

# Grandstream Networks, Inc.

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## Analog IP Gateway GXW4248



# GXW4248 USER MANUAL

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**CONFIGURATION GUI INTERFACE EXAMPLES**  
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[http://www.grandstream.com/products/gxw\\_series/GXW42xx/documents/GXW42xx\\_gui.zip](http://www.grandstream.com/products/gxw_series/GXW42xx/documents/GXW42xx_gui.zip)

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## GNU GPL INFORMATION

GXW4248 firmware contains third-party software licensed under the GNU General Public License (GPL). Grandstream uses software under the specific terms of the GPL. Please see the GNU General Public License (GPL) for the exact terms and conditions of the license.

Grandstream GNU GPL related source code can be downloaded from Grandstream web site from:  
[http://www.grandstream.com/support/faq/gnu\\_gpl](http://www.grandstream.com/support/faq/gnu_gpl) .

## CHANGE LOG

This section documents significant changes from previous versions of GXW4248 user manuals. Only major new features or major document updates are listed here. Minor updates for corrections or editing are not documented here.

## WELCOME

Thank you for purchasing the Grandstream GXW4248 Analog FXS IP Gateway. The GXW4248 offers an easy to manage, easy to configure IP communications solution for any business with virtual and/or branch locations. The GXW4248 supports popular voice codecs and is designed for full SIP compatibility and interoperability with third party SIP providers, thus enabling you to fully leverage the benefits of VoIP technology, integrate a traditional phone system into a VoIP network, and efficiently manage communication costs.

This manual will help you learn how to operate and manage your GXW FXS Analog IP Gateway and make the best use of its many upgraded features including simple and quick installation, multi-party conferencing, and direct IP-IP Calling. This IP Analog Gateway is very easy to manage and scalable, specifically designed to be an easy to use and affordable VoIP solution for the small – medium business or enterprise.

### GATEWAY GXW4248 OVERVIEW

The new GXW4248 has a compact and quiet design and offers superb audio quality, rich feature functionality, strong security protection, and good manageability. It is auto-configurable, remotely manageable and scalable.

The GXW4248 features 48 port FXS interface for analog telephones, dual 10/100/1000Mbps network ports, and RJ21 analog port. In addition, it supports the option of 4 SIP Server profiles, caller ID for various countries/regions, T.38 fax, flexible dialing plans, security protection (SIPS/TLS), comprehensive voice codec including G.711 (a/u-law), G.723.1, G.726(16/24/32/40 bit rates), iLBC and G.729.

### SAFETY COMPLIANCE

The GXW4248 is compliant with various safety standards including FCC/CE. Its power adapter is compliant with UL standard. **Warning:** use only the power adapter included in the GXW4248 package. Use of alternative power adapter may permanently damage the unit.

### WARRANTY

Grandstream has a reseller agreement with our reseller customers. End users should contact the company from whom the product was purchased, for replacement, repair or refund.

If you purchased the product directly from Grandstream, contact your Grandstream Sales and Service Representative for an RMA (Return Materials Authorization) number. Grandstream reserves the right to change the warranty policy without prior notification.

**Caution:** *Changes or modifications to this product not expressly approved by Grandstream, or operation of this product in any way other than as detailed by this User Manual, could void your manufacturer warranty.*

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## CONNECT YOUR GXW4248 GATEWAY

Connecting the GXW4248 gateway is easy. Before you begin, please verify the contents of the GXW4248 package.

### EQUIPMENT PACKAGING

Unpack and check all accessories. Equipment includes:

- one device unit
- one RJ45 Ethernet cable
- one 24V 6.5A universal power adapter
- mount

### CONNECT THE GXW4248

Follow these four (4) steps to connect your GXW4248 gateway to the Internet and access the unit's configuration pages.

1. Connect standard touch-tone analog phones to the GXW4248's RJ21 port with a RJ11 to R21 cable.
2. Insert an RJ45 Ethernet cable into the WAN port of GXW4248 and connect the other end to an uplink port (a router or a modem, etc.)
3. Plug the power adapter into the GXW4248 gateway into a power outlet.

Follow the instructions from the topic "[Configuring GXW 42XX with Web Browser](#)" for initial configuration. The GUI pages will guide you through the remaining steps to set-up your gateway.

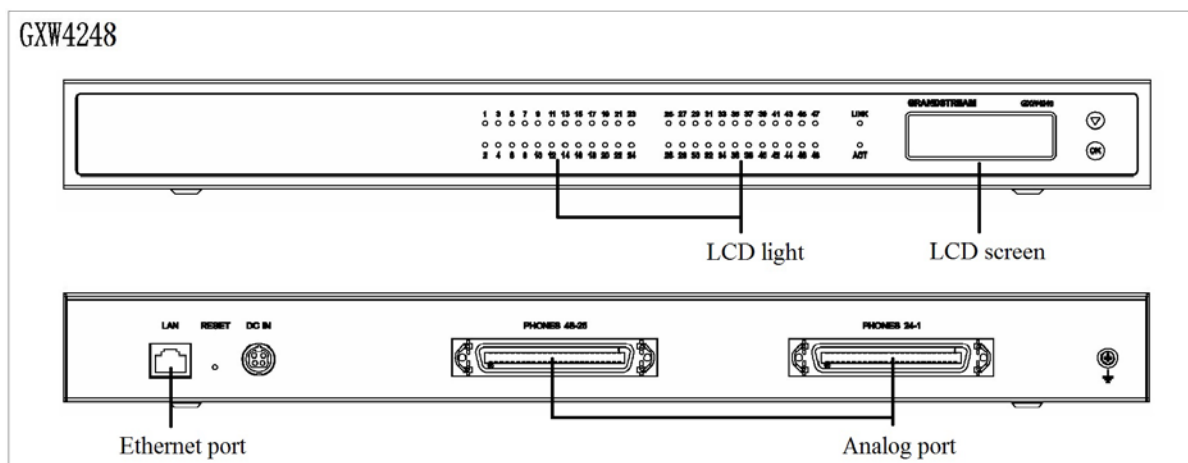


FIGURE 1: DIAGRAM OF GXW4248 PANEL

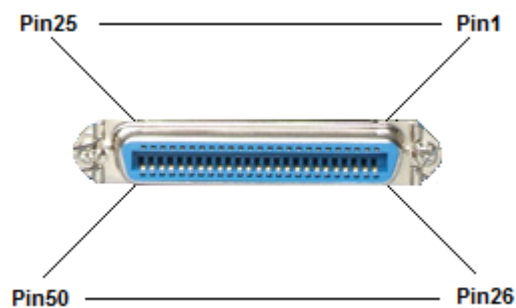
TABLE 1: DEFINITIONS OF THE GXW CONNECTORS

<b>Ethernet port</b>	Connect to the internal LAN network , router or PC
<b>RESET</b>	Factory Reset button. Press and hold for a while to reset factory default settings.
<b>DC IN</b>	Power adapter connection
<b>Analog port</b>	Connect to analog phones / fax machines with an RJ21 to RJ11 cable
<b>FXS ports</b>	FXS port to be connected to analog phones / fax machines.

Note: Once the GXW4248 is turned on and configured, the front display panel indicates the status of the unit.

TABLE 2: DEFINITIONS OF THE GXW DISPLAY PANEL

<b>Act LED</b>	Remains ON if plug the network cable.
<b>LINK LED</b>	Indicates Ethernet port activity.
<b>FXS LED</b>	Indicate status of the respective FXS Ports on the back panel <b>Busy</b> - ON (Solid Green) <b>Available</b> - OFF Slow blinking FXS LEDs indicates Voice Mail for that port. All FXS LEDs slow blinking indicates provisioning.



<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>
1	RING1	26	TIP1
2	RING2	27	TIP2
3	RING3	28	TIP3
4	RING4	29	TIP4
5	RING5	30	TIP5
6	RING6	31	TIP6
7	RING7	32	TIP7
8	RING8	33	TIP8
9	RING9	34	TIP9
10	RING10	35	TIP10
11	RING11	36	TIP11
12	RING12	37	TIP12
13	RING13	38	TIP13
14	RING14	39	TIP14
15	RING15	40	TIP15
16	RING16	41	TIP16
17	RING17	42	TIP17
18	RING18	43	TIP18
19	RING19	44	TIP19
20	RING20	45	TIP20
21	RING21	46	TIP21
22	RING22	47	TIP22
23	RING23	48	TIP23
24	RING24	49	TIP24

**FIGURE 2: 50 PIN TELCO CONNECTOR**

**NOTE:**

- The last pair of pin 25 and 50 on each RJ21 is not connected.
- All LED lights display green when ON.

- LINK LED and ACT LED blinking in following status indicate different network speed.
  - 10M: LINK and ACT all blink, ACT blinks faster then LINK
  - 100M: LINK and ACT all blink, ACT blinks the same fast as LINK
  - 1000M: LINK does not blink, only ACT blink
- Slow blinking of FXS LED together indicates a firmware upgrade or provisioning state.

## GXW4248 FEATURES

The GXW4248 is a next generation IP voice gateway that is interoperable and compatible with leading IP-PBXs, Soft switches and SIP platforms. The GXW4248 FXS gateway is auto-configurable, remotely manageable and scalable. The GXW4248 offers superb voice quality, traditional telephony functionality, easy deployment, and 48 FXS ports. Each model features flexible dialing plans, integrated call routing to support a pure IP network call and an external power supply.

### SOFTWARE FEATURES OVERVIEW

- 48 FXS ports
- RJ-45 Ethernet ports
- 4 configurable SIP profiles
- Supports Voice Codecs:  
G711(a/μ, Annex I & II), G723.1A, G726 (ADPCM with 16/24/32/40 bit rates), G729 A/B, iLBC, T.38 Fax
- Comprehensive Dial Plan support for Outgoing calls.
- G.168 Echo Cancellation
- Voice Activation Detection (VAD), Comfort Noise Generation (CNG), and Packet Loss Concealment (PLC)
- Supports PSTN/PBX analog telephone sets or analog trunks

**TABLE 3: GXW4248 SOFTWARE FEATURES**

	<b>GXW4248</b>
<b>Telephone Interfaces</b>	48 FXS ports
<b>SIP Provisioning</b>	48 SIP accounts, 4 profiles
<b>Network Interface</b>	10/100/1000 Mbps, RJ-45
<b>Number of Concurrent Calls (except when using SRTP)</b>	48 Concurrent Calls
<b>Voice over Packet Capabilities</b>	Voice Activity Detection (VAD) with CNG (comfort noise generation) and PLC (packet loss concealment), LEC with NLP Packetized Voice Protocol Unit (supports

	RTP/RTCP and AAL2 protocol), G.168 compliant Echo Cancellation, Dynamic Jitter Buffer, Modem detection & auto-switch to G.711
<b>Voice Compression</b>	G.711 + Annex I (PLC), Annex II (VAD/CNG format) encoder and decoder, G.722 (pending), G.723.1A, G.726(ADPCM with 16/24/32/40 bit rates), G.729, iLBC, G.726 provides proprietary VAD, CNG, and signal power estimation, Voice Play Out unit (reordering, fixed and adaptive jitter buffer, clock synchronization), AGC (automatic gain control), Status output, Decoder controlling via voice packet header
<b>DHCP Server/Client</b>	DHCP Client only
<b>Fax over IP</b>	T.38 compliant Group 3 Fax Relay up to 14.4kpbs and auto-switch to G.711 for Fax Pass-through, Fax Datapump V.17, V.21, V.27ter, V.29 for T.38 fax relay
<b>QoS</b>	DiffServ, TOS, 802.1P/Q VLAN tagging
<b>Transport Protocol</b>	RTP/RTCP
<b>DTMF Method</b>	In-audio, RFC2833, and/or SIP Info
<b>IP Signaling</b>	SIP (RFC 3261)
<b>Provisioning</b>	TFTP, HTTP, HTTPS
<b>Security</b>	SRTP, IPSEC, TLS/SIPS, HTTPS, 802.1x
<b>Management</b>	Syslog support, HTTP and Telnet access
<b>Dial Plan</b>	Yes
<b>3-Way Conference</b>	3-Way conference with local mixing
<b>Caller ID</b>	Bellcore Type 1 & 2, ETSI, BT, NTT, FSK and DTMF-based CID
<b>Polarity Reversal / Wink</b>	Yes
<b>Network Connectivity</b>	IPv4, IPv6, TCP/UDP, RTP/RTCP, HTTP/HTTPS, ARP/RARP, ICMP, DNS, DHCP, NTP, TFTP, TELNET, PPPoE, STUN

## HARDWARE SPECIFICATION

The hardware specifications of the GXW4248 are detailed in Table 4.

**TABLE 4: HARDWARE SPECIFICATION OF GXW4248 GATEWAY**

<b>GXW4248</b>	
<b>Telephone Interface</b>	2 RJ21 Ports only
<b>FXS LEDs</b>	48

<b>Network interface</b>	LAN, Single 10/100/1000 BASE-TX,RJ45
<b>Power Input</b>	<b>Input:</b> 100-240VAC, 50/60Hz <b>Output:</b> 24V DC, 6.25A
<b>LCD screen</b>	128x32 pixel
<b>Telco connector</b>	2 RJ21 (50 pins)
<b>RJ-11 connectors</b>	No
<b>NAND Flash</b>	64MB
<b>DRAM</b>	128MB (+ separate 8MB if with a slave processor)
<b>Function Buttons</b>	1 button for Reset/Factory Reset
<b>Environmental</b>	Operation: 0°C to 45°C Storage: -20°C to 60°C Humidity: 10% to 90% Non-condensing
<b>Mounting</b>	Desktop and Rack mount
<b>Onhook Voltage</b>	Fixed, 48V
<b>Ring Voltage</b>	50Vrms (balanced ringing)
<b>Ring Frequency</b>	20-50Hz
<b>Short Haul Loop</b>	2REN: Up to 1km on 24 AWG wire
<b>Outdoor Protection</b>	Over-voltage Protection and surge immunity
<b>Signaling</b>	FXS Loop-start
<b>EMC</b>	EN55022/EN55024 and FCC part15 Class B
<b>Safety</b>	UL
<b>Compliance</b>	FCC, CE, C-Tick

## GXW4248 LCD MENU

The GXW4248 gateway includes a small LCD screen for the display of basic information. The LCD has a display area of 128x32 pixels, which will allow for 2 lines of text with a 16px height limitation per line. The LCD menu is shown as Figure 3: LCD Menu. Menu is navigated by the Down-arrow and OK button.

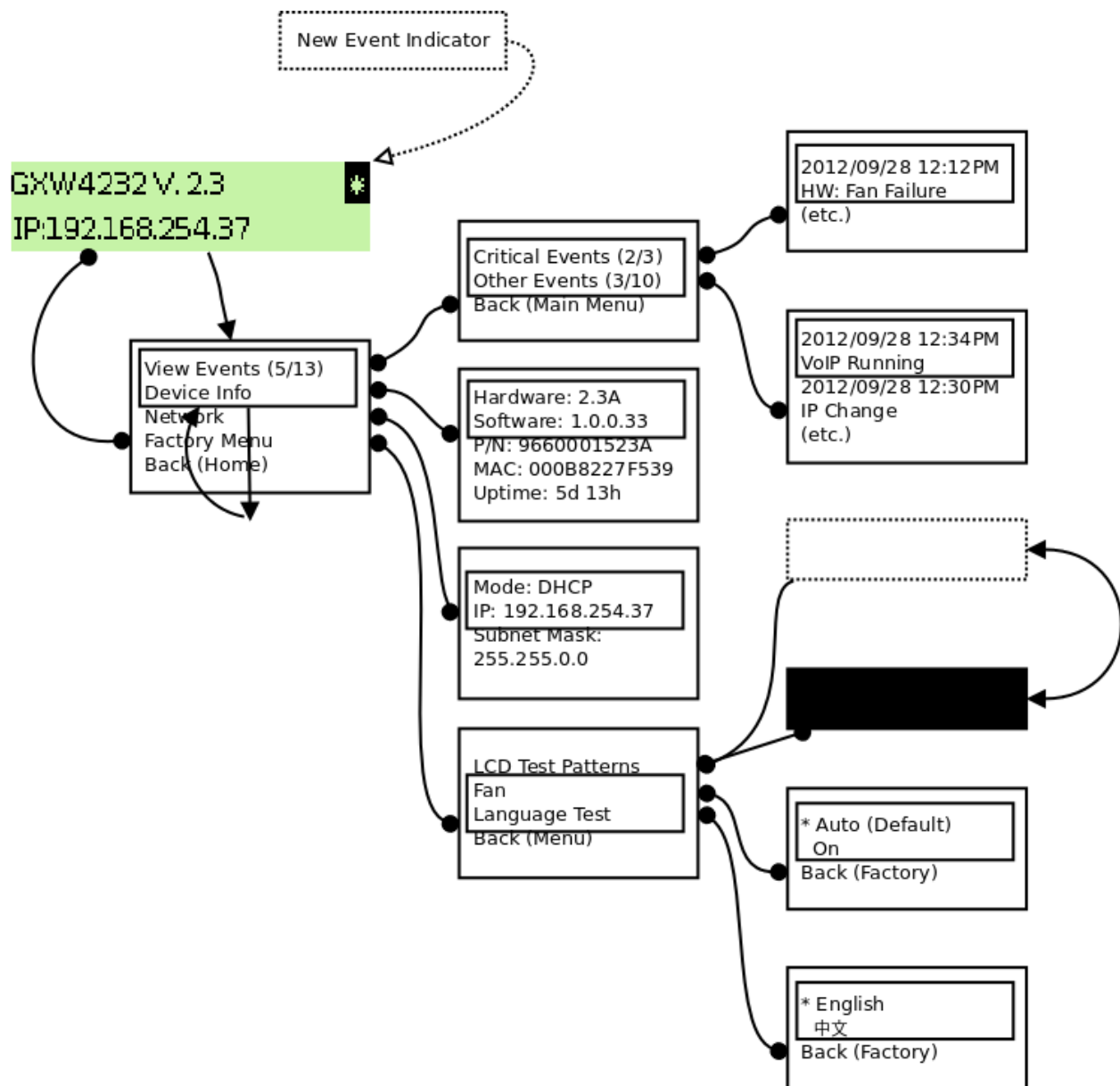


FIGURE 3: LCD MENU



## BASIC OPERATIONS

### UNDERSTANDING GXW VOICE PROMPTS

GXW4248 has a built-in voice prompt menu for simple device configuration. To enter the voice prompt menu, **press \*\*\*** on the standard analog phone connected to any FXS port.

TABLE 5: DEFINITIONS OF THE GXW VOICE PROMPTS

Menu	Voice Prompt	User's Options
<b>Main Menu</b>	"Enter a Menu Option"	Enter "***" for the next menu option Enter "#" to return to the main menu Enter "001 – 005, 007, 010, 013 - 017, 047, 086 or 099" Menu option Enter "9" for confirming a option
<b>001</b>	"DHCP Mode", "PPPoE Mode" or "Static IP Mode"	Enter '9' to toggle the selection <i>If user selects "Static IP Mode", user need configure all the IP address information through menu 002 to 005. If user selects "Dynamic IP Mode", the device will retrieve all IP address information from DHCP server automatically when user reboots the device.</i>
<b>002</b>	"IP Address " + IP address	The current WAN IP address is announced Enter 12-digit new IP address if in Static IP Mode.
<b>003</b>	"Subnet " + IP address	Same as Menu option 002
<b>004</b>	"Gateway " + IP address	Same as Menu option 002
<b>005</b>	"DNS Server " + IP address	Same as Menu option 002
<b>007</b>	Preferred Vocoder	Enter "9" to go to the next selection in the list: <ul style="list-style-type: none"> <li>• PCM U</li> <li>• PCM A</li> <li>• iLBC</li> <li>• G-726</li> <li>• G-723</li> <li>• G-729</li> </ul>
<b>010</b>	"MAC Address"	Announces the Mac address of the unit.
<b>013</b>	Firmware Server IP Address	Announces current Firmware Server IP address. Enter 12 digit new IP address.
<b>014</b>	Configuration Server IP Address	Announces current Config Server Path IP address. Enter 12 digit new IP address.
<b>015</b>	Upgrade Protocol	Upgrade protocol for firmware and configuration update. Enter

		“9” to toggle between <b>TFTP</b> and <b>HTTP</b>
<b>016</b>	Firmware Version	Firmware version information.
<b>017</b>	Firmware Upgrade	Firmware upgrade mode. Enter “9” to rotate among the following three options: <ol style="list-style-type: none"> <li>1. always check</li> <li>2. check when pre/suffix changes</li> <li>3. never upgrade</li> </ol>
<b>047</b>	“Direct IP Calling”	Enter the target IP address to make a direct IP call, after dial tone. (See “ <i>Make a Direct IP Call</i> ”.)
<b>086</b>	Voice Mail	Number of voice mails
<b>099</b>	“RESET”	Enter “9” to reboot the device; or Enter MAC address to restore factory default setting (See <b>Restore Factory Default Setting</b> section)
<b>700-748</b>	Phone calls between different ports of the same GW4248	GXW4248 support inter-port calling from voice menu for easy test/verification in factory “700” Ring all ports and connect to first port pick up the call “701-748” Call individual port
	“Invalid Entry”	Automatically returns to Main Menu

### Five Success Tips when using the Voice Prompt

1. “\*” shifts down to the next menu option
2. “#” returns to the main menu
3. “9” functions as the ENTER key in many cases to confirm an option
4. All entered digit sequences have known lengths - 2 digits for menu option and 12 digits for IP address. For IP address, add **0** before the digits if the digits are less than 3 (i.e. - 192.168.0.26 should be key in like 192168**0000**26. No decimal is needed).
5. Key entry cannot be deleted but the phone may prompt error once it is detected

## PLACING A PHONE CALL

### PHONE OR EXTENSION NUMBERS

1. Dial the number directly and wait for 4 seconds (To change the default value, modify the following setting - “No Key Entry Timeout”)  
or
2. Dial the number directly and press # (Use # as dial key” must be configured in web configuration).

### Examples:

1. Dial a number (e.g. (626) 666-7890), first enter the prefix number (usually 1+ or international code) followed by the phone number. Press # or wait for 4 seconds. Check with your VoIP service provider for further details on prefix numbers.

### DIRECT IP CALLS

Direct IP calling allows two parties, that is, a FXS Port with an analog phone and another VoIP Device, to talk to each other in an ad hoc fashion without a SIP proxy.

#### Elements necessary to completing a Direct IP Call:

1. Both GXW4248 and other VoIP Device, have public IP addresses, or
2. Both GXW4248 and other VoIP Device are on the same LAN using private IP addresses, or
3. Both GXW4248 and other VoIP Device can be connected through a router using public or private IP addresses (with necessary port forwarding or DMZ).

GXW4248 supports two ways to make Direct IP Calling:

#### Using IVR

1. Pick up the analog phone then access the voice menu prompt by dial “\*\*\*\*”
2. Dial “047” to access the direct IP call menu
3. Enter the IP address using format ex. **192\*168\*0\*160** after the dial tone.

#### Using Star Code

1. Pick up the analog phone then dial “\*47”
2. Enter the target IP address using same format as above.

Note: **NO** dial tone will be played between step 1 and 2.

Destination ports can be specified by using “\*” (encoding for “:”) followed by the port number.

### Examples:

- a) If the target IP address is 192.168.0.160, the dialing convention is **\*47 or Voice Prompt with option 047, then 192\*168\*0\*160.** followed by pressing the “#” key if it is configured as a send key or wait 4 seconds. In this case, the default destination port 5060 is used if no port is specified.

- b) If the target IP address/port is 192.168.1.20:5062, then the dialing convention would be:

**\*47 or Voice Prompt with option 047, then 192\*168\*0\*160\*5062** followed by pressing the “#” key if it is configured as a send key or wait for 4 seconds.

## CALL HOLD

Place a call on hold by pressing the “flash” button on the analog phone (if the phone has that button). Press the “flash” button again to release the previously held Caller and resume conversation. If no “flash” button is available, use “hook flash” (toggle on-off hook quickly). You may drop a call using hook flash.

## CALL WAITING

Call waiting tone (2 short beeps) indicates an incoming call, if the call waiting feature is enabled. Toggle between incoming call and current call by pressing the “flash” button. First call is placed on hold. Press the “flash” button to toggle between two active calls.

## CALL TRANSFER

### BLIND TRANSFER

Assume that call Caller A and B are in conversation. A wants to *Blind Transfer* B to C:

3. Caller A presses **FLASH** on the analog phone to hear the dial tone.
4. Caller A dials **\*87** then dials caller C’s number, and then # (or wait for 4 seconds).
5. Caller A will hear the confirm tone. Then, A can hang up.

**NOTE:** “*Enable Call Feature*” must be set to “Yes” in web configuration page.

Caller A can place a call on hold and wait for one of three situations:

1. A quick confirmation tone (similar to call waiting tone) followed by a dial tone. This indicates the transfer is successful (transferee has received a 200 OK from transfer target). At this point, Caller A can either hang up or make another call.
2. A quick busy tone followed by a restored call (on supported platforms only). This means the transferee has received a 4xx response for the INVITE and we will try to recover the call. The busy tone is just to indicate to the transferor that the transfer has failed.
3. Continuous busy tone. The phone has timed out. **Note:** continuous busy tone does not indicate the transfer has been successful, nor does it indicate the transfer has failed. It often means there was a failure to receive second NOTIFY – check firmware for most recent release.

## ATTENDED TRANSFER

Assume that Caller A and B are in conversation. Caller A wants to *Attend Transfer* B to C:

1. Caller A presses **FLASH** on the analog phone for dial tone.
2. Caller A then dials Caller C's number followed by # (or wait for 4 seconds).
3. If Caller C answers the call, Caller A and Caller C are in conversation. Then A can hang up to complete transfer.
4. If Caller C does not answer the call, Caller A can press "flash" to resume call with Caller B.

**NOTE:** When Attended Transfer fails and A hangs up, the GXW4248 will ring back user A to remind A that B is still on the call. A can pick up the phone to resume conversation with B.

## 3-WAY CONFERENCING

The GXW4248 supports Bellcore style 3-way Conference.

### Instructions for 3-way conference:

Assuming that call party A and B are in conversation. A (GXW4248) wants to bring C in a conference:

1. A presses FLASH (on the analog phone, or Hook Flash for old model phones) to get a dial tone.
2. A dials C's number then # (or wait for 4 seconds).
3. If C answers the call, then A presses FLASH to bring B, C in the conference.
4. If C does not answer the call, A can press FLASH back to talk to B.
5. If A presses FLASH during conference, C will be dropped out.
6. If A hangs up, the conference will be terminated or transfer B to C if "Transfer on Conference Hangup" set to yes

## HUNTING GROUP

This feature allows the user to setup a single SIP account on the gateway and have the ability to use all FXS ports to make/receive calls. Using this feature, all ports active in same Hunting Group will have the same phone number and incoming calls will be distributed in a Linear or Circular manner among the ports active in that Hunting Group. The number of hunting groups is limited by the number of ports each GXW model has - i.e. each port can be its own Hunting Group. The most practical and efficient way to use Hunting Groups is to assign 2 or 3 ports to separate Hunting Groups.

One additional and popular way to use the Hunting Group feature is called “*multiplexed analog lines*”. In this configuration, a legacy PBX system with 8 FXO trunks can be connected to 8 GXW 42xx ports configured as a Hunting Group. The GXW can be registered to a SIP server provider using only one phone number. If the SIP service provider allows multiple calls to the same number, the GXW will allow 8 concurrent calls to the same SIP number. All office members can be reached remotely using the same phone number in a round-robin fashion.

#### Example Configuration of a typical Hunting Group:

1. Configure the SIP account from your VoIP Service Provider on **FXS port 1** under **FXS Ports** webpage.
2. Select **Active** under the **Hunting Group** drop box for FXS port 1.
3. For the remaining ports (say 2, 3 and 4) select **1** for **Hunting Group**. Ports 2, 3 and 4 are now active members of the hunting group associated with port 1.

This configuration will route all calls directed to FXS port 1 to ports 2, 3 and/or 4 in round robin fashion respectively *if* port 1 is busy or times out. You can configure the ring timeout on the **Profile** page.

#### Example configuration of a multiple Hunting Group:

FXS Port #1: SIP UserID and Authenticate ID entered, Hunting group set to "**Active**"

FXS Port #2: SIP UserID and Authenticate ID left blank, Hunting Group set to "**1**"

FXS Port #3: SIP UserID and Authenticate ID left blank, Hunting Group set to "**1**"

FXS Port #4: SIP UserID and Authenticate ID entered, Hunting group set to "**Active**"

FXS Port #5: SIP UserID and Authenticate ID left blank, Hunting Group set to "**4**"

FXS Port #6: SIP UserID and Authenticate ID left blank, Hunting Group set to "**4**"

FXS Port #7: SIP UserID and Authenticate ID entered, Hunting group set to "**Active**"

FXS Port #8: SIP UserID and Authenticate ID left blank, Hunting Group set to "**7**"

...

Hunting Group 1 contains ports 1, 2, 3. Hunting Group 4 contains ports 4, 5, 6.

Hunting Group 7 contains ports 7, 8.

Please be aware, the choice of 1 for ports 2 and 3, the choice of 4 for ports 5 and 6, the choice 7 for port

8 is required to indicate that the SIP account tied to port marked as “**Active**” will be used for all members of the same Hunting group. Needless to say, those members of the same Hunting group may not be sequential ports. In following example ports 3, 5 and 7 tied to SIP Account configured in Port #1 marked as “**Active**”, and ports 4,6,8 tied to SIP Account configured in Port #2 marked as “**Active**” as well.

Example of not sequential configuration of a multiple Hunting Group:

FXS Port #1: SIP UserID and Authenticate ID entered, Hunting group set to "**Active**"

FXS Port #2: SIP UserID and Authenticate ID entered, Hunting Group set to "**Active**"

FXS Port #3: SIP UserID and Authenticate ID left blank, Hunting Group set to "1"

FXS Port #4: SIP UserID and Authenticate ID left blank, Hunting group set to "2"

FXS Port #5: SIP UserID and Authenticate ID left blank, Hunting Group set to "1"

FXS Port #6: SIP UserID and Authenticate ID left blank, Hunting Group set to "2"

FXS Port #7: SIP UserID and Authenticate ID left blank, Hunting group set to "1"

FXS Port #8: SIP UserID and Authenticate ID left blank, Hunting Group set to "2"

...

FXS Port #24: SIP UserID and Authenticate ID left blank, Hunting Group set to "2"

**Note:** A single call directed to the SIP account will NOT result in all ports ringing at the same time. They will ring in the hunting group only. This feature is applicable to incoming calls only.

There are two types of hunting groups, Linear and Circular. Linear style will sort the call to the lowest-numbered available line, this is also called “serial hunting”. Circular style will distribute the calls "round-robin". If a call is assigned to line 1, the next call goes to 2 and the next to 3. The succession throughout each of the lines continues even if one of the previous lines becomes available. When the end of the hunt group is reached, the hunting starts over at the first line. Lines are skipped if they are still busy on a previous call. These two hunting styles can be configured from the Profile\_x page.

## INTER-PORT CALLING

In some cases a user may want to make phone calls between the phones connected to multiple ports of the same gateway when it is used as a standalone unit, without the use of a SIP server. This feature will also be applicable when the gateway is used with Hunting Groups and is registered to SIP server only with one master number. In such cases users still will be able to make inter-port calls by using the IVR feature.

For example, on the GXW4248 inter-port calling is achieved by dialing \*\*\* and 7 plus two extra digits corresponding to the port number. For example the user connected to port 1 can be reached by dialing \*\*\* and 701; the user connected to port 24 can be reached by dialing \*\*\* 724.

## SENDING AND RECEIVING FAX

GXW4248 supports fax in two modes: 1) T.38 (Fax over IP) and 2) Fax Pass through. T.38 is the preferred method because it is more reliable and works well in most network conditions. If the service provider supports T.38, please use this method by selecting T.38 as fax mode (default). If the service provider does not support T.38, pass-through mode may be used. If you have problems with sending or receiving Fax, toggle the Fax Tone Detection Mode setting.

## SUPPORT RADIUS PROTOCOL

GXW4248 supports RADIUS for authentication, authorization and billing purposes. Primary and secondary RADIUS server configurations are available to provide redundancy to this feature. In case Primary Radius server becomes unusable, RADIUS requests will be automatically sent to the secondary server. When at least one RADIUS server was configured, the device will allow users to make phone calls only after authorization from RADIUS server has been received. CDR (Call Detail Record) is also sent to the RADIUS server for billing purposes. RADIUS server can send requests to terminate calls when run out of pre-paid credit.

The GXW4248 will be able to work in VoIP billing environment using redundant double server configuration. User will be able to configure primary and secondary RADIUS server IP Addresses or FQDNs. Once at least one RADIUS server was configured, the device will allow users to make phone calls only after permission from RADIUS server has been received. In case Primary Radius server becomes unusable, secondary will take role of primary and will manage credit recourses in the network. Imbedded RADIUS client also supports request generated by Radius server to terminate calls when run out of pre-paid credit.



## CALL FEATURES

GXW4248 supports the traditional telephony features available in a PBX as well as additional advanced telephony features.

TABLE 6: CALL FEATURES TABLE (STAR CODE)

Key	Call Features
*02	<b>Forcing a Codec</b> (per call) *027110 (PCMU), *027111 (PCMA), *02723 (G723), *02729 (G729), *0272616 (G726-r16), *0272624 (G724-r24), *0272632 (G726-r32), *0272640 (G726-r40), *027201 (iLBC)
*03	<b>Disable LEC</b> (pe call) Dial “*03” + “ number “. <b>No</b> dial tone is played in the middle.
*16	<b>Enable SRTP</b>
*17	<b>Disable SRTP</b>
*30	<b>Block CallerID</b> (for all-config change)
*31	<b>Send CallerID</b> (for all-config change)
*67	<b>Block CallerID</b> (per call)
*82	<b>Send CallerID</b> (per call)
*47	<b>Direct IP Calling.</b> Dial “*47” + “IP address”. <b>No</b> dial tone will be played in the middle. Detail see Direct IP Calling section on page 12.
*50	<b>Disable Call Waiting</b> (for all-config change)
*51	<b>Enable Call Waiting</b> (for all-config change)
*69	<b>Call Return Service:</b> Dial *69 and the phone will dial the last incoming phone number received.
*70	<b>Disable Call Waiting</b> (Per Call)
*71	<b>Enable Call Waiting</b> (Per Call)
*72	<b>Unconditional Call Forward:</b> Dial “*72” and then the forwarding number followed by “#”. Wait for dial tone and hang up. (dial tone indicates successful forward)
*73	<b>Cancel Unconditional Call Forward:</b> Dial “*73” and wait for dial tone, then hang up.
*74	<b>Enable Paging Call:</b> Dial “*74” and then the destination phone number you want to activate in Paging mode.
*78	<b>Enable Do Not Disturb (DND):</b> When enabled all incoming calls will be rejected.
*79	<b>Disable Do Not Disturb (DND):</b> When disabled, incoming calls will be accepted.
*87	<b>Blind Transfer</b>

<b>*90</b>	<b>Busy Call Forward:</b> Dial “*90” and then the forwarding number followed by “#”. Wait for dial tone then hang up.
<b>*91</b>	<b>Cancel Busy Call Forward:</b> dial “*91”. Wait for dial tone. Hang up.
<b>*92</b>	<b>Delayed Call Forward:</b> Dial “*92” and then the forwarding number followed by “#”. Wait for dial tone then hang up.
<b>*93</b>	<b>Cancel Delayed Call Forward:</b> Dial “*93” for a dial tone, then hang up.
<b>Flash/Hook</b>	If user hears call waiting beep, flash/hook will switch to the new incoming call. Also used to switch to a new channel for a new call.
<b>#</b>	Pressing pound sign will serve as <b>Re-Dial</b> key.

## CONFIGURATION GUIDE

### CONFIGURING GXW4248 VIA VOICE PROMPT

#### **DHCP MODE**

Select voice menu option 001 to enable GXW4248 to use DHCP.

#### **STATIC IP MODE**

Select voice menu option 001 to enable GXW4248 to use STATIC IP mode, then use option 002, 003, 004, 005 to set up IP address, Subnet Mask, Gateway and DNS server respectively.

#### **PPPoE MODE**

Select voice menu option 001 to enable GXW4248 to use PPPoE mode.

#### **FIRMWARE SERVER IP ADDRESS**

Select voice menu option 013 to configure the IP address of the firmware server.

#### **CONFIGURATION SERVER IP ADDRESS**

Select voice menu option 014 to configure the IP address of the configuration server.

#### **UPGRADE PROTOCOL**

Select voice menu option 015 to choose firmware and configuration upgrade protocol. User can choose between TFTP, HTTP, and HTTPS.

#### **FIRMWARE UPGRADE MODE**

Select voice menu option 017 to choose firmware upgrade mode among the following three options:

1) always check, 2) check when pre/suffix changes, and 3) never upgrade

### CONFIGURING GXW4248 WITH WEB BROWSER

The GXW4248 gateway has an embedded Web server that allows users to configure the GXW4248 through a web browser.

## ACCESS THE WEB CONFIGURATION MENU

The GXW4248 HTML configuration menu can be accessed via Ethernet port:

To access the HTML configuration menu from the Ethernet port:

1. Follow table 4 to find the Ethernet port IP address.
2. Open a web browser, type in the IP address – for example: <http://GXW4248-IP-Address> (the GXW4248 IP-Address is the Ethernet IP address for the GXW4248).

### NOTE:

- The IVR announces 12 digits IP address, you need to strip out the leading “0” in the IP address. For ex. IP address: 192.168.001.014, you need to type in <http://192.168.1.14> in the web browser.

Once the HTTP request is entered and sent from a web browser, the user will see a log-in screen. There are two default passwords for the login page:

User Level:	Password:	Web pages allowed:
End User Level	123	Only Status and Basic Settings
Administrator Level	admin	Browse all pages

The password is case sensitive with maximum length of 25 characters. The factory default password for End User and administrator is “123” and “admin” respectively. Only an administrator can access the “ADVANCED SETTING”, “Profile 1~4”, and “FXS PORTs” configuration pages. Please reference the GUI pages using the following link:

<http://www.grandstream.com/products/ip-voice-telephony/enterprise-analog-gateways/GXW4248/GUI.zip>.

## IMPORTANT SETTINGS

The end-user must configure the following settings according to the local environment.

**NOTE:** Most settings on the web configuration pages are set to the default values.

### NAT SETTINGS

If you plan to keep the gateway within a *private network* behind a firewall, we recommend using STUN

Server. The following three (3) settings are useful in the STUN Server scenario:

1. **STUN Server** (under Advanced Settings webpage)  
Enter a STUN Server IP (or FQDN) that you may have, or look up a free public STUN Server on the internet and enter it on this field. If using Public IP, keep this field blank.
2. **NAT Traversal** (under the Profile web pages)  
Set this to Yes when gateway is behind firewall on a private network.

## DTMF METHODS

DTMF Settings are in Profile pages.

- DTMF in-audio
- DTMF via RTP (RFC2833)
- DTMF via SIP INFO

You can enable set priority of DTMF methods according to your preference, from Priority 1 to 3. This setting should be based on your server DTMF setting.

## PREFERRED VOCODER (CODEC)

The GXW4248 supports a broad range of voice codecs. Under Profile web pages, choose your preferred order of different codecs:

- PCMU/A (or G711 $\mu$ /a)
- G729
- G723
- G726 (16/24/32/40)
- iLBC
- AAL2 (all G726)

This section will describe the options in the Web configuration user interface. As mentioned, a user can log in as an administrator or end-user.

Functions available for the end-user are:

- **STATUS:** Displays the network status, account status, software version and MAC-address of the phone
- **MAINTENANCE:** Basic settings such as basic network, date and time settings, and web/telnet

access settings can be set here.

- **PROFILE - AUDIO SETTINGS:** DTMF, Vocoder, and Analog Line settings can be configured here for each port.

Additional functions available to administrators are:

- **MAINTENANCE:** Full settings for network, upgrade/provisioning, TR-069, Security and Syslog.
- **ADVANCED SETTINGS:** To set advanced Ring Tongs, FXO Failover, and System Features.
- **PROFILE X:** To configure each of the SIP accounts.
- **FXS PORTS:** To configure each of the FXS ports and Hunting Groups etc.

TABLE 7: STATUS

System Info	
<b>Product Model</b>	Contains the product model info.
<b>Part Number</b>	Product Part Number.
<b>Software Version</b>	<p><b>Program:</b> This is the main software release. <i>This number is always used for firmware upgrade.</i> current version is 1.0.3.4.</p> <p><b>Boot:</b> current version is 1.0.3.2.</p> <p><b>Core:</b> current version 1.0.3.3.</p> <p><b>Base:</b> current version is 1.0.3.4.</p>
<b>System Up Time</b>	Shows system uptime since the last reboot.
<b>System Time</b>	The time according to NTP server.
<b>Service Status</b>	Shows the status of the VOIP applications.
Network Status	
<b>MAC Address</b>	The device ID in hexadecimal format. This is needed for Internet Service Provider troubleshooting. The MAC address will be used for provisioning and can be found on the label on original box and on the label located on the bottom panel of the device.
<b>IP Address Mode</b>	Shows the current IP mode.
<b>IP Address</b>	Shows IP address of GXW4248.
<b>Subnet Mask</b>	Shows Subnet Mask of GXW4248.
<b>Gateway</b>	Shows Default Gateway of GXW4248.
<b>DNS Server</b>	Shows DNS Server of GXW4248.

**NAT Traversal** Shows type of NAT the GXW4248 is connected to via its WAN port. It is based on STUN protocol.

### Port Status

Displays relevant information regarding the individual FXS ports. Example:

Port	Hook	SIP Registration	DND	Forward	Busy Forward	Delayed Forward
FXS1	On Hook	Registered	No	613		
FXS2	Off Hook	Registered	No		614	
FXS3	On Hook	Not Registered	No			
FXS4	On Hook	Registered	Yes			615
FXS...	...	...	...			

**TABLE 8: MAINTENANCE**

### Network Settings

<b>IP Address Mode</b>	Choose how the IP address obtained on the phone.	
<b>Preferred DNS Server</b>	Enter the preferred DNS server that should be used for DHCP and PPPoE.	
<b>DHCP Settings</b>	Host name (Option 12)	Specifies the name of the client. This field is optional but may be required by Internet Service Providers.
	DHCP Domain	Specifies the DHCP Domain. This value is optional, but may be required by Internet Service Providers.
	Vendor Class ID (Option 60)	Used by clients and servers to exchange vendor class ID.
<b>Static IP Settings</b>	Configure IP Address, Subnet Mask, Gateway, DNS Server 1, and DNS Server 2.	
<b>QoS Settings</b>	Layer 3 QoS	Defines the Layer 3 QoS parameter. This value is used for IP Precedence, Diff-Serv or MPLS.
	Layer 2 QoS 802.1Q/VLAN Tag	Value used for layer 2 VLAN tag. Default setting is <b>blank</b> .
	Layer 2 QoS 802.1p Priority Value	Assigns the priority value of the Layer 2 QoS packets. Valid range is 0 to 7.
<b>STUN Settings</b>	Use STUN	Yes or No. Default is <b>No</b> .
	STUN server	The IP address or Domain name of the STUN server. Only non-symmetric NAT routers work with STUN.

Number of STUN Response Misses Allowed	The Number of STUN response misses allowed before restarting DHCP. The minimum is 3 misses.
Keep-Alive Interval	Specifies in seconds how often the phone sends a blank UDP packet to the SIP server in order to keep the "ping hole" on the NAT router to open. The default is 20 seconds.

### Upgrade and Provisioning

<b>Lock Keypad Update</b>	If set to "Yes", the configuration update via keypad is disabled.
<b>Firmware Upgrade and Provisioning</b>	Specifies how firmware upgrading and provisioning request to be sent. There are three options to choose from: "Always Check for New Firmware", "Check New Firmware only when F/W pre/suffix changes", and "Always Skip the Firmware Check".
<b>XML Config File Password</b>	The password used for encrypting the XML configuration file using OpenSSL. This is required for the phone to decrypt the encrypted XML configuration file.
<b>HTTP/HTTPS User Name</b>	The user name needed to authenticate with the HTTP/HTTPS server.
<b>HTTP/HTTPS Password</b>	The password needed to authenticate with the HTTP/HTTPS server.
<b>Upgrade via</b>	Allows users to choose the firmware upgrade method via TFTP, HTTP or HTTPS.
<b>Firmware Server Path</b>	IP address or domain name of firmware server. That URL of the server that hosts the firmware release. The default server is: <b>fm.grandstream.com/gs</b>
<b>Config Server Path</b>	IP address or domain name of configuration server. The server hosts a copy of the configuration file to be installed on the gateway. The default server is: <b>fm.grandstream.com/gs</b>
<b>Firmware File Prefix</b>	Default is <b>blank</b> . If configured, GXW4248 will request firmware file with the prefix. This setting is useful for Internet Telephone Service Providers. End users should keep it blank.
<b>Firmware File Postfix</b>	Default is <b>blank</b> . This setting is useful for Internet Telephone Service Providers. End users should keep it blank.
<b>Config File Prefix</b>	Default is <b>blank</b> . This setting is useful for Internet Telephone Service Providers. End users should keep it blank.
<b>Config File Postfix</b>	Default is <b>blank</b> . This setting is useful for Internet Telephone Service Providers. End users should keep it blank.



<b>Allow DHCP Option 43 and Option 66 to Override Server</b>	If set to “Yes”, configuration and upgrade server’s information can be obtained using DHCP option 66 from DHCP server. This option specifies the URL of the tftp server. <b>Note:</b> If DHCP Option 66 is enabled, the gateway will attempt downloading a configuration file from the server URL provided by DHCP, even though <b>Config Server Path</b> is left blank.
<b>Automatic Upgrade</b>	Choose “Yes” to enable automatic upgrade and provisioning. When set to No, GXW4248 will only do upgrade once at boot up. When “Check every day” or “Check every week” is checked, user can specify “Hour of the day (0-23)” or “Day of the week (0-6)”. Default time is Monday 1AM.
<b>Authenticate Conf File</b>	If set to Yes, configuration file is authenticated before being accepted. This protects the configuration from unauthorized modifications.
<b>Firmware Key</b>	For firmware encryption. It should be 32-digit in Hexadecimal Representation. End user should keep it blank.

### Web/Telnet Access

<b>Web Port</b>	By default, HTTP uses port 80. This field is for customizable web port.
<b>Disable Telnet</b>	If set to Yes, telnet access will be disabled. Default is <b>No</b> .
<b>User Password</b>	Set new password for web GUI access as User. This field is case sensitive with a maximum length of 30 characters.
<b>Admin Password</b>	Set new password for web GUI access as Admin. This field is case sensitive with a maximum length of 30 characters.

### TR-069

<b>ACS URL</b>	URL of the TR-069 Auto Configuration Servers (e.g., http://acs.mycompany.com, or IP address).
<b>ACS Username</b>	User specify the ACS Username
<b>ACS Password</b>	User specify the ACS password
<b>Periodic Inform Enable</b>	Default is <b>No</b> . If set to YES, device will send inform packets to the ACS
<b>Periodic Inform Interval</b>	Frequency that the inform packets will be sent out to the ACS
<b>Connection Request Username</b>	The user name for the TR-069 Auto Configuration Server to connect to the phone.

<b>Connection Request Password</b>	The password for the TR-069 Auto Configuration Server to connect to the phone.
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### Security Settings

<b>SIP TLS Certificate</b>	The GXW4248 supports SIP over TLS. It has built-in private key and SSL certificate. The user specified SSL certificate used for SIP over TLS is in X.509 format.
<b>SIP TLS Private Key</b>	You may also customize the SIP TLS Private Key. The user specified SIP TLS private key used for SIP over TLS is in X.509 format.
<b>SIP TLS Private Key Password</b>	SSL Private key password used for SIP Transport in TLS/TCP.
<b>Primary RADIUS Server</b>	Remote Authentication Dial In User Service (RADIUS). GXW4248 supports RADIUS for authentication, authorization and billing purposes. Primary and secondary RADIUS server configurations are available to provide redundancy to this feature. In case Primary Radius server becomes unusable, RADIUS requests will be automatically sent to the secondary server. When at least one RADIUS server was configured, the device will allow users to make phone calls only after authorization from RADIUS server has been received. CDR (Call Detail Record) is also sent to the RADIUS server for billing purposes. RADIUS server can send requests to terminate calls when run out of pre-paid credit.
<b>Primary RADIUS Authentication Port</b>	Default is 1812. Specifies the port to be used for the Primary RADIUS Authentication.
<b>Primary RADIUS Account Port</b>	Default is 1813. Specifies the port to be used for the Primary RADIUS Account.
<b>Primary RADIUS Server Secret</b>	Specifies the secret string to be used to authenticate the RADIUS connection to the Primary Server. It should match RADIUS configuration.
<b>Secondary RADIUS Server</b>	Set the IP or FQDN of the Secondary RADIUS Server. In case Primary Radius server becomes unusable, secondary will take role of primary and will manage credit recourses in the network
<b>Secondary RADIUS Authentication Port</b>	Default is 1812. Specifies the port to be used for the Secondary RADIUS Authentication.

<b>Secondary RADIUS Account Port</b>	Default is 1813. Specifies the port to be used for the Secondary RADIUS Account.
<b>Secondary RADIUS Sever Secret</b>	Specifies the secret string to be used to authenticate the RADIUS connection to the Secondary Server. It should match RADIUS configuration.
<b>RADIUS Timeout</b>	Default is 2
<b>RADIUS Retry</b>	Default is 3
<b>Download Device Configuration</b>	Allows user to download and save a text file containing all the P values of each setting as configured at that point on the unit. (Note: For Security Reasons, all Passwords won't be Downloaded)

### Date and Time

<b>NTP Server</b>	URI or IP address of the NTP (Network Time Protocol) server. Used by the phone to synchronize the date and time. An extensive list of public NTP servers can be found at <a href="http://www.ntp.org">http://www.ntp.org</a>
<b>NTP Update Interval</b>	Defines the update interval( in minutes ) to obtain the date and time from the server.
<b>Time Zone</b>	Configures the date/time used on the phone according to the specified time zone.
<b>Self-Defined Time Zone</b>	This parameter allows the users to define their own time zone. For syntax and examples, please refer to user manual.

### Syslog

<b>Syslog Server</b>	The IP address or URL of System log server. The server collects system log information from the device.
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<b>Syslog Level</b>	<p>Select the GXW4248 to report the log level. Default is <b>NONE</b>. The level is one of DEBUG, INFO, WARNING or ERROR. Syslog messages are sent based on the following events:</p> <ol style="list-style-type: none"> <li>1. product model/version on boot up (INFO level)</li> <li>2. NAT related info (INFO level)</li> <li>3. sent or received SIP message (DEBUG level)</li> <li>4. SIP message summary (INFO level)</li> <li>5. inbound and outbound calls (INFO level)</li> <li>6. registration status change (INFO level)</li> <li>7. negotiated codec (INFO level)</li> <li>8. Ethernet link up (INFO level)</li> <li>9. SLIC chip exception (WARNING and ERROR levels)</li> <li>10. memory exception (ERROR level)</li> </ol> <p>The Syslog uses USER facility. In addition to standard Syslog payload, it contains the following components:</p> <p>GS_LOG: [device MAC address][error code] error message</p> <p><i>Example:</i> May 19 02:40:38 192.168.1.14 GS_LOG: [00:0b:82:00:a1:be][000] Ethernet link is up</p>
<b>Print SIP in Syslog</b>	<p>Enable or disable printing of full SIP messages in Syslog.</p>

**TABLE 9: ADVANCED SETTINGS**

<b>Ring Tones</b>	
<b>System Ring Cadence</b>	<p>Configuration option for all FXS ports ring cadence for all incoming calls. (Syntax: c=on1/off1-on2/off2-on3/off3; [...]) Default is set to c=2000/4000; (US standards)</p>

<b>Call Progress Tones</b>	<p>Using these settings, user can configure tone frequencies according to user preference. By default, the tones are set to North American frequencies. Frequencies should be configured with known values to avoid uncomfortable high pitch sounds. ON is the period of ringing (ON time in ms) while OFF is the period of silence. In order to set a continuous ring, OFF should be zero. Otherwise it will ring ON ms and a pause of OFF ms and then repeat the pattern.</p> <ul style="list-style-type: none"> <li>• “Dial tone”</li> <li>• “Ringback tone”</li> <li>• “Busy tone”</li> <li>• “Reorder tone”</li> <li>• “Confirmation tone”</li> <li>• “Call-Waiting tone”</li> </ul> <p>Please refer the document below to determine your local call progress tones:  <a href="http://www.itu.int/ITU-T/inr/forms/files/tones-0203.pdf">http://www.itu.int/ITU-T/inr/forms/files/tones-0203.pdf</a></p>
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### FXO Failover

<b>Failover to FXO Gateway</b>	Enable or disable the Failover FXO Gateway.
<b>FXO Gateway IP</b>	IP Address or URI of the FXO gateway.

### System Features

<b>Disable Direct IP Call</b>	Disables the Direct IP Call function. Default is “No”. If set to “Yes” direct IP-to-IP calling will not be supported.
<b>Disable SIP NOTIFY Authentication</b>	Disables challenging SIP NOTIFY reboot and resync messages.
<b>Disable Voice Prompt</b>	Disables the voice prompt configuration. Default is “No”. If set to “Yes” accessing integrated voice menu will be impossible.
<b>IVR Language</b>	Choose English, Chinese, or Spanish.

**TABLE 10: PROFILES**

### General Settings

<b>Profile Active</b>	When set to Yes, the SIP Profile is activated.
<b>SIP Server</b>	SIP Server’s IP address or Domain name provided by VoIP service provider.

<b>Failover SIP Server</b>	Failover SIP Server's IP address or Domain name provided by VoIP Service provider. This server will be used if the Primary SIP server becomes unavailable.
<b>Prefer Primary SIP Server</b>	Default is No. If set to yes it will register to Primary Server if registration with Failover server expires
<b>Outbound Proxy</b>	IP address or Domain name of Outbound Proxy, or Media Gateway, or Session Border Controller. Used by GXW4248 for firewall or NAT penetration in different network environments. If symmetric NAT is detected, STUN will not work and ONLY outbound proxy can correct the problem.

## Network Settings

<b>DNS Mode</b>	<p>One from the 3 modes available for "DNS Mode" configuration:</p> <ul style="list-style-type: none"> <li>-A Record (for resolving IP Address of target according to domain name)</li> <li>-SRV (DNS SRV resource records indicates how to find services for various protocols)</li> <li>-NAPTR/SRV (Naming Authority Pointer according to RFC 2915)</li> <li>-Use Configured IP (If selected, please fill in Primary IP, Backup IP 1 and Backup IP 2.)</li> </ul> <p>One mode can be chosen for the client to look up server.</p> <p>The default value is "A Record"</p>
<b>Primary IP</b>	Configures the primary IP address where the phone sends DNS query to when "Use Configured IP" is selected for DNS mode.
<b>Backup IP 1</b>	Configures the backup IP 1 address where the phone sends DNS query to when "Use Configured IP" is selected for DNS mode.
<b>Backup IP 2</b>	Configures the backup IP 2 address where the phone sends DNS query to when "Use Configured IP" is selected for DNS mode.
<b>NAT Traversal</b>	<p>This parameter defines whether the GXW4248 NAT traversal mechanism is activated or not. If activated (by choosing "Yes") and a STUN server is also specified, then the GXW4248 performs according to the STUN client specification. Under this mode, the embedded STUN client will detect if and what type of firewall/NAT is being used. If the detected NAT is a Full Cone, Restricted Cone, or a Port-Restricted Cone, the GXW4248 will use its mapped public IP address and port in all of its SIP and SDP messages.</p> <p>If the NAT Traversal field is set to "Yes" with no specified STUN server, the GXW4248 will periodically (every 20 seconds) send a blank UDP packet (with no payload data) to the SIP server to keep the "hole" on the NAT open.</p>
<b>Use NAT IP</b>	The NAT IP address used in SIP/SDP messages. It should ONLY be used if required by your ITSP.

<b>Proxy-Require</b>	A SIP Extension to notify the SIP server that the phone is behind a NAT/Firewall.
<b>SIP Settings - Basic Settings</b>	
<b>SIP transport</b>	User can select UDP or TCP or TLS. Please make sure you're SIP Server or network environment supports SIP over the selected transport method. Default is UDP.
<b>SIP Registration</b>	This parameter controls whether the GXW4248 needs to send REGISTER messages to the proxy server. The default setting is "Yes".
<b>Unregister on Reboot</b>	Default is <b>No</b> . If set to "Yes", the SIP user's registration information is cleared on reboot.
<b>Outgoing Calls Without Registration</b>	<p>Default is <b>No</b>. If set to "Yes," user can place outgoing calls even when not registered (if allowed by Internet Telephone Service Provider) but is unable to receive incoming calls.</p> <p>Any port, member of a Hunting Group that is not registered with a SIP account, will be able to place outbound calls using the SIP credentials of the primary Hunting Group port.</p> <p><u>For example:</u> Port 1, 3 and 5 are members of the same Hunting Group. Port 1 is registered with a SIP account. Ports 3 and 5 are not registered. Ports 3 and 5 will be able to place outbound calls using the SIP account of port 1, even if <b>Outgoing Call without Registration</b> is set to No</p>
<b>Register Expiration</b>	Allows the user to specify the time frequency (in minutes) for the GXW4248 to refresh its registration with the specified registrar. The default interval is 60 minutes (or 1 hour). The maximum interval is 65535 minutes (about 45 days).
<b>SIP Registration Failure Retry Wait Time</b>	Allows the user to specify the time frequency (in seconds) for the GXW4248 to re-register after registration failure. The default interval is 20 seconds. The maximum interval is 3600 seconds (1 hour).
<b>Reregister Before Expiration</b>	Determines how many seconds before the previous registration expires that the port should reregister.
<b>Local SIP Port</b>	Defines the local SIP port the GXW4248 will listen and transmit. The default value for Profile 1 is 5060 and 6060 for Profile 2.
<b>Use Random SIP Port</b>	Default is <b>No</b> . If set to Yes, the device will pick randomly-generated SIP ports. This is usually necessary when multiple GXW4248/HT50X are behind the same NAT.
<b>SIP T1 Timeout</b>	T1 is an estimate of the round-trip time between the client and server transactions. If the network latency is high, select larger value for more reliable usage.
<b>SIP T2 Timeout</b>	Maximum retransmission interval for non-INVITE requests and INVITE responses.

<b>Remove OBP from Route Header</b>	Default is <b>No</b> . If set to Yes, the Outbound Proxy will be removed from the route header.
<b>Support SIP Instance ID</b>	Default is <b>Yes</b> . If set to Yes, the contact header in REGISTER request will contain SIP Instance ID as defined in IETF SIP Outbound draft.
<b>Refer-To Use Target Contact</b>	Default is <b>No</b> . If set to YES, then for Attended Transfer, the “Refer-To” header uses the transferred target’s Contact header information.
<b>SUBSCRIBE for MWI</b>	Default is <b>No</b> . When set to “Yes” a SUBSCRIBE for Message Waiting Indication will be sent periodically.
<b>Enable 100rel</b>	Enables the use of PRACK (Provisional Acknowledgment) method.
<b>TEL URI</b>	The default setting is “Disabled”. If the phone has an assigned PSTN Number, this field should be set to “User=Phone” then a “User=Phone” parameter will be attached to the “From header” in the SIP request to indicate the E.164 number. If server supports TEL URI format, then this option needs to be selected.

### SIP Settings - Session Timer

<b>Session Expiration</b>	<p>Grandstream implemented SIP Session Timer. The session timer extension enables SIP sessions to be periodically “refreshed” via a SIP request (UPDATE, or re-INVITE. When the session interval expires, if there is no refresh via a UPDATE or re-INVITE message, the session will be terminated.</p> <p>Session Expiration is the time (in seconds) at which the session is considered timed out, if no successful session refresh transaction occurs beforehand. The default value is <b>180 seconds</b>.</p>
<b>Min-SE</b>	The minimum session expiration (in seconds). The default value is <b>90 seconds</b> .
<b>Caller Request Timer</b>	If selecting “Yes” the phone will use session timer when it makes outbound calls if remote party supports session timer.
<b>Callee Request Timer</b>	If selecting “Yes” the phone will use session timer when it receives inbound calls with session timer request.
<b>Force Timer</b>	<p>If selecting “Yes” the phone will use session timer even if the remote party does not support this feature. Selecting “No” will allow the phone to enable session timer only when the remote party support this feature.</p> <p>To turn off Session Timer, select “No” for Caller Request Timer, Callee Request Timer, and Force Timer.</p>



<b>UAC Specify Refresher</b>	As a Caller, select UAC to use the phone as the refresher, or UAS to use the Callee or proxy server as the refresher.
<b>UAS Specify Refresher</b>	As a Callee, select UAC to use caller or proxy server as the refresher, or UAS to use the phone as the refresher.
<b>Force INVITE</b>	Session Timer can be refreshed using INVITE method or UPDATE method. Select “Yes” to use INVITE method to refresh the session timer.

### SIP Settings - Security Settings

<b>Validate Incoming Messages</b>	Defines whether the incoming messages will be validated.
<b>Check SIP User ID for Incoming INVITE</b>	If set to "Yes", SIP User ID will be checked in the Request URI of the incoming INVITE. If it doesn't match the phone's SIP User ID, the call will be rejected. Direct IP calling will also be disabled.
<b>Accept Incoming SIP from Proxy Only</b>	If set to "Yes", SIP User ID will be checked in the Request URI of the incoming INVITE. If it doesn't match the phone's SIP User ID, the call will be rejected. Direct IP calling will also be disabled.
<b>Authenticate Incoming INVITE</b>	If set to "Yes", the phone will challenge the incoming INVITE for authentication with SIP 401 Unauthorized response.

### Fax Settings

<b>Fax Mode</b>	T.38 (Auto Detect) FoIP by default, or Pass-Through (must use codec PCMU/PCMA)
<b>Fax Tone Detection Mode</b>	Default is <b>Callee</b> . This decides whether Caller or Callee sends out the re-INVITE for T.38 or Fax Pass Through.
<b>Send Re-INVITE After Fax Completion</b>	Default is <b>No</b> , If set to “Yes”, device will send an INVITE with audio vocoders upon completion of Fax to continue session in audio only.
<b>Send Re-INVITE After Fax Tone</b>	If set to “Yes”, device will send an Re-INVITE after Fax tone is detected, disabling will only work under Broadsoft feature.
<b>Enable Silence Detection for Fax Disconnect</b>	For fax machines that do not send a Disconnect when fax is done. This option Enables/Disables the detection of silence in order to know the fax has finished. The silence period is non-configurable and fixed to 7 seconds.

### Audio Settings

<b>Preferred DTMF method (in listed order)</b>	The GXW4248 supports up to 3 different DTMF methods including in-audio, via RTP (RFC2833) and via Sip Info. The user can configure DTMF method in a priority list.
<b>Disable DTMF Negotiation</b>	Default is <b>No</b> . If set to yes, use above DTMF order without negotiation
<b>DTMF Payload Type</b>	Sets the payload type for DTMF using RFC2833.
<b>Preferred Vocoder</b>	The GXW4248 supports up to 5 different Vocoder types including G.711 A-/U-law, G.726 (Supports bit rates 16, 24, 32 and 40), G.723.1, G.729A/B, iLBC. The user can configure Vocoders in a preference list that will be included with the same preference order in SDP message. The first Vocoder is entered by choosing the appropriate option in “Choice 1”. The last Vocoder is entered by choosing the appropriate option in “Choice 8”.
<b>Voice Frames per TX</b>	Number of the frame size when it transmits. Default is <b>2</b> , from 1 -4 for G711/G726/G729
<b>G723 Rate</b>	Defines the encoding rate for G.723 vocoder. By default, 6.3kbps rate is chosen.
<b>G726-32 Packing Mode</b>	Choose the packing mode for G726-32
<b>iLBC Frame Size</b>	Sets the iLBC frame size in 20ms or 30ms
<b>iLBC Payload type</b>	Default value is <b>97</b> . Defines payload type for iLBC. The valid range is between 96 and 127.
<b>AAL2-G726-16 Payload type</b>	Default value is <b>100</b> . Range is from 96 to 127.
<b>AAL2-G726-24 Payload type</b>	Default value is <b>99</b> . Range is from 96 to 127.
<b>AAL2-G726-32 Payload type</b>	Default value is <b>104</b> . Range is from 96 to 127.
<b>AAL2-G726-40 Payload type</b>	Default value is <b>103</b> . Range is from 96 to 127.
<b>Use First Matching Vocoder in 200OK SDP</b>	Default is <b>No</b> . If set to “Yes”, device will include only the first match vocoder in its 200OK response, otherwise it will include all match vocoders in same order received in INVITE.

<b>SRTP Mode</b>	<p>Default is <b>Disabled</b>. Other options are <b>Enabled but not forced</b>, and <b>Enabled and forced</b>.</p> <p>It uses SDP Security Description to exchange key. Please refer</p> <p>SDES: <a href="http://www.apps.ietf.org/rfc/rfc4568.html">http://www.apps.ietf.org/rfc/rfc4568.html</a></p> <p>SRTP: <a href="http://www.apps.ietf.org/rfc/rfc3711.html">http://www.apps.ietf.org/rfc/rfc3711.html</a></p>
<b>Silence Suppression (VAD)</b>	<p>Default is <b>No</b>. VAD allows detecting the absence of audio and conserve bandwidth by preventing the transmission of "silent packets" over the network.</p>
<b>Jitter Buffer Type</b>	<p>Select either Fixed or Adaptive based on network conditions.</p>
<b>Jitter Buffer Length</b>	<p>Select Low, Medium or High based on network conditions.</p> <ul style="list-style-type: none"> <li>• High (initial 200ms, min 40ms, max 600ms) Note: not all vocoders can meet the high requirement</li> <li>• Medium (initial 100ms, min 20ms, max 200ms)</li> <li>• Low (initial 50ms, min 10ms, max 100ms)</li> </ul>
<b>SLIC Setting</b>	<p>Depends on standard phone type (and location)</p>
<b>Caller ID Scheme</b>	<p>Select the value according to the local Telco standard where the GXW4248 is installed.</p> <p>Please refer to the pull down list to select.</p>
<b>Polarity Reversal</b>	<p>Default is <b>No</b>. If set to "Yes", polarity will be reversed upon call establishment and termination.</p>
<b>Loop Current Disconnect</b>	<p>Set to Yes if the traditional PBX you are using with GXW4248 uses this method for signaling call termination. Default is <b>No</b>.</p>
<b>Loop Current Disconnect duration</b>	<p>Default is <b>200</b>. In 100 - 1 0000 milliseconds range.</p>
<b>Enable Hook Flash</b>	<p>If no, flash will be treated as an on hook event.</p>
<b>Hook Flash timing (Minimum)/ (Maximum)</b>	<p>Sets the minimum/maximum time the phone is on hook before being detected as a hook flash. The range is 40 to 2000 milliseconds</p>
<b>On Hook Timing</b>	<p>Sets the time required to detect that the phone is on hook. The range is 40 to 2000 milliseconds. Default is 400 milliseconds.</p>

<b>Gain</b>	Handset volume adjustment. RX is for receiving volume (direction FXS→to analog phone), TX is for transmission volume (Analog phone→ to FXS). Default values are <b>0dB</b> for both parameters. Loudest volume: +6dB Lowest volume: -6dB.
<b>Disable Line Echo Canceller (LEC)</b>	Default is <b>No</b> . If set to “Yes”, device will not use LEC to remove echo from a voice communication.
<b>SLIC Setting</b>	Depends on standard phone type (and location)
<b>Caller ID Scheme</b>	Select the value according to the local Telco standard where the GXW4248 is installed. Please refer to the pull down list to select.
<b>Call Settings</b>	
<b>Early Dial</b>	<p>Default is <b>No</b>. Use only if proxy supports 484 response. This parameter controls whether the phone will send an early INVITE each time a key is pressed when a user dials a number. If set to “Yes”, an INVITE is sent using the dial-number collected thus far; Otherwise, no INVITE is sent until the “(Re-)Dial” button is pressed or after about 5 seconds have elapsed if the user forgets to press the “Re-Dial” button. The “Yes” option should be used <b>ONLY</b> if there is a SIP proxy configured and the proxy server supports 484 Incomplete Address response. Otherwise, the call will likely be rejected by the proxy (with a 404 Not Found error).</p> <p><u><i>This feature is NOT designed to work with and should NOT be enabled for direct IP-to-IP calling.</i></u></p>
<b>Dial Plan Prefix</b>	Sets the prefix added to each dialed number.

## Dial Plan

### Dial Plan Rules:

1. Accept Digits: 1,2,3,4,5,6,7,8,9,0 , \*, #, A,a,B,b,C,c,D,d
2. Grammar: x - any digit from 0-9;
  - a. xx+ - at least 2 digits number;
  - b. xx. – at least 2 digits number;
  - c. ^ - exclude;
  - d. [3-5] - any digit of 3, 4, or 5;
  - e. [147] - any digit 1, 4, or 7;
  - f. <2=011> - replace digit 2 with 011 when dialing
  - g. <=1> - add a leading 1 to all numbers dialed, vice versa will remove a 1 from the number dialed
  - h. | - or

• **Example 1:** {[369]11 | 1617xxxxxxx} –

Allow 311, 611, 911, and any 10 digit numbers of leading digits 1617

• **Example 2:** {^1900x+ | <=1617>xxxxxxx} –

Block any number of leading digits 1900 and add prefix 1617 for any dialed 7 digit numbers

• **Example 3:** {1xxx[2-9]xxxxxx | <2=011>x+} –

Allow any length of number with leading digit 2 and 10 digit-numbers of leading digit 1 and leading exchange number between 2 and 9; If leading digit is 2, replace leading digit 2 with 011 before dialing.

3. Default: Outgoing - {x+}

#### Example of a simple dial plan used in a Home/Office in the US:

```
{ ^1900x. | <=1617>[2-9]xxxxxx | 1[2-9]xx[2-9]xxxxxx | 011[2-9]x. | [3469]11 }
```

#### **Explanation** of example rule (reading from left to right):

- **^1900x.** - prevents dialing any number started with 1900
- **<=1617>[2-9]xxxxxx** - allows dialing to local area code (617) numbers by dialing 7 numbers and 1617 area code will be added automatically
- **1[2-9]xx[2-9]xxxxxx** |- allows dialing to any US/Canada Number with 11 digits length
- **011[2-9]x.** - allows international calls starting with 011

**[3469]11** - allow dialing special and emergency numbers 311, 411, 611 and 911

**Note:** In some cases user wishes to dial strings such as \*123 to activate voice mail or other application provided by service provider. In this case \* should be predefined inside dial plan feature and the Dial Plan will be: **{ [x\*]+ }**.

<b>Use # as Dial Key</b>	Allows users to configure the “#” key as the “Send” (or “Dial”) key. If set to “Yes”, “#” will send the number. In this case, this key is essentially equivalent to the “Dial” key. If set to “No”, this “#” key can be included as part of number.
<b>No Key Entry Timeout</b>	Default is <b>4 seconds</b> . Call will be completed within this time interval if no additional key entry occurs.
<b>Off-Hook Auto-Dial Delay</b>	Determines how many seconds after off-hook to wait before autodialing the extension set under Advanced Port Settings. The range is 0 to 60 seconds.
<b>Enable Call Features</b>	Default is <b>Yes</b> . (If Yes, call features using star codes will be supported locally)
<b>Disable Call Waiting</b>	Default is <b>No</b> . If set to <b>YES</b> Call Waiting indication information will not be provided to analog phone connected to this FXS port.
<b>Disable Call Waiting Caller ID</b>	Default is <b>No</b> . If set to <b>YES</b> Call Waiting caller ID will not be provided to analog phone connected to this FXS port.
<b>Disable Call Waiting Tone</b>	Default is <b>No</b> . This is to disable the stutter Call Waiting Tone when a Call Waiting call arrives. The CWCID will still be displayed.
<b>Disable Receiver Offhook Tone</b>	Default is <b>No</b> . If <b>YES</b> , ROH tone will not be played after off hook for 60 seconds.
<b>Disable Reminder Ring for On-Hold Call</b>	Default is <b>No</b> . This is to disable the Reminder Ring that is played when a call is waiting on hold and the analog phone goes on-hook.
<b>Disable Visual MWI</b>	Visual message indicator is a special on-hook caller ID type message that enables and disables the message waiting light on certain phones. GXW4248 has this feature enabled by default. However, certain phones (rare) that do not support it may mistakenly treat this CID signal as an incoming call. A configuration option is needed to turn on MWI in this case.
<b>Visual MWI Type</b>	This is the type of signal sent to the analog phone to make it turn the lamp ON upon receiving a Voice mail. Check the phone's manual to find out what signal is supported, FSK (default) or Neon.
<b>Transfer on Conference Hangup</b>	Defines whether the call is transferred to the other party if the conference initiator hangs up.
<b>Disable Bellcore-style 3-Way Conference</b>	Disable Bellcore-style 3-Way Conference

<b>Send Hook Flash Event</b>	Default is <b>No</b> . If set to yes, flash will be sent as a DTMF event.
<b>Ring Timeout</b>	Incoming call will stop ringing when not picked up given a specific period of time.
<b>Delayed Call Forward Wait Timeout</b>	Default value is <b>20 seconds</b> . In case this feature activated using * codes (*92 code), the call will be forwarded after this preconfigured amount of time.
<b>Send Anonymous</b>	If this parameter is set to "Yes", the "From" header along with Privacy and P_Asserted_Identity headers in outgoing INVITE message will be set to anonymous, blocking Caller ID.
<b>Anonymous Call Rejection</b>	Default is <b>No</b> . If set to Yes, incoming calls with anonymous Caller ID will be rejected with 486 Busy message.
<b>Hunting Group Type</b>	Linear and Circular. Linear style will sort the call to the lowest-numbered available line, this is also called "serial hunting". Circular style will distribute the calls "round-robin". If a call is assigned to line 1, the next call goes to 2 and the next to 3. The succession throughout each of the lines continues even if one of the previous lines becomes available. When the end of the hunt group is reached, the hunting starts over at the first line. Lines are skipped if they are still busy on a previous call. These two hunting styles can be configured from the Profile_x page.
<b>Hunting Group Ring Timeout</b>	Default is <b>20 seconds</b> . If call is not answered within this designated time period, the call will be forwarded to the next member of a Hunt Group.
<b>Special Feature</b>	Default is <b>Standard</b> . Choose the selection to meet some special requirements from Softswitch vendors. Example of vendors - CBCOM, RNK.

## Ring Tones

<b>Distinctive Ringtone</b>	<p>Custom Ring Tone 1 to 3 with associate Caller ID: when selected, if Caller ID is configured, then the device will ONLY uses this ring tone when the incoming call is from the Caller ID. System Ring Tone is used for all other calls. When selected but no Caller ID is configured, the selected ring tone will be used for <b>all</b> incoming calls. Distinctive ring tones can be configured not only for matching whole number, but also for matching prefixes. In this case symbol * (star) will be used.</p> <p>If server supports Alert-Info header and standard ring tone set (Bellcore) or distinctive ring tone 1-10 is specified, then the ring tone in the Alert-Info header from server will be used.</p> <p><b>For example:</b></p> <p>If configured as *617, Ring Tone 1 will be used in case of call arrived from Massachusetts. Any other incoming call will ring using cadence defined in parameter System Ring Cadence located under Advanced Settings Configuration page.</p>
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**Ring Tones**

Configure ring cadences according to preference.



**TABLE 11: FXS PORTS**

<b>Port Settings</b>	SIP User ID	User account information, provided by VoIP service provider (ITSP). Usually in the form of digit similar to phone number or actually a phone number.
	Authenticate ID	SIP service subscriber's Authenticate ID used for authentication. Can be identical to or different from SIP User ID.
	Password	SIP service subscriber's account password for GXW4248 to register to (SIP) servers of ITSP.
	Name	Any name to identify this specific user.
	Profile	Select the corresponding Profile ID (1/2/3/4)
	Enable FXS (TR-069)	Enable or disable the FXS port.
<b>Advanced Port Settings</b>	Offhook Auto-dial	Configure an auto dial number when offhook.
	Hunting Group	Assign this port to a certain hunting group
<b>FXO Mapping</b>	Map to FXO Port #	This is used only when peering with a Grandstream GXW410x. Default 1, Supported values are 1-8, meaning line 1 to 8 of the GXW410x device where the port will be mapped to.
	Map to FXO Gateway IP	This is used when peering with an FXO gateway of any brand. You have to specifically mention the IP and sip port where call will be sent to.
	And Port	Sip port that will be annexed to the IP address above.

## SAVING THE CONFIGURATION CHANGES

After user makes a change to the configuration, press the "Update" button in the Configuration Menu. The web browser will then display a message window to confirm saved changes.

Grandstream recommends reboot or power cycle the gateway after saving changes.

## REBOOTING FROM REMOTE

Press the "Reboot" button at the bottom of the configuration menu to reboot the phone remotely. The web

browser will then display a message window to confirm that reboot is underway. Wait 30 seconds to log in again.

## CONFIGURATION THROUGH A CENTRAL SERVER

Grandstream GXW4248 can be automatically configured from a central provisioning system.

When GXW4248 boots up, it will send TFTP or HTTP/HTTPS requests to download configuration files, “cfg000b82xxxxx” and “cfg00082xxxxx.xml”, where “000b82xxxxx” is the LAN MAC address of the GXW4248. If the download of “cfgxxxxxxxxxxx.xml” is not successful, the provision program will issue request a generic configuration file “cfg.xml”. Configuration file name should be in lower case letters.

The configuration data can be downloaded via TFTP or HTTP/HTTPS from the central server. A service provider or an enterprise with large deployment of GXW4248 can easily manage the configuration and service provisioning of individual devices remotely from a central server.

Grandstream provides a central provisioning system GAPS (Grandstream Automated Provisioning System) to support automated configuration of Grandstream devices. GAPS uses enhanced (NAT friendly) TFTP or HTTP (thus no NAT issues) and other communication protocols to communicate with each individual Grandstream device for firmware upgrade, remote reboot, etc.

Grandstream provides GAPS service to VoIP service providers. Use GAPS for either simple redirection or with certain special provisioning settings. At boot-up, Grandstream devices by default point to Grandstream provisioning server GAPS, based on the unique MAC address of each device, GAPS provision the devices with redirection settings so that they will be redirected to customer’s TFTP or HTTP/HTTPS server for further provisioning.

Grandstream also provides configuration tools (Windows and Linux/Unix version) to facilitate the task of generating device configuration files. The Grandstream configuration tools are free to end users. The configuration tools and configuration templates are available for download from <http://www.grandstream.com/support/tools> .

## SOFTWARE UPGRADE

Software upgrade can be done via either TFTP or HTTP/HTTPS. The corresponding configuration settings are in the ADVANCED SETTINGS configuration page.

### FIRMWARE UPGRADE THROUGH TFTP/HTTP/HTTPS

To upgrade via TFTP or HTTP/HTTPS, the “Firmware Upgrade and Provisioning upgrade via” field needs to be set to TFTP HTTP or HTTPS, respectively. “Firmware Server Path” needs to be set to a valid URL of a TFTP or HTTP server, server name can be in either FQDN or IP address format. Here are examples of some valid URL.

**e.g.** firmware.mycompany.com:6688/Grandstream/1.0.7.6

**e.g.** firmware.grandstream.com

#### NOTES:

- Firmware upgrade server in IP address format can be configured via IVR. Please refer to the CONFIGURATION GUIDE section for instructions. If the server is in FQDN format, it must be set via the web configuration interface.
- Grandstream recommends end-user use the Grandstream HTTP server. Its address can be found at <http://www.grandstream.com/support/firmware> . Currently the HTTP firmware server URL is firmware.grandstream.com. For large companies, we recommend to maintain their own TFTP/HTTP/HTTPS server for upgrade and provisioning procedures.
- Once a “Firmware Server Path” is set, user needs to update the settings and reboot the device. If the configured firmware server is found and a new code image is available, the GXW will attempt to retrieve the new image files by downloading them into the GXW420x 's SRAM. During this stage, the GXW's LEDs will blink until the checking/downloading process is completed. Upon verification of checksum, the new code image will then be saved into the Flash. If TFTP/HTTP/HTTPS fails for any reason (e.g. TFTP/HTTP/HTTPS server is not responding, there are no code image files available for upgrade, or checksum test fails, etc), the GXW will stop the TFTP/HTTP/HTTPS process and simply boot using the existing code image in the flash.
- Firmware upgrade may take as long as 15 to 30 minutes over Internet, or just 5 minutes if it is performed on a LAN. It is recommended to conduct firmware upgrade in a controlled LAN environment if possible. For users who do not have a local firmware upgrade server, Grandstream provides a NAT-friendly TFTP server on the public Internet for firmware upgrade.

- Grandstream's latest firmware is available <http://www.grandstream.com/support/firmware> .  
*Oversea users are strongly recommended to download the binary files and upgrade firmware locally in a controlled LAN environment.*
- Alternatively, user can download a free TFTP or HTTP server and conduct local firmware upgrade. A free windows version TFTP server is available for download from <http://support.solarwinds.net/updates/New-customerFree.cfm>. Our latest official release can be downloaded from <http://www.grandstream.com/y-firmware.htm>.

### **INSTRUCTIONS FOR LOCAL FIRMWARE UPGRADE:**

1. Unzip the file and put all of them under the root directory of the TFTP server.
2. Put the PC running the TFTP server and the GXW4248 device in the same LAN segment.
3. TFTP server's security settings should be changed from "Receive Only" to "Transmit Only" for the firmware upgrade.
4. Configure the Firmware Server Path with the IP address of the PC
5. Update the change and reboot the unit.

### **CONFIGURATION FILE DOWNLOAD**

Grandstream SIP Device can be configured via Web Interface as well as via Configuration File through TFTP or HTTP/HTTPS. "Config Server Path" is the TFTP or HTTP/HTTPS server path for configuration file. It needs to be set to a valid URL, either in FQDN or IP address format. The "Config Server Path" can be same or different from the "Firmware Server Path".

A configuration parameter is associated with each particular field in the web configuration page. A parameter consists of a Capital letter P and 1 to 3 (Could be extended to 4 in the future) digit numeric numbers. i.e., P2 is associated with "Admin Password" in the ADVANCED SETTINGS page. For a detailed parameter list, please refer to the corresponding firmware release configuration template.

When a Grandstream device boots up or reboots, it will issue a request for a configuration file "cfgxxxxxxxxxxx", where "xxxxxxxxxxx" is the MAC address of the device, i.e., "cfg000b820102ab". In addition, device will also requests a XML configuration file "cfgxxxxxxxxxxx.xml". If the download of "cfgxxxxxxxxxxx.xml" is not successful, the provision program will issue a request for a generic configuration file "cfg.xml". Configuration file name should be in lower case letters.

## FIRMWARE AND CONFIGURATION FILE PREFIX AND POSTFIX

Firmware Prefix and Postfix allows device to download the firmware name with the matching Prefix and Postfix. This makes it possible to store ALL of the firmwares with different version in one single directory. Similarly, Config File Prefix and Postfix allows device to download the configuration file with the matching Prefix and Postfix. Thus multiple configuration files for the same device can be stored in one directory.

In addition, when the field “Check New Firmware only when F/W pre/suffix changes” is selected, the device will only issue firmware upgrade request if there are changes in the firmware Prefix or Postfix.

## MANAGING FIRMWARE AND CONFIGURATION FILE DOWNLOAD

When “Automatic Upgrade” is set to “Yes”, Service Provider can use P193 to have the devices periodically check with either Firmware Server or Config Server, whenever they are defined. This allows the device periodically check whether there is any new changes need to be taken, similar to the AntiVirus Software to upgrade the Virus Definition files. Screenshot is below:

Automatic Upgrade:

- No  Yes, every  minutes(60-5256000).
- Yes, daily at hour  (0-23).  Yes, weekly on day  (0-6).

## RESTORE FACTORY DEFAULT SETTING

### FACTORY RESET

**WARNING!** Restoring the Factory Default Setting will DELETE all configuration information of the phone. Please BACKUP or PRINT out all the settings before you approach to following steps. Grandstream will not take any responsibility if you lose all the parameters of setting and cannot connect to your VoIP service provider.

There are two (2) methods for resetting your unit:

### RESET BUTTON

Reset default factory settings following these four (4) steps:

1. Unplug the Ethernet cable.
2. Locate a needle-sized hole on the back panel of the gateway unit next to the power connection.
3. Insert a pin in this hole, and press for more than 4 seconds.
4. Take out the pin. All unit settings are restored to factory settings.

### IVR COMMAND

Reset default factory settings using the IVR Prompt (Table 5):

1. Dial “\*\*\*\*” for voice prompt.
2. Enter “099” and wait for “reset” voice prompt.
3. Enter the encoded MAC address (Look below on how to encode MAC address).
4. Wait 15 seconds and device will automatically reboot and restore factory settings.

### Encode the MAC Address

1. Locate the MAC address of the device. It is the 12 digit HEX number on the bottom of the unit.
2. Key in the MAC address. Use the following mapping:  
0-9: 0-9

- A: 22 (press the “2” key twice, “A” will show on the LCD)
- B: 222
- C: 2222
- D: 33 (press the “3” key twice, “D” will show on the LCD)
- E: 333
- F: 3333

*For example:* if the MAC address is 000**b**8200**e**395, it should be keyed in as “000**222**8200**333**395”.

**NOTE:**

1. Factory Reset will be disabled if the “**Lock keypad update**” is set to “Yes”.
2. If still have difficulties to get access to the device, pushing the reset button during booting up will trigger the **RECOVERY MODE**, and device will use static IP 192.168.1.234/24. You may need a direct connection to access the configuration page.



## FCC Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### FCC 15.105 Class B

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a

particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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