User Manual

Unicorn 3002

Analog Telephone Adaptor

Hanlong Technology Co., Ltd

http://www.hanlongtek.com

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1. WELCOME

Unicorn 3002 is an all-in-one VoIP integrated access device that features superb audio quality, rich functionalities, high level of integration, compactness and ultra-affordability. The Unicorn 3002 is fully compatible with SIP industry standard and can interoperate with many other SIP compliant devices and software on the market.

Unicorn 3002 has two FXS ports.

- Special compatibility features include:
- Nortel MCS
- Standard SIP
- Broadsoft
- Howdy

2. WHAT IS IN THE PACKAGE

The Unicorn 3002 package contains:

- One Unicorn 3002 VoIP adapter
- One universal power supply
- One Ethernet cable

3. PRODUCT OVERVIEW

3.1. Key Features

- Supports SIP 2.0(RFC 3261), TCP/UDP/IP, RTP/RTCP, HTTP, ICMP, ARP/RARP, DNS, DHCP (both client and server), NTP, PPPOE, STUN, TFTP, etc.
- Built-in router, NAT, Gateway and DMZ port forwarding
- Device bridge mode support
- Supports dual SIP accounts via dual FXS ports
- Powerful digital signal processing (DSP) to ensure superb audio quality; advanced adaptive jitter control and packet loss concealment technology
- Support various vocoders including G.711 (a-law and u-law), G.723.1 (5.3K/6.3K), G.726 (32K), as well as G.729A, and ILBC（pending）.
- Support Caller ID/Name display or block, Hold, Call Waiting/Flash, Call Transfer, Call Forward, 3-way conferencing, Call Waiting Caller ID, in-band and out-of-band DTMF, Dial Plans, etc.
- Support fax pass through (for PCMU and PCMA) and T.38 FoIP (Fax over IP)
- Support syslog
- Support volume amplification

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- 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 and 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
- Support device configuration via built-in IVR, Web browser or central configuration file through TFTP or HTTP
- Support firmware upgrade via TFTP or HTTP with encrypted configuration files.
- Ultra compact (wallet size) and lightweight design, great companion for travelers
- Compact, lightweight Universal Power adapter.

3.2. Hardware specification

Model	Unicorn 3002
LAN interface	1 x RJ45 10Base-T
WAN interface	1 x RJ45 10Base-T
FXS telephone port	2 x FXS
LED light	Green and red color
Universal switching power supply	Input: 100-240VAC 50-60 Hz Output: +5VDC, 1200mA, UL certified
Dimension	70mm (W) ×130mm (D)×27mm (H)
Weight	0.30kg
Temperature	40 – 130 F 5 – 45 C
Humidity	10 - 90%

4. INSTALLATIONS

Unicorn 3002 Analog Telephone Adaptor is an all-in-one VoIP integrated device designed to be a total solution for networks providing VoIP services.

The Unicorn 3002 VoIP functionalities are available via regular analog telephones.

Unicorn 3002 has two FXS ports. The PHONE1 port next to the LAN is FXS port 1 and the PHONE2 on the side of the Unicorn 3002 is FXS port 2. Each FXS port can have a separate SIP account. This is a key feature of Unicorn 3002. Both ports can make calls concurrently.

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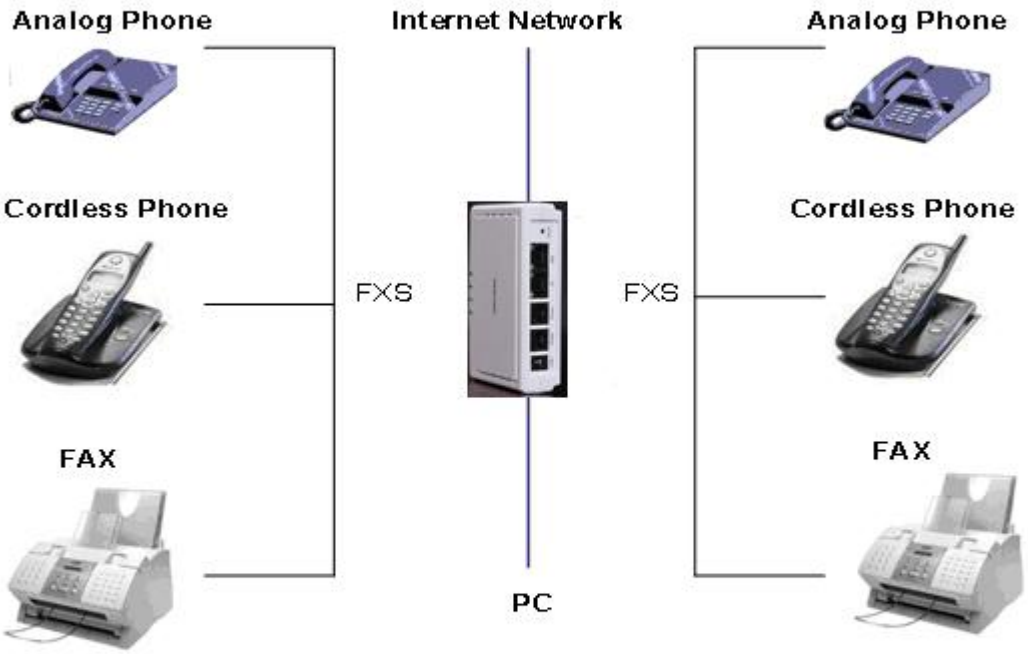

Following are the steps to install a Unicorn 3002:

- Connect a standard touch-tone analog telephone (or fax machine) to PHONE1 port.
- Connect another standard touch-tone analog telephone (or fax machine) to PHONE2 port.
- Insert the Ethernet cable into the WAN port of Unicorn 3002 and connect the other end of the Ethernet cable to an uplink port (a router or a modem, etc.)
- Connect a PC to the LAN port of Unicorn 3002.
- Insert the power adapter into the Unicorn 3002 and connect it to a wall outlet.

4.1. Safety

The Unicorn 3002 is compliant with various safety standards including FCC/CE and C- Tick. Its power adaptor is compliant with UL standard. The Unicorn 3002 should only operate with the universal power adaptor provided in the package.

Warning: Please do not use a different power adapter. Using other power adapter may damage the Unicorn3002 and will void the manufacturer warranty!

Caution: Changes or modifications to this product not expressly approved by Hanlong

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Technology, 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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5. BASIC OPERATIONS

5.1. Get Familiar with Voice Prompt

Unicorn 3002 has stored a voice prompt menu for quick access to settings and simple configuration. You can enter this voice prompt menu two ways:

- Pick up the receiver (or press the Handsfree button) of the analog telephone and press "***",

A voice will say, "Enter the new option." At this point, you can select from the following menu voice prompt options to begin using the Unicorn 3002:

Menu	Voice Will Say the Following:	
Main Menu	"Enter a Menu Option"	Enter "*" for the next menu option Enter "#" to return to the main menu Enter 01 – 07,12 - 17, 47, 86 or 99 Menu option
01	"DHCP Mode", "Static IP Mode"	Enter '9' to toggle the selection If user selects "Static IP Mode", user need configure all the IP address information through menu 02 to 05. If user selects "Dynamic IP Mode", the device will retrieve all IP address information from DHCP server automatically when user reboots the device.
02	"IP Address " + IP address	The current WAN IP address is announced Enter 12-digit new IP address if in Static IP Mode.
03	"Subnet " + IP address	Same as Menu option 02
04	"Gateway " + IP address	Same as Menu option 02
05	"DNS Server " + IP address	Same as Menu option 02
06	"MAC Address"	Announces the Mac address of the unit.
07	Preferred Vocoder	Enter "9" to go to the next selection in the list: ➢ PCM U ➢ PCM A ➢ G-726 ➢ G-723 ➢ G-729
12	WAN Port Web Access	Enter "9" to toggle between enable and disable
13	Firmware Server IP Address	Announces current Firmware Server IP address. Enter 12 digit new IP address.
14	Configuration Server IP	Announces current Config Server Path IP

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	Address	address. Enter 12 digit new IP address.
15	Upgrade Protocol	Upgrade protocol for firmware and configuration update. Enter “9” to toggle between TFTP and HTTP
16	Firmware Version	Firmware version information.
17	Firmware Upgrade	Firmware upgrade mode. Enter “9” to rotate among the following three options: 1. always check 2. check when pre/suffix changes 3. never upgrade
47	“Direct IP Calling”	Enter the target IP address to make a direct IP call, after dial tone. (See “Make a Direct IP Call”.)
99	“RESET”	Enter “9” to reboot the device; or Enter MAC address to restore factory default setting (See Restore Factory Default Setting section)
	“Invalid Entry”	Automatically returns to Main Menu

Other Menu Prompt Features:

- By pressing “***” on the analog telephone, you can access the voice menu.
- “*” shifts down to the next menu option.
- “#” returns to the main menu.
- “9” functions as the ENTER key in many cases to confirm an option.
- All entered digit sequences have known lengths-2 digits for menu option and 12 digits for IP address. Once all of the digits are collected, the input will be processed.
- Incorrect keyed entry cannot be deleted or undone. The Unicorn 3002 will prompt you to start over by telling you that you made an error.

5.2. Make Phone call

5.2.1. Calling Phone or Extension Numbers

- Dial the number directly and wait for 4 seconds (Default is 4 seconds. To change the default, change the settings via the web configuration page under “No Key Entry Timeout”). Or
- Dial the number directly, and press # (assuming that “Use # as Dial Key” is set to “YES” during web configuration of your Unicorn 3002).

Other functions available during the call are call-waiting/flash, call-transfer, and call-forward. Your SIP gatekeeper/proxy server needs to support these features in order for them to work.

5.2.2. Call Hold

While in conversation, pressing the “FLASH” button on the attached phone will put the remote end on hold. Pressing the “FLASH” button again will release the previously Hold

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party and the bi-directional media will resume.

5.2.3. Call Waiting

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 can press the flash button to put the current call party on hold and switch to the other call. Pressing flash button toggles between two active calls.

5.2.4. 3-way Conferencing

Unicorn3002 supports 3-way conference in two styles: star code style or Bellcore style.

Star Code Style 3-way Conference

Assuming that call party A and B are in conversation. A 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 *23 then C's number then # (or wait for 4 seconds).
3. If C answers the call, then A press "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.

Bellcore Style 3-way Conference

Bellcore style 3-way conference is also supported. To do this, user needs to enable "Use Bell-style 3-way Conference" in FXS web configuration.
Assuming that call party A and B are in conversation. A 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 press "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.

5.2.5. Direct IP-to-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 Unicorn3002 and other VoIP Device, have public IP addresses, or
2. Both Unicorn3002 and other VoIP Device are on the same LAN using private IP addresses, or
3. Both Unicorn3002 and other VoIP Device can be connected through a router using public or private IP addresses (with necessary port forwarding or DMZ).
Unicorn3002 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 "47" to access the direct IP call menu
3. Enter the IP address using format ex. 192*168*0*160 after the dial tone.

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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 47, 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 47, then 192*168*0*160*5062** followed by pressing the "#" key, if it is configured as a send key or wait for 4 seconds.

NOTE: When completing direct IP call, the "**Use Random Port**" should set to "NO".You can not make direct IP calls between FXS1 to FXS2 since they are using same IP.

5.2.6. Blind Transfer

Assuming that call party A and party B are talking to each other on the phone. Party A wants to transfer party B to party C:

- Party A presses FLASH (on the analog phone, or Hook Flash for old model phones) to get a dial tone.
- Then party A dials *87 then dials party C's number, and then # (or wait for 4 seconds) Party A can hangs up the phone.
- Note: Call features have to be activated during web configuration by selecting YES to "Enable Call Features". These features need to be supported by your SIP gatekeeper /proxy server in order to work.
- Party A can hold on to the phone and wait for one of the three following events:

1. A quick confirmation tone (temporarily using the call waiting indication tone) followed by a dial tone. This indicates the transfer is successful (transferee has received a 200 OK signal from transfer target). At this point, party A can either hang up or make another call.
2. A quick busy tone followed by a restored call (on supported SIP gatekeeper platforms only). This means the transferee has received a 4xx response signal for the INVITE and will try to recover the call. The busy tone is just to indicate to the transferor that the transfer has failed.
3. Busy tone keeps playing. This means the Unicorn 3002 has failed to receive the second NOTIFY signal from the transferee and decided to time out.

Note: this does not indicate the transfer has been successful, nor does it indicate the transfer has failed. When transferee uses a device that does not support the second NOTIFY signal, this will be the case. In poor or unstable network scenarios, this could also happen, although the transfer may have been completed successfully.

5.2.7. Attended Transfer

Assuming that call party A and party B are in conversation. Party A wants to Attend

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Transfer party B to party C:

- Party A presses FLASH (on the analog phone, or Hook Flash for old model phones) to get a dial tone.
- Party A then dials party C's number then # (or wait for 4 seconds). Party A and party C now are in conversation.
- Party A can hang

Note: When Attended Transfer failed and if party A hangs up, the Unicorn 3002 will ring party A again to remind party A that party B is still on the call, by pressing FLASH or Hook again will restore the conversation between party A and party B.

5.2.8. Hunting Group

This feature allows 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 hunt group will have the same phone number and incoming calls will be distributed in a round robin manner among the ports active in that hunt group.

5.3. CALL FEATURES

Call Features Tables

Following table shows the call features of Unicorn 3002:

Key	Call Features
*23	3-way conference
*87	Blind Transfer
*30	Block Caller ID (for all subsequent calls)
*31	Send Caller ID (for all subsequent calls)
*67	Block Caller ID (per call)
*82	Send Caller ID (per call)
*50	Disable Call Waiting (for all subsequent calls)
*51	Enable Call Waiting (for all subsequent calls)
*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 and "#" for a dial tone, then hang up.
*73	Cancel Unconditional Call Forward. To cancel "Unconditional Call Forward", dial "*73" and get the dial tone, then hang up.
*90	Busy Call Forward. To use this feature, dial "*90" and get the dial tone. Then dial the forward number and "#" for a dial tone, then hang up.
*91	Cancel Busy Call Forward. To cancel "Busy Call Forward", dial "*91" and get the dial tone, then hang up.
*92	Delayed Call Forward. To use this feature, dial "*92" and get the dial tone. Dial the forward number and "#" for a dial tone and then hang up.
*93	Cancel Delayed Call Forward. To cancel this feature, dial "*93", get the dial tone, and then hang up.

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Flash/Hook	call waiting indication. When in conversation without an incoming call, this action will switch to a new channel to make a new call.

5.4. FAX

Unicorn3002 supports FAX in two modes: T.38 (Fax over IP) and 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 Fax mode to be T.38. If the service provider does not support T.38, pass-through mode may be used. To send or receive faxes in fax pass through mode, users will need to select all the Preferred Codecs to be PCMU/PCMA.

5.5. Status Light Indicator

Following tables show the Unicorn 3002 button light pattern indication. But the Button light Show the PHONE1 status only.

Red light always indicates not normal status, Green light mostly indicate normal working status.

Light Indicator	Signal Pattern	Status Meaning
Red Light	Red light flashes every 2 seconds (if internet connection is configured for DHCP)	DHCP failed or WAN port has no Ethernet connection.
Red Light	Red light flashes every 2 seconds (if SIP server is configured)	Unicorn 3002 is not able to register with SIP gatekeeper/proxy server
Green Light	Button flashes every 2 seconds	Message waiting (if feature is available)
Green Light	Button flashes at 1/10 second	Phone is ringing. Incoming call in progress.

6. CONFIGURATION GUIDE

6.1. Configuring Unicorn 3002 using Web Browser

Unicorn 3002 has embedded Web server and HTML pages that allow users to configure the Unicorn 3002 through an easy-to-use Web browser interface such as Microsoft's Internet Explorer or Netscape browser. Below is a screen shot of the Unicorn 3002 configuration page:

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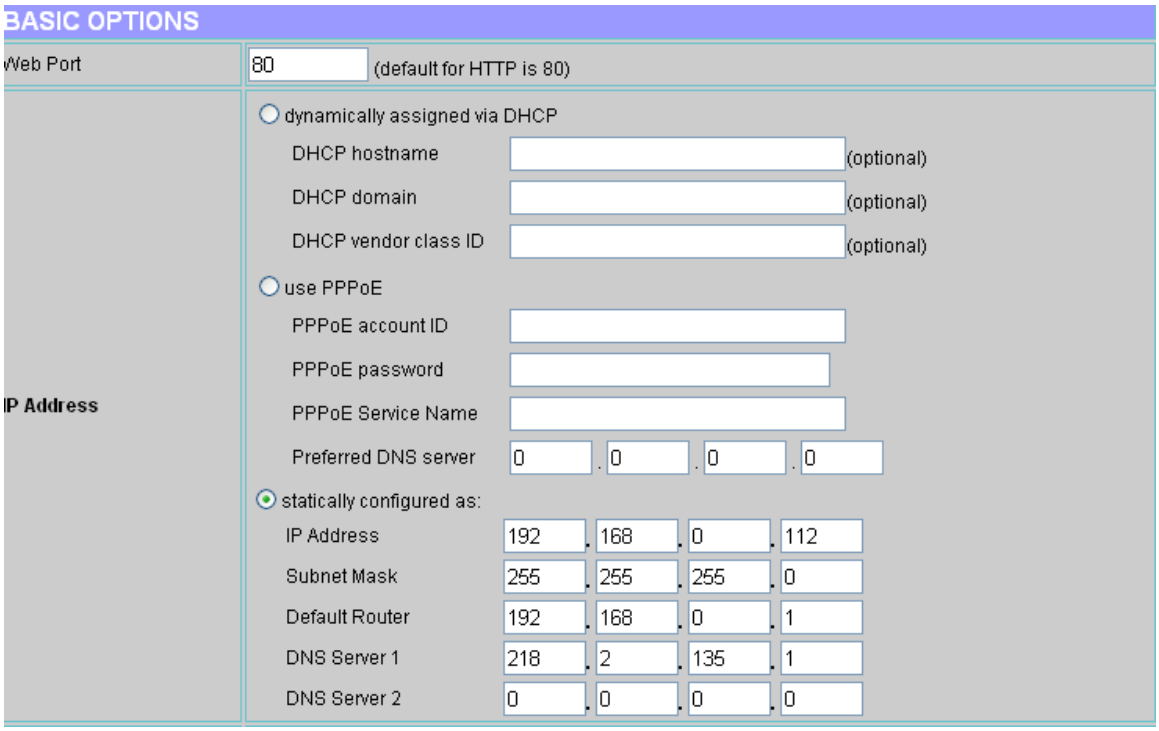


6.1.1. Accessing the Web Configuration

The Unicorn 3002 configuration page can be accessed via the LAN or WAN port.

6.1.2. Programming Unicorn 3002 via the LAN Port

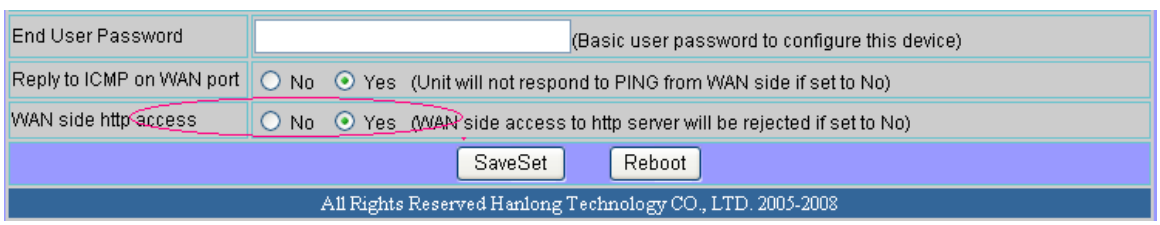
To program Unicorn 3002 via the LAN port, directly connect an Ethernet cable from your PC to the LAN port of the Unicorn 3002. After connecting the cable, confirm that the green light of the LAN port is on. If the green light is not on, this means that your PC is not yet properly connected to the Unicorn 3002 via the LAN port.

For LAN port configuration, use the following default IP address to access the device:

http://192.168.22.1

6.1.3. Programming Unicorn 3002 via the WAN Port

The WAN port access for web configuration is disabled by default from the factory. To access the web configuration menu from the WAN port, you must first access the device via the device LAN port (see instructions above “Programming Unicorn 3002 via the LAN port”) and enable the “Enable WAN Web Access” option.



After enabling WAN access, be sure that the WAN port of the Unicorn 3002 is connected to an uplink (i.e. router, hub, switch, etc). Then, get the WAN IP address of the Unicorn 3002 by following section 5.1 of this user manual and selecting menu option 02. Then, access the Unicorn 3002 via your web browser by entering the WAN IP address:

http://Unicorn 3002's IP Address

Be sure that your PC is connected to the router/hub/switch directly or via the LAN port (which also serves as a pass-through connection for internet/network access for your PC) of the Unicorn 3002.

6.1.4. User Programming and Configuration

From your web browser, the Unicorn 3002 will show the following login screen:

Enter the password and click on the "Login" button

6.1.5. Passwords

Passwords are case sensitive and all Unicorn devices come with factory default passwords as indicated below:

Advanced User Password for access to Super User Options: admin
End User Password for access to Basic User Options: 1234

6.1.6. Configuration Options and Explanations

After a correct password is entered in the login screen, the embedded web server inside the Unicorn 3002 will show the configuration page, which is explained in details below:

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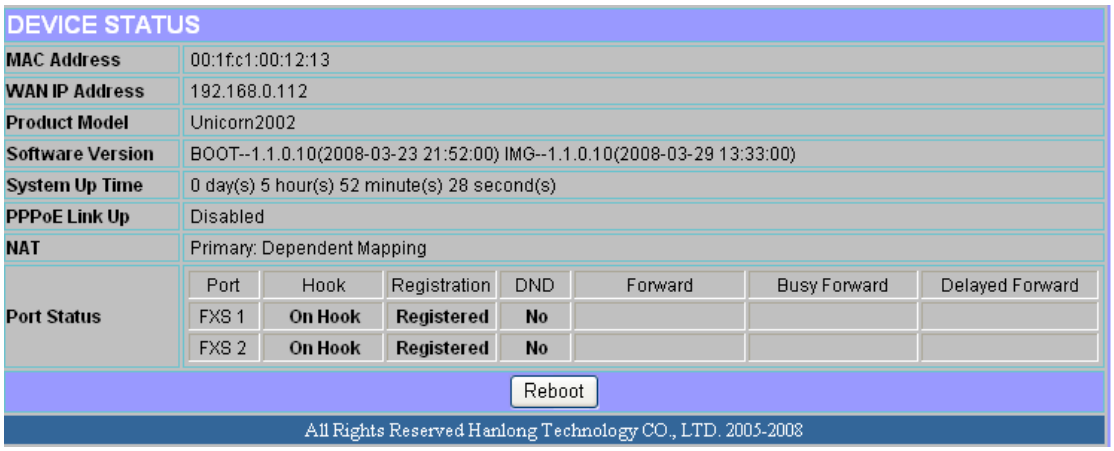
6.1.6.1 Device Status:



Device Status	
Options	**Meaning**
MAC Address	The device ID, in HEX format. This is a very important ID for ISP troubleshooting.
WAN IP Address	There are 2 modes under which the Unicorn 3002 can operate: - 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 chipset's memory). The Unicorn 3002 will acquire its IP address from the first DHCP server it discovers from the office/home network it is connected to. To use the PPPoE feature, the PPPoE account settings need to be set. The Unicorn 3002 will attempt to establish a PPPoE session if any of the PPPoE fields have been entered with data. - If Static IP mode is enabled, then the IP address, Subnet Mask, Default Router IP address, DNS Server 1 (primary), DNS Server 2 (secondary) fields will need to be configured by the user. These fields are reset to zero by default.
Product Model	Contains the product model info.
Software Version	Program: This is the main software release. Boot and Loader are seldom changed.
System Up Time	Shows system up time since the last reboot.
PPPoE Link Up	Indicates whether the PPPoE connection is up if the Unicorn3002 is connected to DSL modem.
NAT	Indicates the type of NAT connection used by the Unicorn3002 via its WAN port. Based on STUN protocol.

Port Status

Shows several information regarding the individual FXS ports.

Port	Hook	Registration	DND	Forward	Busy Forward	Delayed Forward
FXS1	**On Hook**	**Registered**	Yes	613		
FXS2	**On Hook**	**Registered**	No		614	

• Both FXS port1 and FXS port2 are registered with this SIP Server.
• FXS Port 1 user has set Do Not Disturb.

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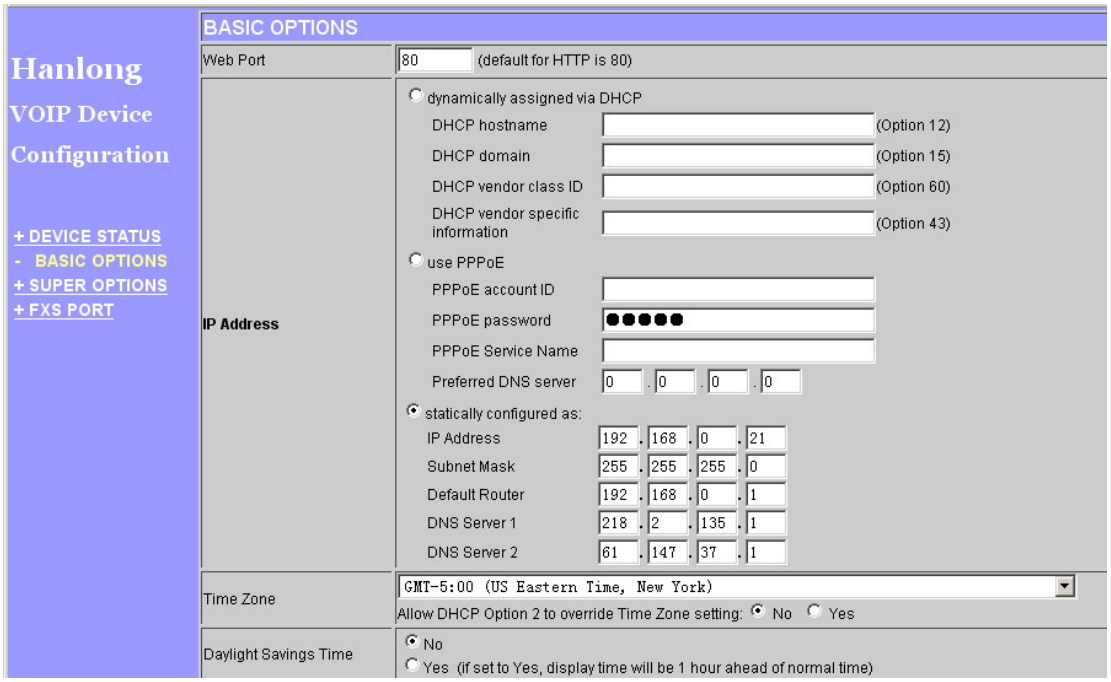
• FXS Port 1 user has set his calls to be forwarded unconditionally to ext 613. • FXS Port 2 user has set his calls to forward to 614 when his phone is busy.

6.1.6.2 Basic Options



BASIC OPTIONS SETTING	
Options	**Meaning**
Web Port	Default is 80.
IP Address	All the field values for the Static IP mode are not used (even though they are still saved in the Flash memory.) The Unicorn3002 acquires its IP address from the first DHCP server it discovers from the LAN it is connected set the PPPoE account settings. The Unicorn3002 will establish a PPPoE session if any of the PPPoE fields is set. Configure the IP address, Subnet Mask, Default Router IP address, DNS Server 1 (primary), DNS Server 2 (secondary) fields. These fields are set to zero by default.
Time Zone	This parameter controls how the displayed date/time will be adjusted according to the specified time zone.
Daylight Savings Time	This parameter controls whether the displayed time will be daylight savings time or not. If set to Yes, then the displayed time will be 1 hour ahead of normal time.

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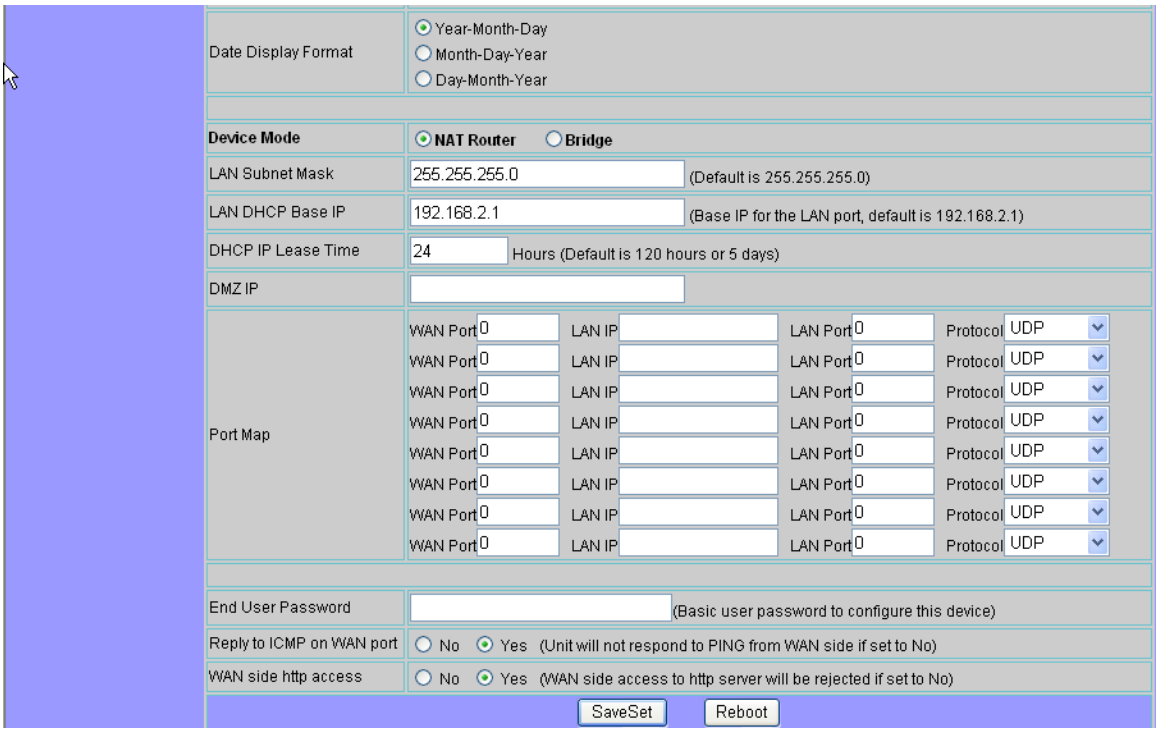

BASIC OPTIONS SETTING	
Options	**Meaning**
Date Display Format	Allow user to choose among the following three formats: Year-Month-Day Month-Day-Year Day-Month-Year
Device Mode	To use the device as a router or a bridge.
LAN Subnet Mask	Sets the LAN subnet mask. Default value is 255.255.255.0
LAN DHCP Base IP:	Base IP for the LAN port which functions as a Gateway for the subnet. Default value is 192.168.22.1
DHCP IP Lease Time:	Value is set in units of hours. Default value is 120hr (5 Days) The time IP address are assigned to the LAN clients
DMZ IP:	Forward all WAN IP traffic to a specific IP address if no matching port is used by Unicorn 3002 itself or in the defined port forwarding
Port Map	Forwards a matching (TCP/UDP) port to a specific LAN IP address with a specific (TCP/UDP) port
End User Password	This contains the password to access the Web Configuration Menu. This field is case sensitive.
Reply to ICMP on WAN port	If set to “Yes”, the unicorn3002 will respond to the PING command from other computers, but it also is vulnerable to the DOS attack. Default is **No**.
Wan Side Http Access	If this parameter is set to “No”, the HTML configuration update via WAN port is disabled.

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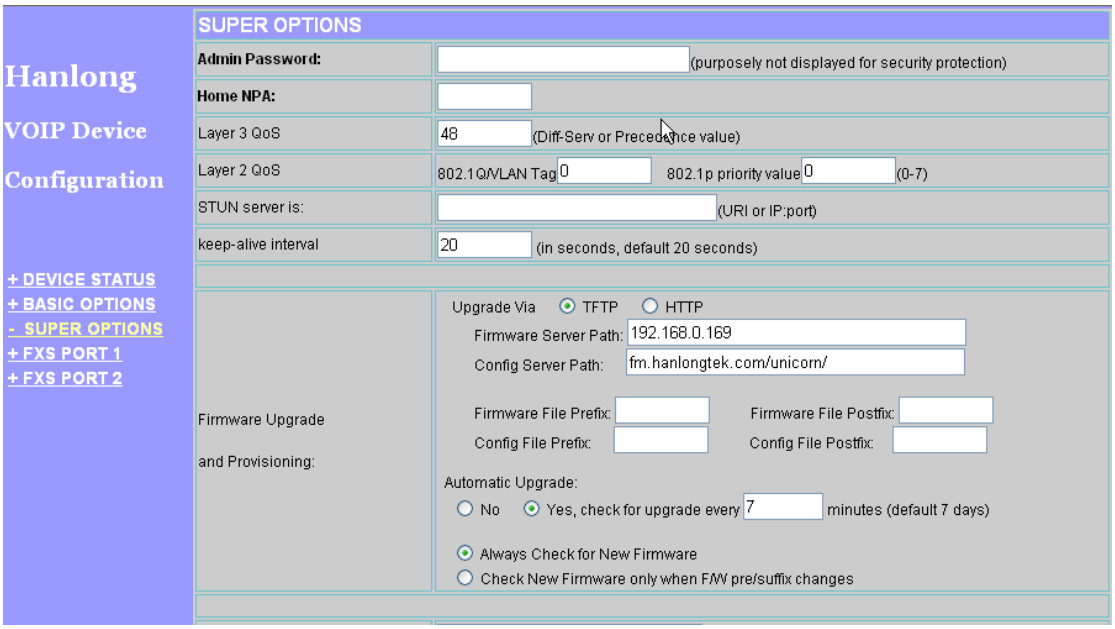
6.1.6.3 Super Options



Super Options	
Setting Options	Meaning
Admin Password	This contains the password to access the Advanced Web Configuration page. This field is case sensitive. Only the administrator can configure the “Advanced Settings” page. Password field is purposely left blank for security reasons after clicking update and saved. The maximum password length is 26 characters,only digit or letter.
Home NPA	Local area code for North American Dial Plan.
Layer3 Qos	This field defines the layer 3 QoS parameter which can be the value used for IP Precedence or Diff-Serv or MPLS. Default value is 48.
Layer2 Qos	Value used for layer 2 VLAN tag. Default setting is blank
Stun sever is：	IP address or Domain name of the STUN server.
Keep-alive interval	This parameter specifies how often the Unicorn3002 sends a blank UDP packet to the SIP server in order to keep the “hole” on the NAT open. Default is 20 seconds. Minimum value is 20 seconds.
Firmware Upgrade and Provisioning:	Enables Unicorn3002 to download firmware or configuration file through either the TFTP or HTTP server.

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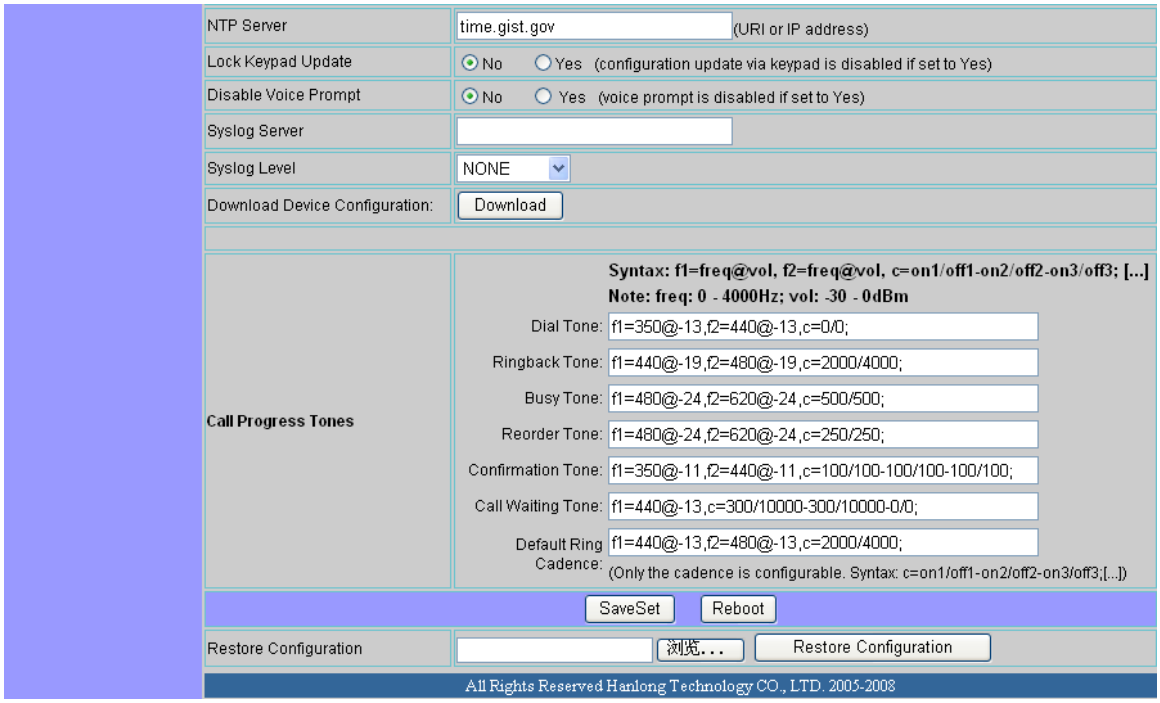

Super Options	
Setting Options	Meaning
NTP server	URI or IP address of the NTP (Network Time Protocol) server. Used by the phone to synchronize the date and time.
Lock Keypad Update	If set to “Yes”, the configuration update via keypad is disabled.
Disable Voice Prompt	Default is No
Syslog Sever	The IP address or URL of System log server. This feature is especially useful for the ITSP (Internet Telephone Service Provider)
Syslog level	Select the unicorn3002 to report the log level. Default is NONE. The level is one of DEBUG, INFO, WARNING or ERROR. Syslog messages are sent based on the following events: 1. product model/version on boot up (INFO level) 2. NAT related info (INFO level) 3. sent or received SIP message (DEBUG level) 4. SIP message summary (INFO level) 5. inbound and outbound calls (INFO level) 6. registration status change (INFO level) 7. negotiated codec (INFO level) 8. Ethernet link up (INFO level) 9. SLIC chip exception (WARNING and ERROR levels) 10. 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 *Example*: May 19 02:40:38 192.168.1.14 GS_LOG: [00:0b:82:00:a1:be][000]

	Ethernet link is up
Download Device Configuration	User can download configuration from the web page and save to configuration file.
Call Progress Tones	Using these settings, users can configure tone frequencies and cadence according to their preference. By default they are set to North American frequencies. Configure these settings 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 tone, OFF should be zero. Otherwise it will ring ON ms and a pause of OFF ms and then repeat the pattern. Example configuration for N.A. Dial tone: f1=350@-13,f2=440@-13,c=0/0; Syntax: f1=freq@vol, f2=freq@vol, c=on1/off1-on2/off2-on3/off3; [...] (Note: freq: 0 - 4000Hz; vol: -30 - 0dBm)
Restore Configuration	User can restore the before configuration from the configuration file saved at local pc

6.1.6.4 End User Settings:

FXS PORT 1 OPTIONS	
Account Active:	○ No ◉ Yes
SIP Server:	william.xanadu.hanlongtec.cn (e.g., sip.mycompany.com, or IP address)
Outbound Proxy:	192.168.0.100 (e.g., proxy.myprovider.com, or IP address, if any)
NAT Traversal	○ No ◉ No, but send keep-alive ○ STUN ○ UPNP
SIP User ID:	8201 (the user part of an SIP address)
Authenticate ID:	8201 (can be identical to or different from SIP User ID)
Authenticate Password:	(purposely not displayed for securityprotection)
Name:	grace (optional, e.g., John Doe)
Use DNS SRV	◉ No ○ Yes
User ID is phone number	◉ No ○ Yes
SIP Registration	○ No ◉ Yes
Unregister On Reboot	◉ No ○ Yes
Register Expiration	2 (in minutes. default 1 hour, max 45 days)
Outgoing Call without Registration	◉ No ○ Yes
local SIP port	5060 (default 5060)
local RTP port	5004 (1024-65535, default 5004)
Use random port	◉ No ○ Yes
Refer-To Use Target Contact	◉ No ○ Yes

Two FXS SIP accounts each has its own configuration page. Their configurations are identical. The following is a screen shot of FXS Port 1 Account settings.

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END USER SETTING	
Settings Options	**Meaning**
Account active	When set to Yes the FXS port is activated
SIP Server	This field contains the URI string or the IP address (and port, if different from 5060) of the SIP proxy server. 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
Outbound Proxy	This field contains the URI string or the IP address (and port, if different from 5060) of the outbound proxy. If there is no outbound proxy, this field SHOULD be left blank. If not blank, all outgoing requests will be sent to this outbound proxy.
NAT Traversal	This parameter defines whether or not the Unicorn3002 NAT traversal mechanism is activated. If activated (by choosing "Yes") and a STUN server is also specified, then the Unicorn3002 performs according to the STUN client specification. Using 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 Unicorn3002 will use its mapped public IP address and port in all of its SIP and SDP messages. If the NAT Traversal field is set to "Yes" *with no specified STUN server*, the Unicorn3002 will periodically (every 20 seconds or so) send a blank UDP packet no payload data) to the SIP server to keep the "hole" on the NAT open.
SIP User ID	SIP service subscriber's User ID
Authenticate ID	SIP service subscriber's Authenticate ID. Can be identical to or different from SIP User ID
Authenticate Password	SIP service subscriber's account password
Name	SIP service subscriber's name which will be used for Caller ID display
Use DNS SRV	Default is No. If set to Yes the client will use DNS SRV for server lookup
User ID is Phone Number	If the Unicorn 3002 has an assigned PSTN telephone number, this field should be set to "Yes". Otherwise, set it to "No". If "Yes" is set, a "user=phone" parameter will be attached to the "From" header in SIP request
SIP Registration	This parameter controls whether the Unicorn 3002 needs to send REGISTER messages to the proxy server. The default setting is "Yes".
Unregister on Reboot	Default is "No." If set to "Yes", then the SIP user will be unregistered on reboot.
Register Expiration	This parameter allows the user to specify the time frequency (in minutes) the Unicorn 3002 refreshes its registration with the specified registrar. The default interval is 60 minutes (or 1 hour). The maximum interval is 65535 minutes (about 45 days).
Outgoing call without Registration	Default is **No**. If set to "Yes," user can place outgoing calls even when not registered (if allowed by ITSP) but is unable to receive incoming calls.

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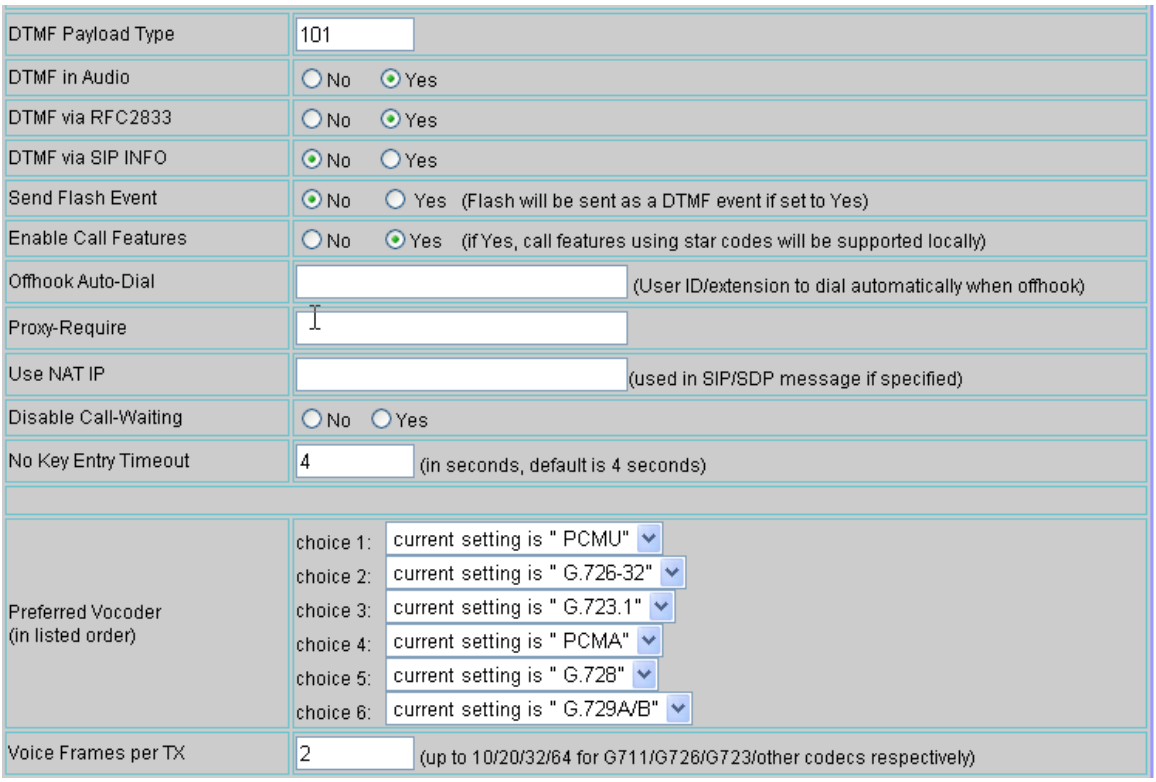
Local SIP port	This parameter defines the local SIP port the Unicorn 3002 will listen and transmit. The default value for FXS port is 5060. The default value for FXO port is 5062.
Local RTP port	This parameter defines the local RTP-RTCP port pair the Unicorn 3002 will listen and transmit. It is the base 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 for FXS port is 5004. The default value for FXO port is 5008.
Use Random Port	This parameter, when set to Yes, will force random generation of both the local SIP and RTP ports. This is usually necessary when multiple Unicorn 3002 are behind the same NAT.
Refer-To Use Target Contact	Default is NO. If set to YES, then for Attended Transfer, the "Refer-To" header uses the transferred target's Contact header information.



END USER SETTING	
Setting Options	**Meaning**
DTMF Payload Type	This parameter sets the payload type for DTMF using RFC2833
DTMF in Audio	Send DTMF as inband (in-audio).
DTMF via RFC2833	Send DTMF via RTP (According to RFC 2833).
DTMF via SIP INFO	Send DTMF via SIP INFO message.
Send Flash Event	This parameter allows users to control whether to send an SIP NOTIFY message indicating the Flash event, or just to

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	switch to the voice channel when users press the Flash key.
Enable Call Features	Default is No. If set to Yes, Call Forwarding & Do-Not-Disturb are supported locally
Offhook Auto-Dial	This parameter allows users to configure a User ID or extension number to be automatically dialed upon offhook. Please note that only the user part of a SIP address needs to be entered here. The Unicorn 3002 will automatically append the "@" and the host portion of the corresponding SIP address.
Proxy-Require	SIP Extension to notify SIP server that the unit is behind the NAT/Firewall.
USE NAT IP	NAT IP address used in SIP/SDP message. Default is blank.
Disable call-waiting	Default is No.
No Key Entry Timeout	Default is No.
Preferred Vocoder	The Unicorn 3002 supports up to 7 different Vocoder types including G.711 A-/U-law， G.723.1, G.726, G.728, G.729A/B, iLBC（pending）. Depending on the product model, some of these Vocoders may not be provided in standard release. Users can configure Vocoders in a preference list that will be included with the same preference order in SDP message. The first Vocoder in this list can be entered by choosing the appropriate option in "Choice 1". Similarly, the last Vocoder in this list can be entered by choosing the appropriate option in "Choice 7".
Voice Frames per TX	This field contains the number of voice frames to be transmitted in a single packet. When setting this value, the user should be aware of the requested packet time (used in SDP message) as a result of configuring this parameter. This parameter is associated with the first vocoder in the above vocoder Preference List or the actual used payload type negotiated between the 2 conversation parties at run time. e.g., if the first vocoder 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 vocoder

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	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 Unicorn 3002 will use and save the maximum allowed value for the corresponding first vocoder 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.

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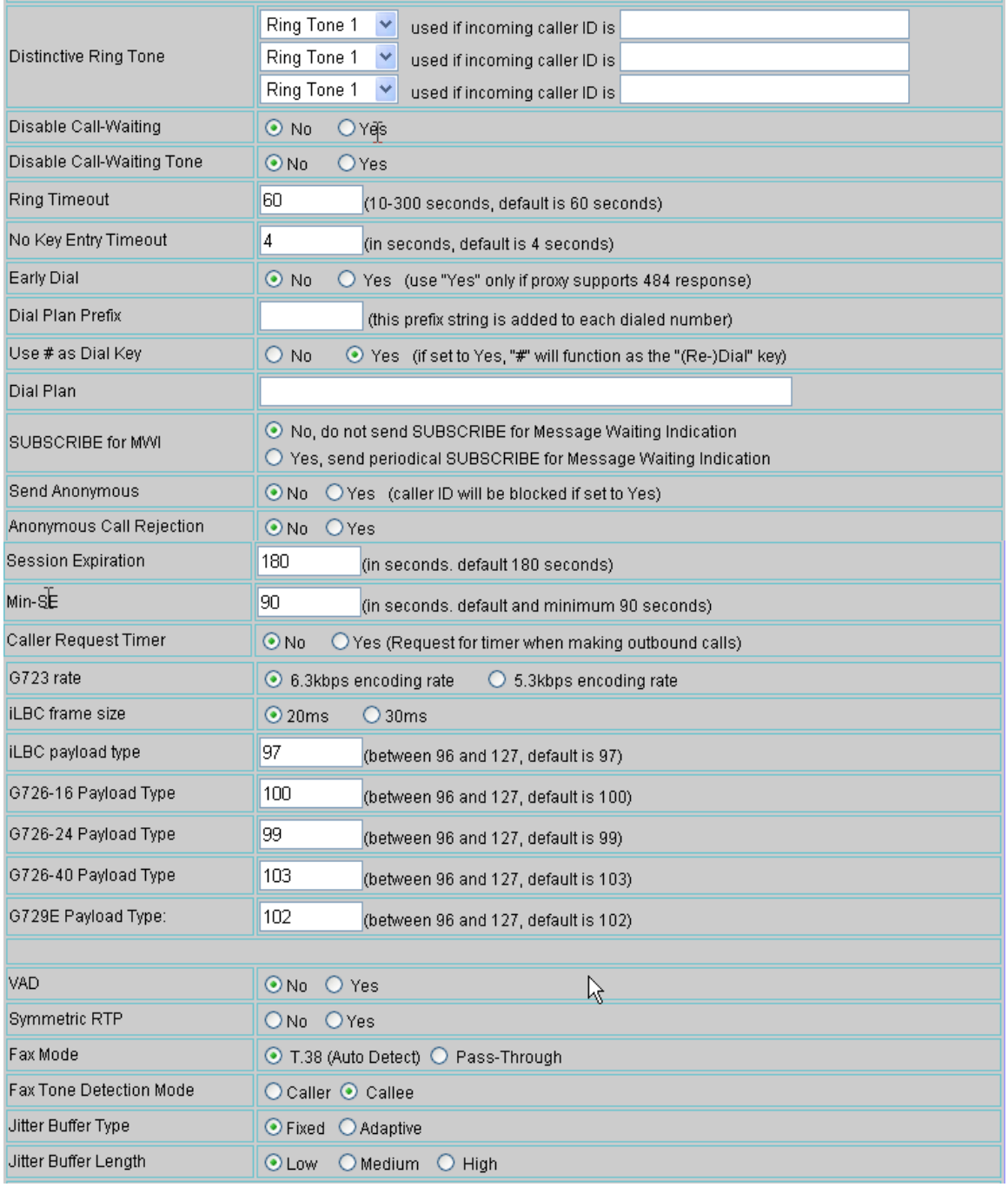

END USER SETTING	
Settings Options	**Meaning**
G723 Rate	This defines the encoding rate for G723 vocoder. By default, 6.3kbps rate is chosen.
iLBC frame size	This sets the iLBC size in 20ms or 30ms
iLBC payload type	This defines payload time for iLBC. Default value is 98. The valid range is between 96 and 127.
G726-16 Payload Type	Default value is 98. Range is from 96 to 127.
G726-24 Payload Type	Default value is 99. Range is from 96 to 127.
G726-40 Payload Type	Default value is 103. Range is from 96 to 127.

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G729E Payload Type	Default value is 102. Range is from 96 to 127.
VAD	Default is **No**. VAD allows detecting the absence of audio and conserve bandwidth by preventing the transmission of "silent packets" over the network.
Symmetric RTP	Default is **No**. When set to Yes the device will change the destination to send RTP packets to the source IP address and port of the inbound RTP packet last received by the device.
FAX Mode	T.30Auto Detect) FoIP by default, or Pass-Through (must use codec PCMU/PCMA)
Fax Tone Detection Mode	Default is Callee. This decides whether Caller or Callee sends out the REINVITE for T.38 or pass through(T.30)
Jitter Buffer Type	Select either Fixed or Adaptive based on network conditions.
Jitter Buffer Length	Select Low, Medium or High based on network conditions.
Distinct Ring Tone	Using these settings, user can configure ring or tone frequencies according to their preference. By default they 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. Ring 1 - 6 are reserved for distinct call waiting tones through SIP Alert-Info. Ring 7 – 12 are distinct ring tones through SIP Alert-Info. Both client and Server need to support this to be a useful feature. Currently, distinct ring tone feature is only supported under Lucent Special Feature.
Disable Call -Waiting	Default is No.
Disable Call –Waiting Tone	Default is **No**. This is to disable the stutter Call Waiting Tone when a Call Waiting call arrives. The CWCID will still be displayed.
Ring Timeout	Incoming call will stop ringing when not picked up given a specific period of time.
No Key Entry Timeout	Default is 4 seconds.
Early Dial	Default is No. Use only if proxy supports 484 response
Dial Plan Prefix	Sets the prefix added to each dialed number
Use # as Send Key	This parameter allows users to configure the "#" key to be used as the "Send" (or "Dial") key. If 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 "(Re)Dial" key. If set to "No", this "#" key will then be included as part of the dial string to be sent out.
Dial Plan	**Dial Plan Rules**:- 1. Accept Digits: 1,2,3,4,5,6,7,8,9,0 2. Grammar: x - any digit from 0-9; a. xx+ - at least 2 digit number; b. ^ - exclude; c. [3-5] - any digit of 3, 4, or 5;

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	d. [147] - any digit 1, 4, or 7; e. <2=011> - replace digit 2 with 011 when dialing • **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+}
Subscribe for MWI	Default is No. When set to "Yes" a SUBSCRIBE for Message Waiting Indication will be sent periodically.
Send Anonymous	If this parameter is set to "Yes", the "From" header in outgoing INVITE message will be set to anonymous, essentially blocking the Caller ID from displaying.
Anonymous Call Rejection	Default is **No**. If set to Yes, incoming calls with anonymous Caller ID will be rejected with 486 Busy message.
Session Expiration	Default is **180** seconds.
Min-SE	Default is **90** seconds.
Caller Request Timer	Default is **"NO".**

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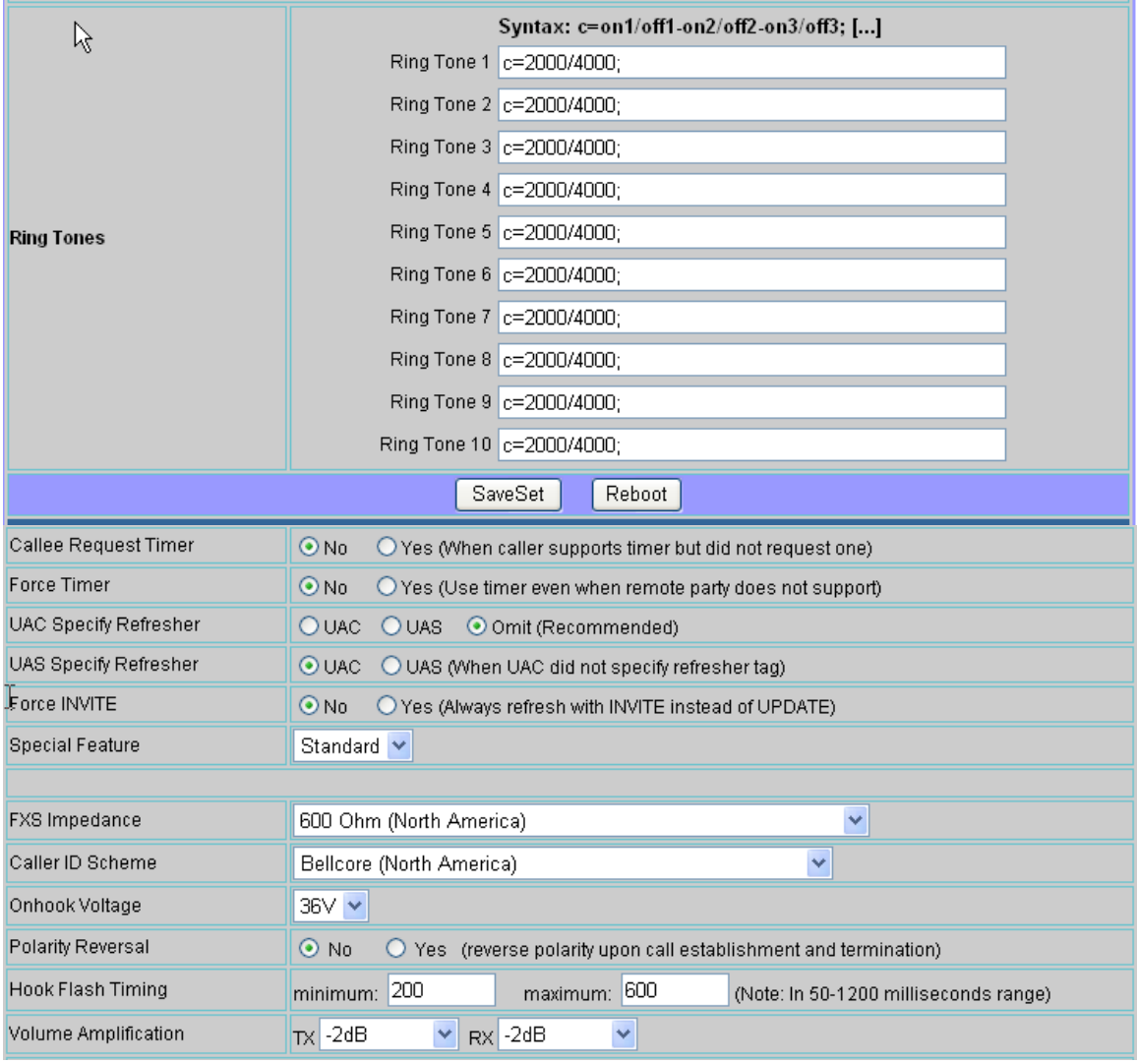

Callee Request Timer	Default is NO
Force Timer	Default is NO
UAC Specify Refresher	Default is Omit
UAS Specify Refresher	Default is UAC
Force INVITE	Default is NO
Special Feature	Default is Standard. Choose the selection to meet some special requirements from Soft Switch vendors like Lucent FS5000 Simple Endpoint, CBCOM, etc.
FAS Impedance	Select the impedance of anolog telephone connected to phone port
Caller ID Scheme	Bellcore (North America) CID-Canada DTMF-Brazil DTMF(Denmark) ETSI-DTMF(Finland, Sweden) ETSI-FSK(France, German, Norway, Taiwan, UK-CCA)
Onhook Voltage	Select the onhook voltage to suit different area or PBX.
Polarity Reversal	Default is No. If set to Yes, polarity will be reversed upon call establishment and termination.
Hook Flash Timing	Time period when the cradle is pressed (Hook Flash) to simulate FLASH. To prevent unwanted activation of the Flash/Hold and automatic phone ring-back, adjust this time value.

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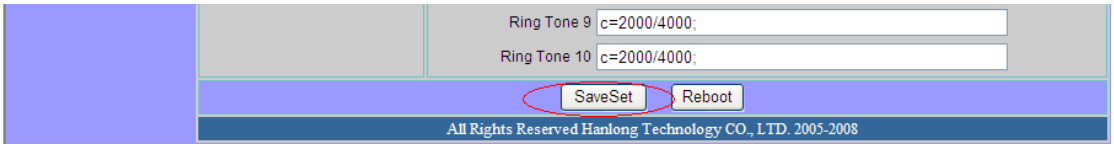
Volume Amplification	Handset volume adjustment. RX is for receiving volume, TX is for transmission volume. Default values are 0dB for both parameters. +6dB generates the highest volume and -6dB generates the lowest volume.
Ring Tones	This function lets you configure ring tone cadence preferences. User has 10 choices. The configuration, completed in Distinctive Ring Tones block in the same page, applies to ring tones cadences configured here.

6.1.7. Saving the Configuration Changes

Once a change is made, users should click on the "SaveSet" button in the Configuration page, as follow:



The Unicorn 3002 will then display the following screen to confirm that the changes have been saved. Please allow 5 to 10 seconds before rebooting the device.

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6.1.8. Rebooting the Unicorn 3002

You can reboot the Unicorn 3002 by clicking on the “Reboot” button after each update to the configuration page. Alternatively, you can reboot by unplugging the power supply of the Unicorn 3002 and then powering it on again. If your Unicorn 3002 ever becomes “stuck” or un-responsive, you can unplug the power supply to reboot it. Frequent rebooting by unplugging the power supply is not recommended and should not be necessary.

6.2. Configuring Unicorn 3002 via Voice Prompt

6.2.1. DHCP Mode

Follow section 5.1 with voice menu option 01 to enable Unicorn 3002 to use DHCP

6.2.2. STATIC IP Mode

Follow section 5.1 with voice menu option 01 to enable Unicorn 3002 to use STATIC IP mode, then use option 02, 03, 04 to set up Unicorn 3002’s IP, Subnet Mask, Gateway respectively.

6.2.3. Configuration through a Central Server

Unicorn 3002 devices can be automatically configured from a central provisioning system.

When Unicorn 3002 boots up, it will send TFTP or HTTP request to download configuration files. There are two configuration files, one is “cfg.txt” and the other is“cfg001fc1xxxxxx”, where “001fc1xxxxxx” is the MAC address of the Unicorn 3002.

For more information regarding configuration file format, please refer to the related technical documentation.

The configuration file can be downloaded via TFTP or HTTP from the central server. A service provider or an enterprise with large deployment of Unicorn 3002s can easily manage the configuration and service provisioning of individual devices remotely and automatically from a central server. The central provisioning system uses enhanced (NAT friendly) TFTP or HTTP (thus no NAT issues) and other communication protocols to communicate with each individual Unicorn 3002 for firmware upgrade, etc.

7. SOFTWARE UPGRADE

To upgrade software, Unicorn 3002 can be configured with a TFTP server where the new code image is located. The TFTP upgrade can work in either static IP or DHCP mode using private or public IP address. It is recommended to set the TFTP server address in either a public IP address or on the same LAN with the Unicorn 3002.

There are two ways to set up the TFTP server to upgrade the firmware, namely through voice menu prompt or via the Unicorn 3002's Web configuration interface. To configure the TFTP server via voice prompt, follow section 5.1 with option 06, once set up the TFTP IP address, power cycle the ATA, the firmware will be fetched once the ATA boots up.

To configure the TFTP server via the Web configuration interface, open up your browser to point at the IP address of the Unicorn 3002. Input the admin password to enter the configuration screen. From there, enter the TFTP server address in the designated field towards the bottom of the configuration screen.

Once the TFTP server is configured, please power cycle the Unicorn 3002.

TFTP process may take as long as 1 to 2 minutes over the Internet, or just 20+ seconds if it is performed on a LAN. Users are recommended to conduct TFTP upgrade in a controlled LAN environment if possible. For those who do not have a local TFTP server, Hanlong technology provides a NAT-friendly TFTP server on the public Internet for firmware upgrade. Please check the Service section of Hanlong's Web site to obtain this TFTP server's IP address.

NOTES:

When Hanlong ATA boot up, it will send TFTP or HTTP request to download configuration files, there are two configuration files, one is "cfg.txt" and the other is "cfg001fc1xxxxxx", where "001fc1xxxxxx" is the MAC address of the Unicorn 3002. These two files are 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.

8. RESTORE TO FACTORY DEFAULT SETTINGS

Warning:

Restoring to the factory default settings will delete all configuration information of the device.

Steps to follow in restoring to factory default settings:

a) Press "***" for voice prompt.

b) Enter "99" and then you will hear the voice prompt "Reset".

c) Enter the number "862584658050". A "click" sound will be heard.

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d) Wait for 15 seconds.

The device is now restored to the factory default setting.

9. TECHNICAL SUPPORT CONTACT

Email: Support@mail.hanlongtek.com

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