
LoRaWAN application-grade gateway router



**—LoRa application-grade gateway
router(EU868MHz/US915MHz/AS923)**

Product name: LoRaWAN gateway router

Table of contents

Attention.....	3
Product introduction.....	4
1. Product definition.....	4
2. Interface introduction.....	5
3. Basic information.....	5
4. Restore factory setting.....	7
5. Gateway frequency setting.....	7
5.1. EU863-870.....	8
5.2. US902-928.....	8
5.3. AS923.....	9
6. Product dimension.....	10
7. Technical parameter.....	10
Installation:.....	12
1. SIM card installation.....	12
2. Installation of antenna.....	13
3. Installation of the whole kit.....	15

Accessory

Attention

- 1) Gateway should be installed in the place with at least 20 degrees of depression angle to building edges, and with at least 50cm clearance when installed at the side of a building wall.
- 2) LoRa Omni directional antenna should be as far as possible from the other antennas, and should be lower than the highest elevated point of the building.
- 3) The antenna should be installed vertically to the ground to achieve good effect.
- 4) Do the protection of lightning protection for gateway equipment, access network cable of gateway, gateway antennas(surge arrester/lightning protector), and make sure the antenna with the feeder to be connected to ground.
- 5) Using low power consumption RF coaxial cable of the feeder, as short as possible.
- 6) The feeder connector of antennas should be waterproof. If the feeder connector has been flooded for a long time, the contact resistance of the connector is increased, the line loss of the signal line is increased, and the antenna performance will be decreased.
- 7) If using 4G, you should choose a place with better LTE signal; The monthly traffic plan should be more than 6G (depending on the number of nodes).
- 8) When the gateway is power on, the sequence of connection is: firstly, connect one end of network cable to gateway, and then the other end of the network cable to POE power source or the end of POE exchanger, otherwise, the POE power source or POE exchanger port will be damaged.
- 9) If using the PC side browser, it is strongly recommended that you use Google or Firefox.
- 10) We suggest to connect POE splitter with backup power supply to prevent damage of the log stored in TF card after power cut. If there is big data stored in TF card, it'll take long time to restore the log of the TF card after restarting the gateway, and the gateway can work normally after you finished restoring the log of TF card.

Product introduction

1. Product definition

Shuncom Technology have launched the IoT base station gateway GW5000A based on low power LoRaWAN protocol, which can provide low power, mobile and safe local bidirectional communication service for IoT devices. LoRaWAN can simplify the interconnection of device, user and network, as well as provide standard.

LoRaWAN Gateway is designed to be used in long range star network architectures; it can achieve message delivery between front-end device and central network server. GW5000A is connected to the network server via standard IP connections while front-end devices use single-hop wireless communication to one or many GW5000A gateways.

The communication between front-end devices and GW5000A is established by different channels and data rate, which can be negotiated in advance. In order to save the battery life, GW5000A can maximize the power saving by implementing ADR(Adaptive Date Rate). With our IoT technology and our base station gateway GW5000A, users can then have their own IoT control system to achieve customized smart services, which will be widely applied in the fields of smart parking, smart fire-fighting, energy management, asset tracking, smart grid, industry 4.0, smart agriculture and ect in the future.

2. Interface introduction

Interface introduction

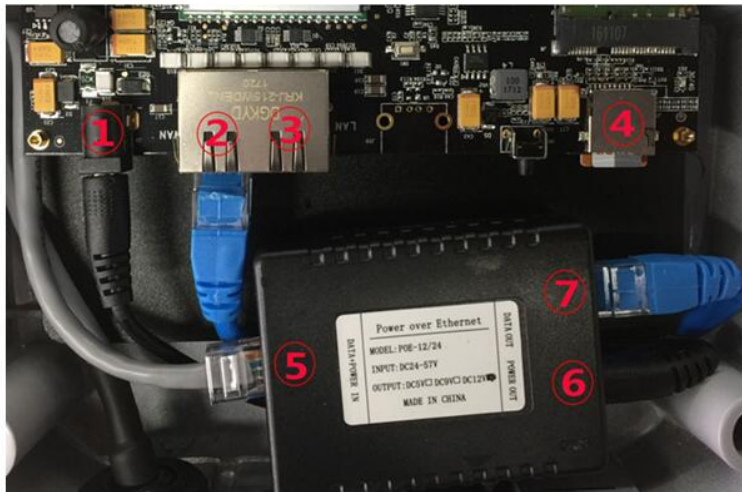


Port 1: 4G antenna **Port 2:** GPS antenna

Port 3: LoRa antenna **Port 4:** Wifi antenna

Port 5: standard POE input

Internal interface introduction



- ① Input(DC12V)
- ② WAN
- ③ LAN
- ④ Card slot(the above is for TF card; the below is for SIM card)
- ⑤ POE splitter input
- ⑥ POE splitter power output
- ⑦ POE splitter network output

3. Basic information

1) LAN IP: 192.168.3.1, DHCP server is enabled by default;

2) Web page default user: root, login password: WelcomeTo2018;

3) WAN open DHCP client by default, need to connect with router;

4) 4G/LTE: Europe LTE, US 4G, support automatic dialing by default;

5) Wi-Fi hotspot : GW5000_+the end 6 characters of gateway ID, password :

gateway2018better

6)WAN and 4G network, priority in using the WAN traffic by default, 4G as a backup. When WAN is not working, switch to 4G; Gateway needs to be able to get normal access to the internet, network delay(ping lora.smartkit.io)less than 50ms, if using Ethernet, network speed should be above 2M; If using 4G card, the monthly data access plan should be above 6G(it depends on the nodes quantity)

7) The default file format of TF card: FAT32, When the rest memory less than 2G, the oldest log files will be cleared.

8) The gateway ID naming rule : 0102+physical address of WAN, the previous two digits stand for the area where the gateway are using. For example:

00 CN470-510 (China)

01 EU863-870 (Europe)

02 US902-928 (USA)

03 Australia 915-928 (Australia)

04 Southeast Asia 920-923 (Southeast Asia)

05 Southeast Asia 923-925 (Southeast Asia)

9) Support foreign server, e.g. TTN;

10) Support reporting status regularly (WAN, LTE, LoRa, WiFi, TF card)

11) Support reporting LoRa configuration parameter regularly;

12) Support remote modification of LoRa parameter;

13) Support remote upgrade;

14) Support remote reboot;

15) Support remote administrator login and maintenance;

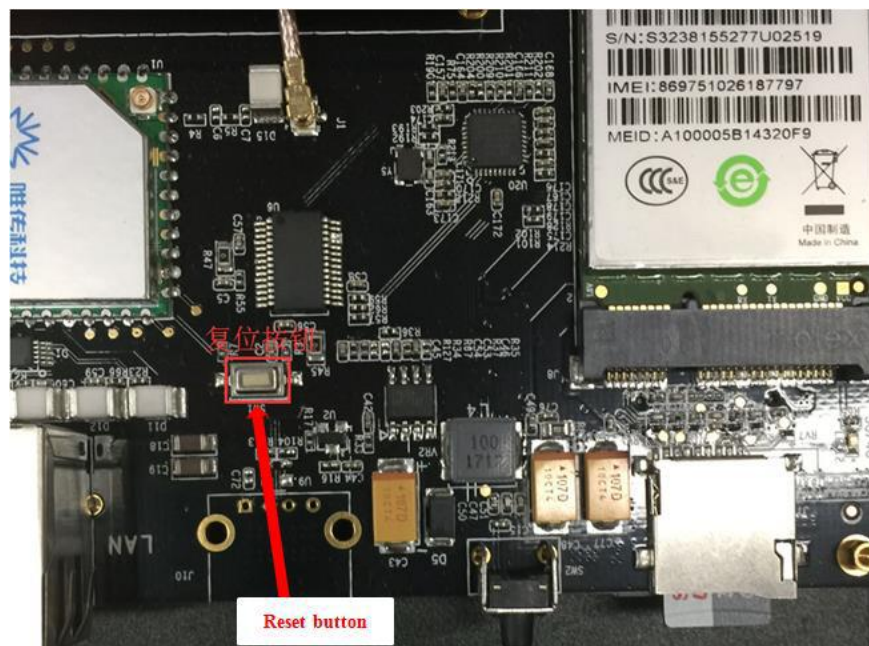
16) Support button or WEB operation to restore factory setting;

17) For security reasons, root login SSH2 and serial port have been disabled, and the account of login SSH2 and serial port is not open to the public.

4. Restore factory setting

If you've modified some parameters of gateway, and the gateway won't work properly, there are two methods to restore factory settings.

- 1) 1st method: press the reset button on the main board for more than 8 seconds(short press will restart the system) , the reset button is as below:



5. Gateway frequency setting

5.1. EU863-870

The default frequency is as below: (8 frequencies, from 867.1MHz to 868.5MHz) :

Channel plan No	Channel combination	Channel	8 frequencies No	Uplink frequency of node	The frequency of the 1st receiving window of node,BW125	The frequency of the 2nd receiving window of node	The center frequency setting of SX1257 of gateway	The offset of channel and SX1257 center frequency point
1 (A1B1)	A1	3	0	867.1	867.1	Frequency: 869.525M, bandwidth:125K,SF12	center frequency: 867.5	-400000
		4	1	867.3	867.3			-200000
		5	2	867.5	867.5			0
		6	3	867.7	867.7			200000
		7	4	867.9	867.9			400000
	B1	0	5	868.1	868.1		center frequency:868.5	-400000
		1	6	868.3	868.3			-200000
		2	7	868.5	868.5			0
		8	8	868.3(BW250SF7)				-200000
		9	9	868.8 (FSK,125K,datarate 50000)				300000

5.2.US902-928

Frequency as below: (Default: A1B1, the red part: 8 frequencies, from 902.3 MHz to 903.7MHz) :

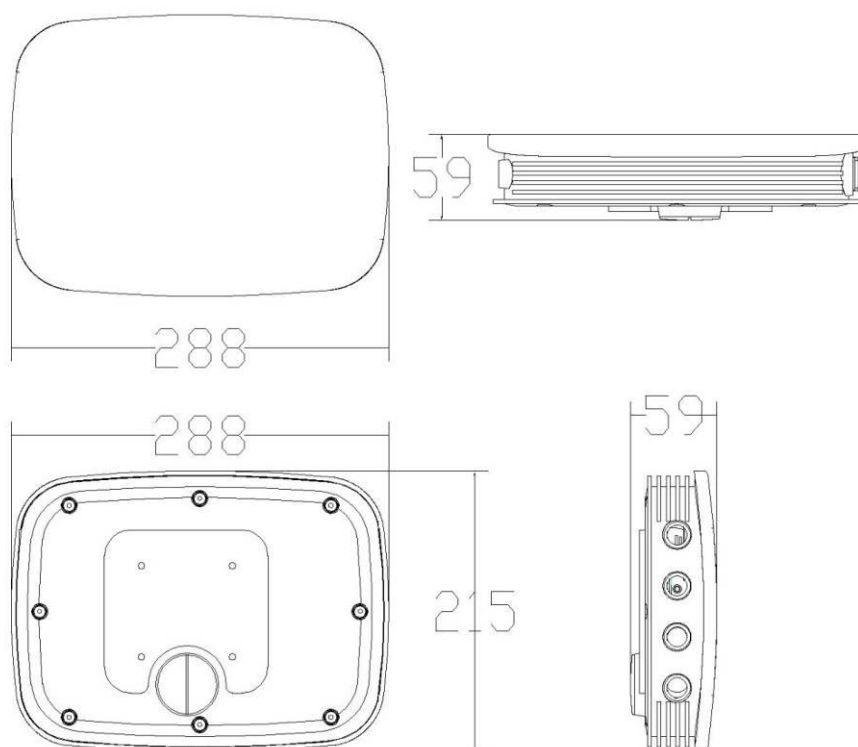
Channel plan No	Channel combination	Channel	64 frequencies No (with bandwidth of 125K)	Uplink frequency of node,BW125	The frequency of the 1st receiving window of node,BW500	The frequency of the 2nd receiving window of node	The center frequency setting of SX1257 of gateway	The offset of channel and SX1257 center frequency point
1 (A1B1)	A1	0	0	902.3	923.3	923.3M,SF12BW500	center frequency: 902.5	-200000
		1	1	902.5	923.9			0
		2	2	902.7	924.5			200000
		3	3	902.9	925.1			400000
	B1	4	4	903.1	925.7		center frequency: 903.3	-200000
		5	5	903.3	926.3			0
		6	6	903.5	926.9			200000
		7	7	903.7	927.5			400000
		8	903.0 BW500SF8					-300000
2 (A2B2)	A2	0	8	903.9	923.3	923.3M,SF12BW500	center frequency:904.1	-200000
		1	9	904.1	923.9			0
		2	10	904.3	924.5			200000
		3	11	904.5	925.1			400000
	B2	4	12	904.7	925.7		center frequency:904.9	-200000
		5	13	904.9	926.3			0
		6	14	905.1	926.9			200000
		7	15	905.3	927.5			400000
		8	904.6 BW500SF8					-300000
3 (A3B3)	A3	0	16	905.5	923.3	923.3M,SF12BW500	center frequency:905.7	-200000
		1	17	905.7	923.9			0
		2	18	905.9	924.5			200000
		3	19	906.1	925.1			400000
	B3	4	20	906.3	925.7		center frequency:906.5	-200000
		5	21	906.5	926.3			0
		6	22	906.7	926.9			200000
		7	23	906.9	927.5			400000
		8	906.2 BW500SF8					-300000
4 (A4B4)	A4	0	24	907.1	923.3	923.3M,SF12BW500	center frequency:907.3	-200000
		1	25	907.3	923.9			0
		2	26	907.5	924.5			200000
		3	27	907.7	925.1			400000
	B4	4	28	907.9	925.7		center frequency:908.1	-200000
		5	29	908.1	926.3			0
		6	30	908.3	926.9			200000
		7	31	908.5	927.5			400000
		8	907.8 BW500SF8					-300000
5 (A5B5)	A5	0	32	908.7	923.3	923.3M,SF12BW500	center frequency:908.9	-200000
		1	33	908.9	923.9			0
		2	34	909.1	924.5			200000
		3	35	909.3	925.1			400000
	B5	4	36	909.5	925.7		center frequency:909.7	-200000
		5	37	909.7	926.3			0
		6	38	909.9	926.9			200000
		7	39	910.1	927.5			400000
		8	909.4 BW500SF8					-300000
6 (A6B6)	A6	0	40	910.3	923.3	923.3M,SF12BW500	center frequency:910.5	-200000
		1	41	910.5	923.9			0
		2	42	910.7	924.5			200000
		3	43	910.9	925.1			400000
	B6	4	44	911.1	925.7		center frequency:911.3	-200000
		5	45	911.3	926.3			0
		6	46	911.5	926.9			200000
		7	47	911.7	927.5			400000
		8	911.0 BW500SF8					-300000
7 (A7B7)	A7	0	48	911.9	923.3	923.3M,SF12BW500	center frequency:912.1	-200000
		1	49	912.1	923.9			0
		2	50	912.3	924.5			200000
		3	51	912.5	925.1			400000
	B7	4	52	912.7	925.7		center frequency:912.9	-200000
		5	53	912.9	926.3			0
		6	54	913.1	926.9			200000
		7	55	913.3	927.5			400000
		8	912.6 BW500SF8					-300000
8 (A8B8)	A8	0	56	913.5	923.3	923.3M,SF12BW500	center frequency:913.7	-200000
		1	57	913.7	923.9			0
		2	58	913.9	924.5			200000
		3	59	914.1	925.1			400000
	B8	4	60	914.3	925.7		center frequency:914.5	-200000
		5	61	914.5	926.3			0
		6	62	914.7	926.9			200000
		7	63	914.9	927.5			400000
		8	914.2 BW500SF8					-300000

5.3. AS923

The default frequency is as below: (8 frequencies, from 923.2 MHz to 924.5MHz):

Channel plan No	Channel combination	Channel	8 frequencies No	Uplink frequency of node,BW125	The frequency of the 1st receiving window of node,BW125	The frequency of the 2nd receiving window of node	The center frequency setting of SX1257 of gateway	The offset of channel and SX1257 center frequency point
1 (A1B1)	A1	0	0	923.2	923.2	Frequency: 923.2M, bandwidth: 125K,SF10	center frequency:923.5	-300000
		1	1	923.4	923.4			-100000
		2	2	923.6	923.6			100000
		3	3	923.8	923.8			300000
	B1	4	4	924	924		center frequency: 924.4	-400000
		5	5	924.2	924.2			-200000
		6	6	924.4	924.4			0
		7	7	924.6	924.6			200000
		8	8	924.5 BW250SF7 924.8 (FSK,125K,data rate 50000)				100000
		9	9					400000

6. Product dimension



7. Technical parameter

Technical parameter	CPU	Industrial level CPU
		Linux system

Wireless parameter	LoRa data rate	300bps ~ 5.4Kbps
	Ethernet communication rate	100Mbps
	LTE communication rate	50Mbps
	Working frequency	EU868 US915 AS923
	Max transmitted power	25dbm
	Rx sensitivity	-143dBm
	Channels	9 settable channels (8 channels with the band width of 125KHz, adaptive data rate, support spreading factor of SF7~SF12, a 250KHz/500KHz high speed channel)
	Communication interface	1xLAN , 1xWAN , 1xWIFI , 1xLTE module
Electrical specification	Input	POE power supply with 48V input (24~48V)
	Working temperature	-30°C ~ 80°C
	Working humidity	10% ~ 90%
Physical parameter	IP grade	IP67
	Dimension	288mm*215mm*59mm
	Installation	Wall-mounted or with holding rod
	Certificate	CE/FCC
	Thunder protection	optional

Installation:



1. Using the hexagonal wrench to unscrew the eight screws on the back of the gateway router.



2. Insert the 4G SIM card (Telecom or Unicom or China Mobile) into the card slot (under TF card slot) with the chip outwards and the notch inwards.



3. Then tighten the screws on the back of the gateway router.



4. Then tighten the screws on the back of the gateway router.



5. Insert the LoRa feeder with one end into the LoRa port, the other end to LoRa antenna with sleeve



6. Install the gateway with LoRa antenna to the bracket using the holding rod.



7. Install the Wifi, 4G, GPS antennas into their port, and tighten them



8. Pass the network cable through the RJ45 waterproof rubber ring, press the crystal head, insert the RJ45, and tighten the waterproof ring.

1. SIM card installation

When the gateway is power off, open the gateway with a hexagon screwdriver. (As below

picture)



Insert the 4G SIM card (Telecom or Unicom or China Mobile) into the card slot with the chip outwards and the notch inwards. (As below picture)



2. Installation of antenna

The gateway is mounted on a pole and the antenna is up, and from left to right, the antennas are:

Wifi antenna, LoRa antenna, GPS antenna, and 4G antenna, fix the antenna to the corresponding

interface, as below:



3. Installation of the whole kit

