



E870-L868LG12



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1. Features

- Supports 1 wired WAN port with switchable LAN port
- Supports LORAWAN gateway
- Support LED status monitoring (display of power PWR, LINK, ETH, WLAN, LoRaRX, LoRaTX;)
- Support for Web platform management configuration methods.
- One-click recovery of factory settings.
- Support 10/100Mbps rate for both wired network ports.
- Support wired and wireless online at the same time, multi-network intelligent switching.
- Support firmware upgrade and firmware configuration backup function.
- Firewall, NAT, DMZ host, black and white list of access control, IP speed limit.
- QOS, traffic service, can limit the speed according to the interface.
- Support for VPN clients.
- Support load balancing multi-network port flow control settings, with network port priority, enable, flow control ratio and other working methods.

2. Quick Start

To ensure that the product the user gets in the first place is qualified, here we provide a simple testing process for the user to refer to throughout the process, while also allowing the customer to act as a quick start.

2.1 Preparation for start-up

Before working on the LORAWAN gateway, the user needs to prepare at least one PC, one network cable and product supporting devices.

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2. 2 Hardware connections



Connect the WIFI antenna, and LoRa antenna, respectively, to the SMA connector under the device panel logo, as shown above, before powering up the device (the power-up location is identified at the panel). After the above steps have been completed, use the power supply that came with the device and then power up the gateway. Connect the computer to the WIFI of the device (WIFI name E890-XXXX) and the WAN port of the device to Ethernet.

After power on, wait for about 1 minute or so, the WORK indicator on the panel is always on, which indicates that the power on is complete, in addition, on the panel, the LoRa signal indicator and the indicator in the network properties also start to work properly.

To ensure that the computer can access the WEB management interface via the LAN, the customer needs to ensure that the computer's network properties are to automatically obtain an IP address, as well as to automatically obtain a DNS server address, as shown in the figure below.

州指连接 → · · · ↑ · · · · · · · · · · · · · · ·	> 网络连接	Internet 协议版本 4 (TCP/IPv4) 屬性 常规 备田配置
R · 第用此网络设备 译版之 · · · · · · · · · · · · · · · · · · ·	↓ 以大阿 居性 网络 英享 连接时使用: ✓ Realtek PCIe GbE Family Controller 配置(C	
	此進接使FFF列項目(O):	子照推码(U): 主 认例关(C): ・・・ 意 しの数様得 DNS 服务器地址(B) 〇 使用下面的 DNS 服务器地址(E): 首选 DNS 服务器地址(F):
	 Internet が知知る 6 (TCP/IPv6) 安装(V) 印載(U) 屋住(R) 描述 (特認知時が以/Internet 抗议、该协议是默认的广城网络协议 (下面の中の日本中の日間(2 日本)) 	 ▶ 音用 DNS 服务器(A): 遇出时验证设置(L) 高级(M).
项目 选中1个项目	士仕不同的相互连接的网络上通信。	補定

2.3 Web access

After the PC is connected to the device through the WIFI connection, on the PC, open any browser and enter: 192.168.10.1 to enter our gateway web login interface, as shown below.

LoRaWAN Gateway			
	Authorization	Required	
	Please enter your username	and password.	
	Username	root	
	Password	[
		LOGIN RESET	

Here, our default password is: root

Once you have entered your password, you will be taken to our web administration interface.

At the bottom right of the web page, you can click on the following link to access our website, which verifies that the device is successfully connected to the external network.

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(((*)) EBYTE C佰特 MOIDER	£	LoRaWAN Gateway					
Status	^	Encryption: None Associations: 1					
Overview							
System Log Load Balancing							
System	\sim	Associated Stations					
Services	~	Network	MAC-Address	Host	Signal / Noise	RX Rate / TX Rate	Disconnect
_oRaWAN Network	~	Master "EBT-E890-A0E0" (wlan0)	B4:6D:83:9A:ED:63	DESKTOP-HJNQENF.lan (192.168.10.104)	🗐 -31 / 0 dBm	72.2 Mbit/s, 20MHz, MCS 7, Short GI 57.8 Mbit/s, 20MHz, MCS 5, Short GI	DISCONNECT
Network	~						
<u>-ogout</u>		Dynamic DNS Configuration	Next Update	Lookup Ho	stname	Registered IP	Network
		myddns_ipv4	Disabled	yourhost.exa	mple.com		IPv4 / wan
		myddns_ipv6	Disabled	yourhost.exa	mple.com		IPv6 / wan6
		MWAN Interfaces	ace: wwan :: Disabled				
						Powered by Chengdu Ebyte c	onnect us. / E890-868/915LG12

Well, after the above steps, if there are no faults generated, it means that the device is working properly. In addition, if customers want to know the current network speed, they can carry out a network test with the help of relevant software.

3. Product introduction

3.1 Basic parameters

	Projects	Indicators
	Product size(H*W*D)	110*105*41
	Product weight	386±5g
	Operating temperature	-40° C~+85° C
Hardware	Storage temperature	-40° C~+85° C
parameters	Working humidity	5%~95%
	Storage humidity	1%~95%
	Operating voltage	8V~28V
	Current consumption	120mA@12V (room temperature)

3. 2 Dimensions & Interface Description



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Interface serial number	Name	Remarks
1	DC8~28V	Power supply range DC8~28V, standard 5.5*2.1 power socket
2	DC-IN+	Power supply range DC:8~28V, positive power terminal
3	DC-IN-	Power supply range DC:8~28V, negative power terminal
4	Vacant	Vacant
5	USB	USB debugging interface
6	Restore	Press and hold for more than 5s and then release to restore factory settings
7	WAN/LAN	WAN port, Wide Area Network Interface, 10/100Mbps, Auto MDI/MDIX support
8	WIFI-M antenna	WIFI main antenna SMA interface (STA mode)
9	WIFI-D antenna	WIFI auxiliary antenna SMA interface (AP mode)
10	LoRa antennas	LoRa antenna SMA interface

The hardware interfaces are described as follows.

4. Function setting

In this section, we will go through the function menus on the web interface, where, for reasons of space, we will focus on some of the function options, and we will choose to outline some of the less common and less important functions.

4.1 Menu at a glance

In the web management interface, users can set up the functions they need or view the relevant status. Through the menu bar on the left side of the web page, they can set up specific functions or information as well as make enquiries, and they can see the directory tree structure of the menu as shown in the table below.

Submenu \ menu	Status	Systems	Services	Network	LORAWAN network setup
1	General	Systems	Frp intranet	Interface	LORAWAN
	overview	5	penetration		band settings
2	System	Management rights	Dynamic	Wireless	LORAWAN
2	log	Munugement rights	DNS	W neress	Gateway Setup
3	Load	Planned tasks	WAN/LAN	Switches	

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	Balancing				
4		Backups/Upgrades	WIFI Scheme	DHCP/DNS	
5		Reboot		Host Name	
6				Firewalls	
7				Network	
/				Diagnostics	
8				Qos Features	
0				Load	
9				Balancing	
10				Static routing	

5. Functional Overview

5.1 Status

In the "Status" menu column, the user can view the current status of the gateway, including the firewall. The gateway, the system internal work log, and the real-time refresh of network-related information, etc. The user cannot set anything in this column. Here, the user can query the content of the relevant sub-menu according to their needs.

5.2 Systems

In the system bar, we can set the administrative parameters of the gateway, etc. These include the login password for the web pages, the host name, upgrades and other functions.

5. 2. 1 Hostname and time zone settings

In the System->System Properties->Basic Settings option, the user can set the host name of the module and also modify the time zone, here, our default host name is: EBYTE, the time zone used is UTC (if the product is used in China, it can be set to: Asia/Shanghai).

Set the host name as shown below.

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(():)) EDYTE C佰特 NKHORSE	LoRaWAN	Gateway	AUTO RE	FRESH ON
Status System System	System Here you can	Configure the basic aspects of your device like its I	ts hostname or the timezone.	
Administration Scheduled Tasks Backup / Flash Firmware Reboot	Syster	n Properties		
Services ~ LoRaWAN Network ~ Network ~	General	Local Time Hostname Timezone	Wed Feb 23 18:47:36 2022 SYNC WITH BROWSER EBYTE UTC V	
Logout	Time	Synchronization Enable NTP client Provide NTP server NTP server candidates	Öpenwrtpoolntp.org 2 Lopenwrtpoolntp.org 2 Sopenwrtpoolntp.org 2 Jopenwrtpoolntp.org 2 Jopenwrtpoolntp.org 2	

In addition, users can set the language of the web interface (Chinese/English) as well as different style themes. Here, our default language is Chinese and the style used is our Tech Blue theme.

5. 2. 2 User name login password setting

In the System-> Admin Rights-> Host Password option, set the Web Login screen, the host password setting needs to be at least one character, then click the Save button, the login password can be set. This is shown in the image below.

《(**)》 EBYTE 亿佰特 教授的历史家		LoRaWAN Gateway
Status	~	Router Password
System	^	Pouter Password
System		Notel Password
Administration		Changes the administrator password for accessing the device
Scheduled Tasks		Password ·
Backup / Flash Firmware		Conference of the Conference o
Reboot		Commission
Services	\sim	SAVE
LoRaWAN Network	\vee	

5. 2. 3 Restoring factory settings and upgrading

In the System -> Backup/Upgrade option, you can perform the Restore Factory Settings button to ensure that the user can return to the initial state after setting up the gateway with the wrong operation so that it can be used normally. At the same time, we have reserved the upgrade function so that when we update the new version of firmware, the user can perform the upgrade operation by themselves so that they can experience more functions. The factory settings can be restored and upgraded as shown below.

(0:0) EBYTE C佰特 MHRORSE	1	LoRaWAN Gateway
Status System	~ ^	Flash operations
Administration Scheduled Tasks		Backup
Backup / Flash Firmware Reboot		Click "Generate archive" to download a tar archive of the current configuration files.
Services	\sim	Download backup GENERATE ARCHIVE
LoRaWAN Network	\sim	Destere
Network	~	Restore
Logout		Reset to defaults PERFORM RESET Restore backup 透釋文件 UPLOAD ARCHIVE_
		Custom files (certificates, scripts) may remain on the system. To prevent this, perform a factory-reset first.
		Save mtdblock contents
		Click "Save mtdblock" to download specified mtdblock file. (NOTE: THIS FEATURE IS FOR PROFESSIONALS!)
		Choose mtdblock firmware
		Download mtdblock SAVE MTDBLOCK
		Flash new firmware image
		Upload a sysupgrade-compatible image here to replace the running firmware. Check "Keep settings" to retain the current configuration (requires a compatible firmware image).
		Keep settings
		Image 选择文件 FLASH IMAGE

It should be noted here that when the user upgrades the firmware, please do not disconnect the power, load the firmware that you have browsed to on the page, click on the firmware swipe and wait for more than 10 seconds before the next window pops up, click on execute and wait for a few minutes, the web page will automatically return to the login screen and the upgrade will be successful at this point.

5.2.4 Rebooting

In the System -> Reboot option, you will be brought to the following interface, click on Execute Action to execute the reboot, wait for about 40 seconds, the WORK indicator of the device panel is often on, at this time, the reboot is successful.

5.3 Services

5. 3. 1 Frp intranet penetration

For intranet users without public IP, it is an awkward problem to remotely manage the gateway under the intranet or other ports of the gateway, intranet penetration can realize accessing the devices under the intranet (such as this machine) through the public network There are many intranet penetration tools nowadays, FRP intranet penetration with its high-performance reverse proxy application not only allows customers to easily perform intranet penetration and provide services to the external network, but also has stable performance Efficient, supports multiple protocol types, etc.

The use of Frp intranet penetration requires the use of a Frp server, which can be set up by the user or purchased from a Frp server provider according to their needs. Please refer to the "Frp Server Construction Tutorial" for the process of setting up your own.

Here is an example of how to use the intranet penetration service with a set up Frp server.

1 Open the frp intranet penetration interface of the gateway and set it as follows

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		LoRaWAN Gate	eway		1	UNSAVED CHANGES: 2	
Status System	~ ~	Global Set	tting				
Services Frp Setting	^	Basic Settings	Settings Other Settings Client Log				
Dynamic DNS WAN/LAN				Enabled	0		
Wifi Schedule	~			Software version	0.16.1 Custom version.current version:		
Network	~		Down	load source address	download-2 v		
Logout				Server	your remote server IP		
				Port	7000		
				Privilege Token	Time duration between server of frpc and frps mustrit exceed 15 minutes.		
			Vhost HTTP Port	443			
			Service	registration interval	40 0 means disable this feature, unit min		

Note: The configuration will not take effect immediately when first configured and will require a reboot. 2 Add HTTP, configure relevant parameters

((**)) EBYTE 亿佰特 (MKMGRUM	l.	LoRaWAN Gateway	UNSAVED CHANGES 4
Status System	~ ~	Frp Domain Config	
Services Frp Setting Dynamic DNS	^	Config Frp Protocol	
WAN/LAN		Basic Settings Other Settings	
Wifi Schedule		Enable State	Disable •
LoRaWAN Network	×	Frp Protocol Type	HTTP v
Network	\sim	Domain Type	Custom Domains 🗸
Logout		Custom Domains	If SubDomain is used, Custom Domains couldn't be subdomain or wildcard domain of the maindomain(subdomain_host).
		Local Host Address	127.0.0.1
		Local Host Port	
		Use Encryption	8
			Encrypted the communication between frpc and frps, will effectively prevent the traffic intercepted.
		Use Compression	
			The contents will be compressed to speed up the traffic forwarding speed, but this will consume some additional cpu resources.
		Service Remark Name	
			Please ensure the remark name is unique.
		BACK TO OVERVIEW	SAVE & APPLY SAVE RESET

Caution.

The domain name type should be selected as a sub-domain, e.g. if the server is set to xxx.com, the actual mapped domain name will be frptest.xxx.com

3 Reboot the gateway device

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(();)) EBYTE (乙佰特 NHADRON EBYTE	2
Status Svstem	~
System Administration	
Scheduled Tasks Backup / Flash Firmware	
Services	~
LoRaWAN Network Network	~ ~
Logout	

4 View client logs after reboot

```
2021/09/28 17:25:53: frpc ok...
2021/09/28 09:25:54 [I] [service.go:304] [c924e4aa37012578] login to server success, get run id [c924e4aa37012578], server udp port [0]
2021/09/28 09:25:54 [I] [proxy_manager.go:144] [c924e4aa37012578] proxy added: [test]
2021/09/28 09:25:54 [I] [control.go:180] [c924e4aa37012578] [test] start proxy success
```

Frp in operation

frpc 运行中

Open the secondary domain: Here is http://frptest.ebyte.com/ to access the gateway configuration page.

LoRaWAN Gateway	
Authorization Required	
Please enter your username and password.	
likename 100t	
Password I	

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5. 3. 2 Dynamic DNS

In the Services --> Dynamic DNS option, users can add a domain name resolution service to set up the gateway remotely, etc., as shown in the figure below.

(())) EBYTE 亿佰特 NHAIGATE	ŧ.	LoRaWAN Gateway	UNSAVED CHANGES					
Status	v	OpenWrt Wiki: DDNS Client Documentation DDNS Client Configuration						
System	\sim	Details for: myddas inv4	Datails for mudden in d					
Services	^	Details for. myddils_pv4						
Frp Setting		Configure here the details for selected Dynamic DNS se	service.					
Dynamic DNS		Basic Settings Advanced Settings Timer Settings	gs Log File Vlewer					
WAN/LAN		Enabler	led 🗌					
Wifi Schedule LoRaWAN Network	~		If this service section is disabled it could not be started. Neither from LuCI interface nor from console					
Network	\sim	Lookup Hostnam	ne yourhost.example.com					
			Hostname/FQDN to validate, if IP update happen or necessary					
Logout		IP address version	on					
			O IPv6-Address					
			Defines which IP address 'IPv4/IPv6' is send to the DDNS provider					
		DDNS Service provider [IPv4	بد] <u>dyn.com</u>					
		Domair	ain youthost example.com					
			Replaces [DOMAIN] in Update-URL					
		Usernam	ne your_username					
			Replaces [USERNAME] in Update-URL (URL-encoded)					
		Password	иа					
			Replaces [PASSWORD] in Update-URL (URL-encoded)					
		Use HTTP Secure	Jine 🗌					
			Enable secure communication with DDNS provider					
		BACK TO OVERVIEW	SAVE & APPLY SAVE RESET					

In the dynamic settings interface, certain DDNS service providers are already pre-configured in the drop-down menu in DDNS Service Providers, if the DDNS service provider selected by the customer is not in the drop-down box, you can choose to customize it.

Dynamic DNS is not enabled by default, please click to enable it first before using this feature.

After modifying, please restart the gateway to ensure it works properly.

Customers need to strictly fill in the parameters filled in to set up DDNS to ensure that the network matches properly.

DDNS is also available under multi-level routing.

If the network where the gateway is located is not assigned a separate public IP, then this function will not work.

Off-site access to the gateway intranet can be achieved if the relevant port mapping is set up in the firewall.

Multiple dynamic domain names can be added to the gateway.

5.3.3 WAN/LAN

In Service --> WAN/LAN option, user can set the working mode of Network Port 1 (default is WAN port) as WAN port or LAN port, click Save and Apply, the device will take effect after reboot. 4G mode can set Network Port 1 as LAN port to achieve LAN output. The specific settings are shown in the figure below.

((()) [*] 乙倍特 МКНСЛТВ EBYTE	2	LoRaWAN Gateway
Status	~	WAN/LAN Port setting
System	\sim	
Services	^	setting the work Mode of Ethernet Port (WAN/LAN/)xestart to take effect!
Frp Setting Dynamic DNS		Configuration
Wifi Schedule		Mode of Ethernet Port 1
LoRaWAN Network	\sim	WAN/LAN WAN Y
Network	\sim	
Logout		SAVE & APPLY SAVE HESET

5. 3. 4 WIFI Scheme

In the Services-->WIFI Plan option, users can set events related to wireless WIFI, such as wifi activation or deactivation, as shown below.

((1))) EBYTE 亿佰特 特联网位海军家	ļ.	LoRaWAN Gateway
Status	\sim	
System	\sim	Global Settings
Services Frp Setting Dynamic DNS WAN/LAN Wrifi Schedule LoRaWAN Network Network Logout	~ ~	Enable Wifi Schedule
		Schedule events
		BUSINESSHOURS Enable Day(s) of Week Day(s) of Week Start WiFi 06:00 Stop WiFi 22:00 Force disabiling wifi even if stations associated

5.4 Network

In the Network Settings section, users can set and query network related parameters such as login gateway settings, wifi settings, firewall, etc. The following will introduce some of the common setting options for users.

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5. 4. 1 Interfaces

In Network -> Interfaces, the user can set the relevant settings for the LAN port, WAN port, as shown in the following figure.

(();0) EBYTE 亿佰特 \$\$\$\$96.918		LoRaWAN Gateway		
Status	~	LAN WAN WANG WWAN		
System	~	Interfaces		
Services	~	interfaces		
LoRaWAN Network	~			
Network Interfaces	^	LAN ジ (記念) br-lan	Protocol: Stalic address Uptime: '71 Adm: 446 MAC: 40:D6:3C:2C:A0:E0 RX: 1.33 MB (1202) FXts.) TX: 3.15 MB (1242) FXts.)	RESTART STOP EDIT DELETE
Switch			IPv4: 192.168.10.1/24 IPv6: fd19:d8c4:549b::1/60	
DHCP and DNS Hostnames		WAN	Protocol: DHCP client MAC: 40:D63:C2:CA0E1 RX: 0:B (0:Pirks) TX: 7:34 MB (21729 Pirks.)	RESTART STOP EDG DELETE
Firewall Diagnostics		WAN6	Protocol: DHCPv6 client MAC: 40:D63;3;2;2:cA0:E1 RV: 0:8 (0 Pufs.) TX: 7:34 MB (21723 Pkts.)	RESTART STOP EDT DELETE
QoS Load Balancing		WWAN 2 wwwan0	Protocol: DHCP client RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.) Error: Network device is not present	RESTART STOP EDIT DELETE
Logout				

In the LAN option, you can set the gateway, subnet mask, etc., as well as the DHCP function for the relevant settings, as shown in the figure below.

CEN CEN PRODIE	LoRaWAN Gateway	AUTO REFRESH O
Status v	LATI WANI WANNE WYWAN	
System ~	Interfaces - LAN	
Services v	On this page you can configure the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several network interfaces separated by spaces. You can also use <u>VLAN</u> notation. DIMENCL 10.400 (<u>p.g.</u> , edb. 0.	
LoRaWAN Network 🗸 🗸		
Network ^	Common Configuration	
Wireless	General Setup Advanced Settings Physical Settings Firewall Settings	
Switch DHCP and DNS Hostnames Static Routes Firewall	Status #7 Service herbits MAC 40 point C C Add 0 mAC 40 point C C Add 0 m 20 Add 0 point C C Add 0 m 20 A	
Diagnostics	Protocol Stafic address	
QoS	IP-4 address 192.168.10.1	
	Pv4 netnask 255.255.255.0 -	
Logout	Pr-4 pdba-by	
	IP-4 broadcast	
	Use outom DNS servers 3	
	IPv6 anigoment length 60 • Anigon a part of given length of every public IPv6-prefix to this interface	
	Prd assignment Net Artilize wolfs: water union this based of and university (1) for this interface.	
	19-6 suffice = 1	
	Optional. Allowed values: 'au64', 'andom', fixed value like '>1' or '>12'. When Plv6 prefix (like 'abcd:?) is received from a delegating server, use the suffix (like '>1' to form the IPv6 address (abcd:?) for the interface.	
	DHCP Server	
	General Satup Advanced Sattings (Privi Sattings	
	Ignore interfece	
	includes and the second s	

The default DHCP IP allocation range is 192.168.10.100 to 192.168.1.250, with a default lease period of 12h. Dynamic DHCP IP allocation is enabled by default, and users can choose to turn it off or off according to their needs.

This device also supports VPN clients (pptp,l2tp protocol types). In the following, a demonstration of the VPN client will be given.

First, we click on Add New Interface and get the following information. Here, we set the name to PPTP and the protocol to PPtP.

8:8 26钟 (9896858) 68976 (261) (9896858)		LoRaWAN Gateway	
Status System	~	Create Interface	
Services LoRaWAN Network	~	Name of the new interface	pole The allowed characters are [A-28], [area: [0-9] and [].
Logout	~	Note: interface name length Protocol of the new interface	Maximum length of the name is 15 characters including the automatic protocol/bridge prefix (in-, fisi-, popoe-etc.) PPP v
		GANCEL	

In the basic settings we enter the appropriate server IP, username and password and add the interface to the firewall and save and apply it.

0:0 CON REPORT		LoRaWAN Gateway		UNSAVED CHANGES: 2	AUTO REFR	RI SH O
Status	~	LAN WAN WANG WWAN				
System Services LoRaWAN Network	~ ~ ~	Interfaces - PPTP On this page you can configure the network interfaces. You can t	sign saveral interfaces by licking the "bridge interfaces" field and enter the names of several network interfaces separated by spaces. You can also use <u>VLAM</u> notation 2022/CE 12400 (g.g. with 1).			
Network Interfaces	~	Common Configuration				
Wireless Switch DHCP and DNS Hostnames		General Setup Advanced Settings Firewall Settings Status	Roview softs optimized K0 06 (0 Freat)			
Static Routes Firewall		Protocol	ppp v			
Diagnostics QoS Load Balancing		PAP/CHAP username PAP/CHAP password	ray			
Logout		BACK TO OVERVIEW		SAVE & APPLY	SAVE	KE SET

Wait a little, then the VPN interface is assigned an IP address by the server, indicating that the remote VPN server has been connected.

At this point, we pinged the server's internal IP and were able to get through.

C:\Users\Roy>ping 192.168.20.1
正在 Ping 192.168.20.1 具有 32 字节的数据: 来自 192.168.20.1 的回复: 字节=32 时间=40ms TTL=63 来自 192.168.20.1 的回复: 字节=32 时间=40ms TTL=63 来自 192.168.20.1 的回复: 字节=32 时间=40ms TTL=63 来自 192.168.20.1 的回复: 字节=32 时间=41ms TTL=63
192.168.20.1 的 Ping 统计信息: 数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失), 往返行程的估计时间(以毫秒为单位): 最短 = 40ms, 最长 = 41ms, 平均 = 40ms
C:\Users\Roy>

Again, the L2TP method of VPN and PPTP are set up in much the same way.

Here, we do not give an overview of other interfaces, and we also advise our customers not to set the relevant parameters of other interfaces, as easily as possible, if they do not have special needs or are professionals.

5.4.2 Wireless

In the Network --> Wireless --> Wireless Profile option, click on the Edit option to set and query wireless related parameters, such as setting wireless password, operating mode, MAC filtering, etc., as shown in the figure below.

(1)) (1))	LoRaWAN Gateway	UNEAVED CHARGES 1 AUTO REPAIRS ON
Status v	radio0: Master "EBT-E890-A0E0"	
System ~ Services ~	Wireless Network: Master "E	ST-E890-A0E0" (wlan0)
LoRaWAN Network 🗸 🗸		
Network ^	Device Configuration	
Wireless	General Setup Advanced Settings	
Switch DHCP and DNS Hostnames Static Routes Firewall	Status	Mean Music (SDD) 617 6350-3400 Dig SS10 (a) 0525 CCA 060 Baryping Toxic Dig SS10 (a) 0525 CCA 060 Baryping Toxic Dig SS10 (a) 0525 CCA 060 Baryping Toxic Baryping Toxic <t< td=""></t<>
Diagnostics	Wireless network is enabled	POME .
QoS Load Balancing	Operating frequency	Mode Channel Width N • 11(2482)MHz) • 20 MHz •
Logout	Transmit Power	ada v dan
	Interface Configuration	
	General Setup Wireless Security MAC-Filter Ad-	aned Sellings
	ESSID	E6TE600-AUE0
	Network	Les 25 2 • Oceans the network() you want to attach to this values of () out the moster fail to defer a new extensive
	Hide ESSID	
	WMM Mode	a
	BACK TO OVERVIEW	SINE SAMEY SALE HERE'

In wireless WIFI, the default WIFI name is: EBT-E890-XX:XX

where the next characters are the first four bits of the MAC address of the device.

WIFI password is empty by default

a 1009

100%

WiFi client mode is also supported. Configure the name of the WiFi you need to connect to and the key, save the parameters and the gateway will connect to the router.

(注意) 乙倍特 manor	10	LoRaWAN Gate	eway						UNS	AVED CHANGES: 2 AUTO RE
Status	~	radio0: Master "EBT-E890	J-A0E0"							
System Services	~	Wireless O	Verview							
LoRaWAN Networ Network	k ~ ^		😤 radic0 Ge Cha	neric MAC80211 802.11 nnel: 11 (2.452 GHz) Bitrate	bgn r: 57.8 Mbit/s					RESTART SCAN AL
Interfaces Wireless Switch			100% SSI BSS	D: EBT-E890-A0E0 Mode: Mi ID: 40:D6:SC:2C:A0:E0 Energy	sster ption: None					DISABLE EDIT REMO
DHCP and DNS Hostnames		Associated	d Stations							
Firewall Diagnostics			Network		MAC-Address	Hes		Signal / Neise	RX Rate / TX Rate	Disco
QoS Load Balancing			Master "EBT-E890-AOEO" (wlan	20	84:6D:83:9A:ED:63	DESKTOP-HJNQENF.Is	(192.168.10.104)	🚄 -35 / 0 dBm	72.2 Mbit/s. 20MHz. MCS 7. Short GI 65.0 Mbit/s. 20MHz. MCS 6. Short GI	DISCONNE
10 NUMBER LO	RaWAN	N Gateway							UNSAVED CHANGES	AUTO REFRESH ON
č J	loin N	letwork: Wir	reless Scan							
~		Signal	SSID	Channel	Mede	BSSID	Encryption			
Network 🗸										

80:95:8E:58:4E:69

WPA2 - PSI

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Logout

$\leftarrow \rightarrow$ C \blacktriangle	不安全 192.168.10.1/cgi-bin/luci/admin/network/wire	sjoin	P	Aø	ର୍ ଚୈ	G	Σ,≣	۱.	
():0) * 亿倍特 панолен пауун 亿倍特 панолен	LoRaWAN Gateway								
Status v System v	Joining Network: "HUAWEIQ								
Services v LoRaWAN Network v	Replace wireless configuration) Next this option to delive the existing networks from this radio;							
Network ~	WPA passphrase	peoly the secret encryption kay here.							
	Name of the new network	waad he allowed characters are [<u>k-1</u>], [<u>k-2</u>], [<u>b-9</u>] and []							
	Create / Assign firewall-zone	were were the financial cone you want to assign to this interface. Salect unspecified to remove the interface from the associated zone or fill out the create field to define a new zone and attach the	interface t	to it.					
	BACK TO SCAN RESULTS								SUBMIT
():(): ():():():():():():():():():():():():():(LoRaWAN Gateway							AUTO	REFRESH ON
Status v	radio0: Master "EBT-E890-A0E0" radio0: Client "HUAWEIQB"								
System v	Wireless Overview								
Services v									
LoRaWAN Network 🗸 🗸	Comparie MA	0311 003 11 hav				_			
Network ^	generic MA	GHz) Bitrater 72.2 Mbit/s				RESTAR	RT SC	AN A	500
Interfaces	100% SSID: E87-E89 BSSID: 42:D6:3	ED Meder Master C:A0.ED Encryption: None				DISABLE	EDIT	REM	OVE
Switch	100% SSID: HUAWEI BSSID: 40:D6:3	Mode: Client CA0.E0 Encryption: WPA2 PSK (CCMP)			1	DISABLE	EDIT	REM	DVIE
DHCP and DNS									
Hostnames									

5.4.3 Switches

In the Network -> Switch option, users can combine Network -> Interface to set the type of network port (such as LAN port or WAN port) or network port enable/disable, in the later version, it will be combined with load balancing to do related settings, the setting interface is shown in the figure below.

CONCERNMENTER		LoRaWAN Gateway																					AUTO R	EFRESH O
Status System Services LoRaWAN Network Network Interfaces Wireless	× × × ×	Switch The network ports on this de Switch "switch(vice can be con D" (rt305) Enable VL	lbined to several <u>VI</u> (- CSW) AN functionality	<u>AN</u> s in wh	ich computers	: can communicate dire	ctly wi	ith each other. <u>V</u>	(<u>LAN</u> s are often use	d to :	separate diffe	rent network segm	ents. Of	ften there is by	default one Uplini	c port fo	or a connection	to the next grea	iter netwo	rk like the internet	and other por	ts for a local	network.
Switch DHCP and DNS Hostnames Static Routes Firewall		VLANS ON "SWI	tch0" (rt3	O5x-esw) CPU (eth0)			LAN 1		L	AN 2			LAN 3			LAN 4			WAN					
QoS Load Balancing		Port status:	tagged	1000baseT full-duplex	* *	untagged	no link	× .	untagged	no link	·	untagged	no link	*	untagged	no link	* *	off	no link	* *	DELETE			
		DD																			SA	/E & APPLY	SAVE	RESET

5.4.4 DHCP/DNS

In the Network->DHCP/DNS option, use MAC-Address to identify the host, IPv4-Address to assign an address, and Hostname to assign a logo. Static address assignment: set at "Network->DHCP/DNS-> Basic Settings". This function is an extension of the DHCP settings for the LAN interface and is used to assign fixed IP addresses and host identifiers to DHC clients. Only the assigned hosts can connect and the interface must be non-dynamically configured.

(((•))) EBYTE

DEST CAN MORENESS	LoRaWAN Gateway	n and a second secon	o refresh on
Status × System × Services ×	DHCP and DNS Dramasq is a combined <u>DHCP</u> . Gerver and <u>DHS</u> -Forwarder for <u>b</u>	援 brock	
LoRaWAN Network ~ Network ^	Server Settings		_
Interfaces	General Settings Resolv and Hosts Files TFTP Settin	ge Advanced Settings	
Wireless Switch	Domain required	2 Don't forward <u>2016</u> -Requests without <u>2016</u> -James	
DHCP and DNS	Authoritative		
Static Routes		This is the only DHCP in the local network	
Firewall	I mai server		
Diagnostics		Cacil domain specification. Names matching this domain are never forwarded and are resolved from DHCP or hosts files only	
QoS Load Balancing	Local domain	Bn Local domáin suffia agondate to CHCP nema and teors file wetrias	
Lonout	Log queries		
1009000		Where repleted DHS requests to pulloa	
	DNS forwardings	Intersple any (13.12.3	
	Rabind protection		
		Distard upstream RFC1918 responses	
	Allow localhost	C Alou updatem responses in the 127.00.018 mage, e.g. for XIII, services	
	Domain whitelist	Asstandington In of Acception station BY/1915 approach for	
	Local Service Only		
		Limb DNS service to subvest interfaces on which we are serving DNS.	
	Non-wildoerd	0	
	Listen Interfaces	End dynamically to interface rather than villours software to finul activute	
	Exclude Interfaces	Prevent linesing on three interferors.	

5.4.5 Hostnames

In the Network-> Hostname option, you can implement a custom domain name resolution, users can fill in any host name (domain name) they want, here we set "EBYTE-4G-ROUTER" as the host name, the corresponding IP address is 192.168.10.109. This enables the mapping between hostname and IP address, so that when the EBYTE-4G-ROUTER is resolved locally it actually resolves to the 192.168.10.109 address.

010 CARH	2	LoRaWAN Gateway			
Status System	š	Hostnames			
iervices .oRaWAN Network	ž	Host entries			
letwork Interfaces	^	Hostname	This section contains no values yet	IP address	
Wireless Switch		A00			
HCP and DNS Hostnames Itatic Routes					
Firewall				SWEIZAPRY	SALE

Then, we ping the hostname at the windows command line as follows.

C:\Windows\system32\cmd.exe
C:\Users\Roy> C:\Users\Roy>ping EBYTE-4G-ROUTER
正在 Ping EBYTE-4G-ROUTER.1an [192.168.10.109] 具有 32 字节的数据: 来自 192.168.10.109 的回复: 字节=32 时间<1ms TTL=128 来自 192.168.10.109 的回复: 字节=32 时间<1ms TTL=128 来自 192.168.10.109 的回复: 字节=32 时间<1ms TTL=128 来自 192.168.10.109 的回复: 字节=32 时间<1ms TTL=128
192.168.10.109 的 Ping 统计信息: 数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失), 往返行程的估计时间(以毫秒为单位): 最短 = Oms, 最长 = Oms, 平均 = Oms
C+\Ilsers\Rov>

5. 4. 6 Load balancing

The load balancing function dynamically assigns priority, enablement and even traffic ratios between network ports for multiple network interfaces of the gateway (e.g. wired Ethernet and 4G wireless). It enables the user to make the allocation mechanism relevant to the actual network environment. In the following, we will explain the load balancing function. On our gateway, we have access to two network interfaces wan (wired Ethernet) and wwan (4G wireless). When we switch on the gateway, we can check the operational status of the two interfaces in Status -> Load Balancing Selection.

BOATS CON COLORS	L	oRaWAN Gateway	
tatus	~	Interface Detail Diagnostics	s Troubleshooting
Overview lystem Log coad Balancing		MWAN Interfaces	
ystem ervices	~	Interface: wan Status: Disabled	Interface: www. Status: Disabled
RaWAN Network	~		

Here, the user can handle exceptions or set some parameters for some interfaces through other sub-options. In the option Network -> Load balancing, the user can set the parameters related to load balancing, as shown in the figure below.

2/6W CONCREM	LoRaWAN Gatew	ау									
v.	Globals Interfaces Mer	nbers Policies Rules N	lotification								
∨ ∨ N Network ∽	WWAN - Interfaces Tarke are consensity of of Buggeorde listeriors configured WMMMDG listerior and the in the list more the mean reading table WMMMDG listerior and the interface and the interface configured WMMMDG listerior and the interface										
# DNS	MWAN supports up MWAN requires that Names must match t Names may contain- interfaces may not si	to 252 physical and/or logical int all interfaces have a unique met he interface name found in /etc/ characters A-Z, a-z, D-S, _ and no are the same name as configure	Nerfaces tric configured in /etc/config/network: /configuretork: o paces ed mambers, policies or rules								
s DNS as	MWAN supports up MWAN requires that Names must match in Names may contain Interfaces may not al Name	to 252 physical and/or logical in all interfaces have a unique met he interface name found in /etc) haracters A-2, a-2, D-5, and no are the same name as configure Enabled	heritoes tric configured in /etc/config/network: /config/network; o spaces di members, policies or rules Tracking method	Tracking reliability	Ping interval	Interface down	Interface up	Metric			
d DNS es	MWAN supports up MWAN requires that Names must match th Names must contain Interfaces may contain Name Name wan	to 252 physical and/or logical int all interfaces have a unique meth interface name found in /rdv characters A-2, a-2, 0-9, _ and no are the same name as configure Enabled Yes	herfaces sic coeffigured in /etc/config/hetwork: (coeffiguretwork) ed members, policies or rules Tracking method ping	Tracking reliability	Ping interval 5a	Interface down	Interface up	Metric 10	EDT DELETE		
s DNS is tas	MWAN supports up MWAN requires that Names must match t Names may contail. Interfaces may nos al Name wan wan	to 252 physical and/or logical int all interfaces have a unique met he interface name found in /etc/ haracters A-2, a-2, O-9, and no eare the same name as configure Enabled Yes Yes	terhozi nic configuration, inc/config/network: configurations, spaces dimembers, pelicidis or rules Tracking method ping ping	Tracking valability 1 1	Ping interval Sa Sa	Interface down 3 3	Interface up 3 3	Metric 10 20	EDT OBLETE EDT OBLETE		

In this device, we have set up the load balancing configuration of 2 multiple interfaces for users by default. In the following, we make a brief explanation of the relevant sub-options of this function for the load balancing constituted by these two interfaces respectively, so that users can learn to configure their own rules after understanding them.

Interfaces:

Members:

This is used to set the number of leap points (i.e. interface priority) and the weighting of each MWAN interface. The general naming convention for members is: "interface_name_leap_point_weighting_ratio". This is shown in the diagram below.

201 2/011 COLLETT		LoRaWAN Gateway				
itatus	~	Globals Interfaces Members Policies Rules Notification				
ystem iervices	÷	MWAN - Members				
oRaWAN Network letwork	~	Members are profiles attaching a metric and weight to an MWAP Nemes may contails characters A-2, a-2, 0-9, and no spaces Members may not shave the same name as configured interfaces	l'interface policies or rules			
Wireless		Name	Interface	Metric	Weight	
Switch		wan_m1_w3	wan	1	3	I COLETE
DHCP and DNS Hostnames		wan_m2_w3	wan	2	3	TOT DELETE
Static Routes		4g_m1_w2	www.an	1	2	► CDT DELETE
Firewall Diagnostics		4g_m2_w2	www	2	2	A VEDT DELETE
QoS Load Balancing		004				
.ogout						SAELARRY SAE

The above defines four members, each with a different combination of leap points and weights, which serve the strategies that follow.

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Strategy.

This is used to group members together and tell MWAN how to allocate the traffic in the "rules" that use this policy. Members with a lower number of leap points will be used first. Members with the same number of leap points will have their traffic divided proportionally according to their weight. Members with a higher weighting between load-balanced members will be allocated more traffic. The device defaults to five policies, as shown in the diagram below.

us v ^{Gk}	bals Interfaces Members Policies Rules Notificati	on											
em 🗸	WAN - Policies												
vices ~													
aWAN Network 🗸 🗸													
work ^	Packies are porflas granding on or more members controlling how MWMM distributes traffic. Member investments and low members are used from												
artaces	Nerbeit mindlas von lower mensca ar case frak Nerbeit mindlas von lower mensca ar case frak Nerbeit mindlas von lower and the lower melle set and the lower												
reless	Los-balancia menier interlicia databili de nos tetita da taba etta data da la data da la databili de nos tetita Name nun construita databili da 2,4 and to gosto												
tch	Policies may not share the same name as configured interfac	es, members or rules											
CP and DNS	Name	Members assigned	Last resort										
triames ic Routes	wan_only	wan_m1_w3	unreachable (reject)	CALLETE DELETE									
wall	balanced	4g_m1_w2 wan_m1_w3	unreachable (reject)	CELETE DELETE									
s and a second s	4g_only	4g_m1_w2	unreachable (reject)	COLORE EDIT DELETE									
d Balancing	wan_1_4g_2	4g_m2_w2 wan_m1_w3	unreachable (reject)	TOT DILETE									
out	4g_1_wan_2	ág_m1_w2 wan_m2_w3	unreachable (reject)										

The explanatory notes are shown in the table below.

Name	Description					
wan_only	Use only traffic from the wired Ethernet interface					
halamaad	Traffic from both the Ethernet and 4G wireless interfaces are used					
balanced	and captured in a 3:2 ratio					
4g_only	Wired first, 4G spare capacity					
wan_1_4g_	Wind professed 4G hade up					
2	wired preferred, 40 back-up					
4g_1_wan_	AG first wired heat up					
2	40 mst, when back-up					

Rules.

It classifies traffic into a specified "policy" based on IP address, protocol and port. The rules are matched in order from top to bottom. All rules are ignored except for the first rule that matches a single communication. Traffic that does not match any rule will be routed by the system default routing table.

The diagram below characterises the policy of going wan_1_4g_2 for all destination addresses or protocols, i.e. giving priority to wired network data and getting traffic from the 4G interface when the wired Ethernet goes down or no data stream is available. When the first rule is not satisfied, match the following one, otherwise it will be ignored.

010 C6H C002078	LoRaWAN Gateway														
Status ~	Globals Interfaces Members i	Glabal Herrices Reider Reider Reider													
öystem 🗸 🗸	MWAN - Rules														
ŝervices 🗸 🗸															
LoRaWAN Network ~															
Network ^	Rules specify which staffs will use a particular MIMM policy Rules are based on the Rules appet or protectel Rules are and Rule from policy Rules are and Rules are and Rules are and Rules Rules are and Rules are and Rules Rules are and Rules Rules are and Rules R														
Interfaces															
Wireless	Traffic not matching any rule is	routed using the main routing table													
Switch	Traffic destined for known (oth Traffic matching a rule, but all \	er than default) networks is handled by the m WAN interfaces for that policy are down will be	sin routing table s blackholed												
DHCP and DNS	Names may contain characters	A-Z, a-z, 0-9, _ and no spaces	diciae												
Hostnames	Name	Course address	Course port	Dectination address	Destination port	Protocol	Policy arrivated								
Static Routes		50000 00000	Joint part	Control Control	of the second seco	Trotoco	Tony assigned								
Firenall	default_rule	-	-	0.0.0/0	-	all	wan_1_4g_2	▲ Y EDIT DELETE							
Diagnostics	https	-	-	-	443	top	wan_only	A V EDIT DELETE							
QoS	_														
Load Balancing		400													
ogour															

If the current policy type meets your needs, you can modify the policy by clicking the edit button on the default_rule rule in the diagram above.

CONTR CONTRACTOR	LoRaWAN Gateway											
Status ~	Globals Interfaces Members Policies Rules Notific	adon										
System ~ Services ~	MWAN Rule Configuration - default_rule											
LoRaWAN Network ~ Network ^	Source address	Supports COR incertion (kg 1121-168, 105:0041) without sources										
Wireless Switch	Source port	May be where an a single or multiple particip (log 122 or 15,447) or all a partnerge (log 1124,2047) white a conse										
DHCP and DNS Hostnames Static Routes	Destination address Destination port	u u u u u Supporta CRR notation (kg. "182:168.100.004") without quarke										
Firewall Diagnostics QoS	Protocol	Nay be enseed as a single or multiple pont(s) (og 122° or 10,407) or mit a pontenge (og 1124/2047) effect tootes af										
Load Balancing	Stely	Veen the same of inscipatoosis for protocol description No Particle on the same source IF address that previously institute this inclusion formeus approximation with the states source approximation of the states source appro										
	Stidy timeout	Seconds. Acceptable values: 1-000000. Defaults to 600 if not set										
	iPset	Name of Piet vie. Realises Piet vie its Actionersage of its "post-Acades conjugated"										
	BACK TO OVERMEW	140,002										

5. 4. 7 Firewalls

In the Network -> Firewall option, make settings related to network security and communication rules, as shown in the figure below.

010 - 260 - 0002010	LoRaWAN Gateway											
Status ~ System ~	Owered Series Portforweds Teefficials Catembular											
Services ~ LoRaWAN Network ~	The freed outsits zones over your reduced institution to control reduced traffic from.											
Network ^	General Settings											
Wireless Switch	Instal 511-Adoptedetion g											
DHCP and DNS Hostnames	Des invalle passes											
Static Routes Firewall	light seath V											
Diagnostics QoS	Romail Red v											
Load Balancing	Koding/NAC (Hossing Experimental habute: http://www.sch.opublic.com/sch.opublic/sch.opubli											
Logout	Schwar four diffuality Schware based officiality for nutry Net Schware based officiality for nutry Net											
	Zones											
	News Zone Streamfung leget Output Forward Masgumenting Lifest											
	A0											

1. IP Dynamic Masquerade (MASQ)

MASQ, also known as MASQUREADE, address masquerading, will leave the source IP of the packet into the IP address of an interface of the gateway, as shown in the figure check the IP dynamic masquerading, the system will modify the source IP address of the packet flowing out of the gateway to the IP address of the WAN port, here, the default way for IP dynamic masquerading on.

one	es												
Name	Zone ⇒ For	rwardings		Input			Output			Forward		Masquerading	MSS clamping
lan	lan =	wan	accept		~	accept		~	accept		~		
wan	wan =	REJECT	reject		~	accept		~	reject		~	53	2
ADD	o l												

2. Communication rules (SNAT & DNAT)

In Network --> Firewall --> Communication Rules, there is a Source NAT column, Source NAT is a special form of packet disguise, change the source address of the packet leaving the gateway, for example, the source IP of the packet leaving the gateway address is fixed to 192.168.1.1 (real IP: 192.168.10.1), the setting interface is shown below, the

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name EBYTE for the display interface after the setting, named TEST, for the display interface when added.

In this device, Source NAT is not added by default, when using this function, the user can make the relevant settings according to the relevant requirements.

DNAT is destination address substitution, replacing the destination IP address of a packet whose destination address into the gateway is the WAN port IP with the IP address set by the user.

3. Port forwarding

Port forwarding allows computers from the Internet to access computers or services on a private LAN, e.g. forwarding TCP data from port 82 on the external network to port 82 on the internal network 192.168.10.119 would have the following settings.

5. 4. 8 Network Diagnostics

In the Network -> Network Diagnostics option, the online diagnostic function is supported.

Ping tool, directly on the gateway side, to perform a ping test to a specific address.

Gateway parsing tool to get the routing path through which the address is accessed.

DNS viewer tool that resolves domain names to IP addresses.

This is shown in the diagram below.

EDVYE CON CONCERN		LoRaWAN Gateway		
Status System	ž	Diagnostics		
Services LoRaWAN Network	~	Network Utilities		
Network Interfaces Wireless Switch	^	ophinit og 00 IP-i v Train IP-i v Train	enintog K≪ TNADDUR	spennet og

5. 4. 9 Flow control management (Qos)

In the Network -> Qos option, you can sort traffic packets according to network address, port or service, and apply network speed limits for a particular interface, among other functions. This is shown in the diagram below.

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DEVTE COMPANY	LoRaWAN Gateway														
Status × System × Services ×	Quality of Service With <u>Q2</u> you an protect revenue traffic selected by softeness, ports or services.														
Losarana neteron e Weters Sento OCI2 and DG Not and DG Not and DG Not and DG Deposit Logosit	Interfaces WAN Classification B	Enable Classification group Catulates oniversal Half-cuptes Update speed (bits) Update speed (bits) Catulates Update speed (bits)	default 0 1024 128			×								GAT	
		Target		Source host		Destination host		Protocol		Ports		Number of bytes	Comment		
	priority		~	a	•	di -	- 4	(22,53		•		sah, dris	A V DELETE	
	normal		*	81	-	ai -	- тс	p -	20.21,25,80	10.443.993.995	· -		ftp, smtp, http(s), imsp	► ► DELETE	
	express		*	al	<u> </u>	NI -	- al	•	5190		· -		AOL, IChat, ICQ	► ▼ DELETE	
	GGA														
														SAVE BAPPLY SAVE RES	SET

5.5 LoRaWAN network setup

In the LoRaWAN network settings section, users can set and query the LoRaWAN frequency band, LoRaWAN gateway related parameters, and view the current status information. For example, the number of received and transmitted messages, current channel usage, RSSI & SNR, upstream and downstream packet time and airtime. Some of the common user settings options are described below.

5. 5. 1 LoRaWAN band settings

LoRaWAN band settings are divided into band region and band settings.

Band Region refers to the Regional Parameter specified in the LoRaWAN protocol,

EU868/IN865/RU864/US915/AU915/AS923/KR920, this model supports three regional files, EU868/IN865/RU864, where the EU868 band region configuration is as follows.

ENVIE CONCERN		LoRaWAN Gateway			
Status	~	Channel Plan			
System	~				
Services	~				
LoRaWAN Network	~	Region	EU803-870	×	
LoRaWAN channel plan		Standard Mode	SWITCH TO ADVANCED MODE		
LoRaWAN Gateway Settings		chan_multiSF	868.1MHz	×888.3MHz	808.5MHz
LoRaWAN status			Freq.(MHz) Add		
Network	~	Standard LoRa Channel	808.3MHz		
Logout			Freq.(MHz) Add		
		FSK Channel	808.3WHz		
			Freq.(MHz) Add		

The IN865 default band area is configured as follows:

201 C/8H COLLEGE	LoRaWAN Ga	ateway				
Status ~	Channel	Plan				
System 🗸	Channel	T IGHT				
Services ~						
LoRaWAN Network 🗠		Region	IN865-867	~		
LoRaWWN channel plan	1	Standard Mode	SWITCH TO ADVANCED MODE			
LoRaWAN Gateway Settings		chan_multiSF	865.0825MHz	865.4025MHz	885 985MHz	
Network			Freq.(MHz) Add			
		FSK Channel	-			
Logout			Heq.(MH2) Add			

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The default configuration for the RU864 band area is as follows.

CONTRACTOR CONSERVATION	oRaWAN Gateway					
Status ~	Channel Plan					
System ~	Charmer han					
Services ~						
LoRaWAN Network		Region	RU884-870		~	
LoRaWAN channel plan		Standard Mode	SWITCH TO A	ADVANCED MODE		
LoRaWAN Gateway Settings		chen_multiSF	858.9MHz		850.1MHz	
Network status			Freq.(MHz)	Add		
Network S		Standard LoRa Channel				
Logout			Freq.(MHz)	Add		
		FSK Channel				
			Freq.(MHz)	Add		

In addition to the default configuration, there is also support for custom band settings, click on the interface can be custom band settings, you can custom add the desired band, each band interval of at least 0.2MHz, up to eight configuration.

BOATE COM CONCERN	LoRaWAN Gateway				
Status 🗸 🗸	Channel Plan				
System 🗸					
Services ~					
LoRaWAN Network 🗠	Region	EU883-870	<u> </u>		
LoRaWAN channel plan	Standard Mode	SWITCH TO ADVANCED MODE			
LoRaWAN Gateway Settings	chan_multiSF	868.1MHz	868.3MHz	868.6MHz	
LoRaWAN status		Freq.(MHz) Add			
Network ~	Standard LoRa Channel				
Logout		Freq.(MHz) Add			
	FSK Channel				
		Freq.(MHz) Add			
					SAVE & APPLY SAVE RESET

5. 5. 2 LoRaWAN gateway setup

LoRaWAN gateway settings set the relevant parameters of the gateway

CONTRACTOR CONTRACTOR		oRaWAN Gateway	
Status System		LoRaWAN Gateway Settings	
Services	-		
LoRaWAN Network		settings	
LoRaWAN channel plan	_	Gatway ID	000000000000000000000000000000000000000
LoRaWAN Gateway Settings		Server Address	kanawinak abyla con
Network		Server Port Up	170
		Server Port Down	1700
Logout		Push Timeout (ms)	100
		Statistic Interval (s)	30
		Keepalive Interval (s)	10
		RF forwarding screening	forward CPC wild package

Gateway ID: Gateway identification number, ensure that the gateway ID set is not duplicated with the existing gateway ID of the server used, otherwise data loss and other problems may occur.

Server address: LoRaWAN server address

Server uplink port: data uplink port number

Server downstream port: Data downstream port number

Response timeout: gateway-server communication timeout

Statistical interval: gateway status reporting period

Heartbeat time: gateway heartbeat reporting period

Forwarding rules: gateway forwarding policy for corresponding LoRa packets

5. 5. 3 LoRaWAN Status

BOAT CAN CONCERN	LoRaWAN Gateway	A JTO N	EFRESH ON
Status ~ System ~	LoRaWAN Network Status		
Services ~	Received	Transmitted	
LoRaWAN Network 🗠		0 0	
LoRaWAN channel plan			
LoRaWINN status			
Network 🗸	Usage Rate Of the LoRa Channel	RSSI & SNR	
Logout		Packet	
		3.6	
		06	
		62	
		0 Product vie-15 vie-10 vie-5 vie0 vie5 vie10 vie15 v15	
		20	
	868.3.NaN% 868.1 860.3 868.5 860.3	6 0013 (req.(MAZ) 0.2	
		0	
	Uplink package Time	Uplink air Time	
	O DRD O DR1 O DR2 O DR3 O DR4 O DR5 O DR5 O DR7 DR7/0 (796)	O DEC O DEL	
	DR6-0 (04)	DRI: 0 (PN) - DRI: 0 (PN)	
	DR3: 0 (0%)	DR5(0 (0%)	
	plegMin DR4: 0 (0%) DR3: 0 (0%)	Airtirectms/Min	
	0.8	0.0	
	0.6 0.4	0.6	
	0.2		
	0 าร์เลย าร์เสร กร์เรา กรับรา รอบรา	ร้อง เพิ่มร	

Incoming messages: Shows the total number of LoRa messages received by the LoRaWAN gateway Send messages: shows the total number of LoRa messages sent by the LoRaWAN gateway

lora channel usage: The graph shows the occupancy rate of all channels over a 12 hour period, usually the 8

channels are evenly distributed, if one channel is much less used than the others, it means that the channel may be faulty. RSSI & SNR.

The RSSI chart shows the statistical signal strength of the received messages, which can be used to determine the current environmental information, the smaller the RSSI value, the higher the sensitivity of the reception.

The SNR graph shows the statistical signal-to-noise ratio of the received message. The higher the SNR value, the lower the noise to signal ratio and the better the communication.

Uplink package Time	Uplink air Time
0 0	O CH0
Downlink package Time	Downlink air Time
0 0	O DEO O DEI

Uplink/Downlink Packet Time: Number of LoRa packets received/sent by the gateway per minute Uplink/Downlink Airtime: Airtime to receive/send LoRa packets

6. Equipment panel identification and function settings

A physical view of the equipment panel (front view) is shown below.



6.1 LED indicators

In the panel, each LED indicator is described, as shown in the table below.

Name	Description
WLAN indicator	WiFi light flashes on power up
Indicator light	Vacant
ETH Indicator	Network cable connection lights up
LINK indicator	Always on when connected to the server
RXD light	Gateway Receive Data Light
TXD light	Gateway sending data light
SYS light	RF module and network always on for normal operation
PWR light	Always on when powered up

6.2 Key settings

In the panel, the function of each physical button and the description of its use are shown in the table below.

Name	Description
Restore	Press and hold the button for more than 5s to restore the factory settings

6.3 Other markingssss

In the panel, other markings are described, as shown in the diagram below.

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Revision history

Version	Date	Description	Issued by
1.0	2022-04-19	Initial version	LM
1.1	2023-02-25	Change picture	LM

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