Contents

6 Advanced Features

Getting Started

<div style="text-align: right; font-size: 2em;">**1**</div>

Overview

- <u>Introducing Access Point 3</u>
- <u>Network operation</u>
- <u>Setup overview</u>
- <u>User interfaces</u>

Introducing Access Point 3

The Access Point 3 (AP-3) functions as a wireless network access point to data networks. AP-3 networks provide:

- Seamless client roaming.
- Easy installation and operation.
- Over-the-air encryption of data.
- High speed network links.

To be fully operational, the AP-3 needs at least one Avaya Wireless PC Card.

For more information about the various card types available, refer to "PC Cards" at the end of this section.

Network operation

The AP-3 provides wireless access to network infrastructures. As wireless clients move from one coverage cell to another, AP-3 units automatically allow client roaming within the same subnet. Figure 1-1 illustrates a typical configuration.

Figure 1-1   Standalone wireless network access infrastructure
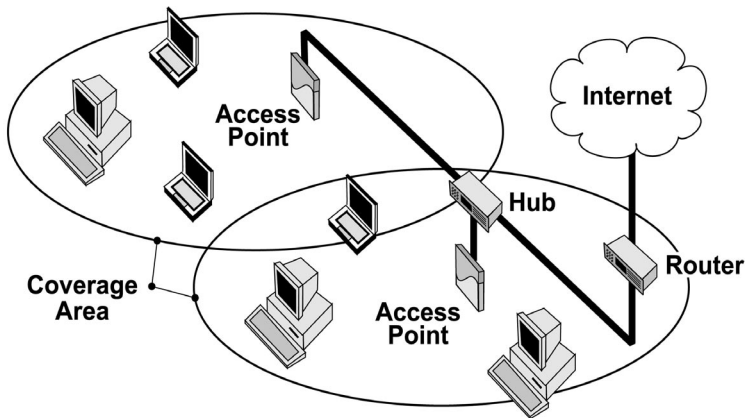
Setup overview

The AP-3 must first be initialized, and then configured for your network. The Network Administrator typically provides network values.

Before starting, review the contents of this manual, especially sections on information you need before performing an operation.

Initialization overview

To initialize the AP-3, you set a unique IP Address using a DHCP Server or the *Scan Tool* utility. After setting the IP Address, configure the unit using the HTTP Interface or the CLI.

When using DHCP, network administrators typically reserve an IP Address for each unit based on its MAC Address. Each time the unit reboots, the DHCP Server assigns the same IP Address. This method helps track network devices and facilitates AP-3 configuration.

AP-3 also accepts a dynamic IP Address from a DHCP Server. If this is the case, you must identify the IP Address before configuration. To identify the IP Address, view the client IP Pool Table in your DHCP Server, or use the *Scan Tool* utility.

To initialize network parameters using *Scan Tool*, refer to "Initialization".

To initialize and manage network parameters over LAN or serial port using the CLI, refer to the "Command Line Interface Reference Manual".

Configuration overview

To configure the AP-3 you set specific network, wireless interface, and bridge parameters. The HTTP (web browser) Interface provides easy configuration and management. "Configuration" covers each configuration category.

Wireless clients use Client Manager software for network access. Once connected, users may roam from one coverage cell to another while maintaining connection. The AP-3 is easily accessible for configuration and management using the interfaces described hereafter.

User interfaces

HTTP (web browser) Interface

The HTTP Interface provides easy graphical access to configuration settings and network statistics. Use the HTTP Interface through your LAN (switch, hub, etc.) through the Internet, or with a "crossover" Ethernet cable connected directly to your computer's Ethernet Port.

⇒ NOTE:
The HTTP Interface is not backwards compatible with Access Point II hardware. To manage AP-II devices, use the AP Manager software.

Logging In to the HTTP Interface

1. Open your browser and enter the IP Address of your AP-3.
2. Press **ENTER** to connect. Result: The *Login* screen appears, similar to the following example.

Figure 1-2 Login screen

> **NOTE:**
> Leave the **User Name** field empty.

3. Enter **public** in the **Password** field. Result: The HTTP Interface *System Status* screen appears.

Figure 1-3   AP-3 System Status screen

HTTP Interface features

Operation buttons

Status	View system status screens.
Configure	Configure the AP-3.
Monitor	Monitor network values.
Commands	Perform system commands.

The Help, Refresh, and Back buttons

Click the **Help** button to access on-line AP-3 information.

Click the **Refresh** Button to update your display.

Click the **Back** button to return to the previous page.

Command Line Interface

The Command Line Interface (CLI) represents a set of keyboard commands and parameters used for configuring and managing the AP-3.

Users enter Command Statements, composed of CLI Commands and their associated parameters. Statements may be issued from the keyboard for real time control, or from scripts that automate configuration.

For example, when downloading a file, administrators enter the **download** CLI Command along with IP Address, file name, and file type parameters.

■ If necessary, use the CLI with your computer serial port to initialize the proper IP address for your network. For more information about initializing your unit, please refer to "Initialization".

■ The CLI provides configuration and management access for most generic Telnet and Terminal clients. Use the CLI through your computer serial port, over your LAN, through the Internet, or with a "crossover" Ethernet cable connected directly to your computer.

The "Command Line Interface Reference Manual", contained on the installation CD-ROM provides more information about using the CLI.

Initialization

2

Overview

When shipped from the factory, the AP-3 contains "boot loader" and "image" software. The boot loader initializes the AP-3 on power-up, and the executable image (AP Image) is the real-time AP-3 software.

Since each network configuration is different, your AP-3 must be initialized with the proper IP Address. After assigning an IP Address, use the HTTP Interface or the CLI to configure the AP-3. Refer to "Configuration" for more information.

You can assign the IP Address using one of the following options:

- Assign IP Address using DHCP
- Assign IP Address using the Scan Tool

Assign IP Address using DHCP

When using DHCP, network administrators typically reserve an IP Address for each AP-3 based on its MAC Address. Each time a unit reboots, the DHCP Server assigns the same IP Address. This method helps track network devices and facilitates unit configuration.

The AP-3 also accepts a dynamic IP Address from a DHCP Server Pool. If this is the case, you must identify the AP-3 IP Address before configuration. To identify the IP Address, view the client IP Pool Table in your DHCP Server, or use the **Scan Tool** utility to locate all AP-3 units, regardless of their state. You may then change certain network parameters.

Assign IP Address using the Scan Tool

Use Scan Tool to initialize units and download image files for any unit connected to the LAN subnet. You can set the IP Address, IP Address Type (Static or Dynamic), and other values. The **Scan Tool.exe** application is included on the installation CD-ROM.

⇒ NOTE:

Scan Tool is very useful because units can be installed without prior bench initialization. To track units, you must record the MAC Address and physical location of each unit during installation. Since Scan Tool identifies each unit by its MAC Address, you can install multiple units simultaneously and initialize them from Scan Tool.

When sent from the factory, the AP-3 is set for DHCP operation. If using DHCP, the unit requests an IP Address from the DHCP server when rebooted or powered up. Since the IP Address could come from a large DHCP address pool, it may be difficult to identify the IP Address assigned to the unit.

Use the following procedure to open Scan Tool and set AP-3 network parameters. You should have the AP-3 unit(s) and your computer connected to the same LAN subnet.

1. Install the AP-3 hardware and connect the unit(s) to the LAN.
2. Power up, reboot, or reset the AP-3. Result: If set for DHCP, the unit requests an IP Address from the network DHCP server.
3. Open Scan Tool. Result: Scan Tool scans the subnet and locates all AP-3 units. The Scan Tool *Main* screen appears, similar to the example below, that shows a single unit in the factory default state
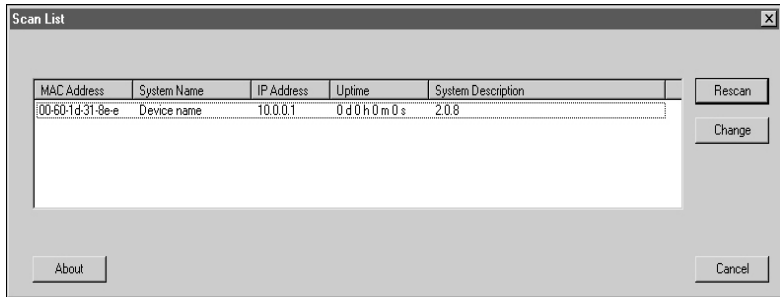
To re-scan the network and update the display after changing values, click the **Rescan** button.

To change values or download an AP Image, select the desired unit, and then click the **Change** button. Result: the Scan Tool *Change* screen appears, similar to the following example. Our example shows a unit with factory default settings.

You may perform the following operations. Note that certain options are available only when selecting Static IP Address mode.

— **MAC Address**. This read-only field displays the MAC Address of the selected unit.

— **Name**. Enter the System Name of the unit. This is typically descriptive text, such as "Main Lobby".

— **IP Address Type**. Select **Static** if you wish to enter the IP values manually. Select **DHCP** to force the unit to request and IP Address from a DHCP server each time it is powered up or rebooted.

— **IP Address**. If you selected **Static**, then enter the IP Address.

— **Subnet Mask**. If you selected **Static**, then enter the Subnet Mask.

— **Gateway IP Address**. If you selected **Static**, then enter the IP Address of the Gateway.

— **TFTP Server IP Address**. If you wish to download a new AP Image file, then enter the IP Address of the TFTP server.

— **Image File Name**. If you wish to download a new AP Image file, then enter the full directory path and file name. If the file is located in the default TFTP directory, you need enter only the file name.

— **Read/Write Password**. Enter the read/write password. The default password is "public".

To reboot the unit to make the changes effective, verify the entered values and then click the **OK** button. Result: The unit will reboot and the new values will be in effect.

To cancel the operation and return to the Scan Tool *Main* screen, click the **Cancel** button.

Reboot the AP-3

You may reboot the AP-3 from the HTTP Interface. Rebooting saves configuration information to FLASH memory before the unit is restarted and is therefore preferable to resetting the hardware. Remember that the LAN interfaces are disconnected when the AP-3 reboots.

To reboot from the HTTP Interface, click the **Commands** operation button, and then click the **Reboot** tab. Result: The *Reboot* screen appears, allowing you to enter the number of seconds until reboot. To reboot immediately, enter 0 (zero) seconds.

⇒ NOTE:

To reset the AP-3 hardware, use a pencil or similar pointed object to press and release the **RESET** button, located on the indicator side of the unit.

Installation

3

Installation

This information completes the AP-3 Quick Start Flyer packaged with the kit.

- Installation overview
- Hardware kit contents
- PC Cards
- Record your product information
- Mounting Guidelines
- Power up the AP-3

Installation overview

Install the hardware according to the Quick Start Flyer. The following steps identify the basic process for installation.

1. Verify kit contents, and record AP-3 information.
2. Assemble the mounting plate, power supply, and processor module.
3. Insert the PC Card(s) and connect the network interfaces.
4. Mount the cover plate.
5. Insert the CD-ROM and follow the initialization instructions.

Hardware kit contents

Your AP-3 kit includes the following components, similar to those depicted in Figure 3-1. (Serial Port Adapter and hardware bag not depicted.)

1. Mounting plate and hardware to mount the AP-3 unit.
2. a. Power supply (not included with Active Ethernet units).

   b. AC power Cord (not included with Active Ethernet units).
3. Active Ethernet Splitter.
4. Processor Module.
5. AP-3 cover.
6. Installation CD-ROM.

Figure 3-1   AP-3 Kit contents
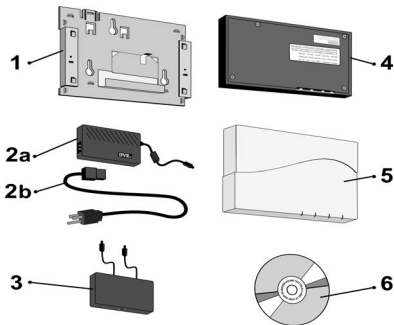
PC Cards

To operate an AP-3, you will need at least one standard Avaya Wireless PC Card. PC Cards are not included with your kit and must be ordered as separate items.

The standard Avaya Wireless PC Card is a wireless network card with integrated radio modules and antennas (2.4 GHz). The card complies with the IEEE 802.11b and Wi-Fi ™ standards on wireless LANs.

Unpack the PC Card(s) and verify that all items are present as described in the user's guide that came with your PC Card kit.

Record your product information

Before you proceed with your AP-3 placement and installation:

1. Copy the Site Information Form from "Documenting Your Configuration" and write down the information on the form.
2. Keep the form available for future use. For example, to identify a specific unit when configuring it, or to provide details to Avaya Wireless Technical Support.
3. You may need the MAC Address of the AP-3 for configuration. Locate and record the serial number and MAC address, printed on a small label (depicted in Figure 3-2) at the top right side of the processor module.

Figure 3-2   Identification Label

```
P/N 011151 C
Comcode 848312096
Eth. MAC Add. 00601D03D52B
S/N 99UT03201039 T/N 91103415
```

Mounting Guidelines

⇒ **NOTE:**

> The unit is not designed for ceiling mounting.

Mount the AP-3 on a vertical surface (such as a wall), or place the unit on a flat surface (such as a table or cabinet).

Before you mount the AP-3 to a fixed location, consider performing a site survey to determine optimal placement for your unit(s).

Observe these requirements when mounting the unit:

- If not using Active Ethernet, connect the unit to a grounding type AC wall outlet (100-240 VAC), using the standard power cord supplied with the unit.
- Placement must allow for easy access to disconnect the unit from the AC wall outlet if necessary.

- Do not cover the unit or block the airflow to the unit with any other objects.
- Keep the unit away from excessive heat and humidity and keep the unit free from vibration and dust.
- Installation must at all times conform to local regulations.
- Customer provided Cat 5 Ethernet cable shall be Plenum rated if the unit is installed above a false ceiling, and the cable must never exit the building.

⚠ WARNING:

If you want to connect the AP-3 to an outdoor antenna system, consult the documentation that came with the outdoor antenna kit for additional regulatory information, safety instructions, and installation requirements.

Indoor antenna placement

The integrated antenna of your PC Card performs best in an open environment with as few obstructions as possible. To ensure the best performance:

- Place the AP-3 as high and as centrally as possible relative to nearby wireless clients.
- When using two PC Cards, one PC Card should have an external antenna that is placed at least 2 meters away from the AP-3 to reduce the effects of normal radio interference.
- Do not conceal the external antenna.

Outdoor antenna placement

The AP-3 device has been designed for indoor placement. You can connect the device to an outdoor antenna installation using an optional antenna kit. Refer to the antenna installation guide for instructions on selecting the proper antenna.

Power up the AP-3

The AP-3 power supply accepts any input AC voltage in the range of 100-240 VAC.

⚠️ **WARNING:**

For your own safety, use only the power cord supplied with the unit. Insert it in a grounded AC outlet. When using the unit in combination with outdoor antennas, the grounding of the AC outlet must be connected to the safety grounding system of the outdoor antenna system and the lightning arrestor.

When using Active Ethernet, which supplies power over the Ethernet cable, the AP-3 is not connected to a local power outlet. For more information about Active Ethernet, contact your reseller.

LED Indicators

When powered on, the AP-3 performs start-up diagnostics and the POWER LED flashes green to indicate a successful hardware test, or glows red if the test is unsuccessful. When start-up has finished, the indicators show status. The following table shows status when the AP-3 is fully configured and running properly.

Table 3-1   Normal LED Indications

POWER	ETHERNET	PC CARD A	PC CARD B
Green	Green Flash with data activity	Green Flash with data activity, or Off if no card present	Green Flash with data activity, or Off if no card present

Configuration

4

Overview

Configuration Overview

Since each network is unique, the AP-3 must be configured to operate in your network environment.

Most administrators use the HTTP Interface (web browser) for configuration; however, the Command Line Interface (CLI) provides the same functionality by entering CLI Commands or scripts from Terminal and Telnet sessions. For information about using CLI, please refer to the "Command Line Interface Reference Manual", included on the installation CD-ROM.

In some cases, you need to make configuration choices (for example, which radio channel to use). This guide explains each choice. When in doubt, we suggest you accept the default values.

Things to know before AP-3 configuration

Before configuring the AP-3, you need to know certain network information. The following section identifies the information you need, and "Documenting Your Configuration" in this guide provides a form you should use to document your system. Before configuration, you need to know:

- **Network Name** (of your wireless cards). Each wireless interface of your AP-3 must be given a Network Name before users can sign on. This is not the same as the System Name, which applies only to the AP-3 unit. There must be at least one active network, but there can be multiple networks. The network administrator typically provides the Network Name(s).

- **Password**. Each AP-3 requires a read/write password to make changes. The default password is "public".

- **Authentication method**. A primary authentication server may be configured; a backup authentication server is optional. The network administrator typically provides this information.

- **Authentication server "Shared Secret"**. This is a kind of password shared between the AP-3 and the RADIUS authentication server, and is typically provided by the network administrator.

- **Authentication server authentication port**. This is a port number (default is 1812) and is typically provided by the network administrator.

- **Client IP Address Pool allocation scheme**. The AP-3 can automatically provide IP addresses to clients as they sign on. The network administrator typically provides this value.

- ■ **Default Router IP Address**. The network administrator typically provides this IP Address.
- ■ **Primary Domain Name Server (DNS) IP Address**. The network administrator typically provides this IP Address.
- ■ **Gateway IP Address**. The network administrator typically provides this IP Address.
- ■ **Subnet Mask**. The network administrator typically provides this mask.

⟹ **NOTE:**

Client Manager software comes with the PC Cards used in wireless client computers. The current network profile on the wireless client must contain a valid Network Name; in other words, one of the case-sensitive Network Names defined in the AP-3 PC Card "Wireless Interface" properties. For more information, please refer to the PC Card documentation.

Configuration Procedure

Once you have a valid IP Address assigned to your AP-3 and an Ethernet connection, use your web browser to configure the AP-3 through the HTTP Interface.

The following procedure explains how to configure each item.

1. Open your browser and enter the IP Address

2. Press **ENTER**. Result: The AP-3 *Login* screen appears.

Figure 4-1   Login Screen
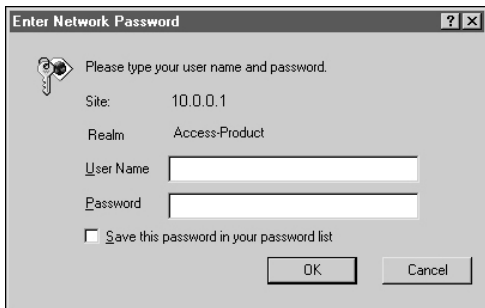
> **NOTE:**
> Leave the **User Name** field empty

3. Enter **public** in the **Password** field. Result: The *System Status* screen appears.

Figure 4-2   System Status Screen

4. Click the **Configure** operation button. Result: The *System Configuration* screen appears. Each tab contains information for specific configuration categories.

Figure 4-3   Configuration Screen

5. You are now ready to configure each AP-3 category, depending on your system. In some cases, you will not need to make any changes. If you are in doubt about any setting, we recommend that you use the default values. The following section covers configuration options for each tab in order, beginning with the **System** tab.

⟹ **NOTE:**

When setting most configuration values, confirmation screens tell you if the information has been successfully modified.

AP-3 Configuration Tabs (categories)

The configuration options of your AP-3 can be divided into two major categories:

■ that cover the options that will apply to most users.

■ <u>Advanced Configuration Tabs</u> that you may wish to explore to customize your AP-3 device once it is up and running.

This chapter will describe the Basic tabs. For information about the Advanced tabs, please consult <u>Advanced Features (page 6-51)</u>.

Table 4-1 Basic Configuration Tabs

■ <u>System Configuration Tab (page 4-34)</u>	General system information and inventory management.
■ <u>Network Configuration Tab (page 4-34)</u>	IP and DHCP Server configuration settings and Link Integrity information.
■ <u>Interfaces Configuration Tab (page 4-36)</u>	Set up the Network Name and PC Card properties for each PC Card and the Ethernet configuration.

Configuration Procedure

- <u>Serial Configuration Tab (page 4-37)</u>   Set up communication port parameters for the RS-232 compatible interface.

- <u>HTTP Configuration Tab (page 4-38)</u>   Set up the HTTP Interface and assign a password.

- <u>Security Configuration Tab (page 4-38)</u>   Set MAC Address control, RADIUS Server, and Encryption properties.

Table 4-2   Advanced Configuration Tabs

■ <u>SNMP Configuration Tab (page 6-57)</u>	Set up SNMP parameters, including Trap Host IP and IP Access Table
■ <u>IAPP Configuration Tab (page 6-59)</u>	Set up the Inter-Access Point Protocol (IAPP) so multiple AP-3 devices can accommodate client roaming.
■ <u>Telnet Configuration Tab (page 6-60)</u>	Set up the Telnet Interface to be used with most generic Telnet clients.
■ <u>Bridge Configuration Tab (page 6-64)</u>	Set Protocol and Address filters. Setup Spanning Tree properties.

Setting configuration properties

To set properties for each category, click on the desired tab. Result: The selected configuration screen appears. Each configuration screen allows you to select options, or enter, edit, and delete information.

In some cases, the AP-3 reminds you that it must be rebooted for a change to take effect. In a given session, you can wait to reboot until all changes have been made.

After entering or editing information on configuration screens, click **OK** to save changes, or click **Cancel** to restore previous settings.

To see the latest information, "Refresh" your browser after making changes. For example, after modifying IP Pool Tables from the DHCP Server settings, the browser must be refreshed to show the results. Remember that some changes won't actually take effect until the unit reboots.

⇒ NOTE:
For default values or range of valid values, please consult the parameter tables listed in the "Command Line Interface Reference Manual".

Basic Configuration Tabs

System Configuration Tab

This screen displays low level (read-only) information useful to network engineers and managers, and allows you to enter the information described below.

— **Name**. Enter the System Name of the AP-3. This is not the same as the Network Name, which is assigned to each PC Card.

— **Location**. Enter text describing the location of your unit; for example "Main Lobby".

— **Contact Name**, **Contact Email**, and **Contact Phone**. Enter text identifying the responsible network administrator or other point of contact.

The Inventory Management table displays pertinent information about your hardware and software configuration, such as serial numbers and firmware versions of the software loaded on your AP-3.

The Component ID information is used to identify software and hardware compatibility issues by technical support engineers.

Network Configuration Tab

Use this tab to set network related values according to the information described on the pages listed below:

■ IP Configuration Tab (page 4-35)

Network administrators typically provide IP configuration information.

IP Configuration Tab

— **IP Address Assignment Type**. Select **Static** to assign a fixed IP Address, or select **Dynamic** for use with a DHCP Server.

➡ **NOTE:**

To set a static IP Address using this screen, first select **Static** as the IP Address Assignment Type, and then click **OK**. Wait for the acknowledgement message before setting the IP Address. If the IP Address assignment is not first modified, the IP Address information will be lost.

— **IP Address**. If you select **Static** under IP Address Type, enter the specific IP Address for the AP-3.

— **Subnet Mask**. If you select **Static** under IP Address Type, enter the Subnet Mask for the AP-3.

— **Default Router IP Address**. If you select **Static** under IP Address Type, enter your default Gateway IP Address.

— **Default TTL**. Enter an integer specifying the Time To Live value.

35

Interfaces Configuration Tab

Use this category to set up the network interfaces of the AP-3 according to the information described on the pages listed below:

- Wireless Slot A and B Tabs (page 4-36)
- Ethernet Tab (page 6-56).

Wireless Slot A and B Tabs

The following description is the same for the tabs that relate to PC Card Slot A and B of your AP-3 equipped with a Avaya Wireless PC Card.

— **MAC Address**. A read-only field listing the MAC Address of the PC Card.

— **Network Name**. Enter a Network Name for each PC Card. This is the same name used on client machines to connect using Client Manager.

— **Frequency Channel**. Select the desired card frequency. Ensure nearby devices do not use the same frequency.

— **RTS/CTS Medium Reservation**. This value affects message flow control, and should not be changed under normal circumstances.

— **Interference Robustness**. Enable this option if other electrical devices may be interfering with the wireless signal.

— **DTIM Period**. Deferred Traffic Indicator Map (DTIM) is used with clients that use power management. DTIM should be left at the default value.

— **Closed System**. Set **Enable** to allow only clients configured with your specific Network Names to access the AP-3. When set to **Disable**, a client configured with the Network Name "ANY" will be able to connect with the AP-3.

— **Distance Between APs**. Set to **Large**, **Medium**, or **Small**, depending on the site survey for your system. The "Specifications" section of this guide provides guidelines for evaluating this value. The distance value is related to the **Multicast Rate** (described next). In general, larger systems operate at a slower average rate.

— **Multicast Rate**. Set the rate at which Multicast messages may be sent. This value is related to the **Distance Between APs** parameter (described previously).

See also:

Serial Configuration Tab

Use this tab to set up the AP-3 serial communications port.

— **Baud Rate**. Select the serial port speed (bits per second). The default Baud Rate is **9600**.

— **Data Bits**. A read-only field indicating 8-bit data transfers.

— **Parity**. A read-only field indicating the parity setting.

— **Stop Bits**. A read-only field indicating a single stop bit.

— **Flow Control**. Select either **None** (default) or **Xon/Xoff** (software controlled) data flow control.

⚠️ **CAUTION:**

To avoid unexpected performance of your AP-3, leave the setting Flow Control to its default value (none) unless you are sure what this setting should be.

HTTP Configuration Tab

Use this tab to set up the HTTP Interface.

— **Status**. Select **Enable** to allow access through the HTTP Interface, or select **Disable** to prevent access through the HTTP Interface.

— **Password, Confirm**. Enter the password in the Password and Confirm fields. When you change the password, the *Login* screen will reappear.

— **Port**. Enter the HTTP Port number.

Security Configuration Tab

Use this tab to customize security settings, according to the information described on the pages listed below:

■ Encryption Security Tab (page 4-38)

■ MAC Authentication Tab (page 6-61)

■ RADIUS Authentication Tab (page 6-62)

Encryption Security Tab

Use this tab to set over-the-air encryption properties for each wireless card. In this procedure, "Slot A" refers to PC Card A, and "Slot B" refers to PC Card B.

— **802.1x Security Mode**. Select **None** to disable 802.1x Security Mode and use only WEP encryption, select **802.1x** to active the 802.1x Security Mode, or select **Mixed (WEP and 802.1x)** encryption.

With 802.1x security mode, an Encryption Key entry is not required, since this mode creates keys dynamically. In Mixed mode, Encryption Keys 2-4 are not required.

Wireless Interface (Slot A and Slot B)

If you are using 802.1x Security Mode, the only parameter you need to set is the Key Length.

— **Encryption Status**. Select **Enable** to use with WEP encryption.
— **Key Length**. Select the encryption key length from the pull down menu. Even if you are using 802.1x only, you must select the Key Length. The available values depend on the card type. The Avaya Wireless PC Card supports both 40-bit and 128-bit encryption.
— **Encryption Key1**. When using WEP only or Mixed modes, enter an alphanumeric key value. Enter 5 characters for 40-bit encryption, and enter 13 characters for 128-bit encryption.
— **Encryption Key2**. Enter the alphanumeric key value. Enter 5 characters for 40-bit encryption, and enter 13 characters for 128-bit encryption.
— **Encryption Key3**. Enter the alphanumeric key value. Enter 5 characters for 40-bit encryption, and enter 13 characters for 128-bit encryption.
— **Encryption Key4**. Enter the alphanumeric key value. Enter 5 characters for 40-bit encryption, and enter 13 characters for 128-bit encryption.
— **Deny Non-encrypted Data**. Select **Enable** to prevent use of non-encrypted data, or select **Disable** to allow non-encrypted data.
— **Encrypt Data Transmissions Using**. For Mixed mode, select **Encryption Key1**.

39

Verifying installation and configuration

Once you have completed the initialization and configuration of your AP-3 device, verify proper operation by connecting to it using a wireless computer running the Client Manager diagnostics tool.

If you encounter problems...

- Cannot Associate with a Network. When the Client Manager starts, it automatically looks for a network. If it cannot associate with a network, you will see a message reminding you to update the case-sensitive Network Name in the current Client Manager Configuration Profile.

⇒ NOTE:

Ask your network administrator for the correct Network Name, and then edit the profile by opening Client Manager. Select **Actions -> Add/Edit Configuration Profile -> Edit Profile -> Basic**. Enter the Network Name and then click **OK**. For more information, please refer to your PC Card documentation.

- If the Network Name is the same in both the client and the AP-3, then verify the settings in the Security Properties table, which includes encryption settings.

- Other Errors. Systematically double-check the AP-3 settings, especially the IP Addresses and the client IP Address Pool.

For more information, please refer to "Troubleshooting" in this guide.

Management

5

Overview

Management Options

Once you have a valid AP-3 IP Address and an Ethernet connection, you may use your web browser to issue commands and monitor network statistics.

The Command Line Interface (CLI) also provides a method for issuing commands and viewing network statistics using Telnet and Terminal clients. This section covers only use of the HTTP Interface. For more information about issuing commands and viewing network statistics with the CLI, refer to the "Command Line Interface Reference Manual".

1. Open your browser and enter the IP Address in the address bar.
2. Press the **ENTER** key. Result: The AP-3 *Login* screen appears.

Figure 5-1   Login Screen

$\Longrightarrow$ **NOTE:**

Leave the **User Name** field empty

3. Enter "public" in the **Password** field. Result: The HTTP Interface *System Status* screen appears.

Figure 5-2   System Status Screen

Each section of the *System Status* screen provides the following information.

— **System Status**. This area provides system level information, including the AP-3 IP Address and contact information.

— **System Traps**. System traps (if any) appear in this area. Each trap identifies a specific severity level.

To delete a single System Trap, click the check box next to the trap, click the **Delete** button.

Use the **Select All** and the **Deselect All** buttons to manage all traps simultaneously.

For more information about System Traps, refer to "Troubleshooting" in this guide.

Monitoring Network Statistics

To observe the AP-3 network statistics, click on the **Monitor** operation button. Result: The *Monitor* screen appears. Each tab contains information for specific network aspects.

Figure 5-3   Monitor Screen

Network monitoring categories include:

— **Wireless**. This tab identifies network frame and fragment statistics for both Slot A (PC Card A) and Slot B (PC Card B).

— **ICMP**. This tab provides message related information for both received and transmitted messages directed to the AP-3 (does not count all network traffic).

— **IAPP**. This tab displays statistics relating to client handovers and communications between Access Points.

— **RADIUS**. This tab provides RADIUS authentication information. RADIUS authentication must be enabled for this information to be valid. To enable RADIUS authentication, please refer to "Configuration" of this guide.

— **Remote Link Test**. This tab displays information on the quality of the wireless link to clients and other AP-3 units in the wireless distribution system. To find wireless clients connected to the AP-3, click **Explore**, then the **Refresh** button. To test the link quality, select a station, and then click **Link Test**. Quality is measured in terms of Signal strength, Noise strength, and the Signal to Noise Ratio (SNR).

— **Interfaces**. This tab displays information for the Ethernet interface, as well as each PC Card interface.

— **IP ARP Table**. This tab provides information based on the Address Resolution Protocol (ARP), which relates MAC Address and IP Addresses.

— **Learn Table**. This tab displays information relating to network bridging, specifically, the MAC Address and interface number.

Issuing System Commands

To issue commands, click on the **Commands** operation button. Result: The *Commands* screen appears. Each tab allows a specific operation.

Figure 5-4   Commands Screen

Download

Use the **Download** tab to download Configuration, AP Image, and Bootloader files to the AP-3. A TFTP server must be running and configured to point to the directory containing the file.

If you don't have a TFTP server installed on your system, install the TFTP server from the CD. Select the "Xtras/SolarWinds" sub-directory, double-click "OEM-TFTP-Server.exe", and follow the directions given to complete the installation.

The **Download** tab shows version information and allows you to enter TFTP information as described below.

— **Server IP Address**. Enter the TFTP server IP Address.
Double-click on the TFTP server icon on your desktop and locate the IP address assigned to the TFTP server. Note: This is the IP address that will be used to point the Access Point to the AP Image file.

— **File Name**. Enter the name of the file to be downloaded.
Copy the updated AP Image file to the shared TFTP server folder. The default AP Image is located at C:/Program Files/Avaya_Wireless/AP/.

— **File Type**. Select the proper file type. Choices include:

— **Config** for configuration information, such as System Name, Contact Name, and so on.

— **Img** for the AP Image (executable program).

— **BspBl** for the Bootloader software.

— **File Operation**. Select either **Download**, or **Download & Reboot**. You should reboot the AP-3 after downloading files.

Upload

Use the **Upload** tab to upload Configuration files from the AP-3. The TFTP server must be running, and configured to point to the directory that is to contain the uploaded file. We suggest you assign the file a meaningful name, which may include version or location information.

If you don't have a TFTP server installed on your system, install the TFTP server from the CD. Select the "Xtras/SolarWinds" sub-directory, double-click "OEM-TFTP-Server.exe", and follow the directions given to complete the installation.

— **Server IP Address**. Enter the TFTP server IP Address.
  Double-click on the TFTP server icon on your desktop and locate the IP address assigned to the TFTP server. Note: This is the IP address that will be used to point the Access Point to the AP Image file.
— **File Name**. Enter the name of the file to be uploaded.
  Copy the updated AP Image file to the shared TFTP server folder. The default AP Image is located at C:/Program Files/Avaya/AP/.
— **File Type**. Select **Config**.
— **File Operation**. Select **Upload**.

Reboot

Use the **Reboot** tab to save configuration changes (if any) and reset the AP-3. Entering a value of 0 (zero) seconds causes an immediate reboot.

Note that **Reset**, covered below, does not save configuration changes.

Reset

Use the **Reset** tab to restore the AP-3 to factory default conditions. The AP-3 may also be reset from the **RESET** button on indicator side of the unit. Since this will reset the current AP-3 IP Address, a new IP Address must be assigned. Please refer to "Initialization".

Help

To open **Help**, click the **Help** icon on any display screen.

During initialization, the AP-3 on-line help files are downloaded to the default location: **C:\Program Files\Avaya\AP\Help**.

If you want to place these files on a shared drive, copy the Help Folder to the new location, and then specify the new path in the Help Link box.

Advanced Features

<div style="text-align: right">**6**</div>
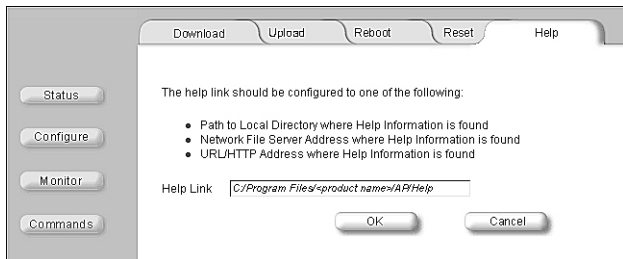
Overview

This section covers the following items of theAP-3 configuration screens.

Advanced Network Configuration Settings

For Basic Network Configuration settings consult

DHCP Server Configuration Tab

Use DHCP configuration to provide dynamic client IP Addresses from one or more IP Pool Tables. Create IP Pool Tables by specifying a Start IP Address and an End IP Address.

— **DHCP Server Status**. Select **Enable** to allow the AP-3 to assign clients IP Addresses from IP Pool Tables. Select **Disable** to prevent client IP Address assignment from the AP-3.

⟹ NOTE:

You must have at least one entry in the DHCP Server client IP Address assignment table before you can enable the DHCP Server Status feature.

— **Subnet Mask**. Read-only value of the AP-3 mask.
— **Default Router IP Address**. Enter the default Gateway IP Address.
— **DNS IP Address**. Enter the Domain Name Server IP Address.
— **Default Lease Time**. Enter the default time value (seconds) for clients to retain the assigned IP Address. DHCP automatically renews IP Addresses without client notification.

— **Maximum Lease Time**. Enter the maximum time value (seconds) for clients to retain the assigned IP Address. DHCP automatically renews IP Addresses without client notification.

IP Pool Table setup

To add an entry, click **Add**, and then specify the start and end IP Address.

— **Start IP Address**. Enter the starting IP Address for this IP Pool Table.
— **End IP Address**. Enter the ending IP Address for this IP Pool Table.
— **Comment**. Enter related information.
— **Status**. Shows enabled/disabled status.

To edit or delete an entry, click **Edit**. Edit the information, or select **Enable**, **Disable**, or **Delete** from the *Status* pull-down menu.

Link Integrity Tab

This feature checks the link between the AP-3 and connected network server(s). If the link goes down, the client will connect to another AP-3 in your network that still communicates with the server.

— **Link Integrity Status**. Select **Enable** to activate the Link Integrity feature.
— **Poll Interval**. Set the interval (in milliseconds) between polls. This value should be greater than 500 ms.
— **Poll Retransmissions**. Set the number of times a poll should be retransmitted before the link is considered down.

IP Address Table setup

To add an Target IP Address entry, click **Add**, and then specify the IP Address of the servers you want to check.

— **Target IP Address**. Enter the IP Address

— **Comments**. Enter related information.

— **Status**. Shows enabled/disabled status. A disabled status only means that the AP-3 is not checking the link, for example, when the network server is being serviced.

To edit or delete an entry, click **Edit**. Edit the information, or select **Enable**, **Disable**, or **Delete** from the *Status* pull-down menu.

Advanced Interface Configuration Settings

For Basic Interface Configuration Settings consult Basic Configuration Tabs (page 4-31).

Wireless Slot A and B Tabs

Wireless Distribution System setup

The Wireless Distribution System allows you to set up a wireless backbone between AP-3 devices. To setup a wireless backbone follow the steps below for each AP-3 that you wish to include in the wireless distribution system:

1. Write down the PC Card slot number (A or B) of the AP-3 device that you wish to setup for the wireless backbone link.
2. Write down the MAC Address of the Avaya Wireless PC Card inside that slot (this value is printed on a label on the back of the PC Card.
3. In the HTTP Configuration window, select the **Wireless Slot** tab that matches the slot value you registered in Step 1 above.
4. Enter the MAC Address that you registered in Step 2 in the **Partner MAC Address** field of the Wireless Distribution Setup window.
5. Set the **Status** for each device to enabled or disabled.

To edit or delete an entry, click **Edit**. Edit the information, or select **Enable** or **Disable** from the *Status* pull-down menu.

Ethernet Tab

Use the Ethernet category to set Ethernet speed and transmission mode.

— **MAC Address**. A read-only field showing the AP-3 MAC Address.
— **Configuration**. Select the desired speed and transmission mode from the pull down menu. The recommended setting is **auto-speed-auto-duplex**.

SNMP Configuration Tab

Use the Simple Network Management Protocol (SNMP) tab to set passwords, specify IP Access entries, and set Trap Host IP Addresses.

You should select new passwords during initial configuration.

— **Read Password, Confirm**. Enter the SNMP password in both the **Read Password** field and the **Confirm** field. The default password is "public".

— **Read/Write Password, Confirm**. Enter the password in both the **Read Password** field and the **Confirm** field. The default password is "public".

— **Configuration Trap Status**. Select **Enable** or **Disable** to control this trap group.

— **Security Trap Status**. Select **Enable** or **Disable** to control this trap group.

— **Wireless Trap Interface Status**. Select **Enable** or **Disable** to control this trap group.

— **Operational Trap Interface Status**. Select **Enable** or **Disable** to control this trap group.

— **Flash Memory Trap Status**. Select **Enable** or **Disable** to control this trap group.

— **TFTP Trap Status**. Select **Enable** or **Disable** to control this trap group.

— **Image Trap Status**. Select **Enable** or **Disable** to control this trap group.

IP Access Table

Entries in this table show which stations are allowed to use SNMP, HTTP, and Telnet management interfaces. To add an entry, click **Add**, and then specify the IP Address and Subnet Mask of the station you want.

— **IP Address**. Enter the IP Address for the device.
— **Subnet Mask**. Enter the Subnet Mask. The Subnet Mask acts as a filter to limit access to a range of IP Addresses.
— **Interface**. Specify the Interface value from the pull down menu.
— **Comment**. Enter related information.

To edit or delete an entry, click **Edit**. Edit the information, or select **Enable, Disable**, or **Delete** from the *Status* pull-down menu.

Trap Host Table

To add an entry and enable the AP-3 to send SNMP trap messages to a Trap Host, click **Add**, and then specify the IP Address and Password for the Trap Host.

— **IP Address**. Enter the Trap Host IP Address.
— **Password, Confirm**. Enter the password in the **Password** field and the **Confirm** field.
— **Comment**. Enter related information.

To edit or delete an entry, click **Edit**. Edit the information, or select **Enable, Disable**, or **Delete** from the *Status* pull-down menu.

IAPP Configuration Tab

Use the Inter Access Point Protocol (IAPP) tab to set values for AP-3 polling and client handover. We recommend leaving these settings at the default values.

— **Status**. Select **Enable** or **Disable** to control IAPP operation.
— **Periodic Announce Interval (seconds)**. Set the announcement interval.
— **Announce Response Time**. This read-only value indicates allowed response time.
— **Handover Timeout (milliseconds)**. Select the value at which the handover will time out.
— **Handover Retransmissions**. Select the number of times a handover may be retransmitted.

Telnet Configuration Tab

Use this tab to set the number of Telnet sessions, password, and other values.

— **Telnet Sessions**. Select the maximum number of concurrent Telnet and HTTP sessions allowed. Setting a value of 0 (zero) disables only the Telnet management access. Reboot the AP-3 for this setting to take effect.

— **Port Number**. The Telnet Port number. The default port number is 23.

— **Password, Confirm**. Enter the password in the Password and Confirm fields. The default password is "public".

— **Login Timeout**. Enter the number of seconds to wait for a login after connection. The AP-3 closes the connection when it times out.

— **Session Idle Timeout**. Enter the number of seconds to wait while there is no activity. The AP-3 closes the connection when it times out.

Advanced Security Settings

To enhance wireless security, you may wish to create a list of authorized wireless computers that may access the wireless network.

Authorized stations will be identified by the unique MAC Address of their wireless interface.

To perform this type of authentication, you can use either one of the following options:

- MAC Authentication Tab
- RADIUS Authentication Tab

MAC Authentication Tab

The MAC Authentication tab allows you to build a list of authorized stations that will be stored inside each AP-3 within your network.

— **MAC Access Control Status**. Select **Enable** to allow MAC Address authentication, or select **Disable** to turn off the MAC Address authentication feature.

— **MAC Access Control Operation**. Select **Allow** to permit access by only the devices specified in the MAC Access Control Table. In contrast, select **Deny** to prevent access by devices listed in the MAC Access Control Table. This only takes effect when the MAC Access Control Status is enabled.

> ⇒ **NOTE:**
> For larger networks that include multiple AP-3 devices, you may
> prefer to maintain this list on a centralized location using a <u>RADIUS
> Server</u>.

MAC Access Control Table

To add an entry, click **Add**, and then specify the MAC Address and related
comment.

— **MAC Address**. Enter the MAC Address of the device.

— **Comment**. Enter related information.

To edit or delete an entry, click **Edit**. Edit the information, or select **Enable,
Disable**, or **Delete** from the *Status* pull-down menu.

RADIUS Authentication Tab

If your network includes a RADIUS Server, you can use this tab to define the
IP Address of the server that contains a central list of MAC Address values
that identify the authorized stations that may access the wireless network.

You must specify information for at least the Primary RADIUS server. The
Backup RADIUS server is optional.

> ⇒ **NOTE:**
> Problems with RADIUS Server configuration or RADIUS
> Authentication should be referred to the RADIUS Server developer.

— **RADIUS MAC Access Control Status**. Select **Enable** to provide authentication by the RADIUS server. Select **Disable** to prevent use of the RADIUS server.

— **Authorization Lifetime (seconds)**. Enter the time, in seconds, each client session may be active before being automatically re-authenticated.

— **Shared Secret, Confirm Shared Secret**. Enter the password in both fields. The password for the user on the RADIUS Server must be the same as the Shared Secret.

RADIUS Server

— **Server Status**. Select **Enable** or **Disable** to control the Primary (or Backup) RADIUS server.

— **IP Address**. Enter the IP Address of the RADIUS server. The AP-3 will send the client MAC Address to the RADIUS Server as the "User Name", using the following format: `00601D - 123456`. That is, the first six characters of the MAC Address, then the remaining six characters separated by a dash.

— **Destination Port**. Enter the RADIUS Authentication port. The default value is 1812.

— **Response Time (sec)**. Enter the maximum time, in seconds, to wait for RADIUS to respond with authentication status.

— **Maximum Retransmissions**. Enter the maximum number of times an authentication may be retransmitted.

Bridge Configuration Tab

Use this tab to control and optimize network performance.

Ethernet Protocol Filter

Filter Operation. If set to **Allow**, only the enabled Ethernet Protocols listed in the Filter Table will be active. If set to **Deny**, only the enabled Ethernet Protocols listed in the Filter Table will be inactive.

Ethernet Protocol Filter Table

This table is pre-populated, however, you may add specific protocols.

To add an entry, click **Add**, and then specify the **Protocol Number** and a protocol name in the **Comment** field.

— **Protocol Number**. Enter the protocol number.
— **Protocol Name**. Enter related information, typically the protocol name.
— **Status**. Select **Enable**, **Disable**, or **Delete**.

To edit or delete an entry, click **Edit**. Edit the information, or select **Enable, Disable**, or **Delete** from the *Status* pull-down menu.

Static MAC Address Filter

You can use the Static MAC Address filter to optimize the performance of a wireless (and wired) network. The filter is an advanced Bridge setup parameter

for AP-3 devices. It enables you to deny data traffic between two specific devices via the wireless interface(s) of the AP-3 bridge.

For example, to prevent redundant traffic from being transmitted over the wireless network, you could deny traffic between two particular servers, identified by their MAC Address and their location as perceived by the AP-3 (on the 'wired' or wireless' port of the bridge).

In most situations, however, it will be easier to control redundant traffic via other filtering options, such as Protocol Filtering.

— **Wired MAC Address**. Enter the MAC Address of the device.
— **Wired Mask**. Enter the Wired Mask value.
— **Wireless MAC Address**.Enter the MAC Address of the device.
— **Wireless Mask**. Enter the Wireless Mask value
— **Comment**. Enter related information.

Spanning Tree

An advanced Bridge setup option for complex network topologies that enables you to enhance data traffic efficiency and eliminate the possibility of data loops. With the spanning tree algorithm, all bridges on the LAN exchange special configuration messages that allow them to:

■ Elect a single bridge in connected LAN segments to be the root bridge.
■ Calculate the distance of the shortest path to the Root Bridge.
■ Elect a 'Designated Bridge' in each LAN segment to forward packets.
■ between that LAN segment and the Root Bridge.
■ Select a 'Root Port' among all ports of the bridge unit.

The spanning tree algorithm enables bridges to calculate a loop-free subset of the LAN topology that provides the most efficient level of connectivity between every pair of physically connected Local Area Network segments.

If the 'shortest data path' fails, (for example as a result of a physical breakdown), the Spanning Tree will automatically rebuild the topology within the confines of the available bridged LAN components. These settings should be left at the default values.

— **Spanning Tree Status**. Select **Enable** to allow Spanning Tree operations, or select **Disable** to prevent Spanning tree operations. Default is **Enable**.

— **Bridge Priority**. Enter the Bridge Priority value. Default is **0**. The bridge units must determine which unit is the root bridge amongst themselves.

— **Max Age**. Enter the maximum age allowed. Default is **2000** seconds.

— **Hello Time**. Enter the Hello Time value. Default is **200** seconds.

— **Forward Delay**. Enter the Forward Delay value. Default is **1500** seconds.

Storm Threshold

An advanced Bridge setup option that you can use to protect the network against data overload by:

■ Specifying a maximum number of frames per second as received from a single network device (identified by its MAC address).

■ Specifying an absolute maximum number of messages per port.

The 'Storm Threshold' parameters allow you to specify a set of thresholds for each port of the AP-3, identifying separate values for the number of broadcast messages/second and Multicast messages/second.

When the number of frames for a port or identified station exceeds the maximum value per second, the AP-3 will ignore all subsequent messages issued by the particular network device, or ignore all messages of that type.

— **Address Threshold**. Enter the maximum allowed number of packets per second.

— **Interface 1 Threshold**. Enter the maximum allowed number of packets per second.

— **Interface 2 Threshold**. Enter the maximum allowed number of packets per second.

— **Interface 3 Threshold**. Enter the maximum allowed number of packets per second.

Advanced Filtering

— **Proxy ARP Status**. Select **Enable** to allow proxy Address Resolution Protocol, or **Disable** to prevent proxy Address Resolution Protocol.

— **IP/ARP Filtering Status**. Select **Enable** to allow filtering, or **Disable** to prevent filtering.

— **IP/ARP Filtering Address**. Enter the IP Address.

— I**P/ARP Subnet Mask**. Enter the Subnet Mask.

The following advanced filtering protocols can filter in the wireless-to-Ethernet direction, the Ethernet-to-wireless direction, or both directions. Use the **Status** field to enable or disable the filter.

■ Deny IPX RIP
■ Deny IPX SAP
■ Deny IPX LSP
■ Deny IPX Broadcast
■ Deny IPX Multicasts

SpectraLink VoIP

SpectraLink is a third part provider of wireless phone sets operating on the 2.4 GHz band. This feature is used allow voice packets to be transmitted over the 802.11 wireless LAN protocol.

— **SpectraLink VoIP Status**. Select **Enable** to allow SpectraLink VoIP operation, or **Disable** to prevent SpectraLink VoIP operation.

Specifications **A**

Overview

This section lists the specifications of the AP-3 and its wireless interface.

-
-
-

Hardware Specifications

Physical specifications

Dimensions (HxWxL) = 5x18.5x26 cm (2x7.25x10.25 in.)

Weight = 1.75 Kg (3.5 lb.)

Electrical specifications

Voltage = 100 to 240 VAC (50-60 Hz), Current = 0.2 Amp

Power Consumption = 20 Watts

Environmental specifications

Operating = 0° to 50°C (32° to 122°F) @ 20 to 90% relative humidity

Transport = -40° to 60°C (-40° to 140°F) @ 15 to 95% relative humidity (no condensation allowed)

Storage = -10° to 60°C (14° to 140°F) @ 10 to 90% relative humidity (no condensation allowed)

Ethernet interface

10/100 Base-T, RJ-45 female socket

PCMCIA interface

PC Card Slot (A & B) = Standard PC Card slot for Avaya Wireless PC Card

Serial port interface

Connector Type = MiniDIN 8-pin female socket (MiniDIN 8-pin to DB-9 adapter included with kit)

Serial Cable = Standard RS-232C serial data cable

Software Specifications

Boot Loader and Power On Self Tests (POST)

AP-3 executable program (AP Image)

CLI compatible with generic Telnet and Terminal clients

Serial port Interface is compatible with most ASCII terminal programs (such as HyperTerminal)

HTTP Interface compatible with web browsers equivalent to Microsoft Internet Explorer 4.0 and Netscape 4.0 and higher.

Radio Specifications

Channel frequencies

The following table shows the channel allocations that vary from country to country. Values listed in bold font indicate default channels and frequencies.

Table A-1   IEEE 802.11b Channel Sets

Channel ID	FCC/World (MHz)	ETSI (MHz)	France (MHz)	Japan (MHz)
1	2412	2412	-	2412
2	2417	2417	-	2417
3 (default - most countries)	**2422**	**2422**	**-**	**2422**
4	2427	2427	-	2427
5	2432	2432	-	2432
6	2437	2437	-	2437
7	2442	2442	-	2442
8	2447	2447	-	2447
9	2452	2452	-	2452
10	2457	2457	2457	2457
11 (default- France)	2462	2462	**2462**	2462
12	-	2467	2467	2467
13	-	2472	2472	2472
14				2484

Wireless Range

The range of the wireless signal is related to the composition of objects in the radio wave path, and the transmit rate of the wireless communication. Communications at a lower transmit range may travel longer distances.

➡ NOTE:

The range values listed in the Communications Range Chart are typical distances as measured at the development laboratories. These values provide a rule of thumb and may vary according to the actual radio conditions at the location where the product is used.

The range of your wireless devices can be affected when the antennas are placed near metal surfaces and solid high-density materials. Ranges for outdoor antenna installations are related to type of outdoor antennas used, and length of antenna cables. Range is also impacted due to "obstacles" in the signal path of the radio that may either absorb or reflect the radio signal.

In Open Office environments, antennas can "see" each other (no physical obstructions between them). In Semi-open Office environments, workspace is divided by shoulder-height, hollow wall elements; antennas are at desktop level. In a Closed Office environment, solid walls and other obstructions may affect signal strength.

The following table shows typical range values for various environments.

Table A-2   Wireless communications ranges

Range	11 Mbs	5.5 Mbs	2 Mbs	1 Mbs
Open Office	160 m (525 ft)	270 m (885 ft)	400 m (1300 ft)	550 m (1750 ft)
Semi-Open Office	50 m (165 ft)	70 m (230 ft)	90 m (300 ft)	115 m (375 ft)
Closed Office	25 m (80 ft)	35 m (115 ft)	40 m (130 ft)	50 m (165 ft)
Receiver Sensitivity	-82 dBm	-87 dBm	-91 dBm	-94 dBm
Delay Spread (at FER of <1%)	65 ns	225 ns	400 ns	500 ns

Documenting Your Configuration

B

Default AP-3 settings

The following table lists the settings defined at the factory for all AP-3 units, and provides a place to enter values for your system.

Item	Default Value	My System Value
System Name	Device name	
IP Address Type	dynamic (DHCP)	
IP Address	10.0.0.1	
Subnet Mask	255.0.0.0	
Gateway IP Address	10.0.0.1	
TFTP Server IP Address	10.0.0.2	
Image File Name	FILENAME	
Read Password	public	
Read/Write Password	public	
CLI Password	public	
Network Name ■ Slot A: ■ Slot B:	 ■ My Wireless Network A ■ My Wireless Network B	
Wireless Cell ID	MAC Address of the IEEE 802.11b PC Card	
Medium Reservation	2473 (Disabled)	
Transmit Rate	Auto Rate Select	

Recording unique settings

Use the following form to record configuration settings specific to your configured AP-3.

General Information

Item	Information
Install Date:	
Project Name:	
Unit Location:	
Network Administrator name:	
Network Administrator phone:	
Network Administrator e-mail:	
Completed by:	
Organization:	

SNMP information

Item	Information
Read Password:	
Read/Write Password:	
Trap Host IP Address (optional):	
Trap Host Password (optional):	

RADIUS information

Item	Information
Authentication Server IP Address:	
Authentication server Destination Port for Authorization:	
RADIUS Shared Secret:	

Troubleshooting

C

Overview

Introduction

This section helps you locate problems related to AP-3 setup. The most common installation problems relate to IP Addressing. For example, without the TFTP server IP Address, you will not be able to download the AP Image to the AP-3.

IP Address management is fundamental. We suggest you create a chart to document and validate the IP addresses for your system.

If the password is lost or forgotten, you will need to reset the AP-3 to default values. The **Reset to Factory Default** procedure resets configuration settings, but does not change the current AP Image. The **Forced Reload** procedure erases the current AP Image if you need to download a new image.

It is useful to set up the serial port and use your terminal emulator to monitor AP-3 activity. Serial port setup is described in "Troubleshooting".

Reset to Factory Default procedure

Use this procedure to reset the network configuration values, including the AP-3 IP Address, Subnet Mask, and so on. The current AP Image is not deleted. This procedure may required if the AP-3 password is forgotten.

1. Press and hold the **RELOAD** button for about 10 seconds. Result: The AP-3 reboots, and the factory default network values are restored.
2. If not using DHCP, use the Scan Tool or normal CLI to set the AP-3 IP Address, Subnet Mask, and so on. Please refer to the "Command Line Interface Reference Manual" for CLI information.

Forced Reload **procedure**

Use this procedure to force the AP-3 back to default network configuration values and download a new AP Image. This procedure may be required when the password is forgotten or the current AP Image is missing or corrupted.

In this procedure, use the Bootloader CLI over the serial port to set the IP Address and download a new AP Image.

1. While the AP Image is running, press the **RESET** button. Result: The AP-3 reboots and the indicators begin to flash.

⇒ **NOTE:**

By completing Step 2, the firmware in the Avaya AP-3 will be erased. A serial cable will be required to reload firmware.

2. Press and hold the **RELOAD** button for about 20 seconds until the **POWER LED** turns amber. Result: The AP-3 deletes the current AP Image and Configuration files. The Bootloader CLI becomes active. The following procedure describes how to use the Bootloader CLI to assign an IP Address and download a new AP Image.

Initialize the AP-3 using the Bootloader CLI

In some cases, specifically when a bad AP Image prevents successful booting, you may need to use the Bootloader CLI to download a new executable AP Image. If you need to force the AP-3 to factory default state, use the "Forced Reload Procedure" above.

To download the AP Image, you will need an Ethernet connection to the computer on which the TFTP server resides. This can be any computer on the LAN, or connected to the AP-3 with a "crossover" Ethernet cable.

You must also connect the AP-3 to a computer with a standard serial cable and use a terminal client, such as HyperTerminal. From the terminal, enter CLI Commands to set the IP Address and download an AP Image.

Preparing to download the AP Image

Before starting, you need to know the AP-3 IP Address, Subnet Mask, the TFTP Server IP Address, and the AP Image file name. Ensure the TFTP sever is running and configured to point to the folder containing the image to be downloaded.

Download procedure

1. Connect the computer serial cable to the AP-3 serial port.
2. Start TFTP Server, and ensure the new AP Image file is in the TFTP directory. In this procedure, TFTP downloads an AP Image to the AP-3.
3. Open your terminal emulator, set the following connection properties, and then connect.

- ■ Com Port: <COM1, COM2, etc., depending on your computer>
- ■ Baud rate: 9600
- ■ Data Bits: 8
- ■ Stop bits: 1
- ■ Flow Control: None
- ■ Parity: None

4. Enable the "ASCII Setup" settings by selecting "Send line ends with line feeds". Result: HyperTerminal sends a line return at the end of each line of code.

5. Press the **RESET** button on the AP-3. Result: The terminal display shows Power On Self Tests (POST) activity. After approximately 30 seconds, a message indicates: **Sending Traps to SNMP manager periodically**. After this message appears, press the **ENTER** key repeatedly until the following prompt appears.

```
[Device name]>
```

6. Enter only the following statements.

```
[Device name]> set ipaddrtype <Access Point IP Address>
[Device name]> set ipsubmask <Subnet Mask>
[Device name]> set ipaddrtype static
[Device name]> set tftpipaddr <TFTP Server IP Address>
[Device name]> set tftpfilename <AP Image File Name>
[Device name]> set ipgw <Gateway IP Address>
[Device name]> reboot 0
```

Example:

```
[Device name] > set ipaddrtype 10.0.0.12
[Device name] > set ipsubmask 255.255.255.0
[Device name] > set ipaddrtype static
[Device name] > set tftpipaddr 10.0.0.20
[Device name] > set tftpfilename MyImage
[Device name] > set ipgw 10.0.0.30
[Device name] > reboot 0
```

Result: The AP-3 will reboot and then download the image file. Observe the **TFTP** display and you should see downloading activity begin after a few seconds. When downloading has stopped, the AP-3 is ready for configuration, providing the AP-3 IP Address is correct.

7. Once the AP-3 image is downloaded and you have a valid AP-3 IP Address, configure the AP-3 as described in "Configuration".

Setting IP Address using serial port and normal CLI

Use the following procedure to set an IP Address over the serial port using the normal CLI. The network administrator typically provides the AP-3 IP Address.

Hardware and software requirements

■   Standard serial data (RS-232) cable with a male DB-9 connector on one end and a female DB-9 connector on the other end.

■   Serial Port Adapter plug to convert DB-9 to Mini-DIN8 (supplied with kit).

■ ASCII Terminal software, such as HyperTerminal.

Attaching the serial port cable

1. Remove power from the AP-3 and your computer.
2. Connect the male end of the serial port cable to the Serial Port Adapter, and then plug the Serial Port Adapter into the Mini-DIN8 connector on the back of the AP-3.
3. Connect the female end of the serial port cable to the computer.
4. Restart the computer and power up the AP-3.

Initializing the IP Address using normal CLI

After installing the serial port cable, you may use the CLI to communicate with the AP-3. You may use most generic terminal programs, such as HyperTerminal. Once the IP Address has been assigned, use the HTTP Interface or the CLI to complete configuration. Many web sites offer shareware or commercial terminal programs you can download.

Use the following procedure to initialize the AP-3 IP Address.

1. Open your terminal emulator, and then set the following connection properties:
   - Com Port: <COM1, COM2, etc., depending on your computer>
   - Baud rate: 9600
   - Data Bits: 8
   - Stop bits: 1
   - Flow Control: None
   - Parity: None

2. Enable the "ASCII Setup" settings by selecting "Send line ends with line feeds". Result: HyperTerminal sends a line return at the end of each line of code.

3. Press the **RESET** button on the AP-3 (located on the LED Indicator side of the unit). Result: The terminal display shows Power On Self Tests (POST) activity, and then displays a CLI prompt, similar to the example below. This process may take up to 90 seconds.

[Device name] > **Please enter password:**

4. Enter the password (default is "public"). Result: The terminal displays a welcome message and then the CLI Prompt:

```
[Device name]>
```

5. Enter **show ip**. Result: Network parameters appear:

```
[Device name]> show ip

     IP Address: 10.0.0.1
     Subnet Mask: 255.0.0.0
     Default Router: 10.0.0.1
     Default TTL: 64
     Address Type: 1
```

6. Change the IP Address and other network values using **set** and **reboot** CLI commands, similar to the example dialog below (use your own IP Address and Subnet Mask). Result: After each entry the CLI reminds you to reboot; however wait to reboot until all commands have been entered.

```
[Device name]> set ipaddrtype static

[Device name]> set ipaddr <IP Address>

[Device name]> set ipsubmask <Subnet Mask>

[Device name]> set ipgw <Default Gateway IP Address>

[Device name]> reboot 0
```

7. After the AP-3 reboots, verify the new IP Address by reconnecting, and then entering a **show ip** CLI statement (as in Step 5). Alternatively, you can use the **ping** network command from networked computers to test the new IP Address.

8. When the proper IP Address is set, use CLI or the HTTP Interface over the LAN to complete configuration and manage operations.

System Traps

Security Traps

oriTrapAuthenticationFailure	Wireless Card (A and/or B) incompatible vendor detected
oriTrapUnauthorizedManagerDetected	Wireless Card (A and/or B) firmware download failure detected

Wireless Interface Card Traps

oriTrapWLCNotPresent	Wireless Card (A and/or B) not present
oriTrapWLCFailure	Wireless Card (A and/or B) general failure
riTrapWLCRemoval	Wireless Card (A and/or B) removal
oriTrapWLCIncompatibleFirmware	Wireless Card (A and/or B) incompatible firmware detected
oriTrapWLCVoltageDiscrepancy	Wireless Card (A and/or B) voltage discrepancy detected
oriTrapWLCIncompatibleVendor	Wireless Card (A and/or B) incompatible vendor detected
oriTrapWLCFirmwareDownloadFailure	Wireless Card (A and/or B) firmware download failure detected

Operational Traps

oriTrapWatchDogTimerExpired	Watch Dog Timer has expired
oriTrapRADIUSServerNotResponding	RADIUS Server is not responding or error communicating with RADIUS Server
oriTrapModuleNotInitialized	Module has not been initialized
oriTrapDeviceRebooting	Device is rebooting
oriTrapTaskSuspended	Task suspension has been detected
oriTrapBootPFailed	BootP failure detected (no response from BootP Server)
oriTrapDHCPFailed	DHCP Client failure detected (no response from DHCP server)

FLASH Memory Traps

oriTrapFlashMemoryEmpty	Flash memory card detected empty
oriTrapFlashMemoryCorrupted	Flash memory data corrupted

TFTP Traps

oriTrapTFTPFailedOperation	FTP (upload or download) failure detected
oriTrapTFTPOperationInitiated	TFTP (upload or download) operation initiated
oriTrapTFTPOperationCompleted	TFTP (upload or download) operation completed

Image Traps

oriTrapZeroSizeImage	Zero size image has been downloaded to device
oriTrapInvalidImage	Invalid image has been downloaded to device
oriTrapImageTooLarge	Image downloaded to device is too big
oriTrapIncompatibleImage	Incompatible image has been downloaded to device

Standard MIB-II (RFC 1213) Traps

coldStart	Device has been cold started
warmStart	Device has been warm started
linkUp	Device Link is up (Ethernet interface is up)
linkDown	Device Link is down (Ethernet interface is down)

Bridge MIB (RFC 1493) Traps

newRoot	New root has been added to Bridge
topologyChange	Network Topology change has been detected

Related applications

RADIUS Authentication server

If the RADIUS authentication server is selected for authentication during configuration, ensure RADIUS is configured and running. Otherwise, clients will not be able to log in. There are several reasons the authentication server services might be unavailable, here are two typical things to check.

■ Ensure you have the proper RADIUS authentication server information setup configured in the AP-3. Check the RADIUS server IP Address authentication Port number (default is 1812), and Shared Secret.

■ Ensure the RADIUS authentication server RAS setup matches the AP-3.

TFTP server

The "Trivial File Transfer Protocol" server allows you to transfer files across a network. You can upload files from the AP-3 for backup or copying, and you can download the files for configuration and AP Image upgrades. The TFTP software is located on the Avaya AP-3 CD-ROM.

If a TFTP server is not configured and running, you will not be able to download and upload images and configuration files to/from the AP-3. Remember that the TFTP server does not have to be local, so long as you have a valid TFTP IP Address. TFTP does not have to be running for AP-3 operations that do not transfer files.

After the TFTP server is installed:

■ Check to see that TFTP is configured to point to the directory containing the AP Image.

■ Ensure you have the proper TFTP server IP Address, the proper AP Image file name, and that the TFTP server is connected.

■ Ensure the TFTP server is configured to both send and receive, with no timeout.

LED indicators

POWER	ETHERNET	PC CARD A	PC CARD B	Indication
Green	Green flash with data activity	Green flash with data activity	Green flash with data activity	Normal Operation
Amber	n/a (not applicable)	Amber	Amber	Rebooting
Amber	n/a	n/a	n/a	Missing or bad AP Image if Amber after reboot
Red	Red	n/a	n/a	Power On Self Test
n/a	n/a	Red	Red	PC Card incompatible on indicated interface
n/a	n/a	Red	Red	PC Card failure on indicated interface
Green	n/a	Amber	Amber	Indicated interface in Administrative State
n/a	n/a	Off	Off	PC Card not present