PLANET
Networking & Communication

User's Manual

4-/8-Port SIP Internet Telephony Gateway

► VGW-x10 Series

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CE Mark Warning

This is a class B device, in a domestic environment; this product may cause radio interference, in which case the user may be required to take adequate measures.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy 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:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio technician for help.

FCC Caution

To assure continued compliance, for example, use only shielded interface cables when connecting to computer or peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal Equipment, and the mutual recognition of their conformity (R&TTE). The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) as of April 8, 2000.

WEEE Caution

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Contents

Chapter 1 Product Introduction

1.1 Product Description

High Quality yet Affordable for All Businesses

PLANET VGW-x10FS enterprise-class 4-/8-port SIP VoIP Gateway provides added flexibility during migration to Unified Communications by supporting the traditional analog devices. These devices include analog phones, fax machines, modems, voicemail systems and speakerphones.

PLANET VGW-x10FS 4/8-port FXS VoIP Gateway is a fully SIP standard compliant residential gateway that provides a total solution for integrating voice-data network with built-in PPPoE/DHCP/DDNS clients, up to 4/8 concurrent connections voice communications can be established from anywhere around the world. It not only provides quality voice communications, but also offers secure, reliable Internet sharing capabilities for daily voice and Internet communications.

Distributed VoIP Network Infrastructure

PLANET VGW series is easy to use for all types of businesses. The VGW-x10FS offers quality voice communications and real-time fax data over IP networks and it does not need human resources to deploy a VoIP network. With the optimized SIP architecture, PLANET VGW-x10FS is the ideal choice for P2P /SIP proxy (IP PBX) voice chat, and ITSP cost-saving solution.

Figure 1-1-1 VGW-410FS

Figure 1-1-2 VGW-810FS

1.2 Product Features

- **SIP Applications**
  - IETF SIP RFC3261 compliance
  - 4-/8-line FXS connects to analog phone set or PABX
  - ITU-T G.711 A-law, G.711 μ-law, G.723.1 and G.729 voice coding
  - In-band / out of band DTMF (RFC4733, RFC2833 / SIP INFO)
  - Echo cancellation exceeding ITU-T G.165/G.168-2002, up to 128ms tail length
- **Internet Features**
  - SIP DDoS attack prevention
  - Supports NAT and Firewall
  - Supports DHCP server / client
  - Supports VLAN and QoS: DSCP, TOS (RFC 791, 1394)
- **Call Features**
  - Supports peer to peer dialing
  - Supports STUN NAT Traversal
  - Supports black list and white list Caller ID recognition DTMF and FSK
  - T.30 transparency, T.30 bypass, and T.38 fax
  - Multi-party conferencing, call forward, call waiting, hot-line call, DND (Do Not Disturb) and alarm clock

1.3 Functional Specifications

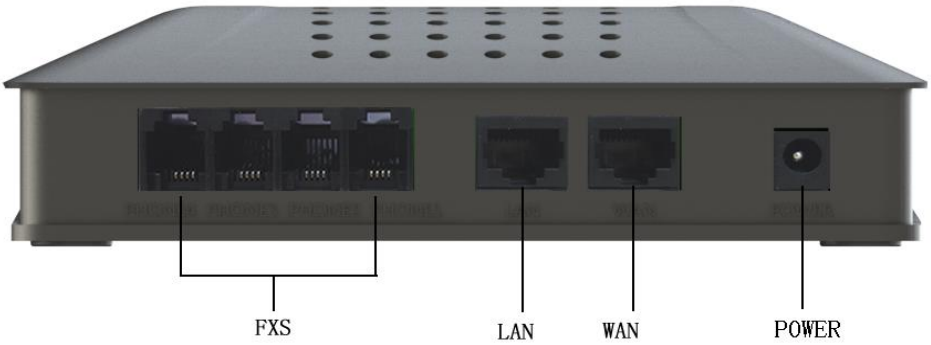
Product	VGW-410FS	VGW-810FS
Hardware		
WAN	1 x 10/100BASE-TX RJ45 port	
LAN	1 x 10/100BASE-TX RJ45 port	
Voice	4 x RJ11 connection (8 x foreign exchange station)	8 x RJ11 connection (8 x foreign exchange station)
Telephone Wire Transmission Distance	< 1000 m	
Connectors	■ Two 10/100BASE-TX RJ45 Ethernet ports ■ Four RJ11 ports ■ DC power jack	■ One console port ■ Two 10/100BASE-TX RJ45 Ethernet ports ■ Eight RJ11 ports DC power jack
Weight	205 g	565 g
Dimensions (W x D x H)	160 x 115 x 30 mm	267 x 196 x 40 mm
Power Requirements	12V DC, 1.0A	12V DC, 2.0A
Protocols and Standard		
Data Networking	■ TCP/IP, UDP(RFC 793/768), RTP/RTCP(RFC 1889/1890), ARP, FTP/TFTP, HTTP, HTTPS, Telnet, ICMP, NTP/SNTP, DHCP Server/Client ■ IPv4 ■ Static IP ■ PPPoE Client ■ DHCP Server, LAN port ■ DHCP Client (RFC 2131), WAN port, NAT server (RFC 1631) ■ Firewall ■ SIP attack prevention ■ VLAN ■ QoS: DSCP, TOS (RFC 791, 1394)	
VoIP	■ IETF SIP RFC3261 compliance ■ Primary and secondary SIP server to automatic switch ■ Voice coding: ITU-T G.711 A-law, G.711 μ-law, G.723.1(5.3K/6.3Kbit/s), G.729 and auto-negotiate with call agent ■ Echo cancellation exceeding ITU-T G.165/G.168-2002, up to 128ms tail length ■ 10 ~ 180ms adjustable delay jitter ■ DSP gain can be adjusted, -5dB ~ + 10dB ■ In-band / out of band DTMF (RFC4733, RFC2833 / SIP INFO) ■ Integrate heartbeat function ■ Supports active and standby call agent ■ Supports VGW series expanding (One master and two slaves) ■ Supports local polyphonic ringtone ■ Supports call routing and digit map	

	■ Supports caller ID, DTMF and FSK ■ Supports Dial route IP; calls between two VGWs are supported without a SIP server ■ Supports multi-party conferencing, call forward, call waiting, hot-line call, DND (Do Not Disturb) and alarm clock ■ Supports high/low speed fax/modem. T.30 transparency, T.30 bypass, and T.38 fax
Management	■ Multilingual Web user interface ■ 3 levels of user access right with password protection with a different Web language (administrator, supervisor and user) ■ Configuration backup/restore ■ Reset to factory default
Environments	
Operating Temperature	-10 ~ 50 degrees C
Operating Humidity	10%~90% relative humidity, non-condensing
Emission	CE, FCC, RoHS

1.4 Physical Specifications

➢ **Dimensions of VGW-410FS**

Dimensions	160 x 115 x 30 mm
Weight	205 g



➢ Figure 1-4-1 VGW-410FS

Indicator Description

LED	Description	
Indicators	8 indicators, showing the status of WAN, LAN, power, call agent register and FXS (FXS 1~ FXS 4)	
LED	**Color**	**Function Description**
POWER	**Green**	ON: Power on
		OFF: Power off
REG	**Green**	ON: Device has been successfully registered to the SIP server
		OFF: Device is power off or not registered to the SIP server
FXS1-4	**Green**	ON: The telephone is off hook
		OFF: The telephone is on hook
WAN / LAN	**Green**	BLINK: WAN/LAN data transfer
		OFF: Physical connect status is disconnected
		ON: Physical connect status is connected

Interface Descriptions

Port	Function Description
Power	Power port (This unit does not include the 12V/1000mA power adapter.)
WAN	10/100BASE-TX RJ45 socket for WAN port, connecting to wide area network.
LAN	10/100BASE-TX RJ45 socket for LAN port, connecting to PC for management purpose.
Port 1 - 4	Connected to phone with RJ11 analog line. FXS port is connected to your telephone sets or fax.

Dimensions of VGW-810FS

Dimensions	267 x 196 x 40 mm
Weight	565 g

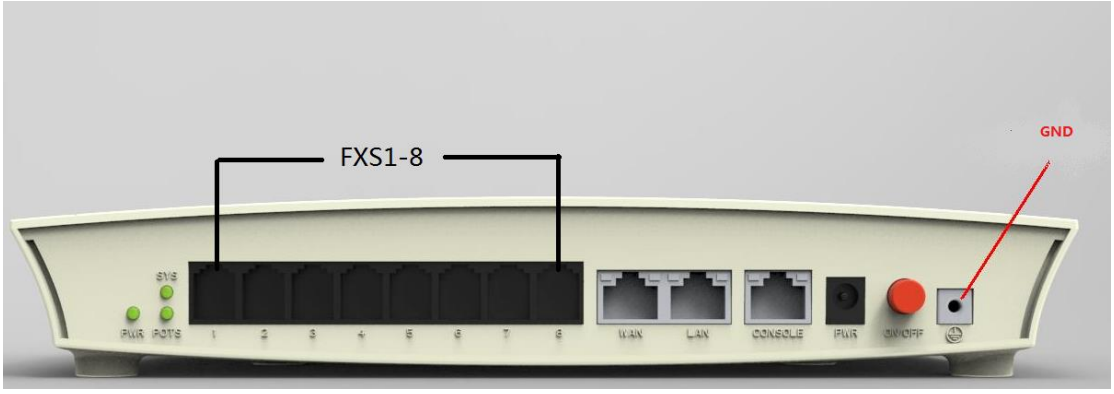


Figure 1-4-1 VGW-810FS

Indicator Description

LED	Color	Function Description
PWR	**Green**	ON: Power on
		OFF: Power off
SYS	**Green**	BLINK: Working
		OFF: Power off or abnormal
		ON: Abnormal
POTS	**Green**	ON: Telephone on from POTS
		OFF: Telephone hook from POTS

Interface Descriptions

Port	Function Description
Power Switch	Switch the power on or off
PWR	Power port (This unit does not include the 12V/2000mA power adapter.)
Console	VGW debug interface, connect with RJ45, input CLI command to connect terminal
LAN	10/100BASE-TX RJ45 socket for LAN port, connecting to PC for management purpose.
WAN	10/100BASE-TX RJ45 socket for WAN port, connecting to wide area network.
Port 1 - 8	Connected to phone with RJ11 analog line. FXS port is connected to your telephone sets or fax.

Chapter 2 Installation Preparation

2.1 Standard Packing Contents

Thank you for purchasing PLANET Internet Telephony Gateway system, the VGW-400 series. This Quick Installation Guide will introduce how to finish the basic setting of connecting the web management interface and the Internet. Open the box of the Internet Telephony Gateway system and carefully unpack it. The box should contain the following items:

- VGW-x10 Series x 1
- Quick Installation Guide x 1
- Power Adapter x 1 (12V)
- RJ45 x 1 (VGW-810 series only)

If any of the above items are damaged or missing, please contact your dealer immediately.

2.1.1 Warning

To avoid device damage caused by improper use and personal injury, please comply with the following precautions:

- ✧ Don't install it on the wet place.
- ✧ Put the device on a clean, flat, sturdy bench top.
- ✧ Make sure that supplied power voltage is the same as that of the device required.
- ✧ It is forbidden to open the device's panel without permission.
- ✧ Before cleaning the device, make sure that power is off. Don't use liquid to clean the device.

2.1.2 Installation Conditions

The VGW-x10 series must be installed indoors, and also the following items must be had:

- ✧ Basic items needed include power supply, Internet cable and PC.
- ✧ Single phase three core power socket like AC socket is required. And make sure that the device power must be connected to the ground.
- ✧ Enough space for heat dissipation
- ✧ Working temperature is -10℃~ 50℃, humidity of 10% to 90%
- ✧ The electromagnetic interference of nearby broadcasting station, radar transmitters and high frequency, high power device, etc. must be avoided.
- ✧ Connecting cable usually is installed indoors. If the cable is installed outdoors, surge protection measurement must be taken into consideration.

2.2 Device installation

This chapter describes two common installation methods. After device's install spot is selected, phone line, RJ45 cable and power cable must be connected.

2.2.1 Fixed to the plane

Put the VGW-x10 series on a clean, flat, steady bench top, and follow the steps below:

- ✧ Ensure workplace is flat and stable.
- ✧ Keep certain space for all sides of the device for heat dissipation.
- ✧ Don't place anything on it.

2.3 Cable connection

2.3.1 Common connection

The downlink is made through LAN using RJ45 cable to connect with user PC, switch or hub, while the uplink is made through WAN using RJ45 cable to connect with Ethernet (such as ONU) or ADSL modem. RJ11 is used to connect user telephone and VGW's FXS port.

- ✧ Before you push the power button, make sure that all cables have been connected.
- ✧ It is strong recommended to use a neutral point power connector, which has a single-phase three-wire power or multi-purpose PC power socket. In this case, power has grounded outlet that assure operator's safety. Do not use extension cords.

2.3.2 Network topology graph

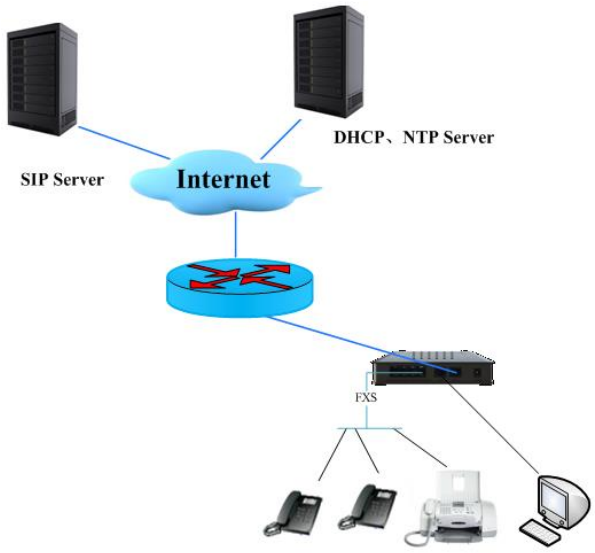


Figure 2-3-2 VGW-410FS Application chart

- ✧ Uplink via WAN port connect to xDSL (Cable) Modem as proxy server.
- ✧ Downlink via LAN port connect to user PC, switch and hub.
- ✧ According to the LAN environment, select corresponding DHCP, PPPoE or static IP to connect to the internet.
- ✧ FXS port can direct connect to telephone, fax and POS terminal.
- ✧ Support power survival function. When the device power supply is interrupted, the upper and lower port circuits connect directly.

2.3.3 Cascade Connection

This connection is used for VGW that opened master and slave mode. Firstly, make sure WAN port of the master device connected to Internet. Secondly, keeps slave device's WAN port connecting to master device's LAN port. If there is another slave device, connect this device's WAN port to the first slave device's LAN port.

For the purpose of cascade mode is that user allow to expand master device's number of voice ports. Enable this mode we should refer to the notes below for details:

- ✧ Currently a cascade group allows up to three devices together, i.e. 1 Master 2 Slave, 1 Master 1 slave mode.
- ✧ In cascade mode, just allowed only one device to make a role as master.
- ✧ If an device is setting as master in cascade mode, it means that it's LAN port access to LAN is prohibit.

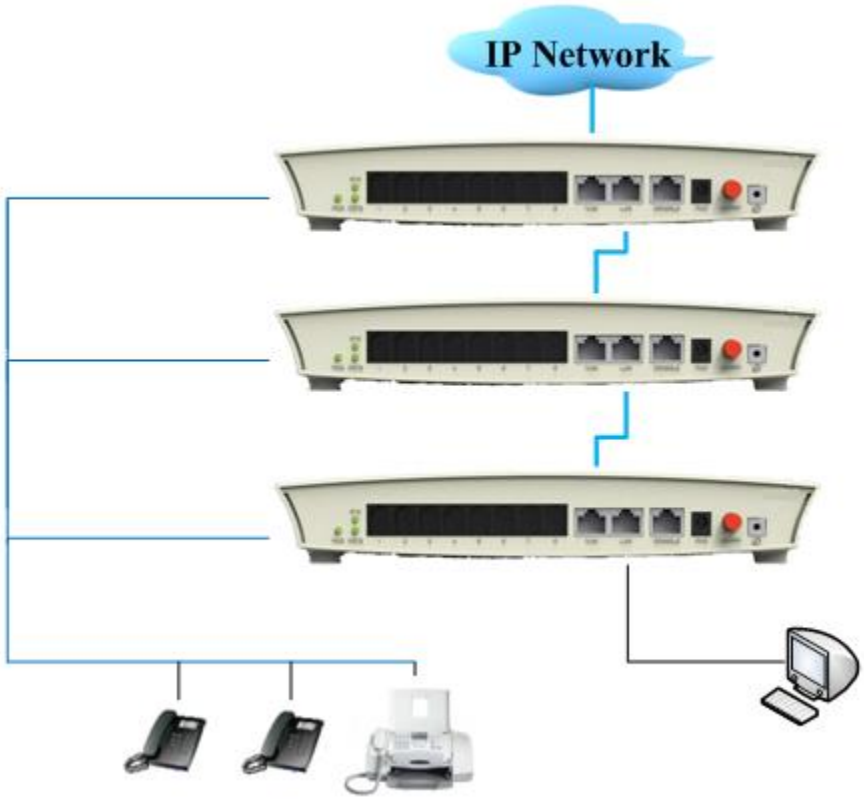


Figure 2-3-3 VGW-810FS Cascade connection

Note	*VGW cascade mode of start and stop，See "4.1.1 WAN port configuration settings in cascade".*

2.4 Installation check

In this step, we should check VGW device when power is on. But before this, you should ensure cable connection and power connections are done by referring to the following steps:

- ✧ Check the power indicator (PWR) whether is on or not. If so, it indicates that device's power is ready, otherwise please check the connection of the power plug or power adaptor.
- ✧ When LAN or WAN port LED is blinking, it indicates that network is ready. Otherwise, check network connection.
- ✧ When device's (SYS) LED is blinking, at the same time when you pick up the phone and the phone port LED is on. It proves telephone port is ready, otherwise check the telephone connection.

Chapter 3 UI Introduction

After finishing the basic connection configuration, you can use its basic function. In order to satisfy individual service requirements, this chapter provides you with parameter modification and individual configuration description.

VoIP Gateway can be configured with your web browser. A web browser is included as a standard application in the following operating systems: Windows 2003/NT/XP/7/8/10/Me, MAC, Linux, etc. The product provides a very easy and user-friendly interface for configuration.

Note	*Web configuration interface may vary with different software versions.* *Administrator-level and general user-level configuration interfaces display differently.* *The following section is an example of an administrator-level description.*

3.1 Preparation

3.1.1 Factory parameters

The first time you use the VGW, you need to learn about these related default parameters:

Item name	Factory parameters
Username and Password	Administrator: – username: admin – password: psw.iad Operator: – username: ac_iad – password: access.iad
IP and Subnet Mask	WAN: – IP Address: 192.168.0.235 – Subnet Mask: 255.255.255.0 LAN: – IP Address: 192.169.0.1 – Subnet Mask: 255.255.255.0
Console	Baud rate: 9600
Local Maintenance Port	Web: 8008 Telnet: 1250 HTTPS:443 SSH:22

SIP	Server Port: 5060 Local SIP Port: 5060

Configuring parameters for administrator-level and operator-level users are as follows:

- The identity of administrator has a key to overwriting Web configuration parameters.
- The identity of operator is restricted to certain Web configurations, such as configuration items from "User Management", "Config Backup", "Default Settings", "Device Information" and so on.

3.1.2 Login conditions

In order to visit web configuration, besides correcting physical connection of network cable, you should pay attention to items below:

- Configure your PC's network setting and make sure PC and VGW are in the same network group (such as VGW's IP: 192.169.0.1, and PC's IP should be between 192.169.0.2 -- 192.169.0.254). For details, please refer to "**3.1.1 Factory parameters**".
- Please use IE 6.0+ or other popular browsers to access web configuration.

3.2 Login

The device is configured by the web interface. The following steps will enable you to log in:

1） Follow "**Installation Preparation**" to install;

2） The device default IP is 192.169.0.1;

3） Open your web browser, and type the device IP in the address bar;
for example, **http://192.169.0.1:8008**

4） Entry of the username and password will be prompted. Enter the default login User Name , Password and Verification Code.

Note	*The default login User Name of administrator is "***admin***", and the default login Password is "***psw.iad***".*

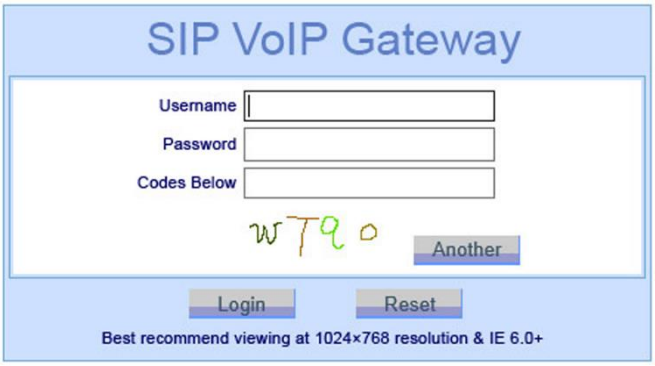


Figure 3-2-1 Login

3.3 Status

This part shows the main information of the product.

3.3.1 Device Info

This page shows the device basic information, such as model, hardware version, software version and software compilation time.

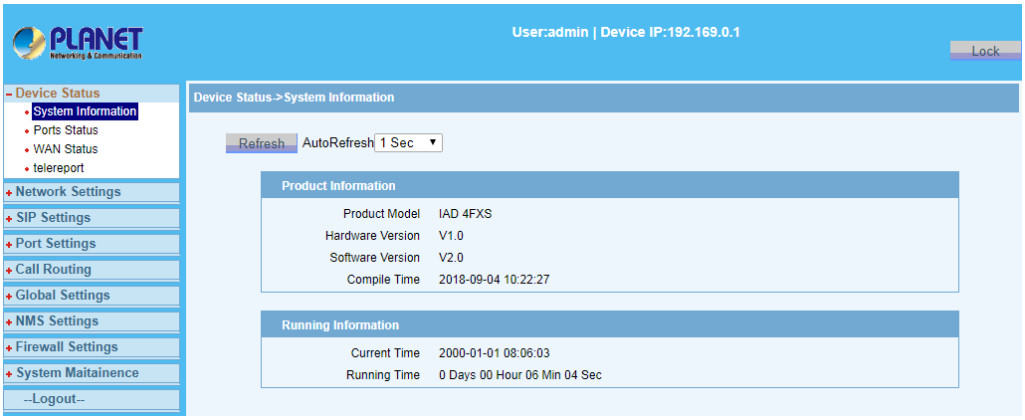


Figure 3-3-1 VGW-410FS Product/Running info

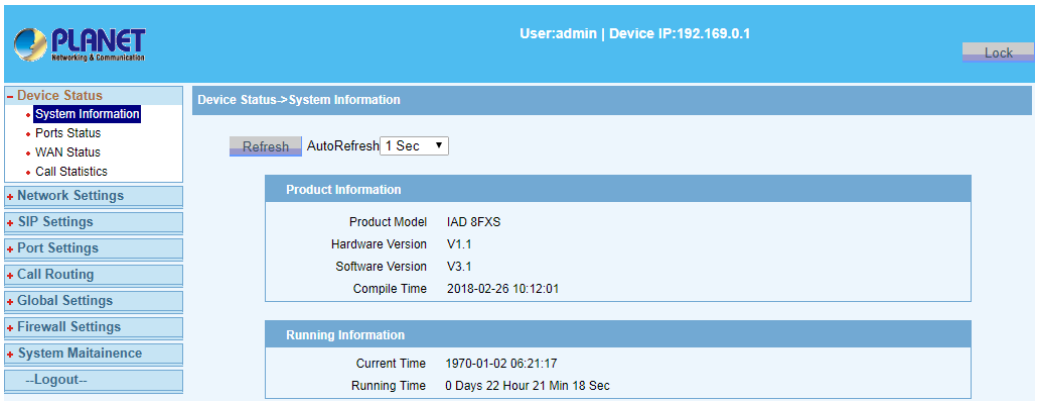
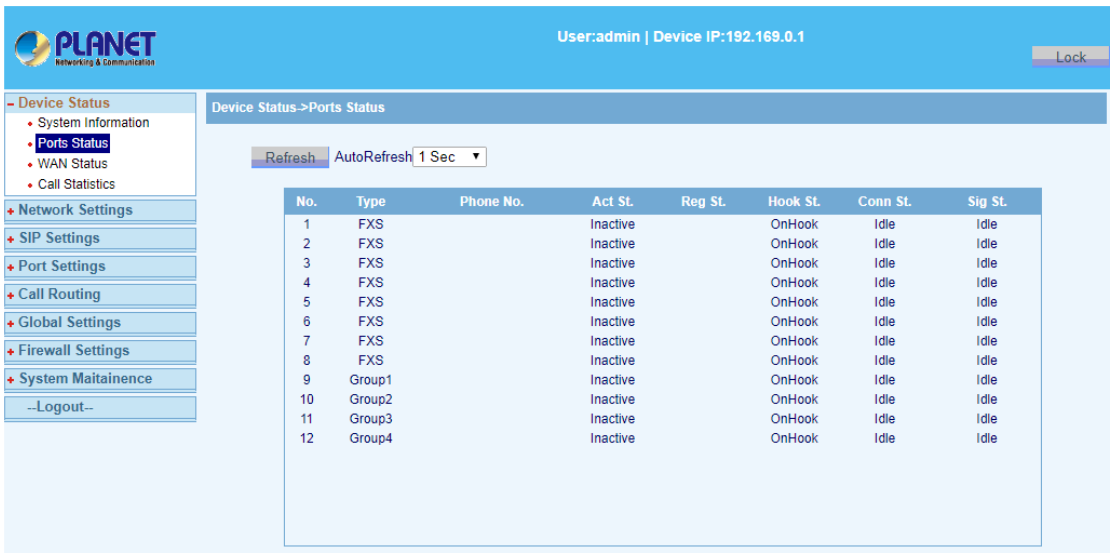


Figure 3-3-2 VGW-810FS Product/Running info

3.3.2 POTS Info

This page shows port status for every port, such as phone number, activation status, register status, hook status, connection status and signal status.



No.	Type	Phone No.	Act St.	Reg St.	Hook St.	Conn St.	Sig St.
1	FXS		Inactive		OnHook	Idle	Idle
2	FXS		Inactive		OnHook	Idle	Idle
3	FXS		Inactive		OnHook	Idle	Idle
4	FXS		Inactive		OnHook	Idle	Idle
5	FXS		Inactive		OnHook	Idle	Idle
6	FXS		Inactive		OnHook	Idle	Idle
7	FXS		Inactive		OnHook	Idle	Idle
8	FXS		Inactive		OnHook	Idle	Idle
9	Group1		Inactive		OnHook	Idle	Idle
10	Group2		Inactive		OnHook	Idle	Idle
11	Group3		Inactive		OnHook	Idle	Idle
12	Group4		Inactive		OnHook	Idle	Idle

Figure 3-3-3 POTS info

3.3.3 Network Info

This page shows WAN and LAN connection information you have configured.

3.3.3.1 WAN / LAN Information

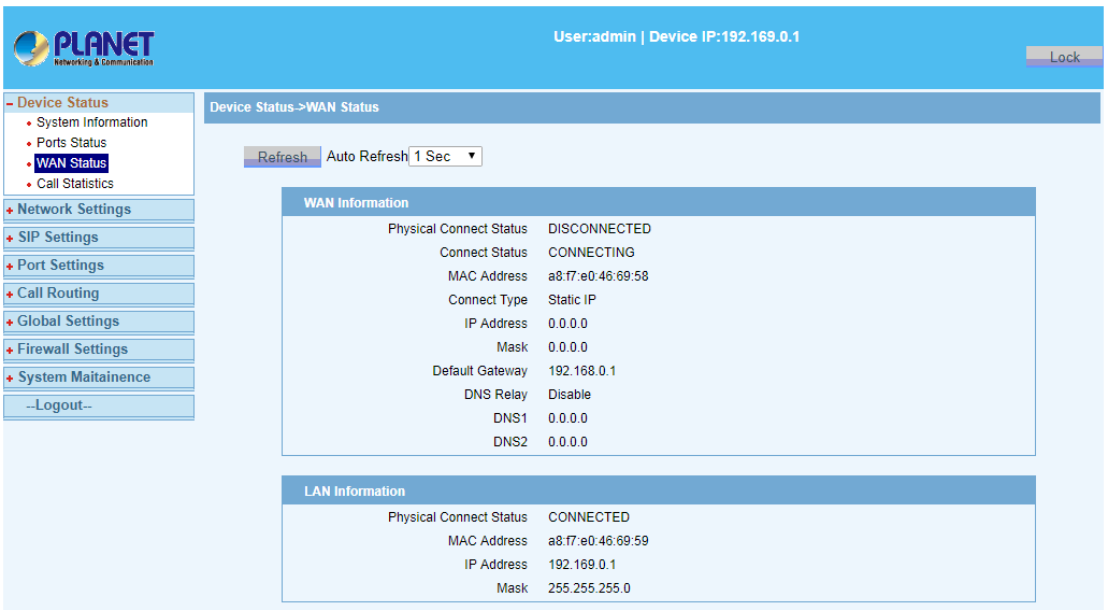


Figure 3-3-3 WAN info

3.4 Fast configuration

Select "Network Settings->WAN Settings", "Port Settings->Basic Settings" and "SIP Settings->Basic Settings" from the navigation menu. You can achieve the purpose of quickly configuring the VGW.

3.4.1 WAN configuration

This page allows you to configure WAN port basic settings. Basic settings include Network Type, DNS settings, SNTP settings and Expanding Function Settings.

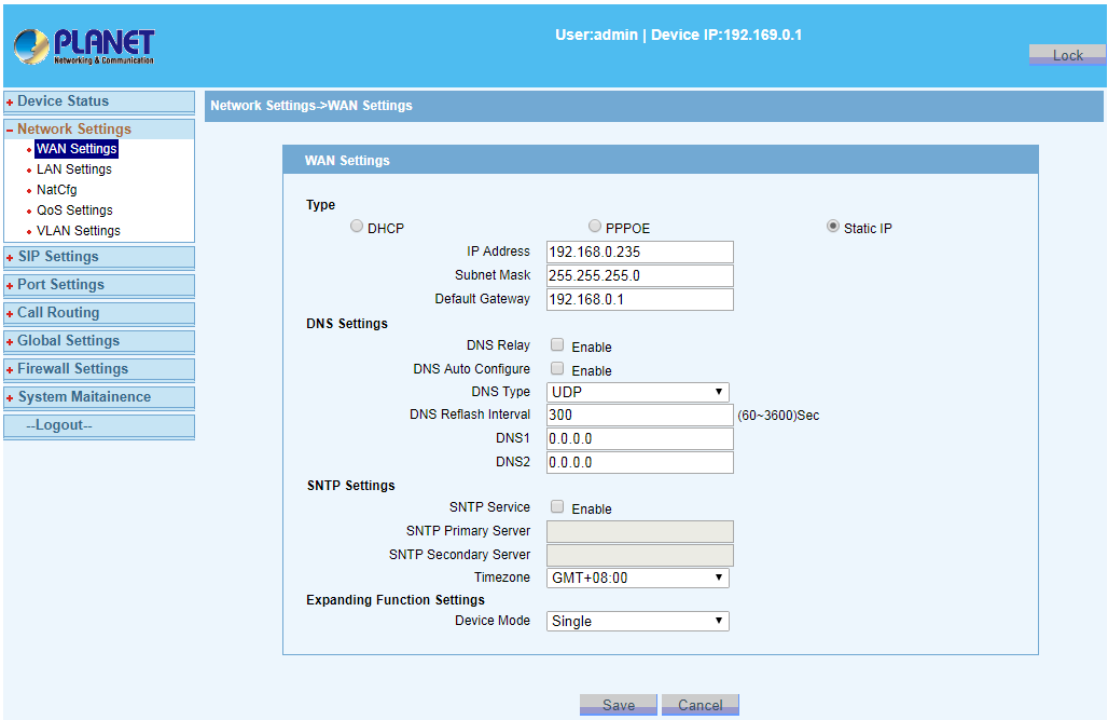


Figure 3-4-1 Internet settings

3.4.2 SIP account configuration

This page provides the user with a number of phone numbers, authentication information, caller ID (FSK and DTMF), and so on.

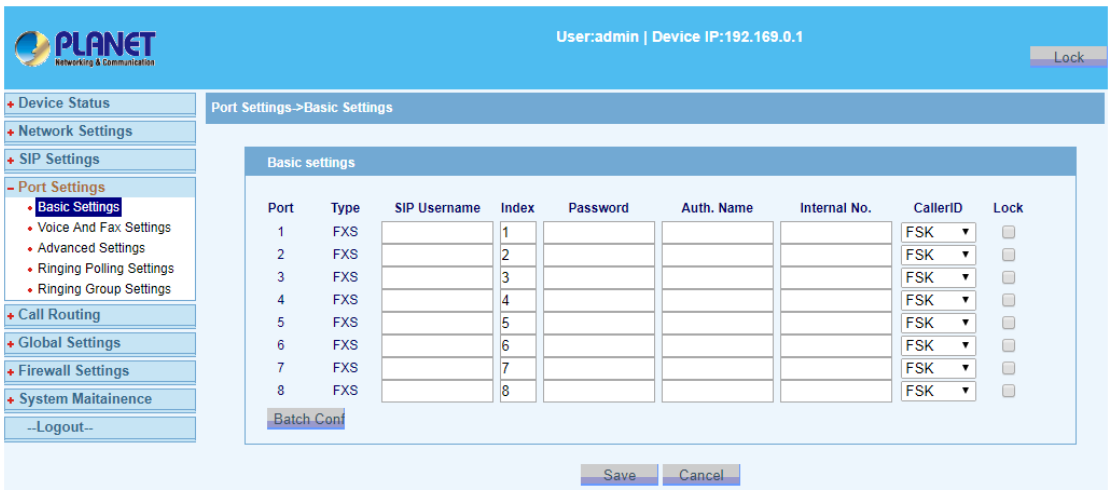


Figure 3-4-2 Phone settings

Note	*This page shows the "User Name" and "internal numbers". "User Name" for calls is in SIP network; "internal number" is used to call individually or for group calls, not through the SIP network, so do not set them to the same number.*

3.4.3 SIP server configuration

VGW supports the primary and secondary SIP servers.

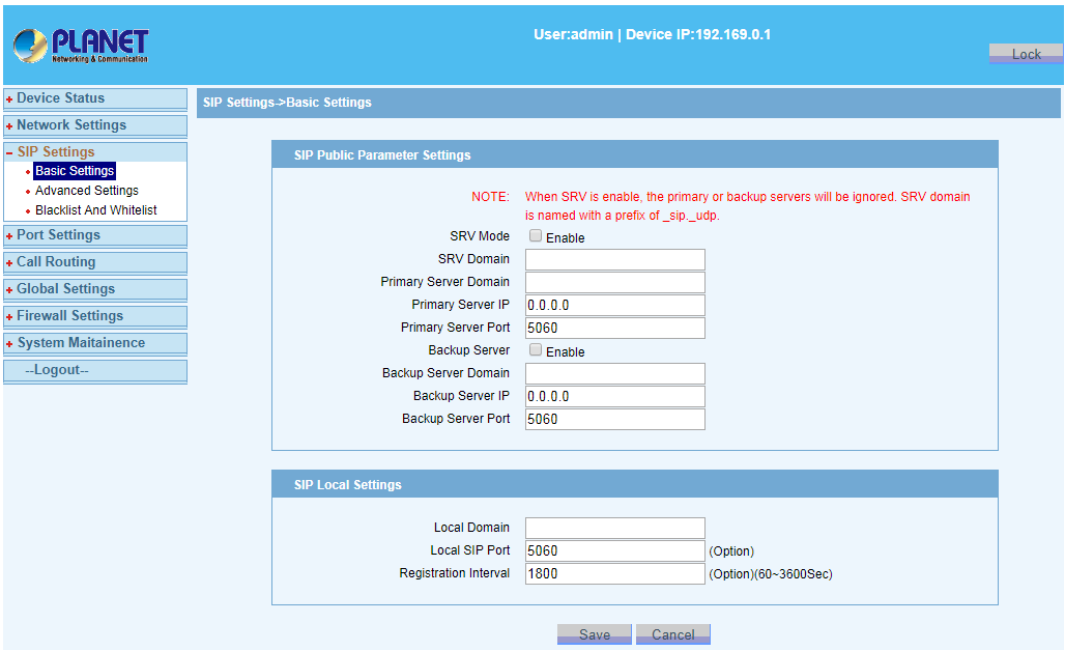


Figure 3-4-3 SIP Public / Local settings

Chapter 4 Detailed Configuration

This chapter will introduce how to configure device's VoIP simply through web, so that you can configure VGW quickly. This chapter includes the following contents:

- Network Settings
- Application
- Security
- Management

4.1 Network settings

4.1.1 WAN settings

After logging in to the web, select "Network Settings -> WAN port settings". VGW supports three network access methods: DHCP, PPPoE, static IP. Please fill out the parameters according to the actual situation. Click the "Save" button to save configuration when it is done.

4.1.1.1 Network type

1） DHCP mode

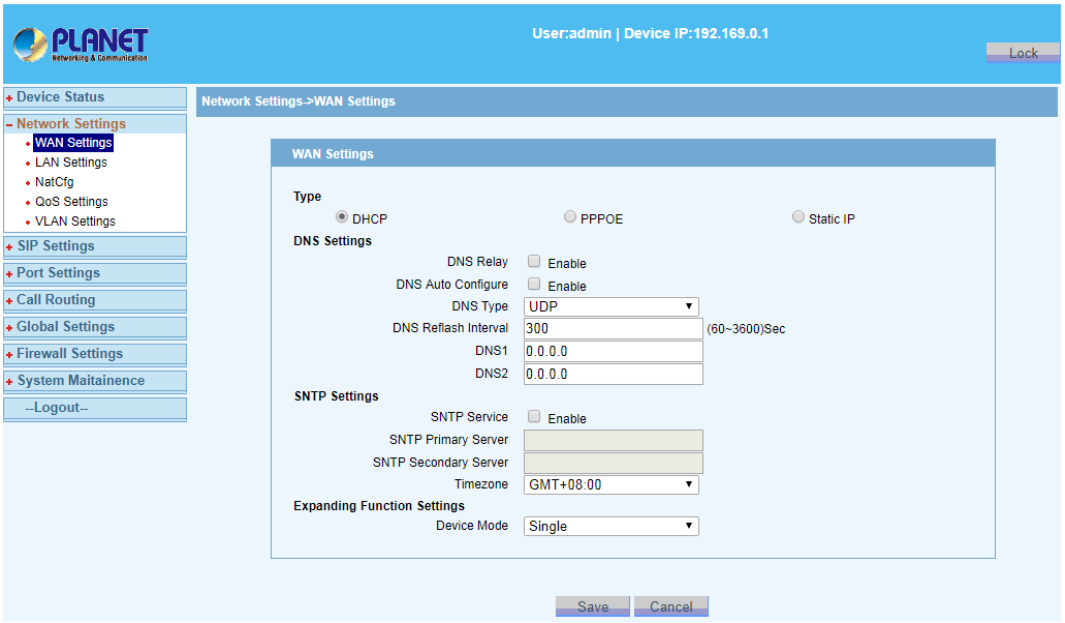


Figure 4-1-1 DHCP settings

2） PPPoE mode

Input Username and Password provided by ISP.

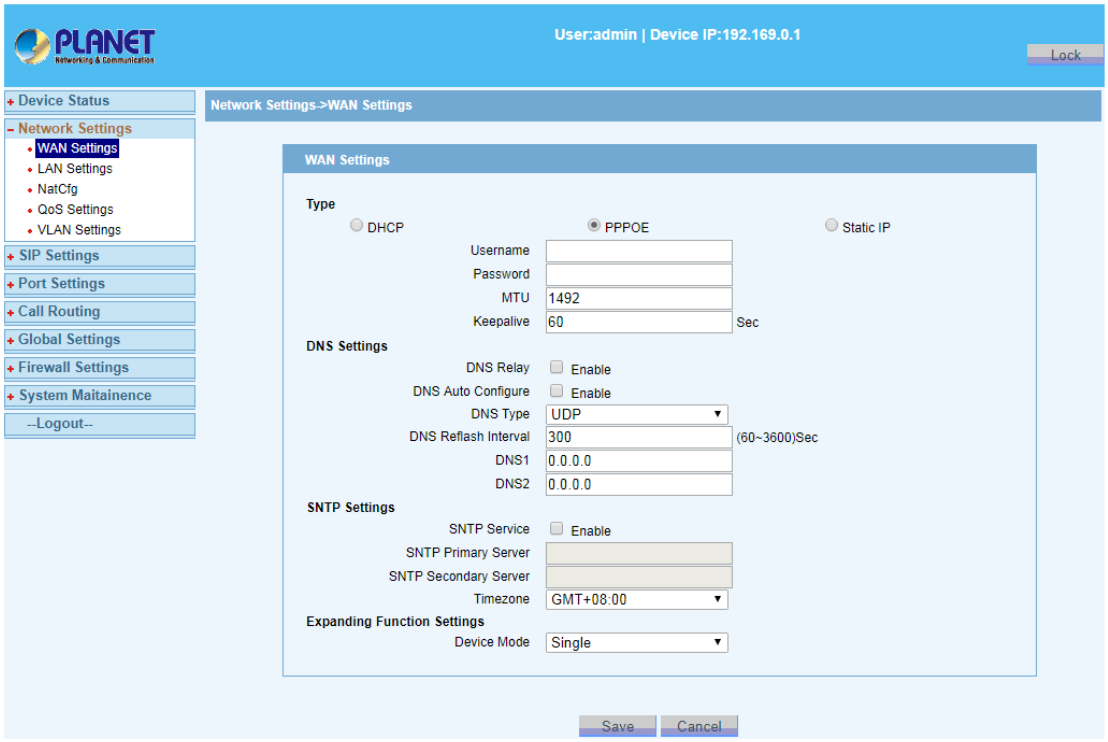


Figure 4-1-2 PPPoE settings

3） Static IP mode

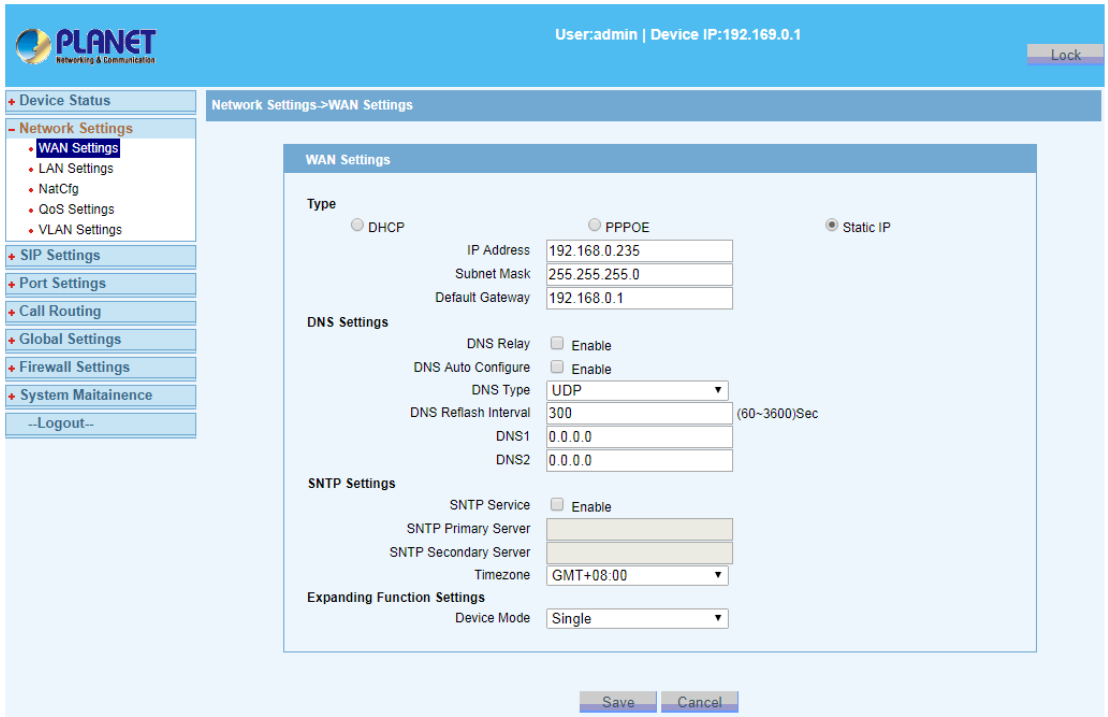


Figure 4-1-3 Static IP settings

Note	*You can select the appropriate network type based on your network conditions from the three network types.*

4.1.1.2 DNS Settings

DNS service is not enabled by default. If you want to enable DNS service, DNS needs to choose the type of transmission in accordance with DNS refresh interval (default 300 seconds).

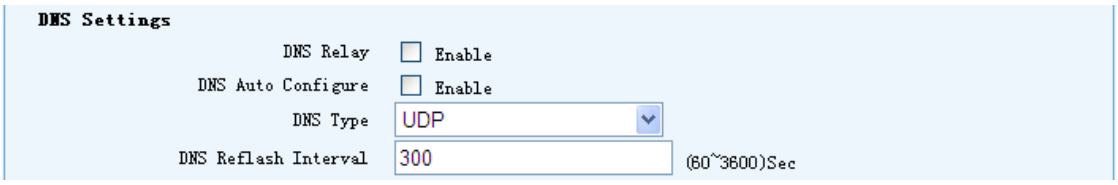


Figure 4-1-4 DNS service

DNS server address: Address the primary and secondary DNS servers, Please fill out the parameters according to the actual situation.

Figure 4-1-5 DNS settings

4.1.1.3 SNTP Settings

Synchronization Network Time Protocol automatically synchronizes the device time. VGW default start time is: 1970-01-01 08:00:00.

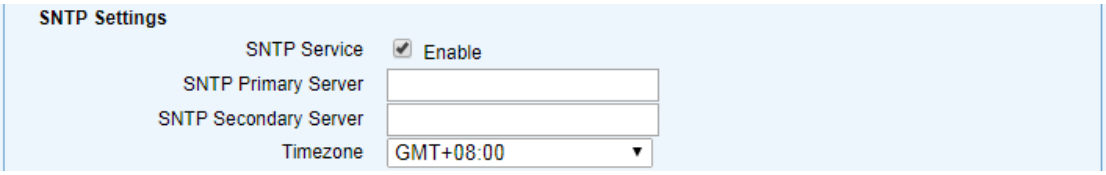


Figure 4-1-6 STNP settings

4.1.1.4 Expanding Function Settings

Device operating mode includes Single, Master and Slave. The default is Single mode. Before cascading, you must set the appropriate mode first. Currently each cascade group (including the Master mode device) cannot exceed three devices.

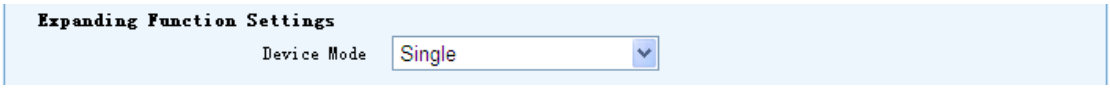


Figure 4-1-7 Expanding function settings

4.1.2 LAN settings

4.1.2.1 LAN IP

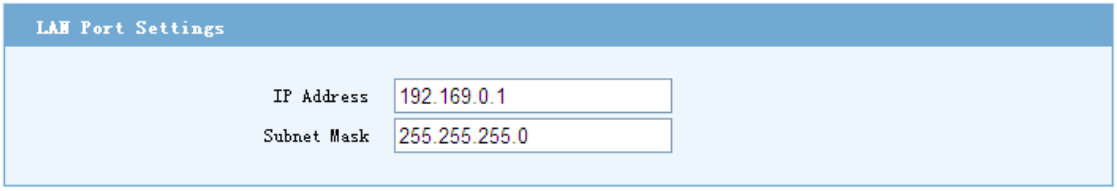


Figure 4-1-8 LAN port settings

Note	*The LAN port and WAN port's IP network segment cannot be repeated.*

4.1.2.2 LAN DHCP Service Settings

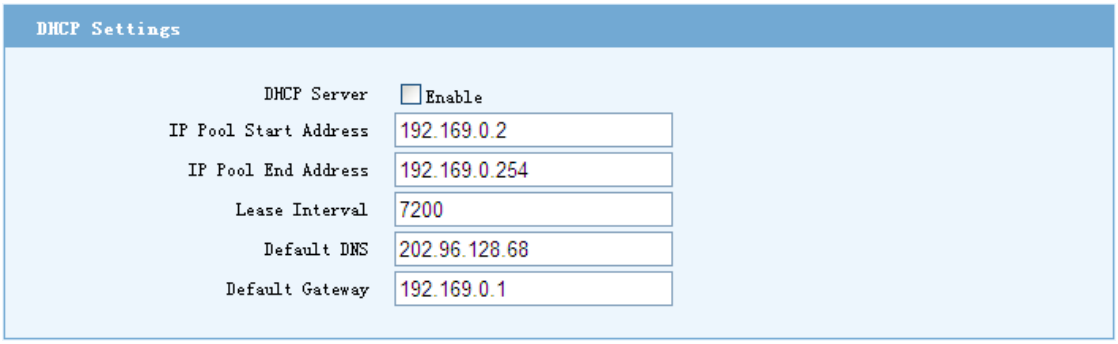


Figure 4-1-9 LAN DHCP settings

4.1.3 VLAN settings

You can access the main configuration page by "Network Settings->VLAN Settings" in the menu bar.

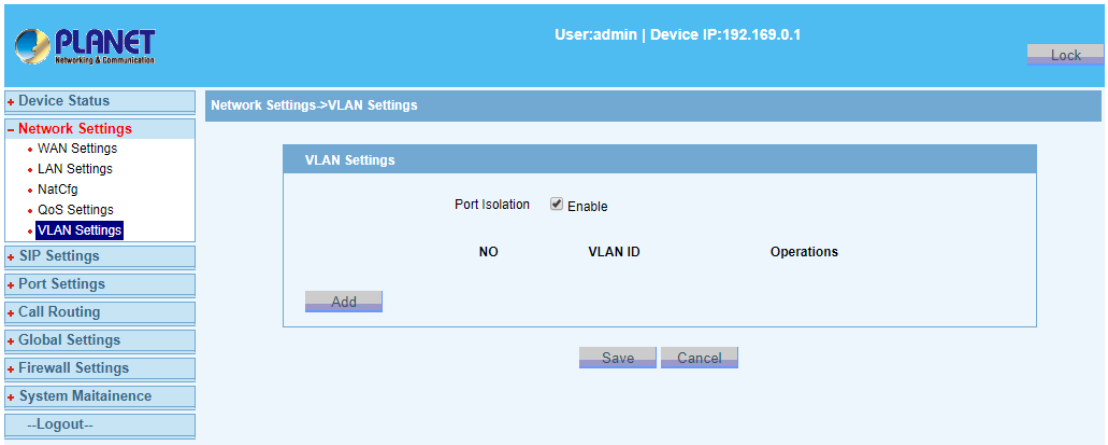


Figure 4-1-10 VLAN settings

4.1.4 QoS settings

Select "Network Settings->QoS Settings" to reach the QoS configuration page.

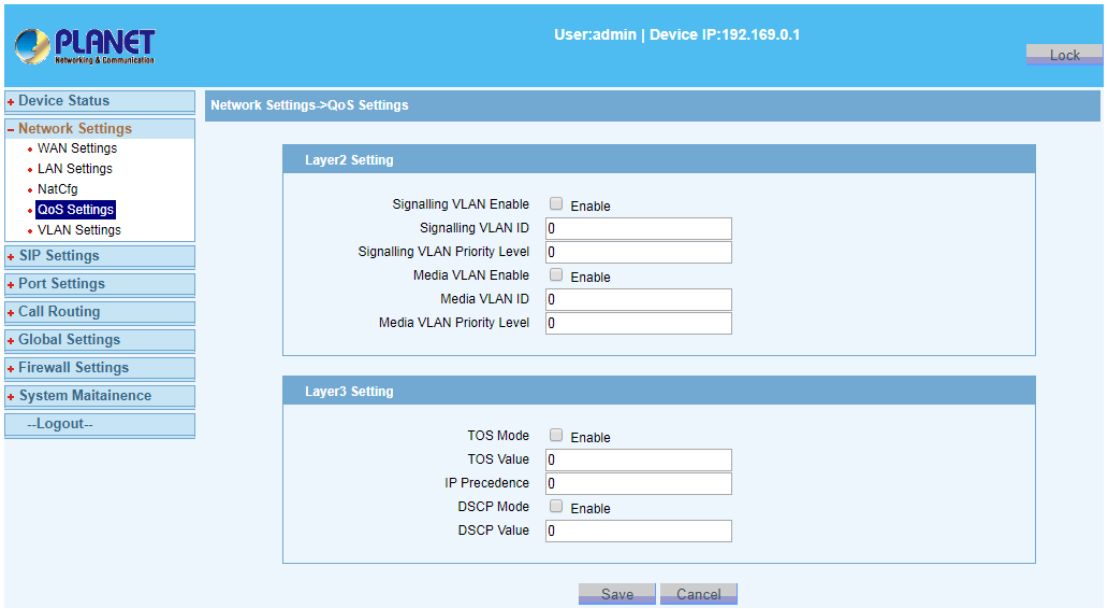


Figure 4-1-11 Layer2/ Layer3 QoS settings

Note	*Make sure the device supports VLAN before you enable Layer 2 QoS. Otherwise, it will cause problems to IP network like DNS resolution failure and SIP account registration failure.*

4.1.5 NAT settings

Figure 4-1-12 NAT Settings / NAT Port mapping

4.2 Application

VGW currently has two main applications: voice and fax.

4.2.1 Voice Application

Select "Port Settings->Basic Settings" from the menu bar; you can set voice-related parameters: SIP registered account, registered user name and password, caller ID and so on.

1） Voice Basic settings

If the voice parameters are to be configured with a regular increment, you can use the "Batch Config" function on the page.

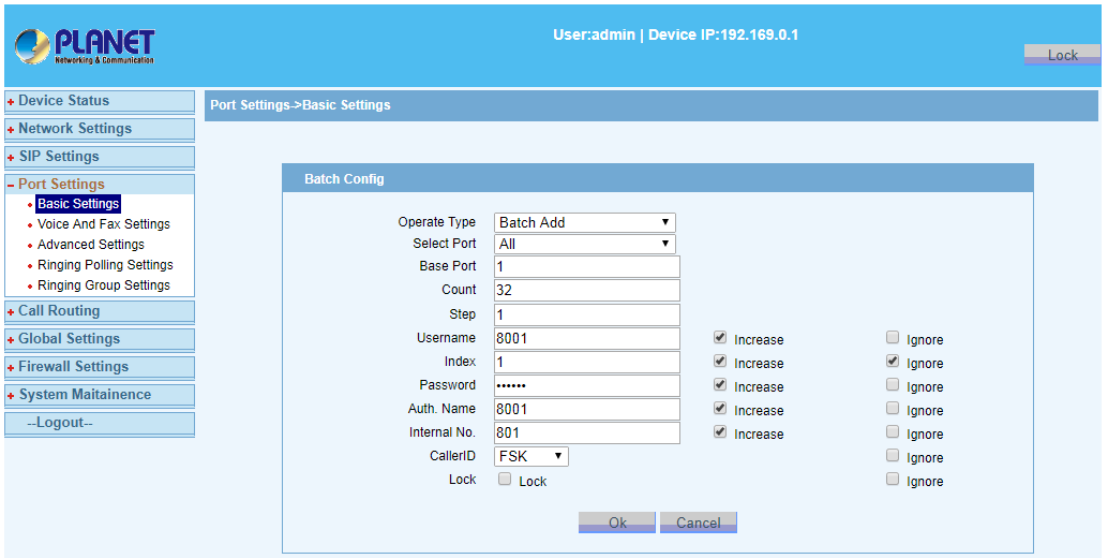


Figure 4-2-1 Batch configuration

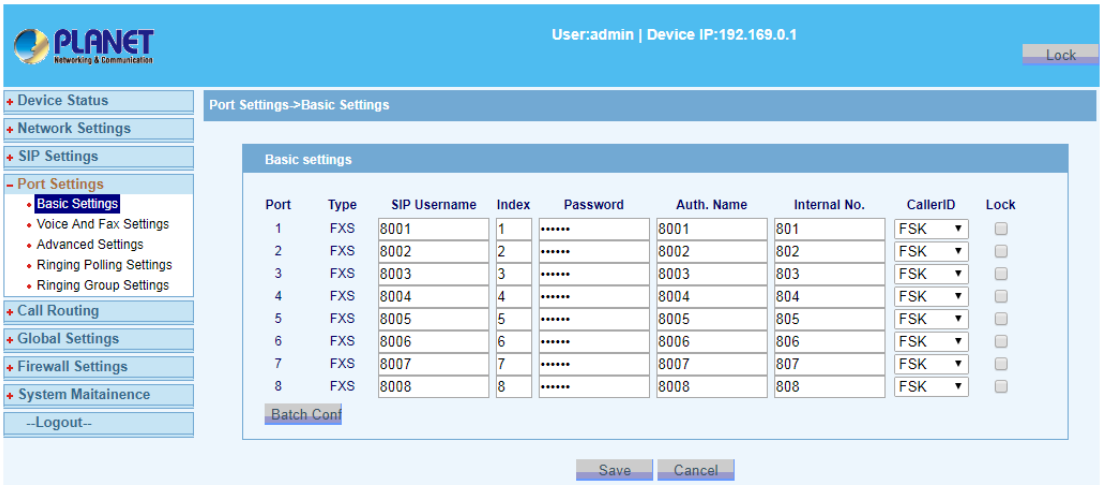


Figure 4-2-2 Basic settings

Parameters	Illustration
Username	In fact, it's the phone number of user (port).
Password	SIP user password -- It is necessary when user registers to softswitch.
Auth. Name	SIP user name -- It is necessary when user registers to softswitch.
Internal No.	In a single device or group of device in a cascade, without network, all users can make internal call to each other with internal number.
Caller ID	VGW supports both FSK and DTMF formats: ➢ FSK: first ring and then have Caller ID. ➢ FSK1: first Caller ID and then start ringing. ➢ DTMF: first ring and then have Caller ID. ➢ DTMF1: first Caller ID and then start ringing.
Lock	Disable user port.

2） Voice advanced settings

Select "Port Settings->Voice And Fax Settings" from the navigation menu.

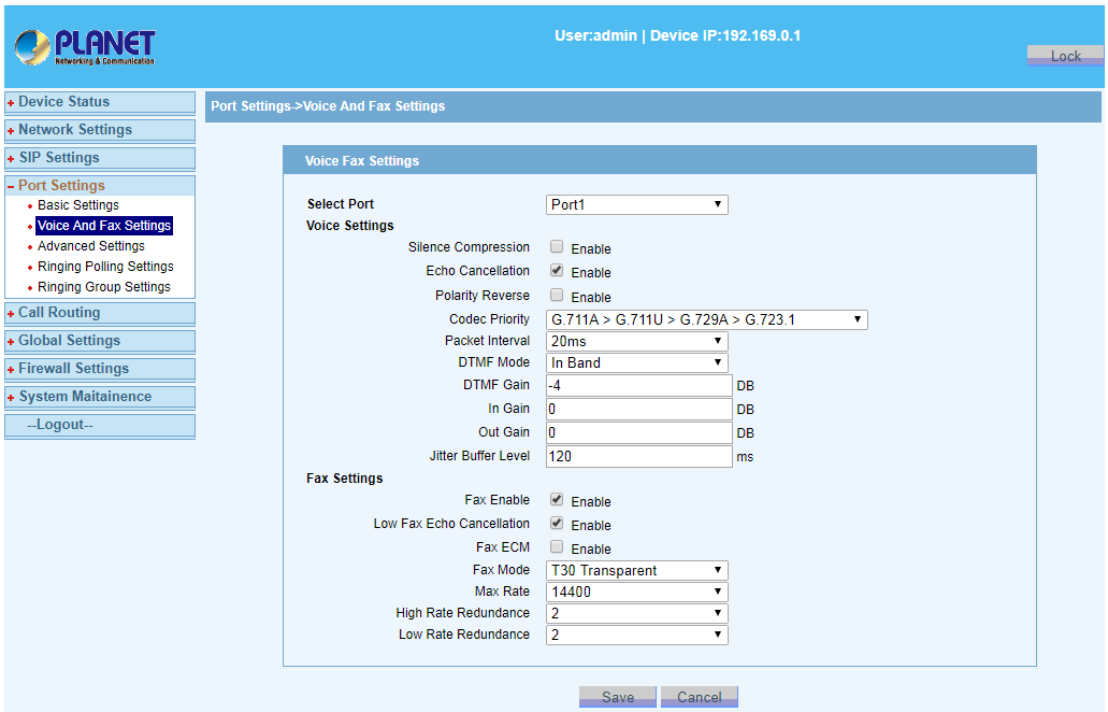


Figure 4-2-3 Voice settings

Parameters	Illustration
Select Port	Select one or all ports to configure.
Silence Compression	Identify and eliminate the long silent period from RTP, in order to save network resources.
Echo Cancellation	The parameter sets the ITU-T coding standard of the voice. The coding technologies supported by this device are G.711 A law, G.711 U law, G.723.1 and G.729 A and so on. Users can choose one or several coding

	modes, but one of those modes must be chosen as the priority.
Flash	It is disabled by default.
Codec Priority	Set the size of RTP packages. The larger the value, the larger the RTP packages and better utilization of network bandwidth.
Packet Interval	Disable user port.
DTMF Mode	It is referred to the transfer mode of users pressing the button in the progress of talk. It can be set in such four modes as In Brand, RFC2833, RFC2198 and INFO.
DTMF Gain	The DTMF gain can be set between -31 and 31 decibels (dB).
In Gain	The device allows you to configure the level of the received (input gain) Tel-to-IP signal and the level of the transmitted (output gain) IP-to-Tel signal. The gain can be set between -31 and 31 decibels (dB).
Out Gain	
Jitter Buffer Level	Defines the starting jitter capacity of the buffer. (0 msec to 250 msec)

4.2.2 Fax application

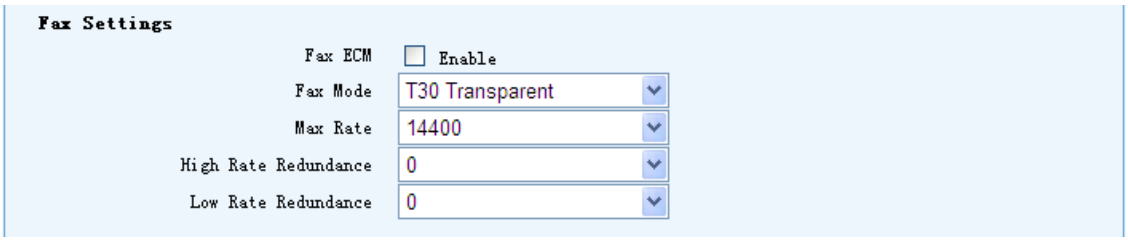


Figure 4-2-4 Fax settings

Parameters	Illustration
Fax ECM	You can also enable or disable Error Correction Mode (ECM) fax mode using the 'Fax Relay ECM Enable's parameter (FaxRelayECMEnable).
Fax Mode	This parameter is used for users to choose the mode of faxes, and the users can choose the T30 Transparent, T30 Bypass or T38 mode.
Max Rate	Fax maximum rate.
High Rate Redundancy	The High/Low Rate Redundancy can be set between 0 and 3.
Low Rate Redundancy	

Note

Fax service is based on port's application. Therefore, please select the correct port when configuring the fax application.

4.2.3 SIP services basic configuration

Select from the menu bar "SIP Settings -> Basic Settings". You can set the VGW's SIP server.

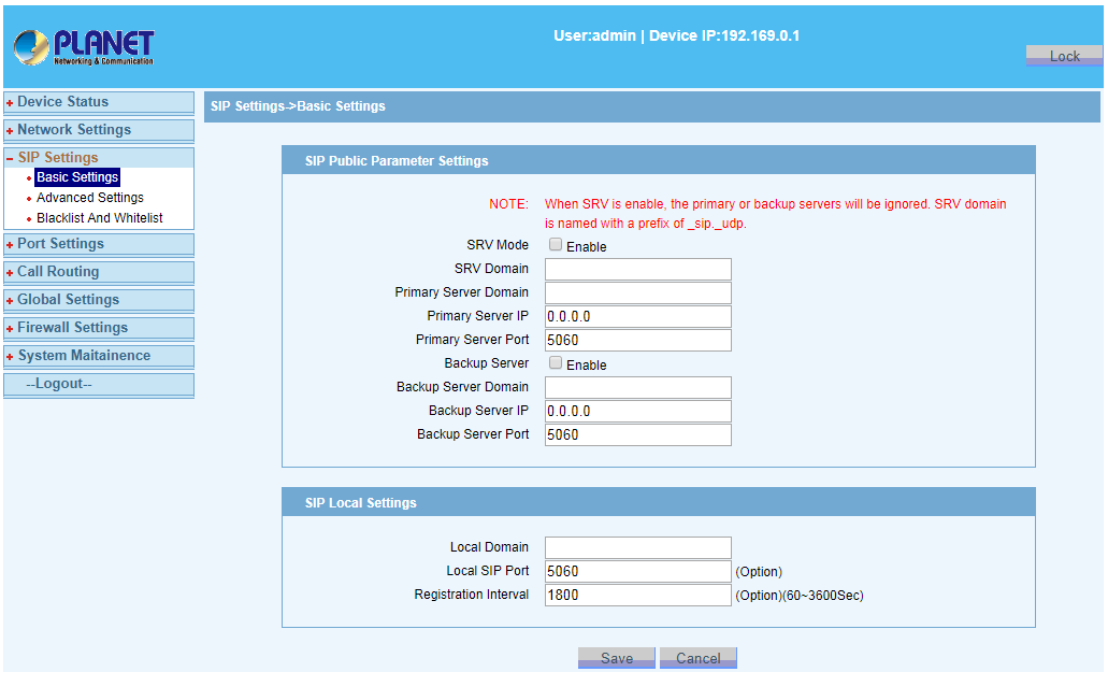


Figure 4-2-5 SIP Public parameter / SIP Local settings

Parameters	Illustration
SRV Mode	SRV Mode has to be **enable** when DNS server is SRV.
SRV Domain	SRV Domain has to be input when DNS server is SRV, and SRV Domain is named with a prefix of _sip_udp.
Primary Server Domain	The domain address of primary soft switch.
Primary Server IP	The IP address of primary soft switch.
Primary Server Port	The port number of primary soft switch that is used for SIP signal.
Backup Server	It is disabled by default.
Backup Server Domain	When it fails to register the primary server, register the secondary softs switch.
Backup Server IP	The IP address of secondary softs switch.
Backup Server Port	Port number of secondary softs switch.
Local Domain	Local Domain is necessary if SRV Mode is Enable.
Local SIP Port	Port number of device used for SIP signal.
Registration Interval	How long will VoIP gateway send register message to soft switch again.

Note	*Local Domain is generally the same as register server or leave this field blank.*

4.2.4 SIP advanced settings

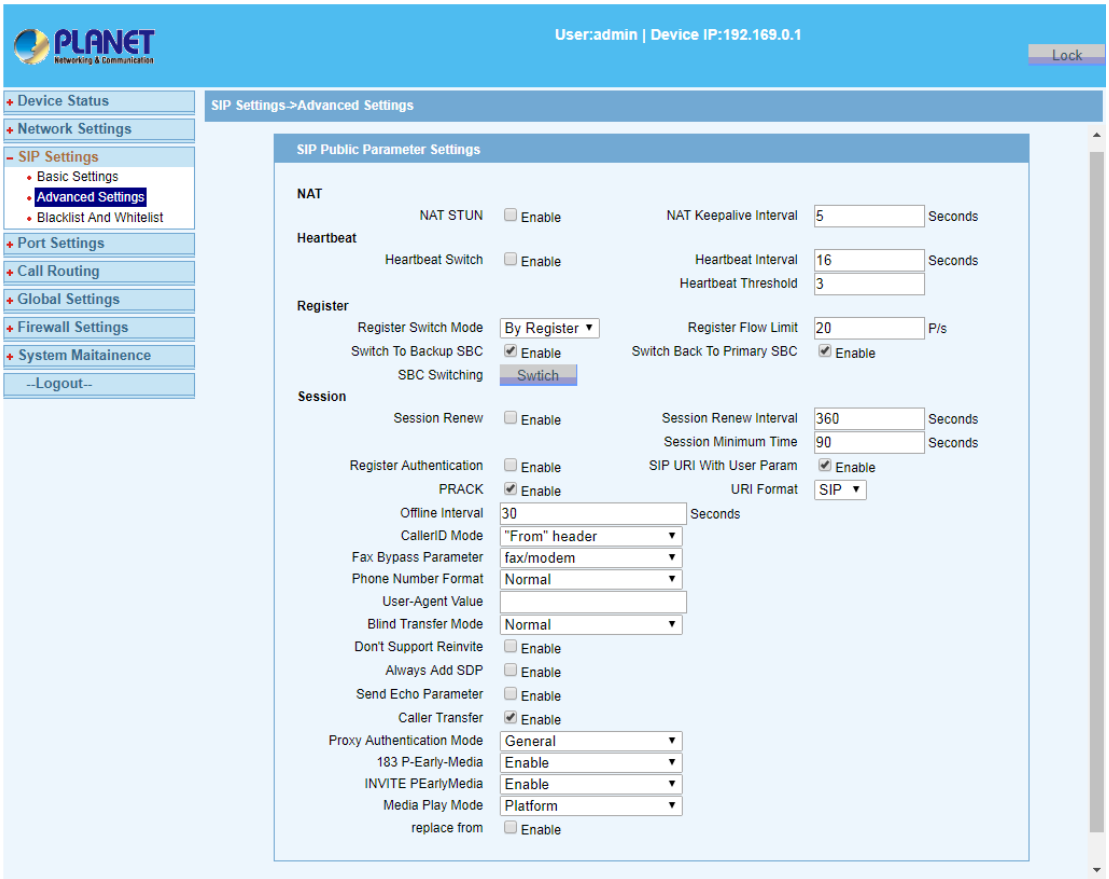


Figure 4-2-6 SIP Advanced settings

Parameters	Illustration
NAT STUN	It is disabled by default.
NAT Keepalive Interval	The valid range of parameters is 0-999999.
Heartbeat Switch	Heartbeat parameters is sent to soft switch or not. It is disabled by default.
Heartbeat Interval	How long will VOIP Gateway send heartbeat parameters to soft switch again. The valid range of parameters is 0-999999.
Heartbeat Threshold	The valid range of parameters is 1-255.
Register Switch Mode	This option is used for switching between primary and second server. There are Register mode and Option mode. By default, Register mode is effective.
Register Flow Limit	To limit the number of register packets. By default, only 20 register packets can be sent per second. The valid range is 1-100.
Switch To Back up SBC	It is enabled by default.
Switch Back To Primary SBC	It is enabled by default.

Session Update	It is disabled by default.
Session Update Interval	The time that session will update. It must be greater than session minimum time.
Session Minimum Time	The default value is 90s.
Register Authentication	It should be enabled if the soft switch uses SIP DIGIST for authentication.
SIP URI With User Param	SIP header fields content attributes. Generally appear in the "From", "To" and "P-Preferred-Identity". If you enable it, "INVITE" header field "From" and "To" will carry "user = phone".
PRACK	SIP's extension header field, disabled by default. "ACK" temporary response message headers.
URI Format	Supports both formats: SIP and TEL Generally appear in the From, To and P - Preferred - Identity. SIP：From: "88880009"<sip:88880009@192.168.3.216;user=phone>; TEL ： From: <tel:88880009>;
Offline Interval	The interval that VGW initiates registration again after registration has failed. Note: It is not a registered retransmission mechanism.
CallerID Mode	Specify the origin of caller ID. There are two modes, "From" header and PPI (P-Prefered-Identity) header.
Fax Bypass Parameter	This fax parameter is the used for adapting requirements of a different soft switch when consulting with opposite side.
Phone Number Format	"Normal" and "Escape Character".
User-Agent Value	By default, it is blank. But the value of this field in the SIP messages is the name of device, otherwise it's what you filled in.
Blind Transfer Mode	VGW supports two modes, Normal and Cancel->Refer. Normal: VGW will send SIP signal by INVITE form when hook flash in blind transfer. Cancel->Refer: VGW will send SIP signal by REFER when hook flash in blind transfer.
Don't Support Reinvite	It is disabled by default. VGW will not send INVITE message when hook flash.
Proxy Authentication Mode	The default is general.

Note

- *"**Option**" mode is based on heartbeat function. So if you choose this mode, you must enable Heartbeat Switch. In this mode, VoIP Gateway sends heartbeat packets both to the primary and secondary server simultaneously. VGW will try up to 3 times to send heartbeat until primary server responds. If the primary server responds, device will send registration request to it. If VGW tries three times continuously with no*

response of the primary server during heartbeat threshold time, it will switch to secondary server.

- *Once the primary server recovers normal and responds heartbeat messages, VGW will switch back to it again.*
- *In "Register" mode, whether it is switched or not between primary and secondary server, it is decided by response of registration or invite messages. Firstly, VGW sends registration messages to primary server. If the server doesn't respond for 3 times continuously, VGW will switch to secondary server. Switching from secondary server to primary is the same mechanism. When VGW has registered to soft switch for 3 times with no response of invite messages, VGW will switch to another server. In "Register" mode, primary and secondary servers are parallel in relationship, meaning it will only switch when the server gets a breakdown.*

4.2.5 SIP blacklist and whitelist (VGW-810FS only)

Select from the menu bar "SIP Settings->Blacklist and Whitelist". Go to the SIP black list settings page. It is disabled by default.

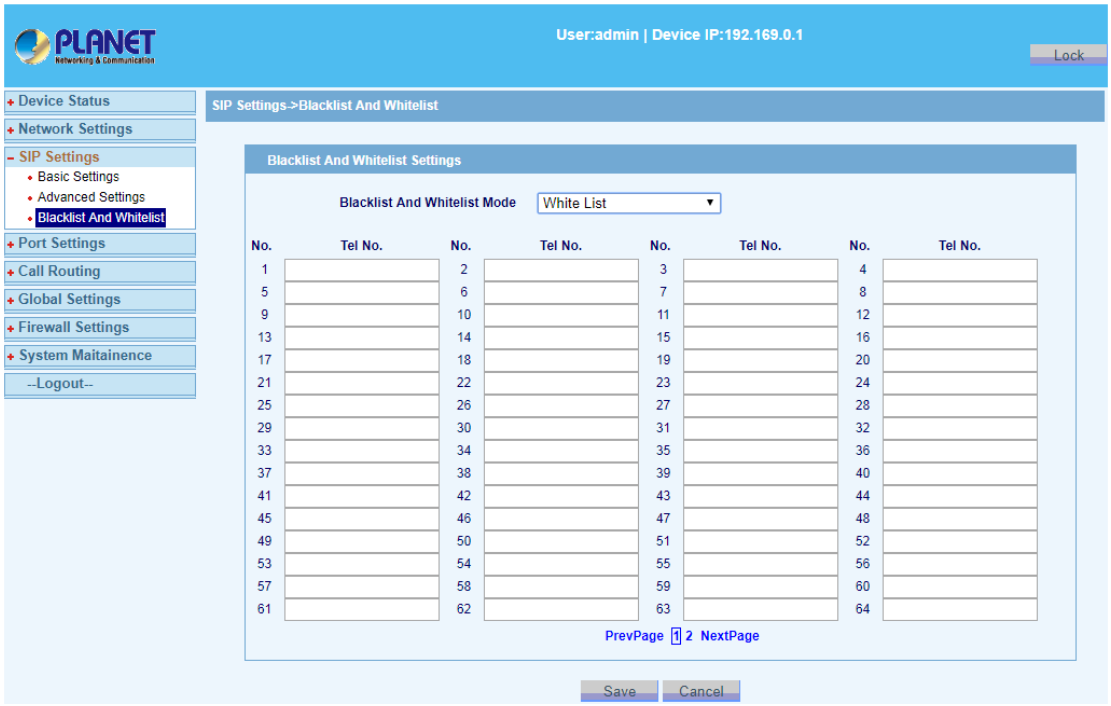


Figure 4-2-8 SIP whitelist settings

Note	*SIP blacklist and whitelist function is to limit the number of SIP callouts.*

4.2.6 Call routing

Select "Call Routing->Digit Map" from the menu bar and set dial plan rules.

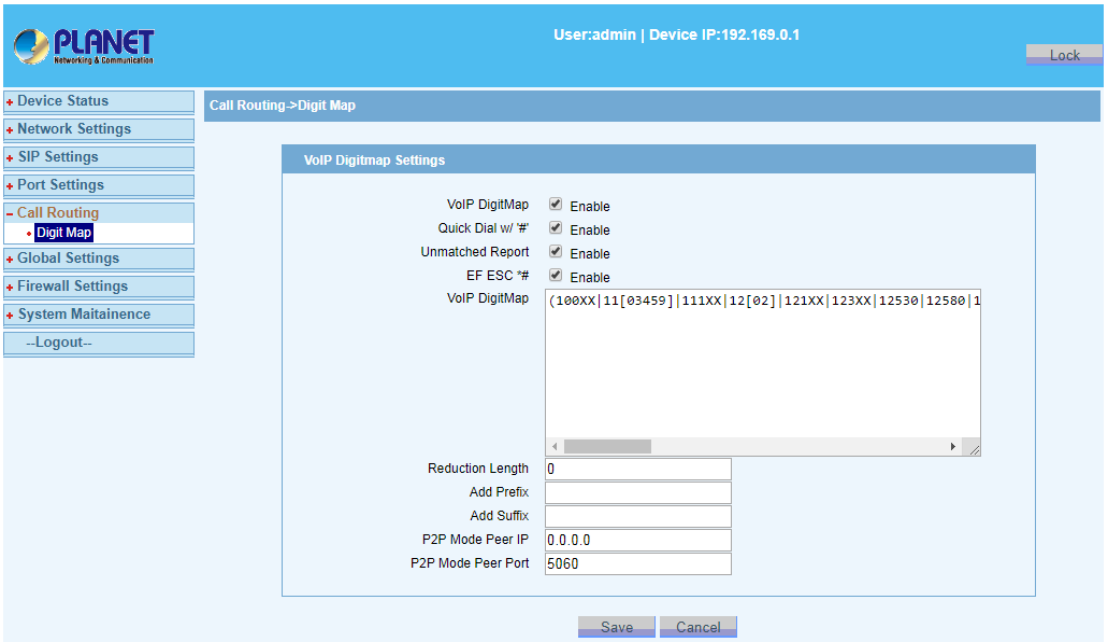


Figure 4-2-9 DigitMap

Parameters	Illustration
Digit Map	When there are multiple dialing rules, you can separate with the '|', such as X. | FXXXE. What's more, 'F' stands for '#' and 'E' stands for '*'.
Quick Dial	Port will make a call when it receives #.
Reduce Length	Called number replacement rules.
Add Prefix	Called number replacement rules.
Add Suffix	Called number replacement rules.
Dial Route IP	It should be the IP address of the other side if the call is point to point.
Route Port	5060 by default.

4.2.6.1 Digit Map grammar

The interpretation and grammar of Dial plan follow the following rules:

0-9, E, or F	A DTMF digit is recognized as valid if it is one of the following: 0-9 or * or #
X	The letter "x" is used as a wildcard, designating any event corresponding to symbols in the range"0"-"9". The string may also contain explicit ranges and, more generally, explicit sets of symbols, designating alternative events any one of which satisfies that position of the dial plan.
•	The dot symbol "." stands for zero or more repetitions of the event selector (event, range of events, set of alternative events, or wildcard) that precedes it. As a consequence of the third timing rule above, inter-event timing while matching a terminal dot symbol uses the short timer by default.
[X-X]	Sub-range, starts with the first number to last number. For example, [2-8] means a digit in the range 2 to 8.
S, L	"S" and "L" respectively indicate that the MG should use the short(S) timer or the long (L) timer for subsequent events, overriding the timing rules described above.

As an example, consider the following dial plan:

0	Local operator.
00	Long-distance operator.
xxxx	Local extension number (starts with 1-7).
8xxxxxxx	Local number.
#xxxxxxx	Off-site extension.
*xx	Star services.
91xxxxxxxxxx	Long-distance number.
9011 + up to 15 digits	International number.

Note

- *Digit Map is not case sensitive.*
- *'(' and ')' represents the start and end of digit map.*
- *In the "[]", it cannot fill in the wildcard. For example, 'X' on behalf of 0-9, but [0-9] is true, and [X] is the wrong rule.*

4.2.7 Global settings

4.2.7.1 DSP global settings

Select the menu bar of the "Global Settings->DSP Settings"; you can set RFC2833 payload, RFC2198 payload, RTP port range, Flash Min and Flash Max limits of hook flash.

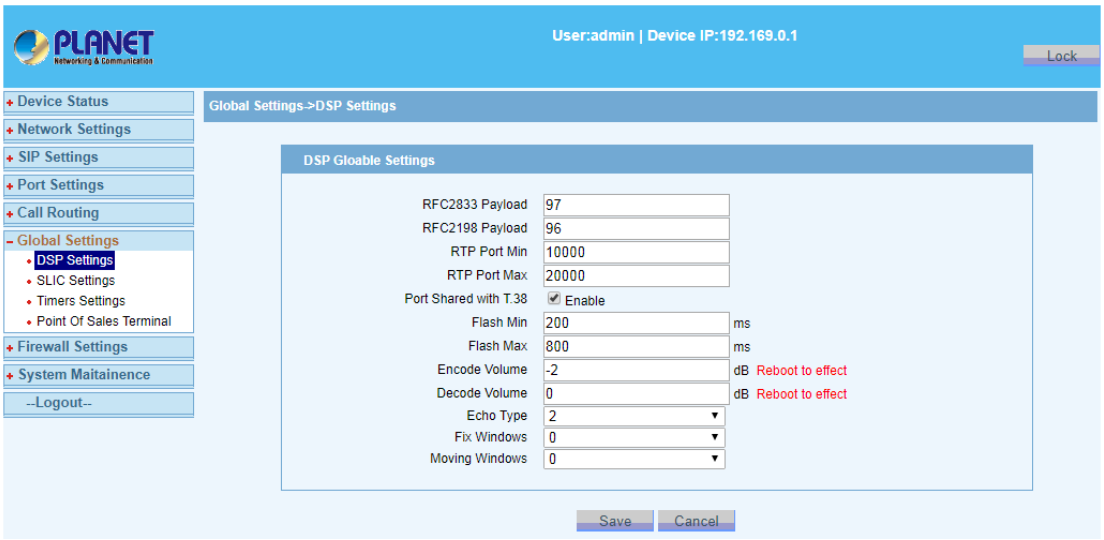


Figure 4-2-10 Global settings

Parameters	Illustration
RFC2833/RFC2198 Payload	The range of RFC2833/ RFC2198 Payload is from 96 to 127.
RTP Port Min/Max	The range of RTP Port Min/Max is from 1024 to 65535.
Port Shared with T.38	It is enabled by default.
Flash Min/Max	The range of Flash Min/Max is from 100 to 1000.
Encode/Decode Volume	-

4.2.7.2 Timers and ringing pattern settings

Select the menu bar of the "Global Settings->Timers Settings", you can set off-hook not dialing timeout (Start Timer), Dial-up interval (Short Timer), Dial number matching Digit Map rule timeout (Long Timer), Ring Tone Duration, Busy Tone Duration, Howler Tone Duration, RingBack Tone Duration, Ringing Pattern Settings, and International Call Setting.

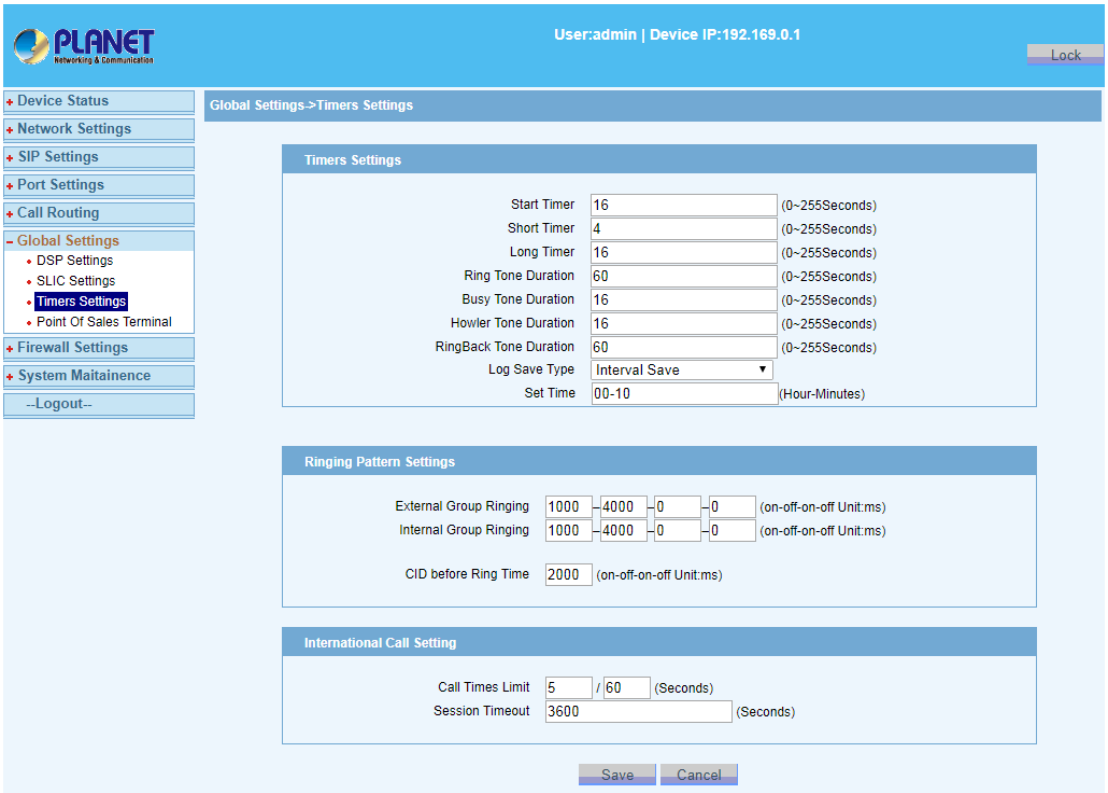


Figure 4-2-11 Timers Settings

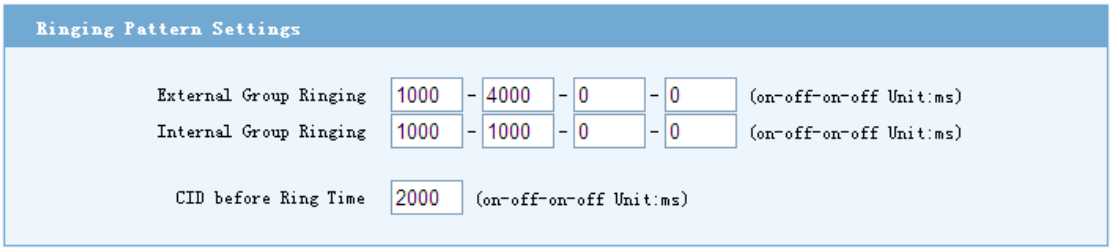


Figure 4-2-12 Ringing Pattern Settings

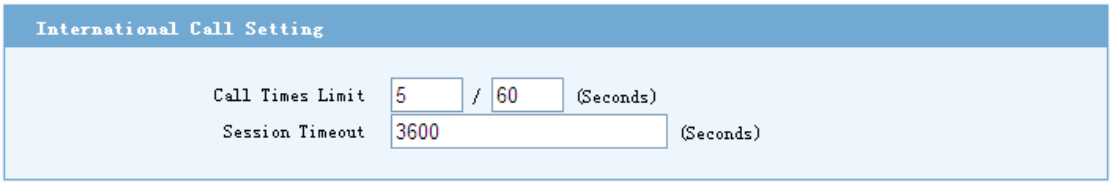


Figure 4-2-13 International Call Setting

Parameters	Illustration
Start Timer	Its default value is 16 sec
Short Timer	Its default value is 4 sec
Long Timer	Its default value is 16 sec
Ring Tone Duration	Its default value is 60 sec
Busy Tone Duration	Its default value is 16 sec
Howler Tone Duration	Its default value is 16 sec
RingBack Tone Duration	Its default value is 40 sec
Ringing Pattern Settings	The ringing sequence (interval): External Group Ringing and Internal Group Ringing; External Group Ringing function is used by default.
International Call Setting	International outgoing call restrictions.

4.3 Security

Select the menu bar of the "Firewall Settings->White List"; you can set the IP whitelist. It is disabled by default.

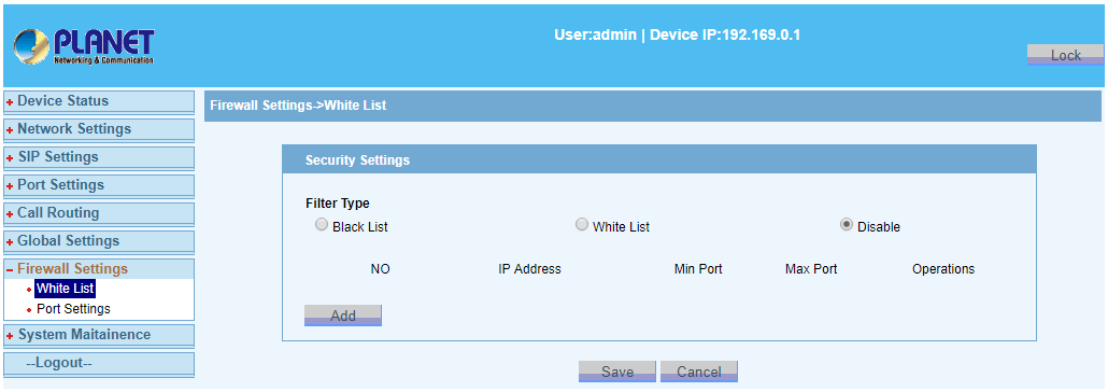


Figure 4-3-1 IP white list settings

Note

- *SIP blacklist and whitelist function is to limit the number of SIP callouts. When enabling and setting the whitelist IP address and then saving it, IP addresses that are not configured in the whitelist will be denied access to VGW Web.*
- *Through the menu bar of the "Firewall Settings->Port Settings", it will be able to set the device's local maintenance port. It includes Web, and SSH access port.*

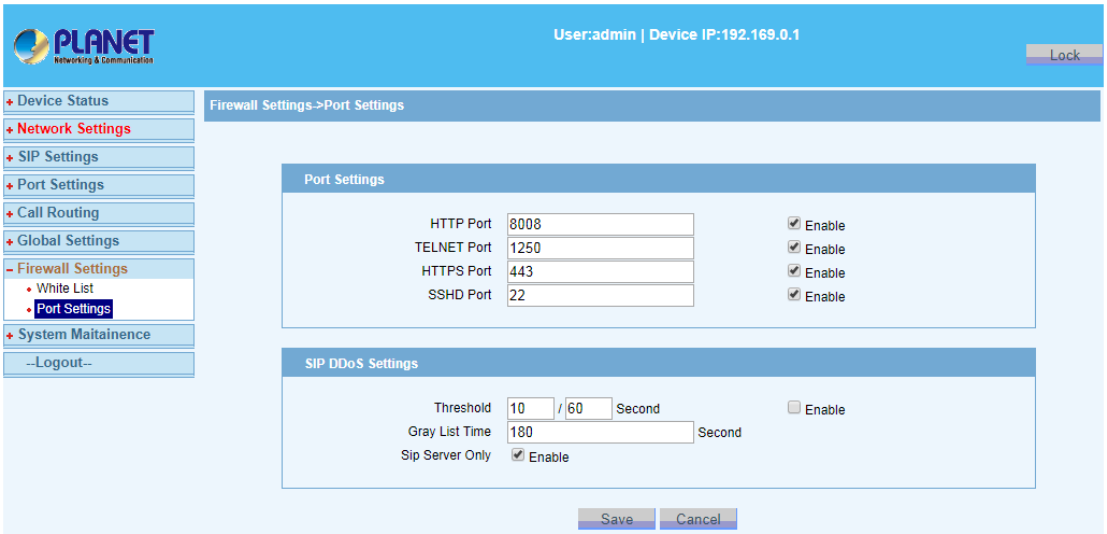


Figure 4-3-2 Port / SIP DDoS settings

Note	• *"SIP Servers Only" is enabled by default. VGW will refuse to receive illegal SIP messages that come from the device not specified.* • *If you need to make SIP and PSTN conversion, please disable this feature.*

4.4 Management

4.4.1 User management

Select "System Maitainence->User Management" setting page, and jump to the page of User manage.

There are two kinds of users, Administrator and Operator. The Administrator has all the permissions. It can add, modify and delete user. However, every level has to have one user at least. The Operator is invisible to some pages of VGW.

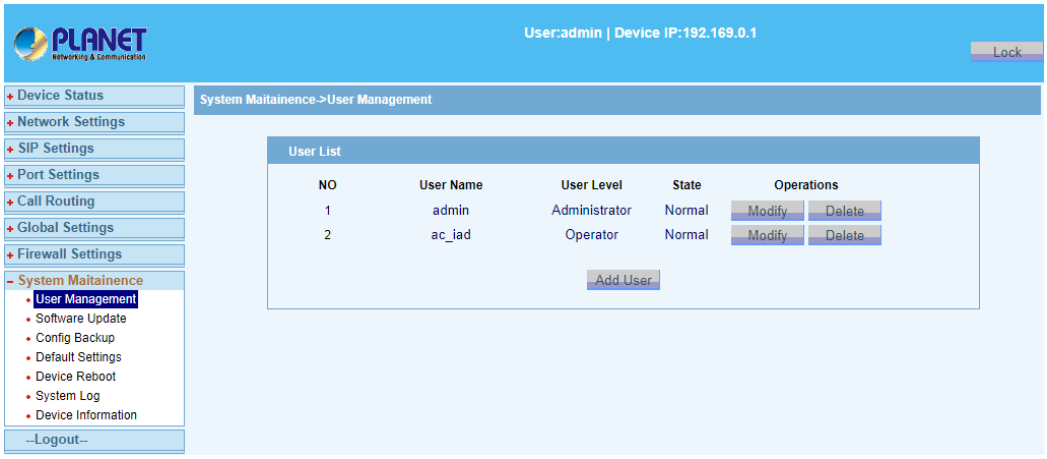


Figure 4-4-1 User list

Note	*If you enter the password wrong for more than five times, your current account will be locked, and you will not be able to log in VGW anymore. If you happen to remember the password, you need to log in device with the correct password and unlock it through serial port (i.e. CONSOLE port). Otherwise, please contact the manufacturer.* *Unlock command as follows:* *#system>**user unlock** username*

4.4.2 Config backup

Select the "System Maitainence->Config Backup" setting page, and jump to the page of Config Backup.

VGW is allowed to download config file from local PC, and also allowed to upload config to local PC. If you want to download config from PC, you should click the "Upload" button after you have selected config file in your local PC by the "Browse" button. If you want to back up config of device, just click the "Backup" button.

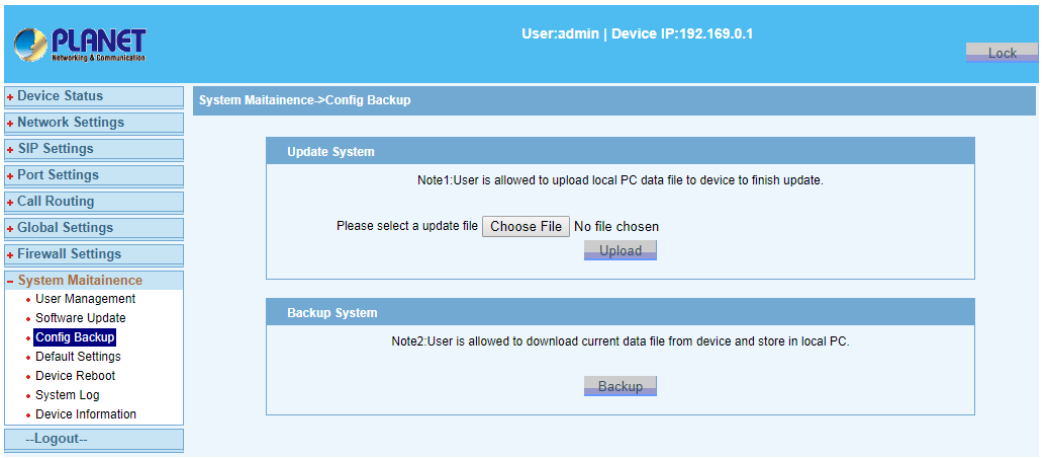


Figure 4-4-2 Import / Export Configuration

4.4.3 Reset

Select "System Maitainence->Default Settings" from the navigation menu, and click on the "Submit" button; VGW will perform the restore factory settings.

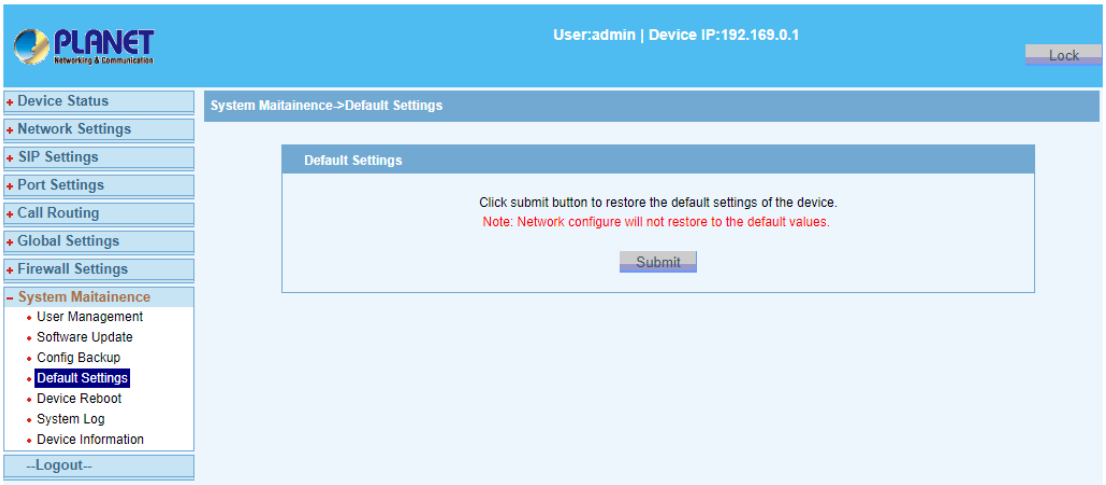


Figure 4-4-4 Factory reset

Note	*Through the Web to restore factory Settings, VGW's gateway and IP will be retained.*

4.4.4 Reboot

Select "System Maitainence->Device Reboot" from the menu bar to reboot the device remotely.

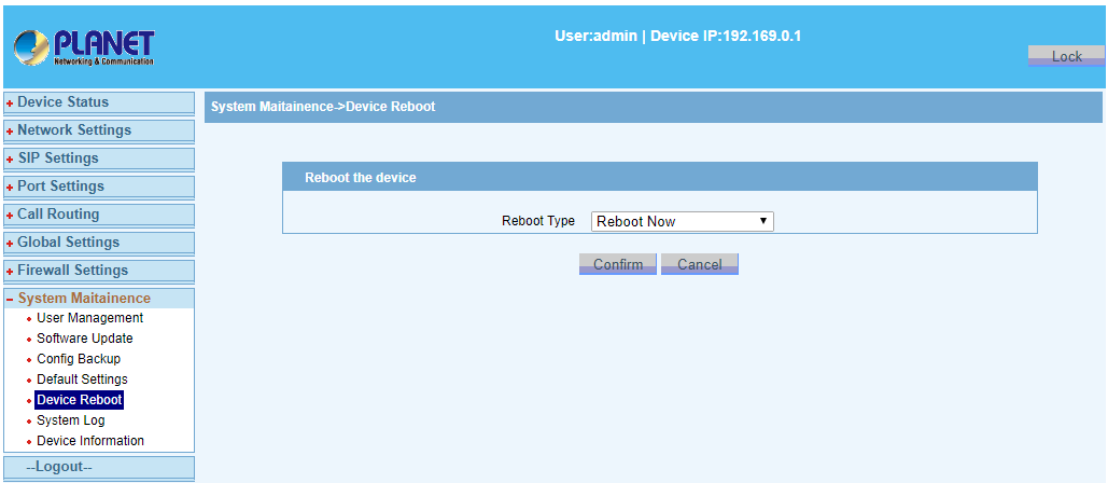


Figure 4-4-5 Reboot

Note	*Through the Web to reboot device, unsaved data will be lost. It will take about 1 minute to restart.*

4.4.5 System log

Select "System Maitainence->System Log" from the navigation menu to view the log information depending on the module type. You can also Clear, Refresh or Download (export) the log files.

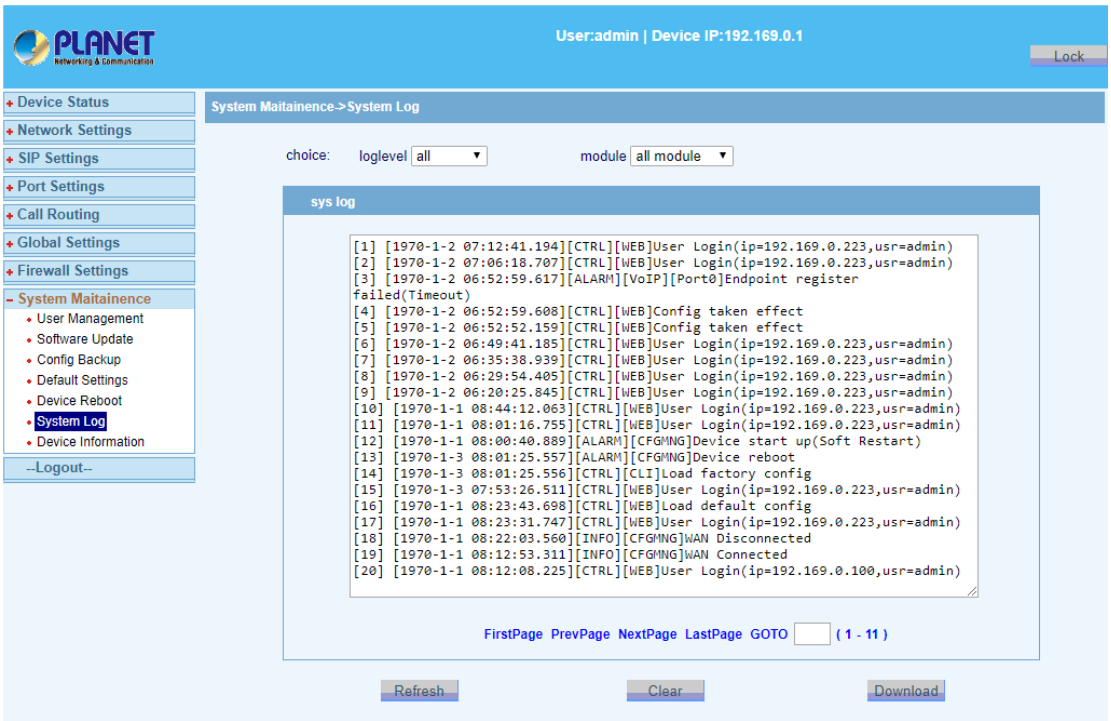


Figure 4-4-6 System log

4.4.6 Device information (VGW-810FS only)

Select "System Maitainence->Device Information" from the navigation menu to add a personalized name for your device as required.

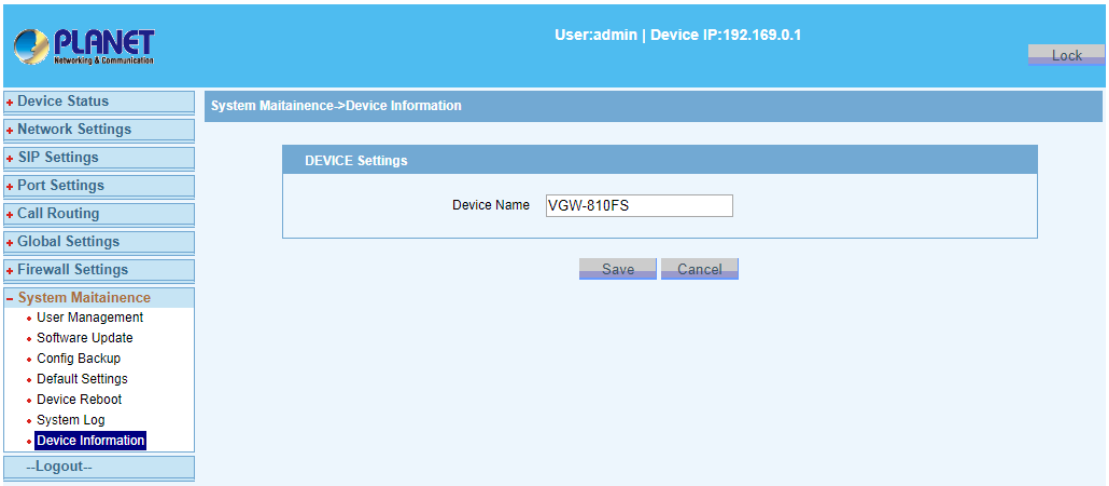


Figure 4-4-7 Information settings

After the device name is set, you can select "Device Status->System Information" from the navigation menu to view it.

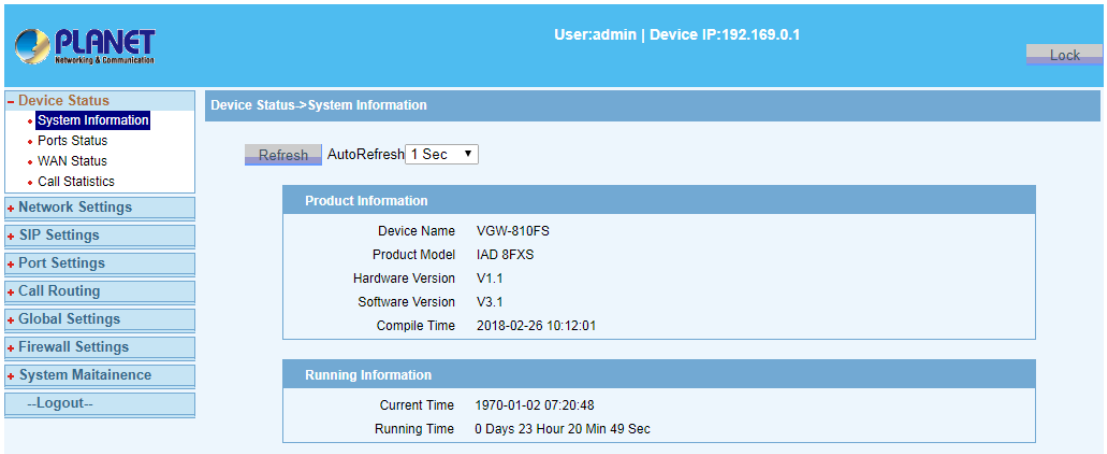


Figure 4-4-8 View information

Chapter 5 Examples

5.1 FXS business

Select "User Port Settings -> Advanced Business Setup" setting page, so you can jump to the main configuration page.

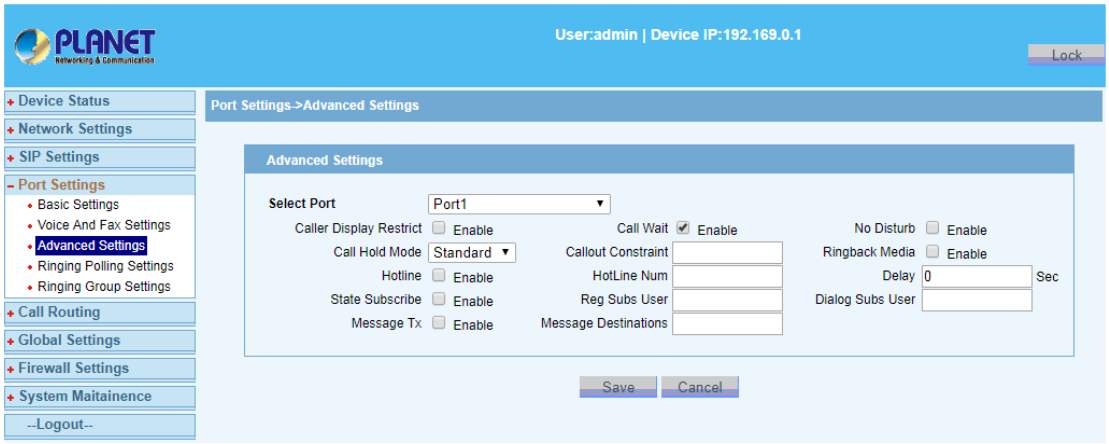


Figure 5-1-1 Advanced business configuration

Parameters	Illustration
Select Port	Select a port number or all ports to be configured.
Caller Display Restrict all	It's default by "disable".
Call wait	Between "Enable" and "Disable", you could choose one of them.
No disturb	When you select enable, it means that called port is forbidden.
Call Hold mode	These four modes are Standard, Disable, SSCC and SIP INFO, Default is "Standard".
Callout Constraint	For the purpose to control call out number's prefix (etc: +8652-88888888, +8652 is number's prefix), you can filter it here.
Ringback Media	VGW supports local ringback tones; if you need, you can enable it.
Hotline mode	Hotline mode is disabled by default.
State Subscribe	Specify subscriber, not enabled by default.
Reg Subs User	Specify subscriber, default is empty.
Dialog Subs User	Specify subscriber, default is empty.
Message Tx	Designate a message transmitting user, not enabled by default.
Message destination	Default is empty.

5.1.1 Multi-party conferencing

VGW makes enabling multi-party conferencing service as default.

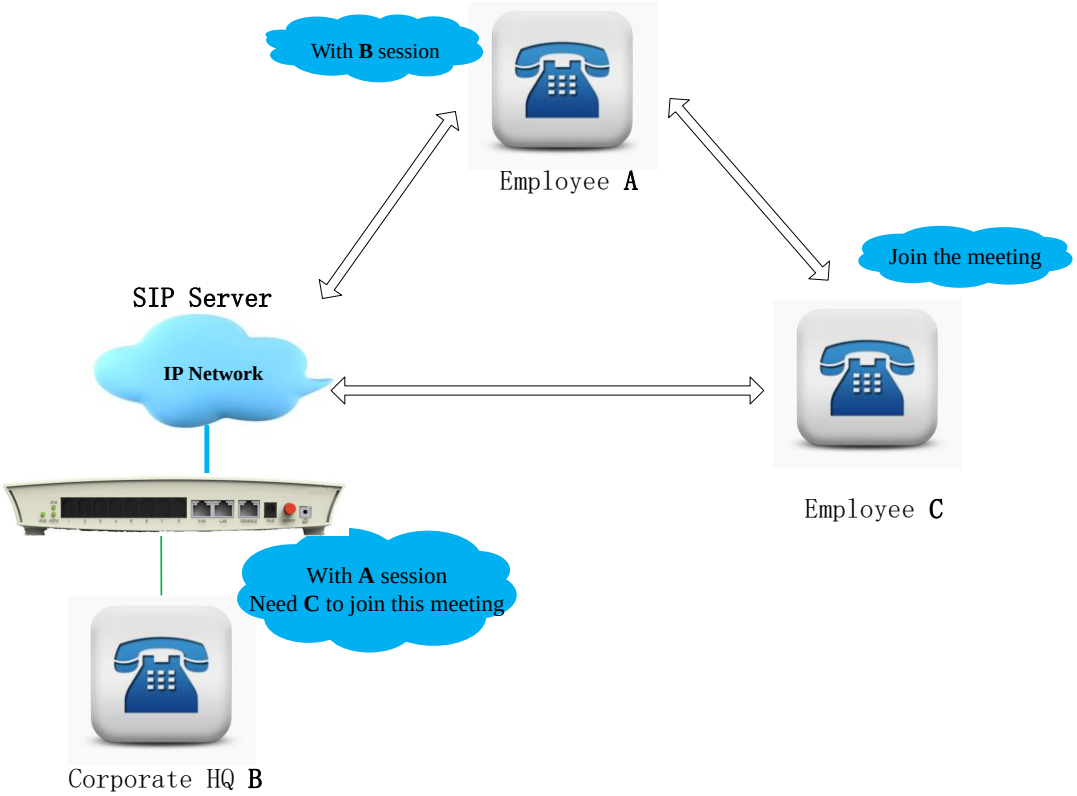


Figure 5-1-2 Multi-party conferencing

VGW's multi-party conferencing's procedure is shown as follows:

1) **B** dials to **A**, and then **A** is off hook, so a session is established between **A** and **B**.
2) **B**'s hook flashes, and now **B** can hear a dial tone. **A** is on call waiting. When **B** dials to **C**, a session is established between **B** and **C**.
3) **B**'s hook flashes, and now **B** can hear a dial tone. **A** and **C** are on call waiting. Let **B** continue to do the following things:
   - **B**dial**1**: established a call between **B** and **A**.
   - **B**dial**2**: established a call between **B** and **C**.
   - **B**dial**3**: established a call among **A**, **B** and **C**.

5.1.2 Consulting and blind transfer business

VGW makes enabling consult transfer and blind transfer business as default. The following PIC will show a business instance that A and C connect to the same VGW.

5.1.2.1 Consulting transfer business

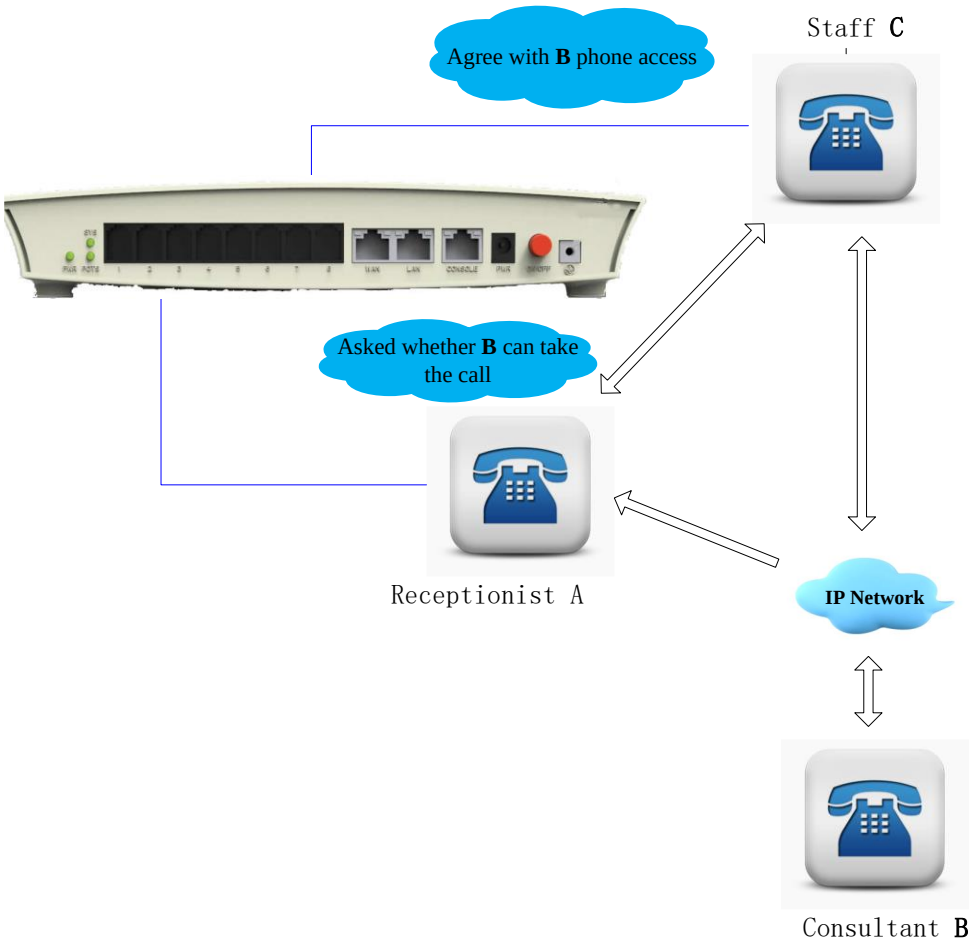


Figure 5-1-3 Multi-party conferencing

VGW's consulting transfer service steps are as follows:

1) **B** dials to **A**, and then **A** is off hook, so a session is established between **A** and **B**.
2) **A**'s hook flashes, and now **A** can hear a dial tone, **B** is on call waiting. **A** continues to dial to **C**, so a session is established between **A** and **C**.
3) When **A** is on hook, a session is established between **B** and **C**.

5.1.2.2 Blind transfer business

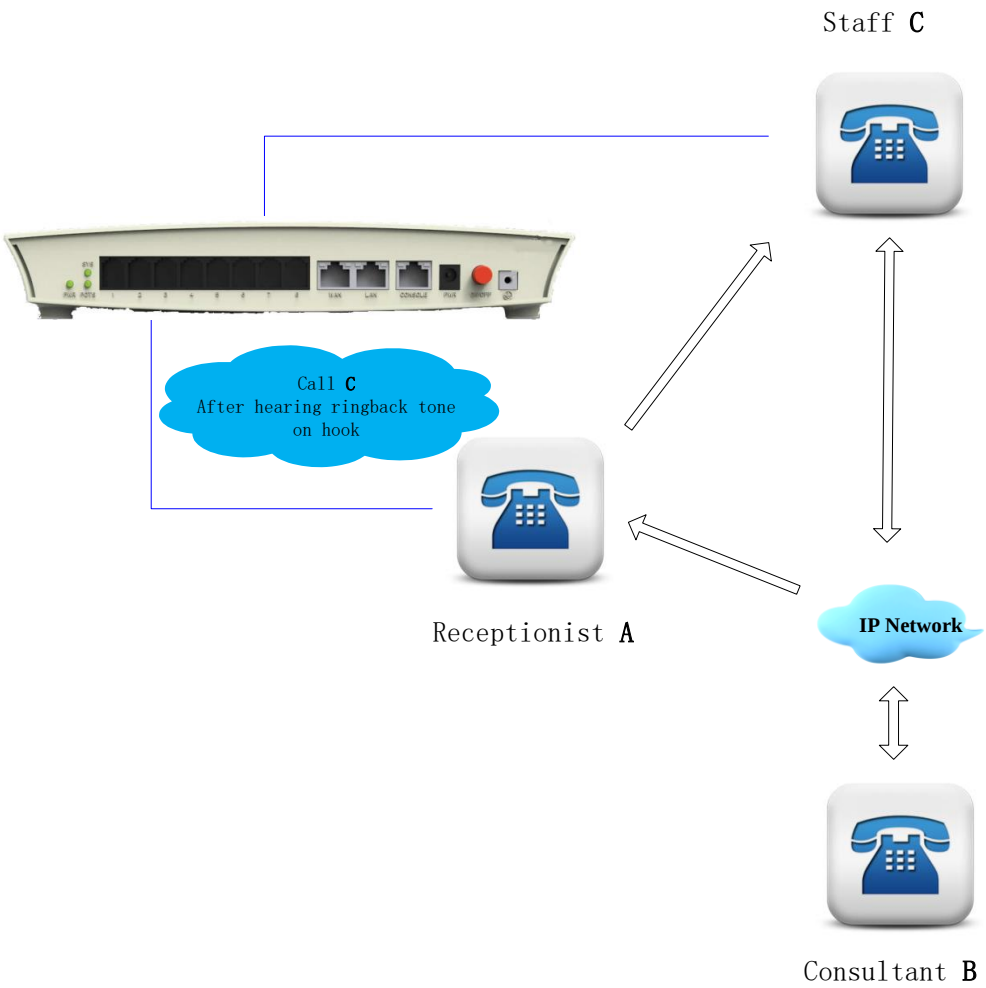


Figure 5-1-4 Blind transfer business

With VGW's blind transfer business, the call processes are as follows:

1) **B** dials to **A**, and then **A** is off hook, so a session is established between **A** and **B**.
2) **A**'s hook flashes, and now **A** can hear a dialing tone. **B** is on call waiting. **A** continues to dial to **C**, and when **A** hears a ringback tone, then it is on hook.
3) If **C** is off hook, a session is established between **B** and **C**. Otherwise, **B** would first hear a ringback tone and then a busy tone for a period of time. After that vanishes, the session ends.

5.1.3 Call waiting service

VGW in the call waiting service is not enabled by default. To enable this service, go to the

"Port Settings->Advanced Settings" configuration page to enable the corresponding port "Call Wait" function.

The call waiting service steps are as follows (refer to "Figure 5-1: Multi-party conferencing" steps; for example, **B** is on call waiting service):

1) **A** dials to **B**, and then **B** is off hook, so a session is established between **A** and **B**.
2) **C** dials to **B**, during the call, **B** will hear the call waiting tone.
3) **B**'s hook flashes, and now **B** hears the dialing tone at which time both **A** and **C** are waiting call.
   B continues to do the following:
   - **B** dial **0**: stop **C**.
   - **B** dial **2**: connect with **C**.

Note	*For the port that is on call waiting service. When user's hook flashes, press number "**2**", and a session is established between one user and one user. When number "**2**" is pressed twice, a session is established between another user and another. Press number "0" to stop another user, meaning to keep the current session.*

5.1.4 Ringing group

Select "Port Settings->Ringing Group Settings" setting page, and you can jump to the page for the ringing group.

Figure 5-1-5 Ringing group settings

Note	• *By dividing the Ring Group, achieve much incoming extension parallel ringing; can be divided up to 16 groups.* • *It is strongly suggested that one device's group member isn't over 16 users.*

5.1.5 Point to Point function

VGW's P to P function that makes business between two VGW's without an SIP server comes true. If the VGW can allocate a unique IP, a remote call is allowed between two VGW's via Internet.

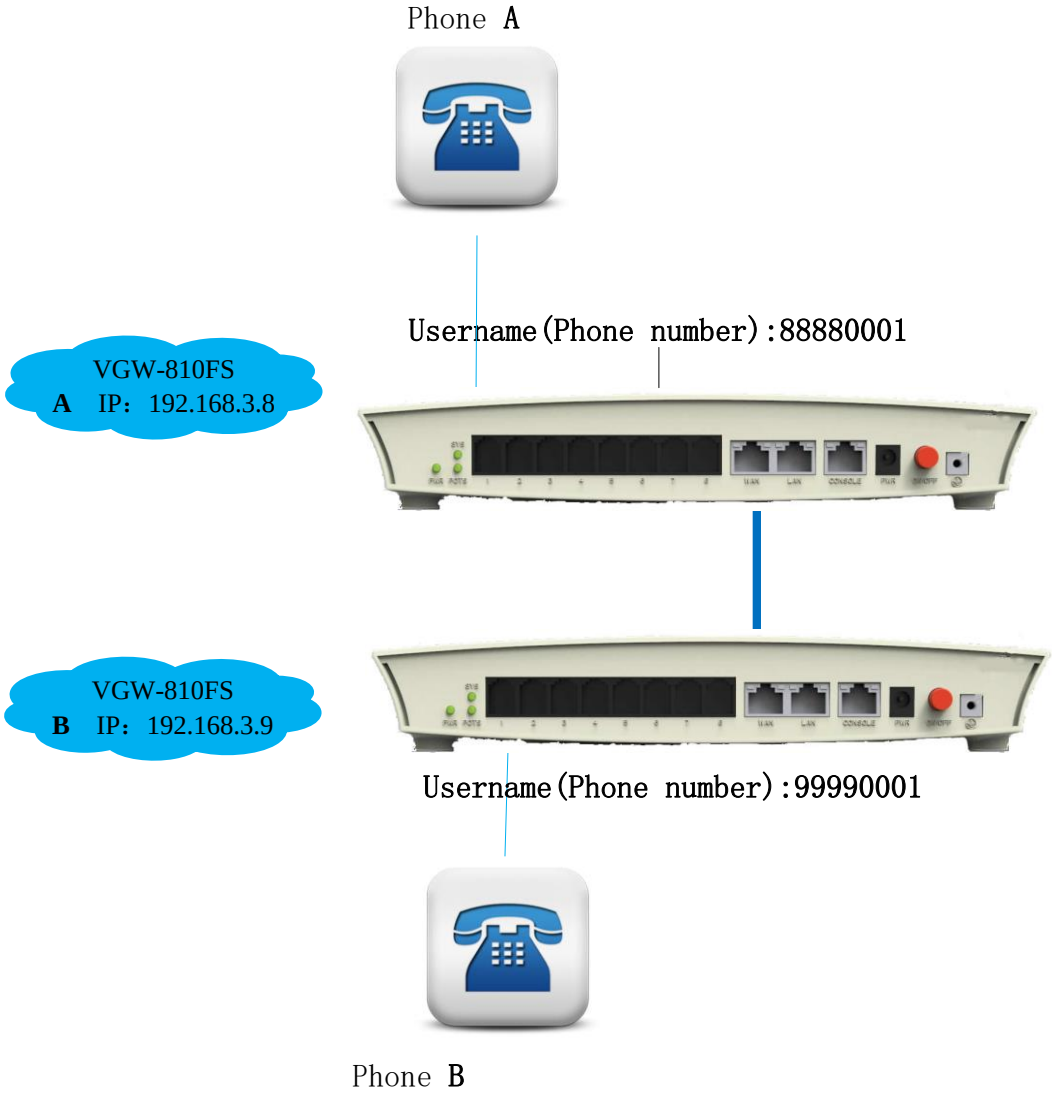


Figure 5-1-6 Point to Point function

Follow the steps:

1) Go to the "4.2.6 Call routing" setting page, in "Dial Route IP" and "Route Port" input opposite VGW's IP address and port number. Like "Figure 4-2.6: Digit Map", "dial routing", device **B** inputs device **A**'s IP and port number, on the other hand, device **A** inputs device **B**'s IP and port number.
2) Select "Device Status->Ports Status" menu by navigation, where the registration status could be inquired. When all ports are successfully registered, we could see "registered" displayed on the Web page. It is showed that we could make VGW's P to P business.

Otherwise, please check WAN port's configuration parameters and network.

5.2 System update

Select "System Maitainence->Software Update" setting page to upgrade positon. During upgrade, keep the power on, and don't press the restart button. After the upgrade is completed, the device will automatically restart.

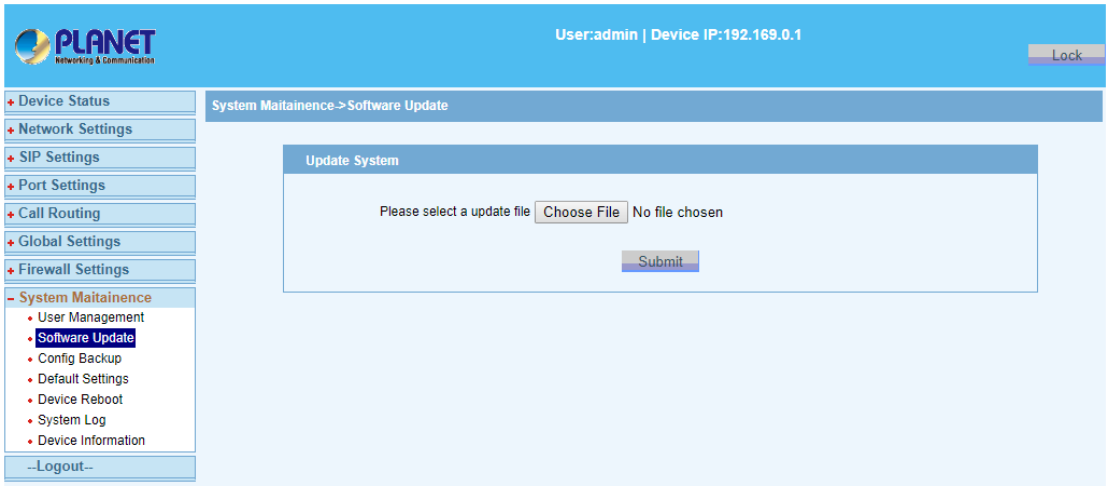


Figure 5-2-1 System update

Note	*If done incorrectly, it can cause irreversible damage. Please be cautious.*

Chapter 6 FAQs

6.1 CLI maintenance tools

CLI is a command-line terminal maintenance tool. In order to solve problems efficiently, you should have a certain understanding about the following details.

The following procedure parameters are "factory default ". For more parameter information, refer to "3.1.1 Factory parameters". When dealing with the issue, you should do according to the actual configuration parameters.

6.1.1 Telnet login

We can make configuration on command-line terminal， manage device in-band.

When configurate VGW's technical parameter, we could use "telnet" to login.（First, ensure that device's power is on, LAN port default IP is 192.169.0.1, subnet mask is 255.255.255.0）We can make configuration from command terminal, manage device in-band.

VGW gateway allowed telnet to login WEB configuration by LAN or WAN port。However, due to the WAN port IP address might be dynamically obtained through DHCP and PPPoE, which is not easy for "telnet" to access, so it is strongly recommended that keep the LAN port to connect "telnet". "telnet" login process can be performed as follows:

Prepare a direct or a cross network cable.

Keep network cable connect PC and VGW’s LAN port. If the LAN port LINK led is on, it means that PC and device has been properly connected.

Modify/Add the PC IP address*192.169.0.X* (X is an integer greater than 2 and less than 254) mask of *255.255.255.0*.

Open a command line window on PC。（From the windows menu<start>, <Run>, where you can input "cmd" command or "command", then click "OK" to open cmd.exe.）

Input the following command in the command line window: telnet 192.169.0.11250 refer to the following picture:

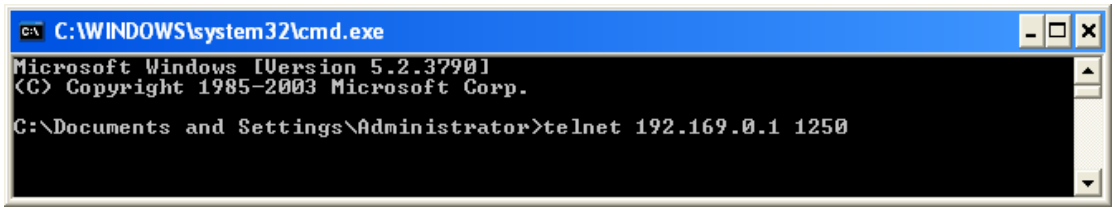


Figure 6-1-1 VGW Telnet login

1) Press enter， Telnet into the device's login screen, as shown below：

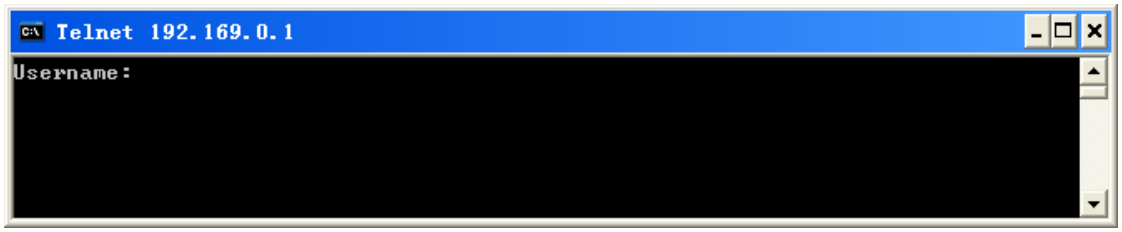


Figure 6-1-2 VGW Telnet login

2) Input correct user name and password to enter, the system default username is "admin", the default password is "psw.iad".

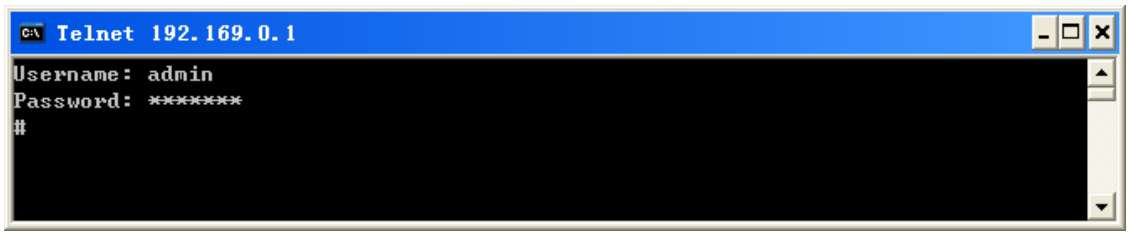
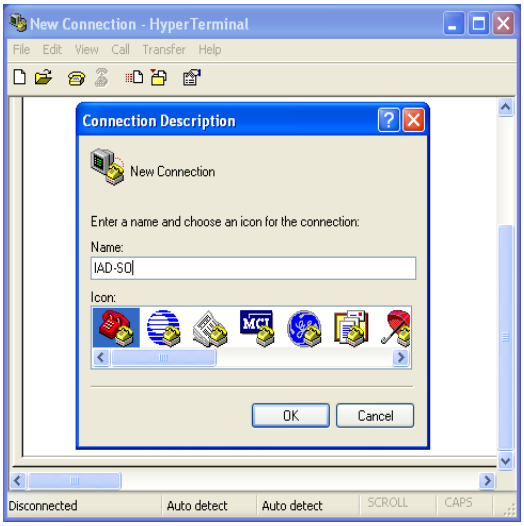


Figure 6-1-3 VGW Telnet login

6.1. 2 Serial port login

VGW can be used to configure the device via CONSOLE port. Use one end of the serial cable to the VGW's CONSOLE port, and the other end connected to any serial port on computer. Then operator computer will do as follows: (Open a windows "start" menu by doing the following: "start->All Programs->Accessories->Communications->HyperTerminal"), and then click "Hyper Terminal. exe". If you can't find out the application, please install application from the PC's "control panel". With other help, please refer to Windows help.

1) Start HyperTerminal; there will be a "Connection Description" dialog box, required to enter a name and select an icon for the connection as shown below:



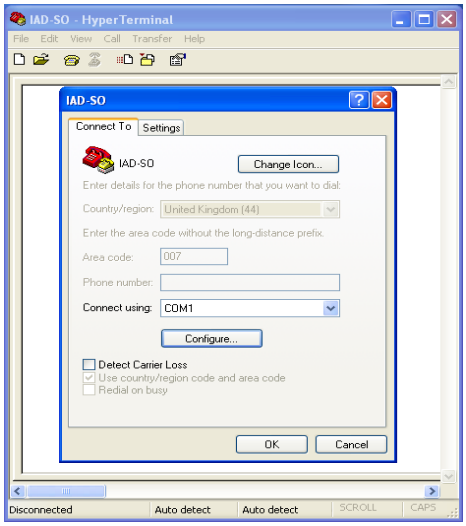


Figure 6-1-4 HyperTerminal configuration

2) Input a connection name, and press the Enter key or use the mouse to click "OK" to enter the next step. Then there will be a "connected" dialog. In the "Connect using" pull down menu, your selected port must be in accordance with the port actually connected to the PC as shown in picture below.

3) Press Enter or click on the "OK" button to enter the next step to set port's other attributions.

Port attributions should be set as follows:

- Bits per second: **9600**
- Data bits: **8**
- Parity: **None**
- Stop bits: **1**
- Flow control: **None**

Press Enter key or use mouse to click "OK".

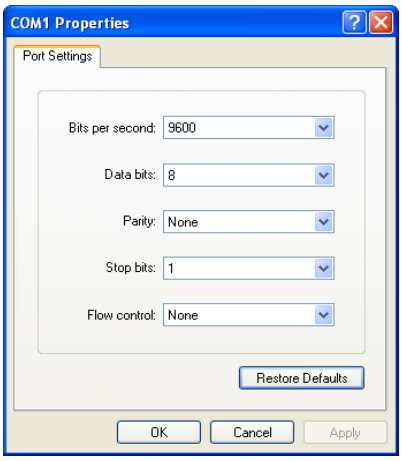


Figure 6-1-5 Serial settings

4) If the device has been started (device automatically starts when power is on), you can see the user login message.

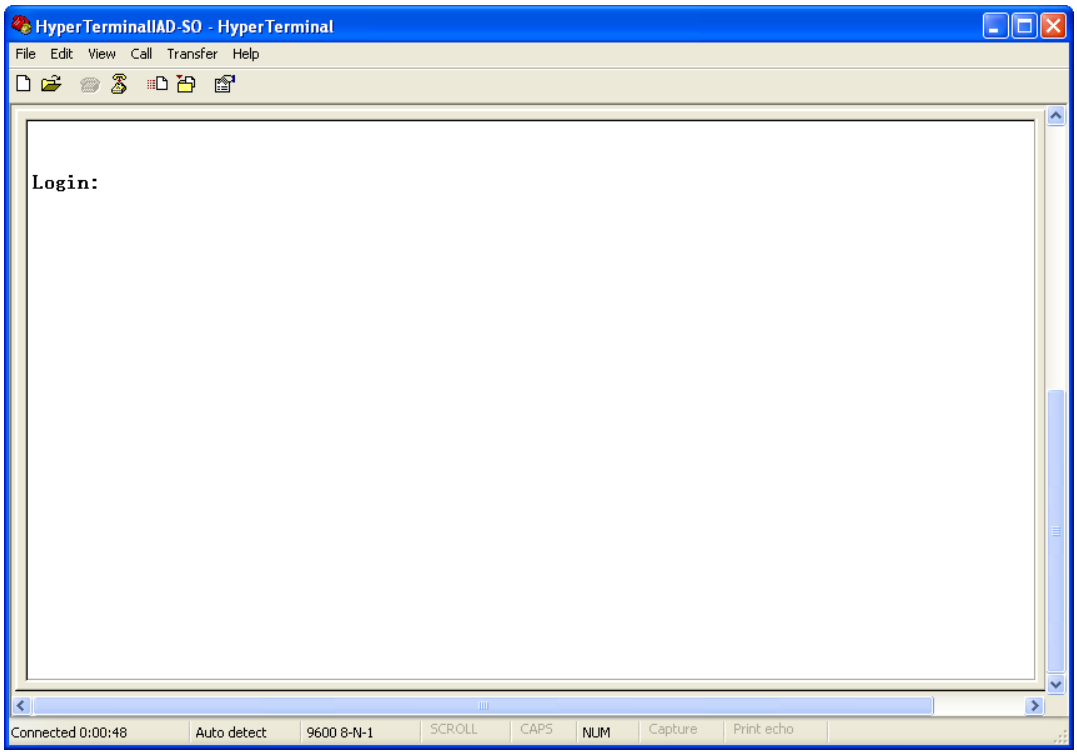


Figure 6-1-6 Serial login

5) According to information on command screen, input correct login user name and password, then you can log in.

If this is your first time to log in, please use the default account. System default username is "admin", default password is "psw.iad". For details on the command, please refer to the instructions on the back.

Note	*VGW CLI command maintenance tools, in addition to supporting Serial, also support SHH. As SHH function usage is similar to Serial, do not repeat here.*

6.1.3 CLI instruction use

1) **Instruction**

Instruction function	CLI instruction	Application
Reboot device	reboot	Serial/Telnet
Load default settings	load df1	Serial/Telnet
Username unlock	user unlock "username"	Serial
System upgrade	download program tftp "server IP" upgrade filename"	Serial/Telnet
Debug open	debug call debug "level" debug start	Serial/Telnet
Debug close	Ctrl-C to quit	Serial/Telnet

2) **Instruction examples**

Instruction function	Instruction examples
Reboot device	#reboot<CR>
Load default settings	#system<CR> #system> load df1<CR>
Username unlock	#system<CR> #system> user unlock admin<CR>
System upgrade	#system<CR> #system> download program 192.168.3.30 VGW-x10FSL.img<CR>
Debug open	#system<CR> #system> debug call 3<CR> #system> debug start<CR>
Debug close	Keyboard enter "Ctrl + C" to quit

6.1.4 Troubleshooting

Problem type	Possible reasons	Solutions
All LEDs are off	1) No power or power adapter is not working.	1) Change power or replace power adapter.
Ethernet port LED can't work	1) Network is not connected or cable damage. 2) Cable type error. 3) Cable length is out of range.	1) Check cable or replace another one. 2) Ethernet cable must be a direct or cross network cable.
Can't access to Web	1) PC and VGW devices are not on the same network. 2) Cable error. 3) IP conflict or circuit loop. 4) Wrong port access.	1) Check whether the PC is in 192.169.0.X / 24 network group. 2) Change cable. 3) PC connected directly to the device's LAN port. 4) Change correct access port. (VGW's default port for access Web http is "8008", and https is 443).
Can't make a call	1) Telephone or telephone line not working. 2) VGW phone port fault. 3) SIP registers failure. 4) Dialing rules are not configured correctly.	1) Replace telephone or cable. 2) Change another VGW phone port. 3) Check the SIP user registration status. 4) Check the dialing rules configured correctly.
Stop after work for a period of time	1) Power abnormal. 2) Device over-heated.	1) Check power connection and voltage. 2) Check circumstance and air outlet.