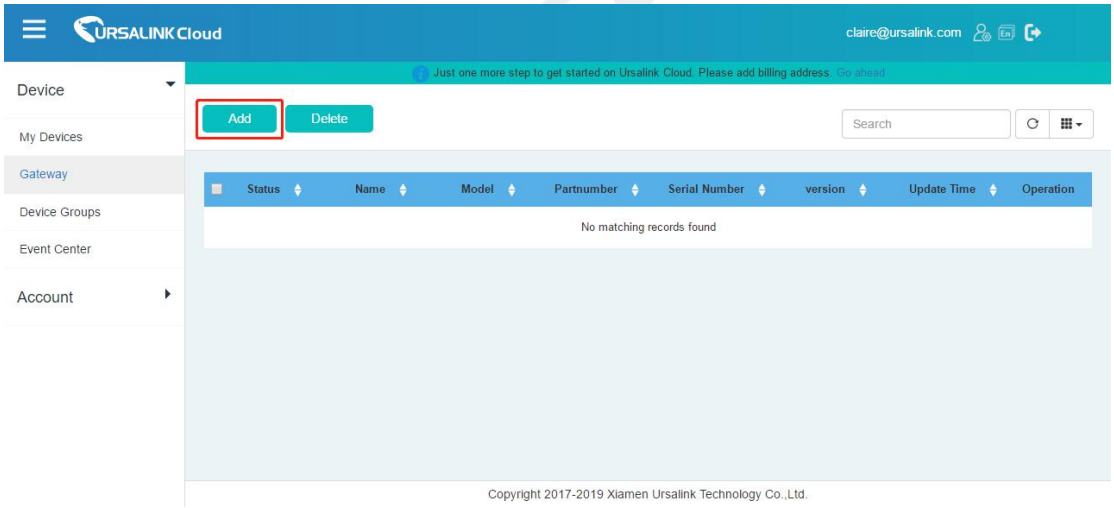
4.2 Add a Ursalink LoRaWAN Gateway

To add your Ursalink gateway to the Ursalink Cloud, please follow these steps:

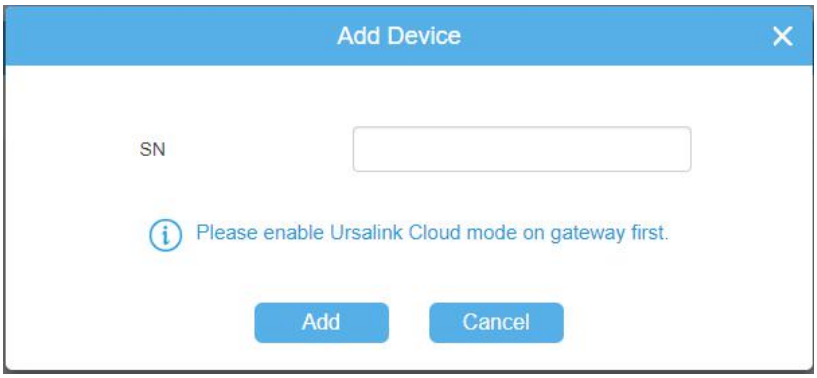
1. On the main page, click "Gateway".



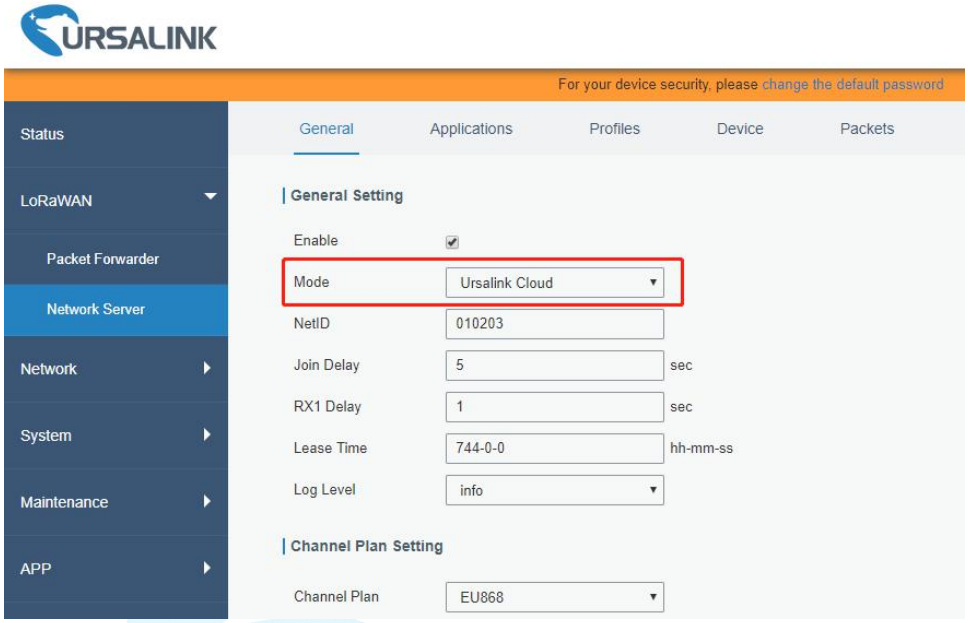
2. On the gateway page, click "Add" to add a gateway.



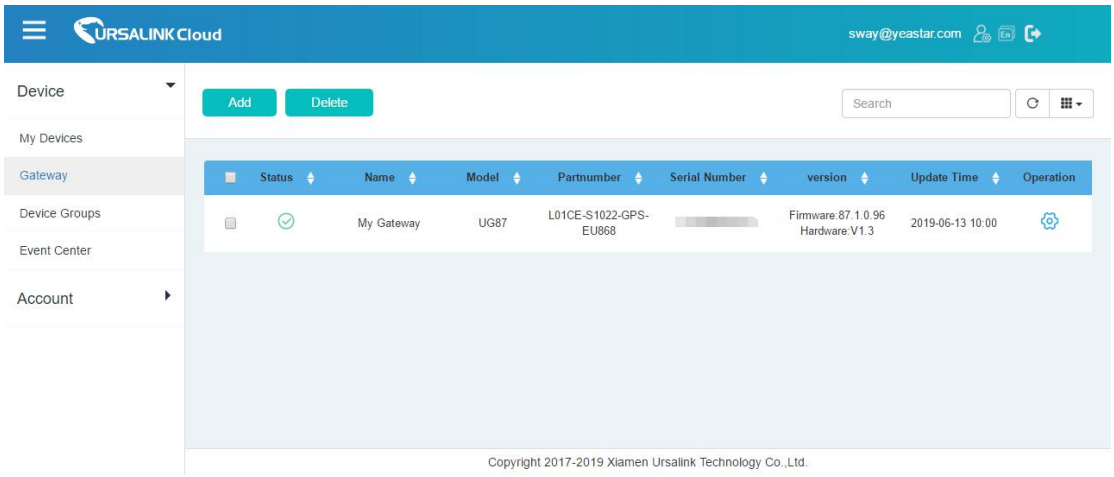
Enter the correct SN of the gateway and click “Add”. You can find your gateway SN either on the label on the bottom of the device or on the web GUI .



Note: Please make sure the working mode of gateway is Ursalink Cloud.



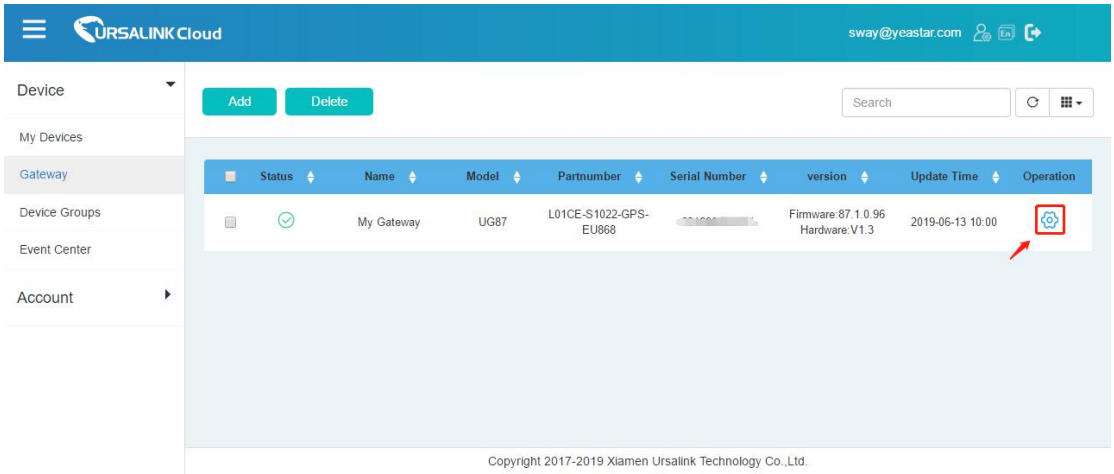
Once the device has been added successfully, You will see the device in the list.



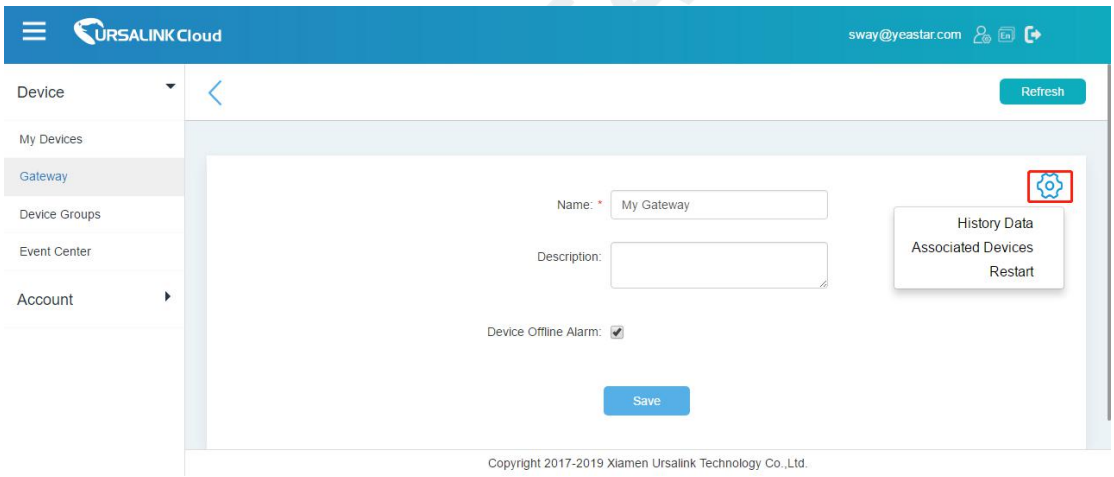
4.3 Add Devices to Ursalink Cloud

To add a UC11-T1 to Ursalink Cloud, please follow these steps:

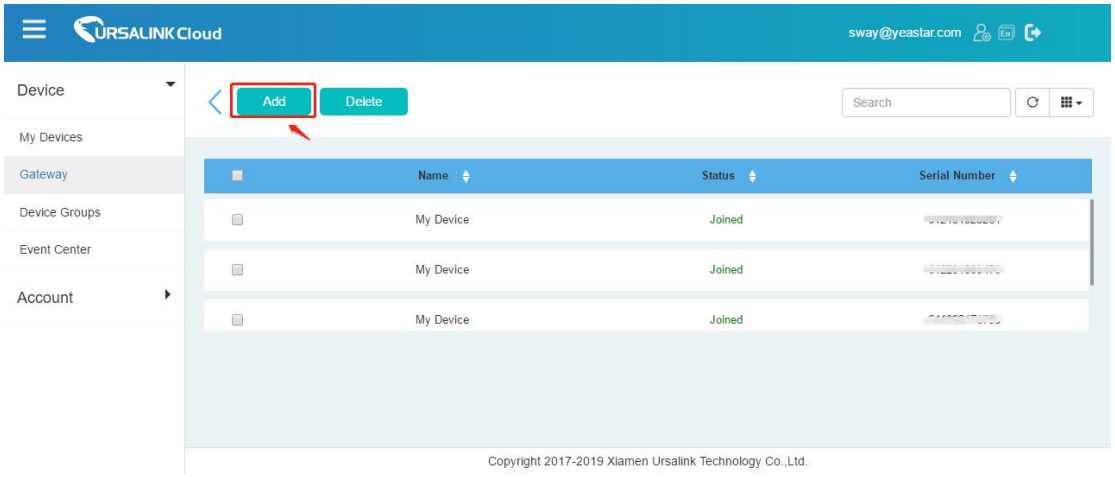
1. Click to go to the configuration page of this gateway.



2. Click then click “Associated Devices” .

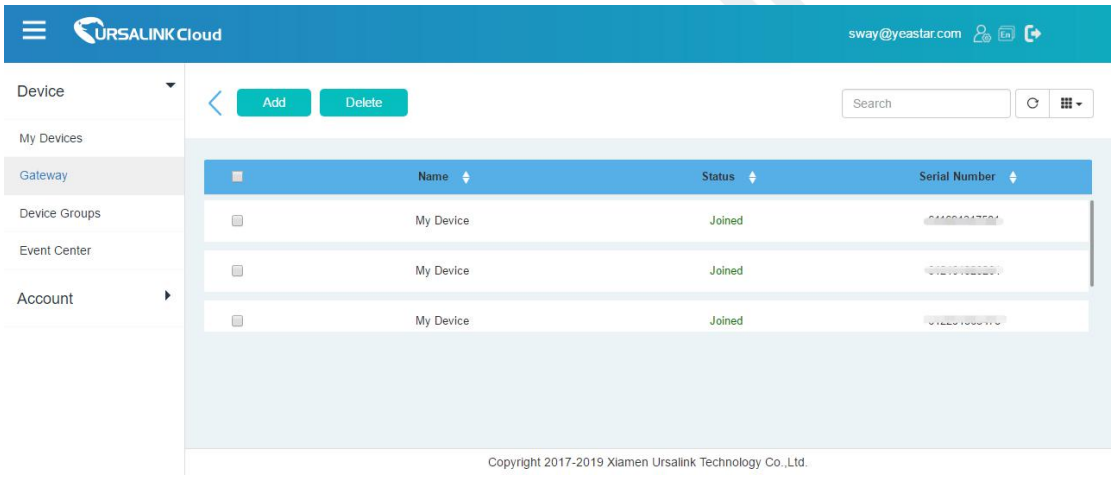


3. Click ”Add” to add a UC11-T1 to this gateway.



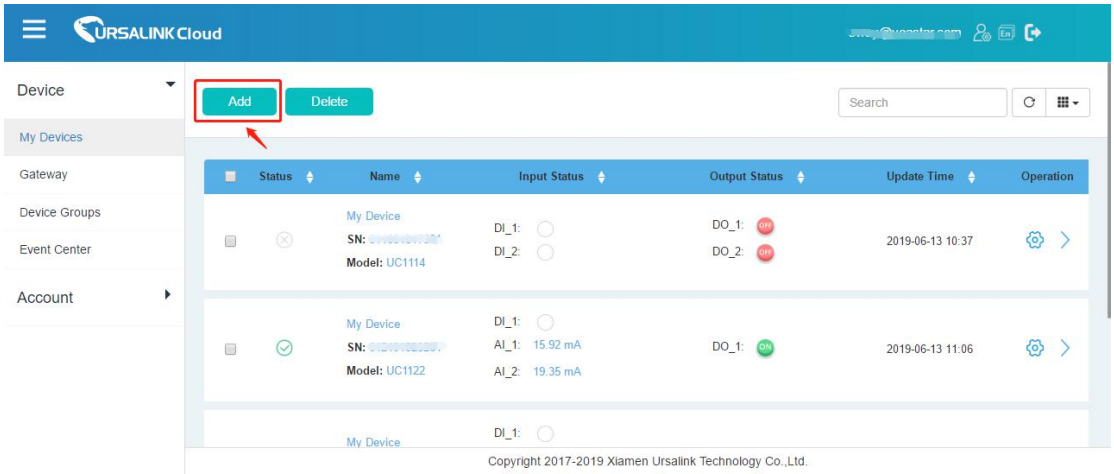
4. Enter the correct SN of the UC11-T1, and then click ”Add”. Sensor SN can be found on the bottom of the sensor.

5. Once the device has been added successfully, You will see the device in the list.



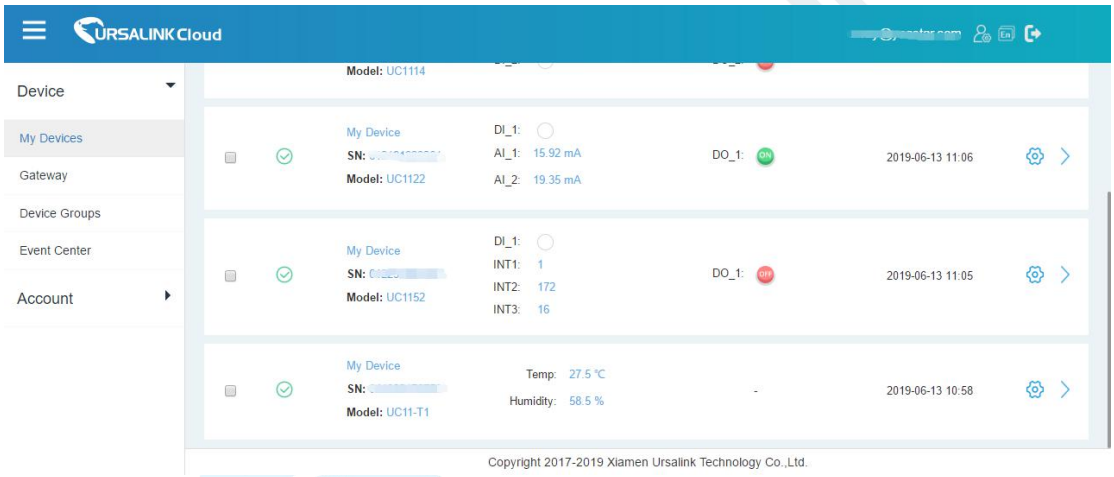
You can also add UC11-T1 directly to the main page, please follow these steps:

1. Click “Add” on the upper left corner.



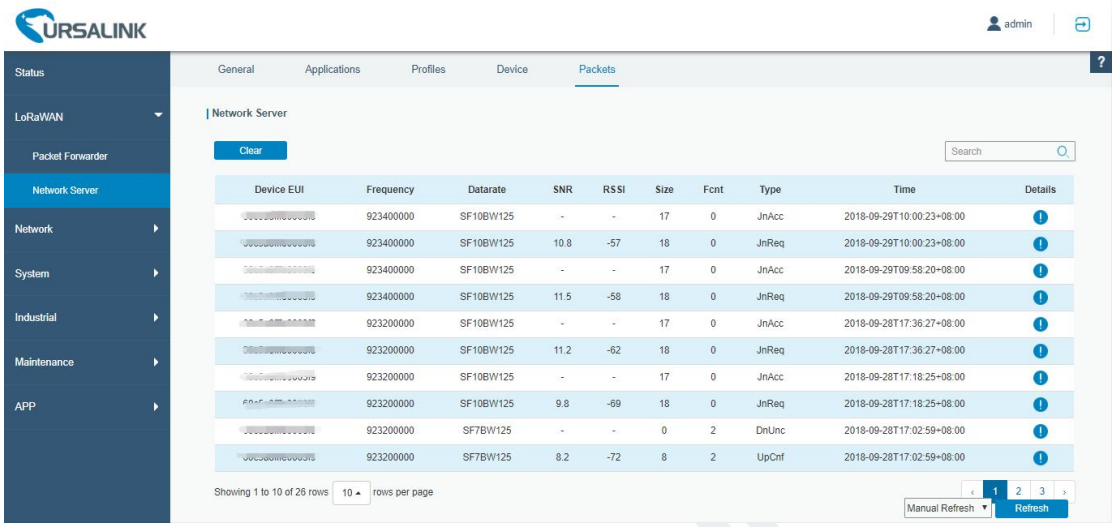
2. Enter the correct SN of UC11-T1 and select the correct gateway. Then click “Add”.

3. Once the device has been added successfully, You will see the device in the list.

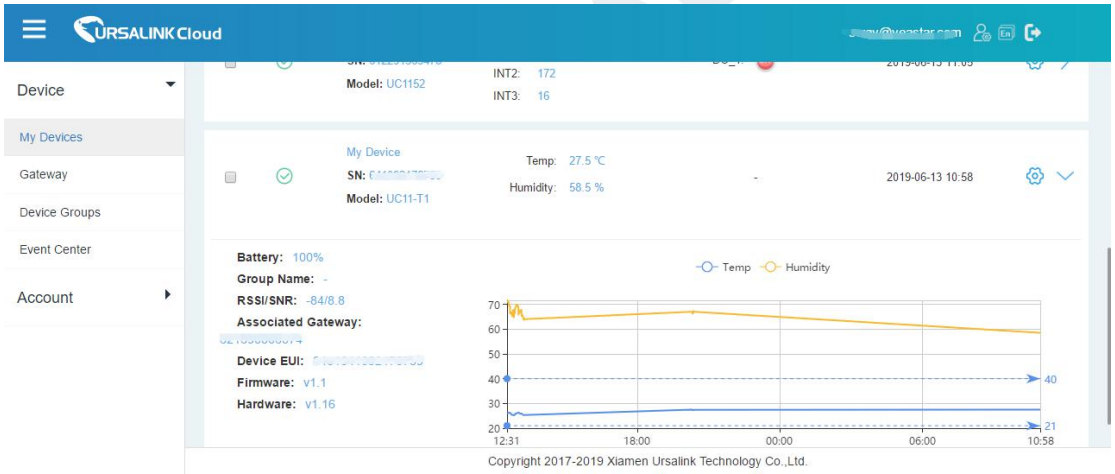


4.4 Check the Data of UC11-T1

Click “LoRaWAN”->”Network Server”->”Packets” to view the data transmission.

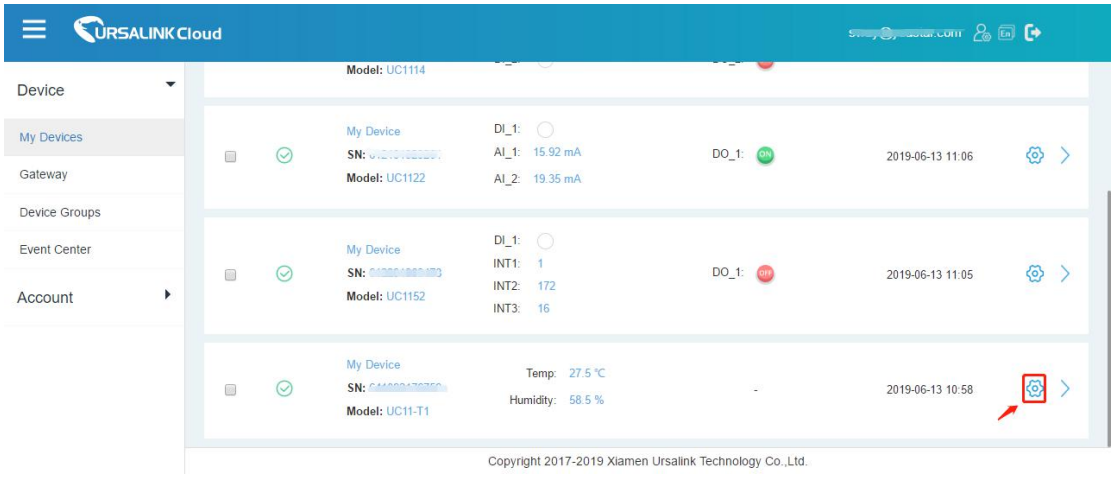


You can see the basic status of the UC11-T1 on the Ursalink Cloud main page.

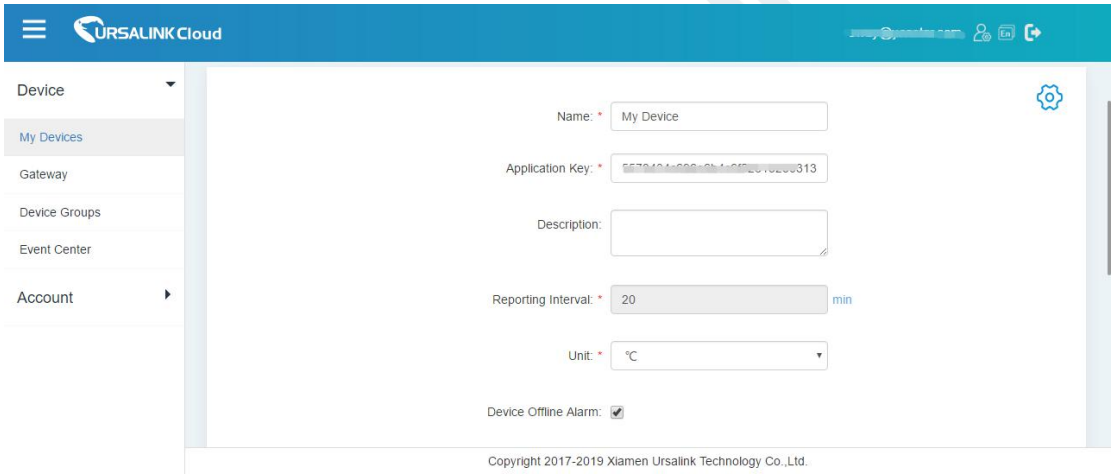


4.5 Configure UC11-T1 via Ursalink Cloud

Click  to go to the configuration page of UC11-T1. You can edit the basic information of the device on this page.

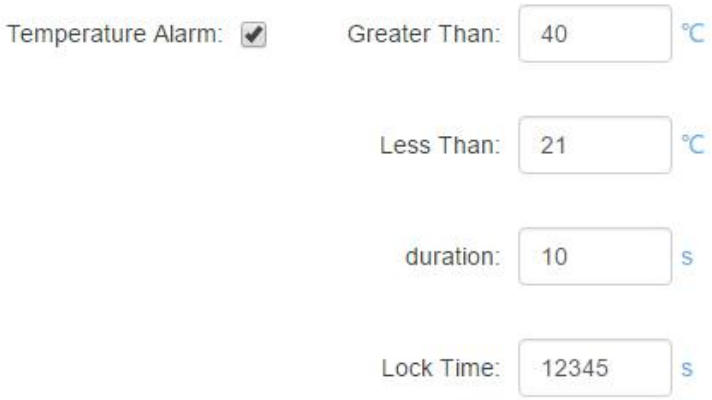


4.5.1 Basic Settings



Basic Settings		
Item	**Description**	**Default**
Device Name	Enter the custom name of this device.	LoRaWAN Temperature & Humidity Sensor
Application Key	Enter the application key. Whenever an end-device joins a network via over-the-air activation, the application key is used for derive the Application Session key.	5572404c696e6b4c6f5261323031382 3

Description	The description of the device.	--
Reporting Interval	The interval of sending data to Ursalink Cloud.	20min
Unit	Unit displayed on Ursalink Cloud.	℃
Device Offline Alarm	The device will send an alert if disconnected.	Enabled
Low Battery Alarm	The device will send an alert if battery is less than 20%.	Enabled



Basic Settings		
Item	**Description**	**Default**
Temperature Alarm	The device will send an alert to Ursalink Cloud if the temperature goes above/below temperature thresholds.	Disabled
greater than	Enter the maximum temperature threshold.	Null
less than	Enter the minimum temperature threshold.	Null

Note: If you set a "lockout time" of 10s, a "continued time" of 5s, the alarm will be triggered as soon as the temperature goes above the maximum temperature threshold or goes below the minimum temperature threshold for 5s. It will then start checking the temperature again after 10s and be triggered once more if the temperature goes above/below temperature thresholds for 5s.

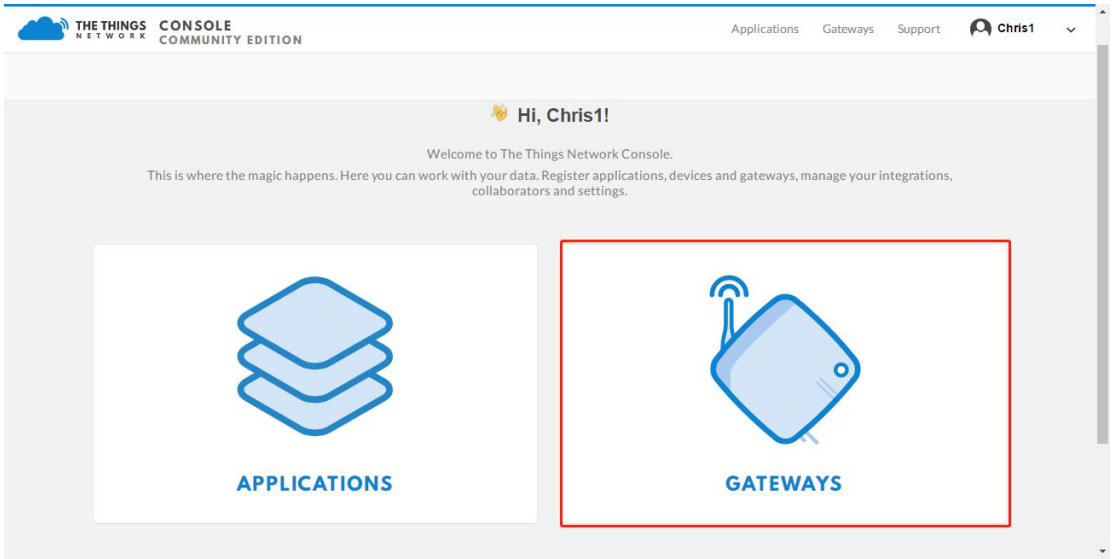
5.Configuration via TTN

5.1 Add a LoRaWAN Gateway to The Things Network

5.1.1 Register Your Gateway in The Things Network

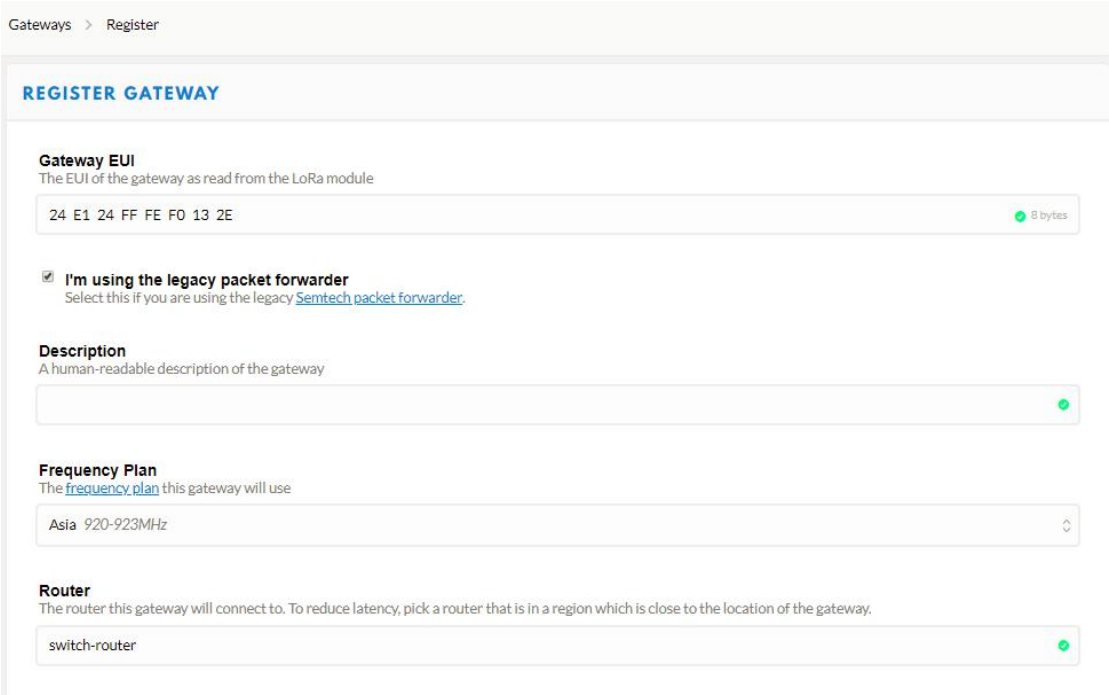
To register your gateway in the The Things Network, please follow these steps:

1. Click “GATEWAYS” on the console screen.



2. Click “register gateway”.

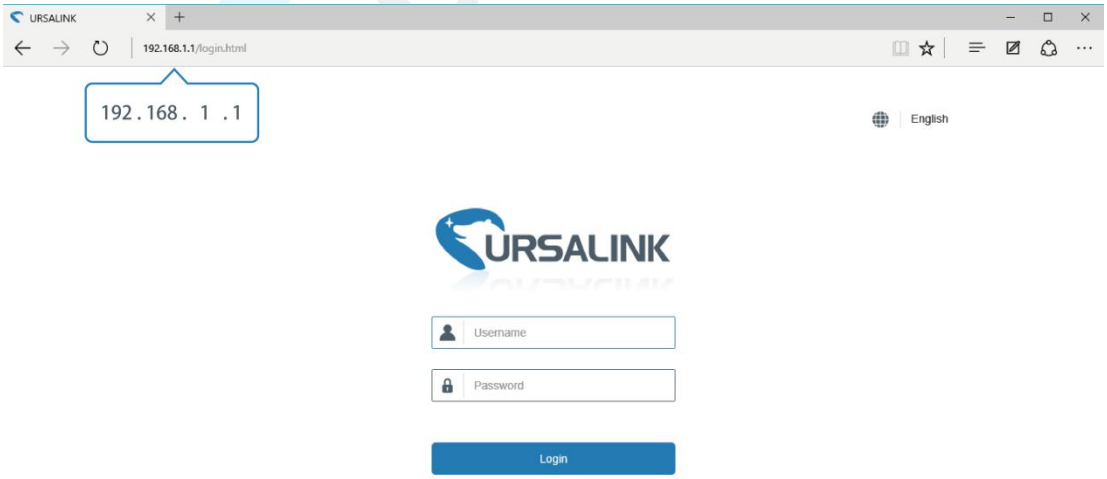
3. Enter the gateway information.



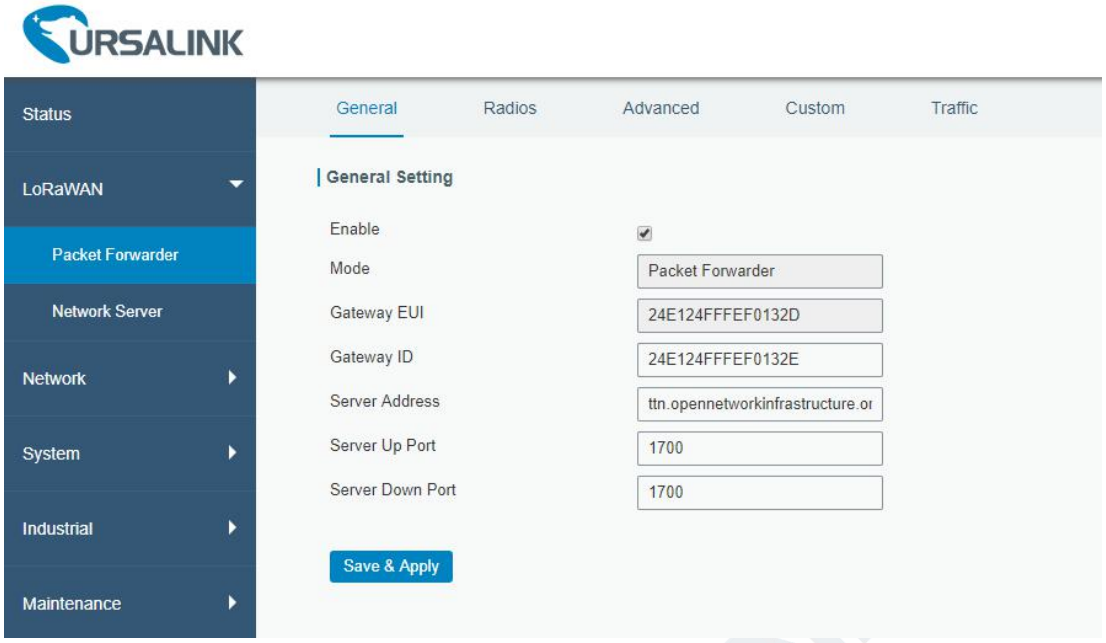
5.1.2 Connect Ursalink gateway to The Things Network

To connect your gateway to TTN , please follow these steps:

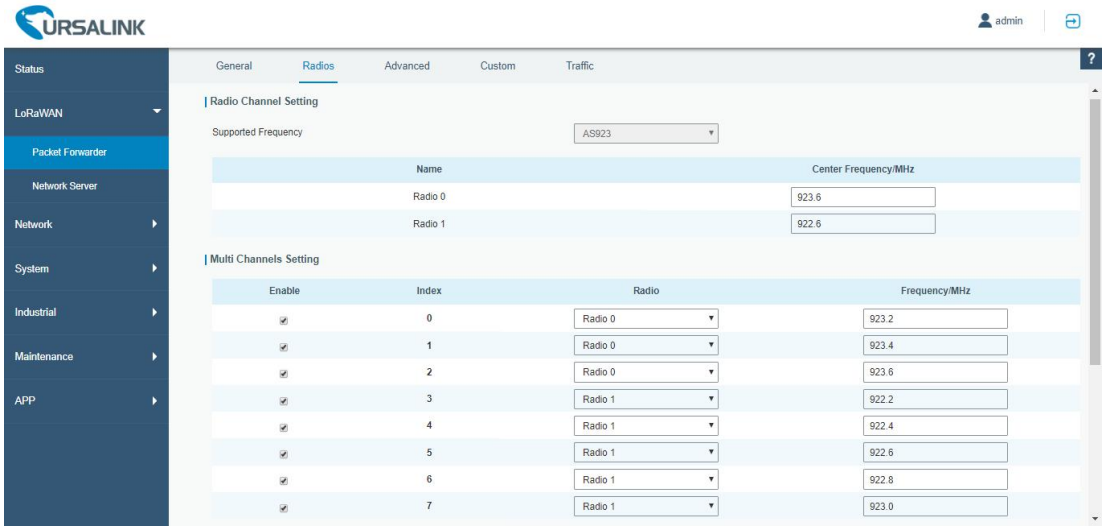
1. Log in gateway web GUI.



2. Click “LoRaWAN” → “Packet Forwarder” → “General” to configure the general setting.



3. Click “Radios” to configure the center frequency and channels.



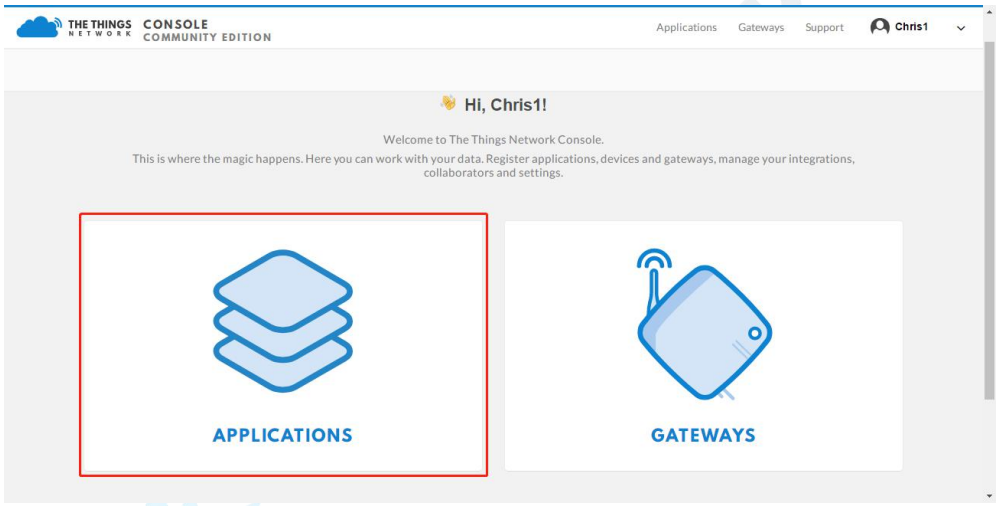
5.2 Add UC11-T1 To The Things Network

5.2.1 Create an Application in The Things Network

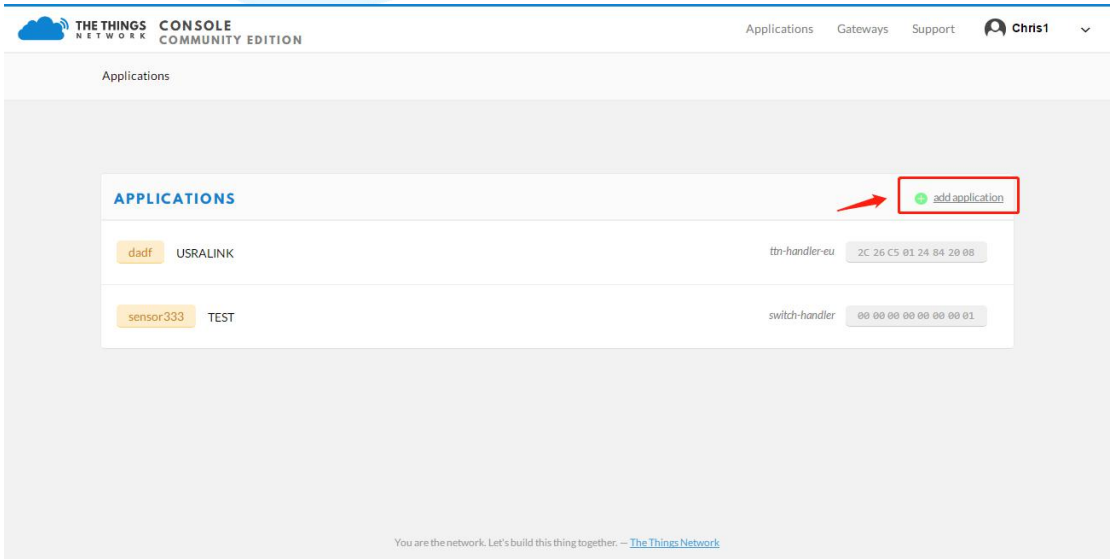
TTN server uses Applications to create groups of devices.
Gateways are associated with user account but not Applications. All gateways connected to TTN servers forward all LoRaWAN data traffic to the TTN message router. The TTN network server filters LoRa traffic by Application ID so that the data is routed to the correct user/application and users are only able to access data from devices registered to their account.

To add an application, follow these steps:

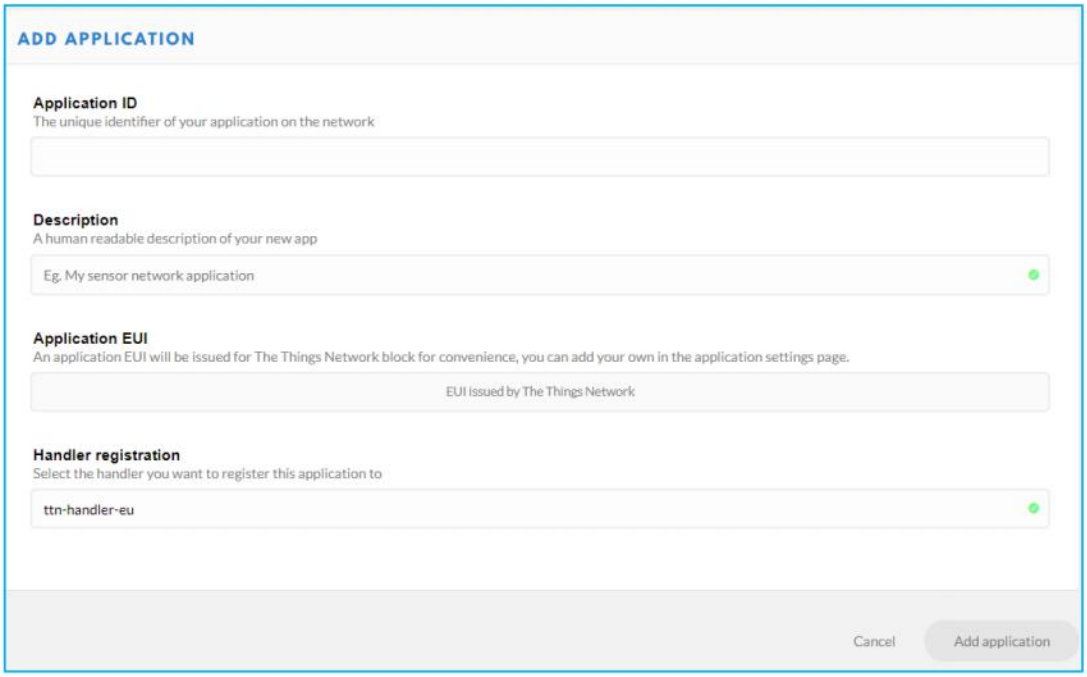
1. Click “APPLICATIONS” located on the Console page.



2. Click “add application” .



3. Fill in the information of Application. Handler Registration is the same as previous in Gateway registration.



5.2.2 Add Devices to The Application

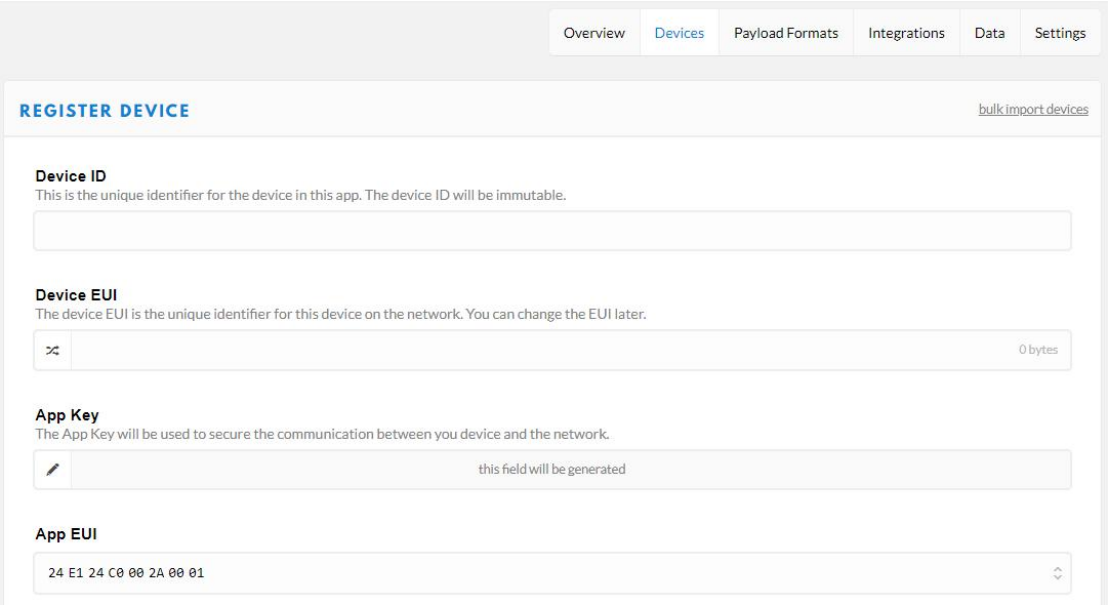
To add a UC11-T1 to the Application ID recently established, follow these steps:

1. Click “Register Device” under Devices in the application overview page.
2. Enter the Device ID. This ID must be unique on the user’s account.

We recommend using the convention dev (for device) followed by the Sensor Dev EUI. For instance, if the device has a Dev EUI of 0025ca000000000f then the Device ID is dev-0025ca000000000f.

3. Enter the Device EUI, App EUI and App Key of UC11-T1.

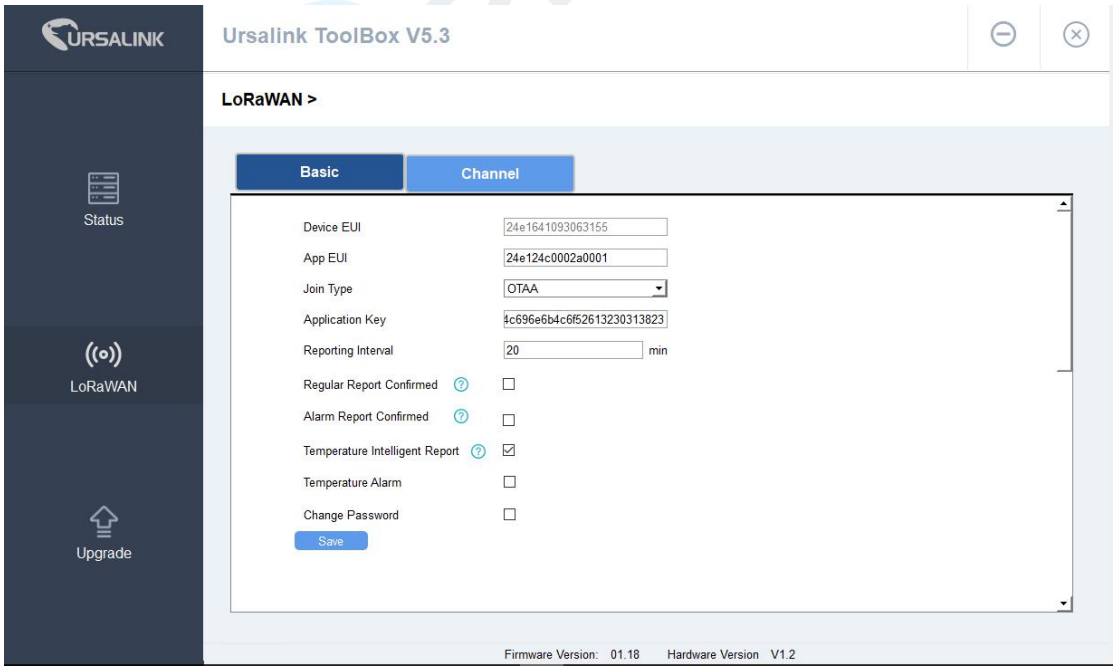
Note: Please go to “APPLICATION -> settings -> EUIs” to add UC11-T1 App EUI.



4. Click “Register” to complete registration.

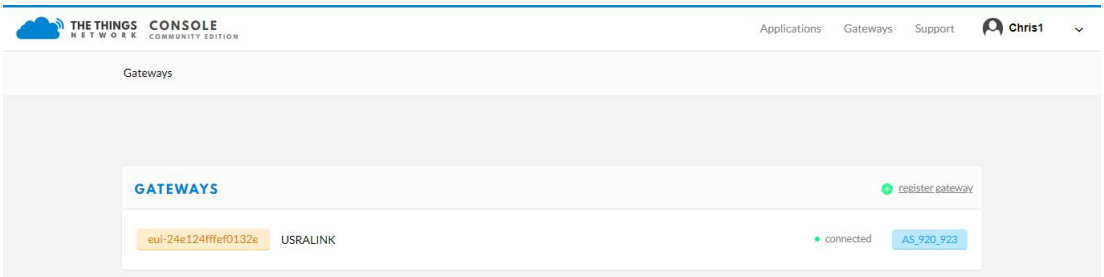
5.2.3 Configure UC11-T1

Connect T1 to PC and configure it via Toolbox.

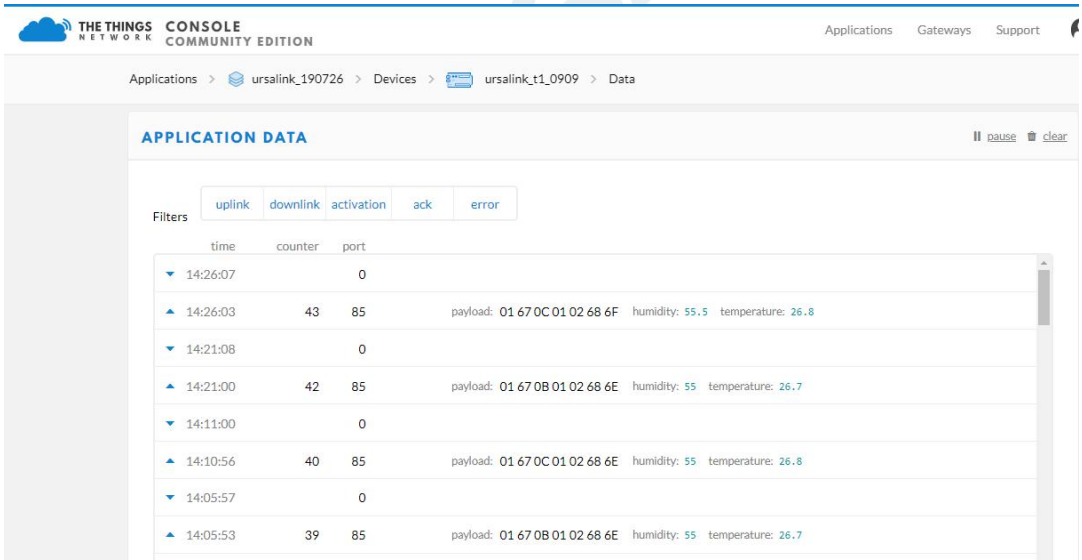


5.3 Check Data Transmission on The Things Network

1. Click “Gateways” to check the Gateways status.



2. Click “Applications” and select the Applications, then go to “Data”, you can find the data from UC11-T1.



-End-