DWG2000-1G User Manual v1.0

Dinstar Technologies Co., Ltd.

Address: Floor 9, Guoxing Building, Changxing Road, Nanshan District, Shenzhen, China

Postal Code: 518057

Telephone: +86 755 61919966

Fax: +86 755 2645 6659

Emails: sales@dinstar.com, support@dinstar.com

Website: www.dinstar.com, www.dinstar.cn

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1 Product Description

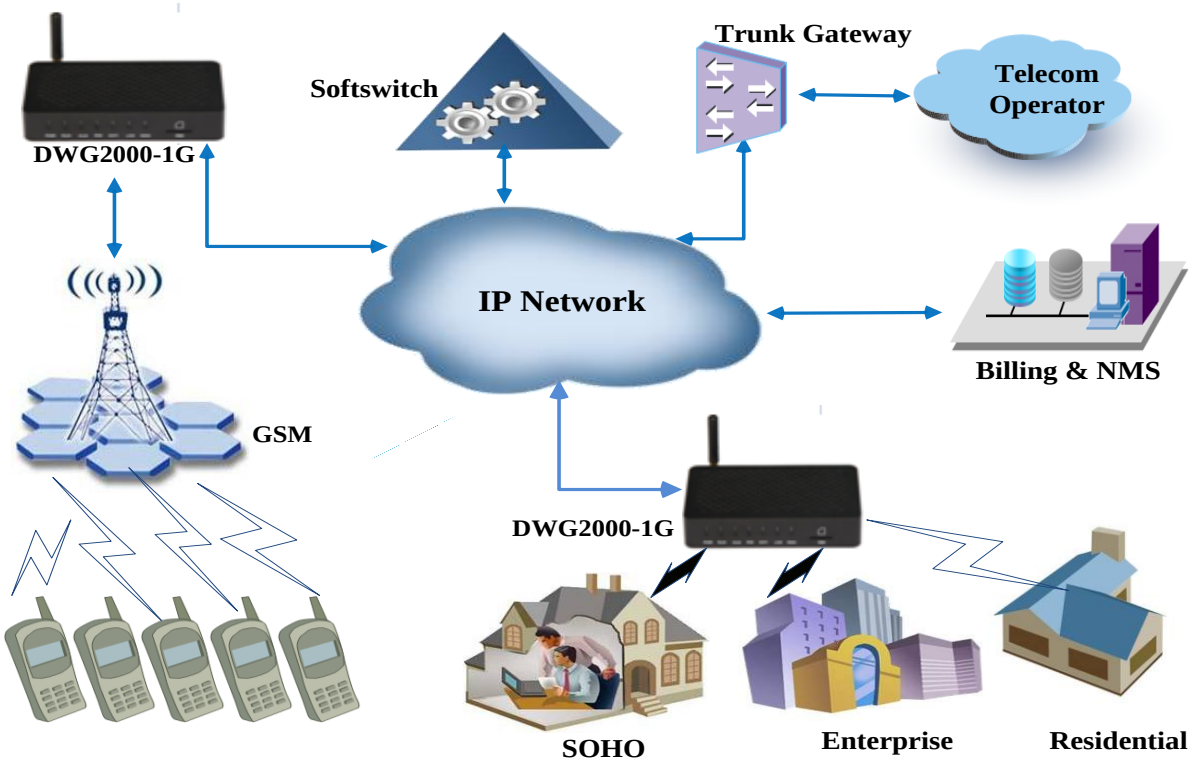
1.1 Overview

DWG2000-1G is multi-functional VoIP gateway, which interconnects the GSM/CDMA wireless network with the IP network. By virtue of inserted SIM cards, the gateway registers mobile numbers to a VoIP softswitch and places calls to the numbers under the IP network. Thus, it can help reducing telephone costs for telecom operators, businesses, SOHO and residential users.

DWG2000-1G not only provides seamless interconnectivity between the GSM/CDMA network and the IP network, but ensures smooth calling, good voice quality, flexible network configuration and other beneficial functions.

1.2 Application Scenario

DWG2000-1G provides high-quality and cost-effective VoIP solution. Its application scenario is shown as follows:



1.3 Product Appearance

1.3.1 Images of DWG2000-1G

Front View

Rear View

Note

The above pictures are only for reference, and please take the real product as the standard.

1.3.2 Indicators and Related Explanation

Indicator	Explanation
PWR	When the indicator is on green, it means DWG2000-1G is power on.
RUN	When the indicator is on green with slow flash, it means DWG2000-1G is running normally; when the indicator is on green with fast flash, it means DWG2000-1G is reset.
SIM	When the indicator is on green, it means SIM cards have been registered. Otherwise, SIM cards are not registered.
LAN	When the indicator is on green, it means the LAN cable is connected successfully.
WAN	When the indicator is on green, it means the WAN cable is connected successfully.
RST	Press the RST button for 6 seconds, and the factory setting of DWG2000-1G will be restored.

1.4 Functions and Features

1.4.1 Protocols Supported

- Standard SIP and MGCP(optional) Protocol
- Simple Traversal of UDP over NATs (STUN)
- Point-to-point Protocol over Ethernet (PPPoE)
- Hypertext Transfer Protocol (HTTP)
- Dynamic Host Configuration Protocol (DHCP)
- Domain Name System (DNS)
- GSM/CDMA/WCDMA
- ITU-T G.711α-Law/μ-Law
- G.723.1
- G.729AB

1.4.2 System Function

- PLC: Packet Loss Concealment
- VAD: Voice Activity Detection
- CNG: Comfort Noise Generation
- Remote SIM Management by SIMBank
- Adjustable Gain of Port
- DTMF Adjustment
- Alarm for Balance
- Support SIMBank/SIM Server
- Lock/Unlock SIM/UIM

- Reject to Display Number of Incoming Call
- Sending/Receiving SMS
- Customize IVR Recording
- White List and Black List
- One Number Access
- Open API for Bulk SMS
- Support USSD/SSD
- Echo Cancellation (with ITU-T G.168/165 standard)
- Automatic negotiate network
- Hotline
- BCCH Management

1.4.3 Industrial Standards Supported

- Stationary Use Environment: EN 300 019: Class 3.1
- Storage Environment: EN 300 019: Class 1.2
- Transportation Environment: EN 300 019: Class 2.3
- Acoustic Noise: EN 300 753
- CE EMC Directive 2004/108/EC
- EN55022: 2006+A1:2007
- EN61000-3-2: 2006,
- EN61000-3-3: 1995+A1: 2001+A2: 2005
- EN55024: 1998+A1: 2001+A2: 2003
- Certifications: FCC, CE

1.4.4 General Hardware Specifications

- Power Supply:AC100~240V 50/60HZ DC12V/1A
- Temperature: 0~40 ℃（Operation）, -20~80 ℃（storage）
- Humidity: 5%～90% RH,
- Power Consumption: 12 W
- Dimensions: 126(W) x76 (D) x 25(H) mm
- Net weight: 0.2 kg

2 Quick Installation

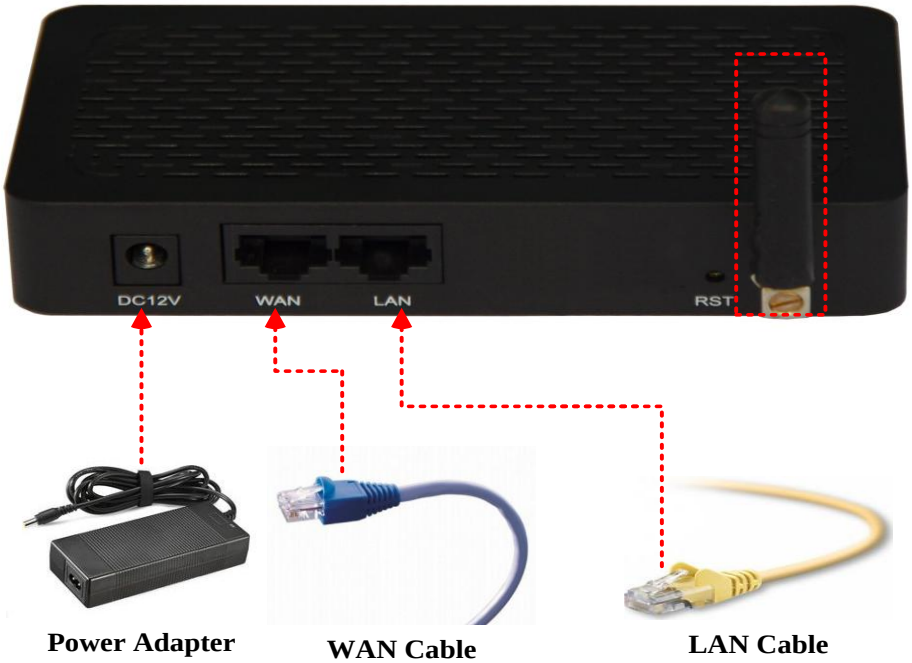
2.1 Prerequisites

The prerequisites for installing DWG2000-1G include:

- DC power should be grounded well to ensure reliability and stability;
- Network interface should be standard RJ45 with 10Mbps or 100Mbps interfaces;
- GSM channels work properly.

2.2 Installation Procedures

- Connect the antenna to the DWG2000-1G device
- Connect the power wire to the DWG2000-1G device;
- Connect network cable (LAN cable and WAN cable) to the DWG2000-1G device;
- Insert the SIM card to the SIM slot.



Note

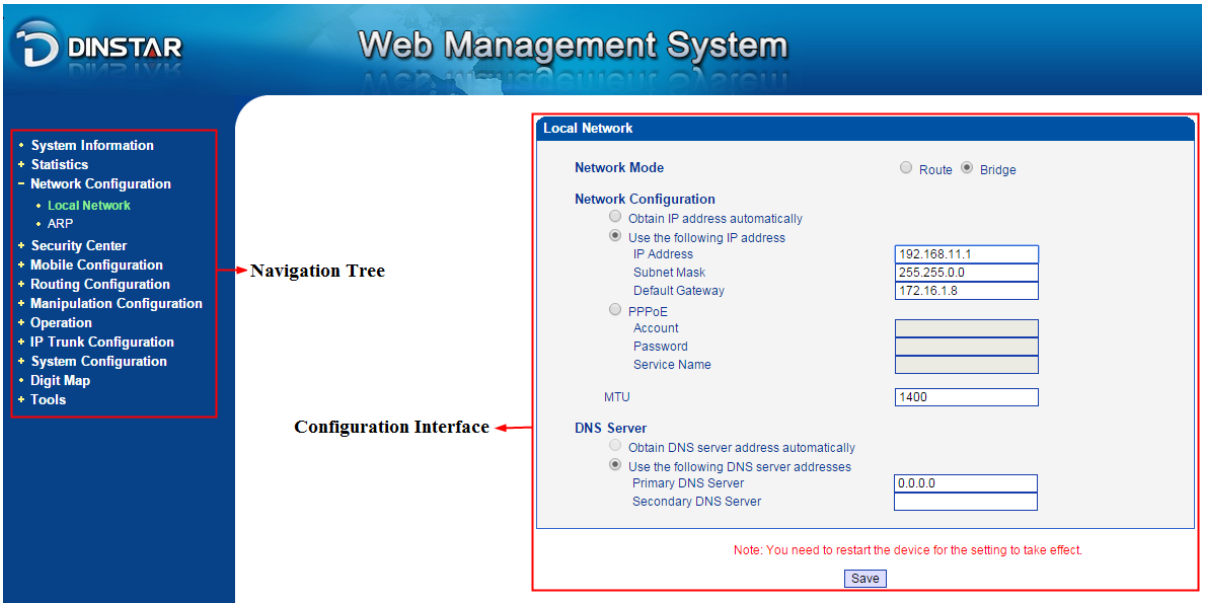
For connections between DWG2000-1G and other devices, please make reference to 交叉引用

3 Web Management System

3.1 Introduction to Web Management System

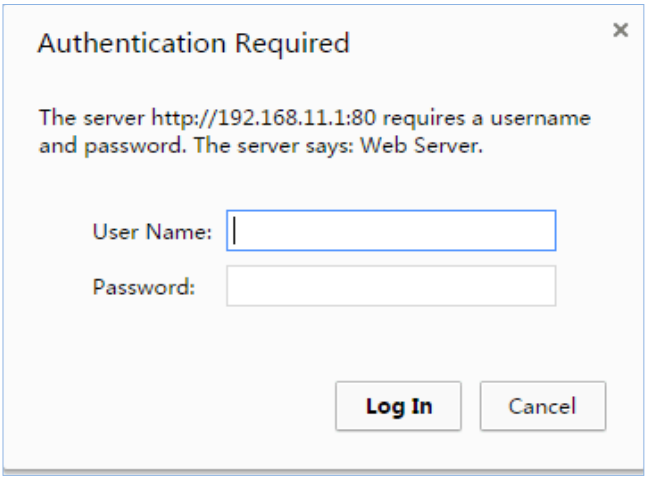
3.1.1 Parts of Web Management Interface

The web management system of the DWG2000-1G consists of the navigation tree and detailed configuration interfaces.



3.1.2 Login GUI of Web Management Interface

Open a web browser and enter the IP address of the DWG2000-1G device (the default IP is 192.168.11.1). Then the login GUI will be displayed. Both the default username and password are admin.



4 Network Configuration

4.1 Working Mode of Network

DWG2000-1G works in two modes: route mode and bridge mode. When it is under the route mode, the IP of WAN port must be different from the IP f LAN port. But when it is under the bridge mode, the IP of WAN and the IP of LAN are the same.

4.2 Network Configuration under Route Mode

Under the route mode, the default IP address of WAN port is a DHCP IP address, while the default IP address of the LAN port is 192.168.11.1.

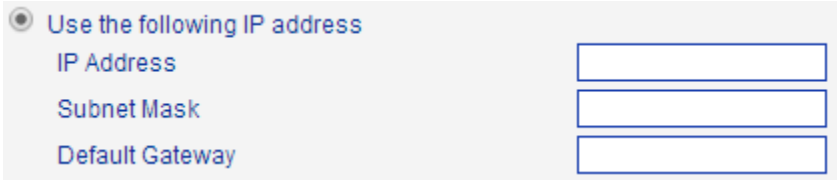
In fact, there are three kinds of IP addresses for selection for the WAN port, including Static IP address, DHCP IP address and PPPOE IP address.

DHCP: Obtain IP address automatically.
DWG2000-1G is regarded as a DHCP client, which sends a broadcast request and looks for a DHCP server to answer. Then the DHCP server automatically assigns an IP address to a computer from a defined range of numbers configured for a given network. DHCP IP address herein refers dynamic IP address which is automatically assigned.

Static IP Address:
Static IP address is a permanent IP address which is assigned by Internet Service Provider (ISP) and remains associated with a single computer over an extended period of time. This differs from a dynamic IP address**,** which is assigned *ad hoc* at the start of each session, normally changing from one session to the next.

If you choose static IP address, you need to fill in the following information:

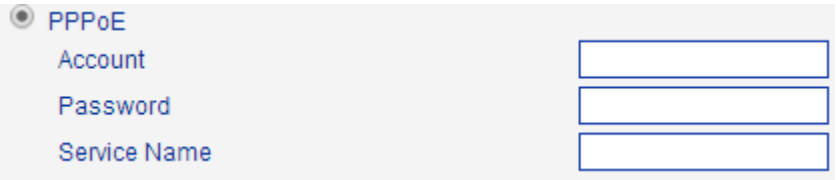
- IP Address: the IP address of the DWG2000-1G device;
- Subnet Mask: the subnet mask of the router connected the DWG2000-1G;
- Default Gateway: the IP address of the router connected the DWG2000-1G.



PPPoE:

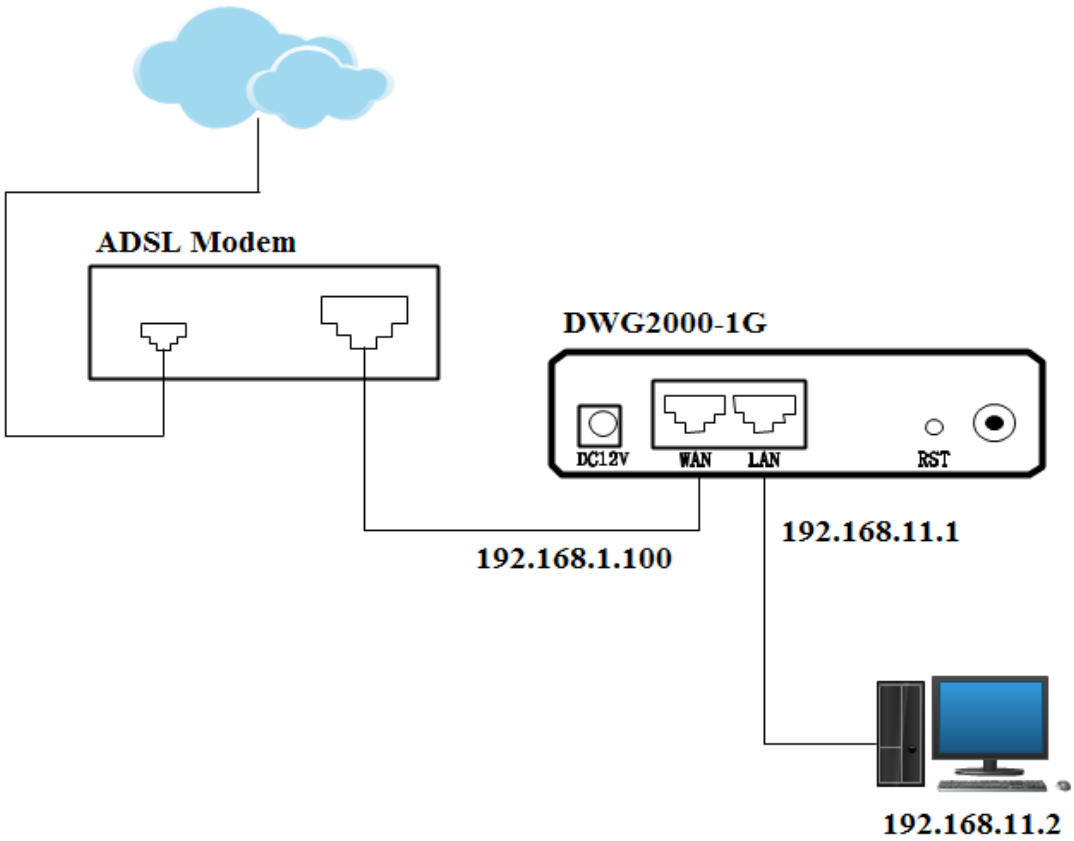
PPPoE is an acronym for point-to-point protocol over Ethernet, which relies on two widely accepted standards: PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem. All the users over the Ethernet share a common connection, so the Ethernet principles supporting multiple users in a LAN combine with the principles of PPP, which apply to serial connections. PPPOE IP address refers to IP address assigned through the PPPoE mode.

If you choose PPPoE, you need to fill in the account, password and service name, which are provided by telecom operator.



4.2.1 Network Connection Diagram

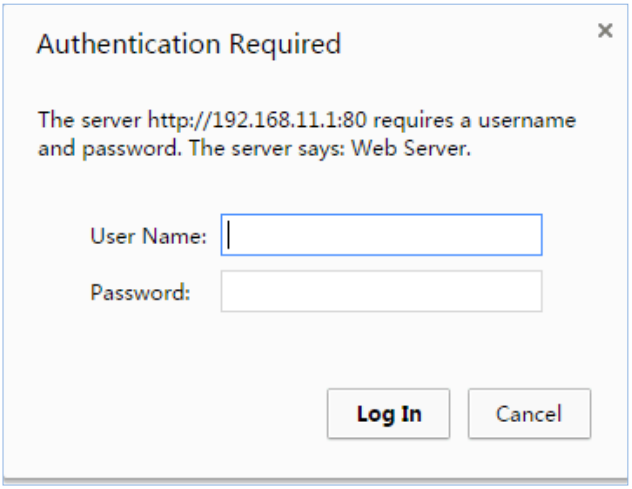
Under the route mode, the default IP address of WAN port is a DHCP IP address, while the default IP address of the LAN port is a static IP address, namely 192.168.11.1.



4.2.2 Configuration Procedures on Web Management System

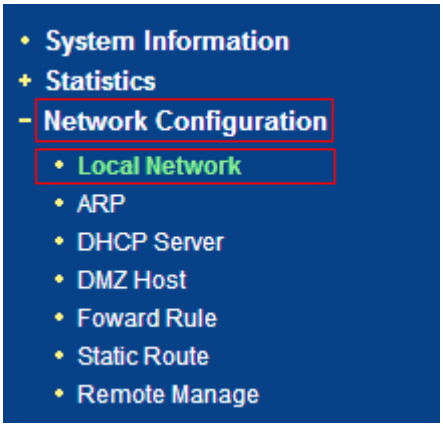
The following procedures are based on the example where the IP address of WAN port is a static IP address while the IP address of LAN port is 192.168.11.1.

Step 1. Open a web browser and enter the IP address of the DWG2000-1G device (the default IP is 192.168.11.1). Then a login GUI will be displayed.

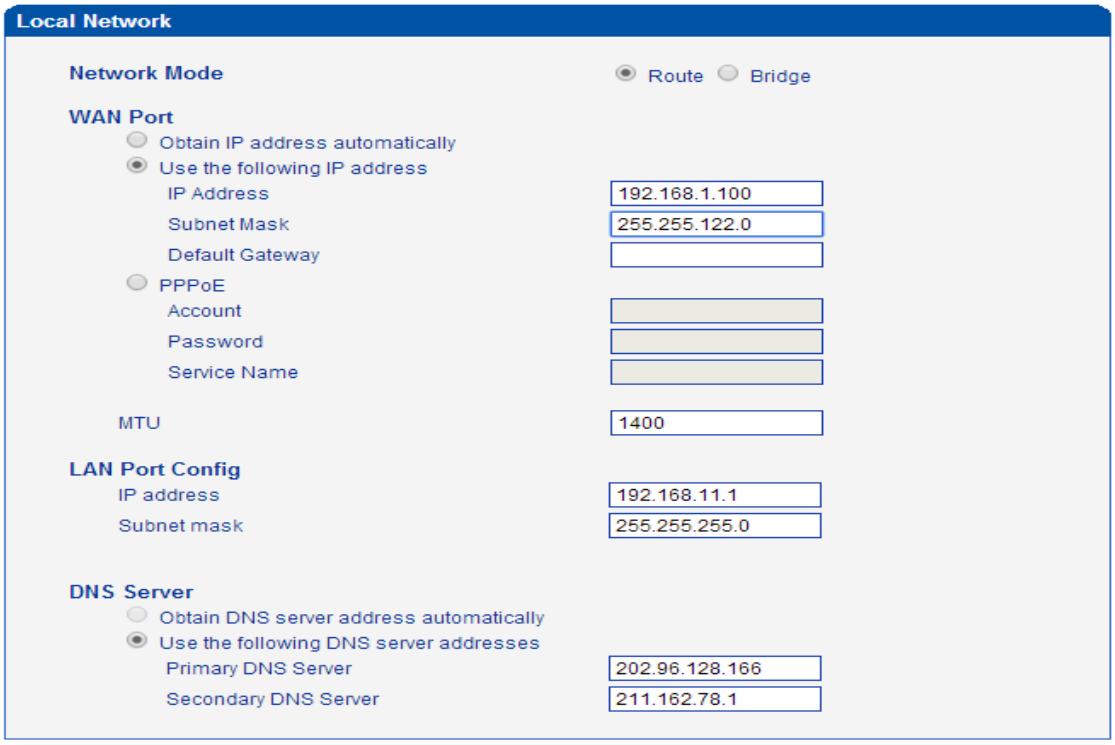


Step 2. Enter username and password and then click **OK** in the login GUI. Both the default username and password are "admin".

Step 3. Click **Network Configuration → Local Network** in the navigation tree on the left.



And the following interface will be displayed.



Step 4. Click on the left of **Route**.

Step 5. Click on the left of **Use the following IP address**, and fill in the following information.

- IP Address: the IP address of the DWG2000-1G device (it is 192.168.1.100 in this example).
- Subnet Mask: the subnet mask of the router connected the DWG2000-1G;
- Default Gateway: the IP address of the router connected the DWG2000-1G.

Step 6. Configure the IP address of LAN port as 192.168.11.1, and configure the subnet mast of LAN port according to actual conditions.

Step 7. Configure the IP address of DNS server according to actual conditions.

Step 8. Click **Save** on the bottom of the interface.

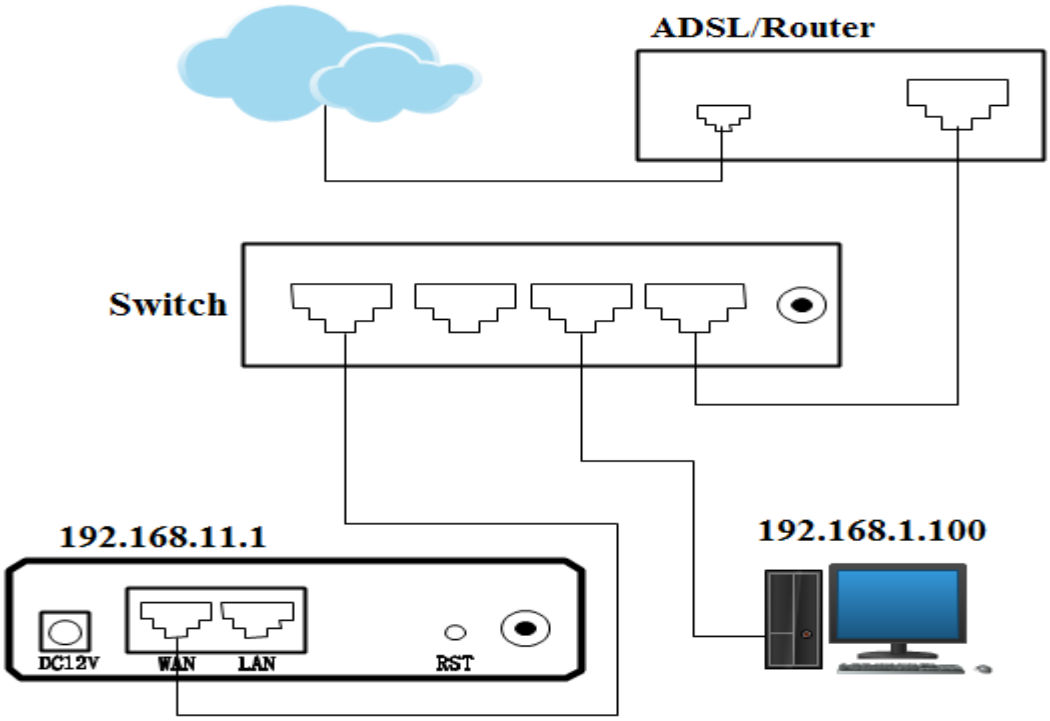
Note

The default IP address of WAN port is a DHCP IP address, but in actual conditions, the IP address of WAN port is more often set as a static IP address.

4.3 Network Configuration under Bridge Mode

4.3.1 Network Connection Diagram

Under the bridge mode, both the default IP addresses of the WAN port and the LAN port are 192.168.11.1. Its network connection diagram in the network is shown as follows:



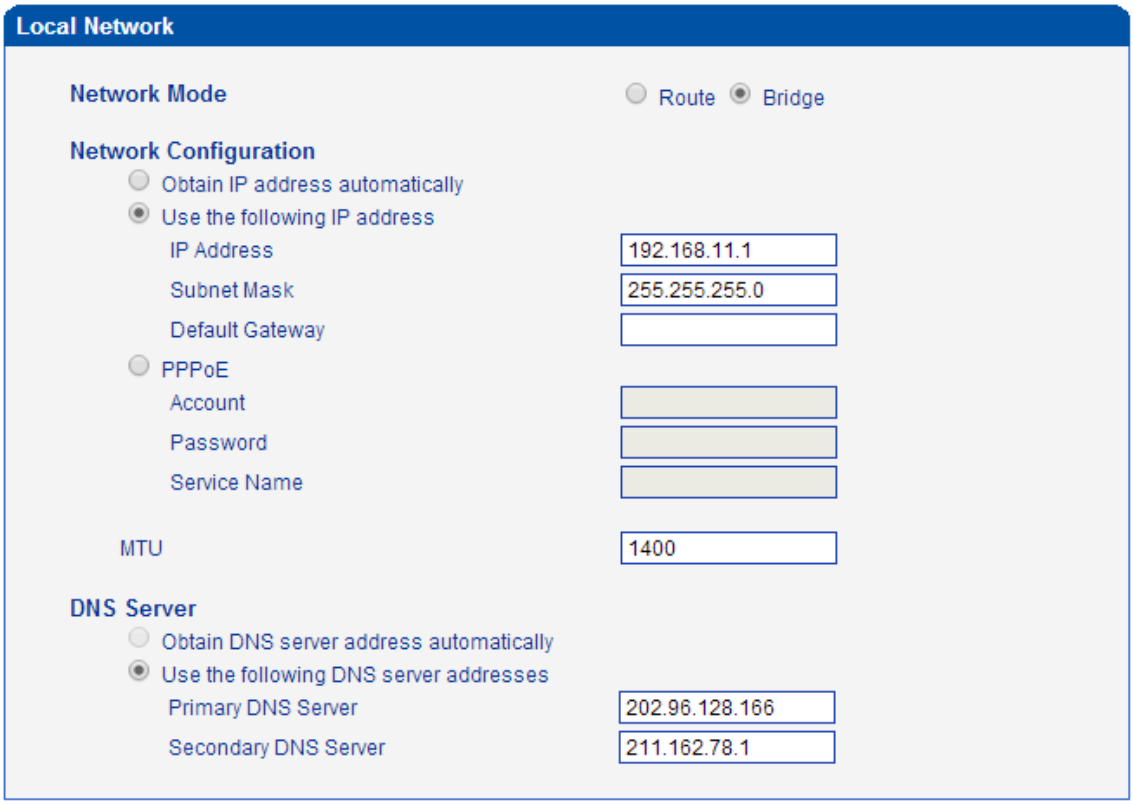
4.3.2 Configuration Procedures on Web Management System

The following procedures are based on the example where both the IP address of WAN port and LAN port is 192.168.11.1.

Step 1. Open a web browser and enter the IP address of the DWG2000-1G device (the default IP is 192.168.11.1). Then a login GUI of the Web Management System will be displayed.

Step 2. Enter username and password and then click **Log in**. Both the default username and password are "admin".

Step 3. In the navigation tree on the left, click **Network Configuration → Local Network**. And the following interface will be displayed.



Step 4. Click on the left of **Bridge**.

Step 5. Click on the left of **Use the following IP address**, and fill in the following information.

- IP Address: the IP address of the DWG2000-1G, namely 192.168.11.1;
- Subnet Mask: the subnet mask of the router connected the DWG2000-1G;
- Default Gateway: the IP address of the router connected the DWG2000-1G.

Step 6. Configure the IP address of DNS Server according to actual conditions.

Step 7. Click **Save** on the bottom of the interface.

5 Mobile Configuration

5.1 SMS API

5.1.1 Introduction to SMS API

The SMS API protocol is used for external applications (for instance: SMS Server) to control the sending and receiving of SMS/USSD on the DWG. The protocol is carried over TCP and adopts a request/response method.

To enable the SMS API function of the DWG2000-1G, the IP address, port, user ID and password of SMS Sever must be correctly configured, and the TCP Intercept function of the SMS Server must be enabled. Once the connection between DWG2000-1G and TCP is established, the DWG2000-1G will send user ID and password to the SMS Server, and then the SMS Server will send back a message which indicates successful authentication. Later, the DWG2000-1G will send ***Status message*** and ***Csq rssi message*** to the SMS Server.

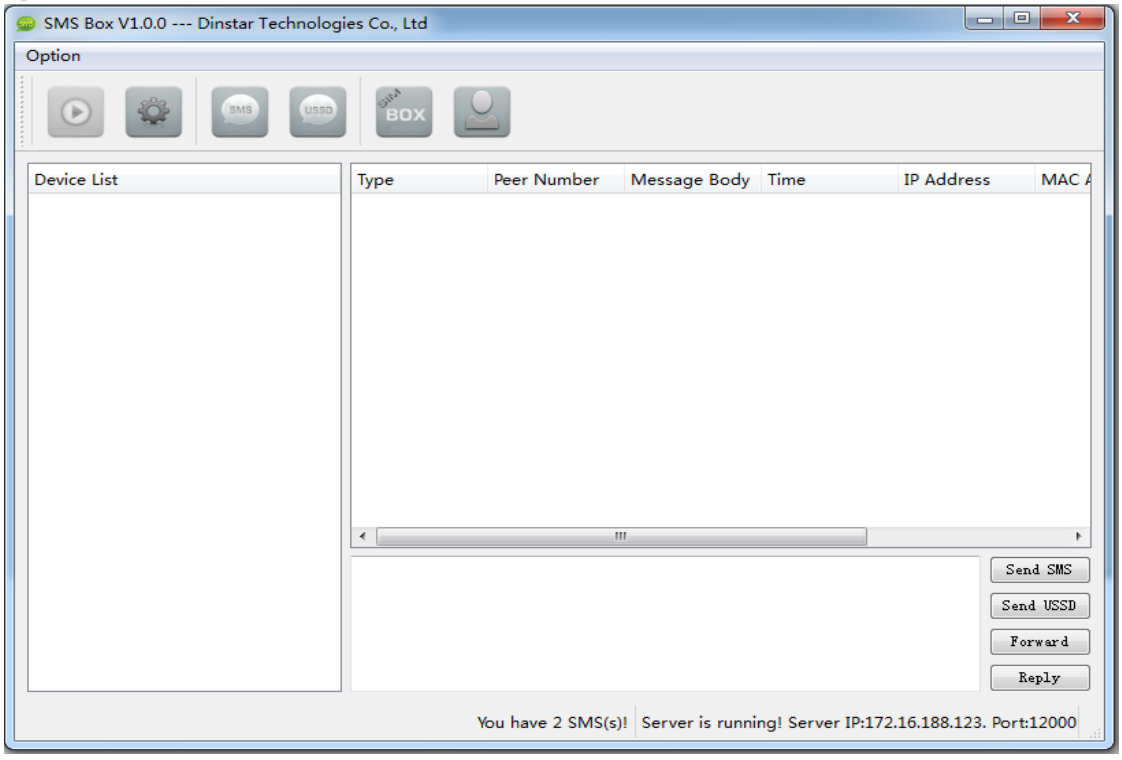
5.1.2 Configuration Procedures for SMS API

Step 1. Connect the DWG2000-1G and computer according to 4.2.1.

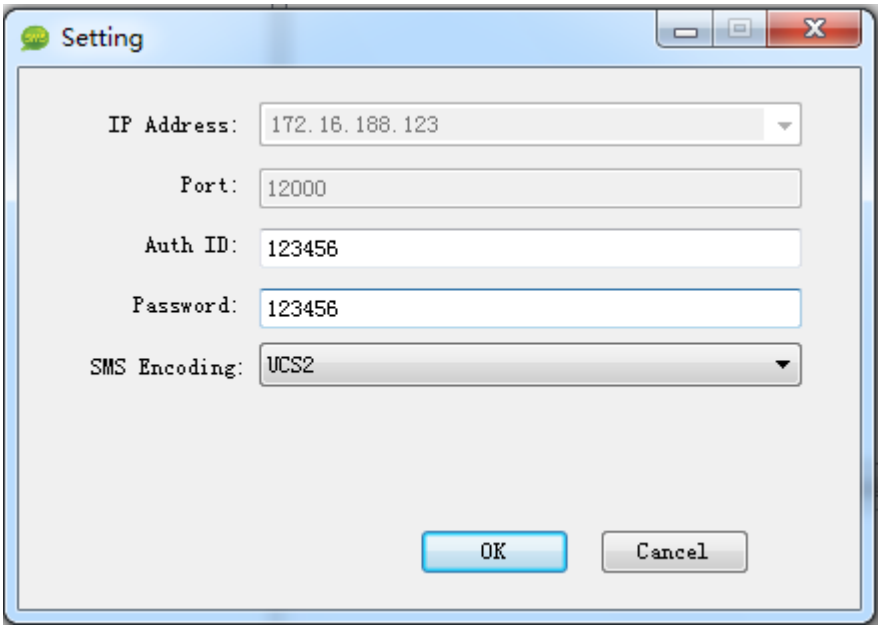
Step 2. Configure the IP address of DWG2000-1G and local network's subnet according to Step 5 in 4.3.2.

Step 3. Open the SMS Server.

1.

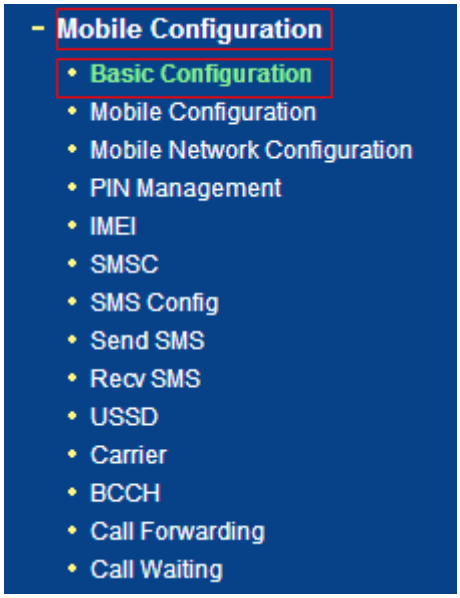


Step 4. Configure the SMS Server according to actual conditions.

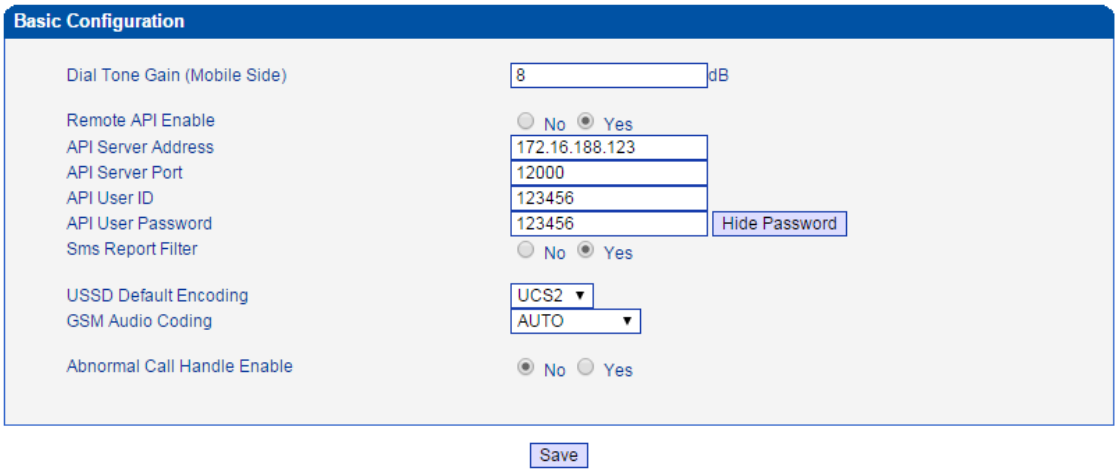


Step 5. Log into the DWG2000-1G according to 3.1.2.

Step 6. On the Web Management System GUI, click **Mobile Configuration → Basic Configuration**.



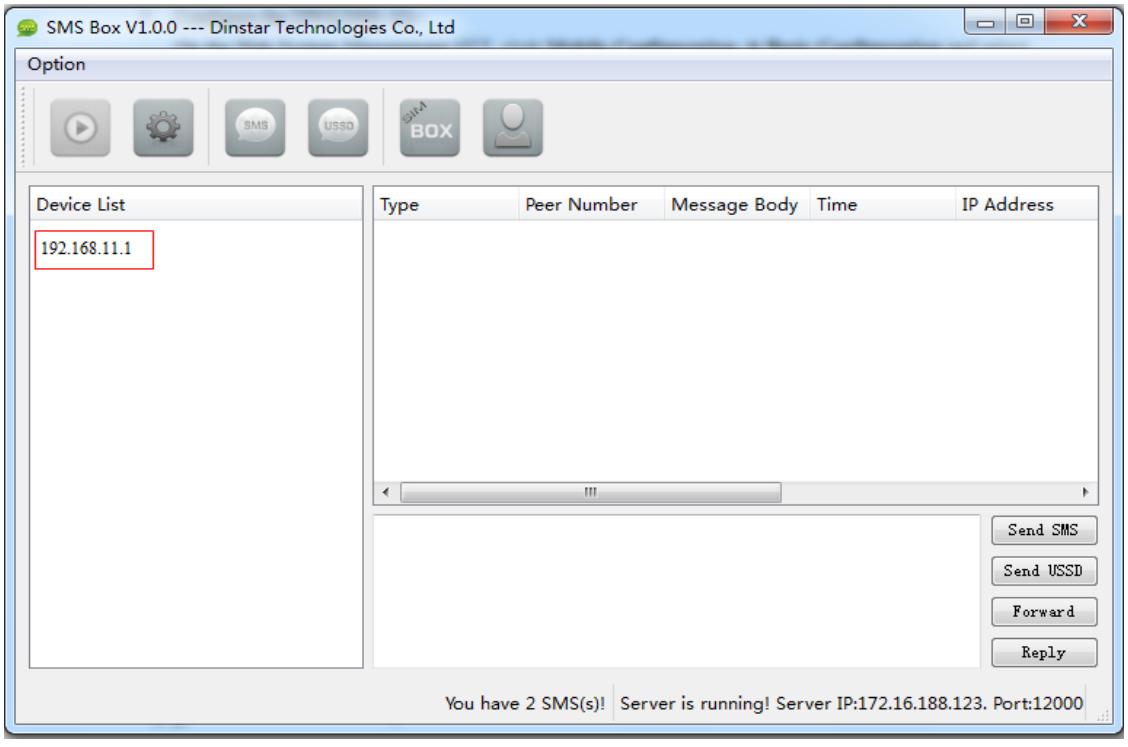
Step 7. Select the checkbox on the left of **Yes** for **Remote API Enable**.



Step 8. Configure the parameters on the above interface.

The API Server Address, API Server Port, User ID and API User Password on the above interface of DWG2000-1G must be the same with the IP Address, Port, Auth ID and Password on the setting interface of SMS Server (make reference to Step 4).

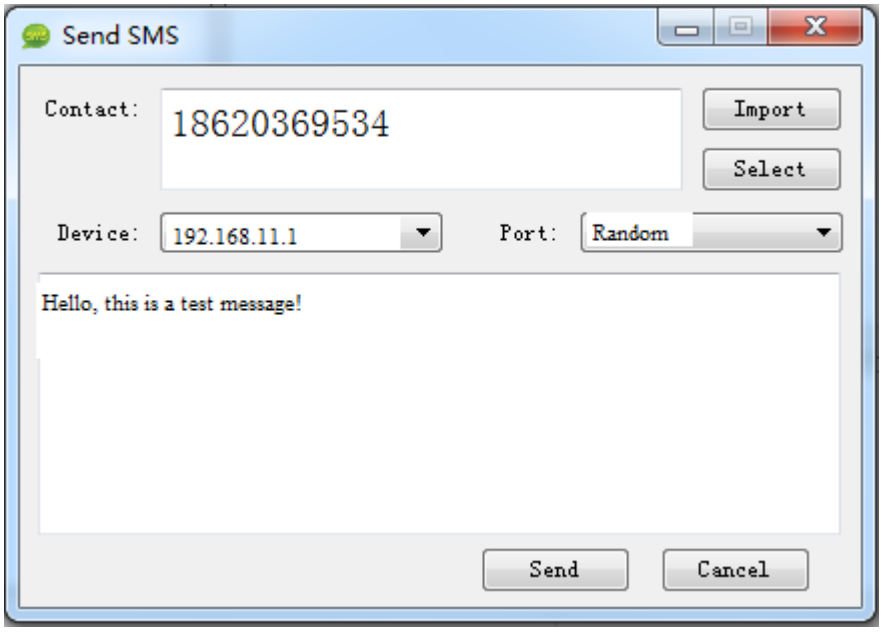
Step 9. Check the connection.



Note: If the IP address of the DWG2000-1G is showed on the left, it means the connection between the gateway and the SMS Server is successful.

Step 10. Send a message from the SMS Server to verify the SMS API function of the DWG2000-1G is effective.

Click **Send Message,** input message in the popup, and then click **Send**.

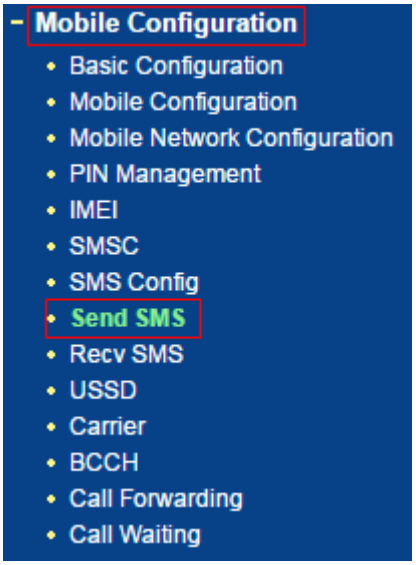


5.2 Send SMS & Receive SMS

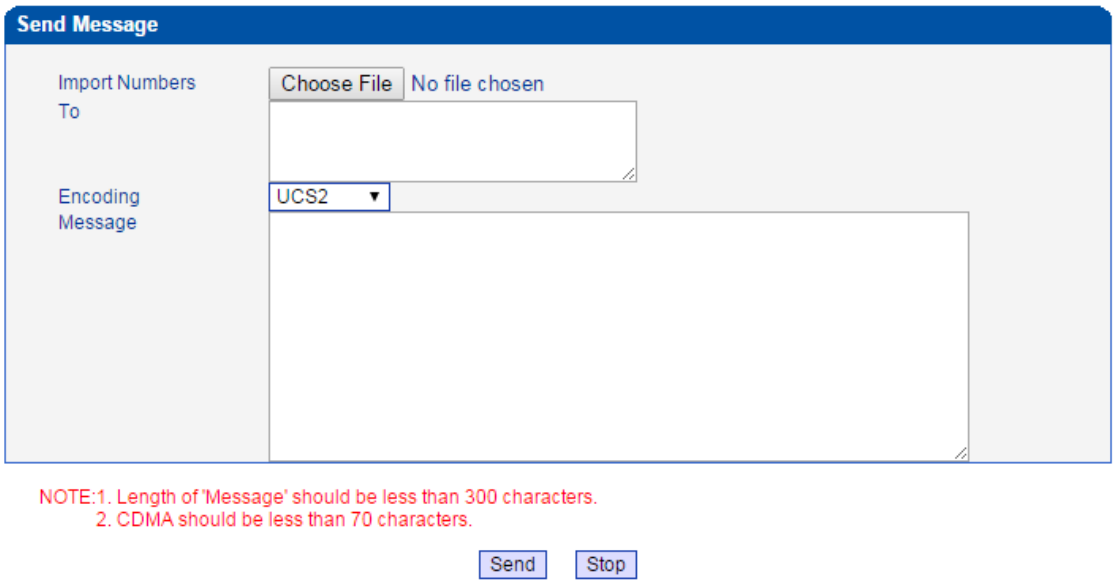
The DWG2000-1G can be used to send messages and receive massages.

5.2.1 Configuration Procedures for Sending SMS

Step 1. In the navigation on the left, Click **Mobile Configuration → Send SMS**.



Step 2. On the displayed configuration interface, configure the following parameters:

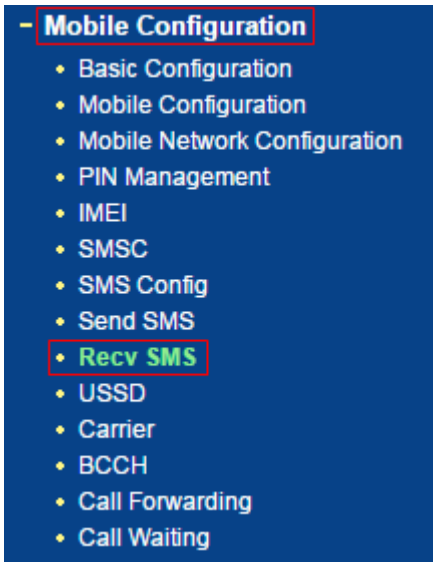


Parameter	Explanation
Import Number	You can click **Choose File** to choose a txt file which contains a range of numbers. When a file has been chosen, the numbers will be displayed on the box on the right of **To**.
To	The number(s) where the message will be sent.
UCS2	Support English and Chinese
GSM 7bit	Support English only
Message	The content of the message

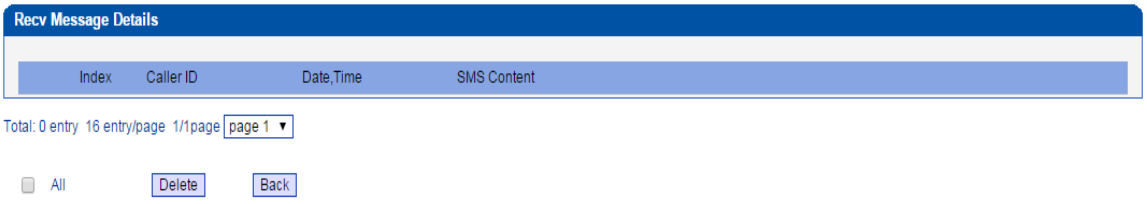
Step 3. Click **Send**.

5.2.2 Configuration Procedures for Receiving SMS

Step 1. In the navigation on the left, Click **Mobile Configuration →Recv SMS**.



Step 2. On the displayed interface, all the messages that the DWG2000-1G has received are shown.



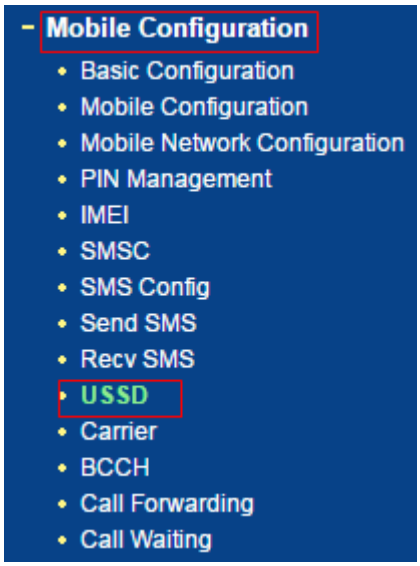
Step 3. If you want to delete a message, click the checkbox on the left of the message and then click **Delete**.

5.3 USSD

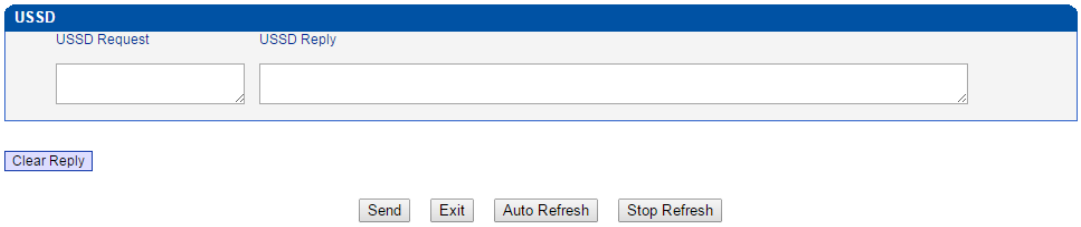
USSD (Unstructured Supplementary Service Data): is a service which is provided by a telecom operator and allows GSM mobile phones to interact with the telecom operator's computers. USSD messages travel over GSM signaling channels and are used to query information and trigger services. Unlike similar services (SMS and MMS), which are stored and forwarded, USSD is session-based. It establishes a real-time session between mobile phones and telecom operators' computers or other devices.

5.3.1 Configuration Procedures for USSD

Step 1. In the navigation on the left, Click **Mobile Configuration →USSD**.



Step 2. On the displayed interface, enter a function code in the box under **USSD Request**. (Function codes are different in different countries.)



Step 3. Click the **Send** button.

Step 4. Reply from telecom operators will be display in the box under **USSD Reply**.

Step 5. If you want to clear replies, click the **Clear Replay** button. If you want to exit the USSD session, click the **Exit** button.

5.4 GSM Audio Coding

5.4.1 Introduction to GSM Audio Coding

There are eight formats for GSM Audio Coding, including Auto, FR, HR, EFR, AMR_FR, AMR_HR, FR and EFR, EFR and FR.

Auto: it means GSM Audio Coding is automatic.

FR (Full Rate): the first digital speech coding speech standard used in the GSM digital mobile phone system. The bit rate of the codec is 13 kbit/s, or 1.625 bits/audio sample (often padded out to 33 bytes/20

ms or 13.2 kbit/s).

HR (Half Rate): the bit rate of the codec is 6.5 kbit/s. It requires half the bandwidth of the Full Rate codec and network capacity for voice traffic is doubled, at the expense of audio quality. It is recommended to use this codec when the battery is low as it may consume up to 30% less energy.

EFR (Enhanced Full Rate): is a speech coding standard that was developed in order to improve the quite poor quality of Full Rate codec. Working at 12.2 kbit/s, the EFR provides good quality in any noise conditions. The EFR is compatible with the highest AMR mode (both are ACELP). Although the EFR helps to improve call quality, this codec has higher computational complexity, which in a mobile device can potentially result in an increase in energy consumption as high as 5% compared to 'old' FR codec.

AMR (Adaptive Multi-Rate): is an audio compression format optimized for speech coding. AMR speech codec consists of a multi-rate narrowband speech codec that encodes narrowband (200–3400 Hz) signals at variable bit rates ranging from 4.75 to 12.2 kbit/s with toll quality speech starting at 7.4 kbit/s.

There are two modes for the AMR codec in the DWG2000-1G:

AMR_FR: the AMR codec in a full rate channel (FR)
AMR_HR: the AMR codec in a half rate channel (HR).

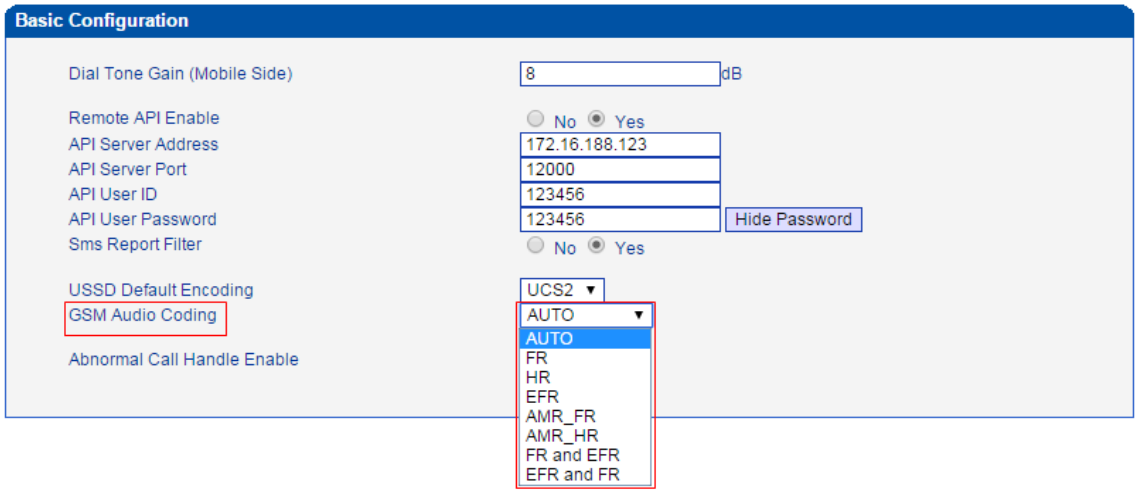
FR and EFR: GSM Audio Coding supports both FR and EFR, but FR is prior to EFR.
EFR and FR: GSM Audio Coding supports both EFR and FR, but EFR is prior to FR.\

5.4.2 Configuration Procedures for GSM Audio Coding

1. Log into the Web Management System GUI of the DWG2000-1G.

2. In the navigation tree of the Web Management System, click **Mobile Configuration → Basic Configuration**.

3. and then click the drop-down box on the right of GSM Audio Coding.



4. Select one format (Auto, FR, HR, EFR, AMR_FR, AMR_HR, FR and EFR, EFR and FR) in the drop-down box.

5.5 Abnormal Call Handle

The Abnormal Call Handle function involves three industry terms:

ACD (**Average Call Duration):** is a measurement in telecommunication, which reflects an average length of telephone calls transmitted on telecommunication networks. ACD = total call duration/total connected calls.

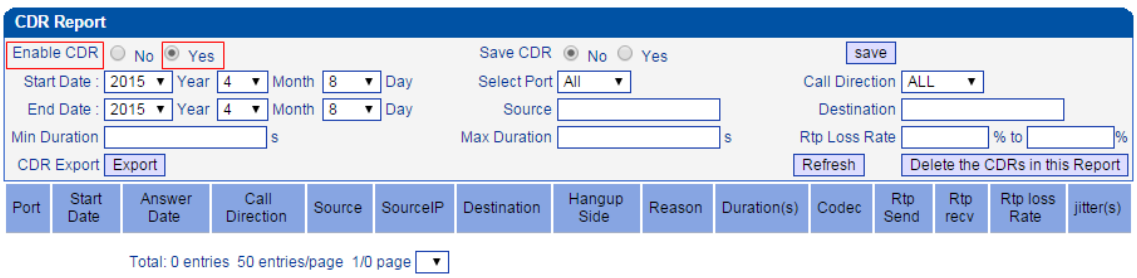
ASR (**Answer-seizure Ratio):** is a call success rate in telecommunication, which reflects the percentage of answered telephone calls with respect to the total call volume. ASR = answered call/total attempts of calls.

CDR (**Call Detail Record):** is a data record produced by a telephone exchange or other telecommunication equipment, which contains the details of a telephone call that passes through the facility or the device.

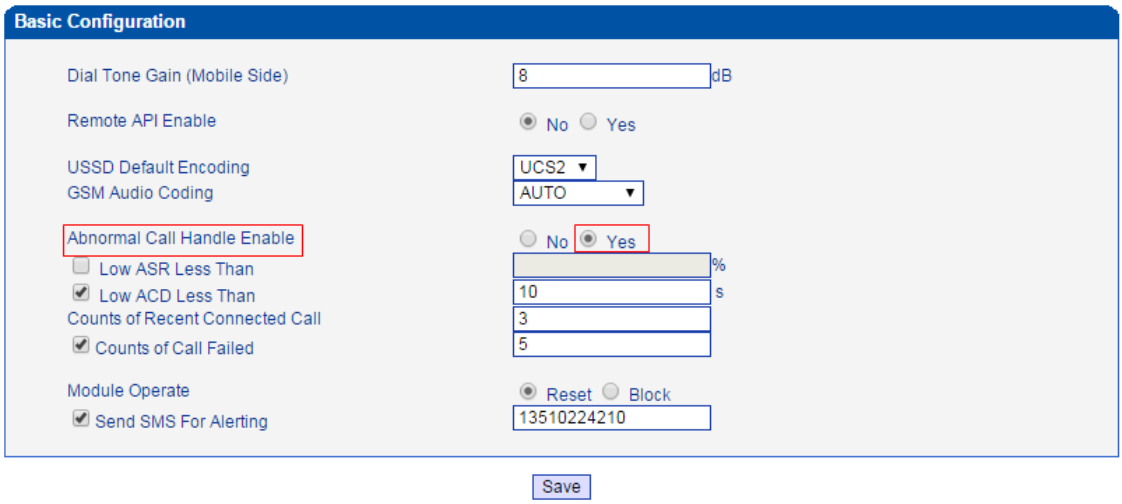
5.5.1 Configuration Procedures for Abnormal Call Handle

Step 1. Log into the Web Management System GUI of the DWG2000-1G.

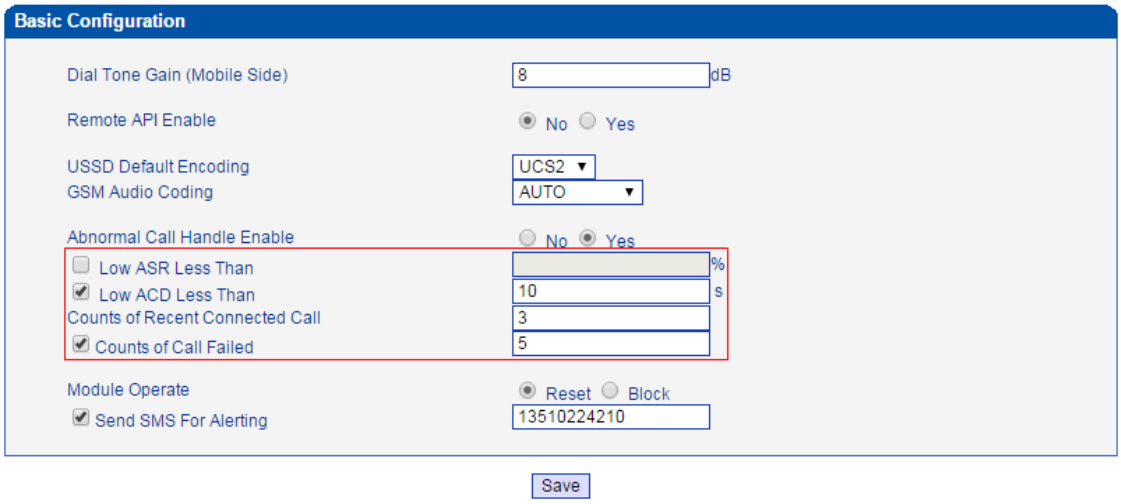
Step 2. Enable CDR (the CDR on the DWG2000-1G is disabled by default).
Click **Statistics → CDR Report**, and select the checkbox on the left of **Yes** for **CDR**.



Step 3. On the Web System Management GUI, click **Mobile Configuration → Basic Configuration**, and then click the checkbox on the left of **Yes** for **GSM Audio Coding**.



Step 4. Configure the following parameters according to your needs.



Parameter	Explanation
Low ASR Less Than	It is the threshold of the ASR. Once the actual ASR is lower than this value, the DWG port will be considered as low ASR.
Low ACD Less Than	It is the threshold of the ACD. Once the ACD is lower than this value, the DWG port will be considered as low ACD.
Counts of Recent Connected Calls	This value determines how many recent connected calls will be used to calculate the ACD.
Counts of Call Failed	It is the counts of consecutive call failures. For example: If the value is 5, the gateway module will be blocked after the gateway detects 3 call failures consecutively.

Step 5. Click **Save** on the bottom of the interface.

5.6 Enable Call Duration Limitation of Single Call & Enable Call Duration Limitation

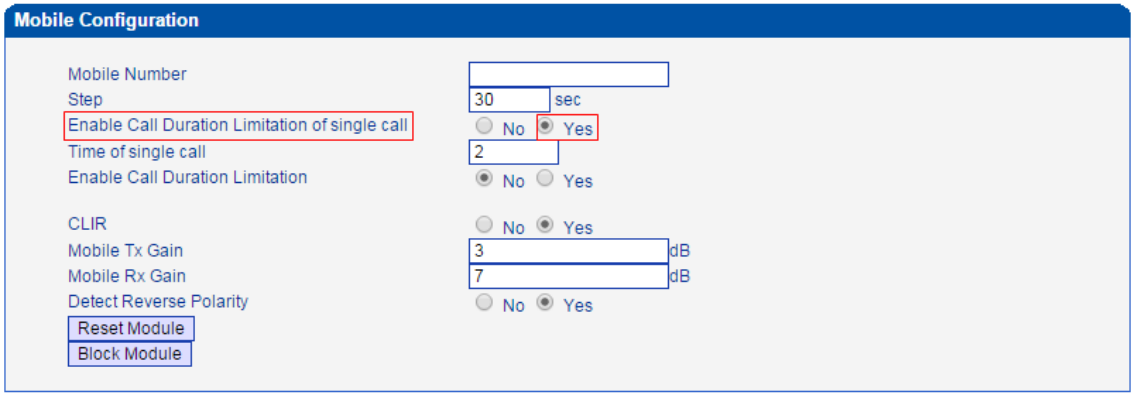
Enable Call Duration Limitation of Single Call: It means the call duration of every single call will be limited after the function is enabled. There is a maximum value can be set for the call duration.

Enable Call Duration Limitation: It means the total call duration of all calls will be limited after the function is enabled.

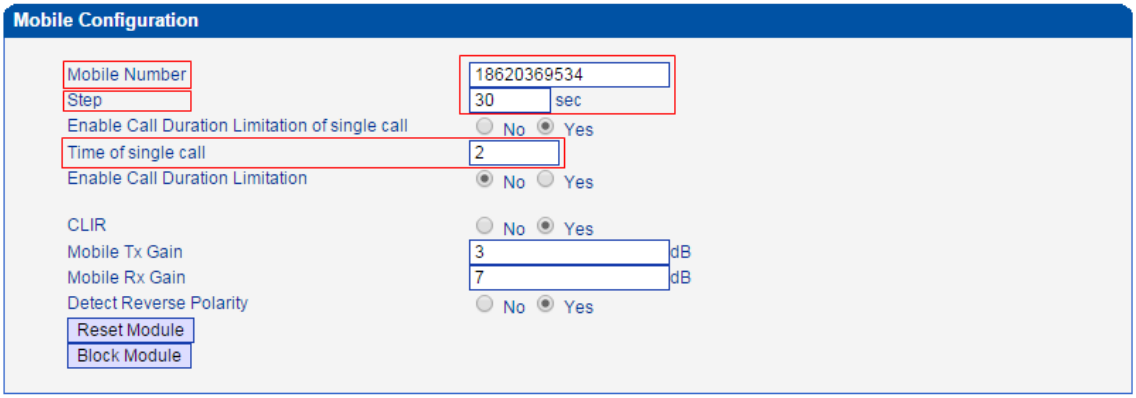
5.6.1 Configuration Procedures for Enable Call Duration Limitation of Single Call

1. Log into the Web Management System GUI of the DWG2000-1G.

2. On the Web System Management GUI, click **Mobile Configuration → Mobile Configuration**, and then click the checkbox on the left of **Yes** for **Enable Call Duration Limitation of Single Call**.



3. Enter a mobile number which makes calls, set a base unit in the box on the right of **Step**, and set the times for the base unit in the box on the right of **Time of Single Call**.



Note: Call Duration of Single Call = Step x Time of Single Call

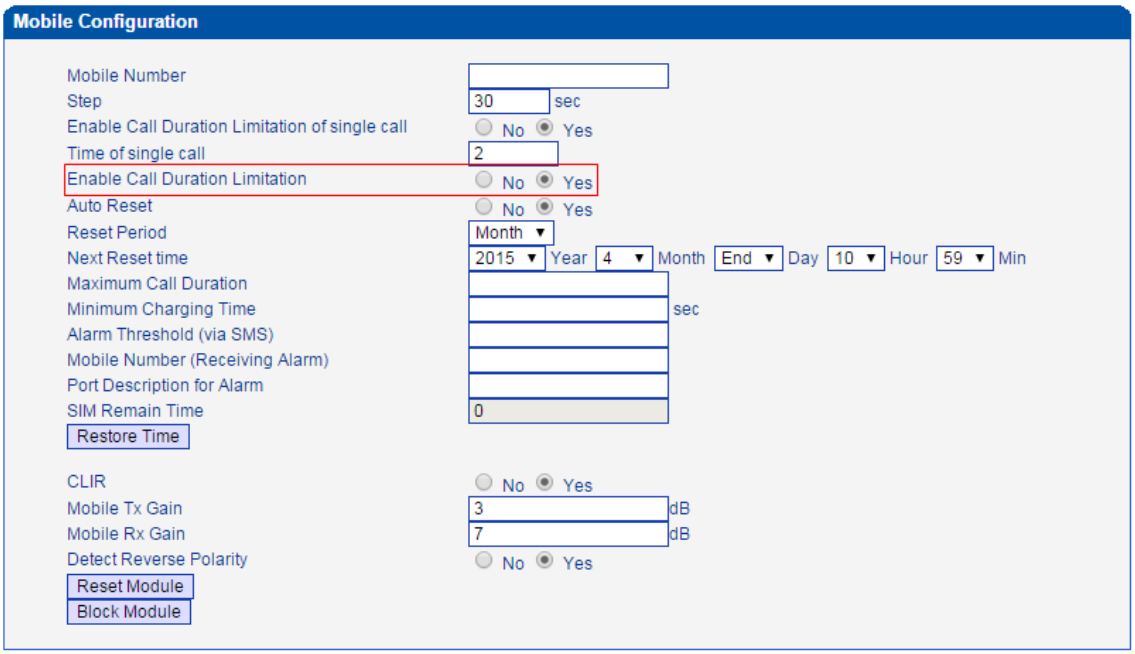
Take the values in the above figure for example, the call duration is: 30 x 2 = 60 seconds**.**

4. Click **Save** on the bottom of the interface.

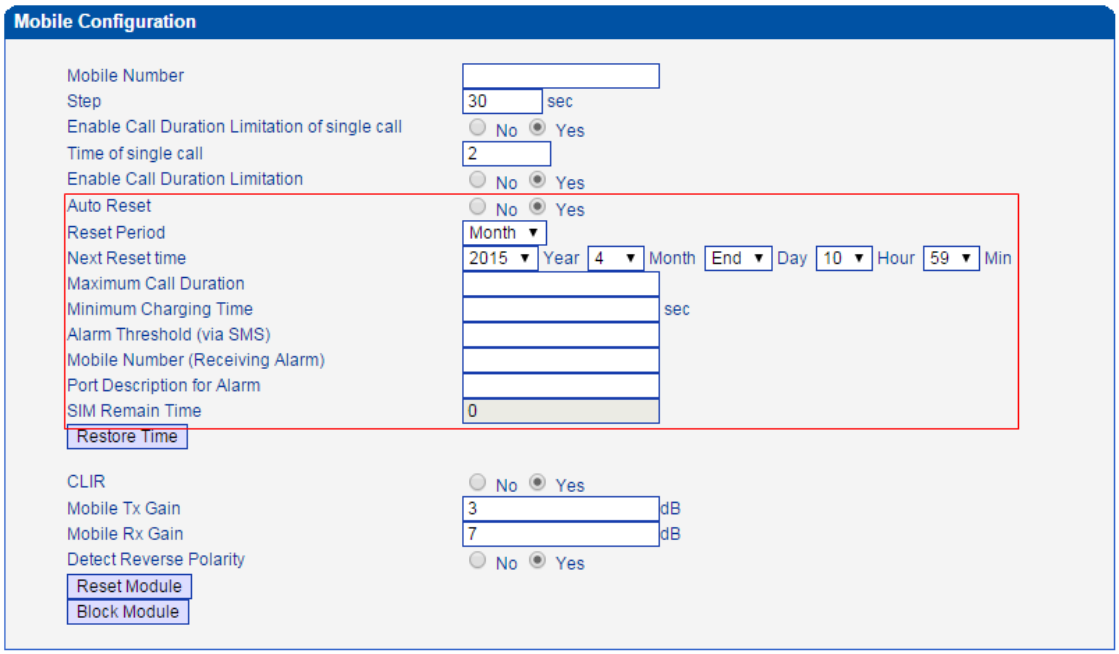
5.6.2 Configuration Procedures for Enable Call Duration Limitation

Step 1. Log into the Web Management System GUI of the DWG2000-1G.

Step 2. On the Web Management System GUI, click **Mobile Configuration → Mobile Configuration**, and then click the checkbox on the left of **Yes** for **Enable Call Duration Limitation**.



Step 3. Configure the following parameters (including Auto Reset, Next Reset Time, Maximum Call Duration, Maximum Charging Time, Alarm Threshold, Mobile Number Receiving Alarm, Port Description for Alarm and SIM Remain Time)



Parameter	Explanation
Auto Reset	If Auto Reset is enabled, the call duration will be automatically reset to the maximum value when the Next Reset Time arrives.
Next Reset Time,	It is the time when the call duration is reset to the maximum value.
Maximum Call Duration,	In the box on the right of this parameter, you need to enter the times of basic unit. For example, if the Step value is 30s, the value of this parameter is 2, the maximum call duration is: 30s x 2 = 60s.
Maximum Charging Time	If the duration of a call is less than the value of 'Minimum Charging Time', it will be not included in call duration.
Alarm Threshold,	If the remaining time reaches the value of ‘Alarm Threshold’, an alarm message will be sent.
Mobile Number Receiving Alarm,	The mobile number which receives alarm messages.
Port Description for Alarm	If you set any description here, the description will be contained in the alarm message.
SIM Remain Time	The remaining call time of mobile number. For example, if maximum call duration is 60s and 40s has been consumed, the ‘SIM Remain Time’ is 20s.

Step 4. Click **Save** on the bottom of the interface.

5.7 CLIR & Detect Reverse Polarity

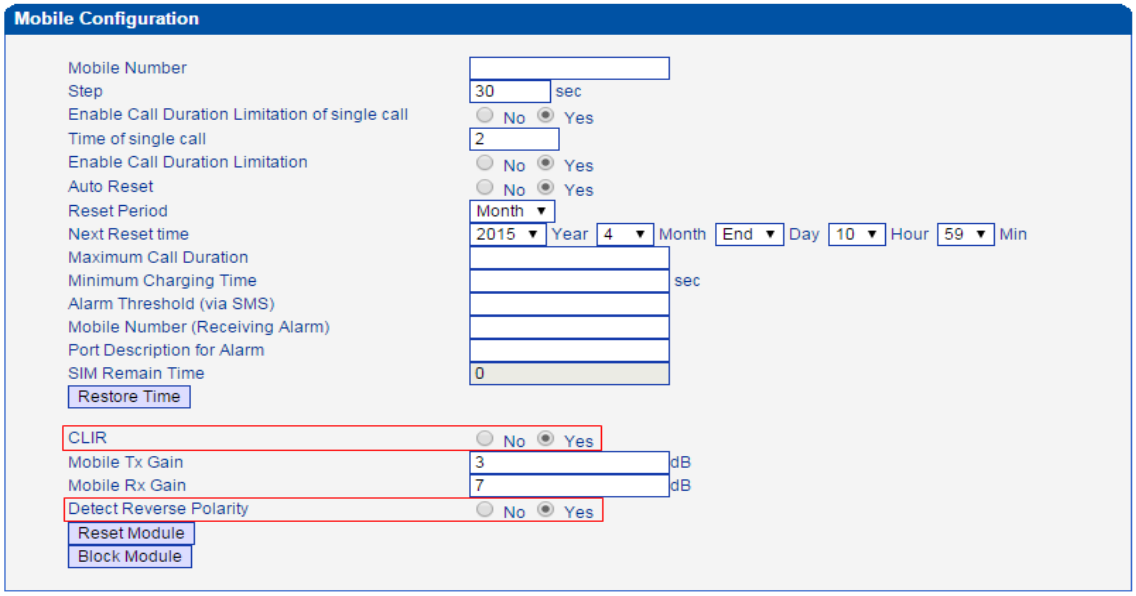
CLIR (Calling Line Identification Restriction): If the CLIR function is enabled, the phone number of the caller will not be displayed on the called phone.

Detect Reverse Polarity: If the function is enabled, the caller will learn whether the called person has got through the phone.

5.7.1 Configuration procedures for CLIR & Detect Reverse Polarity

Step 1. Log into the Web Management System GUI of the DWG2000-1G.

Step 2. On the Web System Management GUI, click **Mobile Configuration → Mobile Configuration**, and then click the checkbox on the left of **Yes** for **CLIR** & **Detect Reverse Polarity.**



Step 3. Click **Save** on the interface.

5.8 BCCH

BCCH (Broadcast Control Channel): BCCH is a logical broadcast channel used by the base station in a GSM network to send information about the identity of the network. The information is used by a mobile station to get access to the network. Information includes the Mobile Network Code (MNC), the Location Area Code (LAC) and a list of frequencies used by the neighboring cells.

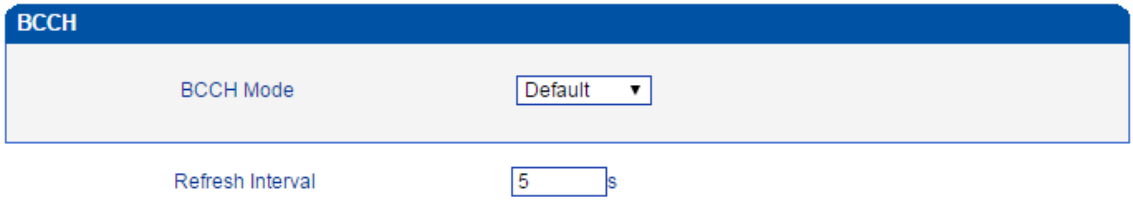
5.8.1 Configuration Procedures for BCCH

Step 1. Log into the Web Management System of the DWG2000-1G.

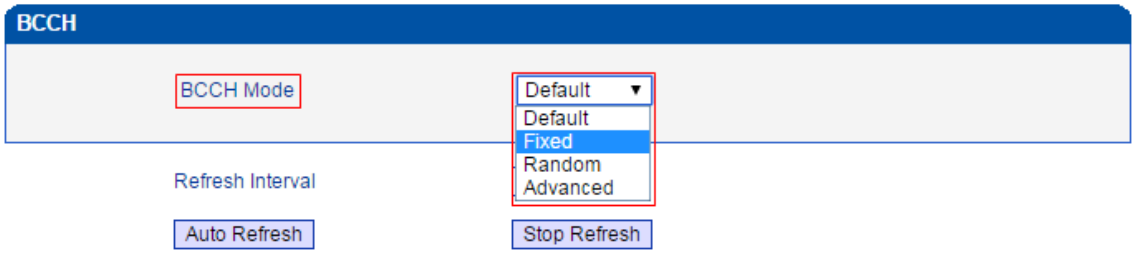
Step 2. On the Web Management System, click **Mobile Configuration → BCCH**.

Step 3. Drag the scroll bar on the bottom of the interface, and you will see a Detail button.

Step 4. Click the **Detail** button, and you will see the following interface.

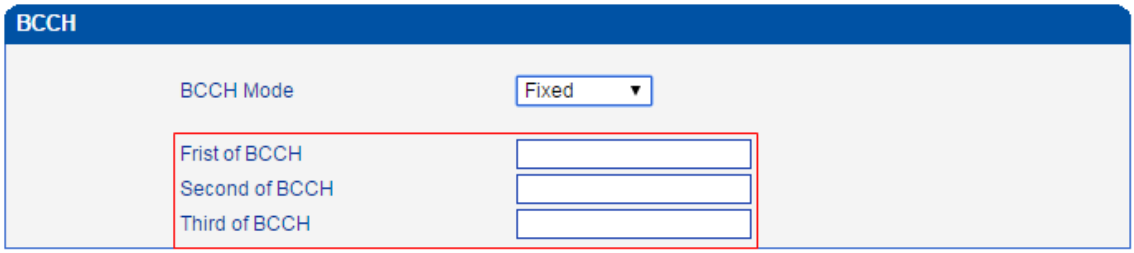


Step 5. Click the drag-down box on the right of **BCCH Mode**, and select a mode.

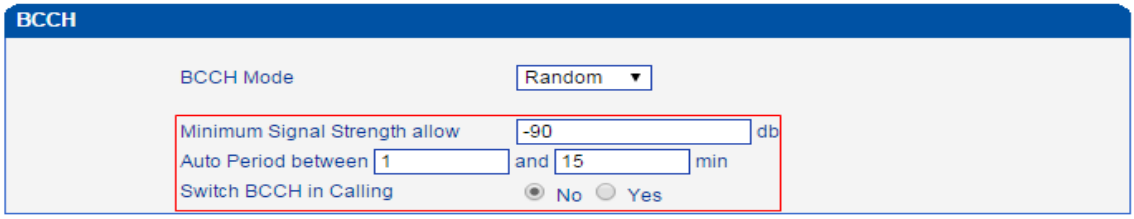


Default: All frequencies will be automatically matched with the DWG2000-1G.

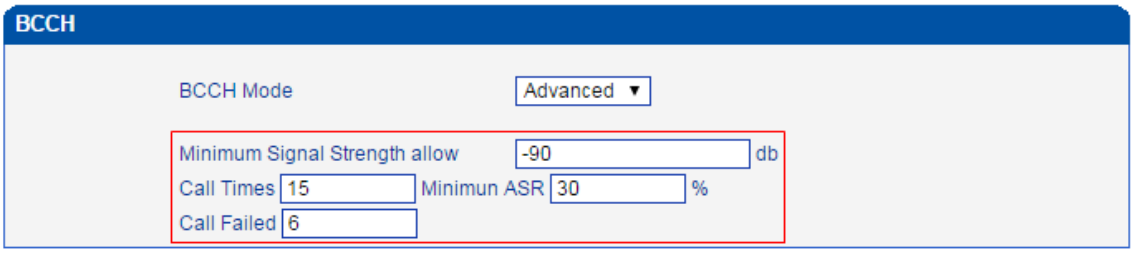
Fixed: You are required to set three fixed frequencies, and the frequencies will be matched with the DWG2000-1G permanently.



Random: you are required to set some conditions, including minimum signal strength, the period for automatic frequency switch, and whether to switch frequency during calling.



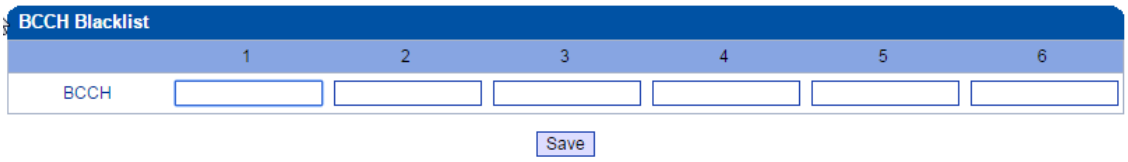
Advanced: you are required to set some conditions, including minimum signal strength, minimum answer-seizure ratio, number of calls and number of failed calls.



Note: When the actual number of failed calls reaches the set number, frequencies will be switched or when the actual answer-seizure ratio is less than the minimum answer-seizure ratio, frequencies will be switched.

Step 6. Click the **Save** button, and a prompt message indicating successful setting will pop up.

Step 7. On the navigation tree, click **Mobile Configuration → BCCH**. You will see the following figure on the upper interface. If there are some frequencies that are not useful, you can set them on the BCCH Blacklist, and then those frequencies cannot be used by the mobile station.



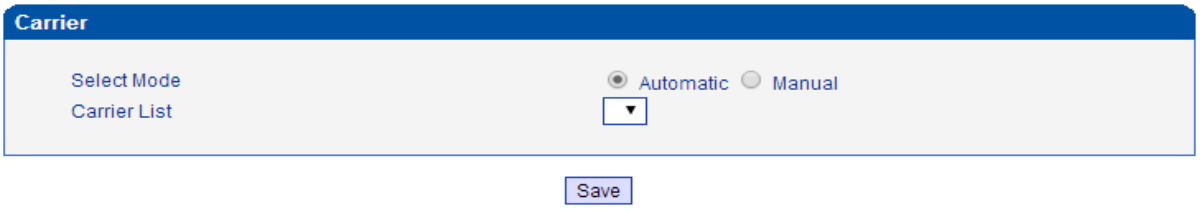
Note: The BCCH Blacklist only works at random mode and advanced mode.

Step 8. On the **Mobile Configuration → BCCH** interface, you can also set a refresh interval. For example, if you set refresh interval as 5 seconds, frequencies will be refreshed every 5 seconds.

Step 9. Click the **Save** button on the interface.

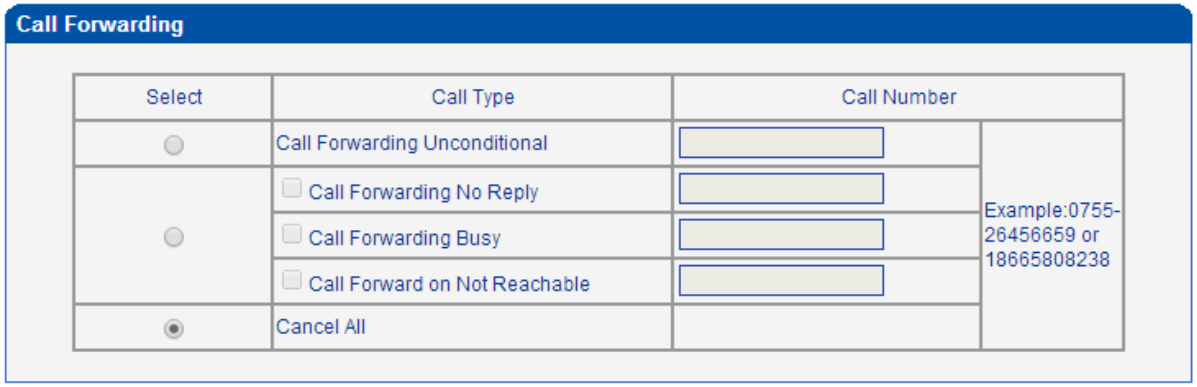
5.9 Carrier

On the **Mobile Configuration → Carrier** interface, if **Automatic** is selected, the DWG2000-1G device will automatically identify the carrier which the inserted SIM card belongs to. If **Manual** is selected, you need to choose a carrier in the drop-down box.



5.10 Call Forwarding

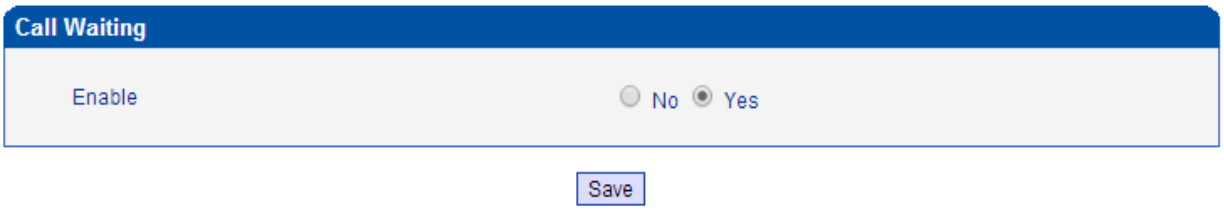
Calls can be forwarded unconditionally or under certain conditions.



Parameter	Explanation
Call Unconditional	Calls will be forwarded unconditionally
Call Forwarding No Reply	If there is no reply from the called number, calls will be forwarded.
Call Forwarding Busy	If the called number is busy, calls will be forwarded.
Call Forward on Not Reachable	If the called number is not reachable (for example, the called phone is power off), calls will be forwarded.
Cancel All	Calls will not be forwarded.
Call Number	The number where calls will be forwarded.

5.11 Call Waiting

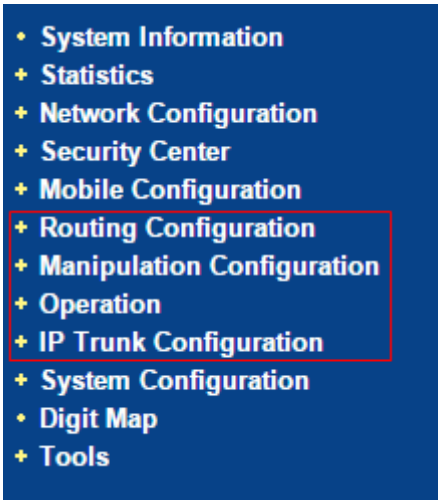
On the **Mobile Configuration →Call Waiting** interface, the call waiting function can be disabled or enabled.



6 Call Control

6.1 Navigation Subtree of Call Control

Call control includes routing configuration, manipulation configuration, operation configuration and IP trunk configuration.



Basic configuration procedures for a call are:

1. IP trunk configuration
2. Routing configuration
3. Operation configuration

If you want to have value-added functions, you can carry out configurations for number manipulation or auto call.

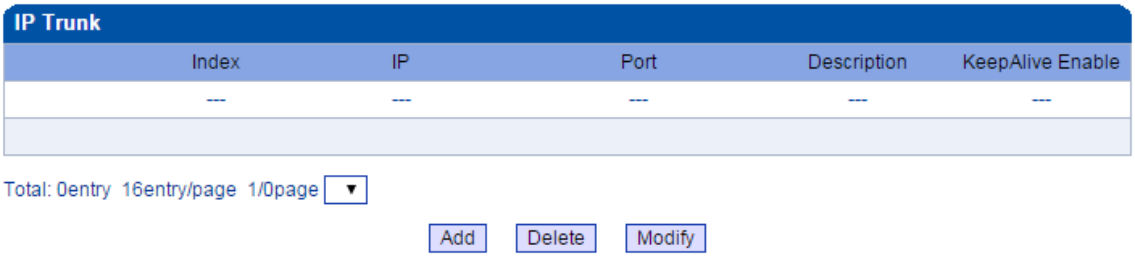
6.2 IP → Tel Calls and Tel →IP Calls

As the DWG2000-1G device provides interconnectivity between the GSM network and the IP network, we define calls from the IP network to the GSM network as outgoing calls (IP → Tel calls), and define calls from GSM network to the IP as incoming calls (Tel →IP calls).

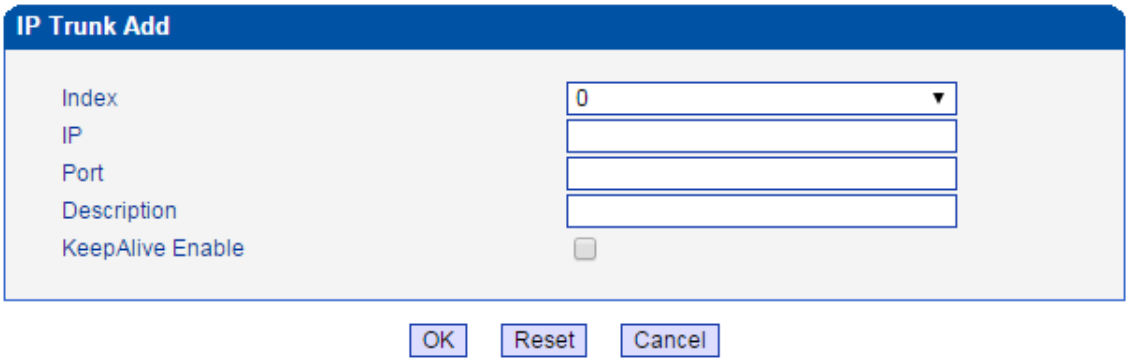
6.3 Configuration of IP Trunk and IP Trunk Group

6.3.1 Configuration of IP Trunk

Step 1. In the navigation tree of Web Management System, click **IP Trunk Configuration → IP Trunk**, and the following interface will be displayed.



Step 2. Click the **Add** button to configure IP Trunk.



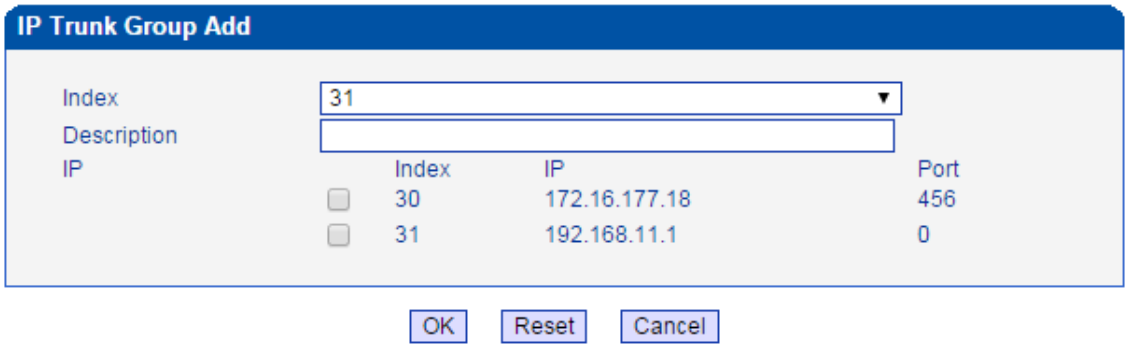
Parameter	Explanation
Index	You can choose any one from 0 – 31, but indexes of different IP trunk cannot be the same.
IP	The IP address of the device (for example: DAG) connected to the DWG2000-1G.
Port	The port of the device (for example: DAG), through which the DWG2000-1G is connected to the device.
Description	You can enter any description you want.
KeepAlive Enable	If KeepAlive is enabled, the DWG2000-1G will examine whether the IP trunk is available or not.

Step 3. Click **OK** on the interface.

Step 4. If you need to delete or modify the IP trunk, click the ☐ on the left of the IP Trunk, and then click **Delete** or **Modify**.

6.3.2 Configuration of IP Trunk Group

Step 1. In the navigation tree of Web Management System, click **IP Trunk Configuration → IP Trunk Group**, and the following interface will be displayed.



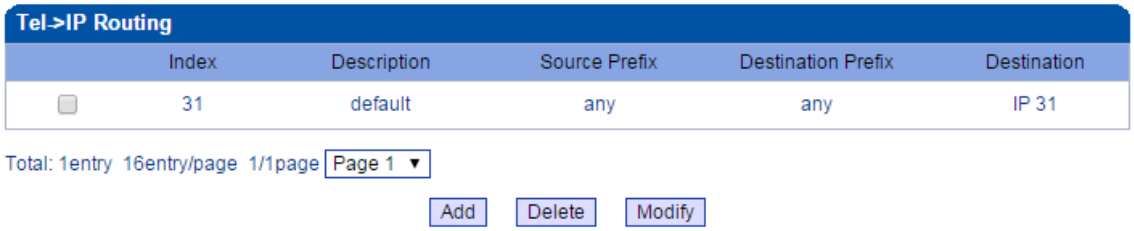
Step 2. Click ☐ on the left of the IP trunks which you intend to include into the IP trunk group. (You need to select more than one IP trunks)

Step 3. Click **OK** on the interface.

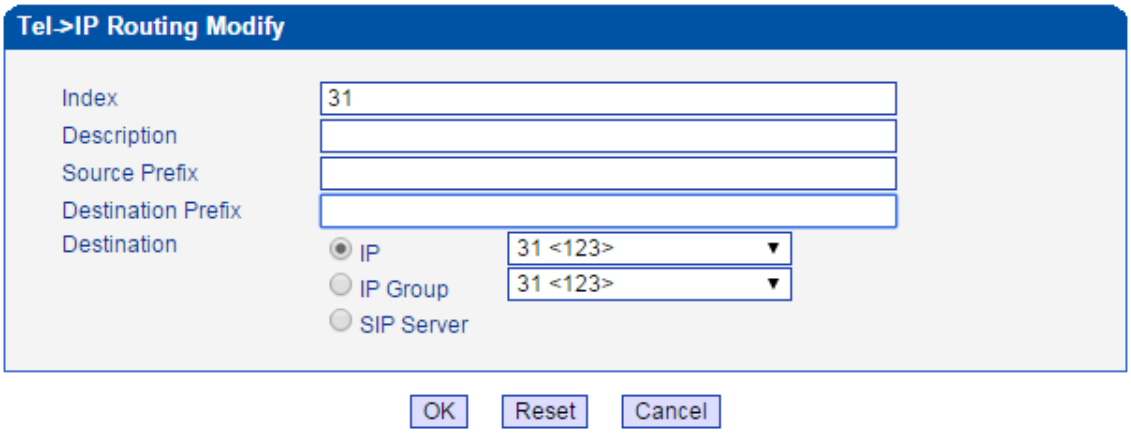
Step 4. If you need to delete or modify the IP trunk group, click the ☐ on the left of the IP Trunk, and then click **Delete** or **Modify**.

6.4 Routing Configuration

Step 1. In the navigation tree on the left, click **Routing Configuration → Tel -> IP Routing**, and the following interface will be displayed.



Step 2. Click **Add** to configure routing.



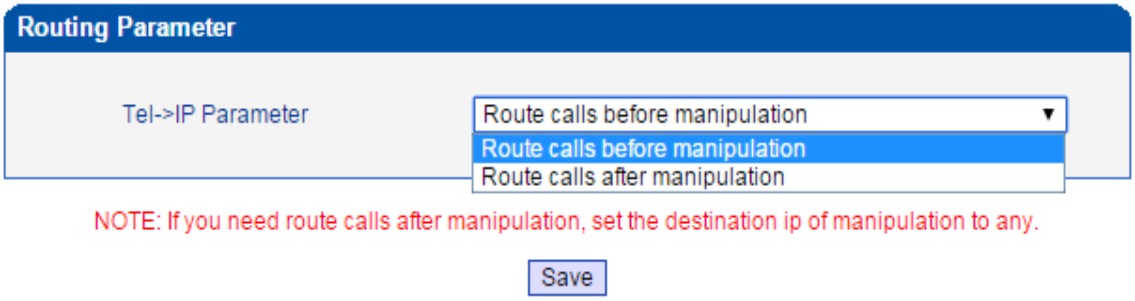
Parameter	Explanation
Index	The index of the routing
Description	You can enter any description you want
Source Prefix	The prefix of the source number; when it's found that the source number includes the prefix, this routing will be selected.
Destination Prefix	The prefix of the destination number; when it's found that the destination number includes the prefix, this routing will be selected.
Destination	The IP Trunk, IP Trunk Group or SIP Server linked to the routing

Note: You can add 1 to 31 routings, but the routing whose index is 31 cannot be deleted, since there must be one routing at least.

Step 3. Click **OK.**

Step 4. If you need to delete or modify the routing, click the ☐ on the left of the routing, and then click **Delete** or **Modify**.

Step 5. In the navigation, Click **Routing Configuration → Routing Parameter**. Choose 'Route calls before manipulation' or 'Route calls after manipulation' according to your needs.



Note: Route calls before manipulation is the default setting.

Step 6. Click **Save** on the interface.

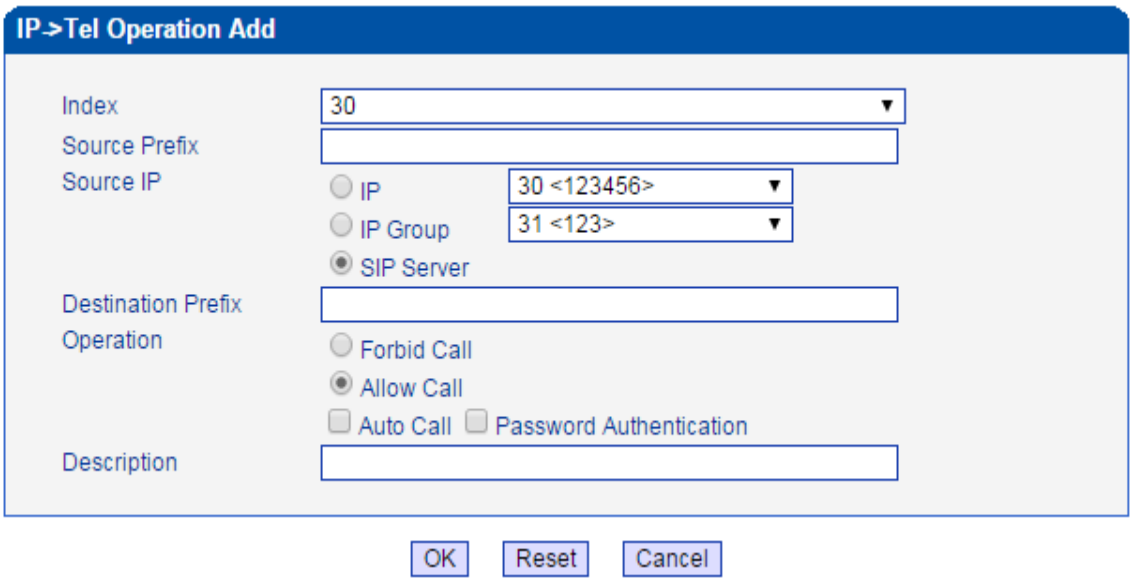
6.5 Operation

The Operation function is used to control outgoing calls and incoming calls. It can determine whether a call is allowed or forbidden.

6.5.1 Configuration Procedures for IP -> Tel Operation

Step 1. In the navigation, click **Operation → IP->Tel Operation**, and the following interface will be displayed.

Step 2. Click **Add** to configure the following parameters.



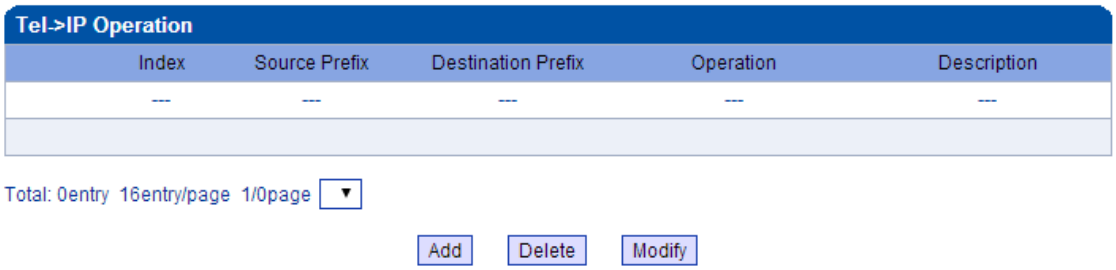
Parameter	Explanation
Index	The index of the operation
Source Prefix	The prefix of the source number. When a source number includes this prefix, the operation will be executed.
Source IP	The IP Trunk, IP Trunk Group or SIP Server linked to the operation.
Destination Prefix	The prefix of the destination number. When a destination number includes this prefix, the operation will be executed.
Operation	Operation includes Forbid Call, Allow Call, Auto Call and Password Authentication. For example, if source prefix is set as 200, the source number is 2009966, Allow Call and Auto Call are selected, the outgoing call of 2009966 will be dialed by the DWG2000-1G automatically.
Description	Enter any description that you want.

Note: If Auto Call is selected, IP -> Tel call will be dialed by the DWG2000-1G automatically.

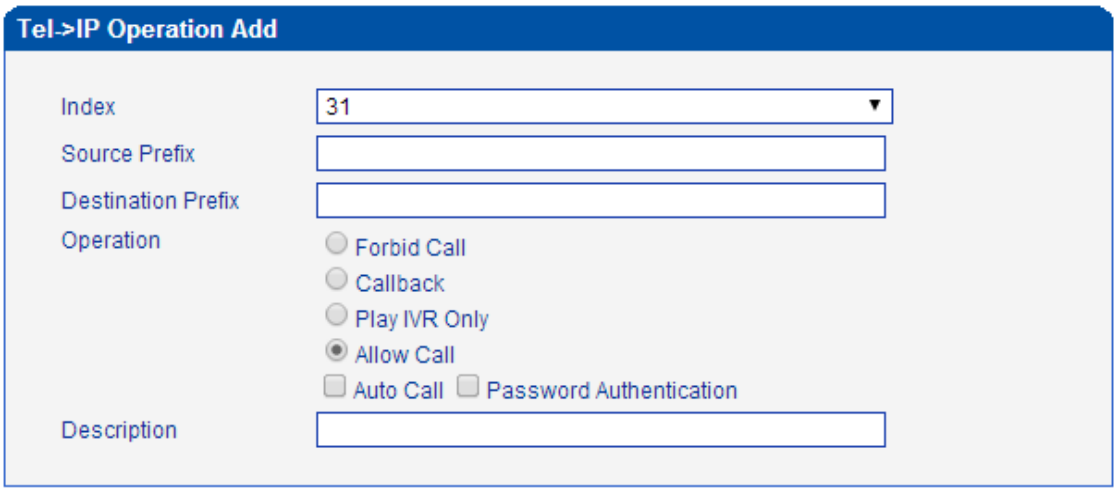
Step 3. Click **OK**.

6.5.2 Configuration Procedures for Tel -> IP Operation

Step 1. In the navigation, click **Operation → Tel -> IP Operation**, and the following interface will be displayed.



Step 2. Click **Add** to configure the following parameters.



Note: "Play IVR Only" cannot be used for VOIP Calling. And the device will hangup after playing IVR for 3 times.

OK Reset Cancel

Parameter	Explanation
Index	The index of the operation
Source Prefix	The prefix of the source number. When a source number includes this prefix, the operation will be executed.
Source IP	The IP Trunk, IP Trunk Group or SIP Server linked to the operation.
Destination Prefix	The prefix of the destination number. When a destination number includes this prefix, the operation will be executed.
Operation	Operation includes Forbid Call, Callback, Play IVR Only, Allow Call, Auto Call and Password Authentication.

Description	Enter any description that you want.

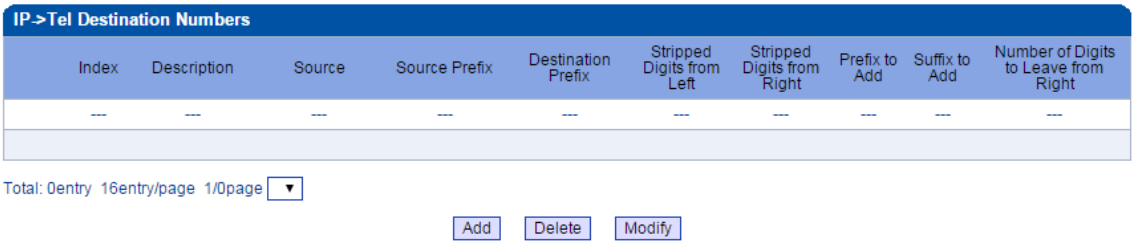
Step 3. Click **OK**.

6.6 Number Manipulation

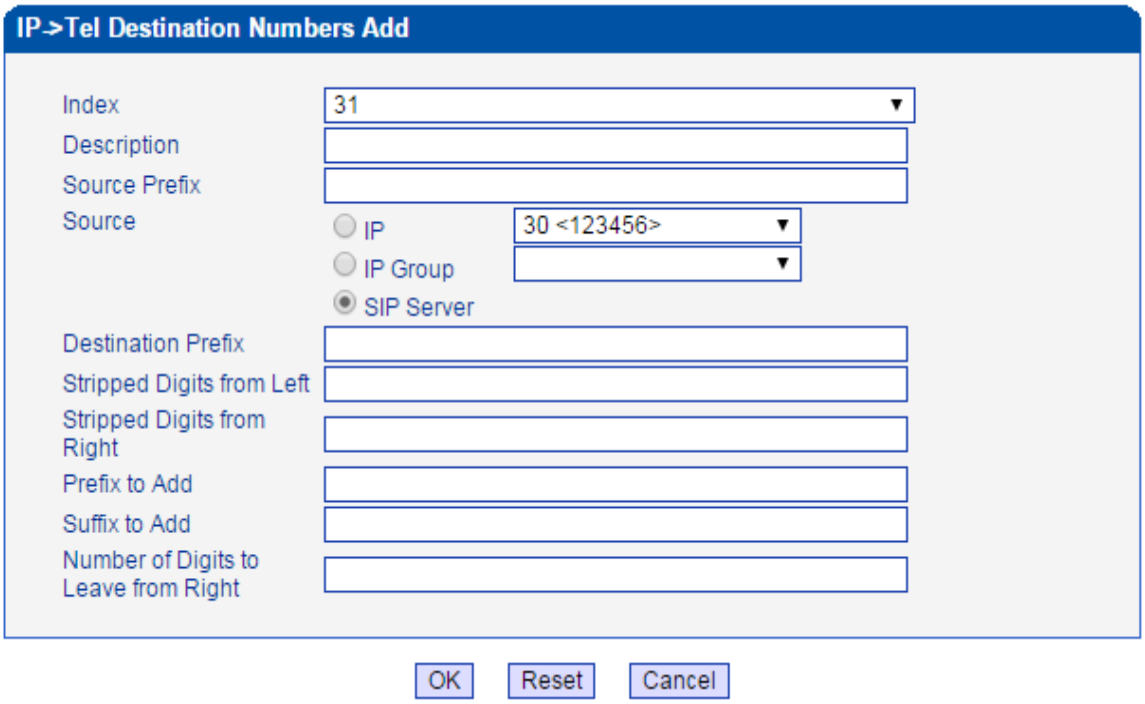
Number manipulation refers to the change of the destination number during the IP→ Tel calling process, the change of the source number during the Tel→ IP calling process, and the change of the destination number during the Tel→ IP calling process.

6.6.1 Configuration Procedures for Manipulating IP –> Tel Destination Numbers

Step 1. In the navigation tree of Web Management System, click **Manipulation Configuration → IP –> Tel Destination Numbers**, and the following interface will be displayed.



Step 2. Click **Add**, and the following interface will be displayed.



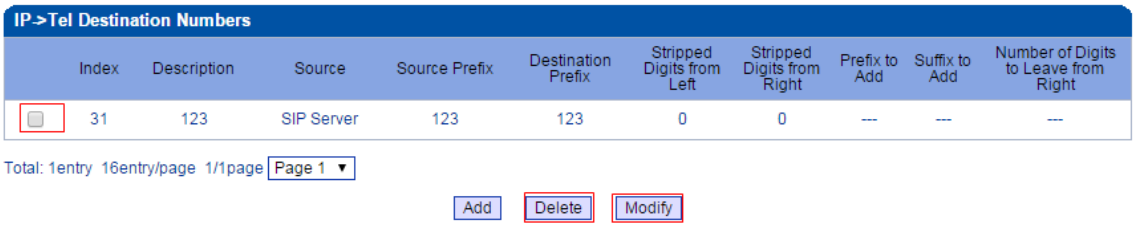
Parameter	Explanation
Index	You can choose any one from 0 – 31, but an index cannot be used repeatedly.
Description	You can enter any description you want.
Source Prefix	The prefix of the source number
Source	The source IP in the Operation → IP – Tel Operation interface
Destination Prefix	The prefix of the destination number
Stripped Digits from Left	The number of digits which are lessened from the left of the destination number
Stripped Digits from Right	The number of digits which are lessened from the right of the destination number
Prefix to Add	The prefix added to the destination number after its digits are lessened.
Suffix to Add	The suffix added to the destination number after its digits are lessened
Number of Digits to Leave from Right	The number of the retained digits which. are counted from the right of the destination number

Note: You can only configure some of the parameters according to your needs.

Parameters (Source Prefix, Source IP, Source IP Trunk and Destination Prefix) are the triggering conditions for number manipulation, while the remaining parameters (Stripped Digits from Left or From Right , Prefix/Suffix to Add and Number of Digits to Leave from Right) are the rules to change numbers.

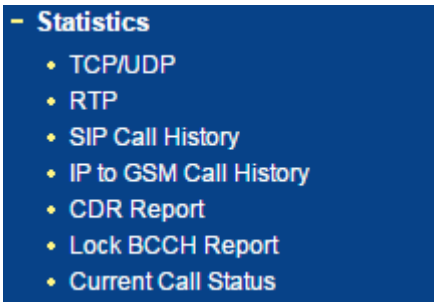
Step 3. Click **OK**

Step 4. If you need to delete or modify the configuration, click the ☐ on the left, and then click **Delete** or **Modify**.



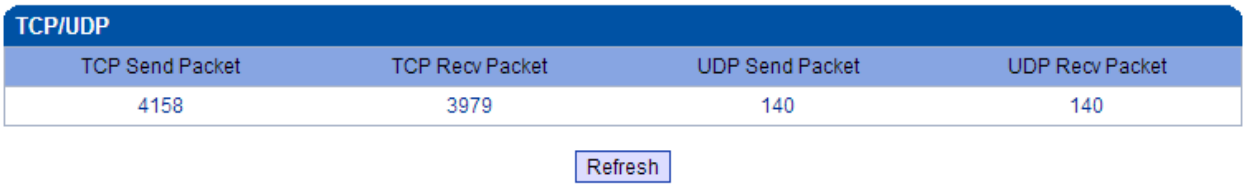
7 Statistics

7.1 Navigation Subtree for Statistics



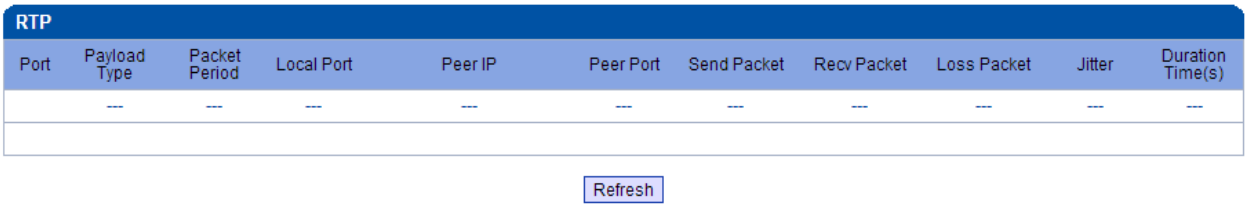
7.2 TCP/UDP

On the **Statistic → TCP/UDP** interface, the number of the sent packages over TCP/UDP and the number of the received packages over TCP/UDP are displayed. If the **Refresh** button is clicked and the numbers change, it means the communication is normal.



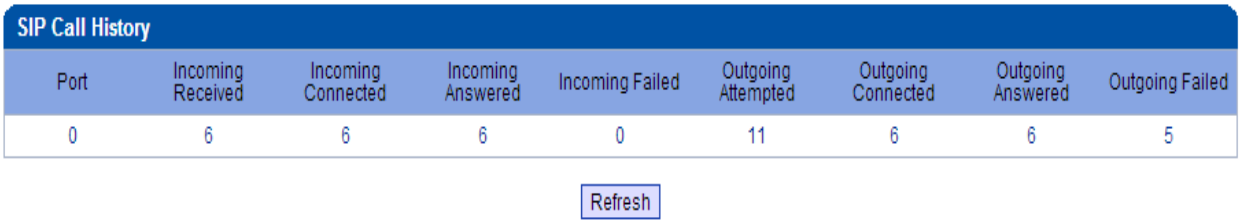
7.3 RTP

On the **Statistic →RTP** interface, the data packages related to RTP (Real-time Transport Protocol) are displayed. The packages can be refreshed automatically or manually. If data are shown, it means a call is ongoing.



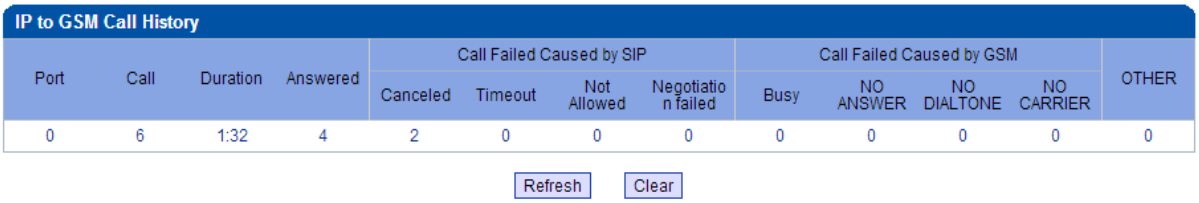
7.4 SIP Call History

On the **Statistic →SIP Call History** interface, the number of incoming calls and the number of outgoing calls through the port of DWG2000-1G will be displayed.



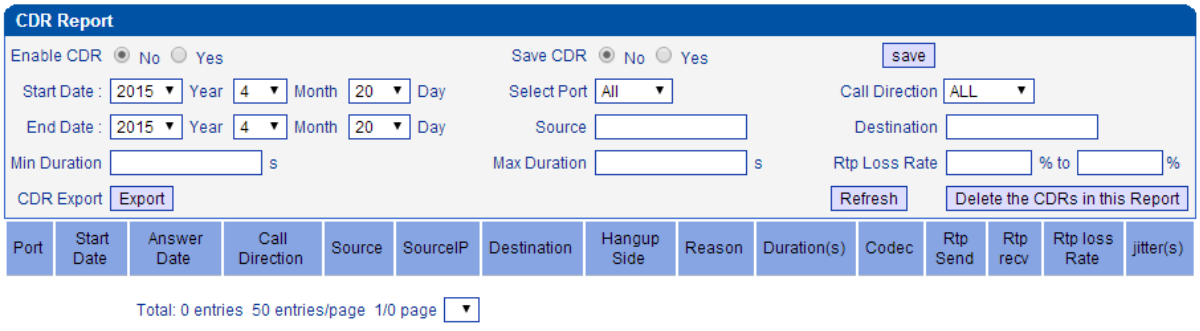
7.5 IP to GSM Call History

On the **Statistic → IP to GSM Call History** interface, history of IP → GSM calls is displayed.



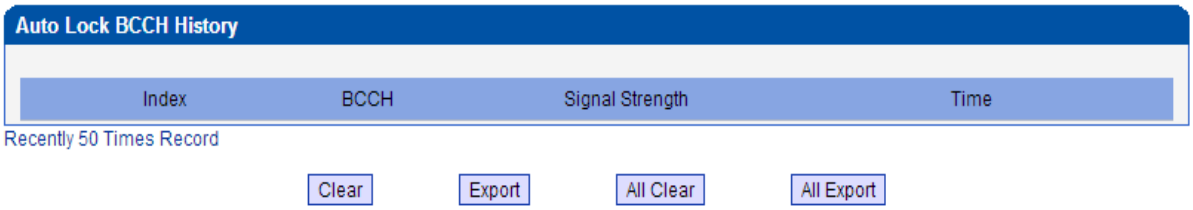
7.6 CDR Report

On the **Statistic → CDR Report** interface, details of all calls through the port of DWG2000-1G are displayed. The CDR function can be enabled on this interface.



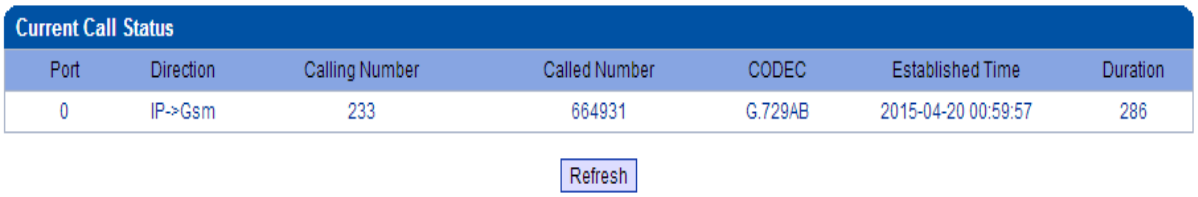
7.7 Lock BCCH Report

On the **Statistics → Lock BCCH Report** interface, history of the changes of BCCH frequencies is shown.



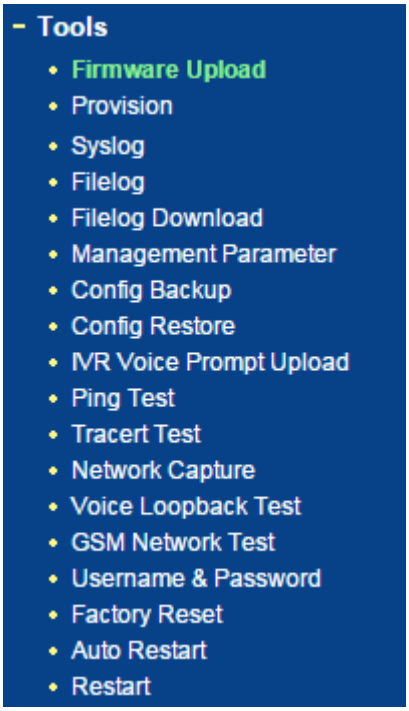
7.8 Current Call Status

On the Statistics → Current Call Status, status and detail of the current call are shown.



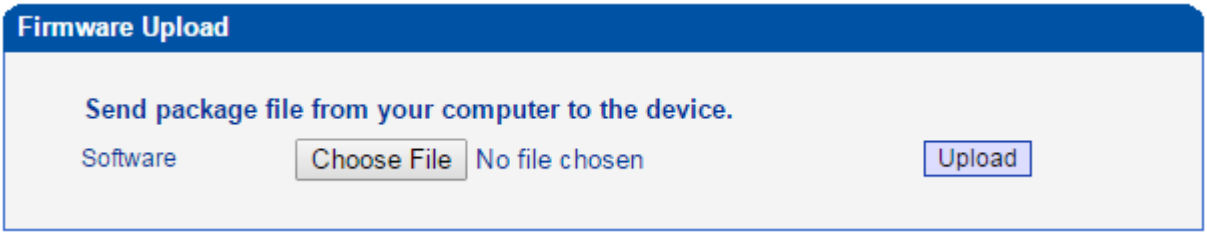
8 Tools

8.1 Navigation Subtree of Tools



8.2 Firmware Upload

On the **Tools → Firmware Upload**, you can upload a firmware to upgrade the DWG2000-1G. But you need to restart the DWG2000-1G device for the change to take effect.



8.3 Provision

On the **Tools → Provision** interface, you can carry out some configurations to make the DWG2000-1G automatically upgrade with the latest firmware stored on a http server, ftp server or a ftp server.

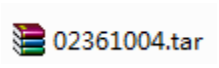
The following is an example where ftp server is taken as an example to show how to do the configurations.

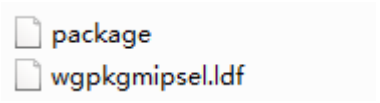
8.3.1 Configuration on FTP Server

Assume that the URL of the FTP server is //172.16.77.200.

Step 1. Open the ftp server, create a file folder under the following path: ftp://172.16.77.200/home, and then name the file folder as "36" (36 is the product ID of DWG).

Step 2. Ask the technical support of Shenzhen Dinstar Technology Co.,Ltd to provide the following compression package, which contains two files (the "package" file and the "wgpkgmipsel.ldf" file).





Step 3. Open the "package" file, and copy the following words in the red box.

```
<?xml version="1.0" encoding="utf-8"?>
<provision version="1.0">
    <product id="23">
        <package ver="02231101" rely="02230701" buildtime="2015-02-28 21:42:21" name="wgpkgarmuc.ldf" type="official">
            <param name="boxapp.ldf" value="boxapp.ldf" ver="02231101" md5="e439491906f9e828594627e084627a07"/>
            <param name="box_fpga.ldf" value="box_fpga.ldf" ver="02231101" md5="216281e5fd6cd51314ddc1f2f3eff30c"/>
            <param name="config_default" value="config_default" ver="02231101" md5="003277db1a560cba91ced91e5a2861fc"/>
            <param name="drv" value="drv" ver="02231101" md5="e964b11dc47d784796280e653a68c5c8"/>
            <param name="dwg_db" value="dwg_db" ver="02231101" md5="7b3bbd811d4c7666220502d63bbdc4de"/>
            <param name="firmware" value="firmware" ver="02231101" md5="375767695cfd403e86ae05e7475c5a81"/>
            <param name="libsqlite3.gz" value="libsqlite3.gz" ver="02231101" md5="0466cbd4dc8f8bee48744dc9b0dbf3bf"/>
            <param name="net_hook.ko" value="net_hook.ko" ver="02231101" md5="021bad0a9467acf7c04d6e5c1ff560c1"/>
            <param name="pthtimer.ko" value="pthtimer.ko" ver="02231101" md5="f7bd8b29f571520b05dfa095b36a1d69"/>
            <param name="startapp" value="startapp" ver="02231101" md5="eb14ecef50eae97021b2d8e92caf8fd6"/>
            <param name="summary" value="summary" ver="02231101" md5="712db9f900250a8eca27be97afcb5ac4"/>
            <param name="udhcpc.script" value="udhcpc.script" ver="02231101" md5="9018a604c49edefee2c9edf9dea9a0d2"/>
            <param name="udpmux.ko" value="udpmux.ko" ver="02231101" md5="6409f2a3011cbe4df4298c78bd4d36a1"/>
            <param name="upgrade" value="upgrade" ver="02231101" md5="8d225d00bb9c24232164f933bee89810"/>
            <param name="usctp_daemon.gz" value="usctp_daemon.gz" ver="02231101" md5="4546f5d89ad0d53f2abd4f0d61fdcdb0"/>
            <param name="userboardapp.ldf" value="userboardapp.ldf" ver="02231101" md5="e89ef1134559f1bc426b40b0c29d2a76"/>
            <param name="userboardapp_v5.ldf" value="userboardapp_v5.ldf" ver="02231101" md5="01739aae44421b54a444bfe99976cfd3"/>
            <param name="userboardapp_v6.ldf" value="userboardapp_v6.ldf" ver="02231101" md5="5b357b3d079c7608f2606fdbc4dde7c6"/>
            <param name="userboard_fpga.ldf" value="userboard_fpga.ldf" ver="02231101" md5="3f360b9576443b17dc82d5477c8045b6"/>
            <param name="web" value="web" ver="02231101" md5="8ff13fb970728bc7d4fe3fb081b55ac1"/>
        </package>
    </product>
</provision>
```

Note: If more contents or less contents are copied, the configuration will fail.

The contents that are copied will be used later in the newly-created "default" file.

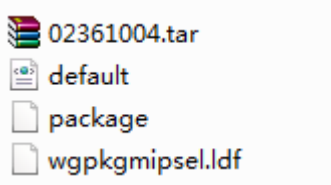
Step 4. Create a file in the "xml" format, and name the file as "default.xml".

Step 5. Write the following contents on the "default.xml" file.

```
<?xml version="1.0" encoding="UTF-8"?>
- <provision version="1.0">
  - <product force="true" url="ftp://172.16.77.200/home/36" snfilter="" id="36">
      <package type="official" name="wgpkgmipsel.ldf" buildtime="2015-04-20 18:54:57" rely="" ver="02361004"/>
    </product>
</provision>
```

Note: The url is ftp://172.16.77.200/home/36 and product id is 36 in the above file.

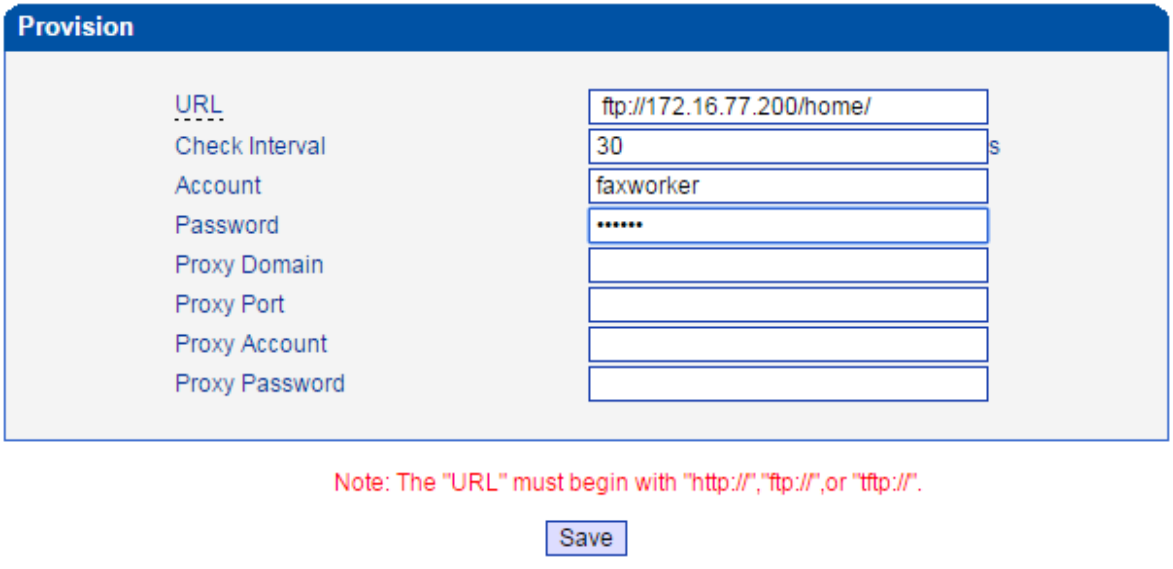
Step 6. Put the following files in the "36" folder. (Except the "default" file, other files are provided by Dinstar.)



8.3.2 Configuration on DWG2000-1G

Step 1. Log into the Web Management System of the DWG2000-1G

Step 2. On the navigation tree on the left, click **Tools → Provision**, and the following interface will be displayed.



Parameter	Explanation
URL	The URL of the ftp server, for example, ftp://172.16.77.200/home

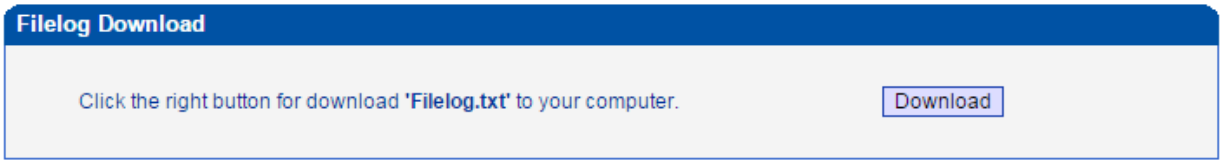
Check Interval:	The interval to check where there is a new firmware in the ftp://172.16.77.200/home
Account	The login name of the ftp server
Password	The login password of the ftp server

Proxy Domain, Proxy Port, Proxy Account and Proxy Password are optional to be configured.

Step 3. Click the **Save** button.

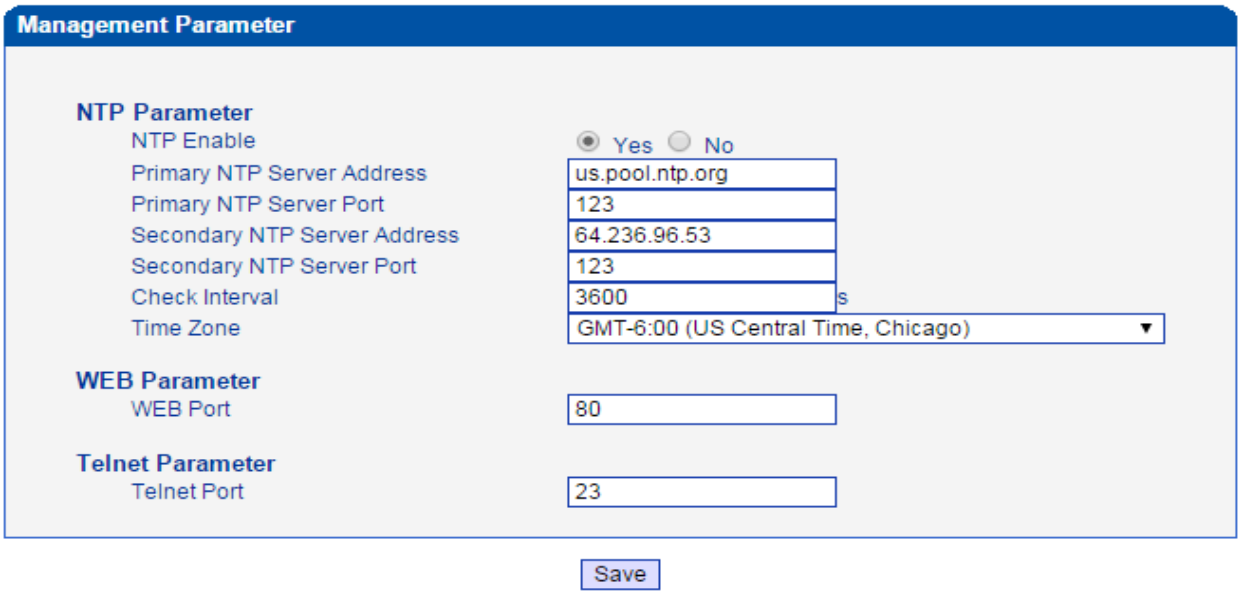
8.4 Filelog Download

The filelog which indicates the details of the operations carried out on the DWG2000-1G device can be downloaded on the **Tools → Filelog Download**.



8.5 Management Parameter

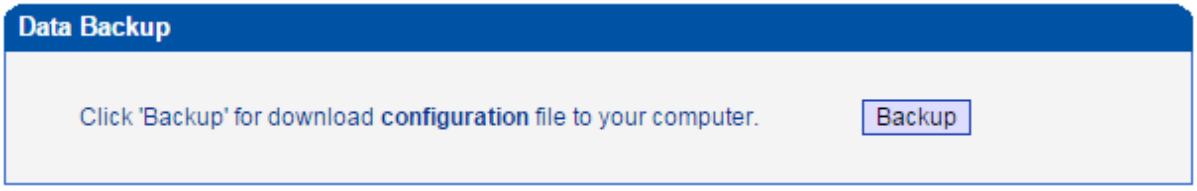
On the **Tools → Management Parameter** interface, the NTP (Network Time Protocol) can be enabled. If the function is enabled, the DWG2000-1G can automatically adjust the real time according to the NTP address and its time zone



8.6 Config Backup & Config Restore

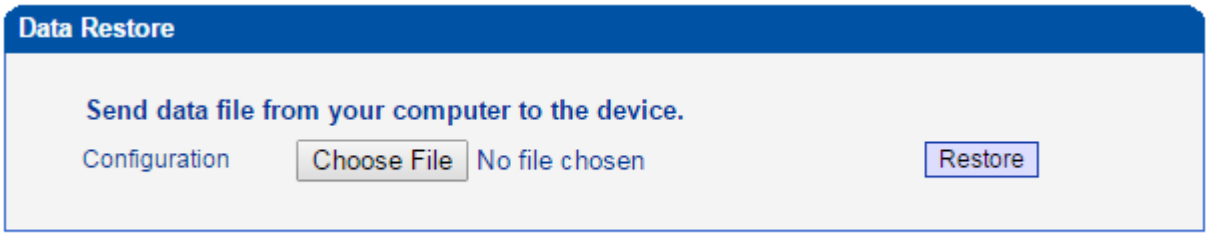
8.6.1 Config Backup

On the **Tools → Config Backup** interface, you can download data as a back for the DWG device.



8.6.2 Config Restore

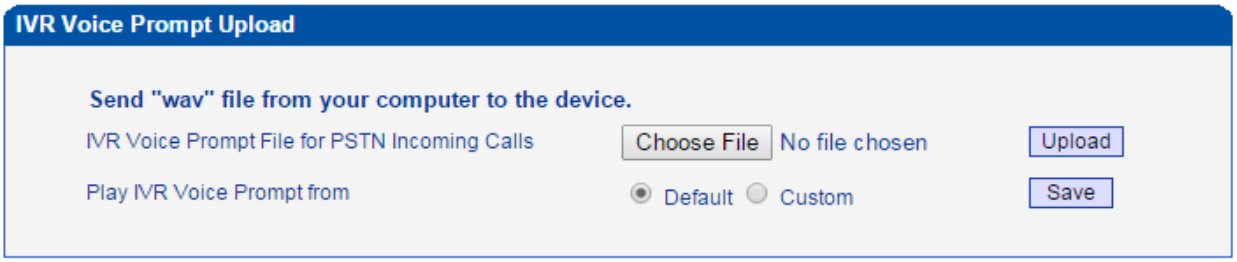
On the **Tools → Config Restore** interface, you can upload a file to restore the data of the DWG device.



NOTES: The upload process will last about 30s.

8.7 IVR Voice Prompt Upload

On the **Tools → IVR Voice Prompt Upload** interface, you can upload a IVR prompt or set a default IVR prompt for PSTN incoming calls.

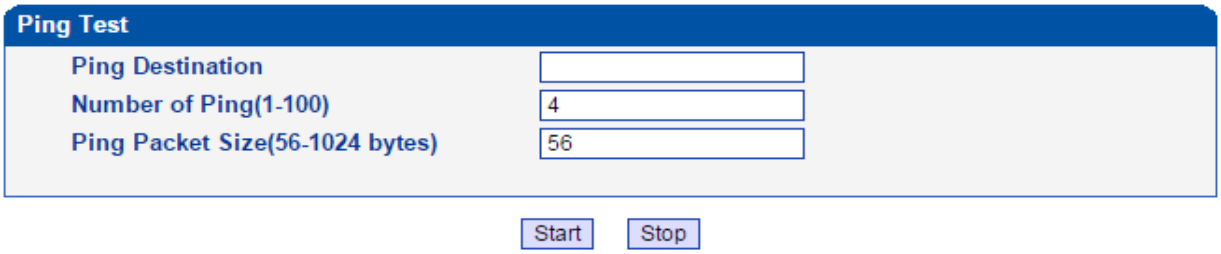


NOTE: 1.Please choose a mono wav file which is 8khz, 16bit and no more than 940k bytes.

8.8 Network Diagnosis

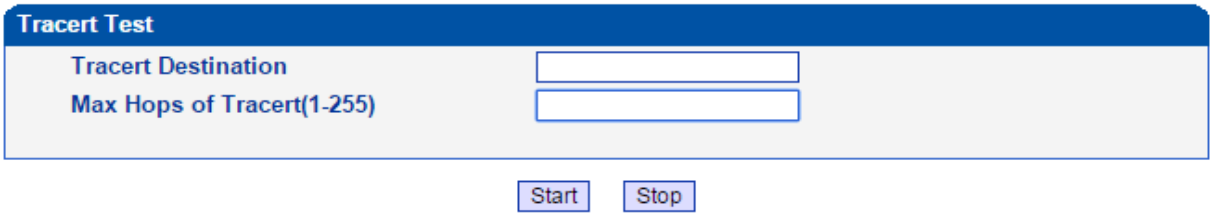
8.8.1 Ping Test

On the **Tools → Ping Test** interface, you can use Ping to check whether the network is working or not.



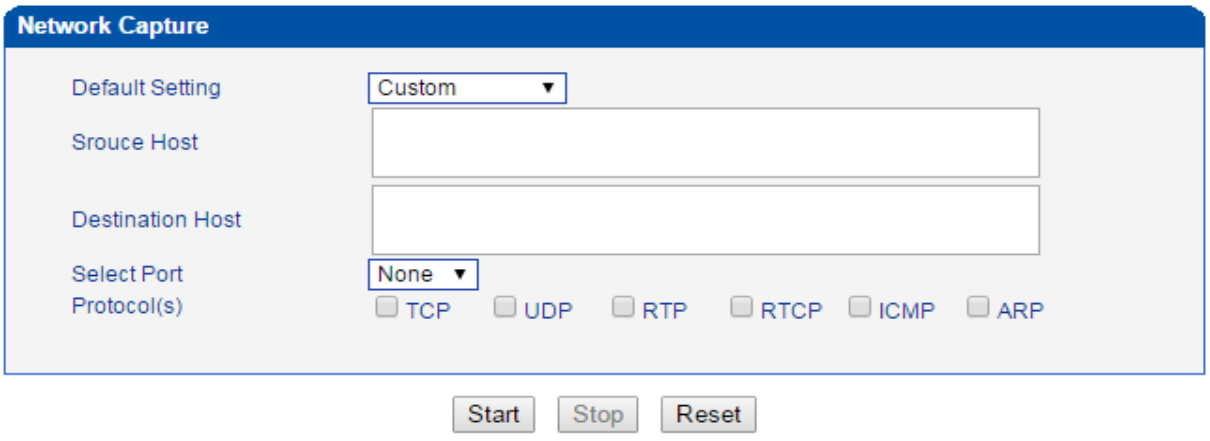
8.8.2 Tracert Test

On the **Tools →Tracert Test** interface, you can check the routes of the tracert destination.



8.8.3 Network Capture

On the **Tools →Network Capture** interface, you can capture data packages of the available network ports.



NOTE:

If all the items are left empty, it means all packets of the available network interfaces will be captured.

If there are multiple IP addresses, please use ¡°,¡± to separate them;

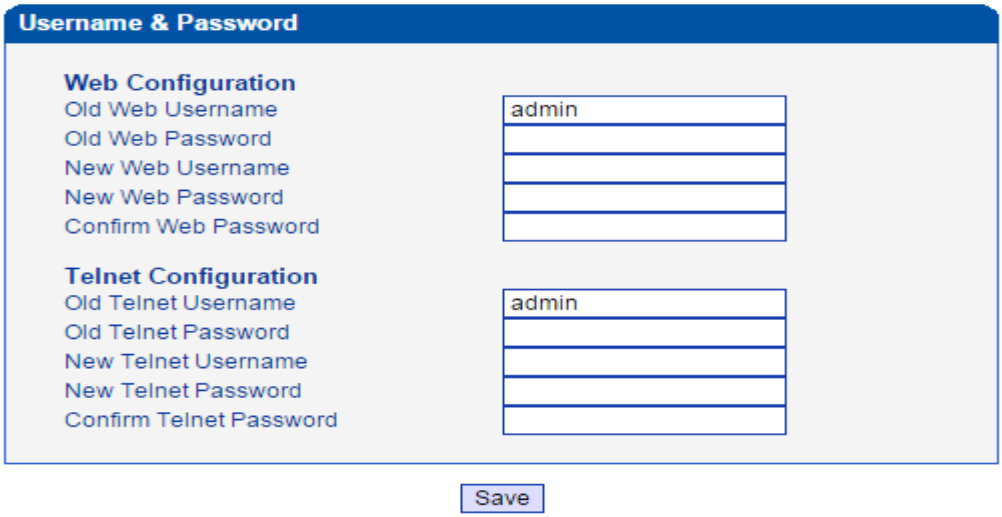
If you need to get the Syslog packets, make sure Syslog has been enabled;

If you need to get the RTP or RTCP packets, make sure the checkbox before UDP have been selected, apart from the checkbox before RTP or RTCP.

If you select a specific port, the SIP and RTP packets of the port will be captured.

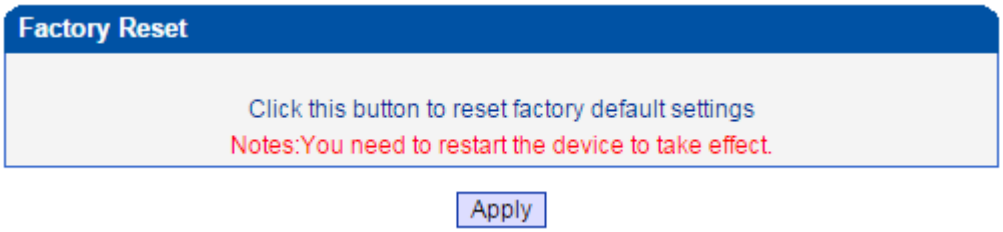
8.9 Username & Password

If you want to change the username or password of the DWG2000-1G device, click Tools → Username & Password. You are required to enter old username and password before inputting new username and password.



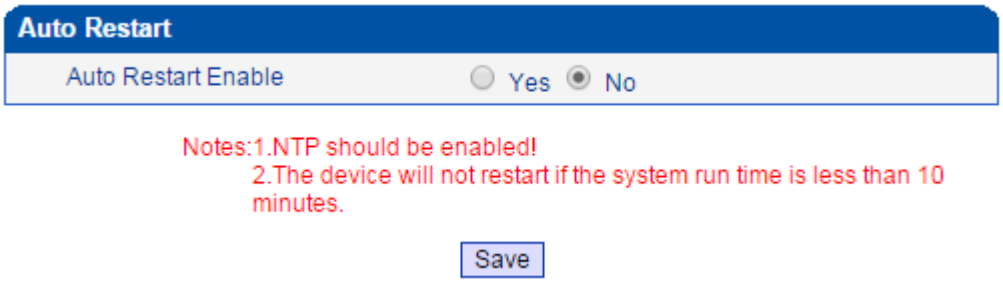
8.10 Factory Reset

On the **Tools → Factory Reset** interface, click **Apply**, and the DWG2000-1G device will be reset The factory settings.

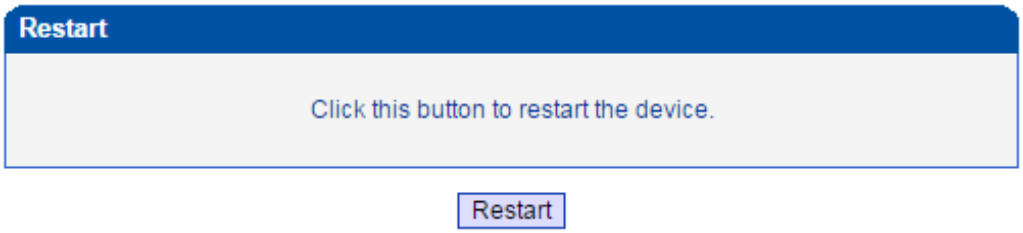


8.11 Auto Restart and Manually Restart

On the **Tools → Auto Restart** interface, you can choose enable or disable Auto Restore.



On the **Tools → Restart** interface, you can manually restart the DWG2000-1G device.



9 How to Connect with SIP Server

This chapter is aimed to describe the configuration procedures for connecting the DWG2000-1G with SIP server. Here we take the Elastix Server for example.

9.1 Configuration for connecting DWG2000-1G with Elastix through IP Trunking

9.1.1 Configuration procedures on Elastix Sever

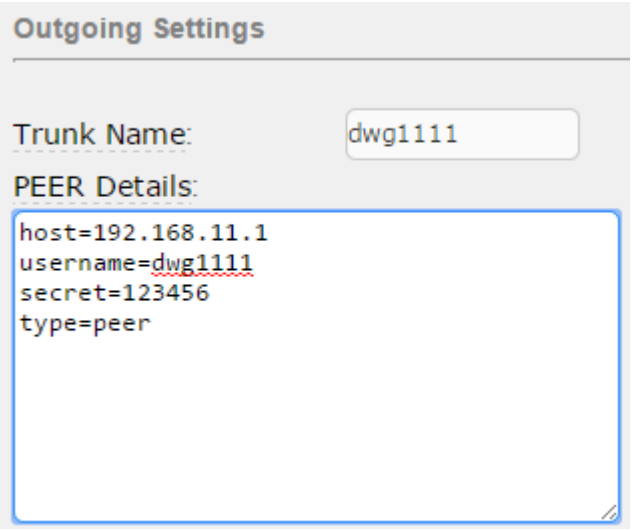
Step 1. Log into the Elastix Sever

Step 2. Click **PBX** on the menu at the top of the interface top, and then click **Trunks** in navigation tree on the left.

Step 3. Click **Add SIP Trunk** to create a SIP Trunk to DWG2000-1G.
Fill in the following information

Outgoing settings ：

- Trunk Name (dwg1111 in this example)
- Host (the IP address of the DWG2000-1G device, "192.168.11.1" in this example)
- Username (the SIP account name assigned by the Elastic Server to the current user; it will be used later in the configuration on the DWG2000-1G)
- Secret (the authentication password for connecting with the Elastic Server)

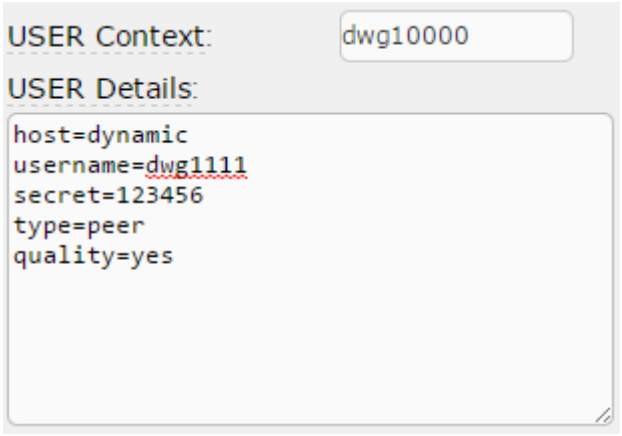


Incoming setting：

- Username (the account name assigned by the Elastic Server to the current user; it will be used

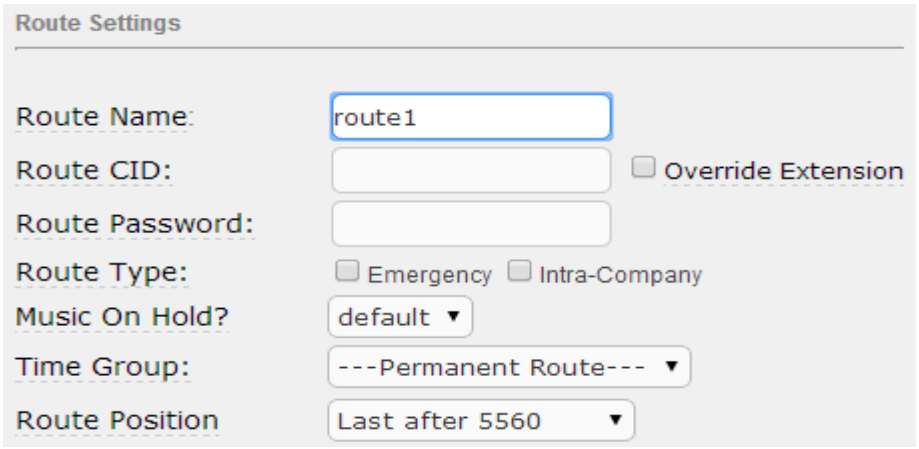
later in the configuration on the DWG2000-1G)

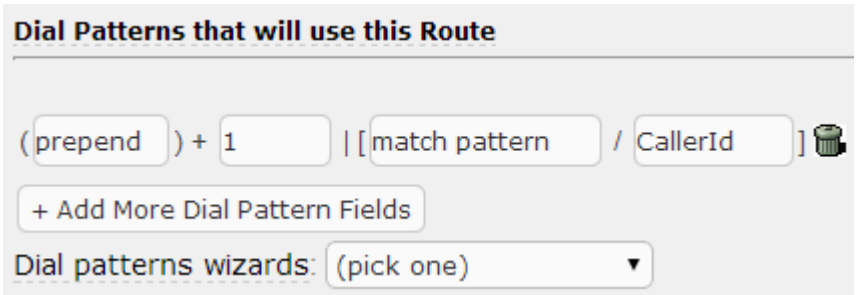
- Secret (the authentication password for connecting with the Elastic Server)



Step 4. Click **Outbound Routes** in the navigation tree to configure outbound route on the **Add Outbound Routes** interface, and fill in the following information.

Route Name (Route1 in this example)



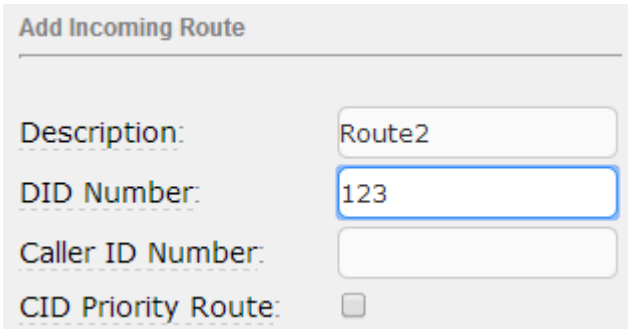


Step 5. Click the **Submit Changes** button.

Step 6. Click **Inbound Routes** to configure inbound route on the **Add Inbound Routes** interface, and fill in the following information.

Add Incoming Route:

- Description (the description of this route, 'Route 2' in this example)
- DID number (the number for access to this route, '123' in this example)



- Destination (the extension number that the route will reach, '101' in this example)

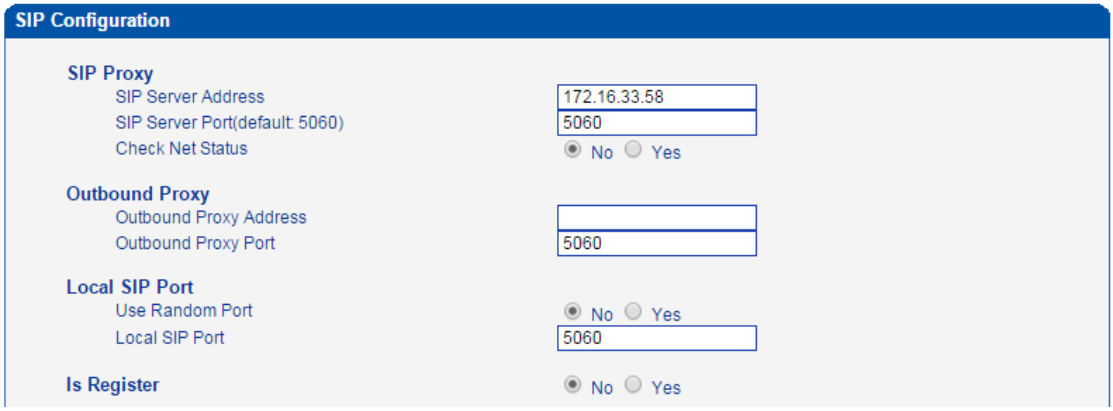
Step 7. Click **Submit** to save the changes.

Step 8. Apply configuration changes.

9.1.2 Configuration procedures on DWG2000-1G

Step 1. Log into the Web Management System of DWG2000-1G.

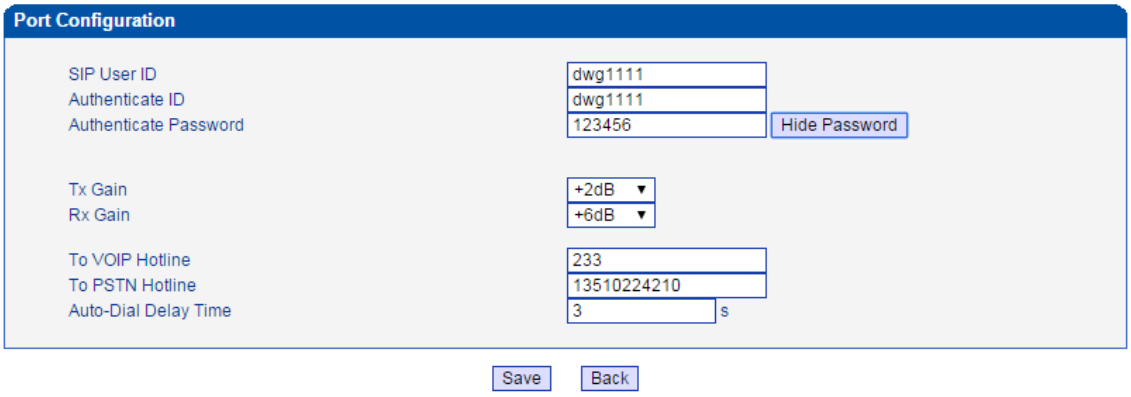
Step 2. On the navigation tree on the right, click **System Configuration → SIP Parameter**, and the following interface will be displayed.



- SIP Server Address (the IP address of the Elastix Server, '172.16.33.58' in this example)
- SIP Server Port (5060 in this example)
- Is Register (Select **No**, as it is IP Trunking instead of SIP registration)

Step 3. Click **Save** on the bottom of the interface.

Step 4. On the navigation tree on the right, click **System Configuration → Port Parameter**, and configure authentication information on the interface.

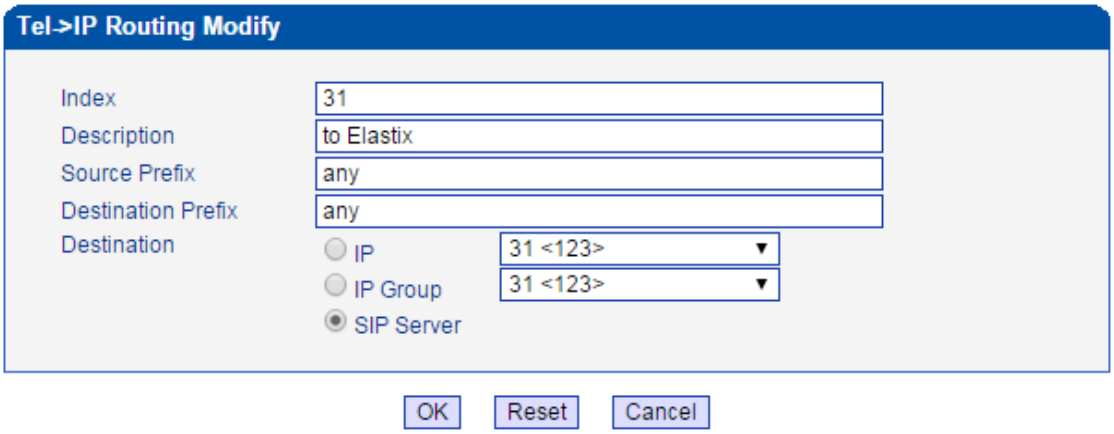


- SIP User ID: the username set in Step 3 of the configuration on Elastix Server.
- Authenticate ID: Same as SIP User ID by default
- Authenticate Password: the secret set in Step 3 of the configuration on Elastix Server.

To VOIP Hotline: the inbound number that is dialed automatically by the DWG2000-1G when 'Auto Call' is selected in the **Operation → Tel-> IP Operation** interface (make reference to 6.5.2)

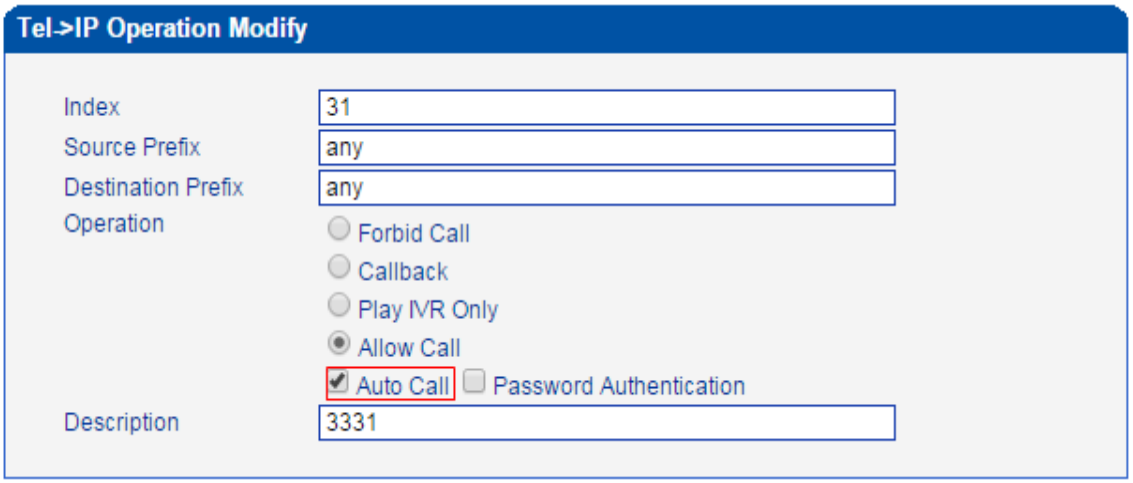
To PSTN Hotline: the outbound number that is dialed automatically by the DWG2000-1G when 'Auto Call' is selected in the **Operation → IP-> Tel Operation** interface (make reference to 6.5.1)

Step 5. In the navigation tree, click **Routing Configuration → IP->Tel Routing**, and modify the default IP ->Tel route.

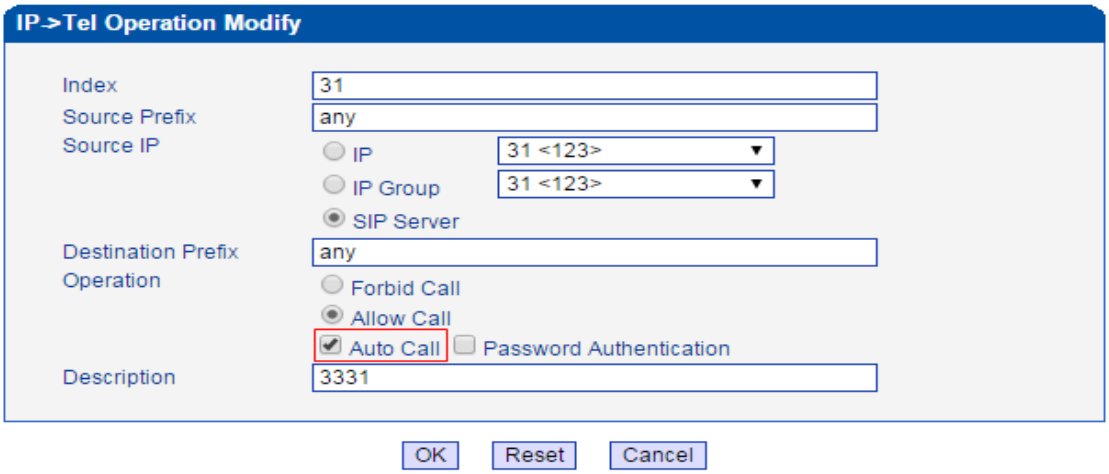


Parameter	How to Configure
Description	Modify the description to 'To Elastix'
Destination	Select 'SIP Server'

Step 6. In the navigation tree, click **Operation → Tel->IP Operation** , click **Add** on the displayed interface, and then click ☐ on the left of 'Auto Call' to enable 'to VoIP Holine'.



Step 7. On the navigation tree, click **Operation → IP->Tel Operation**, click **Add** on the displayed interface, and then click ☐ on the left of 'Auto Call' to enable 'to PSTN Holine'.



Step 8. Click **OK** at the bottom of the interface.

9.2 Configuration Procedures for connecting DWG2000-1G with Elastix through SIP Registration with Trunking

9.2.1 Configuration Procedures on Elastix Sever

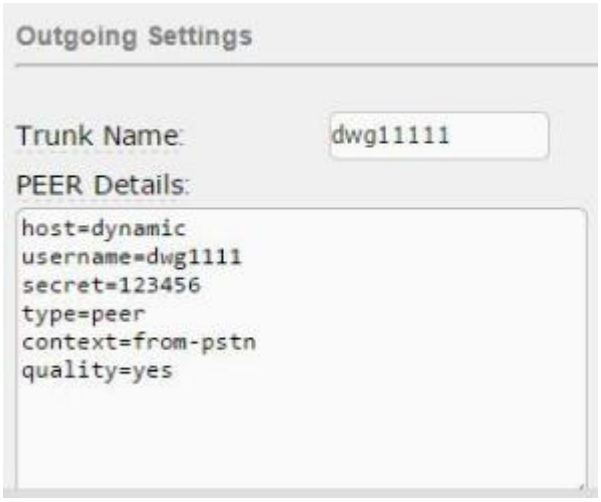
Step 1. Log into the Elastix Sever

Step 2. Click **PBX** on the menu at the top of the interface top, and then click **Trunks** in navigation tree on the left.

Step 3. Click **Add SIP Trunk** to create a SIP Trunk to DWG2000-1G.
Fill in the following information

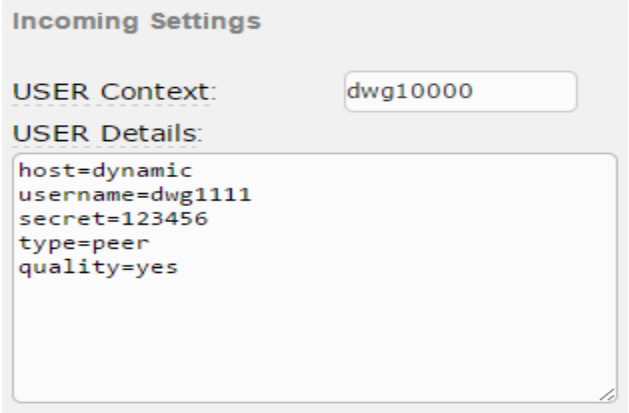
Outgoing settings ：

- Trunk Name (dwg1111 in this example)
- Host (host = dynamic)
- Username (the SIP account name assigned by the Elastic Server to the current user; it will be used later in the configuration on the DWG2000-1G)
- Secret (the authentication password for connecting with the Elastic Server)

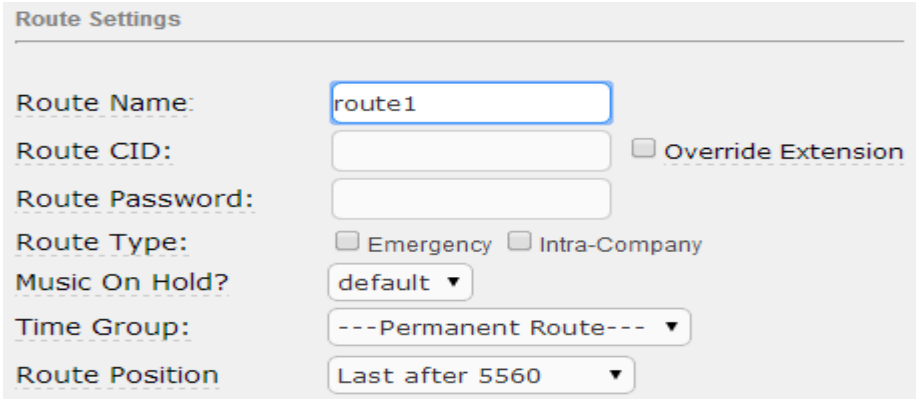


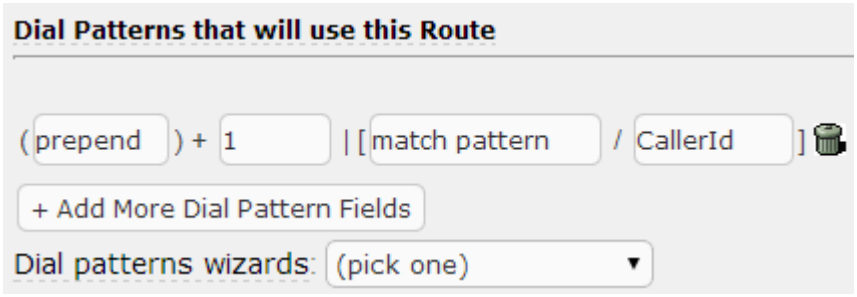
Incoming setting:

- Username (the SIP account name assigned by the Elastic Server to the current user, dwg1111 in this example)
- Secret (the authentication password for connecting with the Elastic Server)



Step 4. Click **Outbound Routes** in the navigation tree to configure outbound route, and fill in the following information.





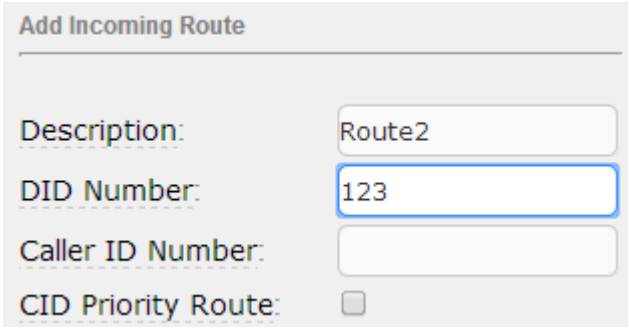
Step 5. Click the **Submit Changes** button.

Step 6. Click **Inbound Routes** to configure inbound route on the **Add Inbound Routes** interface, and fill in the following information.

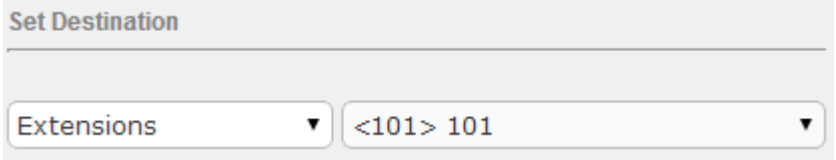
Add Incoming Route:

Description (the description of this route, ‘Route 2’ in this example)

DID number (the number for access to this route, ‘123’ in this example)



Destination (the extension number that the route will reach, ‘101’ in this example)



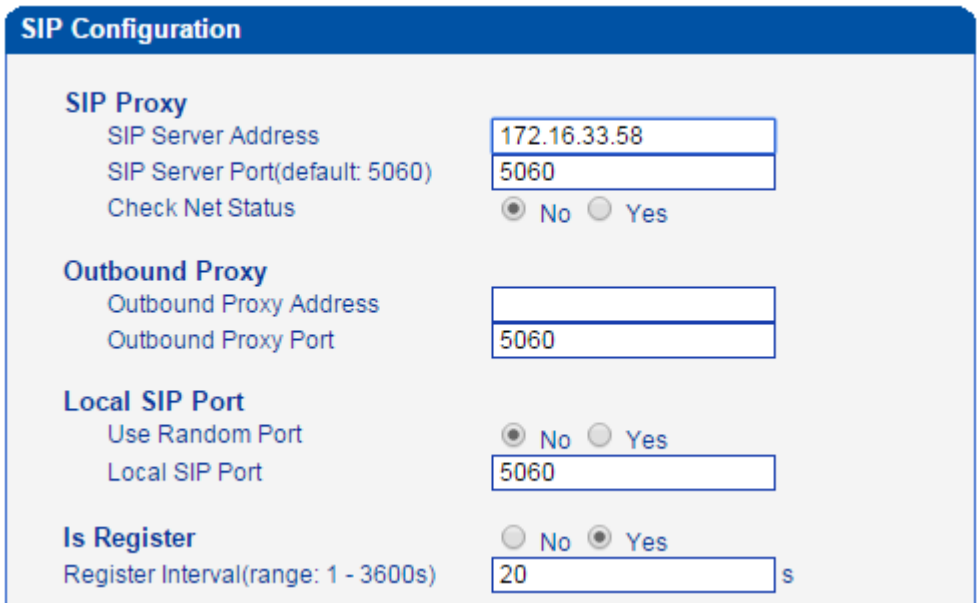
Step 7. Click **Submit** to save the changes.

Step 8. Apply configuration changes.

9.2.2 Configuration Procedures on DWG2000-1G

Step 1. Log into the Web Management System of DWG2000-1G.

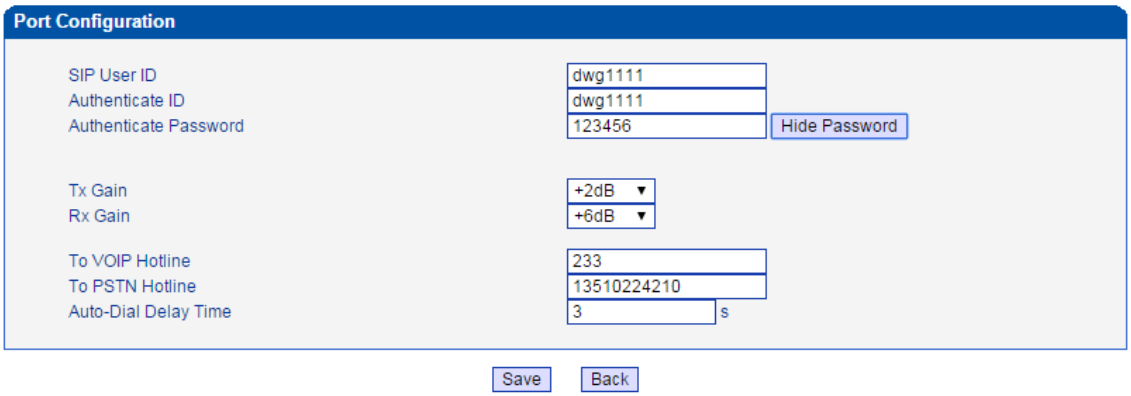
Step 2. On the navigation tree on the right, click **System Configuration → SIP Parameter**, and the following interface will be displayed.



SIP Server Address (the IP address of the Elastix Server, '172.16.33.58' in this example)
SIP Server Port (5060 in this example)
Is Register (Select **YES**, as it is SIP Registration instead of IP Trunking)

Step 3. Click **Save** on the bottom of the interface.

Step 4. On the navigation tree on the right, click **System Configuration → Port Parameter**, and configure authentication information on the interface.



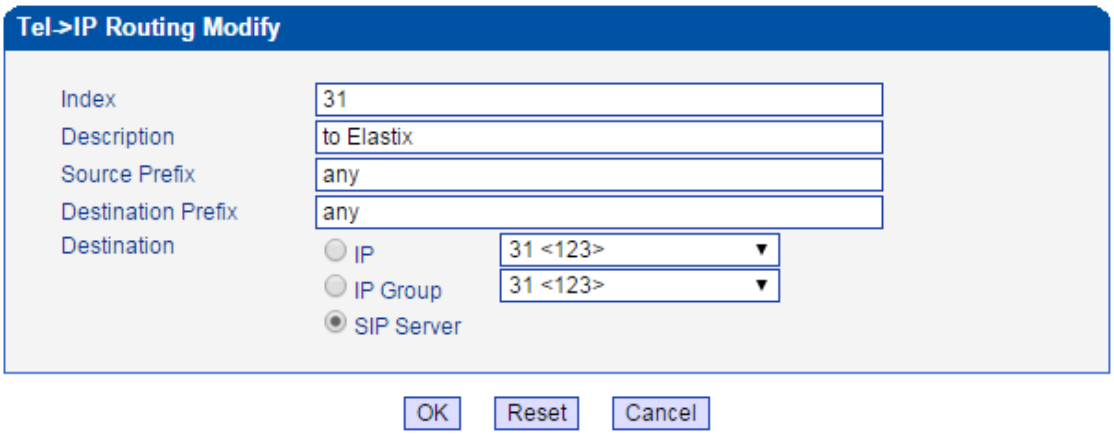
SIP User ID: the username set in Step 3 of the configuration on Elastix Server.
Authenticate ID: Same as SIP User ID by default

Authenticate Password: the secret set in Step 3 of the configuration on Elastix Server.

To VOIP Hotline: the inbound number that is dialed automatically by the DWG2000-1G when 'Auto Call' is selected in the **Operation → Tel-> IP Operation** interface (make reference to 6.5.2)

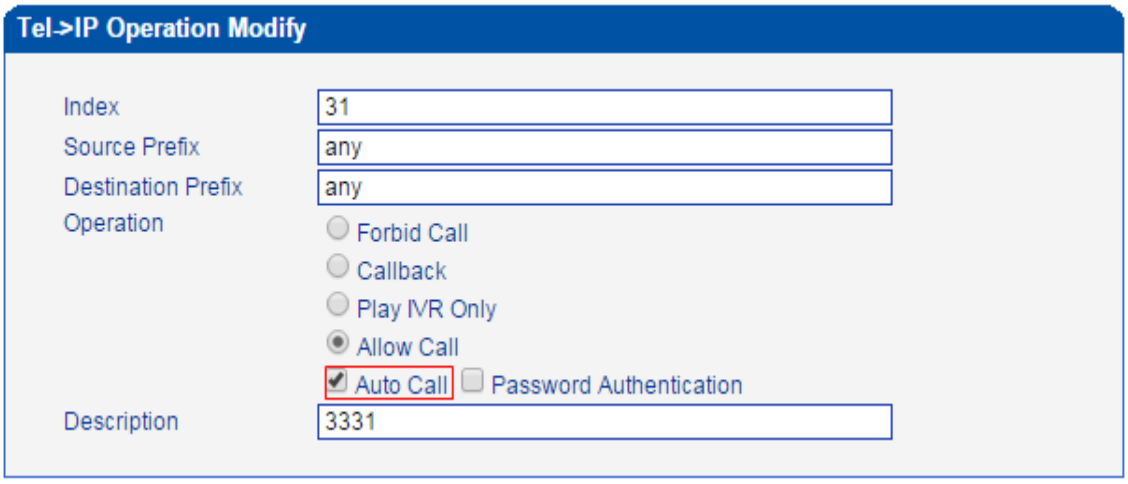
To PSTN Hotline: the outbound number that is dialed automatically by the DWG2000-1G when 'Auto Call' is selected in the **Operation → IP-> Tel Operation** interface (make reference to 6.5.1)

Step 5. In the navigation tree, click **Routing Configuration → IP->Tel Routing**, and modify the default IP ->Tel route.

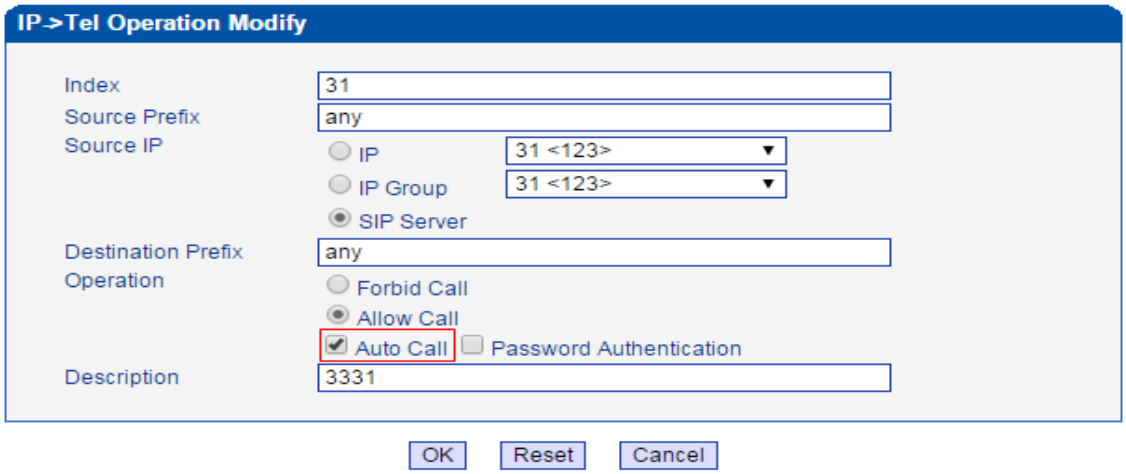


Parameter	How to Configure
Description	Modify the description to 'To Elastix'
Destination	Select 'SIP Server'

Step 6. In the navigation tree, click **Operation → Tel->IP Operation** , click **Add** on the displayed interface, and then click ☐ on the left of 'Auto Call' to enable 'to VoIP Holine'.



Step 7. In the navigation tree, click **Operation → IP->Tel Operation**, click **Add** on the displayed interface, and then click ☐ on the left of 'Auto Call' to enable 'to PSTN Holine'.



Step 8. Click **OK** at the bottom of the interface.

---End

