SAMSUNG
IPX-G5X0 Series Voice Gateway
Installation Manual

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Conventions

The following types of paragraphs contain special information that must be carefully read and thoroughly understood. Such information may or may not be enclosed in a rectangular box, separating it from the main text, but is always preceded by an icon and/or a bold title.

WARNING

Provides information or instructions that the reader should follow in order to avoid personal injury or fatality.

CAUTION

Provides information or instructions that the reader should follow in order to avoid a service failure or damage to the system.

CHECKPOINT

Provides the operator with checkpoints for stable system operation.

NOTE

Indicates additional information as a reference.

Console Screen Output

- A lined box with '`Courier New`' font will be used to distinguish between the main content and console output screen text.
- '**`Bold Courier New`**' font will indicate the value entered by the operator on the console screen.

Revision History

Revision	Date Of Issue	Remarks
1.0	Mar 2016	First Version

Table of Contents

IPX-G5X0 Series Specifications

Hardware Specifications

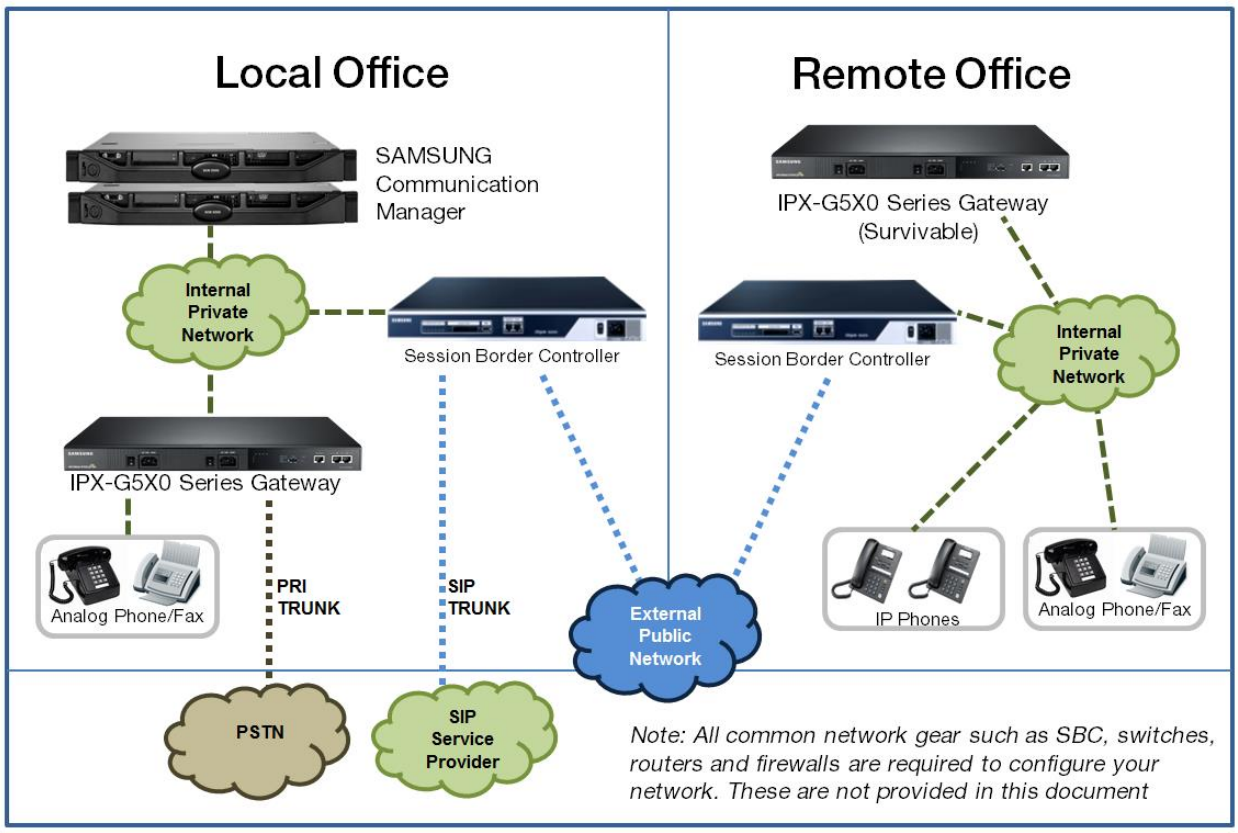
Size	Size (W x D x H): 441.5 × 352 × 44mm	19" Rack Installation: 1U
Power	AC 110/220V ICMUt, DC +12 V/5.5 A Output	
IPX-G500B Base Unit	2 Gigabit Ethernet ports / 1 USB port / 1 Console port	Optional Power Redundancy
	4 Universal Card Slots	RJ-45 connector
	Card Options: 4 port FXS, 4 port FXO, 2 port PRI	No Card Type Limit
IPX-G520S	20 port FXS Expansion Cabinet	Optional Power Redundancy
	Expandable to maximum of 6 cabinets (240 ports)	50p Champ Connector
IPX-G540S	40 port FXS Expansion Cabinet	Optional Power Redundancy
	Expandable to maximum of 6 cabinets (240 ports)	50p Champ Connector

Station & Trunk Capacity

Max stations	FXS port	256	136 port power redundancy
	SIP Phone Survivability	512	UDP/TLS are same
	Simultaneous Survivable Stations	768	Survival mode
Max trunks	FXO port	16	
	PRI channel	240 (E1 PRI)	8 ports
	SIP channel	256	
	Simultaneous Trunk Total	256	

IPX-G5X0 Series Installation

The IPX-G5X0 series gateways provide interfaces to a number of protocols such as PRI, FXS and FXO. It interfaces with the Samsung Communication Manager (SCM) by SIP protocol and can be extended to remote locations as a survivable gateway.



To install an IPX-G5X0 Series Media Gateway you first have to setup your gateway information in the Samsung Communication Manager (SCM). Additionally some basic information must be set within the IPX-G5X0 Series system.

The IPX-GX0 Series is compatible with SCM software version 5.4 or higher. If your SCME software version is prior to version 5.4, you must upgrade the SCM first. Please refer to the SCM documentation for upgrade instructions.

SCM Configuration

Preparation

The following hardware is provided with your IPX-G5X0 Server:

- AC Power Cord
- RJ45 to DB9 Serial Cable

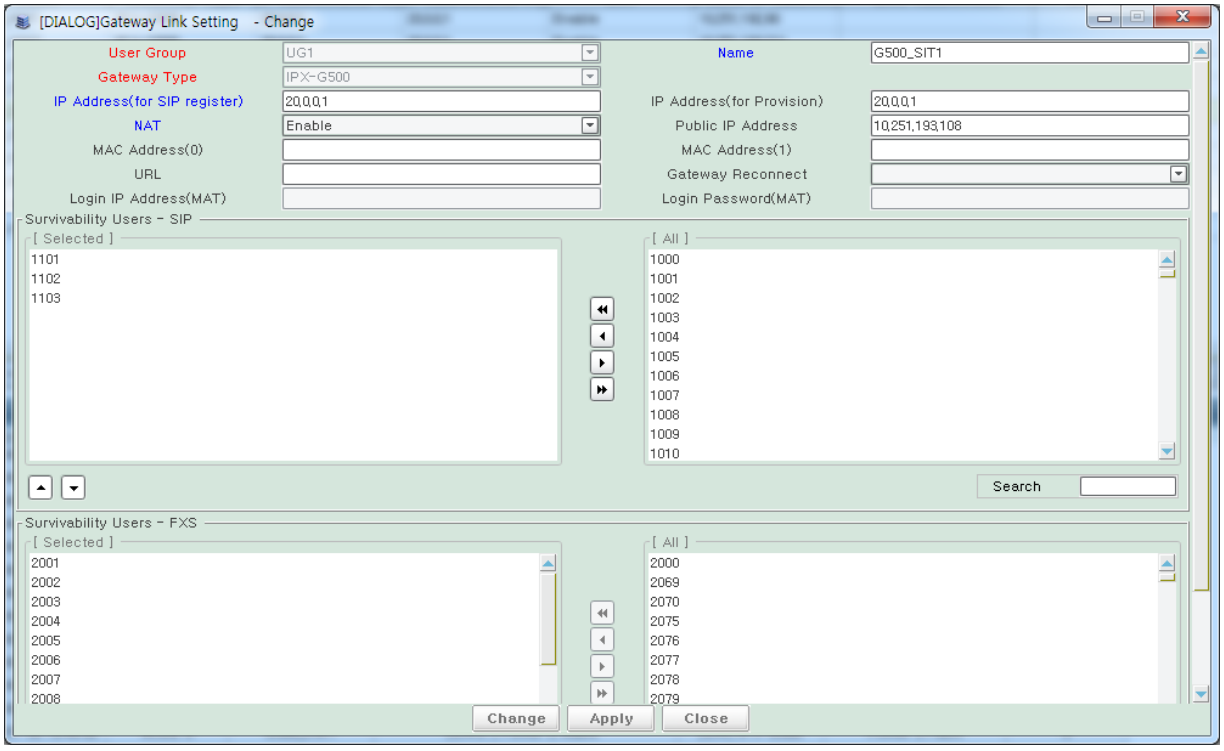
Gateway Link Setting

Begin by creating a new gateway link in the SCM Administrator at:

[Configuration> Gateway> Gateway Link Setting]

Enter a gateway *Name*, *Local IP Address*, *Public IP Address*, and enable or disable *NAT*.

Note: If *NAT* is enabled, then *Public IP Address* should be entered.



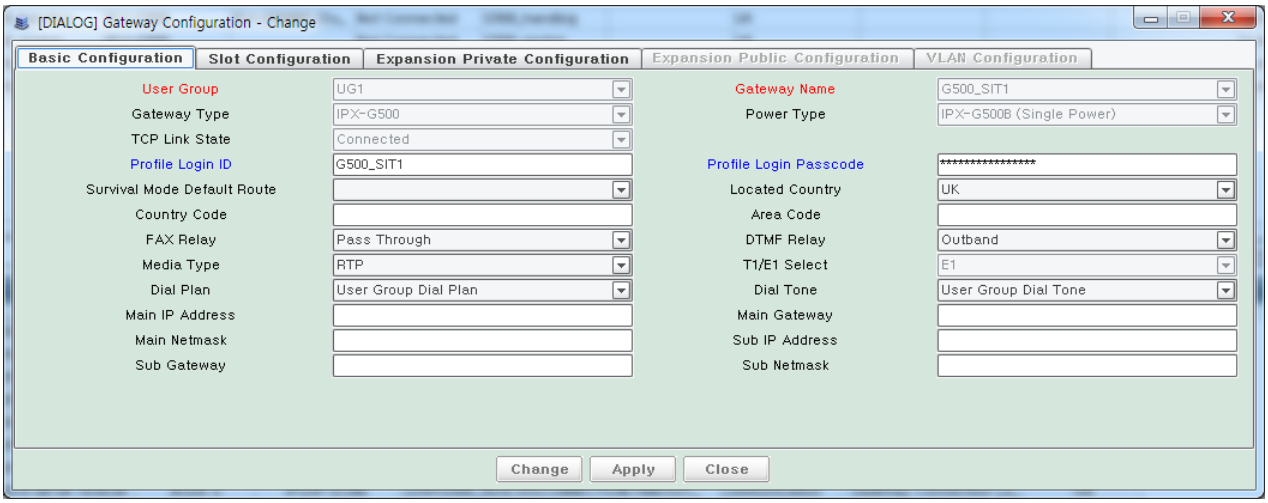
Gateway Configuration

In the SCM Administrator configure a new gateway at:

[Configuration> Gateway> IPX Setting> Gateway Configuration]

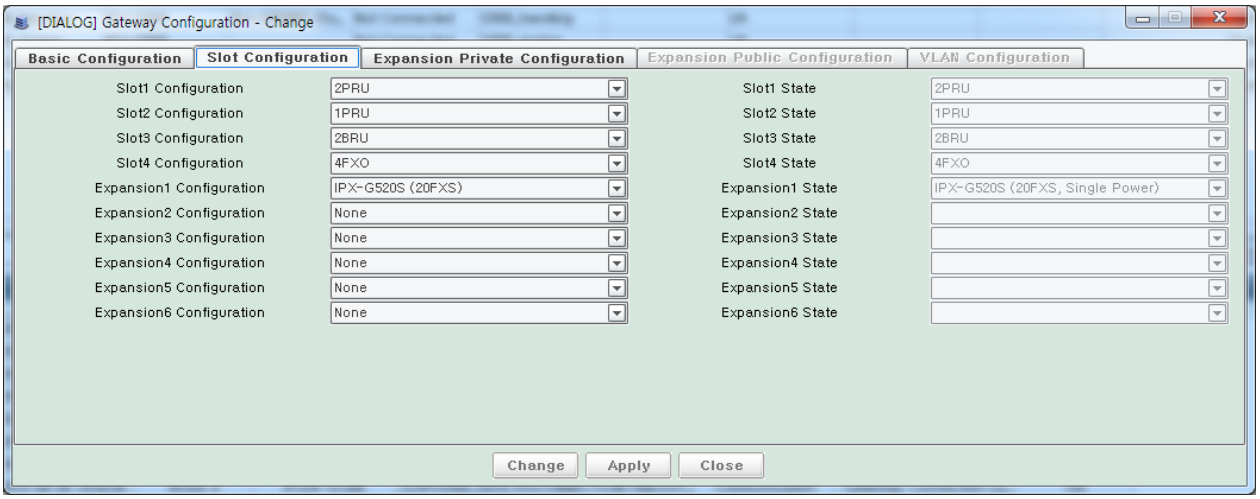
Basic Configuration tab

Enter the *Profile Login ID*, which should be the same as the *Gateway Name*. Then enter the *Profile Login Passcode* (**samsung*#** *by default)*. You don't need to enter any IP addresses here. These fields are not needed for this implementation.



Slot Configuration

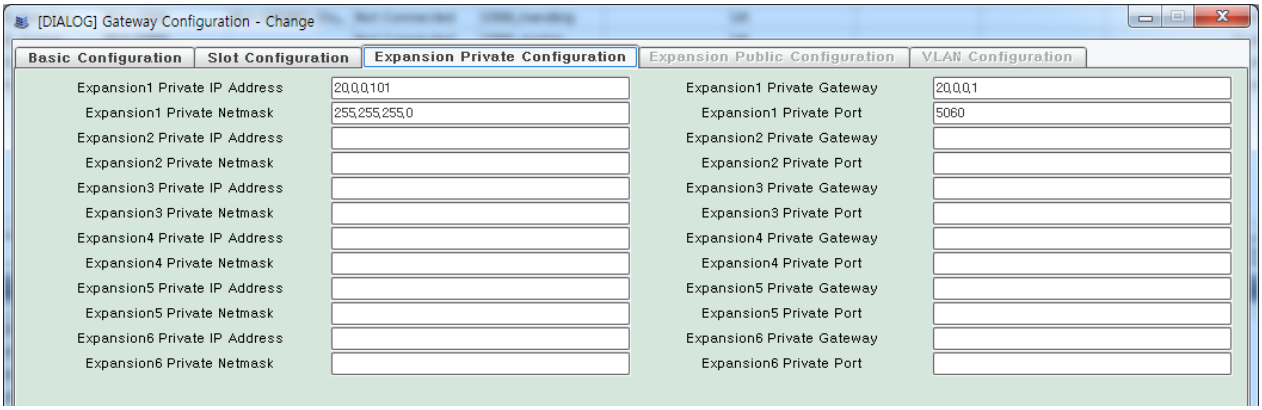
There are 4 slots on the back of the gateway. This tells the SCM what is configured on each slot. On the left side of the slot configuration tab, enter the slot and expansion configuration of the gateway. Select the option cards and expansion cabinets installed in the gateway. After the installation is complete, the actual states of slots and expansions will be updated on the right side.



Expansion Private Configuration

The SCM supports expansion analog gateways. This table sets up the analog line gateways that will be provided with the new G5X0 gateway.

For multiple cabinet configurations, enter the IP address and ports of installed expansion cabinets.



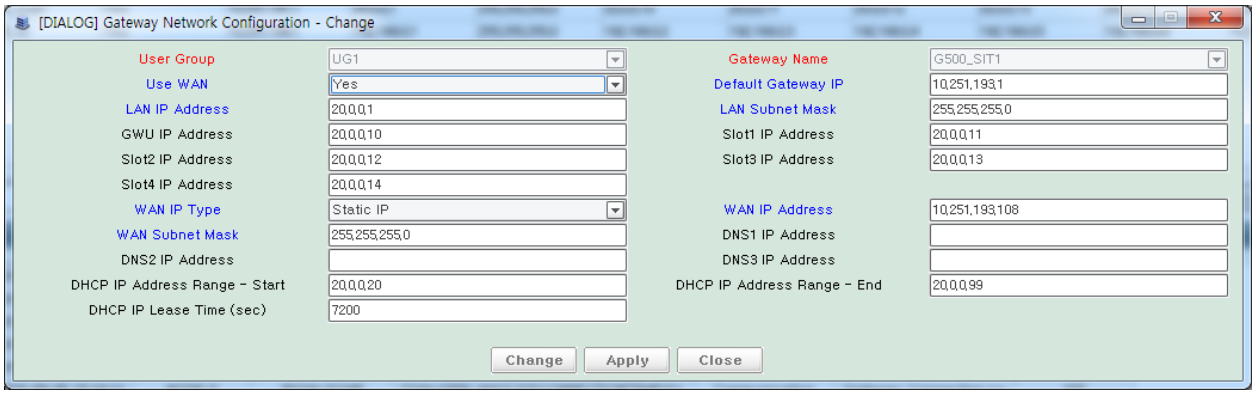
Network Configuration

In the SCM Administrator, enter the network information for the gateway at:

[Configuration > Gateway > IPX Setting > Gateway Network Configuration]

- Depending on whether you are using a WAN interface, set *Use WAN* to 'Yes' or 'No'.
- Then enter the *Default Gateway IP*, *LAN IP Address, LAN Subnet Mask*, and *GWU IP Address*.
- The IPX-G500B has 2 internal hardware units, the CMU and GWU.
- The *LAN IP Address* will be assigned to CMU and *GWU IP Address* will be assigned to the GWU board.
- If you have optional universal cards, enter *Slot IP Addresses* for optional cards. (PRI cards need individual IP addresses, etc.)
- If you selected to *Use WAN*, enter *WAN IP Address* and *WAN Subnet Mask*.
- The IPX-G5X0 Series has an internal DHCP server. If you want to connect another devices, for example IP phones, to the LAN and want to receive IP addresses automatically, set the *DHCP IP Address Range – Start* and *DHCP IP Address Range – End*. The DHCP lease time can also be specified in seconds using the *DHCP IP Lease Time* field.

Note: The IPX-G500B has 2 GbE ports. If you want to use WAN/LAN, you must connect WAN to GbE port 1 and LAN to GbE port 2. If you want to use LAN only, you can connect to any GbE port.



Analog FXS Phone Users

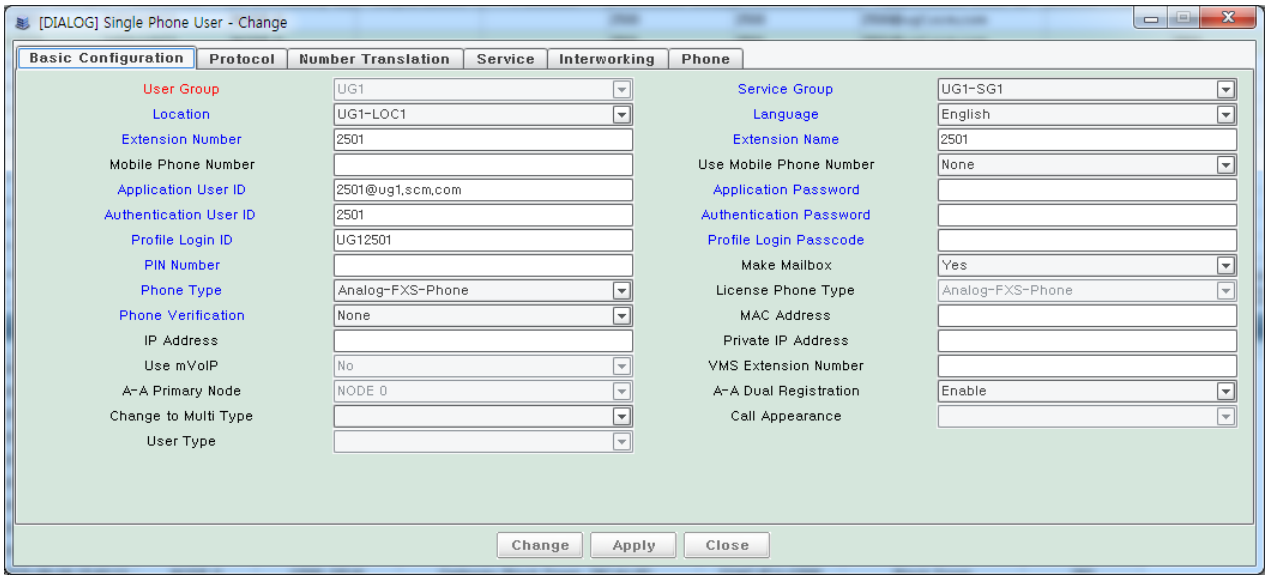
Create an Analog FXS Phone User that will be assigned to the gateway in the SCM at:

[Configuration – User – Single Phone User]

If you already have existing FXS phone users, you may also use those.

Enter the *Extension Number, Name, Application User ID, Application Password, Application User ID, Authentication Password, Profile Login ID, Profile Login Passcode*, and *PIN Number*.

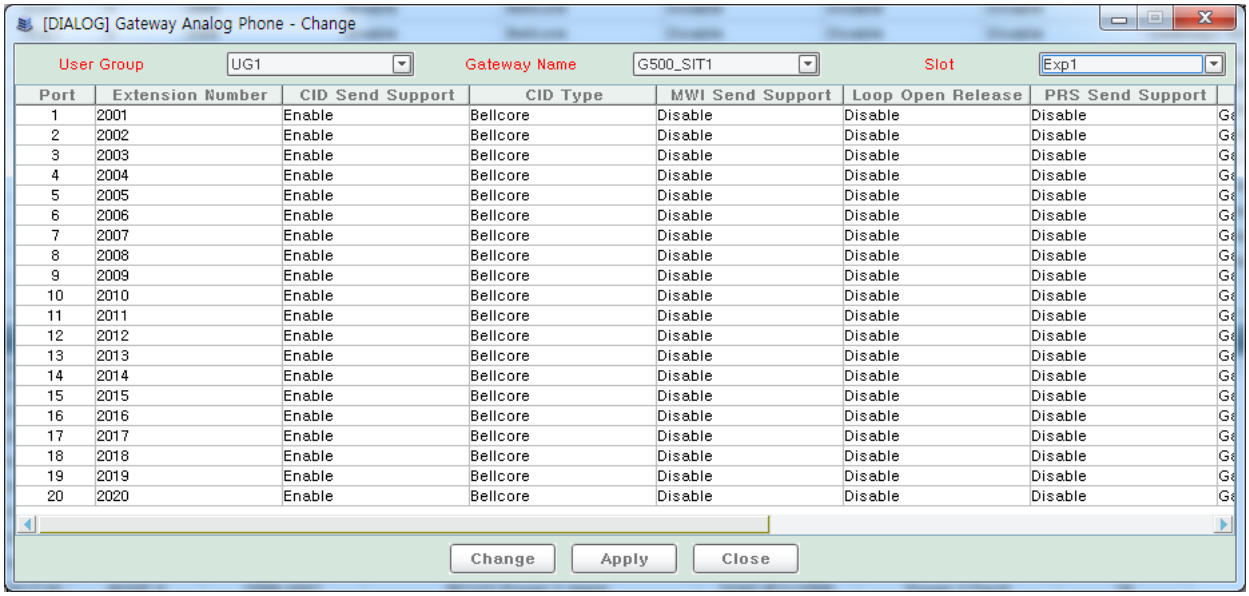
The *Phone Type* should be set to 'Analog-FXS-Phone'.



Assigning Analog Phones

Assign the created Analog FXS Phone to the Slot and Port of the gateway in the SCM at:

[Configuration – Gateway – IPX Setting – Gateway Analog Phone]



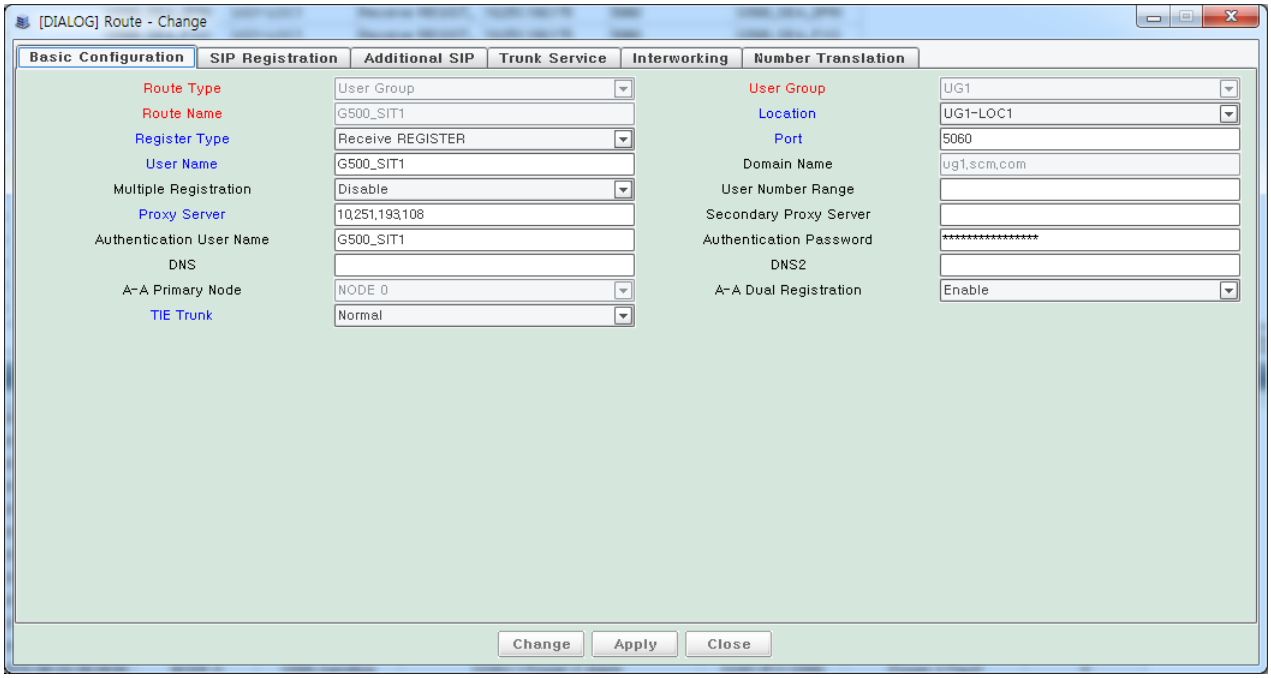
Create a Gateway Route

This table creates the SIP connection between the SCM and the Gateway for Signaling, Media and security of the communication.

Create the route information for the new gateway in the SCM at **[Configuration> Trunk Routing> Route]**

Basic configuration

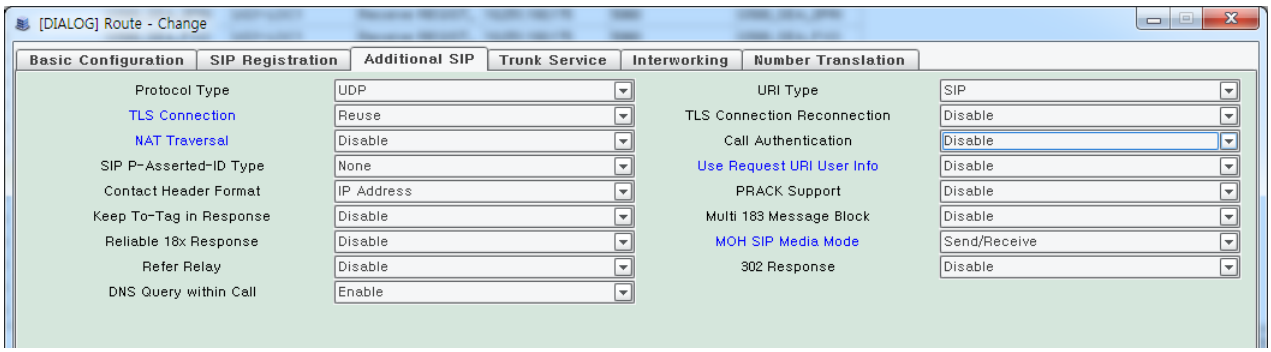
Select *Register Type* and set to 'Receive REGISTER' and enter port 5060.
The *User Name* should match the *Gateway Name*.
Enter the Gateway IP Address for *Proxy Server*, and also add the proper *Authentication User Name* and



Authentication Password.

Additional SIP

Under the Additional SIP tab, set the *Call Authentication* to 'Disable'.



FXO/SIP/PRI Trunk Routing

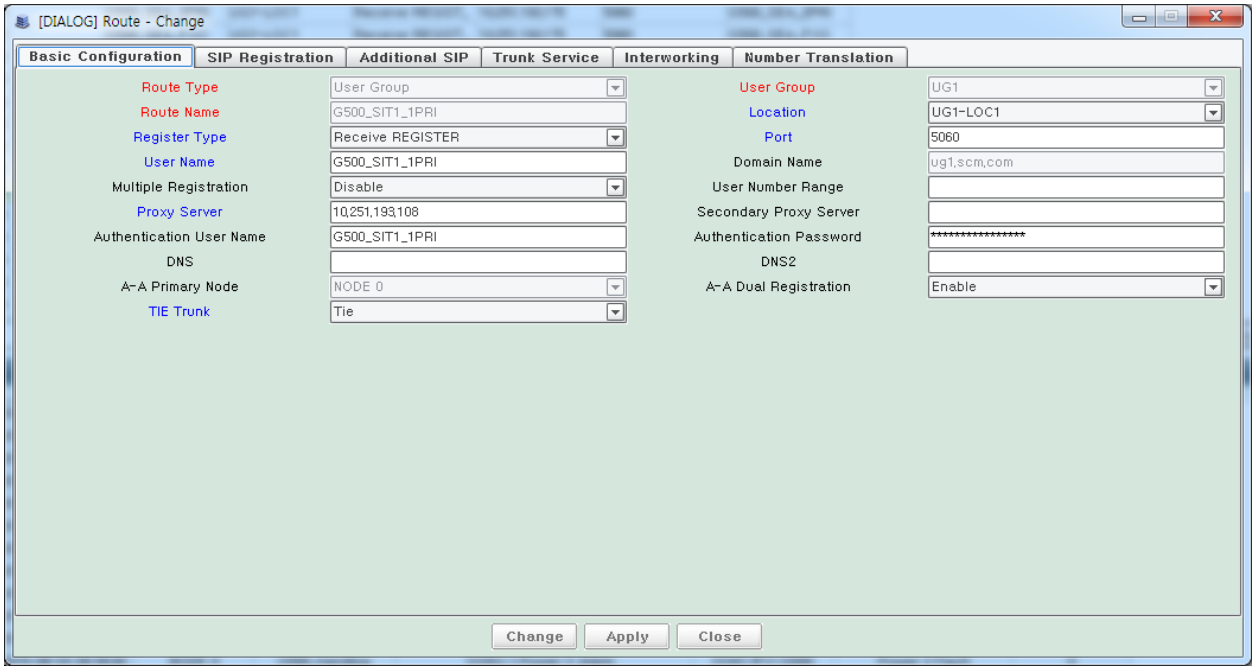
Create the appropriate route information for your FXO/SIP/PRI trunks attached to the gateway in the SCM at: **[Configuration – Trunk Routing - Route]**

Basic Configuration

Set the *Register Type* to 'Receive REGISTER', and enter port 5060.

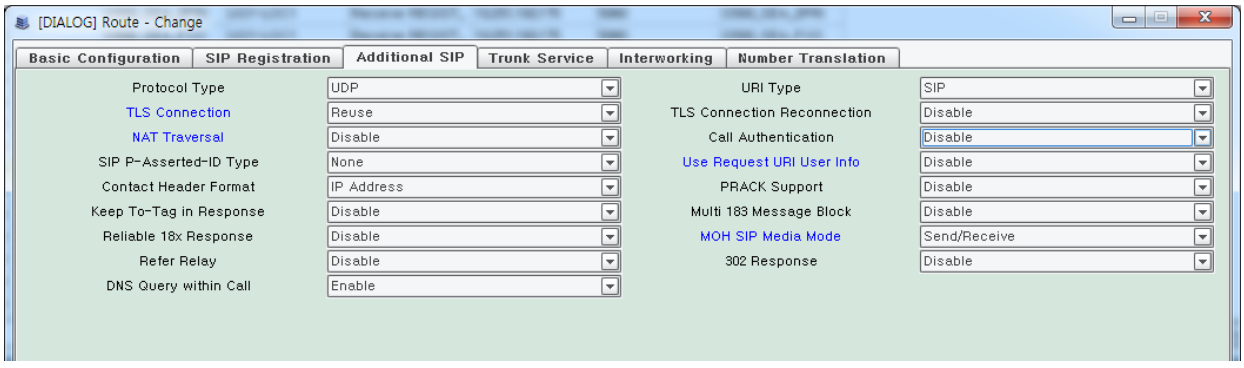
Enter a unique *User Name* for this trunk. This name must not be used elsewhere.

Then Enter the Gateway IP Address for *Proxy Server*, and also add the proper *Authentication User Name* and *Authentication Password*. You can also set access code for this trunk route.



Additional SIP

Under the Additional SIP tab, set *Call Authentication* to 'Disable'.



Analog Trunk

If you have a FXO card configure Analog Trunks in the SCM Administrator at:

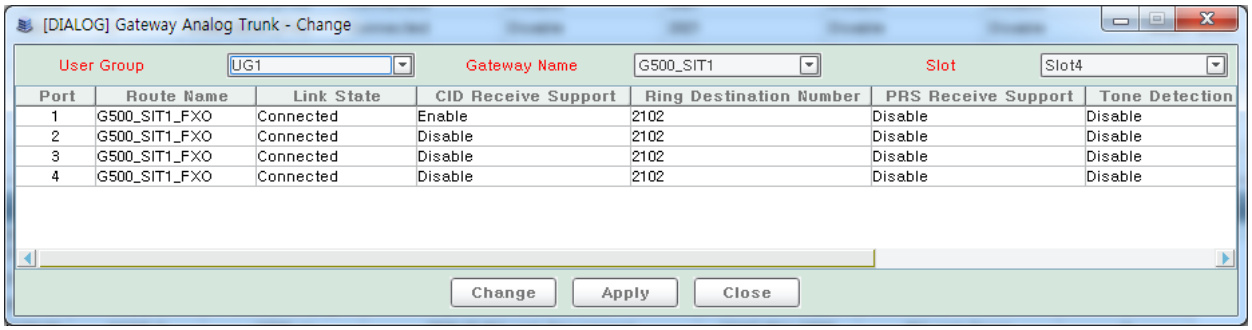
[Configuration – Gateway – IPX Setting – Gateway Analog Trunk]

Select the Gateway and press the *Change* button.

Select the slot you where your FXO card is installed.

Assign the created FXO Trunk Route to the Route Name.

Select other settings at this time, such as CID Receive Support and Ring Destination Number.



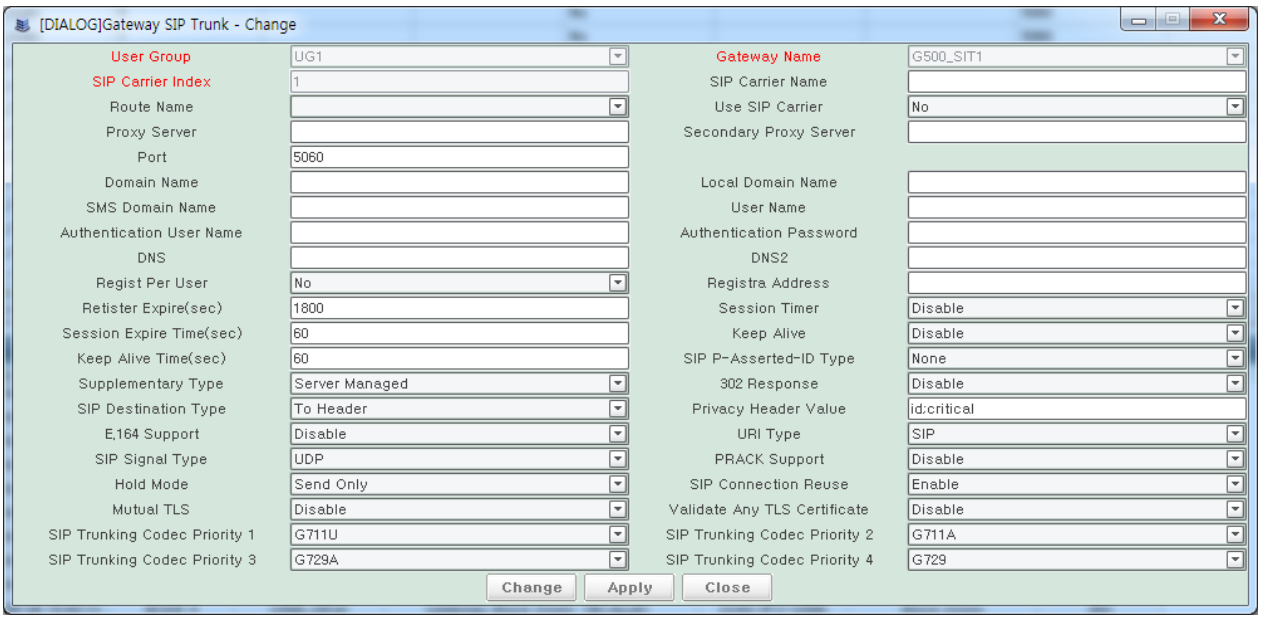
SIP Trunk

SIP Trunks are configured in the SCM Administrator at:

[Configuration – Gateway – IPX Setting – Gateway SIP Trunk]

The IPX-G5X0 Series supports up to 4 SIP carriers.

Note: SIP Servers must be entered as IP addresses. Domain Names are not supported at this time.



PRI Trunk

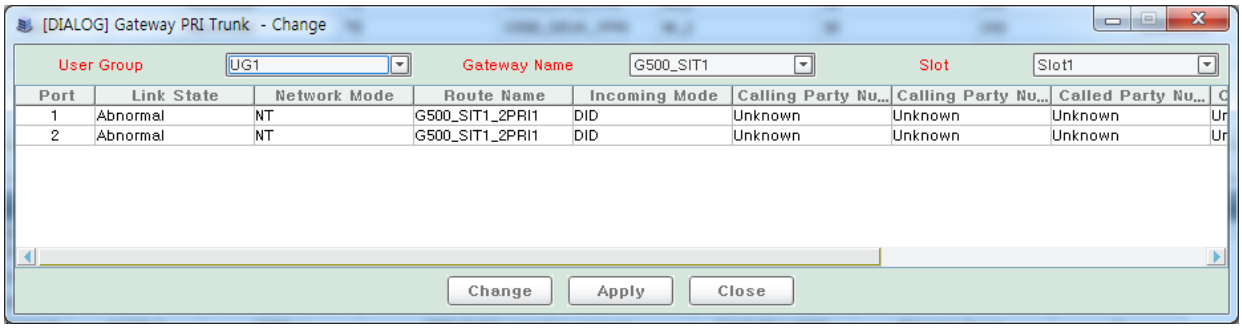
To use a 1PRI/2PRI card you have to configure it in the SCM Administrator at:

[Configuration – Gateway – IPX Setting – Gateway PRI Trunk]

Select the Gateway to edit and press the *Change* button.

Then select the Slot where the PRI card is installed.

Assign the created PRI Trunk Route to the Route Name and select the correct network mode (**TE** : Terminal Mode or **NT** : Network Mode)



IPX-G5X0 Series Configuration

After SCM Configuration is completed begin the configuration of the IPX-G5X0 series gateway.

For the IPX-G500B (Base cabinet) you will have to set the IP Address of the base cabinet, the IP Address of the SCM, and the Gateway Name.

For IPX-G520S/G540S you have to set the IP Address of the Expansion Cabinet and Sequence Number.

Connecting to the Serial Console

Use the following steps to connect to the serial console:

- Connect a serial cable to the console port of the system.
- Run a serial terminal program (I.E., PuTTY, etc.) on your PC and set the baud rate to 38,400.
- The default login ID is: **admin** / The default Password is: **samsung*#**
- Enter '**cli**' to set up the basic gateway configuration.

```
Welcome to Samsung IPX-G500
IPT-NPU login: admin
Password: samsung*#


############################################################
#                                                          #
#                                                          #
#                Samsung IPTGW-CMU                         #
#                                                          #
#         Enter 'cli' to set basic configuration           #
#                                                          #
#                                                          #
############################################################
S A M S U N G  - I P T G W
-------------------------------------------------
admin@IPT-NPU:~#cli
```

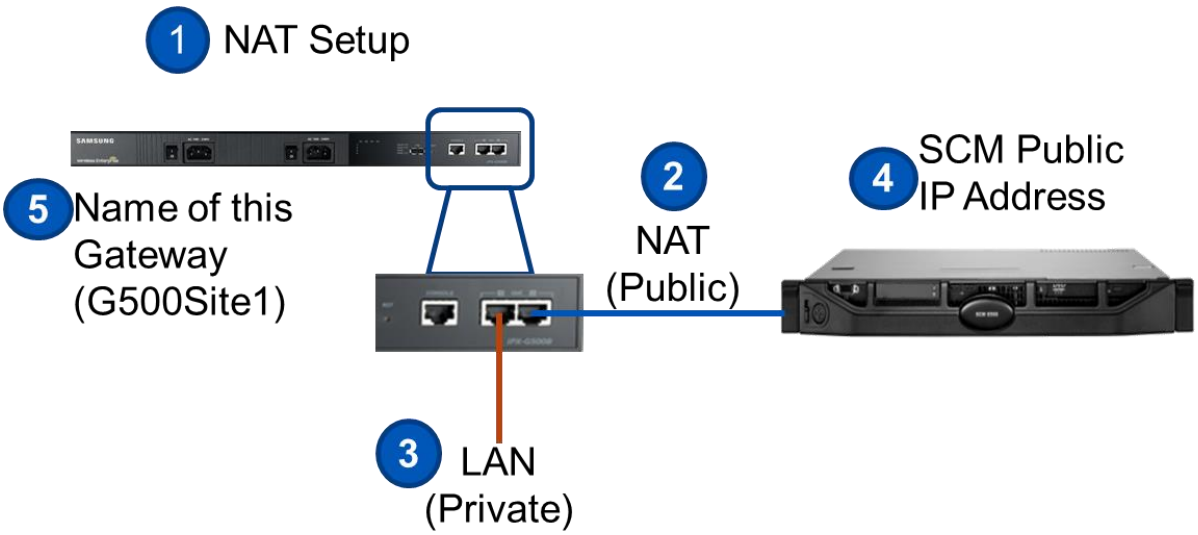
IPX-G500B Basic Configuration

Once connected via serial to the IPX-G500B, you can enter your network information into the gateway. There are options to setup the gateway in a LAN or NAT configuration (see examples in the following pages). Use the following steps to enter network information.

- Select '1. Setup Basic Configuration'.
- According to the prompt, select the network mode. LAN or NAT
- If you select NAT:
- Enter the WAN IP Address, Gateway and Subnet Mask of the IPX-G500B.
- Enter the LAN IP Address, Gateway and Subnet Mask of the IPX-G500B.
- If you select LAN:
- Enter the LAN IP Address, Gateway and Subnet Mask of the IPX-G500B.
- Enter the SCM Composite IP Address.
- Enter the Gateway Name. This must match the Gateway Name in the SCM Configuration.
- After all information is entered it will ask if you want to reset the system to apply the changes.
- To reboot the system enter '**yes**', otherwise enter '**no**'

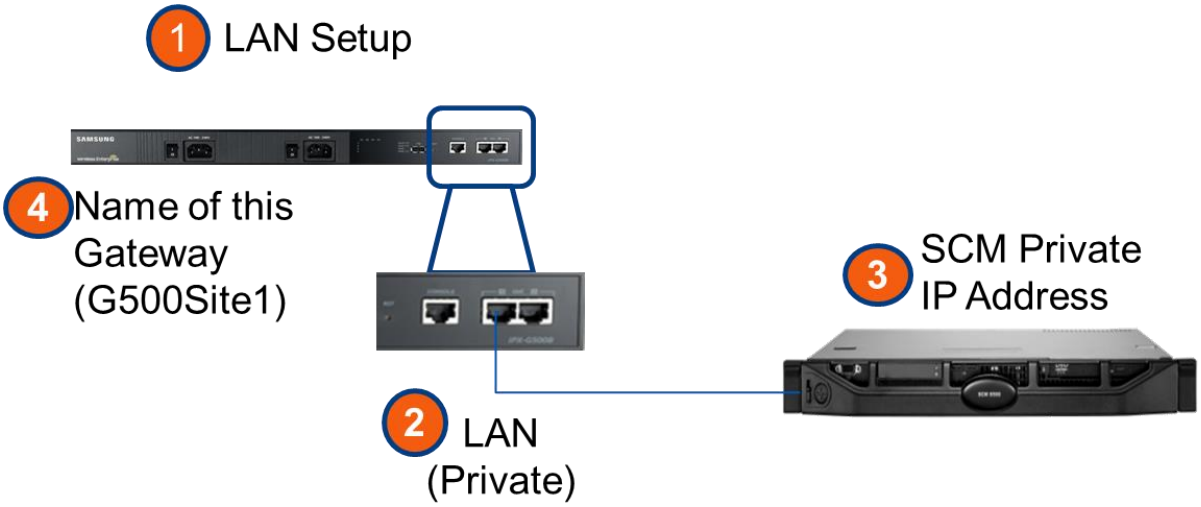
```
######           Please enter network mode of this GW            ######
1. Enter Networkmode [0:LAN / 1:NAT]    (Enter Key : NAT) :

######    Please enter [WAN IP/Gateway/Subnet Mask] of this GW    ######
 1. Enter WAN IP Address     (Enter Key : 10.251.0.10 ) :
 2. Enter Gateway Address    (Enter Key : 10.251.0.1   ) :
 3. Enter WAN IP Subnet Mask (Enter Key : 255.255.255.0  ) :

######        Please enter [LAN IP/Subnet Mask] of this GW       ######
 1. Enter LAN IP Address     (Enter Key : 192.168.0.1    ) :
 2. Enter LAN IP Subnet Mask (Enter Key : 255.255.255.0  ) :

######           Please enter the IP Address of SCME             ######
 1. Enter SCME IP Address (Enter Key : 10.251.0.100 ) :

######       Please enter the name of this GW (Max 30char)       ######
 1. Enter Name of this GW (Enter Key : G500_default   ) : G500Site1


End of Configuration. To apply it, please restart the system.
Do you want to restart? (yes/no) :
```

Example of [NAT]




```
1  ######           Please enter network mode of this GW            ######
   1. Enter Networkmode [0:LAN / 1:NAT]    (Enter Key : NAT) :

   ######    Please enter [WAN IP/Gateway/Subnet Mask] of this GW    ######
2   1. Enter WAN IP Address     (Enter Key : 10.251.0.10 ) :
    2. Enter Gateway Address    (Enter Key : 10.251.0.1   ) :
    3. Enter WAN IP Subnet Mask (Enter Key : 255.255.255.0  ) :

   ######        Please enter [LAN IP/Subnet Mask] of this GW       ######
3   1. Enter LAN IP Address     (Enter Key : 192.168.0.1     ) :
    2. Enter LAN IP Subnet Mask (Enter Key : 255.255.255.0  ) :

4  ######           Please enter the IP Address of SCME             ######
    1. Enter SCME IP Address (Enter Key : 10.251.0.100 ) :

5  ######       Please enter the name of this GW (Max 30char)       ######
    1. Enter Name of this GW (Enter Key : G500_default   ) : G500Site1


   End of Configuration. To apply it, please restart the system.
   Do you want to restart? (yes/no) :
```

Example of [LAN]




```
1  ######           Please enter network mode of this GW            ######
    1. Enter Networkmode [0:LAN / 1:NAT]    (Enter Key : NAT) : 0

   ######    Please enter [LAN IP/Gateway/Subnet Mask] of this GW    ######
2   1. Enter LAN IP Address     (Enter Key : 192.168.0.10     ) :
    2. Enter Gateway Address    (Enter Key : 192.168.0.1    ) :
    3. Enter Subnet Mask       (Enter Key : 255.255.255.0  ) :

3  ######            Please enter the IP Address of SCME            ######
    1. Enter SCME IP Address (Enter Key : 192.168.0.100 ) :

4  ######       Please enter the name of this GW (Max 30char)       ######
    1. Enter Name of this GW (Enter Key : G500_default   ) :


   End of Configuration. To apply it, please restart the system.
   Do you want to restart? (yes/no) :
```

IPX-G520S/G540S (ECU) Basic Configuration

Use the following steps to connect to the serial console:

- Connect a serial cable to the console port of the system.
- Run a serial terminal program (I.E., PuTTY, etc.) on your PC and set the baud rate to 38,400.
- The default login ID is: **admin** / The default Password is: **samsung*#**
- Enter '**cli**' to set up the basic gateway configuration.
- Select '1. Setup basic configuration'.
- Following the prompts enter the IP Address of the ECU, Gateway IP Address, and Subnet Mask.
- Enter the LAN IP Address of the main IPX-G500B, which this expansion cabinet will be connected to.
  Note: The IPX-G520S/G540S LAN port should be connected to the same LAN network as the IPX0-G500.
- Assign the sequence number from 1 to 6 for this expansion cabinet. It should be unique for each gateway.
- After all information is entered it will ask if you want to reset the system to apply the changes.
- To reboot the system enter '**yes**', otherwise enter '**no**'

```
######        Please enter [IP/Gateway/Subnet Mask] of this ECU       ######
 1. Enter ECU IP Address  (Enter Key : 10.251.0.11 ) :
 2. Enter Gateway Address (Enter Key : 10.251.0.1  ) :
 3. Enter Subnet Mask     (Enter Key : 255.255.255.0  ) :

######              Please enter the IP Address of CMU             ######
 1. Enter CMU IP Address  (Enter Key : 10.251.0.10 ) :
 1. Enter this ECU number (Enter Key : 1)             :


End of Configuration. To apply it, please restart the system.
Do you want to restart? (yes/no) :
```

Update Software

Update via SCM Administrator

You can upload and update the IPX-G5X0 series software using the GUI of the SCM Administrator.

File Upload

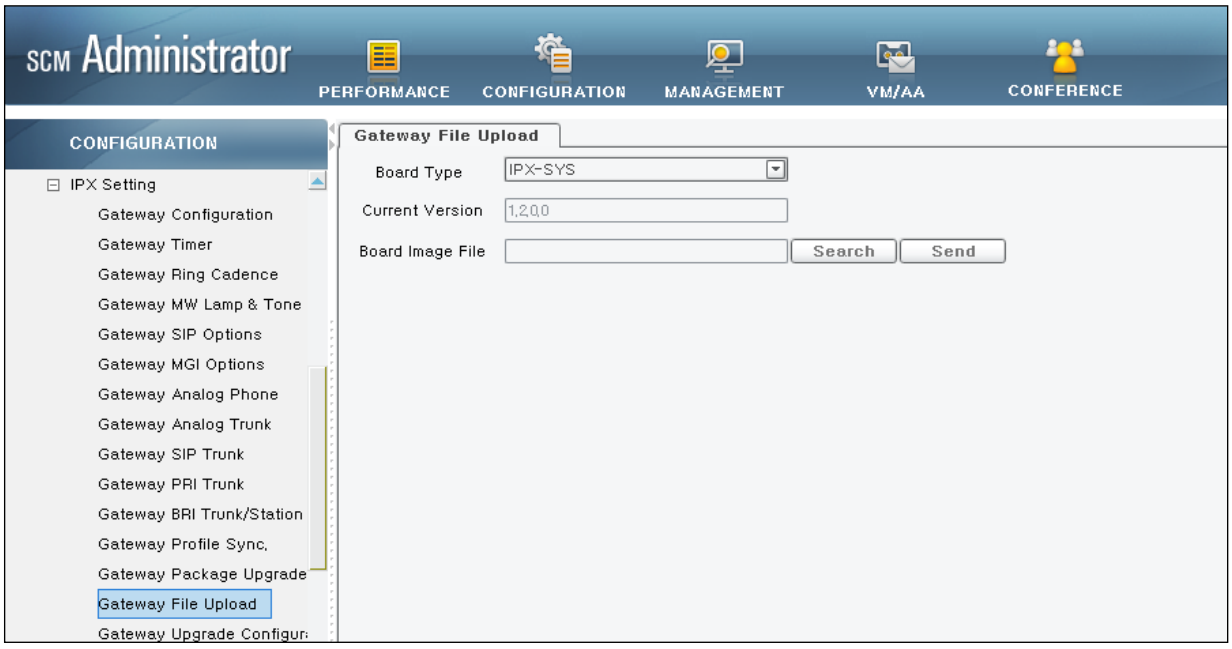
Before updating the gateway software you have to upload the software to the SCM.

You can upload it at: **[Configuration – Gateway – IPX Setting – Gateway File Upload]**

Select the Board Type and press the *Search* button to browse your file system for the gateway software. Select the gateway software then press the *Send* button to upload it.

Example Board Types:

- IPX-SYS = IPX-G500B software
- IPX-ECU = IPX-G520S/G540S software
- IPX-PRI = 1PRI/2PRI card software

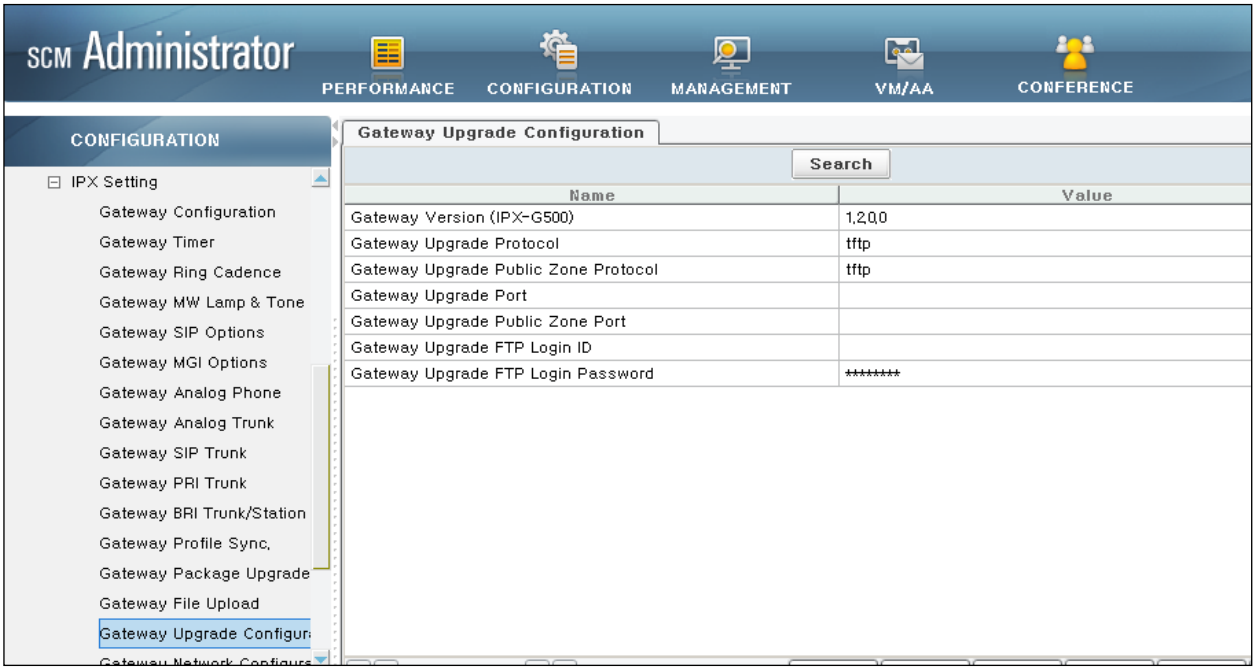


Upgrade Configuration

After uploading the file to the SCM, set the upgrade configuration at:

[Configuration – Gateway – IPX Setting – Gateway Upgrade Configuration]

Enter the Gateway Version to update, the Transfer Protocol (tftp or ftp), Port, Login ID, and Password.

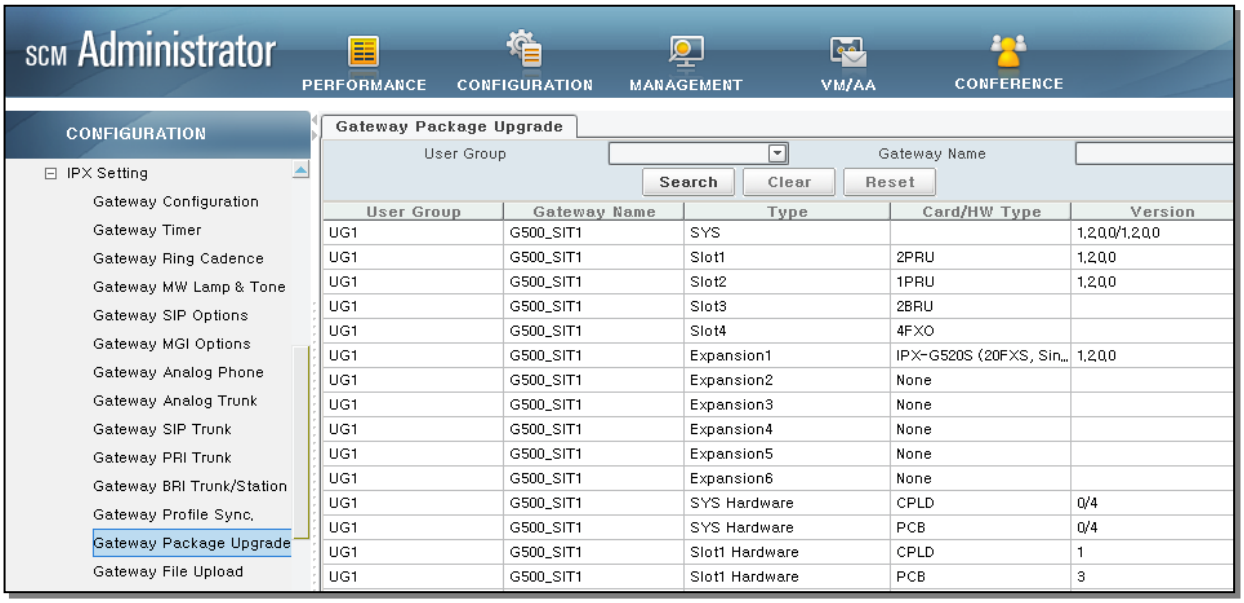


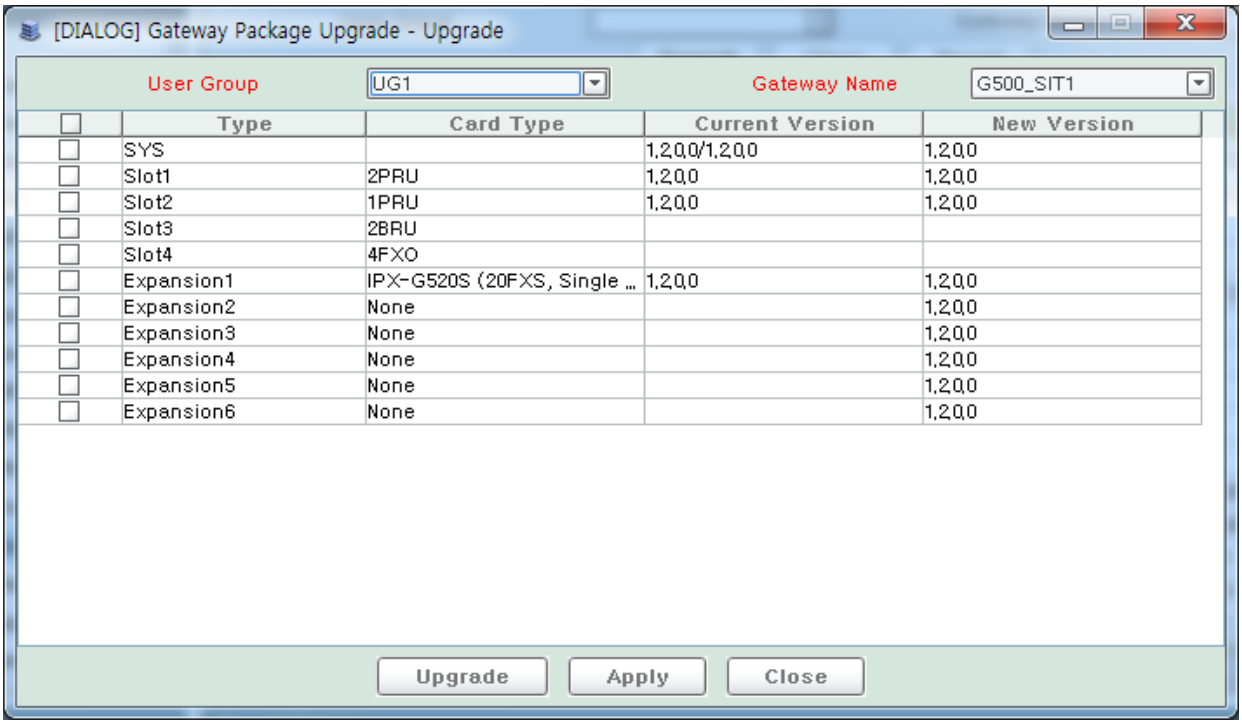
Package Upgrade

You can see the current software/hardware version at:

[Configuration> Gateway> IPX Setting> Gateway Package Upgrade]

- Select the target to update software and press the *Change* button.
- Then check the target to update software and press the *Upgrade* or *Apply* button.
- Then the gateway will then be updated and reboot automatically.





Manual Update

If it is not possible to update software through the SCM Administrator you can also update the gateway software manually.

Preparing manual update

First, you need to extract the gateway software:

IPX-SYS package has a CMU package (ipx-sysn-XXXX.img) and a GWU package (ipx-sysg-XXXX.tar).
IPX-PRI package has a 1PRI package (ipx-pri1-XXXX.tar) and a 2PRI package (ipx-pri2-XXXX.img).
IPX-ECU package only has an ECU package (ipx-ecu-XXXX.tar).

Then you have to prepare your own FTP server and put the software on it so that the gateway can download it.

For a manual update, you have to access the GWU board. To access it you will need a Y type connector to divide the console port of IPX-500B. Console port 1 is for CMU and 2 is for GWU.

IPX-G500B(CMU) software update

- Connect the serial cable to Console Port 1 of the IPX-G500B (Baud Rate: 38,400)
- Enter ID and Password to log on. Default ID: **admin** / Default Password: **samsung*#**
- Change the directory on your FTP Server where the software can be downloaded.
    - (For example: "cd /tmp")
- Enter the following to download and upgrade the software:

```
admin@IPT-NPU:/tmp#wget ftp://ID:PASSWORD@FTP Server IP/CMU Package Name
admin@IPT-NPU:/tmp#upgrade [CMU Package Name]
admin@IPT-NPU:/tmp#reboot
```

IPX-G500B(GWU) software update

- Connect the serial cable to the Console Port 2 of the IPX-G500B. (Baud Rate: 38,400)
- Enter ID and Password to log on. Default ID: **admin** / Default Password: **samsung*#**
- Change the directory on your FTP Server where the software can be downloaded.
    - (For example: "cd /tmp")
- Enter the following to download and upgrade the software:

```
admin@IPT-GWU:/tmp#wget ftp://ID::PASSWORD@FTP Server IP/GWU Package Name
admin@IPT-GWU:/tmp#upgrade [GWU Package Name]
admin@IPT-GWU:/tmp#reboot
```

IPX-G520S/540S(ECU) software update

- Connect the serial cable to the console port of the IPX-G520S/540S. (Baud Rate: 38,400)
- Enter ID and Password to log on. Default ID: **admin** / Default Password: **samsung*#**
- Change the directory on your FTP Server where the software can be downloaded.
    - (For example: "cd /tmp")
- Enter the following to download and upgrade the software:

```
admin@IPT-ECU:/tmp#wget ftp://ID::PASSWORD@FTP Server IP/ECU Package Name
admin@IPT-ECU:/tmp#upgrade [ECU Package Name]
admin@IPT-ECU:/tmp#reboot
```

1PRI/2PRI Card Update

- Connect the serial cable to the console port of the 1PRI/2PRI card. (Baud Rate: 38,400)
- Enter ID and Password to log on. Default ID: **admin** / Default Password: **samsung*#**
- Change the directory on your FTP Server where the software can be downloaded.
    - (For example: "cd /tmp")
- Enter the following to download and upgrade the software:

```
admin@IPT-PRU:/tmp#wget ftp://ID::PASSWORD@FTP Server IP/PRI Package Name
admin@IPT-PRU:/tmp#upgrade [PRI Package Name]
admin@IPT-PRU:/tmp#reboot
```

Factory Reset

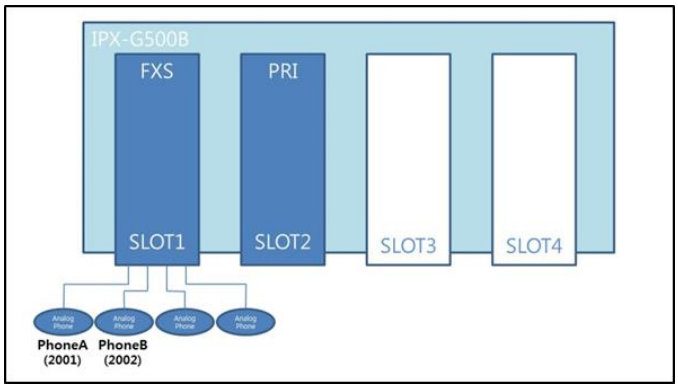
You can initialize the gateway and restore it to the original factory configuration.

- Connect the serial cable to the console port of the gateway to initialize. (Baud Rate: 38,400)
- Enter ID and Password to log on. Default ID: **admin** / Default Password: **samsung*#**
- Enter '**cli**' to set up the basic gateway configuration.
- Select '4. Factory Reset'.
- It will ask again to confirm the selection. Enter 'yes'.

```
##################################
#                                #
#        GW Setup Manager        #
#                                #
##################################
 1. Setup basic configuration
 2. Show current configuration
 3. Show version
 4. Factory Reset
 5. Exit
Please select the number : 4

This will clear all configurations. Do you want to continue? (yes/no) : yes
```

PRI & FXS Basic Function Checklist

The following is a quick guide to testing your PRI functionality after your gateway is installed and configured.



1) **Prepare 2 Analog Phones and FXS / PRI cards.**
    a. In the SCM Administrator apply the following settings:
        i. **[Configuration – Gateway – IPX Setting – Gateway Configuration]**
            1. Set *Country* to 'USA'.
        ii. **[Configuration – Gateway – IPX Setting – Analog Phone]**
            1. Assign extension numbers to the FXS card. (ex. 2001, 2002, 2003, 2004)
        iii. **[Configuration – Trunk Routing – Route]**
            1. Setup a PRI TRUNK with an assigned *Access Code*.
        iv. For testing assume that your Analog Phones are PhoneA and PhoneB.
2) **Check that you can set Switch Type to 5ESS5 in SCM.**
3) **Test calling from FXS to PRI.**
    a. Pick up PhoneA and dial PhoneB ([TRUNK NUMBER]+[PHONE NUMER]+#). *Ex. 99 2001#*
    b. Ensure the call connects and has two way audio.
4) **Test calling from PRI to FXS.**
    a. Make an incoming call with PRI assigned DID number to PhoneA.
    b. Check that the PhoneA is ringing.
    c. Answer and ensure the call connects and has two way audio.
5) **Test that FXS ringing stops when call is terminated.**
    a. Pickup PhoneA and dial PhoneB.
    b. Listen for the ring back tone on PhoneA and hang up. (PhoneB doesn't answer the call.)
    c. Ensure that PhoneB stops ringing after hangup.
6) **Test for busy tone when making a call to a busy station.**
    a. Pickup the handset of PhoneB and put it down without hanging up.
    b. Pickup PhoneA and dial PhoneB.
    c. Check that can hear busy tone.
7) **Repeat steps 2-7 while changing the *Switch Mode* in SCM to the following as needed:**
    a. 5ESS5, 5ESS9, 5ESS10, NI1, NI2, DMS100 and BELLCORE.

SAMSUNG
IPX-G5X0 Series Voice Gateway
Installation Manual