Configuring the UC500 for Key System Operation – Initial Installation and Advance Feature Configuration

This lab exercise provides instructions for configuring a simple key system on the UC500 using Cisco Configuration Assistant (CCA) 1.9.

In a key system, you can set up most of your phones to have a nearly identical configuration, in which each phone is able to answer any incoming PSTN call on any line. Phone users are generally close to each other and seldom need to use the telephone to contact each other.

For example, a 3x3 key system has three PSTN lines shared across three phones, such that all three PSTN lines appear on each of the three phones. This permits an incoming call on any PSTN line to be directly answered by any phone—without the aid of a receptionist, an auto-attendant service, or the use of expensive DID lines. The lines act as shared lines—a call can be put on hold on one phone and resumed on another phone without invoking call transfer.

The information in this document applies to CCA Version 1.9 and Cisco SBCS software package version 1.4.
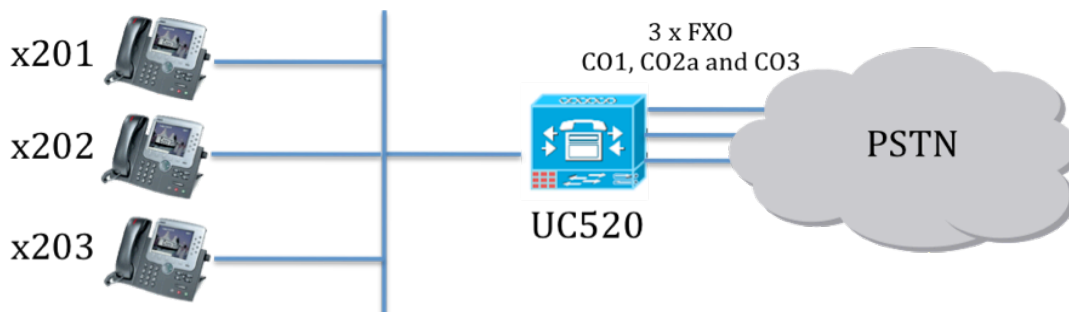
Simple Key System Scenario Description

The example 3x3 key system has three PSTN lines shared across three phones, and all three PSTN lines appear on each of the phones.

In the key system model, the same directory numbers are assigned to all IP phones:

- When an incoming call arrives, it rings all available IP phones.
- When multiple calls are present within the system at the same time, each individual call (ringing or waiting on hold) is visible and can be directly selected by pressing the corresponding line button on an IP phone.
- Calls can be moved between phones simply by putting the call on hold at one phone and selecting the call using the line button on another phone.

The following diagram shows a 3x3 key system example, with three CO trunks mapped to buttons on all three phones.

Note: The number of available buttons on your IP phones can limit the maximum number of PSTN lines that you can assign in this model. One button on each phone must be reserved for the primary extension.

Although the UC500 has 4 FXO ports, this example assumes that only 3 CO lines are connected. The phones used in this example are 1 x CP521G and 2 x CP524G.

A Cisco IP Phone Model 7961 or better is recommended for key system mode on a UC500 platform with 4 FXO ports.

Features Supported in Key System Mode

The following table summarizes UC500 voice feature support in key system mode for CCA 1.9.

Table 1.   UC500 Voice Interface/Feature Key System Support Summary

Voice Features	Supported for Key System
UC500 Voice Interface	
FXO only	X
FXO with any VIC card	X
BRI only	
BRI with FXO or T1/E1 card	X
T1/E1 PRI with FXO	X
T1/E1 CAS and any VIC card	X
T1/E1 PRI and BRI	
AA trigger Optional	X
SIP Trunk Selection	
Voice Feature Configuration	
Paging Groups	X
Intercom	X

Hunt Groups	X
Pickup Groups	
Ad Hoc Conferencing	X
Call Park	
System Speed Dial	X
Incoming Call Handling	
FXO - Hunt groups	
FXO - Operator	
FXO - AA	X
FXO - Custom Configuration	
Call Blocking	

For more information, see the *Cisco SBCS 1.4 Feature Reference Guide*, available on Cisco.com at the following location: www.myciscocommunity.com/community/smallbizsupport

Customer Site Information Required to Configure the UC500 in Key System Mode

The following table lists information that must be obtained from the customer in order to a UC500 in key system mode.

Table 2. Customer Site Information for Key System Configuration

Site Information	Description/Notes	Values Used for this Example
Number of digits per extension	Extension length	3 (CCA default value)
Number of Phones	Number of IP phones deployed at the location that will be part of the key system shared line configuration	Three (3)
Number of Available Buttons on each Phone	The IP phone model must have enough buttons to be able to accommodate the number of shared lines plus a button for the primary extension. CCA automatically reserves the first button on each user's phone for their primary extension.	Cisco IP Phone Model CP 524G with 4 buttons (1 for primary extension and 3 for shared lines) However, a Cisco IP Phone Model 7961 or better is recommended for key system mode on a UC500 platform with 4 FXO ports.
Number of shared PSTN lines	Number of PSTN lines connected to FXO ports on the UC500 that will be shared Each shared line requires a corresponding button on the phone	Three (3)
User Information	Collect the following information each phone user: Last Name, First Name, User ID, Password, Extension	One, Phone, "phoneone", ******, 201 Two, Phone, "phonetwo", ******, 202 Three, Phone, "phonethree", ******, 203
AA Extension	Extension used to access the AA	299 (CCA default is blank)
VM Access Extension	Extension used for accessing voice mail	298 (CCA default is blank)

CCA Configuration Procedures

Perform the procedures in this section to use CCA to configure a key system on the UC500.

Step 1.   Launch CCA and select Configure > Telephony, then click the Device tab.

Step 2.   The UC500 requires a factory reset to defaults before you can configure key system mode. If you need to reset the UC500, choose Maintenance > Restart/Reset, check Reset to Factory Defaults, and click OK.

Step 3.   Once the system comes back up, reconnect using CCA and navigate to Configure > Telephony > Voice. In the Voice System Type field, choose Keysystem.

Step 4.   In the Number of digits per extension field, use the default value of 3.

Step 5.   Configure basic network settings as needed.

Configuration of basic network settings is outside the scope of this application note. See the CCA online help or documentation available on Cisco.com.

Step 6.   Configure required voice mail and Auto Attendant extensions.

a.   Choose to Configure > Telephony > Voice from the left navigation pane.

b.   Click the Voicemail tab.

c.   In the Voicemail Access Extension field, enter the voicemail extension. For this example, the default value of 298 is used.

Step 8. Fill in the user information for the three IP phones that correspond to those ports.

    a.   Click the Users tab and fill in the First Name, Last Name, User ID, and Password for the four Cisco IP phones. The phone user IDs used for the example are "phoneone", "phonetwo" and "phonethree", as shown in the following screen example.

    b.   Note that Phone Type displayed for the four FXS ports is "anl" (analog). Click in the UserID and Password fields and create user names to identify the FXS ports. For the example, fxsone, fxstwo, and fxsthree are used for the UserID.

    c.   Click OK.

The resulting phone user information for the example is displayed below.

Mac Addr	Phone Type	Primary Ext.	LastName	FirstName	UserID
B8FA.9FAE.0000	anl	301	Analog	PhoneA	fxsone
B8FA.9FAE.0001	anl	302	Analog	PhoneB	fxstwo
B8FA.9FAE.0002	anl	303	Analog	PhoneC	fxsthree
B8FA.9FAE.0003	anl	304	Analog	PhoneD	fxsfour
001D.E5EA.98C9	521G	201	One	Phone	phoneone
001D.E5EA.9C19	524G	202	Two	Phone	phonetwo
001E.4AF1.3B80	521G	203	Three	Phone	phonethree

Step 9. Click on the row for Phone One in the table, then click the corresponding More button.

At the bottom of the More Options window for each phone, checkboxes are shown for C01, C02, and C03, and C04. These correspond to the four built-in FXO ports on the UC500. For the example scenario, these are mapped as follows:
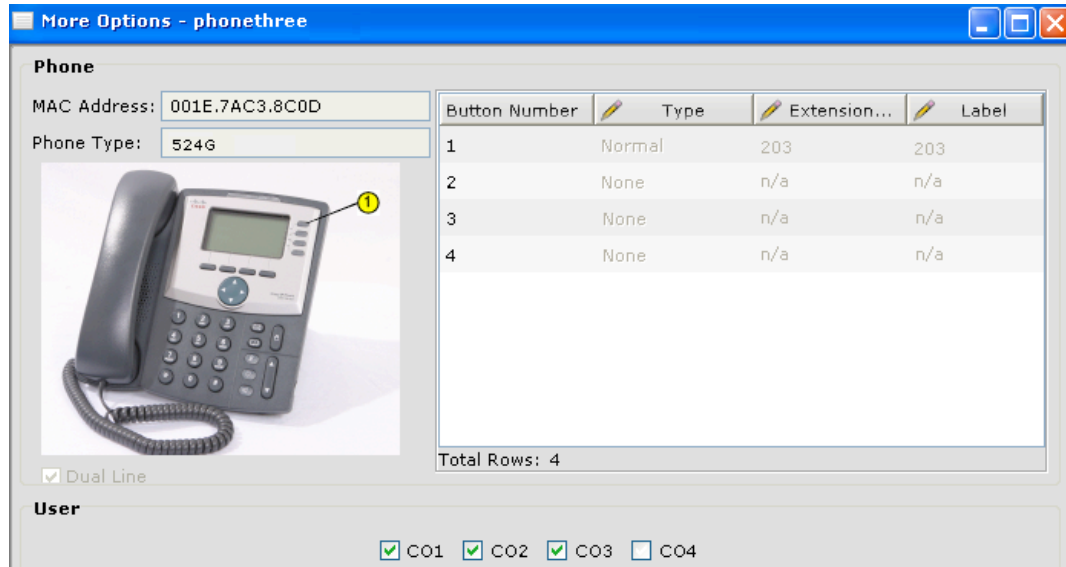
C01 = FXO port 0/1/0, C02 = FXO port 0/1/1, C03 = FXO port 0/1/2, C04=FXO port 0/1/3.

Step 10. In the More Options window for "phoneone", click the checkboxes for C01, C02, and C03, then click OK. Leave the checkbox for C04 unchecked.

This creates the mapping between the buttons on the IP phone and the corresponding FXO lines. Because the first button is reserved for the primary extension, only three can be selected for the 524G phone used in the example.

Step 11. Repeat Step 10 for "phonetwo" and "phonethree" so that C01, C02, and C03 are assigned to buttons on all phones.

The More Options - "phonethree" window for the example is shown below. The More Options window for "phoneone" and "phonetwo" will be the same, except for the MAC address and extension number.
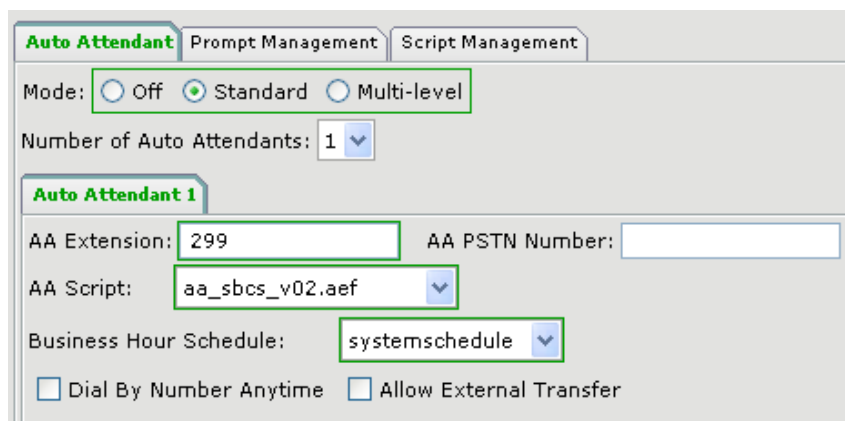

Step 12. Click OK or Apply.

Verification Step: Go off hook on any phone by pressing one f the lines assigned to a trunk, and make an outbound call. Next, make an inbound call to one of the FXO numbers and verify how all phones ring on the corresponding line.

Step 13. Navigate to Configure > Telephony > Auto Attendant.

Step 14. Select your mode of operation, Standard or Multilevel. In this example, Standard is used.

Step 15. Enter the AA internal extension, 299 in our example.

Step 16. At this point you can customize your AA as needed (refer to the First Look AA lab for AA customization tips).

Step 17. Click OK or Apply.

Step 18. You can disconnect and exit CCA at this point.

> **Verification Step: Call you AA and Voicemail number and verify proper operation.**

> **Important Note: The AA configuration here is shown for didactic purpose. You would need additional trunk resources (PRI/BRI) to configure inbound call routing into your AA.**

After completing the configuration, the first button on each phone is the user's primary extension, and the remaining three buttons are mapped to FXO trunks. Incoming calls on the FXO trunks behave as described in the example scenario.

This completes the basic Key System Initial Installation. The following tasks are for additional features that may be needed by the business:

Configuring Paging

In his example, three FXO lines have already been assigned to three different buttons on the phones registered to the UC500. We will use the fourth port, to handle inbound calls and have them routed to AA.

Step 1. Launch CCA and select Configure > Telephony > Voice, then click OK.

Step 2. Navigate to the Voice Features tab.

Step 3. Select the number of paging groups that you need, and the paging group number:

Step 4. Click OK or Apply.

Step 5. Navigate to the Users tab, and assign the phones that you want to be in that paging group (1):

Step 6.   Click OK and once you return to the main window, click Apply. Now, from any phone, when you dial "101", all members of the paging group will get a broadcast loudspeaker message.

Verification Step: From any phone, dial "101". All members of the paging group will get a broadcast loudspeaker message.
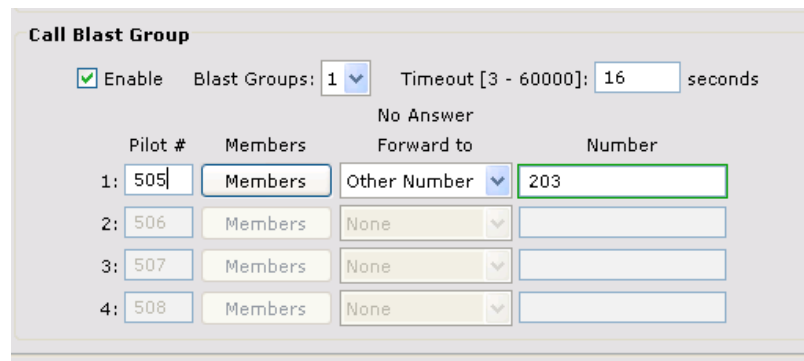
Configuring a Call Blast Hunt Group

In his example, we will assign two phones (extensions 201 and 202) to a call blast group. When the number for the group is dialed, both members will receive the call simultaneously. If none of the members answer the call, it will be forwarded to extension203.
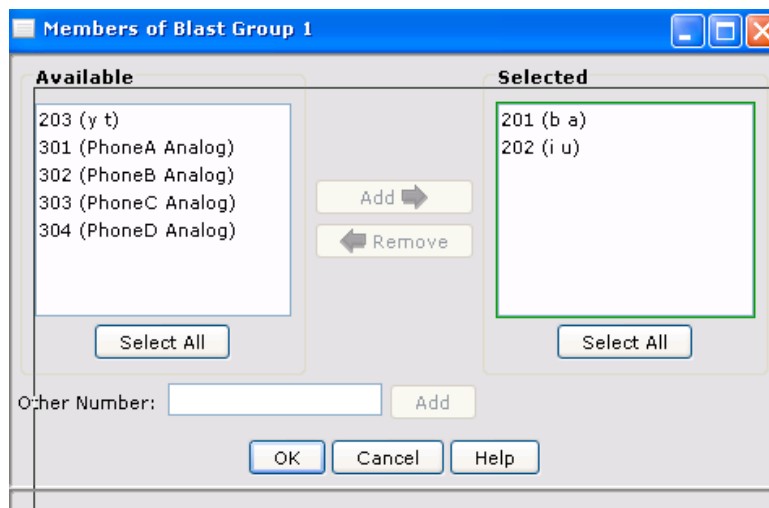
Step 1.   Launch CCA and select Configure > Telephony > Voice, then click OK.

Step 2.   Navigate to the Voice Features tab.

Step 3.   Enable the Call Blast Hunt Group feature, select the number of groups and the timeout before forwarding to the final destination upon no answer:

Step 4.   Click Members, and assign extensions 201 and 202 to the group. Notice that you can also assign arbitrary numbers to the group. In Key System mode however, external numbers are not supported when using FXO trunks.

Step 5.   Click OK and once you return to the main window, click Apply.

Verification Step: When anyone calls "505", extensions "201"annd "202" will ring simultaneously. If no one answers, the call is forwarded to extension "203".

Configuring Multiparty Conferencing

In his example, we will configure a simple ad-hoc conference resource, for a maximum of 4 participants and 4 sessions

Step 1.   Launch CCA and select Configure > Telephony > Voice, then click OK.

Step 2.   Navigate to the Voice Features tab.

Step 3.   Select 4 participants and 4 sessions under the conferencing section (mixed mode is not needed, as there is no VoIP in this example):

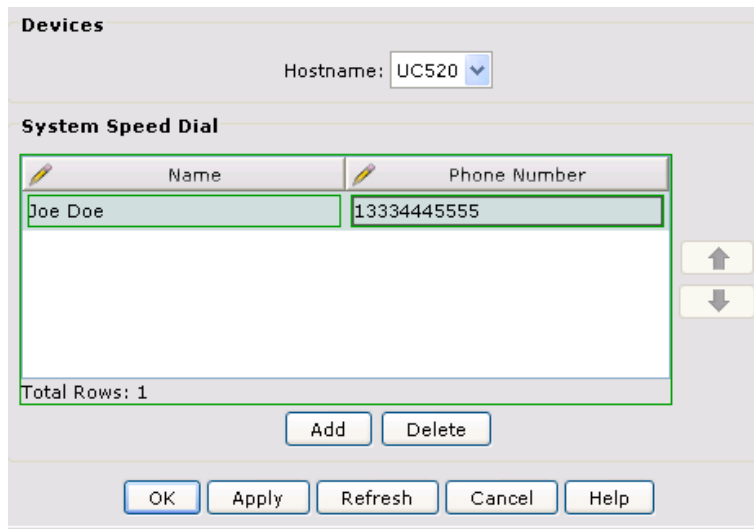Step 4.   Click OK and once you return to the main window, click Apply.

Verification Step: Any phone user already engaged in a conversation, can call up to two more people and join them to the conference.

Configuring System Speed Dials

In his example, we will configure a speed dial entry available to all phones through the "Directories" button:

Step 1.   Launch CCA and select Configure > Telephony > System Speed Dials.

Step 2.   Click Add, and enter a name and number for the contact:

Step 3.   Click Apply. You can add more speed dials and using the arrows, sort them in the order you want.

Step 4.   You can disconnect and exit CCA at this point.

    Verification Step: **Press the directories button (book icon) on your phone. Navigate to "Local Speed Dials" and verify your entries appear in the desired order.**

Caveats and Limitations

The following limitations apply to this configuration.

- Cisco IP phones used for shared lines in key system must have enough available phone buttons (minimum of 1 + the number of shared lines placed on the phone).

For More Information

For more information on Cisco SBCS solutions, visit the SBCS Support Community at the following URL:

www.myciscocommunity/community/smallbizsupport