唯传科技
WINEXT
TECHNOLOGY

GW5000A LoRaWAN Gateway

User Manual

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Packing List

Packing list					
Image	Name	QTY	Image	Name	QTY
	Gateway	1pc		U shape buckle	2 sets
	POE power supply WL-PSE801	1set		little U shape buckle	2 sets
	LoRa antenna	1pc		Shrinkable tube	3pcs
	4G antenna	1pc		Hexagon spanner, Φ5	1pc
	WIFI antenna	1pc		Inner hexagon screw, M6*14	6pcs
	GPS antenna	1pc		Feeder connection	1pc
	Fixed mount	1pc		Ground wire, M*6	1pc
	Fixed seat	1pc		Grounding screw, M3*6	1pc
	Plastic tweezers	1pc		Electrical tape	1pc
	Hoop	3pcs			

Precautions:

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 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) It is recommended to connect a POE splitter with a backup power supply to prevent the logs stored in the TF card from being damaged after a power failure. If there is a lot of data stored in the TF card, it takes a long time to restore the logs of the TF card after restarting the

gateway, and the gateway can work normally only after the logs of the TF card are restored.

The gateway can only work normally after restoring the logs from the TF card..

Description

1. Product Description

The GW5000A is a cutting-edge Industrial-grade IoT gateway operating on the energy-efficient LoRaWAN protocol, offering a versatile suite of wireless communication capabilities including LoRa, 2G/3G/4G, WiFi, and GPS. This gateway enables the deployment of scalable IoT control systems that deliver tailored smart services with ease.

With its star topology, the GW5000A facilitates seamless single-hop wireless communication from end devices to one or multiple gateways, ensuring reliable connectivity between terminal devices and cloud infrastructure. Alternatively, it can establish connections to cloud servers through standard IP protocols.

Ideal for a broad spectrum of applications, the GW5000A is a key component in smart solutions for parking, fire safety, livestock tracking, asset management, cable monitoring in power systems, intelligent street lighting, precision agriculture, and environmental monitoring.

2. Operation condition

1) Install the gateway and make sure that it’s set up firmly;
2) Install all the antennas: 4G, LoRa and GPS antennas;
3) make sure there is at least one way for data backhaul, Ethernet or 4G;
4) If LTE is used as the way for data backhaul, the monthly data access plan of LTE should be greater than 4G, and the specific traffic depends on the number of nodes and will change appropriately, and the 4G signal coverage in the place where the gateway is set up must be good.
5) Make sure the gateway be powered by PoE or solar.
6) Configure the LoRaWAN network server, add the gateway ID to the server, and open the UDP port of the server, allowing it to be ping (the gateway will use the server IP as the ping diagnostic address);
7) Configure the gateway's frequency point plan in the gateway WEB page, and there

are a defaulted setting.

8) Make sure the gateway's network (whether WAN or 4G is used) is normal, and the gateway ping server delay is no less than 100ms, and the recommendation is no less than 50ms (PUSH_ACK can be received). If the delay is too long, and when the server sends the data, it may miss the node RX1 receiving window of Class A.

9) In the gateway interface, you can check whether the LoRa part is working and you can check the log of the LoRa data.

10) Operation temperature: -40℃ ~ 80℃; Operation humidity: 5%~95%; Altitude below 5,000 meters.

11) If gateway is required to support Class B, GPS must be able to locate and synchronize normally in the place where the gateway is located (without GPS signal, gateway only supports Class A/C, as Class B requires GPS PPS signal to be provided to SX1301).

3. Interface Description

No.	Description	Remark	No.	Description	Remark
1	LoRa-1 Antenna Interface	Backup interface	2	LTE Antenna Interface	
3	GPS Antenna Interface		4	LoRa-2 Antenna Interface	
5	POE&WAN Interface		6	WIFI Antenna	
7	SYS System Indicator		8	SIM card slot	Standard SIM Card
9	TF Card Slot				

4. 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) Wifi: 2.4GHz, AP mode, max transmit power:18dBm; WiFi 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) Support foreign server, e.g. TTN;

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

10) Support reporting LoRa configuration parameter regularly;

11) Support remote modification of LoRa parameter;

12) Support remote upgrade;

13) Support remote reboot;

14) Support remote administrator login and maintenance;

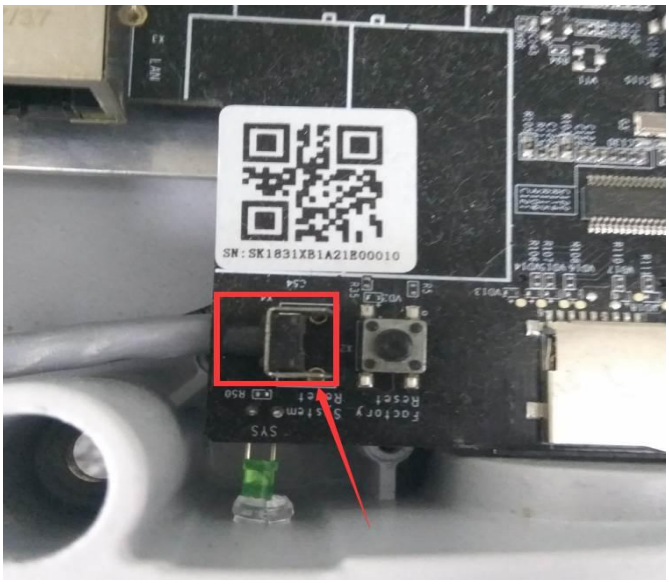
15) Support button or WEB operation to restore factory setting;

16) 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.

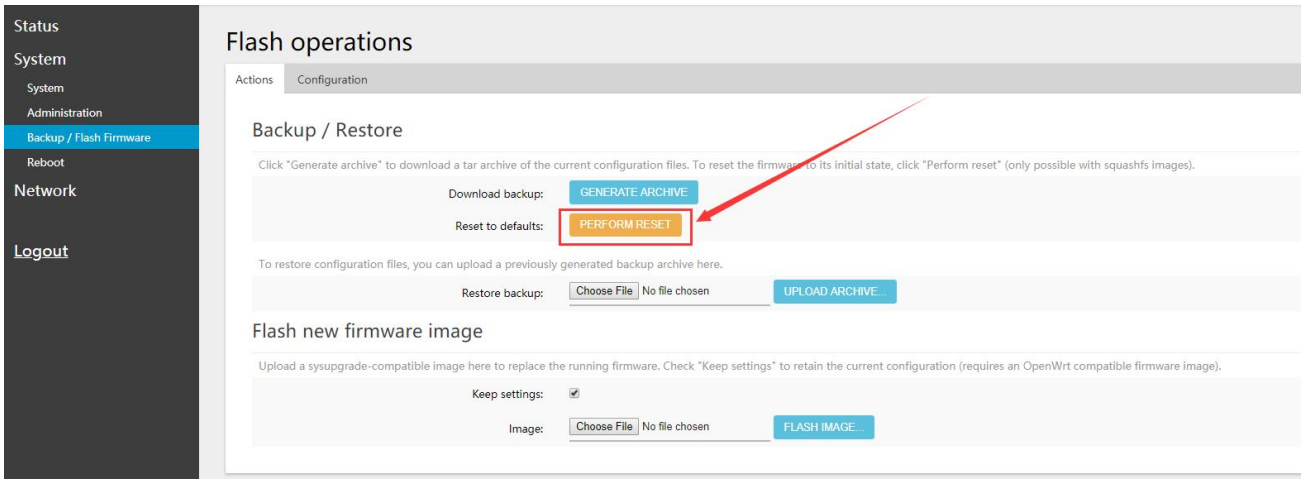
5. Restore factory setting

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:



2) 2nd method: Login the following interface:



Wait 1~2 minutes, then login.

6. Gateway frequency setting

6.1 EU863-870MHz

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

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

6.2 AS923

It consists of AS920-923MHz and AS923-925MHz, as below:

1) **AS920-923MHz defaulted frequency:**

Frequency-plans	Channel combination	Gateway channel number	10 frequency points	Uplink(SF7BW125 to SF12BW125)	Downlink RX1(SF7BW125 to SF12BW125)	Downlink RX2	SX1257 center	chan offset
1 (A1B1)	A1	0	0	922	922	923.2-BW125SF10	922.2	-20000
		1	1	922.2	922.2			0
		2	2	922.4	922.4			200000
		3	3	922.6	922.6			400000
			8	921.8 (FSK,datarate 50000)				-400000
			9	922.1 BW250SF7				-100000
	B1	4	4	922.8	922.8		923.2	-400000
		5	5	923	923			-200000
		6	6	923.2	923.2			0
		7	7	923.4	923.4			200000

2) **AS923-925MHz defaulted frequency:**

Frequency-plans	Channel combination	Gateway channel number	10 frequency points	Uplink(SF7BW125 to SF12BW125)	Downlink RX1(SF7BW125 to SF12BW125)	Downlink RX2	SX1257 center	chan offset
1 (A1B1)	A1	0	0	923.2	923.2	923.2-BW125SF10	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		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				100000
		9	9	924.8 (FSK,datarate				400000

6.3 US902-928MHz

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

Frequency-plans	Channel combination	Gateway channel number	64 frequency points	Uplink(SF7BW125 to SF12BW125)	Downlink RX1(SF7BW125 to SF12BW125)	Downlink RX2	SX1257 center	chan offset
1 (A1B1)	A1	0	0	902.3	923.3	923.3-BW500SF12	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		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	923.3-BW500SF12	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		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	923.3-BW500SF12	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		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	923.3-BW500SF12	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		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	923.3-BW500SF12	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		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	923.3-BW500SF12	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		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	923.3-BW500SF12	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		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	923.3-BW500SF12	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		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

6.4 AU915-928MHz

The defaulted is: A1B1, as below:

Frequency-plans	Channel combination	Gateway channel number	64 frequency points	Uplink(SF7BW125 to SF12BW125)	Downlink RX1(SF7BW125 to SF12BW125)	Downlink RX2	SX1257 center	chan offset
1 (A1B1)	A1	0	0	915.2	923.3	923.3-BW500SF12	915.6	-400000
		1	1	915.4	923.9			-200000
		2	2	915.6	924.5			0
		3	3	915.8	925.1			200000
		8		915.9 BW500SF8	923.3			300000
	B1	4	4	916	925.7		916.3	-300000
		5	5	916.2	926.3			-100000
		6	6	916.4	926.9			100000
		7	7	916.6	927.5			300000
2 (A2B2)	A2	0	8	916.8	923.3	923.3-BW500SF12	917.2	-400000
		1	9	917	923.9			-200000
		2	10	917.2	924.5			0
		3	11	917.4	925.1			200000
		8		917.5 BW500SF8	923.9			300000
	B2	4	12	917.6	925.7		917.9	-300000
		5	13	917.8	926.3			-100000
		6	14	918	926.9			100000
		7	15	918.2	927.5			300000
3 (A3B3)	A3	0	16	918.4	923.3	923.3-BW500SF12	918.8	-400000
		1	17	918.6	923.9			-200000
		2	18	918.8	924.5			0
		3	19	919	925.1			200000
		8		919.1 BW500SF8	924.5			300000
	B3	4	20	919.2	925.7		919.5	-300000
		5	21	919.4	926.3			-100000
		6	22	919.6	926.9			100000
		7	23	919.8	927.5			300000
4 (A4B4)	A4	0	24	920	923.3	923.3-BW500SF12	920.4	-400000
		1	25	920.2	923.9			-200000
		2	26	920.4	924.5			0
		3	27	920.6	925.1			200000
		8		920.7 BW500SF8	925.1			300000
	B4	4	28	920.8	925.7		921.1	-300000
		5	29	921	926.3			-100000
		6	30	921.2	926.9			100000
		7	31	921.4	927.5			300000
5 (A5B5)	A5	0	32	921.6	923.3	923.3-BW500SF12	922	-400000
		1	33	921.8	923.9			-200000
		2	34	922	924.5			0
		3	35	922.2	925.1			200000
		8		922.3 BW500SF8	925.7			300000
	B5	4	36	922.4	925.7		922.7	-300000
		5	37	922.6	926.3			-100000
		6	38	922.8	926.9			100000
		7	39	923	927.5			300000
6 (A6B6)	A6	0	40	923.2	923.3	923.3-BW500SF12	923.6	-400000
		1	41	923.4	923.9			-200000
		2	42	923.6	924.5			0
		3	43	923.8	925.1			200000
		8		923.9 BW500SF8	926.3			300000
	B6	4	44	924	925.7		924.3	-300000
		5	45	924.2	926.3			-100000
		6	46	924.4	926.9			100000
		7	47	924.6	927.5			300000
7 (A7B7)	A7	0	48	924.8	923.3	923.3-BW500SF12	925.2	-400000
		1	49	925	923.9			-200000
		2	50	925.2	924.5			0
		3	51	925.4	925.1			200000
		8		925.5 BW500SF8	926.9			300000
	B7	4	52	925.6	925.7		925.9	-300000
		5	53	925.8	926.3			-100000
		6	54	926	926.9			100000
		7	55	926.2	927.5			300000
8 (A8B8)	A8	0	56	926.4	923.3	923.3-BW500SF12	926.8	-400000
		1	57	926.6	923.9			-200000
		2	58	926.8	924.5			0
		3	59	927	925.1			200000
		8		927.1 BW500SF8	927.5			300000
	B8	4	60	927.2	925.7		927.5	-300000
		5	61	927.4	926.3			-100000
		6	62	927.6	926.9			100000
		7	63	927.8	927.5			300000

6.5 KR920-923MHz

The defaulted is as below:

Frequency-plans	Channel combination	Gateway channel number	8 frequency points	Uplink(SF7BW125 to SF12BW125)	Downlink RX1(SF7BW125 to SF12BW125)	Downlink RX2	SX1257 center	chan offset
1 (A1B1)	A1	0	0	921.9	921.9	921.9-BW125SF12	922.3	-400000
		1	1	922.1	922.1			-200000
		2	2	922.3	922.3			0
		3	3	922.5	922.5			200000
	B1	4	4	922.7	922.7		923	-300000
		5	5	922.9	922.9			-100000
		6	6	923.1	923.1			100000
		7	7	923.3	923.3			300000

6.6 RU864-870MHz

The defaulted is as below:

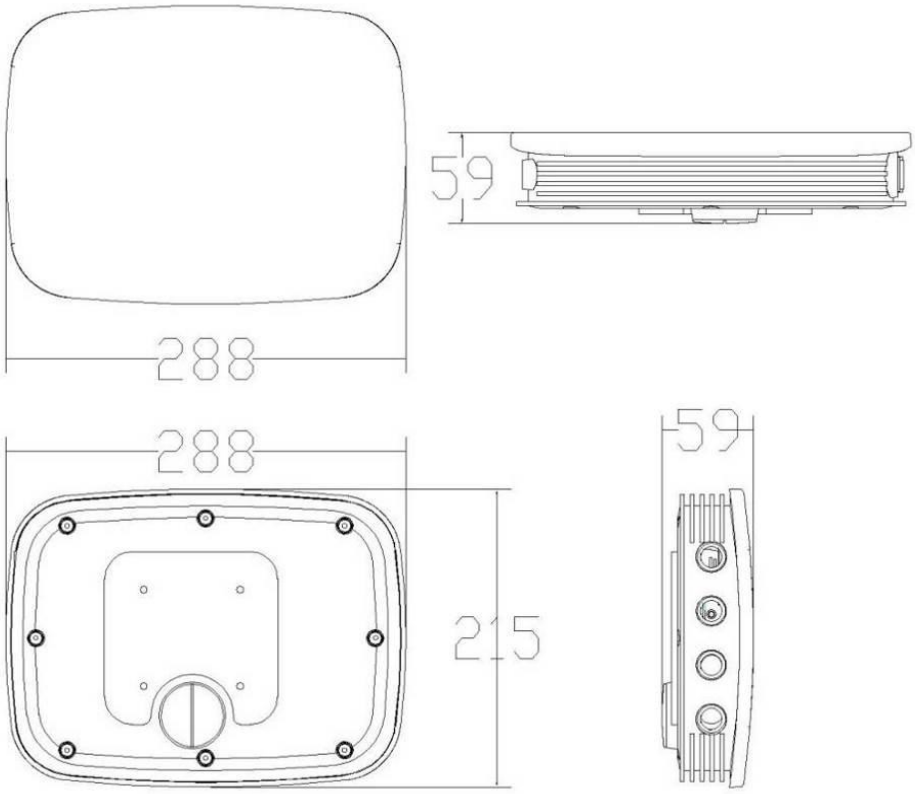
Frequency-plans	Channel combination	Gateway channel number	8 frequency points	Uplink(SF7BW125 to SF12BW125)	Downlink RX1(SF7BW125 to SF12BW125)	Downlink RX2	SX1257 center	chan offset
1 (A1B1)	A1	0	0	864.1	864.1	869.1-BW125SF12	864.5	-400000
		1	1	864.3	864.3			-200000
		2	2	864.5	864.5			0
		3	3	864.7	864.7			200000
	B1	4	4	868.7	868.7		869	-300000
		5	5	868.9	868.9			-100000
		6	6	869.1	869.1			100000
		7	7	869.3	869.3			300000
		8	8	868.8(BW250SF7)				-200000
		9	9	869.4 (FSK,datarate 50000)				400000

6.7 CN470-510MHz

The defaulted is in red part as below:

Frequency-plans	Channel combination	Gateway channel number	96 frequency points	Uplink(SF7BW125 to SF12BW125)	Downlink RX1(SF7BW125 to SF12BW125)	Downlink RX2	SX1255 center	chan offset
1 (A1B1)	A1	0	0	470.3	500.3	505.3-SF12BW125	470.6	-300000
		1	1	470.5	500.5			-100000
		2	2	470.7	500.7			100000
		3	3	470.9	500.9			300000
	B1	4	4	471.1	501.1		471.4	-300000
		5	5	471.3	501.3			-100000
		6	6	471.5	501.5			100000
		7	7	471.7	501.7			300000
2 (A2B2)	A2	0	8	471.9	501.9	505.3-SF12BW125	472.2	-300000
		1	9	472.1	502.1			-100000
		2	10	472.3	502.3			100000
		3	11	472.5	502.5			300000
	B2	4	12	472.7	502.7		473	-300000
		5	13	472.9	502.9			-100000
		6	14	473.1	503.1			100000
		7	15	473.3	503.3			300000
3 (A3B3)	A3	0	16	473.5	503.5	505.3-SF12BW125	473.8	-300000
		1	17	473.7	503.7			-100000
		2	18	473.9	503.9			100000
		3	19	474.1	504.1			300000
	B3	4	20	474.3	504.3		474.6	-300000
		5	21	474.5	504.5			-100000
		6	22	474.7	504.7			100000
		7	23	474.9	504.9			300000
4 (A4B4)	A4	0	24	475.1	505.1	505.3-SF12BW125	475.4	-300000
		1	25	475.3	505.3			-100000
		2	26	475.5	505.5			100000
		3	27	475.7	505.7			300000
	B4	4	28	475.9	505.9		476.2	-300000
		5	29	476.1	506.1			-100000
		6	30	476.3	506.3			100000
		7	31	476.5	506.5			300000
5 (A5B5)	A5	0	32	476.7	506.7	505.3-SF12BW125	477	-300000
		1	33	476.9	506.9			-100000
		2	34	477.1	507.1			100000
		3	35	477.3	507.3			300000
	B5	4	36	477.5	507.5		477.8	-300000
		5	37	477.7	507.7			-100000
		6	38	477.9	507.9			100000
		7	39	478.1	508.1			300000
6 (A6B6)	A6	0	40	478.3	508.3	505.3-SF12BW125	478.6	-300000
		1	41	478.5	508.5			-100000
		2	42	478.7	508.7			100000
		3	43	478.9	508.9			300000
	B6	4	44	479.1	509.1		479.4	-300000
		5	45	479.3	509.3			-100000
		6	46	479.5	509.5			100000
		7	47	479.7	509.7			300000
7 (A7B7)	A7	0	48	479.9	500.3	505.3-SF12BW125	480.2	-300000
		1	49	480.1	500.5			-100000
		2	50	480.3	500.7			100000
		3	51	480.5	500.9			300000
	B7	4	52	480.7	501.1		481	-300000
		5	53	480.9	501.3			-100000
		6	54	481.1	501.5			100000
		7	55	481.3	501.7			300000
8 (A8B8)	A8	0	56	481.5	501.9	505.3-SF12BW125	481.8	-300000
		1	57	481.7	502.1			-100000
		2	58	481.9	502.3			100000
		3	59	482.1	502.5			300000
	B8	4	60	482.3	502.7		482.6	-300000
		5	61	482.5	502.9			-100000
		6	62	482.7	503.1			100000
		7	63	482.9	503.3			300000
9 (A9B9)	A9	0	64	483.1	503.5	505.3-SF12BW125	483.4	-300000
		1	65	483.3	503.7			-100000
		2	66	483.5	503.9			100000
		3	67	483.7	504.1			300000
	B9	4	68	483.9	504.3		484.2	-300000
		5	69	484.1	504.5			-100000
		6	70	484.3	504.7			100000
		7	71	484.5	504.9			300000
10 (A10B10)	A10	0	72	484.7	505.1	505.3-SF12BW125	485	-300000
		1	73	484.9	505.3			-100000
		2	74	485.1	505.5			100000
		3	75	485.3	505.7			300000
	B10	4	76	485.5	505.9		485.8	-300000
		5	77	485.7	506.1			-100000
		6	78	485.9	506.3			100000
		7	79	486.1	506.5			300000
11 (A11B11)	A11	0	80	486.3	506.7	505.3-SF12BW125	486.6	-300000
		1	81	486.5	506.9			-100000
		2	82	486.7	507.1			100000
		3	83	486.9	507.3			300000
	B11	4	84	487.1	507.5		487.4	-300000
		5	85	487.3	507.7			-100000
		6	86	487.5	507.9			100000
		7	87	487.7	508.1			300000
12 (A12B12)	A12	0	88	487.9	508.3	505.3-SF12BW125	488.2	-300000
		1	89	488.1	508.5			-100000
		2	90	488.3	508.7			100000
		3	91	488.5	508.9			300000
	B12	4	92	488.7	509.1		489	-300000
		5	93	488.9	509.3			-100000
		6	94	489.1	509.5			100000
		7	95	489.3	509.7			300000

7. Product Dimension

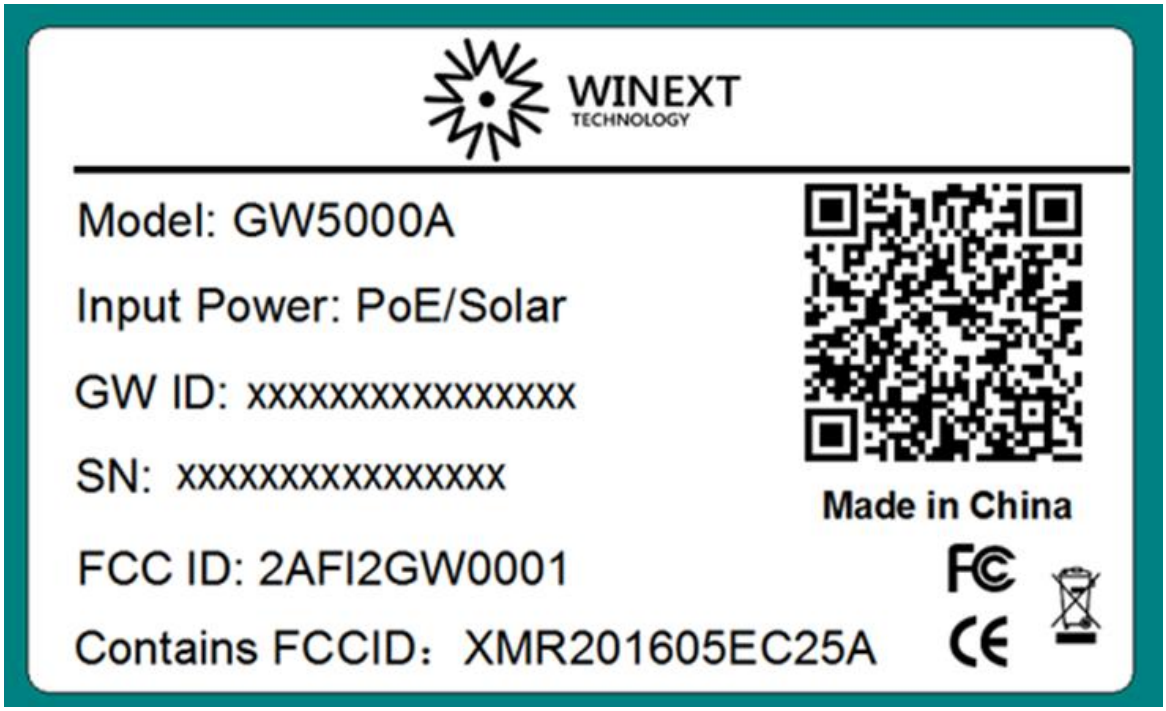


8. Technical parameter

Technical parameter	**CPU**	Industrial Grade CPU operating at 400MHZ
	System	Linux-3.18.27 (32-bit system,128kB L2 cache)
Wireless parameter	**LoRa data rate**	292bps ~ 5.4Kbps
	Ethernet communication rate	100Mbps
	LTE communication rate	50Mbps
	Working frequency	CN470~510MHz EU863~870MHz; US902~928MHz; AS920~925MHz; AU915~928MHz; KR920~923MHz; RU864~870MHz IN865-867MHz
	Transmission power	17dBm (26dBm Max)
	Rx sensitivity	-142dBm@SF12 (half-duplex)/-138dBm@SF12 (full-duplex)
	Channels	8 Data Channels , 1 Control Channel
	Communication interface	1xLAN ，1xWAN ， 1xWIFI，1xLTE module
Electrical specification	**Input**	POE power supply with 48V input (24~48V)
	Working temperature	-40℃ ~ 80℃
	Working humidity	5% ~ 95%
Physical parameter	**IP grade**	IP67
	Dimension	288mm*215mm*59mm
	Installation	Wall-mounted or Pole-mounted
	Certificate	CE/FCC
	Thunder protection	optional

9. Label

Neutral label as below:



Remark:

The “manufacturer address xxxxxx” and “importer name xxxxx, address xxxxx” shall be provided on the product before the product into the market.

Model on label above can be replaced by other models.

Installation:

1.Open the SIM/TF card slot cover with a large screwdriver.

2.Insert SIM card into the card slot with the chip side upwards and the notch inwards.

3.Install the fixed seat on the back of the gateway with inner hexagon screws.

4.Install the gateway with U shape buckle to the holding pole and fix gateway with inner hexagon screws, and then install the LoRa antenna to the holding pole.

5.Wrap the antennas of wifi, 4G and GPS with shrinkable tube from the antenna port, and then tighten the antennas.

6.Usage of shrinkable tube: grasp the bottom about 2cm of the shrinkable tube with your left hand, and pull it up with your right hand until you pull all it up.

7.Connect one end of the feeder to the LoRa antenna port on the gateway, and the other end of the feeder to the LoRa antenna and tighten.

8.Pass the network cable through the RJ45 waterproof rubber ring, press the crystal head, insert the RJ45, and tighten the waterproof ring. Wrap a waterproof tape around the waterproof gasket when power on the gateway normally.

1. SIM card installation

Note: Supported LTE models as below:

LTE models	**China:** LTE-TDD : B38/B39/B40/B41; LTE-FDD: B1/B3/B5/B7/B8; TD-SCDMA: B34/B39; UMTS: B1/8; EVDO: 800MHz; CDMA1x: 800MHz; GSM: 850/900/1800/1900 **Europe:** FDD LTE: B1/B3/B5/B8/B20; TDD LTE: B38/B40/B41; WCDMA: B1/B5/B8; GSM: B3/B8 **America:** FDD LTE: B2/B4/B12; WCDMA: B2/B4/B5

Insert SIM card into the card slot with the chip side upwards and the notch inwards(there are two card slots, the above one is for TF card, the below one is for standard SIM card) :

2. Installation of antenna

The gateway is mounted on a pole and the antenna is up, and from left to right, the antennas are: LoRa antenna, GPS antenna, and 4G antenna, fix the antenna to the corresponding interface, as below:

3. Installation of the whole kit


ground
cable(yellow)


ground cable(yellow)

4. Power supply instruction

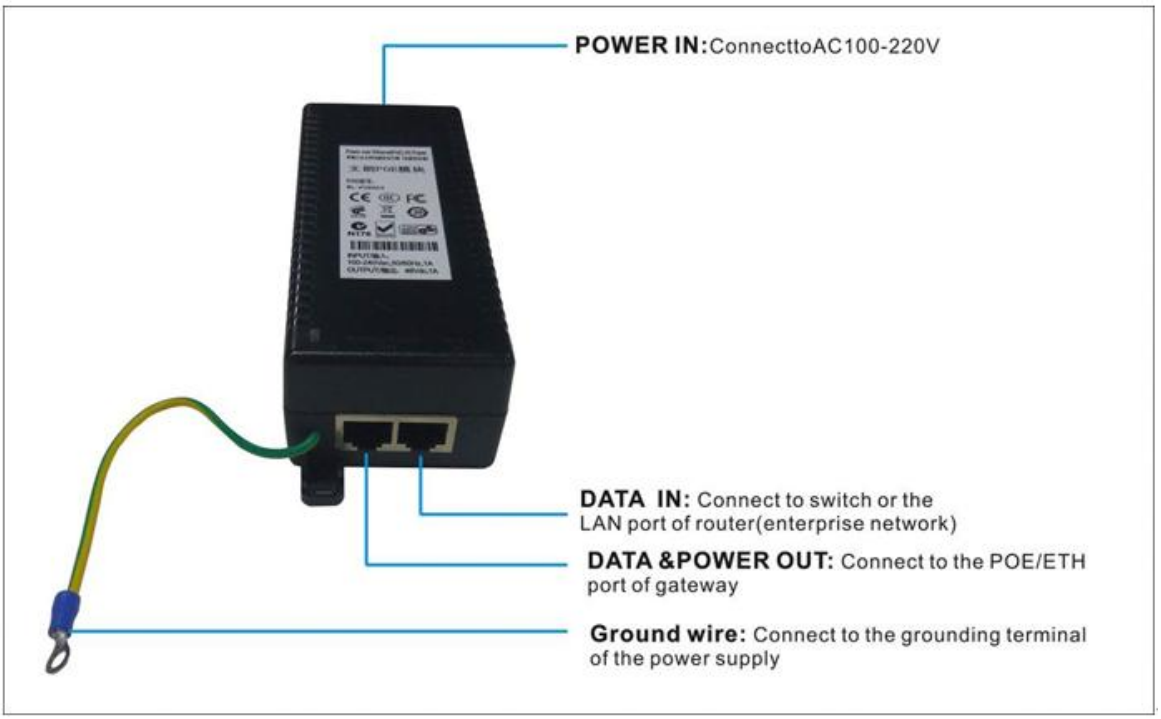
Powered by POE, as below:

Notes:

For GW5000A version 3.4, it should be with the POE model of WL-PSE801;

While GW5000A version 2.0 should be with the POE model of WL-PSE803.

The POE is in the accessory package of the gateway, pls don't use POE from others.

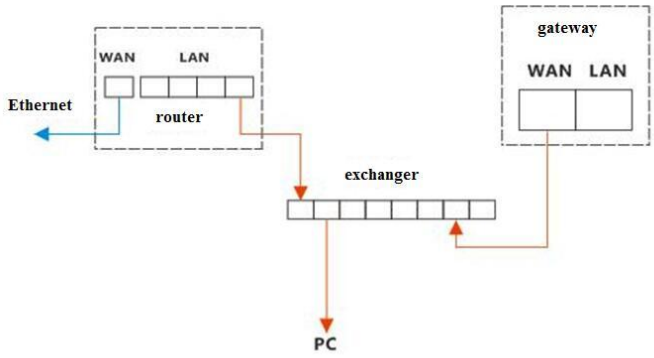


(POE ports diagram)

Network setting

1. Routing mode of network

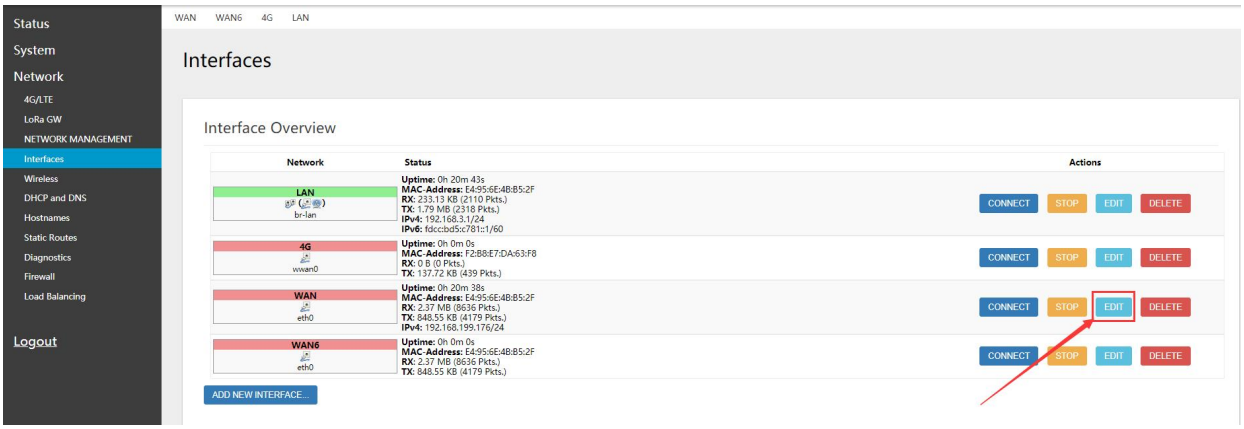
Splitter（exchanger） cable is connected to the WAN port, as below:



Remark：

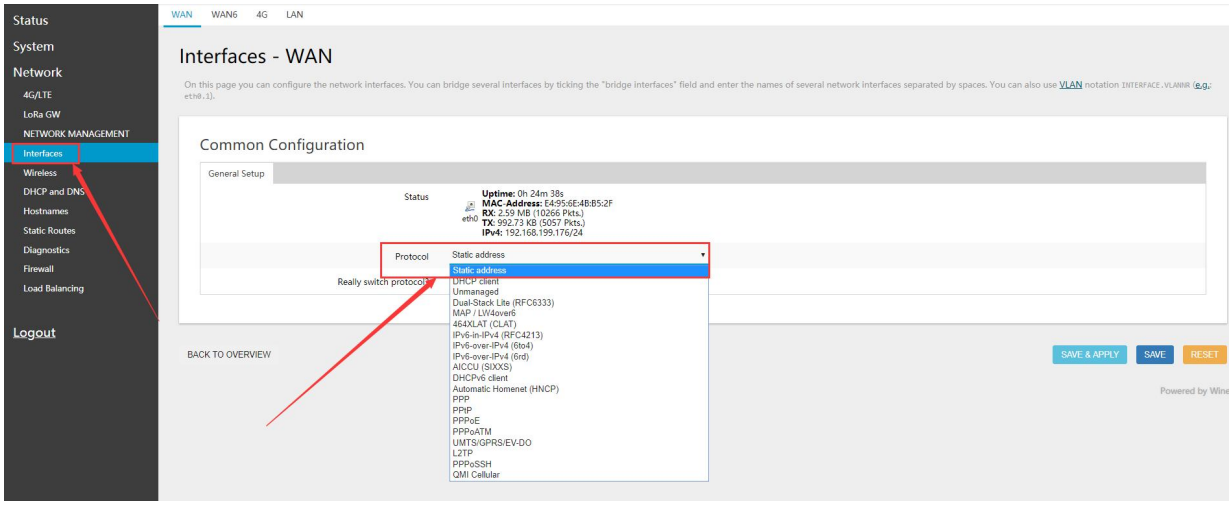
The router that the gateway is connected must be able to connect to Internet, and you should start the DHCP function for the router, and then the gateway automatically obtains the IP. If you do not start DHCP, or because of network security management, you need to assign a fixed IP to the gateway, then manually modify the assigned IP address in the gateway interface, as below:

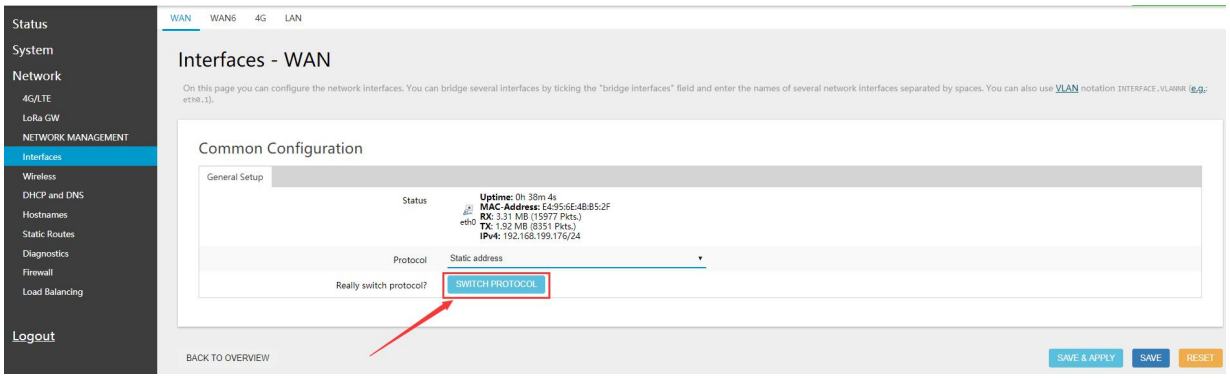
Select “Network/interfaces”, enter “interface overview”, come to WAN, then you can choose “EDIT” to modify, as below:



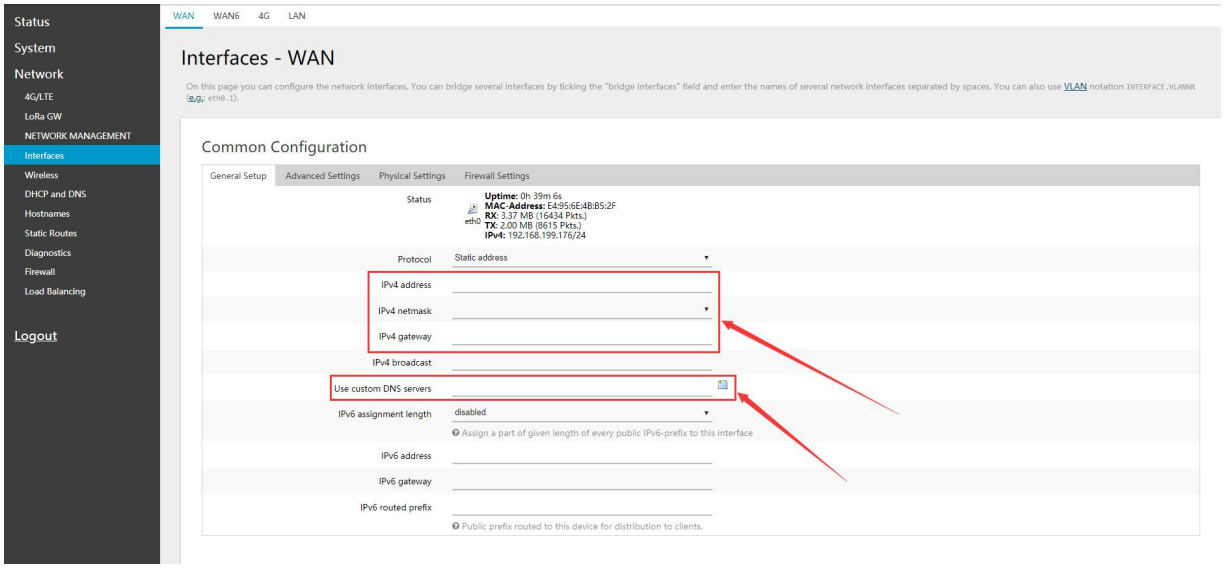
In “interfaces-WAN”, choose the Protocol to “DHCP client” and then “SAVE&APPLY”, then

choose “Static address” in Protocol, then click “Switch protocol”, as below:



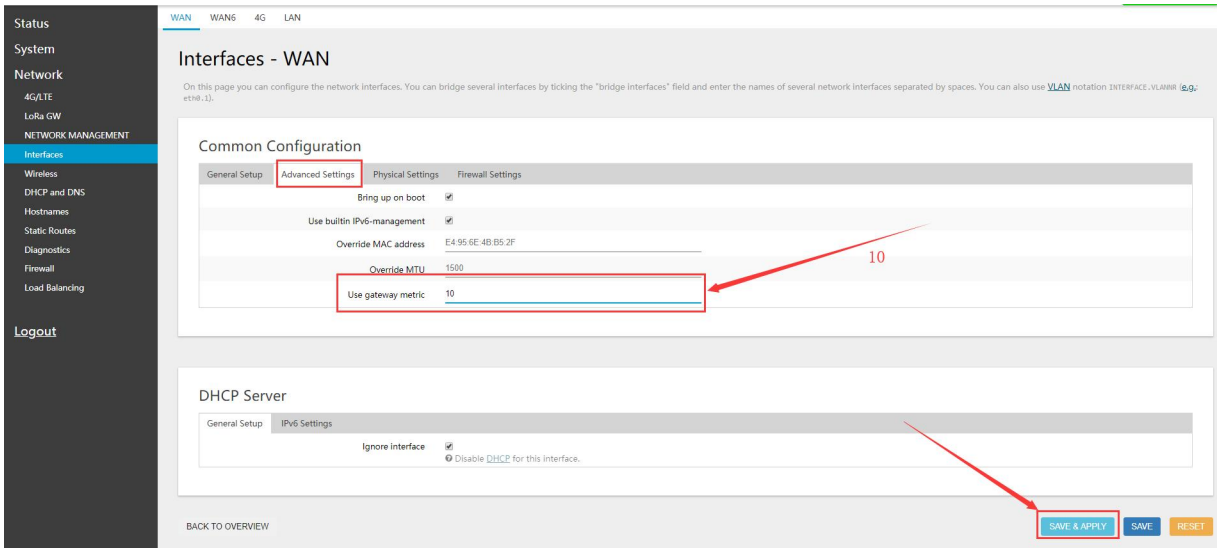


Then, you’ll come to the below interface, and input the following items:



In “Advanced Settings”, modify the “Use gateway metric” to be 10, click “SAVE&APPLY”,

as below:

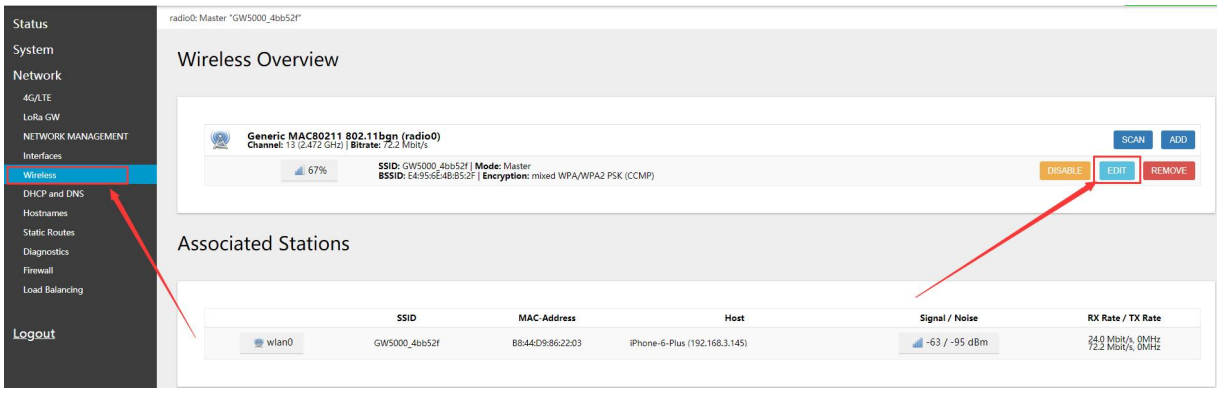


2. Wi-Fi setting

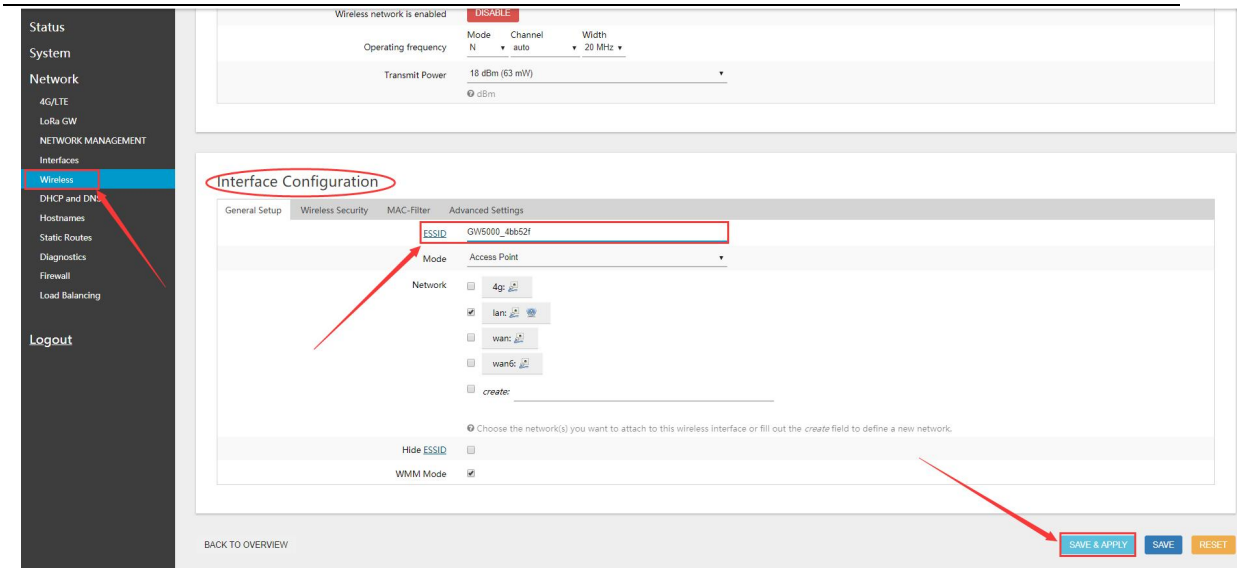
The default Wi-Fi ESSID: **GW5000_+ the last 6 characters of gateway ID**

The default password: **gateway2018better**

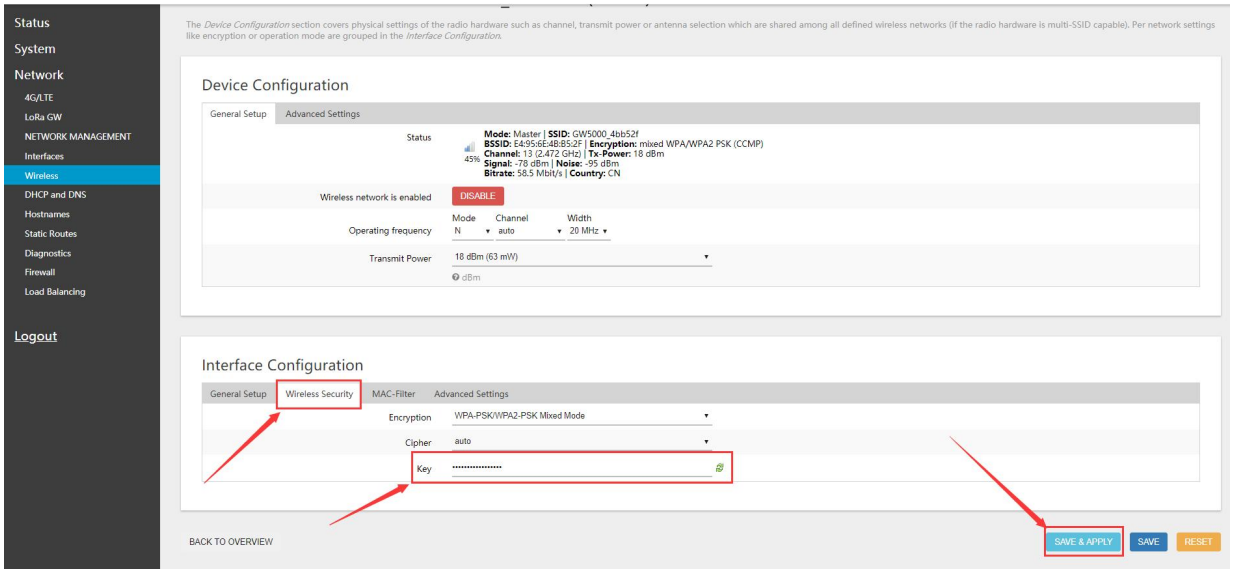
If you'd like to modify, click "Network/wireless/edit, as below:



Then, you'll come to wireless network interface, pulldown to "Interface C onfiguration", in the "General Setup", you can modify "ESSID"(wifi hotspot), then click "SAVE&APPLY", as below:

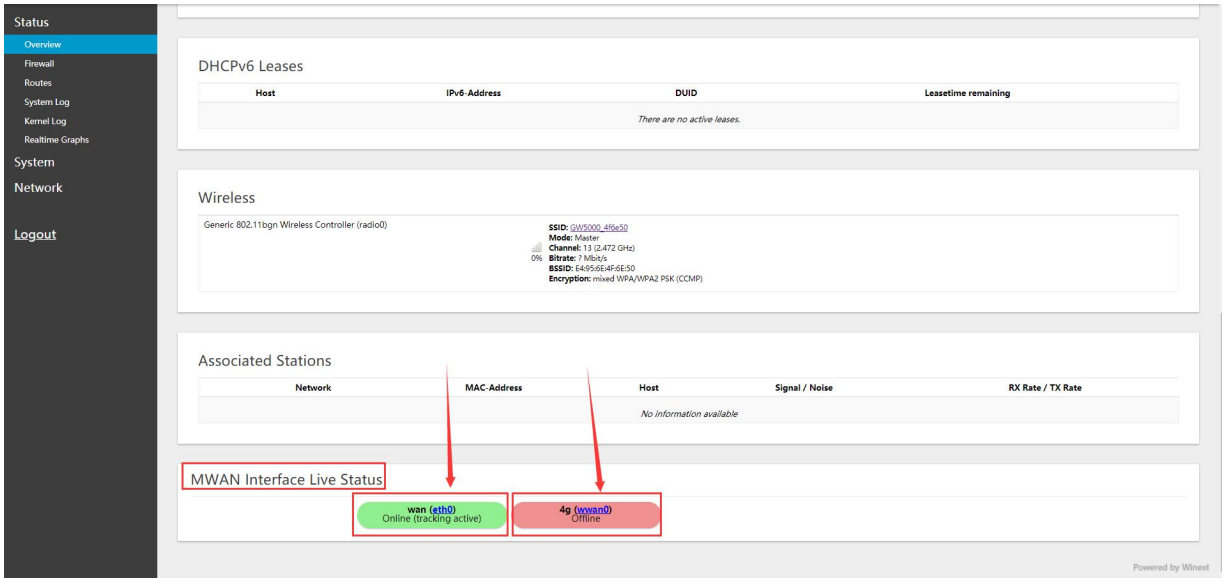


In “Wireless Security”, you can modify the password of wifi hotspot, click “SAVA&APPLY”, as below:



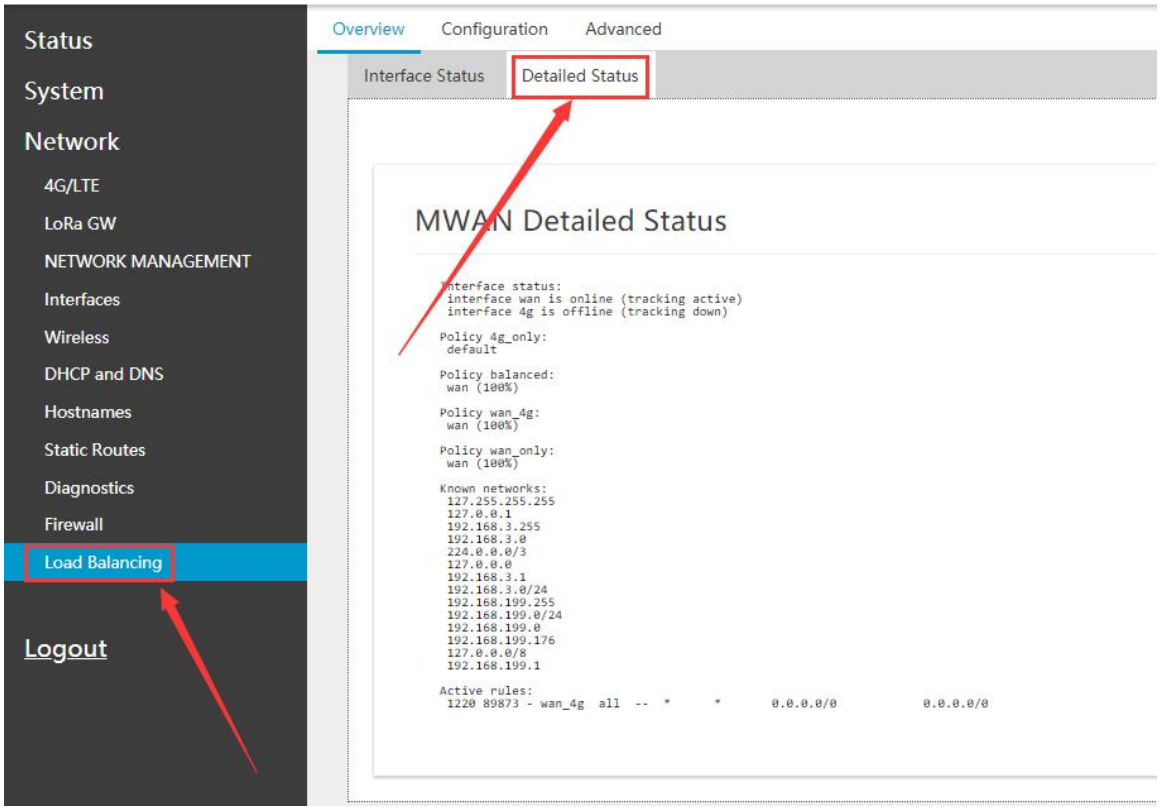
3. Check the current network status

Enter “Status/Overview”, as below:



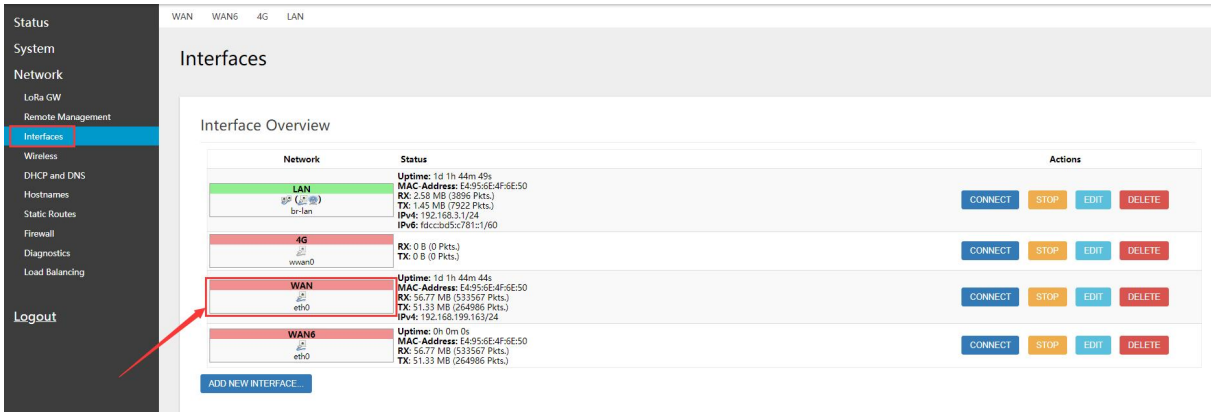
Here, it shows that WAN is online, 4G is offline.

Enter “Network/Load Balance/Detailed Status”, you can check the details as below:



4. Check the status of WAN(Ethernet)

Enter “Network/Interfaces”, as below:



Here, it shows run time and IP address, and RX and TX is not 0, it indicates the WAN is normal.

5. Check the network status of 4G

Enter:

Network->4G/LTE

When deploying gateway, the network should be stable, and if there is no wired network, we can also use 4G network, but we should choose a position with strong 4G signal to deploy gateway.

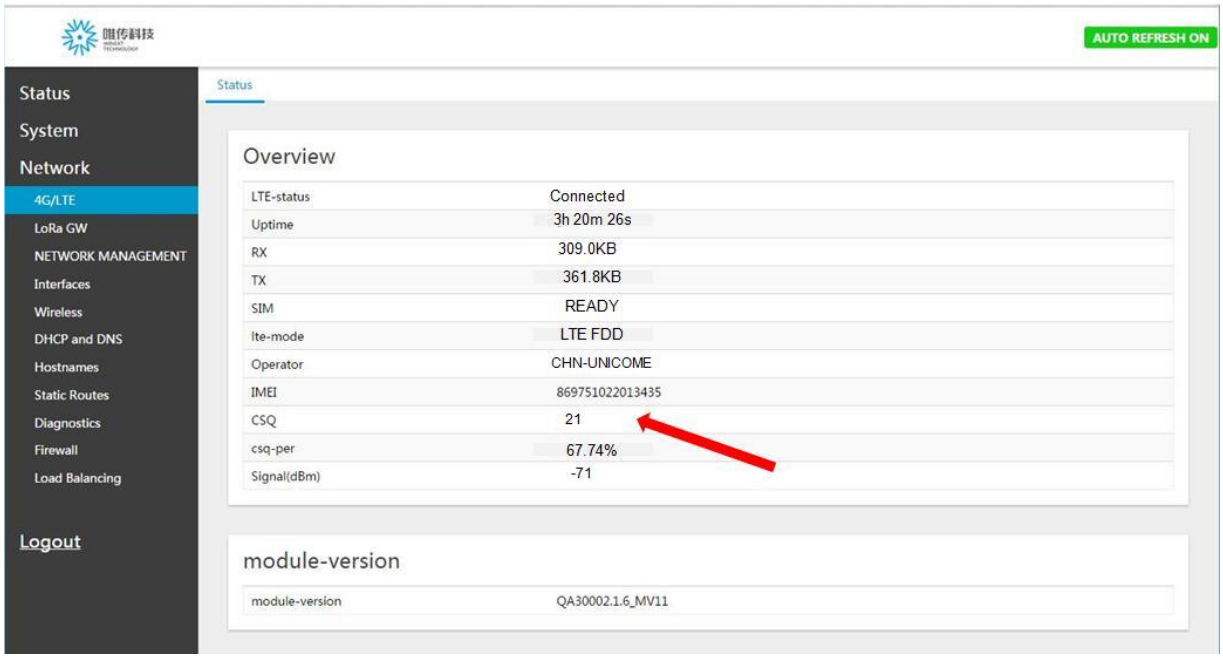
Qualified LTE network should meet the following :

1)**Network mode display :LTE**（China Mobile: TDD, China Telecom and China Unicom: FDD）

2）**Signal strength above 25**（the network signal should be stable the whole day）

3) **The network delay from the gateway to the server is less than 100ms, and if the delay is too big, the server cannot send packets to the RX1 window of nodes with Class A.**

As below, it's under unqualified network:



Here, it's under unqualified network: weak signal and it's not 4G network.

If you insert a usable 4G card, the picture above should appear. If there is no card, the content of the interface is basically empty like "--". 4G dialing adopts QMI dialing, and the protocol is set as DHCP, so the parameters of 4G do not need to be modified.

The APN for 4G is empty by default and does not need to be set (it is know that China mobile/Unicom/Telecom, most operators in Southeast Asia and most operators in Europe do not need to set up APN).

About 4G disconnection protection:

The range of CSQ is **0~31**,

wherein: **<15:** the gateway believes that 4G signal is not enough to connect to LTE 4G network(the signal is so bad that it will drop continuously and connected to 2G or 3G network), and the service layer will not be forces to dial again when disconnected.

15~31: dial on (or fail to dial), however, if there is no connection to ping public network IP (for example, 114.114.114.114, 8.8.8.8), forced dialing will be conducted, try 10 times of dialing per 3 minutes. But if the 10 times of dialing is still not connected, and WAN port is also not connected, the gateway will restart, and reset its 4G module; Then try again to enter the dial, again 10 consecutive rounds; As long as one of the dials succeeds, the number of dials is counted from 0. A total of three 10 attempts will be made. A total of 30 times cannot be dialed, and the IP of the public network is not connected, then the SIM card is considered overdue, and it will not be forces to dial again, but the 4G module will still redial per 1 hour by its own reconnection mechanism.

The network operators will switch the network mode from 4G to 3G or 2G networks if fees are due generally.

Network Operator	Normal Display	Display if fees are due
Mobile	LTE TDD	TDSCDMA or other
Unicom	FDD LTE	WCDMA or other
Telecom	FDD LTE	EVDO or other

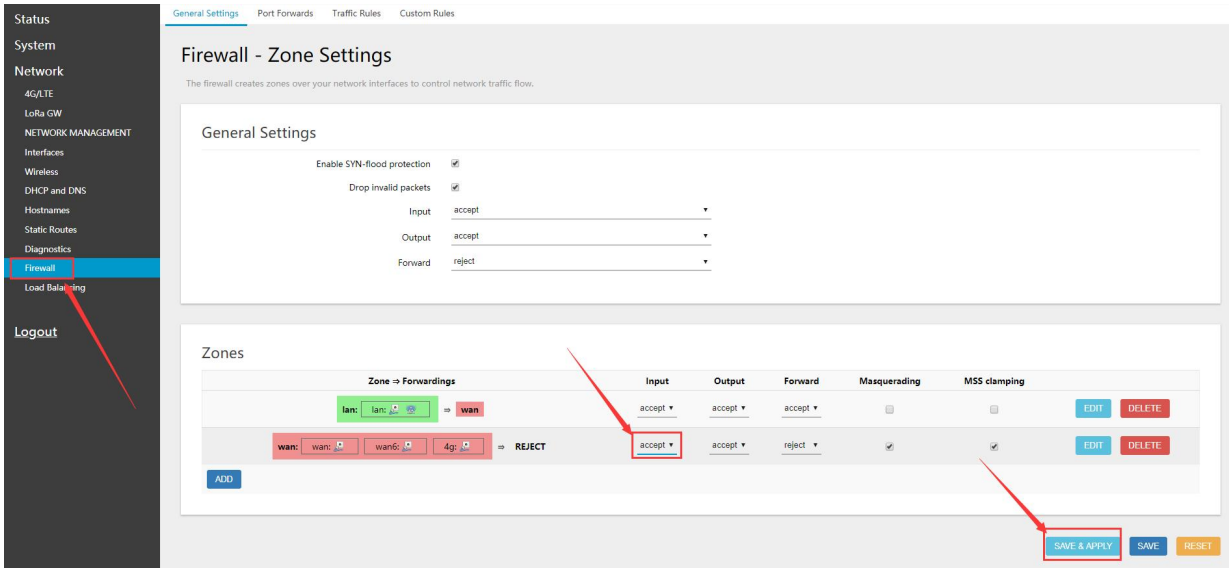
4G network signal display goes from Online to Offline and Offline to Online:

- As display shows Online and lasts for 15 seconds, it means 4G network is well connected.
- If SIM card is not inserted, it will not redial 4G network.

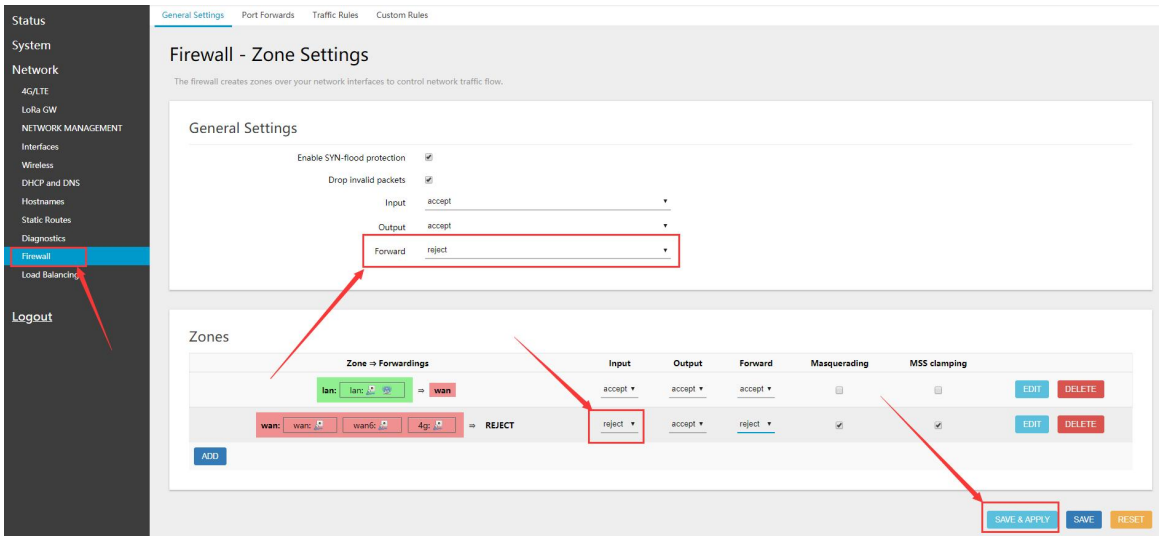
6. Enable/disable WAN port data entry

The WAN port data entry is enabled by default and the WAN port access gateway is supported

Access the gateway page via the WAN port IP (e.g. if IP of the PC is 192.168.8.x, and the gateway is 192.168.8.5, then access on the computer through a browser, enter: 192.168.8.5, you can directly access to the gateway) , configuration as below(default setting):



If you do not want to access the gateway via the WAN, you can use LAN or WiFi to enter the Settings as follows:

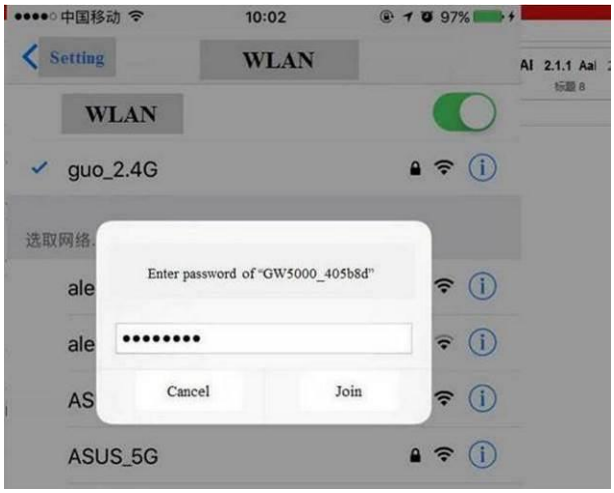


Configuration/upgrade of gateway

1. Login

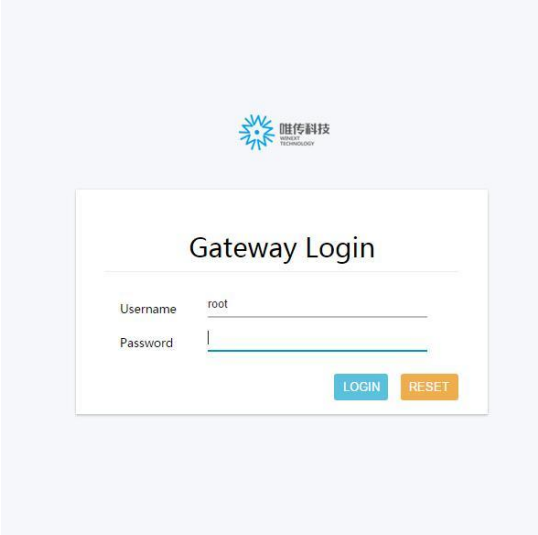
1.1. Gateway login by WI-FI hotspot of phone/laptop

Open the phone/laptop wi-fi setting and connect the GW5000Wi-Fi hotspot(Hotspot name: GW5000_the last 6 characters of gateway ID; Password: gateway2018better) , as below:



1.2. Gateway login on computer

Using google browser on computer, login 192.168.3.1, you'll enter the interface of gateway login, input username and password (Username: root; Password: WelcomeTo2018), as below:



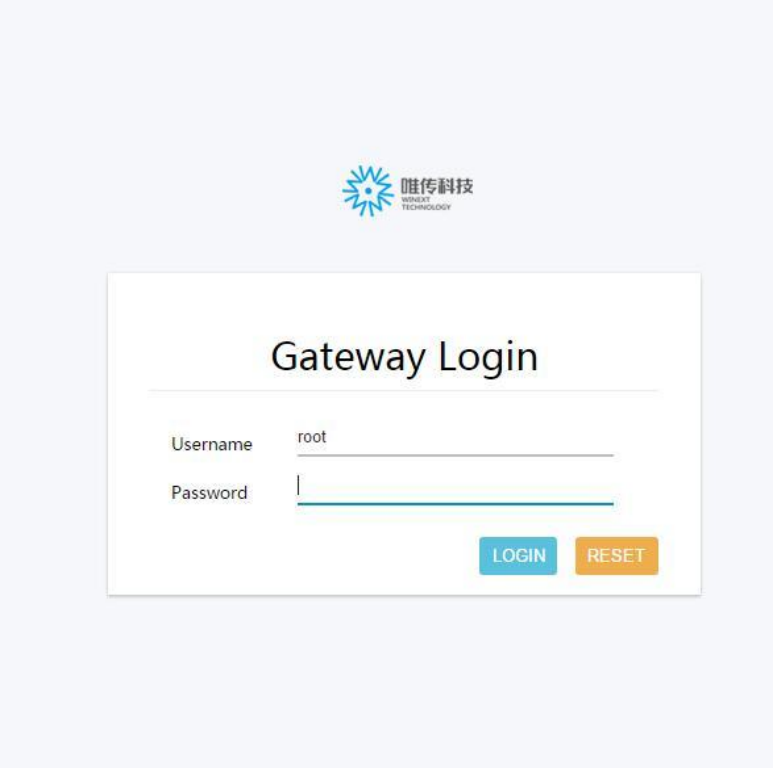
2. Configuration of gateway

Note: The gateway configuration includes wired configuration and wireless configuration. Wired configuration is achieved by using the network LAN port of the computer to connect with gateway; Wireless configuration is achieve by using mobile phone/laptop/PDA to connect to the gateway wi-fi hotspot.

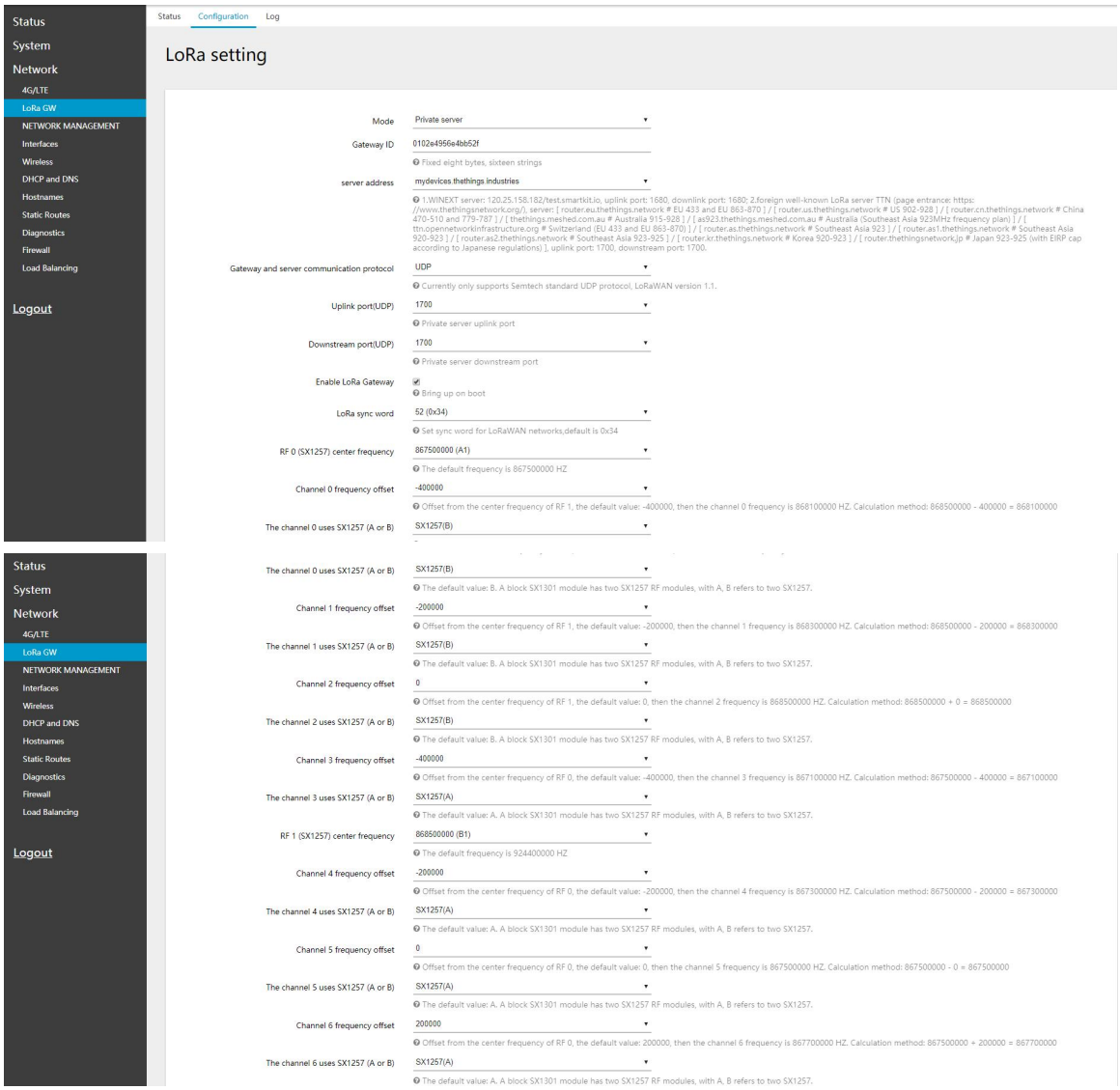
2.1 Wired configuration

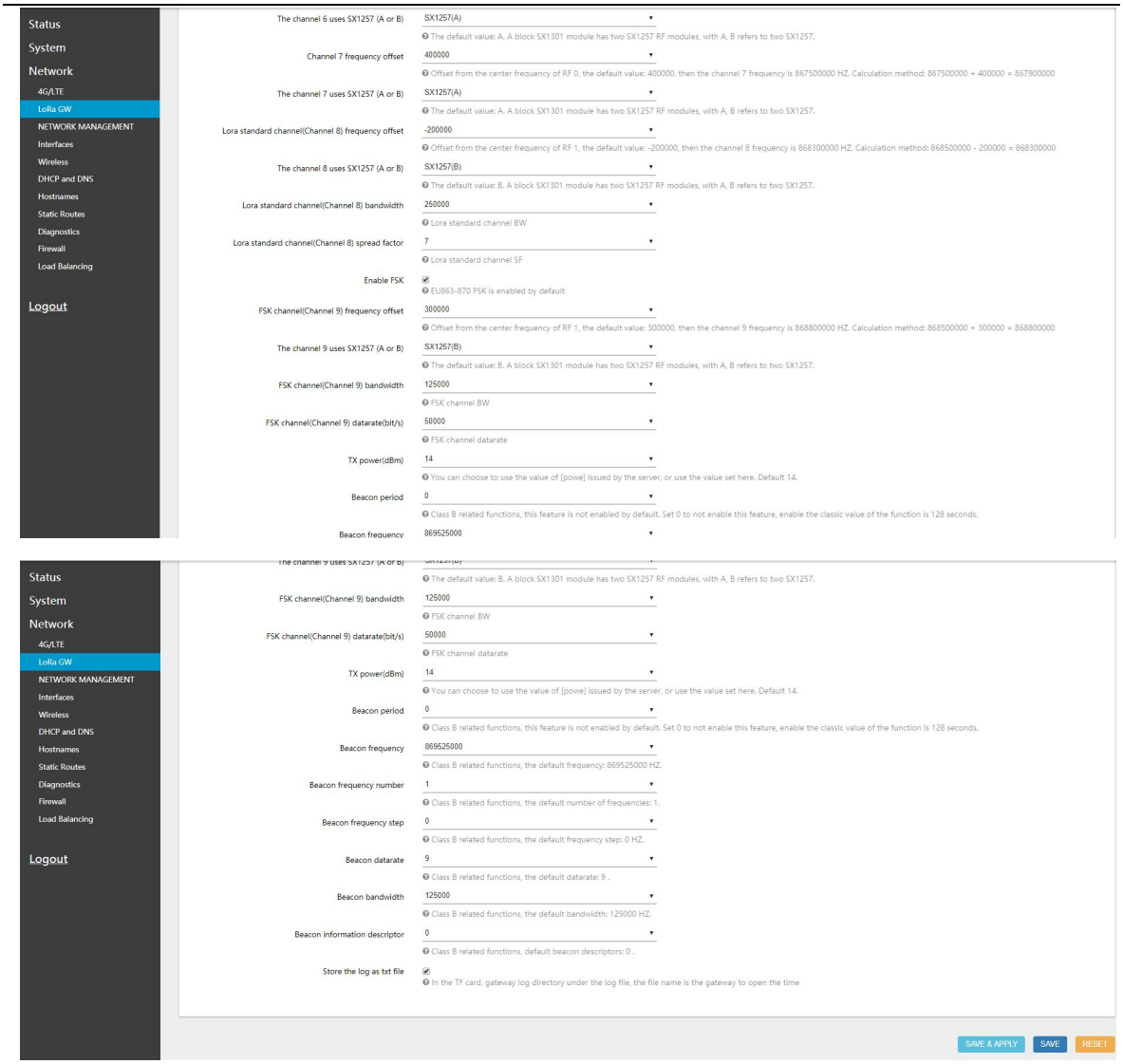
1) Connect the computer to the LAN port of gateway, and power on the gateway;

2) Using google browser to enter “192.168.3.1”, then you’ll come to the gateway login interface, as below: (Username: root; Password: WelcomeTo2018)



3)Select “Network/LoRa GW/Configuration, then you’ll come to LoRa setting interface, as below:





4) In the “Configuration/LoRa setting” interface, you can configure the “server address”, “Enable LoRa Gateway”, “Store the log as txt file” ;

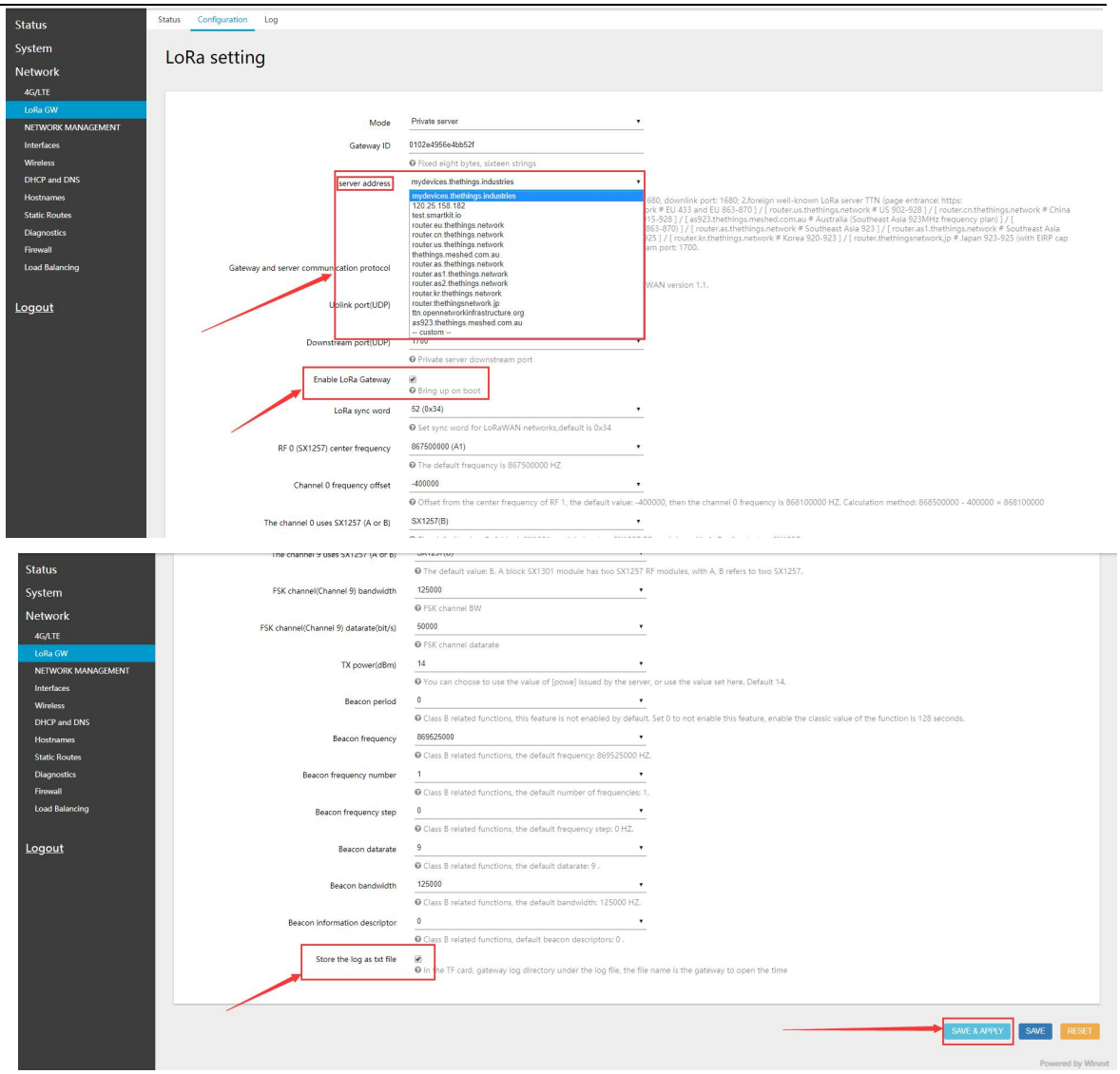
---Server address: choose your LoRa network server address, if there is nothing to choose, pls click “Custom” in the bottom, and input your own LoRa network server address;

---Enable LoRa gateway: you should tick to choose it;

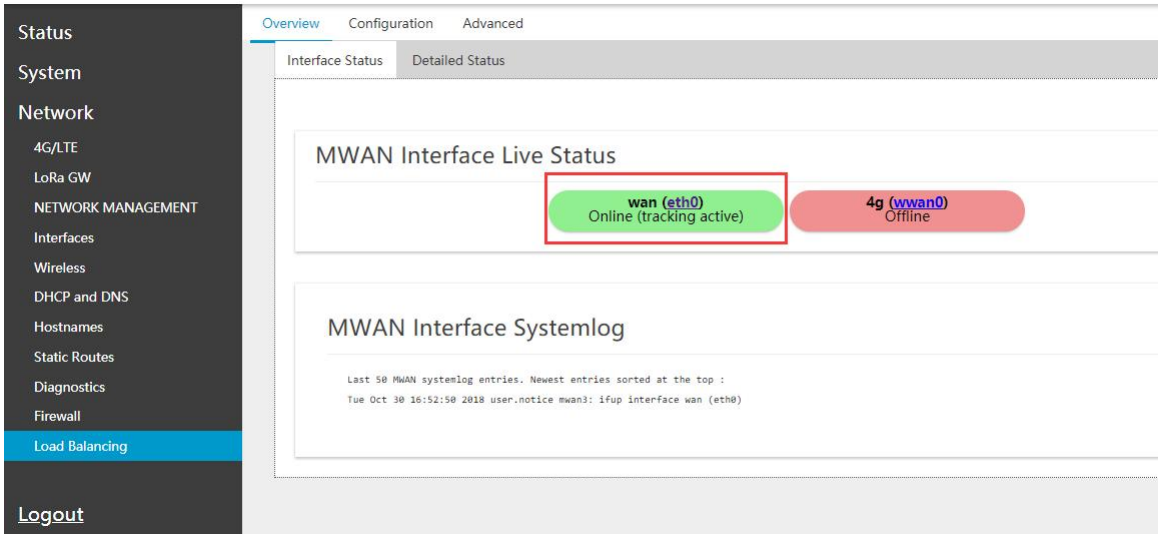
---Store the log as txt file: you should tick to choose it;

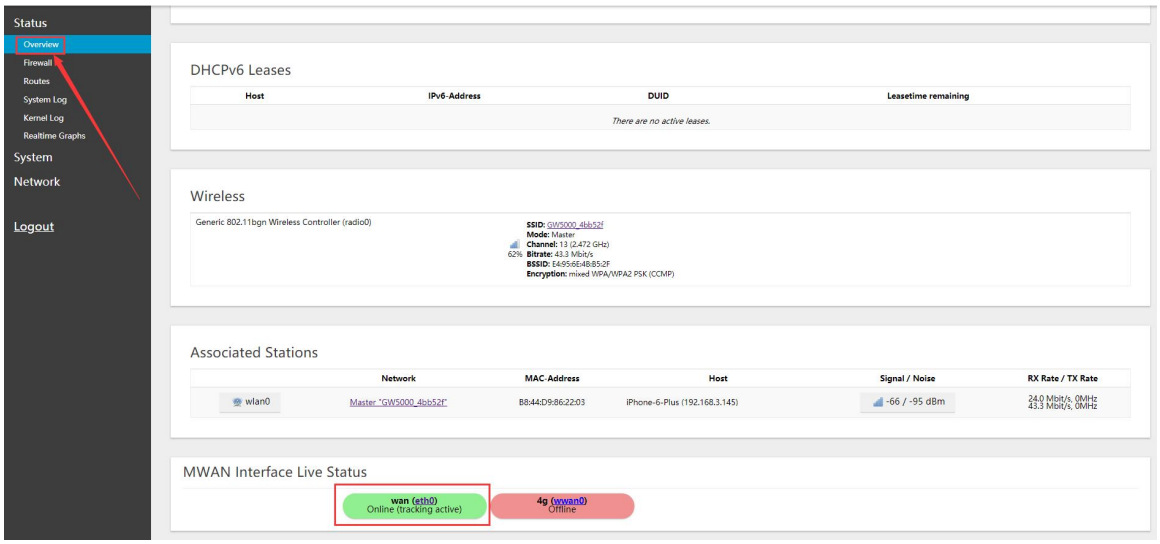
Finally, click SAVE&APPLY.

As below:



5）Check the network status of gateway, click “Network/Load Balancing/Overview”, as below:





Here, it shows WAN is online, you can access Ethernet; 4G is offline or 4G SIM card haven't been installed.

6) Check the status of GPS, click "Network/LoRa GW", you'll come to GPS overview, as below: (here, it shows the GPS is not in working status, as there is no information)

7) After the above confirmation is normal, the gateway box is closed with hexagonal screwdriver.

2.2 Wireless configuration

The steps are the similar as that of wired configuration, only displayed by cell phone/PDA/laptop.

2.3 Firmware upgrade of gateway

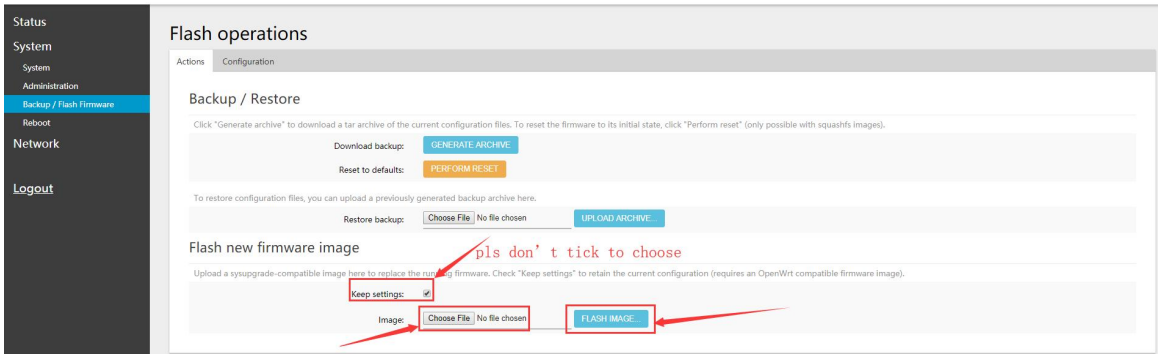
Enter "System/backup/Flash Firmware/Action",

1) Keep settings: pls don't tick to choose;

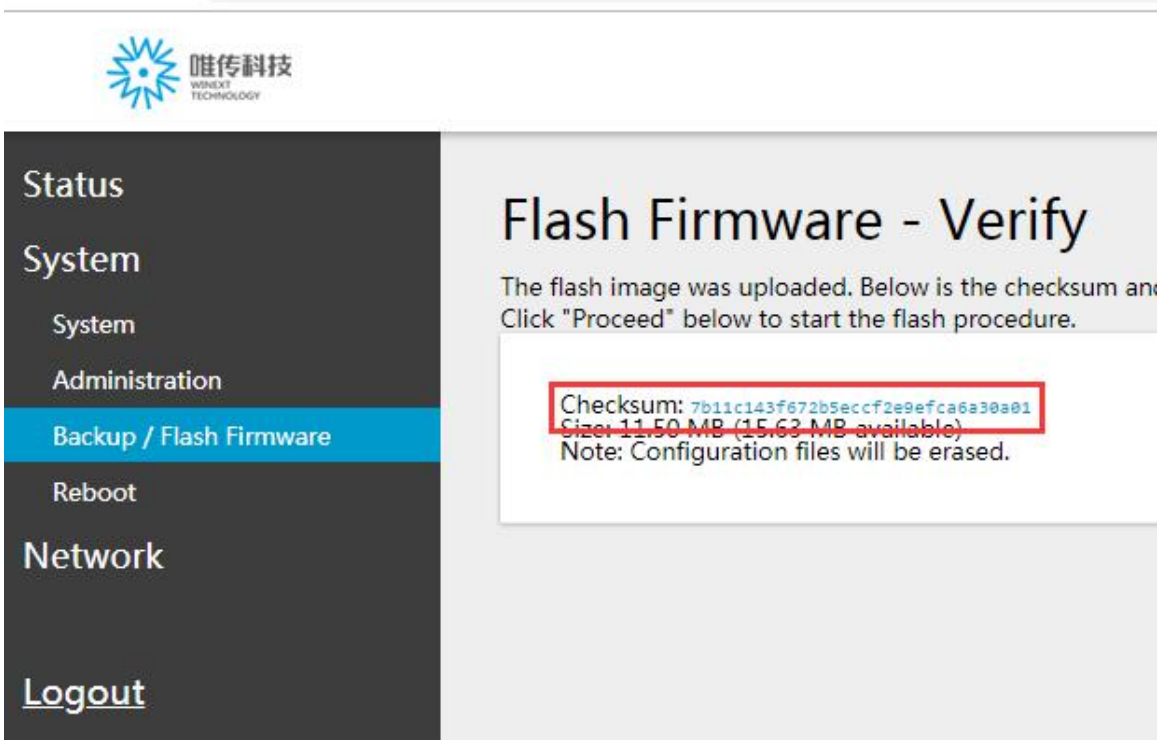
2) Choose file: Choose the provided version in .bin format;

3) Click "Flash image"

As below:



After click "Flash image" , pls wait for a moment until the upload complete, then come to the interface of "Flash Firmware-Verify", as below:



Note: When file is finished uploading, wait and check to make sure the Checksum is as same as that of md5 file(which will be sent to customer together with the bin format file), if it's the same, pls click PROCEED button. If the Checksum is not as same as that of md5 file, it's possible that the upload file damages. You should click CANCEL button to re-upload, because

the damaged file can make gateway to be brick. As below:

Note: After click PROCEED button, it's flashing the firmware, pls make sure the power supply be stable, and wait for **3~5** minutes until it finishes.

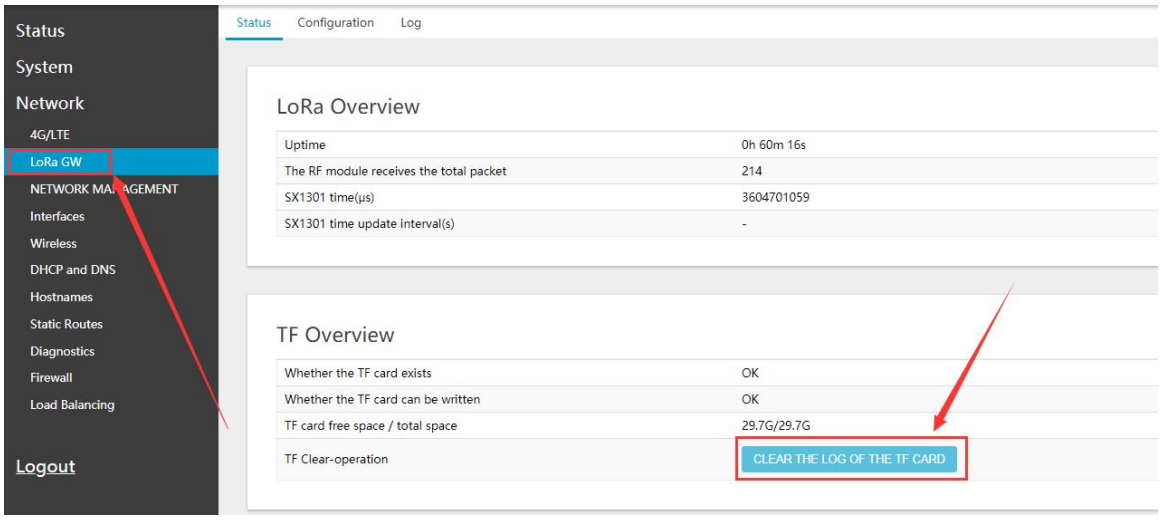
After finishing flash firmware, there is no need to enter the Web page, the gateway will enable by default.

FAQ

1. Gateway will not work after a power failure

When there is a power failure, the log on the TF card is damaged, after restart gateway, it'll do self-check to automatically repair log, if TF card data quantity is large, it'll take a long time to repair, in the process of repairing, the gateway is not working.

Solution: enter the configuration interface of gateway (192.168.3.1) , gateway login, select "Network/LoRa GW/Status", click "CLEAR THE LOG OF TF CARD", as below:



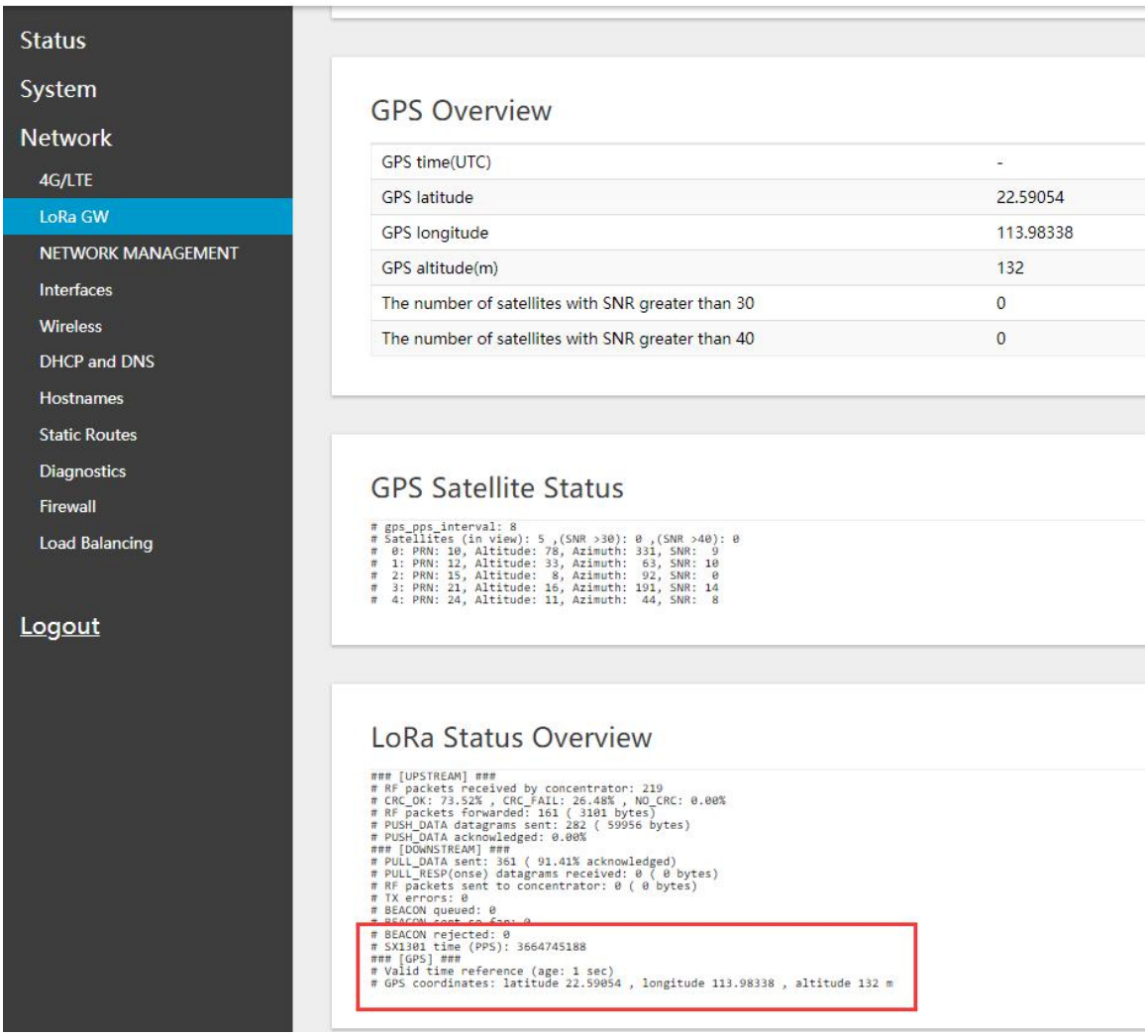
After clear the log of TF card, pls restart the gateway, then it'll work again.

2. GPS unable to locating

Enter 192.168.3.1 interface:

1) Check whether there is positioning information or not, if yes, it means GPS is normal

2) Check whether there is time synchronization or not, as below:



If GPS is normal, the time synchronization should be less than 5 seconds, the above picture shows “(age: 1 sec), that means the GPS is normal.

3)If GPS has no location information, you can re-plug the GPS antenna, or repositioning in an open area, or update GPS antenna.

3. Nodes cannot access to the network

1) Check whether the gateway works normally or not.

2) Check whether there is power supply for nodes

3) Nodes power on

4. LoRa signal and data rate

1) Received Signal Strength Indicator(RSSI)

125KHZ band width, rate: 300 ~ 5.4K bit/s, as below:

SF	Data rate (bit/sec)	Sensitivity (dBm)
7	5469	-130.0
8	3125	-132.5
9	1758	-135.0
10	977	-137.5
11	537	-140.0
12	293	-142.5

Note: the limit value of SF12 is -142. Generally speaking, if signal below -124 dBm, the packet drop rate (PDR) will be high, normal value should be during -120dBm~ -40dBm.

2) Signal Noise Ratio(SNR)

Modulation	Typical SNR
LoRa SF12	-20 dB
LoRa SF10	-15 dB
GMSK	9 dB

Note: The limit value of SF12 is -20db, the limit value of SF10 is -15db. The closer it's from the limit value, the worse the signal.

The above data is based on the basis of the gateway test, if you use a node test, the data is different.