

LoRaWAN Sensor Node

Multi-interface Platform for Connecting Sensors

UC11-N1 V1.0

EVRSALINK SENSOR NODE LoRaWAN



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e Platform for Connecting Sen



www.ursalink.com

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1. Preface

Thank you for choosing Ursalink UC11-N1. This user guide will present in detail all the functions and features of the product. The UC11-N1 is designed for both industrial and commercial applications and helps devices stay connected. The product should be used under the guidance of this user guide, referring to parameters and technical specifications. The UC11-N1 is a compact, high-performance device 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-N1 is a smart wireless module featuring LoRaWAN protocol. Supporting the most widely used industrial communication network protocols, UC11-N1 covers industries like industrial automation, building automation and smart agriculture applications, to provide network capability in remote or factory floor environments. It can also connect 4-20mA analog devices, the most commonly deployed devices in industrial environments.

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/

Note: Please contact Ursalink or the original battery manufacturer to replace the battery!

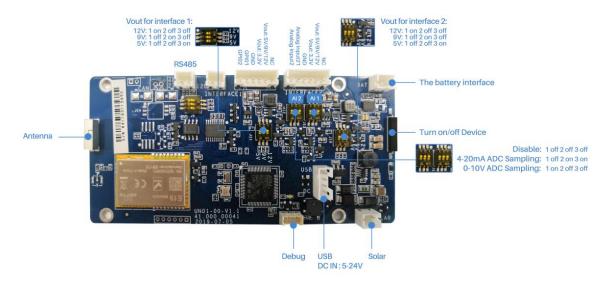
2.1 Features

- Add or change a device probe in seconds
- Multiple interfaces including serial and I/O
- Over the Air Programming (OTA)
- Multiple power supply option: battery, DC or solar
- Battery life: 5 years life under LoRaWAN Class A mode
- Support Frequency: CN470/EU868/US915/EU433/AU915/AS923/KR920/IN865
- Robust waterproof IP67 enclosure
- LoRa wireless module included, up to 11km communicate range

2.2 Parameters

Parameter Item	Reference Scope
	2 x GPIO: Digital Input (0-3.3v)
	or Digital Output (0-3.3v)
Interface 1	1 x RS232/RS485
	1 x 3.3 V output
	1 x 5/9/12 V output switchable
	2 x Analog input (4-20mA or 0-10v)
Interface 2	1 x 3.3 V output
	1 x 5/9/12 V output switchable
Fraguency Band	EU 433, CN 470-510, EU 863-870, US 902-928,
Frequency Band	AU 915-928, KR 920-923
Operating Temperature	-20 $^{\circ}$ C to +70 $^{\circ}$ C (-4 $^{\circ}$ F to +158 $^{\circ}$ F)
	1.19000mhA replaceable Li-SOCL2 battery
Power Supply	2.5-24 VDC with 5000mhA battery backup
	3.Solar powered with 5000mhA battery
Dimensions	120.1 x 120.1 x 55.4 mm
Ingress Protection	IP67

2.3 Terminal Description



2.4 Turn on/off the Device

Put a magnet close to the reed switch to turn on or turn off the device. 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-N1 to PC via USB port.

Step 2: Power on the Ursalink UC11-N1.

Step 3: Run the Ursalink ToolBox.

Ursalink ToolBox V2.4	Θ	
Serial information >		
Serial Port Settings		
Serial port COM5 Login password Baud rate 115200 Data bits 8 Parity bits None Stop bits 1 Save Cancel		
Firmware Version: Hardware Version		

Serial Port Settin	ngs	
ltem	Description	Default
Serial Port	Select the serial port for data transmission.	Null
Login Password	Enter the correct password to login.	Null
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:

	Ursalink ToolBox V	2.4	Θ	
	Status >			
Status General ((o)) LoRaWAN	Model: Serial Number: Partnumber: Firmware Version: Hardware Version: RSSI/SNR:	UC11N1 641192416310 EU968-0080 01.05 V1.1 -59/39		
습 Upgrade		Firmware Version: 01.05 Hardware Version V1.1		

3.3 General

3.3.1 Basic

	Ursalink ToolBox V2.4	e	9	ப
	General >			
Status	Basic Serial GPIO AI			
General	Device ID 6411 Description This is a devic for Reporting Interval 1200			
((°)) LoRaWAN	Interface 1 (Pin2) 3V3 Output Interface 2 (Pin2) 3V3 Output Change Password Save			
알 Upgrade	Firmware Version: 01.05 Hardware Version V1.1			

Basic Settings		
Item	Description	Default
Device ID	Show the Serial Number of this device.	The identifier of this device.
Description	Enter the description of this device.	Null
Reporting Interval	The UC11-N1 reports the collected data at regular intervals. Range: 30-86400 (s)	1200
Interface 1 (Pin2)3V3 Output	Enabled: UC11-N1 will provide power to device connected to Interface 1(pin2). Voltage is 3.3V.	Disabled
Interface 2 (Pin2)3V3 Output	Enabled: UC11-N1 will provide power to device connected to Interface 2(pin2). Voltage is 3.3V	Disabled
Change Password	Enable: Change Toolbox login password.	Disabled

3.3.2 Serial

	Ursalink ToolBox V	2.4			Θ	
	General >					
Status	Basic	Serial	GPIO	AI		-
General		Enable Interface Type Interface 1 (Pin1) 5/9/12V Output	☑ RS485 (Modbus N ☑	faster)		
((•)) LoRaWAN		Power Output Time Before Collect Baud Rate Data Bit Stop Bit	0 9600 8 bits 1 bits	ms T T		_
Ŷ		Parity Data Polling Interval Execution Interval	None 10 50	s ms		
≡ Upgrade		Max Resp Time Max Retry Times Firmware Version: 01.0	500 3 5 Hardware Versi	on V1.1		<u>_</u>

On this page, you can enable the serial ports and set the parameters of RS485(Modbus Master).

RS485 Settings		
Item	Description	Default
Enable	Enable/disable RS485.	Enable
		RS485
Interface Type	Show the interface type.	(Modbus
		Master)
Interface 1(Pin 1)	Enable: UC11-N1 will provide power to	
5v/9v/12v Output	device connected to Interface 1(pin1).	Disabled
50/ 50/ 120 Output	Voltage is 5V, 9V or 12V.	
	If the time is set 100ms, then before	
Power Output	collecting data from end nodes,	
Time Before	UC11-N1 will provide power for end	1-5000
Collect	nodes for 100ms.	
	Range:1-5000(ms).	
Baud Rate	Select from "9600", "57600", "115200".	9600
Data Bits	Select from "5", "7", "8".	8
Stop Bits	Select from "1", "2".	1
Parity Bits	Select from "Even", "Odd", "None".	None
Data Polling	Set the interval for reading remote	
Interval	channels. When the read cycle ends, the	0
	new read cycle begins until this interval	

	expires . If it is set to 0, the device will restart the new read cycle after all channels have been read. Range: 0-86400(s).	
Execution Interval(ms)	The execution interval between each command. Range: 10-1000.	50
Max Resp Time(ms)	Set the maximum response time that the UC11-N1 waits for the response to the command. If the device does not get a response after the maximum response time, it's determined that the command has timed out. Range: 10-1000.	500
Max Retry Times	Set the maximum retry times after it fails to read, range: 0-5. The default value is 3.	3
Modbus RS485 bridge LoRaWAN	Enable this mode to collect data from slave devices and then send it to Network Server via LoRaWAN. This mode also has the capability to change the behaviour of the ModBus device by writing into its registres.	Disable
Port	Eenter the LoRaWAN frame port for transparent transmission between UC11-N1 and Network Server. Range: 2-84,86-223.	Null

	Ursalink ToolBo	ox V2.6			Θ	Ċ
	General >					
Status	Basic	Serial	GPIO	AI		
		Data Polling Interval Execution Interval	50	s ms		1
General		Max Resp Time Max Retry Times Modbus RS485 bridge LoRa	500 3 aWAN ⑦	ms		
		Port 🕜	100			
((0)) LoRaWAN	Channel Settings Channel ID Na	ame Slave ID Address Qua	antity Type	Sign Value		
					\otimes $(+)$	-
습 Upgrade	Save				Up to 8 channels	-
		Firmware Vers	sion: 01.08 Hardware Versi	on V1.0		

Channel Settings		
Item	Description	Default
Channel ID	Assign the channel for the slave device, 8 channels selectable.	Null
Name	Set the name to identify the remote channel. It cannot be blank.	Null
Slave ID	Set Modbus slave ID.	Null
Address	The starting address for reading.	Null
Quantity	Set read how many digits from starting address.	Null
Туре	Read command, options are "Coil", "Discrete", "Holding Register (INT16)", "Input Register (INT16)", "Holding Register (INT32)" and "Holding Register (Float)".	Holding Register (INT16)
Sign	To identify whether this channel is signed. Default: Unsigned.	Null
Value	Show the data which read from this slave device.	Null
Fetch	Click to read the data from this slave device.	Null

3.3.3 GPIO

	Ursalink ToolBox	V2.4			Θ	
	General >					
Status	Basic	Serial	GPIO	Al		_
General		Interface Name Enable Interface Type Status	GPIO 1	Fetch		
((0)) LoRaWAN		Interface Name Enable Interface Type	GPIO 2 Digital Input2 Pull Down	*		
습 Upgrade		Status Save	Low	Fetch		
		Firmware Ver	sion: 01.05 Hardware Versi	on V1.1		

GPIO Settings		
Item	Description	Default
Interface Name	Show the name of this interface.	Null
Enable	Click to enable this interface.	Disable
Interface Type	Choose from:Digital Input,Digital Output Digital Input: This GPIO will be used as Digital Input. Then you will need to select the initial state of this digital input form "Pull Up"(High), "Pill Down"(Low). Digital Output: This GPIO will be used as Digital Output.	Digital Input1
Status	Show the current status of this interface. Click "Fetch" to fetch the latest status.	Null

3.3.4 AI

	Ursalink ToolBox	V2.4			ن (
	General >				
Status	Basic	Serial	GPIO	AI	
General		Interface 2 (Pin1) 5/9/12V Output Power Output Time Before Collect Data Polling Interval	☑ 3000 10	ms s	
((0)) LoRaWAN		Interface Name Enable Status	Analog Input 1	Fetch	
습 Upgrade		Interface Name Enable Status Save	Analog Input 2	Fetch	
		Firmware Version:	1.05 Hardware Version	n V1.1	

AI Settings		
Item	Description	Default
Interface 2(Pin 1) 5v/9v/12v Output	Enable: UC11-N1 will provide power to device connected to Interface 1(pin1). Voltage is 5V, 9V or 12V.	Disabled
Power Output Time Before Collect	If the time is set to 100ms, then before collecting data from end nodes, UC11-N1 will provider power for end nodes for 100ms. Range:1-5000(ms).	1-5000
Data Polling Interval	Set the interval for reading analog input. Range: 5-3600(s).	5
Interface Name	Show the name of this interface.	Null
Enable	Click to enable this interface.	Disable
Status	Show the current status of this interface. Click "Fetch" to fetch the latest status.	Null

3.4 LoRaWAN

3.4.1 Basic

	Ursalink ToolBox V2.6	Θ	
	LoRaWAN >		
Status	Basic Channel		-
General	Device EUI 24e1641192 App EUI 24e124c0002 Application Key 5572404c696e6b4c6f526 Save		-
((•)) LoRaWAN			
슱 Upgrade	Firmware Version: 01.08 Hardware Version V1.0		<u> </u>

Basic Settings		
ltem	Description	Default
Device EUI	Show the identifier of this device.	the identifier of this device.
Application EUI	Enter the application EUI.The Network Server receives request and consults the entity associated with the APPEUI to validate the request.If permission is granted, it responds with a join-accept message.	24E124C00 02A0001
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.	5572404c6 96e6b4c6f 526132303 13823
Class Type	Show the working mode of the device. UC11-N1: Null. UC11-N1-DC: Select from: "Class A", "Class C".	Class A

	A :Class A operation is the lowest power end-device	
	system.	
	C: Class C end-device will use more power to operate	
	than Class A but they offer the lowest latency for server	
	to end-device communication.	

3.4.2 Channel

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

	Ursalir	nk Tooli	Box V2	2.4			Θ	Ċ
	LoRaWA	N >						
Status		Basic		Channel				
			Index	Supported Frequency Frequency/MHz	EU868 Max Datarate	Min Datarate		-
General			0	868.1	5-SF7BW125 *	0-SF12BW125 *		
General			1	868.3	5-SF7BW125 _	0-SF12BW125		
4.5			2	868.5	5-SF7BW125 _	0-SF12BW125 _		
((0)) LoRaWAN			3	0	5-SF7BW125 _	0-SF12BW125 _		
			4	0	5-SF7BW125 _	0-SF12BW125		
~			5	0	5-SF7BW125 _	0-SF12BW125		_
알 Upgrade			6	0	5-SF7BW125 💌	0-SF12BW125 💌		-
				Firmware Vers	ion: 01.05 Hardware Version V1.	1		

Note: Make sure that 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.

Enable	Index	Radio	Frequency/MHz
ø	0	Radio 0 🔻	923.2
e	1	Radio 0 🔻	923.4
۲	2	Radio 0 🔻	923.6
	3	Radio 1	922.2
	4	Radio 1	922.4
۲	5	Radio 1 🔻	922.6
×.	6	Radio 1 🔻	922.8
	7	Radio 1 🔻	923.0

3.5 Upgrade

	Ursalink ToolBox V2.4	Θ	Ċ
	Upgrade >		
Status			
General	Firmware Version 01.05		
((0)) LoRaWAN	Upgrade Firmware Upgrade Browse Upgrade Restore Factory Defaults Reset		
습 Upgrade			
	Firmware Version: 01.05 Hardware Version V1.1		

Step 1: Connect UC11-N1 to PC via the USB port.

Step 2: Install the battery to power on UC11-N1.

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.

UC11-N1 User Guide

<form></form>	WRSALINK Cloud		_		Englist	~
<form></form>					Sign in	
<form></form>				Email Address		1
<form><form><text><text><text></text></text></text></form></form>	Ursa	link Cloud		Password	Forgot password) ?]
Abort S Contra Partial Test and an analysis of the strate			No and A		-	
Usalities is a professional loT company that beergages the top trending technologies to simplify the process of data collection, storage and retrieval in order to accomptible 1 code Subcrite 1 Error of Use 1 Privacy Policy 1 Code Image: Connecting Yhings" to Cloud Subcrite 1 Error of Use 1 Privacy Policy 1 Code Error Image: Connecting Yhings" to Cloud Image: Connecting Yhings" to Cloud Image: Connecting Yhings" to Cloud Error Image: Connecting Yhings" to Cloud Image: Connecting Yhings" to Cloud Image: Connecting Yhings Image: Connec						• •
geneticing Wings' to Claud Subscript 1 2017-2019 Xiamen Ursalink Technology Co.Ltd. English						
Address Email * Password * Confirm Password * I agree to Ursalink Cloud's Terms & privacy policy and to receive information about Ursalink's products.						
Password * Confirm Password *	Ursalink is a professional IoT company that lev goal: connecting "things" to Cloud Copyright 2017-2019 Xiamen Ursalink Te		mplify the process of data collection, sto		Privacy Policy Cookie	English
Confirm Password *	Ursalink is a professional IoT company that lev goal: connecting "things" to Cloud Copyright 2017-2019 Xiamen Ursalink Te		nplify the process of data collection, sto 2 Verify Email		Privacy Policy Cookle	English
I agree to Ursalink Cloud's Terms & privacy policy and to receive information about Ursalink's products.	Ursalink is a professional IoT company that lev goal: connecting "things" to Cloud Copyright 2017-2019 Xiamen Ursalink Te	verages the top trending technologies to si chnology Co.,Ltd.	nplify the process of data collection, sto 2 Verify Email		Privacy Policy Cookle	English
information about Ursalink's products.	Ursalink is a professional IoT company that lev goal: connecting "things" to Cloud Copyright 2017-2019 Xiamen Ursalink Te	verages the top trending technologies to si chnology Co.,Ltd.	nplify the process of data collection, sto 2 Verify Email		Privacy Policy Cookle	English
	Ursalink is a professional IoT company that lev geal: connecting "things" to Cloud Copyright 2017-2019 Xiamen Ursalink Te	verages the top trending technologies to si chnology Co.Ltd. Email * Password *	nplify the process of data collection, sto 2 Verify Email		Privacy Policy Cookle	English
	Ursalink is a professional loT company that lev goat: connecting "things" to Cloud Copyright 2017-2019 Xiamen Ursalink Te	erages the top trending technologies to air chnology Co.Ltd. Email * Password * Confirm Password *	pplify the process of data collection, sto 2 Verify Email Address	Subscribe Terms of Use	Privacy Policy Cookle	English

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".

	ALINK C	loud						claire@(ursalink.com {	2a 🖬 🕻	
Device	•		0	Just one more step	to get started on Ursal	ink Cloud. Please a	dd billing address.	Go ahead			
My Devices		Add	Delete					Search		C	. 1
Gateway		Status	Name 🔶	Model 🔶	Partnumber 🔶	Serial Number	version	n 🔺	Update Time	≜ On	eratio
Device Groups		Junio	Hunte	moder		records found	Versie		opute mile		cruto
Event Center					-						
Account	•										
				Copyrig	ht 2017-2019 Xiamer	Ursalink Technolo	ogy Co.,Ltd.				

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

	ALINK	oud claire@ursalink.com 🖉 🕞 🕞
		🕧 Just one more step to get started on Ursalink Cloud. Please add billing address. Go ahead
Device	•	
My Devices		Add Delete Search C #+
Gateway		Status Name Model Partnumber Serial Number version Update Time Operation
Device Groups		
State Contraction		No matching records found
Event Center		
Account	۲	
		Copyright 2017-2019 Xiamen Ursalink Technology Co.,Ltd.

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.

	Add Device	×
		1
SN		
(i) Please en	able Ursalink Cloud mode on gateway first.	
	Add Cancel	

💄 admin 🛛 🔁 URSALINK For your device Help General Applications Profiles Packets Device General Setting General Setting Enable LoRaWAN Click to enable Network Server mode. Enable • Packet Forwarder Mode Mode Network Server working mode of Show the LoRaWA Network Server 010203 NetID NetID Join Delay 5 Enter the network identifier. The default is 01023. Range: 6-digit hexadecimal string 501 Network RX1 Delay 1 Sec Lease Time 744-0-0 hh-mm-ss Join Delay Log Level info . Enter the interval time between the end-device sends a Join_request_message to network server and the end-Industrial Channel Plan Setting Maintenance Channel Plan EU868 ۳ device prepares to open RX1 to receive the Channel Mask

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

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

	SALINK C	loud						sway@y	yeastar.com 🔏 🖬) (+
Device	-	Ad	d Dek	ete				Search		0 ₩.
My Devices										
Gateway			Status 🔶	Name 🔶	Model 🔶	Partnumber 🔶	Serial Number 🔶	version 🝦	Update Time 🝦	Operation
Device Groups			\bigcirc	My Gateway	UG87	L01CE-S1022-GPS- EU868		Firmware:87.1.0.96 Hardware:V1.3	2019-06-13 10:00	ନ୍ତ
Event Center										
Account	•									
					Copyrigi	nt 2017-2019 Xiamen L	Jrsalink Technology C	p.,Ltd.		

4.3 Add Devices to Ursalink Cloud

മ to go to the configuration page of this gateway. 1. Click sway@yeastar.com 🔏 🖬 🚺 Device Search о ш. My Devices Gateway Status 🔶 Name 🔶 Model 🔶 Partnumber 🔶 Serial Number 🔶 Update Time 🔶 Operation version 🔶 L01CE-S1022-GPS-EU868 Firmware:87.1.0.96 Hardware:V1.3 Device Groups My Gateway UG87 2019-06-13 10:00 ල ----Event Center Account ۲ Copyright 2017-2019 Xiamen Ursalink Technology Co.,Ltd.

To add a UC11-N1 to Ursalink Cloud, please follow these steps:

		3		
2.	Click	3	then click "Associated Devices" .	

	nd sway@yeastar.com 🔏 🖬 🕞
Device	Refresh
My Devices	
Gateway	(@)
Device Groups	Name: * My Gateway History Data
Event Center	Description: Associated Devices Restart
Account	(Kesidit
	Device Offline Alarm: 🕑
	Save
	Copyright 2017-2019 Xlamen Ursalink Technology Co.,Ltd.

3. Click "Add" to add a UC11-N1 to this gateway.

	5ALINK C	loud			way@yeastar.com 🔏 🖬 🔂
Device	•	Add	Delete		Search O 🛄 -
My Devices					
Gateway			Name 🔶	Status 🔶	Serial Number 🝦
Device Groups			My Device	Joined	-012101020201
Event Center			My Device	Joined	+012201000-ITO
Account	۲				
			My Device	Joined	-014000-TUTEU
			Copyright 2017-2	2019 Xiamen Ursalink Technology Co.,Ltd.	

4. Enter the correct SN of the UC11-N1, and then click "Add". The device SN can be found on the bottom of the device.

	5ALINK C	loud			sway@yeastar.com 🔏 🖬 🔂
Device	•	< Add	Delete		Search O III -
My Devices					
Gateway			Name 🔶	Status 🔶	Serial Number 🝦
Device Groups			My Device	Joined	C11001017501
Event Center			My Device	Joined	-012101020201
Account	•		My Device	Joined	012201000110
			Copyright 2017-20	019 Xiamen Ursalink Technology Co.,Ltd.	

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

You can also add UC11-N1 directly to the main page, please follow these steps:

1. Click "Add" on the upper left corner.

Device	-	Add	d Del	ete			Search	O	
My Devices	1						Search		
Gateway			Status 🔶	Name 🔶	Input Status 🝦	Output Status 🖕	Update Time 🝦	Оре	ation
Device Groups Event Center		۰	8	My Device SN: Chicken 201 Model: UC1114	DI_1: DI_2:	DO_1: 00 DO_2: 00	2019-06-13 10:37	ଡ	>
Account	•		\odot	My Device SN: 01200000000 Model: UC1122	DL_1: AL_1: 15.92 mA AL_2: 19.35 mA	D0_1: 🚳	2019-06-13 11:06	0	>
				My Device	DI_1: Copyright 2017-2019 Xiamen	Ursalink Technology Co.,Ltd.			

- 2. Enter the correct SN of UC11-N1 and select the correct gateway. Then click "Add".
- 3. Once the device has been added successfully, you will see the device in the list.

	ALINK CI	oud				claire@ursalink.cor	- A 🗉 C +
Device	•	Add	Delete			Search	0 Ⅲ•
My Devices							
Gateway			Status 👌	Name 👌	Interface Status	Update Time 🕴	Operation
Device Groups Event Center			查	My Device SN: 6411 Model: UC11-N1	GPIO_1: GPIO_2: .	2019-07-24 17:57	@ >
Account	×						
					Copyright 2017-2019 Xiamen Ursalink Technology Co., Ltd.		

4.4 Check the Data of UC11-N1

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

Status		General Applicati	ons Profile:	s Device	P	ackets					
DRaWAN	-	Network Server									
Packet Forwarder		Clear								Search	Q
Network Server		Device EUI	Frequency	Datarate	SNR	RSSI	Size	Fcnt	Туре	Time	Details
letwork		Constanterroom	923400000	SF10BW125	(14)		17	0	JnAcc	2018-09-29T10:00:23+08:00	0
ietwork	· ·	Jocodomococod	923400000	SF10BW125	10.8	-57	18	0	JnReq	2018-09-29T10:00:23+08:00	0
System	•	Construction	923400000	SF10BW125			17	0	JnAcc	2018-09-29T09:58:20+08:00	0
		and the second second	923400000	SF10BW125	11.5	-58	18	0	JnReq	2018-09-29T09:58:20+08:00	0
ndustrial	•	10.0.000.0000	923200000	SF10BW125	121	12	17	0	JnAcc	2018-09-28T17:36:27+08:00	0
laintenance		Official and a second	923200000	SF10BW125	11.2	-62	18	0	JnReq	2018-09-28T17:36:27+08:00	0
an nemance		Billionssousia	923200000	SF10BW125			17	0	JnAcc	2018-09-28T17:18:25+08:00	0
.PP	•	F0-F-07.000	923200000	SF10BW125	9.8	-69	18	0	JnReq	2018-09-28T17:18:25+08:00	0
		(Inclusion Inclusion)	923200000	SF7BW125			0	2	DnUnc	2018-09-28T17:02:59+08:00	0
		occadineooosis	923200000	SF7BW125	8.2	-72	8	2	UpCnf	2018-09-28T17:02:59+08:00	0

You can see the basic status of the UC11-N1 on the Ursalink Cloud main page.

	LINKCI	oud					alink.com	6 🖬 🔂
Device	•	Add Delete					Search	0 Ⅲ.
My Devices								
Sateway		🔲 Status 🔶	Name 🔶		Interface Status 🔶		Update Time 🔶	Operation
Device Groups Event Center		□ 渣	My Device SN: 6411 Model: UC11-N1	GPIO_1: OPIO_2: OPIO_2:			2019-07-24 17:57	@ ~
ccount	•	RSSI: -48dBm Battery: 100% Group Name: - Associated Gateway: 6216 Device EUI: 24e164 Firmware: v1.5 Hardware: v1.1		20 High 10 5 0 Low 20:21 00:00 07:22 07:23		-O- AJ_1 -C	- Al_2 -O- GPIO_1 -O- GPIO_ 0000 07-2	
				Copyright 2017-2	019 Xiamen Ursalink Technol	ay Co. Ltd.		

4.5 Configure UC11-N1 via Ursalink Cloud

Click to go to the configuration page of UC11-N1. You can edit the basic information of the device on this page.

UC11-N1 User Guide

vice	Add	Delete				Search	с ш.
Devices							
eway	Sta	itus 🔶	Name 🔶	Inter	ace Status 🔶	Update Time 🔶	Operation
nt Center		ŤĽ.	My Device SN: 641 Model: UC11-N1	GPIO_1: O GPIO_2: O	-	2019-07-24 17:57	@ >

4.5.1 Basic Settings

General Settings	General Settings					
Item	Description	Default				
Device Name	Enter the custom name of this device.	LoRaWAN Temperatu re & Humidity device				
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.	5572404c6 96e6b4c6f 526132303 13823				
Description	The description of the device.					
Reporting Interval	The interval of sending data to Ursalink Cloud.	20min				
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				

4.5.2 Interface Settings

Name	Custom Name	Value	Visualization
GPIO 1(Digital Input)	GPIO_1	Low	3
GPIO 2(Digital Input)	GPIO_2	Low	

Note:

Before checking GPIO data on Ursalink Cloud, you need to configure UC11-N1 via ToolBox and enable correspondent GPIO, and set port type for GPIO as digital input or digital output.

GPIO Settings					
Item	Description	Default			
Name	Show the name and the type of this interface.	GPIO x (Digital Input x)			
Custom Name	Enter the custom name of this interface.	GPIO_1			
Value	Show the latest value of this interface.	Null			
Visualization	Enable: The interface's name and value will be shown on the home page. Disable: The interface's name and value will not be shown on the home page.	Disable			



Note:

Before checking AI data on Ursalink Cloud, you need to configure UC11-N1 via ToolBox and enable correspondent AI.

AI Settings				
Item	Description	Default		
Name	Show the name and the type of this interface.	AI 1		
Custom Name	Enter the custom name of this interface.	Al_1		
Osh	High limit of the scale for the scaled output value.	Null		
Osl	Low limit of the scale for the scaled output value.	Null		
Unit	Enter the unit for the scaled output value.	Null		
Value	Show the latest value of this interface.	Null		
	Enable: The interface's name and value will be shown on the home page.			
Visualization	Disable: The interface's name and value will not be shown on the home page.	Disable		

The following variables are pertinent to the scaling formula:

Ov = scaled output value

Iv = analog input value

Osh = high limit of the scale for the scaled output value

Osl = low limit of the scale for the scaled output value

Ish = high limit of the scale for the analog input value

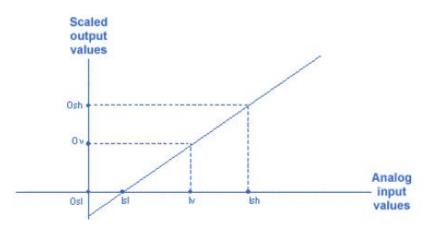
Isl = low limit of the scale for the analog input value

The scaling scheme can be diagrammed as follows:

The following formula for calculating the scaled value can be derived from the diagram:

Ov = [(Osh - Osl) * (Iv - Isl) / (Ish - Isl)] + OslWhich can be rewritten as:

Ov = [(Osh -Osl)/(lsh-lsl)/(lsh -lsl)] + Osl



Channel ID	Channel Name	Туре	Sign	Decimal Place	Raw Data	Value	Unit	Operation
•								

Note:

Before checking channel data on Ursalink Cloud, you need to configure UC11-N1 in Toolbox and create channel on Ursalink Cloud. The channel ID of channels on Toolbox and Ursalink Cloud should be correspondent.

Channel Settings	Channel Settings					
Item	Description	Default				
Channel ID	Assign the channel for the slave device. 8 channels selectable.	Null				
Channel Name	Set the name to identify the remote channel. It cannot be blank.	Null				
Туре	Read command, options are "Coil", "Discrete", "Holding Register (INT16)", "Input Register (INT16)", "Holding Register (INT32)" and "Holding Register (Float)".	Holding Register (INT16)				
Sign	To identify whether this channel is signed. Default: Unsigned.	Null				
Decimal Place	To indicate a dot in the read into the position of the channel. For example: if the channel raw data is 204d, and a Decimal Place is equal to 2, then the actual value is 12.34.	Null				
Raw Data	Show the raw data of this channel (Hex).	Null				
Value	Show the conversion results (Dec).	Null				
Unit	Enter the unit for the channel's value.	Null				

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 with the The Things Network, please follow these steps:

1. Click "GATEWAYS" on the console screen.

THETHINGS CONSOLE COMMUNITY EDITION	Applications Gateways Support 🕰 Christ 🤟
👋 Hi, C	hris1!
Welcome to The Thing This is where the magic happens. Here you can work with your data. Re collaborators a	gister applications, devices and gateways, manage your integrations,
APPLICATIONS	GATEWAYS

2. Click "register gateway".

	THINGS CONSOLE	Applications	Gateways	Support	Chris1	~
1	Gateways					
	GATEWAYS		1	😗 register	gateway	
	cui accesso FF		not connected	d AS_923	_925	

3. Enter the gateway information.

GISTER GATEWAY	
Cateway EUI he EUI of the gateway as read from the LoRa module	
24 E1 24 FF FE F0 13 2E	🥑 8 byt
I'm using the legacy packet forwarder Select this if you are using the legacy <u>Semtech packet forwarder</u> .	
Description human-readable description of the gateway	
requency Plan he <u>frequency plan</u> this gateway will use	
Asia 920-923MHz	
touter he router this gateway will connect to. To reduce latency, pick a router that is in a region which is close to the location of the gateway.	

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.

♥ URSALINK × +		-		×
\leftrightarrow \rightarrow \circlearrowright 192.168.1.1/login.html	四 女 🗉	- 0	٩	
192.168.1.1	English			
	CURSALINK			
	Lusemame			
	Password			
	Login			

2. Click "LoRaWAN" \rightarrow "Packet Forwarder" \rightarrow "General" to configure the general setting.

ÚRSALINK	y					
Status	General	Radios	Advanced	Custom	Traffic	
Lorawan	General Setting					
Packet Forwarder	Enable Mode		Packet Forwa	arder		
Network Server	Gateway EUI		24E124FFFE	F0132D		
Network 🕨	Gateway ID		24E124FFFE	F0132E		
	Server Address		ttn.opennetw	orkinfrastructure.or		
System 🕨	Server Up Port		1700			
	Server Down Port		1700			
Industrial F						
Maintenance 🕨	Save & Apply					

Status		General	Radios	Advanced	Custom	Traffic			
_oRaWAN	-	Radio Channe	I Setting						
		Supported Freq	uency			AS923	٣		
Packet Forwarder				Name				Center Frequency/MHz	
Network Server				Radio 0				923.6	
Network	×			Radio 1				922.6	
System		Multi Channel	s Setting						
.)		Er	nable	Index		Radio		Frequenc	y/MHz
ndustrial	•			0		Radio 0	۲	923.2	
Maintenance				1		Radio 0	٣	923.4	
Maintenance			2	2		Radio 0	٣	923.6	
NPP	×		2	3		Radio 1	•	922.2	
			2	4		Radio 1	٣	922.4	
				5		Radio 1	•	922.6	
			2	6		Radio 1	T	922.8	
				7		Radio 1	•	923.0	

3. Click "Radios" to configure the center frequency and channels.

5.2 Add UC11-N1 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.

Hi, Chris1! Welcome to The Things Network Console. This is where the magic happens. Here you can work with your data. Register applications, devices and gateways, manage your integrations, collaborators and settings.	·
Welcome to The Things Network Console. This is where the magic happens. Here you can work with your data. Register applications, devices and gateways, manage your integrations, collaborators and settings.	
This is where the magic happens. Here you can work with your data. Register applications, devices and gateways, manage your integrations, collaborators and settings.	
collaborators and settings.	
APPLICATIONS GATEWAYS	

2. Click "add application" .

THINGS CONSOLE		Applications	Gateways	Support	A Chris1	~
Applications						
					_	
APPLICATIONS				👴 add appl	ication	
dadf USRALINK		ttn-handler-ei	2C 26 C5	01 24 84 20 08		
sensor333 TEST		switch-handle	r 00 00 00	00 00 00 00 01		
	You are the network. Let's build this thing together. $- \frac{\text{The Things Network}}{\text{The Things Network}}$					

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

Note: Application EUI field is auto-generated by the TTN. This is required when setting up UC11-N1 that are associated to this application ID.

he unique identifier of your application	ation on the network		
Description			
Eg. My sensor network application			
Application EUI In application EUI will be issued for	The Things Network block for convenience, you o EUI issued by The 1	can add your own in the application settings page. Things Network	
Handler registration ielect the handler you want to regis	ter this application to		
	iter this application to		•

5.2.2 Add Devices to the Application

To add a UC11-N1 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 device Dev EUI. For instance, if the device has a Dev EUI of 0025ca00000000f then the Device ID is dev-0025ca000000000f.

3. Enter the Device EUI, App Key of UC11-N1.

Note: The App EUI field was previously auto-generated by the TTN network when the application ID was created. The application EUI is associated with the application ID and used by the TTN server to associate the device with the application ID.

				Payload Formats	Integrations		Settin
EGISTER DEVICE						bulkim	sport dev
Device ID This is the unique identifier for the dev	vice in this app. The device ID wi	II be immutable.					
Device EUI The device EUI is the unique identifier	r for this device on the network."	You can change the EUI late	E.				
×							0 bytes
App Key The App Key will be used to secure the	e communication between you d	evice and the network.					
		this field will be generated					
/							
							0
App EUI							0
App EUI							0

4. Click "Register" to complete registration.

5.2.3 Configure UC11-N1

Change the App EUI of UC11-N1 to the App EUI auto-generated by TTN.

	Ursalink ToolBox V2.6	Θ	
	LoRaWAN >		
Status	Basic Channel		_
General	Device EUI 24e1641192 App EUI 24e124c0002 Application Key 5572404c6996e6b4c6f526 Save		<u></u>
((0)) LoRaWAN			_
습 Upgrade	Firmware Version: 01.08 Hardware Version V1.0		_

5.3 Check Data Transmission on The Things Network

1. Click "Gateways" to check the Gateways status.

SS CONSOLE K COMMUNITY FDITION	Applications	Gateways	Support	Chris1	~
Gateways					
GATEWAYS		0	register gatewa		
eui-24e124fffef0132e USRALINK	• α	onnected	AS_920_923		

2. Click "Applications" and select the Applications, then go to "Data", you can find the data from UC11-N1.

GS CONSOLE community Edition	Applications	Gateways	Support	Chris1	~
Applications					
APPLICATIONS		•	add applicatio	0	
123454321 USRALINK	switch-handler	70 B3 D5 7E D6	00 7A C2		

NETW	ORK COMMU	ISOLE	N							Applic	ations Gatew	ays Su	ipport	Chris1
	Applications	> 📔 1	23454321	> Data										
								Overview	Devices	Payload Formats	Integrations	Data	Settings	
	APPLIC	ATION	DATA									II <u>pau</u>	se 🛍 <u>clear</u>	
	Filters	uplink	downlink	activation	ack	error								
	✓ 1 ²	time 1:23:03	counter	port 0		devid: <u>ursalink</u>							*	
	▲ 1 ²	4:23:01	3	8	retry confirmed	devid: <u>ursalink</u>	payload: 5	3 01 00 00 01	00 00 64					
	• 14	4:22:57		0		devid: <u>ursalink</u>							-11	
		4:22:55 4:22:52	3	8	retry confirmed	devid: <u>ursalink</u> devid: <u>ursalink</u>		3 01 00 0 <mark>0</mark> 01	00 00 64				-11	
		1:22:50	3		confirmed	devid: <u>ursalink</u>		53 01 00 00 01	00 00 6 <mark>4</mark>				-11	
	• 14	1:22:43		0		devid: <u>ursalink</u>								

-End-