



Using Polycom® KIRK® Wireless Server 300 or 6000 with Asterisk

Technical Bulletin

Introduction

This document provides introductory information on how to use a Polycom[®] KIRK[®] Wireless Server 300 or 6000 DECT system with the Asterisk PBX. It offers answers to frequently asked questions along with feature configuration examples for both Asterisk and Polycom KIRK DECT Systems.

Find the Asterisk wiki at <http://www.voip-info.org>.

This document assumes that you have an installed and functioning Asterisk server. If you do not have a functioning Asterisk server, see one of the following support pages:

- Asterisk Business Edition: <http://www.digium.com>
- General Asterisk information: <http://www.voip-info.org/wiki-Asterisk>

Terms and Definitions:

- The terms KWS300 or KWS6000 refer to the Polycom KIRK DECT System KIRK Wireless Server 300 and/or KIRK Wireless Server 6000.
- Asterisk or Asterisk server refers to a functioning Asterisk PBX installation.

The examples in this document were tested with Polycom KWS300 or KWS6000 Q3/2010 PCS05C_ (both available from <http://www.polycom.eu/support/voice/dect/index.html>) with Asterisk version 1.6.2.6.

If there is an issue with a configuration that is specific to a particular software release, the issue is noted.

Please ensure that you have read and understood our Admin Guide and set up the KWS System before following the advice given below:

KWS300

http://www.polycom.eu/global/documents/support/setup_maintenance/products/voice/KWS300_insta_config_guide.pdf

KWS6000

http://www.polycom.eu/global/documents/support/setup_maintenance/products/voice/KWS6000_insta_config_guide.pdf

The Asterisk community is the source of much of the material provided in this document.

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The topics in this document include:

- [Creating a Basic Configuration](#)
- [Enabling Auto Answer for Intercom](#)
- [Paging a Group of Extensions](#)
- [Using different Ringtone Patterns for External and Internal Calls](#)
- [Call Forward Feature](#)
- [Remotely Rebooting the KWS System to Force a Configuration Reload](#)
- [Changing and Reading Configuration Settings via HTTP Commands](#)
- [Adding Corporate Phone Book \(KWS6000 only\)](#)
- [Additional Resources](#)

The configuration file fragments in the figures of this document show the basic settings required to configure both Asterisk and the KWS300 or KWS6000 to successfully interoperate. Note that these settings are minimal configurations and only show changes from default factory settings on the KWS.

Creating a Basic Configuration

To create a basic configuration:

1. For each phone to be connected, define the phone extension number in the Asterisk **sip.conf** file, as shown in the example below.

```
[general]
language=en
context=default
bindport=5060
bindaddr=0.0.0.0
srvlookup=yes
vmexten=mailbox
disallow=all
allow=G722
allow=ulaw
allow=alaw
defaultexpiry=65
maxexpiry=145
subscribecontext=default
allowssubscribe=no
notifyingringing=yes
notifyhold=yes
useclientcode=yes
canreinvite=yes
limitonpeers=yes
progressinband=never
dtmfmode=rfc2833 ;
alwaysauthreject=yes

[700]; Extension 700
domain=0.0.0.0
user=700
type=friend
secret=700
mailbox=700
nat=yes; we assume clients are behind NAT
host=dynamic; and have dynamic IP addresses
callerid="Polycom Demo" <700> ;
context=polycom
allowssubscribe=yes
call-limit=10 ;
.
.
Fragment from "sip.conf"
```

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In the above example, the extension number 700 is defined. This extension:

- is defined by the number inside square brackets **[700]**.
- has a SIP registration username of **700**.
- has a SIP registration password of **700**.
- uses the Asterisk mailbox number **700** in the **default** context.
- is an Asterisk type **friend**, meaning it is both a user and a peer.
- is a **dynamic** host according to Asterisk.
- sends DTMF tones as special RTP packets according to RFC2833.
- exists in the Asterisk context **polycom**.
- allows RTP traffic to bypass the Asterisk server.
- sends a caller ID with text as **Polycom Demo** and a number **700**.

2. Define the dial plan in the Asterisk **extensions.conf** file for the context declared above, as shown in the example below.

```
[general]
static=yes
writeprotect=no

[globals]
DIALTIMEOUT=45 ;; seconds
.
.

[polycom]
exten => 700, hint, SIP/700
exten => 700,1,NoOp(SIP/mypeer ${CALLERID(num)} ext ${EXTEN})
exten => 700,n,GotoIf("${CALLERID(num)}" = "${EXTEN}")?vm:vm2)
exten => 700,n(vm),VoicemailMain(s${EXTEN})
exten => 700,n(vm2),Dial(SIP/700,25,Tt)
exten => 700,n,VoiceMail(700).
.
```

Fragment from "extensions.conf"

In the above example, the extension **700** was added to the dial plan.

When someone dials the extension **700** from within the context **polycom**:

- Asterisk will allow other Phones to monitor the status of the extension **700** via the Hint functionality. Other Polycom desk phones can utilize this facility either via Buddy watch or BLF (please check with the Asterisk community for further support).
- Asterisk will first try to ring the extension **700** using the SIP channel, waiting up to 25 seconds for the extension to answer.
- if the extension is unanswered, Asterisk will direct it to mailbox **700**.
- if the extension is busy, Asterisk will direct it to mailbox **700**.
- the **s** in the (**s\${EXTEN}**) enables the users to automatically log on to their mailbox without having to add their voicemail password.

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An even simpler Asterisk **extensions.conf** could look like this:

```

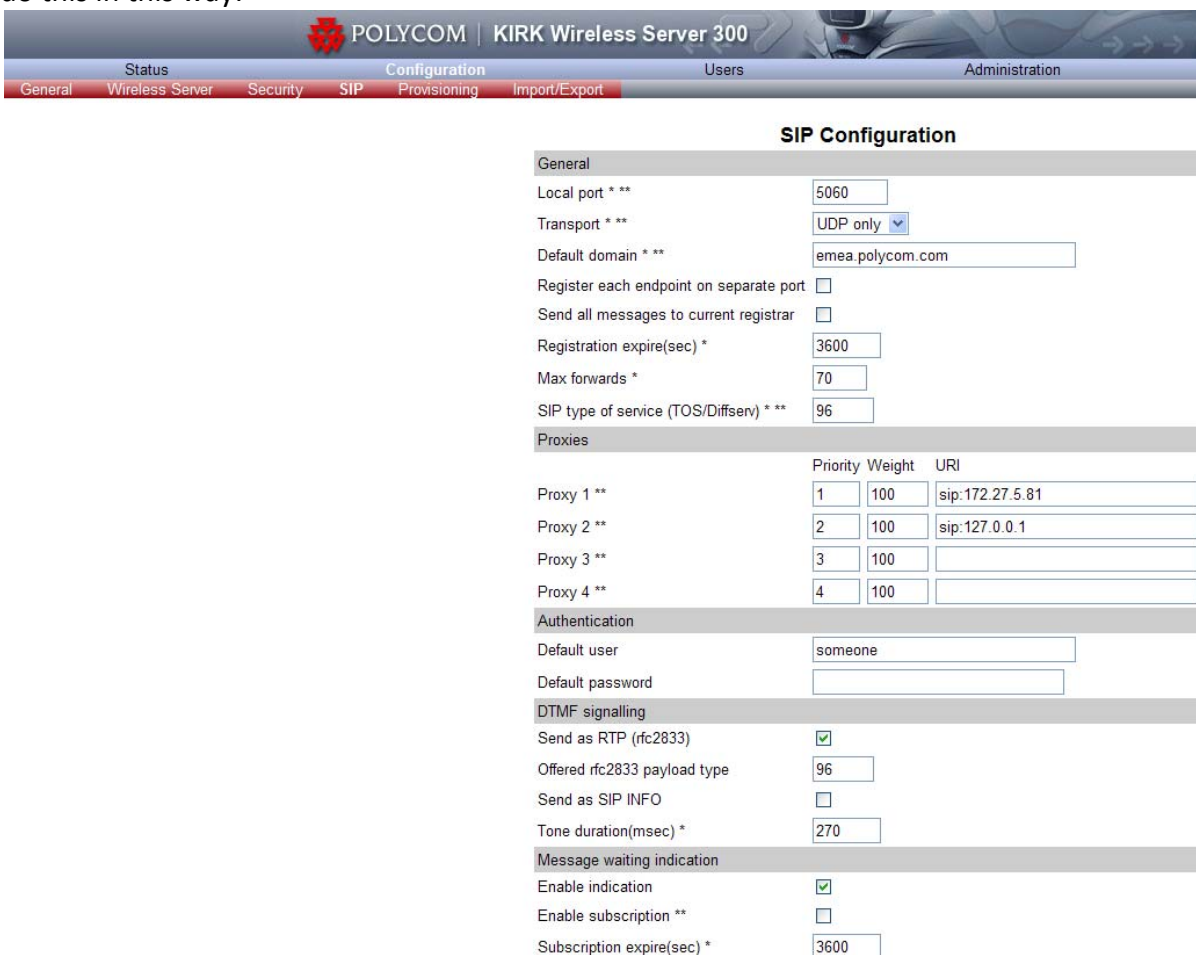
.
.
[polycom]
exten => _7XX,hint,SIP/${EXTEN}
exten => _7XX,1,NoOp(SIP/mypeer ${CALLERID(num)} ext ${EXTEN})
exten => _7XX,n,GotoIf("${CALLERID(num)}" = "${EXTEN}")?vm:vm2)
exten => _7XX,n(vm),VoicemailMain(s${EXTEN})
exten => _7XX,n(vm2),Dial(SIP/${EXTEN},25,Tt)
exten => _7XX,n,VoiceMail(${EXTEN})
.
Fragment from "extensions.conf"

```

In the above example, the extension Range **700 to 799** was added to the dial plan.

The same values as explained above will also match this easier setup.

3. Once the Asterisk configuration is complete, configure the KWS300 or KWS6000. You can do this in this way:



The screenshot shows the web interface for the Polycom KIRK Wireless Server 300. The navigation bar includes: Status, Configuration, Users, Administration, General, Wireless Server, Security, SIP, Provisioning, and Import/Export. The main content area is titled "SIP Configuration" and is divided into several sections:

- General:** Local port (5060), Transport (UDP only), Default domain (emea.polycom.com), Register each endpoint on separate port (unchecked), Send all messages to current registrar (unchecked), Registration expire (3600), Max forwards (70), SIP type of service (96).
- Proxies:** A table with columns for Priority, Weight, and URI.

Priority	Weight	URI
1	100	sip:172.27.5.81
2	100	sip:127.0.0.1
3	100	
4	100	
- Authentication:** Default user (someone), Default password (empty).
- DTMF signalling:** Send as RTP (checked), Offered rfc2833 payload type (96), Send as SIP INFO (unchecked), Tone duration (270).
- Message waiting indication:** Enable indication (checked), Enable subscription (unchecked), Subscription expire (3600).

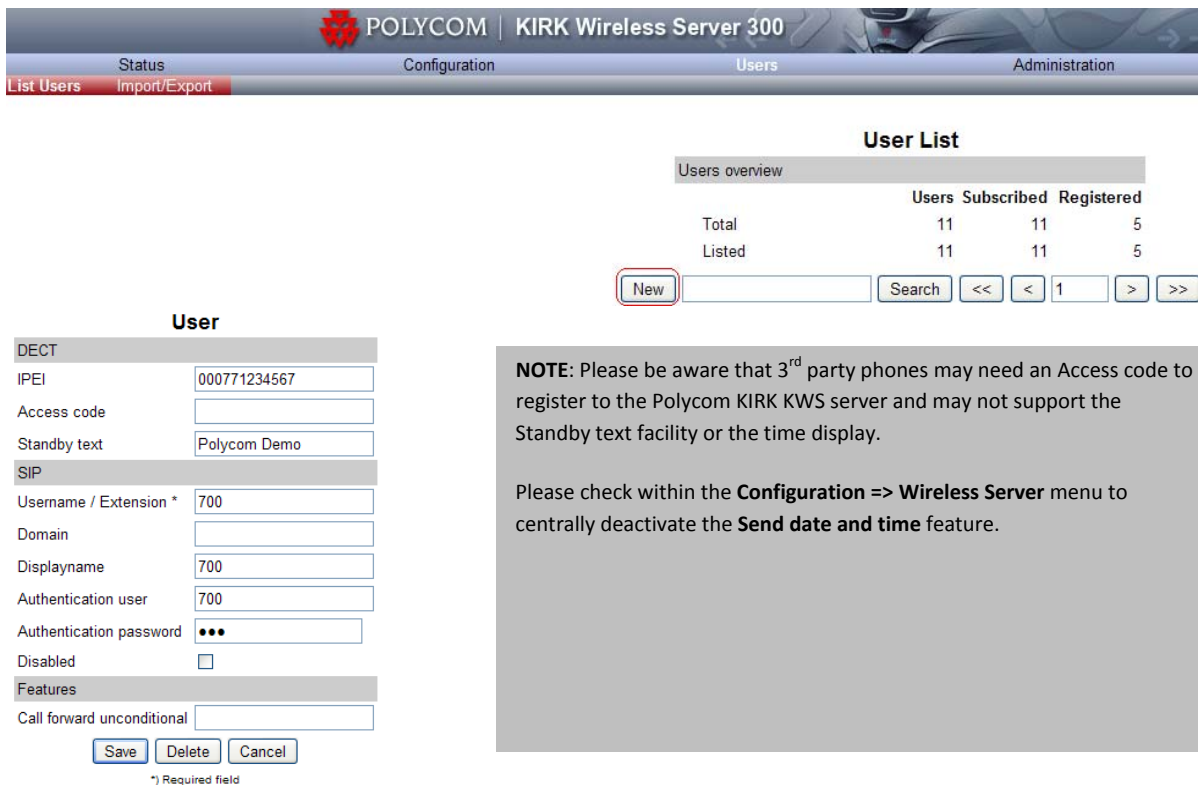
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The above configuration shows a basic setup:

- a valid Domain Name **emea.polycom.com**
- the Proxy 1 is **172.27.5.81** which is the first SIP server against which the KWS will register its SIP users.
- the Proxy 2 is **127.0.0.1** in order for the KWS to handle internal calls between the DECT handsets in case the first Proxy cannot be reached.

All other settings can be left as they are from factory default.

Adding the user:



The screenshot shows the Polycom KIRK Wireless Server 300 web interface. The top navigation bar includes Status, Configuration, Users, and Administration. The 'Users' tab is active, showing a 'User List' overview table and a 'User' configuration form.

User List			
Users overview			
	Users	Subscribed	Registered
Total	11	11	5
Listed	11	11	5

The 'User' configuration form includes the following fields:

- DECT**
 - IPEI: 000771234567
 - Access code: [empty]
 - Standby text: Polycom Demo
- SIP**
 - Username / Extension *: 700
 - Domain: [empty]
 - Displayname: 700
 - Authentication user: 700
 - Authentication password: ●●●
 - Disabled:
- Features**
 - Call forward unconditional: [empty]

Buttons: Save, Delete, Cancel. A note at the bottom indicates: *) Required field.

NOTE: Please be aware that 3rd party phones may need an Access code to register to the Polycom KIRK KWS server and may not support the Standby text facility or the time display.

Please check within the **Configuration => Wireless Server** menu to centrally deactivate the **Send date and time** feature.

In the above example, the following was added:

- the 12 digit IPEI of the DECT handset **000771234567**¹.
- the Standby text shown in the Idle display **Polycom Demo**.
- the Username / Extension is **700**. (user=700 from the sip.conf)
- the Domain field can be used on a per-user basis in order to register the specific handset to a separate SIP call handler.
- the Display name is **700** and may be overwritten by the SIP call handler.
- the Authentication user ². (user=700 from the sip.conf)
- the Authentication password is **700**. (secret=700 from the sip.conf)

¹ It is not necessary to fill out the IPEI field. The system will do it automatically when the handset is subscribed.

² With firmware >=PCS05C_ the Authentication user is not required if it is the same as the Username.

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- call forward unconditional can be set on a per-user basis via the web interface instead of the phone itself.

Enabling Auto Answer for Intercom

Polycom KIRK DECT handsets can utilize a special SIP header in order to ring with a special audible signalling and automatically answer an incoming call and activate the loudspeaker.

NOTE: Please be aware that 3rd party phones cannot utilize this facility.

This has been tested on the following handset software versions:

2010	not supported
3040	not supported
4020	not supported
4040	not supported
50xx	14141201 PCS08Ha
60xx	141799X0 PSC06Da
70xx	141799X0 PSC06Da

Change the dial plan in the Asterisk **extensions.conf** file as shown in the example below.

```
[general]
static=yes
writeprotect=no

[globals]
DIALTIMEOUT=45 ;; seconds
INTERNAL_HEADER=internal
PAGING_HEADER=intercom
.
.

[macro-pagingintercom]
exten=s,1,SIPAddHeader(Alert-Info: ${PAGING_HEADER})
exten=s,2,Set(CALLERID(name)=INTERCOM)
exten=s,3,Page(${ARG1},${ARG2})
exten=s,4,Hangup
[page_a_single_extension]
exten=_*80XXX,1,Macro(pagingintercom,Local/${EXTEN:3},qd);Full Duplex
.

Fragment from "extensions.conf"
```

In the above example, the extension **PAGING_HEADER=intercom** was added to the dial plan.

The **SIPAddHeader** utilizes this facility to signal to the KWS DECT System that the calling extension is “paging” and therefore the handset will ring with a special ringtone and answer the call automatically with the loudspeaker activated and the microphone muted.

The **CALLERID=INTERCOM** additionally signals visually the call as **Intercom** call to the called extension.

NOTE: Please be aware that currently there are no plans to automatically activate the microphone due privacy regulations.

Please liaise with your local Polycom reseller if you wish further details on this.

Paging a Group of Extensions

Polycom KIRK DECT handsets can utilize a special SIP header in order to ring with a special audible signalling and automatically answer an incoming call and activate the loudspeaker.

NOTE: Please be aware that 3rd party phones cannot utilize this facility.

This has been tested on the following handset software versions:

2010	not supported
3040	not supported
4020	not supported
4040	not supported
50xx	14141201 PCS08Ha
60xx	141799X0 PCS06Da
70xx	141799X0 PSC06Da

Change the dial plan in the Asterisk **extensions.conf** file as shown in the example below.

```
[general]
static=yes
writeprotect=no

[globals]
DIALTIMEOUT=45 ;; seconds
INTERNAL_HEADER=internal
PAGING_HEADER=intercom
.
.

[macro-groupintercom]
exten=s,1,SIPAddHeader(Alert-Info: ${PAGING_HEADER})
exten=s,2,Set(CALLERID(name)=GROUP CALL)
exten=s,3,Page(SIP/704&SIP/705&SIP/702)
exten=s,4,Hangup

[page_an_defined_group]
exten=_*83,1,Macro(groupintercom,Local/${EXTEN},q);Loudspeaker only
.

Fragment from "extensions.conf"
```

In the above example, the extension **PAGING_HEADER =intercom** was used as in the previous example.

The **SIPAddHeader** utilizes this facility to signal to the KWS DECT system that the calling extension is “paging” and therefore the handset will ring with a special ringtone and answer the call automatically with the loudspeaker activated and the microphone muted and cannot be activated as Asterisk only allows audio to come from the caller.

The **CALLERID=GROUP CALL** additionally signals visually the call as **Group call** to the called extension.

The extensions 702 and 705 will be placed in a listen-only MeetMe room.

Extensions that are busy will be unaffected. All extensions will be disconnected when the caller/pager hangs up.

NOTE: This requires a working MeetMe installation.

Using different Ringtone Patterns for External and Internal Calls

Polycom KIRK DECT handsets can utilize a special SIP header in order to audibly signal incoming calls depending on internal or external calls. If the Asterisk SIP server supports external CLI, the CLIP information is additionally displayed.

NOTE: Audible signalling has been tested on the following handsets with the software versions below:

2010	Not supported
3040	1330991007Ea
4020	1409600006Rc
4040	1412280006Uc
50xx	14141201 PCS08Ha
60xx	14179910 PCS06Da
70xx	141799X0 PCS06Da

Change the dial plan in the Asterisk **extensions.conf** file as shown in the example below.

```
[general]
static=yes
writeprotect=no

[globals]
DIALTIMEOUT=45 ;; seconds
INTERNAL_HEADER=internal
.
.

[polycom]
exten => _7XX,hint,SIP/${EXTEN}
exten => _7XX,1,SIPAddHeader(Alert-Info: ${INTERNAL_HEADER})
exten => _7XX,2,NoOp(SIP/myppeer ${CALLERID(num)} ext ${EXTEN})
exten => _7XX,n,GotoIf("${CALLERID(num)}" = "${EXTEN}")?vm:vm2)
exten => _7XX,n(vm),VoicemailMain(s${EXTEN})
exten => _7XX,n(vm2),Dial(SIP/${EXTEN},25,Tt)
exten => _7XX,n,VoiceMail(${EXTEN})
.

```

Fragment from "extensions.conf"

In the above example, the extension **INTERNAL_Header =internal** was added to the dial plan.

The **SIPAddHeader** utilizes this facility to signal to the KWS DECT system that the calling extension is calling internally, and therefore the handset will ring with an interrupted version of the originally chosen ringtone.



Call Forward Feature

The simple Call Forward feature (CFU) can be configured in Asterisk or in the KIRK Wireless Server.

Configuration of the Call Forward Feature in Asterisk:

In the Asterisk **extensions.conf** file add the CFU On and Off sequence based on the pre-defined setting within the KIRK Factory default.

```
.
.
; Unconditional Call Forward for other SIP Devices like KIRK KWS6000&KWS300
exten => *_21*X.,1,Dbput(CFIM/${CALLERIDNUM}=${EXTEN:4})
exten => *_21*X.,2,Hangup
exten => #21#,1,Dbdel(CFIM/${CALLERIDNUM})
exten => #21#,2,Hangup
.
```

Fragment from "extensions.conf"

Configuration of the Call Forward Feature in the KIRK Wireless Server:

Via the KIRK Wireless Server web interface within the configuration => Wireless Server Configuration, you can activate the Feature code for CFU and change or modify the code itself.



Wireless Server Configuration

DECT

Subscription allowed

Authenticate calls

Encrypt voice/data

Autocreate users

System access code

Send date and time

Application interface

Username *

New password

New password again

Enable MSF **

Enable XML-RPC **

Internal messaging

Feature codes

Enable

Call forward unconditional - enable

Call forward unconditional - disable

*) Required field **) Require restart

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Activation on a KIRK Handset:

On a KIRK handset in off-hook state dial ***21*701#** and press the off-hook button to activate the CFU to example extension 701.

The activated call forward is shown on the handset idle display.



On a KIRK Handset in off-hook state dial **#21#** and press the dial button to de-activate the CFU.

NOTE: A 3rd party handset will not be able to display this message as it is a special standby text update sent to the KIRK handset in the KIRK specific format.

A **KIRK 3040** Handset will display the **CFU** entry without the standby time.

A **KIRK 2010** Handset will **not** display the activated call forward as standby text.

Remotely Rebooting the KWS System to Force a Configuration Reload

You can remotely reboot a KIRK KWS by using the **SIP NOTIFY** method with an event type of check-sync. When the KWS DECT system receives the SIP message, it will do one of the following (depending on how the KWS DECT system is configured):

- reboot the KWS.
- update the KWS Configuration utilizing a provisioning server.



POLYCOM | KIRK Wireless Server 300

Status Configuration Users Administration
 General Wireless Server Security SIP Provisioning Import/Export

Provisioning Configuration

Server

Method * **

URL **

Checking

Interval(minutes) **

Time(hh:mm) **

NOTIFY check_sync *

Users

Import

Firmware

KWS

*) Required field **) Require restart

If the **NOTIFY check_sync** is set to **Reboot**, then the KWS DECT system will reboot once it receives a Check Sync SIP message to any SIP peer.

If the **NOTIFY check_sync** is set to **Update**, the KWS DECT server will connect to the specified URL and check the provisioning server and will download new firmware or change values/settings based on the configuration file.

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To remotely reboot the KWS or to force configuration/firmware reload:

1. if you have Asterisk 1.4 or later, you can send a check-sync to the KWS from the CLI. In **sip_notify.conf**, add the lines shown below. (If you have Asterisk 1.6, the lines already exist in **sip_notify.conf**.)

```
.  
. [polycom=check-cfg]  
Event=>check-sync  
Content-Length=>0  
..  
Fragment from "sip_notify.cfg"
```

2. From the Asterisk CLI command line, add the line shown below (1.6 syntax is used).

```
sip notify polycom-check-cfg <peer>
```

The <peer> in the above example is the extension / username specified in the KWS.

For more detailed Information about the KWS provisioning, please read this separate Guide:

http://www.polycom.eu/global/documents/support/setup_maintenance/products/voice/Provisioning_guide_KWS300_6000.pdf.

Changing and Reading Configuration Settings via HTTP Commands

The Configuration of the KWS DECT system can be changed or read via HTTP Commands.

1. Check the original KIRK Wireless Server configuration by exporting the configuration via Configuration > Import/Export.

```
.  
.br/><upnp>  
  <broadcast>>false</broadcast>  
    <enable>>false</enable>  
</upnp>  
..  
Fragment from "config.xml"
```

2. Change the KIRK Wireless Server configuration from the browser address line by adding the line shown below.

```
http://172.27.5.106/config/set?upnp.enable=true
```

The **<true>** value in the above example changes the setting within the KWS configuration and enables the feature.

3. Read the KIRK Wireless Server configuration from the browser address line by adding the line shown below.

```
http://172.27.5.106/config/get?upnp.enable
```

Adding Corporate Phone Book (KWS6000 only)

The KWS6000 can be set up to work with different corporate LDAP servers in order to browse corporate phone books. This is described in the Application Note “Configuring Corporate Phonebook in the KIRK[®] Wireless Server 6000”. The document can be downloaded from the Polycom.com Support site. Click [here>>](#) to open the document.

Additional Resources

KIRK Solutions General FAQ:

http://www.polycom.eu/products/voice/wireless_solutions/dect_communications/faq/general_faq.html

KIRK Handset FAQ:

http://www.polycom.eu/products/voice/wireless_solutions/dect_communications/faq/handset_faq.html

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