

# User Manual

BudgeTone-100 Series

IP Phone

For Firmware Version 1.0.8.32



Grandstream Networks, Inc.

[www.grandstream.com](http://www.grandstream.com)

 **GRANDSTREAM NETWORKS**  
Grandstream Innovative IP Telephony

## Table of Contents

<b>1</b>	<b>WELCOME</b>	<b>- 4 -</b>
<b>2</b>	<b>INSTALLATION</b>	<b>- 5 -</b>
2.1	INTERCONNECTION DIAGRAM	- 6 -
<b>3</b>	<b>WHAT IS INCLUDED IN THE PACKAGE</b>	<b>- 7 -</b>
3.1	SAFETY COMPLIANCES	- 7 -
3.2	WARRANTY	- 7 -
<b>4</b>	<b>PRODUCT OVERVIEW</b>	<b>- 8 -</b>
4.1	KEY FEATURES	- 8 -
4.2	HARDWARE SPECIFICATIONS	- 9 -
<b>5</b>	<b>BASIC OPERATIONS</b>	<b>- 11 -</b>
5.1	GET FAMILIAR WITH LCD/LED	- 11 -
5.2	GET FAMILIAR WITH KEYPAD	- 12 -
5.3	MAKE PHONE CALLS	- 14 -
5.3.1	<i>Make Calls using Numbers</i>	- 14 -
5.3.2	<i>Make Calls using IP Address</i>	- 14 -
5.3.3	<i>Answer an Incoming Call</i>	- 15 -
5.3.4	<i>Handset Mode, Speakerphone/Headset Mode</i>	- 15 -
5.3.5	<i>Call Hold</i>	- 15 -
5.3.6	<i>Call Waiting and Call Flashing</i>	- 15 -
5.3.7	<i>Call Transfer</i>	- 16 -
5.3.8	<i>Conference Call</i>	- 17 -
5.4	CALL FEATURES	- 18 -
<b>6</b>	<b>CONFIGURATION GUIDE</b>	<b>- 19 -</b>
6.1	CONFIGURATION WITH KEYPAD	- 19 -
6.2	CONFIGURATION WITH WEB BROWSER	- 23 -
6.2.1	<i>Access the Web Configuration Menu</i>	- 23 -
6.2.2	<i>Configuration Menu</i>	- 24 -
6.2.3	<i>Saving the Configuration Changes</i>	- 38 -
6.2.4	<i>Rebooting the Phone from Remote</i>	- 39 -
6.3	CONFIGURATION THROUGH A CENTRAL SERVER	- 40 -
<b>7</b>	<b>SOFTWARE UPGRADE</b>	<b>- 41 -</b>
7.1	UPGRADE THROUGH HTTP	- 41 -
7.2	UPGRADE THROUGH TFTP	- 41 -
7.3	FIRMWARE AND CONFIGURATION FILE PREFIX AND POSTFIX	- 43 -

7.4	MANAGING FIRMWARE AND CONFIGURATION FILE DOWNLOAD	- 43 -
<b>8</b>	<b>RESTORE FACTORY DEFAULT SETTING</b>	<b>- 44 -</b>
<b>9</b>	<b>HEADSET CONNECTION</b>	<b>- 45 -</b>
<b>10</b>	<b>GLOSSARY OF TERMS</b>	<b>- 48 -</b>

# 1 Welcome

Congratulations on becoming an owner of BudgeTone-100 IP telephone! You made an excellent choice and we hope you will enjoy all its capabilities.

Grandstream's award-winning BudgeTone-100 series of SIP phones are innovative IP telephones that offer a rich set of functionality and superb sound quality at ultra-affordable price. They are fully compatible with SIP industry standard and can interoperate with many other SIP compliant devices and software on the market.

Grandstream BudgeTone-100 IP telephone has been awarded the Best of Show product in 2003 Internet Telephony Conference and Expo.

This document is subject to changes without notice. The latest electronic version of this user manual can be downloaded from Grandstream Networks' official website:

[http://www.grandstream.com/user\\_manuals/budgetone100.pdf](http://www.grandstream.com/user_manuals/budgetone100.pdf)



## 2 Installation

BudgeTone-100 series IP phones are designed to look and feel like standard telephones. The following photo illustrates the appearance of a BudgeTone IP phone and the use of its key buttons.

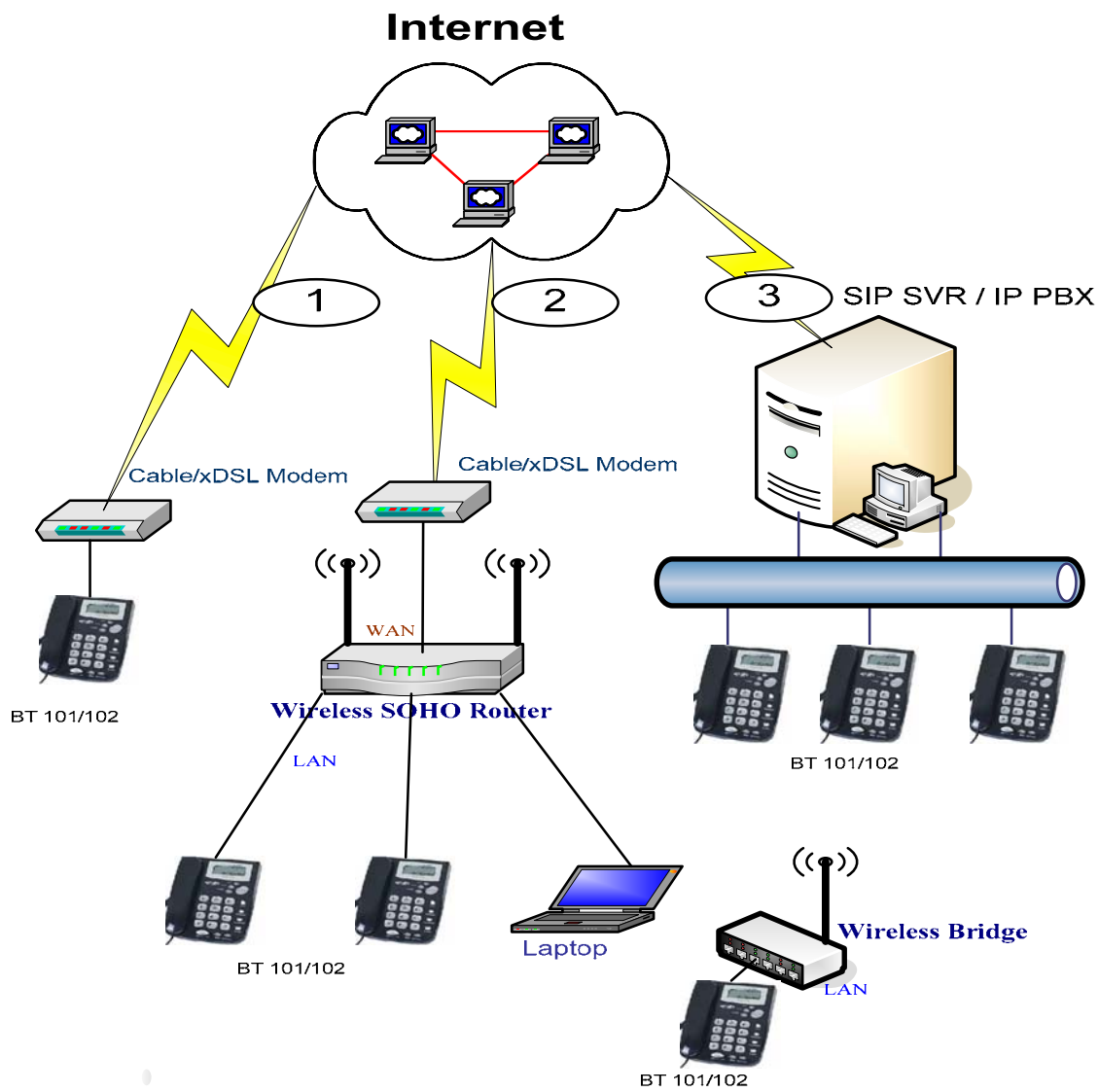


## 2.1 Interconnection Diagram

There are several ways to connect the BT100 series IP telephone:

1. Connected directly behind Cable/DSL modem
2. Connected to LAN side of a (wireless) SOHO router (*This is the most popular connection*).
3. Connected to an Ethernet network

Following diagram illustrates the interconnection of phones in above-mentioned networks:



## 3 What is Included in the Package

The BudgeTone-100 phone package contains:

- 1) One BudgeTone-100 phone
- 2) One universal power adaptor
- 3) One Ethernet cable

### 3.1 Safety Compliances

The BudgeTone-100 phone is compliant with various safety standards including FCC/CE. Its power adaptor is compliant with UL standard. The phone should only operate with the universal power adaptor provided with the package. Damages to the phone caused by using other unsupported power adaptors would not be covered by the manufacturer's warranty.

### 3.2 Warranty

Grandstream has a reseller agreement with our reseller customer. End user should contact the company from whom you purchased the product for replacement, repair or refund.

If you purchased the product directly from Grandstream, contact your Grandstream Sales and Service Representative for a RMA (Return Materials Authorization) number.

Grandstream reserves the right to remedy warranty policy without prior notification.

***Warning: Please do not attempt to use a different power adaptor. Using other power adaptor may damage the BudgeTone-100 IP telephone and will void the manufacturer warranty.***

***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.***

Information in this document is subject to change without notice. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose without the express written permission of Grandstream Networks, Inc..

---

## 4 Product Overview

Grandstream IP Phone is a next generation IP network telephone based on industry open standard SIP (Session Initiation Protocol). Built on innovative technology, Grandstream IP Phone features market leading superb sound quality and rich functionalities at mass-affordable price.

### 4.1 Key Features

- Support SIP 2.0 (RFC 3261), TCP/UDP/IP, RTP/RTCP, HTTP, ICMP, ARP/RARP, DNS, DHCP, NTP, PPPoE, STUN, TFTP, etc.
- Powerful Digital Signal Processing (DSP) technology to ensure superior audio quality
- Advanced and patent pending adaptive jitter buffer control, packet delay and loss concealment technology
- Support various codecs including G.711 (PCM a-law and u-law), G.723.1 (5.3K/6.3K), G.729A, G.726 (32K) and iLBC
- Support standard voice features such as numeric Caller ID Display, Call Waiting, Hold, Transfer, Forward, 3-Way Conference, in-band and out-of-band DTMF, off hook autodial, auto answer.
- Support syslog, full duplex hands-free speakerphone, redial, call log, volume control, voice mail with indicator, downloadable ring tones.
- Support Silence Suppression, VAD (Voice Activity Detection), CNG (Comfort Noise Generation), Line Echo Cancellation (G.168), and AGC (Automatic Gain Control)
- Support standard encryption and authentication (DIGEST using MD5, MD5-sess)
- Support for Layer 2 (802.1Q VLAN, 802.1p) and Layer 3 QoS (ToS, DiffServ, MPLS)
- Support automated NAT traversal without manual manipulation of firewall/NAT
- Provide easy configuration through manual operation (phone keypad), Web interface or automated centralized configuration file via TFTP or HTTP.
- Support firmware upgrade via TFTP or HTTP.



## 4.2 Hardware Specifications

There are two models in the BudgeTone-100 family, namely:

BudgeTone-101

BudgeTone-102 (As show in the below picture)



The ONLY difference between BT101 and BT102 is that the two RJ-45 ports of BT102 is actually a 10Base-T **mini-Hub** that allows user to share or sniff the network using another data device like PC.

The table below describes the difference among these models.

<b><u>Model</u></b>	<b><u>BudgeTone-101</u></b>	<b><u>BudgeTone-102</u></b>
LAN interface	1xRJ45 10Base-T	2xRJ45 10Base-T
Phone Case	25-button keypad 12-digit caller ID LCD	25-button keypad 12-digit caller ID LCD
Headset Plug	3.5 mm	3.5 mm
Universal Switching Power Adaptor	Input: 100-240VAC Output: +5VDC, 400mA, UL certified	Same as left
Dimension	18cm (W) 22cm (D) 6.5cm (H)	Same as left
Weight	2 lbs (0.9 kg)	Same as left
Operating Temperature	32 - 104°F 0 - 40°C	Same as left
Humidity	10% - 95% (non-condensing)	Same as left
Compliance	FCC/CE/C-Tick	Same as left






## 5 Basic Operations


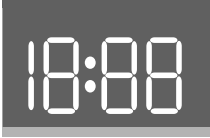

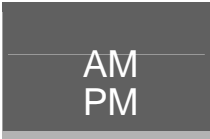


### 5.1 Get Familiar with LCD/LED

BudgeTone-100 phone has a numeric LCD of 64mmx24mm size with backlight. The new model (which is shipping now) has a small red LED status reminder. Here is the display when all segments illuminate:



When the phone is in the normal idle state, the backlight is off. Whenever an event (call) occurs, the backlight and the red LED will turn on automatically to bring the user’s attention. In addition, if Voice Mail configured and there is a VM waiting, the backlight will be blinking and the red LED message light will light up to remind user there is a Voice Mail in the Voice Mail server.

Icon	LCD Icon Definitions
	<p>Network Status Icon:                      FLASH in the case of Ethernet link failure or the phone is not registered properly.                      OFF if IP address or SIP server is not found                      ON if IP address and SIP server are located</p>
	<p>Phone Status Icon:                      OFF when the handset is on-hook                      ON when the handset is off-hook</p>
	<p>Speakerphone/Headset Status Icon:                      FLASH when phone rings                      OFF when the speakerphone/headset is off                      ON when the speakerphone/headset is on</p>

	Handset and Speakerphone/Headset Volume Icons: 0-7 scales to adjust handset / speakerphone volume
	Real-time Clock: Synchronized to Internet time server Time zone configurable via web browser
	Call Logs: 01-10 for <i>CALLED</i> history (dialed number) 01-10 for <i>CALLERS</i> history (Incoming caller ID)
	Time Icon: AM for the morning PM for the afternoon
	IP Address Separator Icons:
	Numerical Numbers and Characters: 0 - 9 * = L # = J A, b, C, c, d, E, F, G, g, H, h, I, L, n, O, o, P, q, r, S, t, U, u, Y

## 5.2 Get Familiar with Keypad

BudgeTone-100 phone has a 25-button keypad.

Key Button	Key Button Definitions
0 - 9, *, #	Digit, star and pound keys are usually used to make phone calls
↓	<ol style="list-style-type: none"> <li>1) Reduce handset, speakerphone/headset volume after off hook the phone via handset or speaker</li> <li>2) Reduce ring tone volume when phone in IDLE and off hook to confirm the changed ring tone volume</li> <li>3) Next menu item browsing when phone is in IDLE mode after MENU key pressed, off hook to interrupt and exit</li> </ol>

↑	<p>1) Increase handset, speakerphone/headset volume after off hook the phone via handset or speaker</p> <p>2) Increase ring tone volume when phone in IDLE and off hook to confirm the changed ring tone volume</p> <p>3) Previous menu item browsing when phone is in IDLE mode after MENU key pressed, off hook to interrupt and exit</p>
<b>MENU</b>	Enter keypad MENU mode when phone is in IDLE mode. It is also the ENTER key once entering MENU
<b>CALLED</b>	After off hook, press to display the dialed numbers. When number displayed, press the SEND key can make call using that displayed number
<b>CALLERS</b>	After off hook, press to display the incoming Caller IDs. When number displayed, press the SEND key can make call using that displayed number
<b>MESSAGE</b>	Enter to retrieve voice mails from Voice Mail Portal or Server
<b>HOLD</b>	Temporarily hold the active call
<b>TRANSFER</b>	Transfer the active call to another party
<b>CONFERENCE</b>	Establish 3-way conferencing call
<b>FLASH</b>	Flash event to switch between two lines
<b>MUTE/DEL</b>	Mute an active call; or Delete a key entry, call log etc
<b>SEND/(RE)DIAL</b>	Dial a new number inputted or Redial the number last dialed. After entering the phone number, pressing this key would force a call to go out immediately before timeout
<b>SPEAKERPHONE</b>	Enter hands-free mode

## 5.3 Make Phone Calls

### 5.3.1 Make Calls using Numbers

There are three ways to make phone calls:

1. Pick up handset or press SPEAKERPHONE button, and then enter the phone numbers
2. Press the SEND button directly to redial the number last called.  
Once pressed, the last dialed number will be displayed on the LCD as the corresponding DTMF tones are played out and an outgoing call is sent.
3. Browse the CALLED/CALLER history and press the SEND/REDIAL button.  
Pick up the handset or press the speakerphone button, then press the “CALLED/CALLERS” button to browse thru the last 10 numbers dialed out. Once the desired number is identified and displayed on the LCD screen, press the SEND button and a new call to that displayed number will be sent out immediately.

Examples:

- To dial another extension on the same proxy, such as 1008, simply pick up handset or press speakerphone, dial 1008 and then press the “SEND” button.
- To dial a PSTN number such as 6266667890, you might need to enter in some prefix number followed by the phone number. Please check with your VoIP service provider to get the information. If your phone is assigned with a PSTN-like number such as 6265556789, most likely you just follow the rule to dial 16266667890 as if you were calling from a regular analog phone, followed by pressing the “SEND” button.

### 5.3.2 Make Calls using IP Address

Direct IP calling allows two parties, that is, a BudgeTone phone and another VoIP Device, to talk to each other in an ad hoc fashion without a SIP proxy. This kind of VoIP calls can be made between two parties if:

- Both BudgeTone phone and other VoIP Device (i.e., another IP Phone or BudgeTone SIP phone or other VoIP unit) have public IP addresses, or
- Both BudgeTone phone and other VoIP Device are on the same LAN using private or public IP addresses, or
- Both BudgeTone phone and other VoIP Device can be connected through a router using public or private IP addresses (with necessary port forwarding or DMZ).

To make a direct IP to IP call, first off hook, then press “MENU” key, then enter a 12-digit target IP address to make the call. If port is not default 5060, destination ports can be specified by using “\*4” (encoding for “:”) followed by the port number.

Examples:

- If the target IP address is 192.168.0.10, the dialing convention is  
**MENU\_key 192 168 000 010**  
followed by pressing the “SEND” key or wait for seconds in the No Key Entry Timeout.
- If the target IP address/port is 192.168.1.20:5062, then the dialing convention would be:  
**MENU\_key 192168001020\*45062**  
followed by pressing the “SEND” key wait for seconds in the No Key Entry Timeout.

### **5.3.3 Answer an Incoming Call**

There are two ways to answer an incoming call:

1. Pick up the handset to answer the call normally using handset, or
2. Press the SPEAKERPHONE button to answer in speakerphone or headset mode

### **5.3.4 Handset Mode, Speakerphone/Headset Mode**

Handset mode and Speakerphone/Headset mode cannot be enabled at the same time. Pressing the hook-switch or Speakerphone button would toggle the phone between these two modes.

### **5.3.5 Call Hold**

While in conversation, pressing the “Hold” button will put the remote end on hold. Pressing the “Hold” button again will release the previously Hold state and resume the bi-directional media.

### **5.3.6 Call Waiting and Call Flashing**

If call waiting feature is enabled, while the user is in a conversation, he will hear a special stutter tone if there is another incoming call. User then can press FLASH button to put the current call party on hold automatically and switch to the other call. Pressing flash button toggles between two active calls.

### 5.3.7 Call Transfer

Two transfer operations are supported.

#### 5.3.7.1 Blind Transfer

User can transfer an active call to a third party without announcement.

User presses the “TRANSFER” button and if the other voice channel is available (i.e., there is no other active conversation besides the current one), user will hear a dial tone. User can then dial the third party’s phone number followed by pressing SEND button.

**NOTE:**

- *“Enable Call Feature” has to be configured to “Yes” in web configuration page in order to make the features to work.*

A can hold on to the phone and wait for one of the three following behaviors:

- A quick confirmation tone (temporarily using the call waiting indication tone) follows by a dial tone. This indicates the transfer has been successful. At this point, the user can either hang up or make another call.
- A quick busy tone followed by a restored call (On supported platforms only). This means the transfer has failed due to the failed response sent from server and the phone will try to recover the call. The busy tone is just to indicate to the transferor that the transfer has failed.
- Busy tone keeps playing. This means the phone has failed to receive the final response and decide to time out. Be advised that this does not indicate the transfer has been successful, nor does it indicate the transfer has failed.

#### 5.3.7.2 Attended Transfer

User can transfer an active call to a third party with announcement.

User presses the “FLASH” button and hears a dial tone, then dial the third party’s phone number followed by pressing “SEND” button. If the call is answered, press “TRANSFER” to complete the transfer operation and hand up, if the call is not answered, pressing “FLASH” button to resume the original call.

**NOTE:**

- *When Attended Transfer failed, if A hangs up, the BudgeTone phone will ring user A back again to remind A that B is still on the call. A can pick up the phone to restore conversation with B.*



### **5.3.8 Conference Call**

BudgeTone 100 phone supports 3-way conference.

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

1. A presses the “CONFERENCE” button to get a dial tone and put B on hold
2. A dials C’s number then “SEND” key to make the call
3. If C answers the call, then A presses “CONFERENCE” button to bring B, C in the conference.
4. If C does not answer the call, A can press FLASH back to talk to B.

**NOTE:**

- *During the conference, if B or C drops the call, the remaining two parties can still talk. However, if A the conference initiator hangs up, all calls will be terminated.*

## 5.4 Call Features

Following table shows the available call features of BudgeTone 100 by using keypad star(\*) code, if the VoIP service provider supports these call features in the server side:

Key	Call Features
*30	Block CallerID (for all-config change)
*31	Send CallerID (for all-config change)
*67	Block CallerID (per call base)
*82	Send CallerID (per call base)
*50	Disable Call Waiting (for all-config change)
*51	Enable Call Waiting (for all-config change)
*70	Disable Call Waiting. (Per Call)
*71	Enable Call Waiting (Per Call)
*72	Unconditional Call Forward. To use this feature, dial “*72” and get the dial tone. Then dial the forward number followed by pressing “SEND” button and hear dial tone again to confirm the forward, then hang up.
*73	Cancel Unconditional Call Forward To cancel “Unconditional Call Forward”, dial “*73” and get the dial tone to confirm the cancel, then hang up.
*90	Busy Call Forward To use this feature, dial “*90” and get the dial tone. Then dial the forward number followed by pressing “SEND” button and hear dial tone again to confirm the forward, then hang up.
*91	Cancel Busy Call Forward To cancel “Unconditional Call Forward”, dial “*91” and get the dial tone to confirm the cancel, then hang up
*92	Delayed Call Forward To use this feature, dial “*92” and get the dial tone. Then dial the forward number followed by pressing “SEND” button and hear dial tone again to confirm the forward, then hang up.
*93	Cancel Delayed Call Forward To cancel this Forward, dial “*93” and get the dial tone to confirm the cancel, then hang up
Flash or Hook Flash	When in conversation, this action will switch to the new incoming call if user hears the call waiting sound. When in conversation and no other incoming call, this action will switch to a new channel for a new call.

## 6 Configuration Guide

### 6.1 Configuration with Keypad

When the phone is IDLE or On Hook, press the *MENU* button to enter key pad menu state. When the phone goes off-hook or a call comes in, the phone automatically exits the key pad menu state and prepare for the call. It also exits the key pad menu state if left idle for 20 seconds.

Here are the key pad menu options supported:

Menu Item	Menu Functions
1	Display “[1] <b>dhcP On</b> ” or “[1] <b>dhcP OFF</b> ” for the current selection Press <i>MENU</i> key to enter edit mode Press ‘↓’ or ‘↑’ to toggle the selection Press <i>MENU</i> to save and exit Must recycle power to take effective!!!
2	Display “[2] <b>IP Addr</b> ” Press <i>MENU</i> to display the current IP address Enter new IP address if DHCP is OFF Press ‘↓’ or ‘↑’ to exit Press <i>MENU</i> to (save and) exit Must recycle power to take effective!!!
3	Display “[3] <b>SubNet</b> ” Press <i>MENU</i> to display the Subnet mask Enter new Subnet mask if DHCP is OFF Press ‘↓’ or ‘↑’ to exit Press <i>MENU</i> to (save and) exit Must recycle power to take effective!!!
4	Display “[4] <b>router</b> ” Press <i>MENU</i> to display the Router/Gateway address Enter new Router/Gateway address if DHCP is OFF Press ‘↓’ or ‘↑’ to exit Press <i>MENU</i> to (save and) exit Must recycle power to take effective!!!

Menu Item	Menu Functions
5	Display “[5] dnS ” Press <i>MENU</i> to display the DNS address Enter new DNS address if DHCP is OFF Press ‘↓’ or ‘↑’ to exit Press <i>MENU</i> to (save and) exit Must recycle power to take effective!!!
6	Display “[6] tFtP ” Press <i>MENU</i> to display the TFTP address Enter new TFTP server IP address Press <i>MENU</i> to save Press ‘↓’ or ‘↑’ to exit
7	Display “[7] G-711u 2” Press <i>MENU</i> to select new codec Press ‘↓’ or ‘↑’ to browse a list of available codecs line 1 “ - G-711A 2” 2 “ - G-722 2” 3 “ - G-723 1” 4 “ - G-726 2” 5 “ - G-728 8” 6 “ - G-729 2” 7 “ - iLBC 1” Press 1 to 9 to indicate number of frames per TX packet Press <i>MENU</i> to save and exit Must recycle power to take effective!!!
8	Display “[8] SIP SP-1” Reserve for future products.

Menu Item	Menu Functions
9	<p>Display “[9] codE rEL”                      Press <i>Menu</i> to display the code releases                      Press ‘↓’ or ‘↑’ to browse                      line 1 “<b>b</b> 2006-03-06” – date: <i>boot</i> code                      2 “ 1. 0. 8. 11” – version: <i>boot</i> code                      3 “<b>P</b> 2006-09-14” – date: <i>phone</i> code                      4 “ 1. 0. 8. 32” – version: <i>phone</i> code                      5 “<b>c</b> 2005-03-05” – date: <i>codec</i>                      6 “ 1. 0. 1. 0” – version: <i>codec</i>                      7 “<b>h</b> 2006-09-14” – date: <i>web</i> server                      8 “ 1. 0. 8. 32” – version: <i>web</i> server                      9 “1<b>r</b> 2004-05-12” – date: 1<sup>st</sup> <i>ring</i> tone                      10 “ 1. 0. 0. 0” – version: <i>ring</i> tone                      11 “2<b>r</b> 2005-07-21” – date: 2<sup>nd</sup> <i>ring</i> tone                      12 “ 1. 0. 0. 0” – version: <i>ring</i> tone                      13 “3<b>r</b> 0000-00-00” – date: 3<sup>rd</sup> <i>ring</i> tone                      14 “ 0. 0. 0. 0” – version: <i>ring</i> tone                      (all zeroes means unavailable or unsupported)                      Press <i>MENU</i> to exit</p>
10	<p>Display “[10] Phy Addr”                      Press <i>MENU</i> to display the physical / MAC address                      Press ‘↓’ or ‘↑’ to exit</p>
11	<p>Display “[11] ring 0”                      Press <i>MENU</i> to hear the selected ring tone, press ‘↓’ or ‘↑’ to select the stored ring tones. Now only 3 are available, ring 0 (default), ring 1 and ring 2. ring 3 is unavailable or unsupported.                      Press <i>MENU</i> to select and exit</p>
	<p>Display “ -- rESet --”, please be very <b>CAREFUL</b> here. Only shown when ‘↑’ key to pressed:</p> <ul style="list-style-type: none"> <li>• Key in the physical / MAC address on back of the phone, Press <i>MENU</i>, phone will be reset to <b>FACTORY DEFAULT</b> setting, and all your setting will be erased.</li> <li>• Press <i>MENU</i> key without key in anything, phone will function the same as power cycle or reboot. This is called soft reboot.</li> </ul>

Menu Item	Menu Functions
Others	<p>When phone is powered on and time is displayed</p> <ul style="list-style-type: none"><li>• Press ‘↓’ or ‘↑’, Display “ ring [4] ”, press ‘↓’ or ‘↑’ again to hear and adjust the ring tone volume, from 0 (off) to 7 (maximum), off and on hook to set</li><li>• Press “SPEAKERPHONE” button, or off hook and pick up handset, press ‘↓’ or ‘↑’ to adjust the speakerphone/headset or handset volume</li></ul>

## 6.2 Configuration with Web Browser

BudgeTone-100 series IP phone has an embedded Web server that will respond to HTTP GET/POST requests. It also has embedded HTML pages that allow a user to configure the IP phone through a Web browser such as Microsoft's IE or Mozilla's Firefox..

### 6.2.1 Access the Web Configuration Menu

The BudgeTone-100 IP Phone Web Configuration Pages can be accessed by input the phones IP into browser's URL address field like:

<http://Phone-IP-Address>

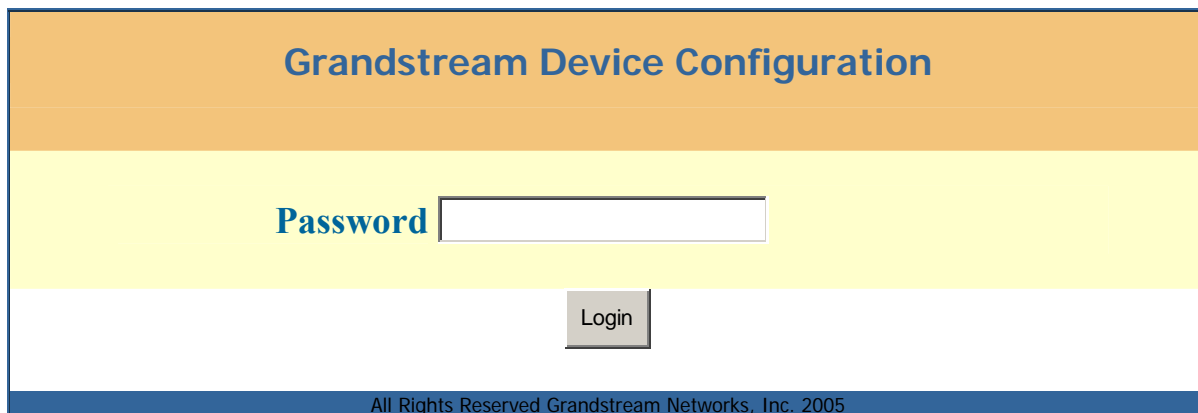
where the **Phone-IP-Address** is the IP address of the phone. There are two ways to retrieve this IP address from the phone:

- 1) When the phone is *off-hook* or in *speakerphone* mode, simply press *MENU* button. (*This is most common way to get the IP address of the phone*)
- 2) When the phone is on-hook, press *MENU* button and then the browsing arrow keys to “[2] IP Addr”, press *MENU* again.

#### NOTE:

- To type IP address into browser to bring up the configuration pages, please strip out the leading “0” as the browser will parse in octet. e.g.: if the IP address is: 192.168.001.014, please type in: 192.168.1.14.

Once the correct IP address of the phone is input into browser and “Enter” key pressed, the web log in page will come up like following:



Grandstream Device Configuration

Password

Login

All Rights Reserved Grandstream Networks, Inc. 2005

The password is case sensitive with maximum length of 25 characters. The factory default password for End User is “123”, for Administrator is “admin” respectively. Only administrator has the privilege to get access to “ADVANCED SETTINGS” configuration page.

**NOTE:**

- *If you cannot log into the configuration pages by using default password, please check with the VoIP service provider. Most likely, the service provider has already provisioned and automatically configured the device for you and has changed the default password.*

### 6.2.2 Configuration Menu

After input the correct password into the login screen, the embedded Web server of the IP phone will respond with the Configuration Pages screen, which is explained in details below.

- **Status Page:**

Grandstream Device Configuration	
STATUS	BASIC SETTINGS    ADVANCED SETTINGS
MAC Address:	00.0B.82.05.CA.91
IP Address:	192.168.1.101
Product Model:	BT100 REV 2.0
Software Version:	Program-- 1.0.8.32    Bootloader-- 1.0.8.11    HTML-- 1.0.8.32    VOC-- 1.0.1.0
System Up Time:	0 day(s) 18 hour(s) 1 minute(s)
Registered:	Yes
PPPoE Link Up:	disabled
NAT:	detected NAT type is full cone
NAT Mapped IP:	70.22.120.137
NAT Mapped Port:	60617
Total Inbound Calls:	7
Total Outbound Calls:	2
Total Missed Calls:	3
Total Call Time (in minutes):	19
Total SIP Message Sent:	428
Total SIP Message Received:	626
Total RTP Packet Sent:	38542
Total RTP Packet Received:	38514
Total RTP Packet Loss:	0



<b>MAC Address</b>	The device ID, in HEX format. This is very important ID for ISP troubleshooting.
<b>IP Address</b>	This field shows IP address of BudgeTone 100.
<b>Product Model</b>	This field contains the product model info. Like BT100 (4M, discontinued legacy product) or BT100 REV2.0 (8M RAM)
<b>Software Version</b>	<b>Program:</b> This is the main firmware release usually requested by support. <b>Bootloader:</b> This indicates bootloader version. <b>HTML:</b> This indicates the web interface version, normally not changed unless there is new parameter introduced in. <b>VOC:</b> This indicates the coder program version, normally not changed.
<b>System Uptime</b>	This shows system up time since last reboot.
<b>Registered</b>	This shows whether the unit is registered to VoIP service provider's server or proxy.
<b>PPPoE Link Up</b>	This shows whether the PPPoE is up if connected to DSL modem
<b>NAT</b>	This shows what kind of NAT the BudgeTone is behind if it is not in open interne, determined by STUN, usually is Full Cone, Port Restricted Cone etc., non-symmetric NAT if using general SOHO router. If symmetric NAT detected, STUN can NOT be used and Outbound Proxy (or Session Border Controller) is required to resolve the NAT issue.
<b>NAT Mapped IP</b>	WAN side public IP of the NAT router if phone connected to LAN port of the router
<b>Other Statistical Status of Phone</b>	Self-explainable, see the page displayed.

- **Basic Settings:**

Grandstream Device Configuration	
<b>STATUS</b> <b>BASIC SETTINGS</b> <b>ADVANCED SETTINGS</b>	
<b>End User Password:</b>	<input type="password"/> (purposely not displayed for security protection)
<b>IP Address:</b>	<input checked="" type="checkbox"/> dynamically assigned via DHCP (default) or PPPoE (will attempt PPPoE if DHCP fails and following is non-blank) <input type="checkbox"/> statically configured as: PPPoE account ID: <input type="text"/> PPPoE password: <input type="text"/> Preferred DNS server: <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> IP Address: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Subnet Mask: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Default Router: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> DNS Server 1: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> DNS Server 2: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<b>Time Zone:</b>	<input type="text" value="GMT-5:00 (US Eastern Time, New York)"/>
<b>Daylight Savings Time:</b>	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (if set to Yes, display time will be 1 hour ahead of normal time)
<b>Date Display Format:</b>	<input checked="" type="checkbox"/> Year-Month-Day <input type="checkbox"/> Month-Day-Year <input type="checkbox"/> Day-Month-Year
<input type="button" value="Update"/> <input type="button" value="Cancel"/> <input type="button" value="Reboot"/>	
All Rights Reserved Grandstream Networks, Inc. 2005	

<b>End user Password</b>	<p>This contains the password for end user to access the Web Configuration Menu. This field is case sensitive and maximum length is 25 characters. The default end user password is “123”.</p> <p>End user only has privilege to see the Status page and change parameters in Basic page. End user can NOT access to Advanced Settings pages and will get error message if try to.</p>
<b>IP Address</b>	<p>There are 2 modes under which the IP phone can operate:</p> <ul style="list-style-type: none"> <li>- If DHCP mode is enabled, then all the field values for the Static IP mode are not used (even though they are still saved in the Flash memory) and the IP phone will acquire its IP address from the first DHCP server it discovers on the LAN it attaches to.</li> <li>. PPPoE account settings are configured here if the user is connecting the IP phone directly to the DSL/ADSL modem. Users can specify DNS server manually by entering DNS server’s IP address. The IP Phone will attempt to establish a PPPoE session if PPPoE account is set. For most users, just leave them blank</li> <li>- If Static IP mode is selected, the IP address, Subnet Mask, Default Router IP address, DNS Server 1 (mandatory), DNS Server 2 (optional) fields need to be configured. These fields are set to zero by default.</li> </ul>
<b>Time zone</b>	Displayed date/time will be adjusted according to the specified time zone.
<b>Day light savings time</b>	Default NO. If set to Yes, then the displayed time will be 1 hour ahead of normal time.
<b>Date display format</b>	This parameter controls the date display format.

- **Advanced Settings:**

Grandstream Device Configuration	
<span style="background-color: #cccccc;">STATUS</span> <span style="background-color: #cccccc;">BASIC SETTINGS</span> <span style="background-color: #0056b3; color: white;">ADVANCED SETTINGS</span>	
<b>Admin Password:</b>	<input type="text"/> (purposely not displayed for security protection)
<b>SIP Server:</b>	<input type="text" value="abc.sipprovider.com"/> (e.g., sip.mycompany.com, or IP address)
<b>Outbound Proxy:</b>	<input type="text"/> (e.g., proxy.myprovider.com, or IP address, if any)
<b>SIP User ID:</b>	<input type="text" value="1003"/> (the user part of an SIP address)
<b>Authenticate ID:</b>	<input type="text" value="1003"/> (can be identical to or different from <b>SIP User ID</b> )
<b>Authenticate Password:</b>	<input type="text"/> (purposely not displayed for security protection)
<b>Name:</b>	<input type="text" value="Tom Smith"/> (optional, e.g., John Doe)
<b>Advanced Options:</b>	
<i>Preferred Vocoder:</i> (in listed order)	choice 1: <input type="text" value="G.729A/B"/> choice 2: <input type="text" value="iLBC"/> choice 3: <input type="text" value="G.723.1"/> choice 4: <input type="text" value="PCMU"/> choice 5: <input type="text" value="PCMA"/> choice 6: <input type="text" value="G.726-32"/> choice 7: <input type="text" value="G.722 (wide band)"/> choice 8: <input type="text" value="PCMA"/>
<b>G723 rate:</b>	<input checked="" type="checkbox"/> 6.3kbps encoding rate <input type="checkbox"/> 5.3kbps encoding rate
<b>iLBC frame size:</b>	<input checked="" type="checkbox"/> 20ms <input type="checkbox"/> 30ms
<b>iLBC payload type:</b>	<input type="text" value="97"/> (between 96 and 127, default is 97)
<b>Silence Suppression:</b>	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
<b>Voice Frames per TX:</b>	<input type="text" value="2"/> (up to 10/20/32/64 for G711/G726/G723/other codecs respectively)
<b>Layer 3 QoS:</b>	<input type="text" value="48"/> (Diff-Serv or Precedence value)
<b>Layer 2 QoS:</b>	802.1Q/VLAN Tag <input type="text" value="0"/> 802.1p priority value <input type="text" value="0"/> (0-7)
<b>Allow incoming SIP messages from SIP proxy only:</b>	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes

<i>Use DNS SRV:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes
<i>User ID is phone number:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes
<i>SIP Registration:</i>	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>Unregister On Reboot:</i>	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>Register Expiration:</i>	<input type="text" value="900"/> (in seconds, default 1 hour, max 45 days)
<i>Early Dial:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes (use "Yes" only if proxy supports 484 response)
<i>Allow outgoing call without Registration:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes
<i>Dial Plan Prefix:</i>	<input type="text"/> (this prefix string is added to each dialed number)
<i>No Key Entry Timeout:</i>	<input type="text" value="4"/> (in seconds, default is 4 seconds)
<i>Use # as Dial Key:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes (if set to Yes, "#" will function as the Dial key)
<i>local SIP port:</i>	<input type="text" value="5060"/> (default 5060)
<i>local RTP port:</i>	<input type="text" value="5004"/> (1024-65535, default 5004)
<i>Use random port:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes
<i>NAT Traversal:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes, STUN server is: <input type="text" value="stun.fw.dnet.net:3478"/> (URI or IP:port)
<i>keep-alive interval:</i>	<input type="text" value="20"/> (in seconds, default 20 seconds)
<i>Use NAT IP</i>	<input type="text"/> (if specified, this IP address is used in SIP/SDP message)
<i>Proxy-Require:</i>	<input type="text"/> (if specified, the content will appear in Proxy-Require header)
<i>Voice Mail UserID:</i>	<input type="text" value="8502"/> (User ID/extension for 3rd party voice mail system)
<i>SUBSCRIBE for MWI:</i>	<input checked="" type="checkbox"/> No, do not send SUBSCRIBE for Message Waiting Indication <input checked="" type="checkbox"/> Yes, send periodical SUBSCRIBE for Message Waiting Indication
<i>Auto Answer:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes
<i>Offhook Auto-Dial:</i>	<input type="text"/> (User ID/extension to dial automatically when offhook)
<i>Enable Call Features:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes (if Yes, Call Forwarding & Call-Waiting-Disable are supported locally)
<i>Disable Call-Waiting:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes

<i>Send DTMF:</i>	<input type="checkbox"/> in-audio <input checked="" type="checkbox"/> via RTP (RFC2833) <input type="checkbox"/> via SIP INFO
<i>DTMF Payload Type:</i>	<input type="text" value="101"/>
<i>Send Flash Event:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes (Flash will be sent as a DTMF event if set to Yes)
<i>Onhook Threshold:</i>	<input type="text" value="800 ms"/>
<i>NTP Server:</i>	<input type="text" value="time.nist.gov"/> (URI or IP address)
<i>Default Ring Tone:</i>	<input checked="" type="checkbox"/> system ring tone
	<input checked="" type="checkbox"/> custom ring tone 1, used if incoming caller ID is <input type="text"/>
	<input checked="" type="checkbox"/> custom ring tone 2, used if incoming caller ID is <input type="text" value="1001"/>
	<input checked="" type="checkbox"/> custom ring tone 3, used if incoming caller ID is <input type="text"/>
<i>Send Anonymous:</i>	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes (caller ID will be blocked if set to Yes)
<i>Anonymous Method:</i>	<input checked="" type="checkbox"/> Use From Header <input type="checkbox"/> Use Privacy Header
<i>Time to ring:</i>	<input type="text" value="60 seconds"/>
<i>Special Feature:</i>	<input type="text" value="Standard"/>
<i>Syslog Server:</i>	<input type="text"/>
<i>Syslog Level:</i>	<input type="text" value="NONE"/>
<i>Firmware Upgrade and Provisioning:</i>	Upgrade Via <input checked="" type="checkbox"/> TFTP <input checked="" type="checkbox"/> HTTP
	Firmware Server Path: <input type="text" value="fm.grandstream.com/gs"/>
	Config Server Path: <input type="text"/>
	Firmware File Prefix: <input type="text"/> Firmware File Postfix: <input type="text"/>
	Config File Prefix: <input type="text"/> Config File Postfix: <input type="text"/>
	Automatic Upgrade:
	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes, check for upgrade every <input type="text" value="10080"/> minutes (default 7 days)
	<input checked="" type="checkbox"/> Always Check for New Firmware
	<input checked="" type="checkbox"/> Check New Firmware only when F/W pre/suffix changes
	<input checked="" type="checkbox"/> Always Skip the Firmware Check

Firmware Key:	<input type="text"/>	(in Hexadecimal Representation)
Authenticate Conf File:	<input type="checkbox"/> No <input type="checkbox"/> Yes	(cfg file would be authenticated before acceptance if set to Yes)
Lock keypad update:	<input type="checkbox"/> No <input type="checkbox"/> Yes	(configuration update via keypad is disabled if set to Yes)
Allow conf SIP Account in Basic Settings:	<input type="checkbox"/> No <input type="checkbox"/> Yes	
Override MTU Size:	<input type="text" value="0"/>	
<input type="button" value="Update"/> <input type="button" value="Cancel"/> <input type="button" value="Reboot"/>		
All Rights Reserved Grandstream Networks, Inc. 2005		

<b>Admin Password</b>	Administrator password. Only administrator can configure the “Advanced Settings” page. Password field is purposely blanked for security reason after clicking update and saved. The maximum password length is 25 characters.
<b>SIP Server</b>	IP address or FQDN domain name provided by VoIP service provider. e.g., the following are some valid examples: sip.my-voip-provider.com or sip:my-company-sip-server.com or 192.168.1.200:5066 (where 5066 is the port number different to default 5060)
<b>Outbound Proxy</b>	IP address or FQDN domain name of Outbound Proxy (or called Media Gateway or Session Border Controller). Used by IP phone for firewall or NAT penetration in different network environment. If symmetric NAT is detected, STUN will not work and ONLY outbound proxy will provide solution for it.
<b>SIP User ID</b>	User account information, provided by VoIP service provider (ITSP), usually has the form of digits similar to phone number or actually a phone number
<b>Authentication ID</b>	ID used for authentication, usually same as SIP user ID, but could be different and decided by the ITSP
<b>Authenticate Password</b>	Account information, password for IP Phone to register to (SIP) servers of ITSP. Maximum length is 25 characters.
<b>Preferred Vocoder</b>	The BudgeTone IP phone supports up to 8 different codec types including G711-ulaw (PCMU), G711-alaw (PCMA), G723, G729A, G726-32 (ADPCM), G722, G728 and iLBC. A user can configure codecs in a preference list that will be included with the same preference order in SDP message. The first codec in this list can be entered by choosing the appropriate option in “Choice 1”. Similarly, the last codec in this list can be entered by choosing the appropriate option in “Choice 8”.
<b>G723 Rate:</b>	Encoding rate for G723 codec. By default, 6.3kbps rate is set.

<b>iLBC frame size</b>	iLBC packet frame size. Default is 20ms. For Asterisk IP-PBX, 30ms might need to be configured for compatibility
<b>iLBC payload type</b>	Payload type for iLBC. Default value is 97. The valid range is between 96 and 127.
<b>Silence Suppression</b>	This controls the silence suppression/VAD feature of G723 and G729. If set to “Yes”, when a silence is detected, small quantity of VAD packets (instead of audio packets) will be sent during the period of no talking. If set to “No”, this feature is disabled.
<b>Voice Frames per TX</b>	This field contains the number of voice frames to be transmitted in a single Ethernet packet (be advised the max. size of Ethernet packet is 1500 byte (or 120k bit) so user should be aware that there IS a limit there). When setting this value, the user should be aware of the requested packet time (ptime, used in SDP message) as a result of configuring this parameter. This parameter is associated with the first codec in the above codec Preference List or the actual used payload type negotiated between the 2 conversation parties at run time. e.g., if the first codec is configured as G723 and the “Voice Frames per TX” is set to be 2, then the “ptime” value in the SDP message of an INVITE request will be 60ms because each G723 voice frame contains 30ms of audio. Similarly, if this field is set to be 2 and if the first codec chosen is G729 or G711 or G726, then the “ptime” value in the SDP message of an INVITE request will be 20ms. If the configured voice frames per TX exceeds the maximum allowed value, the IP phone will use and save the maximum allowed value for the corresponding first codec choice. The maximum value for PCM is 10 (x10ms) frames; for G726, it is 20 (x10ms) frames; for G723, it is 32 (x30ms) frames; for G729/G728, 64 (x10ms) and 64 (x2.5ms) frames respectively. Please be very careful when message those parameters. By adjust this, user also get jitter buffer changed accordingly. BT-100 phone has patent dynamic jitter buffer handling algorithm. The jitter buffer range from 20 ~ 200 ms. Incorrect setting will affect voice quality so do not touch the parameter if not understand and most of the case the default value will work in GS products. Please refer to the Codec FAQ in our website for more technical details: <a href="http://www.grandstream.com/FAQ-Codec.pdf">http://www.grandstream.com/FAQ-Codec.pdf</a>
<b>Layer 3 QoS</b>	This field defines the layer 3 QoS parameter, which can be used for IP Precedence or Diff-Serv or MPLS. Default value is 48.
<b>Layer 2 QoS</b>	Layer 2 QoS settings. Default setting is blank or “0” Other VLAN supported equipments like VLAN switch/router required if user wants to configure these settings.
<b>Allow incoming SIP messages from SIP proxy only</b>	If set to “Yes”, the phone will ignore any SIP message that does not come from the IP address (Source IP in the IP header, the SIP server) that it is registered to. Default is No.



<b>Use DNS SRV</b>	Default is No. If set to Yes, the phone will use DNS SRV configured to lookup for the server
<b>Use ID is phone number</b>	If “Yes” is set, a “user=phone” parameter will be attached to the “From” header in SIP request, which will be processed by supported SIP proxy. Default is No.
<b>SIP registration</b>	This parameter controls whether the BudgeTone phone needs to send REGISTER messages to the proxy server. The default setting is “Yes”.
<b>Unregister On Reboot</b>	Default is No. If set to Yes, the phone will send “remove all register” request to the server (“*” in the contact header) to remove all previous bindings. If server does not support this it will cause some problems
<b>Register Expiration</b>	This parameter allows the user to specify the time frequency (in seconds) the IP phone will refresh its registration with the specified registrar (SIP Server). The default interval is 3600 seconds (or 1 hour). The maximum interval is 45 days.
<b>Early Dial</b>	Default setting is No. The “Yes” option should be used ONLY if there is a SIP proxy configured and the proxy server supports 484 Incomplete Address response (like Asterisk). Otherwise, the call will most likely be rejected by the proxy (with a 404 Not Found error). Please note that this feature is NOT designed to work with and should NOT be enabled for direct IP-to-IP calling.
<b>Allow outgoing call without Registration</b>	Default is No. If set to Yes, if ITSP permit, phone can make outgoing call even not registered. But can not get incoming calls. This feature is highly depended on ITSPs.
<b>Dial Plan Prefix</b>	Sets the prefix added to each dialed number. If configured, the prefix will be added to EVERY number input
<b>No key Entry Timeout</b>	Default is 4 seconds. User can short or extend that depends on digits dialed habit
<b>Use # as Dial Key</b>	This parameter allows the user to configure the “#” key to be used as the “SEND” key. Once set to “Yes”, pressing this key will immediately trigger the sending of dialed string collected so far. In this case, this “#” key is essentially equivalent to the “SEND” key. If set to “No”, this # key will then be included as part of the dial string to be sent out.
<b>Local SIP port</b>	This parameter defines the local SIP port the IP phone will listen and transmit on. The default value is 5060.

<b>Local RTP port</b>	This parameter defines the local RTP-RTCP port pair the IP phone will listen and transmit. It is the base RTP port for channel 0. When configured, channel 0 will use this port_value for RTP and the port_value+1 for its RTCP; channel 1 will use port_value+2 for RTP and port_value+3 for its RTCP. The default value is 5004.
<b>Use Random port</b>	Default No. If set to Yes, the device will pick randomly generated SIP and RTP ports. This is usually necessary and useful when multiple IP Phones are behind the same full cone NAT router.
<b>NAT Traversal</b>	Defines whether the NAT traversal mechanism is activated. It should be set to YES if the device is behind NAT router. If Outbound Proxy is NOT configured, STUN server needs to be set to activate STUN detection mechanism. Usually ITSP will provide these settings for device to work properly behind NAT/Firewall. If this field is set to “Yes” without STUN server, then the device will periodically (every <i>Keep-alive interval</i> ) send a dummy UDP packet to the SIP server to pinhole the NAT in the router side.
<b>Keep alive interval</b>	Default is 20 seconds. The interval of sending dummy UDP packet to keep NAT “pin hole” open in the router side. Min. value is 10 seconds.
<b>Use NAT IP</b>	NAT IP address (WAN side) used in SIP/SDP message. Default is blank.
<b>Proxy-Require</b>	SIP Extension to notify SIP server that the unit is behind the NAT/Firewall. Required by some soft switch vendor like Nortel MCS.
<b>Voice Mail User ID</b>	User ID (extension or access number) of a 3 <sup>rd</sup> party VoiceMail system where the user may have an account. By defining it, user presses the “MESSAGE” button on the phone, an INVITE message will send to that ID/number to allow the user to retrieve VM.
<b>Subscribe for MWI</b>	Default is No. When set to Yes, a SUBSCRIBE for Message Waiting Indication will be sent periodically to server. BT-100 support both synchronize and non-synchronized SUBSCRIBE SIP message.
<b>Auto Answer</b>	Default is No. When set to Yes, the phone will automatically pick up the call after a short beep and turn on the speaker.
<b>Offhook Auto-Dial</b>	This parameter allows the user to configure a User ID or extension number to be automatically dialed upon off hook (like hot line). Please note that only the user part of a SIP address needs to be entered here. The phone will automatically append the “@” and the host portion of the corresponding SIP address.
<b>Enable call features</b>	Default is Yes. Advance call features or feature codes functions (Star code, see Section 5.4 of this manual) are supported locally
<b>Disable Call Waiting</b>	Default is No. User can use * code to use this feature per call basis.

<b>Send DTMF</b>	This parameter specifies the mechanism to transmit DTMF digits. There are 3 modes supported: in audio, which means DTMF is combined in in-band audio signal (not very reliable with low-bit-rate codec); via RTP (RFC2833); or via SIP INFO. Make sure this setting is synchronized with SIP server otherwise will not work.
<b>DTMF Payload Type</b>	This parameter sets the payload type for DTMF using RFC2833. Default is 101.
<b>Send Flash Event</b>	Default is NO. If set to Yes, flash will be sent as DTMF event therefore the FLASH key to switch calls will NOT work.
<b>Onhook Threshold</b>	Time period when cradle pressed (Hook Flash) to simulate FLASH. Adjust this time value will prevent user on hook carelessly to activate Flash/Hold and cause the phone ring back. Default is 800ms.
<b>NTP server</b>	URI or IP address of the NTP (Network Time Protocol) server, which will be used by the phone to synchronize the date and time.
<b>Default Ring Tone</b>	<ul style="list-style-type: none"> <li>• By default “System Ring Tone” is selected. All calls received that do not match any “incoming caller ID” number will generate the selected ring tone - system, 1, 2 or 3.</li> <li>• The user can setup up one number on each of the ring tones 1, 2, and 3. When a call is received from one of these numbers, the respective ring tone will be generated.</li> <li>• If the ring tone does not exist, the system default ring tone will be played. For BT-100, ring 3 is not supported.</li> </ul>
<b>Send Anonymous</b>	If this parameter is set to “Yes”, user ID will be sent as anonymous, essentially block the Caller ID from displaying.
<b>Anonymous Method</b>	This is decided by supported SIP server/proxy. Either “Use From Header” or “Use Privacy Header” depends on how SIP sever/proxy process the SIP header.
<b>Time to ring</b>	Allow user to adjust the ring time of the phone. Default is 60 seconds.
<b>Special Feature</b>	Default is <b>Standard</b> . Choose the selection to meet some special requirements from Soft Switch vendors like Nortel, Sonus, Broadsoft, etc. End user please do not touch this parameter.
<b>Syslog Server</b>	The IP address or URL of System log server, especially useful for ITSP (Internet Telephone Service Provider). End user don’t encourage to touch this part.

**Syslog level**

Select the level for the phone to report the log messages. Default is NONE. Useful for ITSP.

The level is one of DEBUG, INFO, WARNING or ERROR.

Syslog messages are sent based on the following events:

- product model/version on boot up (INFO level)
- NAT related info (INFO level)
- sent or received SIP message (DEBUG level)
- SIP message summary (INFO level)
- inbound and outbound calls (INFO level)
- registration status change (INFO level)
- negotiated codec (INFO level)
- Ethernet link up (INFO level)
- SLIC chip exception (WARNING and ERROR levels)
- memory exception (ERROR level)

The Syslog uses USER facility. In addition to standard Syslog payload, it contains the following components:

GS\_LOG: [device MAC address][error code] error message

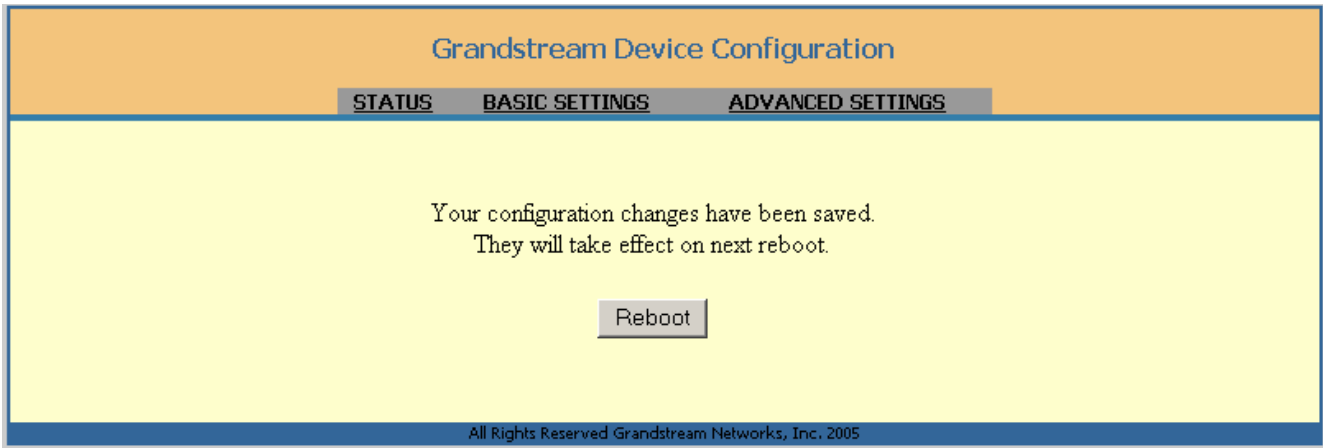
Here is an example: May 19 02:40:38 192.168.1.14 GS\_LOG: [00:0b:82:00:a1:be][000] Ethernet link is up

<p><b>Firmware Upgrade and Provisioning</b></p>	<p><b>Firmware upgrade and Provisioning can be done via either TFTP or HTTP. This is mutual exclusive choice. Default if HTTP.</b></p> <p>Via TFTP: <i>(default is pointing to Grandstream Firmware TFTP server)</i>  <b>The TFTP server needs to be configured. If it is non-zero or not blank, the IP phone will attempt to retrieve new configuration file or new firmware from the specified TFTP server at boot time. It will make up to 3 attempts before timeout and then it will start the boot process using the existing code image in the Flash memory.</b></p> <p><i>Be very careful when the TFTP is in progress (the phone’s LCD backlight will be ON). Do NOT interrupt the process (especially the power supply) otherwise might make the phone broken.</i></p> <p><i>Be patient as in some network environment this process will take up to 15 minutes.</i></p> <p>Via HTTP: <i>(default is pointing to Grandstream Firmware HTTP server)</i>  <b>The URI for the web server used for firmware upgrade and configuration. For example,</b>  <a href="http://provisioning.mycompany.com:6688/Grandstream/1.0.8.16">http://provisioning.mycompany.com:6688/Grandstream/1.0.8.16</a>  <b>Here “:6688” is the specific TCP port that the HTTP server is listening to, it can be omitted if using default port 80.</b></p>
<p><b>Firmware Server Path</b></p>	<p>IP address or domain name (URI) of firmware server. Default to Grandstream’s firmware server</p>
<p><b>Config Server Path</b></p>	<p>IP address or domain name (URI) of configuration server. Default to Grandstream’s server. It can be different with Firmware server.</p>
<p><b>Firmware File Prefix</b></p>	<p>Default blank. If configured, the phone will request the firmware file with the prefix.          Useful for provisioning of ITSPs. End user should keep it blank.</p>
<p><b>Firmware File Postfix</b></p>	<p>Default is blank. Similar to Prefix. End user should keep it blank.</p>
<p><b>Config File Prefix</b></p>	<p>Default is blank. The phone will request configure file prefix is configured. Used by ITSP for provisioning. End user should keep it blank.</p>
<p><b>Config File Postfix</b></p>	<p>Default is blank. End user should keep it blank.</p>

<b>Automatic Upgrade</b>	<p>Default is Yes. Choose Yes to enable automatic HTTP upgrade and provisioning.</p> <p>In “Check for upgrade every” field, enter the number of minutes to enable the phone to check the HTTP server for firmware upgrade or configuration changes in the defined period of time.</p> <p>When set to No, the phone will only do HTTP upgrade and configuration check once at boot up. Used by ITSP. End user should NOT touch these parameters.</p>
<b>Always Check for New Firmware</b>	<p>The phone will check for new firmware once reboot and also when the configured automatic upgrade time period comes</p>
<b>Check New Firmware only when F/W pre/suffix changes</b>	<p>The phone will check for new firmware once reboot and also when the configured automatic upgrade time period comes, upon detected the pre/suffix changes. Otherwise will quit the planed process.</p>
<b>Firmware Key</b>	<p>32 digits in Hexadecimal.</p> <p>Once configured, the firmware will ONLY be changed if the key is matched. This will lock the unit and firmware by ITSP.</p> <p>Useful for ITSP to encrypt firmware. End user should keep it blank.</p>
<b>Authenticate Conf File</b>	<p>Default No. Useful by ITSPs. End user should use default setting.</p> <p>Once configured, only authenticated configuration file will be used.</p>
<b>Lock keypad update</b>	<p>Default is No. The configuration update via keypad is disabled if set to Yes. User can not change settings via key pad and only WebUI and configuration file can be used to change setting if set to Yes. Be very careful for this setting</p>
<b>Allow conf SIP Account in Basic Settings</b>	<p>Default NO.</p> <p>If set to Yes, User ID, Authentication ID and Password can be configured in basic settings.</p> <p>This parameter is decided by related ITSP.</p>
<b>Override MTU Size</b>	<p>Override the MTU size to meet some special network settings.</p> <p>Default is “0”, means no override.</p>

### 6.2.3 Saving the Configuration Changes

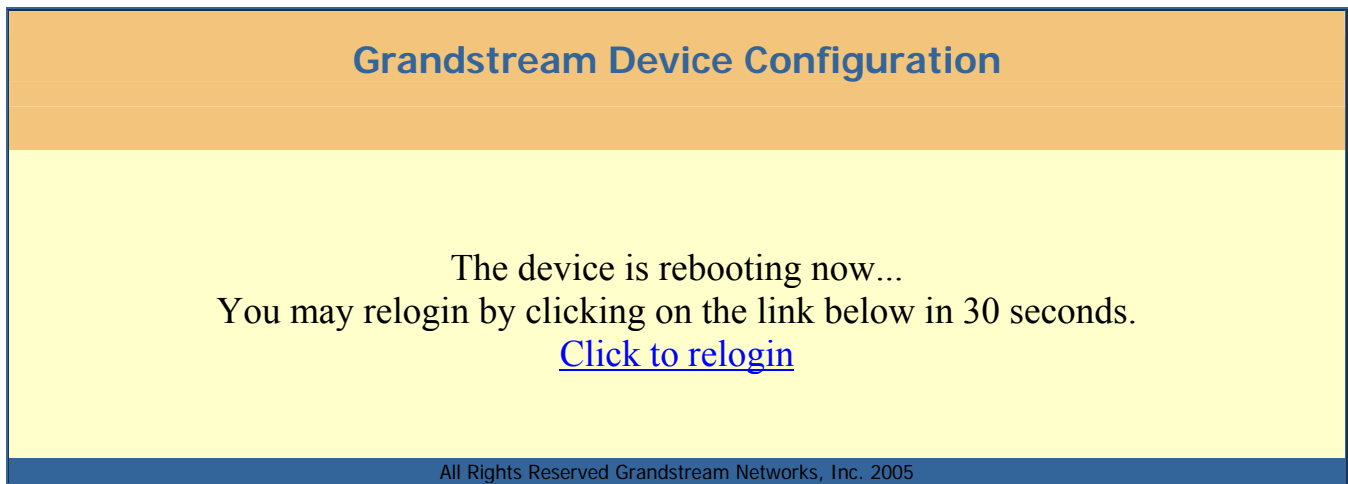
Once a change is made, the user should press the “Update” button in the Configuration Menu. The IP phone will then display the following screen to confirm that the changes have been saved.



User is recommended to reboot or power cycle the IP phone after all the changes are made so that those changes can take effect.

#### 6.2.4 Rebooting the Phone from Remote

The administrator of the phone can remotely reboot the phone by pressing the “Reboot” button at the bottom of the configuration menu. Once done, the following screen will be displayed to indicate that rebooting is underway.



At this point, the user can relogin to the phone after waiting for about 30 seconds.

## 6.3 Configuration through a Central Server

Grandstream IP phone can be automatically configured from a central provisioning system.

When BudgeTone phone boots up, it will send TFTP or HTTP request to download configuration file. The name of the configuration file is “cfg000b82xxxxx”, where “000b82xxxxx” is the MAC address of the BudgeTone.

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

Grandstream provides a licensed provisioning system called GAPS that can be used to support automated configuration of BudgeTone. GAPS (Grandstream Automated Provisioning System) uses enhanced (NAT friendly) TFTP or HTTP (thus no NAT issues) and other communication protocols to communicate with each individual BudgeTone phone for firmware upgrade, configuration parameters change or remote reboot, etc.

Grandstream provide GAPS (Grandstream Automated Provisioning System) service to VoIP service providers. It could be either simple redirection or with certain special provisioning settings. Initially upon booting 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 server for further provisioning. Grandstream also provide GAPSLite software package which contains our NAT friendly TFTP server and a configuration tool to facilitate the task of generating device configuration files.

The GAPSLite configuration tool is now free to end users. The tool and configuration templates can be downloaded from [http://www.grandstream.com/DOWNLOAD/Configuration\\_Tool/](http://www.grandstream.com/DOWNLOAD/Configuration_Tool/).

For details on how GAPS works, please refer to the documentation of GAPS product.



## 7 Software Upgrade

Software (or firmware) upgrade can be done either via TFTP or HTTP. The corresponding configuration settings are on the configuration page. End users should NOT touch the configuration settings that are useful for ITSPs.

### 7.1 Upgrade through HTTP

To upgrade firmware via HTTP, the field “*Firmware Upgrade and Provisioning: Upgrade Via*” needs to be set to HTTP. The “*Firmware Server Path*” should be set to where the firmware files are located.

For example, user can fill the following URL in the Firmware Server Path:

[firmware.mycompany.com:6688/Grandstream/1.0.8.32](http://firmware.mycompany.com:6688/Grandstream/1.0.8.32)

where `firmware.mycompany.com` is the FQDN of the HTTP server. It can also be in IP address format. “:6688” is the TCP port the HTTP server listening to, default http server listens to port 80. “/Grandstream/1.0.8.16” is the RELATIVE directory to the root dir on HTTP web server.

### 7.2 Upgrade through TFTP

To upgrade firmware via TFTP, the field “*Firmware Upgrade and Provisioning: Upgrade Via*” needs to be set to TFTP.

TFTP server can be configured in either IP address format or FQDN.

There are two ways to set up the TFTP server in IP format to upgrade the firmware, namely through the Key Pad MENU or via the BudgeTone phone’s Web configuration interface. To configure the TFTP server via Key Pad, please refer to Section 6.1 of this user manual. If TFTP server is in FQDN format, it must be set via web configuration interface.

To configure the TFTP server via the Web configuration interface, open up your browser to input the IP address of the BudgeTone phone. Enter the admin password to enter the configuration screen. From there, enter the TFTP server address or URL in the “Firmware Server Path” field near the bottom of the configuration screen. Once the “Firmware Server Path” is set, user needs to update the change by clicking the “Update” button. Then “Reboot” or power cycle the phone, the firmware files will be fetched upon booting up.

If the configured updating server is found and a new code image is available, the BudgeTone phone will attempt to retrieve the new image files by downloading them into the BudgeTone phone’s SRAM. During this stage, the BudgeTone phone’s LED/LCD will blink until the checking/downloading process is completed. Upon verification of checksum, the new code image will be saved into the Flash. If TFTP fails for any reason (e.g., TFTP server is not responding, there are no code image files

available for upgrade, or checksum test fails, etc), the BudgeTone phone will stop the TFTP process and simply boot using the existing code image in the flash.

Firmware upgrading may take as long as 1 to 20 minutes over Internet, or just 20+ seconds if it is performed on a LAN. It is generally recommended to conduct firmware upgrade in a controlled LAN environment if possible.

For users who do not have local TFTP server, Grandstream provides a NAT-friendly TFTP server on the public Internet for users to download the latest firmware upgrade automatically. Please check the Services section of Grandstream's Web site to obtain this TFTP server IP address:

Alternatively, user can download and install free TFTP or HTTP server in his LAN to do firmware upgrading.

A free Windows version TFTP server can be downloaded from:

<http://support.solarwinds.net/updates/New-customerFree.cfm>.

Our latest official release can be downloaded from:

<http://www.grandstream.com/y-firmware.htm>

Unzip the file and put all of them under the root directory of the TFTP server. Put the PC running the TFTP server and the BT-100 phone in the same LAN segment. Please go to File -> Configure -> Security to change the TFTP server's default setting from "Receive Only" to "Transmit Only" for the firmware upgrade. Start the TFTP server, in the phone's web configuration page, configure the Firmware Server Path with the IP address of the PC, update the change and reboot the unit.

User can also choose to download the free HTTP server from <http://httpd.apache.org/> or just use Microsoft IIS web server

#### NOTE:

- *When BudgeTone phone boots up, it will send TFTP or HTTP request to download configuration file "cfg000b82xxxxx", where "000b82xxxxx" is the MAC address of the BudgeTone phone. This file is for initial automatically provisioning purpose only, for normal TFTP or HTTP firmware upgrade, the following error messages in a TFTP or HTTP server log can be ignored.*

```
TFTP Error from [IP ADDRESS] requesting cfg000b82023dd4 : File does not exist  
Configuration File Download
```

Grandstream SIP Device can be configured via Web Interface as well as via Configuration File through TFTP or HTTP. "Config Server Path" is the TFTP or HTTP 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 2 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 or P values, please refer to the corresponding firmware release configuration template of the related products.

When Grandstream Device boots up or reboots, it will issue request for configuration file named “cfgxxxxxxxxxxxx”, where “xxxxxxxxxxxx” is the MAC address of the device, i.e., “cfg000b820102ab”. The configuration file name should be in lower cases.

### **7.3 Firmware and Configuration File Prefix and Postfix**

Starting from firmware version 1.0.8.16 for BT-100 phone Rev 2.0, adding prefix and postfix for both firmware and configuration file is supported.

Firmware Prefix and Postfix allows device to download the firmware name with the matching Prefix and Postfix. This makes it the possible to store ALL of the firmware 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. Therefore 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 set to “Yes”, the device will only issue firmware upgrade request if there are changes in the firmware Prefix or Postfix.

### **7.4 Managing Firmware and Configuration File Download**

When “Automatic Upgrade” is set to “Yes”, Service Provider can use P193 (Auto Check Interval, in minutes, default and minimum is 60 minutes) to have the devices periodically check with either Firmware Server or Config Server, whenever they are defined. This allows the device periodically check if there are any new changes need to be taken on a scheduled time. By defining different intervals in P193 for different devices, Server Provider can spread the Firmware or Configuration File download in minutes to reduce the Firmware or Provisioning Server load at any given time.

## 8 Restore Factory Default Setting

### **WARNING !!!**

*Restore 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.*

Please disconnect network cable and power cycle the unit before trying to reset the unit to factory default. The steps are as follows:

#### **Step 1:**

Find the MAC address of the device. It is a 12 digits HEX number located on the bottom of the unit.

#### **Step 2:**

Encode the MAC address. Please use the following mapping:

0-9: 0-9

A: 22 (when pressed 2 twice, the "A" letter will show on the LCD)

B: 222

C: 2222

D: 33

E: 333

F: 3333

For example, if the MAC address is 000b8200e395, it should be encoded as "0002228200333395".

#### **Step 3:**

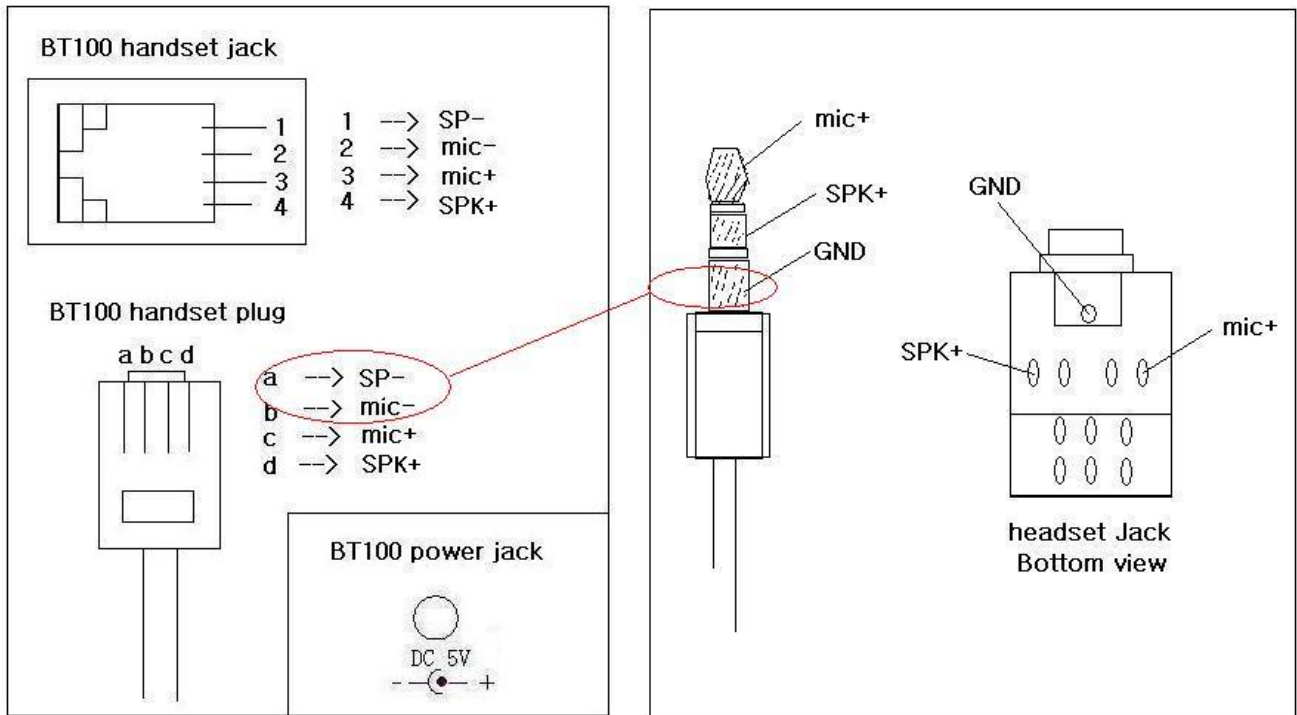
To perform factory reset:

- a. Press the **MENU** button for Key Pad Menu options.
- b. Press the Up or Down button to see "reset".
- c. Enter the encoded MAC address.
- d. Press the **MENU** button again
- e. Wait for phone reboot and the LCD backlight finish flashing.

## 9 Headset Connection

The BT-100 phone has a headset socket allowing user to plug the headset into the phone.

The picture below shows the handset and headset connectors' wiring schema.



As show in the schema, the left side is pin assignment for a RJ11 interface headset; while the right side is showing a normal 3.5mm headset plug. A 3.5mm to 2.5mm plug converter is required if user want to user normal 2.5mm cell phone headset. The plug converter can be purchased from any electronics component store.

- **Cross Over Cable For Plantronic Headset**

Some users want to use headset products with RJ22 plug, like the Plantronic headset. In this case, a special cable is required.

The handset twisted cable is a **roll-over cable** standard for ALL handset, using RJ22 plug.

Since the default handset plug lay out is Asia standard which is just reversed to North American or Europe standard, therefore US and Europe customer can not use popular Plantronic Handset without tweaking the connection wiring.

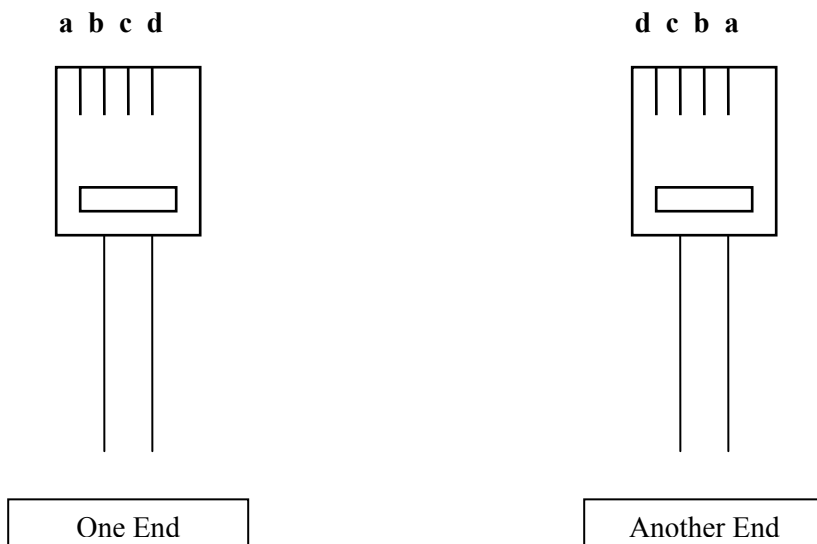
The quick and easy solution will be a special cable: a **cross-over cable**. Please ask for help from electrician if user can not understand this part.

Here is the example and instruction to hand made such an adapter or cable and confirmed to work with Plantronic M12 headset with amplifier, which is most popular headset used in call centers.

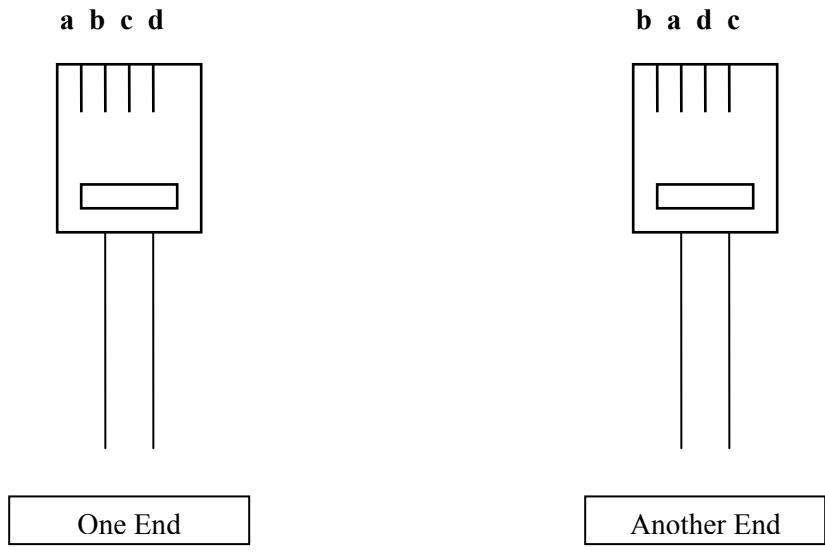
Here are the schemas of the two cables; the plug is viewed with Pin facing user, with PINs as specified above:

d: SP +                      c: Mic +  
a: SP -                      b: Mic -

**Roll Over Cable:** (already provided, to connect the handset to phone base)



**Cross Over Cable:** (required to allow Plantronic Headset to work with the phone)



## 10 Glossary of Terms

### ADSL

Asymmetric Digital Subscriber Line: Modems attached to twisted pair copper wiring that transmit from 1.5 Mbps to 9 Mbps downstream (to the subscriber) and from 16 kbps to 800 kbps upstream, depending on line distance.

### AGC

Automatic Gain Control, is an [electronic system](#) found in many types of devices. Its purpose is to control the [gain](#) of a system in order to maintain some measure of performance over a changing range of real world conditions.

### ARP

Address Resolution Protocol is a protocol used by the [Internet Protocol \(IP\)](#) [[RFC826](#)], specifically IPv4, to map [IP network addresses](#) to the hardware addresses used by a data link protocol. The protocol operates below the network layer as a part of the interface between the OSI network and OSI link layer. It is used when [IPv4 is used over Ethernet](#)

### ATA

Analogue Telephone Adapter. Covert analogue telephone to be used in data network for VoIP, like Grandstream HT series products.

### CODEC

Abbreviation for Coder-Decoder. It is an analog-to-digital (A/D) and digital-to-analog (D/A) converter for translating the signals from the outside world to digital, and back again.

### CNG

Comfort Noise Generator, generate artificial background [noise](#) used in [radio](#) and [wireless](#) communications to fill the [silent](#) time in a transmission resulting from [voice activity detection](#).

### DATAGRAM

A data packet carrying its own address information so it can be independently routed from its source to the destination computer

### DECIMATE

To discard portions of a signal in order to reduce the amount of information to be encoded or compressed. Lossy compression algorithms ordinarily decimate while subsampling.

### DECT

Digital Enhanced Cordless Telecommunications: A standard developed by the European Telecommunication Standard Institute from 1988, governing pan-European digital mobile telephony. DECT covers wireless PBXs, telepoint, residential cordless telephones, wireless access to the public switched telephone network, Closed User Groups (CUGs), Local Area



Networks, and wireless local loop. The DECT Common Interface radio standard is a multi-carrier time division multiple access, time division duplex (MC-TDMA-TDD) radio transmission technique using ten radio frequency channels from 1880 to 1930 MHz, each divided into 24 time slots of 10ms, and twelve full-duplex accesses per carrier, for a total of 120 possible combinations. A DECT base station (an RFP, Radio Fixed Part) can transmit all 12 possible accesses (time slots) simultaneously by using different frequencies or using only one frequency. All signaling information is transmitted from the RFP within a multi-frame (16 frames). Voice signals are digitally encoded into a 32 kbit/s signal using Adaptive Differential Pulse Code Modulation.

**DNS**

Short for *Domain Name System* (or *Service* or *Server*), an [Internet](#) service that translates [domain names](#) into IP addresses

**DID**

Direct Inward Dialing

Direct Inward Dialing. The ability for an outside caller to dial to a PBX extension without going through an attendant or auto-attendant.

**DSP**

Digital Signal Processing. Using computers to process signals such as sound, video, and other analog signals which have been converted to digital form.

Digital Signal Processor. A specialized CPU used for digital signal processing.

Grandstream products all have DSP chips built inside.

**DTMF**

Dual Tone Multi Frequency

The standard tone-pairs used on telephone terminals for dialing using in-band signaling. The standards define 16 tone-pairs (0-9, #, \* and A-F) although most terminals support only 12 of them (0-9, \* and #).

**FQDN**

Fully Qualified Domain Name

A FQDN consists of a host and domain name, including top-level domain. For example, [www.grandstream.com](#) is a fully qualified domain name. www is the host, grandstream is the second-level domain, and.com is the top level domain.

**FXO**

Foreign eXchange Office

An FXO device can be an analog phone, answering machine, fax, or anything that handles a call from the telephone company like AT&T. They should also operate the same way when connected to an FXS interface.

An FXO interface will accept calls from FXS or PSTN interfaces. All countries and regions have their own standards.

FXO is complimentary to FXS (and the PSTN).

## **FXS**

Foreign eXchange Station

An FXS device has hardware to generate the ring signal to the FXO extension (usually an analog phone).

An FXS device will allow any FXO device to operate as if it were connected to the phone company. This makes your PBX the POTS+PSTN for the phone.

The FXS Interface connects to FXO devices (by an FXO interface, of course).

## **DHCP**

The *Dynamic Host Configuration Protocol* (DHCP) is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, to deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and to provide other configuration information such as the addresses for printer, time and news servers.

## **ECHO CANCELLATION**

Echo Cancellation is used in [telephony](#) to describe the process of removing [echo](#) from a voice communication in order to improve voice quality on a [telephone call](#). In addition to improving quality, this process improves [bandwidth](#) savings achieved through [silence suppression](#) by preventing echo from traveling across a [network](#).

There are two types of echo of relevance in telephony: acoustic echo and hybrid echo. [Speech compression](#) techniques and [digital processing](#) delay often contribute to echo generation in [telephone networks](#).

## **H.323**

A suite of standards for multimedia conferences on traditional packet-switched networks.

## **HTTP**

Hyper Text Transfer Protocol; the World Wide Web protocol that performs the request and retrieve functions of a server

## **IP**

Internet Protocol. A packet-based protocol for delivering data across networks.

## **IP-PBX**

IP-based Private Branch Exchange

**IP Telephony**

(Internet Protocol telephony, also known as Voice over IP Telephony) A general term for the technologies that use the Internet Protocol's packet-switched connections to exchange voice, fax, and other forms of information that have traditionally been carried over the dedicated circuit-switched connections of the public switched telephone network (PSTN). The basic steps involved in originating an IP Telephony call are conversion of the analog voice signal to digital format and compression/translation of the signal into Internet protocol (IP) packets for transmission over the Internet or other packet-switched networks; the process is reversed at the receiving end. The terms IP Telephony and Internet Telephony are often used to mean the same; however, they are not 100 per cent interchangeable, since Internet is only a subcase of packet-switched networks. For users who have free or fixed-price Internet access, IP Telephony software essentially provides free telephone calls anywhere in the world. However, the challenge of IP Telephony is maintaining the quality of service expected by subscribers. Session border controllers resolve this issue by providing quality assurance comparable to legacy telephone systems.

**IVR**

IVR is a software application that accepts a combination of voice telephone input and touch-tone keypad selection and provides appropriate responses in the form of voice, fax, callback, e-mail and perhaps other media.

**MTU**

A Maximum Transmission Unit (MTU) is the largest size [packet](#) or [frame](#), specified in [octets](#) (eight-bit bytes), that can be sent in a packet- or frame-based network such as the Internet. The maximum for Ethernet is 1500 byte.

**NAT**

Network Address Translation

**NTP**

Network Time Protocol, a protocol to exchange and synchronize time over networks  
The port used is UDP 123  
Grandstream products using NTP to get time from Internet

**OBP/SBC**

Outbound Proxy or another name Session Border Controller. A device used in [VoIP](#) networks. OBP/SBCs are put into the signaling and media path between calling and called party. The OBP/SBC acts as if it was the called VoIP phone and places a second call to the called party. The effect of this behavior is that not only the signaling traffic, but also the media traffic (voice, video etc) crosses the OBP/SBC. Without an OBP/SBC, the media traffic travels directly between the VoIP phones. Private OBP/SBCs are used along with [firewalls](#) to enable VoIP calls to and from a protected enterprise network. Public VoIP service providers use OBP/SBCs to allow the use of VoIP protocols from private networks with [internet](#) connections using [NAT](#).

**PPPoE**

Point-to-Point Protocol over Ethernet, is a network protocol for encapsulating PPP frames in Ethernet frames. It is used mainly with cable modem and DSL services.

**PSTN**

Public Switched Telephone Network

i.e. the phone service we use for every ordinary phone call, or called POT (Plain Old Telephone), or circuit switched network.

**RTCP**

Real-time Transport Control Protocol, defined in [RFC 3550](#), a sister protocol of the [Real-time Transport Protocol](#) (RTP), It partners RTP in the delivery and packaging of multimedia data, but does not transport any data itself. It is used periodically to transmit control packets to participants in a streaming multimedia session. The primary function of RTCP is to provide feedback on the quality of service being provided by RTP.

**RTP**

Real-time Transport Protocol defines a standardized packet format for delivering audio and video over the Internet. It was developed by the Audio-Video Transport Working Group of the [IETF](#) and first published in 1996 as [RFC 1889](#)

**SDP**

Session Description Protocol, is a format for describing [streaming media](#) initialization parameters. It has been published by the [IETF](#) as [RFC 2327](#).

**SIP**

Session Initiation Protocol, An IP telephony signaling protocol developed by the IETF (RFC3261). SIP is a text-based protocol suitable for integrated voice-data applications. SIP is designed for voice transmission and uses fewer resources and is considerably less complex than H.323.

All Grandstream products are SIP based

**STUN**

Simple Traversal of UDP over NATs, is a [network protocol](#) allowing clients behind [NAT](#) (or multiple NATs) to find out its public address, the type of NAT it is behind and the internet side port associated by the NAT with a particular local port. This information is used to set up UDP communication between two hosts that are both behind NAT routers. The protocol is defined in [RFC 3489](#). STUN will usually work well with non-symmetric NAT routers.

**TCP**

Transmission Control Protocol, is one of the core protocols of the [Internet protocol suite](#). Using TCP, applications on networked hosts can create *connections* to one another, over which they can exchange data or [packets](#). The protocol guarantees reliable and in-order delivery of sender to receiver data.

**TFTP**

Trivial File Transfer Protocol, is a very simple [file transfer protocol](#), with the functionality of a very basic form of [FTP](#); It uses [UDP](#) (port 69) as its [transport protocol](#).

**UDP**

User Datagram Protocol (UDP) is one of the core protocols of the [Internet protocol suite](#). Using UDP, programs on networked computers can send short messages known as [datagrams](#) to one another. UDP does not provide the reliability and ordering guarantees that [TCP](#) does; datagrams may arrive out of order or go missing without notice. However, as a result, UDP is faster and more efficient for many lightweight or time-sensitive purposes.

**VAD**

Voice Activity Detection or Voice Activity Detector is an algorithm used in [speech processing](#) wherein, the presence or absence of human speech is detected from the audio samples.

**VLAN**

A virtual [LAN](#), known as a VLAN, is a logically-independent [network](#). Several VLANs can co-exist on a single physical [switch](#). It is usually refer to the [IEEE 802.1Q](#) tagging protocol.

**VoIP**

Voice over IP

VoIP encompasses many protocols. All the protocols do some form of signaling of call capabilities and transport of voice data from one point to another. e.g: SIP, H.323, etc.