Grandstream Networks, Inc.

HT812/HT814

Analog Telephone Adaptors

User Guide

WARNING

Please do not use a different power adaptor with your devices as it may cause damage to the products and void the manufacturer warranty.

GNU GPL INFORMATION

The firmware for the HT812/HT814 contains third-party software licensed under the GNU General Public License (GPL). Grandstream uses software under the specific terms of the GPL. Please see the GNU General Public License (GPL) for the exact terms and conditions of the license.

Grandstream GNU GPL related source code can be downloaded from Grandstream web site from:
https://www.grandstream.com/support/faq/gnu-general-public-license/gnu-gpl-information-download

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WELCOME

The HT812/HT814 analog telephone adapters provides transparent connectivity for analog phones and faxes to the world of internet voice. Connecting to any analog phone, fax, or PBX, the HT812/HT814 are an effective and flexible solution for accessing internet-based telephone services and corporate intranet systems across established LAN and internet connections. The Grandstream Handy Tones HT812/HT814 are a new addition to the popular Handy Tone ATA products family. This manual will help you learn how to operate and manage your HT812/HT814 analog telephone adaptors and make the best use of its many upgraded features including simple and quick installation, 3-way conferencing, direct IP-IP Calling, and new provisioning support among other features. This HT812/HT814 are very easy to manage and configure, and specifically designed to be an easy to use and affordable VoIP solution for both the residential user and the teleworker.

PRODUCT OVERVIEW

The HT812/HT814 are 2/4 ports analog telephone adapters (ATA) that allows users to create a high-quality and manageable IP telephony solution for residential and office environments. Their ultra-compact size, voice quality, advanced VoIP functionality, security protection and auto provisioning options enable users to take advantage of VoIP on analog phones and enables service providers to offer high quality IP service. The HT812/HT814 are an ideal ATAs for individual use and for large scale commercial IP voice deployments since they permit small and medium businesses to create integrated IP and PSTN telephony systems that efficiently manage communication costs. HT812/HT814's inclusion of an integrated NAT router and dual 10/100/1000Mbps Ethernet WAN and LAN ports enables a shared broadband connection between multiple Ethernet devices as well as the extension of VoIP services to analog phones.

Feature Highlights

The following table contains the major features of the HT812/HT814:

Table 1: HT812/HT814 Features at a Glance

HT812 / HT814  	• Support 2 SIP profiles through 2 FXS ports for HT812 and 4 FXS port for HT814 and dual 10/100/1000Mbps Ethernet port for HT812 • Support 3-way voice conferencing. • Support wide range of caller ID formats. • Support advanced telephony features, including call transfer,call forward, call-waiting, do not disturb, message waiting indication, multi- language prompts, flexible dial plan and more. • Support T.38 Fax for creating Fax-over-IP. • Failover SIP server automatically switches to secondary server if main server loses connection.

HT812/HT814 Technical Specifications

The following table resumes all the technical specifications including the protocols/standards supported, voice codecs, telephony features, languages, and upgrade/provisioning settings for the HT812/HT814.

Table 2: HT812/HT814 Technical Specifications

Interfaces	
Telephone Interfaces	Two (2) RJ11 FXS ports for HT812. Four (4) RJ11 FXS sports for HT814.
Network Interface	Two (2) 10/100/1000 Mbps Ethernet port (RJ45).
LED Indicators	POWER, LAN, WAN, PHONE1, PHONE2 for HT812. POWER, LAN, WAN, PHONE1, PHONE2, PHONE3, PHONE4 for HT814.
Factory Reset Button	Yes.
Voice, Fax, Modem	
Telephony Features	Caller ID display or block, call waiting, flash, blind or attended transfer, forward, hold, do not disturb, 3-way conference.
Voice Codecs	G.711 with Annex I (PLC) and Annex II (VAD/CNG, G.729A/B, dynamic jitter buffer, advanced line echo cancellation.
Fax over IP	T.38 compliant Group 3 Fax Relay up to 14.4kpbs and auto-switch to G.711 for Fax Pass-through.
Short/Long Haul Ring Load	For HT812: 3 REN, up to 1km on 24AWG line. For HT814: 2 REN, up to 1km on 24AWG line.
Caller ID	Bellcore Type 1 & 2, ETSI, BT, NTT, and DTMF-based CID.
Disconnect Methods	Busy Tone, Polarity Reversal/Wink, Loop Current.
Signaling	
Network Protocols	TCP/IP/UDP, RTP/RTCP, HTTP/HTTPS, ARP/RARP, ICMP, DNS, DHCP, NTP, SIP (RFC3261)
QoS	Layer 2 (802.1Q VLAN, SIP/RTP 802.1p) and Layer 3 (ToS, DiffServ, MPLS).
DTMF Methods	In-audio, RFC2833.
Provisioning and Control	HTTPS, secure and automated provisioning, syslog.

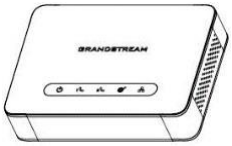
Security	
Control	SIPS/HTTPS/
Management	Syslog support
Physical	
Universal Power Supply	Input: 100-240VAC, 50-60Hz Output: 12V/0.5A for HT812. Output: 12V/1A for HT814.
Environmental	Operational: 32º – 104ºF or 0º – 40ºC. Storage: 14º – 140ºF or -10º – 60ºC. Humidity: 10 – 90% Non-condensing.
Dimensions and Weight	Dimension: 28.5 x 130 x 90 mm (H x W x D). Weight: 353.33g for HT812 and for 423.5g for HT814.
Compliance	
Compliance	FCC/CE/RCM.

GETTING STARTED

This chapter provides basic installation instructions including the list of the packaging contents and also information for obtaining the best performance with the HT812/HT814.

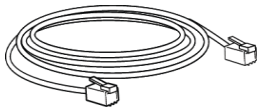
Equipment Packaging

The HT812/HT814 ATAs packages contains:

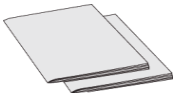


1x HT812

1x 12V Power Adapter



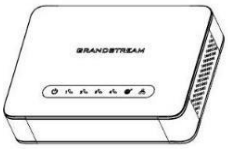
1x Ethernet Cable



1x Quick Installation Guide

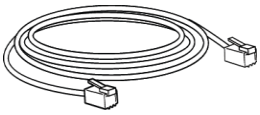
1x GPL Statement

Figure 1: HT812 Package Contents

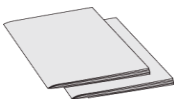


1x HT814

1x 12V Power Adapter



1x Ethernet Cable



1x Quick Installation Guide

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Figure 2: HT814 Package Contents

Note: Check the package before installation. If you find anything missing, contact your system administrator.

HT812/HT814 Ports Description

The following figure describes the different ports on the back panel of the HT812/HT814.

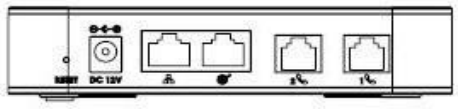

Figure 3: HT812 Back Panel

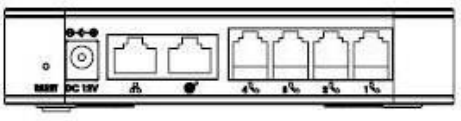

Figure 4: HT814 Back Panel

Table 3: Definition of the HT812/HT814 Connectors

Phone 1 & 2 (HT812) **Phone 1,2,3 & 4 (HT814)**	Connects the analog phones / fax machines to the ATA using an RJ-11 telephone cable.
WAN	Connects the ATA to your router, switch or modem using an Ethernet RJ45 network cable.
LAN	Connects the ATA to your PC or switch using an Ethernet RJ45 network cable.
DC Power	Connects the ATA to PSU (12V – 0.5A for HT812) and (12V - 1A for HT814).
Reset	Factory reset button. Press for 7 seconds to reset factory default

Connecting HT812/HT814

The HT812/HT814 are designed for easy configuration and installation. To connect your HT812/HT814, please follow the steps below:

Scenario 1: Connecting the HT812/HT814 using WAN Port

When connecting HT812/HT814 using the WAN port, they will act as simple DHCP Client.

1. Insert a standard RJ11 telephone cable into the p hone ports and connect the other end of the telephone cable to a standard touch-tone analogtelephone.
2. Connect the WAN port of the HT812/HT814 to a router, switch or modem using an Ethernet cable.
3. Insert the power adapter into the HT812/HT814 and connect it to a wall outlet and make sure to respect the technical specifications of the power adapter used.
4. Power, WAN and Phone LEDs will be solidly lit when the HT812/HT814 is ready for use.

The device is pre-provisioned to connect to the Airespring network at https://commportal.airespring.com/sip-ps/ and no

manual provisioning is required.

Figure 5: Connecting the HT812/HT814

HT812/HT814 LEDs Pattern

There are four (4) LED types that help you manage the status of your HT812/HT814.

Figure 6: HT812/HT814 LEDs Pattern

Table 4: HT812/HT814 LEDs Pattern Description

LED Lights	Status
Power LED	The Power LED lights up when the HT812/HT814 are powered on and it flashes when the HT812/HT814 is booting up
WAN LED	The WAN LED lights up when the HT812/HT814 are connected to your network through the WAN port.
LAN LED	The LAN LED lights up when the HT812/HT814 are connected to your network through the LAN port.
Phone LED 1&2 (HT812) **Phone LED 1,2,3 & 4 (HT814)**	The phone LED 1 & 2 indicates status of the respective FXS port-phone on the back panel • **OFF** - Unregistered • **ON (Solid Blue)** - Registered and Available • **Blinking every 500 ms** - Off-Hook / Busy • **Slow blinking** - FXS LEDs indicates voicemail

Understanding HT812/HT814 Interactive Voice Prompt Response Menu

The HT812/HT814 have a built-in voice prompt menu for simple device configuration which lists actions, commands, menu choices, and descriptions. The IVR menu works with any phone connected to the HT812/HT814. Pick up the handset and dial "***" to use the IVR menu. The end user or administrator should not have to use these prompts, they are only included here for troubleshooting.

Table 5: Voice Prompt Menu

Menu	Voice Prompt	Options
Main Menu	"Enter a Menu Option"	Press "*****" for the next menu option Press "#" to return to the main menu Enter 01-05, 07,10, 12-17,47 or 99 menu options
01	"DHCP Mode", "Static IP Mode" "PPPoE Mode"	Press "**9**" to toggle the selection If using "Static IP Mode", configure the IP address information using menus 02 to 05. If using "Dynamic IP Mode", all IP address information comes from the DHCP server automatically after reboot. If using "PPPoE Mode", configure PPPoE Username and Password from web GUI to get IP from your ISP.
02	"IP Address " + IP address	The current WAN IP address is announced If using "Static IP Mode", enter 12-digit new IP address. **You need to reboot your HT812/HT814 for the new IP address to take Effect.**
03	"Subnet " + IP address	Same as menu 02

04	"Gateway " + IP address	Same as menu 02
05	"DNS Server " + IP address	Same as menu 02
07	Preferred Vocoder	Press "**9**" to move to the next selection in the list: • PCM U / PCM A • iLBC • G-726 • G-723 • G-729 • OPUS • G-722
10	"MAC Address"	Announces the MAC address of the unit. **Note**: The device has two MAC addresses. One for the WAN port and one for the LAN port. The device MAC address announced is the address of LAN port.
12	WAN Port Web Access	Press "**9**" to toggle between **enable**/**disable**. Default is disabled.
13	Firmware Server IP Address	Announces current Firmware Server IP address. Enter 12-digit new IP address.
14	Configuration Server IP Address	Announces current Config Server Path IP address. Enter 12-digit new IP address.
15	Upgrade Protocol	Upgrade protocol for firmware and configuration update. Press "**9**" to toggle between **TFTP** / **HTTP / HTTPS/ FTP/FTPS**. Default is HTTPS.
16	Firmware Version	Announces Firmware version information.
17	Firmware Upgrade	Firmware upgrade mode. Press "**9**" to toggle among the following three options: • Always check • Check when pre/suffix changes • 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*".)
86	Voice Mail	Access to your voice mails messages.
99	"RESET"	Press "**9**" to reboot the device. Enter MAC address to restore factory default setting (See **Restore Factory Default Setting** section)
701-704	Phone calls between different ports of the same HT81x	HT81x supports inter-port calling from voice menu. 70X (X is the port number)

	"Invalid Entry"	Automatically returns to main menu
	"Device not registered"	This prompt will be played immediately after off hook If the device is not register and the option Outgoing Call without Registration is in NO

Five success tips when using the voice prompt

- "*" shifts down to the next menu option and "#" returns to the main menu
- "9" functions as the ENTER key in many cases to confirm or toggle an option.
- All entered digit sequences have known lengths - 2 digits for menu option and 12 digits for IP address. For IP address, add 0 before the digits if the digits are less than 3 (i.e. - 192.168.0.26 should be key in like 192168000026. No decimal is needed).
- Key entry cannot be deleted but the phone may prompt error once it is detected.

Note: Please make sure to reboot the device after changing networ Subnet…) to apply the new configuration.

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CONNECTING THE WORLD

CALL FEATURES

The HT812/HT814 support all the traditional and advanced telephony features.

Table 6: HT812/HT814 Call Features

Key	Call features
***02**	**Forcing a Codec** (per call) *027110 (PCMU), *02729 (G729)
***03**	**Disable LEC** (per call) Dial "*03" +" number". **No** dial tone is played in the middle.
***30**	**Block Caller ID** (for all subsequent calls)
***31**	**Send Caller ID** (for all subsequent calls)
***50**	**Disable Call Waiting** (for all subsequent calls)
***51**	**Enable Call Waiting** (for all subsequent calls)
***67**	**Block Caller ID (per call)**. Dial "*67" +" number". **No** dial tone is played in the middle.
***82**	**Send Caller ID (per call)**. Dial "*82" +" number". **No** dial tone is played in the middle.
***69**	**Call Return Service:** Dial *69 and the phone will dial the last incoming phone number received.
***70**	**Disable Call Waiting (per call).** Dial "*70" +" number". **No** dial tone is played in the middle.

***71**	**Enable Call Waiting (per call).** Dial "*71" +" number". **No** dial tone is played in the middle
***72**	**Unconditional Call Forward:** Dial "*72" and then the forwarding number followed by "#". Wait for dial tone and hang up. (dial tone indicates successful forward)
***73**	**Cancel Unconditional Call Forward**. To cancel "Unconditional Call Forward", dial "*73", wait for dial tone, then hang up.
***78**	**Enable Do Not Disturb (DND):** When enabled all incoming calls are rejected.
***79**	**Disable Do Not Disturb (DND):** When disabled, incoming calls are accepted.
***87**	**Blind Transfer**

***90**	**Busy Call Forward:** Dial "*90" and then the forwarding number followed by "#". Wait for dial tone then hang up.
***91**	**Cancel Busy Call Forward**. To cancel "Busy Call Forward", dial "*91", wait for dial tone, then hang up.
***92**	**Delayed Call Forward.** Dial "*92" and then the forwarding number followed by "#". Wait for dial tone then hang up.
***93**	**Cancel Delayed Call Forward.** To cancel Delayed Call Forward, dial "*93", wait for dial tone, then hang up
Flash/ Hook	Toggles between active call and incoming call (call waiting tone). If not in conversation, flash/hook will switch to a new channel for a new call.
#	Pressing pound sign will serve as Re-Dial key.

CALL OPERATIONS

Placing a Phone Call

To make the outgoing calls using your HT812/HT814

1. Pick up the handset of the connected phone.
2. Dial the number directly and wait for 4 seconds (Default “No Key Entry Timeout”); or
3. Dial the number directly and press # (Use # as dial key” must be configured in web configuration).

Examples:

1. Dial an extension directly on the same proxy, (e.g., 1008), and then press the # or wait for 4 seconds.
2. Dial an outside number (e.g. (626) 666-7890), first enter the prefix number (usually 1+ or international code) followed by the phone number. Press # or wait for 4 seconds. Check with your VoIP service provider for further details on prefix numbers.

Call Hold

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

Call Waiting

The call waiting tone (3 short beeps) indicates an incoming call, if the call waiting feature is enabled.
To toggle between incoming call and current call, you need to press the “flash” button the first call is placed on hold.
Press the “flash” button to toggle between the active calls.

Call Transfer

Blind Transfer

Assume that the call is established between phone A and B are in conversation. The phone A wants to *blind transfer* phone B to phone C:

1. On the phone A presses FLASH to hear the dial tone.

2. The phone A dials *87 then dials caller C's number, and then # (or wait for 4 seconds)
3. The phone A will hear the dial tone. Then, A can hang up.

Note: "Enable Call Feature" must be set to "Yes" in web configuration page.

Attended Transfer

Assume that the call is established between phone A and B are in conversation. The phone A wants to *attend transfer* phone B to phone C:

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

Note: When attended transfer fails and A hangs up, the HT812/HT814 will ring back user A to remind A that B is still on the call. A can pick up the phone to resume conversation with B.

3-Way conferencing

The HT812/HT814 support Bellcore style 3-way Conference. To perform the 3-way conference, we assume that the call is established between phone A and B are in conversation. Phone A(HT812/HT814) wants to bring third phone C into conference:

1. Phone A presses FLASH (on the analog phone, or Hook Flash for old model phones) to get a dial tone.
2. Phone A dials C's number then # (or wait for 4 seconds).
3. If phone C answers the call, then A presses FLASH to bring B, C in the conference.
4. If phone C does not answer the call, phone A can press FLASH back to talk to phone B.
5. If phone A presses FLASH during conference, the phone C will be dropped out.
6. If phone A hangs up, the conference will be terminated for all three parties when configuration "Transfer on Conference Hang up" is set to "No". If the configuration is set to "Yes", A will transfer B to C so that B and C can continue the conversation. This is an option in the phone profile.

Note: All star codes (*XX) related features mentioned above are supported by ATA default settings. If your service provider provides different feature codes, please contact them for instructions.

Inter-Port Calling

In some cases, a user may want to make phone calls between the phones connected to multiple ports of the same HT81x when it is used as a standalone unit, without the use of a SIP server. In such cases, users still will be able to make inter-port calls by using the IVR feature.

On the HT81x inter-port calling is achieved by dialing ***70X (X is the port number). For example, the user connected to port 1 can be reached by dialing *** and 701.

Voice Mail

VM Notification

The HT812/HT814 indicates new voice mail messages using Phone LEDs and Stutter Tone.
The Phone LEDs on HT812/HT814 will start blinking slowly when a new voice mail message is available on corresponding account.
A stutter tone will be played at first few seconds followed by dial tone when picking up the handset.

Note: New VM messages can be also indicated by LED blink, screen display, etc.… if they are supported on connected analog phones.

Accessing VM

To retrieve the new voice mail messages received, please refer to following steps:

1. Pick up the handset of the connected phone (stutter tone will be played).
2. Dial *98 or use the built-in voicemail button on the analog handset

RESTORE FACTORY DEFAULT SETTINGS

Warning:

Restoring the Factory Default Settings will delete all configuration information on the phone.– Factory defaulting the ATA will delete all provisioning information and should only be performed under the guidance of Airespring. To reprovision the phone PC access to the ATA will be required after the factory default.

There are three (3) methods for resetting your unit:

Using the Reset Button

To reset default factory settings using the reset button please follow the steps above:

1. Unplug the Ethernet cable.
2. Locate the reset hole on the back panel of your HT812/HT814.
3. Insert a pin in this hole and press for about 7 seconds.
4. Take out the pin. All unit settings are restored to factory settings

Using the IVR Command

Reset default factory settings using the IVR prompt:

1. Dial "***" for voice prompt.
2. Enter "99" and wait for "reset" voice prompt.
3. Enter the encoded MAC address (Look below on how to encode MAC address).
4. Wait 15 seconds and device will automatically reboot and restore factory settings.

Encode the MAC Address

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

Table 7: MAC Address Key Mapping

Key	Mapping
0-9	0-9
A	22 (press the "2" key twice, "A" will show on the LCD)
B	222
C	2222

D	33 (press the “3” key twice, “D” will show on the LCD)
E	333
F	3333

For example: if the MAC address is 000b8200e395, it should be keyed in as “0002228200333395”