



BroadSoft Partner Configuration Guide

Grandstream GXW-400X
FXS Analog Gateway
&
HandyTone HT-50X
Analog Telephone Adapter

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BroadWorks® Guide

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Document Revision History

Version	Reason for Change
1.1	Introduced document.

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1 Overview

This document describes the configuration procedures required for a Grandstream GXW-4004 / GXW-4008 / HT-502 to make full use of the capabilities of BroadWorks.

The GXW-4004 / GXW-4008 / HT-502 are a few of the many access devices that interoperate with BroadWorks.

The GXW-4004 / GXW-4008 / HT-502 uses the Session Initiation Protocol (SIP) to communicate with BroadWorks for call control. It also translates voice to audio packets for transmission across a packet network.

This guide describes the specific configuration items that are important for use with BroadWorks. It does not describe the purpose and use of all configuration items on the GXW-4004 / GXW-4008 / HT-502. For those details, see the *GXW-4004 / GXW-4008 / HT-502 User Manual* supplied by Grandstream [1.a\).\[1\]](#)

2 BroadWorks Validation Package Support Level

Devices are validated according to *BroadWorks Validation Packages*. Each package validates a subset of features or items. This section describes the device's support level for a *BroadWorks Validation Package* as well as the features or items in the package that are not supported. For specific issues, see section [3.2 Interoperability Issues](#). For a complete list of items validated per package, see [Appendix B: BroadWorks Validation Package Test Items](#).

BroadWorks Package	Support Level	Items Not Supported
Basic Call	Full	
BroadWorks Enhanced Services	Partial	Ring Splash Advanced Call Control (Talk, Auto-Answer)
DUT Services – Call Control	Partial	Network Conference 3-Way Network Conference N-Way
DUT Services – Registration and Authentication	Partial	BroadWorks Authentication
DUT Services – FAX	Full	
DUT Services – Busy Lamp Field	None	
Redundancy	Full	
SBC/ALG	Full	
Shared Call Appearance	None	
Video	None	
TCP	Full	

3 Device Capabilities and Known Interoperability Issues

This section describes the features supported by the GXW-4004 / GXW-4008 / HT-502, as well as BroadWorks interoperability issues and impact. The following table describes capabilities.

Verified Revisions shows the results of partner (vendor) testing of a specific BroadWorks version with a specific partner's device under test (DUT) version.

Compatible Revisions indicates the maintenance versions that should interface properly with BroadWorks.

3.1 Capabilities

Device Type	Generic SIP Smart (Proxy Addr)
Lines and Appearances	GXW-4004: 4 lines 1 appearances per line GXW-4008: 8 lines 1 appearances per line HT-502: 2 lines 1 appearances per line
Speaker/Power/Bridge	No/No/Yes
Verified Revisions	BroadWorks Release 14.0 GXW-4004: Grandstream 1.0.0.39 GXW-4008: Grandstream 1.0.0.39 HT-502: Grandstream 1.0.0.39
Compatible Revisions	BroadWorks Release 14.0 Grandstream Any maintenance version of GXW-4004/GXW-4008/HT-502 1.0.0.39
SIP Proxy FQDN DNS Lookup (A, SRV, NAPTR)	A, SRV
Outbound Proxy Configurable	Yes
Outbound Proxy FQDN DNS Lookup (A, SRV, NAPTR)	A, SRV
BroadWorks Redundancy Enabled	Yes
BroadWorks Shared Call Appearance	N/A
BroadWorks Enhanced IP Phone Configuration	Partial
Device Services	Call Forwarding, Attended/Blind Call Transfer, 3-way Call, Call Waiting, Call Hold, Call Return.
Device Call Control (Device-Controlled or Flash INFO-based)	Device-Controlled
Codecs	PCMU, PCMA, G723.1 G729A/B/E, iLBC, G726-16/24/32/40
RFC 2833 DTMF	Yes
T.38 Fax	Yes

TCP	Yes
TLS	Yes

3.2 Interoperability Issues

This section lists the known interoperability issues between BroadWorks and partner release(s). For more information on issues related to the particular software release, see the partner release notes (*generally, this should only be for GA partner releases*).

Issue Tracking Number	Issue Title and Description	Partner Releases			
	BroadWorks Release 14	1.0.0.39			
1025 - 61	Broadworks to DUT, Do Not Disturb (DND) ring splash DUT does not play a ring splash. DUT driver does not support ring splash.	X			
1025 -119	DUT to BroadWorks via Primary Application Server, DUT Currently Served by Secondary Application Server DUT does not always contact the primary server first for INVITE. It relies on the OPTIONS message from BroadWorks to failback. When DUT is registered on secondary server and the primary server becomes available and sends an OPTIONS request, DUT will send INVITE to the primary server.	X			

4 BroadWorks Device Identity/Profile

BroadWorks configurable device identify/profile is introduced in BroadWorks Release 14.0. **This section applies only to BroadWorks Release 14.0 and later.**

The following table identifies the required BroadWorks device identity/profile settings for interoperability between the GXW-4004/GXW-4008/HT-502 and BroadWorks. For an explanation of the profile parameters, refer to the *BroadWorks Device Inventory Guide 1.a).i.[4]*.

For most of the parameters below, an “X” indicates the parameter function is supported and/or required. If the item is blank, it is not supported.

Grandstream GXW-4004/GXW-4008/HT-502 Identify/Device Profile	
Signaling Address Type	Intelligent Proxy Addressing
Number of Lines	GXW-4004: 4 lines GXW-4008: 8 lines HT-502: 2 lines
Ringback Tone/ Early Media Support	Local Ringback – No Early Media
Registration Capable	X
Static Registration Capable	
E.164 Capable	
Trusted	
Authentication Override	
Video Capable	
RFC 3264 Hold	X
Route Advance	
Wireless Integration	
PBX Integration	
Use Business Trunking Contact	
Forwarding Override	
Conference Device	
Music On Hold Device	
Web Based Configuration URL	
Auto Configuration Type	2 Config file
Reset Event	checkSync
Enable Monitoring	
CPE System File Name	gxwSystem.txt / htSystem.txt
Device File Format	%BWMACADDRESS%.txt

5 BroadWorks Device Type

This section applies to BroadWorks Release 13.0 and before.

The following BroadWorks device type should be used for Grandstream GXW-4004 / GXW-4008 /HT-502.

- Grandstream GXW-4004
- Grandstream GXW-4008
- Grandstream HT-502

The above device types require BroadWorks Release 14 MP<TBD>. If the BroadWorks system is currently at a lower patch level, either apply the necessary patch or use the following generic device type until the system can be patched accordingly.

- Generic SIP Smart (Proxy Addr)

6 Configuration

Grandstream GXW-4004 / GXW-4008 / HT-502 can be configured via Web GUI Interface as well as via Configuration File through TFTP or HTTP.

The GXW-4004 / GXW-4008 / HT-502 accepts configuration files in a proprietary binary format which is produced by the Grandstream configuration tool. The configuration tool creates a device configuration file based on a configuration template and the device's MAC address. All Grandstream products' sample configuration templates are available on Grandstream's web site. A configuration template file contains all configuration parameters available for a product, with comments describing allowed values of the parameters. For a detailed parameter list, please refer to the corresponding firmware release configuration template 1.a)i.[2].

When Grandstream device boots up or reboots, it will issue request for a binary configuration file named "cfgxxxxxxxx", where "xxxxxxxx" is the LAN MAC address of the device, i.e., "cfg000b820102ab". The configuration file name should be in lower cases.

Grandstream offers free Configuration File generator software in both Linux/Unix and Windows platform. Both Configuration File Generators can be downloaded from Grandstream official web site at <http://www.grandstream.com/configurationtool.html> 1.a)i.[2].

The following examples describe how to set the parameters using a configuration file. The GXW-4004 / GXW-4008 / HT-502 should be configured to load the configuration file each time it resets or re-synchronizes. For detailed information on automated provisioning, please check the *GXW-4004 / GXW-4008 / HT-502 User Manual* 1.a)i.[1] and the Grandstream configuration tool user guide 1.a)i.[2].

The capabilities of the GXW-4004 / GXW-4008 / HT-502 have been verified for use with BroadWorks based on the settings described in the following table. For more information on the meaning, purpose, and applicability of the individual configuration items, see the *GXW-4004 / GXW-4008 / HT-502 configuration template* 1.a)i.[2].

Configuration Files

Files Provided by Partner	Level	Description
gxw4004prog.bin/gxw4004core.bin/gxw4004boot.bin/gxw4004base.bin gxw4008prog.bin/gxw4008core.bin/gxw4008boot.bin/gxw4008base.bin ht502prog.bin/ht502core.bin/ht502boot.bin/ht502base.bin	System	Contains the device firmware load.
GXW-4004 / GXW-4008 / HT-502 Configuration Template Example: gxw400x_config_1.0.0.39.txt ht502_config_1.0.0.39.txt	System and Subscriber	Contains configurable parameters that apply to all devices in a given deployment.
cfgMAC Example: cfg000b8200000	System and Subscriber	Binary configuration file generated from configuration template and an individual device's MAC address

6.1 System Level Configuration

This section describes system-wide configuration items that are generally required for each GXW-4004 / GXW-4008 / HT-502 to work with BroadWorks. Subscriber-specific settings are described in the next section.

Step	Command	Purpose
System Configuration File <system-wide configuration file name>		
Step 1	Set SIP Proxy/Domain. SIP Server = as.broadworks.net	Set the GXW-4004 / GXW-4008 / HT-502 SIP server to the Fully Qualified Domain Name (FQDN) for the BroadWorks Application Server cluster. The domain must match the domain configured for the BroadWorks subscriber's line/port domain.
Step 2	Set Outbound Proxy. OutBound Proxy = sbc.broadworks.net	Set the outbound proxy to the session border controller (SBC) if one is deployed between the GXW-4004 / GXW-4008 / HT-502 and BroadWorks. If there are redundant SBCs, set it to the FQDN for the SBC cluster.
Step 3	Enable DNS SRV lookup. Use DNS SRV = "Yes"	Enable DNS SRV lookups.
Step 4	Set register mode. SIP Registration = "Yes"	Enable SIP register.
Step 5	Set SIP Timers. Register Expiration = 60	The default registration period is 60 minutes.
Step 6	Enable negotiated DTMF type. Send DTMF = "via RTP (RFC2833)"	Set the GXW-4004 / GXW-4008 / HT-502 to enable inband or RFC 2833 negotiated DTMF.
Step 7	Configure dialplan. Example: Dial Plan = "{ x+ }"	Configure the GXW-4004 / GXW-4008 / HT-502 dial plan according to the locale. The dial plan shown is the device default dial plan – any number is allowed.
Step 8	Disable local feature code services. Enable Call Features = "No"	Disable feature access codes controlled by the device.

6.2 Subscriber Level Configuration Parameters

This section identifies the device-specific parameters, including registration and authentication. These settings must be unique across devices in order to be matched with the settings for a BroadWorks subscriber.

Provisioning a subscriber to register with BroadWorks allows calls to terminate to the subscriber's line. Registration requires that a unique address of record (AoR) is provisioned on BroadWorks and the phone; provisioning an AoR on BroadWorks consists of setting the line/port parameter to a unique value within the Application Server cluster.

Grandstream GXW-4004 / GXW-4008 / HT-502 supports four SIP accounts (lines), eight SIP accounts, and two SIP accounts respectively. The follow example shows how to configure subscriber elements for an account.

Step	Command	Purpose
Subscriber Configuration Items		
Step 1	Set Register User ID for each line. Example: SIP User_ID = "2405551111" ;	The register user ID must correspond with the line/port setting on BroadWorks.
Step 2	Enable SIP Authentication for each line. Example: Authenticate ID = "1111@as.mycompany.com" ; Authenticate Password = "welcome" ;	If the Authentication service is configured on BroadWorks, these parameters must be configured to match the BroadWorks settings.
Step 3	Configure display name for each line. Example: Name = "Claire Smith" ;	For each line, configure the name to be displayed on the device.
Step 4	Select SIP Profile for each line. Example: Profile ID = Profile 1	Set SIP Profile or each line.

7 Enhanced IP Phone Configuration

Enhanced IP Phone Configuration is a BroadWorks feature that enables automatic generation of device configuration files, given administrator-supplied templates.

For more information on the Enhanced IP Phone Configuration feature, see the *Enhanced IP Phone Configuration Guide* [1.a\)i.\[3\]](#).

NOTE: BroadSoft does not manage or distribute template files for use with the Enhanced IP Phone Configuration feature. Obtain template files from Grandstream or use the configuration files obtained from Grandstream for the specific GXW-4004 / GXW-4008 / HT-502 firmware release to create template files appropriate for your installation.

Since the GXW-4004 / GXW-4008 / HT-502 SIP phones require the configuration files be converted into a binary format, an extra step must be performed when using this feature. After the configuration files have been sent to the TFTP server and before the phone is reset, the configuration files must be converted to binary format using Grandstream's configuration tool. For detailed information on automated provisioning, please check the Grandstream configuration tool user guide [1.a\)i.\[2\]](#).

The GXW-4004 / GXW-4008 / HT-502 use only a phone-specific file to configure the device. However, the Enhanced IP Phone Configuration feature requires a system and a phone-specific file for each device. To satisfy the system file requirement, an empty file (*gxwDefault.txt*, *htDesfult.txt*) will need to be uploaded to BroadWorks as the system file. This file will be sent to the FTP server but will not actually be used for the configuration file generation. The group template file is used to build the configuration files for the devices of this device type assigned to the group. For a sample GXW-4004 / GXW-4008 / HT-502 group template file, see Appendix A.

Appendix A: Sample GXW-4004 / GXW-4008 / HT-502 Configuration Files

NOTE: The following samples are examples and should be used as a reference only. DO NOT CUT AND PASTE THESE EXAMPLES TO GENERATE YOUR CONFIGURATION FILES. Use the configuration files obtained from Grandstream with the specific release to generate your configuration files.

System Default Parameters

NOTE: This is an example file and should be used for reference only.

```
# SIP Default Generic Configuration Parameters

#####
# Profile/Account 1          #
#####

# Profile Active.  0 - no, 1 - yes
P271 = 1

# SIP Server
P47 = as.broadworks.net

# Outbound Proxy
P48 = sbc.broadworks.net

# Use DNS SRV.  0 - no, 1 - yes.
P103 = 1

# SIP Registration.  0 - no, 1 - yes
P31 = 1

# Register Expiration (in minutes. default 1 hour, max 45 days)
P32 = 60

# DTMF via RTP (RFC2833).  0 - no, 1 - yes
P851 = 1

# Dial Plan.
P4200 = { x+ }

# Enable Call Features.  0 - no, 1 - yes
P191 = 0

#####
# Profile/Account 2          #
#####

# Profile Active.  0 - no, 1 - yes
P401 = 1

# SIP Server
P747 = as.broadworks.net
```

```
# Outbound Proxy
P748 = sbc.broadworks.net

# Use DNS SRV. 0 - no, 1 - yes.
P702 = 1

# SIP Registration. 0 - no, 1 - yes
P731 = 1

# Register Expiration (in minutes. default 1 hour, max 45 days)
P732 = 60

# DTMF via RTP (RFC2833). 0 - no, 1 - yes
P861 = 1

# Dial Plan.
P4201 = { x+ }

# Enable Call Features. 0 - no, 1 - yes
P751 = 0
```

Phone-Specific Parameters:

NOTE: This is an example file and should be used for reference only.

```
# SIP Device-specific Configuration Parameters

#####
# HT-502 Account 1 #
#####

# SIP User ID
P35 = 2405551111

# Authenticate ID
P36 = 1111@as.mycompany.com

# Authenticate password
P34 = welcome

# Display Name
P3 = Claire Smith

#####
# HT-502 Account 2 #
#####

# Account 2 SIP User ID
P735 =

# Authenticate ID
P736 =
```

```

# Authenticate Password
P734 =

# Display Name
P703 =

#####
# GXW-4004/GXW-4008      #
#####

# FXS Port 1
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4060 =
P4090 =
P4120 =
P4180 =
P4150 =

# FXS Port 2
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4061 =
P4091 =
P4121 =
P4181 =
P4151 =

# FXS Port 3
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4062 =
P4092 =
P4122 =
P4182 =
P4152 =

# FXS Port 4
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4063 =
P4093 =
P4123 =
P4183 =
P4153 =

#####
# The following 4 ports belong to GXW-4008 only      #
#####

# FXS Port 5
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4064 =
P4094 =
P4124 =
P4184 =
P4154 =

# FXS Port 6
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -

```

```
Profile 1, 1 - Profile 2)
P4065 =
P4095 =
P4125 =
P4185 =
P4155 =

# FXS Port 7
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4066 =
P4096 =
P4126 =
P4186 =
P4156 =

# FXS Port 8
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4067 =
P4097 =
P4127 =
P4187 =
P4157 =
```

Group Template File: GXW-GroupTemplate.txt /HT- GroupTemplate.txt

NOTE: This is an example file and should be used for reference only.

```
# SIP Default Generic Configuration Parameters

#####
# Profile/Account 1 #
#####

# Profile Active. 0 - no, 1 - yes
P271 = 1

# SIP Server
P47 = as.broadworks.net

# Outbound Proxy
P48 = sbc.broadworks.net

# Use DNS SRV. 0 - no, 1 - yes.
P103 = 1

# SIP Registration. 0 - no, 1 - yes
P31 = 1

# Register Expiration (in minutes. default 1 hour, max 45 days)
P32 = 60

# DTMF via RTP (RFC2833). 0 - no, 1 - yes
P851 = 1
```

```

# Dial Plan.
P4200 = { x+ }

# Enable Call Features. 0 - no, 1 - yes
P191 = 0

#####
# Profile/Account 2                #
#####

# Profile Active. 0 - no, 1 - yes
P401 = 1

# SIP Server
P747 = as.broadworks.net

# Outbound Proxy
P748 = sbc.broadworks.net

# Use DNS SRV. 0 - no, 1 - yes.
P702 = 1

# SIP Registration. 0 - no, 1 - yes
P731 = 1

# Register Expiration (in minutes. default 1 hour, max 45 days)
P732 = 60

# DTMF via RTP (RFC2833). 0 - no, 1 - yes
P861 = 1

# Dial Plan.
P4201 = { x+ }

# Enable Call Features. 0 - no, 1 - yes
P751 = 0

#####
# SIP Device-specific Configuration Parameters  #
#####

#####
# HT-502 Account 1                #
#####

# SIP User ID
P35 = %BWLINPORT-1%

# Authenticate ID
P36 = %BWAUTHUSER-1%

# Authenticate password
P34 = %BWAUTHPASSWORD-1%

# Display Name (John Doe)
P3 = %BWCLID-1%

#####
# HT-502 Account 2                #

```

```
#####
# Account 2 SIP User ID
P735 = %BWLINPORT-2%

# Authenticate ID
P736 = %BWAUTHUSER-2%

# Authenticate Password
P734 = %BWAUTHPASSWORD-2%

# Display Name
P703 = %BWCLID-2%

#####
# GXW-4004/GXW-4008 #
#####

# FXS Port 1
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4060 = %BWLINPORT-1%
P4090 = %BWAUTHUSER-1%
P4120 = %BWAUTHPASSWORD-1%
P4180 = %BWCLID-1%
P4150 =

# FXS Port 2
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4061 = %BWLINPORT-2%
P4091 = %BWAUTHUSER-2%
P4121 = %BWAUTHPASSWORD-2%
P4181 = %BWCLID-2%
P4151 =

# FXS Port 3
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4062 = %BWLINPORT-3%
P4092 = %BWAUTHUSER-3%
P4122 = %BWAUTHPASSWORD-3%
P4182 = %BWCLID-3%
P4152 =

# FXS Port 4
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4063 = %BWLINPORT-4%
P4093 = %BWAUTHUSER-4%
P4123 = %BWAUTHPASSWORD-4%
P4183 = %BWCLID-4%
P4153 =

#####
# The following 4 ports belong to GXW-4008 only #
#####

# FXS Port 5
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
```

```
P4064 = %BWLINERPORT-5%
P4094 = %BWAUTHUSER-5%
P4124 = %BWAUTHPASSWORD-5%
P4184 = %BWCLID-5%
P4154 =

# FXS Port 6
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4065 = %BWLINERPORT-6%
P4095 = %BWAUTHUSER-6%
P4125 = %BWAUTHPASSWORD-6%
P4185 = %BWCLID-6%
P4155 =

# FXS Port 7
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4066 = %BWLINERPORT-7%
P4096 = %BWAUTHUSER-7%
P4126 = %BWAUTHPASSWORD-7%
P4186 = %BWCLID-7%
P4156 =

# FXS Port 8
# SIP USER ID, Authenticate ID, Password, Display Name, Profile ID (0 -
Profile 1, 1 - Profile 2)
P4067 = %BWLINERPORT-8%
P4097 = %BWAUTHUSER-8%
P4127 = %BWAUTHPASSWORD-8%
P4187 = %BWCLID-8%
P4157 =
```

Appendix B: BroadWorks Validation Package Test Items

The following table describes the items tested in each *BroadWorks Validation Package*.

BroadWorks Validation Package	Items Supported
Basic Call	<ul style="list-style-type: none"> Basic Call Origination / Termination Call Failure Codes Session Audit Ringback Dial Plan Inband DTMF RFC 2833/Negotiation Codec Renegotiation
BroadWorks Enhanced Services	<ul style="list-style-type: none"> Basic CommPilot Call Manager Functions Voice Messaging Audio MWI Voice Messaging Visual MWI Ring Splash Priority Alerting Priority Call Waiting Alternate Numbers Advanced Call Control Anonymous Call Remote Restart Call Park Retrieve – Answer with Hold
DUT Services – Call Control	<ul style="list-style-type: none"> Call Waiting Call Hold Blind Transfer Attended Transfer 3-Way Call Network Conference 3-Way Network Conference N-Way
DUT Services – Registration and Authentication	<ul style="list-style-type: none"> Authenticated Registration Maximum Registration Minimum Registration Rejected Registration Authenticated Origination Authenticated Re-INVITE Authenticated REFER BroadWorks Authentication

BroadWorks Validation Package	Items Supported
DUT Services - FAX	FAX Passthrough FAX T38
DUT Services – Busy Lamp Field	Basic BLF
Redundancy	DNS Registration Failover Call Setup Failover Mid-Call Failover
SBC/ALG	Registration Call Origination Call Termination
Shared Call Appearance	Line Seize Line Lamp Management Line Hold/Retrieve Multiple Call Arrangement SCA Bridging
Video	Integrated Video Phone Video Add-On
TCP	Basic

References

- [1] Grandstream Networks, Inc. 2007. *GXW-400X / HT-502 User Manual*. Download at
http://www.grandstream.com/user_manuals/GXW400x_User_Manual.pdf,
http://www.grandstream.com/user_manuals/HT502_User_Manual.pdf

AND GUI Interfaces

http://www.grandstream.com/user_manuals/GUI/GUI_GXW400x.rar,
http://www.grandstream.com/user_manuals/GUI/GUI_HT502.rar
- [2] Grandstream Networks, Inc. 2007. Grandstream Configuration Tool and Templates. Available from <http://www.grandstream.com/configurationtool.html>.
- [3] BroadSoft, Inc. 2006. *BroadWorks Enhanced IP Phone Configuration Guide*, Release 14.0. Available from the BroadSoft KnowledgeBase at www.broadsoft.com/KnowledgeBase.
- [4] BroadSoft, Inc. 2006. *BroadWorks Device Inventory Guide*, Release 14.0. Available from the BroadSoft KnowledgeBase at www.broadsoft.com/KnowledgeBase.
- [5] BroadSoft, Inc. 2006. *BroadWorks Redundancy Guide*, Release 14.0. Available from the BroadSoft KnowledgeBase at www.broadsoft.com/KnowledgeBase.

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