802AA
User Guide

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Preface

The intent of this document is to familiarize you with the Actiontec Access Point (AP) Reference Design, its physical characteristics, setup, configuration, and usage. AP hardware developers should refer to the *AP Reference Design Functional Specification, AP Hardware Design Guide, AP Reference Design Board Layouts, AP Reference Design Schematics*, and *AP Reference Design Bill of Materials*. AP software developers should refer to the *AP Programmer's Guide*. Both the *AR5110 Data Sheet* and the *AR5210 Data Sheet* will provide valuable AR5000 chipset reference for both hardware and software developers.

After reading this user's guide, you should be able to install, configure, control, and maintain the Actiontec AP Reference Design provided as part of an Actiontec Evaluation or Developer's Kit.

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a. About this Document

This document consists of the following chapters and appendixes:

Chapter 1	Introduction**—Describes the Access Point package contents and system requirements.**
Chapter Error! Reference source not found.	2. Access Point Physical **Description—Provides a physical description of the Access Point.**
Chapter 2	AP Network Attachment and Configuration**—Describes the Access Point network connections and initial software configuration.**
Appendix A	AP Web Server**—Describes the use of the web server to configure the Access Point.**

b. Audience

The intended audience for this user's guide is evaluators and developers of AP products. The reader is assumed to have conceptual and practical knowledge about AP concepts, features, and functions. This guide relies on the reader's familiarity with APs in general, while discussing the specific characteristics of the Actiontec AP Reference Design.

c. Additional Resources

Actiontec Reference Design hardware, software, and documentation contain proprietary information of Actiontec Electronics, Inc., and are provided under a license agreement containing restrictions on use and disclosure, and are also protected by copyright law. Reverse engineering of this hardware, software, or documentation is prohibited.

If you are working with an Actiontec Developers Kit, the following resources should be referenced regarding topics that are not addressed in this document:

1. ***AR5110 Radio-on-a-Chip for 5-GHz Wireless LANs data sheet***
2. ***AR5210 MAC/Baseband Processor for IEEE 802.11a 5-GHz Wireless LAN data sheet***
3. ***AP Reference Design Functional Specification***
4. ***AP Hardware Design Guide***
5. ***AP Reference Design Bill of Materials***
6. ***AP Reference Design Board Layouts***
7. ***AP Reference Design Schematics***
8. ***CLI Quick Reference***
9. ***AP Programmer's Guide***
10. ***STA User's Guide***

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If you are using an Actiontec Evaluation Kit, you may receive a subset of these documents.

d. Regulatory Compliance Information

This section contains Regulatory Compliance Information for the AP.

i. Radio Frequency Interference Requirements

This device is restricted to indoor use due to its operation in the 5.15 to 5.25 GHz frequency range. FCC regulations require this product to be used indoors to reduce the potential for harmful interference.

High power radars are allocated as primary users of the 5.25 to 5.35 GHz and 5.65 to 5.85 GHz bands. These radar stations can cause interference with and/or damage to this device.

ii. FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules., as well as ICES 003 B/ NMB 003 B. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

11. **Reorient or relocate the radio/TV receiving antenna.**
12. **Increase the separation between the equipment and the radio/TV receiver.**
13. **Connect the equipment into an outlet on a circuit different from that which the radio/TV receiver is connected.**
14. **Consult the dealer or an experienced radio/TV technician for help.**

Modifications made to the product, unless expressly approved by Actiontec Electronics, Inc., could void the user's authority to operate the equipment.

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iii. RF Exposure Requirements

While this device is in operation, a separation distance of at least 20 centimeters must be maintained between the radiating antenna and the body of all persons exposed to the transmitter in order to meet the FCC RF exposure guidelines.. Installers and end-users must follow the installation instructions provided in this user guide.

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1. Introduction

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Actiontec AP Reference Design implements an IEEE 802.11a wireless LAN (WLAN) AP or data-oriented Residential Gateway (RG) on a single PCB. This Reference Design is intended to provide high-level information to designers who want to develop a manufacturing-ready product, or architect a new product based on the Actiontec AR5000 802.11a wireless LAN chipset and the Motorola MPC8245 Power PC processor.

Detailed information regarding the Actiontec AR5110 and AR5210, Motorola MPC8245 processor, National Semiconductor DP83185 Ethernet controller, Micron SDRAM, and Intel Flash memory devices can be found in the appropriate vendor datasheets or by contacting the appropriate company.

The Actiontec AP Reference Design hardware together with AP Reference Design software provide an IEEE 802.11a Access Point supporting up to 128 IEEE 802.11a station associations including the AP itself. Rates of 6 to 54 Mbps are supported in standard IEEE 802.11a mode, and 12 to 72 Mbps in Actiontec turbo mode. All transmission rates are supported across the 5.15 to 5.35 GHz spectrum.

e. Package Contents

The Actiontec AP Reference Design is provided in a completely enclosed plastic housing with two antennas (180° swivel motion), a power supply, and a serial cable for use in AP software configuration. The AP Reference Design contains a single 10/100 Ethernet port. Use an RJ-45 cable Ethernet cable (not provided by Actiontec) to connect the AP to a wired Ethernet LAN. Refer to

AP Network Connections in Chapter 3 for information on connecting the AP to your LAN.

f. System Requirements

The AP contains a small boot executive that allows the main operating system software to be downloaded using the Ethernet port over an FTP connection. The Operating system software can also reside in the Flash memory of the AP, which allows booting without the need to download the operating system from the host PC over an FTP connection. A configuration file is created in Flash memory to store user configurable parameters such as WEP keys. A terminal or PC with an Ethernet connection is required to perform the initial Operating system software loading operation, as well as AP configuration. A freeware FTP server ("a-ftp.exe") is included on the Actiontec distribution CD in the \utils directory.

Actiontec Electronics provides an FTP site you can use to evaluate the firmware update capabilities of the AP for test purposes only. By default, Actiontec Electronicswill set to NULL the default address of the FTP connection. Contact Actiontec Electronics for the location of the FTP site containing test firmware.

Use the updateparam **command to enter parameters for your image and FTP site. Refer to the *AP Programmer's Guide* for information on the** updateparam **command.**

WARNING: **You must confirm that your End User License Agreement (EULA) covers upgrades to the firmware. The Reference Design upgrade code permits direct upgrades of the AP from the configuration screen. As a precaution, you should also use the EULA as your FTP startup text in the event some of your users log in manually.**

You can also use the AP Web Server for firmware updates. Refer to Appendix A, Firmware Update Configuration Windows for information on the web server.

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2. Access Point Physical Description

This section provides an overview of the physical characteristics of the Actiontec Reference Design Access Point (AP).

G. Top Panel

The top panel of the AP provides 3 LEDs for status indication, and a pair of side-mounted antennas that rotate 180° for alternative reception positioning and compact packaging.

WARNING: **To ensure compliance with FCC FR exposure requirements, position the AP so that its antenna is separated by at least 20 centimeters (cm) from all persons.**

Refer to Table 1-1 for a description of the functionality of each LED.

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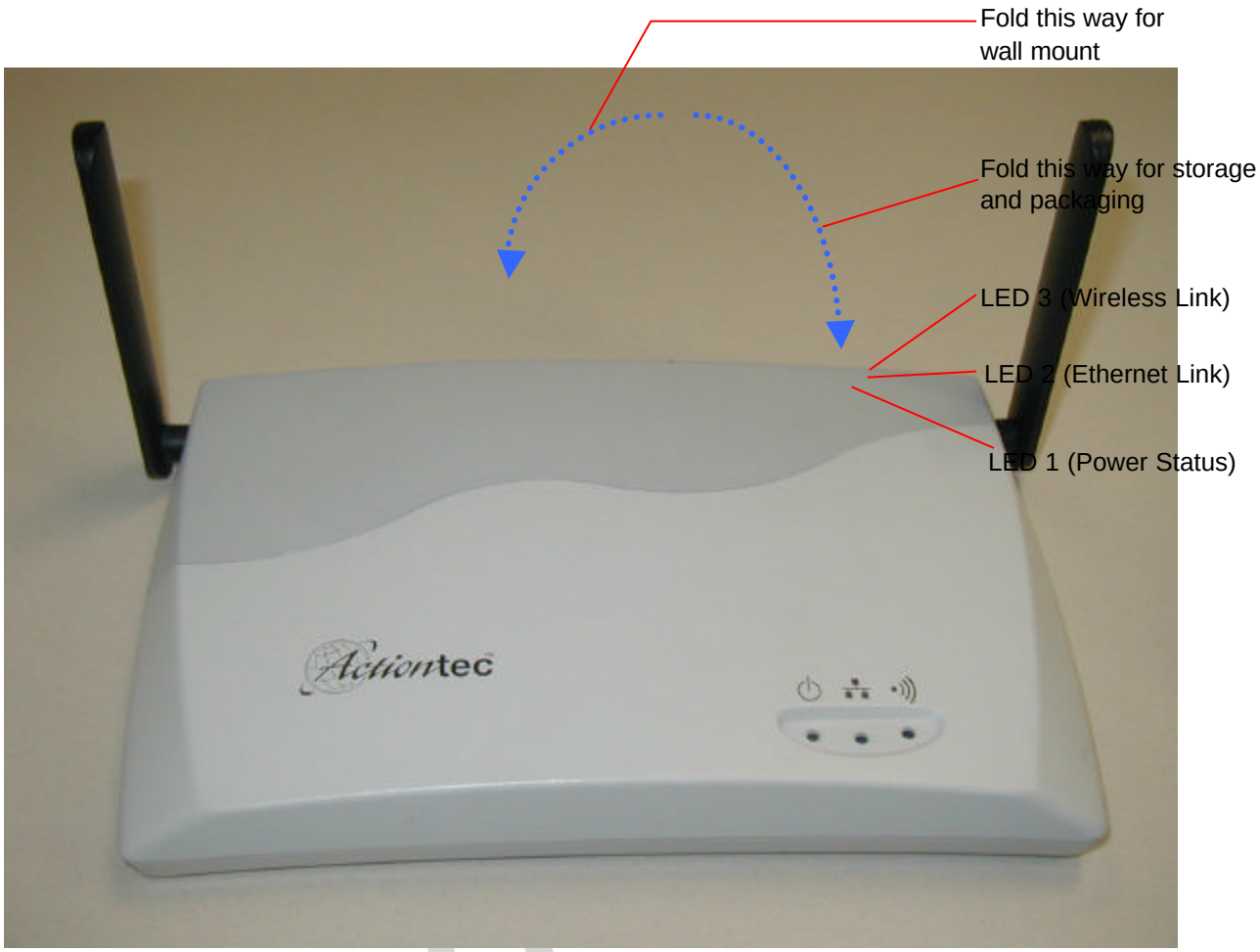

Figure 1-1. Access Point Top Panel

Table 1-1. LED Functionality

LED 1	Description
Off	No Power
On	Power On and Ready for Operation
Blink	Power On but Not Ready for Operation—at initial power on or reset, this indicates self-test or software loading; at other times, this indicates a system fault
LED 2	**Description**
Off	No Ethernet Link Detected
Green On	100 Mbps Link Detected but No Activity
Green Blink	100 Mbps Link Activity—blink rate is proportional to activity
Amber On	10 Mbps Link Detected but No Activity
Amber Blink	10 Mbps Link Activity—blink rate is proportional to activity
LED 3	**Description**
Off	Wireless Link Disabled

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LED 1	Description
Very Slow Blink	Looking for Network Association
Slow Blink	Associated with Network but No Activity
Fast Blink	Associated with Network—blink rate is proportional to activity

H. Rear Panel

The rear panel of the AP (see Fig ref) provides an RS-232 serial interface, an RJ–45 Ethernet jack, a reset button, and a power supply connector (see Figure 1-2). Table 1-2 describes each connection and its function.

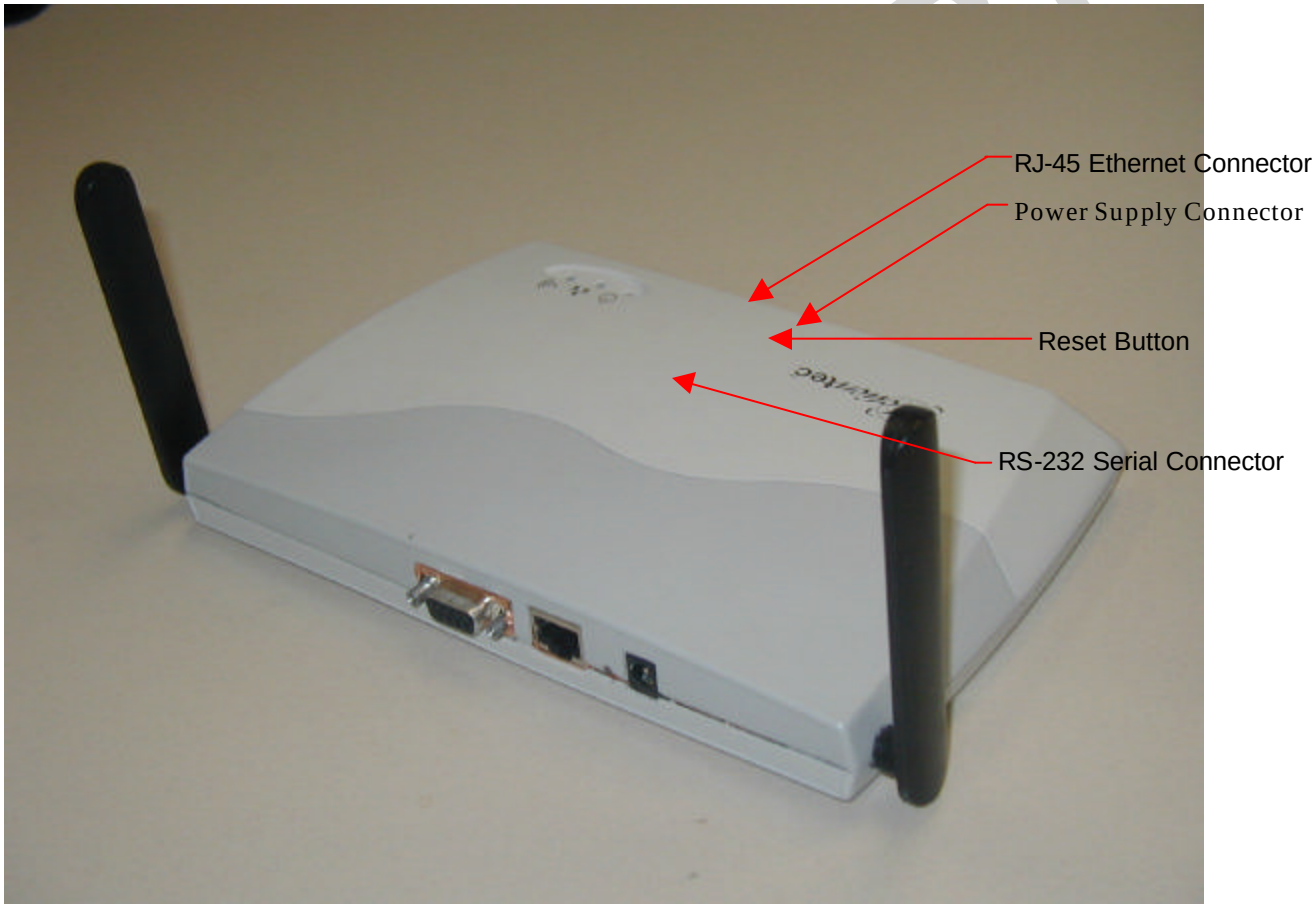

Figure 1-2. Access Point Rear View

Table 1-2. Rear Panel Descriptions

Item	Description
RS-232 Serial	Provides configuration of the AP through a terminal or PC (serial cable

Item	Description
Interface connector	provided), and external connectivity to devices such as analog modems. Selectable serial interface speeds up to 115 Kbps (default is 9600 baud, 8 data bits, one stop bit, and no parity).
RJ-45 Ethernet connector	Provides 10/100 Mbps connectivity to a wired Ethernet LAN.
Reset button	Manual push-button to reset processor, memory, and PCI devices.
Power Supply connector	Connection for the provided 3.3 V power supply.

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AP Network Attachment and Configuration

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This section provides procedures for connecting and configuring the AP to a Host PC (HPC). Configuration can be performed either from a web browser accessing the built-in web server, or by entering command through the serial port command line interface (CLI). For detailed information on using the web server, refer to AP Web Server in Appendix A. For detailed information on using CLI

AP Network Connections

Connect your HPC to the AP using one of the following two methods:

Use an Ethernet crossover cable (not supplied) to connect directly to the Ethernet port of the HPC.

15. Use standard Ethernet cables (not supplied) to connect through a hub or Ethernet switch. Follow these steps to establish the network connections:

17. Attach the supplied serial cable from the AP RS-232 serial interface to the HPC serial COM port.

18. Connect the AP Ethernet port to the HPC Ethernet card through the Ethernet hub/switch or an Ethernet crossover cable.

19. Plug in the provided 3.3 V power supply to the AP power supply connector.

AP Initial Configuration

When you have completed loading the operating system software, initially configure the AP for its channel frequency and Service Set Identifier (SSID) unique to your application. This configuration can be done either through a web browser with access to the built-in AP web server, or by issuing commands through the serial port command line interface (CLI).

You can fully configure the AP at any time to tailor the AP for your application environment. For more information on configuring the AP using the web browser, refer to Appendix A, AP Web Server. For more information on using the CLI, refer to Appendix B,

The following description illustrates the use of the web browser. For information on using the CLI, refer to Command-Line Interface on page 2-4.

i. Web Browser

Follow these steps to configure the channel frequency and SSID using a web browser:

1. Launch a web browser (Netscape Navigator or Internet Explorer are examples of commonly used web browsers).

2. From the HPC, enter the IP address that is assigned to the AP as the URL address, for example **http://192.168.1.1**.

20. Select the Actiontec Access Point Web Server hotlink.

21. A dialog box will appear that requests login authorization. When prompted, enter the following information to log in:

Log in: Admin (case sensitive)

Password: *

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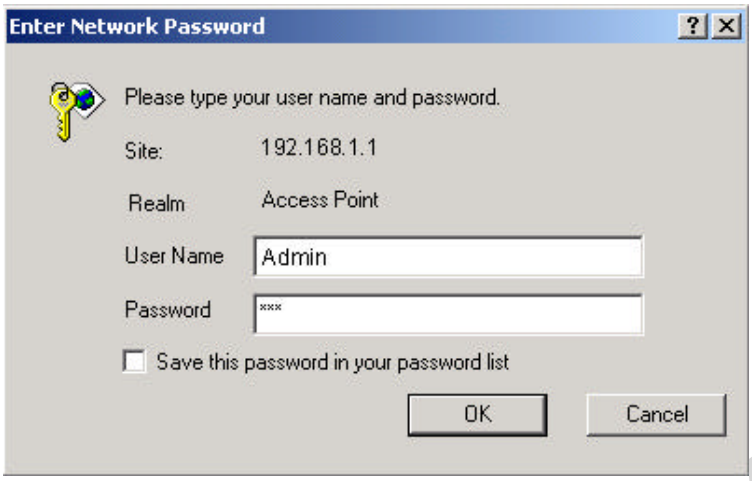

Click OK to complete the login process

22. Select the Configuration hotlink from the navigation bar.

23. Enter the SSID (name or address) for the AP in the SSID field. The SSID must be 1 through 32 characters in length.

You can have more than one AP in a single SSID. If you are configuring more than one AP in a single SSID, you must specify a unique System Name for each AP within a single SSID.

24. Specify the radio channel of operation of the AP by selecting the desired value from the Radio Channel drop-down menu. This value specifies the frequency the stations (STAs) under the AP are associating with in Infrastructure mode.

Note that the radio channel is specified using the IEEE 802.11a standard. For example, channel 48 is the equivalent of 5.240 GHz. The formula below shows how the channel number is derived:

$$\text{Channel Number} = \frac{\text{Channel Frequency (in MHz)} - 5000\ \text{MHz}}{5\ \text{MHz}}$$

25. Click Update to commit the changes.

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At this time you can also change other settings. Refer to Appendix A, AP Web Server for more information about each configuration option.

26. You must reboot the AP to enable any configuration change. To reboot the AP, click on the REBOOT AP button that appears.

Reminder: Click the REBOOT AP button for changes to take effect

Command-Line Interface

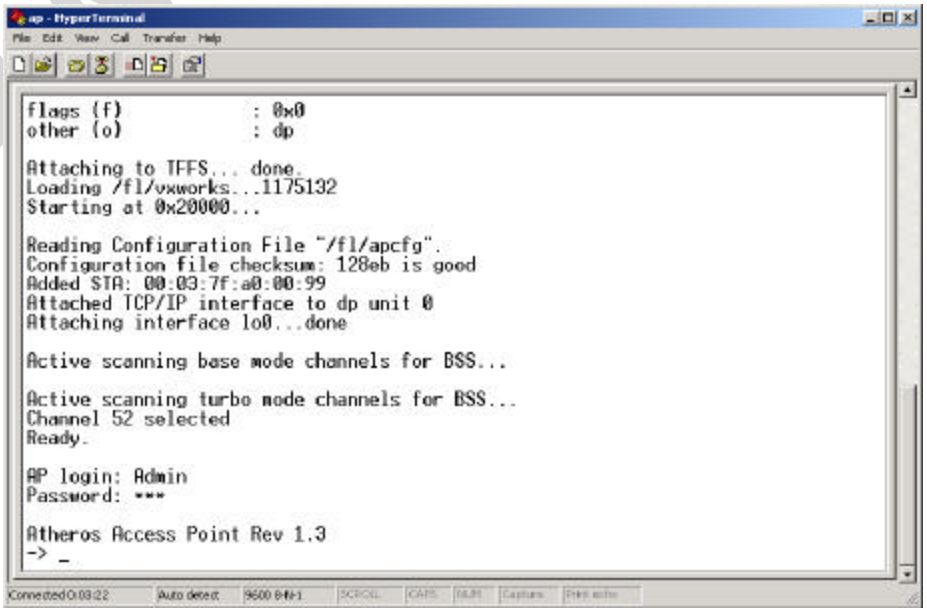
The following procedures show the steps required to configure the AP SSID and channel frequency using the command-line (CLI) interface and HyperTerminal.

3. After the AP boots and the operating system software loads, press Enter to invoke the AP login: prompt. When prompted, enter the following information to log in:

   Username: Admin (case sensitive)

   Password: *

27. Press Enter to complete the login process. The Actiontec Access Point Software revision prompt will appear.



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28. Use the **set ssid <SSID>** command to specify the SSID.

29. Use the **set channel <channel>** command to change the radio channel.

30. Use the **reboot** command and then press Enter, which reboots the AP, to enable any changes.

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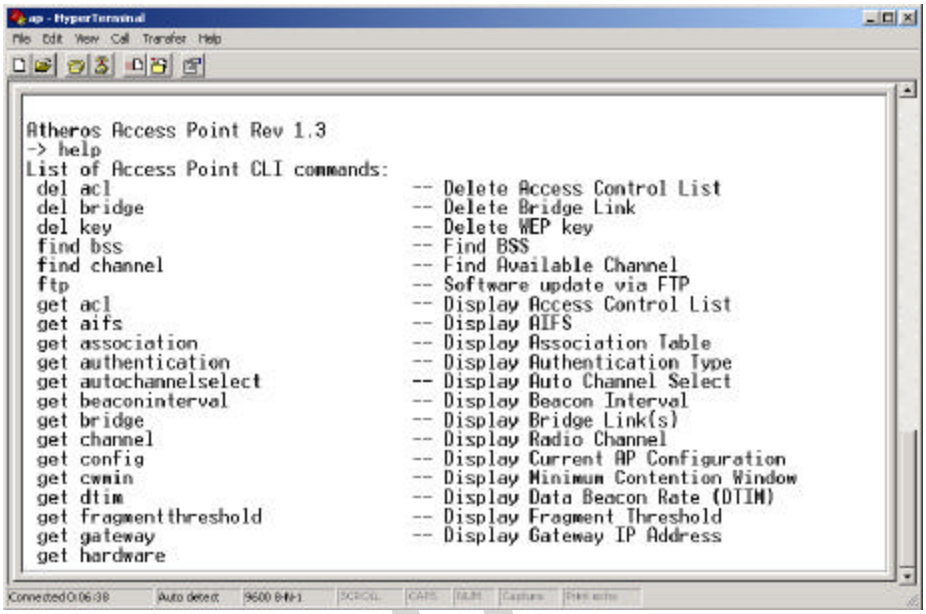
49. To view CLI command options, use the **help** command or refer to Appendix B for details about CLI options.



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AP Web Server

You can configure the AP through either through a web browser interface to the AP web server, or using the CLI through a serial interface. The web server resides in the AP and is accessible from any STA that is connected to the AP Infrastructure network.

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Accessing the AP Web Server

Follow these steps to access the AP Web Server:

2. Launch a web browser (Netscape Navigator or Internet Explorer are examples of commonly used web browsers).

3. From the HPC, enter the IP address that is assigned to the AP as the URL address, for example **http://192.168.1.1**.

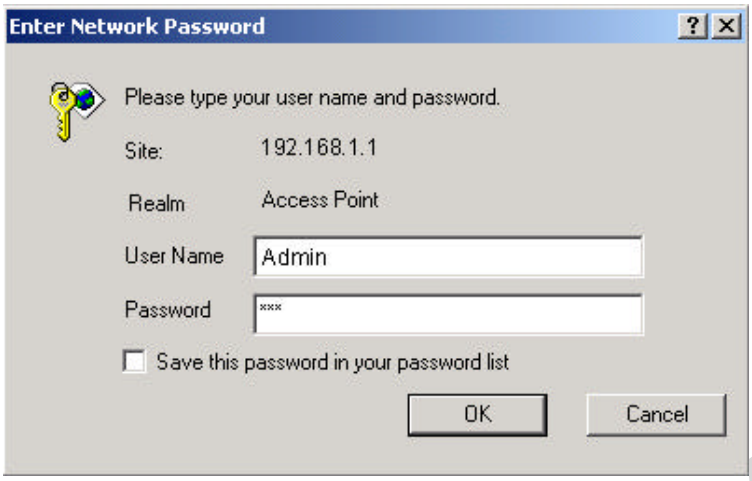
   Customize the appearance of the Access Point Web Server homepage by replacing the .GIF files used on the page. For example, the .GIF file containing the full path filename for a company logo can be replaced with one of your choice.

4. Select the Actiontec Access Point Web Server hotlink.

5. A dialog box appears that requests login authorization. When prompted, enter the following information to log in:

   Log in: Admin (case sensitive)

   Password: *



6. Click OK to complete the login process.

NOTE: **Your browser must support frames and Javascript must be enabled.**

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Configuration Windows

The Access Point Configuration windows allow you to view and edit configuration information for the AP. The AP Web Server provides configuration windows for:

16. **General configuration parameters**
17. **General advanced configuration parameters**
18. **Shared keys**
19. **Per station privacy**
20. **Configuration scripts**
21. **Firmware updates**

To access any of these AP configuration screens, select the desired hotlink from the navigation bar on any configuration screen (see Figure A-3.)

General | Shared Keys | Per Station Privacy | Configuration Script | Firmware Update

Figure A-3. AP Configuration Window Navigation Bar

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i. Working With Configuration Windows

The AP Configuration windows provide a user-friendly interface to help you quickly configure your AP. After you make any additions or changes to any configuration window, you must update the configuration file to save the changes. The new configuration is not in effect until you reboot the AP.

Follow these steps to update configuration files:

1. Enter your configuration updates or changes in the appropriate configuration fields.
2. Click Update

Update

3. Click Reboot AP to make the changes effective.

The web server will lose connectivity with the AP Web Server as the AP reboots.

To reestablish the connection with the AP Web Server, wait until the AP has completed rebooting and navigate to the Web Server to resume communication.

b. General Configuration Window

The General Configuration window allows you to enter general operating information for the AP. Click on Configuration from any window to access the General Configuration window.

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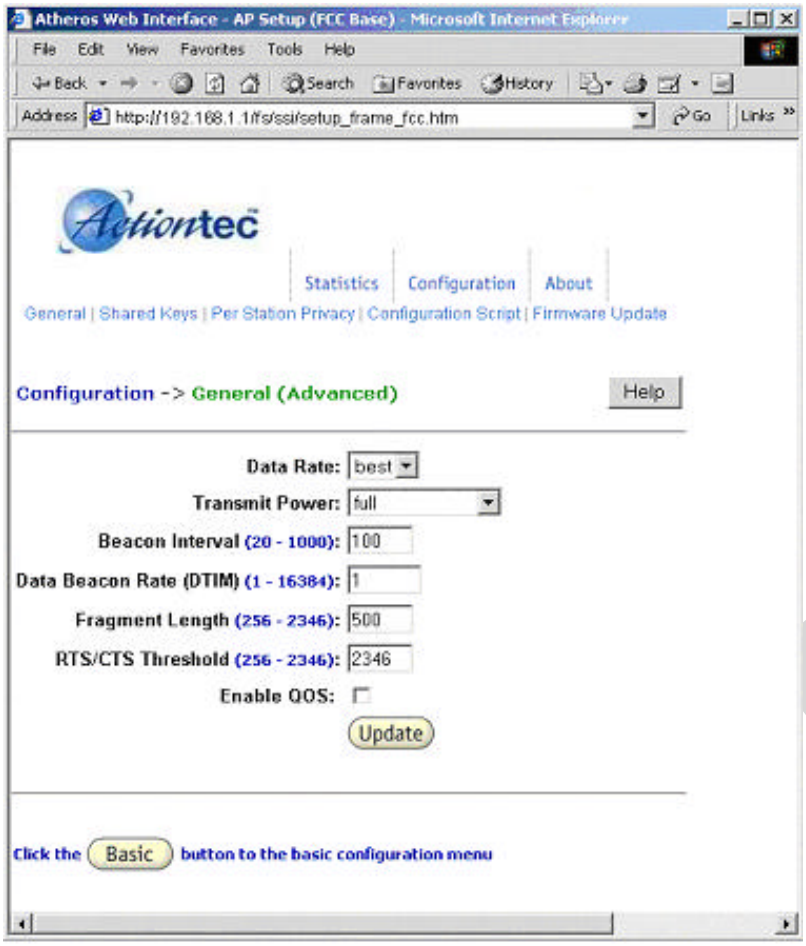

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At this time you can also change other settings.

Table A-1 summarizes the data fields on the AP General Configuration window.

Table A-1. AP General Configuration Window Field Descriptions

General Configuration Field	Description
SSID	Identification of the AP. Enter a number or address between 1 and 32 characters in length that the STAs are associating with in Infrastructure mode. You can specify more than one AP in an SSID. Use the System Name field to uniquely identify each AP.
System Name	Specifies a unique name for AP. Enter a unique text string of up to 32 characters in length.
Radio Channel	Select the desired frequency of operation from the drop-down menu. The radio frequencies that appear in the Radio Channel drop-down menu are dependent on the

General Configuration Field	Description
	Regulatory Domain set specified.
Enable Auto Channel Select	Select the checkbox to automatically search through the frequency list to find an unused channel. If a radio frequency is specified in the Radio Channel field and the Auto Channel Select is enabled, the designated frequency in the Radio Channel field will be the first frequency auto-attempted before scanning the remaining list.
Turbo Mode	Allows transmission on two channels thereby improving data rate. To enable/disable Turbo Mode, click on the appropriate Turbo button.
Enable Encryption	Enables Wired Equivalent Privacy on the AP.
Authentication Type	Specifies the authentication type used. “Open” specifies no authentication. A STA must be authenticated before it can be associated to an AP.
IP Address	Specifies the IP address of the AP.
Subnet Mask	Specifies the subnet mask for the AP.
Default Gateway Address	Specifies the default gateway for the AP.
User Name	Specifies the user name.
Password	Specifies the password

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b. General Advanced Configuration Window

The General Advanced Configuration window allows you to enter advanced, generic operating information for the AP. From the AP General Configuration window, click on Advanced to access the General Advanced Configuration window.

Table A-1 summarizes the data fields on the AP General Advanced Configuration window.

Table A-1. AP General Advanced Configuration Window Field Descriptions

Advanced Configuration Field	Description
Data Rate	Specifies rate of data transmission. Select the desired rate from the drop-down menu. The Best selection will adapt the rate to the best available.
Transmit Power	Specifies the level of transmit power. Specify the value of the transmit power from the drop-down menu. Decrease the transmit power if more than one AP is co-located using the same channel frequency.
Beacon Interval	Specifies the Beacon Interval value. Enter a value between 20 and 1000.
Data Beacon Rate	Specifies the Data Beacon Rate. Enter a value between 1 and 16384 that specifies the Delivery Traffic Indication Message (DTIM).
Fragment Length	Specifies the fragment length. Enter a value between 256 and 2346.
RTS/CTS Threshold	Specifies the value of the RTS/CTS threshold. Enter a value between 256 and 2346.
Enable QOS	Use the checkbox to allow the AP to participate in a QOS environment.

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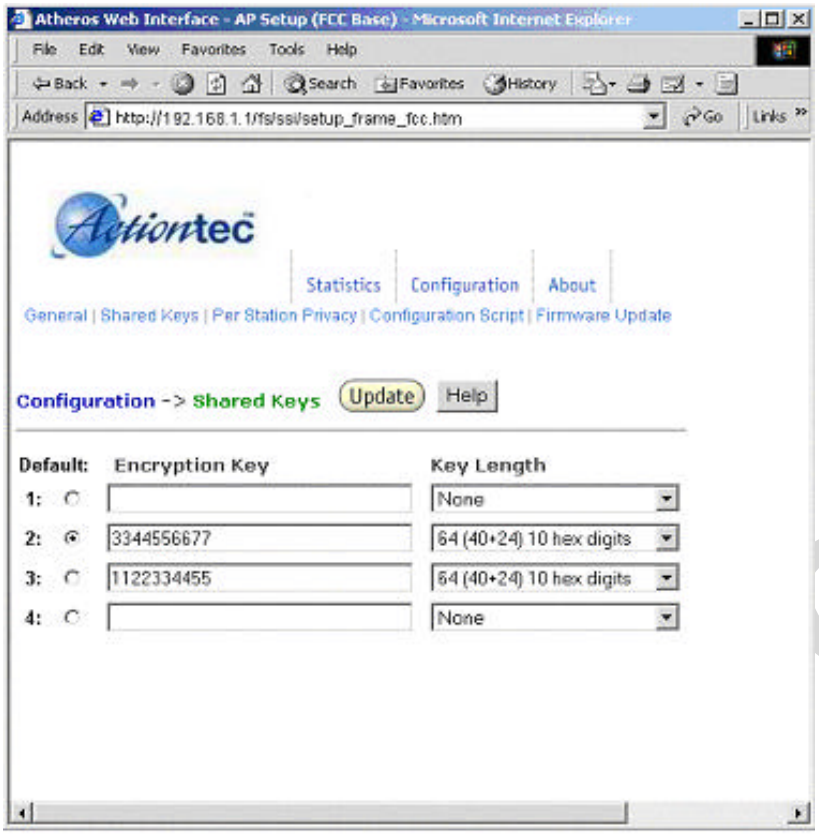
Shared Key Configuration

The Shared Key Configuration window allows you to specify Encryption Key(s) if you enable encryption for the AP in the general configuration window.

Use the Shared Key Configuration window to:



22. Select the default shared Encryption Key

23. Specify the key length

24. Specify the shared WEP keys

Refer to Table A-3 for examples of WEP configurations on the AP and the STA.

Table A-3. Wired Equivalent Privacy Settings

WEP: Disable					WEP is disabled. Any STA can access to the network
WEP: Enable					
Shared Key	**ACL**				**WEP**
	ACL	**MAC address**	**Key Map**	**Permission**	
No	Disable	No	No	No	WEP is disabled. Any STA can access to the network.
Yes	Disable	No	No	No	Only STA with matched shared key can access to the network.

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Yes	Enable	Yes	No	Allow	1. STA with matched MAC ID can access to the network 2. Any STAs with matched shared key are also allowed to access to the network.
Yes	Enable	No	Unique key	Allow	1. STA with matched unique key can access to the network. 2. Any STAs with matched shared key are also allowed to access to the network.
Yes	Enable	Yes	Unique key	Allow	1. STA with matched MAC ID and matched unique key can access to the network. 2. Any STAs with matched shared key are also allowed to access to the network.
x	Enable	Yes	No	Deny	STA with the matched MAC ID is blocked from accessing the network.
x	Enable	No	Unique key	Deny	STA with the matched unique key is blocked from accessing the network.
x	Enable	Yes	Unique key	Deny	STA with the matched MAC ID and unique key is blocked from accessing the network.
Yes	Strict	x	x	x	1. Only STA with MAC ID and/or unique key matched to the setup in ACL can access to the network. 2. The STAs with only shared key are blocked from accessing the network.

After entering or modifying the WEP configuration, you must click Update to save the changes.

To view the configuration of a unique key, use the pull down menu to select the unique key ID.

Per Station Privacy Configuration Window

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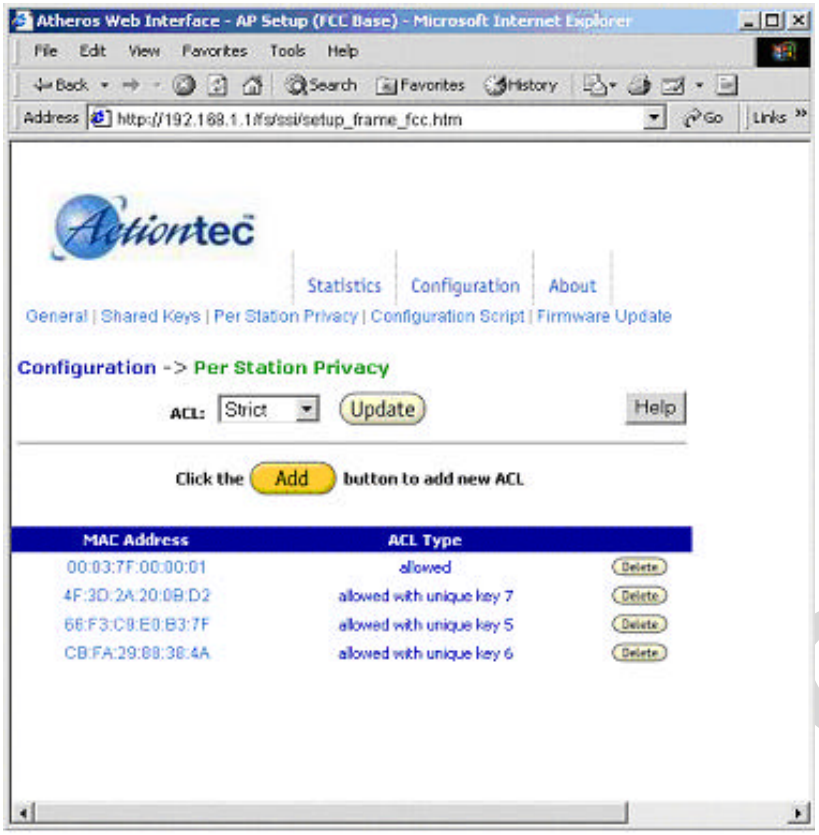

The AP Per Station Privacy Configuration window allows you to configure access control lists for the AP

Table A-4 summaries the data fields on the Per Station Privacy window.

Table A-4. AP Per Station Privacy Field Descriptions

Per Station Privacy Field	Description
ACL	**Specifies the state of the Access Control List (ACL). Use the drop-down menu to specify the state of ACL, where:** **1. Disable—Unrestricted Access—By default, while checking of the ACL is enabled, the access control list itself is empty. This is the same as disabling the checking on the ACL.** **2. Enable—Restricted Access—An ACL entry must exist if you wish to enable ACL. While ACL is enabled, stations with valid shared keys and stations with matching "allow" entries on the ACL are authenticated.**

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Per Station Privacy Field	Description
	3. Strict—Restricted (w/ACL match)—Requires an ACL entry that specifies the station's assigned unique key or the station is denied association. In the strict mode, stations with valid share keys and not on the ACL are not authenticated. The stations must have unique keys defined and matching "allow" ACL entries specified, in order to associate with the AP.
MAC Address	Specifies the MAC address for the STA to be included in the ACL.
ACL Type	Specifies the current state of each STA, where: 4. Allowed—Add/Modify MAC address to the ACL. 5. Denied—Add/Modify MAC address to the disabled ACL.

Follow these steps to configure privacy for stations:

1. Specify the ACL type from the drop-down menu. The Access Control List (ACL) allows an administrator to perform security actions based on the client station MAC address. Use this selection to allow or deny association with the AP and for unique per station WEP key assignment.

3. Click on Add.
4. Enter the MAC address for the STA to be included on the access list. Click on Delete to remove any configured STA from the access list.
5. Click Update to save your changes.

C. Script Configuration Window

The Script Configuration window allows you to execute text scripts of CLI commands. For example, you could construct a text script to enter the shared keys for stations.

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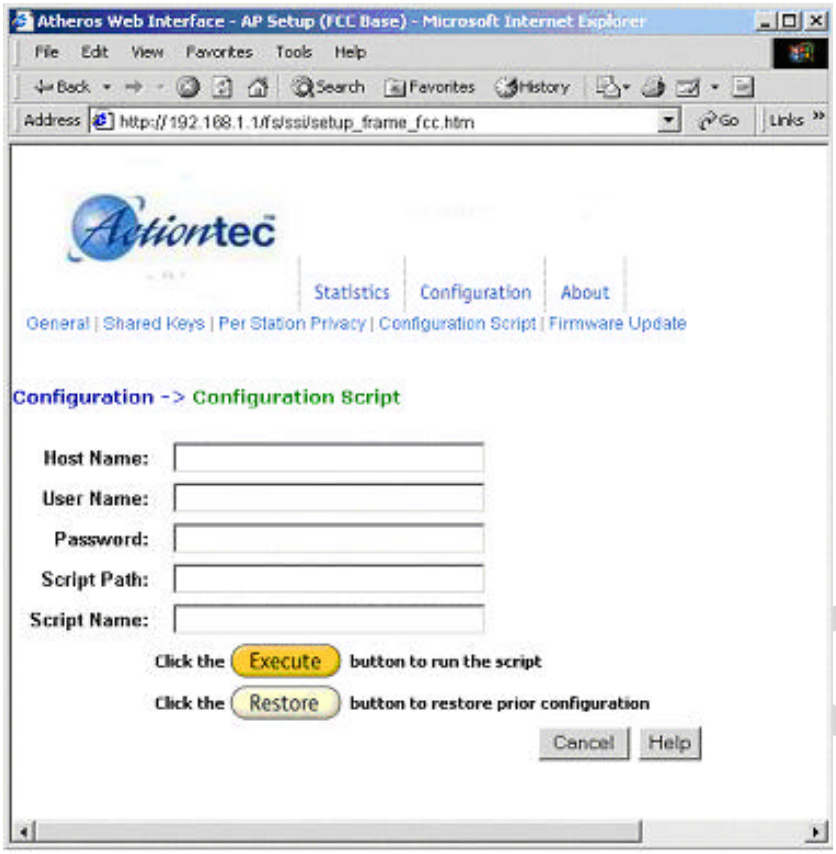

Follow these steps to use scripts:

1. Develop the scripts for your application.
2. Enter the host name where the script resides.
3. Enter the user name and password for the host.
4. Specify the script path and the script name in the data entry fields in the Configuration Script window.
5. Click Execute to run the script.

If you wish to revert to the previous configuration, click Restore.

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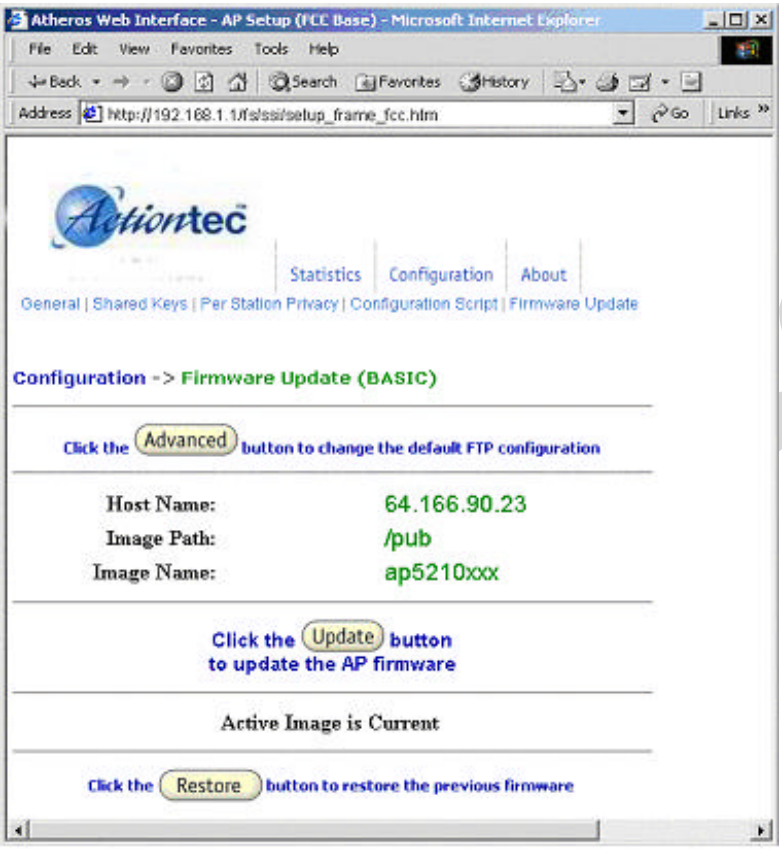
Firmware Update Configuration Windows

The Firmware Update Basic Configuration window allows you to view the FTP location of new firmware. The default values for the Host Name, Image Path, and Image Name appear in the window.

To access the Firmware Update window, click on Firmware Update in the navigation bar.



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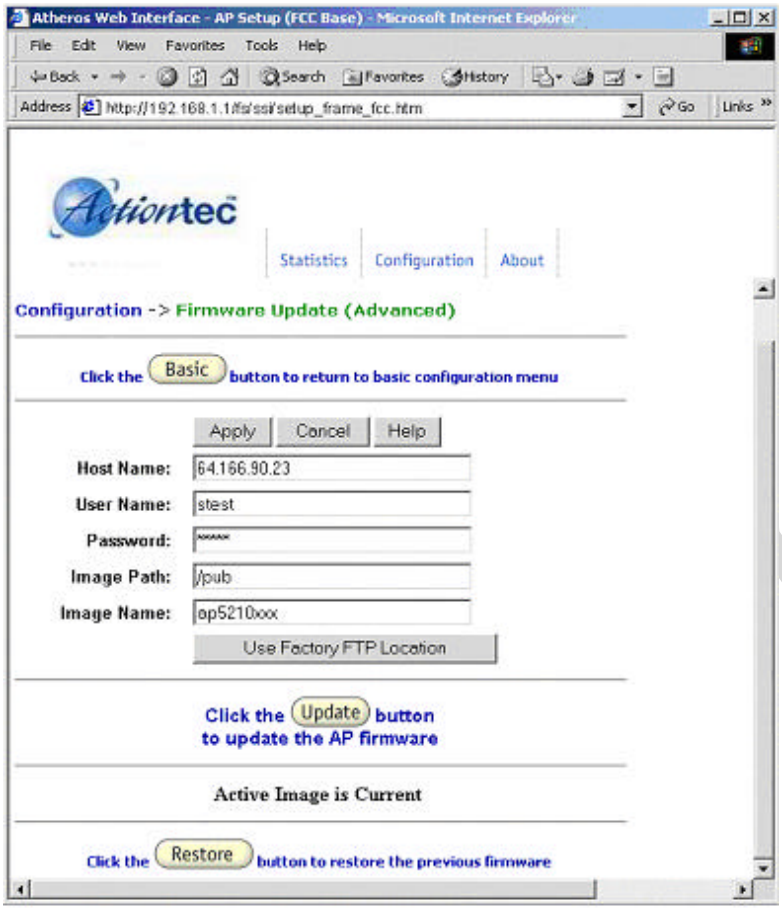
Follow these steps to enable firmware updates:

1. From the Firmware Update Basic window, click on Advanced.

   The Firmware Update Advanced Configuration window allows you to enter new information on the FTP location of new firmware or filename of the firmware.



2. Enter the Host Name, User Name, Password, Image Path, and Image Name in the data-entry fields.

   If you want to revert to the default-vendor values, click Use Factory FTP Location.

3. Click Update Firmware to store the new firmware changes.

   If you want to restore the previous firmware, click Restore.

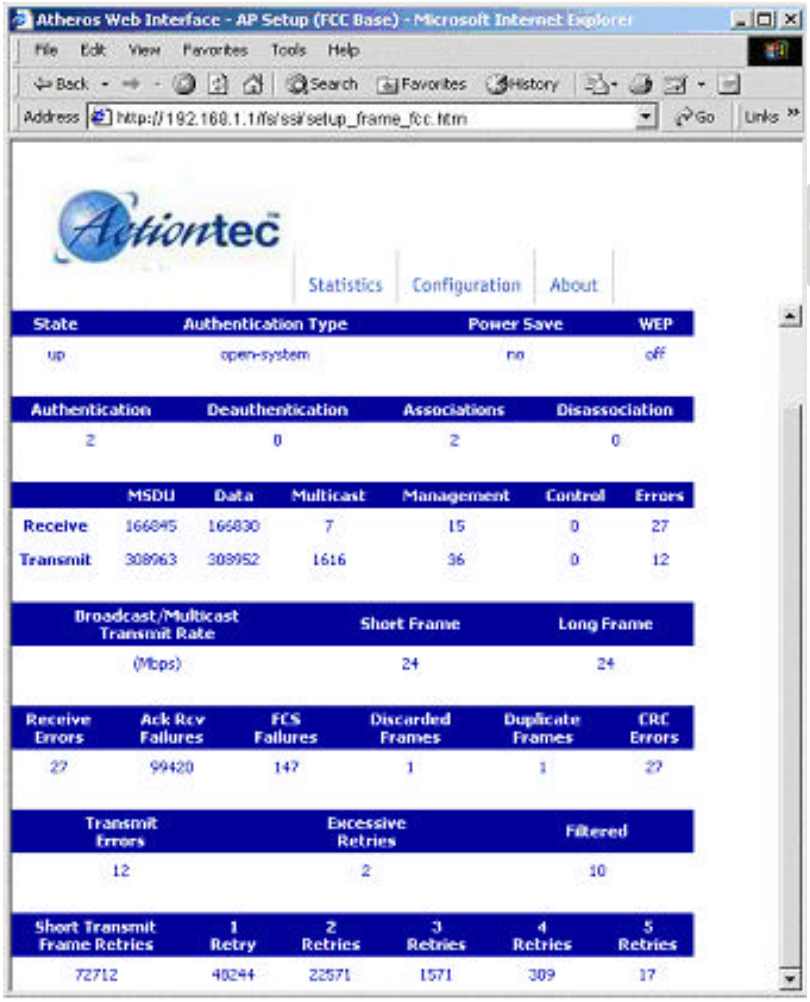
Statistics Windows

From the AP Web Server, choose the Statistics hyperlink to go to the Access Point Statistics window. By default, this is the first window that appears once you enter the AP Web Server.

The AP Statistics window allows you to view the assigned ID, MAC address, and current state of the AP and all stations currently part of its BBS (Basic Service Set). The top-level Statistics window automatically updates each minute.

i. AP Statistics

To view statistics on the AP, click on the MAC address hyperlink for the desired AP in the Statistics window. The BSS Stats window for the selected AP will appear.



State	Authentication Type	Power Save	WEP
up	open-system	no	off

Authentication	Deauthentication	Associations	Disassociation
2	0	2	0

	MSDU	Data	Multicast	Management	Control	Errors
Receive	166845	166830	7	15	0	27
Transmit	308963	308952	1616	36	0	12

Broadcast/Multicast Transmit Rate	Short Frame	Long Frame
(Mbps)	24	24

Receive Errors	Ack Rcv Failures	FCS Failures	Discarded Frames	Duplicate Frames	CRC Errors
27	99420	147	1	1	27

Transmit Errors	Excessive Retries	Filtered
12	2	10

Short Transmit Frame Retries	1 Retry	2 Retries	3 Retries	4 Retries	5 Retries
72712	40244	22571	1571	309	17

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The BSS Stats window for AP is divided into sections that provide the AP configuration, Access Point SME statistics (station association information), or Access Point (Transmit and Receive) Statistics. Refer to Table A-5 for a description of the BSS Statistics for AP window fields.

Table A-5. BSS Stats Fields for AP Descriptions

BSS Stats Field	Description
State	Current state of the AP.
Authentication Type	Specifies open-system or shared key.
Power Save	Specifies the enabled state of the power save option; either yes or no.
WEP	Current state of Wired Equivalent Privacy; either on or off.
Authentication/Deauthentication	Number of times a STA attempted authentication and deauthentication.
Association/Deassociation	Number of times a STA attempted associations and deassociations.
MSDU	Maximum Service Data Unit. Specifies the number of packets sent and received by the AP.
Data/Management/Control	Packets can either be data, control, or management. Specifies the number of packets sent and received for each.
Multicast	Specifies the number of multicast packets both sent and received.
Errors	Specifies the error count for both transmit and receive.
Broadcast/Multicast Transmit Rate	Specifies the transmit rate of broadcast/multicast packets.
Short Frame/Long Frame	Specifies the number of transmitted short and long frames. A short frame is less than 500 bytes; long frames are equal to or greater than 500 bytes.
Receive Errors	Specifies the number of receive errors.
Acknowledgement Receive Failures	Specifies the number of acknowledgement receive errors.
FCS Failures	Specifies the number of receive FCS failures.
Discarded Frames	Specifies the number of receive discarded frames.
CRC Errors	Specifies the number of receive CRC errors.
Transmit Errors	Specifies number of transmit errors.
Discarded Frames	Specifies the number of transmit discarded

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BSS Stats Field	Description
	frames.
Excessive Retries	Specifies the number of transmit excessive retries.
Short Transmit Frame Retries	Specifies the number of short transmit frame retries.
Retries	Specifies the state of transmit retries for each type.

The AP Stats window automatically updates every five seconds.

ii. Station Statistics

To view statistics on the any station (STA), click on the MAC address hyperlink for the desired STA. The BSS Stats window for the selected STA will appear.

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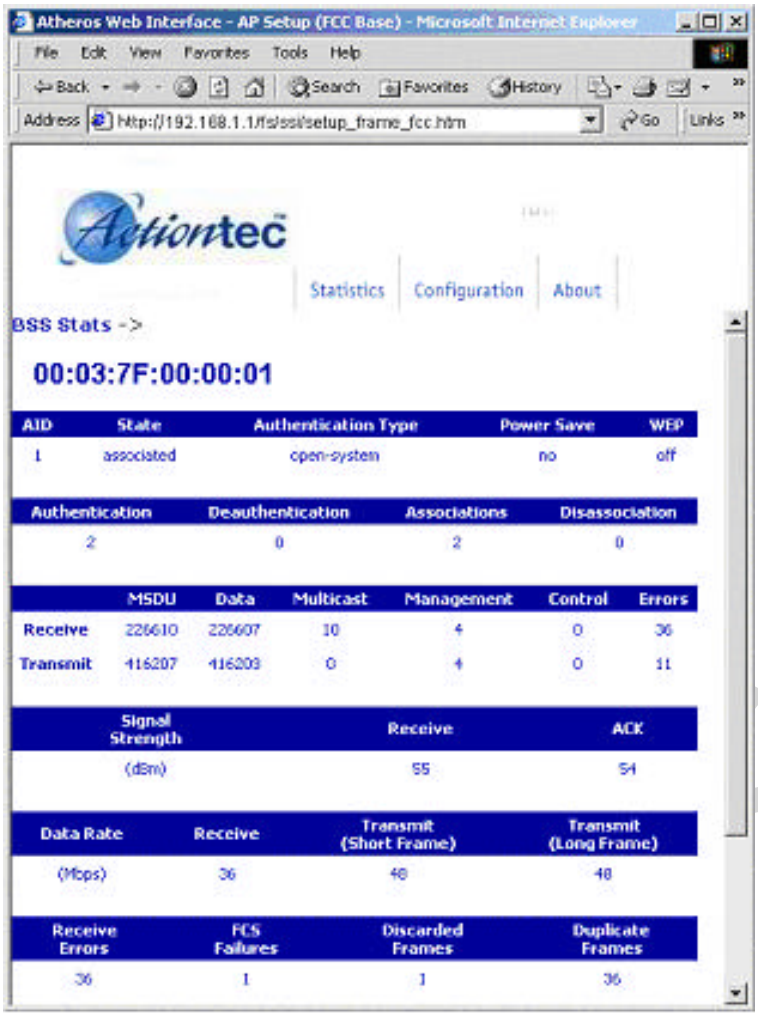

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The BSS Stats window for stations provides the station configuration and statistics for the selected station.

Table A-6 summarizes the information fields on the BSS Stats window for an STA.

Table A-6. BSS Stats Fields for STA Descriptions

BBS Stats Window for STA Field	Description
AID	**The ID of the station.**
State	**Current state of the STA.**
Authentication Type	**Specifies open-system or shared key.**
Power Save	**Specifies the enabled state of the power save option; either yes or no.**

BBS Stats Window for STA Field	Description
WEP	Current state of Wired Equivalent Privacy; either on or off.
Authentication/Deauthentication	Number of times a STA attempted authentication and deauthentication.
Association/Deassociation	Number of times a STA attempted associations and deassociations.
MSDU	Maximum Service Data Unit. Specifies the number of packets sent and received by the STA.
Data/Management/Control	Packets can either be data, control, or management. Specifies the number of frames.
Multicast	Specifies the number of multicast frames.
Errors	Specifies the error count for both transmit and receive sides.
Signal Strength	Specifies the strength of the signal in dBm.
Receive	Specifies the strength of received frames in dBm.
ACK	Specifies the strength of transmitted frames in dBm.
Rate	Specifies the data rate in megabits per second (Mbps).
Receive	Specifies the rate of the received data.
Transmit Short Frame/Long Frame	Specifies the rate of transmitted short and long frames. A short frame is less than 500 bytes; long frames are equal to or greater than 500 bytes. Specifies the number of transmit frames of each type.
Receive Errors	Specifies the number of receive errors.
FCS Failures	Specifies the number of FCS failures.
Short Transmit Frame Retries	Specifies the number of short transmit frame retries.
Retry 1-15	Specifies the number of retries for each retry group.

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