



# **BroadSoft Partner Configuration Guide**

## **Spectralink 84xx Series**

December 2018

Document Version 1.2

## BroadWorks® Guide

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Version	Reason for Change
1.1	Introduced document for Spectralink 84xx Series version 5.4.4D.2167 validation with BroadWorks Release 22.0.
1.2	Edited and published document.

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## 1 Overview

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This guide describes the configuration procedures required for the Spectralink 84xx Series for interoperability with BroadWorks. This includes the following models:

- Spectralink 8440
- Spectralink 8441
- Spectralink 8452
- Spectralink 8453

The 84xx Series is a wireless SIP phone that uses the Session Initiation Protocol (SIP) to communicate with BroadWorks for call control.

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 84xx Series. For those details, see the *Spectralink 84-Series Wireless Telephone Administration Guide* [\[1\]](#) supplied by Spectralink.

## 2 Interoperability Status

This section provides the known interoperability status of the Spectralink 84xx Series with BroadWorks. This includes the version(s) tested, the capabilities supported, and known issues.

Interoperability testing validates that the device interfaces properly with BroadWorks via the SIP interface. Qualitative aspects of the device or device capabilities not affecting the SIP interface such as display features, performance, and audio qualities are not covered by interoperability testing. Requests for information and/or issues regarding these aspects should be directed to Spectralink.

### 2.1 Verified Versions

The following table identifies the verified Spectralink 84xx Series and BroadWorks versions and the month/year the testing occurred. If the device has undergone more than one test cycle, versions for each test cycle are listed, with the most recent listed first.

*Compatible Versions* in the following table identify specific 84xx Series versions that the partner has identified as compatible so should interface properly with BroadWorks. Generally, maintenance releases of the validated version are considered compatible and may not be specifically listed here. For any questions concerning maintenance and compatible releases, contact Spectralink.

**NOTE:** Interoperability testing is usually performed with the latest generally available (GA) device firmware/software and the latest GA BroadWorks release and service pack at the time the testing occurs. If there is a need to use a non-verified mix of BroadWorks and device software versions, customers can mitigate their risk by self-testing the combination themselves using the *BroadWorks SIP Phone Interoperability Test Plan* [6].

Verified Versions			
Date (mm/yyyy)	BroadWorks Release	84xx Series Verified Version	84xx Series Compatible Versions
11/2018	Release 22.0	5.4.4D.2167	None

### 2.2 Interface Capabilities Supported

This section identifies interface capabilities that have been verified through testing as supported by Spectralink 84xx Series.

The *Supported* column in the tables in this section identifies the Spectralink 84xx Series's support for each of the items covered in the test plan, with the following designations:

- Yes Test item is supported
- No Test item is not supported
- NA Test item is not applicable to the device type
- NT Test item was not tested

Caveats and clarifications are identified in the *Comments* column.

### 2.2.1 SIP Interface Capabilities

The Spectralink 84xx Series has completed interoperability testing with BroadWorks using the *BroadWorks SIP Phone Interoperability Test Plan* [6]. The results are summarized in the following table.

The BroadWorks test plan is composed of packages, each covering distinct interoperability areas, such as “Basic” call scenarios and “Redundancy” scenarios. Each package is composed of one or more test items, which in turn are composed of one or more test cases. The test plan exercises the SIP interface between the device and BroadWorks with the intent to ensure interoperability sufficient to support the BroadWorks feature set.

**NOTE:** *DUT* in the following table refers to the *Device Under Test*, which in this case is the Spectralink 84xx Series.

BroadWorks SIP Phone Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
Basic	Call Origination	Yes	
	Call Termination	Yes	
	Session Audit	Yes	
	Session Timer	Yes	
	Ringback	Yes	
	Forked Dialog	Yes	
	181 Call Being Forwarded	Yes	
	Dial Plan	Yes	
	DTMF – Inband	No	
	DTMF – RFC 2833	Yes	
	DTMF – DTMF Relay	Yes	
	Codec Negotiation	Yes	
	Codec Renegotiation	Yes	
BroadWorks Services	Third-Party Call Control – Basic	NA	
	Third-Party Call Control – Advanced	Yes	Does not support Click to Dial.
	Voice Message Deposit/Retrieval	Yes	
	Message Waiting Indicator – Unsolicited	Yes	
	Message Waiting Indicator – Solicited	Yes	
	Message Waiting Indicator – Detail	Yes	Does not support saved and urgent information.
	Voice Portal Outcall	Yes	
	Advanced Alerting – Ringing	No	
	Advanced Alerting – Call Waiting	No	



BroadWorks SIP Phone Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
	Advanced Alerting – Ring Splash	No	
	Advanced Alerting – Silent Alerting	No	
	Calling Line ID	Yes	
	Calling Line ID with Unicode Characters	Yes	
	Connected Line ID	Yes	Does not support Connected Line Restriction.
	Connected Line ID with Unicode Characters	Yes	
	Connected Line ID on UPDATE	Yes	
	Connected Line ID on Re-INVITE	Yes	
	Diversion Header	Yes	
	History-Info Header	No	
	Advice of Charge	No	
	Meet-Me Conferencing	Yes	
	Meet-Me Conferencing – G722	Yes	
	Meet-Me Conferencing – AMR-WB	No	
	Meet-Me Conferencing – Opus	No	
	Collaborate – Audio	Yes	
	Collaborate – Audio – G722	Yes	
	Collaborate – Audio – Opus	No	
	Call Decline Policy	Yes	
	<b>DUT Services – Call Control Services</b>	Call Waiting	Yes
Call Hold		Yes	
Call Transfer		Yes	
Three-Way Calling		Yes	Does not support Three-Way Calling before Answer.
Network-Based Conference		Yes	
<b>DUT Services – Registration and Authentication</b>	Register Authentication	Yes	
	Maximum Registration	Yes	
	Minimum Registration	Yes	
	Invite Authentication	Yes	
	Re-Invite/Update Authentication	Yes	
	Refer Authentication	Yes	
	Device Authenticating BroadWorks	No	
<b>DUT Services – Emergency Call</b>	Emergency Call	No	
	Emergency Call with Ringback	No	

<b>BroadWorks SIP Phone Interoperability Test Plan Support Table</b>			
<b>Test Plan Package</b>	<b>Test Plan Package Items</b>	<b>Supported</b>	<b>Comments</b>
<b>DUT Services – P-Access-Network-Info Header</b>	REGISTER with P-Access-Network-Info Header	No	
	INVITE with P-Access-Network-Info Header	No	
<b>DUT Services – Miscellaneous</b>	Do Not Disturb	Yes	
	Call Forwarding Always	Yes	
	Call Forwarding Always Diversion Inhibitor	No	
	Anonymous Call	No	
	Anonymous Call Block	No	
	Remote Restart Via Notify	Yes	
<b>Advanced Phone Services – Busy Lamp Field</b>	Busy Lamp Field	No	
	Call Park Notification	No	
<b>Advanced Phone Services – Feature Key Synchronization, Private Line</b>	Do Not Disturb	Yes	
	Do Not Disturb Ring Splash	No	
	Call Forwarding	Yes	
	Call Forwarding Always Ring Splash	No	
	Call Forwarding Always Diversion Inhibitor	No	
	Call Center Agent Logon/Logoff	No	
	Call Center Agent Unavailable Code	No	
	Executive – Call Filtering	No	
	Executive-Assistant – Call Filtering	No	
	Executive-Assistant – Diversion	No	
	Call Recording	No	
	Security Classification	No	
	<b>Advanced Phone Services – Feature Key Synchronization, Shared Line</b>	Do Not Disturb	Yes
Do Not Disturb Ring Splash		No	
Call Forwarding		No	
Call Forwarding Always Ring Splash		No	
Call Forwarding Always Diversion Inhibitor		No	
Security Classification		No	
<b>Advanced Phone Services – Missed Calls Display Synchronization</b>	Missed Calls Display Sync	Yes	
	Line-Seize	Yes	

<b>BroadWorks SIP Phone Interoperability Test Plan Support Table</b>			
<b>Test Plan Package</b>	<b>Test Plan Package Items</b>	<b>Supported</b>	<b>Comments</b>
<b>Advanced Phone Services – Shared Call Appearance using Call Info</b>	Call-Info/Lamp Management	Yes	
	Public Hold	Yes	
	Private Hold	No	
	Hybrid Key System	Yes	
	Multiple Call Arrangement	Yes	
	Bridge Active Line	Yes	
	Bridge Active Line – Silent Monitor	No	
	Call Park Notification	No	
<b>Advanced Phone Services – Call Park Notification</b>	Call Park Notification	No	
<b>Advanced Phone Services – Call Center</b>	Hold Reminder	Yes	
	Call Information	No	
	Hoteling Event	No	
	Status Event	No	
	Disposition Code	No	
	Emergency Escalation	No	
	Customer Originated Trace	No	
<b>Advanced Phone Services – Call Recording Controls</b>	Pause/Resume	No	
	Start/Stop	No	
	Record Local Conference	No	
	Record Network Conference	No	
<b>Advanced Phone Services – Call Recording Video</b>	Basic Call	No	
	Record Local Conference	No	
	Record Network Conference	No	
<b>Advanced Phone Services – Security Classification</b>	Security Classification	No	
<b>Advanced Phone Services – Conference Event</b>	Network-Based Conference Creator	No	
	Network-Based Conference Participant	No	
	Meet-Me Conference Participant	No	
<b>Redundancy</b>	DNS SRV Lookup	Yes	
	Register Failover/Failback	Yes	
	Invite Failover/Failback	Yes	
	Bye Failover	Yes	
<b>SBC/ALG - Basic</b>	Register	Yes	

<b>BroadWorks SIP Phone Interoperability Test Plan Support Table</b>			
<b>Test Plan Package</b>	<b>Test Plan Package Items</b>	<b>Supported</b>	<b>Comments</b>
	Outgoing Invite	Yes	
	Incoming Invite	Yes	
<b>SBC/ALG – Failover/Failback</b>	Register Failover/Failback	Yes	
	Invite Failover/Failback	Yes	
<b>Video – Basic Video Calls</b>	Call Origination	No	
	Call Termination	No	
	Call Hold	No	
	Call Waiting	No	
	Call Transfer	No	
<b>Video – BroadWorks Video Services</b>	Auto Attendant	No	
	Auto Attendant – HD	No	
	Voice Messaging	No	
	Voice Messaging – HD	No	
	Custom Ringback	No	
<b>Video – BroadWorks Video Conference</b>	Network-based Conference	No	
	Network-based Conference – HD	No	
	Collaborate – Video	No	
	Collaborate – Video – HD	No	
<b>Video – BroadWorks WebRTC Client</b>	Call from WebRTC Client	No	
	Call to WebRTC Client	No	
<b>TCP</b>	Register	Yes	
	Outgoing Invite	Yes	
	Incoming Invite	Yes	
<b>IPV6</b>	Call Origination	No	
	Call Termination	No	
	Session Audit	No	
	Ringback	No	
	Codec Negotiation/Renegotiation	No	
	Voice Message Deposit/Retrieval	No	
	Call Control	No	
	Registration with Authentication	No	
	Busy Lamp Field	No	
	Redundancy	No	
	SBC	No	
	Video	No	

BroadWorks SIP Phone Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
	Dual Stack with Alternate Connectivity	No	

## 2.2.2 Other Interface Capabilities

This section identifies whether the Spectralink 84xx Series has implemented support for the following:

- BroadWorks Xtended Services Interface (Xsi)
- Extensible Messaging and Presence Protocol (XMPP) (BroadCloud/BroadWorks Collaborate Instant Messaging and Presence [IM&P])

Support for these interfaces is demonstrated by completing the *BroadWorks SIP Phone Xsi and XMPP Test Plan* [7]. Support for these interfaces is summarized in the following table.

BroadWorks Xtended Services Interface (Xsi) and BroadCloud IM&P Support Table			
Interface	Feature	Supported	Comments
<b>Xsi Features – Authentication</b>	Authenticate with SIP Credentials	No	
	Authenticate with BroadWorks User Login Credentials	No	
	Authenticate with BroadWorks User Directory Number	No	
<b>Xsi Features – User Service Configuration</b>	Remote Office	No	
	BroadWorks Anywhere	No	
	Simultaneous Ringing	No	
	Caller ID Blocking	No	
	Call Forwarding Always	No	
	Call Forwarding Busy	No	
	Call Forwarding No Answer	No	
<b>Xsi Features – Directories</b>	Do Not Disturb	No	
	Enterprise Directory	No	
	Enterprise Common Phone List	No	
	Group Directory	No	
	Group Common Phone List	No	
	Personal Phone List	No	
<b>Xsi Features – Call Logs</b>	Search All Directories	No	
	Placed Calls	No	
	Received Calls	No	
	Missed Calls	No	
	All Calls	No	

BroadWorks Xtended Services Interface (Xsi) and BroadCloud IM&P Support Table			
Interface	Feature	Supported	Comments
	Sort by Name	No	
<b>Xsi Features – Visual Voice Mail</b>	View Messages	No	
	Listen to Audio Message	No	
	Watch Video Message	No	
	Mark Message Read/Unread	No	
	Delete Message	No	
	Mark All Messages Read/Unread	No	
<b>Xsi Features – Push Notification</b>	Register/Deregister for Push Notifications	No	
	Incoming Call via Push Notification	No	
	Call Update via Push Notification	No	
	Incoming Call via Push Notification; Second Incoming Call	No	
	MWI via Push Notification	No	
	Ring Splash via Push Notification	No	
<b>Xsi Features – Call Recording Configurations</b>	Call Record Mode Get	No	
	Set Record Mode	No	
	Set Play Call Recording to Start and Stop Announcement	No	
	Set Record Voice Messaging		
	Set Pause and Resume Notification	No	
	Set Recording Notification	No	
<b>Xsi Features – Call Recording Controls</b>	Record Mode set to Never	No	
	Record Mode set to Always	No	
	Record Mode set to Always with Pause/Resume	No	
	Start Recording Mid-Call with Record Mode set to On Demand	No	
	Start Recording During Call Setup with Record Mode set to On Demand	No	
	Perform User Initiated Start with Record Mode set to On Demand	No	
	Perform Mid-Call Start Recording after Placing Call on Hold	No	
	Perform Mid-Call Change to Call Recording Mode	No	
	Record Local Three-Way Call	No	
	Record Network Three-Way Call	No	

BroadWorks Xtended Services Interface (Xsi) and BroadCloud IM&P Support Table			
Interface	Feature	Supported	Comments
XMPP Features – Contact/Buddy List	Contacts	No	
	Favorites	No	
	Groups	No	
	Non-XMPP Contacts	No	
	Conferences	No	
XMPP Features – Presence	Login Invisible	No	
	Presence State	No	
	Presence Status	No	
	Contact's Presence State	No	

### 2.3 Known Issues

This section lists the known interoperability issues between BroadWorks and specific partner release(s). Issues identified during interoperability testing and known issues identified in the field are listed.

The following table provides a description of each issue and, where possible, identifies a workaround. The verified partner device versions are listed with an “X” indicating that the issue occurs in the specific release. The issues identified are device deficiencies or bugs, and are typically not BroadWorks release dependent.

The *Issue Number* is a tracking number for the issue. If it is a Spectralink issue, the issue number is from Spectralink's tracking system. If it is a BroadWorks issue, the issue number is from BroadSoft's tracking system.

For more information on any issues related to the particular partner device release, see the partner release notes.

Issue Number	Issue Description	Partner Version			
		5.4.4D.2167			
	No issued is identified.				

### 3 BroadWorks Configuration

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This section identifies the required BroadWorks device profile type for the Spectralink 84xx Series as well as any other unique BroadWorks configuration required for interoperability with the 84xx Series.

#### 3.1 BroadWorks Device Profile Type Configuration

This section identifies the device profile type settings to use when deploying the Spectralink 84xx Series with BroadWorks.

Create a device profile type for the Spectralink 84xx Series with settings as shown in the following example. A separate device profile type should be created for each Spectralink 84xx Series model. The settings shown are recommended for use when deploying the Spectralink 84xx Series with BroadWorks. For an explanation of the profile parameters, see the *BroadWorks Device Management Configuration Guide* [3].

The device profile type shown below provides the *Number of Ports* (number of SIP lines) setting for Spectralink 8440. For other 84xx Series models, create a new device profile type and set the *Number of Ports* to match the available number of SIP lines per model according to the following table.

Model	Number of Lines
Spectralink 8440	6
Spectralink 8441	6
Spectralink 8452	6
Spectralink 8453	6



Identity/Device Profile Type: Spectralink\_8440  
 Signaling Address Type: Intelligent Proxy Addressing  
 Obsolete

**Standard Options**

Number of Ports:  Unlimited  Limited To

Ringback Tone/Early Media Support:  RTP - Session  
 RTP - Early Session  
 Local Ringback - No Early Media

Authentication:  Enabled  
 Disabled

Hold Normalization:  Unspecified Address  
 Inactive  
 RFC3264

Registration Capable  Authenticate REFER  
 Static Registration Capable  Video Capable  
 E164 Capable  Use History Info Header  
 Trusted

**Advanced Options**

Route Advance  Forwarding Override  
 Wireless Integration  Conference Device  
 PBX Integration  Mobility Manager Device  
 Add P-Called-Party-ID  Music On Hold Device  
 Auto Configuration Soft Client  Requires BroadWorks Digit Collection  
 Requires BroadWorks Call Waiting Tone  Requires MWI Subscription  
 Advice of Charge Capable  Support Call Center MIME Type  
 Support Emergency Disconnect Control  Support Identity In UPDATE and Re-INVITE  
 Enable Monitoring  Support RFC 3398  
 Static Line/Port Ordering  Support Client Session Info  
 Support Call Info Conference Subscription URI  Support Remote Party Info  
 Support Visual Device Management  Bypass Media Treatment  
 Support Cause Parameter

Reset Event:  reSync  checkSync  Not Supported  
 Trunk Mode:  User  Pilot  Proxy  
 Hold Announcement Method:  Inactive  Bandwidth Attributes

Unscreened Presentation Identity Policy:  Profile Presentation Identity  
 Unscreened Presentation Identity  
 Unscreened Presentation Identity With Profile Domain

Web Based Configuration URL Extension:

Figure 1 Device Identity/Profile Type

### 3.2 BroadWorks Configuration Steps

There are no additional BroadWorks configurations required.

## 4 84xx Series Configuration

This section describes the configuration settings required for the 84xx Series integration with BroadWorks, primarily focusing on the SIP interface configuration. The 84xx Series configuration settings identified in this section have been derived and verified through interoperability testing with BroadWorks. For configuration details not covered in this section, see the *Spectralink 84-Series Wireless Telephone Administration Guide* [1].

### 4.1 Configuration Method

The Spectralink 84xx series phones are typically configured using configuration files using the FTP, FTPS, HTTP, HTTPS, or Trivial File Transfer Protocol (TFTP) protocol. The following examples describe how to set the parameters using a configuration file. This configuration description assumes the Spectralink 84xx Series phone is already connected to a Wireless network (see the Spectralink Quick Network Connect (QNC) Administration Guide [2]) and uses the Dynamic Host Configuration Protocol (DHCP) to obtain an IP address, default gateway, DNS Server, Provisioning Server, NTP server, and NTP Offset values. For more information on automated provisioning, see the *Spectralink 84-Series Wireless Telephone Administration Guide* [1].

The capabilities of the Spectralink 84xx phones have been verified for use with BroadWorks based on the settings described in the following table. For more information on the meaning, purposes, and applicability of the individual configuration items, see the *Spectralink 84-Series Wireless Telephone Administration Guide* [1].

#### Configuration Files

84xx Series Configuration Files	Level	Description
<i>Slnk84.sip.ld</i>	System	Contains the device firmware load.
<i>000000000000.cfg</i>	System	Contains list of configuration files for all devices and individual device settings.
<i>site.cfg</i>	System	Contains configurable parameters that apply to all devices in a given deployment.
<i>&lt;MACaddress&gt;-ext.cfg</i>	Subscriber	Contains configurable parameters that apply to an individual device in a deployment.

### 4.2 System Level Configuration

This section describes system-wide configuration items that are generally required for each 84xx Series to work with BroadWorks. Subscriber-specific settings are described in the next section.

#### 4.2.1 Configure Network Settings

This configuration description assumes the Spectralink 84xx Series phone is already connected to a Wireless network (see the Spectralink Quick Network Connect (QNC) Administration Guide) and uses the Dynamic Host Configuration Protocol (DHCP) to obtain an IP address, default gateway, DNS Server, Provisioning Server, NTP server, and NTP Offset values. For more information on network provisioning via DHCP, see the *Spectralink 84-Series Wireless Telephone Administration Guide* [1].

#### 4.2.1.1 Configure IPV6 Settings

Spectralink 84xx Series currently does not support IPv6.

#### 4.2.2 Configure SIP Interface Settings

Step	Command	Description
<b>System configuration file site.cfg</b>		
Step 1	Configure the FQDN of the SIP Proxy: Example: <pre>reg.1.server.1.address="as.iop1.broadworks.net"</pre> Alternatively, you may use: <pre>voIpProt.server.1.address="as.iop1.broadworks.net"</pre>	Set the SIP server to the Fully Qualified Domain Name (FQDN) of the BroadWorks Application Server cluster. This FQDN must match the domain configured for the BroadWorks subscriber's line/port domain.  The reg.x parameter is preferred for single registrations per phone and may be duplicated such that reg.2.server.1.address could be used for the second registration and so on. However, the volpProt parameter can be used to cover all registrations on the phone.
Step 2	Configure the SIP re-registration interval. Example: <pre>reg.1.server.1.expires="3600"</pre> Alternatively, you may use: <pre>voIpProt.server.1.expires="3600"</pre>	The phone's requested registration period in seconds.  The reg.x parameter is preferred for single registrations per phone and may be duplicated such that reg.2.server.1.expires could be used for the second registration and so on. However, the volpProt parameter can be used to cover all registrations on the phone.
Step 3	Configure the Spectralink 84xx to support the Diversion header. Example: <pre>voIpProt.SIP.header.diversion.enable="1"</pre>	BroadWorks supports sending/receiving redirected call information by use of the diversion header.  If volpProt.SIP.header.diversion.enable is set to 1, the diversion header is displayed if received.
Step 4	(Optional) Configure an Outbound Proxy if a SBC is deployed between the Spectralink 84xx and BroadWorks. Example: <pre>voIpProt.SIP.outboundProxy.address="sbcl.iop1.broadworks.net"</pre>	Set the Outbound Proxy to the Session Border Controller (SBC) if one is deployed between the Spectralink 84xx and BroadWorks.  If there are redundant SBCs, set it to the FQDN for the SBC cluster.
Step 5	(Optional) Configure Outbound Proxy Failover Behavior when redundant proxies are available. Example: <pre>voIpProt.SIP.outboundProxy.failover.onlySignalWithRegistered="0"</pre> <pre>voIpProt.SIP.outboundProxy.failover.failback.mode="newRequests"</pre> <pre>voIpProt.SIP.outboundProxy.failover.reRegisterOn="0"</pre>	These parameters configure failover behavior related to the Outbound proxy.

Step	Command	Description
<b>System configuration file site.cfg</b>		
Step 6	(Optional) Enable device authentication of SIP requests from BroadWorks. Example: <pre> voIpProt.SIP.requestValidation .l.request="INVITE" voIpProt.SIP.requestValidation .l.method="digest" voIpProt.SIP.requestValidation .digest.realm="as.iopl.broadwo rks.net"                     </pre>	(Optional) configure the device to challenge SIP requests from BroadWorks. The configuration parameters identify, which SIP requests are challenged by the phone using digest authentication. The registered authentication credentials (user/password) are used for the challenge.
Step 7	(Optional) Configure SIP-Info style of DTMF Signaling (RFC-2976) Example: <pre> tone.dtmf.chassis.masking="1" tone.dtmf.viaRTP="0" voIpProt.SIP.dtmfViaSignaling. rfc2976="1"                     </pre>	Spectralink 84xx phones support RFC 2833 by default and will revert to in band DTMF signaling if the far end does not advertise support for RFC 2833. However, if SIP-Info style of DTMF signaling (RFC2976) is desired, the parameters at left can be used to disable RFC 2833 DTMF signaling and enable RFC 2976.

#### 4.2.3 Configure Service Settings

Step	Command	Description
Step 1	Configure the phone to always restart on checkSync. Example: <pre> voIpProt.SIP.specialEvent.checkSync.alwaysReboot="1"                     </pre>	Enable the phone so that it always restarts when the BroadWorks device reset button is selected.
Step 2	(Optional) Configure Network-managed Conferencing. Example: <pre> voIpProt.SIP.conference.address=conference@as.iopl.broadworks.net call.localConferenceEnabled="0"                     </pre>	The two parameters referenced will configure the phone to use Network Based Conferencing.
Step 3	Configure the dialplan: Example 1: <pre>Dialplan.digitmap="x.T"</pre> Example 2: <pre> dialplan.digitmap="[2346789]11  [0- 1] [2-9]11 0[#T] 00 01 [2-9]xx.[#T]*xx  #xx   011x.[#T]  [0-1]xxxxxxxx[#T]  [0-1] [2-9]xxxxxxxx  [2-9]xxxxxxxx  [2- 9]xxxxxxxx[#T] 101xxxx.[#T] 11 [ 2- 9]x.[#T]"                     </pre>	The digit map used for the dial plan. The dial plan is configured as a string compatible with the MGCPstyle Digit Maps described in RFC 3435.

Step	Command	Description
Step 4	Configure Phone to bypass the Voicemail Summary and display message waiting indications:  Example: <pre>up.oneTouchVoicemail="1" up.mwiVisible="1"</pre>	If up.OneTouchVoicemail is set to 1, the voicemail summary display is bypassed and voicemail is dialed directly.  If up.mwiVisible is set to 1, the MWI for lines whose MWI is disabled will display.

### 4.3 Subscriber Level Configuration

This section identifies the device-specific parameters, including registration and authentication. These settings must be unique across devices to be matched with the settings for a BroadWorks SIP trunk or subscriber. SIP Registration requires that a unique address of record (AoR) be provisioned on BroadWorks and the device.

Step	Command	Description
<b>Subscriber Configuration File: &lt;MACAddress&gt;-ext.cfg</b>		
Step 1	Configure the display name.  Example: <pre>reg.1.displayName="Jane Doe"</pre>	The display name used in SIP signaling and the alias used as the default caller ID.
Step 2	Configure the Registration User ID.  Example: <pre>reg.1.address="2404985300"</pre>	The registration address must match the line/port setting on BroadWorks.  Configure for each line ("reg.x") in use, where "x" is the line number.
Step 3	Configure the SIP Digest Authentication User ID.  Example: <pre>reg.1.auth.userID="TestUser1"</pre>	This is the SIP Digest Authentication User ID. If the Authentication service is configured on BroadWorks, then the Digest Auth User ID parameters must be configured to match the BroadWorks settings.  Configure for each line ("reg.x") in use, where "x" is the line number.
Step 4	Configure the SIP Digest Authentication Password.  Example: <pre>reg.1.auth.password="MySipAccountPW!23"</pre>	This is the SIP Digest Authentication Password. If the Authentication service is configured on BroadWorks, then the Digest Auth Password parameters must be configured to match the BroadWorks settings.  Configure for each line ("reg.x") in use, where "x" is the line number.
Step 5	Configure the line label.  Example: <pre>reg.1.label="5300"</pre>	The text label that displays next to the line key for registration x. If Null, the user part of reg.x.address is used.
Step 6	Configure the line type.  <pre>reg.1.type="private"</pre>	Set the line type to "private" unless you are configuring the phone for Shared Call Appearance. See the Advanced Feature section of this document for Shared Call Appearance configuration requirements.  Configure for each line ("reg.x") in use, where "x" is the line number.
Step 7	(Optional) – Configure Message Waiting Indication Subscription  Example: <pre>Msg.mwi.1.subscribe=""</pre>	If this is set to "non-Null", then the phone sends a SUBSCRIBE request for MWI Notifications for the contact after booting up.  The default value is "Null".

## 4.4 SIP Advanced Feature Configuration

This section provides configuration instructions for advanced SIP features supported by the phone including but not limited to Shared Call Appearance, Busy Lamp Field, Feature Key Synchronization, Call Center, Emergency Call, Advice of Charge, Call Recording, and Security Classification.

### 4.4.1 Shared Call Appearance Configuration

The Shared Call Appearance (SCA) feature allows the administrator to add multiple locations to a given line. Any of the locations can be used to originate or receive calls.

When a call comes in to an idle line, all the provisioned locations for that line are alerted. The first location to answer the call is connected to the originator. If the line is already active in a call, only the active location is alerted.

A subscriber can originate calls from any of the configured locations. All other locations are unable to originate calls until all calls are released.

It is recommended to use the phone number plus an index (<phoneNumber>\_<index>) when provisioning the unique AoR for each shared line, for example: 2405551111\_2. If a phone number does not exist, use the Media Access Control (MAC) address plus an index (<macAddress>\_<index>).

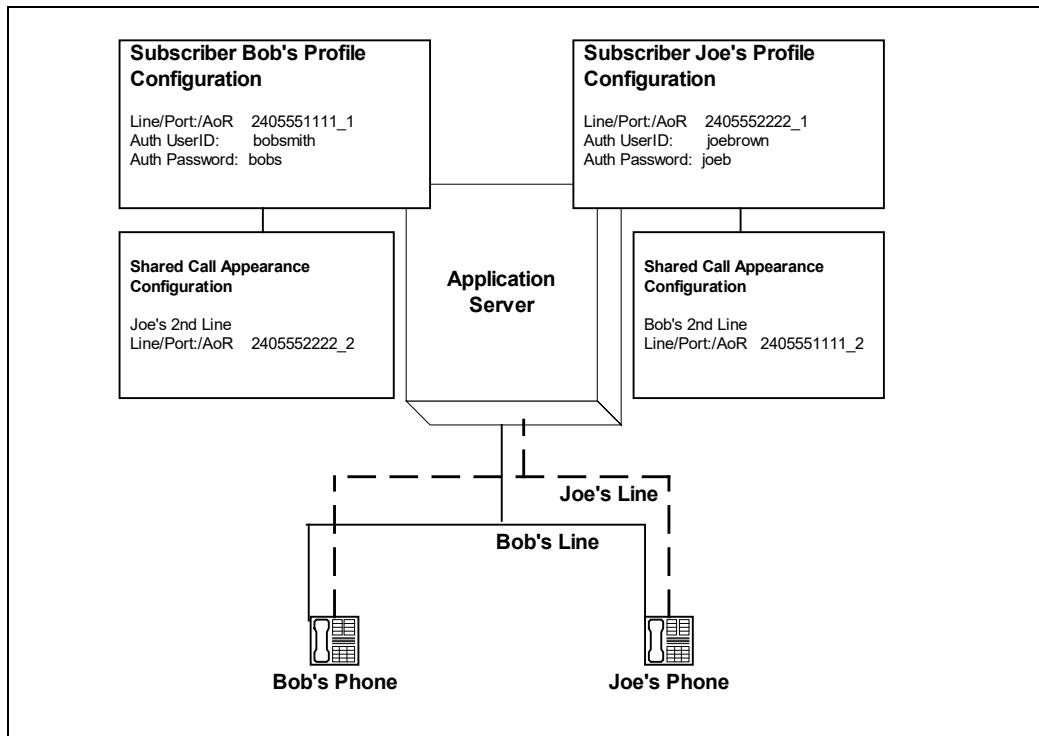


Figure 2 Shared Call Appearance Configuration

Figure 2 shows that Bob and Joe each have two lines and that Bob shares a line with Joe and Joe shares a line with Bob. The figure also shows the applicable Subscriber Profile and Shared Call Appearance configuration data for subscribers Bob and Joe.

When Bob (2405551111) is called, Bob's first line and Joe's second line ring. When Joe (2405552222) is called, Joe's first line and Bob's second line ring.

The following steps show how to configure both phones for this Shared Call Appearance configuration.

#### 4.4.1.1 Bob's Phone Configuration

The following steps are used to configure line 1 for Bob's phone. This line rings when Bob is called, and it has Bob's authentication information.

Step	Command	Purpose
<b>Subscriber Configuration File: &lt;MACAddress&gt;-ext.cfg</b>		
Step 1	Configure the line as shared. Example: <code>reg.1.type="shared"</code>	Configure the line as "shared" (as opposed to "private").
Step 2	Configure the line label. Example: <code>reg.1.label="Bob"</code>	The label is displayed next to the line key.
Step 3	Configure the Registration User ID. Example: <code>reg.1.address="2405551111_1"</code>	This is the register user ID, which is used to register Bob's line 1 with BroadWorks.  The register user ID must correspond with the line/port setting on BroadWorks.
Step 4	Configure the SIP Digest Authentication User ID. Example: <code>reg.1.auth.userID="bobsmith"</code>	This is the SIP Digest Authentication User ID. If the Authentication service is configured on BroadWorks, then the Digest Auth User ID parameters must be configured to match the BroadWorks settings.  This line rings when Bob is called, and it has Bob's authentication information.
Step 5	Configure the SIP Digest Authentication Password. Example: <code>reg.1.auth.password="bobs"</code>	This is the SIP Digest Authentication Password. If the Authentication service is configured on BroadWorks, then the Digest Auth Password parameters must be configured to match the BroadWorks settings.  This line rings when Bob is called, and it has Bob's authentication information.
Step 6	(Optional) Enable Barge-In. Example: <code>reg.1.bargeInEnabled="1"</code>	(Optional) enable the line for barge-in attempts on active Shared Call Appearance calls.

The following steps are used to configure line 2 for Bob's phone. This line rings when Joe is called and it has Joe's authentication information.

Step	Command	Purpose
<b>Subscriber Configuration File: &lt;MACAddress&gt;-ext.cfg</b>		
Step 1	Configure the line as shared. Example: <code>reg.2.type="shared"</code>	Configure the line as "shared" (as opposed to "private").

Step	Command	Purpose
Step 2	Configure the line label. Example: <code>reg.2.label="Joe"</code>	The label is displayed next to the line key.
Step 3	Configure the Registration User ID. Example: <code>reg.2.address="2405551111_2"</code>	This is the register user ID, which is used to register Bob's line2 with BroadWorks.  This should match the SCA line/port field on Joe's Shared Call Appearance page.
Step 4	Configure the SIP Digest Authentication User ID. Example: <code>reg.2.auth.userID="joebrown"</code>	This is the SIP Digest Authentication User ID. If the Authentication service is configured on BroadWorks, then the Digest Auth User ID parameters must be configured to match the BroadWorks settings.  This line rings when Joe is called, and so it has Joe's Authentication information.
Step 5	Configure the SIP Digest Authentication Password. Example: <code>reg.2.auth.password="joeb"</code>	This is the SIP Digest Authentication Password. If the Authentication service is configured on BroadWorks, then the Digest Auth Password parameters must be configured to match the BroadWorks settings.  This line rings when Joe is called, and so it has Joe's Authentication information.
Step 6	(Optional) Enable Barge-In. Example: <code>reg.2.bargeInEnabled="1"</code>	(Optional) enable the line for barge-in attempts on active Shared Call Appearance calls.

#### 4.4.1.2 Joe's Phone Configuration

The following steps are used to configure line 1 for Joe's phone. This line rings when Joe is called, and it has Joe's authentication information.

Step	Command	Purpose
<b>Subscriber configuration file: &lt;MACaddress&gt;-ext.cfg</b>		
Step 1	Configure the line as shared. Example: <code>reg.1.type="shared"</code>	Configure the line as "shared" (as opposed to "private").
Step 2	Configure the line label. Example: <code>reg.1.label="Joe"</code>	The label is displayed next to the line key.
Step 3	Configure the Registration User ID. Example: <code>reg.1.address="240555222_1"</code>	This is the register user ID, which is used to register Joe's line 1 with BroadWorks.  The register user ID must correspond with the line/port setting on BroadWorks.



Step	Command	Purpose
Step 4	Configure the SIP Digest Authentication User ID. Example: <code>reg.1.auth.userID="joebrown"</code>	This is the SIP Digest Authentication User ID. If the Authentication service is configured on BroadWorks, then the Digest Auth User ID parameters must be configured to match the BroadWorks settings.  This line rings when Joe is called, and it has Joe's authentication information.
Step 5	Configure the SIP Digest Authentication Password. Example: <code>reg.1.auth.password="joeb"</code>	This is the SIP Digest Authentication Password. If the Authentication service is configured on BroadWorks, then the Digest Auth Password parameters must be configured to match the BroadWorks settings.  This line rings when Joe is called, and it has Joe's authentication information.
Step 6	(Optional) enable Barge-In. Example: <code>reg.1.bargeInEnabled="1"</code>	(Optional) enable the line for barge-in attempts on active Shared Call Appearance calls.

The following steps are used to configure line 2 for Joe's phone. This line rings when Bob is called, and it has Bob's authentication information.

Step	Command	Purpose
<b>Subscriber Configuration File: &lt;MACaddress&gt;-ext.cfg</b>		
Step 1	Configure the line as shared. Example: <code>reg.2.type="shared"</code>	Configure the line as "shared" (as opposed to "private").
Step 2	Configure the line label. Example: <code>reg.2.label="Bob"</code>	The label is displayed next to the line key.
Step 3	Configure the Registration User ID. Example: <code>reg.2.address="2405552222_2"</code>	This is the register user ID, which is used to register Joe's line2 with BroadWorks.  This should match the SCA line/port field on Joe's Shared Call Appearance page.
Step 4	Configure the SIP Digest Authentication User ID. Example: <code>reg.2.auth.userID="bobsmith"</code>	This is the SIP Digest Authentication User ID. If the Authentication service is configured on BroadWorks, then the Digest Auth User ID parameters must be configured to match the BroadWorks settings.  This line rings when Bob is called, and so it has Bob's Authentication information.

Step	Command	Purpose
Step 5	Configure the SIP Digest Authentication Password. Example: <code>reg.2.auth.password="bobs"</code>	This is the SIP Digest Authentication Password. If the Authentication service is configured on BroadWorks, then the Digest Auth Password parameters must be configured to match the BroadWorks settings.  This line rings when Bob is called, and so it has Bob's Authentication information.
Step 6	(Optional) Enable Barge-In. Example: <code>reg.2.bargeInEnabled="1"</code>	(Optional) Enable the line for barge-in attempts on active Shared Call Appearance calls.

#### 4.4.1.3 Hybrid Key System Configuration

Hybrid Key System emulation requires the phone to support assignment of multiple line keys to a single registering line on the phone. It also requires the phone to limit each line key to a single call appearance or provide the configurability to roll a new call over to the next free line key. Any of the locations can be used to originate or receive calls.

The following table describes the configuration required on each of three phones that would allow the three phones to share one line and provide three call appearances on each phone.

Step	Command	Purpose
<b>Subscriber Configuration File: &lt;MACaddress&gt;-ext.cfg</b>		
Step 1	Configure the line as shared. Example: <code>reg.1.type="shared"</code>	Configure the line as "shared" (as opposed to "private").
Step 2	Configure the number of line keys. Example: <code>reg.1.lineKeys="3"</code>	Specify the number of line keys to use for a single registration.
Step 3	Configure the number of concurrent calls per line for a single registration. Example: <code>reg.1.callsPerLineKey="1"</code>	Set the maximum number of concurrent calls for a single registration x. This parameter applies to all line keys using registration x. If registration x is a shared line, an active call counts as a call appearance on all phones sharing that registration.  Default = 24

#### 4.4.2 Busy Lamp Field Configuration

Spectralink 84xx Series currently does not support this feature.

#### 4.4.3 Feature Key Synchronization Configuration

The Feature Key Synchronization provides synchronization of phone services, such as Call Forwarding and Do Not Disturb, with the settings on BroadWorks for the analogous services. Configuration of the phone to enable Feature Key Synchronization is described as follows.

Step	Command	Purpose
<b>Subscriber Configuration File: &lt;MACaddress&gt;-ext.cfg</b>		

Step	Command	Purpose
Step 1	For Call Forwarding Feature Key Synchronization, disable the local processing of Call Forwarding. Example: <code>voIpProt.SIP.serverFeatureControl.localProcessing.cf="0"</code>	This disables local call forwarding on the first registration when server-based call-forwarding is enabled.
Step 2	For Call Forwarding Feature Key Synchronization, enable server-based call forwarding. Example: <code>voIpProt.SIP.serverFeatureControl.cf="1"</code>	This enables server-based call forwarding on the phone
Step 3	For Do Not Disturb (DND) Feature Key Synchronization, disable the local processing of Do Not Disturb. Example: <code>reg.1.serverFeatureControl.localProcessing.dnd="0"</code>	This disables local Do Not Disturb functionality.
Step 4	For Do Not Disturb (DND) Feature Key Synchronization, enable server-based Do Not Disturb. Example: <code>voIpProt.SIP.serverFeatureControl.dnd="1"</code>	This enables server-based Do Not Disturb on the phone.

#### 4.4.4 Call Center Feature Configuration

Spectralink 84xx Series currently does not support this feature.

#### 4.4.5 Call Recording Feature Configuration

Spectralink 84xx Series currently does not support this feature.

#### 4.4.6 Emergency Call Configuration

Spectralink 84xx Series currently does not support this feature.

#### 4.4.7 Advice of Charge Configuration

Spectralink 84xx Series currently does not support this feature.

#### 4.4.8 Conference Event Configuration

Spectralink 84xx Series currently does not support this feature.

### 4.5 Xtended Services Interface (Xsi) Feature Configuration

Spectralink 84xx Series currently does not support this feature.

#### 4.5.1 Xsi Authentication Method

Spectralink 84xx Series currently does not support this feature.

### 4.6 Instant Message and Presence Configuration

Spectralink 84xx Series currently does not support this feature.

## 5 Device Management

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The Spectralink 84xx Series does not currently support the BroadWorks Device Management feature.

## Appendix A: Reference 84xx Series Configuration Files

The following is a reference configuration for the 84xx Series configured for use with BroadWorks.

### System File: 000000000000.cfg

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

```
# SIP Default Generic Configuration File
<?xml version="1.0" standalone="yes"?>
<!--
*****
* -->
<!-- * Default Master SIP Configuration File
* -->
<!-- *
* -->
<!-- * This file is read by every handset at boot to specify where to load
its * -->
<!-- * software from (APP_FILE_PATH), to specify the sequence in which to
read* -->
<!-- * configuration files (CONFIG_FILES) and whether to store or retrieve
* -->
<!-- * information in specific directories (server root by default)
* -->
<!--
*****
* -->

<MASTER_CONFIG>

    <!-- You can specify a path with subdirectories to specify the
location of the handset software. -->
    <!-- See the Deployment Guide for more information about setting up
subdirectories. -->

    <SOFTWARE
        APP_FILE_PATH="sip.ld"
    />

    <!-- Information from files on the left overrides information from
files to their right -->
    <!-- [PHONE_MAC_ADDRESS] dynamically gets replaced by that handset's
MAC address -->
    <!-- For FLAT DEPLOYMENT, create a <macaddress>-ext.cfg for each
handset following the -->
    <!-- template provided in this directory -->
    <CONFIGURATION
        CONFIG_FILES="[PHONE_MAC_ADDRESS]-ext.cfg, site.cfg"
    />

    <DIRECTORIES
        LOG_FILE_DIRECTORY=""
        OVERRIDES_DIRECTORY=""
        CONTACTS_DIRECTORY=""
        CALL_LISTS_DIRECTORY=""
    />
```

```
</MASTER_CONFIG>
```

### System File: site.cfg

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

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<handsetConfig xsi:noNamespaceSchemaLocation="handsetConfig.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <!--*****-->
  <!--site.cfg template for FLAT DEPLOYMENT-->
  <!--*****-->
  <!--Site Parameters configured in this file apply to all phones.-->
  <!--*****-->
  <!--Only those parameters that apply to ALL phones should be in this
file.-->
  <!--DELETE THOSE PARAMETERS THAT YOU DO NOT DEPLOY.-->
  <!--DO NOT deploy duplicate parameters.-->
  <!--*****-->
  <!--System Parameters are network parameters that all phones use.-->
  <!--*****-->
  <SystemParameters>
    <!--Unless otherwise specified, all values are recommended
settings and do not need to be changed.-->
    <!-- device.set="1"
    <!-- * -->
    <openSIP>
      <SIPserver
        reg.1.server.1.address="BWServerAddress"
        reg.1.server.1.port="5060"
        reg.1.server.1.expires="3600" />
      <dialplan
        dialplan.removeEndOfDial="1"
        dialplan.digitmap="x.T" />
      <voicemail
        up.oneTouchVoicemail="1"
        up.mwiVisible="1"
        msg.mwi.1.callBackMode="registration"
        msg.mwi.1.callBack="">
      </voicemail>
    </openSIP>
  </TelephonyParameters>
  </FeatureParameters>
</handsetConfig>
```

### Device-specific File: <macaddress>-ext.cfg

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

```
# SIP Device-specific Configuration File
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<handsetConfig xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="handsetConfig.xsd">
  <!--
*****
* -->
  <!-- * Sample per-phone Configuration File
      * -->
```

```

        <!-- *
* -->
        <!-- * This file contains the user-specific information for the user
of a * -->
        <!-- * specific handset identified by its MAC address. In particular
it * -->
        <!-- * contains the user name and extension for that user.
* -->
        <!-- * -->
        <!-- * -->
        <!-- * -->
        <!-- * This file MUST be named as <macaddress>-ext.cfg where
<macaddress> is the * -->
        <!-- * 12 digit MAC address of the handset without : separators. The
MAC * -->
        <!-- * address is printed on the label in the battery well of each
handset. * -->
        <!-- * For example if the handset label reads MAC: 00:90:7A:0E:7F:E5,
this file* -->
        <!-- * should be named 00907a0e7fe5-ext.cfg
* -->
        <!--
*****
* -->

        <LineRegistration>

                <!-- * -->

                <!-- * -->

                <!-- The information below is the user-specific information. The
global server settings are in -->

                <!-- the SystemParameters->TelephonyParameters->SIPserver -->
                <openSIPTelephony

                        call.callsPerLineKey="24" >

                        <TelephonyLine1

                                reg.1.address="BWReg1address"

                                reg.1.auth.password="BWReg1Password"

                                reg.1.auth.userID="BWReg1UserID"

                                reg.1.label="BWReg1Label"

                                reg.1.displayName="BWReg1DisplayName"

                                tone.dtmf.chassis.masking="1"

                                tone.dtmf.viaRtp="0"

                                voIpProt.SIP.dtmfViaSignaling.rfc2976="0"

                                call.autoOffHook.1.enabled="1"

                                call.clickToDial.referBased.userConfirm="1"
    
```

```
msg.mwi.1.subscribe="2404985361"

voIpProt.SIP.header.diversion.enable="1"
voIpProt.SIP.conference.address="BWConfAddress"
voIpProt.SIP.requestValidation.1.method="digest" or "all"
voIpProt.SIP.requestValidation.1.request="INVITE"
voIpProt.SIP.requestValidation.digest.realm="BWServerDomainName"
voIpProt.SIP.specialEvent.checkSync.alwaysReboot="1"
voIpProt.SIP.serverFeatureControl.dnd="1"
voIpProt.SIP.serverFeatureControl.cf="1"
reg.1.acd-login-logout="1"
reg.1.acd-agent-available="1"
reg.1.type="shared"
reg.1.type="shared"
reg.1.lineKeys="3"
reg.1.callsPerLineKey="1"
reg.1.type="shared"
reg.1.lineKeys="3"
reg.1.callsPerLineKey="2"
reg.1.bargeInEnabled="1"
voIpProt.SIP.conference.address="BWConferenceAddress"
call.localConferenceEnabled="0"
voIpProt.SIP.conference.parallelRefer="0"
reg.1.server.1.useOutboundProxy="0"
voIpProt.server.1.useOutboundProxy="1"
voIpProt.SIP.outboundProxy.port="0"
voIpProt.SIP.outboundProxy.transport="DNSnaptr"
voIpProt.SIP.outboundProxy.failOver.failRegistrationOn="1"
voIpProt.SIP.outboundProxy.failOver.onlySignalWithRegistered="0"
voIpProt.SIP.outboundProxy.failOver.reRegisterOn="0"
voIpProt.SIP.outboundProxy.failOver.failBack.mode="newRequests"
voIpProt.SIP.outboundProxy.failOver.failBack.timeout="3600"
```



```
reg.1.outboundProxy.address="OutboundProxyAddress" -->

    </TelephonyLine1>

    <!-- Additional lines: -->
    <!-- * -->

    <!-- Additional telephony lines can be added (reg.3, etc...)
by copying the TelephonyLine1 group above and -->

    <!-- editing appropriately-->

    </openSIPTelephony>

</LineRegistration>

</handsetConfig>
```

## References

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- [1] Spectralink. 2017. *Spectralink 84-Series Wireless Telephone Administration Guide* 1725-86984-000 Rev W. Available from Spectralink at [support.spectralink.com](http://support.spectralink.com).
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- [3] BroadSoft, Inc. 2018. *BroadWorks Device Management Configuration Guide, Release 22.0*. Available from BroadSoft at [xchange.broadsoft.com](http://xchange.broadsoft.com).
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