

User Guide

LoRaWAN

Walrus-OD Gateway



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1. Preview

Walrus-OD LoRaWAN gateway integrates a high performance high reliability ARM cortex A53, 1 or 2*SX1301 LoRa core processor, a LTE module, a GPS module, a Wi-Fi module, temperature monitor, RTC, and power management unit. Would have an internal battery for backup which could support over 5 hours duration without external power. Rather than logging into the gateway and doing operation with command in the Linux environment, a web-based utility is built in which help customer use the device much easier.

There are 4 antenna ports, a external power input port, a RJ45 port, and a USB debug port for the device.

ANT1: LoRa antenna.

ANT2: Back up.

ANT3: GPS antenna.

ANT4: Wi-Fi Antenna.

ANT5: LTE Antenna.

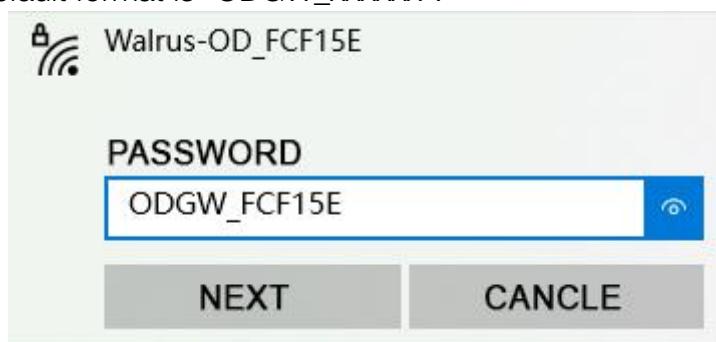
Power: External power supply input port, DC12 to 28V.

RJ45: RJ45 port, Ethernet and PoE power injector.

USB: USB port for debug.

2. Gateway Management

Connect Gateway's Wi-Fi. The gateway's name which likes "Walrus-OD_xxxxxx", then fills in the password, the default format is "ODGW_xxxxxx".



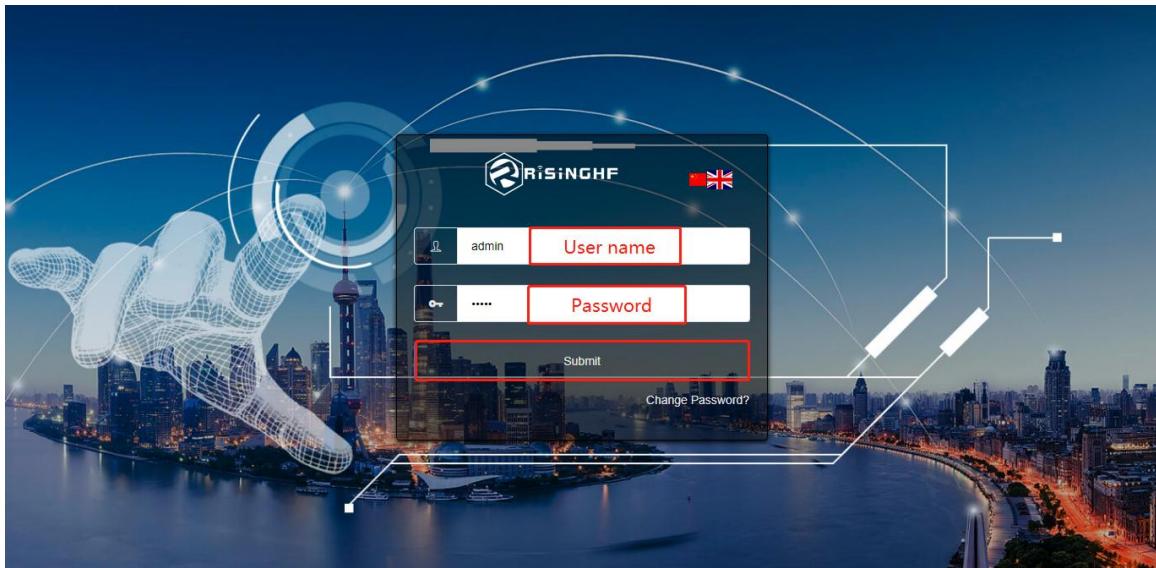
3. Gateway Configure

3.1.Gateway Login

- Open the browser on your computer and fill the IP 192.168.8.1 (default).
- Enter the username and password.

Username: admin

Password: admin



3.2. Device Info

 Device Info

III

External Power Battery 4G LTE ETH GPS WIFI Temperature LoRa0 LoRa1

Device Type: RHF2S208EH8-868 10

System Time
2019-11-13 03:35:28

System Running Time
5Day 01:06:57

MAC
B8:27:EB:54:96:06

IP Address
198.122.0.143

Hardware Version

Firmware Version

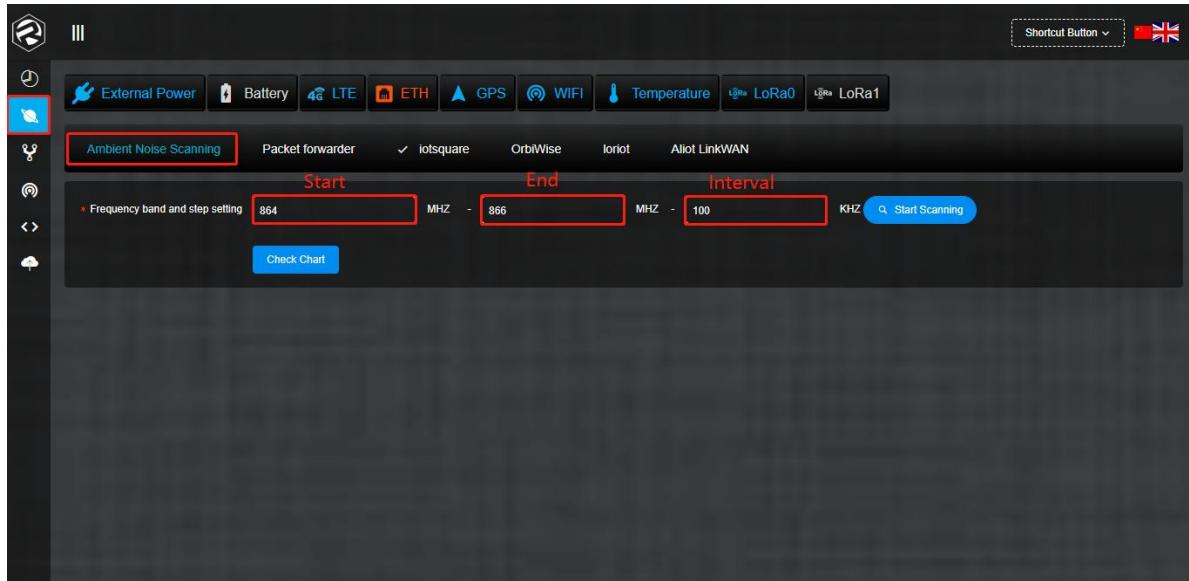
- External Power Status
- Backup Battery Status
- 4G / LTE Status
- Ethernet Status
- GPS Status
- Temperature Status
- LoRa0 Status

Note: The color show blue is working normal, and the red is not working but have the function, the white is mean the gateway doesn't have the function.

3.3. LoRaWAN Config

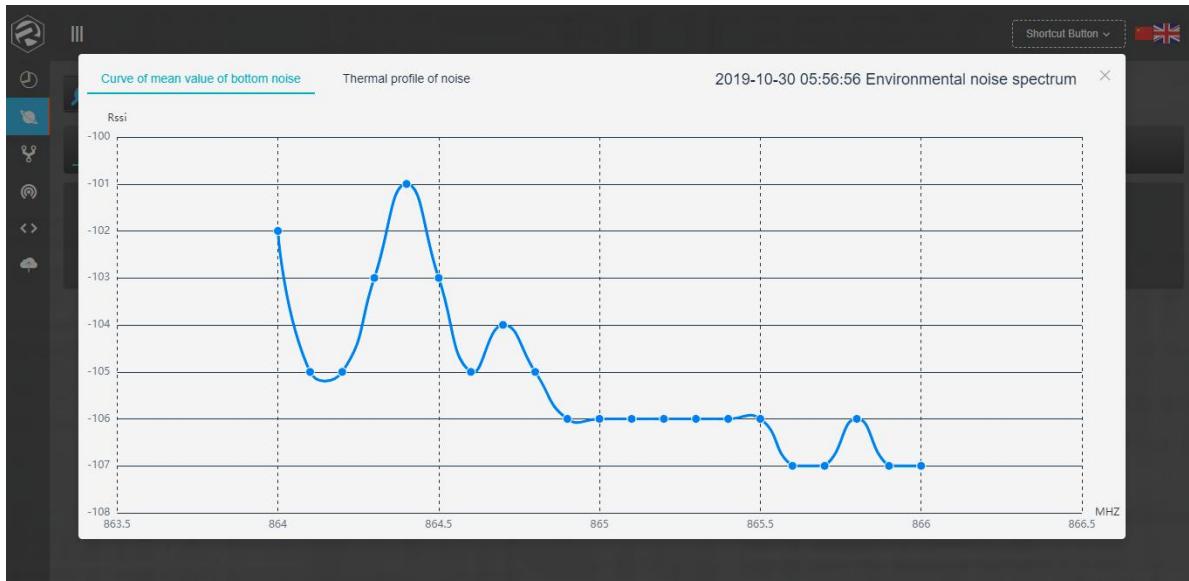


3.3.1. Ambient Noise Scanning



Enter band starts frequency, end frequency, and step width. In this example, the test frequency is 868MHZ, so the frequency band setting from 867 MHZ to 869 MHZ, and the step setting is 100KHZ.

Click the Start Scanning to begin the ambient noise scanning



Note: The ambient noise can't be over -95dBm, normally -100dBm is the worst condition. Example if the value is -107dBm which is the good condition. If the result shows the ambient noise over -95dBm, you must change the installation place. Or the communication distance will be greatly reduced. So if the result like this picture the gateway location is acceptable.

3.3.2. Packet Forwarder

Standard LoRaWAN packet forwarder



SDK Desc: SDK description

Gateway ID: gateway ID

Server Address: network server address

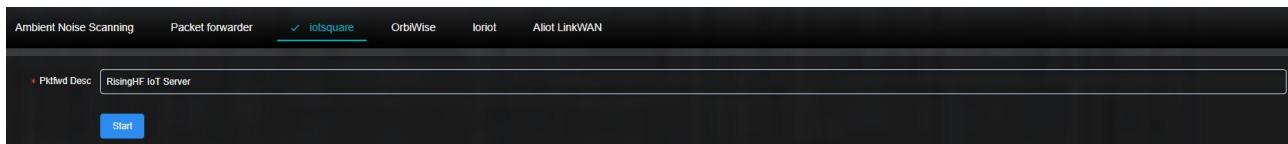
Server Port: server port

Global Configuration: gateway type (frequency) and frequency plan selection

Note: use Bove Alpaca-E platform, the server address is “is0.bovetech.com”, the port is 1780 (downlink and uplink are same)

3.3.3. Other Network Server

Instead of standard packet forwarder, Walrus-OD Gateway also support different network server: lotsquare, OrbiWise, loriot, Alit LinkWAN.



3.4. Server Config

Server Config

- 1) lotsquare Bridge is a program that integrates device management and LoRaWAN data forwarding. The system starts the program by default and connects to the BOVE lotsquare server.
- 2) When the device does not launch the lotsquare SDK, the program is only used to manage the device; when the device starts the lotsquare SDK, the program can be used to manage the device and forward LoRaWAN data.
- 3) If users do not want to use the device management functions provided by the company's servers, and want to provide LoRaWAN services to the company's servers, you can close the lotsquare Bridge and connect to the server using the standard Packet forwarder.

3.5. WIFI Config



3.5.1. WIFI Config



The form contains the following fields:

- * IP Address: 192.168.8.1
- * WIFI Name: Walrus-OD_FCF15E
- WIFI Password: ODGW_FCF15E
- Submit button
- Reset button

IP Address: gateway management address

WIFI Name: gateway wifi name

WIFI Password: gateway wifi password

Note: the parameters can be changed.

3.5.2. IP Config

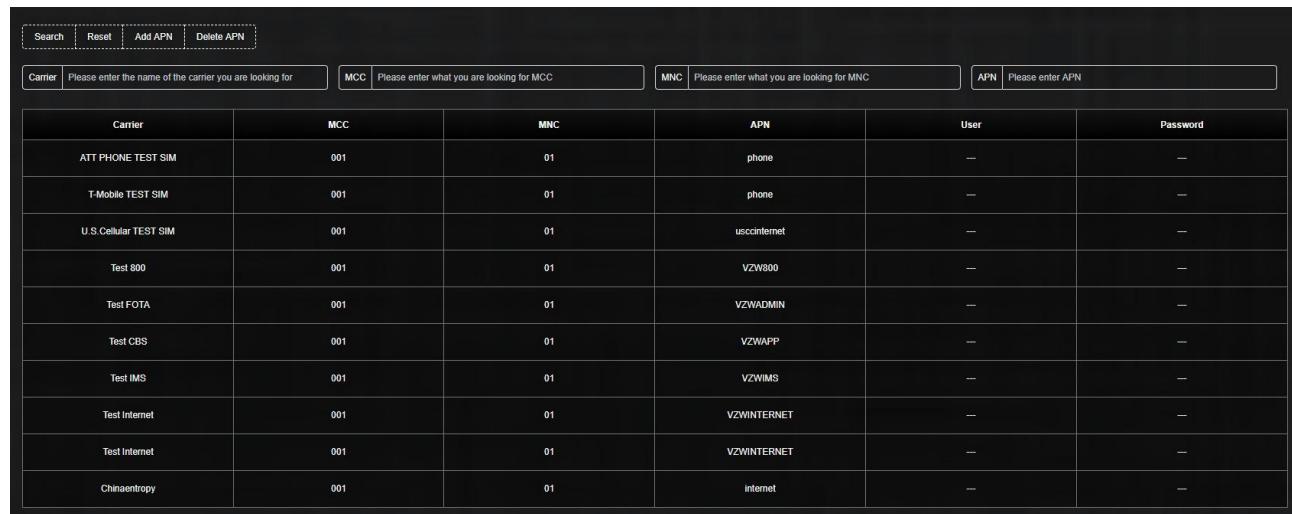


The PROTO dropdown menu is set to DHCP, with STATIC IP as an option.

The default network protocol is DHCP.

3.5.3. APN Config

Walrus-OD gateway has many built-in APN setting. In case of customer's APN is not included, gateway supports add APN operation.



The table lists the following APN configurations:

Carrier	MCC	MNC	APN	User	Password
ATT PHONE TEST SIM	001	01	phone	—	—
T-Mobile TEST SIM	001	01	phone	—	—
U.S.Cellular TEST SIM	001	01	usccinternet	—	—
Test 800	001	01	VZW800	—	—
Test FOTA	001	01	VZWADMIN	—	—
Test CBS	001	01	VZWAPP	—	—
Test IMS	001	01	VZWIMS	—	—
Test Internet	001	01	VZWINTERNET	—	—
Test Internet	001	01	VZWINTERNET	—	—
Chinaentropy	001	01	internet	—	—

Add APN

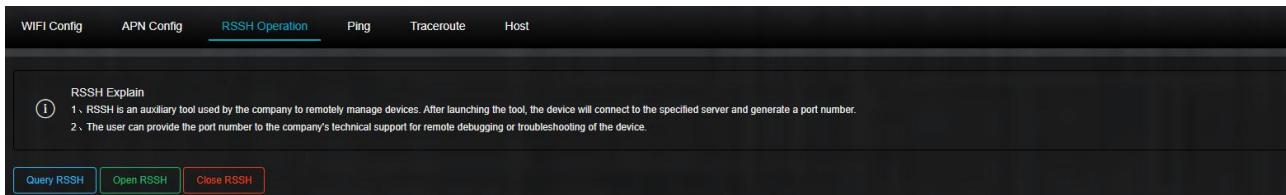
* Carrier	Please enter carrier name
* MCC	Please enter MCC
* MNC	Please enter MNC
* APN	Please enter APN
User	Please enter user
Password	Please enter password

Confirm Add

Note: Add APN need confirm the information on the picture with the operator.

3.5.4. RSSH Operation

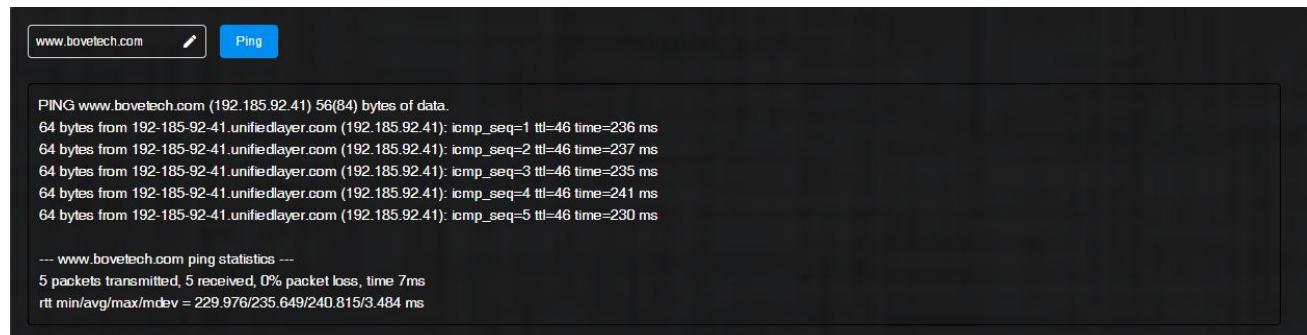
- 1) RSSH is an auxiliary tool used by the company to remotely manage devices. After launching the tool, the device will connect to the specified server and generate a port number.
- 2) The user can provide the port number to the company's technical support for remote debugging or troubleshooting of the device.



RSSH Explain
 1、RSSH is an auxiliary tool used by the company to remotely manage devices. After launching the tool, the device will connect to the specified server and generate a port number.
 2、The user can provide the port number to the company's technical support for remote debugging or troubleshooting of the device.

Query RSSH Open RSSH Close RSSH

3.5.5. Ping / Traceroute / Host



PING www.bovetech.com (192.185.92.41) 56(84) bytes of data.
 64 bytes from 192-185-92-41.unifiedlayer.com (192.185.92.41): icmp_seq=1 ttl=46 time=236 ms
 64 bytes from 192-185-92-41.unifiedlayer.com (192.185.92.41): icmp_seq=2 ttl=46 time=237 ms
 64 bytes from 192-185-92-41.unifiedlayer.com (192.185.92.41): icmp_seq=3 ttl=46 time=235 ms
 64 bytes from 192-185-92-41.unifiedlayer.com (192.185.92.41): icmp_seq=4 ttl=46 time=241 ms
 64 bytes from 192-185-92-41.unifiedlayer.com (192.185.92.41): icmp_seq=5 ttl=46 time=230 ms

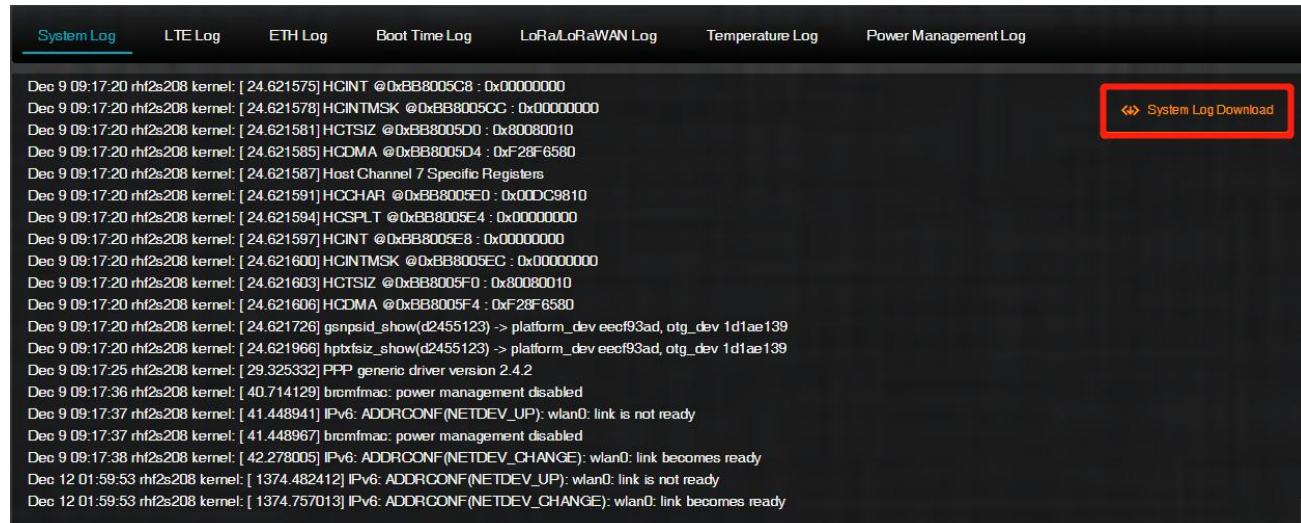
 --- www.bovetech.com ping statistics ---
 5 packets transmitted, 5 received, 0% packet loss, time 7ms
 rtt min/avg/max/mdev = 229.976/235.649/240.815/3.484 ms

Using network tools to check the network status.

3.6. Download Log

[!\[\]\(5ebcf382a6ee952d6c5b8b948415801e_img.jpg\) Download Log](#)

All the logs can be checked and downloaded here.



System Log LTE Log ETH Log Boot Time Log LoRaLoRaWAN Log Temperature Log Power Management Log

Dec 9 09:17:20 rhl2s208 kernel: [24.621575] HCINT @0xBB8005C8 : 0x00000000
Dec 9 09:17:20 rhl2s208 kernel: [24.621578] HCINTMSK @0xBB8005CC : 0x00000000
Dec 9 09:17:20 rhl2s208 kernel: [24.621581] HCITSIZ @0xBB8005D0 : 0x80080010
Dec 9 09:17:20 rhl2s208 kernel: [24.621585] HCDMA @0xBB8005D4 : 0xF28F6580
Dec 9 09:17:20 rhl2s208 kernel: [24.621587] Host Channel 7 Specific Registers
Dec 9 09:17:20 rhl2s208 kernel: [24.621591] HCCHAR @0xBB8005E0 : 0x00DC9810
Dec 9 09:17:20 rhl2s208 kernel: [24.621594] HCSPLT @0xBB8005E4 : 0x00000000
Dec 9 09:17:20 rhl2s208 kernel: [24.621597] HCINT @0xBB8003E8 : 0x00000000
Dec 9 09:17:20 rhl2s208 kernel: [24.621600] HCINTMSK @0xBB8005EC : 0x00000000
Dec 9 09:17:20 rhl2s208 kernel: [24.621603] HCITSIZ @0xBB8005F0 : 0x80080010
Dec 9 09:17:20 rhl2s208 kernel: [24.621606] HCDMA @0xBB8005F4 : 0xF28F6580
Dec 9 09:17:20 rhl2s208 kernel: [24.621726] gsnpnid_show(d2455123) -> platform_dev eecf93ad, otg_dev 1d1ae139
Dec 9 09:17:20 rhl2s208 kernel: [24.621966] hptxfsz_show(d2455123) -> platform_dev eecf93ad, otg_dev 1d1ae139
Dec 9 09:17:25 rhl2s208 kernel: [29.325332] PPP generic driver version 2.4.2
Dec 9 09:17:36 rhl2s208 kernel: [40.714129] brcmfmac: power management disabled
Dec 9 09:17:37 rhl2s208 kernel: [41.448941] IPv6: ADDRCONF(NETDEV_UP): wlan0: link is not ready
Dec 9 09:17:37 rhl2s208 kernel: [41.448967] brcmfmac: power management disabled
Dec 9 09:17:38 rhl2s208 kernel: [42.278005] IPv6: ADDRCONF(NETDEV_CHANGE): wlan0: link becomes ready
Dec 12 01:59:53 rhl2s208 kernel: [1374.482412] IPv6: ADDRCONF(NETDEV_UP): wlan0: link is not ready
Dec 12 01:59:53 rhl2s208 kernel: [1374.757013] IPv6: ADDRCONF(NETDEV_CHANGE): wlan0: link becomes ready

4. REVISION

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+Update the document format, change wifi configure pictures

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