



specification

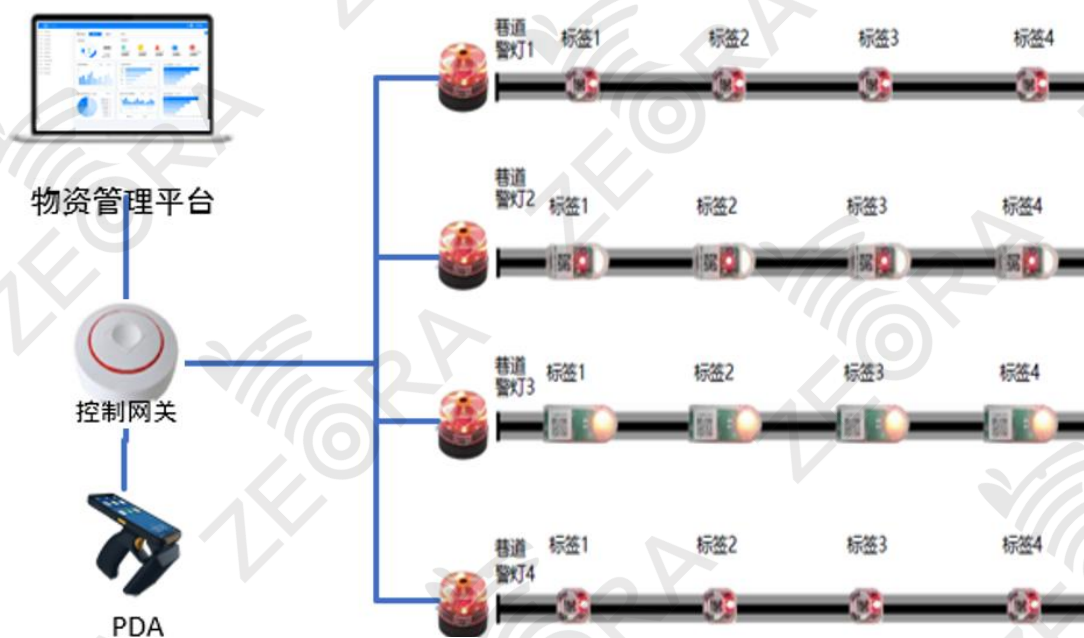
KEY CABINET PRODUCT SPECIFICATION

Intelligent Autonomous Warehouse (PTL)

一、summary

The Unmanned Warehouse (PTL) system utilizes radio technology operating in the 2.4 GHz frequency band, offering advantages such as extensive coverage, low power consumption, support for large-scale connectivity, and cost-effectiveness. The material management platform enables technical information management of materials; color-coded aisle labels and storage location labels clearly indicate product locations for picking personnel. PDA smart terminals facilitate material queries, location tracking, requisitioning, and settlement processes. This system is applicable in various scenarios including parcel retrieval at Cainiao warehouses, warehouse searches, medication retrieval at pharmacies, and laboratory sample identification.

二、PTL System Composition Block Diagram



三、system composition

order	device name	model	remarks
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number			
1	Intelligent Smart Terminal	ZSW-D08	●
2	Wireless Communication Gateway	ZSL-PT20	●
3	Colorful Street Corner Labels	ZSL-PT10	○
4	Colorful Storage	ZSL-PT01	○
5	Location Labels	ZSL-PT02	
6	Material Management Platform	—	●

Note: ● Required ○ Configure as needed

四、ZSW-D08 Intelligent Handheld Terminal

The ZSW-D08 intelligent handheld terminal is a all-in-one device developed by Zebra that supports warehouse inbound/outbound management and inventory counting functions. It handles the storage, return, relocation, and inventory verification of consumables, assets, and reagents, enabling a single PDA to meet comprehensive storage management requirements for various materials.



(一) Product Features

1. Features a 5.5-inch touchscreen with QR code recognition
2. The software system uses the Android operating system.
3. Integrates functions for inventory management of consumables, assets, and reagents, including inbound/outbound storage, return processing, relocation, and inventory counting.
4. Supports account verification login
5. Supports batch inventory operations for consumables, assets, and reagents
6. Supports moving items from Warehouse A Area A to Warehouse B Area

B for quick relocation

7. Supports returning multiple items to the warehouse, allowing selection of another storage area for re-storage
8. Supports conducting inventory counts of stored consumables, assets, and reagents according to predefined tasks.
9. Local Upgrade: Supports updating applications by connecting the upgrade package via a USB external interface;
10. Remote Upgrade: Supports deploying upgrade packages remotely, with the system automatically completing the installation

(二) Specification Parameters

1. Basic Parameters

performance parameter	model	DS08
	operating system	Android 12.0
	processor	Eight-core 64-bit, 2.2 GHz
	internal storage	RAM: 4GB , ROM: 64GB
	extended memory	Micro SD card, supporting up to 256 GB of SDXC capacity
Basic Specifications	outline dimension	156.9mm×72.3mm×16.9mm
	Total weight of the device	Host (with battery) does not exceed 266 g
	display screen	5.5-inch color full-screen display (720×1440)
	touch screen	Supports multi-touch, glove touch, water-resistant operation, and passive pen signatures
	main battery	5000mAh, removable
	charging interval	5V2A, not exceeding 4 hours
	audio	1.5W speaker, microphone (with noise cancellation)

	frequency	support), earpiece (with echo cancellation support)
	Interface	USB Type-C port: Supports OTG and headphone audio transmission Bottom Pogo Pins *4: Support charging/data transfer
	key	Physical buttons: Volume up/down keys, Power button, Scan buttons (2)
	camera	Front 5MP camera Back-mounted 13 MP camera with PDAF and flash support
	sensor	Distance, Light Sensitivity, Acceleration, Geomagnetism, Gyroscope
	scan	Professional scanning engine that supports scanning mainstream one-dimensional and QR codes, including screen scanning
	Slot Type	Single card slot, choose either Nano-SIM or Micro SD (SD cards support up to 256 GB expansion)
data communica tions	wireless wide area network	Supports all networks: 4G, 3G, and 2G
	PDA	BT5.0 + BR/EDR + BLE
	Wi-Fi	2.4G/5G dual-band support IEEE 802.11a/b/g/n/ac/d/h/i/k/r/v/w Standards Fast roaming: PMKID caching; 802.11r (Over-the-Air); OKC: You can set a Wi-Fi roaming threshold
	fixed position	Supports GPS, A-GPS, Beidou, GLONASS, and Galileo
	NFC	RFID frequency: 13.56 MHz; supports ISO 15693, ISO 14443 A/B, Mifare, and Felica standards
service environme nt	working temperatu re	-20 ~ +60℃
	storage temperatu re	-40 ~ +70℃
	humidity	5% RH to 95% RH (no condensation)
	Seismic resistanc e height upon impact with the	Capable of withstanding repeated impacts from falls from a height of 1.5 meters onto a smooth concrete surface.

	ground	
	levels of protection	IP67
	electrostatic protection	Air discharge: ± 15 kV; Contact discharge: ± 8 kV

2. Number of Data Collection Functions

1) Camera

camera	Previous
Photo Features	Prime lens, 1080p video recording
pixel	5MP
camera	postposition
Function Type	Supports flash, autofocus, and 1080p video recording
pixel	13MP; 8MP available as an option

2) Scan Head

	two dimension
Rotation Angle	360°
Up-and-down viewing angle	$\pm 60^\circ$
Left-right perspective offset	$\pm 60^\circ$
Support Code Types	Linear: Codabar, Code 11, Code 128, Code 2 of 5, Code 39, Code 93 and 93i, EAN/JAN-13, EAN/JAN 8, IATA Code 2 of 5, Interleaved 2 of 5, Matrix 2 of 5, MSI, GS1 Databar, UPC-A, UPC E, UPC-A/EAN-13 with Extended Coupon Code, Coupon GS1 Code 32 (PARAF), EAN-UCC Emulation, GS1 Data Bar 2D Stacked: Codablock A, Codablock F, PDF417, MicroPDF417 2D Matrix: Aztec Code, Data Matrix, MaxiCode, QR Code, Chinese Sensible (Han Xin), Grid Matrix, Dot Code Postal: Australian Post, British Post, Canadian Post, China Post, Japanese Post, Korea Post, Netherlands Post, Planet Code, Postnet

3) RFID (HF/NFC)

RFID	Read/Write (HF)
protocol standard	High frequency of 13.56 MHz, supporting ISO 15693, ISO 14443 A/B, Mifare, and Felica protocols
Reading Distance	0-6cm (ISO15693) , 0-4cm (ISO14443A/B)
work pattern	Card Emulation 、Peer-to-Peer 、Reader via Host and U ICC

3. Data Communication Parameters

1) GPS Positioning

fixed position	location parameter
Support Mode	Supports GPS, A-GPS, Beidou, GLONASS, and Galileo
frequency	GPS (L1, 1.575 GHz C/A code), Beidou (B1, 1.561 GHz), GLONASS (L1, 1.602 GHz), Galileo (E1, 1.589 GHz; E2, 1.561 GHz)
Cold startup time	Less than 40 seconds
Maximum Number of Channels	31channel
sensitivity	-130 dB (SNR value: 40 dB Hz)
accuracy	5 - 10 meters (open space)

2) Wireless Communication Function

Wi-Fi	WLAN Wireless Local Area Networks
protocol	IEEE 802.11a/b/g/n/ac/d/h/i/k/r/v/w standard (2.4 GHz/5 GHz dual-band Wi-Fi)
frequency range	2.4G、5G
Work Channel	CH1 - CH13, CH34 - CH140, CH149 - CH165 (depending on country/region)
safety	Enhanced Open/WEP/WPA/WPA2-Personal/WPA3-Personal/WPA/WPA2/WPA3-Enterprise
go on a pleasure trip	PMKID caching; 802.11r (Over-the-Air); OKC - allows setting of Wi-Fi roaming thresholds

3) Wireless Wide Area Network

wireless wide area network	Wide Area Network Communication Parameters
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frequency range	TD-LTE (B34/B38/B39/B40/B41) FDD-LTE (B1/B2/B3/B4/B5/B7/B8/B20/B28A/B28B) WCDMA (B1/B2/B4/B5/B8) TD-SCDMA (B34/B39) CDMA&EVDO:BC0 GSM/EDGE/GPRS (850/900/1800/1900)
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4) Bluetooth

standard	Bluetooth Parameters
Support Mode	BT5.0 + BR/EDR + BLE
Connection Distance	Greater than 10 meters

五、ZSL-PT10 Colorful Lane Label

The ZSL-PT10 Colorful Shelf Light is a 2.4G customizable electronic reminder light featuring color-coded alerts with six available colors, multiple RGB LEDs, and an optional transparent or red housing. Its high brightness enables rapid item location (with illuminated indicators for targeted items), making it ideal for applications such as warehouse shelves, Cainiao Station shelves, supermarket storage areas, and large-scale inventory management systems.



(一) Product Features

- 2.4G low-power design with standby power consumption of 49.3 μ A;
- Features a transparent casing with multiple colors clearly visible
- Features a special sealing compound with an IP64 waterproof rating;
- Total weight: 88 grams;
- Two AA batteries (7V), with a capacity of 1000 mA, providing up to 24 months of operation (over 10 light cycles per day, each lasting 5 seconds);
- The battery is replaceable (Nanfu batteries are recommended due to their high capacity);

(二) Specification Parameters

Main Specification Parameters	
product name	Colorful Street Light Design
product model	ZSL-PT10
product size	φ 70mm*44mm (H)
Product Weight	88g
cell	Cell 2, Battery No.7
communicating protocol	AES Encryption Private
transmitting power	Default: 0 dBm
way to install	lockhole
sheathing material	PC
communication range	Unobstructed radius: 20 m (depending on environmental conditions)
operate time	24 months (the battery lifespan is calculated based on the customers usage frequency)
Storage Temperature	0~65℃
pigment	White transparent (customizable)

六、ZSL-PT01 Colorful Storage Label

The ZSL-PT01 Colorful Storage Label is a 2.4G customizable electronic tag featuring color light alerts in six distinct hues, equipped with a single RGB light source and transparent

housing for high brightness, enabling rapid item location in inventory management (with illuminated indicators for targeted items). It is ideal for applications such as warehouse material tracking, Cainiao Station cargo sorting, herbal medicine selection, supermarket inventory search, and laboratory sample identification.



(一) Product Features

- 2.4G low-power design with standby power consumption of 63 μ A;
- Features a transparent casing with multiple colors clearly visible
- Features a specialized sealing compound with an IP54 waterproof rating;
- The surface can be printed with QR codes, MAC addresses,

etc.;

- Total weight: 20 grams;
- Low-temperature resistant button battery with a capacity of 1000 mA, providing up to 18 months of operation (over 10 light cycles per day, each lasting 5 seconds);
- The battery is replaceable;

(二) Specification Parameters

Main Specification Parameters	
product name	Colorful Storage Location Labels
product model	ZSL-PT01
product size	38 (L) *30 (W) *13mm (H)
Product Weight	20g
cell	CR2477
communicating protocol	AES Encryption Private
frequency point	2.4035GHz
transmitting power	Default: 0 dBm
way to install	paste
sheathing material	PC
communication range	20 - 50 m (depending on environmental conditions)

operate time	18 months (the battery lifespan is calculated based on the customers usage frequency)
Storage Temperature	0~65℃
pigment	White transparent (customizable)

七、ZSL-PT0 2 Colorful Storage Label

The ZSL-PT02 Colorful Storage Label is a 2.4G customizable electronic tag featuring color light alerts, available in six colors with a single RGB light source and transparent housing for high brightness, enabling rapid item location in inventory management (targeted items display luminous indicators). It is ideal for applications such as warehouse material tracking, Cainiao Station cargo sorting, traditional Chinese medicine selection, supermarket inventory search, and laboratory sample identification.



(一) Product Features

- 2.4G low-power design with standby power consumption of

63 μ A;

- Features a transparent casing with multiple colors clearly visible
- Built with ultrasonic welding technology, featuring an IP54 waterproof rating;
- Total weight: 45 grams;
- 2 CR2477 button batteries with a total capacity of 2000 mA, providing up to 36 months of operation (with over 10 点亮 cycles per day, each lasting 5 seconds);
- The battery is replaceable (we recommend using our supplied batteries, which offer higher current capacity);

(二) Specification Parameters

Main Specification Parameters	
product name	Colorful Storage Location Labels
product model	ZSL-PT02
product size	80*32*18mm
Product Weight	45g
cell	2 CR2477s
communicating protocol	AES Encryption Private
transmitting power	Default: 0 dBm
way to install	Back adhesive

sheathing material	PC
communication range	Unobstructed radius: 20 m (depending on environmental conditions)
operate time	36 months (the battery lifespan is calculated based on the customers usage frequency)
Storage Temperature	0~65℃
pigment	White transparent (customizable)

八、ZSL-PT20 (2.4G) Wireless Communication Gateway

The ZSL-PT20 (2.4G) wireless communication gateway supports data transmission via RJ45 ports or Wi-Fi, with power supply options including external power sources (9 - 24 V input) or POE. Its communication with 2.4G tags employs a proprietary encrypted protocol independently developed by our company, ensuring robust security.



(一) Indication Light Status

- Green light: Power indicator
- Blue light: 2.4G wireless communication indicator
- Yellow Light: Device operation indicator light

(二) Specification Parameters

model	2.4G Wireless Communication Gateway	ZSL-PT20
specifications	size	170*170*22mm
	net weight	Approximately 238.6 g
	pigment	white
	Shell Material	ABS
communication mode	Wired Interface	RJ45 Network Port
	radio interface	WIFI wireless
transport	Alibaba Cloud IoT	MQTT protocol

protocol	Protocol	
2.4G Wireless	protocol	AES Encryption Private
	communication distance	20 ~ 50 m (depending on environmental conditions)
source	External power supply: 9 ~ 24 V	100mA@9V
	POE supply electricity	20mA@48V
power dissipation	Working Current	100mA@9V
way to install	Ceiling-mounted installation	Ceiling-mounted
environment	working temperature	-20℃~60℃
	Storage Temperature	0℃~45℃
	Working Humidity	10%~90%

(三) Web Management Interface

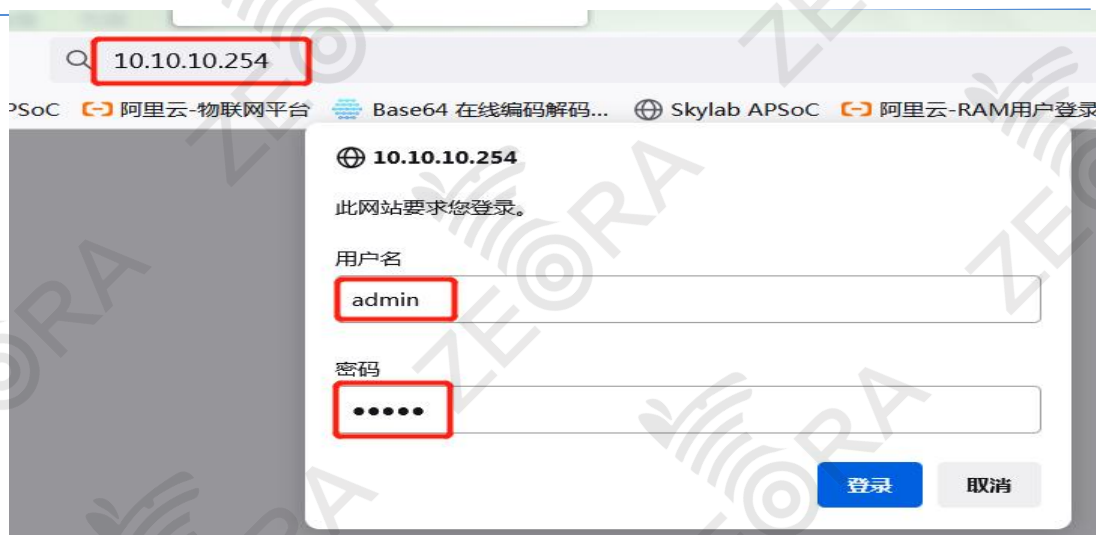
1. Each gateway comes with a built-in Wi-Fi module for configuring parameters, formatted as "XMINNOV_Gateway MAC Address" (as shown in the box below). Connect to the Wi-Fi module labeled "XMINNOV_30EB1F3DE6CA".



2. After connecting your computer to the gateways Wi-Fi, disconnect the wired connection. The default LAN IP address for the gateway is 10.10.10.254. Open a browser, enter the gateways IP address (10.10.10.254), and enter username: admin and password: admin.

Note: The gateway was traditionally connected to a router to obtain DHCP settings and access the internet via the router.

To access the backend, connect your laptop or phone to the hotspot provided by the gateway and enter 10.10.10.254 to access it!



3. The management interface after logging in to 10.10.10.254 is shown below.



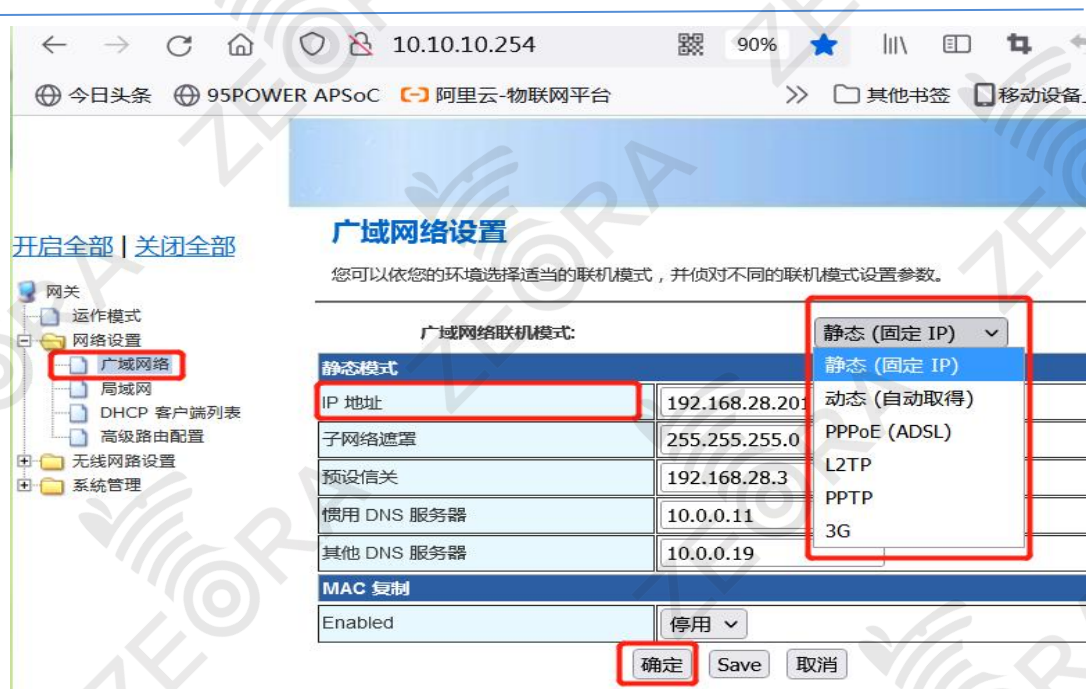
(四) Gateway Distribution Network

1. The gateway defaults to a RJ45 wired network connection, with its IP address dynamically assigned. Under normal conditions, simply plug the network cable into a DHCP-enabled network to automatically connect to Alibaba Cloud servers, as shown in the figure below.



2. If the gateway still cannot connect to the internet even after connecting a wired network, configure its IP address to static mode by navigating to the Gateway Web Management Interface and following these steps: Network Settings → WAN → Static (Fixed IP).

For IP address, subnet mask, router IP, and DNS server fields, consult your on-site network administrator and enter the corresponding values. Click the "OK" button and then check if the network is functioning properly.



If the connection still doesn't work, try:

(1) Open the CMD window on your computer and use the ping command to check whether the local gateway connection is functioning properly.

(2) Check whether the computer network is functioning properly for internet access;

(3) Finally, if all functions operate normally, please contact the manufacturers after-sales service if you encounter any issues.

Note: When configuring the network, set the gateway's DHCP type to "Server" rather than "Disabled"; otherwise, the gateway configuration interface will not open again.

Configuration is shown in the figure below.

局域网设置

您可以启用/停止以及设置所有的网络功能。

网络名称	Mediatek
IP 地址	10.10.10.254
子网络遮罩	255.255.255.0
局域网 2	☐ 启用 ☒ 停用
局域网 2 IP 地址	
局域网 2 子网络遮罩	
MAC 地址	30:EB:1F:3E:05:F3
DHCP 类型	服务器
起始 IP 地址	停用
结束 IP 地址	服务器
子网络遮罩	255.255.255.0
惯用 DNS 服务器	168.95.1.1
其他 DNS 服务器	8.8.8.8
预设信关	10.10.10.254
释放时间	86400

(五) RJ45 Network Connection

The gateway defaults to a RJ45 wired network connection; this setting is not required for factory-installed devices. To connect via the network port, follow these steps:

After entering the Gateway Web Management Interface, click "Operation Mode", select "Gateway", and click "OK".

运作模式设置

您可以在此处设置适合您网络环境的运作模式

☐ Bridge: 所有以太网网络埠、以及无线网络界面，皆被串连到单一的桥接器界面。

☒ Gateway: 第一个以太网网络埠视为广域网络端。其他的以太网网络埠、以及无线网络界面，则串连到单一的桥接器界面，并视为局域网端。

☐ AP Client: 无线网络界面的客户端视为广域网络端。无线网络界面的基地台端、以及所有以太网网络埠，则串连到单一的桥接器界面，并视为广域网端。

启用 NAT

TCP Timeout:

UDP Timeout:

After configuration, refer to the "Gateway Configuration" section to connect to the network.

(六) WIFI Network Connection

If the gateway needs to connect via Wi-Fi, follow these steps:

1. After entering the gateway web management interface, click "Operation Mode", select "AP Client", and click "OK".



2. Set the WAN connection mode to Dynamic Acquisition as shown in the figure below: click "WAN", select "Dynamic (Auto-acquisition)" from the "WAN Online Mode" dropdown menu, then click "OK" to complete the configuration.

← → ↻ 🏠 🔒 10.10.10.254

🌐 今日头条 🌐 95POWER APSoc 🔄 阿里云-物联网平台 🌐 Base64 在线编码解码... 🌐 Skylab APSoc 🔄 阿

开启全部 | 关闭全部

广域网络设置

您可以依您的环境选择适当的联机模式，并针对不同的联机模式设置参数。

广域网络联机模式: 动态 (自动取得) ▾

DHCP 模式

网络名称 (optional)

MAC 复制

Enabled 停用 ▾

确定 Save 取消

3. Under the "Wireless Network Settings" section, click "AP Client". Enter your routers Wi-Fi name in the "SSID" field and your routers Wi-Fi password in the "Passphrase" field. Then click the "Apply" button to complete the configuration.

开启全部 | 关闭全部

AP Client Feature

You could configure AP Client parameters here.

AP Client Parameters

SSID SKYLAB91

MAC Address (Optional)

Security Mode WPA2PSK ▾

Encryption Type AES ▾

Pass Phrase Skylab20026

Apply Save Cancel SCAN

matters need attention :

When upgrading the gateways WIFI module, first navigate to

the "Settings Management" section under "System Management", select "Server Type" and choose "Ali Type". Clear all parameters in the interface, then perform a system reset as shown below.

① 找不到服务器 Gateway APSOC 10.10.10.254

今日头条 95POWER APSOC Base64 在线编码解码... Skylab APSOC 阿里云-RAM用户登录

启全部 | 关闭全部

- 网络
- 运作模式
- 网络设置
- 无线网络设置
- 系统管理
 - 管理
 - 上传固件
 - 设置管理 1**
 - 状态
 - 统计资料

Server Type: Ali Server 2

Ali IOT Server Init	
Host	iot-040a0aqx.mqtt.iothub.aliyuncs.com 3
Device Info Server	iotweb.xminnov.com/prod-api
Port	1883
Product Key	gzgbEi7slgs
Device Name	BG01-8
Device Secret	738060f8908a6dd2d061fb02fa254f80
ClientID	
Keepalive(s)	60
Username	
Password	
Sub	/gzgbEi7slgs/BG01-8/user/81;/gzgbEi7slgs/
Pub	/gzgbEi7slgs/BG01-8/user/
Pub2	/gzgbEi7slgs/BG01-8/user/update/error

Time Suffix Setting Remove

Uart Baud Rate Setting 115200

Timeout(us) 20000

Apply Cancel