



# **IP Office**

## **Wireless Installation and Configuration Guide**

[15-601082] Issue [1] (1 June 2006)

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### **Documentation information**

For the most current versions of documentation, go to the Avaya Support web site (<http://www.avaya.com/support>) or the IP Office Knowledge Base (<http://marketingtools.avaya.com/knowledgebase/>).

### **Avaya Support**

Avaya provides a telephone number for you to use to report problems or to ask questions about your contact center. The support telephone number is 1- 800- 242- 2121 in the United States. For additional support telephone numbers, see the Avaya Web site: <http://www.avaya.com/support>.

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# Declaration of Conformity

**DECLARATION OF CONFORMITY**

We  
SpectralLink Corporation  
5755 Central Avenue  
Boulder, CO 80301

declare under sole responsibility that the Wireless Business Telephone System Components:  
Wireless Telephone Handset Models; SNP2400, RNP2400  
Battery Models; BPE100, BPX100  
System Controller Models; TGA-116, TGU-116, TGA-104, TGU-104, SVP100  
Battery Charger Models; BQC7204, DCE100, DCX100

conform to Directive 89/336/EEC for Electromagnetic Compatibility, R&TTE Directive 1999/5/EEC and LVD Directive 73/23/EEC.  
Compliance was demonstrated to the following specifications as listed in the official *Journal of the European Communities*:

- EN 61000-6-4:2001 Industrial Emissions:
- EN 55022:1994+ A1 Emissions Class A  
(SVP100, TGA/TGU-104 & respective power supplies)
- EN 55024:1998 Immunity
- EN 300-328-1 V1.3.1 2001 ERM
- EN 300-489-1/17: 2002 Common, EMC,ERM, RLAN (Class B for Handsets)
- EN 300-826 ERM/EMC
- EN 50360:2001 SAR
- EN 61000 6-2:2001 Immunity
- EN 61000 3-2:2000 Harmonic Emissions
- EN 61000 3-3:1995 Flicker Emissions
- EN 60950:2000 Safety with CB Reports

  
Mark R. Angliss,  
Manager, Quality & Process Engineering, For the SpectraLink Corporation

 0678

May 23, 2003  
PN 72-0096-00 Rev D

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# Overview

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## About this Guide

Before you can begin using the 3600 series wireless phones, you will need to:

1. Install, configure and maintain the Avaya Voice Priority Processor (AVPP) within an IP telephony system.
2. Configure Avaya IP Office.
3. Configure the Access Points.
4. Install and configure the 3616/3620/3626 wireless phone.

To access software updates, go to [www.spectralink.com/softwareupdates](http://www.spectralink.com/softwareupdates).

Further information about Wireless Telephony Best Practices is available from [www.spectralink.com/files/literature/NetLink\\_Best\\_Practices\\_122105\\_01.pdf](http://www.spectralink.com/files/literature/NetLink_Best_Practices_122105_01.pdf).

Further information about IP Office is available from [www.avaya.com/support](http://www.avaya.com/support) and also from [www.avaya.com/ipoffice/knowledgebase](http://www.avaya.com/ipoffice/knowledgebase).

If you have questions about or problems with your phone that you cannot resolve after reading this document, contact Avaya Technical Support at 1 800 242-2121 (USA only) or your local authorized Avaya dealer.

### Note

- Where **SVP** is documented in this guide, **AVPP** applies.



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## Important Information

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### Safety Information

Follow these general precautions when installing phone equipment:

- Never install phone wiring during a lightning storm.
- Never install phone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated phone wires or terminals unless the phone line has been disconnected at the network interface.
- Use caution when installing or modifying phone lines.

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### Shielded Cables

Avaya recommends the use of shielded cables for all external signal connections, in order to maintain FCC Part 15 emissions requirements.

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### Avaya Voice Priority Processor (AVPP)

The AVPP 10, 20 and 100 have been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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### 3616/3620/3626 Wireless Phones

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

#### Warning

- Changes or modifications to this equipment, not approved by Avaya, may cause this equipment to be non-compliant with part 15 of the FCC rules and void the user's authority to operate this equipment.

#### Warning

- Avaya products contain no user-serviceable parts inside. Refer servicing to qualified service personnel.

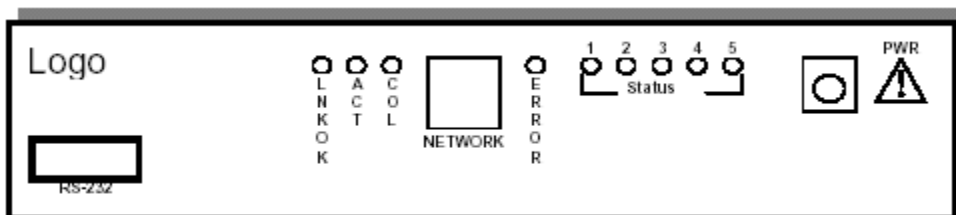
## Overview of the AVPP

Before you can begin using the AVPP, you will need to do the following:

1. Install and configure the Avaya Voice Priority Processor (AVPP) within an IP telephony system.
2. Configure IP Office.
3. Configure the Access Points.
4. Configure the 3616/3620/3626 wireless phones.

## Front Panel of the AVPP

The AVPP's front panel contains ports to connect to the LAN, and an administrative computer via an RS-232 port. Status LEDs supply information about the AVPP's functionality.



- **RS-232 Port** – male DB-9 connector (DTE) used for RS-232 connection to a terminal, terminal emulator, or modem for system administration.
- **Link LEDs:**
  - **LNKOK** – lit when there is a network connection.
  - **ACT** – lit if there is system activity.
  - **COL** – lit if there are network collisions.
- **NETWORK** – connects to wired (Ethernet) LAN.
- **ERROR LED** – lit when the system has detected an error.
- **STATUS LEDs** – indicate system error messages and status.
  - **1** – heartbeat, indicates gateway is running.
  - **2** – if active calls.
  - **3, 4, 5** – currently unused.
- **PWR (power jack)** – connects to the AC adapter supplying power to the system.

### Warning:

- Only use the Avaya-provided Class II AC Adapter with output 24VDC, 1A.

## Multiple AVPP

Multiple AVPP environments are those which have more than one AVPP in the same subnet in order to accommodate larger systems and higher call capacity.

In a system comprised of multiple AVPPs using an IP protocol, a master AVPP must be identified. The master AVPP server must have a static IP address. The wireless phones and the other AVPPs locate the master by using a static IP address, DHCP, or DNS.

The loss of a non-master AVPP does not significantly affect the operation of the remaining AVPPs. However, the loss of the master AVPP results in a loss of all communication between all of the AVPPs. This also means that the loss of the master AVPP results in the loss of all active calls and wireless phones cannot check-in until communication with the master is re-established.

### Note

- 10, 20 and 100 AVPPs will not operate together in a network. The network must consist of all 10, all 20 or all 100 AVPPs.

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## The Timing Function

In the IP PBX environment, AVPPs provide both the connection or "gateway" to the IP PBX for the wireless phones and the "timing" function for active calls. This "gateway" function is distributed across the AVPPs.

The number of active AVPPs is determined dynamically. Whenever AVPPs are added to or removed from the system, the distribution of "timing" function for active calls, as well as the "gateway" function, is affected.

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## Internal Gatekeeper

A gatekeeper is required in certain H.323 protocol systems. Currently, a gatekeeper is not supported.

## AVPP Capacity

The AVPP requires a Cat. 5 cable connection between its network port and the Ethernet switch. The AVPP auto-negotiates to the type of port on the Ethernet switch and supports 10Base-T, 100Base-T, full-duplex and half-duplex port types.

The following table shows the capacity of the AVPP010 and AVPP020:

AVPP Servers	Number of Handsets	
	AVPP010	AVPP020
1	10	20
2	20	40
3	30	N/A
4	40	N/A

The following table shows the capacity of the AVPP100:

AVPP Servers	Calls per Server	Total Calls	Erlangs	#Wireless Phones 10% use	#Wireless Phones 15% use	Wireless Phones 20% use
1	80	80	65	500	433	325
2	64	128	111	1000	740	555
3	60	180	160	1500	1067	800
4	58	232	211	2000	1407	1055
5	57	285	262	2500	1747	1310
6	56	336	312	3000	2080	1560
7	56	392	367	3500	2447	1835
8	55	440	415	4000	2767	2075
9	55	495	469	4500	3127	2345
10	55	550	524	5000	3493	2620
11	55	605	578	5500	3853	2890
12	54	648	621	6000	4140	3105
13	54	702	674	6500	4493	3370
14	54	756	728	7000	4853	3640
15	54	810	782	7500	5213	3910
16	54	864	836	8000	5573	4180

### Note

- These limitations are for AVPPs only. Each IP Office model has its own limitations for supporting extensions. For example, IP Office 412 does not support more than 360 extensions. For specific model number extension units, see the IP Office documentation.

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## Overview of Wireless Phone

The 3600 series wireless phone is a mobile handset for workplace IP phone systems. The wireless phone operates over an 802.11b wireless Ethernet LAN providing users with a wireless Voice over IP (VoIP) extension. By integrating with IP Office, wireless phone users are provided with high-quality mobile voice communications throughout the workplace. The wireless phone gives users the freedom to roam throughout the workplace while providing all the features and functionality of an IP desk phone.

The 3600 series wireless phone provides a wireless extension to IP Office. The wireless phone resides on the wireless LAN with other wireless devices using Direct Sequence Spread Spectrum (DSSS) radio technology. The handset radio transmits and receives packets at up to 11Mb/s.

A wireless phone must be administered on IP Office for the specific features and lines to be accessed by the wireless phone. After the handset is registered, it receives its configuration information from IP Office.

The wireless phone supports Wired Equivalent Privacy (WEP) as defined by the 802.11 specification. Avaya offers the product with both 40-bit and 128-bit encryption. WEP increases the security of the wireless LAN to a level similar to a wired Ethernet LAN.

### Notes

- IP multicast addresses are used by the 3626 wireless phone Push-to-Talk (PTT) feature. This requires that multicasting be enabled on the subnet used for the wireless phones, Avaya Voice Priority Processor (AVPP) server, and telephony gateways.
- Routers are typically configured with filters to prevent multicast traffic from flowing outside of specific domains. The wireless LAN can be placed on a separate VLAN or subnet to reduce the effects of broadcast and multicast traffic from devices in other network segments.

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## Requirements

1. A wireless LAN must be properly configured and operational through the use of 802.11b wireless access points.
2. A TFTP server must be available on the network in order to load the appropriate software into the wireless phones. For detailed instructions for loading software on wireless phones, see License Management.
3. IP Office must be connected to the customer network and be completely operational.
4. The AVPP, which controls the QoS on the wireless LAN for the wireless phones, must be on the same subnet as the wireless phone and have the proper versions of software. To download the latest AVPP software, visit [www.spectralink.com/softwareupdates](http://www.spectralink.com/softwareupdates).
5. Add a station on IP Office for each wireless phone. You will need to administer each wireless phone as a 4606 IP phone.

### Note

For IP Office 403, 406V1, 406V2 and 412 the Voice Compression Module (VCM) is required. The IP Office Small Office Edition (SOE) has built-in VCM Channels for either 3 or 16 simultaneous VoIP calls (depending on which SOE you have).

Configure your wireless phone to ensure that it is associated with the wireless LAN, has the appropriate software and is registered to IP Office.

### Note

- The AVPP and all access points must be on the same subnet.

## Phone Specifications

Radio Frequency	2.4000 - 2.4835 GHz
Transmission Type	Direct Sequence Spread Spectrum (DSSS)
Transmit Data Rate	Up to 11 Mb/s
Radio QoS	Avaya Voice Priority Processor (AVPP)
Wireless Security	Wired Equivalent Privacy (WEP), 40bit and 128bit
FCC Certification	Part 15.247
Management	DHCP, TFTP
Voice Encoding	G.711, G.720a/ab
VoIP Protocols	CCMS
Transmit Power	100 mW peak, < 10 mW average
Display	2 x 16 character alphanumeric, plus line and status indicators
3616 Dimensions	5.5" x 2.0" x 0.9"
3620 Dimensions	5.5" x 2.0" x 0.9"
3626 Dimensions	5.9" x 2.2" x 1.0"
3616 Weight	4.2 ounces
3620 Weight	4.2 ounces
3626 Weight	6.0 ounces
3616 Battery Capacity	4 hours talk time, 80 hours standby
3620 Battery Capacity	4 hours talk time, 80 hours standby
3626 Battery Capacity	4 hours talk time, 80 hours standby If PTT is enabled, the standby battery capacity is decreased to approximately 30 hours.

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## System Components

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### 3600 Series Wireless Phones

As they move throughout the building, users can carry wireless phones to make and receive calls. The wireless phones are to be used on-premises; they are not cellular or satellite phones. They are connected to the facility's existing phone system and to the gateway or IP gateway. Just like wired phones, they can receive calls directly, receive transferred calls, transfer calls to other extensions and make outside and long distance calls (subject to the restrictions applied in your facility).

The wireless phones can operate on an 802.11b wireless network and can operate at a transmission rate of up to 11Mb/s.

- **3616 Wireless Phone**

The 3616 wireless phone is a lightweight, durable handset specifically designed for mobile workplace use within a facility using IP Office and 802.11b access points in a wireless LAN. The phone supports five predefined feature keys and a mixture of six programmable line and feature keys. Among other features, the wireless phone can receive calls directly, receive transferred calls, transfer calls to other extensions, make conference calls, and make outside and long distance calls (subject to the restrictions applied in your facility.)

- **3620 Wireless Phone**

The 3620 wireless phone is a sturdier version of the 3616 phone and is ideally suited for healthcare environments. The handset has the same features as the 3616 phone.

- **3626 Wireless Phone**

The 3626 wireless phone offers a durable design with push-to-talk capabilities as well as the same features as the 3616 phone.

The wireless phones use direct sequence spread spectrum radio technology (DS) to transmit audio packets over wireless LAN access points that support the Avaya Wireless PC card.

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### Avaya Voice Priority Processor

Avaya Voice Priority Processor (AVPP) is an Ethernet LAN appliance that works with access points to provide Quality of Service (QoS) on the wireless LAN. All packets to and from the wireless phones, pass through the AVPP and are encapsulated for prioritization as they are routed to and from IP Office. AVPP is fully compliant with the IEEE802.11 and 802.11b standards.

AVPP is required for QoS because the current IEEE802.11b wireless LAN standard does not provide a mechanism for differentiating audio packets from data packets.

The following AVPP servers are available to meet customer needs:

- AVPP100: Serves 80 calls simultaneously.
- AVPP020: Serves 20 powered-on handsets.
- AVPP010: Serves 10 powered-on handsets.

## IP Office

The call-processing component of the Avaya IP telephony solution.

The following IP Office units (equipped with VCM) are supported:

- Avaya IP Office 403
- Avaya IP Office 406 V1/V2
- Avaya IP Office 412

The following IP Office Small Office Edition units (equipped with built-in VoIP) are supported:

- Avaya IP Office - Small Office Edition 3 VoIP
- Avaya IP Office - Small Office Edition 16 VoIP

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## Access Points

Supplied by either Avaya or third party vendors, access points provide the connection between the wired Ethernet LAN and the wireless (802.11b) LAN. Access points must be positioned in all areas where wireless phones will be used. The number and placement of access points will affect the coverage area and capacity of the wireless system. Typically, the requirements for use of wireless phones are similar to that of wireless data devices.

The wireless phones must connect to access points that use AVPP. For a complete list of access points supported, go to:

[www.spectralink.com/consumer/resources/wifi\\_compatibility.jsp](http://www.spectralink.com/consumer/resources/wifi_compatibility.jsp)

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## Ethernet Switch

Interconnects multiple network devices, including the AVPP, IP Office, IP Phones and the access points. Ethernet switches provide the highest performance networks, which can handle combined voice and data traffic, and are required when using the wireless phones.

Although a single Ethernet switch network is recommended, the wireless phones and the AVPP can operate in larger, more complex networks, including networks with multiple Ethernet switches, routers, VLANs and/or multiple subnets. However, in such networks, it is possible for the Quality of Service (QoS) features of the AVPP to be compromised and voice quality may suffer. Any network that consists of more than a single Ethernet switch should be thoroughly tested to ensure any quality issues are detected.

### Note

- The 3600 series wireless phones cannot “roam” from one subnet to another. If routers and multiple subnets are in use, the wireless phones must only use access points attached to a single subnet, or be powered off and back on to switch to a different subnet.



## Router

A router is an optional component in the wired Ethernet LAN infrastructure that separates a wired LAN into segments so that network traffic is restricted to those segments that are directly involved in the communication. Installation of a network router is recommended in larger networks, where there may be significant network traffic not related to the wireless LAN. A router will isolate the wireless LAN from the associated wired LAN so that they are not impacted by each others' traffic. The gateways, access points and their associated Ethernet switch must all be on the same "side" of the router.

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## Administrative Computer

A computer is required for setup and maintenance of the AVPP. This computer can be temporarily connected directly to the component or to the network, a dedicated computer is not required. Some installations use a laptop to configure and maintain system components.

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## TFTP Server

A TFTP server is required in the system to distribute software to the wireless phones and AVPP. TFTP may be on a different subnet than IP Office, AVPP, access points and/or wireless IP phones. AVPP 10, 20 and 100 do not support IP Office internal TFTP server.

To download Avaya's free TFTP server, go to [www.avaya.com/support](http://www.avaya.com/support).

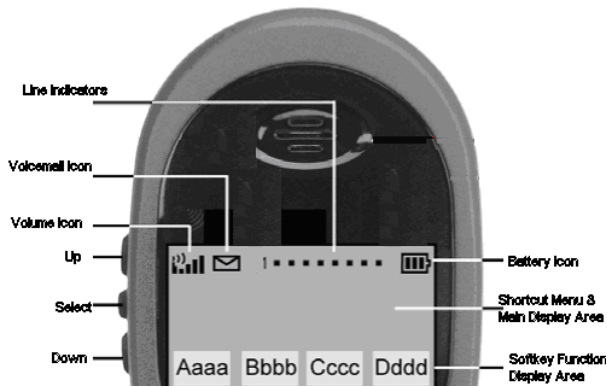
### Note

- An AVPP is required on each subnet. The access points must be on the same subnet(s) as the AVPP(s).
- 

## IP Multicast Addresses

IP multicast addresses are used by the 3626 wireless phone system. This requires that multicasting be enabled on the subnet used for the wireless phones and AVPP servers. Routers are typically configured with filters to prevent multicast traffic from flowing outside of specific domains. The wireless LAN can be placed on a separate VLAN or subnet to reduce the effects of broadcast and multicast traffic from devices in other network segments.

# The Phone Display



## Alphanumeric

The wireless phone display has two lines capable of displaying 16 alphanumeric characters each. Display information (provided by IP Office when the wireless phone is off-hook) will be passed directly to the wireless phone display. The wireless phone will emulate the 4606 phone display handling. Certain characters may be used by IP Office that are not implemented in the wireless phone such as definable and special characters.

In IP Office, the **MENU** key is unavailable. The softkeys operate with a toggle function. To activate a softkey feature, press the left or right side of the corresponding key.

To display the standby menu, press and briefly hold FCN.

- To scroll through the menu, press **Up** and **Down**.
- To select a menu item, press **Select**.

## Voicemail Icon

The voicemail icon is activated in a similar fashion as the message indicator of the display set.

## Ringling and Tones

The ringing types (normal or vibrator) are programmed by the wireless phone user into the wireless phone and are not accessible or changeable by IP Office. Whenever possible the audible and vibrating ringer on the wireless phone will follow the cadence provided by IP Office.

## Audio Features

The 4606 speakerphone features are not available on the wireless phone.

## Line Indicators

The line indicators on the wireless phone will convert to a solid or flashing number to mimic the LEDs next to Line keys on the 4606 phone.

## Note

- The wireless phone will indicate line numbers based on the order line assignments are received from the IP Office, regardless of which button the line is assigned to during system administration.

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# Introducing the AVPP

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## Overview

As shown in the system diagram, the AVPP is connected to the Ethernet switch. The specifications covered here, allow for flexibility in physical placement of the components within the stated guidelines.

See the Setup and Administration Guide for your vendor's IP system, for information on LAN requirements, network infrastructure and IP addressing.

---

## Required Materials

The following equipment must be provided by the customer:

- **Power Outlet** – must accept Avaya provided AC adapter.
- **Backboard space** – the AVPP is designed to be wall mounted to  $\frac{3}{4}$ " plywood securely screwed to the wall.
- **Screws** – required to mount the AVPP to the wall. Four #8 -  $\frac{3}{4}$ " panhead wood screws (or similar device) are required.
- **Cat. 5 Cable** – RJ-45 connector at the AVPP. Connection to the Ethernet switch.

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## Locating the AVPP

The AVPP measures approximately 4 x 12.5 x 7 inches, and weighs about five pounds. The unit can be wall mounted, vertically or horizontally, over  $\frac{3}{4}$ " plywood. The AVPP can also be rack mounted using a rack mount kit (sold separately).

Locate the AVPP in a space with:

- Sufficient backboard mounting space (for wall mount) and proximity to the LAN access device (switched Ethernet hub) and power source.
- Easy access to the front panel, which is used for cabling.
- A maximum distance of 325 feet (100 meters) from the Ethernet switch.

---

# AVPP Configuration

---

## Introduction

During initial setup of the AVPP, the IP address is established and the maximum number of active calls per access point is set. Optionally, you may enter a hostname and a location for software updates via TFTP.

### Note

- Where **SVP** is documented in this section, **AVPP** applies.

---

## Connecting to the AVPP

The initial connection to the AVPP must be made via a serial connection to establish the AVPP's IP address. After the IP address is established, connection to the AVPP can be done via the network using Telnet. It is recommended that the basic setup actions occur while the serial connection is made.

---

## Connecting via the Serial Port

1. Using a DB-9 female, null-modem cable, connect the AVPP to the serial port of a terminal or PC.
2. Run a terminal emulation program (such as HyperTerminal™) or use a VT-100 terminal with the following configuration:

Bits per second: 9600

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None

3. To display the AVPP login screen, press **Enter**.
4. Enter the default login: **admin** and default password: **admin**. These are case sensitive. The NetLink SVP-II System menu is displayed.

## Connecting via Telnet

### Note

- Telnet can only be used after the AVPP's IP address is configured.

The Telnet method of connection is used for routine maintenance of the Avaya server for both local and remote administration, depending on your network.

To connect via Telnet, run a Telnet session to the IP address of the AVPP. Once you connect and log in, the NetLink SVP-II System menu is displayed.

## AVPP System Menu

When you connect via the serial port or via Telnet (for the first time) the following main menu is displayed:

```

NetLink SVP-II System
Hostname: [SVP02_1], Address: 10.8.8.66

System Status
SVP-II Configuration
Network Configuration
Change Password
Exit

Enter=Select      ESC=Exit      Use Arrow Keys to Move Cursor

```

The screen displays:

- System Status** - menu for viewing error messages, status of operation and software code version. The 170 series software is required in the Alcatel IP environment. You can check the version currently installed on AVPP through the **System Status** menu, see Software Version.
- SVP-II Configuration** - allows you to set the mode and reset the system.
- Network Configuration** - allows you to set network configuration options, including IP address and hostname.
- Change Password** - allows you to change the password for AVPP access.

After you have configured a name for the AVPP, the following screen is displayed when you first login to the AVPP:

```

SVP-II Box Selection
Hostname: [AVP10], Address: 192.168.45.200

AVP10 192.168.45.200

Enter=Select  R=Refresh  X=Exit      Use Arrow Keys to Move Cursor

```

The screen displays the name and IP address of the AVPP. To display the main menu, press **Enter**.

## Network Configuration

The IP address and other network settings are established via the **Network Configuration** screen. This is also where you may optionally establish a hostname and enter the IP address of the location of any software updates.

For more information about installing software updates via TFTP, see Software Maintenance.

From the main menu, scroll to **Network Configuration** and press **Enter**. A screen similar to the following is displayed:

```

Network Configuration
  Hostname: [AVP10], Address: 192.168.45.203
Ethernet Address (fixed):  00:90:7A:03:E5:0C
IP Address: 192.168.45.203
Hostname: AVP10
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.45.1
SVP-II TFTP Download Master: 192.168.45.5
Primary DNS Server: NONE
Secondary DNS Server: NONE
DNS Domain: NONE
WINS Server: NONE
Workgroup: WORKGROUP
Syslog Server: NONE
Disable Telnet service: N
Maintenance Lock: N

Enter=Change  S=SendALL  ESC=Exit    Use Arrow Keys to Move Cursor

```

The screen displays:

- **IP Address** - enter the IP address of the AVPP, defined by your system administrator.
- **Hostname** (optional) - change the default host name, if desired. This is the name of the AVPP to which you are connected, for identification purposes only. You cannot enter any spaces in this field.
- **SVP-II TFTP Download Master** - this entry indicates the source of software updates for the AVPP. Valid source locations are:
  - **NONE** - disables.
  - **IP Address** - the IP address of the network TFTP server that will be used to transfer software updates to the AVPP.
- **DNS Server** and **DNS Domain** - these settings are used to configure domain name services. Consult your system administrator for the correct settings. These can also be set to **DHCP**. This will cause the DHCP client in the AVPP to attempt to automatically get the correct setting from the DHCP server. The DHCP setting is only valid when the IP address is also acquired using DHCP.
- **WINS servers** - these settings are used for Windows Name Services. Consult your system administrator for the correct settings. These can also be set to **DHCP**. This will cause the DHCP client in the AVPP to attempt to automatically get the correct setting from the DHCP server. The DHCP setting is only valid when the IP address is also acquired using DHCP.

### Note

- When the name services are set up correctly, the AVPP can translate hostnames to IP addresses. Using Telnet, it is also possible to access the AVPP using its hostname instead of the IP address.

- **Workgroup** - as set in WINS.
- **Syslog Server** - logging can be set to **Syslog** or **NONE**. If Syslog is set, a message is sent to the Syslog server when an alarm is triggered.
- **Disable Telnet service** - prevents Telnet access into the AVPP server. Reset the AVPP server for the change to take effect. Upon reset the Telnet protocol server is not started.

The AVPP must be reset in order to set the configuration options. If the AVPP is in **Maintenance Lock** and you press **Esc**, you will be prompted to reset the AVPP. At the reset prompt, press **Y** (Yes).

To manually reset AVPP, select **Reset** in the **SVP-II Configuration** screen and then press **Y** (Yes).

---

## Send All

In an IP system with multiple AVPPs, the **SendAll** option is provided to speed configuration and ensure identical settings. The **S=SendAll** option allows you to send that configuration parameter to every AVPP on the LAN.

**SendAll** can only be used after the IP address is established on each AVPP via the serial connection. If you anticipate identical settings across the LAN, set the IP address and custom hostname (if desired) for each AVPP using the initial serial connection. Connect via the LAN and use **SendAll** to set identical configuration options for all AVPPs.

If **SendAll** is to be utilized in your system, all passwords must be identical.

### Warning

- Do not change the password at the initial configuration if **SendAll** is desired.

Use the default password and change it globally, if desired, after a LAN connection is established for all AVPPs.

If independent administration of each AVPP is desired, the passwords may be set at initial configuration.

### Note

- The IP address of the master AVPP can be changed in this menu. After rebooting the system, you can change alias IP addresses in each of the other AVPP servers without error.

## AVPP Configuration

The **SVP-II Configuration** screen allows you to set the mode of the AVPP for an IP environment. It is also where you can lock the AVPP for maintenance and reset the AVPP after maintenance.

If the IP address is changed, the AVPP will automatically lock for maintenance. When this Maintenance Lock occurs, the AVPP must be reset upon exit. All active calls are terminated during a reset.

From the main menu, scroll to **SVP-II Configuration** and press **Enter**.

For the **AVP 10** or **20**, the following screen is displayed:

```

SVP-II Configuration
  Hostname: [AVP10], Address: 192.168.45.203
Phones per Access Point: 5
802.11 Rate: Automatic
SVP-II Master: 192.168.45.203
First Alias IP Address: 0.0.0.0
Last Alias IP Address: 0.0.0.0
Enable H.323 Gatekeeper: N
Ethernet link: auto-negotiate
System Locked: N
Maintenance Lock: N
Inactivity Timeout (min): 20
QoS Configuration
Reset
Reset all SVP servers

Enter=Change  S=SendAll  ESC=Exit  Use Arrow Keys to Move Cursor

```

For the AVP 100, the following screen is displayed:

```

SVP-II Configuration
  Hostname: [AVPP100], Address: 192.168.45.203
Phones per Access Point: 5
802.11 Rate: Automatic
SVP-II Master: 192.168.45.203
First Alias IP Address: 0.0.0.0
Last Alias IP Address: 0.0.0.0
Enable H.323 Gatekeeper: N
SVP-II Mode: Netlink IP
Ethernet link: auto negotiate
System Locked: N
Maintenance Lock: N
Inactivity Timeout (min): 20
QoS Configuration
Reset
Reset all SVP servers

Enter=Change  S=SendAll  ESC=Exit  Use Arrow Keys to Move Cursor

```

Complete the configuration changes:

- **Phones per Access Point** - enter the number of simultaneous calls supported for your type. Access point specifications are detailed in the configuration notes for each brand and type.
- **802.11 Rate** - select 1MB/2MB to limit the transmission rate between the wireless phones and access points. To allow the wireless phone to determine its rate (up to 11Mb/s), select **Automatic**.



- **SVP-II Master** - the master AVPP must be identified in an IP system. Select one of the following identification options:
  - To statically configure the IP address of the master AVPP in each of the AVPPs, enter the IP address.
  - To statically configure the IP address of the master AVPP in a DHCP server and configure each of the AVPPs to get the information from the DHCP server, enter **DHCP**. If DHCP is used, the IP address of the master AVPP server must be configured in the DHCP server. For more information about DHCP integration factors, see the wireless phone interface guide for your IP environment.
  - To statically configure the IP address of the master AVPP in a DNS server and configure each of the AVPPs to retrieve this information from the DNS server, enter **DNS**. If DNS is used, the IP address of the master AVPP server must be configured in the DNS server.

For an explanation of the master AVPP, see Introduction to AVPP.

- **First Alias IP Address/Last Alias IP Address** - enter the range of IP addresses this AVPP may use when acting as a proxy for the wireless phones. Alias IP addresses are not necessary in Avaya systems.

#### Note

All alias addresses must be on the same subnet as the AVPP server and cannot be duplicated on other subnets or AVPPs. There is no limit to the number of addresses that can be assigned, however, the capacity of each AVPP is 500 wireless phones.

- **Enable H.323 Gatekeeper** - the Gatekeeper function is not supported. Enter **N** (No).
- **Ethernet link** - the AVPP will auto-negotiate unless there is a need to specify a link speed.
- **System Locked** - this option is used to take the system down for maintenance. The default entry is **N** (No). To prevent any new calls from starting, set as **Y** (Yes). To restore normal operation, return to **N**.
- **Maintenance Lock** - the system automatically sets this option to **Y** (Yes), after certain maintenance activities that require reset (such as changing the IP address). Maintenance Lock prevents any new calls from starting.

#### Note

This option is automatically set by the system and cannot be changed by the system administrator.

To clear the Maintenance Lock, reset the system at exit.

- **Inactivity Timeout (min)** - set the number of minutes the administrative module can be left unattended before the system closes it. This number can be from 1 to 100. If it is set to zero (0), the administrative module will not close due to inactivity.
- **QoS Configuration** - select this option to set the DSCP tags and the 802.1p tags. See QoS Configuration.
- **Reset System** - if this option is selected, you will be prompted to reset the AVPP upon exiting this screen. Resetting the AVPP will terminate any calls in progress.

#### Note

- The AVPP should be reset at the end of any maintenance procedure that requires a reset either via **Maintenance Lock** or manually via **Reset System**.

## QoS Configuration

If QoS Configuration is selected from the **SVP-II Configuration** screen. A screen similar to the following is displayed:

```
QoS Configuration
Hostname: [AVP101]. Address: 192.168.45.203

-----
Traffic Class DSCP Tag
-----
Administration Default
WT (In call) Default
WT (Standby) Default
  RTP Default
  PBX Default
  Inter-SVP2 Default

Enter=Change  S=SendAll  ESC=Exit  Use Arrow Keys to Move Cursor
```

Tags set packet priorities for QoS. Either DSCP or 802.1p tags may be used.

- **DSCP Tag** - DSCP (Differentiated Services Code Point) is a QoS mechanism for setting relative priorities. In the IP header, packets are tagged with a DSCP field for type of service.
- **Traffic Class**
  - **Administration** - tags set the priority for Telnet, TFTP and other administrative traffic. Administrative traffic can have the lowest priority because it does not require voice quality.
  - **WT (In call)/WT (Standby)** - in call traffic requires voice quality and may be set to a higher priority than standby traffic.
  - **RTP** - audio traffic to the IP PBX. It requires voice quality.
  - **PBX** - traffic not audio to the PBX.
  - **Inter-SVP2** - the information passing protocol the AVPP servers use to communicate with each other.

## Change Password

The password to access the AVPP may be changed, if desired. From the **Main Menu**, select **Change Password**. A screen similar to the following is displayed:

```
Change Passuord
Hostname: [SUPU2_1], Address: 10.8.0.61

Old Password *****
New Password *****
Confirm New Password *****
Set Password
Set Password on all SUP servers

Enter=Select      ESC=Exit      Use Arrow Keys to Move Cursor
```

Enter the information and either select **Set Password** or press **S**.

The password parameters are:

- More than four characters.
- First character must be a letter; other characters may be numbers and letters.
- No dashes, spaces or punctuation marks (alphanumeric only).

### Caution

- Remember to keep the password safe as it cannot be reset remotely.

---

# AVPP Administration

---

## Introduction

Whenever an AVPP is removed from the system, wireless phones that are using the system will be affected. If the removal of the AVPP is intentional, the administrator should lock and idle the system, prior to removing an AVPP. Whenever an AVPP is added to the system, the change is seamless and does not affect the wireless phone calling functionality.

---

## Adding an AVPP

In the IP PBX environment, a new AVPP is detected within two seconds of being added to the system (booted/configured/connected). When detected, any wireless phone that is not active in a call will immediately be forced to check out and check in again. Any wireless phone in a call will immediately switch to the AVPP that should provide its 'timing' function. This switch should not be noticeable to the user since it is similar to a normal handoff between access points. When the call is ended, the wireless phone will be forced to checkout and checkin again.

---

## Removing an AVPP

When a AVPP is removed from the system, it is detected within two seconds. Wireless phones not active on calls are immediately forced to check out and check in again.

For wireless phones active in calls, two possible scenarios can occur:

- If the AVPP that was removed was providing the 'gateway' function for the wireless phone, then the call is lost and the wireless phone is forced to check in again.
- If the AVPP that was removed was providing the 'timing' function for the call, then call will switch to the AVPP that should now provide the 'timing' function.

### Note

- During the two seconds while the loss of the AVPP is being detected, the audio for the call will be lost.

---

## Changing the Master AVPP

In the event the master AVPP loses communication with the network, the wireless phone system will fail. All AVPPs will lock and all calls will be lost and no calls will be able to be placed. Therefore, if the master AVPP needs replacing, be sure that the system can be brought down with minimal call interruption. Be sure to reset all AVPPs after the master has been replaced. If the IP address of the master is changed, it must be changed in all AVPPs.

# IP Office Configuration

## Introduction

You need to configure the wireless phones as VoIP extensions on IP Office.

### Note

- The IP Office Manager screen shots below are from IP Office Version 3.1. Depending on the version of your IP Office, the exact screen displays may differ. However, the steps to cover should be similar.

## Configuring the Wireless Phone with IP Office Manager

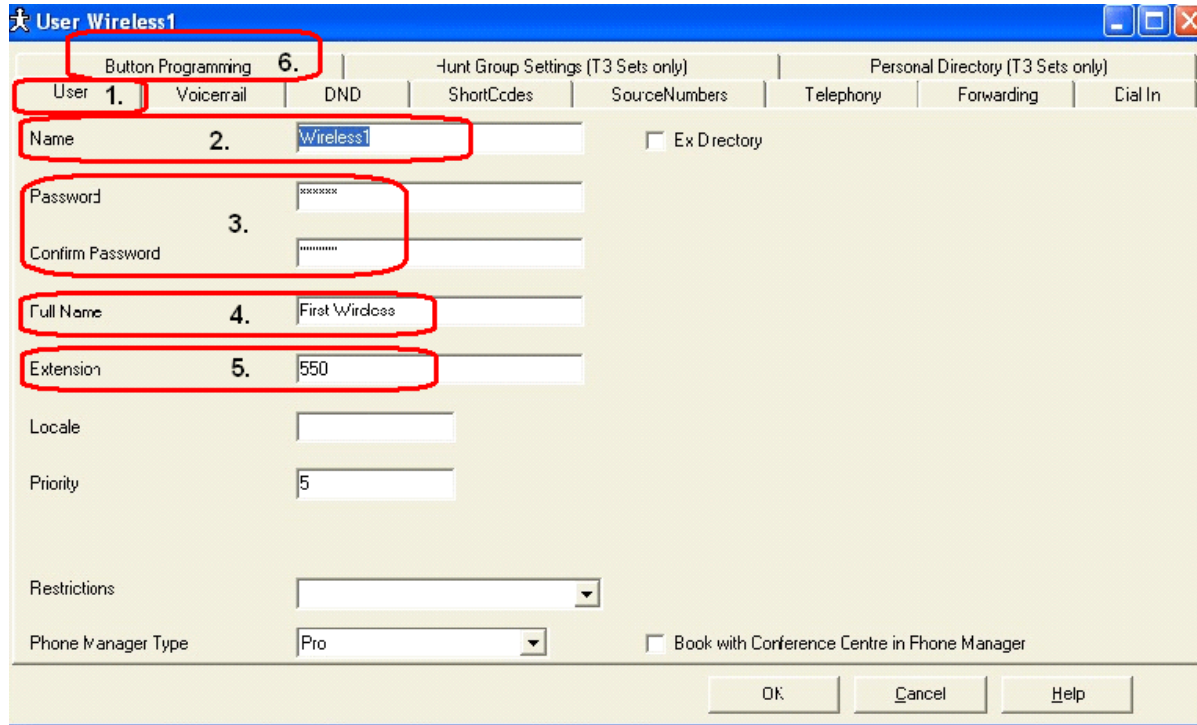
1. Launch IP Office Manager and from the System Configuration screen, click the **System** tab.

The screenshot shows the 'System Configuration : Small Office' window. The 'System' tab is selected. The 'TFTP Server IP Address' field is set to 192.168.45.5 and the 'AVPP IP Address' field is set to 192.168.45.203. The 'OK' button is highlighted.

2. Enter the master **AVPP IP Address**.
3. Enter the **FTP Server IP Address**.
4. Click **OK**.

### Adding a New User

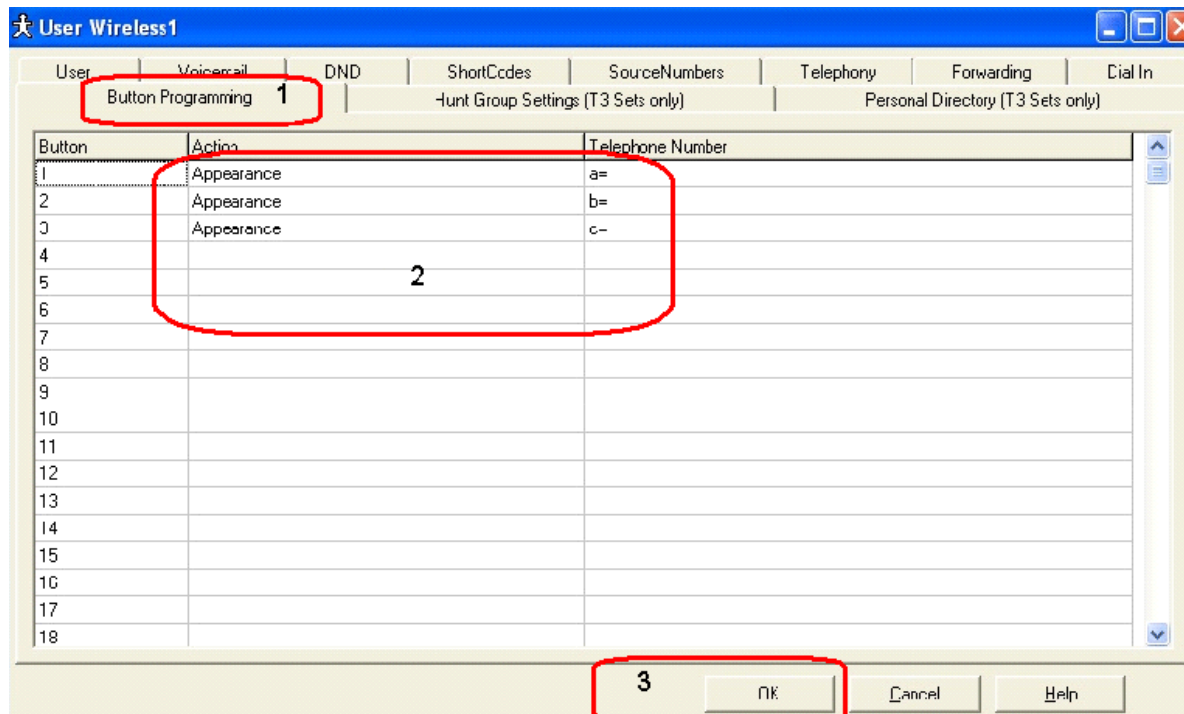
1. Click the **User** tab.



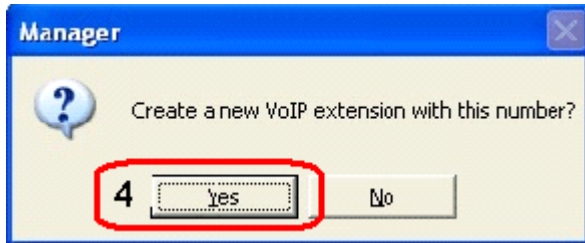
2. Enter the **Name** of the user.
3. Enter the **Password** and confirm.
4. Enter the **Full Name** of the user.
5. Enter the **Extension** number of the user.
6. Click the **Button Programming** tab.

### Button Programming

1. Click the **Button Programming** tab.



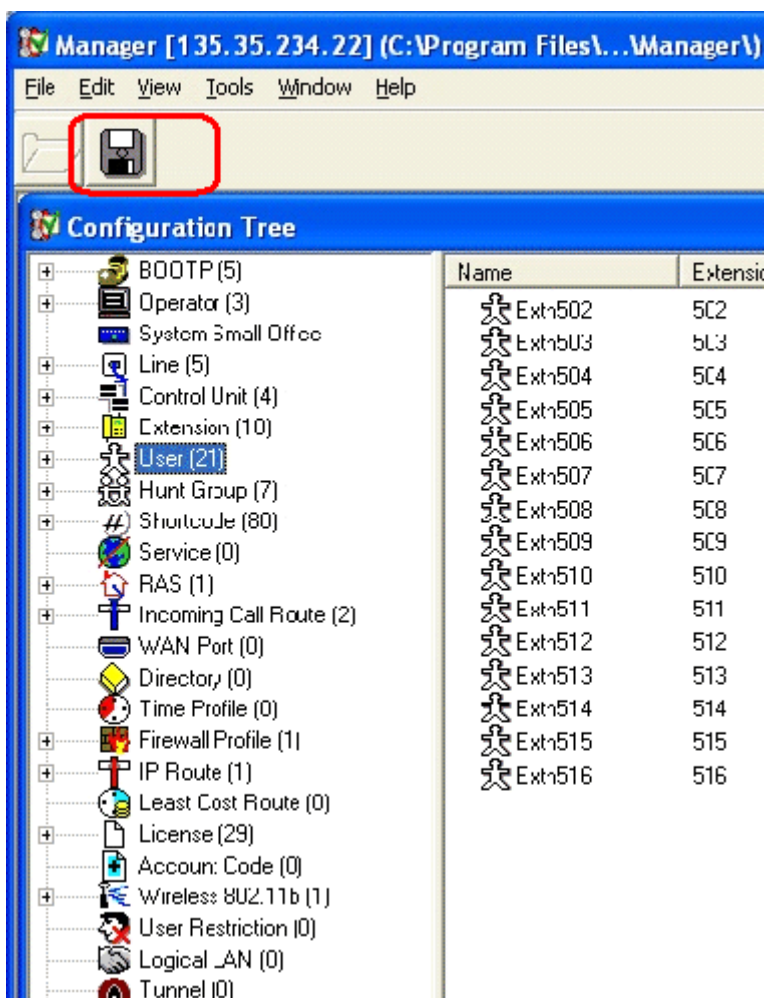
2. Enter the 6 line buttons for the user extension.
3. Click **OK**.



4. When you are prompted to create a new VoIP extension, click **Yes**. Repeat this process for all wireless user extensions.

## Updating the Configuration

From the Configuration Tree, click  to merge the configuration.



## IP Office Integration Factors

---

### Voice Messaging Access

To access voicemail, dial \*17. For verification, check with your system administrator.

---

### CODECS

The wireless phones are compatible with the G.711 and G.729a/ab codecs. There is no setting required on the wireless phone. If the wrong codec is used, there will be no voice path.

---

### DHCP

Dynamic Host Configuration Protocol (DHCP) is a standardized protocol that enables clients to be dynamically assigned with various configuration parameters, such as an IP address, subnet mask, default gateway, and other critical network configuration information. DHCP servers centrally manage such configuration data, and are configured by system administrators with settings that are appropriate for a given network environment. The wireless phone will use the following DHCP options, if DHCP use is enabled:

Option	Meaning
3	Default Gateway
6	DNS Server
15	Domain Name
66	TFTP Server
151	Avaya Voice Priority Processor
176	Avaya Specific Options

#### Note

- The above DHCP options are available if you are using a Win2K DHCP server on your network.
- 

### TFTP

The wireless phone uses TFTP to update its software over the 802.11 wireless LAN. The 3600 series wireless phones and the AVPPs, only support an external TFTP server with IP Office.

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## DNS

Domain Name System (DNS), an industry-standard protocol, locates computers on an IP-based network. IP networks rely on number-based addresses to move information on the network. However, users are better at remembering friendly names than number-based addresses, so, it is necessary to translate user-friendly names into addresses that the network can recognize. The wireless phone will use DNS to automatically translate names into IP addresses for these components: TFTP server, AVPP and IP Office.

---

## Entering an Extension and Password

Several conditions (new phone, Extension Error, Password Error, and Extension in use) can result in the wireless phone asking the user for a new extension and password. The entry process is described below. When a new extension or password is being entered, the asterisk (\*) key can be used to back up and correct an error.

The wireless phone will display:

**Ext. =XXX**  
**#=OK New =**

At this point, a new extension can be entered, or if # is pressed, the wireless phone will retain the current extension.

After a new extension is entered, press # to continue.

The wireless phone will then display:

**Password = \*\*\*\*\***  
**# = OK**

A new password can be entered at this time, or if # is pressed, the wireless phone will continue with its current password.

After a new password is entered, press # to continue.

---

## Extension Error

If the IP Office unit (or all, if there is more than one) does not recognize the extension that the phone is trying to register with, the wireless phone will display:

**Extension Error**

This will last 5 seconds, and then the wireless phone will ask the user to enter a new extension and password.

## Password Error

If the wireless phone has an incorrect password, the display will show:

**Password Error**  
**# to continue**

To enter a new extension and password, press # to continue.

---

## Extension Override

IP Office will detect when a wireless phone tries to register with the same extension as any phone that is already registered to that extension. If this happens, the wireless phone will display:

**Extension in use**  
**# to continue**

To continue, press #.

If the user chooses to continue on with the override information, the wireless phone will register with the override bit set. Any phone currently registered with the given extension will be unregistered, and any activity on the currently registered phone will be stopped. If that phone is in a call, it will be dropped.

If the user does not want to override the existing extension, either enter a different extension and password, or simply power off the wireless phone.

### Note

- If two wireless phones are assigned to the same extension, the IP Office unit will not properly resolve the registration conflict due to the presence of the AVPP. Both wireless phones may fail to operate properly.
- 

## Retry/Restart

Some errors will result in the following display, once # is pressed to continue:

**\* to Retry**  
**# to Restart**

To immediately retry registering with IP Office, press \*. To restart the wireless phone, press # (which will take about 20 seconds)

---

---

# Wireless Phone Installation

---

## Introduction

This section contains information on the installation and configuration of the wireless phone on IP Office. IP Office acts as a routing mechanism for all wireless phones on its system. Information is routed from the phone to IP Office and to the AVPP.

The AVPP is the Quality of Service (QoS) mechanism that is implemented in the wireless phone and access point to enhance voice quality. AVPP gives preference to voice packets on the wireless medium, increasing the probability that all voice packets are transmitted efficiently. These voice packets are then re-routed through IP Office and back to the wireless phone.

The IP Office units currently supported with the wireless phones:

- Avaya IP Office 403
- Avaya IP Office 406 (V1 and V2)
- Avaya IP Office 412

Avaya IP Office – Small Office Edition can be optioned as an 802.11b access point (WiFi pcmcia card and IP400 ACCESS POINT RFA license, to activate the access point software) but without QoS. The access point is configurable via IP Office Manager.

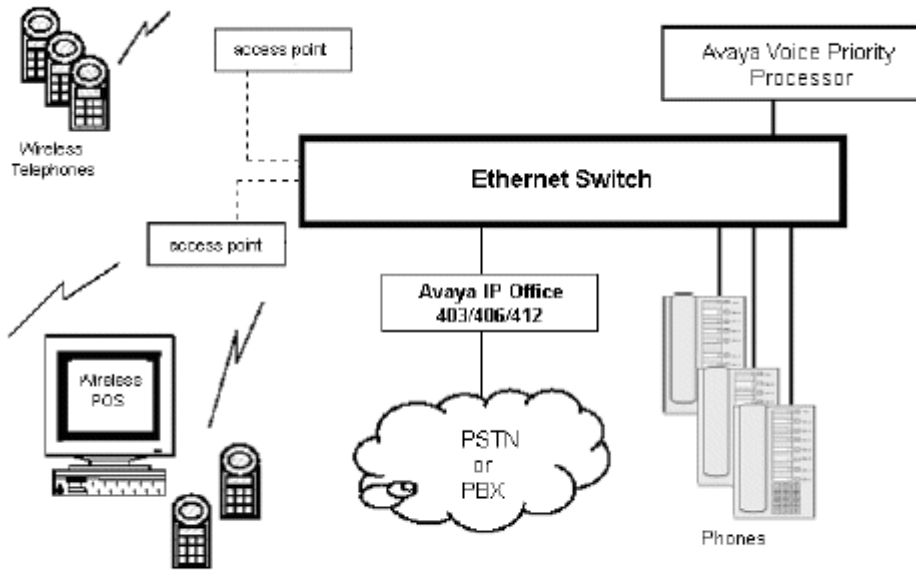
Other wireless solutions are available for the IP Office – Small Office Edition.

### Notes

- The setup for the 3600 series wireless phones requires four major steps:
  1. The configuration of the AVPP.
  2. The configuration of IP Office.
  3. The configuration of the Access Points.
  4. The configuration of the 3616/3620/3626 wireless phones.
- With IP Office, the access point resides on the LAN and is configured based on the manufacturer's guidelines and manuals. For a list of access points supported, go to [www.spectralink.com/consumer/resources/wifi\\_compatibility.jsp](http://www.spectralink.com/consumer/resources/wifi_compatibility.jsp).

# System Configuration

The following diagram shows IP Office residing on a network with a wireless LAN access point, the AVPP and 3600 series phones:



(Example Only)

---

# Sample Installation and Configuration

A sample configuration set-up is available following the instructions below.

## Note

- Before you begin downloading software upgrades, you must create a Spectralink Login and password.

If you have an IP Office unit, do the following to set-up the wireless phones:

1. To create a VoIP extension on IP Office, you must first download the firmware upgrades for the phones and the AVPPs from the SpectraLink website: [www.spectralink.com/softwareupdates](http://www.spectralink.com/softwareupdates)
2. For the 10, 20 or 100 AVPP software, click **Infrastructure**. In the Product column, locate NetLink SVP Server, and do the following:
  - a. Download the .EXE. For the 10 and 20 AVPP, download Netlink SVP Server.exe. For the 100 AVPP, download Netlink SVP Server\_01.exe.
  - b. Double-click the .EXE file and place the files in the same sub-directory as your TFTP server is pointed to.

## Note

- 10, 20 and 100 AVPPs will not operate together in a network. The network must consist of all 10, all 20 or all 100 AVPPs.

For the wireless phone software, click **Handsets**. In the Product column, locate Netlink-e340/h340/i640-Avaya and do the following:

- a. Download the .EXE.
  - b. Double-click the .EXE file and place the files in the same sub-directory as your TFTP server is pointed to.
3. Refer to the manufacturer's documentation to configure the access point with the following information:
    - Access Point IP Address
    - Individual Access Point Name
    - Frequency Channel
    - Security Key Information
  4. Using a Cat. 5 Ethernet cable, connect the IP Office unit's LAN port to the AVPP's Network port.
  5. To configure the AVPP, see AVPP Configuration.
  6. Create a VoIP extension for each wireless phone.
  7. Configure the wireless phone.

## Sample Setup

Below is a sample configuration designed as a quick reference.

### Sample Information

Item	IP Address
Avaya Voice Priority Processor (AVPP)	192.168.42.3
Avaya IP Office 403/406/412	192.168.42.1
PC	192.168.42.10

### AVPP Configuration Screen via Hyperterminal

Title	State	Comment
Error Status	Alarms	System error display
Network Status		Status of networks
Software Versions		Current software version on the AVPP

### AVPP Configuration

Hostname: Sample 1, Address: 192.168.42.3

Title	State	Comment
Phones per access point	3	Dependent on the access point
802.11 Rate:	Automatic/1MB 2MB only	Data rate speed
AVPP Master:	192.168.42.3	AVPP IP address
AVPP Mode:	Netlink IP	Leave as default
Ethernet link:	Auto-negotiate	Leave as default
System locked:	N	Leave as default
Maintenance lock:	N	Leave as default
Reset system	Y/N	Leave as default

**AVPP Network Configuration**

Title	State	Comment
Ethernet Address (fixed):	00:90:7A:01:24:93	Leave as default
IP Address:	192.168.42.3	The AVPP unit
Hostname:	Sample1	System host name
Subnet Mask:	255.255.255.0	Leave as default
Default Gateway:	192.168.42.1	IP Office unit
AVPP TFTP Download Master:	192.168.42.1	PC containing AVPP software
Primary DNS Server:	NONE	Leave as default
Secondary DNS Server	NONE	Leave as default
DNS Domain:	NONE	Leave as default
WINS Server:	NONE	Leave as default
Workgroup:	WORKGROUP	Leave as default
Syslog Server	NONE	Leave as default
Maintenance Lock:	N	Leave as default

**Phone Setup**

Boot up the phone by simultaneously pressing **Power On/Start Call** and **Power Off/End Call**. Release **Power On/Start Call** while still holding down **Power Off/End Call**. The MAC address is displayed.

- To edit and access, press **Up**, **Down** and **Select** on the left side of the phone.
- To navigate back one screen, press **FCN**.
- To end programming, press **Power Off/End Call**.

To search for **Network Config**, press **Down**. To access configuration parameters, press **Select**.

Configure the following information on the phone:

Title	State	Comment
IP Address	Static or DHCP	Select IP address mode
ESS ID (SSID)	Network Name (SSID)	SSID of the access point
License Mgmt	9	Leave as default
Encryption	Match the configuration on the access point	
Ext.	Extension Number	Use the extension number created from User
Password	Extension Password	Enter password for the phone extension from User

---

# Wireless Phone Configuration

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## Introduction

The wireless phone can be automatically configured for IP addresses (by enabling DHCP) and/or ESSID (by enabling ESSID learning).

If any of the wireless phone's default settings need to be changed, follow the procedures in this section.

---

## Opening and Using the Admin Menu

The Admin menu contains configuration options that are stored locally (on each wireless phone).

Every wireless phone is independent and if the default settings are not desired, the admin options must be set in each wireless phone that require different settings.

1. With the wireless phone powered off, simultaneously press and hold **Power On/Start Call** and **Power Off/End Call**.
2. After hearing two beeps, release **Power On/Start Call**, then release **Power Off/End Call**. The first option on the Admin menu is displayed.

### Note

- If an admin password has been set, it must be entered to display the Admin menu. If no password is set, the Admin menu is displayed.
3. To scroll through the menu options, press **Up**, **Down** and **Select** on the left side of the phone.
  4. To change the selected option, press **OK** or press **Up** to return to the previous menu level.
  5. To exit the menu, press **Power Off/End Call**.

The default settings are shown below with an \* prior to the option.



The following table lists the Admin menu items. Detailed descriptions of each item appear below the table.

Admin Menu Items	Second Level	Third Level	Fourth Level	Fifth Level	Sixth Level
Phone Config	License Option	Set Current			
	Ext. Password				
Network Config	IP Office	IP Ofc Enabled IP Ofc Disabled			
	OAI ON/OFF	Enable OAI Disable OAI			
	Push-to-Talk (3626 only)	Allowed Channels		*Channel 1 *Channel 2 *Channel 3 *Channel 4 *Channel 5 *Channel 6 *Channel 7 *Channel 8	
		Allow/Disallow		*Allow PTT Disallow PTT	
	Admin Password				
	IP Address	*Use DHCP			
		Static IP		Phone IP TFTP Server IP Default Gateway Subnet Mask Syslog Server IP Call Server IP Call Server Port AVPP IP OAI Server IP	
	ESS ID	Learn Once Learn Always			

Admin Menu Items	Second Level	Third Level	Fourth Level	Fifth Level	Sixth Level
	Security	Static Entry *None WEP	Authentication  WEP On/Off  Key Information	Open System Shared Key *WEP Off WEP On Default Key Key Length  Key #1 Key #2 Key #3 Key #4	40-Bit 128-Bit
		Cisco FSR	Rotation Secret Username Password		
		WPA-PSK	Passphrase Pre-shared Key		
		WPA2-PSK	Passphrase Pre-shared Key		
	Reg Domain: None				
	Transmit Power	*Maximum  50mW 30mW 20mW 15mW 10mW 5mW			
Diagnostics	Run Site Survey  Diagnostics mode	Diagnostics On			

Admin Menu Items	Second Level	Third Level	Fourth Level	Fifth Level	Sixth Level
Restore Defaults	Syslog mode	*Diagnostics Off *Disabled Errors Events Full			

## IP Address

There are two modes in which the wireless phone can operate: DHCP enabled or static IP. Select the mode for operation from the IP Address menu:

### \* Use DHCP

Will use Dynamic Host Configuration Protocol (DHCP) to assign an IP address each time the wireless phone is turned on. If DHCP is enabled, the wireless phone also receives all other IP address configurations from the DHCP server.

### Static IP

A static IP address allows you to manually set a fixed IP address. If selected, the wireless phone will prompt for the IP address of each of the configurable network components. When entering addresses, enter the digits only, including leading zeroes. No periods are required.

Regardless of the mode in which the wireless phone is operating, the following components must be configured.

### Phone IP

Phone IP refers to the IP address of the wireless phone. This is automatically assigned if DHCP is used. If using static IP configuration, you must obtain a unique IP address for each phone from your network administrator.

### AVPP IP

AVPP IP refers to the IP address of the AVPP. If using static IP configuration, this is simply the IP address of the AVPP.

### Note

- The AVPP must be statically configured to have a permanent IP address. If DHCP is being used, the wireless phone will try the following, in order: the DHCP option 151, then a DNS lookup of "SLNKSVP2" if the DHCP options 6 (DNS Server) and 15 (Domain Name) are configured.

The following components may be configured optionally:

### **TFTP Server IP**

TFTP Server refers to the IP address of a TFTP server on the network that holds software images for updating the wireless phones. If this feature is configured (not set to 0.0.0.0 or 255.255.255.255) with either static IP configuration or using DHCP option 66 (TFTP server), or the Boot server/next server (siaddr) field, the wireless phone will check for newer software each time it is powered on or comes back into range of your network. This check takes only a second and ensures that all wireless phones in your network are kept up-to-date with the same version of software.

### **OAI Server IP**

OAI Server refers to the IP address of the NetLink OAI gateway. If using static IP configuration, this is the IP address of the NetLink OAI Gateway. If DHCP is being used, the wireless phone will try the DHCP option 152.

### **Default Gateway and Subnet Mask**

Default Gateway and Subnet Masks are used to identify subnets, when using a complex network which includes routers. Both of these must be configured (not set to 0.0.0.0 or 255.255.255.255) for the wireless phone to contact any network components on a different subnet. They can be set using either static IP configuration or via DHCP options 3 (default gateway) and 1 (subnet mask) respectively. Contact your network administrator for the proper settings for your network.

#### **Note**

- The wireless phones cannot “roam” across subnets, since they cannot change their IP address while operational. Ensure that all your access points are attached to the same subnet for proper operation. The wireless phone can change subnets if DHCP is enabled, and the wireless phone is powered off then back on when within range of access points on the new subnet.

### **Call Server IP**

The IP address of the IP Office unit. If using static IP configuration, this is the IP address of the IP Office unit.

## ESSID

Select the option that will enable the wireless phone to acquire access points with the correct ESSID (Extended Service Set ID) each time it is turned on.

### Note

- Broadcast ESSID must be enabled in the access points for ESSID learning to function. Refer to the configuration note for your access point or call your access point vendor for specifics. Overlapping wireless systems complicate the use of ESSID learning as the wireless phone in an overlapping area could receive conflicting signals. If this is the situation at your site, use Static Entry or Learn Once in an area with overlapping ESSIDs.

### \* Learn Once

The Learn Once option allows the wireless phone to scan all ESSIDs for a DHCP server and/or TFTP server. Once either is found, the wireless phone retains the ESSID from whichever access point it associates with at that point. When overlapping wireless systems exist, the Learn Once feature allows the wireless phone to use only the ESSID established at first learn at all subsequent power on. This ESSID is retained by the wireless phone until the ESSID option is re-selected.

### Learn Always

The Learn Always option allows the wireless phone to automatically learn the ESSID at each power on or loss of contact with the wireless LAN (out of range). This may be useful if the wireless phone will be used at more than one site.

### Static Entry

If your access points do not accept broadcast ESSID or if there are overlapping wireless systems in use at the site, enter the correct ESSID manually:

- On the keypad, press the first digit/letter of the ESSID. The digit is displayed.
- Press the first digit/letter of the ESSID again, to scroll through the letters associated with that key.

For example:

If you press 2 repeatedly, you will see 2, A, B, and C, a, b, and c.

The following table shows keys that you use to enter non-numeric characters or other characters not represented on the keypad.

To Enter	Press
. - _ ! # \$ % & ' ( ) , ; / \ = @ ~ 1	1
Space	0
Q q	7
Z z	9

- When the correct entry is displayed, press **Up** or **Down** to move on to the next character. Repeat for each digit/letter of the ESSID.
- To save the entry and return to the menu, press **Select**. To abort and return to the menu without saving any changes, press **FCN**.

## License Management

License Management lets you select the VoIP protocol that your site is licensed to download and run. The IP Office Protocol to use for the wireless phones is 009. Any other protocol will cause the wireless phone to malfunction.

- To view the current selection, press **Select**. The protocol number is displayed.
- To change the protocol, press **Select**.
- To scroll through the options, press **Up** or **Down**.
- To select the displayed protocol number, press **Select**.

After selecting the correct protocol for your site, you should upgrade the software for the phones. See [Upgrading Wireless Phones](#) for more information.

---

## Restore Defaults

This option will set all user and administrative parameters to their factory defaults.

---

## Site Survey Mode

This option is used to check the signal strength from access points. When Site Survey Mode is selected, the phone will remain in this mode until it is powered off. For more information on this mode, see [Certifying the Wireless Phone](#).

---

# Security

## \*None

Disables any 802.11 encryption or security authentication mechanisms.

## WEP (Wired Equivalent Privacy)

A wireless encryption protocol that scrambles wireless signals allowing for greater security in the wireless network. If WEP/Encryption is required at this site, you must configure each wireless phone to correspond with the encryption protocol set up in the access points. Select the entries from the options below to enable the wireless phone to acquire the system.

### Notes

- Set each of these options to match exactly the settings in your access points.
- Encryption codes display as they are entered. For security reasons, codes will not display when a user returns to the Admin menu, Encryption options.
- WEP may be set to "optional" at the access point if there are wireless devices in use that do not have WEP capability. All wireless devices must be upgraded to WEP capability for a fully secured WEP environment.

### Authentication

Select either Open System or Shared Key.

### WEP On/Off

Select either WEP On or WEP Off.

### Key Information

To scroll through the options, press **Up** and **Down**:

- **Default Key:** Enter the key # specified for use by the wireless phones. This will be 1 through 4.
- **Key Length:** Select either 40-bit or 128-bit depending on the key length specified for use at this location.
- **Key 1-4:** Scroll to the key option that corresponds to the default key that was entered above. Press 0 and enter the encryption key as a sequence of hexadecimal characters. (Use the 2 and 3 keys to access hexadecimal digits A-F, use the right arrow key to advance to the next digit, and the left arrow key to backspace). For 40-bit keys you will need to enter 10 digits, for 128-bit keys you will need to enter 26 digits. The display will scroll as needed.

### Rotation Secret

This is used for proprietary WEP key rotation. Refer to your custom document if this feature is supported in your system.

### Cisco FSR (Fast Secure Roaming)

A proprietary security mechanism devised by Cisco Systems to overcome some shortcomings in the 802.11 Standard WEP encryption, without impacting the ability of the wireless phones to roam from one access point to another with seamless voice. Cisco FSR requires advanced configuration of the Cisco access points in your site. See your Cisco representative for detailed WEP documentation on configuring your access points and other required security services on your wired network. To configure Cisco FSR on your wireless phone, you must enter a Radius server username and password into each phone.

#### Username

Enter a username that matches an entry on your Radius server. Usernames are alphanumeric strings, and can be entered using the same technique as described above for ESSID entry.

#### Password

Enter the password that corresponds to this username.

---

## OAI On/Off

The Open Application Interface (OAI) enables third-party computer applications to display alphanumeric messages on the wireless phone display and take input from the wireless phone's keypad. Refer to the Open Application Interface (OAI) Specification (Version 1.2) documentation for information about administering the OAI gateway and the services it can provide.

If you have an OAI gateway installed in your system, OAI may be optionally enabled in each wireless phone. You may select whether the wireless phone should attempt to connect to the OEM OAI gateway by choosing either **Enable** or **Disable** in this menu.

If OAI is enabled, and an OAI IP address is available to the phone (either via DHCP or static IP configuration), the phone will communicate with the OAI server at power on, and periodically while it is powered on. If you do not have an OEM OAI gateway installed at your site, you should disable the OAI feature to preserve network bandwidth and battery life.



## Admin PW

The Admin PW (password) controls access to the administration functions in the Admin menu. A password must be set in each wireless phone if controlled access is desired. Wireless phones are shipped without any Admin menu password.

1. To change the password, press **OK**.
2. Enter the password. Press the first digit/letter of the password. The digit is displayed. Press the key again to scroll through the letters associated with that key. For example:

If you press 2 repeatedly, you will see **2**, **A**, **B**, and **C**, **a**, **b**, and **c**.

The following table shows keys that you use to enter non-numeric characters or other characters not represented on the keypad:

To Enter	Press
. - _ ! # \$ % & ' ( ) , : ; / \ = @ ~ 1	1
Space	0
Q q	7
Z z	9

3. When the correct entry is displayed, press **Up** or **Down** to move on to the next character. Repeat for each digit/letter of the password.
4. To save the entry and return to the menu, press **OK**. To abort and return to the menu without saving any changes, press **Up**.

### Note

- If you press **OK** with no entry, the password is erased. The display does not require a password before displaying the Admin menu.

## Extension

Each wireless phone must have an extension assigned to it, as well as having the same extension administered in IP Office. This extension is used to register the wireless phone with IP Office.

1. To enter a new extension, press the number keys.
2. When done, press **OK**.
3. To quit without changes, press **Up**.

---

## Password

A password must be entered in to the wireless phone, that matches the password administered in IP Office. This password can be up to seven digits. If the IP Office unit has no password, leave this option blank.

1. To enter a new password, press the number keys.
2. When done, press **OK**.
3. To quite without changes, press **Up**.

---

## User-defined Preferences

The following user-defined preferences are also covered in the 3600 Series Wireless IP Phone User Guide. Refer to this list for more information about customizing wireless phone settings.

To configure the following options, the phone must acquire the system (no error message may display) and be at the extension display. To open the user options menu, press and hold **FCN** briefly. Use the following keys to display and select options:

- **Up** - return to the previous menu item.
- **Down** - display the next menu item.
- **Select** - select the menu item.
- **Power Off/End Call** - exit menus.

Standby Menu Item	Second Level	Third Level	Fourth Level
Lock Keys			
Ring Options	Telephone Rings	Ring Cadence	Off *PBX Continuous Short Pulse Long Pulse
		Ring Tone	*Tone 1 Tone 2 Tone 3 Tone 4 Tone 5
		Vibrate Cadence	*Off *PBX Continuous Short Pulse Long Pulse
	Auxiliary Ring 1	Ring Cadence	Off *PBX Continuous Short Pulse Long Pulse
		Ring Tone	*Tone 1 Tone 2 Tone 3 Tone 4 Tone 5
		Vibrate Cadence	*Off *PBX Continuous Short Pulse Long Pulse
	Auxiliary Ring 2	Ring Cadence	Off *PBX Continuous Short Pulse Long Pulse
		Ring Tone	*Tone 1 Tone 2 Tone 3 Tone 4 Tone 5
		Vibrate Cadence	*Off *PBX Continuous Short Pulse

Standby Menu Item	Second Level	Third Level	Fourth Level
Phone Options	Noise Mode	*Normal	Long Pulse
		High	
		Severe	
	Key Tones	*Enable Tones	
		Disable Tones	
	Warning Tones	*Enable Warnings	
		Disable Warnings	
	Display Contrast		
	Keypad Autolock	*Autolock Disable	
		Autolock 5 sec	
Autolock 10 sec Autolock 20 sec			
System Info	Phone IP Addr		
	Server IP Addr		
	Firmware Version		
Call Server IP			
Call Server Port			
Push-to-Talk (3626 only)	Channel	Current Chan:01 123456789	
		New chan = ?	
		PTT Enabled *PTT Disabled	
	Audio Volume	Curr Audio Vol:	
	Tone Volume	Curr Tone Vol:	

To change the standard ring used for normal operation:

1. Select **Ring Type** and then select **Telephone Ring**.
2. From the **Telephone Ring** menu, select either **Normal Ring** (an audible alert), **Vibrator Ring**, or **Vib/Norm Ring** (vibrate for five seconds and then audible alert for subsequent rings). The **Auxiliary Ring** modes are reserved for future use. Vibrator ring works only if this wireless phone has the optional vibrating ringer. The ring type currently in use displays with an asterisk (\*).

To select an option that describes the noise level in your environment, select **High Noise Mode** from the menu. Selecting the correct option will adjust the wireless phone to account for background noise.

Select:

- **Normal:** for most office environments.
- **High:** for moderate background noise.
- **Severe:** for extremely noisy conditions.

Use of the non-Normal Noise modes is not recommended unless you are in a loud environment, or you may find it difficult to be heard on your wireless phone.

- **Current IP Address:** displays the IP address currently assigned to the wireless phone. The IP address is not set here, it is merely displayed.
- **Call Server IP:** displays the IP address of the IP Office unit with which the wireless phone is registered.
- **Call Server Port:** displays the UDP port number used when registering with IP Office.
- **Push-to-talk (3626 only):** displays the menu for the two way radio feature in the 3626 wireless phone. The **Channel** option allows you to select a channel 1-8 to send and receive radio messages. The **Enable/Disable** option allows you to enable or disable the radio feature.

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# License Management

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## Introduction

The wireless phone system supports a number of different IP protocol integrations. All wireless phones are shipped from Avaya with generic software loaded, which allows the phones to associate to a wireless LAN and download their functional software from a TFTP server.

### Note

- The wireless phone will not function properly without downloading appropriate software.

---

## Requirements

- A wireless LAN must be properly configured and operational through the use of 802.11b.
- IP Office must also be connected to your network and completely operational.
- A TFTP server must be available on the network in order to load the appropriate software in to.
- Ensure that the battery pack on the wireless phone is fully charged.

---

## Configuration Process

1. Download the latest 3600 series wireless IP phone – IP software from:

[www.spectralink.com/softwareupdates](http://www.spectralink.com/softwareupdates)

2. Load the latest version of the 3600 series wireless phone code and place it on the TFTP server and ensure the TFTP server is started. Ensure the files are unzipped in the root directory of the TFTP server.
3. If statically assigning IP addresses, ensure that the **IP Address**, **TFTP Server IP**, **Subnet Mask**, and **Default Gateway** information are accurate in the Admin menu. If using a DHCP server, ensure that the DHCP option is set. See Wireless Phone Configuration for detailed instructions.
4. Ensure the wireless phone has properly configured **ESSID** and **Reg Domain** information within the Admin menu. If you are accepting broadcast **ESSIDs** at your access points, the handset will automatically learn the ESSID information when powering on.
5. Using the Admin menu on the wireless phone, ensure the **License Mngt** menu option is set to **009**. This ensures the handset will check for the proper software files each time it powers on.
6. Power cycle the wireless phone.

The code will now download to the handset. The status bar will increment fully across the display for each function that is being performed in the download process. Upon completion of the update process, the handset will re-boot with the new firmware.

7. After code has been downloaded for the first time, the wireless phone will ask for an extension and password. Once these have been entered, the phone will register with IP Office.

### Note

- For future software upgrades, simply update the files that are stored on the TFTP server. Each time the wireless phone is powered up, it will check with the TFTP server to ensure it has the proper software version. If a new version of code is downloaded, the currently entered extension and password will be preserved.

---

# Feature Programming

---

## Introduction

The 3600 series wireless phone emulates the 4606 phone. This phone supports line appearances and has the following keys:

- Six programmable keys.
- Dedicated Mute, Hold, Transfer, Conference and Redial softkeys.
- Adjustable speaker volume control.
- Adjustable ringer volume control.

All phone functions and messaging features are supported if possible. Functions that require the use of the volume keys are not supported, nor are Speakerphone functions.

---

## Assigning Functions

The first five feature keys are available as softkeys. **FCN** keys can be programmed as features (e.g. Call Park, Call Ride etc.) via IP Office. If the wireless phone is associated with a desk station, the button features administered for the desk station are assigned to the remaining **FCN** keys.

The keypad mapping for each wireless phone is administered through the IP Office administration software (for example, Avaya MultiVantage Configuration Manager). Programmable keys are accessed by pressing **LINE** on the wireless phone, followed by the appropriate digit key.

- Assigned lines can be accessed by the key sequence **LINE** + a digit, where the digit is the order in which the line has been received from the IP Office unit. This is true regardless of which button is associated with the line.

For example:

If line 1 is assigned to Programmable Key 1, **LINE** + **1** will access line 1. If line 2 is then assigned to Programmable Key 4, **LINE** + **2** will access line 2.

- Change to feature programming will take effect after the wireless phone is powered off and back on again.
- If an Open Application Interface (OAI) is operational, one or more function key sequences will be assigned in the OAI configuration and they will override any function sequence established here.

---

# Testing a Wireless Phone

Verify proper registration and operation of each wireless phone by performing the following tests on each wireless phone in an active wireless area.

1. To power on the wireless phone, press **Power On/Start Call**. A series of messages are displayed as the wireless phone acquires the system. The wireless phone should display the user extension. Any error messages should clear.
2. Press **Power On/Start Call**. The extension number should be replaced by information from the IP Office unit and you should hear a dial tone. Place a call and listen to the audio quality. To end the call, press **Power Off/End Call**.
3. Place a call to the wireless phone and verify ring, answer, clear transmit and clear receive audio.
4. Press **Power On/Start Call**.
5. To verify all programmed features on the wireless phone, press **FCN** and then press **Power Off/End Call** when finished.
6. To verify the programmed line appearances, press **LINE** and then press **Power Off/End Call** when finished.
7. Press **Power Off/End Call**. Any line indicators should turn off and the extension number display will return.



---

# Certifying the Installation

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## Introduction

Conduct a preliminary Site Survey Mode test according to the directions given in this section. Note any areas where coverage is conflicting or inadequate. Note any system difficulties and work with your wireless LAN and/or LAN system administrator to determine the cause and possible remedy. For information on possible sources of difficulties, see Troubleshooting.

---

## Site Certification

### Note

- The installer should not leave the site before performing installation verification.

These tests must be performed in typical operating conditions, especially if heavy loads occur. Testing sequence and procedure is different for every installation. Generally, you should organize the test according to area and volume, placing numerous calls to others who can listen while you perform coverage tests. Note any areas with excessive static or clarity problems and report it to an Avaya engineer.

The coverage test will also require you to put the wireless phone in **Site Survey** mode and walk the entire coverage area to verify all access points.

### Important Note

- The installation is not complete until these certification steps have been performed. Do **NOT** hand out wireless phones at a site that has not been certified.

---

## Solving Coverage Issues

Coverage issues are best resolved by adding and/or relocating access points.

Overlap issues may be resolved by re-assigning channels to the access points or by relocating the access points.

---

## Site Survey Mode

Test signal strength in the covered area by performing a Site Survey. Put a wireless phone in Site Survey Mode (see Wireless Phone Configuration) and walk the entire coverage area while viewing the display.

The **FCN** key toggles between the three coverage modes described below. The wireless phone will remain in Site Survey Mode until it is powered off. When testing is complete, and to power off the wireless phone, press **Power Off/End Call**.

Numbers racing across the wireless phone display indicate access point information is being obtained. A Waiting message indicates the system is not configured properly and the wireless phone cannot find any access points.

---

### Detect dBm Coverage

As you walk the perimeter, the two-line display will show the top four access points that the wireless phone can contact in a code as illustrated below.

```
XXX1 YY XXX2 YY
XXX3 YY XXX4 YY
-dBm
```

- XXX1 through XXX4 are the last four digits of the access point's MAC address. The primary access point (the access point which had the strongest signal to this wireless phone) displays first, followed by the three access points with the next strongest signals.
- YY is the power level in dBm at which this wireless phone heard the associated access point. Although shown as a positive number, YY represents negative dBm and lower numbers represent stronger signals. For example, a displayed value of 40 indicates 40dBm, and is therefore a stronger signal than a display of 50 (which indicates -50dBm). At least one access point's reading should be stronger than -70 dBm in all areas.

Note any areas that have inadequate dBm readings.

---

### Detect Overlap or Conflicts

To toggle to the Site Survey function that shows the channel number of the access points, press **FCN**. Use this information to detect overlaps or conflicts in access point signaling.

```
XXX1 YY XXX2 YY
XXX3 YY XXX4 YY
Chnl
```

- XXX1 through XXX4 are the last four digits of the access points' MAC address.
- ZZ is the channel number that the access point is using.

Note any areas that have access points that are in contention for the same channel.

It is preferable that no overlaps exist anywhere in your facility. If that is not possible, then any location that shares two access points with the same channel should also show at least two access points with stronger signals that do not conflict.

## Confirm Supported Data Rates

To toggle to the Detail function, press **FCN**. Use this information to confirm signal strength and supported data rates.

```
#:          Full
MAC
dB   Ch
     1b2b5b11b
Det1
```

- #: the number (1-4) of the access point.
- Full MAC: the MAC address of the access point.
- dB: the signal strength of the access point.
- Ch: the channel of the access point.
- 1b2b5b11b is an example of the data rates that may be displayed.

Walk around the site to determine supported data rates, one access point at a time. In any location you may use the right arrow key to display the second best access point, arrow again to the third best, and so on to the fourth best. The left arrow key steps you back to the first best.

Each data rate (1,2,5.5, or 11Mbit/sec) that is supported by the access point is shown. Those rates that are in the Basic Rate set (sometimes referred to as “required” rates) are indicated by a ‘b’ following the rate number. The Supported and Basic data rate(s) should be the same on all access points as is appropriate for your environment.

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# Software Maintenance

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## Introduction

### 3600 Series Wireless Phones

The wireless phones use proprietary software programs. The software versions that are running on the wireless phones can be displayed during power on by holding down **Power On/Start Call**.

Avaya or its authorized dealer will provide information about software updates and how to obtain the software (for example, downloading from a web site).

### AVPP

The AVPP uses proprietary software programs. The software versions that are running on the system components can be displayed via the **System Status** screen.

Avaya, or its authorized dealer, will provide information about software updates and how to obtain software, for example; downloading from a web site.

At startup, the AVPP uses TFTP to check the software version it is running against the version in the TFTP location. If there is a discrepancy, the AVPP will download the version in the TFTP location. For more information about using TFTP, see the Setup and Administration guide for your vendor's IP system.

---

## Upgrading Wireless Phones

After software updates are obtained, they must be transferred to the appropriate location in the LAN to update the code used by the wireless phones.

The wireless phones allow over-the-air transfer of software updates from the designated TFTP server to the wireless phones. The downloading function in the wireless phone checks its software version every time the wireless phone is turned on. If there is any discrepancy the wireless phone immediately begins to download the update.

## Normal Download Messages

When the wireless phone is powered on, it displays a series of messages indicating that it is searching for new software, checking the versions, and downloading. The table below shows the normal message progression:

Message	Download
Checking Code	The wireless phone is contacting the TFTP server to determine if it has a newer version of software that should be downloaded.
Erasing Memory	The wireless phone has determined that a download should occur and is erasing the current software from memory. This message also displays a progress bar. When the progress bar fills the display line the erase operation is complete.
Updating Code	The wireless phone is downloading new software into memory. The number icons at the bottom of the display indicate which file number is currently being downloaded. This message also displays a progress bar. When the progress bar fills the display line the update operation is complete on that file.

When the update is complete, the wireless phone displays the extension number and is ready to use.

## Download Failure or Recovery Messages

The table below shows the display messages which indicate a failure or recovery situation during the download process.

Message	Download
Server Busy	The wireless phone is attempting to download from a TFTP server that is busy downloading other phones and refusing additional downloads. The wireless phone will automatically retry the download every few seconds.
TFTP ERROR(x):yy	A failure has occurred during the TFTP download of one of the files. (x) = The file number which was being downloaded; yy is an error code describing the particular failure. Possible error codes are:  01 = TFTP server did not find the requested file. 02 = Access violation (reported from TFTP server). 07 = TFTP server reported "No such user" error. Check the TFTP server configuration. 81 = File put into memory did not CRC. The wireless phone will attempt to download the file again. FF = Timeout error. TFTP server did not respond within a specified period of time.
Erase Failed	Download process failed to erase the memory in the wireless phone. This operation will retry.
Warning	The wireless phone has attempted some operation several times and failed, and is now waiting for a period of time before attempting that operation again.

## Upgrading the AVPP

The AVPP uses proprietary software programs. The software versions that are running on the system components can be displayed via the **System Status** screen.

Avaya, or its authorized dealer, will provide information about software updates and how to obtain software, for example; downloading from a web site.

At startup, the AVPP uses TFTP to check the software version it is running against the version in the TFTP location. If there is a discrepancy, the AVPP will download the version in the TFTP location. For more information about using TFTP, see the Setup and Administration guide for your vendor's IP system.

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# Troubleshooting

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## AVPP Troubleshooting

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### Overview

Information about system alarms and network status are displayed on various screens, which can be accessed via the **System Status Menu**. From the main menu, select **System Status**. A screen similar to the following is displayed:

```
System Status Menu
Hostname: [SUP02_1], Address: 10.0.0.61

Error Status
Network Status
Software Versions
Gatekeeper Database

Enter=Select      ESC=Exit      Use Arrow Keys to Move Cursor
```

The screen displays:

- **Error Status** - displays alarm and error message information.
- **Network Status** - displays information about the Ethernet network to which the AVPP is connected.
- **Software Versions** - lists the software version for the Avaya component.
- **Gatekeeper Database** - not used.

Options on the System Status menu provide a window into the real time operation of the components of the system. Use this data to determine system function and to troubleshoot areas that may be experiencing problems.

## Error Status

The **Error Status** screen displays any alarms that indicate some system malfunction. Some of these alarms are easily remedied and others require a call to Avaya's Customer Support.

From the **System Status Menu**, select **Error Status**. The screen displays active alarms on the AVPP.

The following table displays the list of alarms and a description of the action to take to eliminate the alarm:

Alarm Text	Action
Maximum payload usage reached	Reduce usage, clear alarm
Maximum telephone usage reached	Reduce usage, clear alarm
Maximum access point usage reached	Reduce usage, clear alarm
Maximum call usage reached	Reduce usage, clear alarm
SRP audio delayed	Reduce usage, clear alarm
SRP audio lost	Reduce usage, clear alarm
No IP address	Configure an IP address

To clear all clearable alarms, press **C**.

## Network Status

The AVPP is connected to the Ethernet network, referred to as the LAN or Local Area Network. The information about that connection is provided through the **Network Status** screen.

From the **System Status Menu**, select **Network Status**. A screen similar to the following is displayed:

```

Network Status
  Hostname: [SUPU2_1], Address: 10.8.0.61

Ethernet Address: 00:90:7A:00:77:15      Net: 100/full
System Uptime:   6 days, 02:34         Max calls: 80

RX:  bytes   packets  errors  drop  fifo  alignment  multicast
    432891547 4112190      0      0      0         0         1321217

TX:  bytes   packets  errors  drop  fifo  carrier  collisions
    1478261799 1311194      0      0      0         0         0

SUP-II Sockets in Use      (Last / Max):    0 / 10
SUP-II Access Points in Calls (Last / Max):    0 / 2
SUP-II Telephones in Use   (Last / Max):    0 / 1
SUP-II Telephones in Calls (Last / Max):    0 / 2
SUP-II SRP Audio           (Delay / Lost):  0 / 0

      ESC to Exit

```



The screen displays information about the Ethernet network which can help troubleshoot network problems:

- **Ethernet Address** - MAC address of the AVPP (hexadecimal).
- **System Uptime** - the number of days, hours and minutes since the AVPP was last reset.
- **Net** - the type of connection to the Ethernet switch currently being utilized.

#### Note

- Data is transmitted over Avaya components by proprietary technology developed by Avaya. The Avaya Radio Protocol (ARP) packets and bytes can be differentiated from other types of transmissions and are used to evaluate system functioning by Avaya customer support and engineering personnel.
- **RX** - Ethernet statistics concerning the received packets during System Uptime.
  - **bytes** - bytes received.
  - **packets** - packets received.
  - **errors** - sum of all receive errors (long packet, short packet, CRC, overrun, alignment).
  - **drop** - packets dropped due to insufficient memory.
  - **fifo** - overrun occurred during reception.
  - **alignment** - nonoctet-aligned packets (number of bits NOT divisible by eight).
  - **multicast** - packets received with a broadcast or multicast destination address.
- **TX** - Ethernet statistics concerning the transmitted packets during System Uptime.
  - **bytes** - bytes transmitted.
  - **packets** - packets transmitted.
  - **errors** - sum of all transmit errors (heartbeat, late collision, repeated collision, underrun, carrier).
  - **drop** - packets dropped due to insufficient memory.
  - **fifo** - underrun occurred during transmission.
  - **carrier** - carrier lost during transmission.
  - **collisions** - packets deferred (delayed) due to collision.
- **SVP-II Access Points in Use** - access points in use by wireless phones, either in standby or in a call. 'Last' is current, 'Max' is the maximum number in use at one time.
- **SVP-II Access Points in Calls** - access points with wireless phones in a call.
- **SVP-II Telephone in Use** - wireless phone in standby or in a call.
- **SVP-II Telephone in Calls** - wireless phone in a call.
- **SVP-II ARP Audio (Delay)** - ARP audio packets whose transmission was momentarily delayed.
- **SVP-II ARP Audio (Lost)** - ARP audio packets dropped due to insufficient memory resources.

## Software Version

The AVPP and wireless phones, utilize Avaya's proprietary software that is controlled and maintained through software versions. The **Software Version** screen provides information about the version currently running on the AVPP. This information will help you determine if you are running the most recent version and will assist Avaya engineering and/or customer support in troubleshooting software problems.

From the **System Status Menu**, select **Software Version**. A screen similar to the following is displayed:

```

                Software Version Numbers
      Hostname: [SUPV2_1], Address: 10.0.0.61

Hardware Versions:      32/02 ENG
Factory Page:          230.008
Downloader:            230.157 (5ea5a4cc)
Table of Contents:     173.001 (ddb366ac)
Functional Code:       174.001 (c0942c06)
File System:           175.001 (c0e2b488)

                ESC to Exit
  
```

### Note

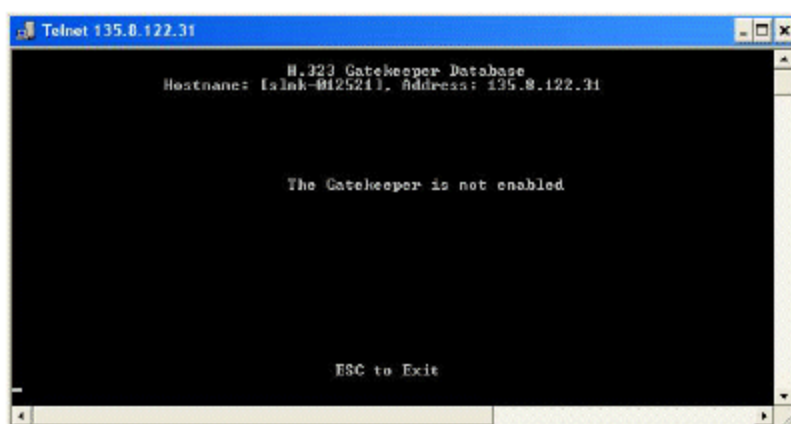
- The software versions on your system will be different from the versions displayed in the above sample screen.

The 170 series software is required in certain IP environments.

Name	Major Version Number	Filename
Table of Contents	173	svp100.toc
Functional Code	174	zvmlinux
File System	175	flashfs

## Gatekeeper Database

The **Gatekeeper Database** screen lists the registered extension numbers and the IP address currently being used by each extension. The Gatekeeper is not enabled. If this option is selected a screen similar to the following is displayed:



```

Telnet 135.0.122.31
H.323 Gatekeeper Database
Hostname: Islak-0125211, Address: 135.0.122.31

The Gatekeeper is not enabled.

                ESC to Exit
  
```

---

# Wireless Phone Troubleshooting

---

## Introduction

Wireless phones can exhibit transmission problems in several ways. They can cease functioning properly, display error messages, or display incorrect data. When using and troubleshooting wireless phones, consider the problem sources described in this section, to determine the best method of approaching any specific situation.

---

## Access Point Problems

Most, but not all, wireless phone audio problems have to do with access point range, positioning and capacity. Performing a Site Survey as described in the Setup and Maintenance document can isolate the access point causing these types of problems. If the wireless phone itself is suspected, conduct a parallel Site Survey with a wireless phone that is known to be properly functioning.

### In Range/Out of Range

Service will be disrupted if a user moves outside the area covered by the wireless LAN access points. Service is restored if the user moves back within range. If a call drops because a user moves out of range, the wireless phone will recover the call if the user moves back into range within a few seconds.

### Capacity

In areas of heavy use, the call capacity of a particular access point may be filled. If this happens, the user will hear three chirps from the wireless phone. The user can wait until another user terminates a call, or move within range of another access point and try the call again. If a user is on a call and moves into an area where capacity is full, the system attempts to find another access point. Due to range limitations, this may be the same as moving out of range.

### Transmission Obstructions

Prior to system installation, the best location for access points for optimum transmission coverage was determined. However, small pockets of obstruction may still be present, or obstructions may be introduced into the facility after system installation. This loss of service can be restored by moving out of the obstructed area, or by adding access points.

---

## Configuration Problems

Certain problems are associated with improper configuration of either IP Office or the wireless phone. Configuration problems are generally corrected by changing the configuration on IP Office or on the wireless phone. See IP Office Configuration and Wireless Phone Configuration for specific configuration steps.

There may also be incorrect programming of the access point. See the Configuration Note for the access point in use at the site.

If IP Office registration fails, note any error messages on the display including which line icons are active. This information will help with the problem resolution.

## Wireless Phone Status Messages

Wireless phone status messages provide information about the wireless phone's communication with the access point and host phone system. The following table summarizes the status messages, in alphabetical order.

Message	Description	Action
3 chirps	The wireless phone is not able to communicate with the best access point, probably because that access point has no bandwidth available.	None. This is only a warning, the call will handoff to the best access point once it becomes available.
ASSERTxxx.c Line yyy	The wireless phone has detected a fault from which it cannot recover.	Record the error code so it can be reported. Turn the wireless phone off then on again. If error persists, try registering a different wireless phone to the phone port. If error still persists, contact Technical Support and repeat the error.
Bad Config	Some needed configuration parameter has not been set.	Check all required wireless phone configuration parameters for valid settings.
Bad ESSID	The wireless phone is configured for "static ESSID" (as opposed to "Learn once" or "Learn always" and no ESS ID has been entered.	Enter an ESSID in the configuration settings or change to one of the "Learn" modes.
Charging...	The wireless phone is charging in the desktop charger.	No action needed.
Charge Complete	The wireless phone is now fully charged.	No action needed.
Checking Code	The wireless phone is contacting the TFTP Server to determine if it has a newer version of software that should be downloaded.	None, this message should only last for approximately one second. If message remains displayed, power off and contact customer support for a replacement phone.
Checking DHCP IP	The wireless phone is retrieving DHCP information from the DHCP server.	None. This is information only.
CRC Code Error	The software which has been TFTP downloaded has a bad redundancy code check.	Try the download again, it is possible the software was corrupted during download. If the error repeats, check that the download image on the TFTP server is not corrupted.
Code Mismatch!	The software loaded into the wireless phone is incorrect for this model phone	Replace the software image on the TFTP server with software that is correct for the phone model.

DHCP Error (1-4)	DHCP Error 1	The wireless phone cannot locate a DHCP server. It will try every 4 seconds until a server is located.
	DHCP Error 2	The wireless phone has not received a response from the server for a request to an IP address. It will retry until a server is found.
	DHCP Error 3	The server refuses to lease the wireless phone an IP address. It will keep trying.
	DHCP Error 4	The server offered the wireless phone a lease that is too short. The minimum lease time is 10 minutes but Spectralink recommend at least one hour minimum lease time. The wireless phone will stop trying. Re-configure the server and power cycle the wireless phone.
DHCP Lease Exp	The wireless phone's DHCP lease has expired, and the call (if any) cannot continue.	The wireless phone failed to renew its DHCP lease, either because the DHCP server is not running, or because the configuration has been changed by the administrator. The wireless phone will attempt to negotiate a new lease, which will either work, or change to one of the above DHCP errors (1-4).
DHCP NACK error	A NACK (Negative ACKnowledge) was received from the DHCP server.	The DHCP lease currently in use by the wireless phone is no longer valid, which forces the wireless phone to restart. This problem should resolve itself on the restart. If it does not, the problem is in the DHCP server.
DO NOT POWER OFF	The wireless phone is in a critical section of the software update.	None. Do not remove the battery or attempt to power off the phone while this is displayed. Doing so may require the phone to be returned to Avaya to be recovered.
Duplicate IP	The wireless phone has detected another device with its same IP address.	If using DHCP, check that the DHCP server is properly configured to avoid duplicate addresses. If using static IP, check that the wireless phone was assigned a unique address.
Erase Failed	Download process failed to erase the memory in the wireless phone.	Operation will retry but may eventually report the error "int. error: 0F" Power cycle the phone.

Erasing Memory	The wireless phone has determined that a download should occur and is erasing the current software from memory.	None. When the progress bar fills the display line the erase operation is complete.
Extension Error	Displayed for 5 seconds when all of the IP Offices contacted indicate that they do not recognize the current extension as valid.	The user will be asked to enter a valid extension and password.
Extension in use	The phone is trying to register with an extension that is already registered on IP Office.	See Avaya IP Office Integration Factors.
Incompatible	The switch is rejecting the software version presented by the phone.	If this condition persists, contact the system administrator.
Initializing...	The wireless phone is performing power on initialization.	None. This is information only.
Internal Err. ##	The wireless phone has detected a fault from which it cannot recover.	Record the error code so that it can be reported. Turn the wireless phone off and then on again. If the error persists, try registering a different wireless phone to the phone port. If error still persists, contact Avaya Technical Support and report the error.
Low Battery, and beep	Low battery	On call: the battery icon displays and a soft beep will be heard when the user is on the wireless phone and the battery charge is low. User has 15–30 minutes of battery life left.  Not on call: The battery icon displays whenever the battery pack charge is low The message <b>Low Battery</b> and a beep sound indicate a critically low battery charge when user is not on the wireless phone. The wireless phone will not work until the battery pack is charged.
Multiple GW Res	More than one SVP server has responded.	Caused by two or more wireless phones sharing the same IP address. Assign unique IP addresses to each wireless phone.
Network Busy	All access points are full or busy.	Try calling again later.

<p>No IP Office or No IP Office (when apparently valid IP, but no response to the GRQ/RRQ process) The No IP Office message may include an error indication</p>	<p>The wireless phone is not administered on IP Office.  IP Office is not working.  No LAN connection at the access point or the IP Office.  The wireless phone cannot locate the IP Office.</p>	<p>The wireless phone is not properly configured. Verify that the extension and password in the wireless phone match those administered on the IP Office unit.  Verify that IP Office is operational. If so, follow standard troubleshooting procedures for IP Office.  Verify the IP Office connection to LAN and all access points.  IP address configuration of IP Office is wrong or missing.</p>
<p>No Host IP</p>	<p>The wireless phone is configured for "static IP" (as opposed to "use DHCP") and no valid host IP address (the wireless phone's IP address) has been entered.</p>	<p>Enter a valid IP address in the configuration settings or change to "use DHCP".</p>
<p>No IP Address</p>	<p>Invalid IP.</p>	<p>Check the IP address in the configuration settings or change to "use DHCP".</p>
<p>No Net Access</p>	<p>Cannot authenticate/associate with access point.  Incorrect WEP settings.</p>	<p>Verify the access point configuration  Verify that all the WEP settings in the wireless phone, match those in the access points.</p>
<p>No Net Found</p>	<p>This indicates on of the following:</p> <ul style="list-style-type: none"> <li>• No radio link</li> <li>• No ESSID - Autolearn not supported (or) incorrect ESSID.</li> <li>• Out of range</li> </ul>	<p>Verify that the access point is turned on.  Verify that the ESSID of the wireless LAN and enter or Autolearn it again if required.  Try getting close to an access point. Check to see if other wireless phones are working within the same range of an access point. If so, check the ESSID of this wireless phone.</p>
<p>No Reg Domain</p>	<p>Regulatory Domain not set.</p>	<p>Configure the Regulatory Domain of the wireless phone.</p>
<p>No AVPP IP</p>	<p>The wireless phone is configured for "static IP" (as opposed to "use DHCP") and no valid AVPP address has been entered.</p>	<p>Enter a valid AVPP IP address in the configuration setting or change to "use DHCP".</p>

No AVPP Response	The AVPP is not responding to requests from the wireless phone.	This may be caused by bad radio reception or a problem with AVPP. The wireless phone will keep trying to fix the problem for 20 seconds, and the message may clear by itself. If it does not, the wireless phone will restart. Report this problem to the system administrator if it keeps happening.
No AVPP Server	The wireless phone cannot locate AVPP.  AVPP is not working.	IP address configuration of the AVPP is wrong or missing.  Check error status screen on the AVPP.
Not Installed!	No LAN connection at the AVPP.  A required software component is missing.	Verify the AVPP connection to LAN.  Check that all required software files are on the TFTP server, if over-the-air downloading is being used. If the error repeats, contact Avaya Technical Support.
Password Error	The phone is not encrypting the challenge string correctly. This indicates that the password set in the phone disagrees with the password administered in IP Office.	Enter the correct password in the phone.
Press End Call	Your call has ended.	To return to standby mode, press <b>Power Off/End Call</b>
Restarting...	The wireless phone is in the process of rebooting. There will be a 20 second delay in an attempt to let potential network/system errors clear.	None.
Retry/Restart	The wireless phone is waiting for user input, prior to retrying the registration process or restarting after a delay.	See Avaya IP Office Integration Factors.
Select License	The correct protocol has not been selected from the license set.	Using the administrative menus, select one license from the set to allow the phone to download the appropriate software.
Server Busy	The wireless phone is attempting to download from a TFTP server that is busy downloading other devices and refusing additional downloads.	None, the wireless phone will automatically retry the download every few seconds.



AVPP Service Rej.	The AVPP has rejected a request from the wireless phone.	The wireless phone will restart and attempt to re-register with the AVPP, which should fix the problem. Report this to your system administrator if it keeps happening.
System Busy	AVPP is busy or out of resources.	All call paths are in use, try calling again in a few minutes.
System Error	An internal failure has occurred in AVPP.	If this condition persists, contact the system administrator.
System Locked (with Busy Tone)	AVPP is locked.	Try calling again later.
TFTP ERROR(x):yy	<p>A failure has occurred during a TFTP software download. (x) = The file number which was being downloaded; yy is an error code describing the particular failure. Possible error codes are:</p> <p>01 = TFTP server did not find the requested file.</p> <p>02 = Access violation (reported from TFTP server).</p> <p>07 = TFTP server reported "No such user" error.</p> <p>81 = File put into memory did not CRC.</p> <p>FF = Timeout error. TFTP server did not respond within a specified period of time.</p>	<p>Error code 01, 02 or 07 - check the TFTP server configuration.</p> <p>Error code 81 - the wireless phone will attempt to download the file again.</p> <p>For other messages, power off the wireless phone, then turn it on again to retry the download. If the error repeats, note it and contact Technical Support.</p>
Trying xxx.xxx.xxx.xxx	The phone is attempting to register with IP Office at IP xxx.xxx.xxx.xxx	None. The display is a progress indicator and may not appear long enough to recognize during a normal check-in.
Undefined Error	The system is rejecting the registration of the wireless phone with an unrecognized error code.	If this condition persists, contact the Avaya system administrator.
Updating Code...	The wireless phone is downloading new software into memory. The number icons at the bottom of the display indicate which file number is currently being downloaded.	None. When the progress bar fills the display line, the update operation is complete on that file.
Updating...	The wireless phone is internally updating its software images.	None. The wireless phone may do this briefly after a download. This is information only.

Waiting...	The wireless phone has attempted some operation several times and failed.	None. The wireless phone is waiting for a specific period of time before attempting that operation again.
Wrong Code Type	Internal consistency check failure.	Check that the license type is set to 9 and that the <i>slnk_cfg.cfg</i> file indicates the proper bode <i>.bin</i> .
Wrong Set Type	The set type administered on IP Office disagrees with the set type for the wireless phone.	Make sure that the set type 4606 is used for the wireless phone.
(No message shown)	There is no voice path.	Verify that the CODEC is G.711.
(No message shown)	Messages are left at the principal station but the MSG icon is not lit on the wireless phone.	Verify that "Message Lamp Ext", on the station form for the wireless phone, is set to the extension of the principal station.

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