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Industrial 4G/WAN Cloud Router
DX-3021L9 Series User Manual

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DX-3021L9 Series User Manual

Revision History

Version	Revision	Date
1st	The first version was published.	2020/01/22

Delta Industrial 4G / WAN Cloud Router DX-3021L9 Series User Manual

Contents

1

Chapter 1 Product Introduction

Table of Contents

About This Manual

The user manual is suitable for **DX-3021L9**.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates radio frequency signal and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

---Reorient or relocate the receiving antenna.

---Increase the separation between the equipment and receiver.

---Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

---Consult the dealer or an experienced radio/TV technician for help.

CE Declaration of Conformity

In accordance with the Directives RED 2014/53/EU. The test record, data evaluation and DX-3021L9 configurations represented herein are true and accurate under the standards herein specified.

EN 301 511 V12.5.1 (2017-03)
Test Items:
Radiated spurious emissions – MS allocated channel (Clause 4.2.16)
Radiated spurious emissions – MS in idle mode (Clause 4.2.17)
EN 301 908-1 V11.1.1 (2016-07)
EN 301 489-1 V2.1.1 (2017-02)
Draft EN 301 489-52 V1.1.0 (2016-11)

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To the maximum extent permitted by law and regardless DELTA be aware or has been advised of the possibility of these damages, DELTA is not liable to any user or anyone else for: (a) any loss of use, data, reputation, goodwill, credit, opportunity, economy or profits, whether or not foreseeable; (b) any special, incidental, indirect, consequential, or punitive damages whatsoever; (c) any losses or damages based on any theory of liability, including breach of contract or warranty, negligence or other tortious action; (d) any losses or damages resulting from use or unable to use the systems or devices to which the Software or Services are incorporated or co-operated; and (e) any losses or damages arising from any other claim or in connection with the use of or access to the Software or Services.

Warning

	此设备应安装在限制进出的场所。限制进出场所指仅能透过特殊工具、锁和钥匙或其他安全手段才能进出的场所。 This equipment should be installed in a place where access is restricted. Restricted places are places that can only be accessed through special tools,
	在接近热源部分的明显位置上会有警告标示。 There will be a warning sign in an obvious position near the heat source part

Warning

Supplied by LPS power source

1.1 Product Overview

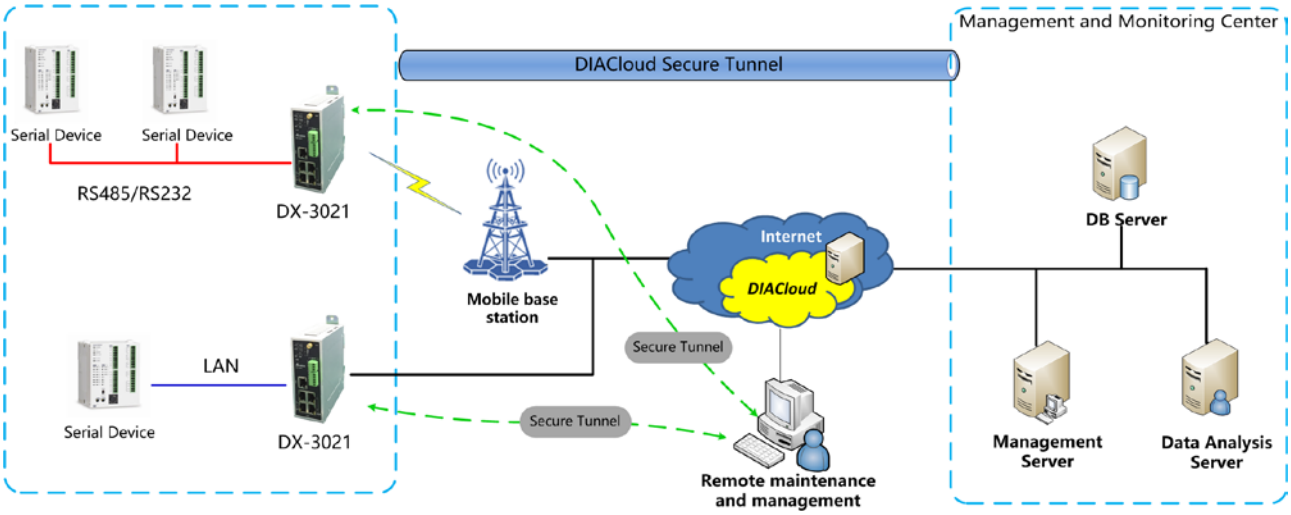
DX-3021L9 is an industrial router, it has 2 SIM card slots and supports multiple mobile networks like LTE, DC-HSPA+, UMTS, EDGE, GPRS, and GSM. When one cellular network fails to work, the device will automatically switch to the other cellular network. Besides the two cellular network connections, the WAN port can be another connection to Internet. Priorities of the connection to Internet over WAN and 2 cellular networks are configurable. As there is only one 4G module in the device, the two cellular networks cannot be active at the same time. Moreover, the product is equipped with multiple application interfaces, including Ethernet interface, RS232 serial interface and RS485 serial interface, and thus can satisfy the user's various different application demands.

The product supports DIACloud platform services, and by this platform, convenient and efficient point-to-point connection with the router, safe and reliable data transmission, remote device management and configuration, remote firmware upgrading, remote maintenance and other functions can be realized, so as to save the cost of device operation and maintenance for users.

The product can be widely used in the fields requiring mobile network interconnection, such as industrial automation, smart home, intelligent building, smart power grids, mobile video surveillance, intelligent self-service and intelligent transportation.

1.1.1 Network Design

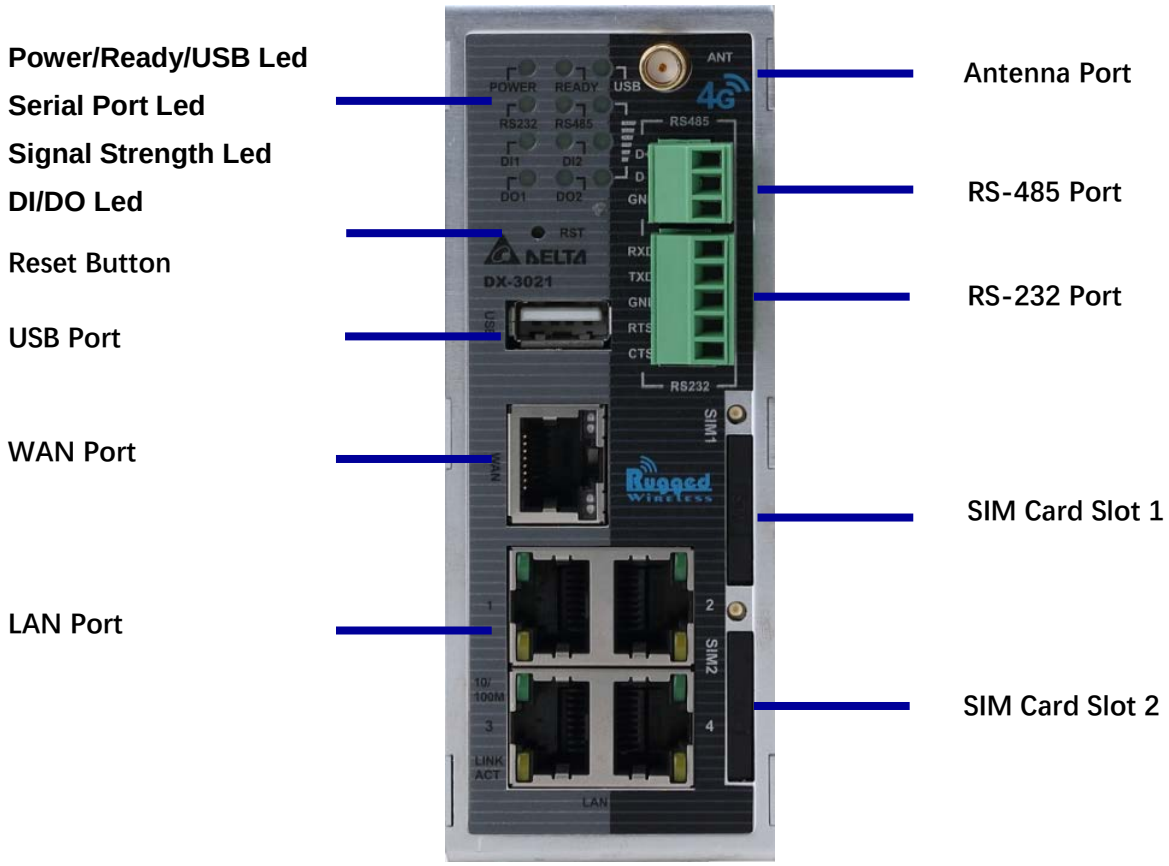
DIACloud platform services supported, users can connect intelligent devices from different locations to the internet with DX-3021 and use point-to-point connection with the router for a safe and reliable data transmission and additionally save the costs of VPN device operation as well as maintenance. By browsing the web or apps on the handheld computers, managers can check the data and monitor the devices remotely in real-time



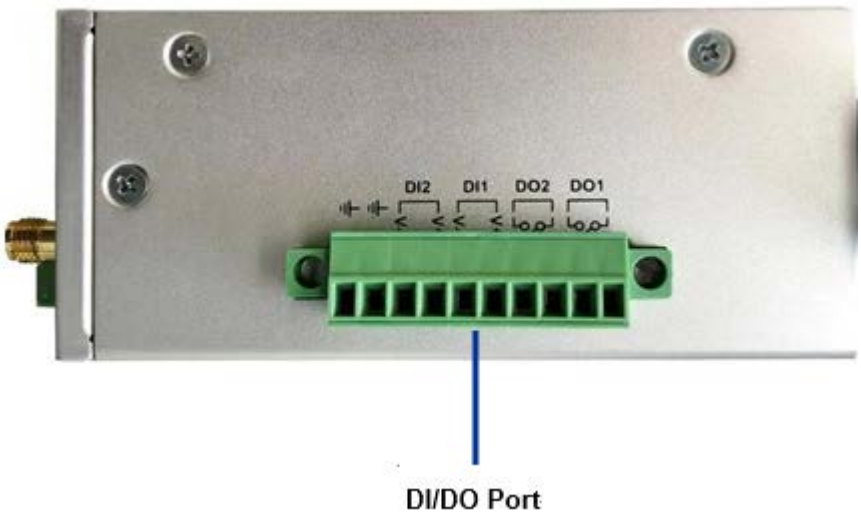
1.1.2 Features

- A wide range of LTE FDD and LTE TDD frequency bands supports, B38/B39/B40/B41 for LTE TDD, and B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 for LTE FDD
- Downward compatible with WCDMA (B1/B2/B4/B5/B6/B8/B19) and GSM (850/900/1800/1900MHz) networks
- Automatic redial when connection is broken
- Priorities of the connection to Internet over WAN and 2 cellular networks are configurable
- Provide Dual Port RS232 & RS485 and LAN Port Interfaces for Different Application Demands
- Built-in a Watchdog Timer to Ensure System Stability
- Built-in RTC and Support NTP Server
- Firmware Upgrade Locally and Remotely
- Support Firewall: Stateful Packet Inspection (SPI), Prevent Denial of Service (DoS) Attacks, NAT (Network Address Translation), Port Trigging, Port Mapping, IP Address Filtering, MAC Address Filtering, URL Filtering, DHCP Server, Dynamic DNS, Static Routes, Demilitarized Zone (DMZ)
- Various Protocols, TCP/IP, UDP, ICMP, DHCP, HTTP, DNS, SSH and More
- Modbus TCP, Modbus ASCII and Modbus RTU protocol
- Mitsubishi MC and Siemens ISO TCP protocol
- Support to upgrade device firmware and configure automatically via USB drive. User can access the USB drive by FTP also.
- Scheduled Task Management
- Support 2 DI/DO and user can config trigger events.
- Servers for Local Log and Remote Log
- Configurations Backup, Export and Import
- Network Flow Monitoring
- Network Fault Detection and Diagnosis
- DIACloud Service to Secure Point-to-point Data Transmission, to Manage Device Configurations Piece by Piece or in Batch and to Upgrade Firmware Remotely

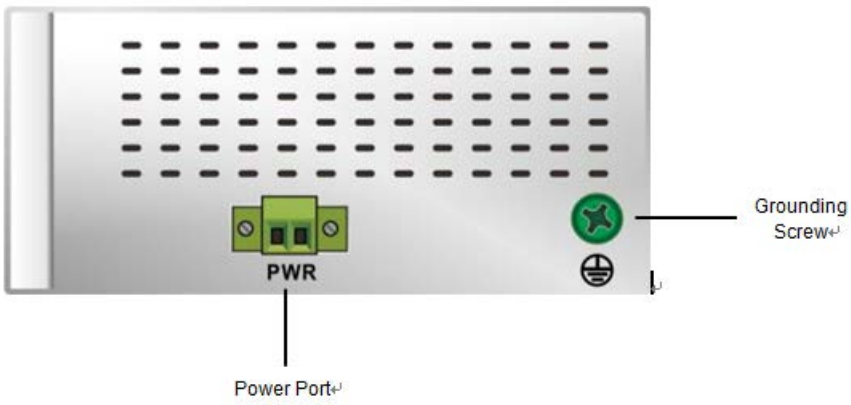
1.1.3 Front Panel Ports and LEDs



1.1.4 Top Panel



1.1.5 Bottom Panel



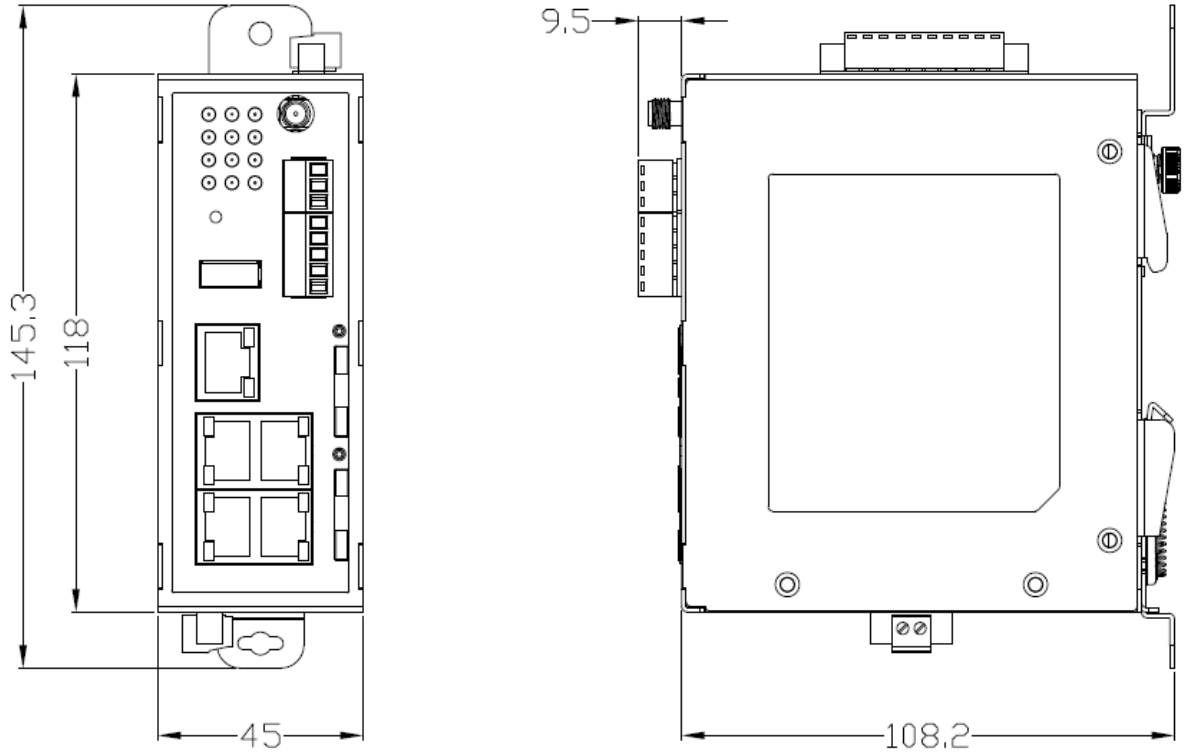
Notice

This router's reset button is on the front panel. By pressing the Reset button, users can reset the router or reset the router to factory default settings. See the instruction below:

- Reset the Router: With the router powered on, press the Reset button and release the button right away.
- Reset to Factory Defaults: With the router powered on, press and hold the Reset button for 3~6 seconds and then release the button.
  - Reset can only be done when the device is running properly.
  - With the router powered on, press and hold the Reset button until all the LEDs go out (except the Power LED). Then release the button and wait the router to reboot to its factory default settings.

1.1.6 Dimension

Unit = mm



1.2 Package Checklist

Unpack the package carefully and check the package contents. The package should contain the following items:

- DX-3021L9 Industrial 4G Cloud Router x 1
- Quick Installation Guide x 1
- SMA Antenna (300cm) x 1

Notice

Verify that nothing is missing from the DX-3021L9 package by using the check list above. If any item is found missing or damaged, please contact your local sales representative for support.

2

Chapter 2 User Interface

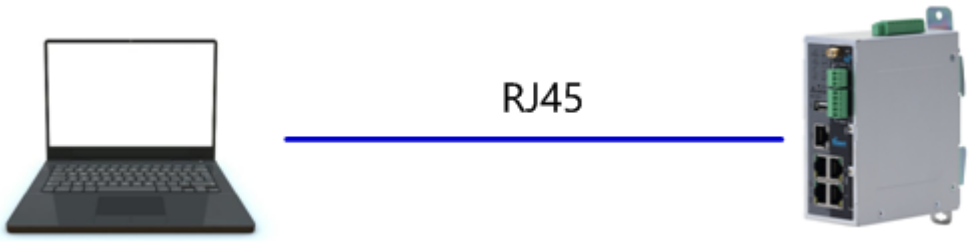
Table of Contents

2.1 Web-based GUI Configuration

The DX-3021L9 Industrial 4G Cloud Router provides a friendly Web Browser Configuration for users to set up and operate more intruitivly.

2.1.1 System Connection

Connect the DX-3021L9 with a computer directly or via a switch/hub.



2.1.2 Default IP Address / Account / Password

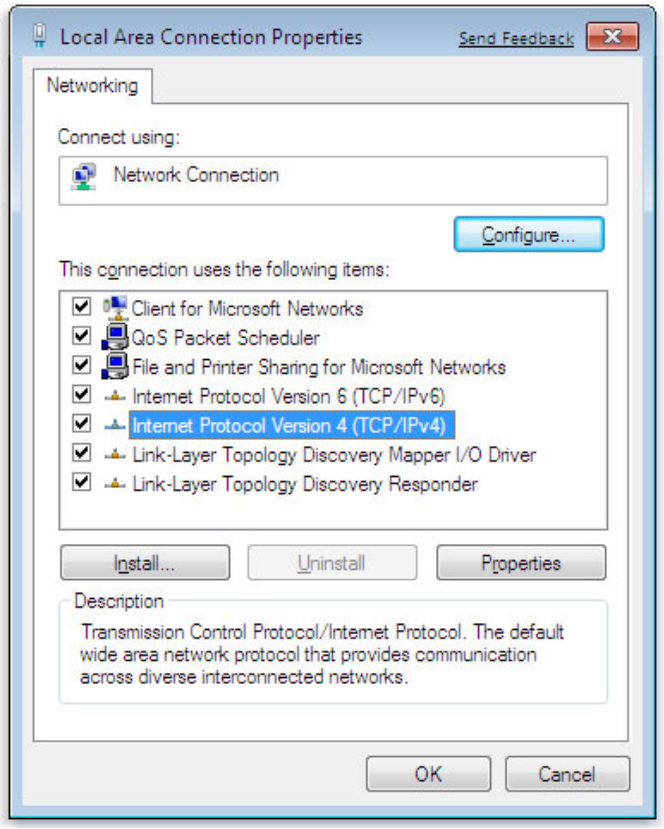
The default IP address of router is 192.168.5.5. The default account and password is admin/admin.

2.1.3 Local Network Setups

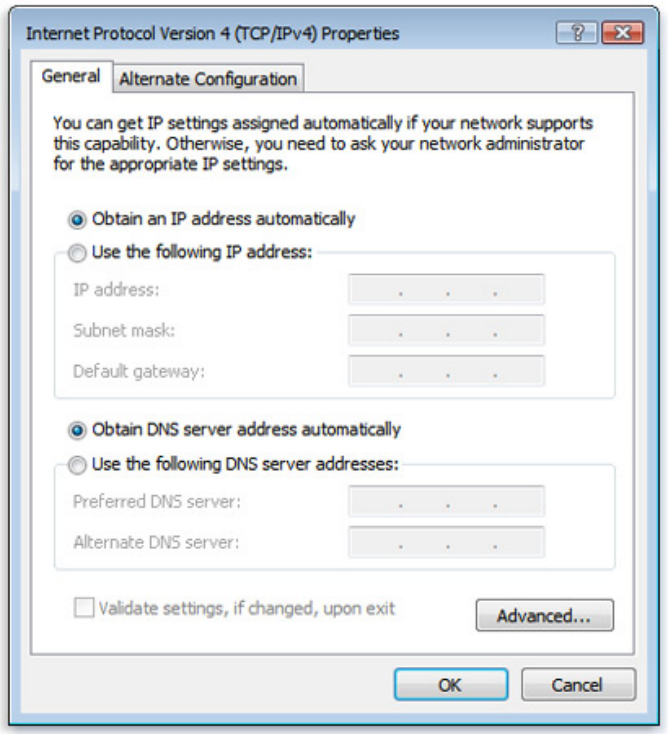
After the connection of the local computer and the router is done, you will need to set the network configruration for your computer. There are 2 methods for the setting, we prefer you use the first one:

- **Obtain an IP address automatically by using the router as a DHCP server.**

  1. Open Network Connections by clicking the Start button, and then clicking Control Panel.
  2. Under Network and Sharing Center, click View network connections.
  3. Right-click the connection that you want to change, and then click Properties. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.
  4. Click the Networking tab. Under This connection uses the following items, click either Internet Protocol Version 4 (TCP/IPv4) or Internet Protocol Version 6 (TCP/IPv6), and then click Properties.



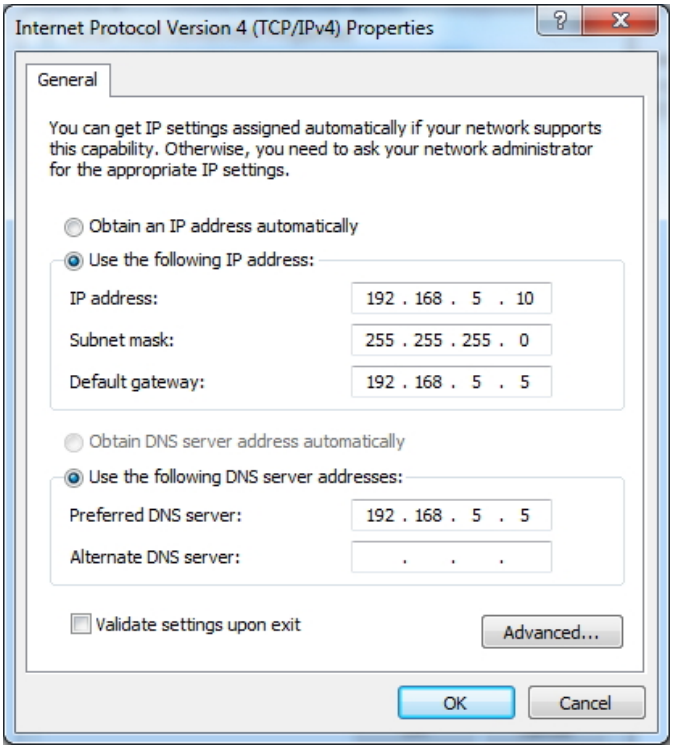
5. Click Obtain DNS server address automatically and then click OK to get a DNS server address automatically using DHCP.



- **Set up the IP address manually.**
  (The IP address of the computer should be in the same subnet as the router's.)

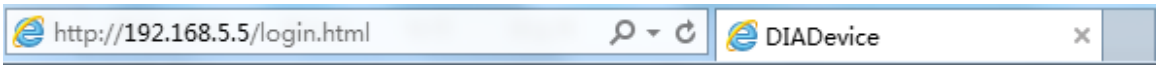
Since the router's default IP address is 192.168.5.5 and the subnet mask is 255.255.255.0, the computer's IP address can be set between 192.168.5.1 to 192.168.5.254 except 192.168.5.5. However, you'll need to make sure there are no IP conflicts.

Here, we set the IP address to 192.168.5.10 and the default gateway to 192.168.5.5. For DNS, the usable DNS address can be selected or the address can also be set to 192.168.5.5.



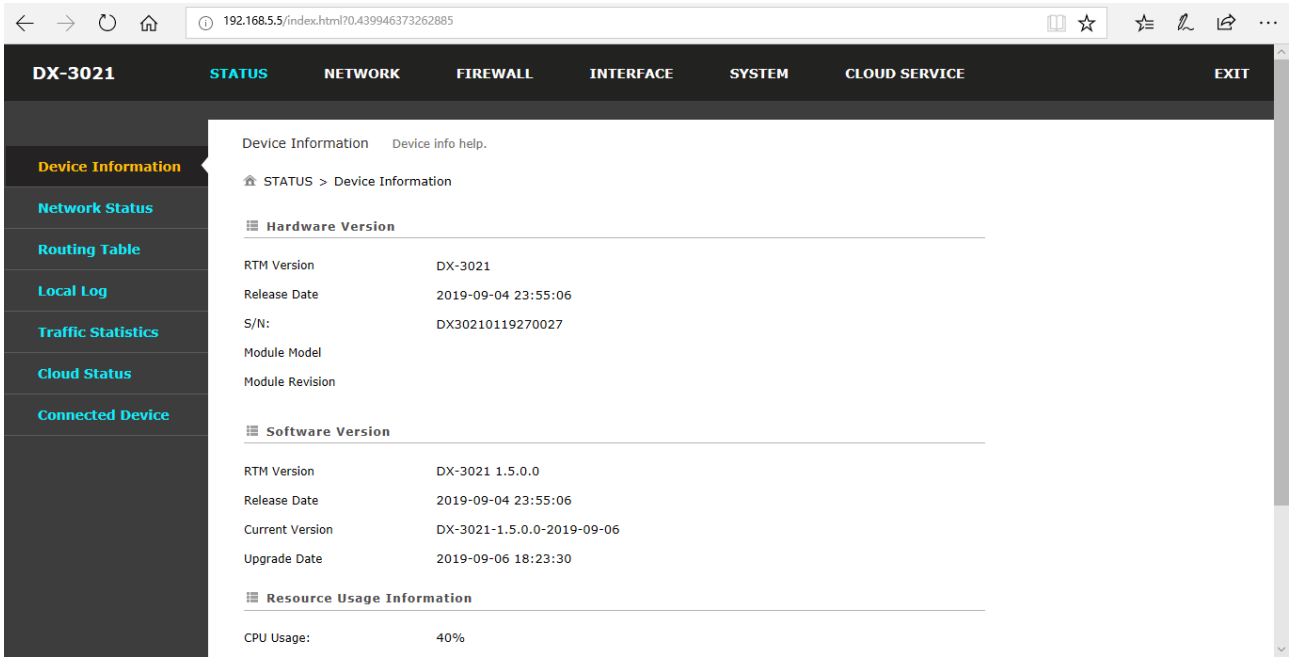
2.1.4 Logging in

1. Open your Internet Explorer browser and input LAN IP address (Default is 192.168.5.5) in the search bar and then press Enter.



2. You'll be prompted with the log-in page. Input the user name and the password (Default is admin/admin) and then press Enter to log in to the setup page.

3. After login, you can see the main selection area on the left hand side and the upper area of the page. The detailed settings can be seen on the right-hand side of the page.



2.2 DIADevice

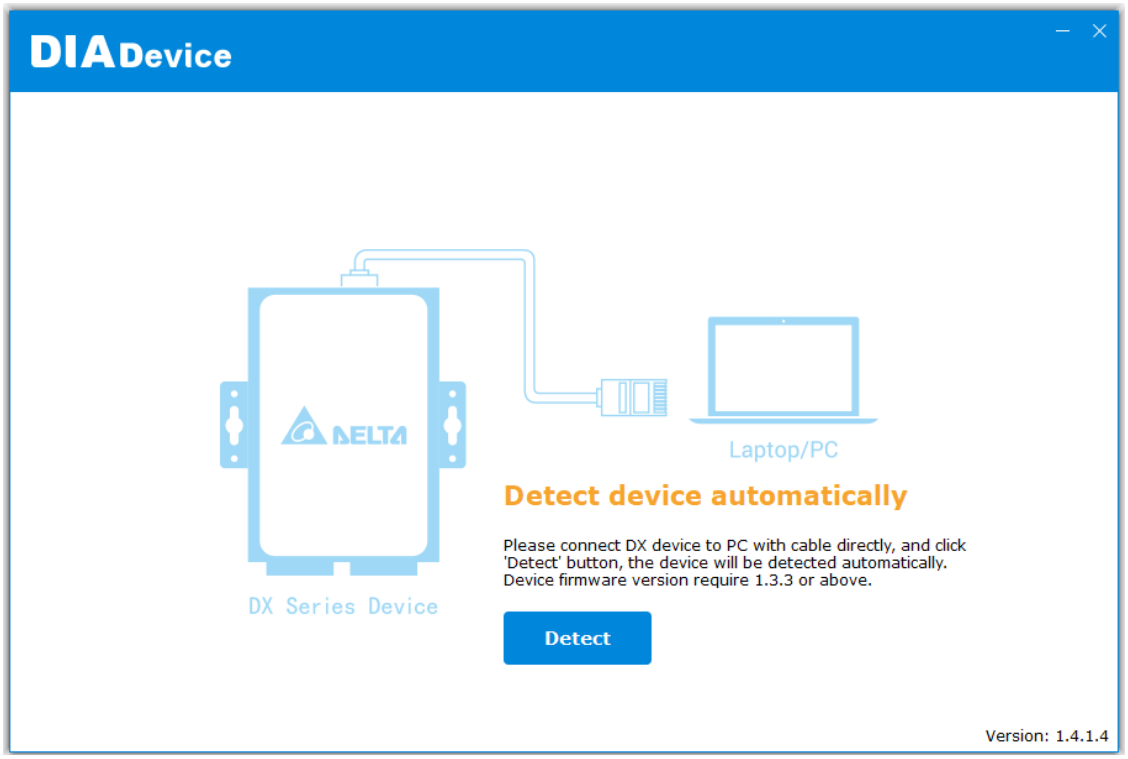
DIADevice is a tool for quickly configuring network devices. Users simply connect the DX device to the PC through the network cable. This tool can be used to quickly and easily configure the network setting of the device and complete the device binding DIACloud cloud account.

The DIADevice software is included in the latest DIACom software package. From the official website or sales staff to obtain DIACom packag.

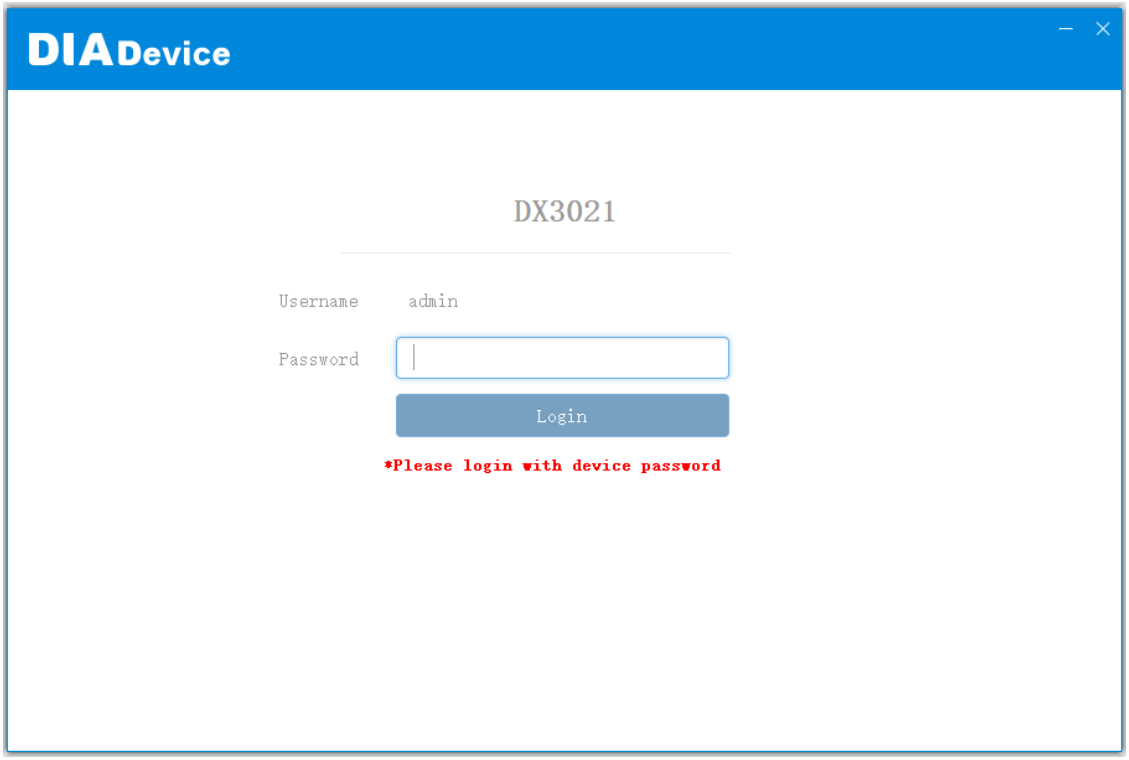
The following example uses DX-3021 to show you how to configure your device with DIADevice.

2.2.1 Device Connection and Detection

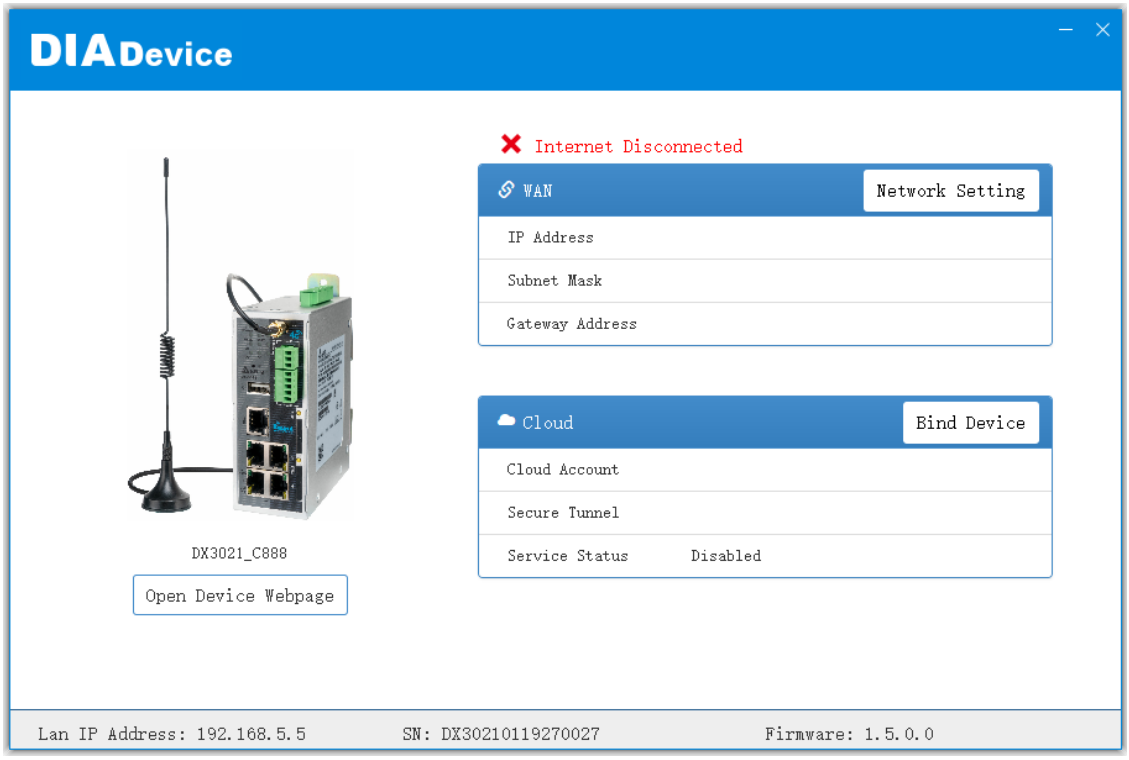
1. Connect the device to the power supply, and connect the device to the PC using a network cable. Plug the network cable connected to the Internet into the WAN port of the device
2. Run DIADevice software, click "Detect" button.



3. After DIACom detects the device, it will automatically go to the login page, and the user needs to enter login password on the login page.



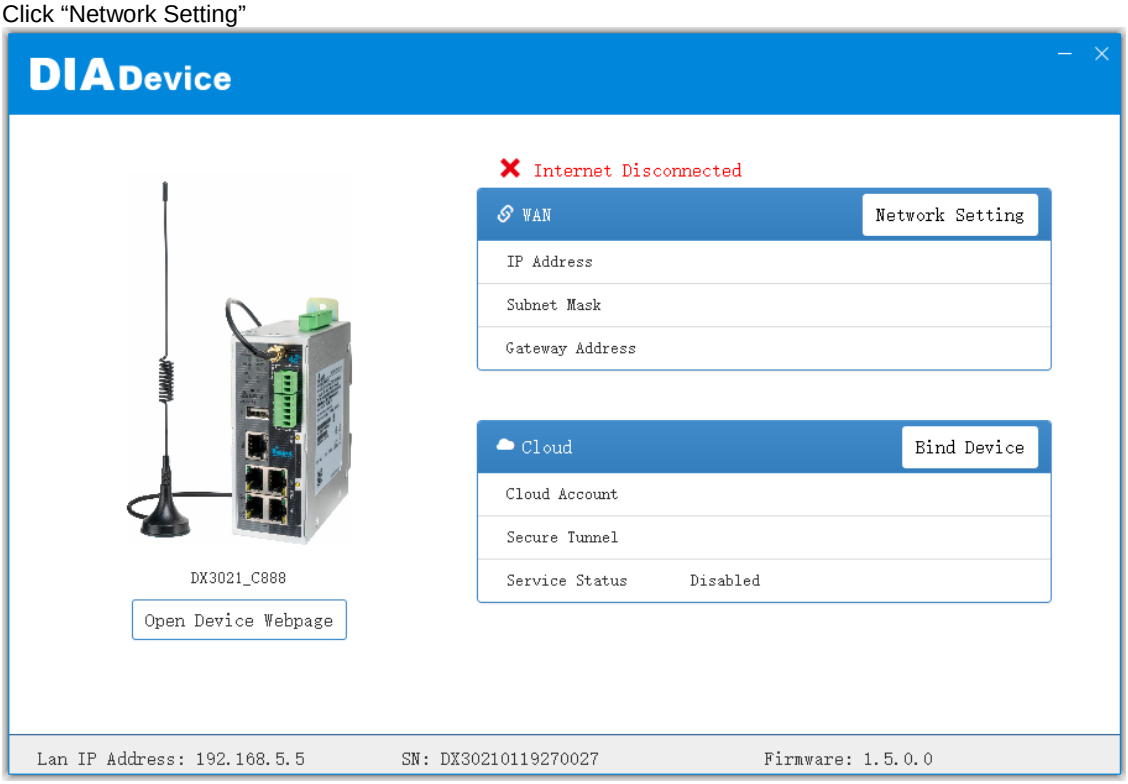
4. After passing the authentication, the device information page is displayed, including the basic device information (Device Name, S / N, firmware, LAN IP address), network status, WAN information, and cloud service information



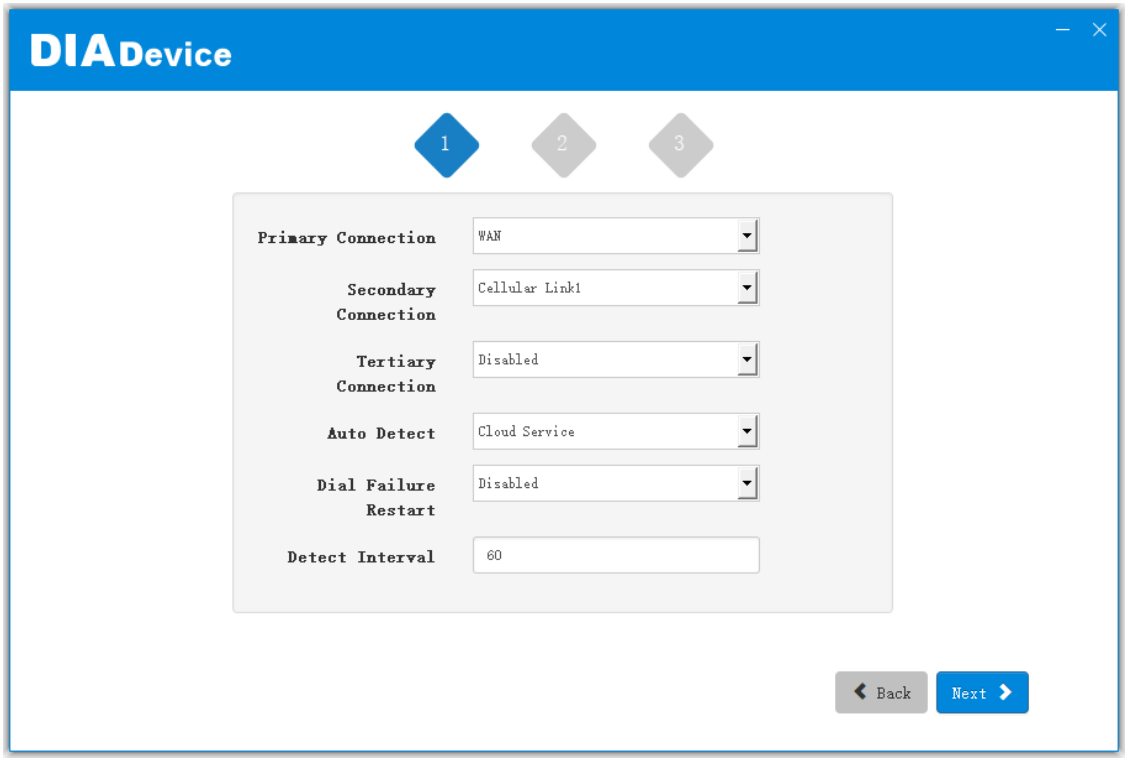
2.2.2 Network Setting

This feature allows you to quickly configure your network in two steps.

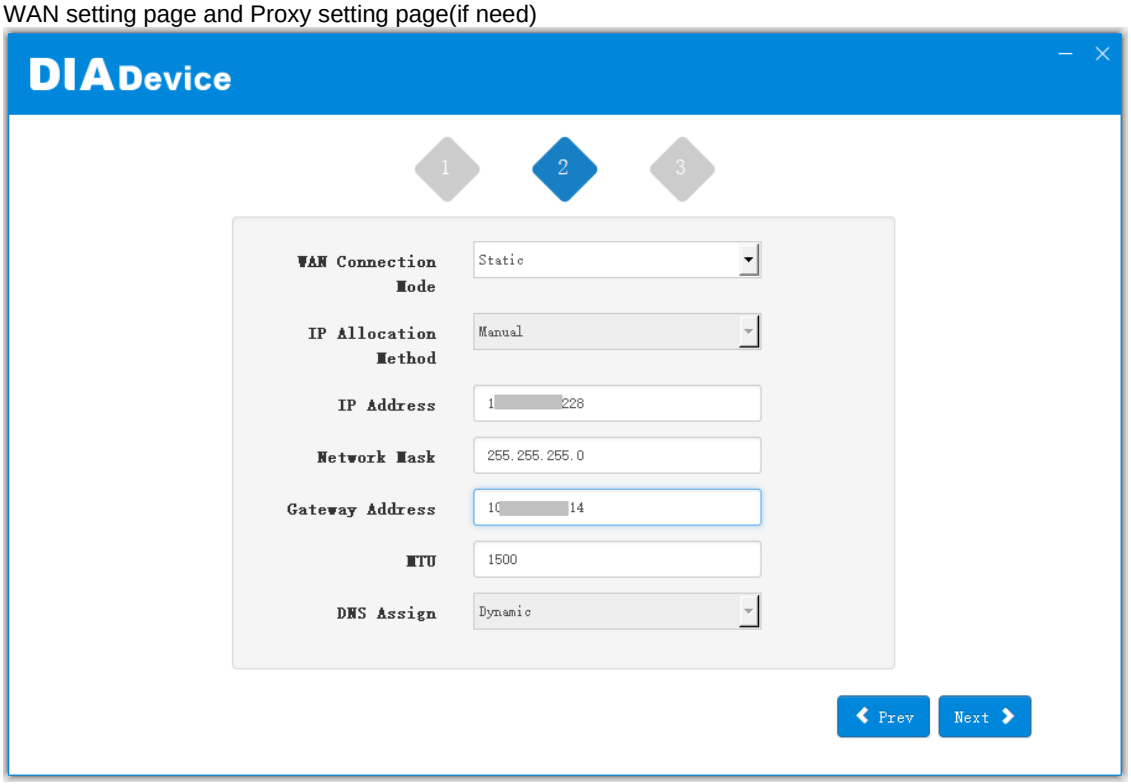
1. Click “Network Setting”

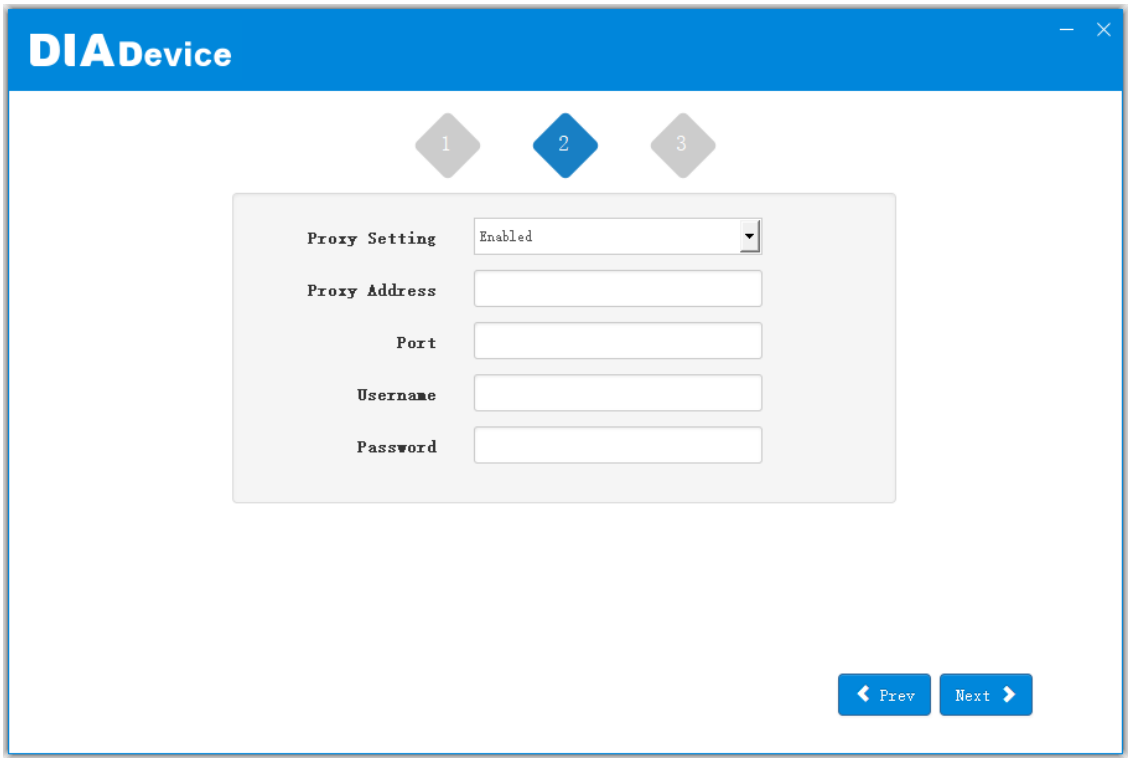


2. You can setup the connection priority here, and then, it will guide you to config each the connection parameter page base on the priority what you setup.

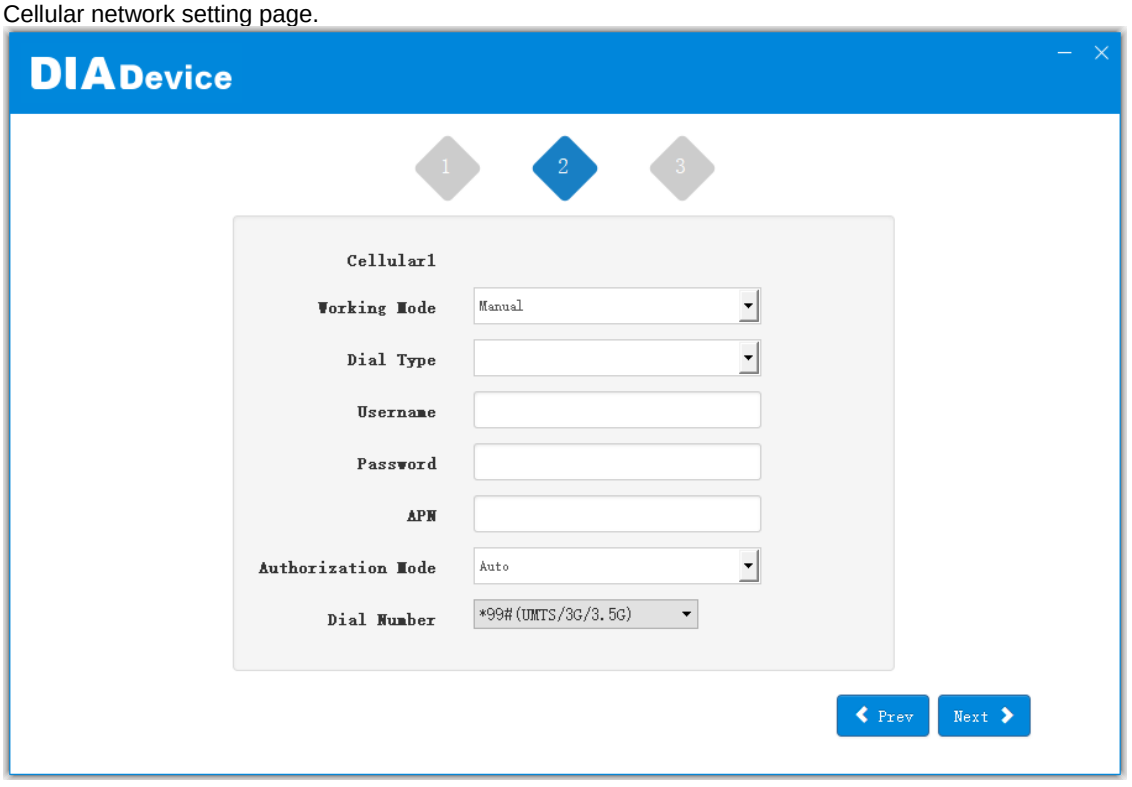


3. WAN setting page and Proxy setting page(if need)

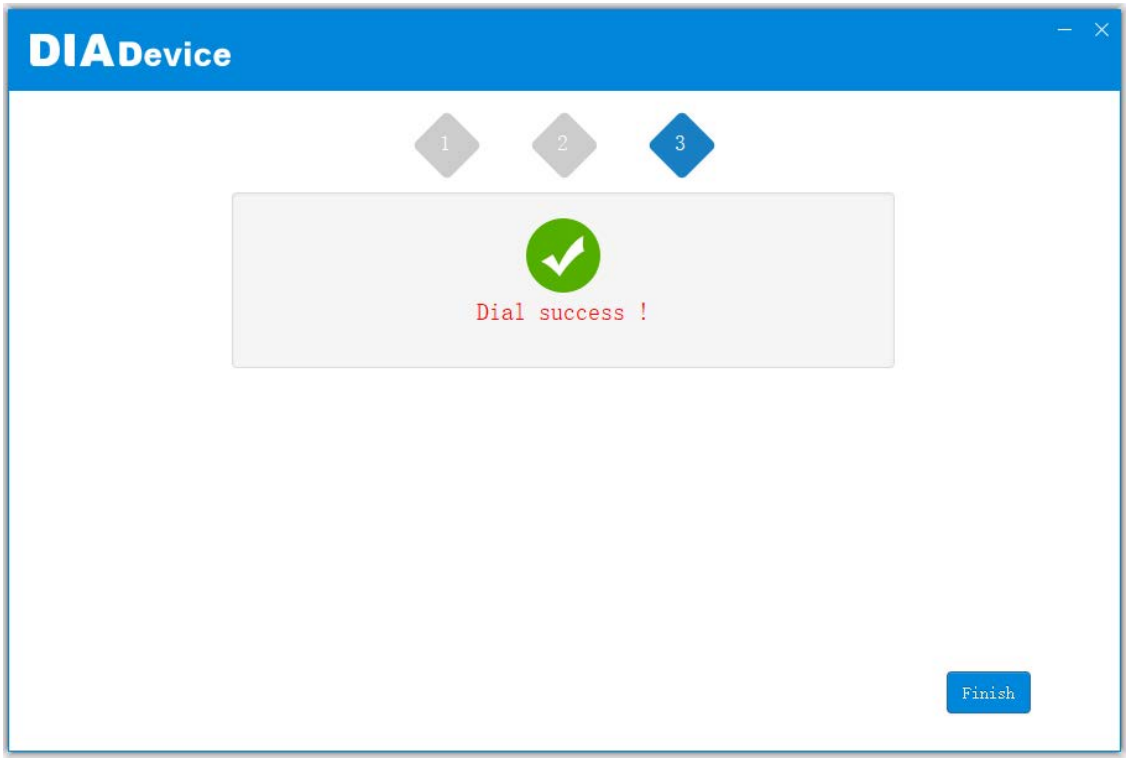




4. Cellular network setting page.



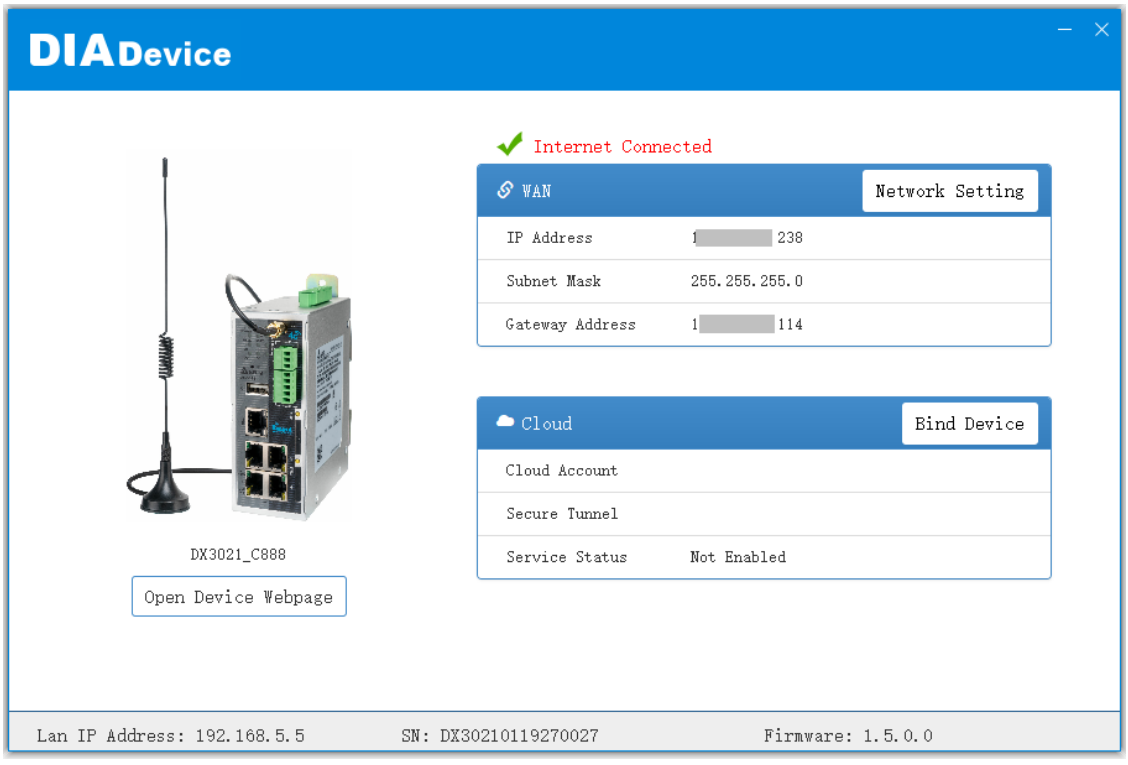
5. After the router connected to the Internet, the network setting was completed successfully.



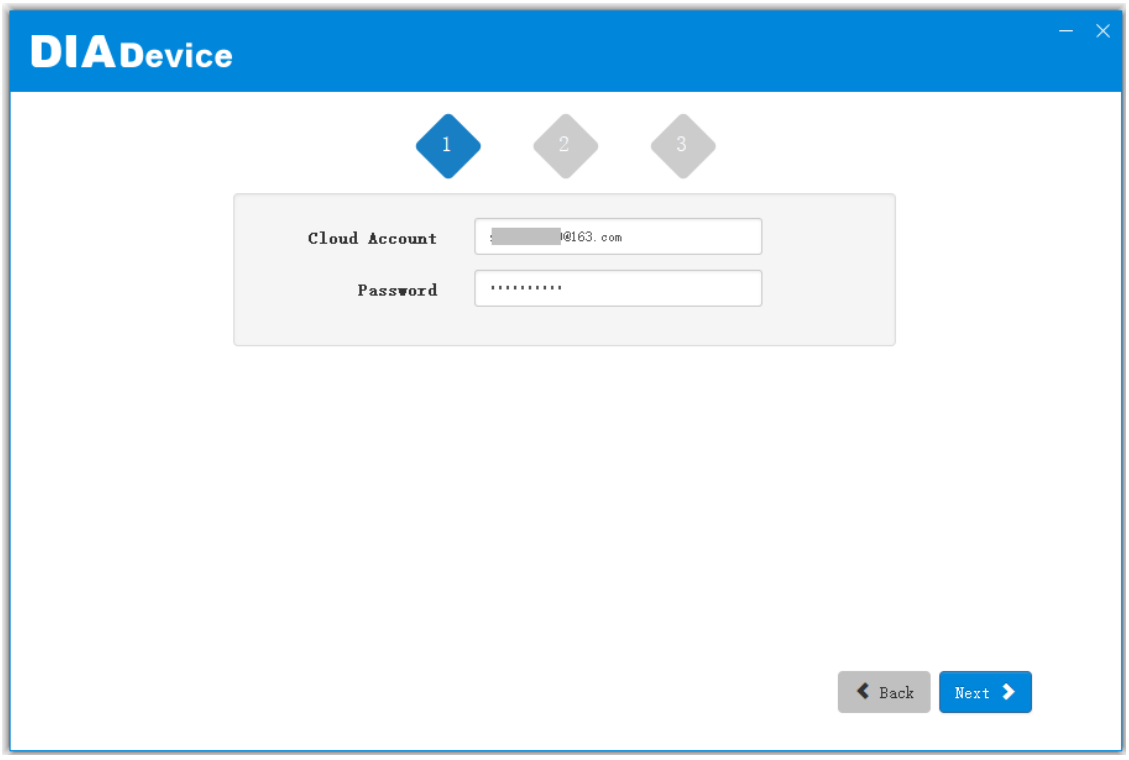
2.2.3 Bind Device

This feature allows you to quickly bind your device to the DIAcloud in three steps.

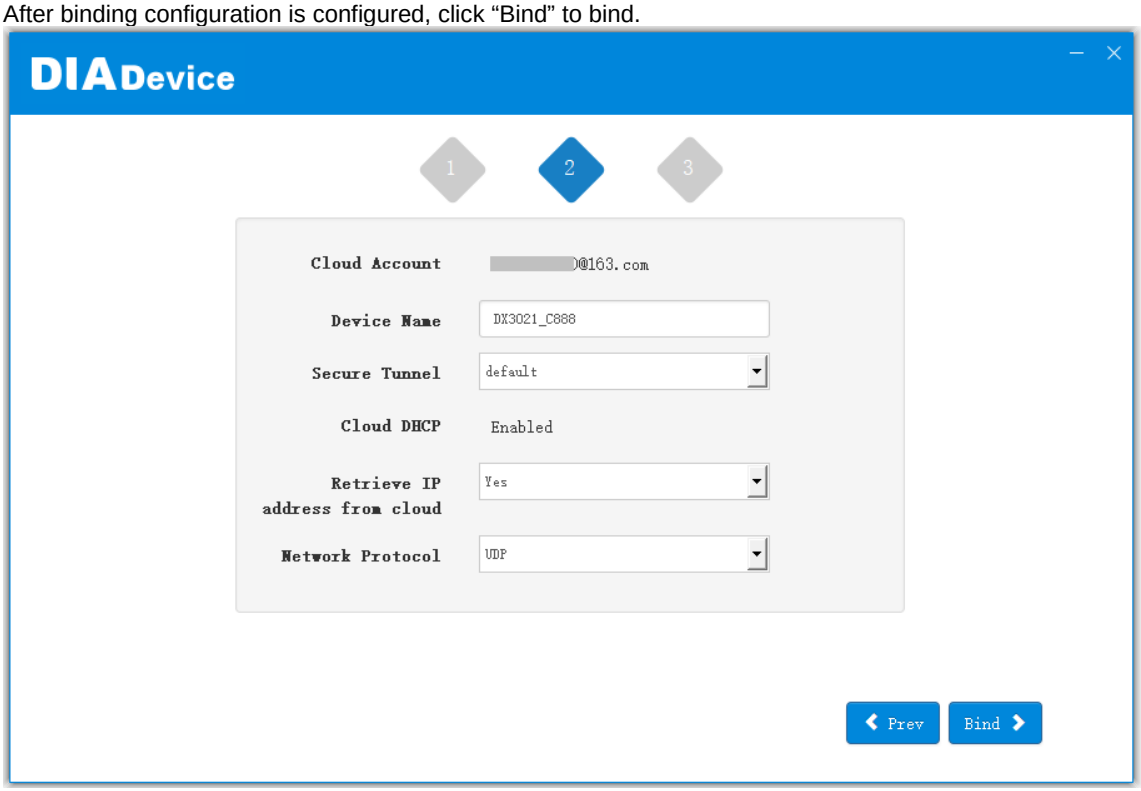
1. Click “Bind Device”



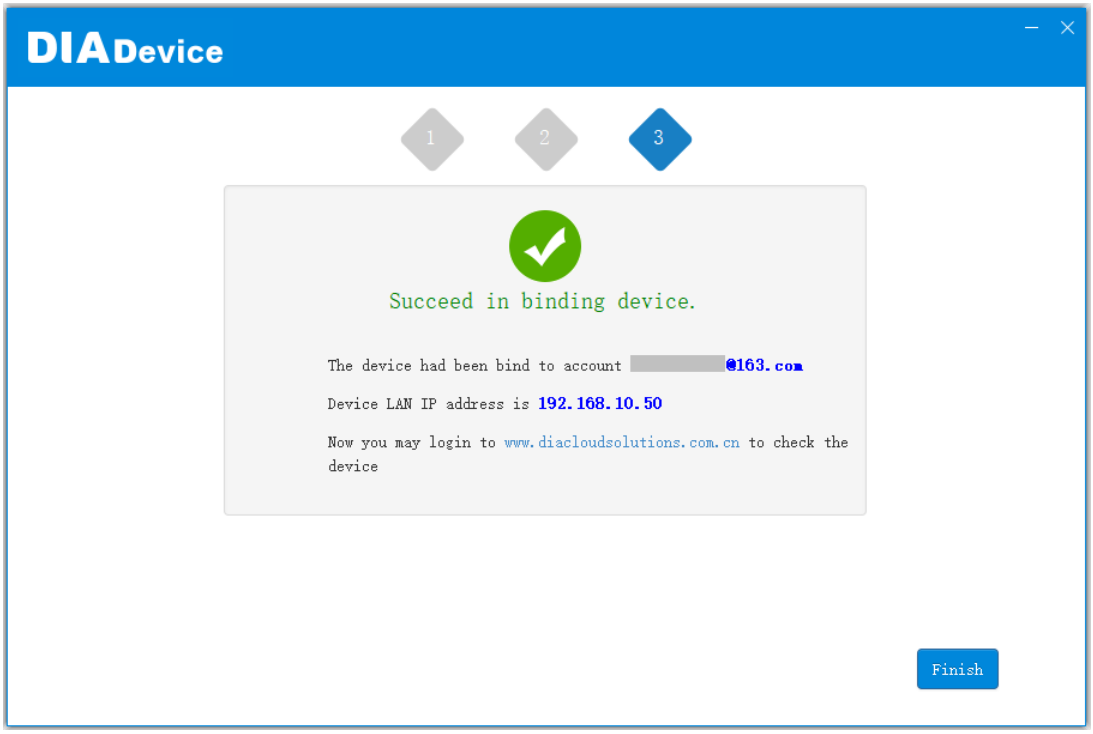
2. Enter the DIAcloud account number and password, and click Next.



3. After binding configuration is configured, click “Bind” to bind.



4. If your device is successfully bound to the cloud, the following screen will appear

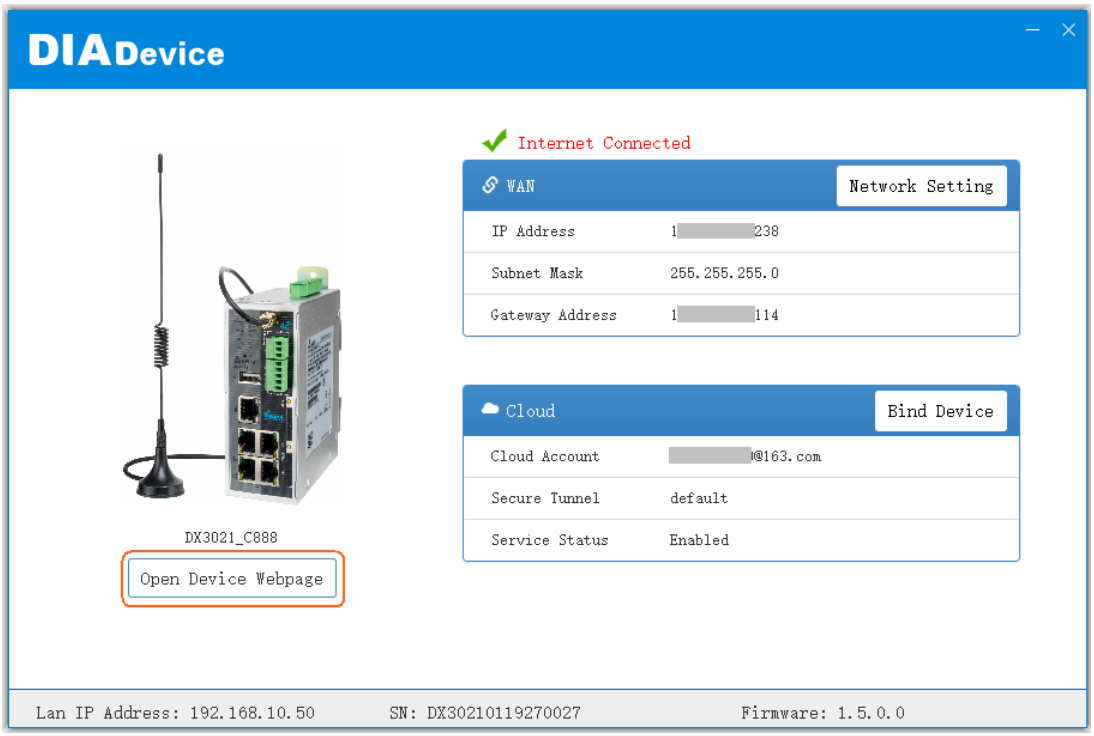


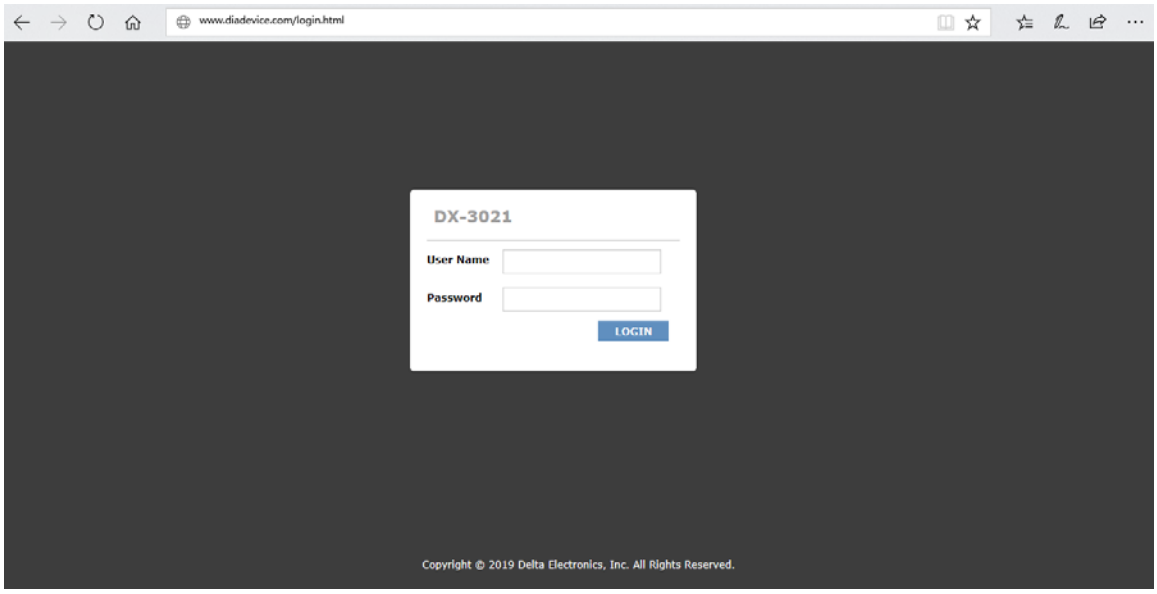
Notice

If the device has been bound to the cloud account, you need to switch to another cloud account binding, you only need to repeat 1-3 steps and then enter the new cloud account you need to bind.

2.2.4 Open Device Webpage

Click open device webpage button, the browser will open the device settings page, the user can setup more the configuration items.





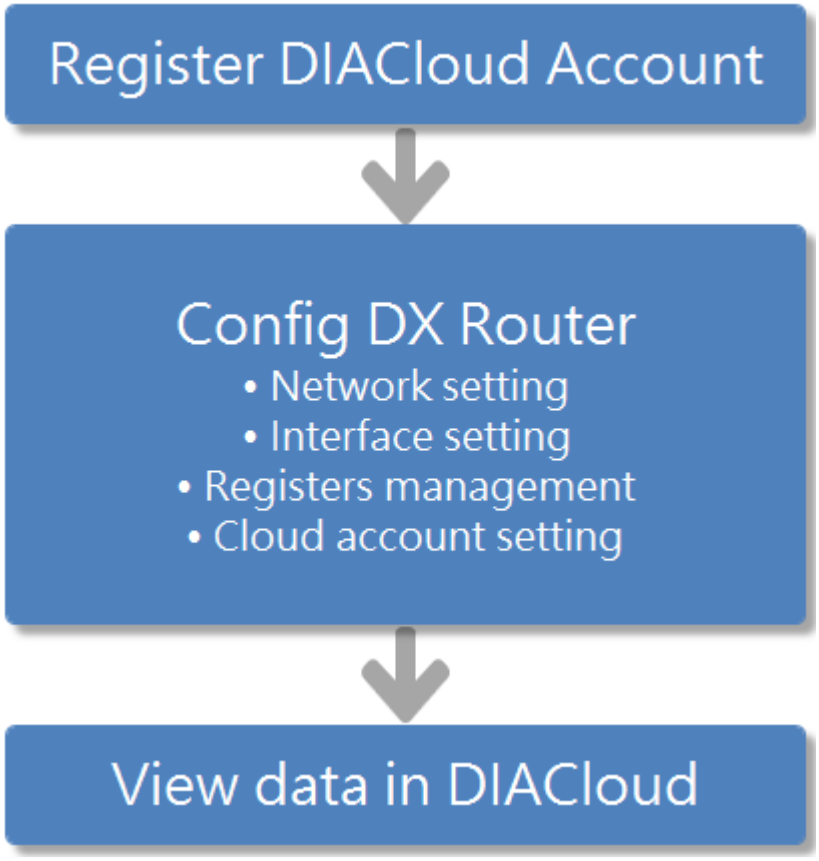
2.3 Typical application configuration

DX-3021 is an industrial-grade cloud router, through it users can easily and quickly collect remote data and remote device debugging.

2.3.1 Data collection

DX router can connect to the Slave via serial port or ethernet port, router builtin more than 2000 registers, through standard Modbus RTU ASCII and Modbus/TCP protocol, and Mitsubishi MC and Siemens TCP protocol, work as Master/Slave role to collecting/receiving data, and upload data to the cloud.

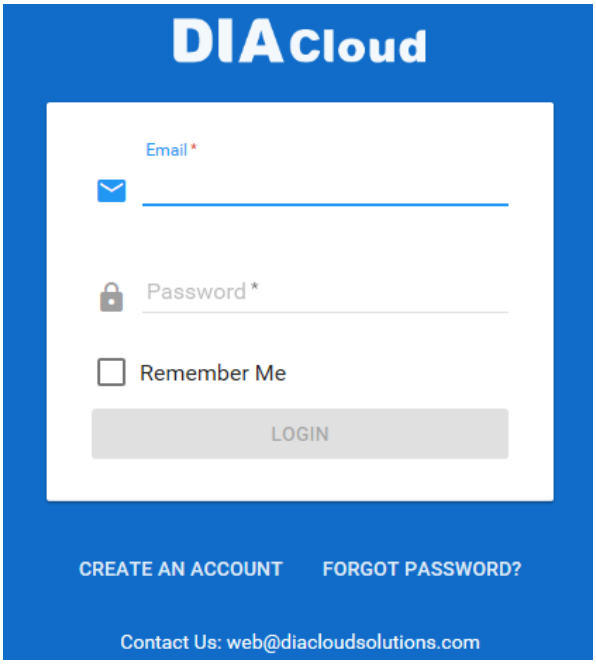
The basic steps of data collection are as follows:



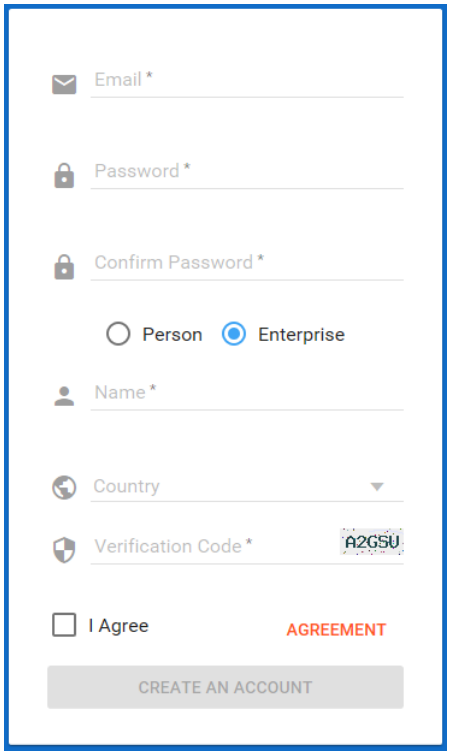
1. Register DIACloud Account

Cloud account is an important credential of DX router ownership. When the router is bound with a DIACloud account, only the account or the sub-account authorized by the account can access the device remotely. All data uploaded by the router belongs to this account, which can only be accessed by this account or sub-accounts authorized by this account. If you don't already have a cloud account, follow these steps to register:

- Browsing DIACloud website (http://www.DIACloudSolutions.com), click “CREATE AN ACCOUNT”.



- Fill in account info and select “I Agree” , click “CREATE AN ACCOUNT” button.

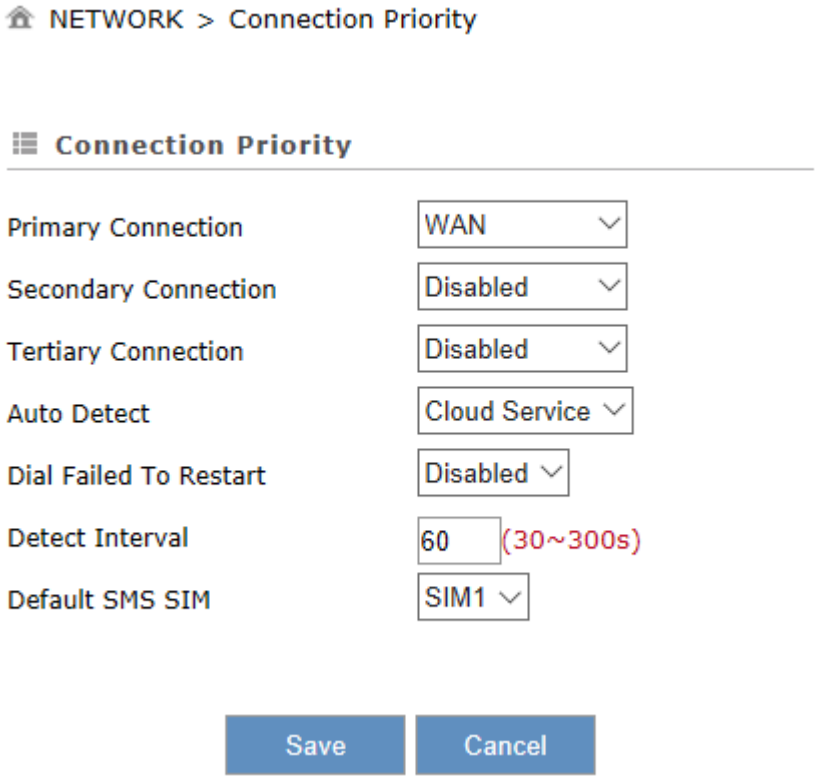


- Login your mailbox. Open the activation email sent from no-reply@DIACloudSolutions.com and complete DIACloud account activation operation.

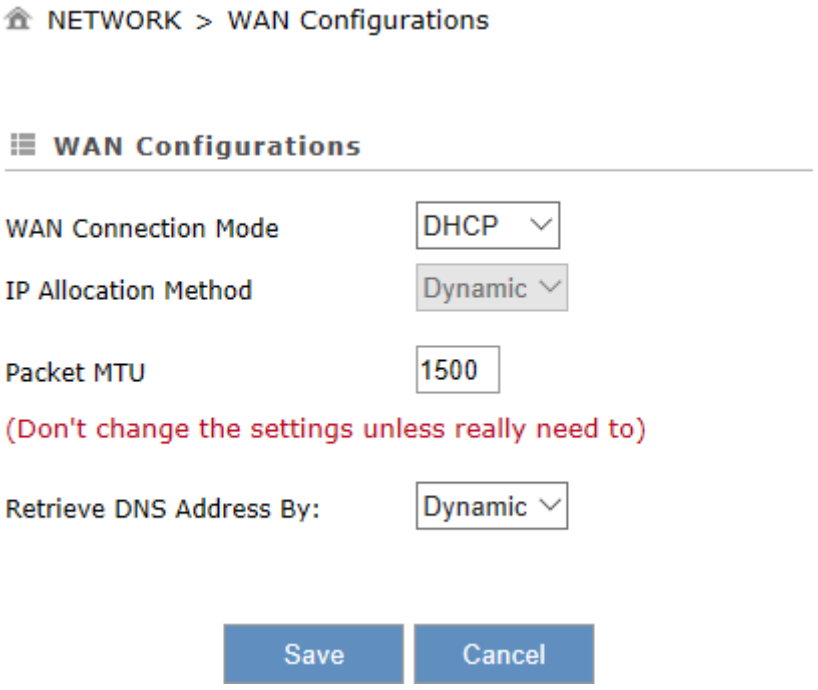
2. Config DX Router

Here show how to config the DX router, make it as the modbus master to collect the data from Delta PLC via RS-485.

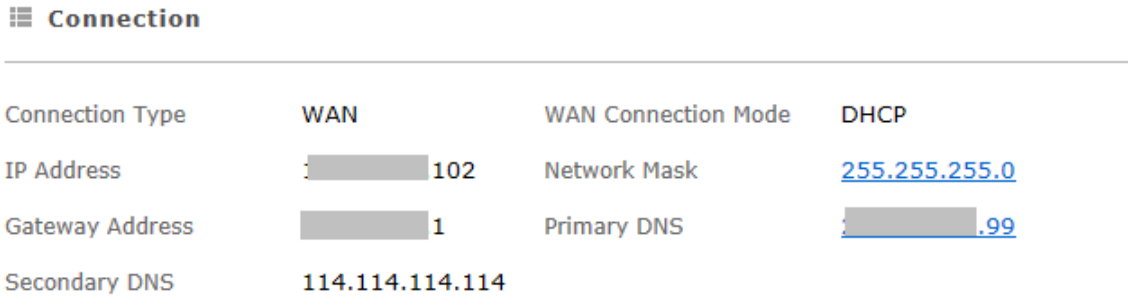
- Connect DX router to local PC via cable, login the config GUI, See section 2.1 for details
- Due to DX-3021 support multiple up-link to connect to intenel, so, you can assign the connect priority in “NETWORK”-“Connection” page as below:



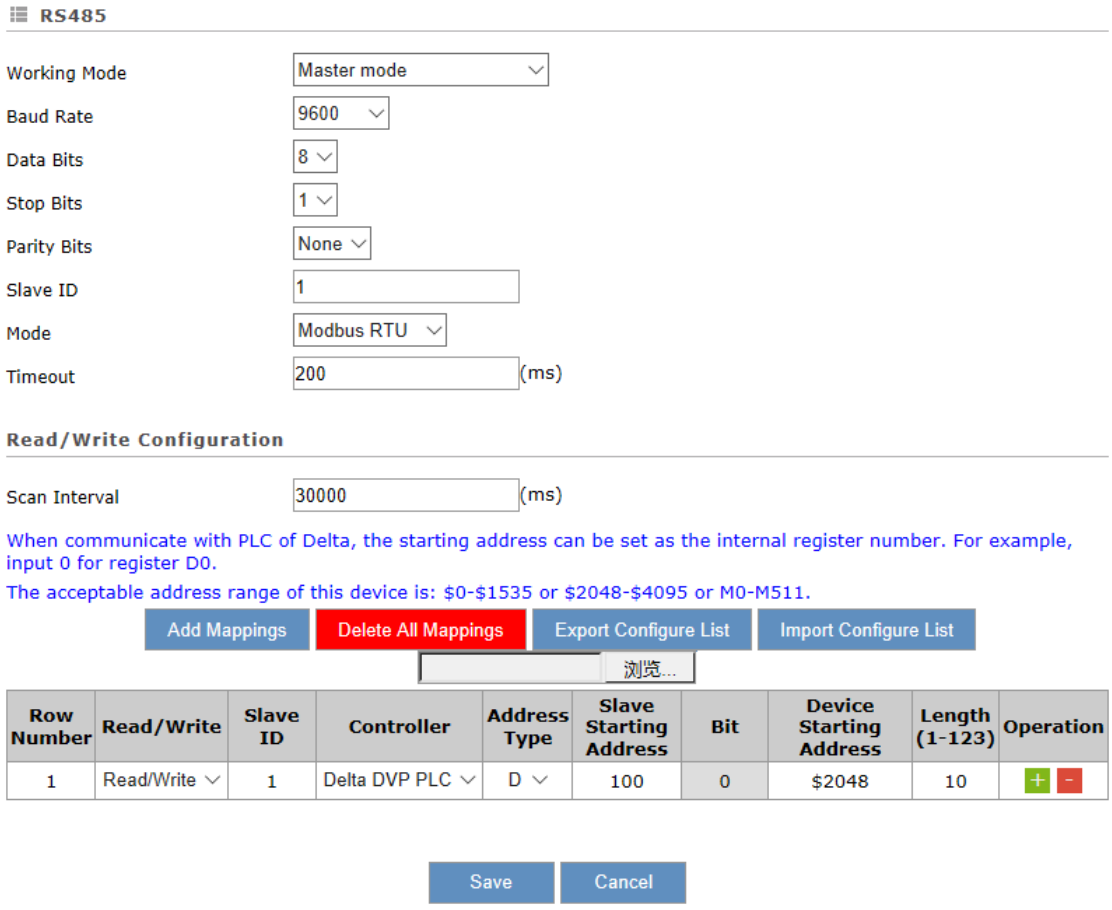
And then, base the connection priority setting, goto corresponding to set up the up-link parameter.



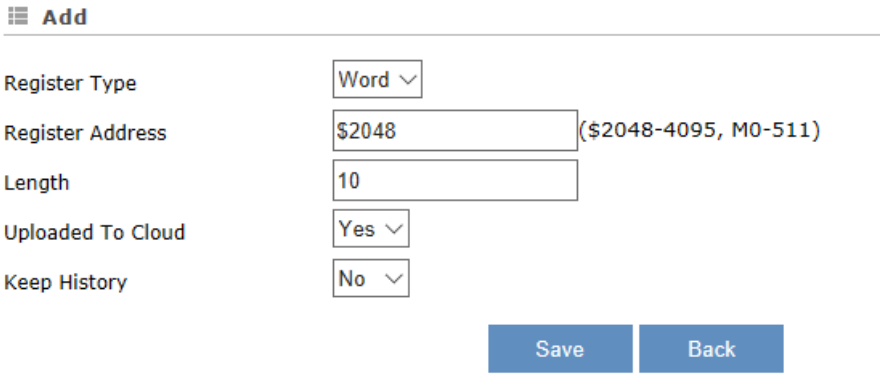
After save the setting, check the network status from “STATUS”-“Network Status” page.



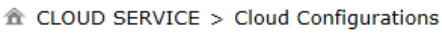
- Click meun ”INTERFACE”-“RS485” to goto RS-485 setting page, set up it’s working mode to “Master mode”, detail configure as the following:

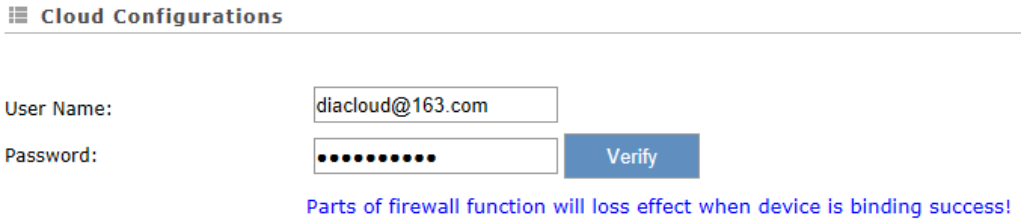


- Click meun ”SYSTEM”-“Register Management” to goto register setting page, set up the data upload rules, detail configure as the following:

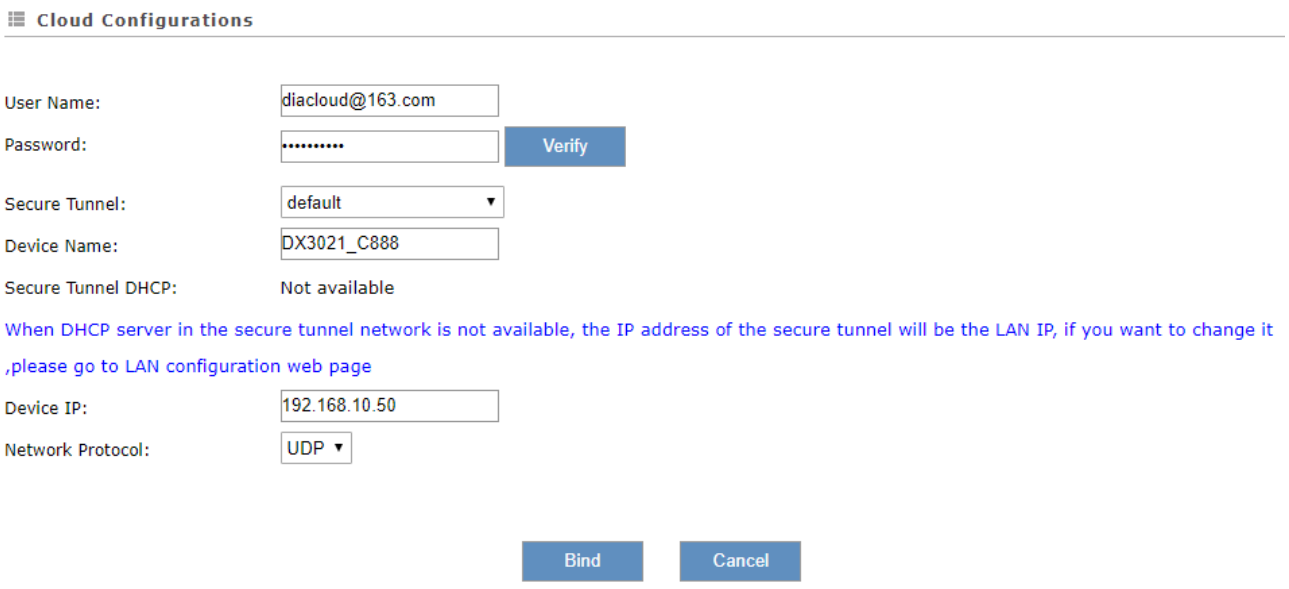


- Click meun ”Cloud Service”-“Cloud configurations” to goto account setting page, bind the device with DIACloud account, detail configure as the following:

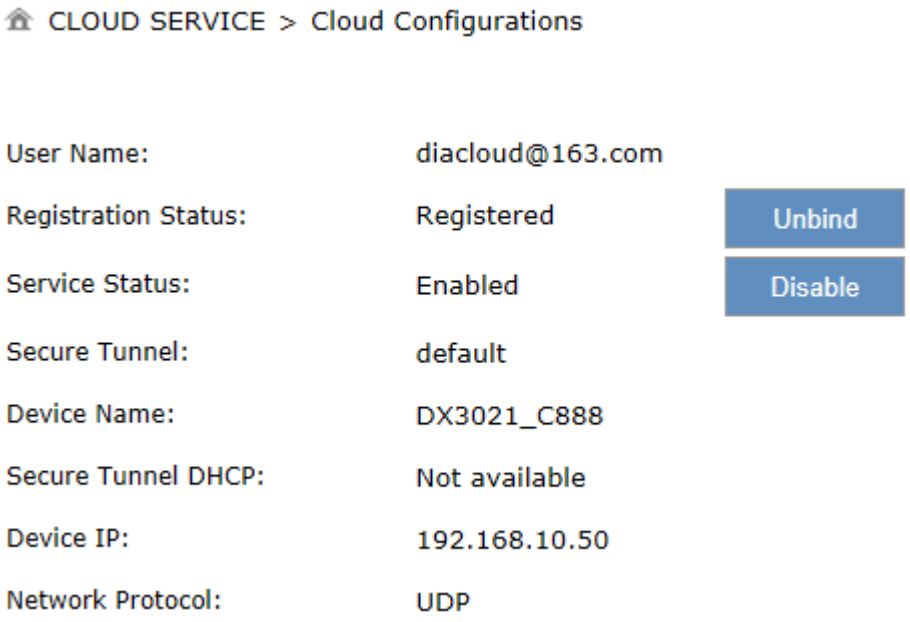




Click the "verify" button to verify the user name/password, it will show below page after verification is pass. User can use the default parameters. Click the "bind" button to bind the device to this account.

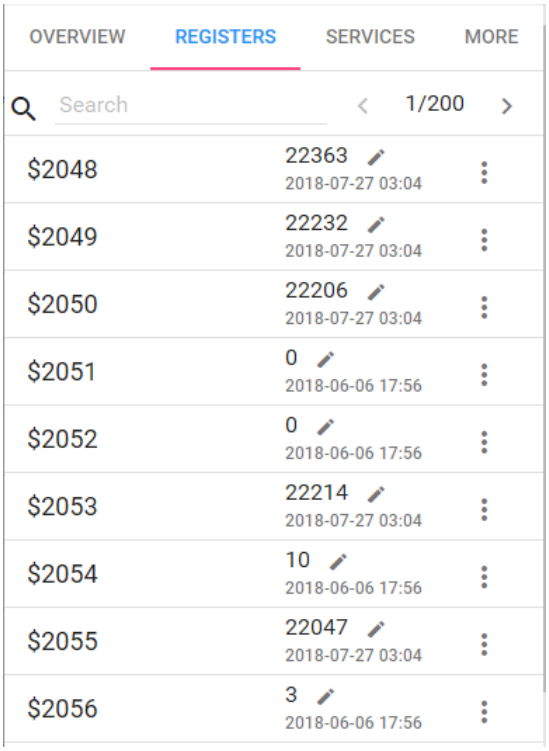


After binding successful, you can log in the device configuration page again and check the binding information.



3. View data in DIACloud

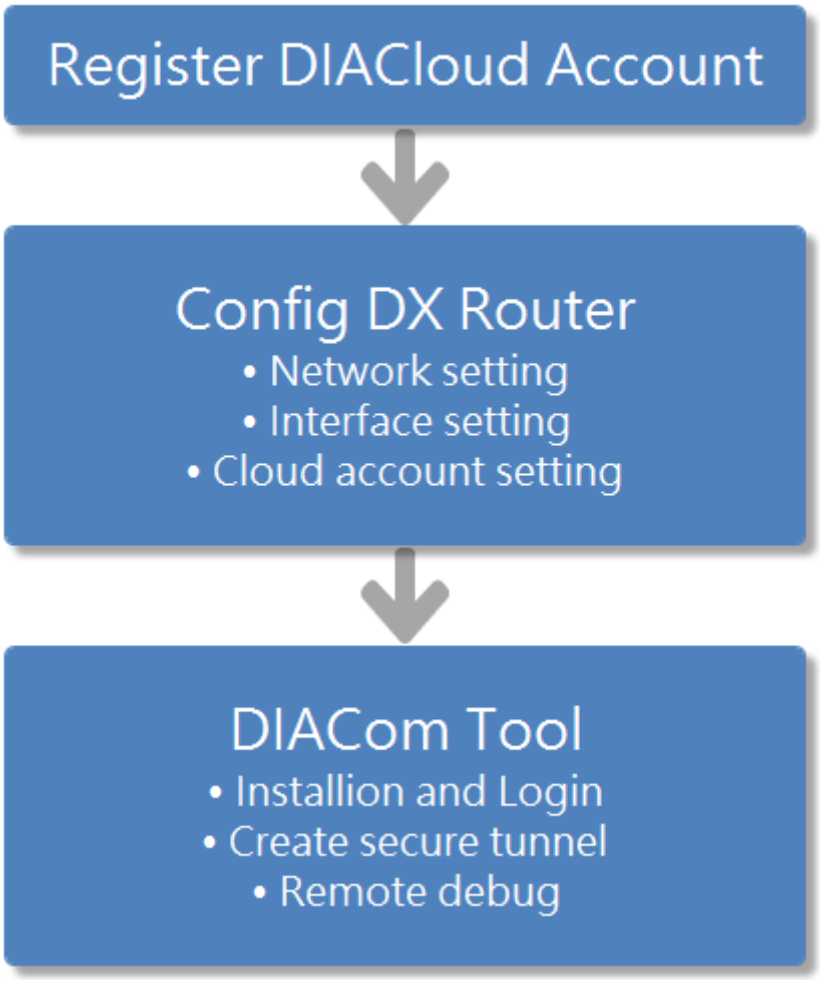
- Browsing DIACloud website, login with your account.
- Click meun “Devices”, find the device and click the *** to view the deail.
- Select “Registers” and then will show register list, the vaule are the collection data.



2.3.2 Remote debugging

DX router have built-in DIACloud cloud service, so when the router is bound to the DIACloud account and connected to the DIACloud cloud platform, the router and the cloud platform will create a secure tunnel, and all the devices in the same secure tunnel group under the account will be in the same secure virtual LAN. With our DIACom PC tool, users can also

add their local computers to the virtual LAN, allowing them to download and debug remote devices as if they were operating locally, either through the network port or by creating a virtual serial port.



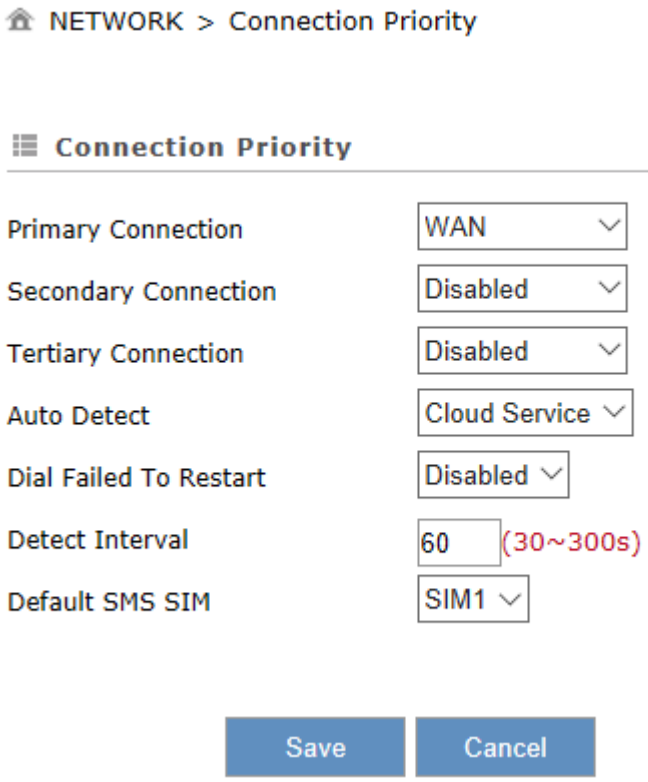
1. Register DIACloud Account

If you have a DIACloud account already, skip this step. To register a new account, please refer to section 2.3.1.

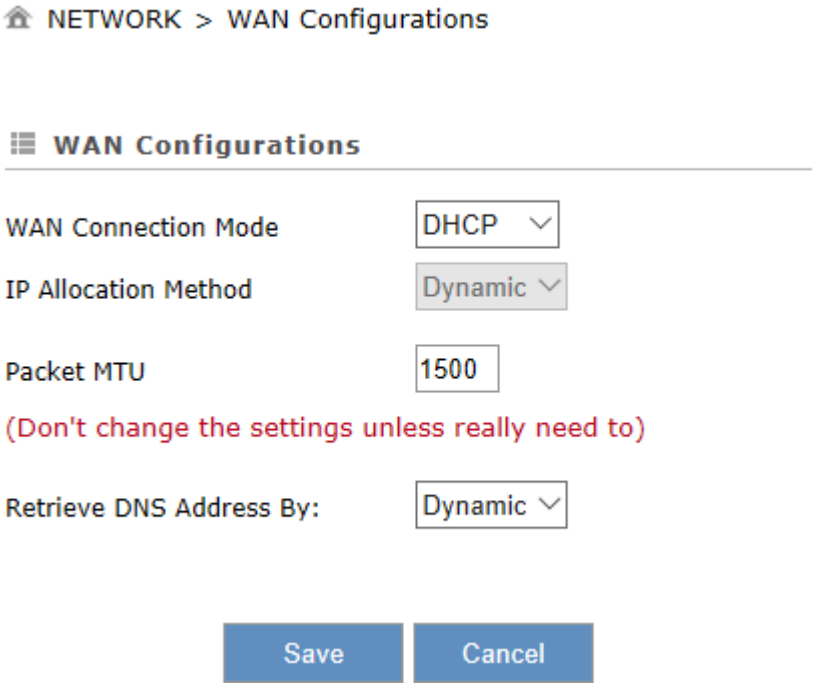
2. Config DX Router

Here show how to config the DX router, to perform remote debug Delta PLC via RS-485.

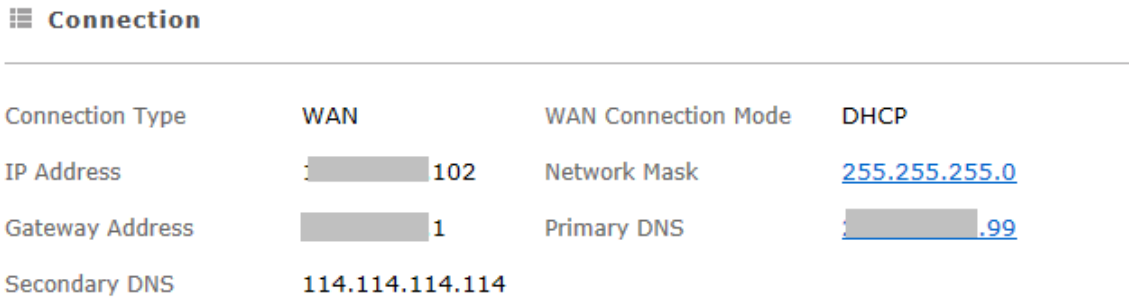
- Connect DX router to local PC via cable, login the config GUI, See section 2.1 for details
- Due to DX-3021 support multiple up-link to connect to intenel, so, you can assign the connect priority in “NETWORK”-“Connection” page as below:



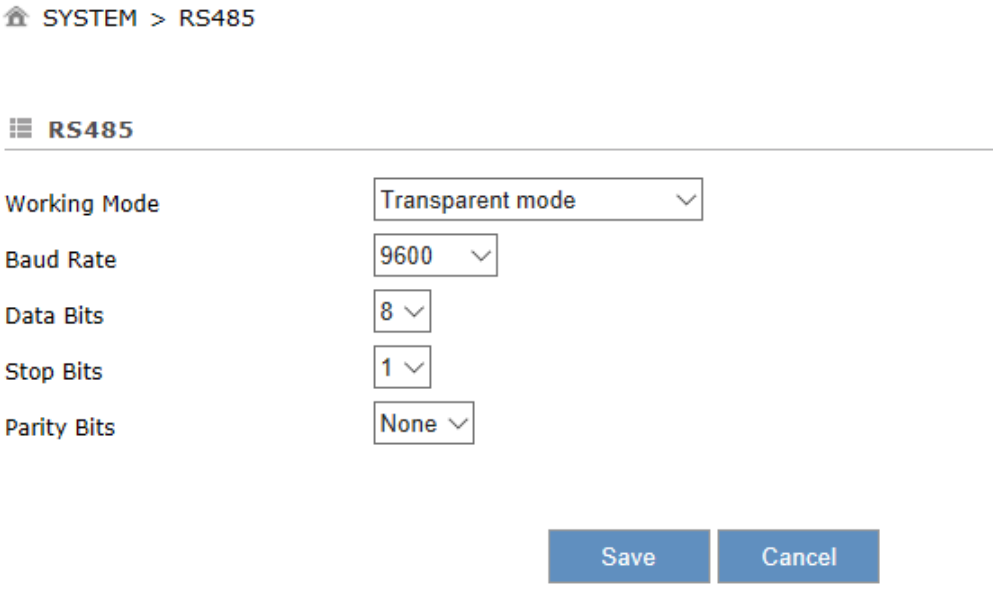
And then, base the connection priority setting, goto corresponding to set up the up-link parameter.



After save the setting, check the network status from “STATUS”-“Network Status” page.



- Click meun ”INTERFACE”-“RS485” to goto RS-485 setting page, set up it’s working mode to “Transparent mode”, configure as the following:

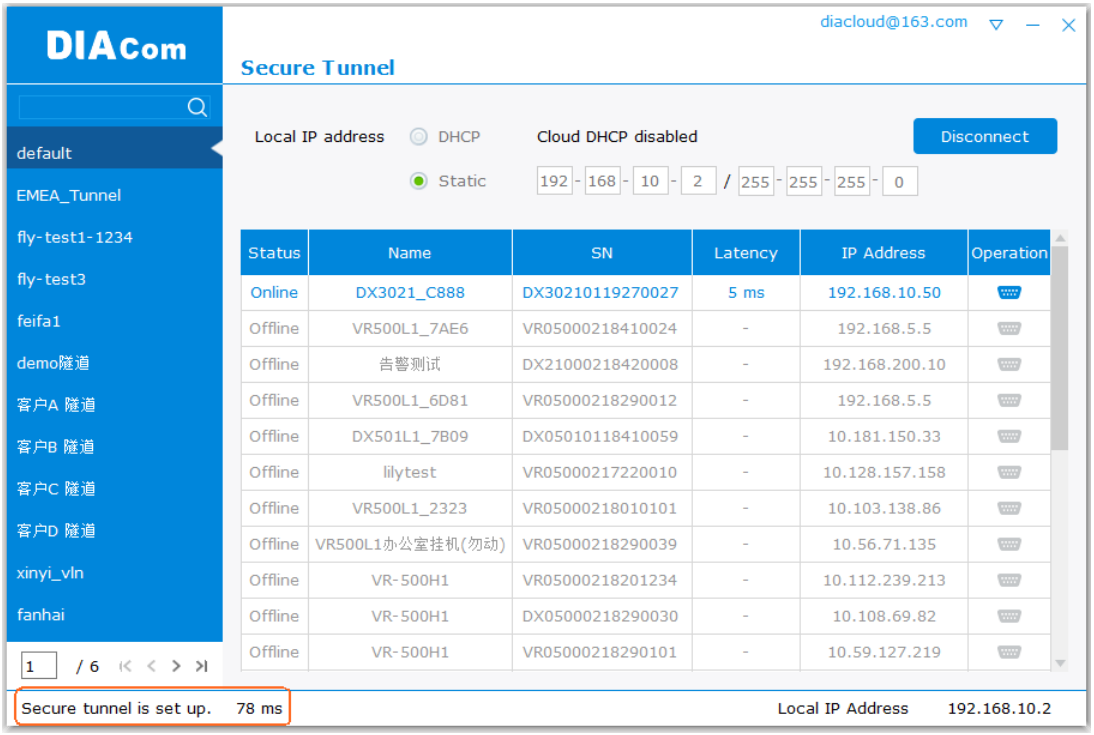


- Click meun ”Cloud Service”-“Cloud configurations” goto account setting page, bind the device with DIACloud account, please refert to section 2.3.1 for the detail.

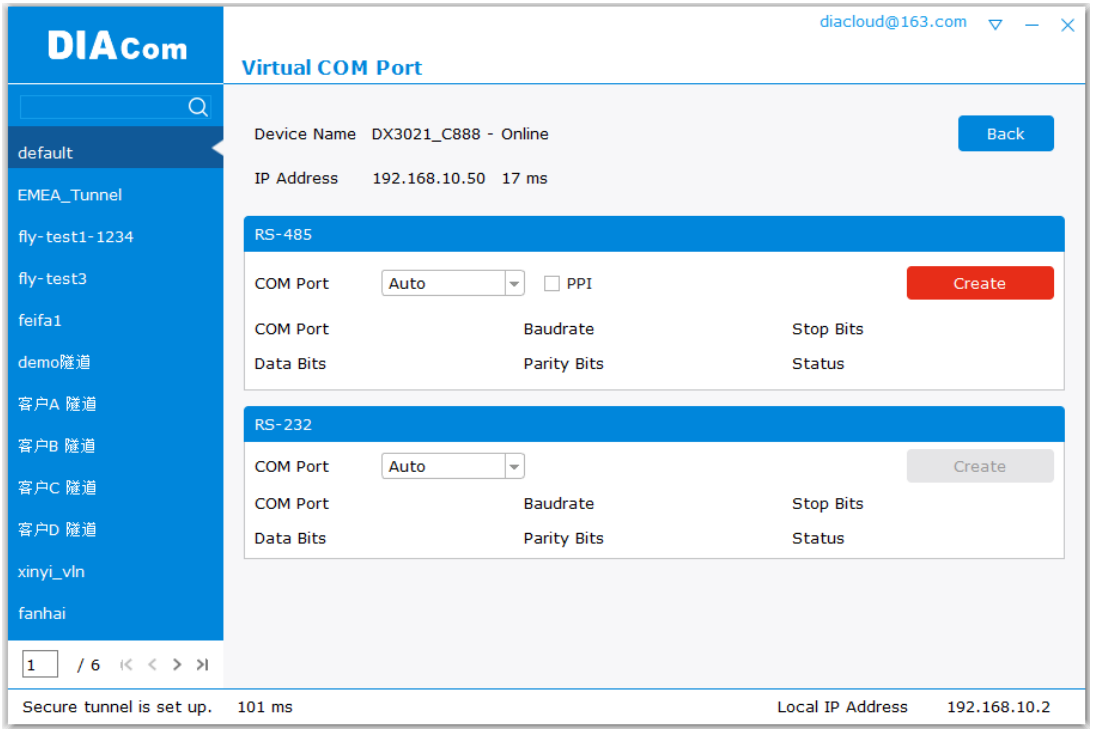
3. DIACom Tool

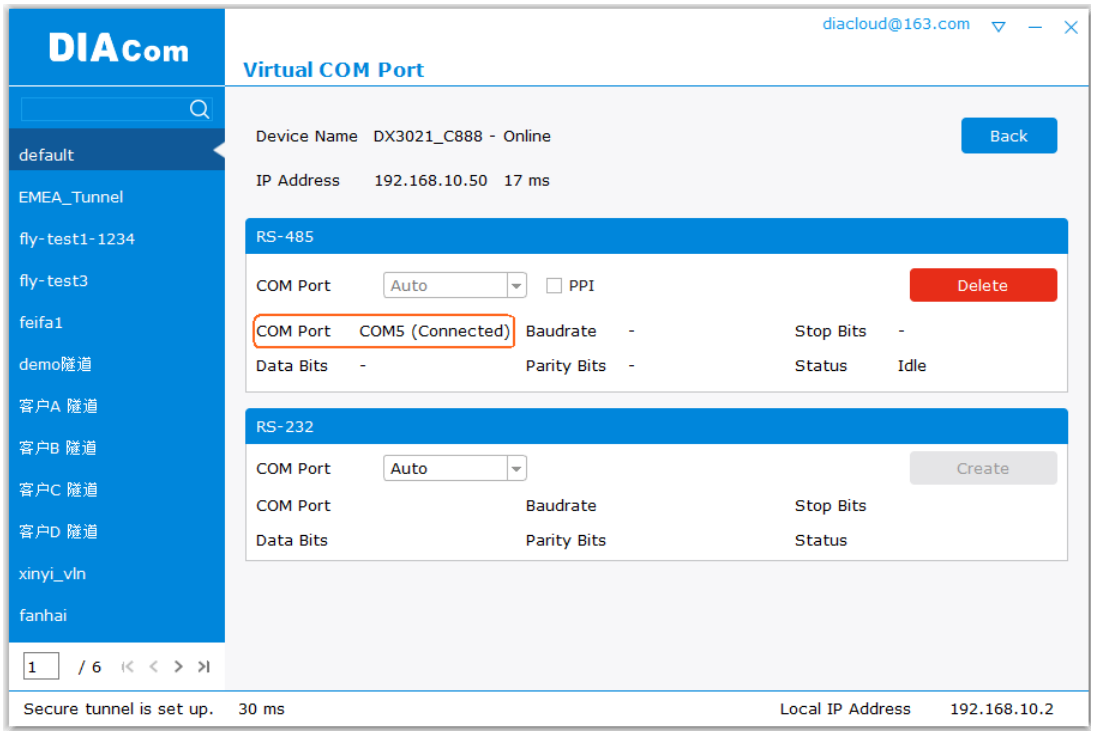
- Obtain the DIACom firmware package from the official website or from our sales representative. Administrator privileges are required to run and install the package. After install successfully, run this programe and login with DIACloud account.

- Seclected the tunnel group which router belong. Set up local IP address same segment with DX route. And click “Create Tunnel” button.

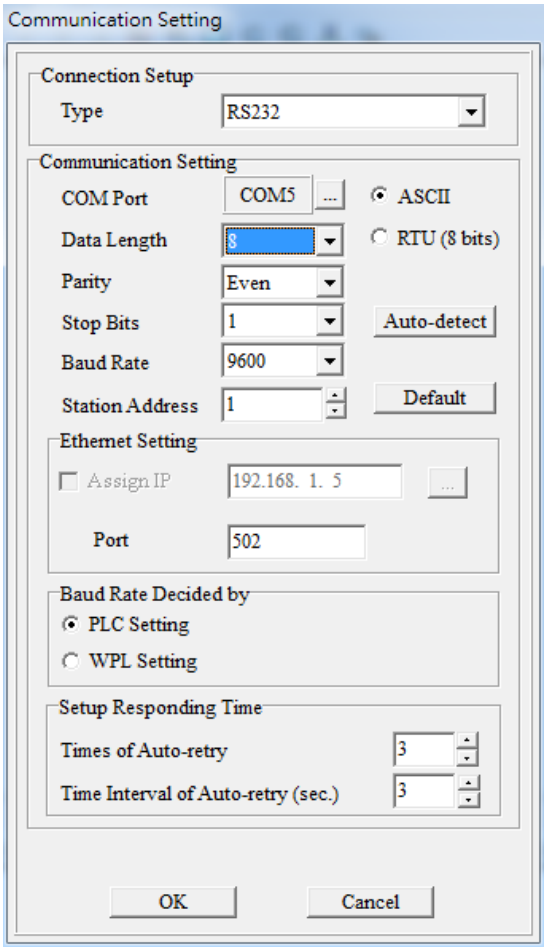


- After the tunnel has been created, click button of the DX router, goto create virtual com page. If “Create” button is not available, please check the RS-485 wrok mode in DX router config page.





- After the virtual serial port is created, open the corresponding debugging tool WPLSoft of Delta PLC, you can remote download the program to the PLC, which connect to DX router through RS-485.



3

Chapter 3 Functions

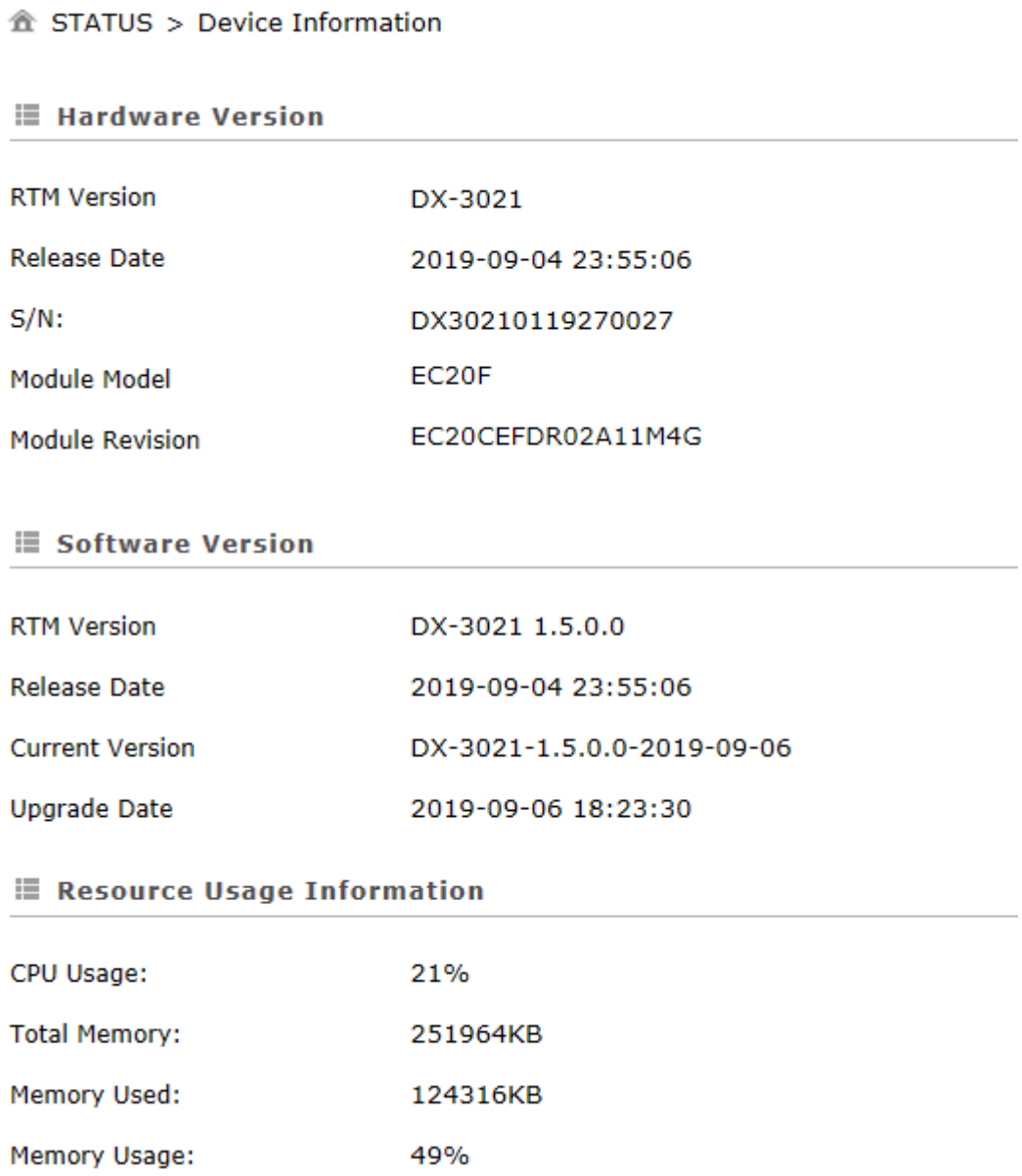
Table of Contents

3.1 Status

You can view summary or detailed information on the Device Information, Network Status, Routing Table, Local Log, Traffic Statistics, Cloud Status, and Connected Device.

3.1.1 Device Information

This page shows basic information on the Hardware/Software version and Resource Usage Information.



- Hardware Version

Item	Description
RTM Version	Release to manufacturing version of the router
Release Date	Hardware release date
S/N	Serial number of the router
Module Model	Cellular module model name
Module Revision	Cellular module Firmware version

- Software Version

Item	Description
RTM Version	Release to manufacturing version of the software
Release Date	Software release date
Current Version	Version number of the software currently used on the router
Upgrade Date	Upgrade time of the software currently used on the router

- Resource Usage Information

Item	Description
CPU Usage	The CPU usage of current router
Total Memory	The total memory on the router
Memory Used	The memory currently used on the router.
Memory Usage	The current ratio of the router usage

3.1.2 Network Status

This page shows basic information about router network.

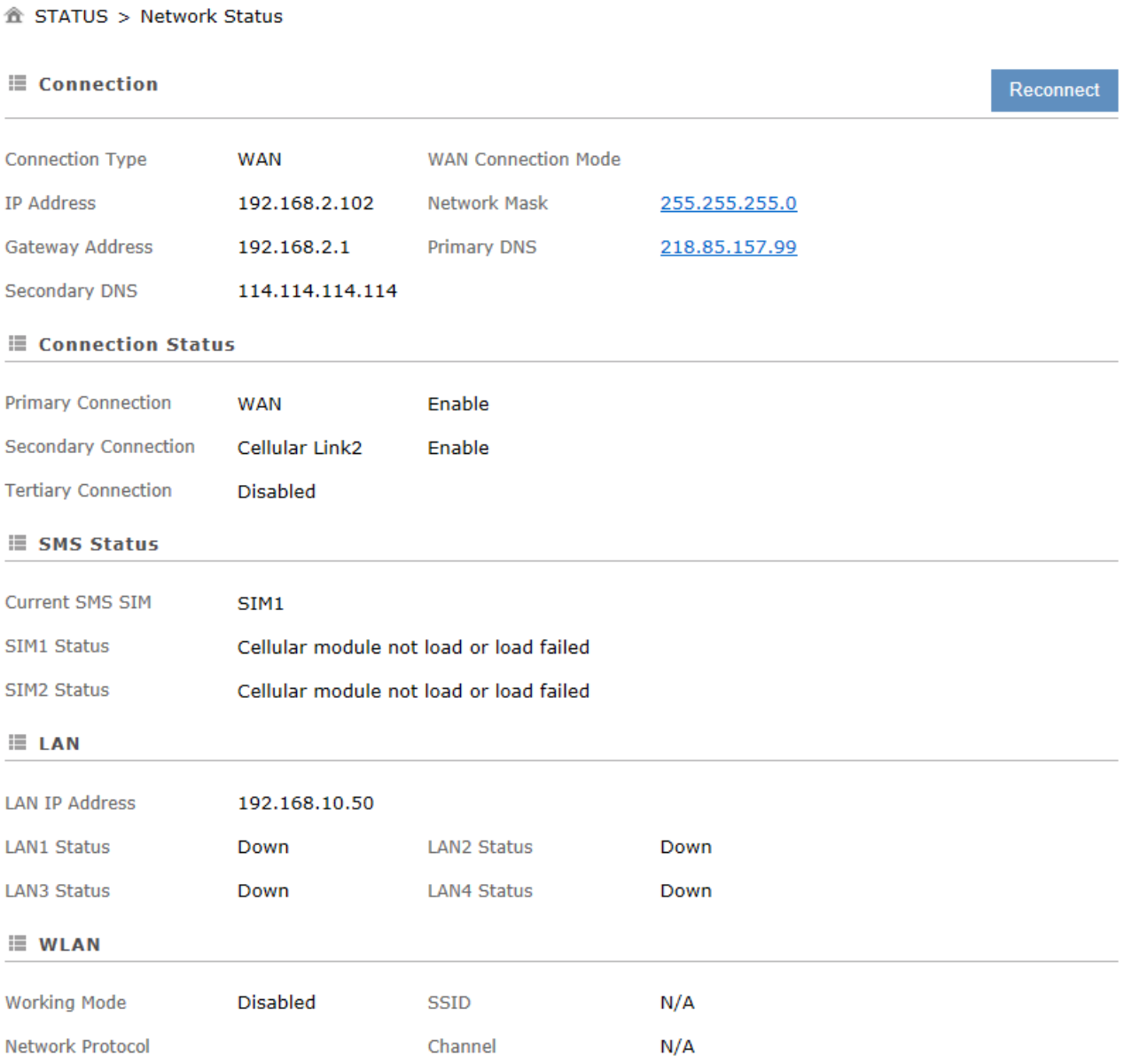
Connection Status show the active uplink to Internet currently, and detail information about this uplink. Connection priority indicate the order which user appoint to connect to Internet for the router.

Gateway Address, primary DNS, and Secondary DNS.

SMS Status show the default SMS will sent/received by which SIM, and SIM1 and SIM2 status.

LAN Status show the LAN IP Address, four LAN ports status.

WLAN Status show Wi-Fi dongle working detail if user enable it by USB port.



3.1.3 Routing Table

This page shows basic information on the routing table, including the Destination, Gateway, Network Mask, HOPS and Network Interface.

STATUS > Routing Table

Destination	Gateway	Network Mask	HOPS	Network Interface
0.0.0.0	192.168.2.1	0.0.0.0	0	eth0
192.168.2.0	0.0.0.0	255.255.255.0	0	eth0
192.168.10.0	0.0.0.0	255.255.255.0	0	br0
192.168.254.0	0.0.0.0	255.255.255.0	0	br0

3.1.4 Local Log

This page shows logs of the router, including the System log, Warning lot and the Debug log. You can use the buttons on the right hand side to refresh, clear or download the displayed logs.

STATUS > Device Logs

Log Type

◉Informative log ○Warning log ○Debug log

Log Content

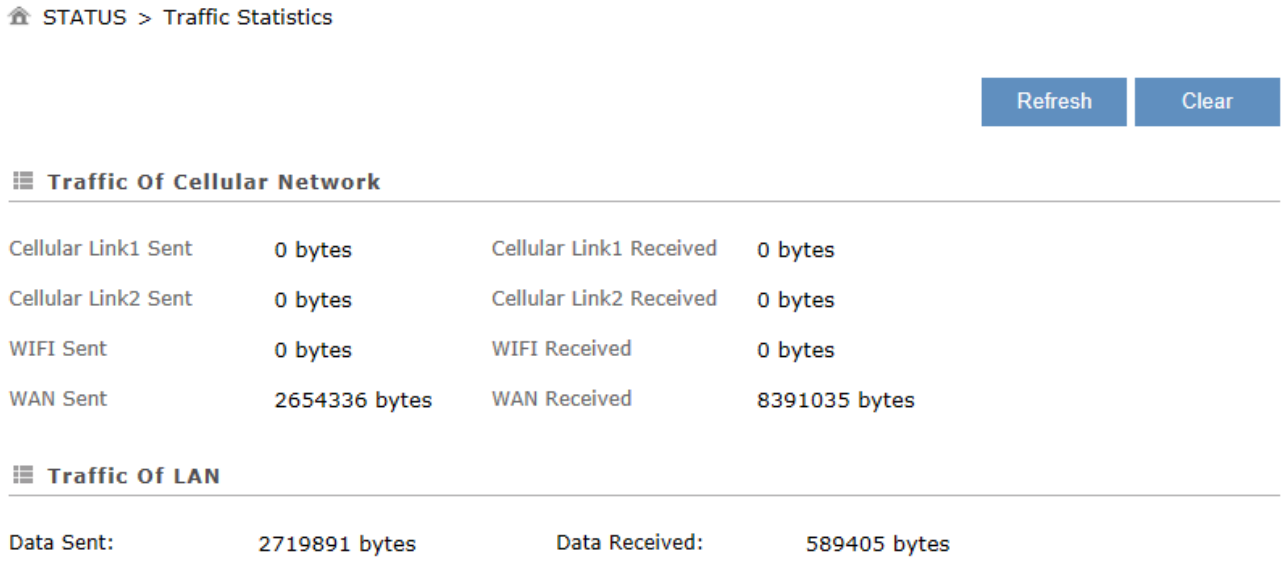
Refresh Clear Download

Timestamp	Content
Sep 6 09:11:06	syslog.info syslogd started: BusyBox v1.22.1
Sep 6 09:11:34	user.info WATCHDOG[1552]: watchdog enabled!
Sep 6 09:11:35	user.info ethcfg[1609]: VLAN enable success
Sep 6 09:11:35	user.err udhcpd: Failure parsing line 5 of /etc/udhcpd.conf
Sep 6 09:11:35	user.err udhcpd: Failure parsing line 6 of /etc/udhcpd.conf
Sep 6 09:11:35	local0.info udhcpd: udhcpd (v0.9.9-pre) started
Sep 6 09:11:35	local0.err udhcpd: max_leases value (254) not sane, setting to 235 instead
Sep 6 09:11:36	user.info gre_app: [GRE_APP] gre_app start ....
Sep 6 09:11:36	user.info gre_app: [GRE] No configuration in grelist1
Sep 6 09:11:36	user.err gre_app: No configuration for gre,exit...
Sep 6 09:11:37	auth.info passwd: Password for root changed by root
Sep 6 09:11:37	authpriv.warn dropbear[1777]: Failed loading /etc/dropbear/dropbear_dss_host_key

PREV 1 2 3 ... 10 11 12 NEXT

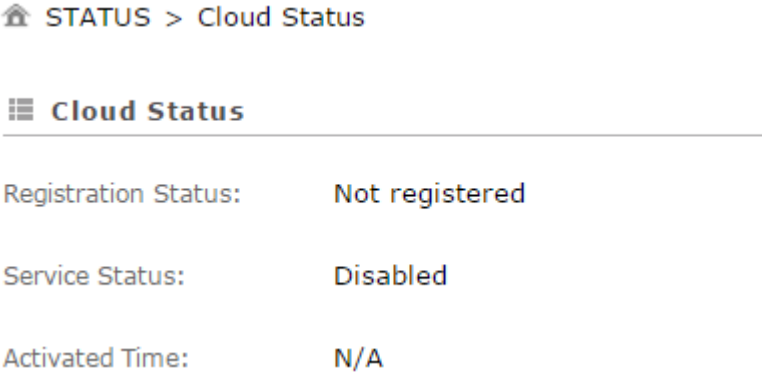
3.1.5 Traffic Statistics

This page shows network traffic information of the router, including the data sent and received over Cellular Link1&Link2, Wi-Fi, WAN and LAN. You can use the buttons on the right-hand side to refresh or clear the traffic information.



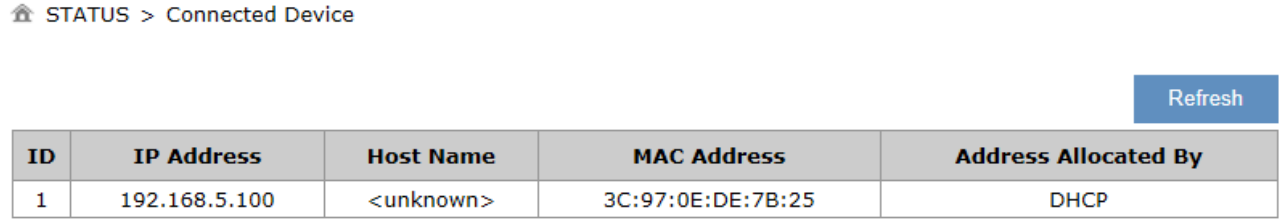
3.1.6 Cloud Status

This page shows cloud server information of the router, including the Registration Status, Service Status, and Activated Time.



3.1.7 Connected Device

This page shows information of the devices connected to the router, including the IP Address, Host Name, MAC Address.



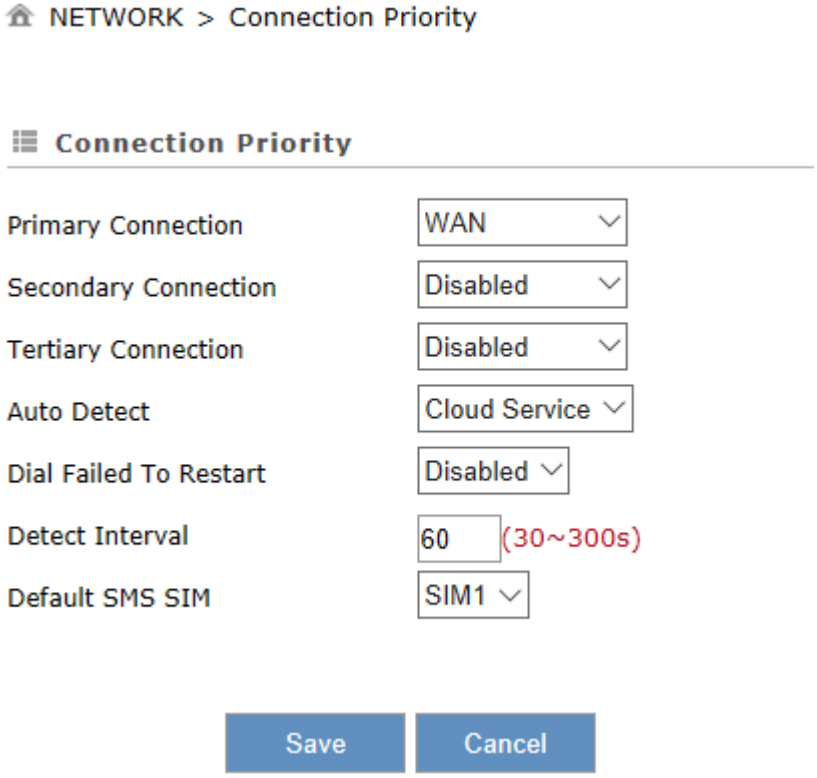
ID	IP Address	Host Name	MAC Address	Address Allocated By
1	192.168.5.100	<unknown>	3C:97:0E:DE:7B:25	DHCP

3.2 Network

You can set up networks, including the Connection priority, Cellular Link1&Link2, PIN Management, WAN Configurations, LAN Configurations, WLAN Setting, Static Routing Rules and Dynamic DNS.

3.2.1 Connection

This page is used for setting up the connection priority. Router provide 3 links to connect to Internet, include cellular network 1&2 and WAN or WLAN, user can appoint the connect order in this page.



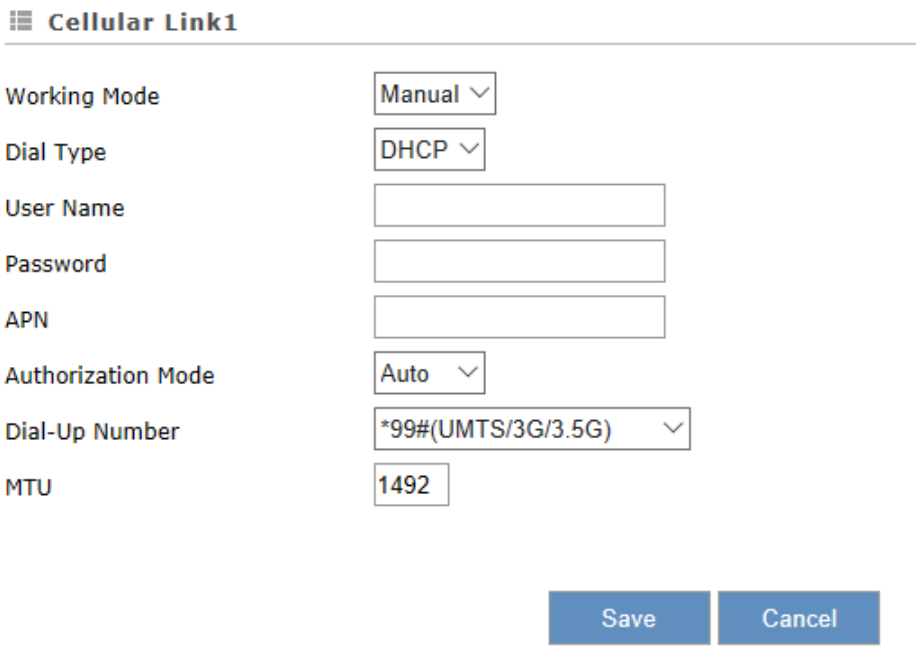
Description	Default
Primary Connection	
Appoint the first uplink interface for internet connection	WAN
Secondary Connection	
Appoint the second uplink interface for internet connection	Disabled
Tertiary Connection	
Set up the tertiary uplink interface for internet connection.	Disabled
Auto Detect	
Cloud Service test was launch to detect the connection is dropped or not. Another method is ping test. User can disable the detect also.	Cloud Service
Target Address 1	
Set the first IP/domain of the server that program will do a ping testing.	N/A
Target Address 1	

Description	Default
Set the second IP/domain of the server that program will do a ping testing.	N/A
Dial Failure To Restart	
Enable or disable the function if the dial failure will be in the default time to restart device.	Disabled
Detect Interval	
Set the interval time for the network detect	60
Default SMS SIM	
Set up the default SIM which be use to sent the SMS when SIM1 and SIM2 both are inactive.	SIM1

3.2.2 Cellular Link1

This page is used for setting up the Cellular Network for SIM1.

NETWORK > Cellular Link1

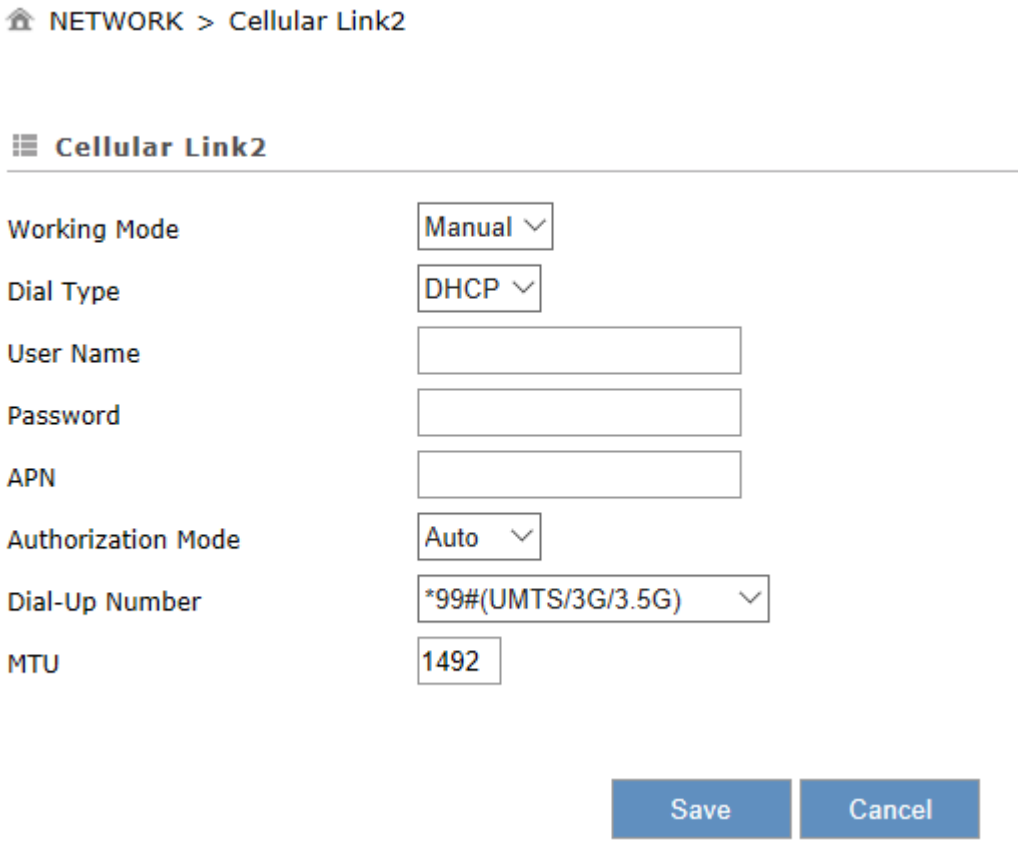


Description	Default
Working Mode	
Select Auto or Others for the Operator from the dropdown list. • **Auto:** the system will detect the operator from the inserted SIM card and set up the parameter accordingly. • **Manual**: users can set up the parameter manually.	AUTO
Dial Type	
For 4G product, dial type only support DHCP currently.	DHCP

Description	Default
User Name	
This name is provided by the operator. When “Auto” is selected, the system will set the name up automatically and users cannot change the setting.	N/A
Password	
This password is provided by the operator. When “Auto” is selected, the system will set the password up automatically and users cannot change the setting.	N/A
APN	
This Access Point Name is provided by the operator.	N/A
Authorization Mod	
Options are “Auto”, “PAP” and “CHAP”.	Auto
Dial-Up Number	
This number is provided by the operator.	*99#
MTU	
Maximum Transmission Unit is the largest packet that can be transmitted over packet based networks.	1492

3.2.3 Cellular Link2

This page is used for setting up the Cellular Network for SIM2.

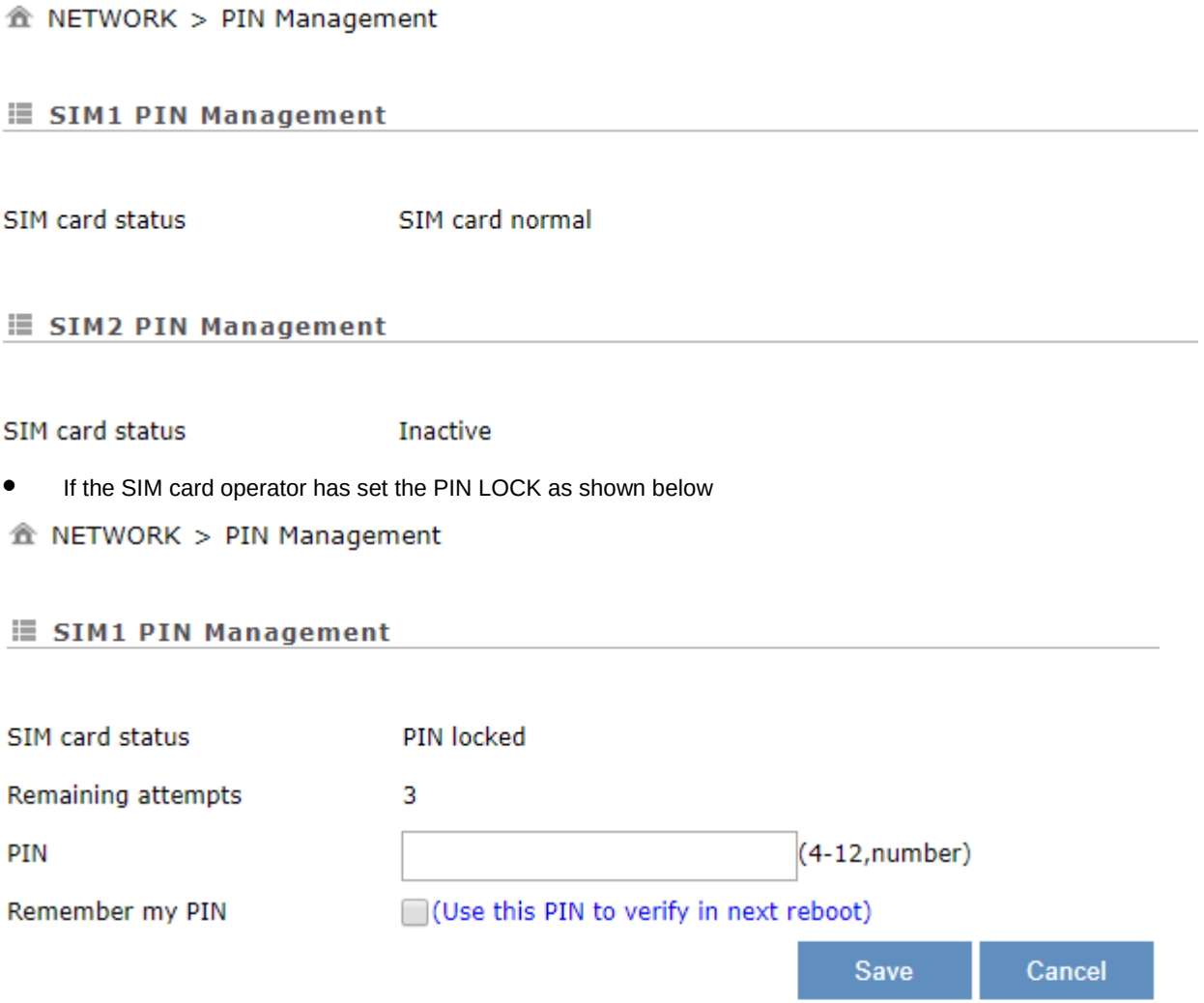


Description	Default
Working Mode	
Select Auto or Others for the Operator from the dropdown list. • **Auto:** the system will detect the operator from the inserted SIM card and set up the parameter accordingly. • **Manual**: users can set up the parameter manually.	AUTO
Dial Type	
For 4G product, dial type only support DHCP currently.	DHCP
User Name	
This name is provided by the operator. When “Auto” is selected, the system will set the name up automatically and users cannot change the setting.	N/A
Password	
This password is provided by the operator. When “Auto” is selected, the system will set the password up automatically and users cannot change the setting.	N/A
APN	
This Access Point Name is provided by the operator.	N/A
Authorization Mod	
Options are “Auto”, “PAP” and “CHAP”.	Auto
Dial-Up Number	
This number is provided by the operator.	*99#
MTU	
Maximum Transmission Unit is the largest packet that can be transmitted over packet based networks.	1492

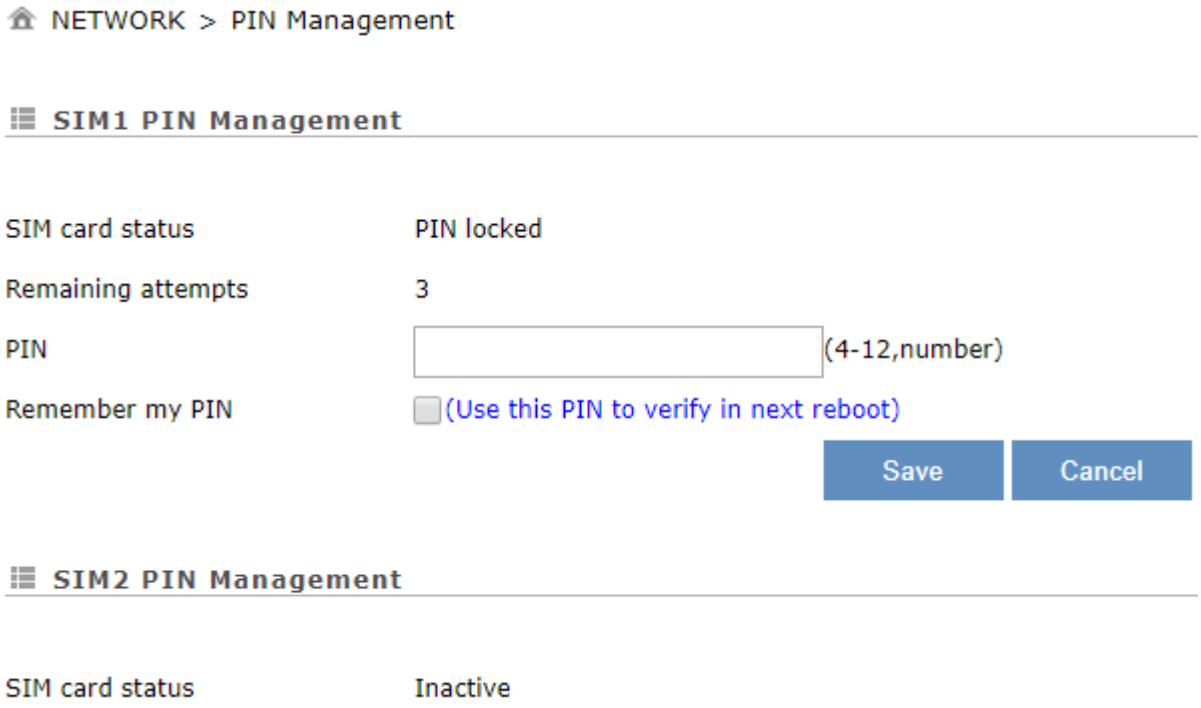
3.2.4 PIN Management

The SIM card operator set the PIN LOCK can use this feature to view or unlock PIN LOCK

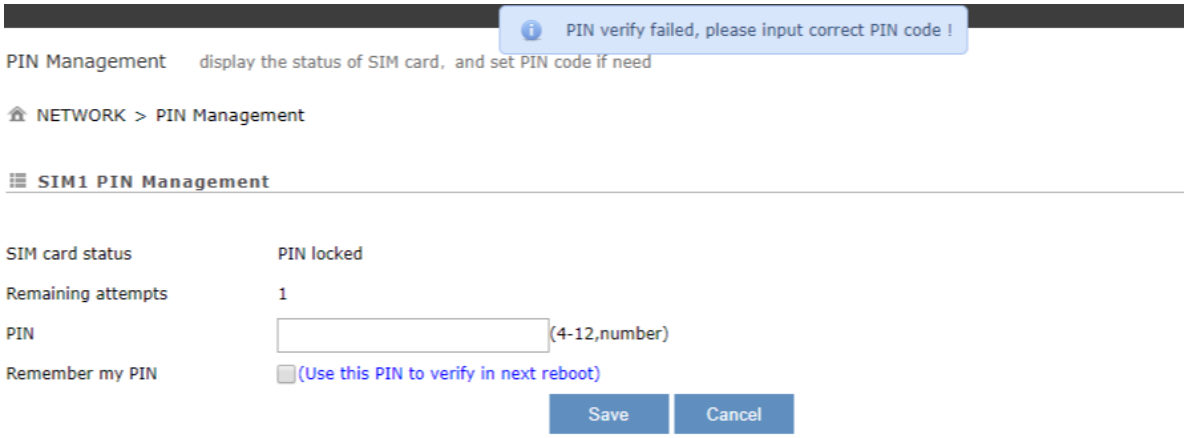
- If the SIM card operator does not set the PIN LOCK, it will show “SIM card normal”; If a SIM card was not inserted into this SIM slot, or the cellular module work on another SIM slot, it will show “Inactive”.



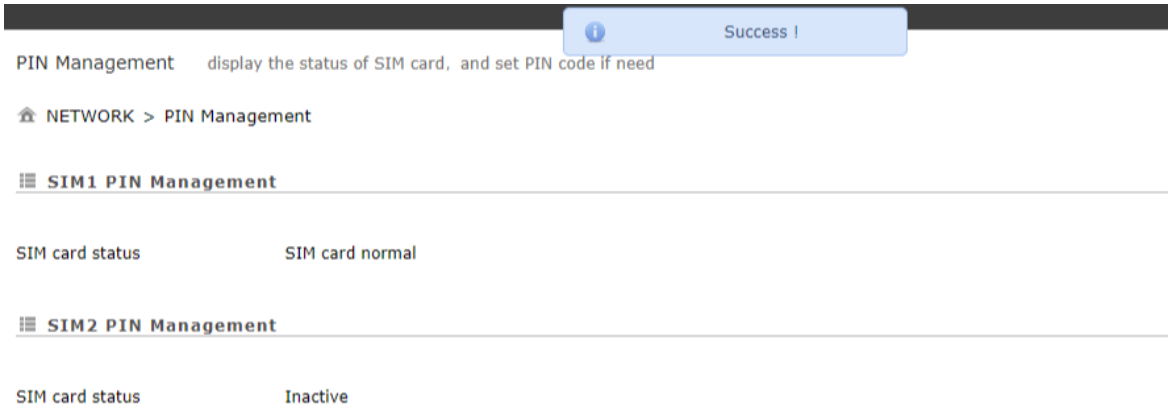
- If the SIM card operator has set the PIN LOCK as shown below



- The verification fails, it will display as below.



- The verification passes, it will display as below.

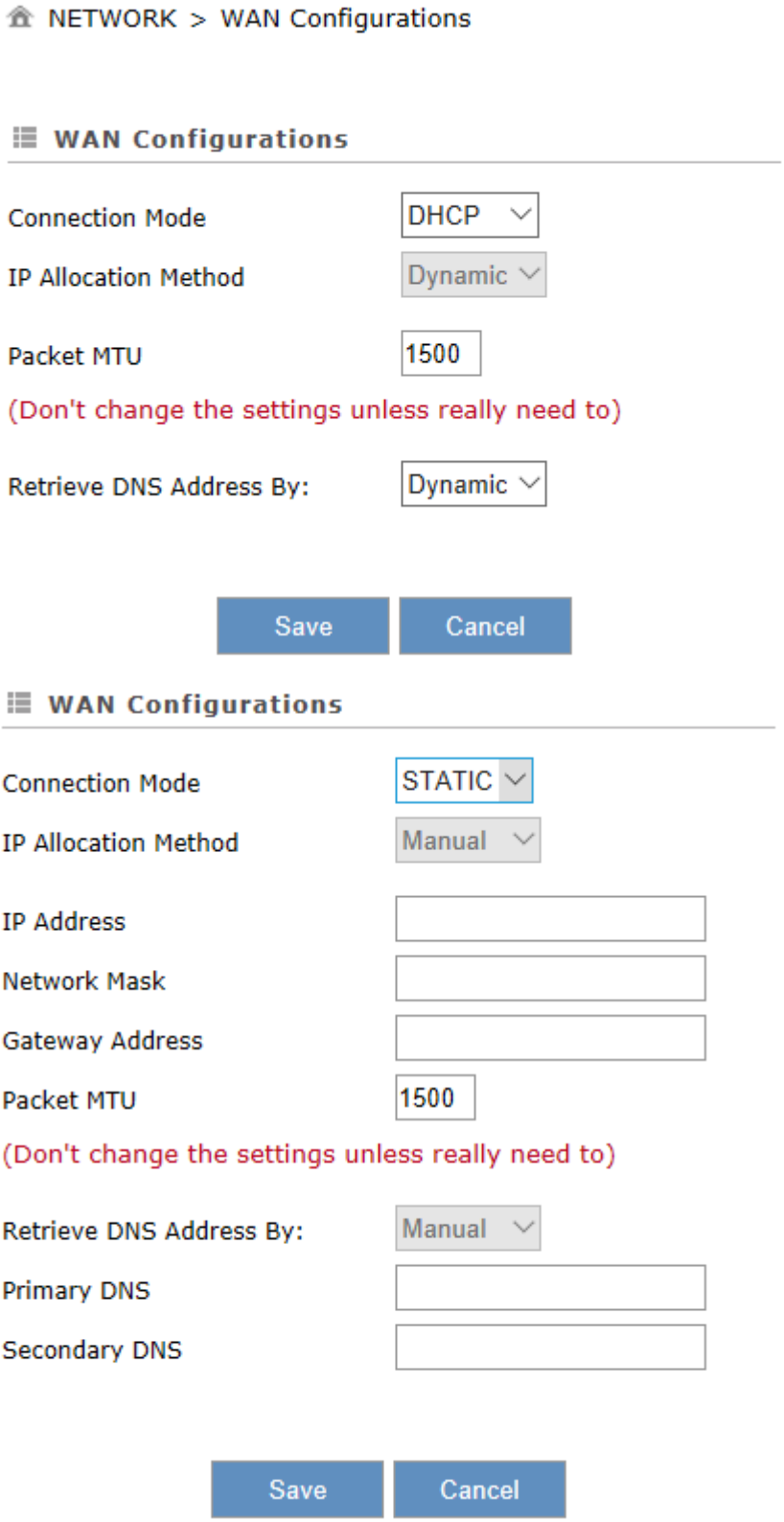


Notice

- If you enter the wrong PIN three times, your SIM card will become locked.
- Once SIM card is blocked, you need PUK code to unlock it or find operator's help.

3.2.5 WAN Configurations

This page is used for setting up the WAN, including the IP address, network mask, gateway and DNS.



Description	Default
Connection Mode	
DX router can connect to the internet via the WAN port with a Dynamic IP or Static IP.	DHCP

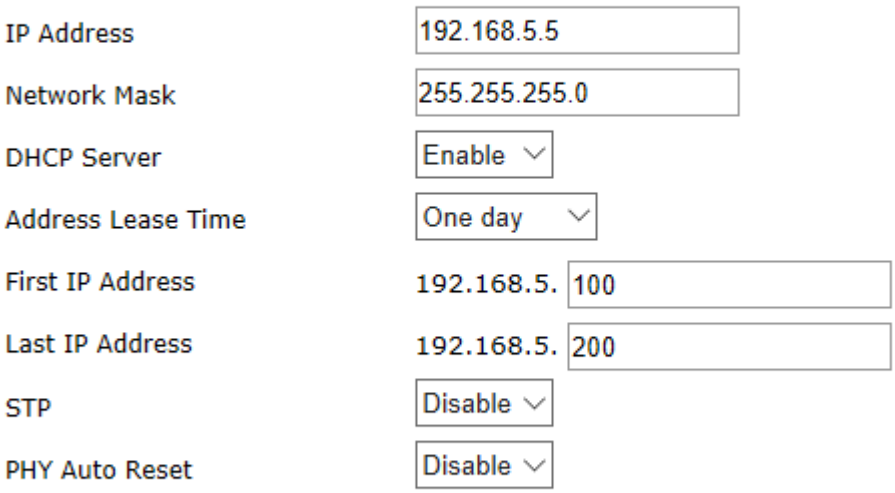
Description	Default
• DHCP: DX router obtain an IP address automatically from DHCP Server. • STATIC: Manually set up the IP address for DX router.	
IP Allocation Method	
The IP Allocation Method is the same as the WAN Connection Mode that you have set. You can apply to different option by modifying the Connection Mode. • Dynamic: Dynamic Host Configuration Protocol (DHCP) allows you to obtain an IP address automatically from your router. • Manual: Manually set up the IP address (Static).	DHCP
IP Address	
Set up an IP address for your device to connect to the internet via the WAN port. It's configurable when the mode is set to Static.	N/A
Network Mask	
Set up the WAN network mask. It's configurable when the mode is set to Static.	N/A
Gateway Address	
Set up the gateway address. It's configurable when the mode is set to Static.	N/A
MTU	
Maximum Transmission Unit is the largest packet that can be transmitted over packet based networks.	1500
Retrieve DNS Address By	
DNS address can be retrieved by DHCP setup or manually set. When connection mode is "STATIC", user must manual assign the DNS address. • Dynamic: DX router obtain a DNS address automatically from DHCP router. • Manual: Manually set up the DNS address.	Dynamic
Primary DNS	
Set up the primary DNS. It's configurable when the mode is set to Static.	N/A
Secondary DNS	
Set up the secondary DNS. It's configurable when the mode is set to Static.	N/A

3.2.6 LAN Configurations

This page is used for setting up the LAN, including the Device Name, IP Address, Network Mask, and DHCP Server.

NETWORK > LAN

LAN Configurations



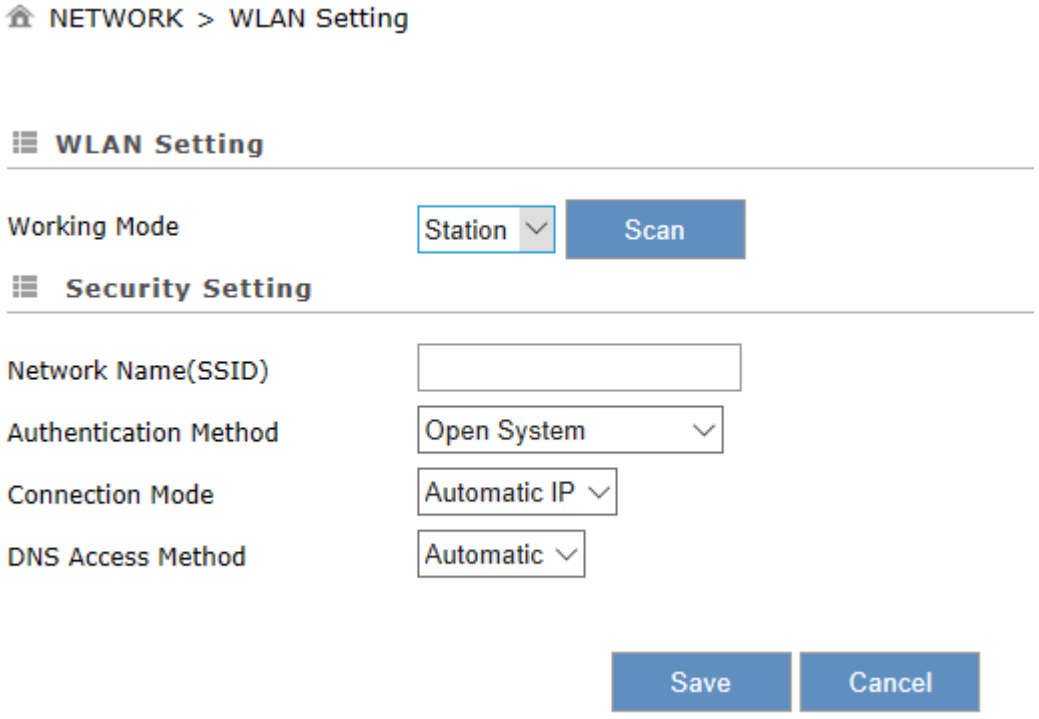
Description	Default
IP Address	
Set up an IP address for your device.	192.168.5.5
Network Mask	
Set up the LAN network mask.	255.255.255.0
DHCP Server	
If DX router uses DHCP to assign IP addresses automatically on your network, you can specify the IP address range and lease time for the clients on your network. Once the DX router have bound the DIACloud and enabled the DIACloud DHCP, the DHCP in DX router will be disabled automatically.	Enable
Address Lease Time	
To set up the address lease time so that a client doesn't hold an IP address indefinitely. It allows for a mechanism to gracefully reuse DHCP addresses. Options here are 1 to 3 days.	One day
First IP Address	
To increase the number of addresses available to clients, you can change the Start Address.	192.168.1.100
Last IP Address	
To increase the number of addresses available to clients, you can change the End Address.	192.168.1.200

Description	Default
STP	
STP is a network protocol that builds a logical loop-free topology for Ethernet networks. The basic function of STP is to prevent bridge loops and the broadcast radiation that results from them. If this STP is enabled, the traffic usage will increase about 15Mbit in 24 hours.	Disable
PHY Auto Reset	
Disable or enable the auto reset function when LAN IP has been changed.	Disable

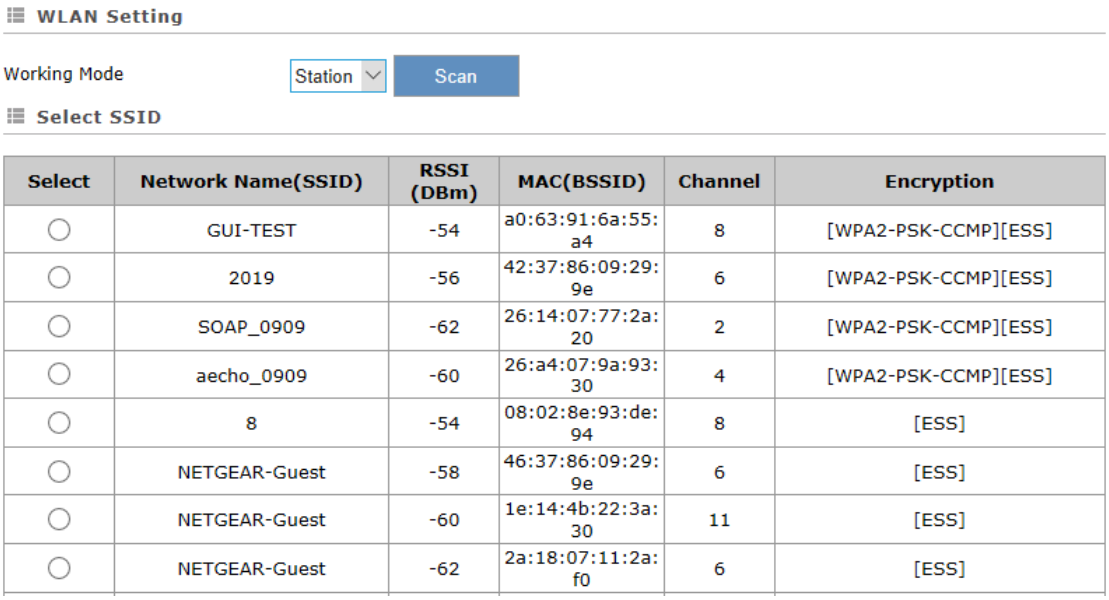
3.2.7 WLAN Setting

DX-3021L9 supports Wi-Fi dongle via USB interface. After setup the WLAN in this page, Wi-Fi will be an uplink option also.

Currently, only product DWA-131 of D-Link company is be support. If you want to enable Wi-Fi dongle function, please insert the DWA-131 into USB and then set the working mode to station.



Click "Scan" button to show the available Wi-Fi AP list.



Select	Network Name(SSID)	RSSI (DBm)	MAC(BSSID)	Channel	Encryption
○	GUI-TEST	-54	a0:63:91:6a:55:a4	8	[WPA2-PSK-CCMP][ESS]
○	2019	-56	42:37:86:09:29:9e	6	[WPA2-PSK-CCMP][ESS]
○	SOAP_0909	-62	26:14:07:77:2a:20	2	[WPA2-PSK-CCMP][ESS]
○	aecho_0909	-60	26:a4:07:9a:93:30	4	[WPA2-PSK-CCMP][ESS]
○	8	-54	08:02:8e:93:de:94	8	[ESS]
○	NETGEAR-Guest	-58	46:37:86:09:29:9e	6	[ESS]
○	NETGEAR-Guest	-60	1e:14:4b:22:3a:30	11	[ESS]
○	NETGEAR-Guest	-62	2a:18:07:11:2a:f0	6	[ESS]

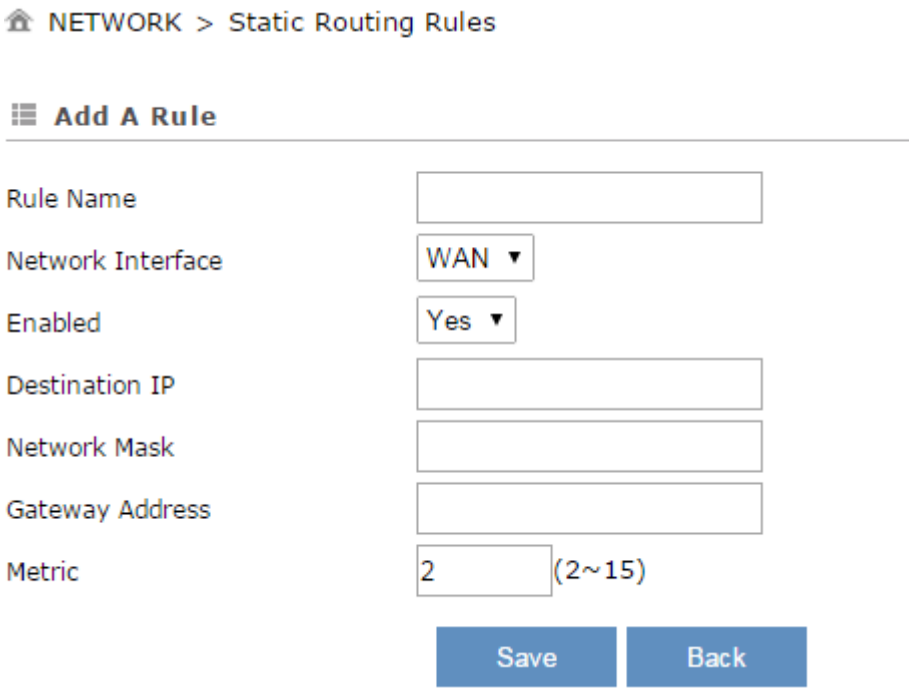
Description	Default
Working Mode	
Set up Wi-Fi dongle working mode, currently support station only.	Disable
Scan	
Scan the available AP list.	
Network Name	
Specify the AP SSID which you intend to connect.	
Authentication Method	
Set up the AP security mode	
WPA Encryption	
Set up the encryption algorithm.	
WPA Pre-Shared Key	
Setup the password to connect to the AP.	
Connection Mode	
Set up the method how station get IP. - Automatic IP: AP assign the IP to station automatic -Static IP: Manual appoint the IP address, Subnet Mask, Gateway and MTU	Automatic IP
IP Address	
Setup the IP address for station	
Subnet Mask	
Setup the subnet mask for station	
Default Gateway	

Description	Default
Setup the getway for station	
DNS Access Method	
Set up the method how station get DNS information. -Automatic: Get DNS information from AP. -Static: Manual appoint the DNS server, include primary and secondary DNS Server	Automatic
Primary DNS	
Setup the primary DNS server	
Secondary DNS	
Setup the secondary DNS server	

3.2.8 Static Routing Rules

This page is used for setting up the Static Routing, including the Rule Name, Network Interface, Enabled, Destination IP, Network Mask, Gateway Address and Metric. Click the "Add A Rule" to add static routing rules.

After clicking the "Add A Rule", you will see the following page.

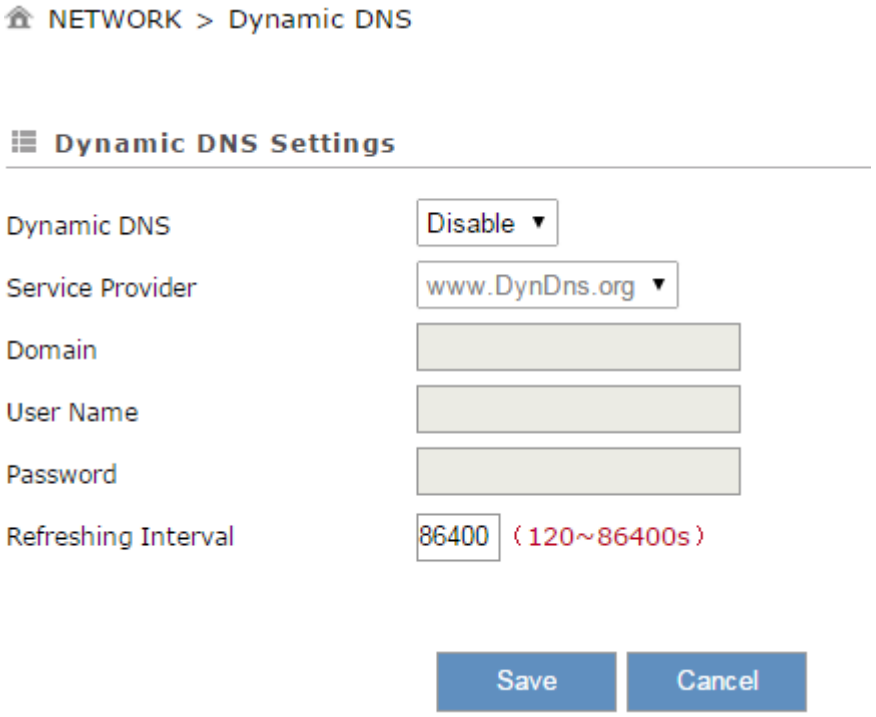


Description	Default

Description	Default
Rule Name	
Set up a name for your rule. The name shall be composed of letters, numbers and underline, starting with a letter or number. The maximum string length is 32 bytes.	N/A
Network Interface	
For a specific network destination address, select the network interface of the router for sending data package. Options are LAN and WAN.	WAN
Enabled	
Activate the static routing functionality.	Yes
Destination IP	
Set up a Destination IP address for your device.	N/A
Network Mask	
Set up the subnet mask corresponding to the destination network segment. If the final destination of the routing is a single host, please type in 255.255.255.255.	N/A
Gateway Address	
Set up the next-hop routing address.	N/A
Metric	
Set up the hops. The number of hops that are passed for reaching the destination address. One hop indicates passing one router passed. The range is 2~15.	2

3.2.9 Dynamic DNS

This page is used for setting up the Dynamic DNS Settings, including the Dynamic DNS, Service Provider, Domain User Name, Password, and the Refreshing Interval.



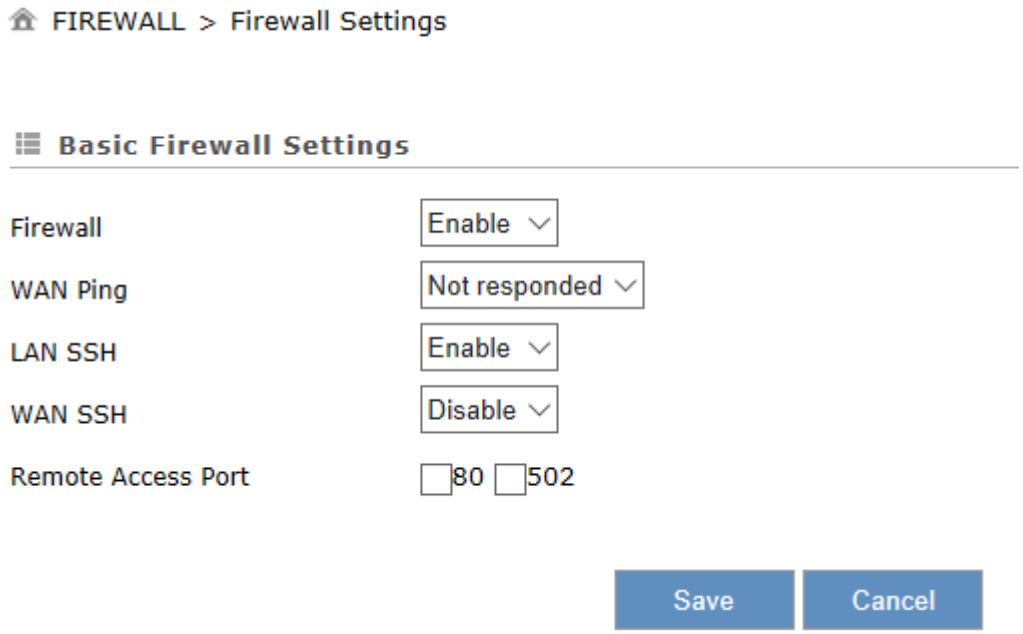
Description	Default
Dynamic DNS	
Dynamic Host Configuration Protocol allows you to obtain an IP address automatically from your router. You can enable or disable this functionality.	Disable
Service Provider	
Select the dynamic domain service provider. Options are www.DynDNS.org and www.NOIP.com	www.DynDns.org
Domain	
The domain applied for to the corresponding dynamic domain service provider.	N/A
User Name	
The name of the user registered at the corresponding dynamic domain service provider.	N/A
Password	
The corresponding password to the registered user.	N/A
Refreshing Interval	
Set up the time for the router to update its public network IP from the dynamic domain service provider. The value range is 120~86400 sec.	86400

3.3 Firewall

You can set up firewall configurations, including the Firewall Settings, DMZ Settings, Port Forward, Port Trigger, URL Filter, MAC Filter, and IP Filter.

3.3.1 Firewall Settings

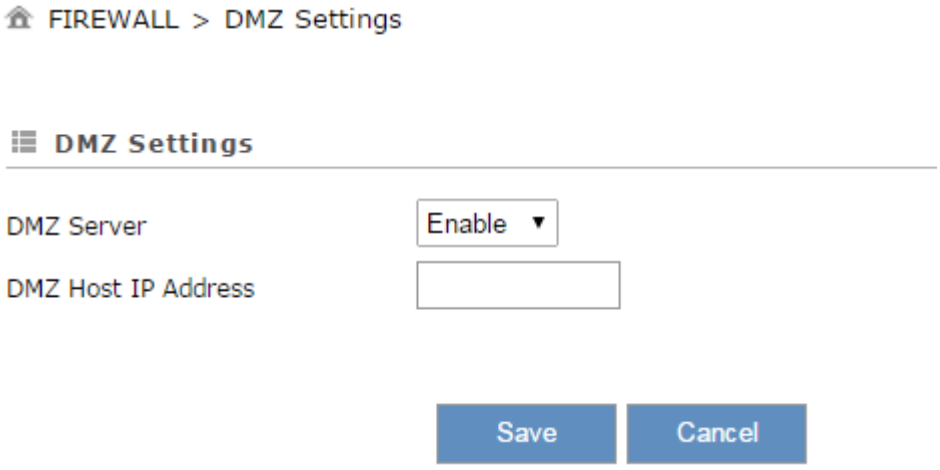
This page is used for setting up the basic firewall settings, including the SPI firewall switch, WAN Ping response, LAN SSH function and WAN SSH.



Description	Default
Firewall	
The SPI Firewall keeps track of the state of network connections travelling across it, protecting your Internet connection against Internet threats and Denial of Service (DoS).	Enable
WAN Ping	
It creates a filter that your router not to respond to Ping command and prevents other users on the internet from pinging your pc and gaining your IP address.	Not responded
LAN SSH	
Set up whether to allow LAN end to connect with the router via SSH.	Enable
WAN SSH	
Set up whether to allow WAN end to connect with the router via SSH.	Disable
Remote Access Port	
If checked, the user is allowed to access port 80 or port 502 through the IP of WAN, port 80 is for access the configuration page of the device. Port 502 is the port of Modbus TCP Server.	Uncheck

3.3.2 DMZ Settings

This page is used for setting up the DMZ server.



Description	Default
DMZ Server	
Demilitarized zone (DMZ) is a special segment of the local network reserved for servers accessible from the Internet, adding an additional layer of security.	Disable
DMZ Host IP Address	
Set up the IP address for the DMZ host.	N/A

3.3.3 Port Forward

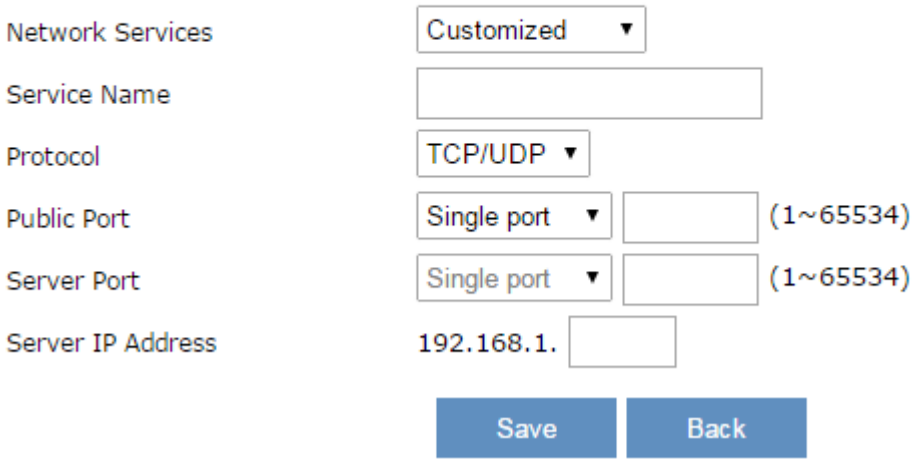
This page is used for setting up the port forward, including configuring the Network Services, Service Name, Protocol, Public Port, Server Port, and Server IP Address.

Click the "Add A Port Forward Rule" to add port forwarding entries to the router.

After clicking the "Add A Port Forward Rule", you will see the following page.

FIREWALL > Port Forward

Add A Portforward Rule



Description	Default
Network Services	
Select the common network services. Refer to the following common service list for optional values.	Customized
Service Name	
Set up the service name for port forwarding. The name is composed of letters, numbers and underline, starting with a letter or number. The maximum string length is 32 bytes.	N/A
Protocol	
Set up the protocol type for port forwarding.	TCP/UDP
Public Port	
Set up the public port for port forwarding. The port range is 1~65534. A Public port should be less than or equal to the server port.	Single Port
Server Port	
Set up the server port for port forwarding. The port range is 1~65534. A server port should be greater than or equal to the public port. When the public port is set to a Single Port, the server port can only be set to a Single Port. When the public port is set to a Port Range, the server port can be set to a Single Port or a Port Range. And when the public port is set to a single port, all the port will be forwarded to ONE single port. Examples of different port forwarding settings: 1:1 Public Port: Single Port 1001 (1~65534) Server Port: Single Port 80 (1~65534)	Single Port

Description	Default
N:1 Public Port: A Port Range ▾ 1001 - 1008 (1~65534) Server Port: Single Port ▾ 80 (1~65534) N:N Public Port: A Port Range ▾ 1001 - 1008 (1~65534) Server Port: A Port Range ▾ 1001 - 1008 (1~65534)	
Server IP Address	
Set up the server IP address that applies to the port mapping rule.	192.168.1.*

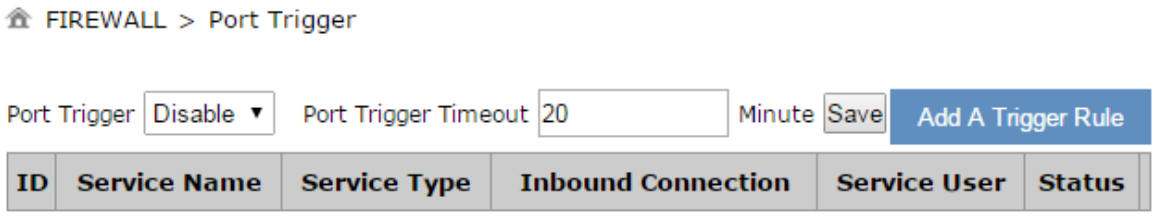
Common Service List for Port Forwarding			
Service name	**Protocol**	**Starting Port**	**Ending Port**
Customized	TCP, UDP, TCP/UDP	1~65534	1~65534
FTP	TCP	20	21
HTTP	TCP	80	80
ICUII	TCP	23566	23566
IP_PHONE	TCP	6670	6670
NetMeeting	TCP	1720	1720
News	TCP	119	119
PPTP	TCP/UDP	1723	1723
Telnet	TCP	23	23
QuakeII/III	TCP/UDP	27960	27960
Real-Audio	TCP	6970	7170

3.3.4 Port Trigger

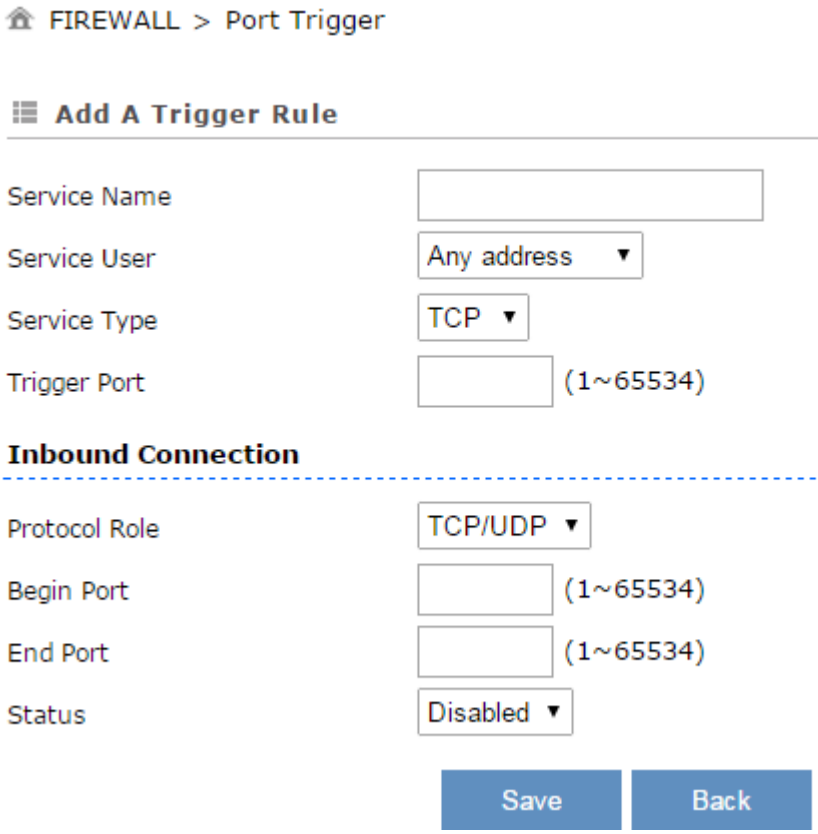
This page is used for setting up the port trigger, including configuring the Service Name, Service User, Service Type, Trigger Port, Protocol Role, Begin Port, End Port, and Status.

Port triggering is port forwarding with an on/off switch for the ports that have been forwarded. Have data flown out of a trigger port or not by enabling or disabling this functionality. Set up the time for the Port Trigger Timeout and click "Save" to save the setting.

Click the "Add A Trigger Rule" to add port trigger entries to the router.



After clicking the "Add A Trigger Rule", you will see the following page.



Description	Default
Service Name	
Set up the service name for port triggering. The name is composed of letters, numbers and underline, starting with a letter or number. The maximum string length is 32 bytes.	N/A
Service User	
Select the service user to apply the port triggering rule.	Any Address
Service Type	
Set up the protocol type for port triggering.	TCP

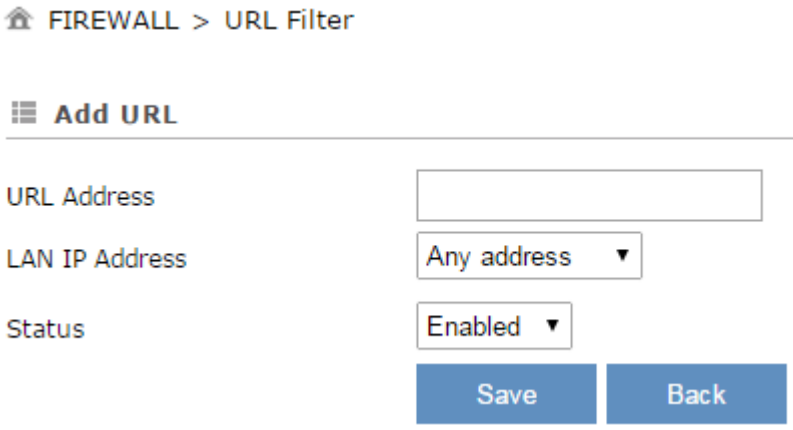
Description	Default
Triggering Port	
Set up the triggering port. The port range is 1~65534.	N/A
Protocol Role	
Set up the protocol type for the inbound connection.	TCP/UDP
Begin port	
Set up the starting port for the inbound connection. The port range is 1~65534.	N/A
End Port	
Set up the ending port for the inbound connection. The port range is 1~65534.	N/A
Status	
Enable/disable the port triggering functionality.	Disabled

3.3.5 URL Filter

This page is used for setting up the URL Filter, including configuring the URL Address, LAN IP Address and Status.

URL Filter is used to block particular website from the local network. Select Enable/Disable to activate/deactivate this functionality. Click the "Add An URL Address" to block the URL.

After clicking the "Add An URL Address", you will see the following page.



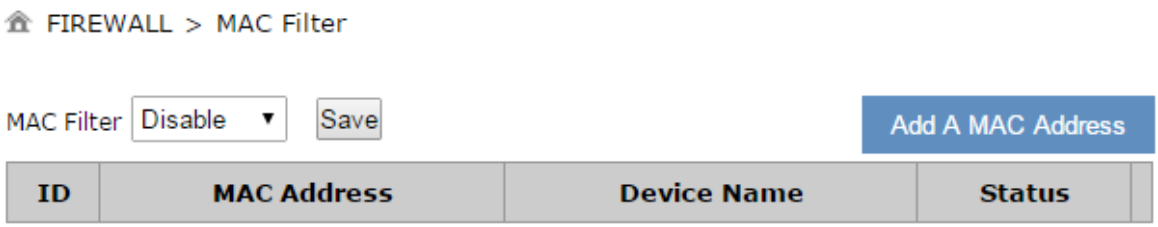
Description	Default
URL Address	
Manually input the URL address that you'd like to block, for example	N/A

Description	Default
www.baidu.com.	
LAN IP Address	
Set up the LAN IP address that you'd like to block. Options are "Any Address", "Single Address" and "Address Range".	Any Address
Status	
Enable/disable the URL Filter functionality.	Enabled

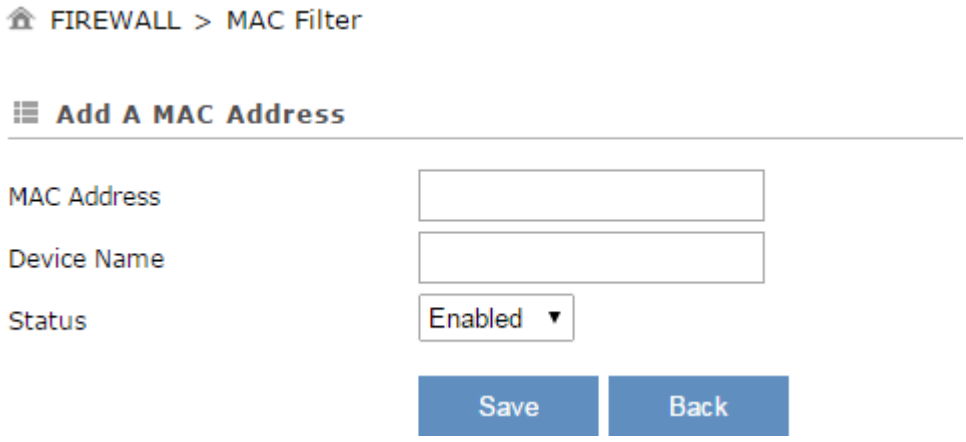
3.3.6 MAC Filter

This page is used for setting up the MAC Filter, including configuring the MAC Address, Device Name and Status.

MAC Filter is used to block particular MAC address from the local network. Select Enable/Disable to activate/deactivate this functionality. Click the "Add A MAC Address" to block the MAC Address.



After clicking the "Add A MAC Address", you will see the following page.

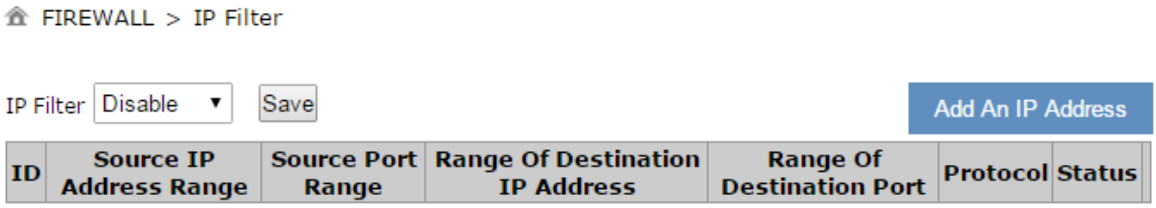


Description	Default
MAC Address	
Manually input the MAC address that you'd like to block.	N/A
Device Name	
Set up the device name corresponding to the set MAC address.	N/A
Status	
Enable/disable the MAC Filter functionality.	Enabled

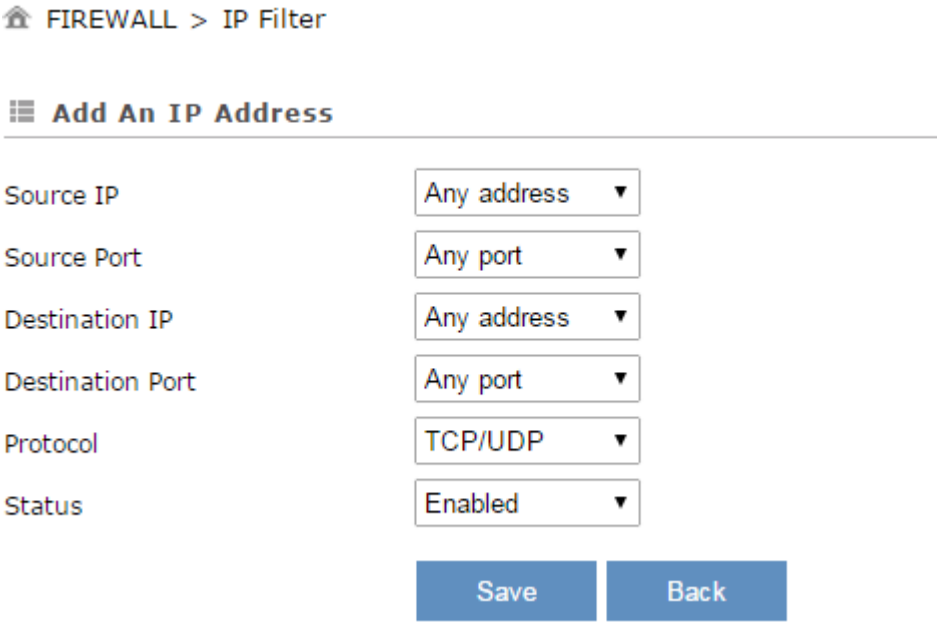
3.3.7 IP Filter

This page is used for setting up the IP Filter, including configuring the Source IP, Source Port, Destination IP, Destination Port, Protocol and Status.

IP Filter is used to block particular IP address from the local network. Select Enable/Disable to activate/deactivate this functionality. Click the "Add An IP Address" to block the IP Address.



After clicking the "Add An IP Address", you will see the following page.



Description	Default
Source IP	
Set up the source IP.	Any Address
Source Port	
Set up the source port where the datagram came from.	Any port
Destination IP	
Set up the destination IP.	Any Address
Destination Port	
Set up the destination port where the datagram is going to.	Any port
Protocol	
Set up the protocol type for the IP Filter.	TCP/UDP
Status	

Description	Default
Enable/disable the URL Filter functionality.	Enabled

3.4 Interface

You can set up the interface configurations, including the RS232, RS485, Modbus TCP, DI/DO and USB interface.

3.4.1 RS232

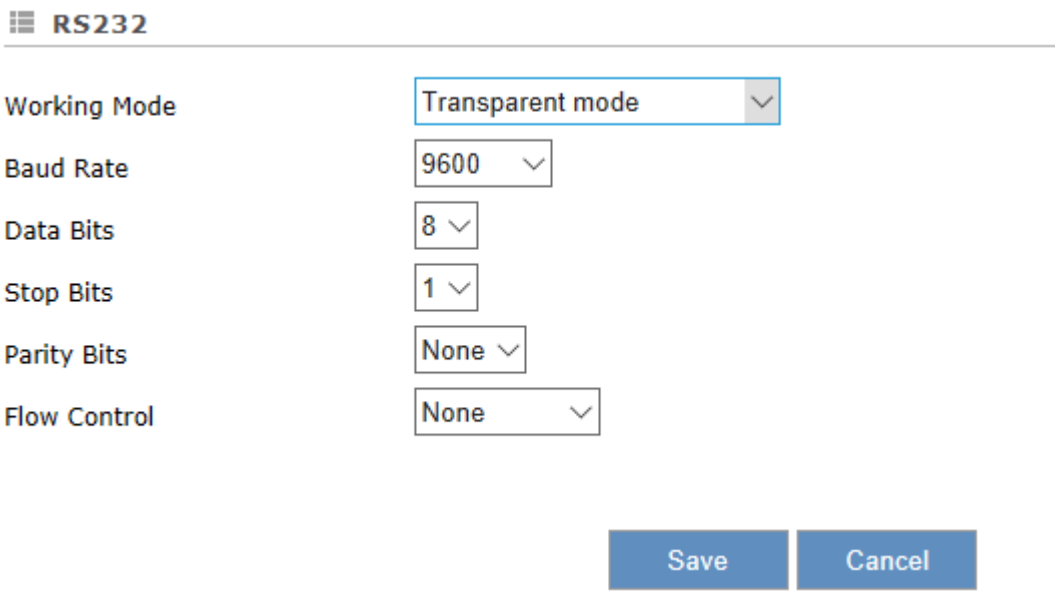
RS232 (Recommended Standard - 232) is a telecommunication standard for binary serial communications between devices. It supports seven work modes, include: Transparent mode, Slave mode, Master mode, Serial Server-TCP Server, Serial Server-TCP Client, Serial Server-UDP Client and MC Master mode.

You can set up the configurations for RS232, including Baud Rate, Data Bits, Stop Bits, Parity Bits and Flow Control.

Description	Default
Working Mode	
Select the working mode for the current active serial port.	Close
Baud Rate	
Set up the baud rate for the serial port. Options are 2400, 4800, 9600, 19200, 38400, 57600 and 115200.	9600
Data Bits	
Set up the data bits for the serial port. Options are 7 and 8. It must be set to 8 when communication mode is Modbus RTU.	8
Stop Bits	
Set up the stop bits for the serial port. Options are 1 and 2.	1
Parity Bits	
Set up the parity bits for the serial port. Options are None, Odd and Even.	None
Flow Control	
Set up the flow control. Options are None, XON, XOFF, RTS, and CTS.	None

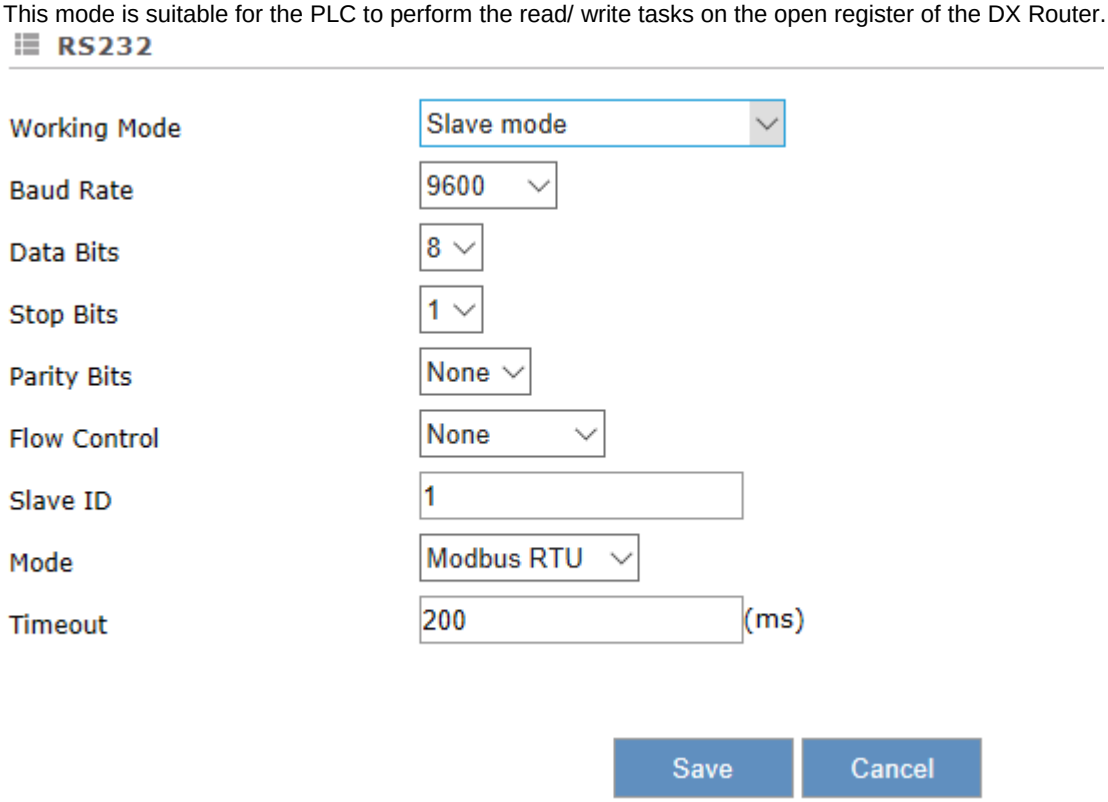
- **Transparent mode**

This mode is suitable for uploading and downloading data remotely via the serial port.



- **Slave mode**

This mode is suitable for the PLC to perform the read/ write tasks on the open register of the DX Router.

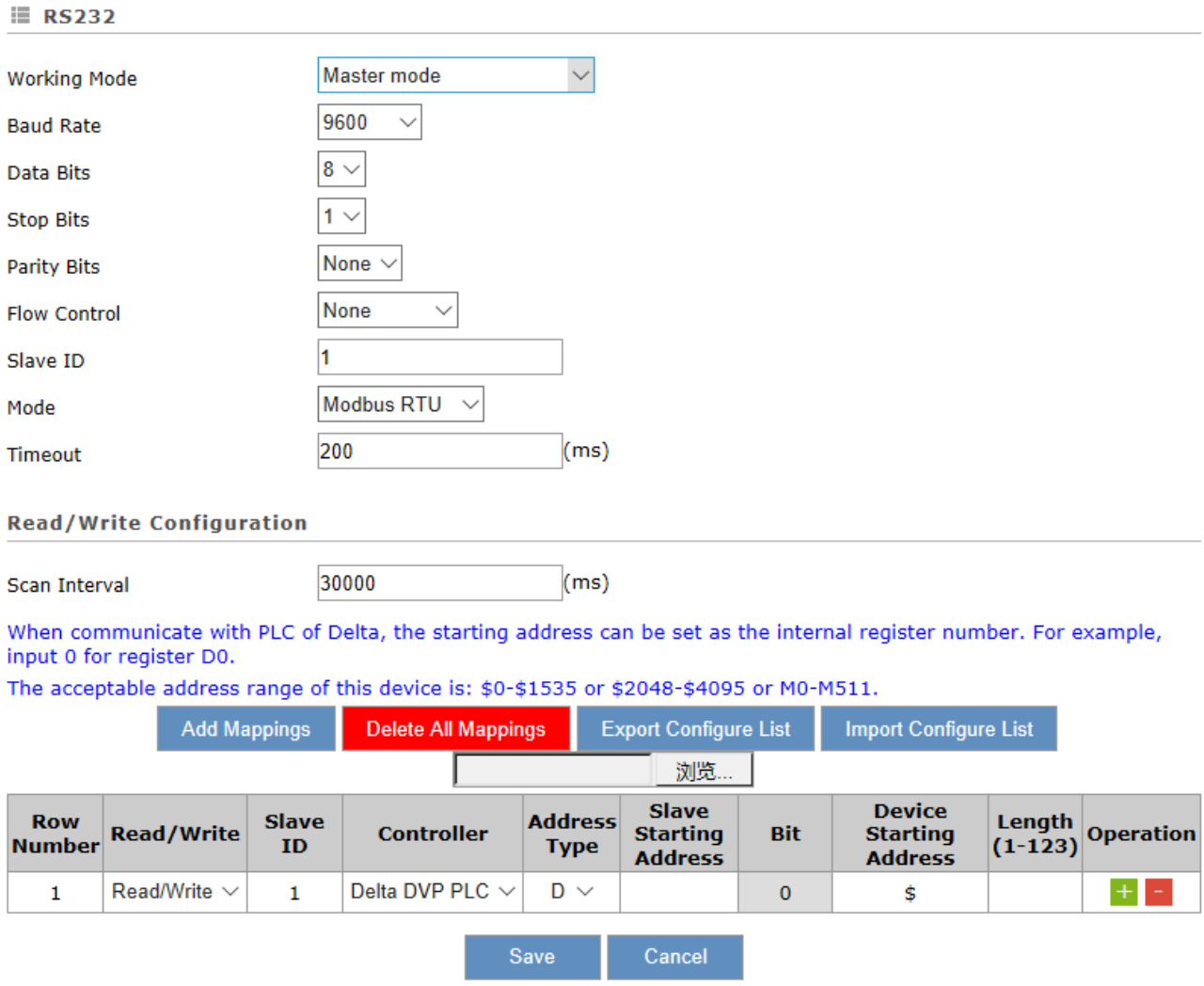


Description	Default
Slave ID	
Set up the MODBUS ID. The value is between 1 and 247.	1
Mode	
Set up the communication mode for the device. Device support Modbus RTU and Modbus ASCII	Modbus RTU

Description	Default
Timeout	
Set up the timeout timer from 200ms to 5000ms. If the set value is out of range, it will be automatically changed to its maximum or minimum value.	200ms

- **Master mode**

This mode is suitable for the DX router to perform the read/write tasks on the open register of the PLC.



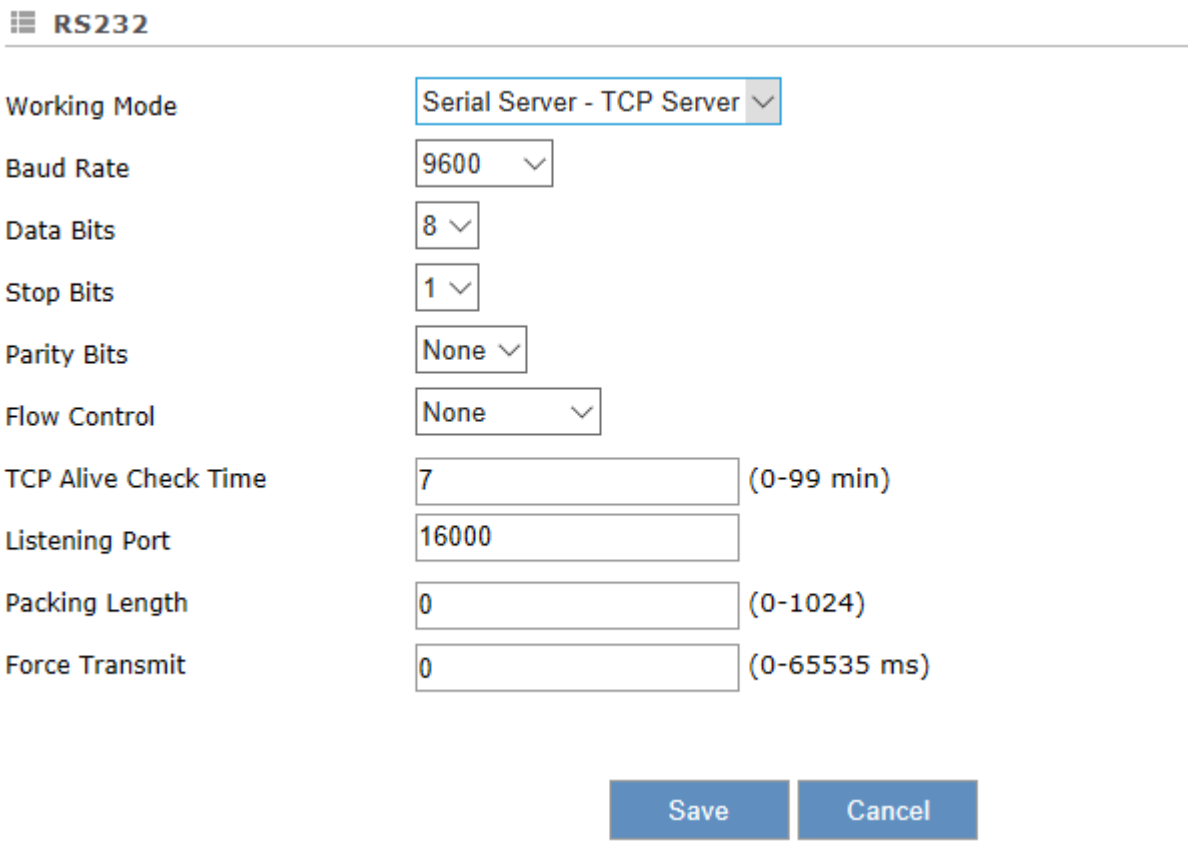
Description	Default
Slave ID	
Set up the MODBUS ID for DX router. Invalid in Master mode.	1
Mode	
Set up the communication mode for the device. Device support Modbus RTU	Modbus RTU

Description	Default
and Modbus ASCII.	
Timeout	
Set up the timeout timer from 200ms to 5000ms. If the set value is out of range, it will be automatically changed to its maximum or minimum value.	200ms
Scan Interval	
Set up the time for scan interval, ranging from 50ms to 60000ms.	30000ms
Add Mappings	
Click the button to add a new mapping;	N/A
Delete All Mappings	
Delete all mappings of RS-232 master mode	N/A
Export Configure List	
Export the configure list to the file and save to local PC	N/A
Import Configure List	
Open local file and import the configure list	N/A
Read/Write	
Set up the access permissions for the mapped register address; • **Read-only:** The device regular read data from appointed registers in the slave, but will not update the data to the slave • **Write-only:** The device updates the data to the slave when the registers values were changed, but will not read the data from the slave • **Read/write:** The device regular read data from appointed registers in the slave, will update the data to the slave when the registers values are changed.	Read/Write
Slave ID	
Set up the corresponding slave communication port. The value is between 1 and 247.	1
Controller	
In master mode, device types options are: • **Delta PLC:** Use this option for Delta DVP / AH / AS series PLCs • **Other:** Use this option for non-Delta PLCs. HEX means hexadecimal address; DEC means decimal address.	Delta DVP PLC
Address Type	
In master mode, it depending on the selected controller type change: • **Delta PLC:** The address type is D/M/S/X/Y; D for word type, M/S/X/Y for bit type • **Other:** The address type is 0x/1x/3x/4x/Swap: **-**0x: Read or write coil data (Modbus function code: 01/05) **-**1x: Read discrete inputs (Modbus function code: 02)	D

Description	Default
-3x: Read or write input registers (Modbus function code: 04) -4x: Read or write holding registers (Modbus function code: 03/16) -Swap: Read or write holding registers, transposition store to DX router's register in pairs	
Slave Starting Address (decimal)	
Set up the slave starting address for read/write the registers in a PLC. • **Delta PLC:** Enter the internal D register number. If you need to read / write D0, please enter 0 here. • **Other:** Enter the Hexadecimal or Decimal actual address. For example: Holding Register: 400100, take 0100 (decimal) that is 64 (hex).	N/A
Bit	
For X/Y type data of Delta AH/AS series, the address format is x1.x2, then x1 input to slave starting address column, x2 input to this column.	N/A
Device Starting Address (decimal)	
Set up the device starting address (decimal, input range is from $2048 to $4095 for word type data, input range is from M0 to M511 for bit type data). $ or M specifies that the match must start at the beginning of a Device Starting Address.	N/A
Length (1-123)	
Set up the number of the continuous address followed by the default mapped address will be read or write. Input range is from 1 to 64.	N/A
Operation	
Click the +/- button to add mapping or delete mapping.	N/A
Edit	
Click an item of register mapping forms that can be edited.	N/A

- **Serial Server-TCP Server**

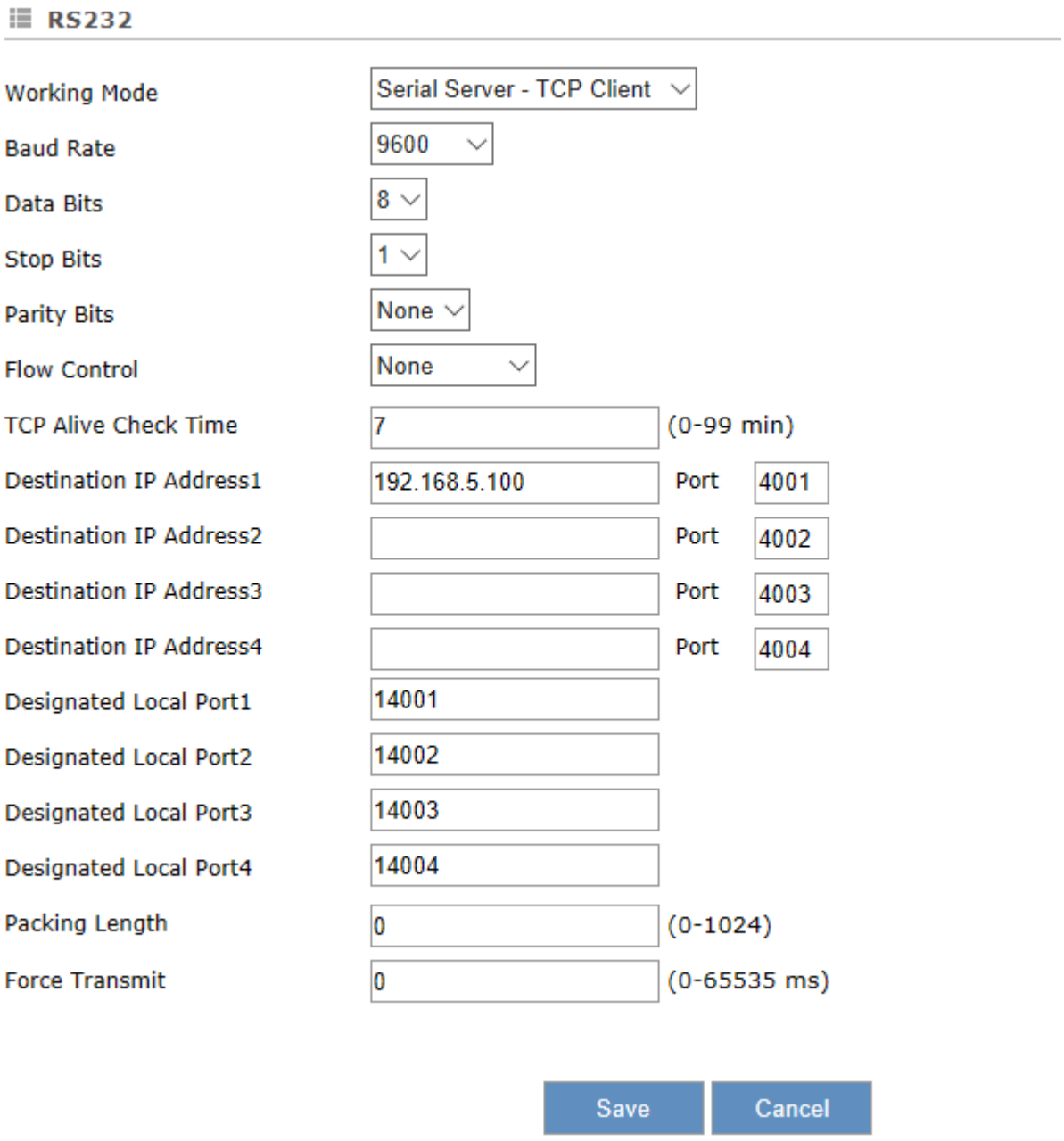
DX router act as a TCP Server, when received the packet from client, parse the packet and transmit to RS-232.



Description	Default
TCP Alive Check Time	
Setting how long TCP activity keep idle, then the TCP connection will be drop. Input range is from 0 to 99 minutes. 0 means will never drop it.	7
Listening Port	
Set up the listening port in server.	16000
Packing Length	
Setting the length of packet, packet will be transmitted when the size reaches the values. Input range is from 0 to 1024 byte. 0 means will transmit at once when received the data.	0
Force Transmit	
Setting how long the program waiting, then transmit the packet. Input range is from 0 to 65535 millisecond. 0 means will never force to transmit.	0

- **Serial Server-TCP Client**

DX router act as a TCP Client, packet RS-232 data and transmit to Server by TCP protocol.

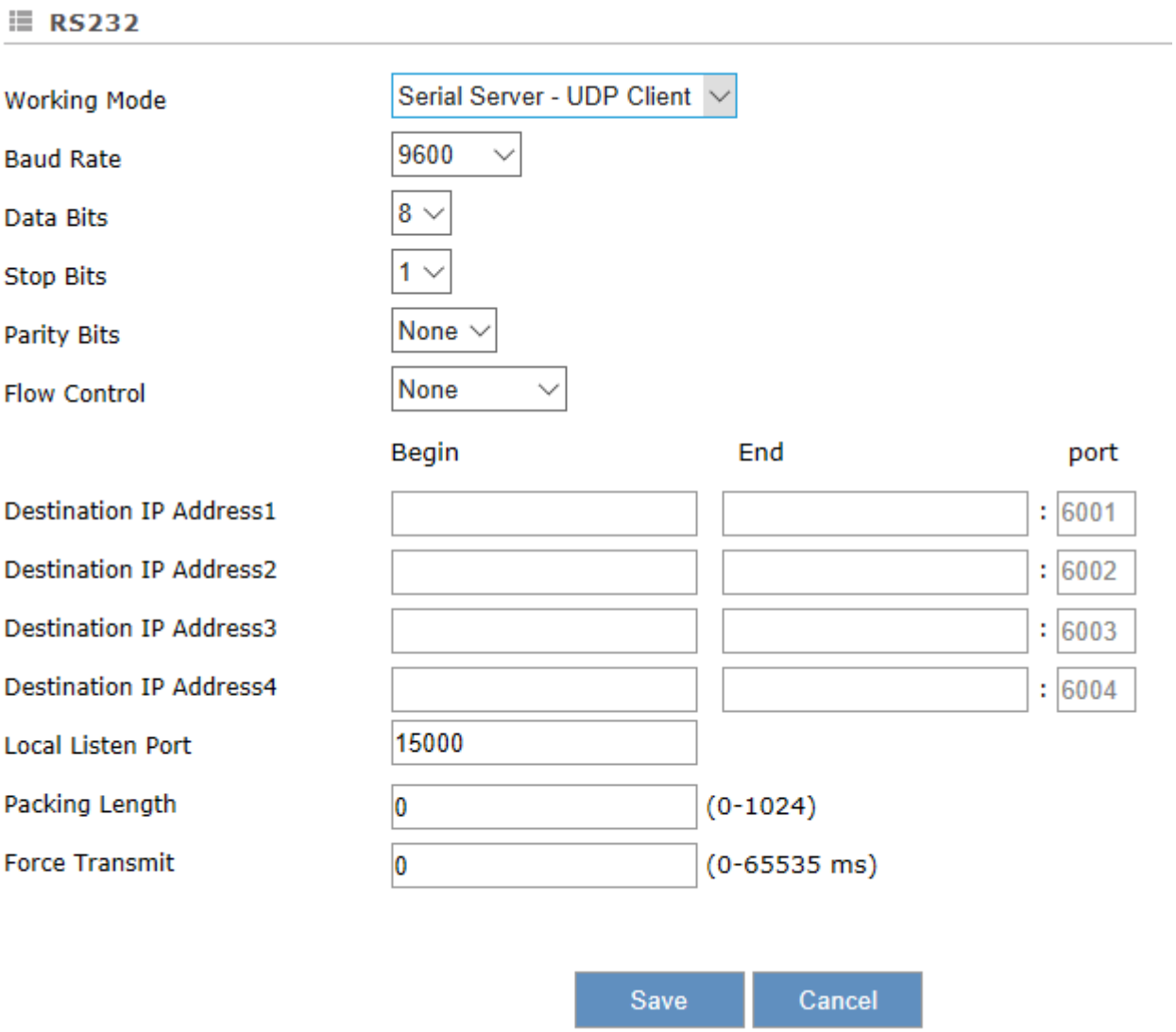


Description	Default
TCP Alive Check Time	
Setting how long TCP activity keep idle, then the TCP connection will be drop. Input range is from 0 to 99 minutes. 0 means will never drop it.	7
Destination IP address and Port	
Setting the serial Server IP address and listening port. You can set 4 different destination at most.	
Designated local port	
Set up the local port for transmission.	14001~14004
Packing Length	

Description	Default
Setting the length of packet, packet will be transmitted when the size reaches the values. Input range is from 0 to 1024 byte. 0 means will transmit at once when received the data.	0
Force Transmit	
Setting how long the program waiting, then transmit the packet. Input range is from 0 to 65535 millisecond. 0 means will never force to transmit.	0

- **Serial Server-UDP Client**

DX router act as a UDP Client, packet RS-232 data and transmit to Server by UDP protocol.

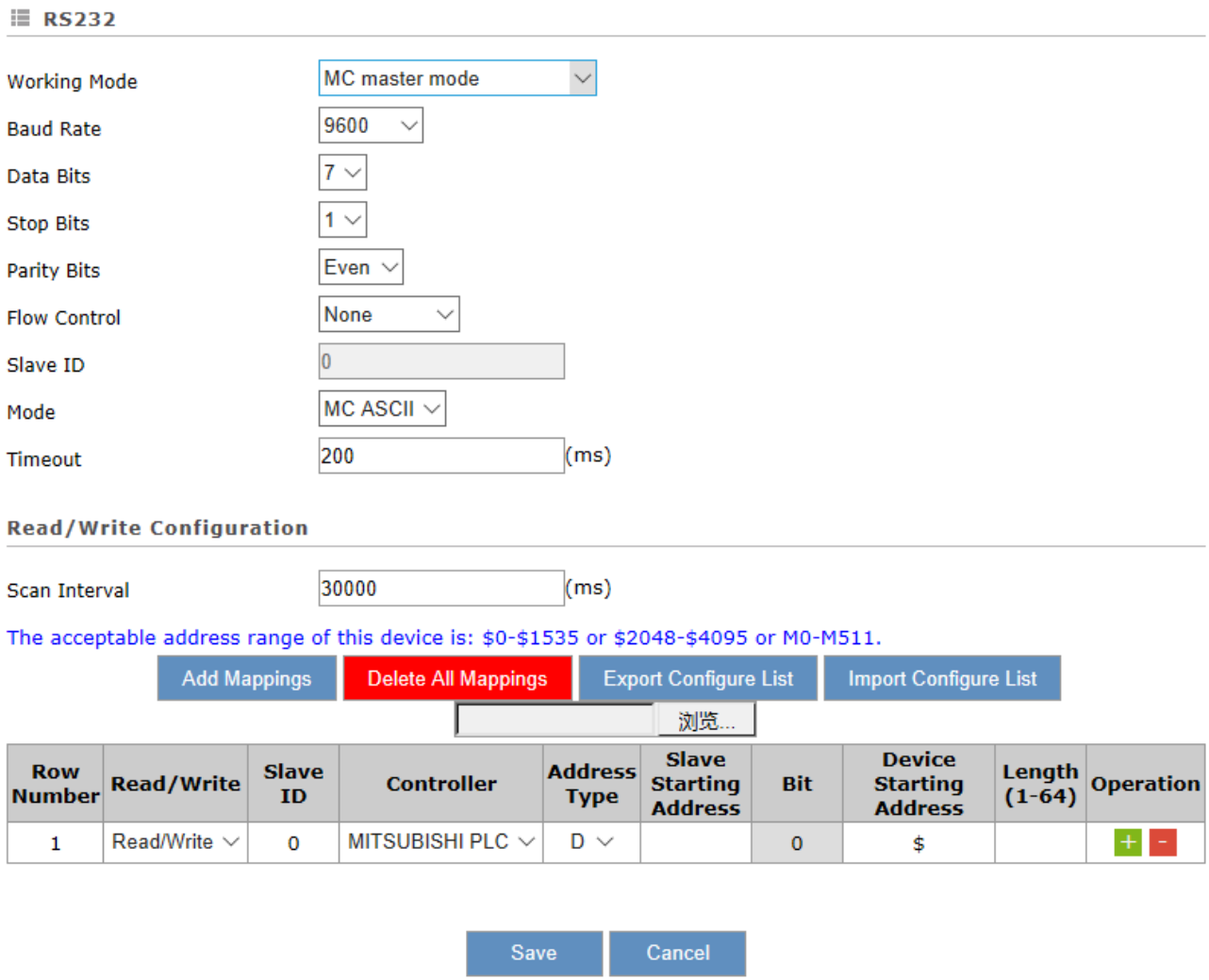


Description	Default
Destination IP address and Port	
Setting the serial Server IP address and listening port. You can set 4 groups destination at most. For each group, it allows 99 IP address max.	

Description	Default
Local listen port	
Set up the local port for transmission.	15000
Packing Length	
Setting the length of packet, packet will be transmitted when the size reaches the values. Input range is from 0 to 1024 byte. 0 means will transmit at once when received the data.	0
Force Transmit	
Setting how long the program waiting, then transmit the packet. Input range is from 0 to 65535 millisecond. 0 means will never force to transmit.	0

- **MC master mode**

This mode is suitable for the DX router to perform the read/write tasks on the open register of the MITSUBISHI FX series PLC via serial port.



Description	Default
Slave ID	
Set up the MODBUS ID for DX router. Invalid in MC Master mode.	0
Mode	
It's fixed to "MC ASCII" in MC master mode.	Modbus RTU
Timeout	
Set up the timeout timer from 200ms to 5000ms. If the set value is out of range, it will be automatically changed to its maximum or minimum value.	200ms
Scan Interval	
Set up the time for scan interval, ranging from 50ms to 60000ms.	30000ms
Add Mappings	
Click the button to add a new mapping;	N/A
Delete All Mappings	
Delete all mappings of RS-232 MC master mode	N/A
Export Configure List	
Export the configure list to the file and save to local PC	N/A
Import Configure List	
Open local file and import the configure list	N/A
Read/Write	
Set up the access permissions for the mapped register address; • **Read-only:** The device regular read data from appointed registers in the slave, but will not update the data to the slave • **Write-only:** The device updates the data to the slave when the registers values were changed, but will not read the data from the slave • **Read/write:** The device regular read data from appointed registers in the slave, will update the data to the slave when the registers values are changed.	Read/Write
Slave ID	
It's fixed to 0 in MC master mode.	0
Controller	
It's fixed to "MITSUBISHI PLC" in MC master mode.	Delta DVP PLC
Address Type	
The address type is D/M/X/Y; D for word type, M/X/Y for bit type	D
Slave Starting Address (decimal)	
Set up the slave starting address for read/write the registers in MITSUBISHI PLC.	N/A
Bit	

Description	Default
It's invalid in MC master mode.	
Device Starting Address (decimal)	
Set up the device starting address (decimal, input range is from $2048 to $4095 for word type data, input range is from M0 to M511 for bit type data). $ or M specifies that the match must start at the beginning of a Device Starting Address.	N/A
Length	
Set up the number of the continuous address followed by the default mapped address will be read or write. Input range is from 1 to 64.	N/A
Operation	
Click the +/- button to add mapping or delete mapping.	N/A
Edit	
Click an item of register mapping forms that can be edited.	N/A

3.4.2 RS485

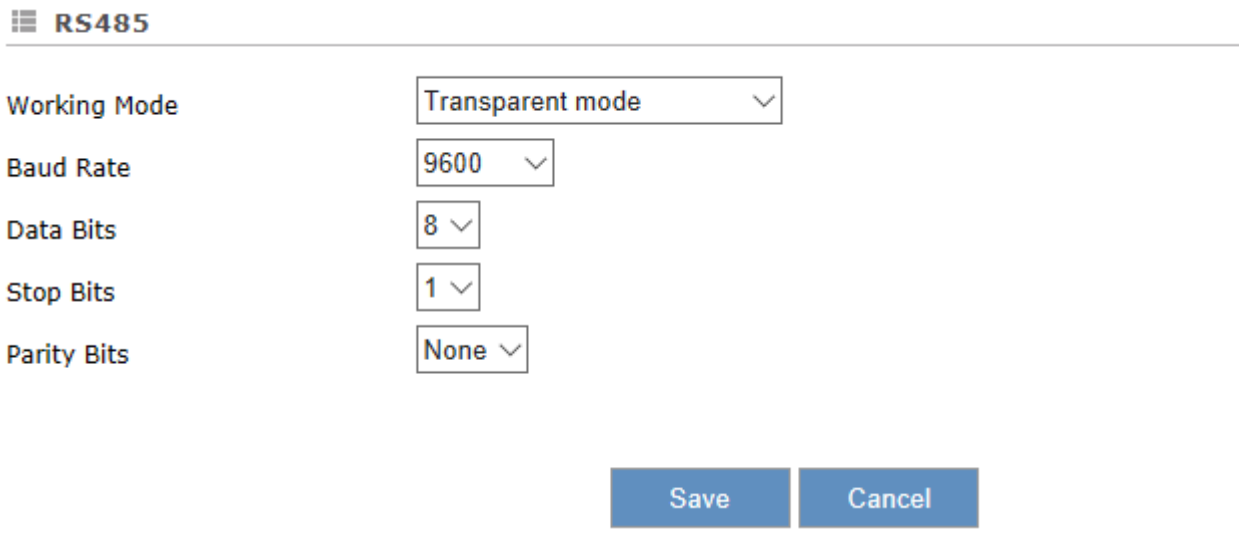
RS-485 (Recommended Standard - 485) is a telecommunication standard for binary serial communications between devices. It supports six work modes, include: Transparent mode, Slave mode, Master mode, Serial Server-TCP Server, Serial Server-TCP Client and Serial Server-UDP Client.

You can set up the configurations for RS-485, including Baud Rate, Data Bits, Stop Bits, Parity Bits, and many more.

Description	Default
Working Mode	
Select the working mode for the current active serial port.	Close
Baud Rate	
Set up the baud rate for the serial port. Options are 2400, 4800, 9600, 19200, 38400, 57600 and 115200.	9600
Data Bits	
Set up the data bits for the serial port. Options are 7 and 8. It must be set to 8 when communication mode is Modbus RTU.	8
Stop Bits	
Set up the stop bits for the serial port. Options are 1 and 2.	1
Parity Bits	
Set up the parity bits for the serial port. Options are None, Odd and Even.	None

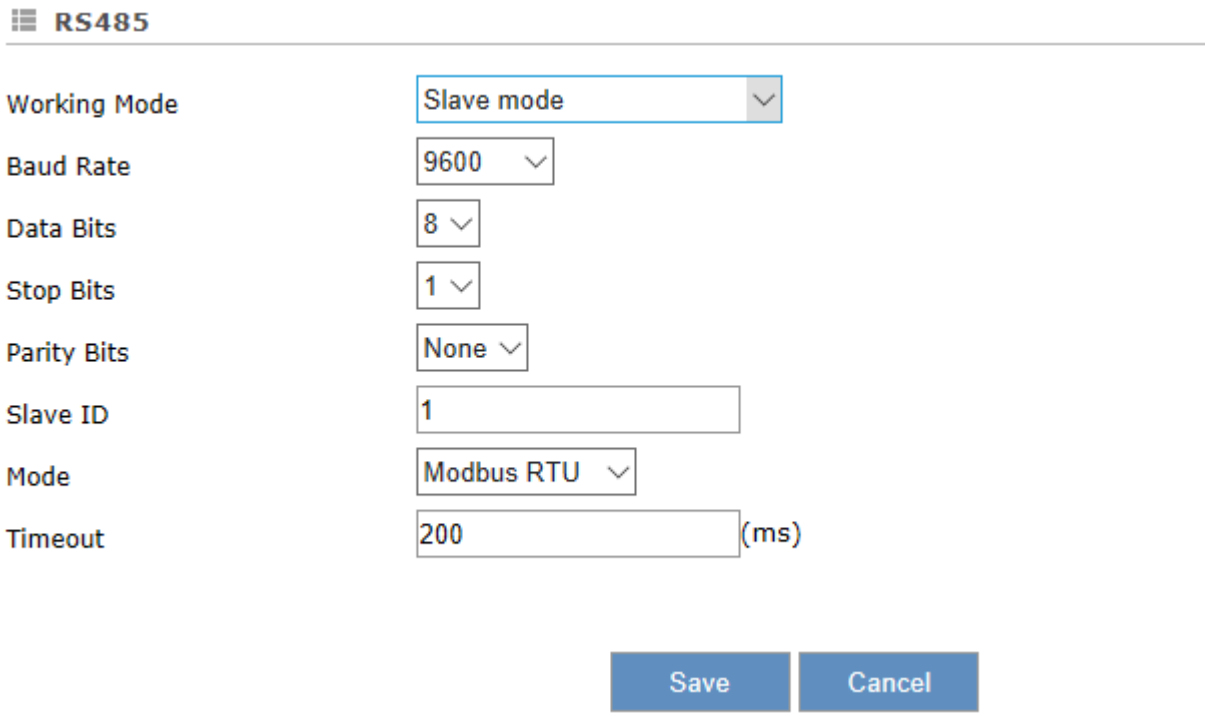
- **Transparent mode**

This mode is suitable for uploading and downloading data remotely via the serial port.



- **Slave mode**

This mode is suitable for the PLC to perform the read/ write tasks on the open register of the DX Router.

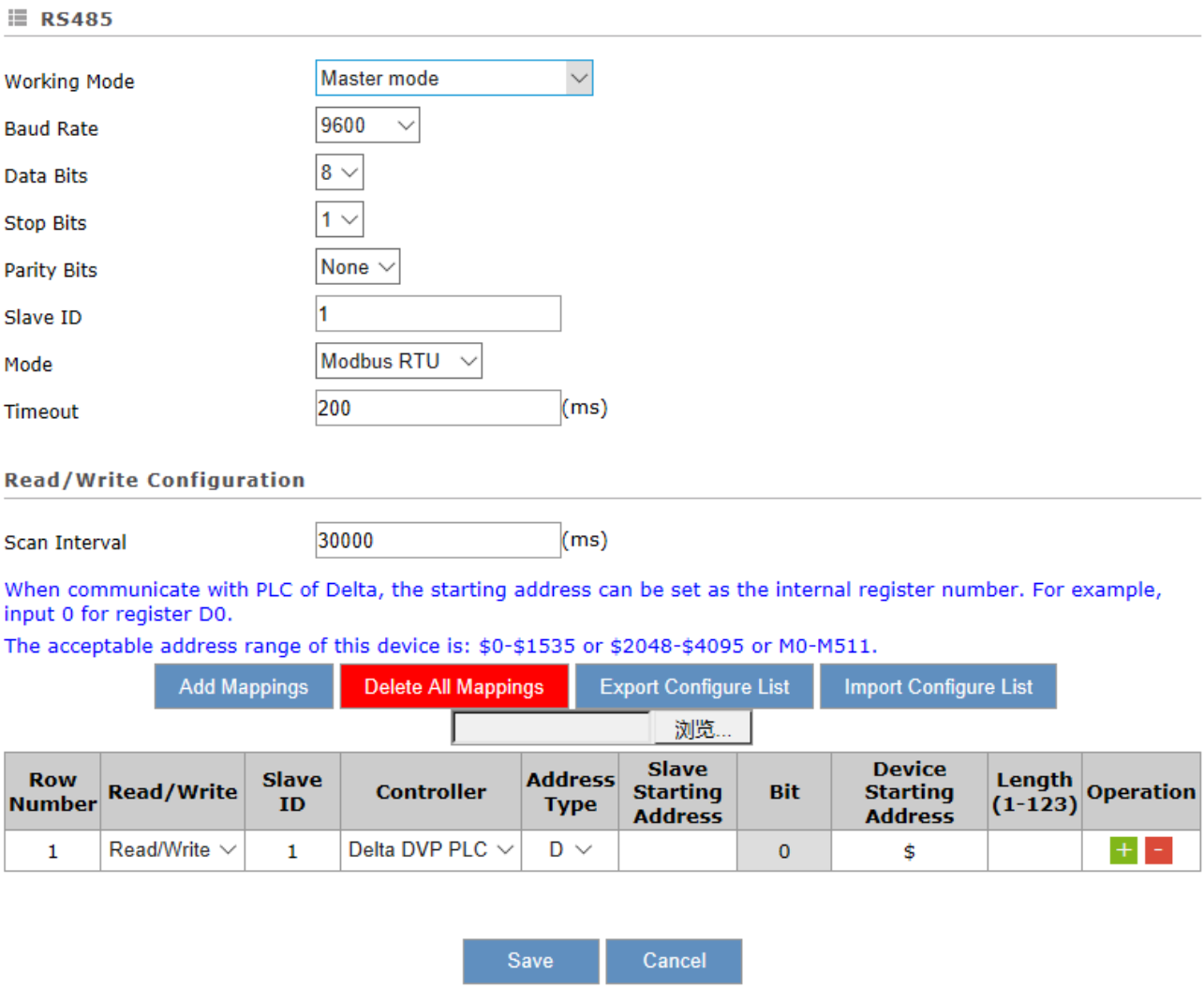


Description	Default
Slave ID	
Set up the MODBUS ID. The value is between 1 and 247.	1
Mode	
Set up the communication mode for the device. Device support Modbus RTU and Modbus ASCII	Modbus RTU
Timeout	

Description	Default
Set up the timeout timer from 200ms to 5000ms. If the set value is out of range, it will be automatically changed to its maximum or minimum value.	200ms

- **Master mode**

This mode is suitable for the DX router to perform the read/write tasks on the open register of the PLC.



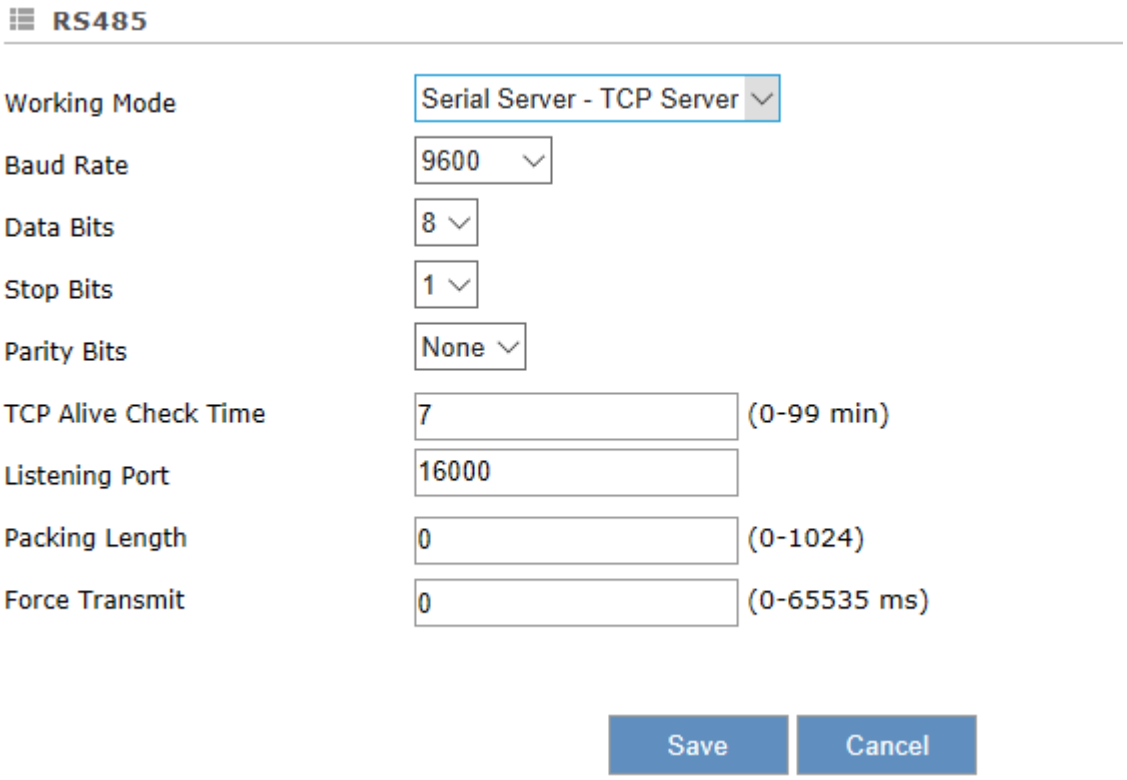
Description	Default
Slave ID	
Set up the MODBUS ID for DX router. Invalid in Master mode.	1
Mode	
Set up the communication mode for the device. Device support Modbus RTU and Modbus ASCII.	Modbus RTU
Timeout	
Set up the timeout timer from 200ms to 5000ms. If the set value is out of range, it will be automatically changed to its maximum or minimum value.	200ms

Description	Default
Scan Interval	
Set up the time for scan interval, ranging from 50ms to 60000ms.	30000ms
Add Mappings	
Click the button to add a new mapping;	N/A
Delete All Mappings	
Delete all mappings of RS-485 master mode	N/A
Export Configure List	
Export the configure list to the file and save to local PC	N/A
Import Configure List	
Open local file and import the configure list	N/A
Read/Write	
Set up the access permissions for the mapped register address; • **Read-only:** The device regular read data from appointed registers in the slave, but will not update the data to the slave • **Write-only:** The device updates the data to the slave when the registers values were changed, but will not read the data from the slave • **Read/write:** The device regular read data from appointed registers in the slave, will update the data to the slave when the registers values are changed.	Read/Write
Slave ID	
Set up the corresponding slave communication port. The value is between 1 and 247.	1
Controller	
In master mode, device types options are: • **Delta PLC:** Use this option for Delta DVP / AH / AS series PLCs • **Other:** Use this option for non-Delta PLCs. HEX means hexadecimal address; DEC means decimal address.	Delta DVP PLC
Address Type	
In master mode, it depending on the selected controller type change: • **Delta PLC:** The address type is D/M/S/X/Y; D for word type, M/S/X/Y for bit type • **Other:** The address type is 0x/1x/3x/4x/Swap: -0x: Read or write coil data (Modbus function code: 01/05) -1x: Read discrete inputs (Modbus function code: 02) -3x: Read or write input registers (Modbus function code: 04) -4x: Read or write holding registers (Modbus function code: 03/16) -Swap: Read or write holding registers, transposition store to DX router's register in pairs	D

Description	Default
Slave Starting Address (decimal)	
Set up the slave starting address for read/write the registers in a PLC. • **Delta PLC:** Enter the internal D register number. If you need to read / write D0, please enter 0 here. • **Other:** Enter the Hexadecimal or Decimal actual address. For example: Holding Register: 400100, take 0100 (decimal) that is 64 (hex).	N/A
Bit	
For X/Y type data of Delta AH/AS series, the address format is x1.x2, then x1 input to slave starting address column, x2 input to this column.	
Device Starting Address (decimal)	
Set up the device starting address (decimal, input range is from $2048 to $4095 for word type data, input range is from M0 to M511 for bit type data). $ or M specifies that the match must start at the beginning of a Device Starting Address.	N/A
Length (1-123)	
Set up the number of the continuous address followed by the default mapped address will be read or write. Input range is from 1 to 64.	N/A
Operation	
Click the +/- button to add mapping or delete mapping.	N/A
Edit	
Click an item of register mapping forms that can be edited.	N/A

- **Serial Server-TCP Server**

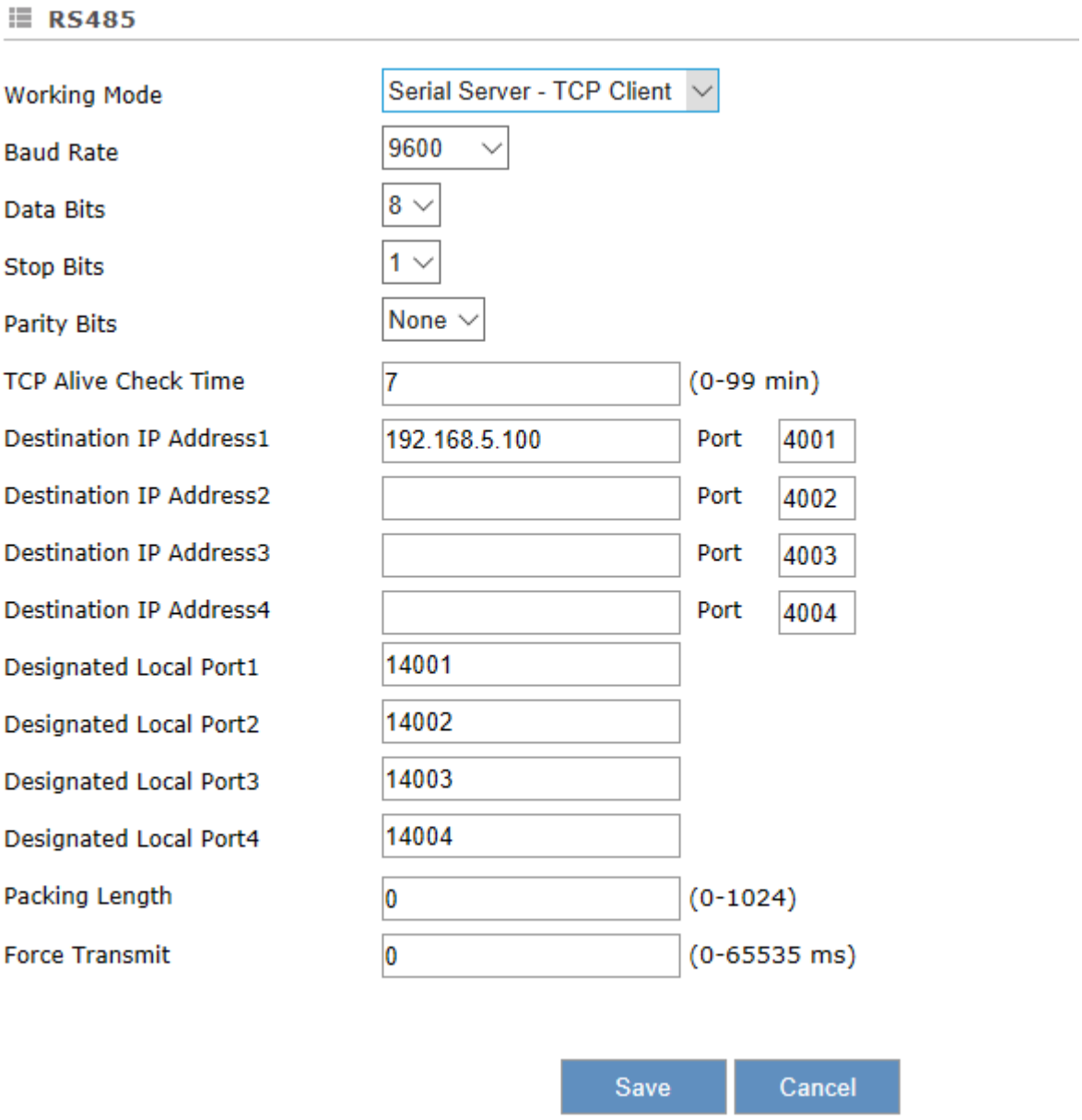
DX router act as a TCP Server, when received the packet from client, parse the packet and transmit to RS-485.



Description	Default
TCP Alive Check Time	
Setting how long TCP activity keep idle, then the TCP connection will be drop. Input range is from 0 to 99 minutes. 0 means will never drop it.	7
Listening Port	
Set up the listening port in server.	16000
Packing Length	
Setting the length of packet, packet will be transmitted when the size reaches the values. Input range is from 0 to 1024 byte. 0 means will transmit at once when received the data.	0
Force Transmit	
Setting how long the program waiting, then transmit the packet. Input range is from 0 to 65535 millisecond. 0 means will never force to transmit.	0

- **Serial Server-TCP Client**

DX router act as a TCP Client, packet RS-485 data and transmit to Server by TCP protocol.

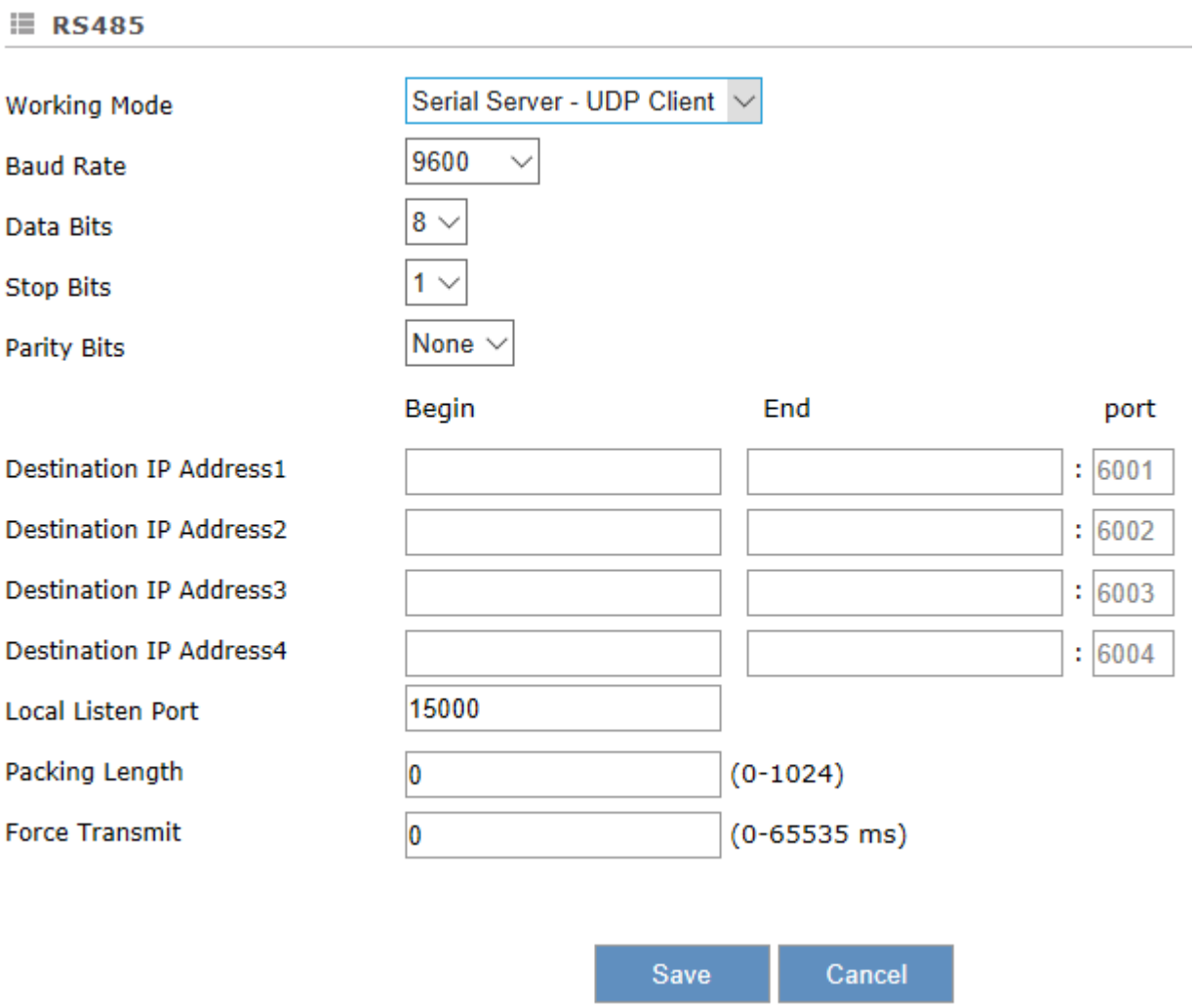


Description	Default
TCP Alive Check Time	
Setting how long TCP activity keep idle, then the TCP connection will be drop. Input range is from 0 to 99 minutes. 0 means will never drop it.	7
Destination IP address and Port	
Setting the serial Server IP address and listening port. You can set 4 different destination at most.	
Designated local port	
Set up the local port for transmission.	14001~14004
Packing Length	
Setting the length of packet, packet will be transmitted when the size reaches	0

Description	Default
the values. Input range is from 0 to 1024 byte. 0 means will transmit at once when received the data.	
Force Transmit	
Setting how long the program waiting, then transmit the packet. Input range is from 0 to 65535 millisecond. 0 means will never force to transmit.	0

- **Serial Server-UDP Client**

DX router act as a UDP Client, packet RS-485 data and transmit to Server by UDP protocol.



Description	Default
Destination IP address and Port	
Setting the serial Server IP address and listening port. You can set 4 groups destination at most. For each group, it allows 99 IP address max.	
Local listen port	
Set up the local port for transmission.	15000

Description	Default
Packing Length	
Setting the length of packet, packet will be transmitted when the size reaches the values. Input range is from 0 to 1024 byte. 0 means will transmit at once when received the data.	0
Force Transmit	
Setting how long the program waiting, then transmit the packet. Input range is from 0 to 65535 millisecond. 0 means will never force to transmit.	0

3.4.3 Modbus TCP

This page allows users to set whether to enable Modbus TCP client mode and set relevant parameters.

SYSTEM > Modbus TCP

Modbus TCP

Working Mode: Modbus TCP Server+Client | Confirm

*32 modbus TCP servers supported at most | Add Server

Row Number	Server IP	Server Port	Response Timeout(ms)	Scan Interval(ms)	Operation

Click "Add Server", it will show below page.

Modbus TCP Client Setting

Server IP:

Server Port: 502

Response Timeout: 300 (ms)

Read/Write Configuration

Scan Interval: 30000 (ms)

When communicate with PLC of Delta, the starting address can be set as the internal register number. For example, input 0 for register D0.

The acceptable address range of this device is: $0-$1535 or $2048-$4095 or M0-M511.

Make sure that the server already exists before importing, otherwise the importing is invalid and it will return to the original state.

Add Mappings | Delete All Mappings | Export Configure List | Import Configure List

浏览...

Row Number	Read/Write	Slave ID	Controller	Address Type	Slave Starting Address	Bit	Device Starting Address	Length (1-123)	Operation
1	Read/Write	1	Delta DVP PLC	D		0	$		+ -

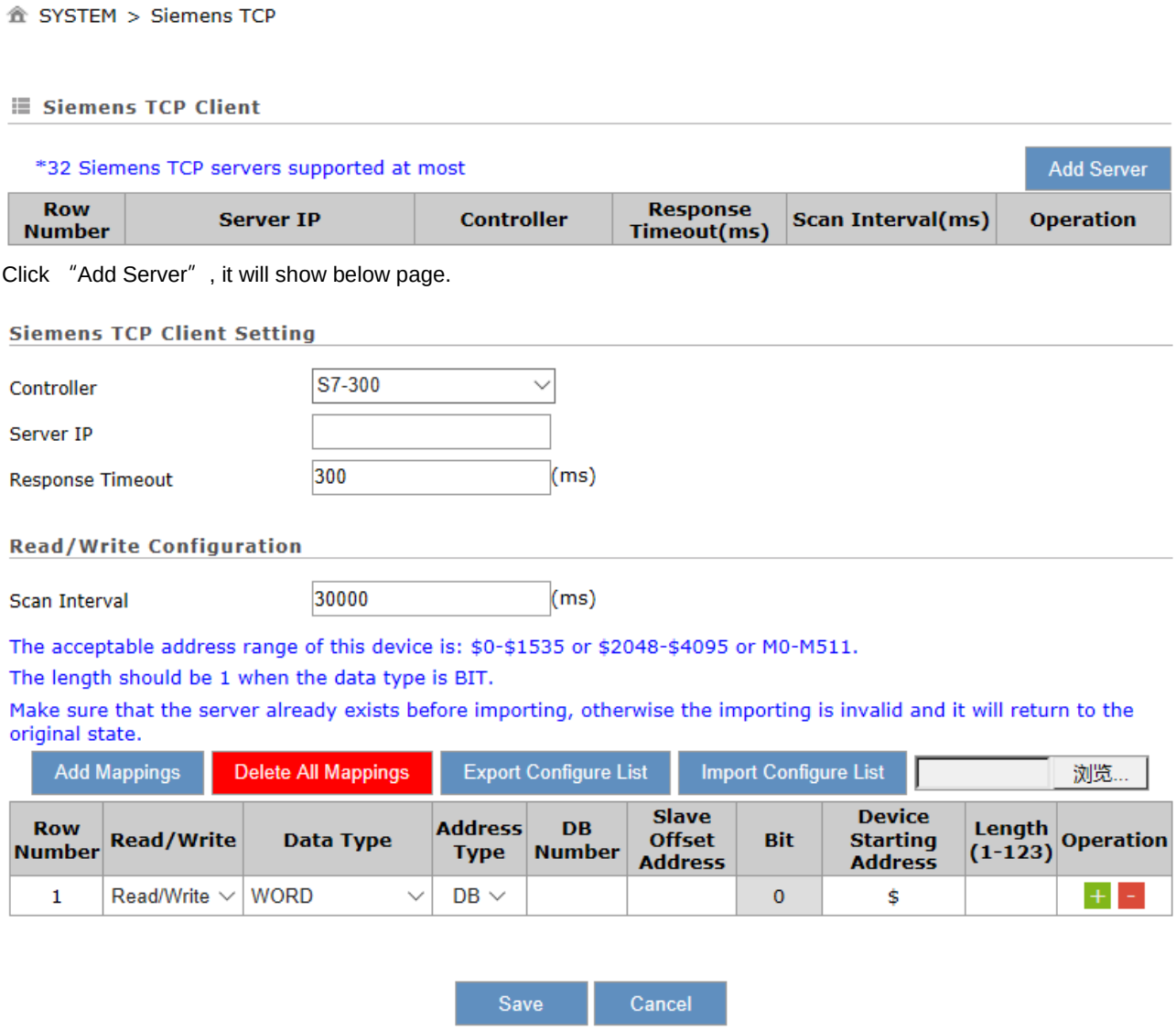
Save | Cancel

Description	Default
Working Mode	
• **Modbus TCP Server:** Only Modbus TCP server works. And supports up to 32 Client to connect. • **Modbus TCP Server+Client:** Modbus TCP server + Modbus TCP client work at the same time. MODBUS TCP Client supports to connect to 32 different servers at most.	Modbus TCP Server
Server IP	
Set up the IP address of a PLC in the Modbus TCP Client mode	N/A
Server Port	
Set up the server port of a PLC in the Modbus TCP Client mode	502
Response Timeout	
Set up the timeout timer from 50ms to 10000ms. If the set value is out of range, it will be automatically changed to its maximum or minimum value. The default is 300ms.	300
Scan Interval	
Set up the time for scan interval, ranging from 50ms to 60000ms; the default is 3000ms.	30000
Add Mappings	
Click the button to add a new mapping;	N/A
Delete All Mappings	
Delete all mappings of this server	N/A
Export Configure List	
Export the configure list to the file and save to local PC	N/A
Import Configure List	
Open local file and import the configure list	N/A
Read/Write	
Set up the access permissions for the mapped register address; • **Read-only:** The device regular read data from appointed registers in the slave, but will not update the data to the slave • **Write-only:** The device updates the data to the slave when the registers values were changed, but will not read the data from the slave • **Read/write:** The device regular read data from appointed registers in the slave, will update the data to the slave when the registers values are changed.	Read/Write
Slave ID	
Set up the corresponding slave communication port. The value is between 1 and 247.	1

Description	Default
Controller	
In master mode, device types options are: • **Delta PLC:** Use this option for Delta DVP / AH / AS series PLCs • **Other:** Use this option for non-Delta PLCs. HEX means hexadecimal address; DEC means decimal address.	Delta DVP PLC
Address Type	
In master mode, it depending on the selected controller type change: • **Delta PLC:** The address type is D/M/S/X/Y; D for word type, M/S/X/Y for bit type • **Other:** The address type is 0x/1x/3x/4x/Swap: -0x: Read or write coil data (Modbus function code: 01/05) -1x: Read discrete inputs (Modbus function code: 02) -3x: Read or write input registers (Modbus function code: 04) -4x: Read or write holding registers (Modbus function code: 03/16) -Swap: Read or write holding registers, transposition store to DX router's register in pairs	D
Slave Starting Address (decimal)	
Set up the slave starting address for read/write the registers in a PLC. • **Delta PLC:** Enter the internal D register number. If you need to read / write D0, please enter 0 here. • **Other:** Enter the Hexadecimal or Decimal actual address. For example: Holding Register: 400100, take 0100 (decimal) that is 64 (hex).	N/A
Bit	
For X/Y type data of Delta AH/AS series, the address format is x1.x2, then x1 input to slave starting address column, x2 input to this column.	
Device Starting Address (decimal)	
Set up the device starting address (decimal, input range is from $2048 to $4095 for word type data, input range is from M0 to M511 for bit type data). $ or M specifies that the match must start at the beginning of a Device Starting Address.	N/A
Length (1-123)	
Set up the number of the continuous address followed by the default mapped address will be read or write. Input range is from 1 to 64.	N/A
Operation	
Click the +/- button to add mapping or delete mapping.	N/A
Edit	
Click an item of register mapping forms that can be edited.	N/A

3.4.4 Siemens TCP

This page allows users to set DX router act as Siemens TCP client and set relevant parameters.



Click "Add Server", it will show below page.

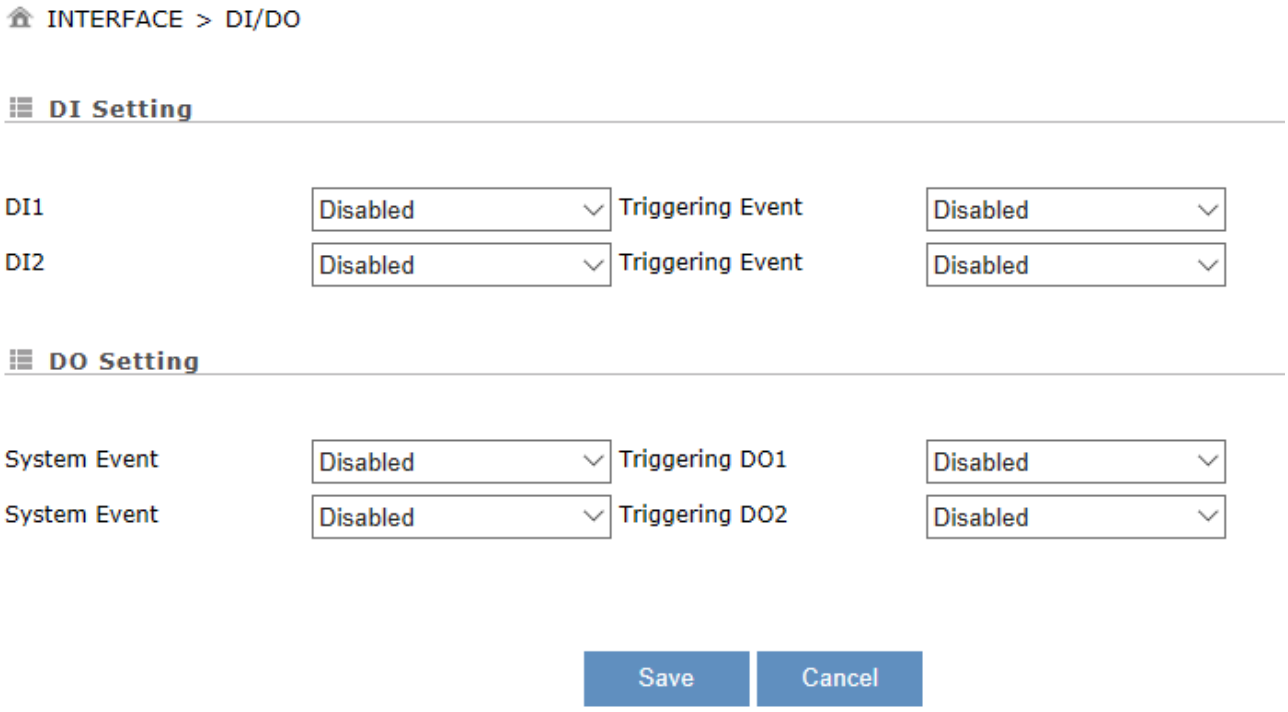
Description	Default
Add Server	
Set up the Siemens TCP server info. Supports to connect to 32 different servers at most.	Modbus TCP Server
Controller	
Set up the device type of the Siemens PLC.	S7-300
Server IP	
Set up the IP address of the Siemens PLC.	N/A
Local TSAP	
Set up local TSAP ID when controller is "S7-200 ISO TCP" or "S7-1200/1500 ISO TCP"	

Description	Default
Remote TSAP	
Set up destination TSAP ID when controller is "S7-200 ISO TCP" or "S7-1200/1500 ISO TCP"	
Response Timeout	
Set up the timeout timer from 50ms to 10000ms. If the set value is out of range, it will be automatically changed to its maximum or minimum value. The default is 300ms.	300
Scan Interval	
Set up the time for scan interval, ranging from 50ms to 60000ms.	30000
Add Mappings	
Click the button to add a new mapping;	N/A
Delete All Mappings	
Delete all mappings of this server	N/A
Export Configure List	
Export the configure list to the file and save to local PC	N/A
Import Configure List	
Open local file and import the configure list	N/A
Read/Write	
Set up the access permissions for the mapped register address; • **Read-only:** The device regular read data from appointed registers in the slave, but will not update the data to the slave • **Write-only:** The device updates the data to the slave when the registers values were changed, but will not read the data from the slave • **Read/write:** The device regular read data from appointed registers in the slave, will update the data to the slave when the registers values are changed.	Read/Write
Data Type	
Set up the data type to be collected. Options are: • BIT: bit type • WORD: word type • DWORD(Swap): double word type, and transposition store to DX router's register in pairs	WORD
Address Type	
• **Controller is "S7-200 ISO TCP" :** Address type options are V/M/Q/I, combine with data type, it will generate: - Bit type: VB/MB/QB/IB - Word type: VW/MW/QW/IW - DWord type: VD/MD/QD/ID	DB

Description	Default
• **Controller is "S7-300" or "S7-200 ISO TCP" :** Address type options are DB/M/Q/I, combine with data type, it will generate: - Bit type: DBn_DBX/MB/QB/IB - Word type: DBn_DBW/MW/QW/IW -DWord type: DBn_DBD/MD/QD/ID	
DB Number	
Set up the unit number of the Siemens PLC start address, it is invalid when controller is" S7-200 ISO TCP":	D
Slave Offset Address	
Set up the starting address for read/write the registers in Siemens PLC. For example, V100 register, just input 100.	N/A
Bit	
For Bit type data, the address format is x.y, then x input to slave starting address column, y input to this column.	
Device Starting Address (decimal)	
Set up the device starting address (decimal, input range is from $2048 to $4095 for word type data, input range is from M0 to M511 for bit type data). $ or M specifies that the match must start at the beginning of a Device Starting Address.	N/A
Length (1-123)	
Set up the number of the continuous address followed by the default mapped address will be read or write. Input range is from 1 to 64.	N/A
Operation	
Click the +/- button to add mapping or delete mapping.	N/A
Edit	
Click an item of register mapping forms that can be edited.	N/A

3.4.5 DI/DO

DX-3021L9 have two sets DI/DO interface, user can setup the trigger even for DI/DO action in this page.

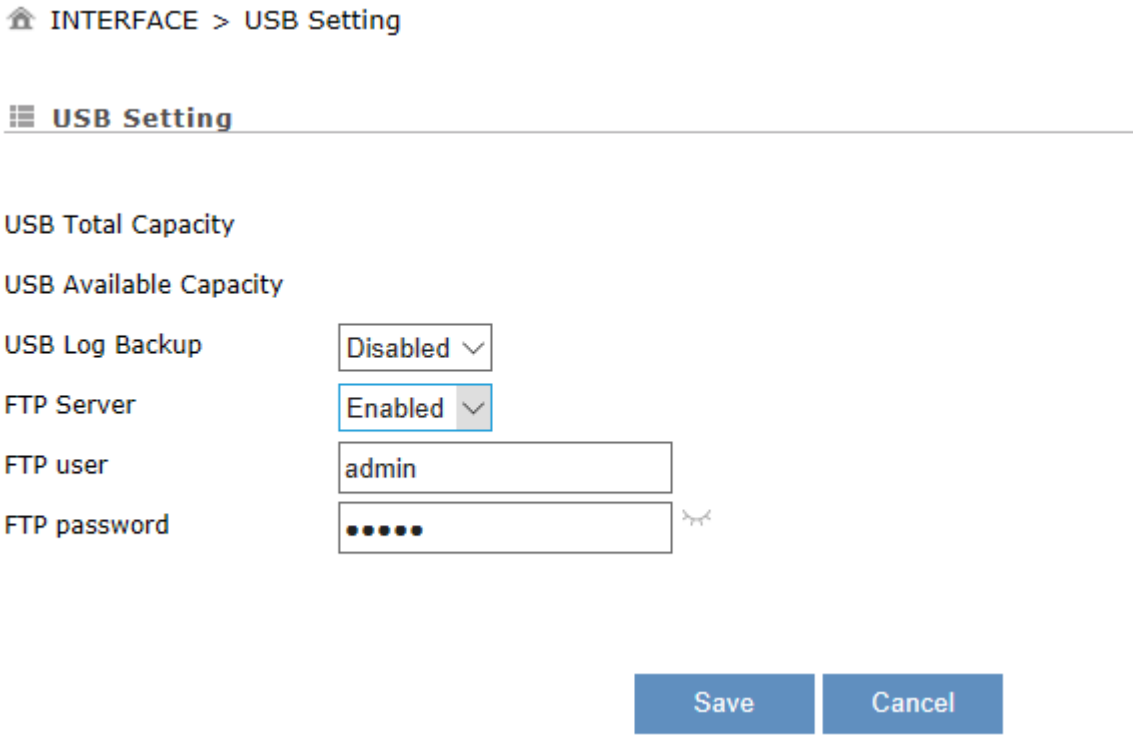


Description	Default
DI1/DI2	
Specify what happens to the DI1/DI2 state, then trigger the event. Options as below: -Disabled: disable DI1/DI2 trigger function -Off->On: When DI1/DI2 status change from OFF to ON, trigger the event -On->Off: When DI1/DI2 status change from ON to OFF, trigger the event	Disabled
Triggering Event	
Specify the trigger event, total 11 events are support: -Restart router -Enable/disable cellular -Enable/disable WAN -Enable/disable Internet -Enable/disable Cloud Service -DO1 on/off -DO2 on/off	Disabled
System Event	
Specify what happens in the system, then trigger the DO action. -Cloud Service Connected/Disconnected -Internet Connected/Disconnected -Cellular Abnormally -WAN Down/Up	Disabled
DO1/DO2	

Description	Default
Setup the DO1/DO2 action when specified event happen. Options include DO On and DO Off.	Disabled

3.4.6 USB

This page will show detail information about USB drive, and enable/disable the USB function.



Description	Default
USB Total Capacity	
Show the total size of the USB drive.	N/A
USB Available Capacity	
Show the free size of the USB drive.	N/A
USB Log Backup	
Enable or disable log backup function. The router's log will duplicate to USB drive after this function has been enable.	Disabled
FTP Server	
Enable or disable FTP server function. User can remote access this USB drive by FTP protocol after this function has been enable.	Disabled
FTP User	
Setup the FTP account name	admin
FTP Password	

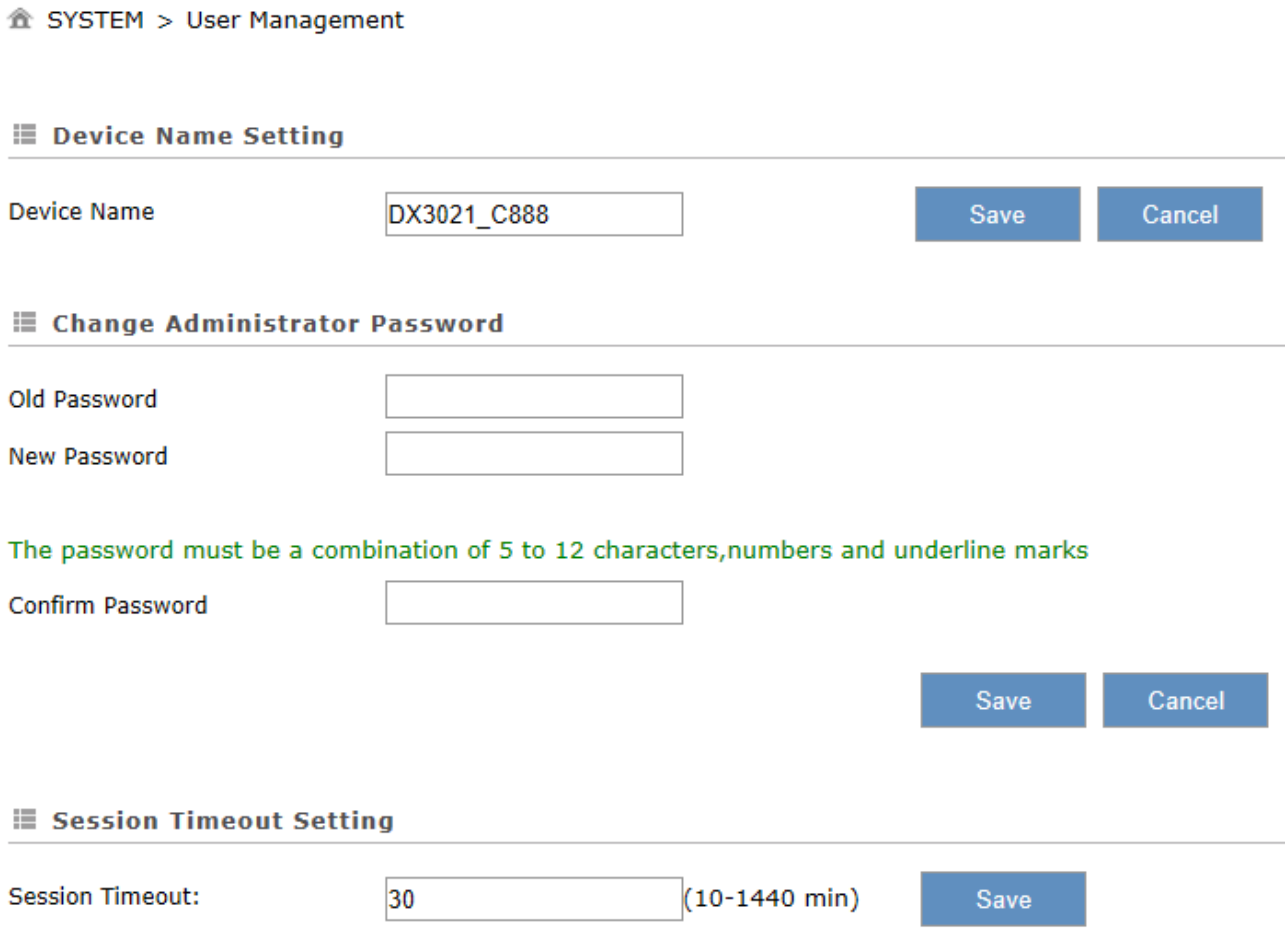
Description	Default
Setup the FTP account password.	admin

3.5 System

You can set up the system configurations, including the User Management, Time Zone Configurations, Log Setting, Firmware Upgrade, Backup & Restore, Scheduled Jobs, Network Diagnosis, System Reboot, Event Management and Register Management.

3.5.1 User Management

You can change the administrator password and set session timeout here. The password must be a combination of 5 to 12 characters, numbers and/or underline symbols.



Description	Default
Device Name	
Set up a device name for your router. The name shall be composed of letters, numbers and underline, starting with a letter or number. The maximum string length is 32 bytes.	DX3021 + "_" + "the last four digits of Mac address"
Old Password	

Description	Default
Input the original password.	admin
New Password	
Input the new password you'd like to use. The password length should be 5-12 digits and is composed of lowercase letters, uppercase letters (case sensitive), numerals 0-9 and underline.	N/A
Confirm Password	
Again input the password you'd like to use to double confirm there is no typo.	N/A
Session Timeout	
Session timeout is an expired time limit for a logged in user which has been inactive for a period of time. Setting range is from 10 to 1440 minutes	30

3.5.2 Time Zone Configurations

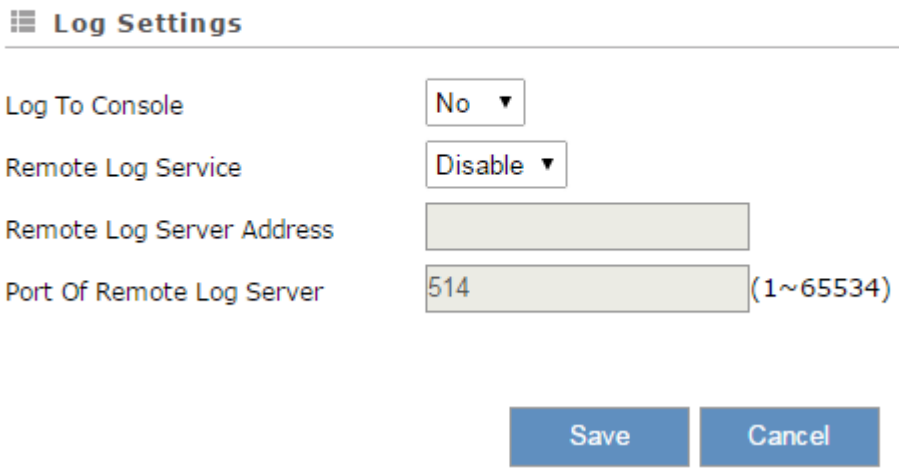
You can change the current time of the device. Use the dropdown list to select the correct time zone for your device.

Description	Default
The current time of device	
Here shows the current time of your device.	N/A
Set Local PC Time	
Set the routing time by PC currently time.	N/A
Time Zone Setting	
Select the operating time zone of your device: GMT-12:00 - GMT+13:00.	N/A

3.5.3 Log Settings

This page is used for configuring the log settings, including Log to Console, Remote Log Service, Remote Log Server Address, and Port of Remote Log Server.

SYSTEM > Log Settings



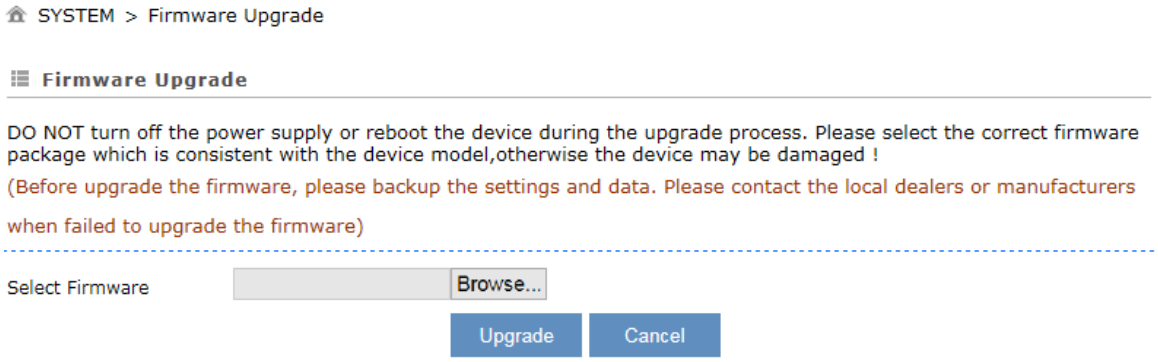
Description	Default
Log to Console	
Set up the log to the console port.	No
Remote Log Service	
Enable/disable the remote log service.	Disable
Remote Log Server Address	
Set up the remote log server address	N/A
Port of Remote Log Server	
Set up the remote log server port, ranging from 1 to 65534.	514

Notice

Remote log service is used for qualified engineers to check the device remotely when errors occurred. With this service, there is no need to log in to the device, device logs can be exported to the remote log server. The server should support the syslog protocol. When this functionality is enabled, it will take up some resources. Do not enable this functionality disabled, unless it' s necessary.

3.5.4 Firmware Upgrade

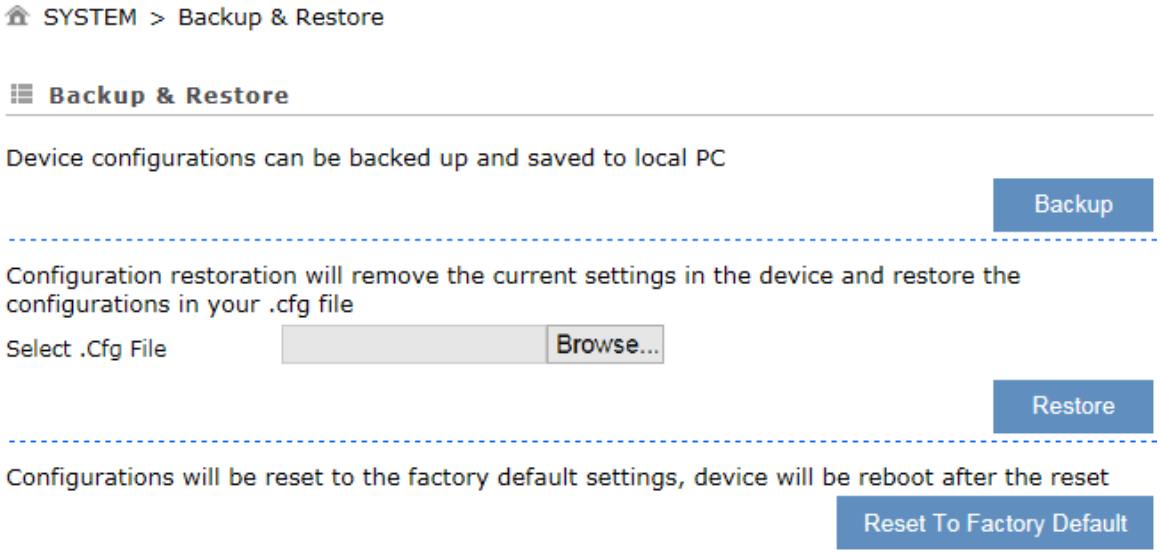
This page is used for upgrading the system.



Description	Default
Select Firmware	
Click “Browse” to select the new firmware file.	N/A
Upgrade	
Click “Upgrade” to upgrade firmware. The device will reboot after the upgrade is done.	N/A

3.5.5 Backup & Restore

This page is used for backing up and restoring the configurations.

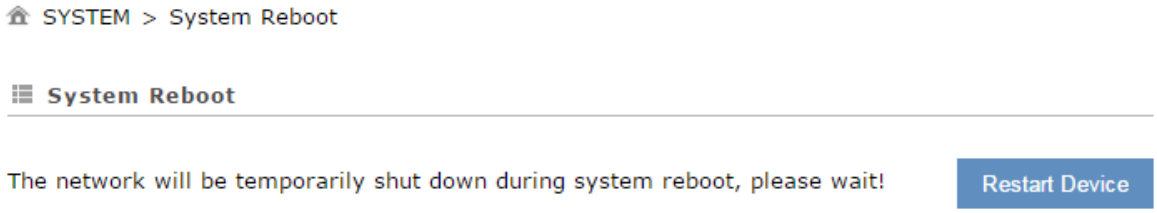


Description	Default
Backup	
Click “Backup” to save the device configurations on your computer.	N/A
Restore	

Description	Default
Click “Browse” to select the backup file and then click “Restore” to restore the configurations. The device configuration will be restored to the previous version and the device will reboot after the restoring is done.	N/A
Restore To Factory Default	
Click “Restore To Factory Default” to reset the configurations to the factory defaults. The device will reboot after the reset is done.	N/A

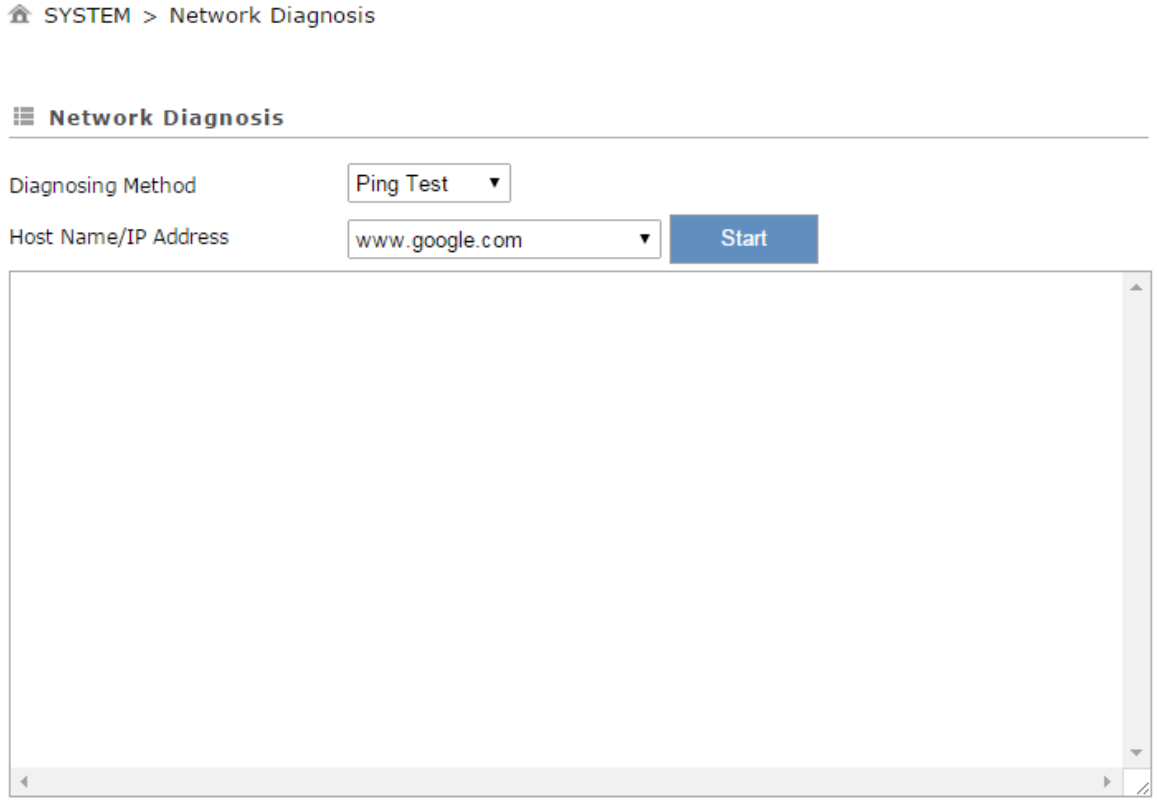
3.5.6 System Reboot

This page is used for manually rebooting the system. Click “Restart Device” and the system will reboot.



3.5.7 Network Diagnosis

This page is used for diagnosing the network status; methods are Ping Test and Route Trace.

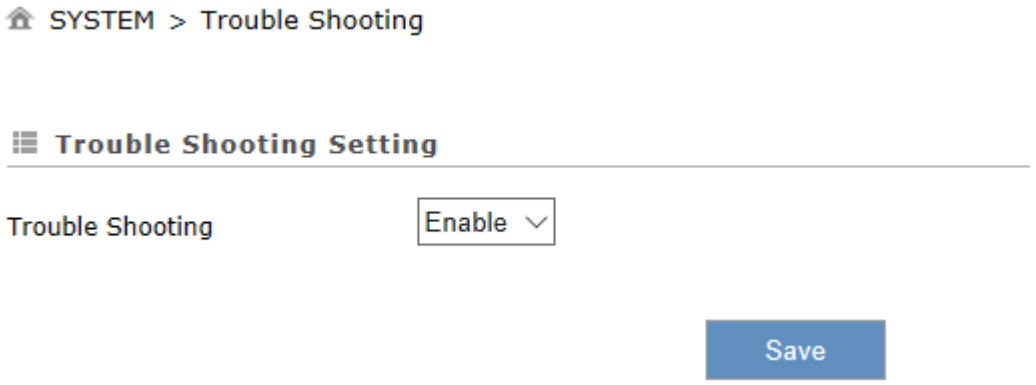


Description	Default
Diagnosing Method	

Description	Default
Select the Diagnosing Method; options are Ping Test and Route Trace.	Ping Test
Host Name/IP Address	
Select the domain name or IP address of the server that you want to test. The default options are www.google.com, www.yahoo.com, www.MSN.com, www.amazon.com, www.wikipedia.org, www.facebook.com, www.diacloudsolutions.com and others. When user choose others, user can input the domain/IP manual.	www.diacloudsolutions.com
Start	
Click “Start” to start the network diagnosing. While running the network diagnosing, the settings cannot be changed.	N/A

3.5.8 Trouble shooting

After enable the trouble shooting function, the DX router will automatically upload the log to the designated server, so that our engineers can remotely analyze and locate the fault of the router. The DX router also can download and run script to help diagnose problems from the designated server automatic if necessary.

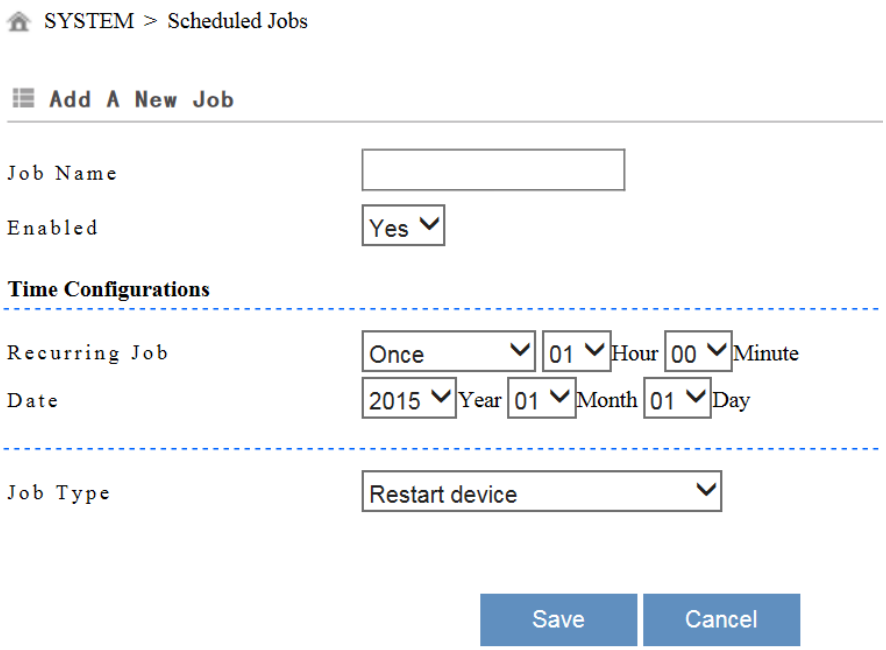


3.5.9 Scheduled Jobs

This page is used for scheduling job configurations, including ADD A New Job, Export Job List, and Import Job List.

- **Add A New Job**

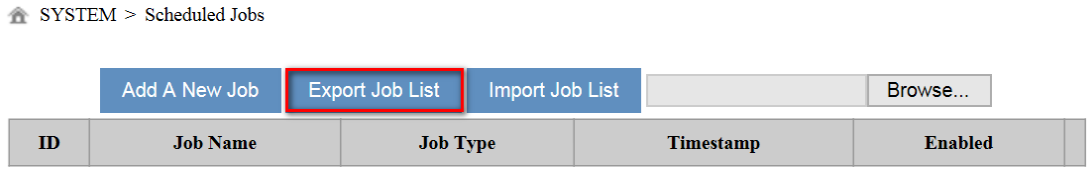
Click “Add A New Job”, and then you will see the following page. Follow the instruction to add a new scheduled job.



Description	Default
Job Name	
Set up a name for your scheduled job. The name shall be composed of letters, numbers and underline, starting with a letter or number. The maximum string length is 32 bytes.	N/A
Enable	
Select “Enable” to activate this functionality.	Enable
Recurring Job	
The scheduled job can be done Once, Every day, Every week, or Every month. And the specific time can be further defined.	Once 01:00
Date	
Select a specific date to perform the scheduled job.	2015.01.01
Job Type	
Select one of the job type for the scheduled job. • **Restart device** • **Enable DIACloud Service** • **Disable DIACloud Service**	Restart device

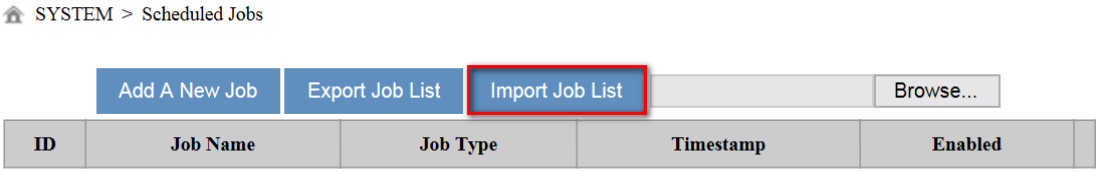
- **Export Job List**

Click “Export Job List” to export the scheduled jobs for future usage.



- **Import Job List**

Click "Chose file" to select the scheduled jobs file you have saved and then click "Import Job List" to import the scheduled jobs you have set before.

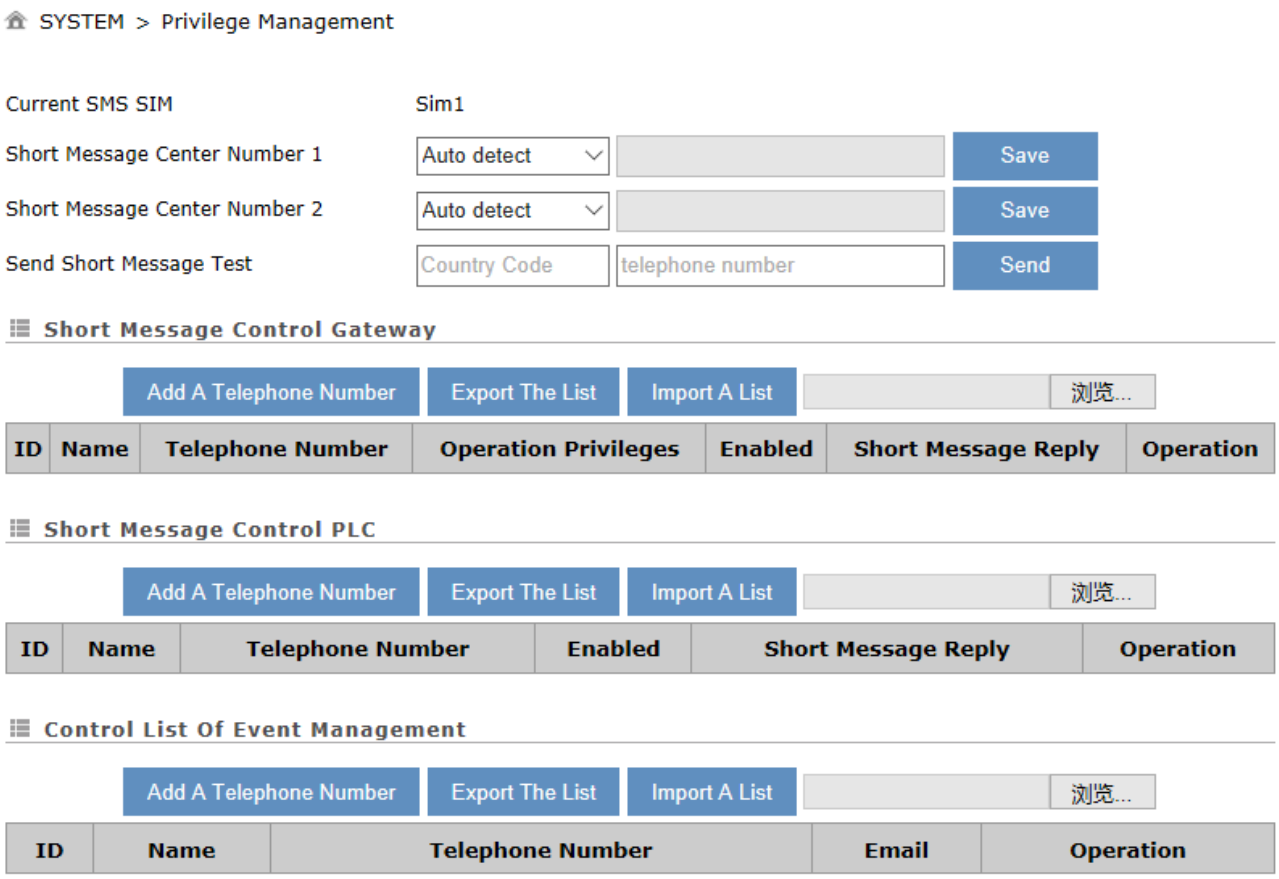


3.5.10 Privilege Management

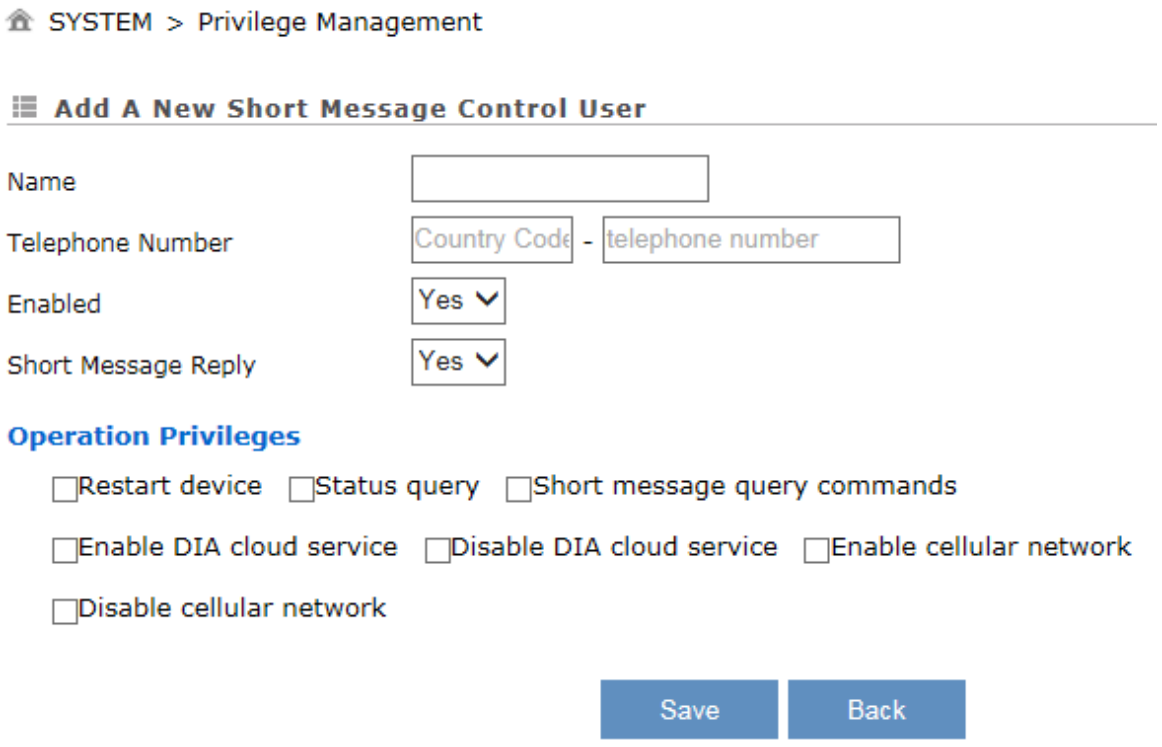
Privilege management use in order to set the white list of phone numbers and the device operation can be triggered via the specific SMS text from the white list of phone numbers.

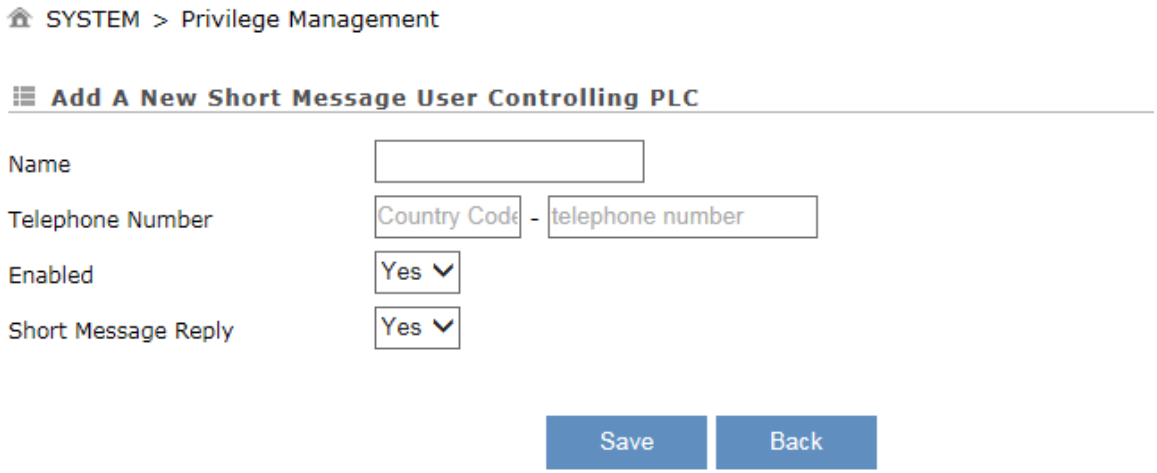
You can fill in the target mobile phone number and press 'Send' button to test the Short Message function of the device. The SMS commands listed below:

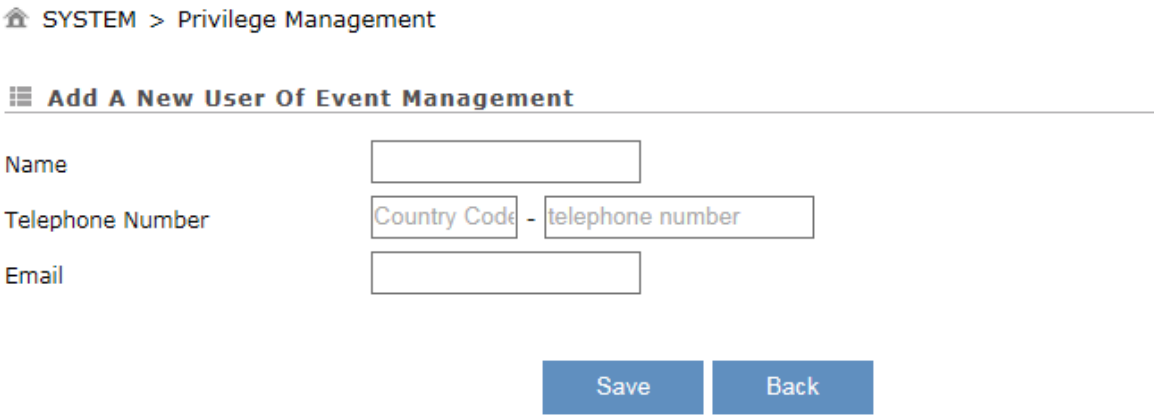
Function	SMS Command	Description
SMS Query commands	"ZLCX" or "zlcx"	List all SMS commands and explanations.
Status Query	"ZTCX" or "ztcx"	Discover the router's current status information, including the following: 1. Cellular network state 2. Firewall state 3. DIACloud state
Restart Device	"CQLY" or "cqly"	Restart the router
Enable cellular network	"KQBH" or "kqbh"	Dial-up the router to internet
Disable cellular network	"DKBH" or "dkbh"	The router disconnects from the internet
Enable DIA cloud service	"KQVD" or "kqvd"	DIA cloud service enables on the router
Disable DIA cloud service	"GBVD" or "gbvd"	DIA cloud service disables on the router



Currently, there are three the main SMS settings: 1. Short Message Control Gateway. 2. Short Message Controlling PLC. 3. Control List of Event Management. Setting interface as follows:







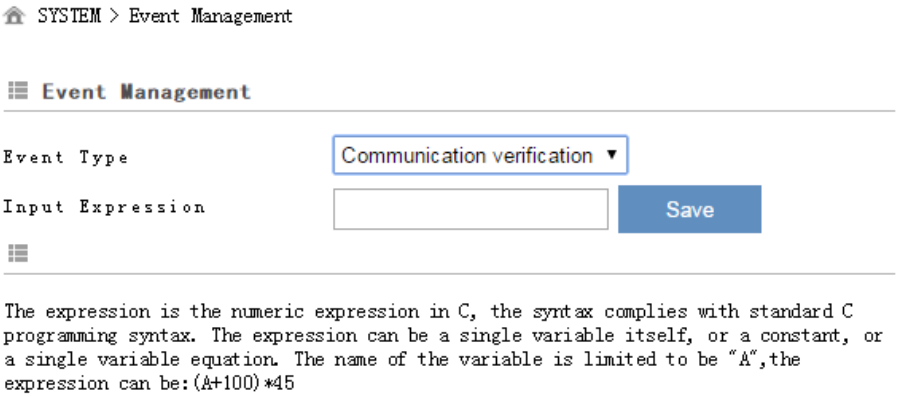
Description		Default
Current SMS SIM		
Show which sim is the default sim to sent Short Message. It can be config in 【Network】-【Connection】function.		N/A
Short Message Center Number1/2		
Input the short message center number supported by this SIM 1&2 card, the input format is: **"+" "country code" "short message center number"**. **Example: +8613800100500**		N/A
Send Short Message Test		
Confirm SMS module related functions are executed correctly, you can send a function test message to the specified number to send a test message to verify the relevant settings are correct. The input format is as follows: • Country Code: **"+" "Country Code".** • Cell phone number: **13800100500.** **Example: +8613800100500**		N/A
Add A Telephone Number	**ID**	
	The maximum allow the 10 phone numbers	N/A
	Name	

Description		Default
	Set up a name for phone number, The name shall be composed of letters, numbers and underline, starting with a letter or number. The maximum string length is 32 bytes.	N/A
	Telephone Number	
	Set up a telephone number and country code which can receive the alarm message. The input format is as follows: • Country Code: **"+" "Country Code".** • Cell phone number: **13800100500.** **Example: +8613800100500**	N/A
	Enabled	
	Set up the permission to enable or disable	Yes
	Short Message Reply	
	When the router receives the SMS commands, the router will response a confirmed message.	Yes
	Email	
	Set up an Email address to receive the alarm message. This setting work with The Event management.	N/A
Edit		
Edit the existing event		N/A
Delete		
Delete the existing event		N/A
Export The List		
Export the event of SMS		Fixed_sms_control_list.cfg
Import A List		
Import the event of SMS to the router		N/A

3.5.11 Event Management

This page is used for setting up 3 types of events, Communication Verification, Alarm Event and SMS Queries Event.

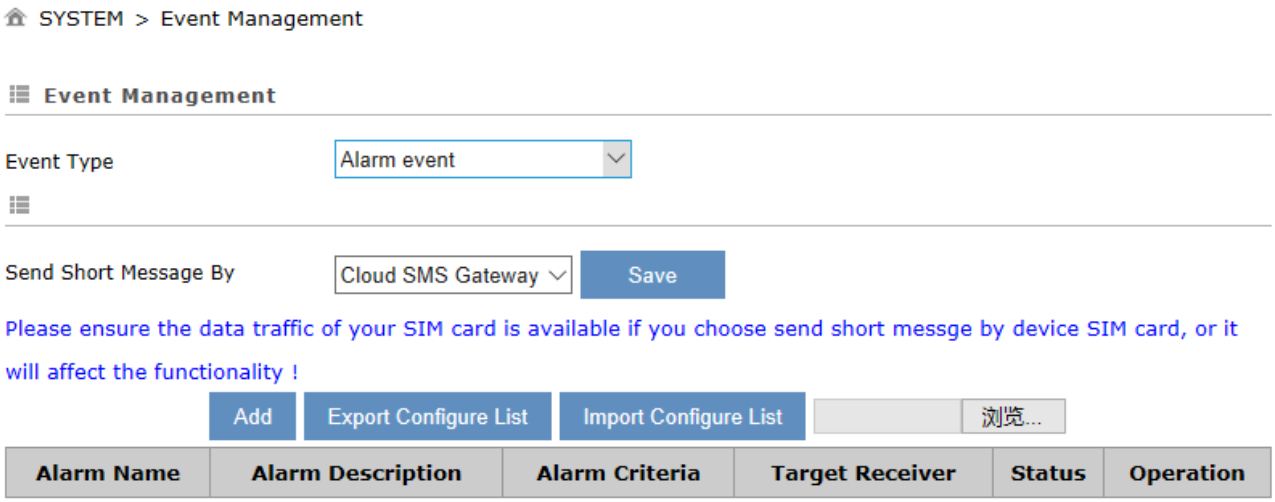
- **Communication Verification:** when this option is selected, the router will monitor and check if this channel is trustable to ensure a safe communication between a router and a PLC via MODBUS TCP, MODBUS ASCII or MODBUS RTU.



The operators that the expression supports are as below:

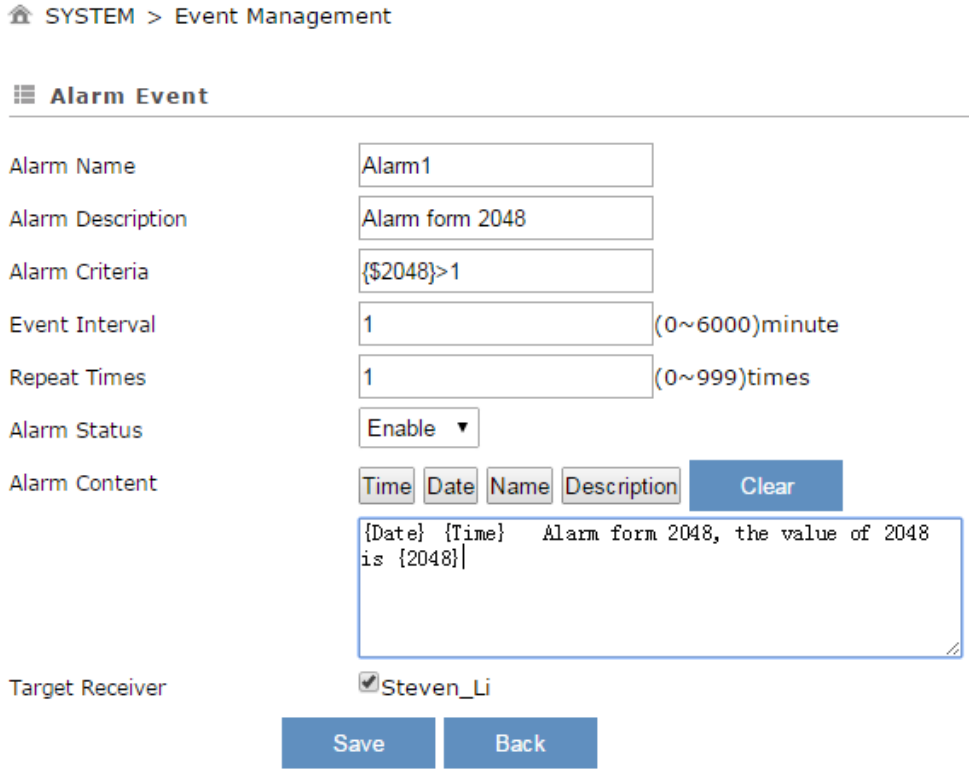
Operators	Types	Examples	Description
+	Arithmetic operator	A+100	Addition
-	Arithmetic operator	A-100	Subtraction
*	Arithmetic operator	A*100	Multiplication
/	Arithmetic operator	A/100	Division
&	Logic operator	A&A+100	Logic AND
|	Logic operator	A|A+100	Logic OR
()	Bracket operator	(A+100)*45	Change operation order
^	XOR operation	A^100	XOR operation

- **Alarm Event:** uses can set up the Alarm Name, Alarm Description, Alarm Criteria, Target Receiver and Operation.



Click "Add" button to create new alarm event, Click "Export configure List" button to export the setting as a file and save to local PC. Click "Import configure List" button to import the setting from a file.

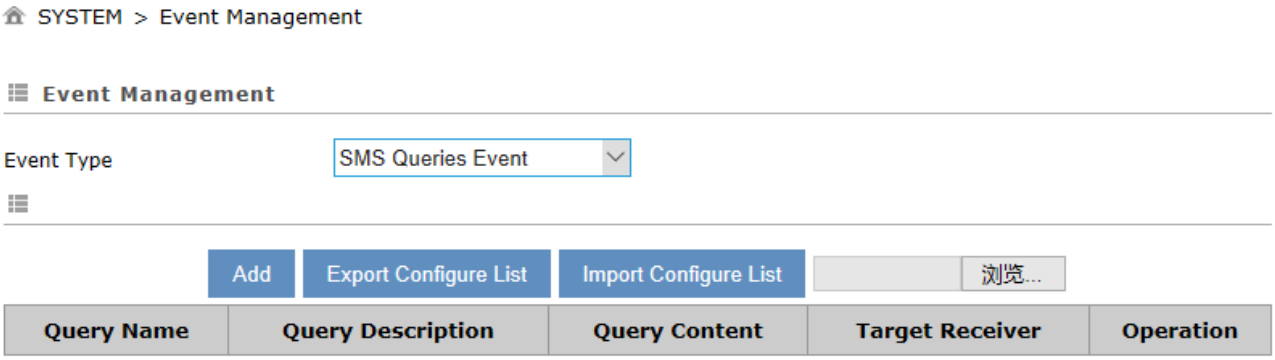
And, in the existing List, click “Details” to edit the existing event, click “Delete” button to delete the selected event. Click “Copy” to duplicate the event.



Description	Default
Alarm Name	
Input an alarm name. The name shall be composed of numbers, English letters, uppercase and lowercase. The maximum string length is 32 bytes.	N/A
Alarm Description	
The alarm description shall be composed of numbers, English letters, uppercase and lowercase. The maximum string length is 50 bytes.	N/A
Alarm Criteria	
Setup the alarm trigger condition. The format of alarm variable is {$number 0-4095}, the alarm criteria can be a single alarm variable, or a formula of one or several alarm criteria. For example, the formula can be: {$2048}>100	N/A
Event Interval	
The time interval of alarm sending	0
Repeat Times	
The repeated times of alarm sending	0
Alarm Status	
Enable or disable this alarm setting	Enable

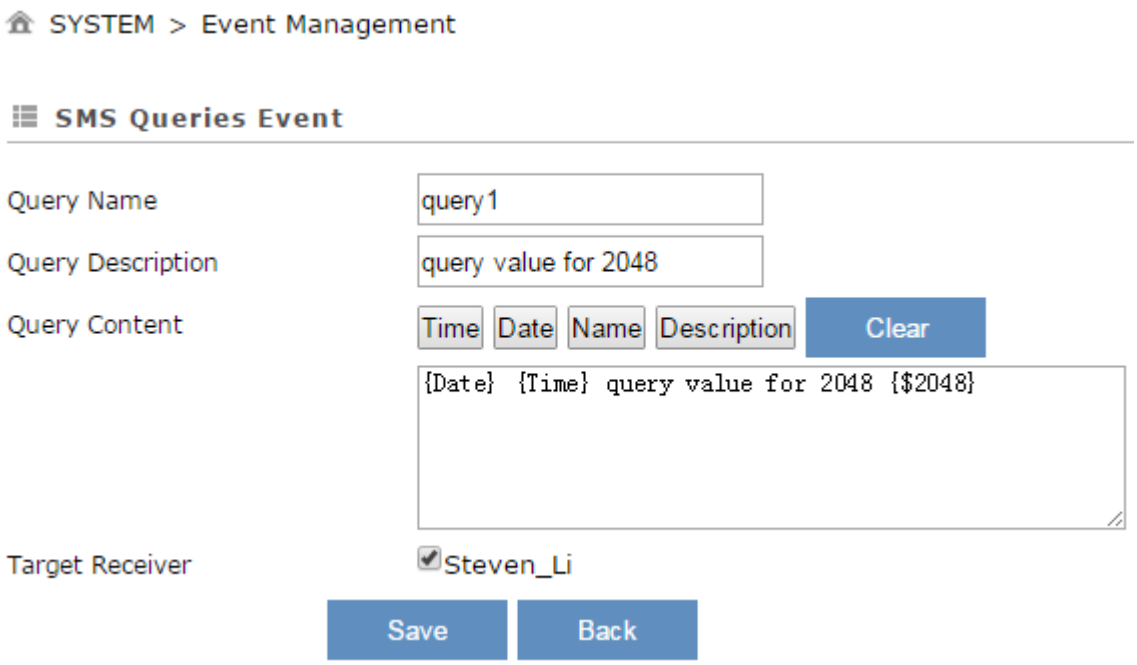
Description	Default
Alarm Content	
Set up the information shown on the alarm contents. The content of the alarm will be sent to the target when alarm criteria are met. The information order can be self-defined. • **Time:** the time when the alarm occurred • **Date:** the date when the alarm occurred • **Name:** the name of the occurred alarm • **Description:** the description of the occurred alarm **For example:** Register $2048 represents electrical voltage, the value of register $2048 is 10, and the alarm content is set as: {Date} {Time} Voltage = {$2048}, then the alarm content received by users will be: 2016/06/01 10:00:00(currently time) Voltage = 10. The maximum content length is 160 characters.	N/A
Target Receiver	
Set up the recipient. User can maintain the list by 【Control List Of Event Management】in Privilege Management function.	N/A

- SMS Queries Event: user can declar a query event, when the mobile number in the Control List of event send a query message, system will reply the special content to the mobile number.



Click “Add” button to create new queries event, Click “Export configure List” button to export the setting as a file and save to local PC. Click “Import configure List” button to import the setting from a file.

And, in the existing list, click “Details” to edit the existing event, click “Delete” button to delete the selected event. Click “Copy” to duplicate the event.



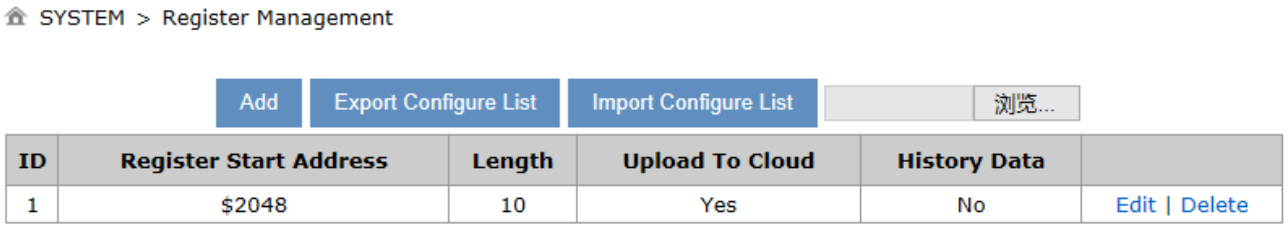
Description	Default
Query Name	
Input an query name. The name shall be composed of numbers, English letters, and underline. The maximum string length is 9 characters. For example, after you create a query event name query1, you can send a message with content #MSG#query1 to device SIM card number, then it will reply you the content you setup in the event.	N/A
Query Description	
The query description shall be composed of numbers, English letters, uppercase and lowercase. The maximum string length is 50 bytes.	N/A
Query Content	
Set up the information shown on the alarm contents. The content of the alarm will be sent to the target when alarm criteria are met. The information order can be self-defined. • **Time:** the time when the alarm occurred • **Date:** the date when the alarm occurred • **Name:** the name of the occurred alarm • **Description:** the description of the occurred alarm **For example:** Register $2048 represents electrical voltage, the value of register $2048 is 10, and the alarm content is set as: {Date} {Time} Voltage = {$2048}, then the query content received by users will be: 2016/06/01 10:00:00(currently time) Voltage = 10. The maximum content length is 95 characters.	N/A
Target Receiver	
Set up the recipient. User can maintain the list by 【Control List Of Event Management】in Privilege Management function. System only response the query from receiver list.	N/A

Notice

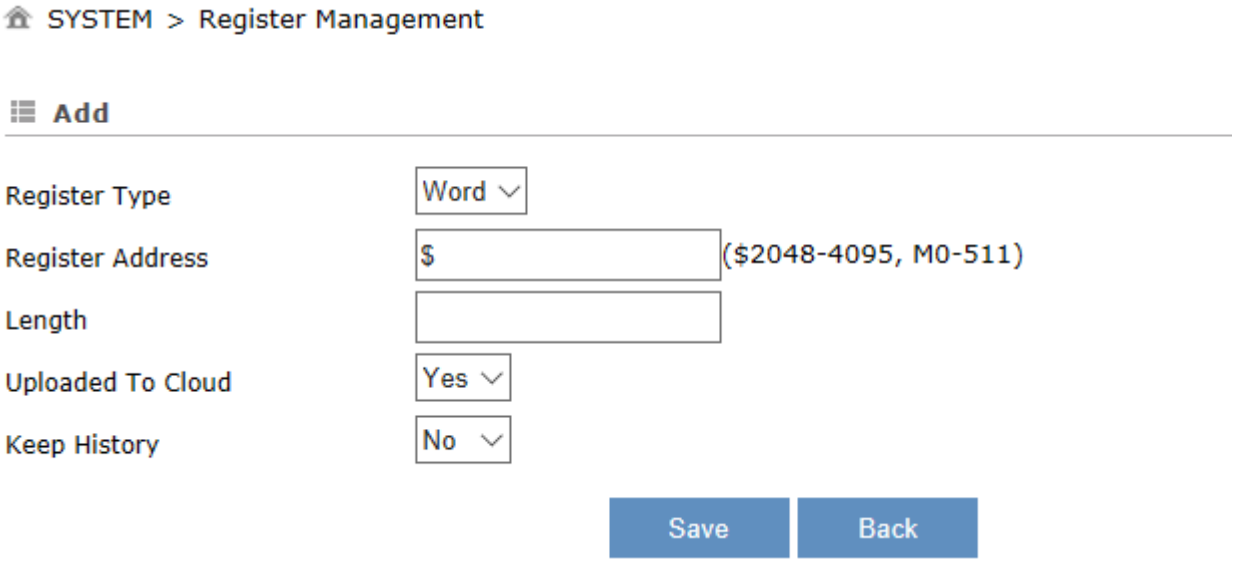
{} is a special system symbol, which is used to reference system variables or system registers, like ${Time}, ${Date} or ${Number 0 - 4095}. Please use it with caution.

3.5.12 Register Management

This page is used for setting up the rules of register data upload to Cloud. Click “Add” to set a new rule. Click ”Edit” to modify the existing rule. Click “Delete” to delete the existing rule.



The address segment M0~M511 and $2048~$4095 can be self-defined. The Start address, Length, Uploaded to Cloud or not and keep history or not can be set up.. After clicking “Add”, the following page will show up.



Description	Default
Export Configure List	
Export the configure list to the file and save to local PC	N/A
Import Configure List	
Open local file and import the configure list	N/A
Register Type	
Set up the register data type, options are “Word” and “Bit”.	Word
Register Start Address	
This rule will effect from which register address. For bit type the range is 0~511 and start with “M”, for word type the range is 2048~4095 and start with $.	N/A

Description	Default
Length	
How many registers will be effect by this rule. For bit type the range is 1~512, for word type the range is 1~2048.	N/A
Uploaded To Cloud	
Whether to upload the variable information to Cloud.	Yes
Keep History Data	
This function will keep or overwrite the history data when the register values are uploaded to Cloud. • **Yes:** The existed register values in the cloud **WON'T** be overwritten by the new uploaded register values. • **No:** The existed register values in the cloud **CAN** be overwritten by the new uploaded register values.	No

Notice

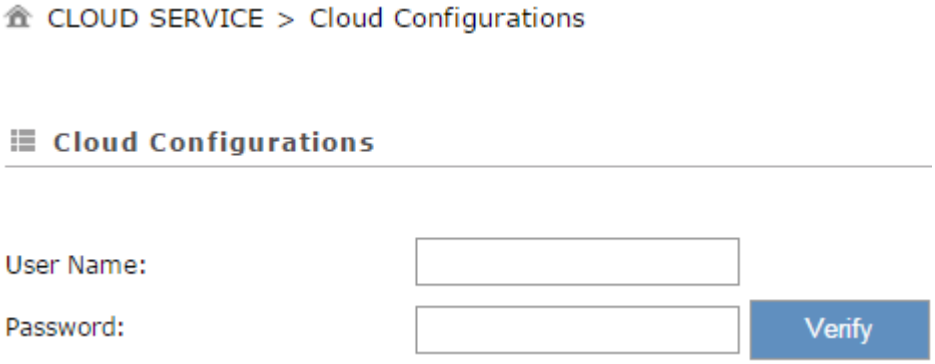
When the values in the register changes, the results will be uploaded to cloud.

3.6 Cloud Service

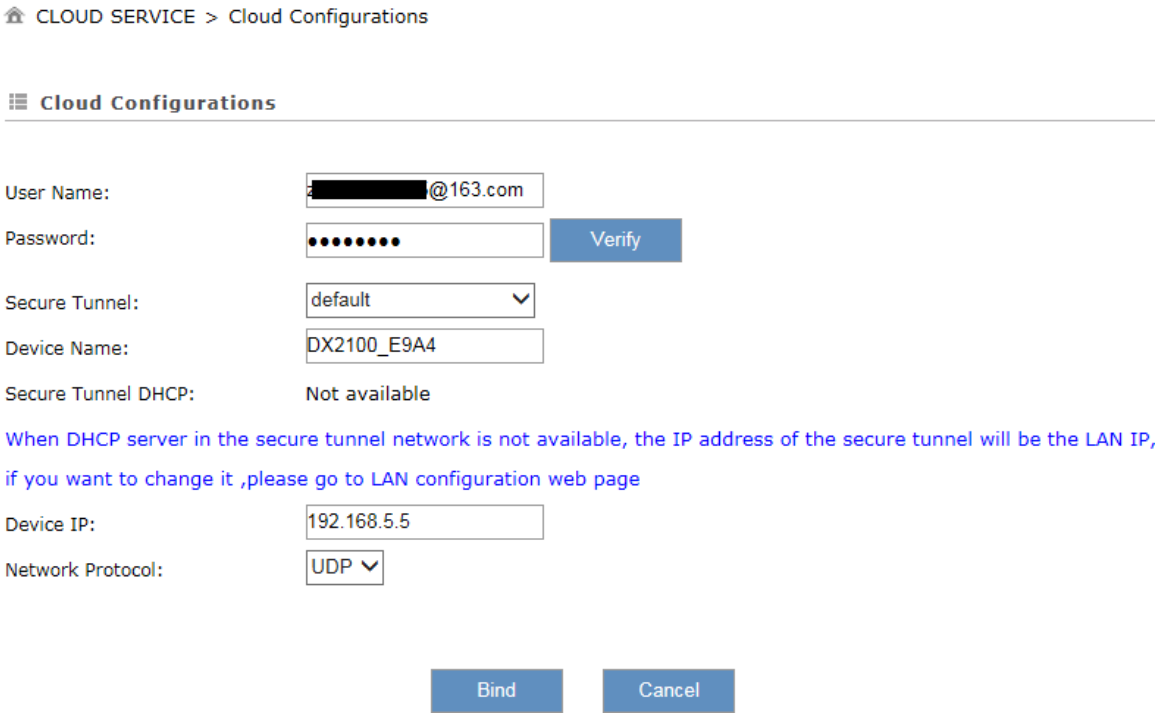
3.6.1 Cloud Configuration

In this page, user can assign the cloud account which will be used to connect to DIACloud by device. Input the user name, the password and click "Verify". Refer to Chapter 4 for DIACloud account registration.

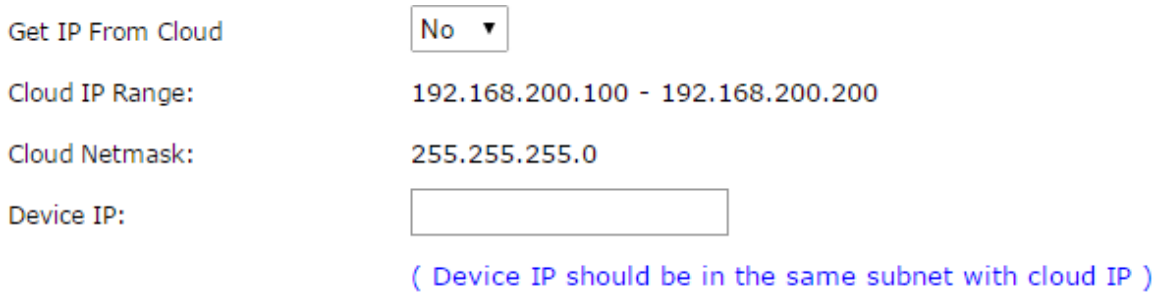
1. Login with your DIACloud account then click the "Verify" button to authenticate with DIACloud server.



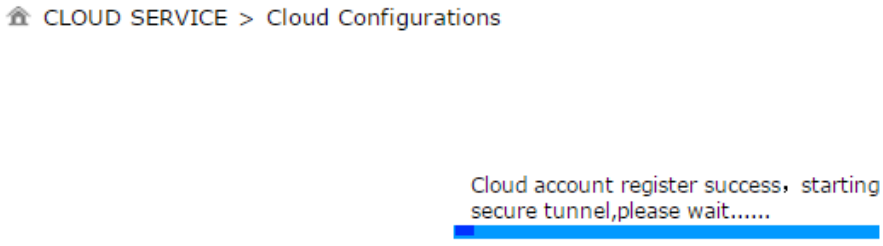
2. After authentication successfully, the cloud configurations will show up then the user can modify the secure tunnel and device name.



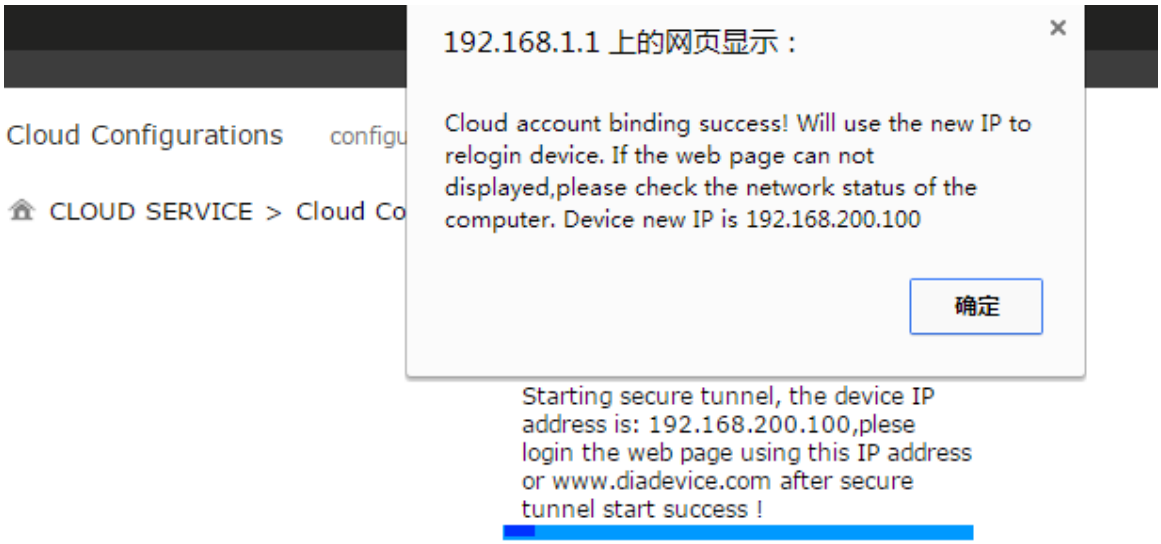
3. The user also can set IP address manually.



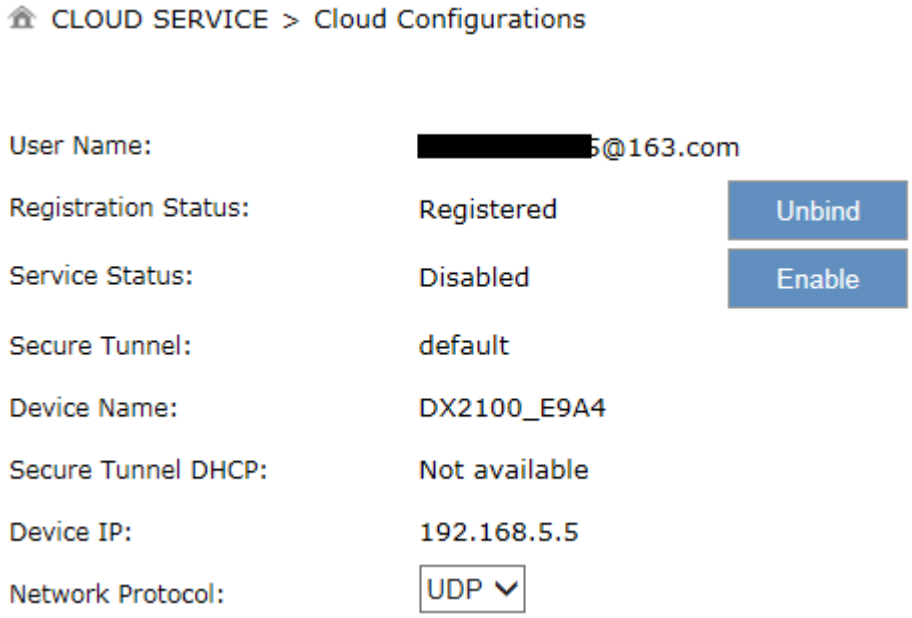
4. Click the "Bind" button, the DX router will bind with DIACloud server and established a secure tunnel between DIACloud server and the DX router. Meanwhile a new IP will assigns to DX router from DIACloud server (assign from the cloud HDCP server or a user specified).



5. Your browser will access to the DX router with new IP address automatically if DIACloud account binds with DIACloud server successfully. Please make sure a PC and DX router are in the same subnet; otherwise PC will not be able to access to the DX router.

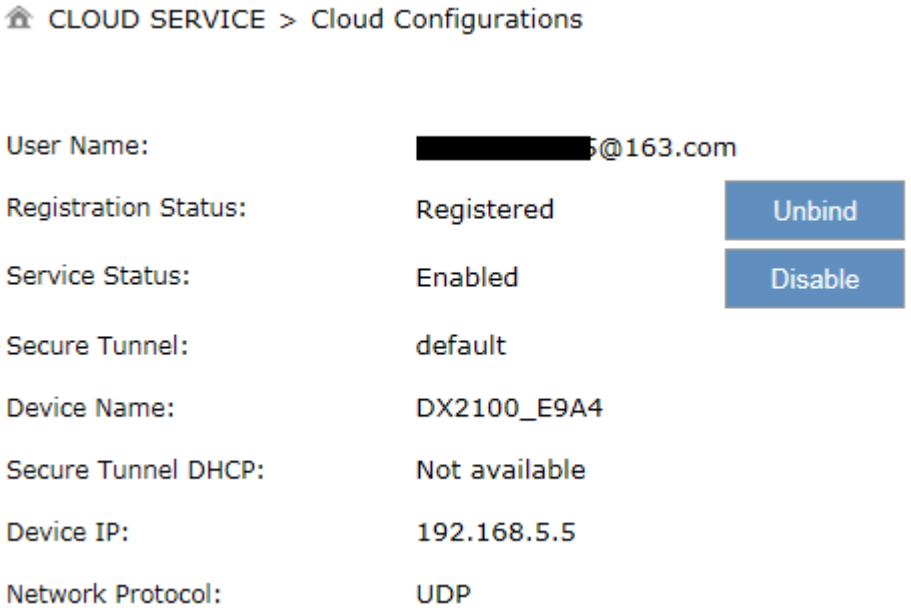


6. If the network is in the poor condition, The binding proccess could be successfully but the Service Status is shown “Disable”.



7. In this situation, the browser will access with 192.168.1.1 and the service status will be “Disable”. You can re-enable the service status to rebuild the secure tunnel again in cloud configurations.

8. When the service status is shown “Enable”, that means the DIACloud service is actived on DX router. The user also can get the related information in cloud platform.



9. Click the “Unbind” button, DX router will remove the registered account in DIACloud.

Description	Default
User Name	
Set up the name for the DIACloud account.	N/A
Password	
Set up the password for the account.	N/A
Verify	
Check if the username and the password are matched.	N/A
Secure Tunnel	
Select the device under the account to join in a certain secure tunnel network group. For secure tunnel related settings, go to http://www.DIACloudsolutions.com/	Default
Device Name	
Set up the name for the device	N/A
Secure Tunnel DHCP	
When secure tunnel DHCP server is available, and the IP address is allocated by the DHCP server in secure tunnel network, the IP address of this device can be found in the cloud portal.	N/A
Get IP From Cloud	
When selecting “Yes”, IP address can be obtained by the cloud. When selecting “No”, the IP address can be manually set.	Yes
Network protocol	

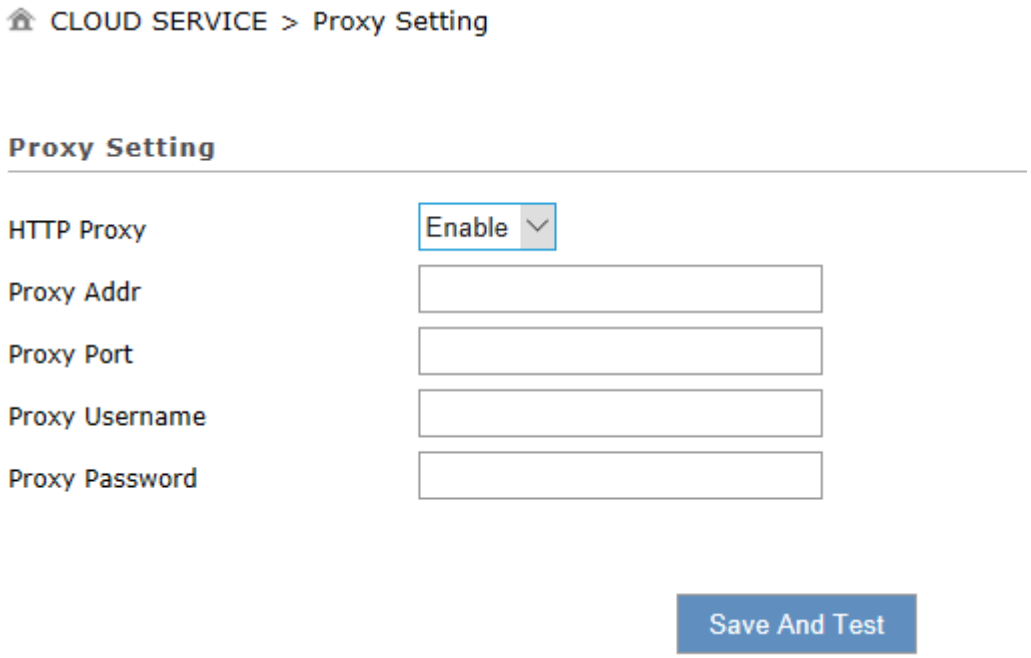
Description	Default
Set the network protocol of the security tunnel.Options are TCP and UDP. • **UDP:** UDP has a faster data transfer speed. If the network is not lost packet, please use this option • **TCP:** When the network packet loss is serious, it is recommended to select TCP. After binding the cloud account, you can still change this option, but you must disable the cloud service before changing. When the agent is turned on, the user can only select TCP.	UDP
Cloud IP Range	
Display the Cloud IP Range. The Cloud IP Range is depended on the secure tunnel setting. For the secure tunnel setting, please refer to 5.2.5 Tunnel Network.	N/A
Cloud Netmask	
Display the Cloud Netmask. The Cloud Netmask is depended on the secure tunnel setting. For the secure tunnel setting, please refer to 5.2.5 Tunnel Network.	N/A
Device IP	
User can assign an IP address manually; remember that IP address should be the same subnet as the secure tunnel setting. For the secure tunnel setting, please refer to 5.2.5 Tunnel Network.	N/A

Notice

- Users can log-in to **http://www.DIACloudSolutions.com/** and register for a DIACloud account.
- In rare case, you can't access the web because the computer did not refresh the IP and DNS after the activation, please re-plug the cable to resolve the issue.

3.6.2 Proxy Setting

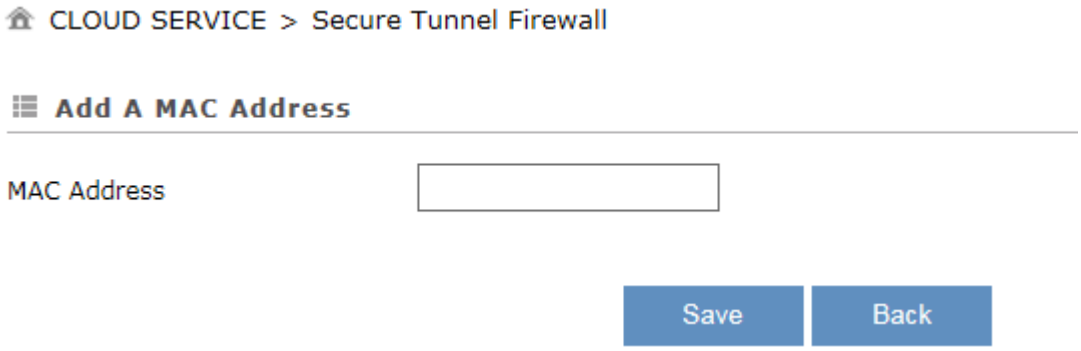
If the user's networking environment requires outbound network connections to go through a HTTP or HTTPS proxy, user can setup it in here.



Description	Default
HTTP Proxy	
Enable or disable the http proxy	Disable
Proxy Addr	
Set up the domain/IP of the proxy server	N/A
Proxy Port	
Set up the port of the proxy server	N/A
Proxy Username	
Set up the user name to login the proxy server	N/A
Proxy Password	
Set up the password to login the proxy server.	N/A
Save and Test	
Save the configuration and test to connect to the DIACloud.	N/A

3.6.3 Tunnel Firewall

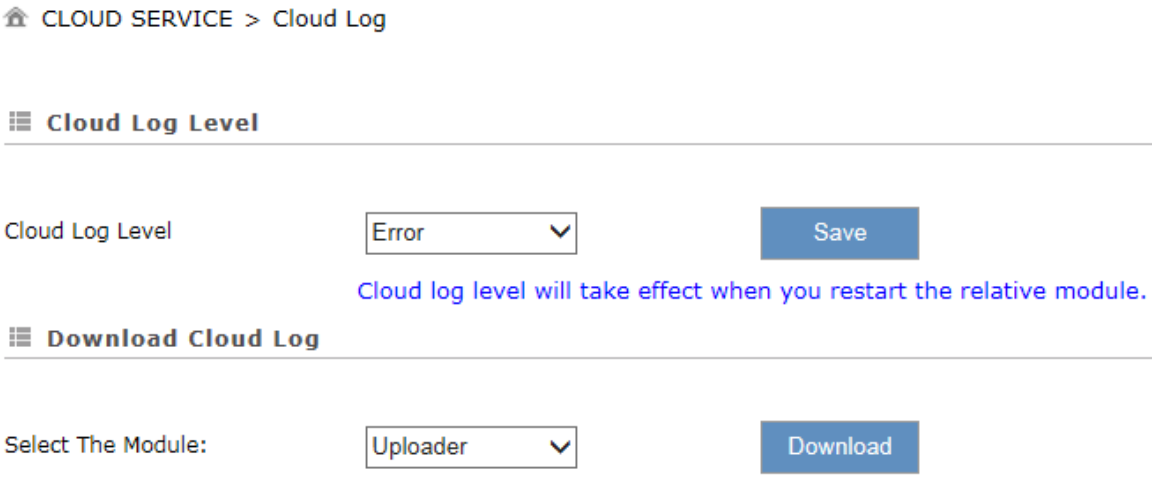
In this page, user can set up the firewall for the secure tunnel.



Description	Default
Allow multicast in secure tunnel	
Set the security tunnel, whether to allow multicast transmission of the nature of the packet. **Options:** Allowed, not allowed	Yes
Firewall of secure tunnel	
Set up the specified MAC device will be allow or forbid to transmit the data in the secure tunnel. Options as below: • **Disable:** Disable this function. • **Black List:** If the network device's MAC address is blacklisted, these devices will **NOT** be able to transmit packets to the secure tunnel • **White List**: If the network device's MAC address is blacklisted, these devices will be able to transmit packets to the secure tunnel.	Disable
Add	
Add a new MAC address into the list.	N/A

3.6.4 Cloud Log

Any information about cloud event can be exported from this function



Description	Default
Cloud Log Level	
You can set different levels of log messages and saved to export to the engineering staff to view. Options as below (Level from low to high): • **Trace:** The TRACE Level designates finer-grained informational events than the DEBUG • **Debug:** Fine-grained informational events that are most useful to debug an application • **Info:** The INFO level designates informational messages that highlight the progress of the application at coarse-grained level. • **Warm:** The WARN level designates potentially harmful situations. • **Error:** The ERROR level designates error events that might still allow the application to continue running. • **Fatal:** The FATAL level designates very severe error events that will presumably lead the application to abort.	Error
Select Log Level	
Specify to download the cloud service module log. Options as below: • Uploader: Data upload module • Secure Tunnel: Secure Tunnel module • Binding: Account binding module	Uploader

3.7 Quick Operation

DX-3021L9 provides the multiple quick operation via USB interface.

- Upgrade the router firmware
- Import the router configuration
- Active the router with the DIACloud account.

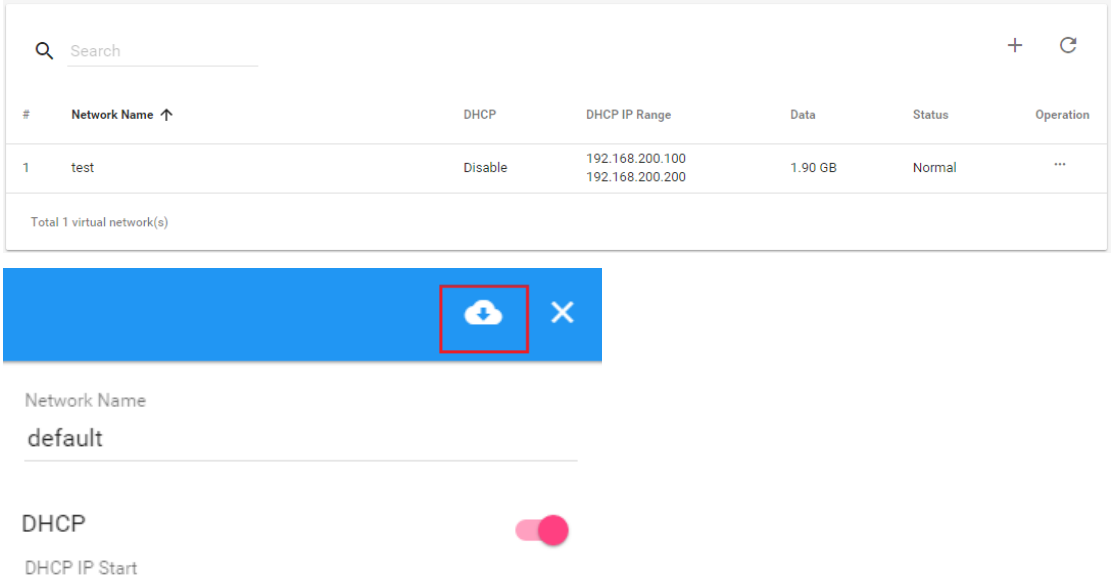
The quick operation will trigger by the following file is created in the USB drive after the DX-3021L9 reboots:

- The upgrade-package file 'DX3021_UpgradeImage_NorFlash_xxxx_xxxx.bin'

- The device configuration files ‘backup.cfg’. (Please refer 3.4.8 Backup & Restore)
- The cloud configuration file ‘Provision.bin’ (Please refer to the following steps).

  Follow below steps, show how to quick bind DIACloud account for the router automatic.

  1. Go to the DIACloud platform (DIACloudSolutions.com).
  2. Log in the DIACloud webpage and click “SECURE TUNNELS”
  3. Click to select the Network which you’d like to use and then click the ••• to see and check the details.
  4. Click the  to download the generated Provision.bin to the local computer.



  5. Copy Provision.bin file to USB drive.
  6. Power off the device and then insert the USB drive into the device. Turn on the device and it will automatically bind. Check the status indicator to see if the binding is successful.

The following beep codes are for Quick Configurations, its definition that the various combinations of the configuration file exist on USB drive. (× – fail, √ - success or not this operation)

Beep Code	Upgrade firmware	Import config	Bind account
1 long	×	√	√
1 long, 1 short	√	×	√
1 long, 2 short	×	×	√
1 long, 3 short	√	√	×
1 long, 4 short	×	√	×
1 long, 5 short	√	×	×
1 long, 6 short	×	×	×

None	√	√	√

Notice

- Please do not change the file name of firmware upgrade-package.
- Please do not create the two different upgrade-package files in USB drive. In order to avoid the upgrading process fails.
- At least a 10-minute interval of separation between the twice quick configuration

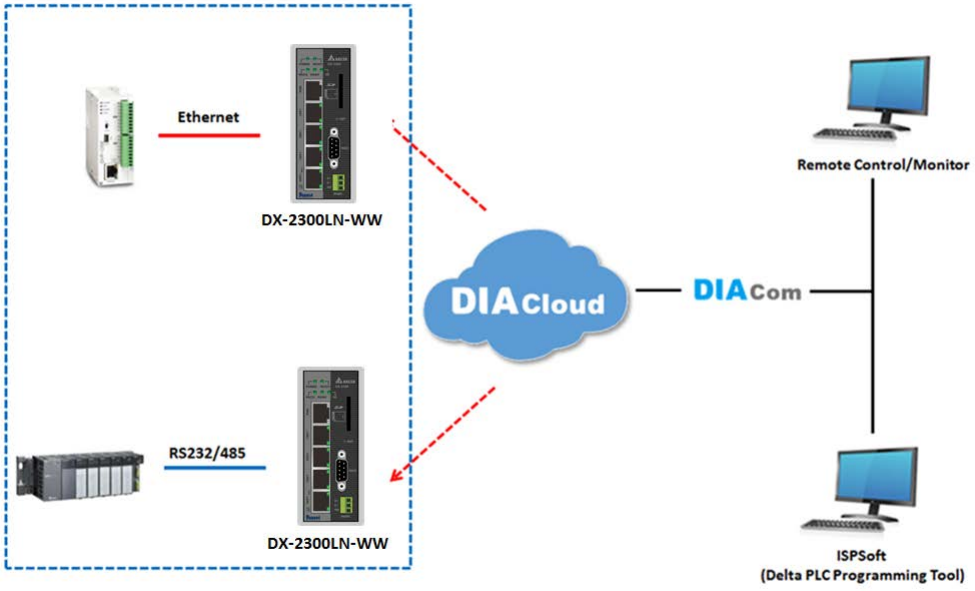
4

Chapter 4 DIACom

Table of Contents

4.1 Introduction to DIACom

DIACom allows you to create a secure tunnel between your PC and router, making it possible for your PC to communicate remotely with the devices connected to the router. Thus engineers can control, monitor, operate, program and diagnose the device remotely whenever there is internet connectivity.



Notice

- DIACloud provides you with cloud services, including the connected device management, secure tunnel network creation, data upload/download, and directional transmission.
- If you need to configure or monitor your controller, you will need to install programmable logic controller software, for example WPLSoft/ISPSoft for Delta PLC.

4.1.1 Select a Suitable Firmware Version

Find a suitable DIACom firmware version according to the following table below for your router.

Corresponding Table:

Device Model	Firmware Version
DX-2100	V1.3.3.0 or above
DX-2300	V1.3.3.0 or above
DX-3021	V1.5.0.0 or above

Notice

If the device firmware is lower than 1.3.3.0, please use DIACom 1.2.8.0 or lower.

4.1.2 DIACom Installation

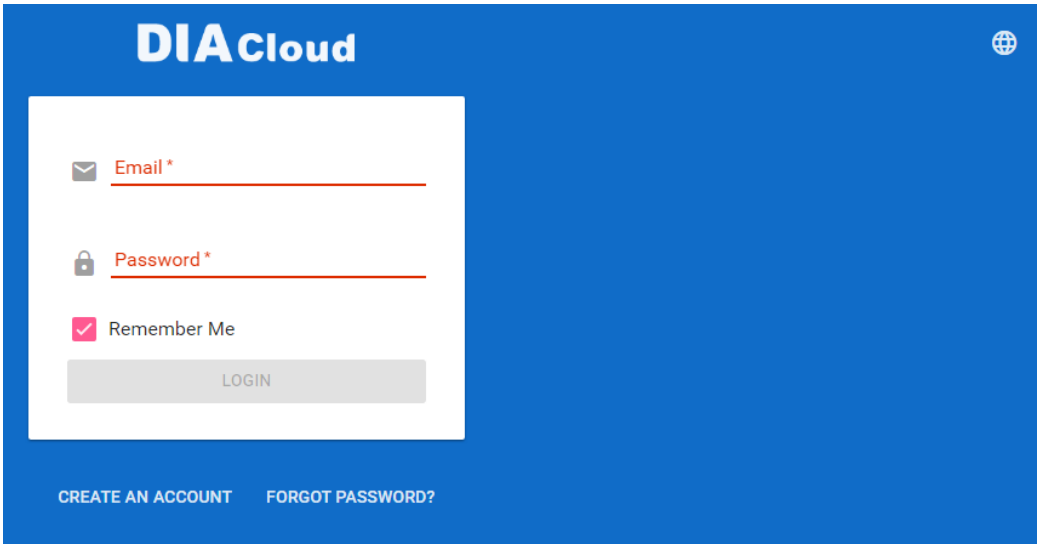
Obtain the DIACom firmware package from the official website or from our sales representative. Administrator privileges are required to run and install the package. Uninstall older versions of DIACom before downloading new DIACom firmware package.

Notice

DIACom supports Windows XP, Windows 7 (32-bit and 64-bit) and Windows 8 (32-bit and 64-bit).

4.1.3 DIACloud Account Registration

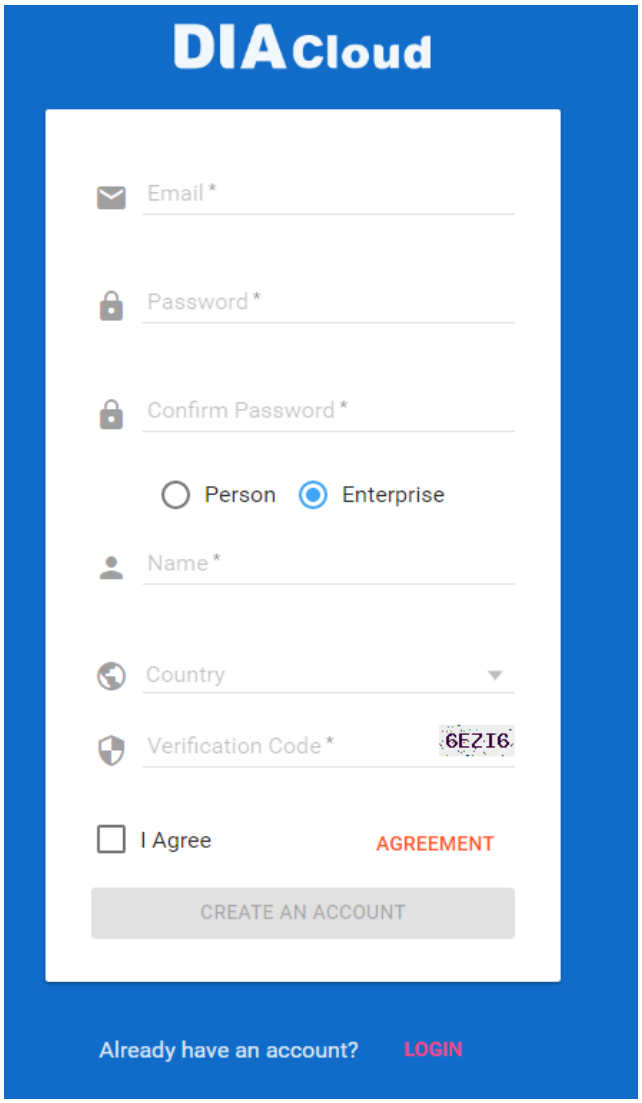
1. Before registration, you should have a valid email account. (DIACloud uses your email address as your account.)
2. Open the DIACloud web page (http://www.DIACloudSolutions.com). The system will redirect you to the registration page:



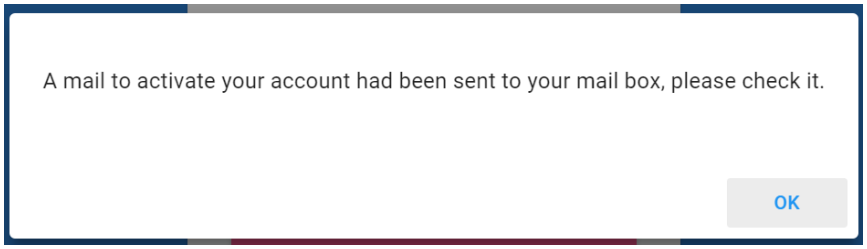
Notice

*Click at the upper right corner to change the interface language to English.

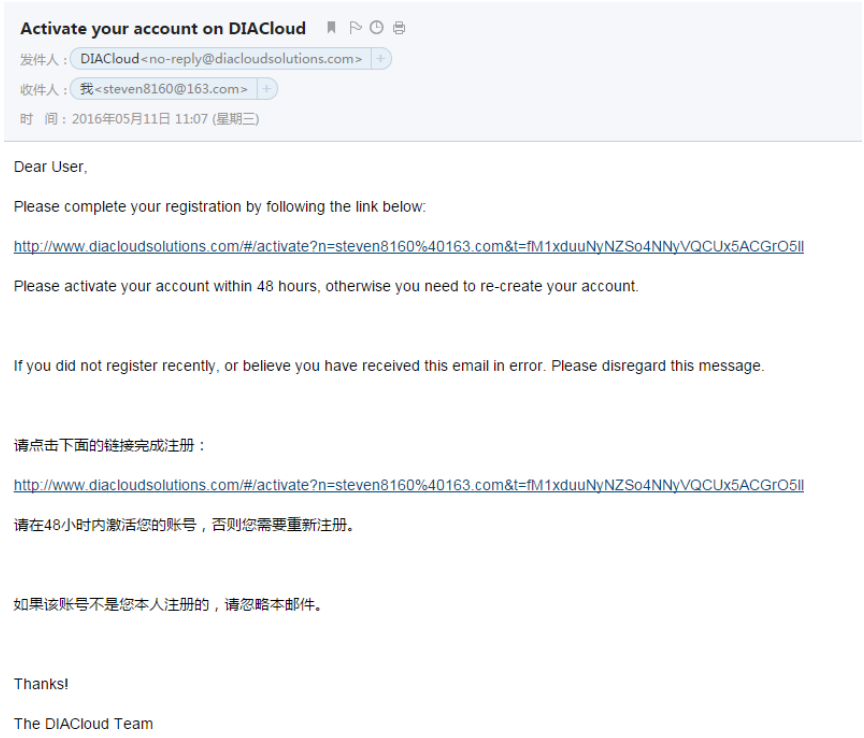
3. Input your email address, password and other relevant information on the registration page. Select “I Agree” and click “CREATE AN ACCOUNT”.



4. After clicking “CREATE AN ACCOUNT”, a congratulation page will be prompted and an activation email will be sent to the email address you have used as your DIACloud account.



5. You will find an activation email sent from no-reply@diacloudsolutions.com in your email box. Open the email, click “here” link in the email and complete DIACloud account activation operation. And you will be redirected to the DIACloud login page. Input your account and password to log in to the DIACloud.



Activate your account on DIACloud

发件人：DIACloud<no-reply@diacloudsolutions.com>

收件人：我<steven8160@163.com>

时 间：2016年05月11日 11:07 (星期三)

Dear User,

Please complete your registration by following the link below:

http://www.diacloudsolutions.com/#/activate?n=steven8160%40163.com&t=fM1xduuNyNZSo4NNyVQCUx5ACGrO5II

Please activate your account within 48 hours, otherwise you need to re-create your account.

If you did not register recently, or believe you have received this email in error. Please disregard this message.

请点击下面的链接完成注册：

http://www.diacloudsolutions.com/#/activate?n=steven8160%40163.com&t=fM1xduuNyNZSo4NNyVQCUx5ACGrO5II

请在48小时内激活您的账号，否则您需要重新注册。

如果该账号不是您本人注册的，请忽略本邮件。

Thanks!

The DIACloud Team

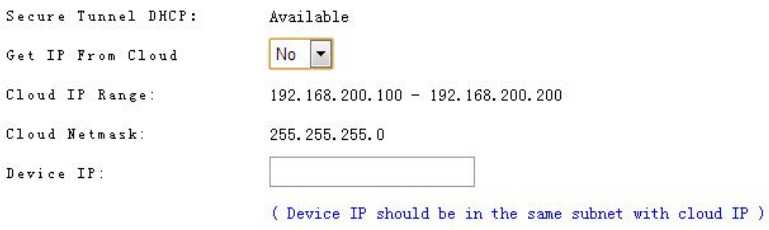
4.1.4 Bind DIACloud Account

Follow the steps blow to bind your DIACloud Account.

1. Local Network Setups: Please refer to Chapter 2.1 to 2.1.3 Web-based GUI Configuration for more information.
2. Bind DIACloud Account: Please refer to Chapter 3.5 Cloud Service for more information.

Notice

- **Secure Tunnel:** Secure tunnel is a virtual network. Users can set up several groups of secure tunnel for easier device management.
- **Device Name:** the serial number + "_" + "Mac address" of the device is the device name by default.
- **Get IP From Cloud:**
  - When selecting "Yes": The system will assign an IP address for the device according to the Secure Tunnel settings and the availability of the IP addresses. Take note of the assigned IP address, it will be used when logging to the DIACloud.
  - When selecting "No": The IP address can be manually set.



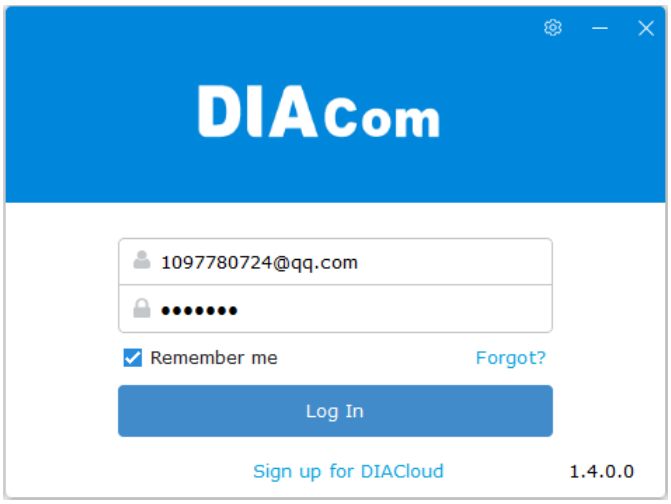
The IP address of the DX-2100 Series and the WAN of your connected PC should be in different network segments.

4.2 DIACom Operation

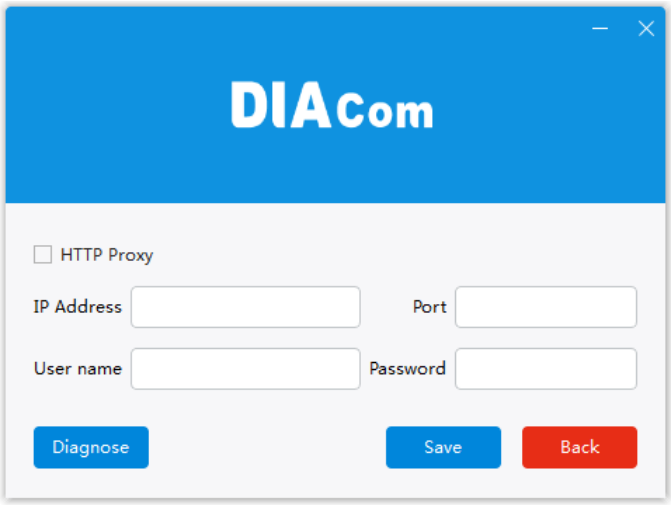
4.2.1 Setup a Secure Tunnel

Make sure there is internet connectivity, before creating a secure tunnel between your local PC and router via the DIACom. Http Proxy and Port Agent are configurable in DIACom network setting function, you can set it to avoid the possible limitation.

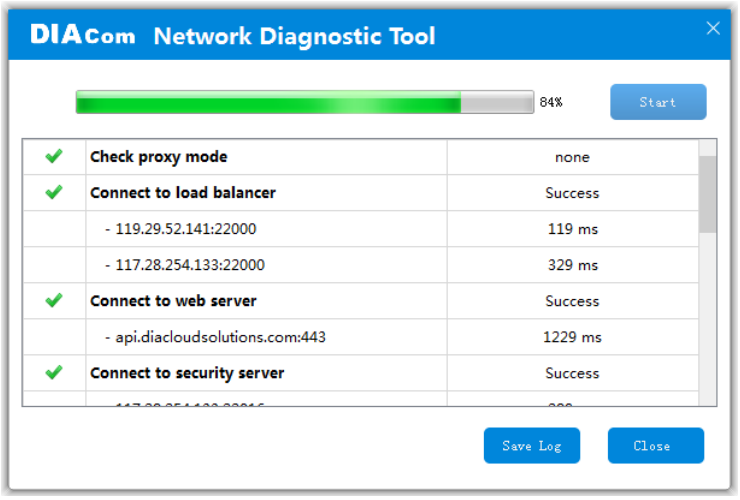
1. Run DIACom and log in with your router's cloud account.



2. Click  to go into network setting page if need be.



- **Http proxy:** Please fill in the proxy server address, port, username and password if the LAN needs to set the proxy to access the Internet. Click "Save" button to enable the config.
- **Diagnose:** The user can click the Diagnostic button to test the current internet settings, whether to connect to the DIACloud server

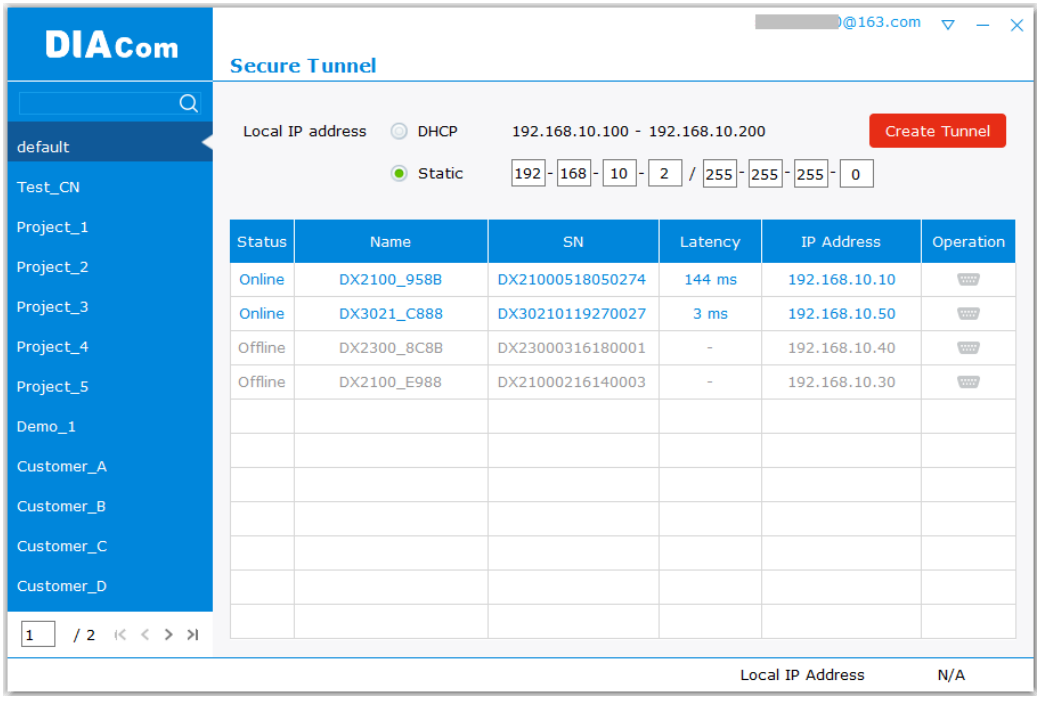


Notice

- DIACom will automatically determine whether the port agent needs to enable.
- Make sure that the external network port 80 and port 443 are opened and can access any network domains and IP addresses

3. After the login is successful, the software displays the security tunnel page. The security tunnel list is displayed on the left side of the page, and the network information of the security tunnel and the device list are displayed on the right. Users can choose to use DHCP or manually set the cloud IP address

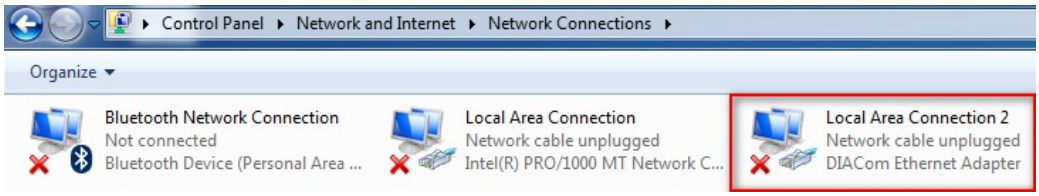
- **DHCP:** Obtain an IP address from Cloud automatically when Cloud DHCP function is available.
- **Static:** Manually set the IP address, the IP should be in the same subnet with DX device



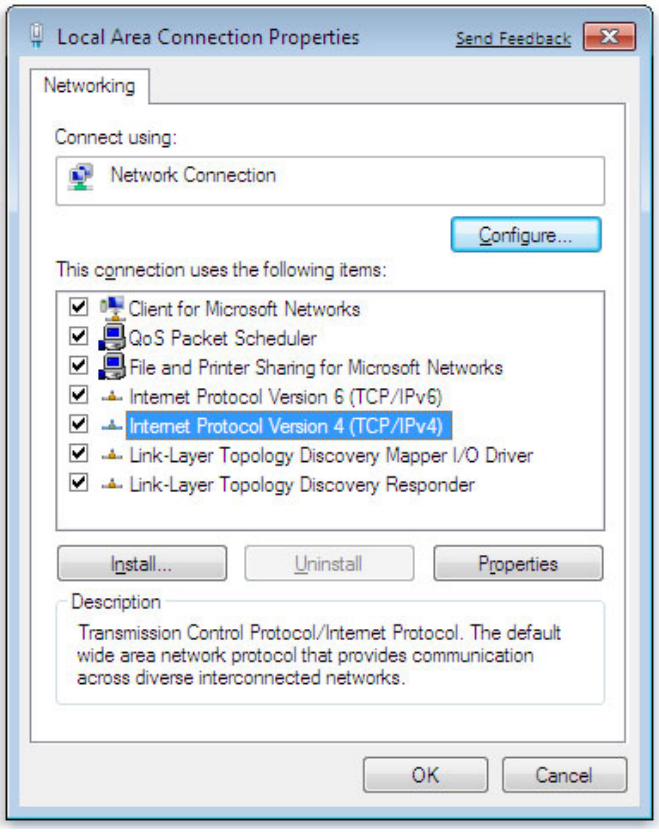
Notice

If it is found that the static IP address is configured from DIACom, the IP address of the local IP address in the bottom right corner will be different from the original setting. Please change according to the following settings.

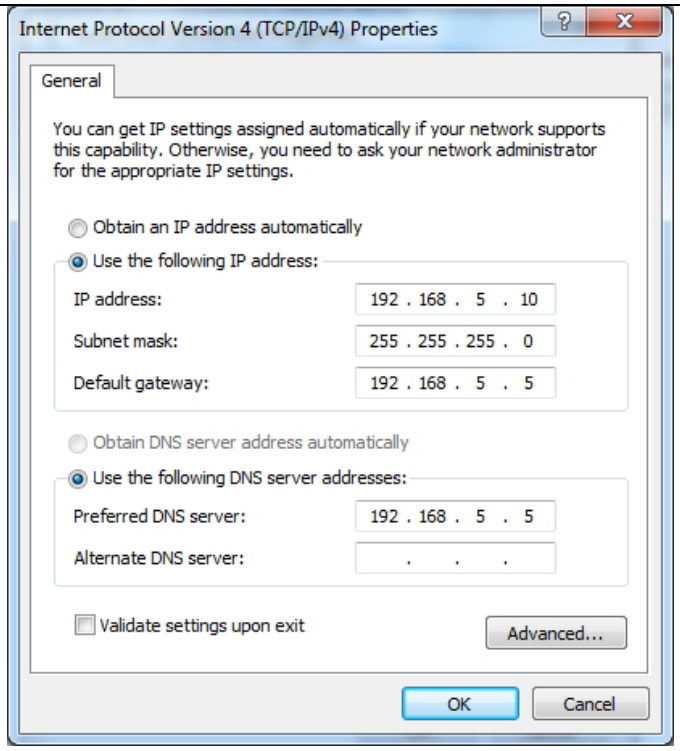
1. Go to Network and Sharing Center and click on the DIACom Ethernet Adapter for your network connection.



2. Right-click, then click Properties.
3. Click the Networking tab. Under This connection uses the following items, click either Internet Protocol Version 4 (TCP/IPv4)。



4. Set the IP address of the local computer manually. However, you'll need to make sure there are no IP conflicts.



4. After the configuration is complete, click the Create Tunnel button to establish a connection with the specified tunnel.

5. The following information is displayed: tunnel connection status, local delay to the DIACloud cloud server, and the IP address used by the local virtual network adapter. The details are as follows:

6. After successful connection with the cloud, the local computer will be able to use debugging tools or monitoring software to debug, monitor, and program the remote network interface

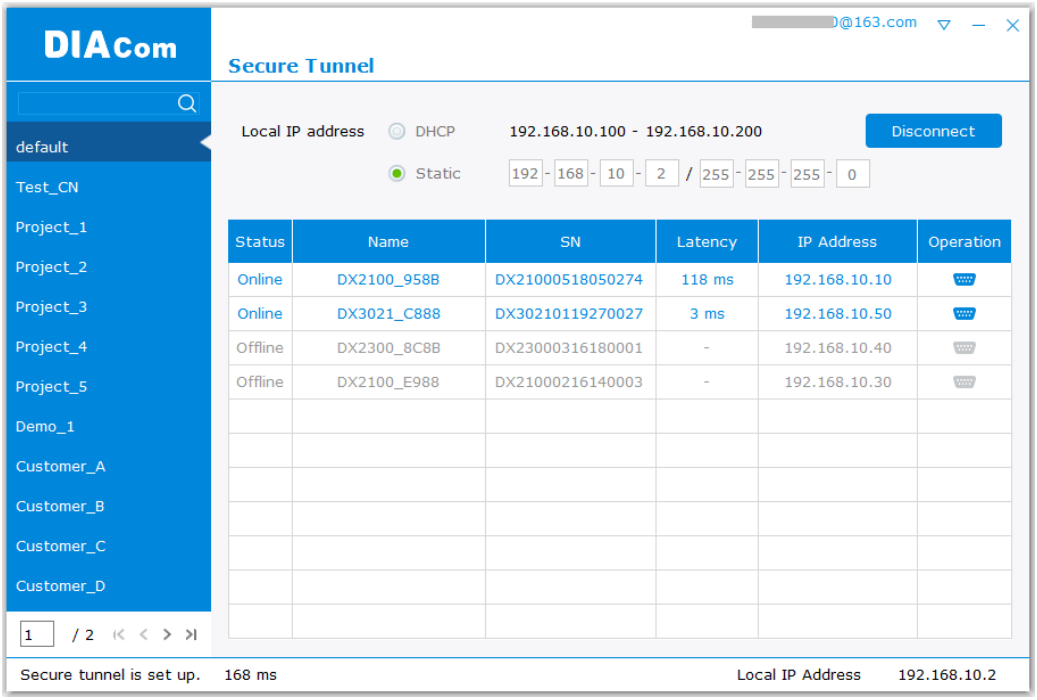
devices. In addition, you can remotely configure the router's router page (click the device in the device list Of the IP address) of the router for remote configuration.

Notice

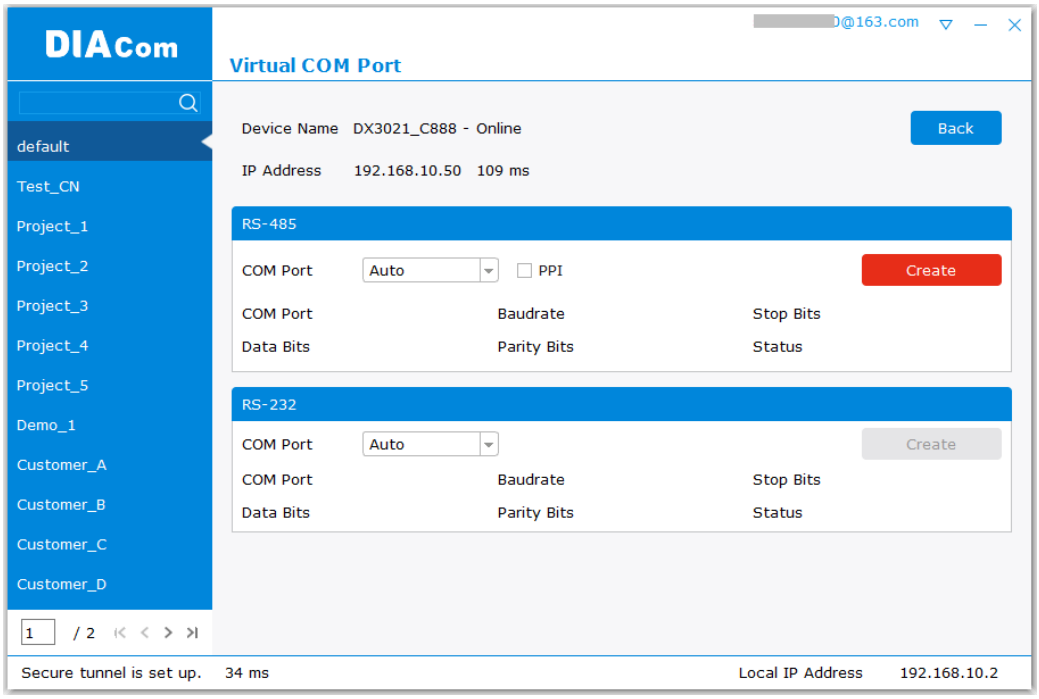
- You can create different groups of secure tunnels, divide different devices into groups according to their needs, and implement group management devices
- To avoid the virtual network card IP network segment and the local computer network card of the actual network to avoid the same network conflict
- After the secure tunnel is successfully connected, you must first disconnect the current connection to select another security tunnel,

4.2.2 Create a Virtual Serial-Port

To debug a remote serial device, click the icon at the back of the corresponding remote device to enter the Create Virtual Serial Interface



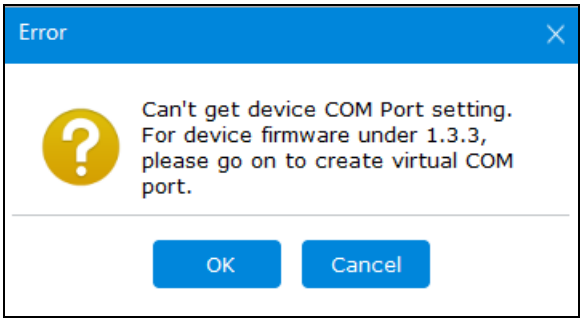
The latest device firmware (V1.3.3) supports RS-232 and RS-485 at the same time in the transparent mode, the interface as shown below:



4

Notice

- If the device's RS-232 / RS-485 is not operating in Transparent mode, the corresponding button is grayed out.
- DIACom will prompt an error message if the FW version of DX is under V1.3.3.



- When RS-232 or RS-485 works in Transparent mode, click on the [Create Serial Port] button on RS-485 to create a virtual serial port.

4.2.3 Remote Control and Monitoring via DIACom

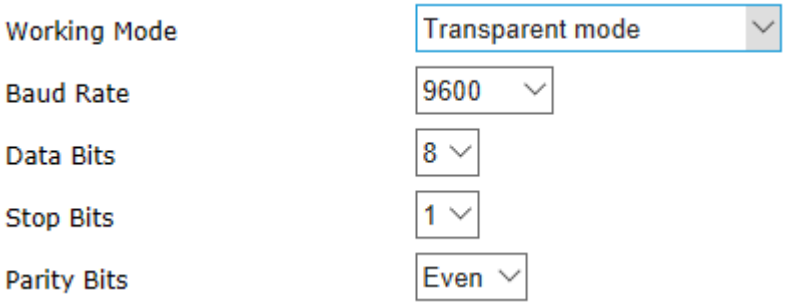
4.2.3.1 Via a LAN Port

If your router is connected to remote devices via a LAN port, you can use the configuring/monitoring software on your local computer to configure and monitor after opening a virtual tunnel. Some program would require the IP addresses of your remote device. Simply input the required information in the configuring/monitoring software and then you can configure and monitor the connected device remotely.

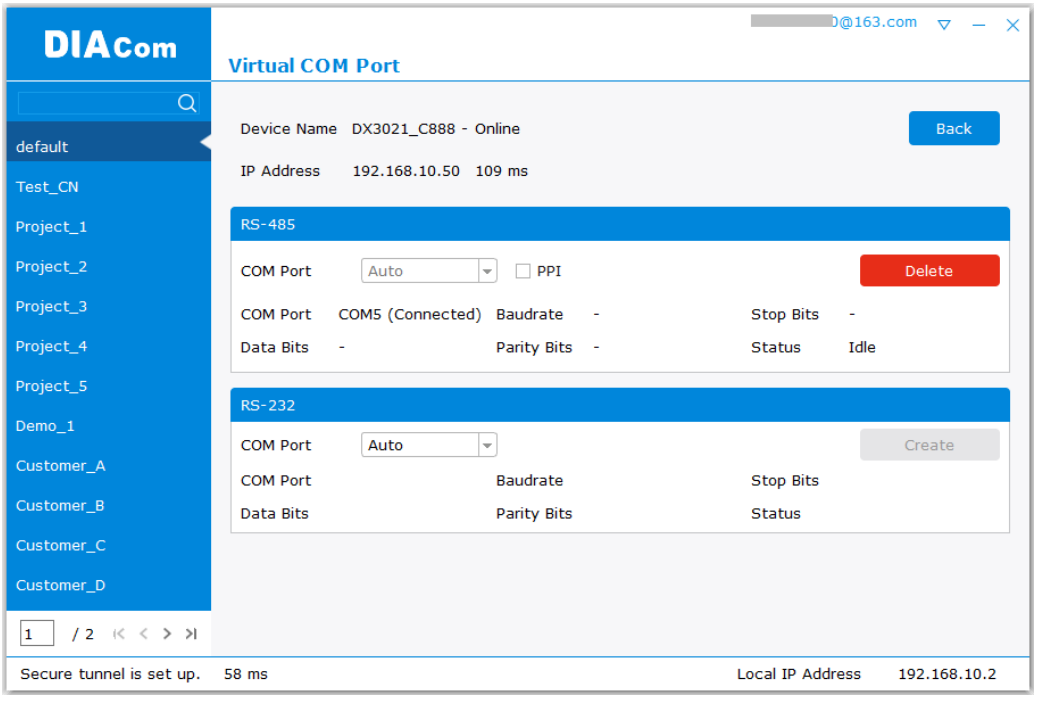
4.2.3.2 Via a RS232/RS485 Port

After opening a virtual tunnel, you will need to follow the setups below before using WPLSoft or other configuring/monitoring software on your local computer to configure and monitor the connected device remotely.

1. Click IP address in the DIACom device list or open a browser and input the IP address of the router which is connected to your remote device on the search bar and then log in.
2. Go to the System setup page, select the setup option RS232 or RS485 and input the required information to set up. Make sure the parameters are consistent with your remote device.
   - Working Mode：Transparent mode
   - Parameters of COM (Baud Rate, Data Bits, Stop Bits, Parity Bits, Flow Control)



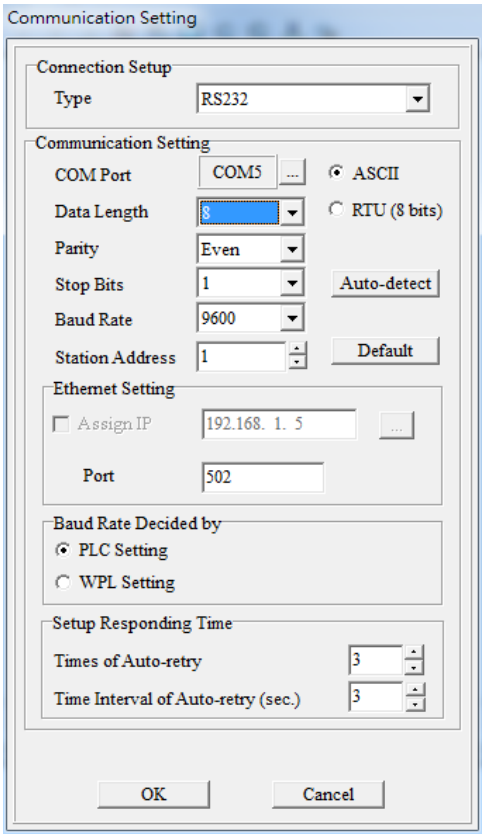
3. Go back to the DIACom and click  to create a virtual tunnel. Once the creation is done, the virtual serial-port number will show up on the same page. Users can use it to configure and monitor the connected device remotely. Click “Delete” to delete the virtual serial-port.



Notice

If the PLC is Siemens S7-200, you can select the “PPI” in the DIACom to support PPI protocol.

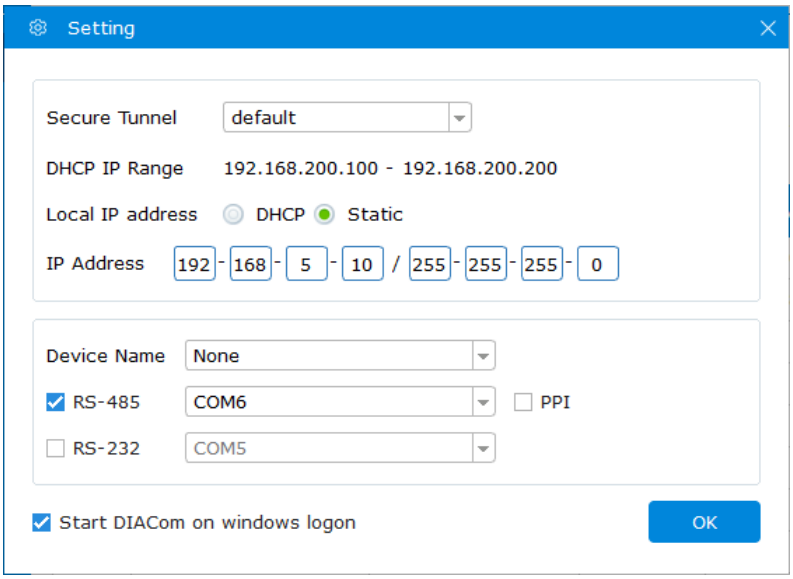
4. Open the WPLSoft to check if the COM parameters are consistent with the settings on your router. When these parameters are consistent, you can use the WPLSoft to configure/monitor your device remotely.



4.2.4 Automation Startup

The user can set Automation Startup for DIACOM, The setting steps see blow.

1. Login to DIACom.
2. Click on the icon button ▽ in the upper right corner of the windows, and select "Settings".
3. Boot automatically log in the required configuration is as follows. Users can set according to your needs. If you only need DIACom to connect the security tunnel automatically, the device list, RS-485 and RS-232 do not need to be set.



4. Check " Start DIACom on windows logon ", and click "OK" button to save the settings.

Notice

- Login must be checked "remember password", otherwise DIACom can not be activated automatically
- Confirm that the IP / Serial Port settings do not cause conflicts

5

Chapter 5 DIACloud

Table of Contents

5.1 Introduction to DIACloud

DIACloud Web is a web portal of DIACloud cloud platform. Users can check the status of connected industrial device through DIACloud Web, browse data that has been collected, receive warnings, notices and other messages that are sent by cloud platform, create and manage sub-account and virtual safety network and check login and interface logging, to improve the manageability of devices, optimize the device performance and efficiency, save the operation cost and enhance the service quality.

5.1.1 Select a Suitable Firmware Version

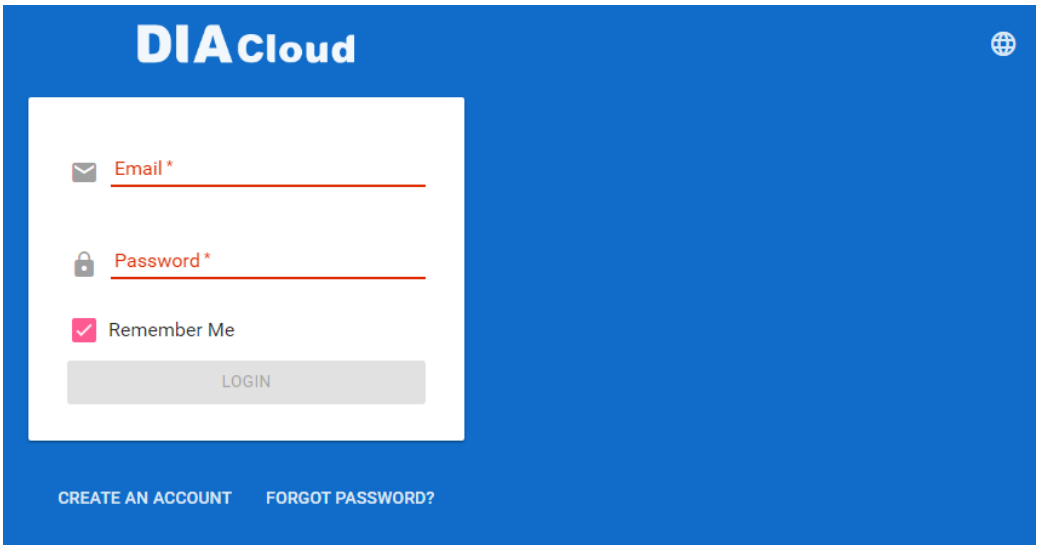
Please confirm that your Firmware version of router meets the requirements in the following table before use:

Device Model	Firmware Version
DX-2100	V1.3.0.1 or above
DX-2300	V1.0.0.1 or above

5.2 Instructions for DIACloud

5.2.1 Register and Login

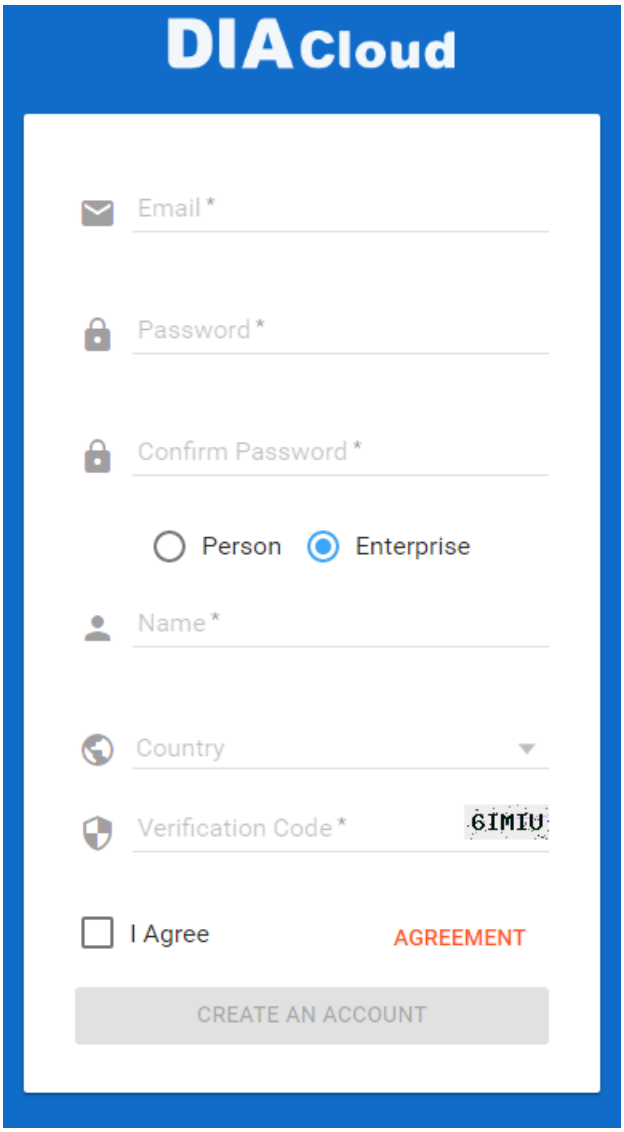
1. Open the DIACloud web page (http://www.DIACloudSolutions.com). If you have got an account, input your account and password in the following page to log in; if you have not got an account, click “CREAT AN COUNT” to register. Then the system will redirect you to the registration page:



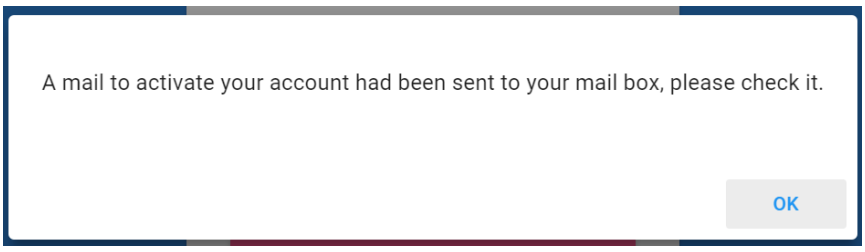
2. Input your email address, password and other relevant information on the registration page. Select “I Agree” and click “CREATE AN ACCOUNT”. Pls insure your region information is correct, otherwise it maybe cause problem in payment when you extend your service.

Notice

Click  at the upper right corner to change the interface language to English or Chinese.



3. After clicking “CREATE AN ACCOUNT”, a congratulation page will be prompted and an activation email will be sent to the email address you have used as your DIACloud account.



4. You will find an activation email sent from no-reply@DIACloudSolutions.com in your email box. Open the email, click “here” link in the email and complete DIACloud account activation operation. And you will be redirected to the DIACloud login page. Input your account and password to log in to the DIACloud.

Activate your account on DIACloud

发件人：DIACloud<no-reply@diacloudsolutions.com>

收件人：我<steven8160@163.com>

时　间：2016年05月11日 11:07 (星期三)

Dear User,

Please complete your registration by following the link below:

http://www.diacloudsolutions.com/#/activate?n=steven8160%40163.com&t=fM1xduuNyNZSo4NNyVQCUx5ACGrO5ll

Please activate your account within 48 hours, otherwise you need to re-create your account.

If you did not register recently, or believe you have received this email in error. Please disregard this message.

请点击下面的链接完成注册：

http://www.diacloudsolutions.com/#/activate?n=steven8160%40163.com&t=fM1xduuNyNZSo4NNyVQCUx5ACGrO5ll

请在48小时内激活您的账号，否则您需要重新注册。

如果该账号不是您本人注册的，请忽略本邮件。

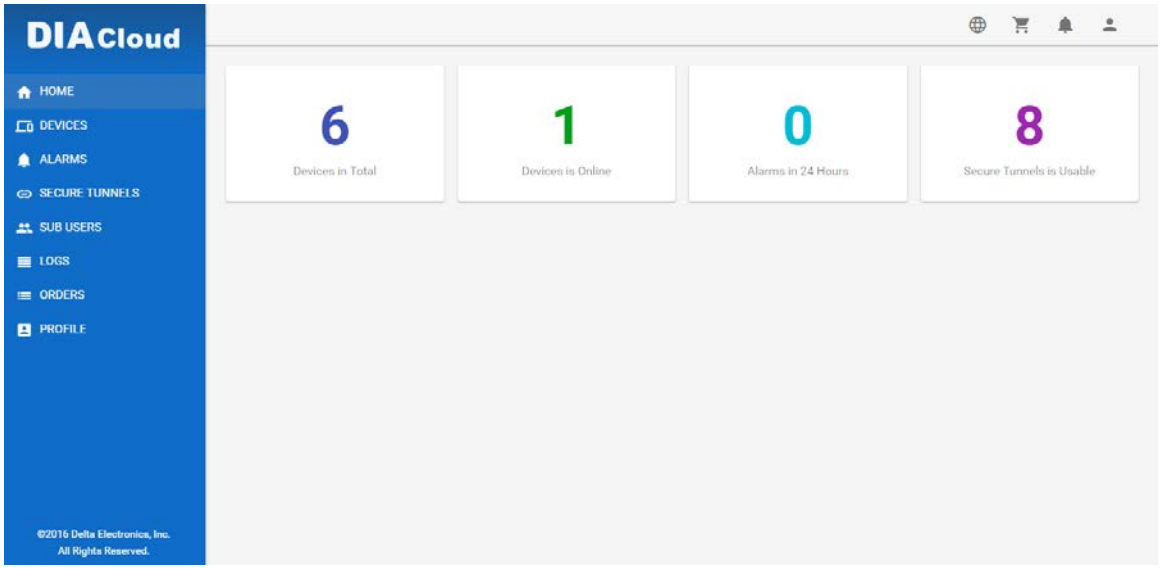
Thanks!

The DIACloud Team

5. Open the DIACloud web page (http://www.DIACloudSolutions.com). Log in using your account that you have registered.

5.2.2 Home

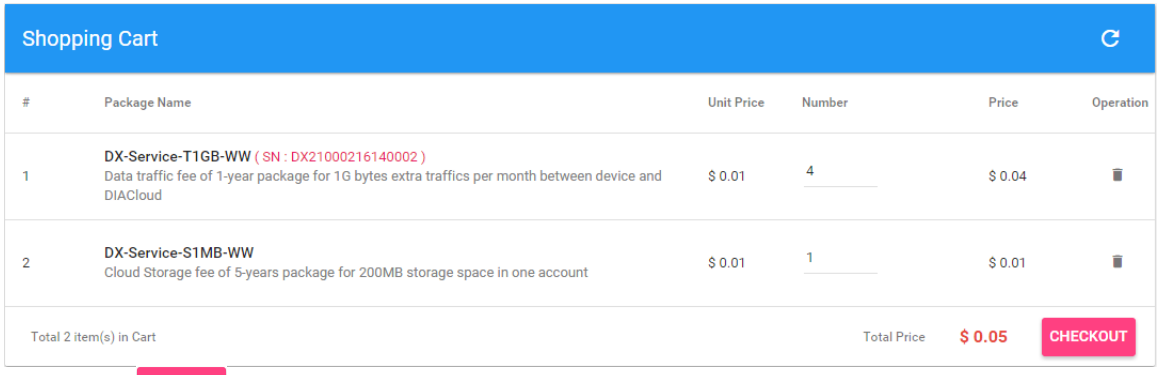
The Home Page will show up after login.



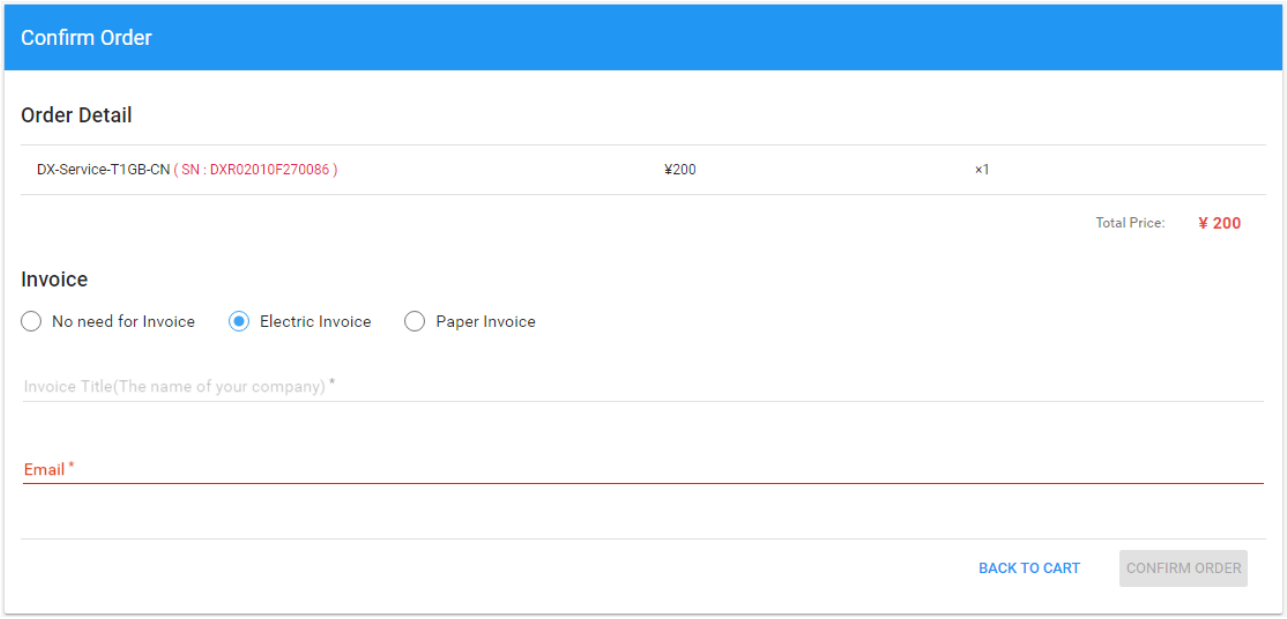
Item	Description
Menu	User can switch to corresponding function through menu on the left.
Devices Total	The number of total devices
Devices is Online	The number of total online devices
Alarms in 24 Hours	The number of alarms in Recently 24 hours
Secure Tunnel is Usable	It will show the number of Secure Tunnel groups under the account.
	Switching among the Chinese and English
	Show the service package you selected, user can add packeage to shopping cart through Devices function and Profile function.
	Show the alarm message(s) in latest 7 days
	Show the profile or logout

Online payment process as below:

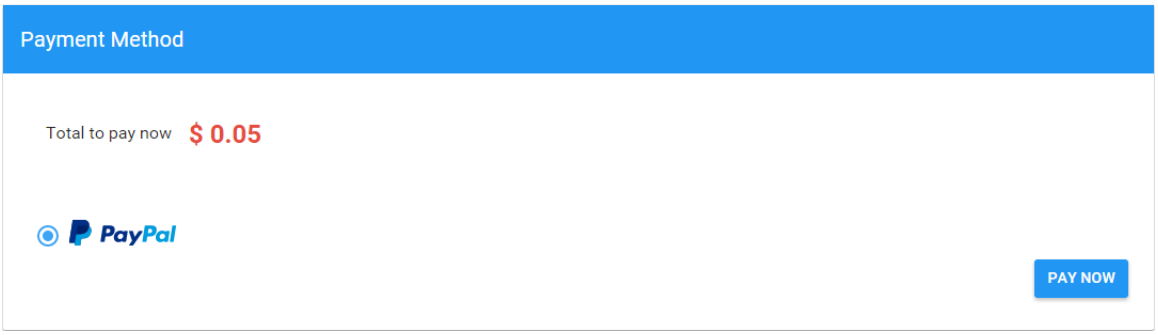
1. After click  , it will show the detail information in shopping cart.



2. Click CHECKOUT to generate an order. DIACloud provides the follow types of invoices.
   - No need For Invoice
   - Electric Invoice
   - Paper Invoice

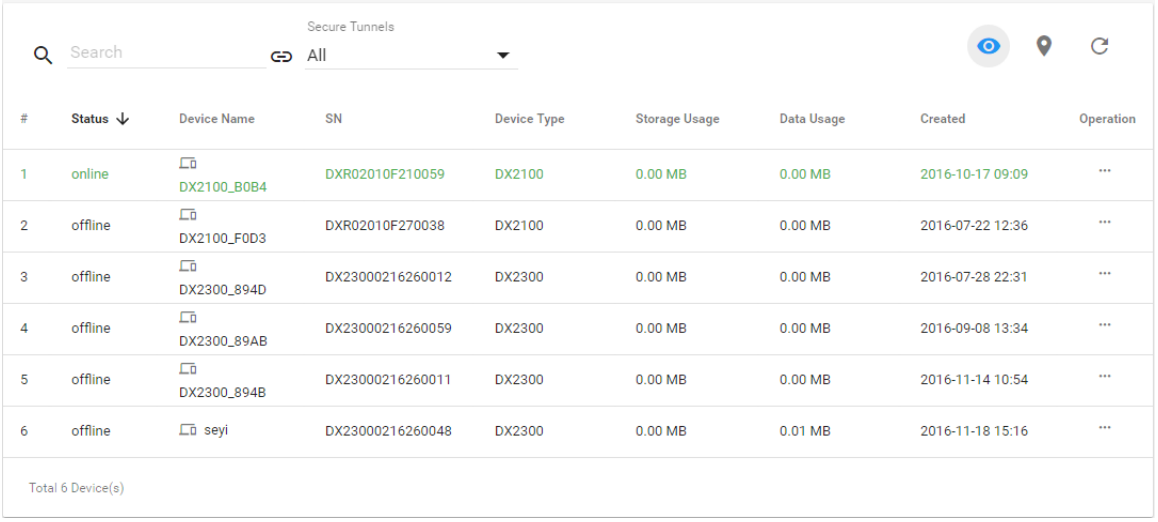


3. Click CONFIRM ORDER, we accept PayPal payments and process credit cards on your order forms.



5.2.3 Devices

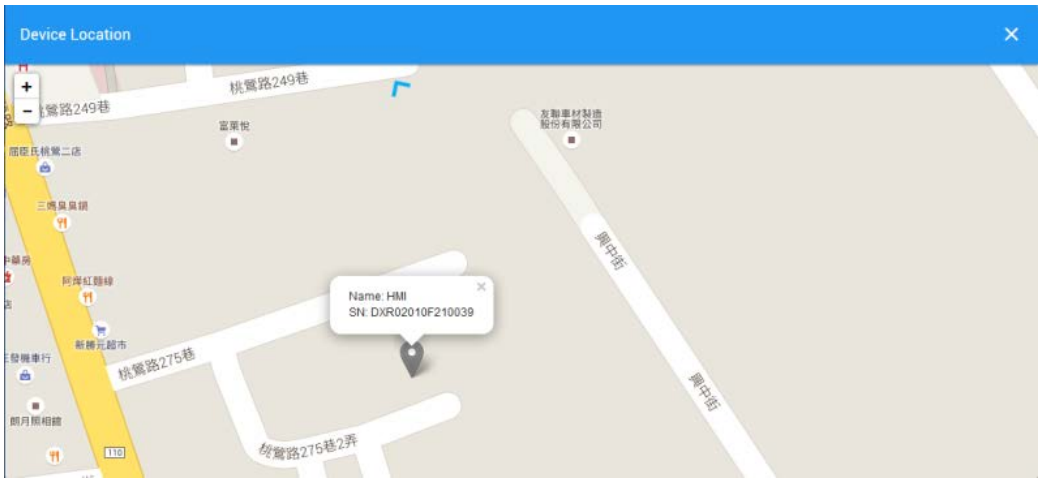
It will switch to page of device list after clicking “Devices” in navigation bar.



Item	Description
Search	You can filter the device base on you input the key word of the device name.

All	Filter base on tunnel group, show all devices or only show the devices under user specified tunnel group.
Devices List	Show the list of device.The information include device's name, device's SN, device's type, storage usage, data usage, the time of binding device. • Green represents that the device is on-line • Gray represents the device is off-line.
	• : Represents that all device is displayed currently, and you can switch to on-line device list after clicking this icon. • : Represents that on-line device is displayed currently, and you can switch to list of on-line device after clicking this icon.
	Show relevant position information of device.
	Refresh pages
...	Show detail information of the device

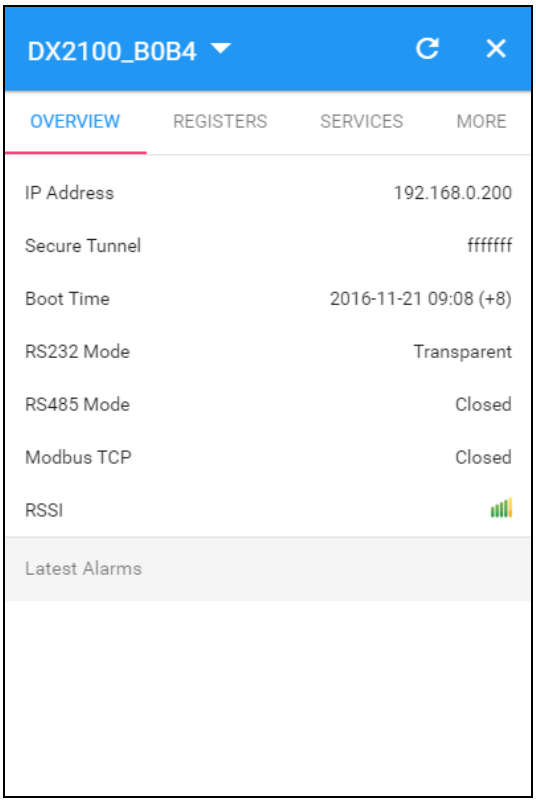
- : It will show relevant position information of device after you click "" , which is shown as follows:



It will show the device name and SN of the device after clicking position icon in the map. When there is large number of device of user, it will switch to corresponding device when user clicks blue arrows at the edge of the map.

- ... : More detail information about device will be shown after clicking ... under the "Operation" at the most right side of device list:

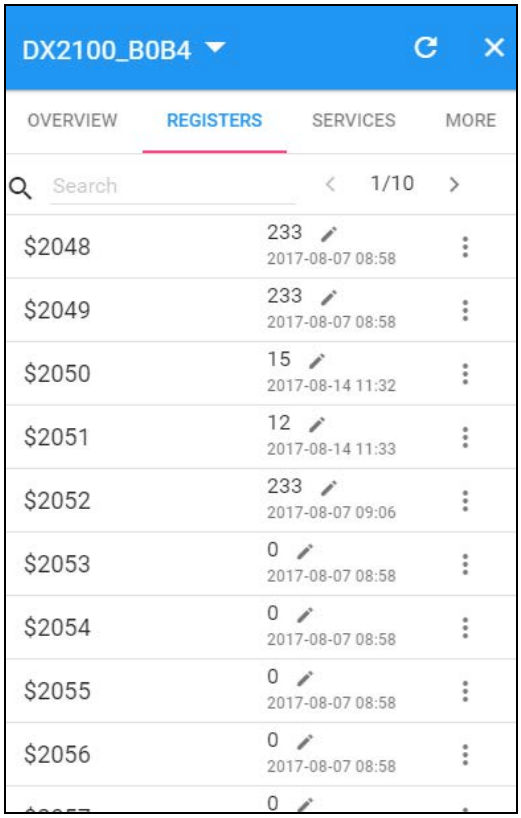
1. **OVERVIEW:** The page will show the basic information of the device and latest alarm message.



Item	Description
Operation zone of device	It represents that device is on-line if background color is blue, and device is off-line if it is gray. • DX2100_B0B4 : Show device names; it can switch device after clicking the drop down arrow. • : Realize refresh of device data on operation page. • : Close the operation page.
Page switching	Operation is divided into 4 pages: • Overview • Registers • Package • More Different buttons are used to switch different pagers.
Basic information zone	Basic information is shown in Overview page. • **IP Address:** it means the IP that has been bound for device; • **Tunnel Network:** it means virtual network that has been bound to device; • **Boot Time:** it means the boot time of device; • **RS232 Mode:** work modes of RS232, including transparent transmission mode and slave station mode; • **RS485** Mode: work modes of RS 485, including transparent transmission mode, slave station mode and master station mode; • **Modbus TCP:** work modes of Modbus TCP, including Modbus TCP Server，

	Modbus TCP Client and Closed • **RSSI:** it means signal strength of device which contains 5 bars; the larger the number of green bars is, the stronger the signal strength is;
Latest Alarms	The latest five Alarm of the current device. "✉" represents the state that the email is being sent; • **Green** represents that the email has been sent successfully • **Red** represents failure of sending.

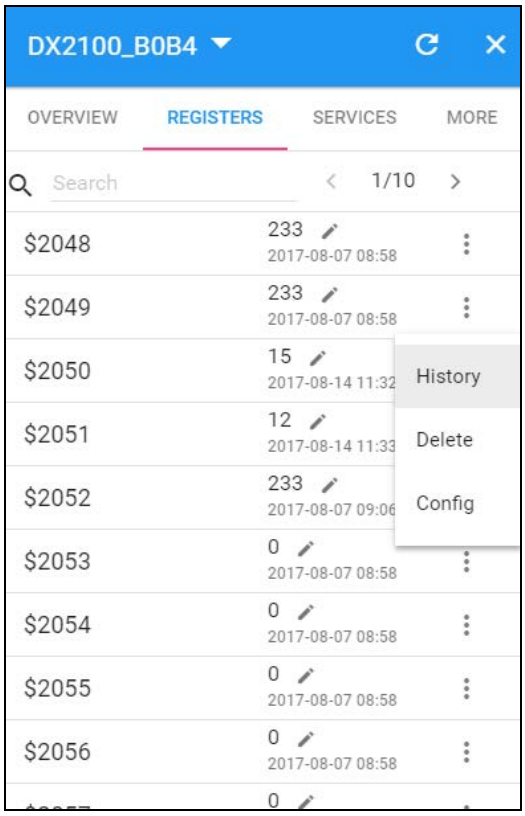
2. **REGISTER:** The page will show and manage register value that uploaded from DX production.



Item	Description
Search	The filtering function displays a list of keywords that match specific register.
✎	Click ✎ and add the corresponding register and register value, then click "SAVE" button. DIACloud server will send the corresponding data to the device.
< 1/205 >	"<" Pervious page · ">" Next page · "1/205" show the current page of register table and the total amount of register table page.
Register Table	Show the register table, registers show a maximum of 10 posts per page.
Register Name	Show the register name, when you do not make an alias configuration in the register, the register number is displayed; an alias configuration in the register will be displayed after you configure the alias

Register Value	Show the current register value and data transfer time.
⋮	You can view the current register of historical data or delete the current register; it can also be configured register. P.S. If this register is not set to remeber history (device configuration page), the menu does not appear [History] after clicking ⋮ icon.

The History and Config options will be shown after clicking ⋮

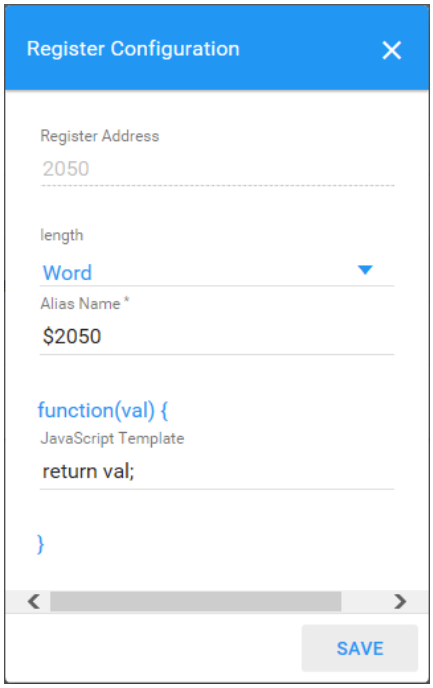


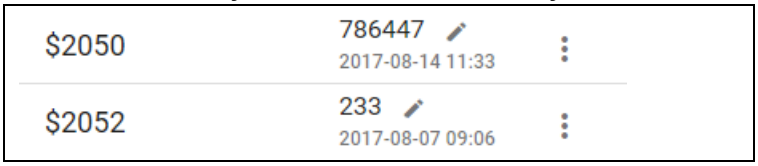
Item	Description
History	It represents trend chart of historical data
Delete	User can delete the all data of this register
Config	User can customize name of register and content returned.

- **History :** The following figure will be shown after clicking “History”:

Item	Description
Date Start	Set the Date Stare and query the historical data for a specific time
Date End	Set the Date End and query the historical data for a specific time
Register Value History Diagram	The latest trend chart of value of register;
Time Axis	User can change time scope of historical data by sliding “ ”.
	Export the data to XLS.file.

- **Config :** The following information will be shown after clicking “Config”



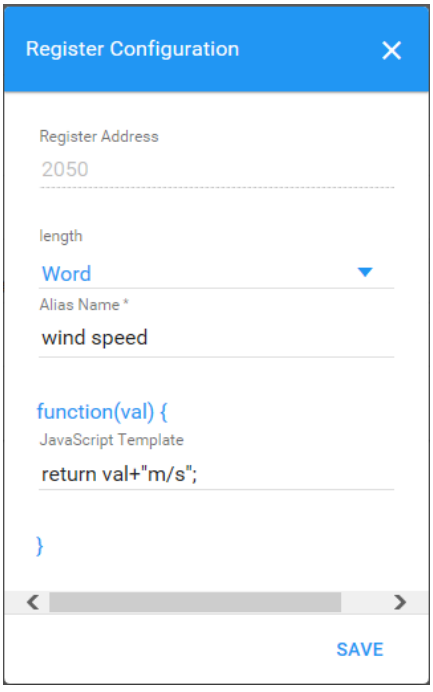
Item	Description
Length	Length can be set to Word, DWord and Float. • **DWord:** DWord needs to use two DX internal registers. For example: $2050 and $2051 are set to DWord and it will combin to $2050, $2050 will be **LOW Byte** and $2051 will be **HIGH Byte.**  • **Float:** Float needs to use two DX internal registers. For example: $2050 and $2051 are set to DWord and it will combin to $2050, $2050 will be **LOW Byte** and $2051 will be **HIGH Byte.**
Alias Name	The user can set the name of the register to be displayed in the "Alias Name"
function(val)	function(val) is used for convert the register value, and the grammar of function-supported JavaScript is similar.

5

There are two examples for “function (val)”.

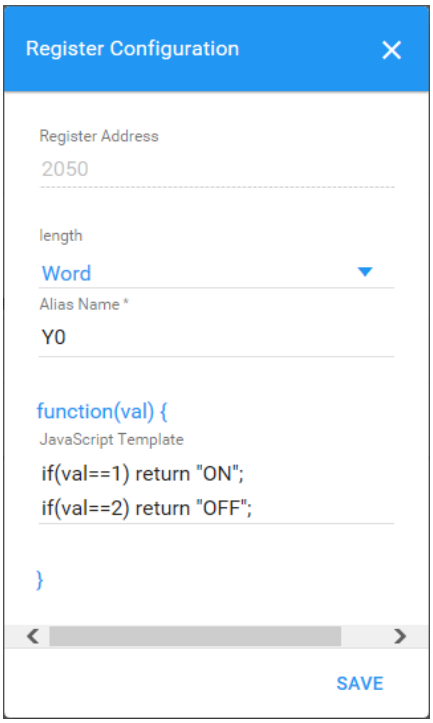
- **Example 1** : If you want to show the wind speed as 10m/s. (Data +unit, such as: speed 10m/s).

  Input the code: **return val+“m/s”** in function (val){…} as the following picture and save the configuration.

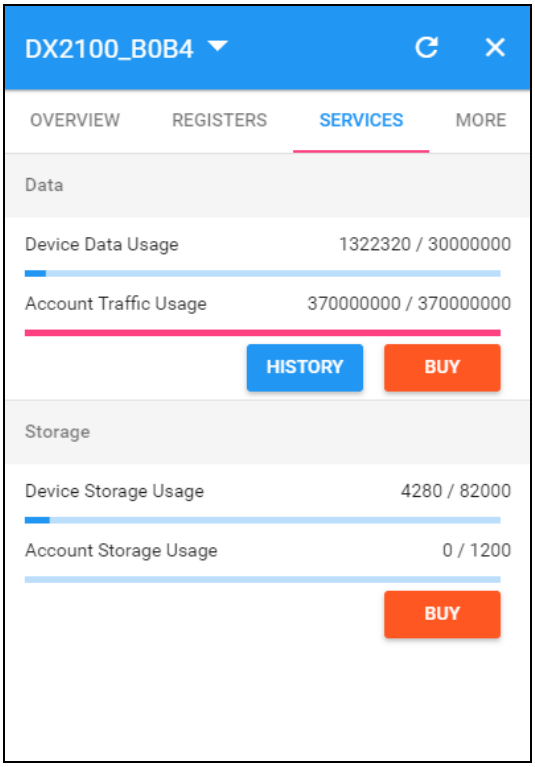


- **Example 2**: If you want to convert the register value to the text such as the register value of 1 shows the text as ‘NO’; register value of 2 shows the text as ‘OFF’

  Input the code in function (val) {…} as the following picture and Click “Save” botton.



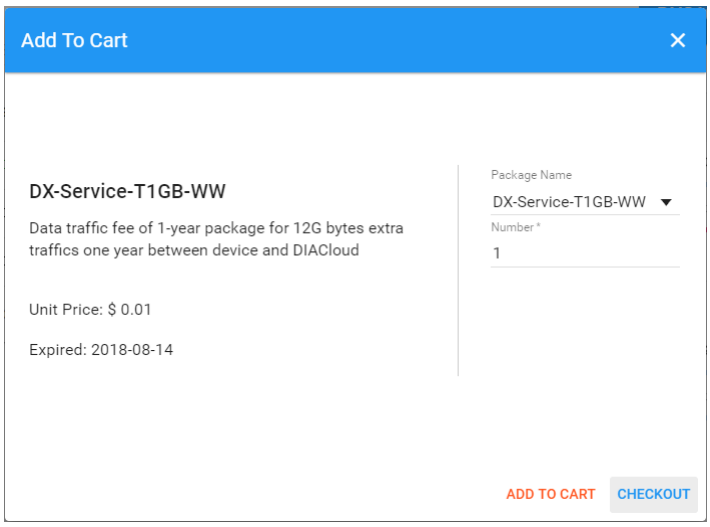
3. **SERVICES:** This page shows the Device Data Usage, Device Storage Usage and Account Storage Usage for users.



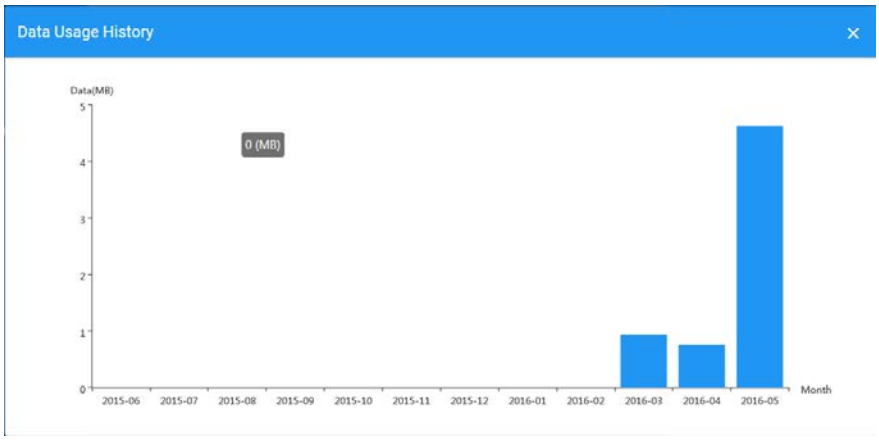
Item	Description
Data	• **Device Data Usage:** Show device traffic usage till now and total capacity. • **Account Traffic Usage:** 1. Account traffic is the total amount of traffic showing additional purchases. 2. Account traffic can be shared with all devices under your account. 3. Before the device traffic is exhausted clould traffic, the account traffic will not be used. • BUY: User can purchase more traffic package for this accoount if need. After successful payment, the moment is ready for use. • HISTORY: Show the Data Usage History in past 12 months.
Storage	• **Device Storage Usage:** Show device storage usage till now and total capacity • **Account Storage Usage:** 1. Account storage is the total amount of traffic showing additional purchases. 2. Account storage can be shared with all devices under your account. 3. Before the device storage is exhausted strorage space, the account storage will not be used.

	• BUY: User can purchase more traffic package for this accoount if need. After successful payment, the moment is ready for use.

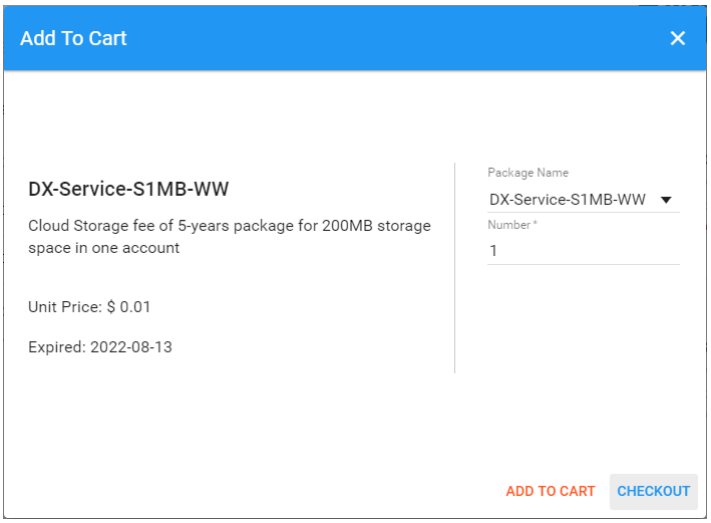
- After Click the BUY in Data field, it will show the traffic package select page. User can add a package to cart or pay it direct.



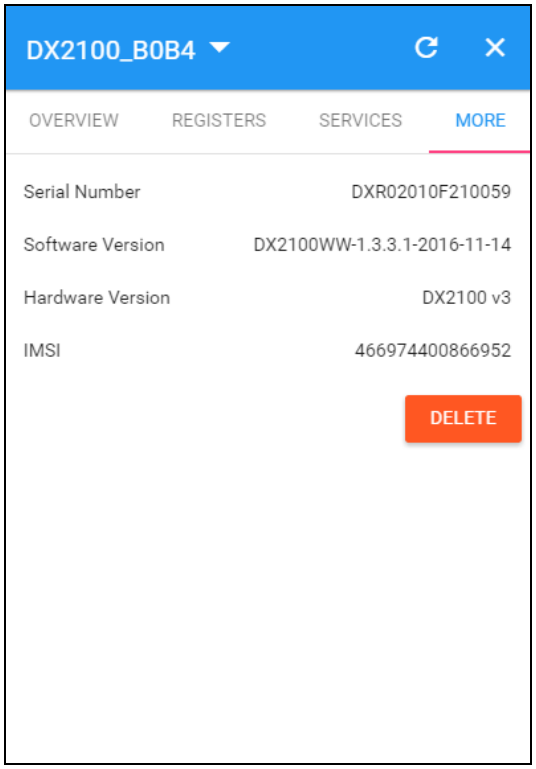
- After Click the HISTORY, it will show the Data Usage History in past 12 months.



- After Click the BUY in Storage field, it will show the storage package select page. User can add a package to cart or pay it direct.



4. **MORE:** This page will show the Serial Number, Software Version, Hardware Version, and IMEI for users.

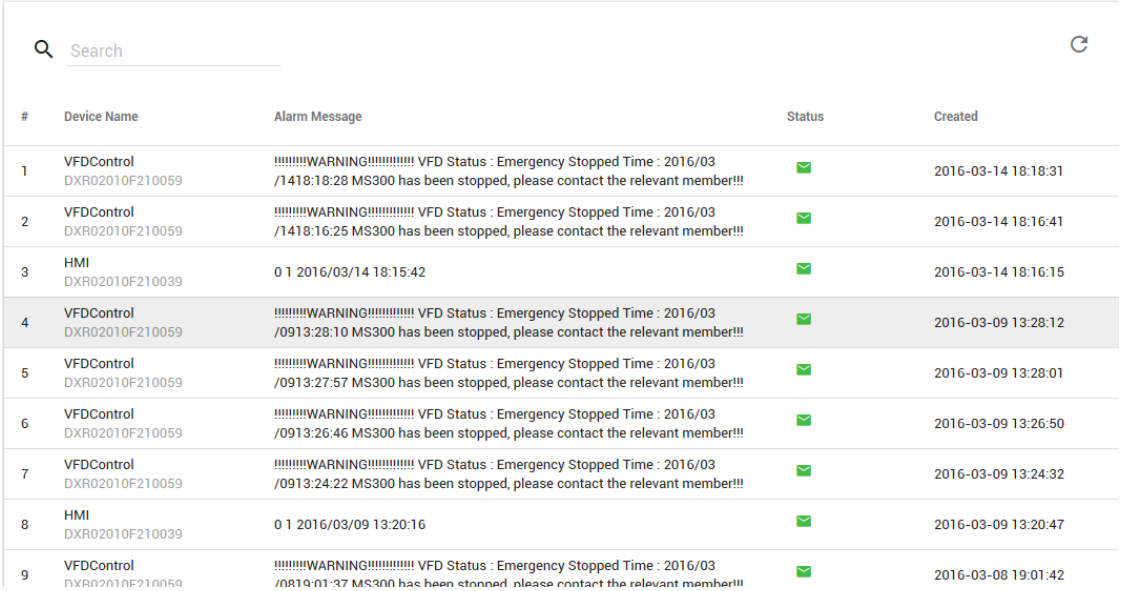


Item	Description
Serial Number	Serial number of device
Software Version	Version information of software
Hardware Version	Version information of hardware
IMSI	International Mobile Subscriber Identification Number.
DELETE	Delete binding relationship between device and the account. Device needs to be un-bund after clicking this button, and user can

	recover the device by rebinding.

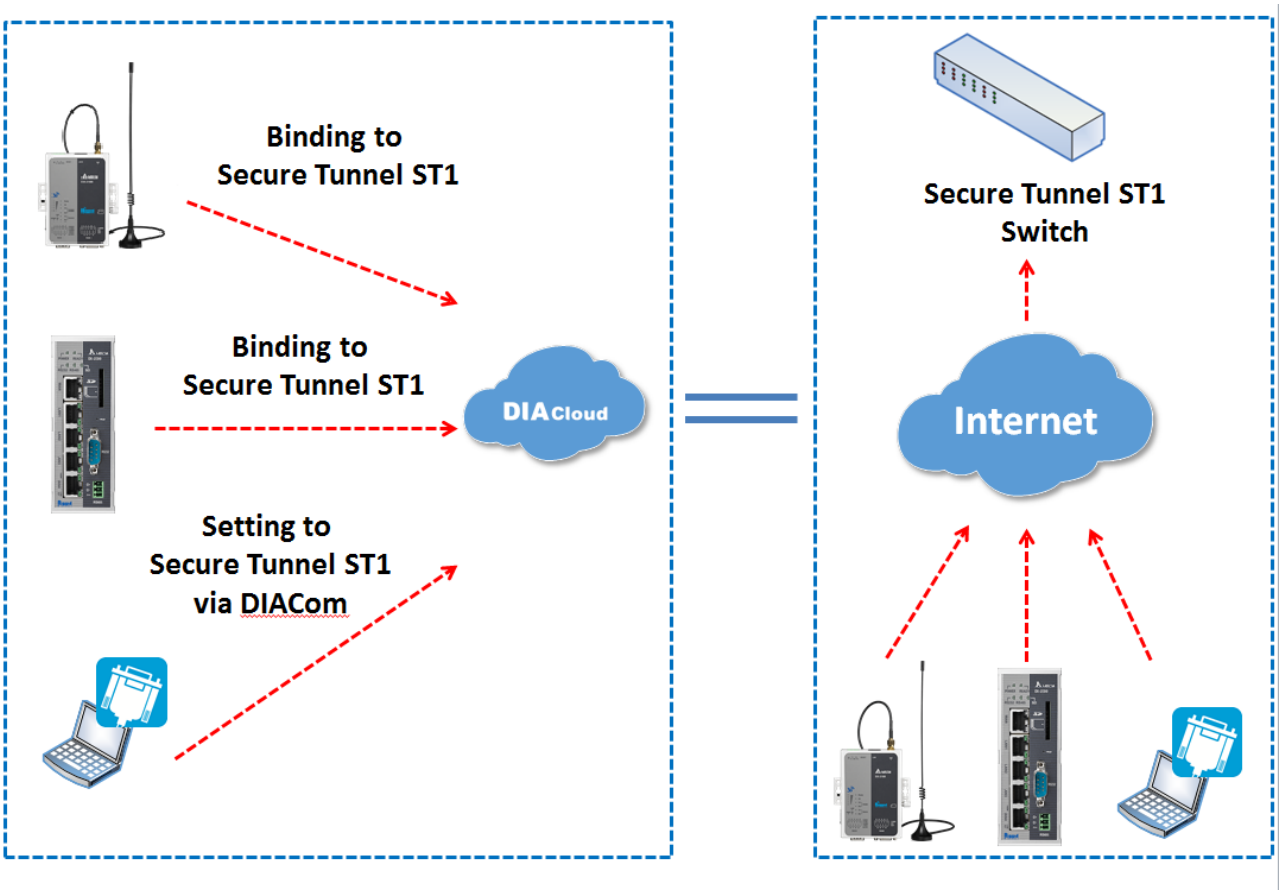
5.2.4 Alarm

Click the Alarm in the left menu. The warning information in the latest 7 days will be shown in this page. The warning information includes name and serial number of device, content of warning, status of email that is being sent (green" " represents that the email has been sent successfully, and red represents fail.), time of warning and content record of warning.



5.2.5 Secure Tunnels

Secure Tunnel is an important concept in DIACloud. Its objective is to realize virtual Switch across Internet; when device is bound to this network, it will be equivalent to adding device with one LAN port; when PC operates DIACom and creates a virtual network, PC and the device will be under the same switch at this time. It is shown as follows



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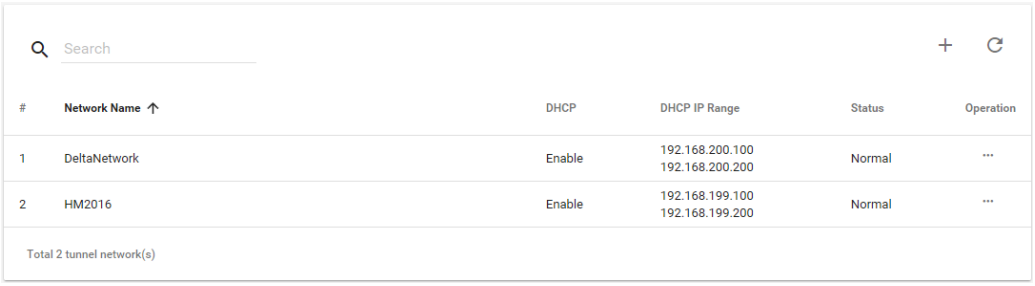
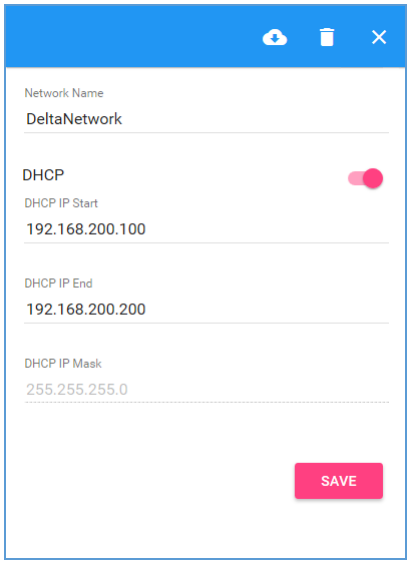
Users can manager the tunnel network in this page. Interface is shown as follows:



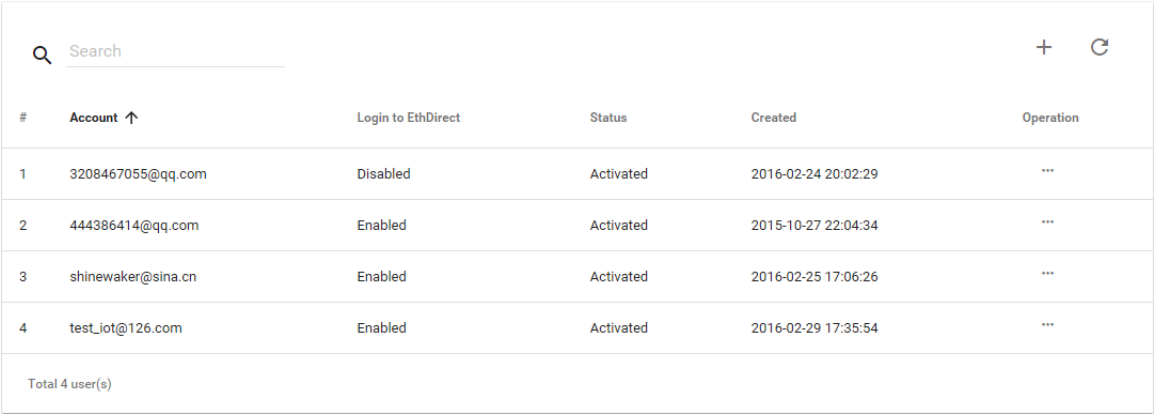
tem	Description
Search	Search the existed tunnel network
Tunnel network List	List all tunnel network under this account
+	Add a new tunnel network
↻	Refresh the tunnel network list
···	Edit the tunnel network



Item	Description
Tunnel Network Information	The detail information of tunnel network: • **Network Name:** User can enter a name of tunnel network. • **DHCP Option:** Automatic IP Address Assignment by DIACloud. • **DHCP IP Start:** it represents the beginning IP in automatic IP distribution address pool of DIACloud • **DHCP IP End:** it represents the ending IP in automatic IP distribution address pool of DIACloud.
	If the DHCP of thes tunnel network is enabled, click  will export configurations include DIACloud Servier /account /Tunnel networks info to a file (default file name Provision_vlnname_date_time.bin). Note: Detail configuration, please refer to **3.2 SD Card Quick Installation.**
	Delete the current tunnel network
	Close the current operation window.
	Save the configuration of tunnel network

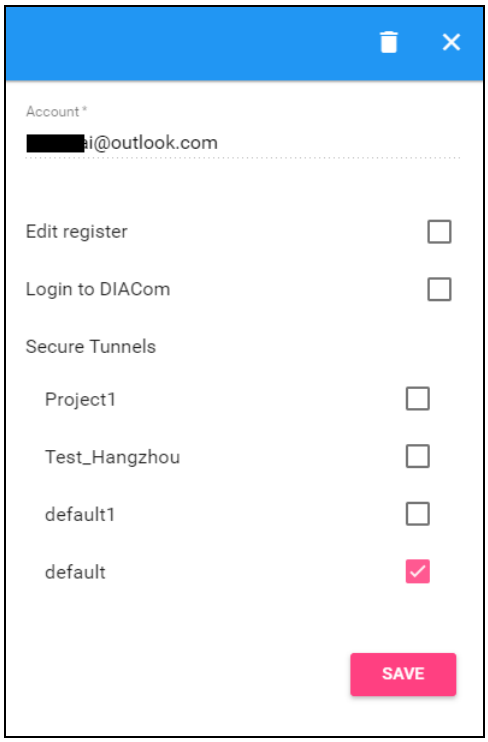
5.2.6 Sub Users

All accounts that are registered through register page of DIACloud (http://www.DIACloudSolutionscom/#/signup) are main accounts. Every main account can create sub-account, and users can realize power separation and grouping management of device by conducting authorization for virtual network and DIACom by sub-account. Use can conduct addition and operation for sub-account through the “Sub Users” page.



Item	Description
Search	Search the sub users.
Sub Users List	Show the list of all sub users in main account.
+	Add a sub user.
↻	Refresh the list of sub users.
···	Modify the access control of the tunnel network.

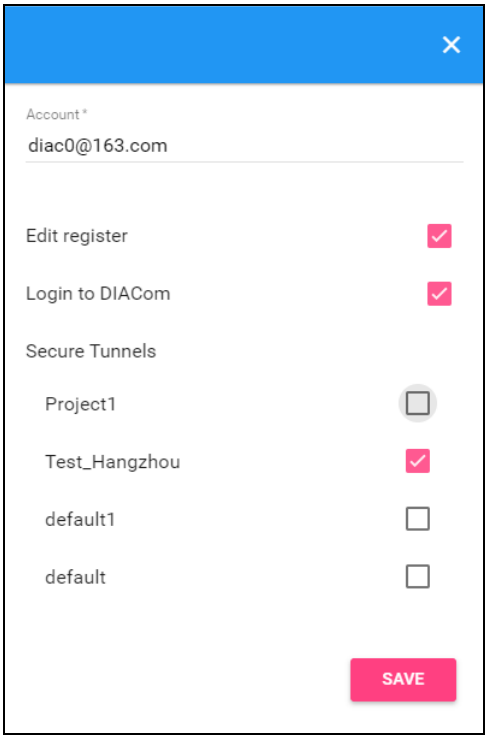
- ··· : User can modify the access control of the tunnel network.



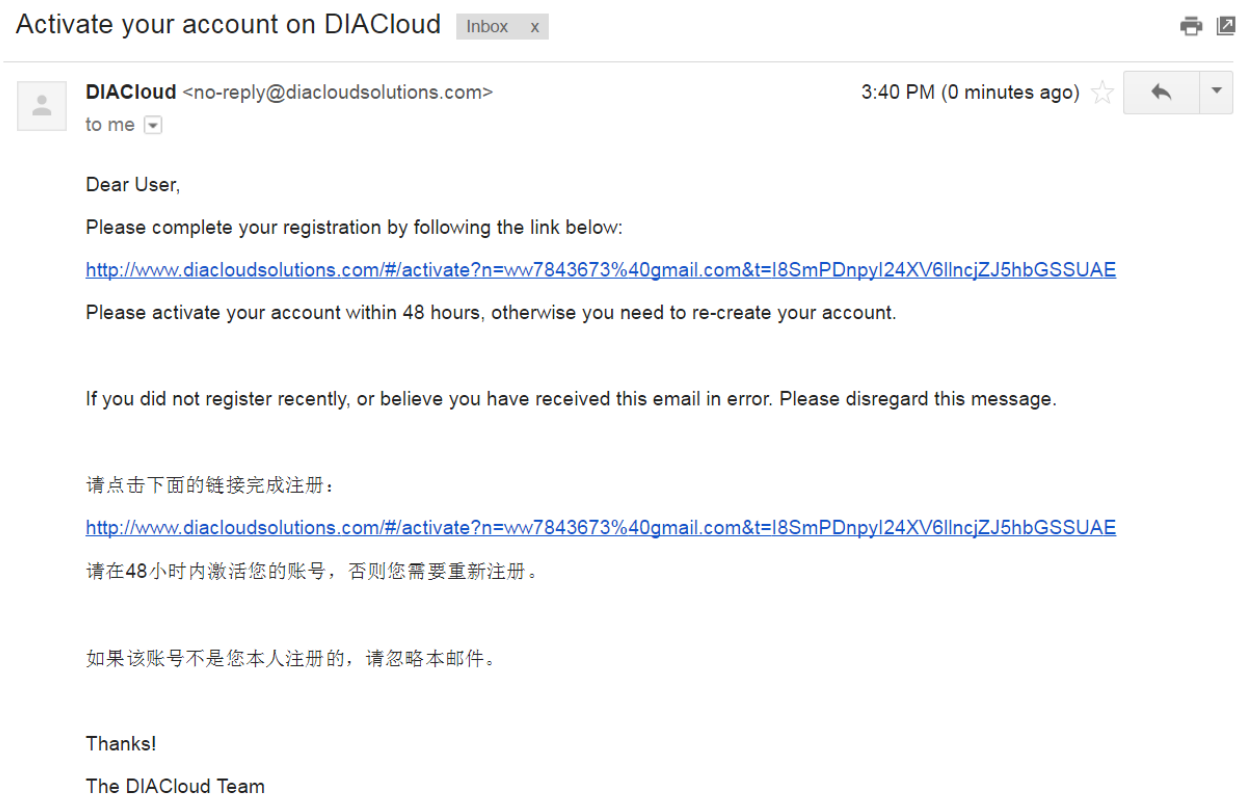
Item	Description
Sub Users Information	• **Edit register:** Allow the Sub User to modify register

	• **Login to DIACom:** Allow the sub user to access the DIACom if the option is enabled. • **Tunnel Network:** Allow the sub user to access the Tunnel Network if the option of Tunnel Network is checked.
	Delete a sub user.
	Close the current operation window.

- ＋ : User can add sub users after clicking the “+” in the page, and. The following interface will be shown after clicking the “+” in the page:



1. Fill in corresponding account information and conduct authorization for it.
2. The system will send an activation email which is attached with random login password to email box of sub user. The account status is “Un-activated” now.
3. Goto the mailbox, click the hyperlink to complete account activation operation, then sub user can login DIACloud with new account.
4. The page will link to the following page after clicking the activation link in the email:



Activate your account on DIACloud Inbox x

DIACloud <no-reply@diacloudsolutions.com> 3:40 PM (0 minutes ago)

to me

Dear User,

Please complete your registration by following the link below:

http://www.diacloudsolutions.com/#/activate?n=ww7843673%40gmail.com&t=I8SmPDnpyI24XV6lIncjZJ5hbGSSUAE

Please activate your account within 48 hours, otherwise you need to re-create your account.

If you did not register recently, or believe you have received this email in error. Please disregard this message.

请点击下面的链接完成注册：

http://www.diacloudsolutions.com/#/activate?n=ww7843673%40gmail.com&t=I8SmPDnpyI24XV6lIncjZJ5hbGSSUAE

请在48小时内激活您的账号，否则您需要重新注册。

如果该账号不是您本人注册的，请忽略本邮件。

Thanks!

The DIACloud Team

5

5. When user login to DIACloud with main account and the sub user that we created has been activated.

5.2.7 Logs

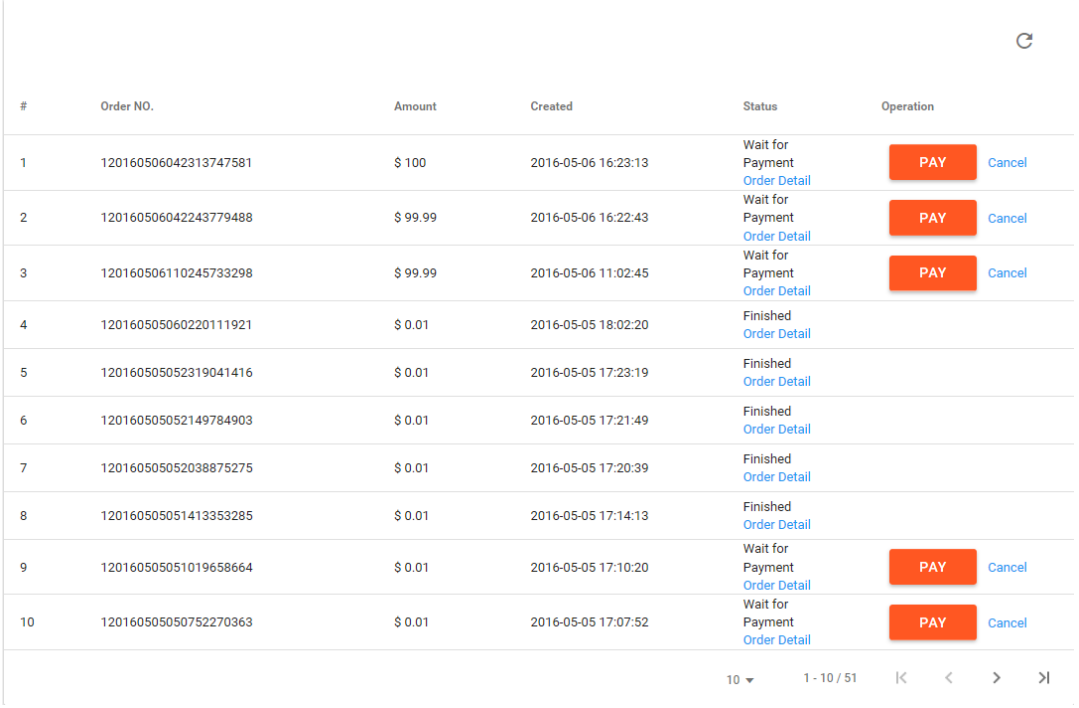
This page will show the web operation information of some users. It includes: login IP, setup of register, API interface call of DIACloud and other information.

#	User Name	Log Content	Created
1	13616061750@163.com	push reg , cmd = 21300,1,2049,556	2016-04-01 11:12:41
2	13616061750@163.com	Login from 211.97.130.218	2016-04-01 11:11:36
3	13616061750@163.com	Login from 218.66.157.46	2016-04-01 10:45:41
4	13616061750@163.com	Login from 211.97.130.218	2016-04-01 10:43:23
5	13616061750@163.com	Edit tunnel network, id= 1247, name = test02, dhcp = 1	2016-04-01 10:38:20
6	13616061750@163.com	Logout	2016-04-01 10:37:55
7	13616061750@163.com	Login from 218.66.157.46	2016-04-01 10:37:54
8	13616061750@163.com	Login failed. username=13616061750@163.com from ip=218.66.157.46	2016-04-01 10:37:48
9	13616061750@163.com	Login failed. username=13616061750@163.com from ip=218.66.157.46	2016-04-01 10:37:41
10	13616061750@163.com	Login failed. username=13616061750@163.com from ip=218.66.157.46	2016-04-01 10:37:35

10 1 - 10 / 1134

5.2.8 Orders

In this page, user can check his all orders. Continue to pay for the unpaid orders or cancel the unpaid orders.

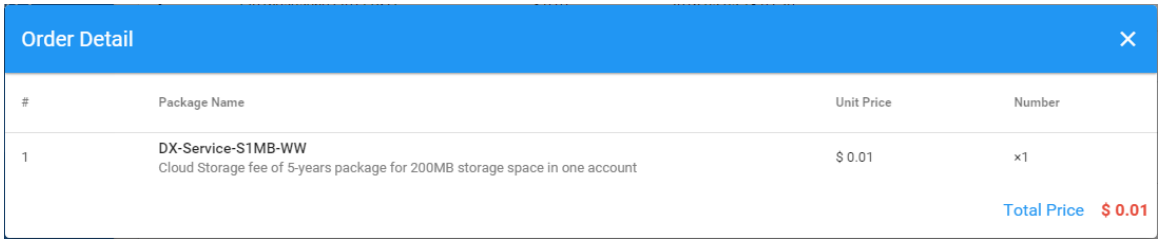


#	Order NO.	Amount	Created	Status	Operation
1	120160506042313747581	$ 100	2016-05-06 16:23:13	Wait for Payment Order Detail	PAY Cancel
2	120160506042243779488	$ 99.99	2016-05-06 16:22:43	Wait for Payment Order Detail	PAY Cancel
3	120160506110245733298	$ 99.99	2016-05-06 11:02:45	Wait for Payment Order Detail	PAY Cancel
4	120160505060220111921	$ 0.01	2016-05-05 18:02:20	Finished Order Detail	
5	120160505052319041416	$ 0.01	2016-05-05 17:23:19	Finished Order Detail	
6	120160505052149784903	$ 0.01	2016-05-05 17:21:49	Finished Order Detail	
7	120160505052038875275	$ 0.01	2016-05-05 17:20:39	Finished Order Detail	
8	120160505051413353285	$ 0.01	2016-05-05 17:14:13	Finished Order Detail	
9	120160505051019658664	$ 0.01	2016-05-05 17:10:20	Wait for Payment Order Detail	PAY Cancel
10	120160505050752270363	$ 0.01	2016-05-05 17:07:52	Wait for Payment Order Detail	PAY Cancel

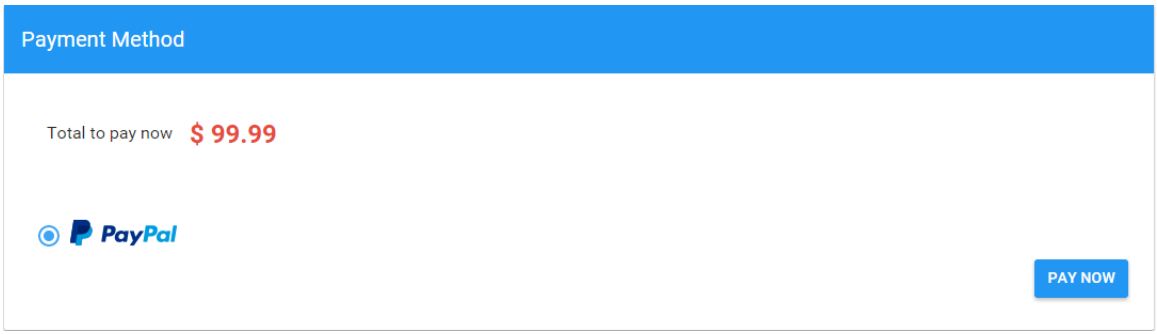
10 1 - 10 / 51

Item	Description
Order Detail	View the order detail information
PAY	Pay for the unpaid order
Cancel	Cancel the order, order will remove from the list.

- Order detail

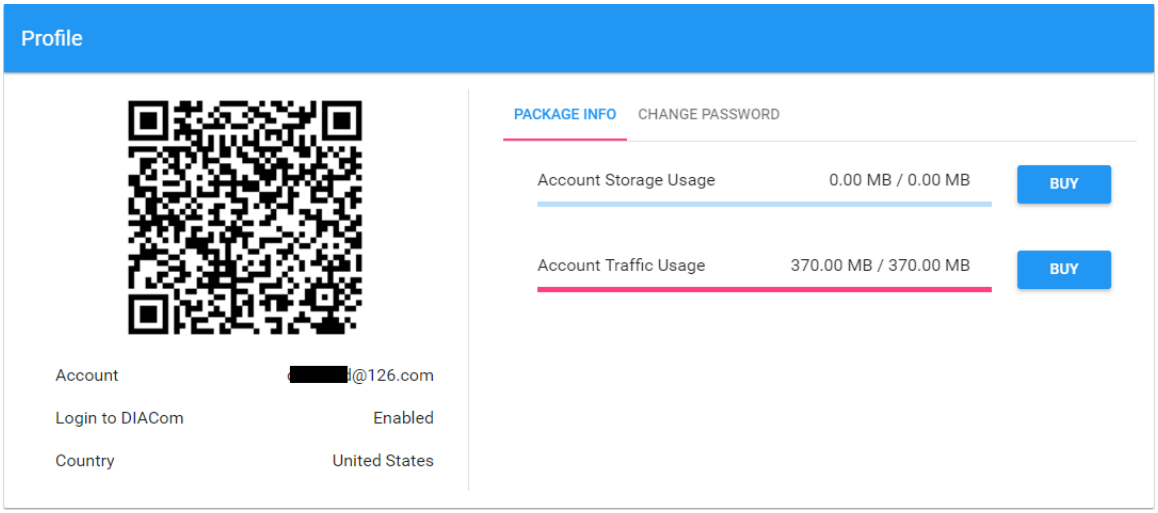


- Payment Method: Currently, we only support PayPal payment for the world wide user.



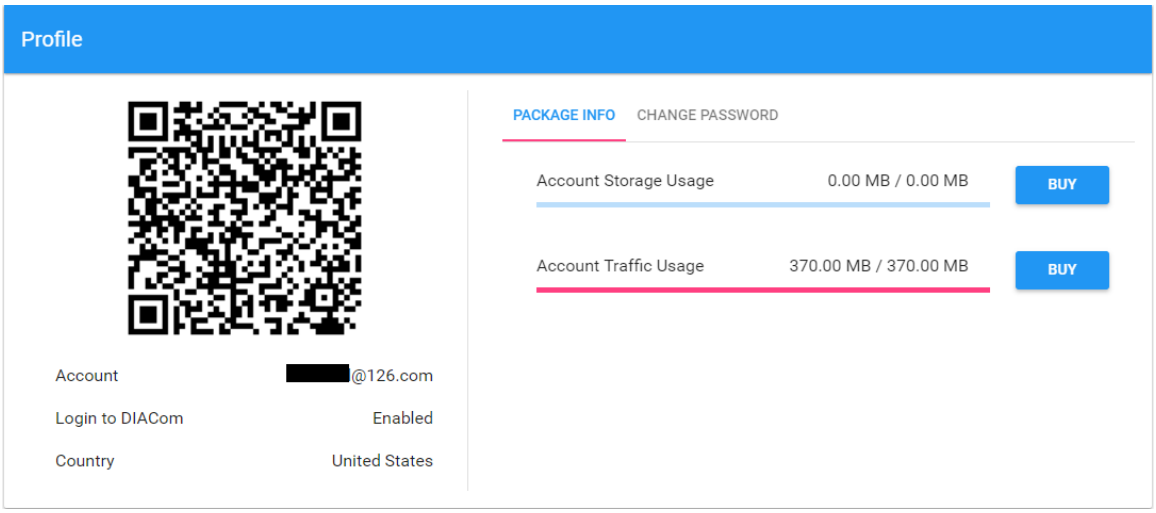
5.2.9 Profile

In this page, QR Code of user, Package info, password management and other information will be shown.



Item	Description
QR Code	You can get the part information of user by using DIACloud APP and scanning QR Code.
Account	The current account information.
Packeage info	• Show account traffic/storage usage till now • BUY User can purchase more traffic/storage package for this account if need ⚠ Account traffic/storage will share to all devices under this account.
Change Password	Change the password of DIACloud user account. Note: parts of old users use password in 6 digits; the new password has been increased to 8 digits to improve safety of their accounts.

Change Password page as below


Profile
PACKAGE INFO
CHANGE PASSWORD
Account Storage Usage
0.00 MB / 0.00 MB
BUY
Account Traffic Usage
370.00 MB / 370.00 MB
BUY
Account
[redacted]@126.com
Login to DIACom
Enabled
Country
United States

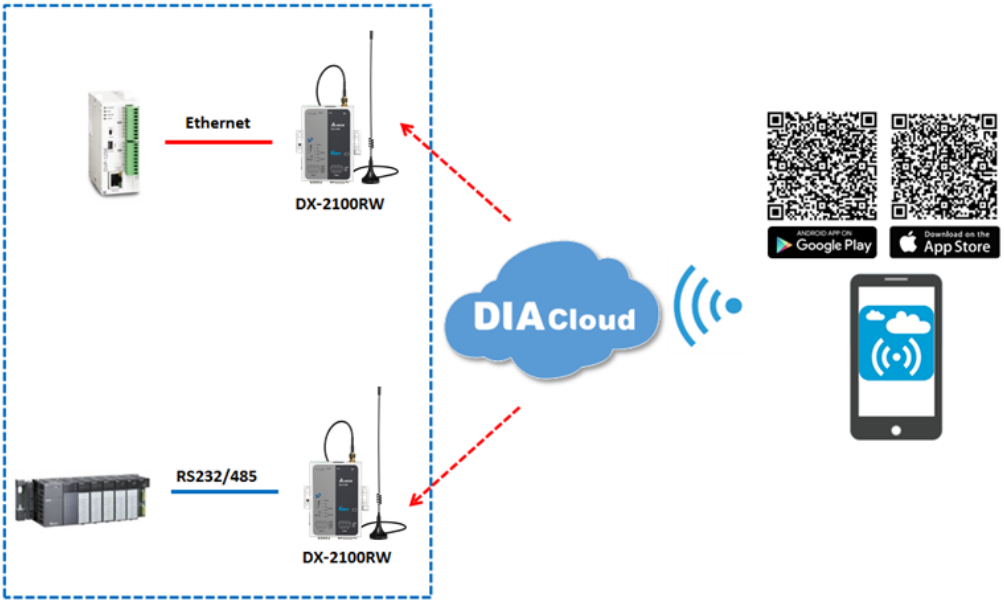
6

Chapter 6 DIACloud APP

Table of Contents

6.1 Introduction to DIACloud APP

DIACloud APP is the client software of DIACloud cloud platform running on mobile devices. The APP supports both iOS and Android mobile system, it enables users to view the field data collected, the locations of the field devices, and the alarms/notifications pushed by the industrial IOT cloud platform, so that keep users posted anytime and anywhere, and therefore improve the manageability of devices, optimize the device performance and efficiency, save the operation cost and enhance the service quality.



6.1.1 Select a Suitable Firmware Version

The APP can support the devices below:

Device Model	Firmware Version
DX-2100	V1.3.0.1 or above
DX-2300	V1.0.0.1 or above

6.1.2 DIACloud APP Installation

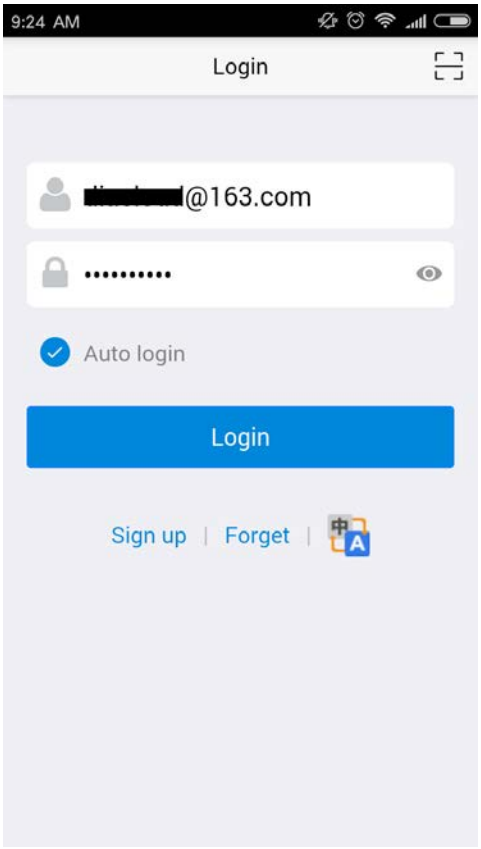
The DIACloud APP is available on Google Play and Apple APP Store.

Mobile Device	OS Version
Android	4.4.0 or above
iPhone	6.2.0 or above

6.2 DIACloud APP Function

6.2.1 DIACloud APP Login

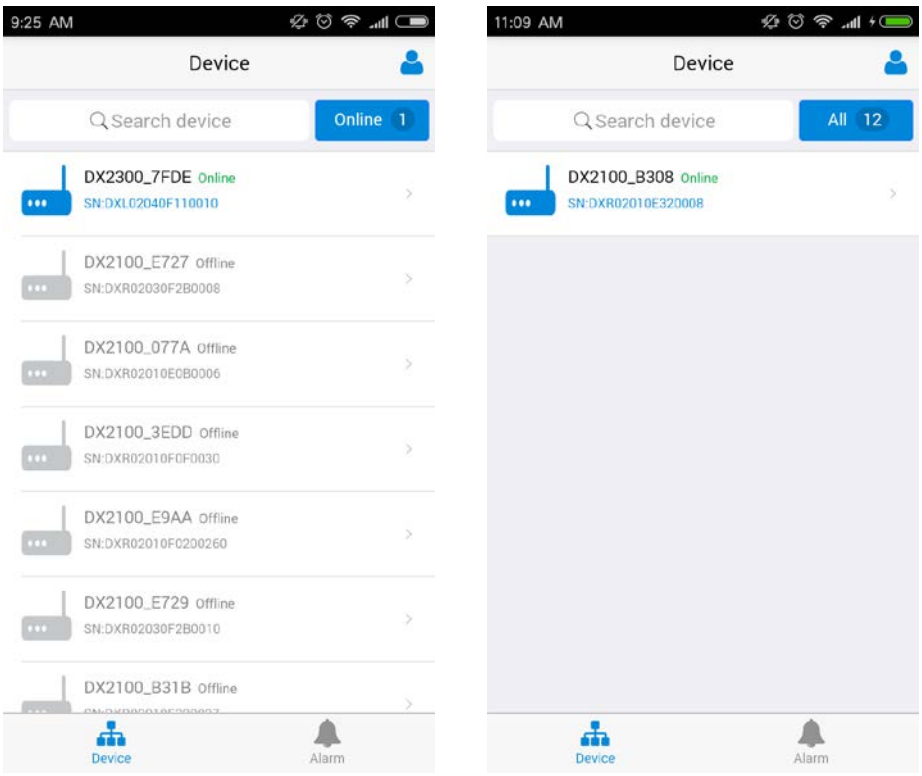
Enter the DIACloud account and password, then click the “Sign in” button to login the APP. Click the “Sign up” to register an account if you don’t have one.



Item	Description
	Scan QR code, the QR code is generated by DIACloud Web portal, which carries the user name and password information. By scanning the QR code, user won’t need to input user name. By default, the APP will connect the default DIACloud server in the cloud, if the APP is to connect other servers, QR code should be scanned to provision the APP.
	DIACloud account, Email format
	The password of DIACloud account, click to see what are you input
Auto Login	Save the password and login the APP automatically
Login	Login to App
Sign up	Create a new DIACloud account
Forget	Reset the password if you forget it.
	Switch the language.

6.2.2 Device List

Device list will be shown after user login the APP.

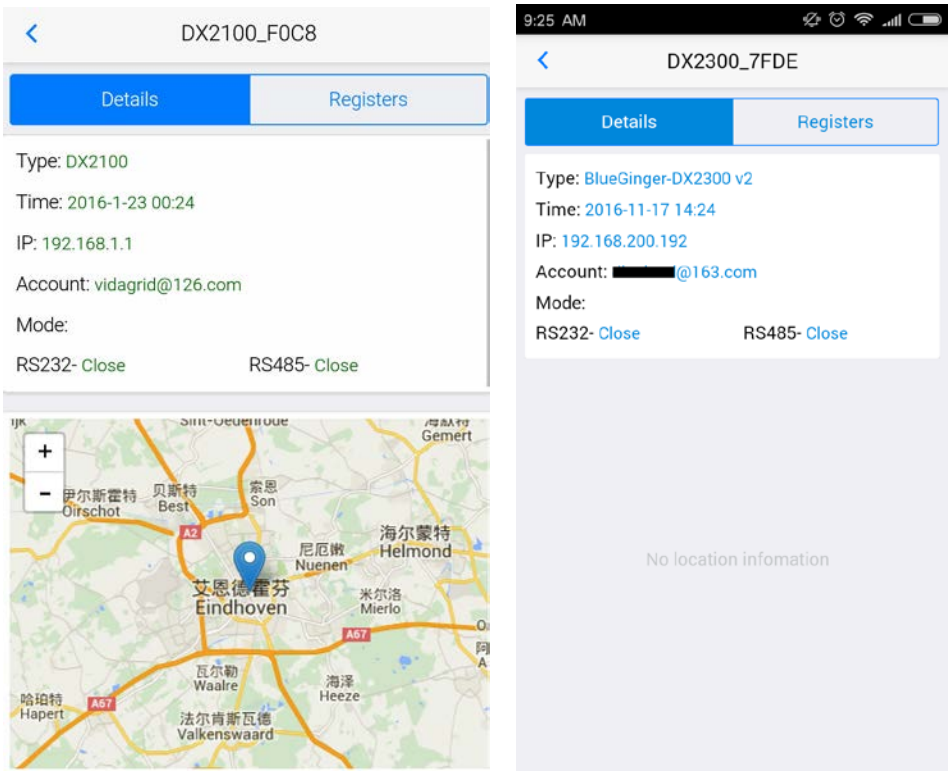


Device tab and alarm tab will be shown in the APP. In the device tab, the device information will be shown, include the value of registers of the remote device. And the value of the register can be changed in the APP as well. In the alarm tab, users can read the alarm messages.

Item	Description
	Logoff or exit App
Search	Search device base on key word
All/Online	• Click “ALL” to show all device • Click “Online” only show online device. Digit at the back is the all/online device count.
Device list	Display device online/offline status, device name, device serial number. Click it will go into device detail page
	Switch to device list page
	Switch to alarm list page.

6.2.3 Device Details

Device details will be shown by selecting a device in the device list.



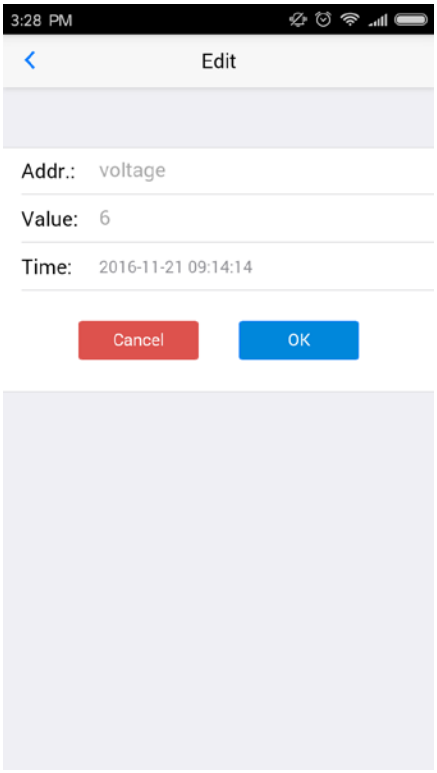
Item	Description
Type	Type of the device
Time	The time when the device is online.
IP	IP Address of the device
Account	DIACloud account activating the device.
Mode	The working mode of RS485 and RS232. • **RS232:** Transparent transmission mode or Slave mode • **RS485:** Transparent transmission mode / Slave mode / Master mode
Map	Showing the location of the device on the map P.S. DX-2300 Series doesn't support this function.

6.2.4 Registers View

Click [Register] on the device details page to switch to the register page

In the register page, the user can browse the collected data. The register data can be refreshed by the pull-down screen. When the number of registers is large, you can pull up the screen to display more data.

Item	Description
	Refresh the register data.
	Edit the register value.

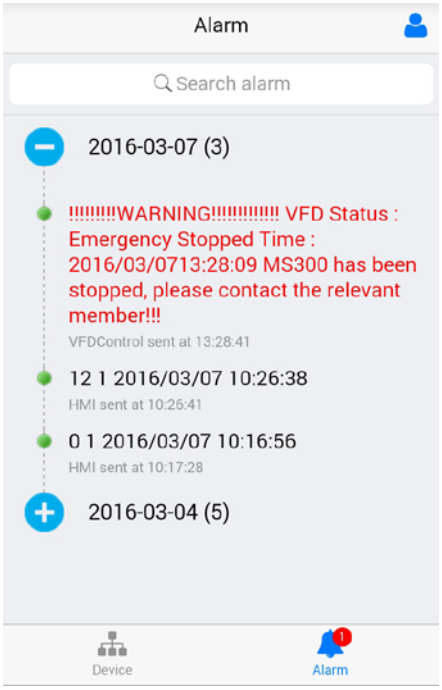


Click “ok” button, the register value will be pushed to the device.

6.2.5 Alarm List

Alarm criteria can be set on the device configuration web page. When the alarm criteria are met, the device will send out alarm messages. User can click the “Alarm” tab to read the alarm messages. When there are new alarm messages, the number of the unread messages will be shown on the icon Alarm.

- Alarm tab will be shown by clicking icon Alarm, the alarm messages in Red are unread messages. Digit in parentheses is the number of alarm messages.
- Pull down the APP to refresh the alarm list.


Alarm
Search alarm
2016-03-07 (3)
!!!!!!!!!WARNING!!!!!!!!!!!! VFD Status : Emergency Stopped Time : 2016/03/0713:28:09 MS300 has been stopped, please contact the relevant member!!!
VFDControl sent at 13:28:41
12 1 2016/03/07 10:26:38
HMI sent at 10:25:41
0 1 2016/03/07 10:16:56
HMI sent at 10:17:28
2016-03-04 (5)
Device
Alarm