ACCTON TECHNOLOGY CORPORATION
WA5001 ACCESS POINT User's Guide
Release 1.0

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Preliminary

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1 Introduction

1.1 Package Contents

The WA5001 Access Point (AP) is provided in a completely enclosed plastic housing with two 180° swivel antennas, a power supply, and a serial cable for use in AP software configuration. The AP contains a single 10/100 Ethernet port. Using this Ethernet port, a RJ-45 cable, (not provided) should be used to connect the AP to a wired Ethernet LAN.

1.2 System Requirements

The AP uses the WindRiver Systems VxWorks™ real-time operating environment, Version 5.4. VxWorks documentation can be obtained through a license agreement with WindRiver Systems. See www.wrs.com for more information about VxWorks licensing.

The AP contains a small boot executive that allows the main VxWorks system software to be downloaded using the Ethernet port over an FTP connection. The VxWorks system software can also reside in the Flash memory of the AP, which allows booting without the need to download VxWorks 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 a serial interface and an Ethernet connection is required to perform the initial VxWorks system software loading operation as well as AP configuration. A freeware FTP server ("a-ftp.exe") is included on the Accton distribution CD in the \utils directory.

2 Getting to Know the Access Point

2.1 Front View

The Accton Reference Design Access Point (AP) has 3 LEDs, and a pair of side-mounted antennas that rotate 180° for alternative reception positioning and compact packaging.
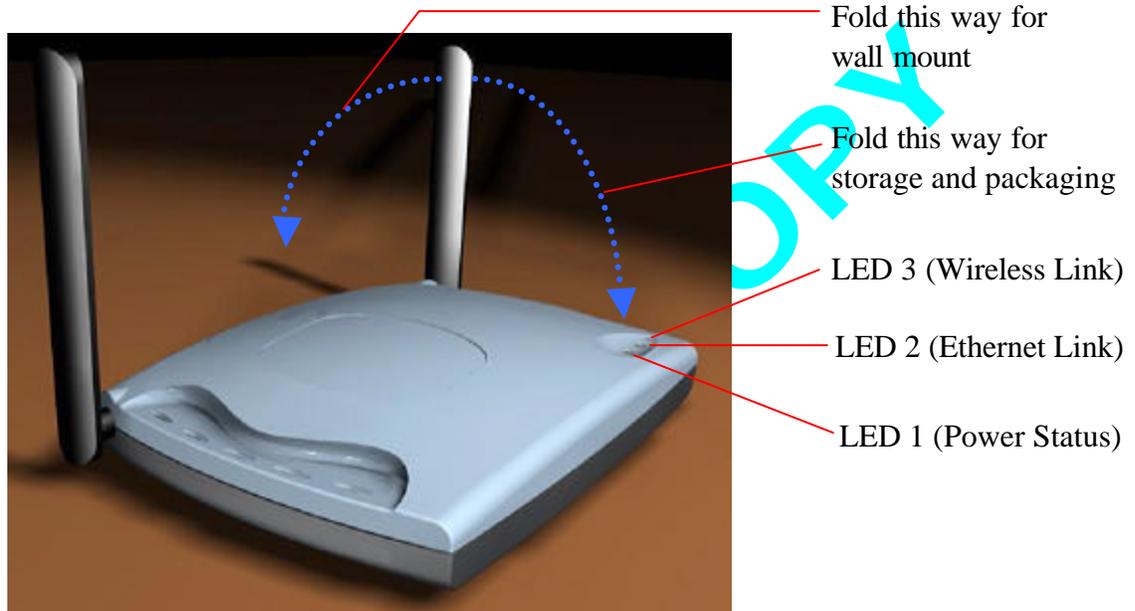

Fold this way for wall mount

Fold this way for storage and packaging

LED 3 (Wireless Link)

LED 2 (Ethernet Link)

LED 1 (Power Status)

Table 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
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

2.2   Rear View

The rear panel of the AP has a RS-232 serial interface, a RJ-45 Ethernet jack, a reset button, and a power supply connector,

Power Supply Connector

Reset Button

RS-232 Serial Interface   RJ-45 Ethernet Jack
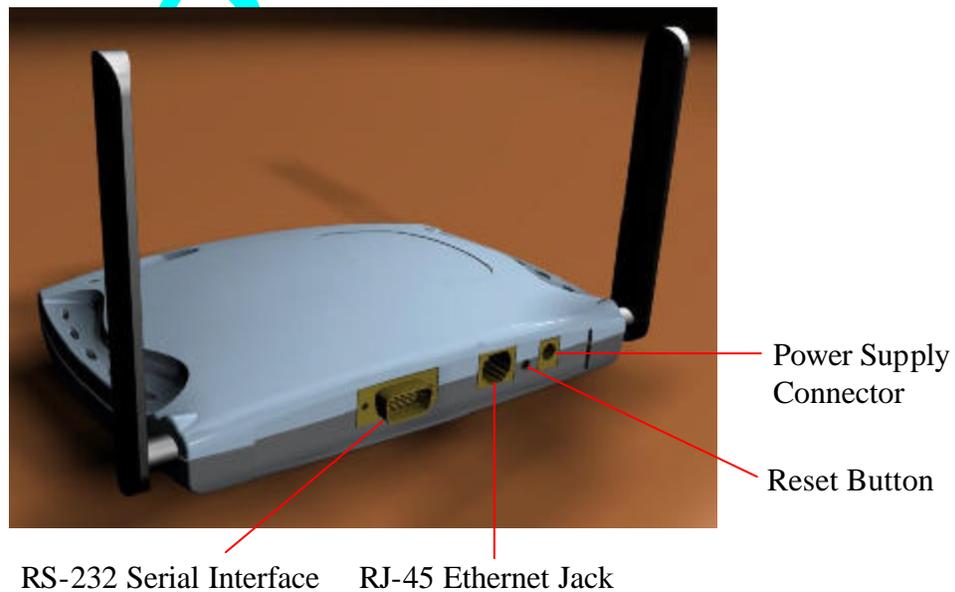
- The RS-232 serial interface is capable of 115 kbps operation, and is provided for the purpose of configuring the AP through a terminal interface and connectivity to other external devices such as analog modems. The AP software provides a selectable serial interface data format to allow selection of the number of start, stop, data, and parity bits. By default the serial interface is set to 9600 baud, 8 data bits, 1 stop bit, and no parity. Use the serial cable provided by Accton to attach to a terminal or PC for AP configuration.

- The RJ-45 Ethernet jack is provided for 10/100 Mbps connectivity to a wired Ethernet LAN. The Ethernet subsystem is based on a single chip 10/100 Mbps integrated PCI Ethernet Media Access Controller (MAC) + PHY (DP83815) from National Semiconductor Corporation.

- An on-board MAX6713 reset circuit provides reset to processor, memory, and PCI devices. A manual push-button reset option provides easy generation of the reset signal without cycling power to the AP. A 3.3 V power supply is provided to power the AP.

- A 3.3 V power supply is provided and is plugged into the power supply connector of the AP.

Installation Note:
- To ensure compliance with FCC RF exposure requirements, the antenna used for this device must be installed to provide a separation distance of at least 20 cm from all persons.

2.3 AP Network Attachment and Configuration

AP Network Configuration and Network Boot
Figure 1 shows an example connection of the AP to a Host PC (HPC). Follow these steps
to establish the physical connections:

1. Plug the serial cable from the AP RS-232 serial interface to the HPC serial COM
   port.

2. Connect the AP Ethernet port to the HPC Ethernet card through the Ethernet
   hub/switch or an Ethernet crossover cable. An Ethernet switch/hub or crossover
   cable is not included with the AP Reference Design.

3. Plug in the 3.3 V power supply adapter to the AP power supply connector.
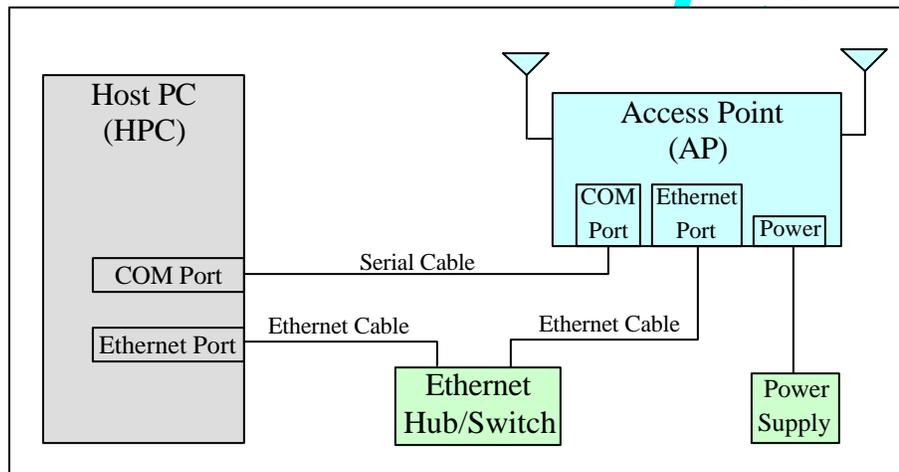
Figure 1 – Connection Between AP and Host PC

At this point, the HPC needs the following configuration steps in order to control the AP:

1. From the Start menu, choose Settings and open the Network and Dial-up
   Connections window.

2. Right-click on the Local Area Connection icon, which belongs to the Ethernet
   controller that is connected to the AP and select Properties.

3. Within the Local Area Connection Properties window, choose Internet Protocol (TCP/IP) and click Properties.
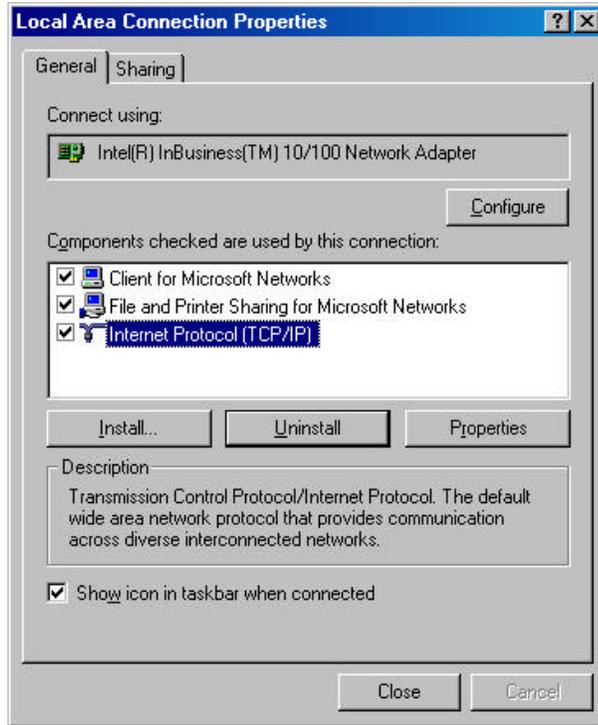
4. Configure the IP address for the Ethernet connection in the Internet Protocol (TCP/IP) Properties window. Click OK to continue, and close Local Area Connection Properties. Note that this IP address is used by the AP to access the VxWorks files stored on the HPC using the Ethernet connection.
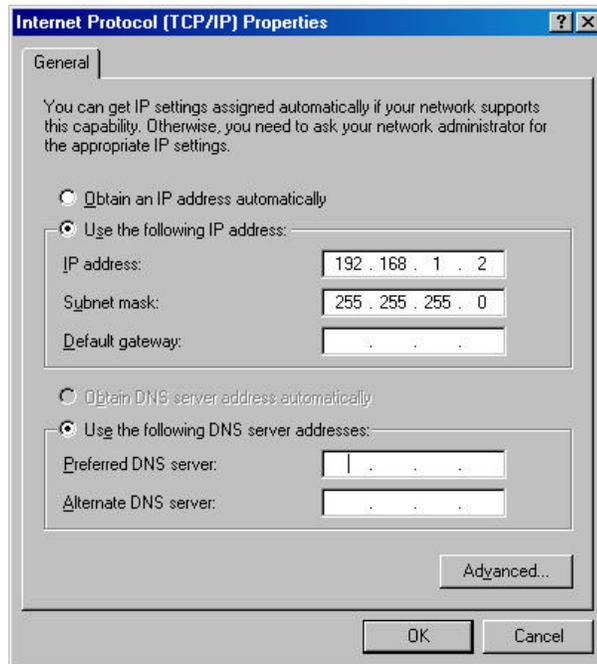
5. The AP uses File Transfer Protocol (FTP) to download the VxWorks image from the HPC. A freeware FTP software package is included on the distribution CD in the \utils directory. Make sure there is no other FTP program such as Internet Information Service (IIS) running on the HPC. Double-click a-ftp.exe under the \utils folder in the distribution CD to start the FTP server. This utility runs in the background to perform the required data transfer between the AP and HPC.
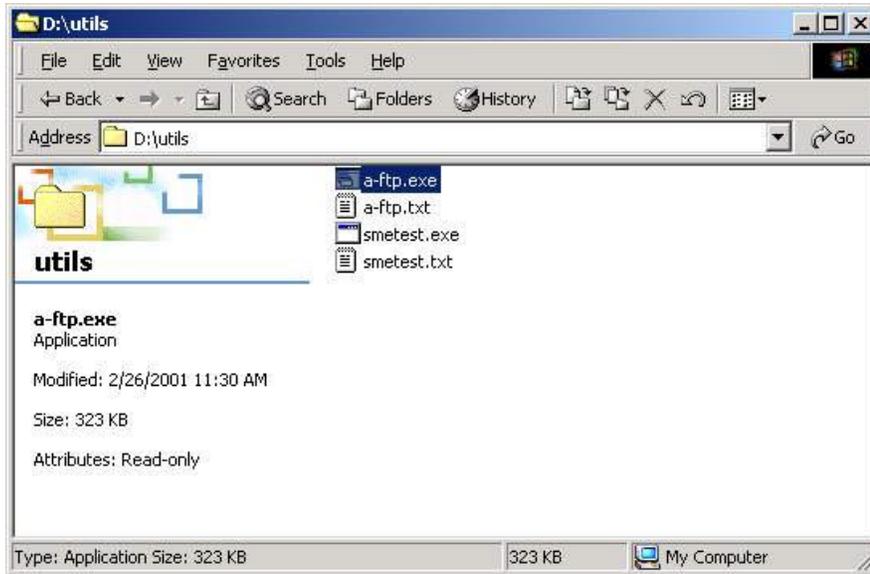
6. The HPC is ready to control the AP through the serial interface. A terminal program such as HyperTerminal needs to run on the HPC. To launch HyperTerminal, go to the Start menu, select Programs, Accessories, Communications, and HyperTerminal.

7. Type any name under the Name field in the Connection Description dialog box and click OK.

8. Select COM1 or the COM port that is connected to the AP through the serial cable. Click "OK" to continue.

9. Set COM port settings to 9600 Bits per second, 8 Data bits, None Parity, 1 Stop bits, and no Flow control. Click OK, and plug the AP power supply into the power source to start the connection.
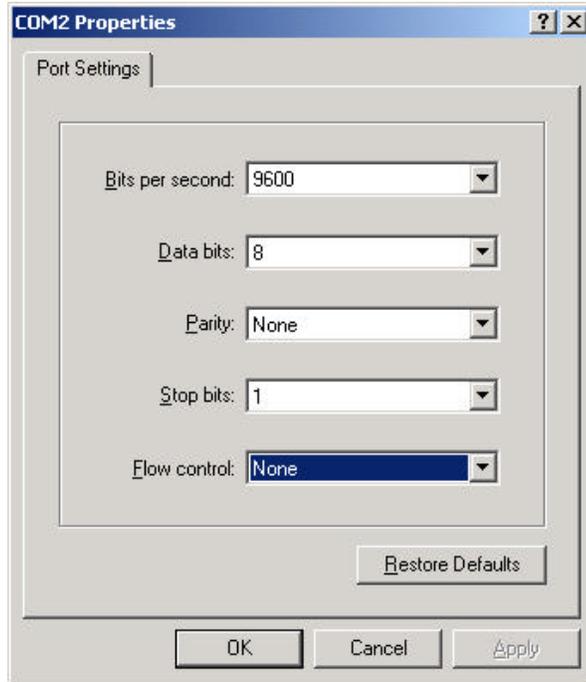
10. An auto-boot message appears on HyperTerminal a few seconds after the AP is connected to the power source. Press any key to stop the auto-boot process and follow Section 3.1.1 to load the VxWorks file over the Ethernet connection, or Section 3.1.2 to load the VxWorks file from Flash memory.

2.3.1 Booting VxWorks From the Ethernet Connection to the HPC

Follow these steps to configure the AP to boot VxWorks from the Ethernet:

1. Type "c" at the command prompt to configure the AP.

2. Follow the Boot from Ethernet settings described in Table 2 to enter the parameters in the configuration steps.

3. Press @ (Shift + 2) to continue, and the VxWorks image is loaded into the SDRAM using the Ethernet connection.

Table 2 – Configuration Parameters For Booting VxWorks

	Boot from Flash	**Boot from Ethernet**
	Default Setting	**National Semiconductor**
boot device	tffs0:	dp0
processor number	0	0
host name	Any value	
file name	/fl/vxworks	Location of VxWorks stored in Host PC
inet on ethernet (e)	IP address assigned to AP	
inet on backplane (b)	Blank	
host inet (h)	IP address set for the Ethernet device in Host PC	
gateway inet (g)	Any value	
user (u)	FTP login name (i.e. anonymous)	
ftp password (pw)	FTP password	
flags (f)	0x0	
target name (tn)	Blank	
startup script (s)	Blank	
other (o)	dp	See AP Programmer's Guide for details

2.3.2 Booting VxWorks From Flash Memory

Follow these steps to configure the AP to boot VxWorks from Flash memory. Refer to Appendix B ("Download Software Image" section on page **Error! Bookmark not defined.**) for CLI commands to load the VxWorks image file to the Flash file system, if VxWorks does not exist in Flash memory.

1. At the command prompt, type "c" to enter the configuration parameters.

2. Follow the default "Boot from Flash" settings described in Table 2 to enter the configuration parameters.

3. Enter @ to load VxWorks.

2.4   Configuring the AP

When the VxWorks system software is loaded, the AP has to be configured to set some options such as the channel frequency and Service Set Identifier (SSID). This can be done in two ways, 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).

2.4.1 Web Browser

The following procedures show the 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) from the Host PC or other PC on the same IP subnet as the AP, and enter the IP address that is assigned to the AP as the URL. This is the "inet on ethernet (e)" value specified during the configuration step in Section 3.1.1 or Section 3.1.2. The Access Point Web Server page appears.
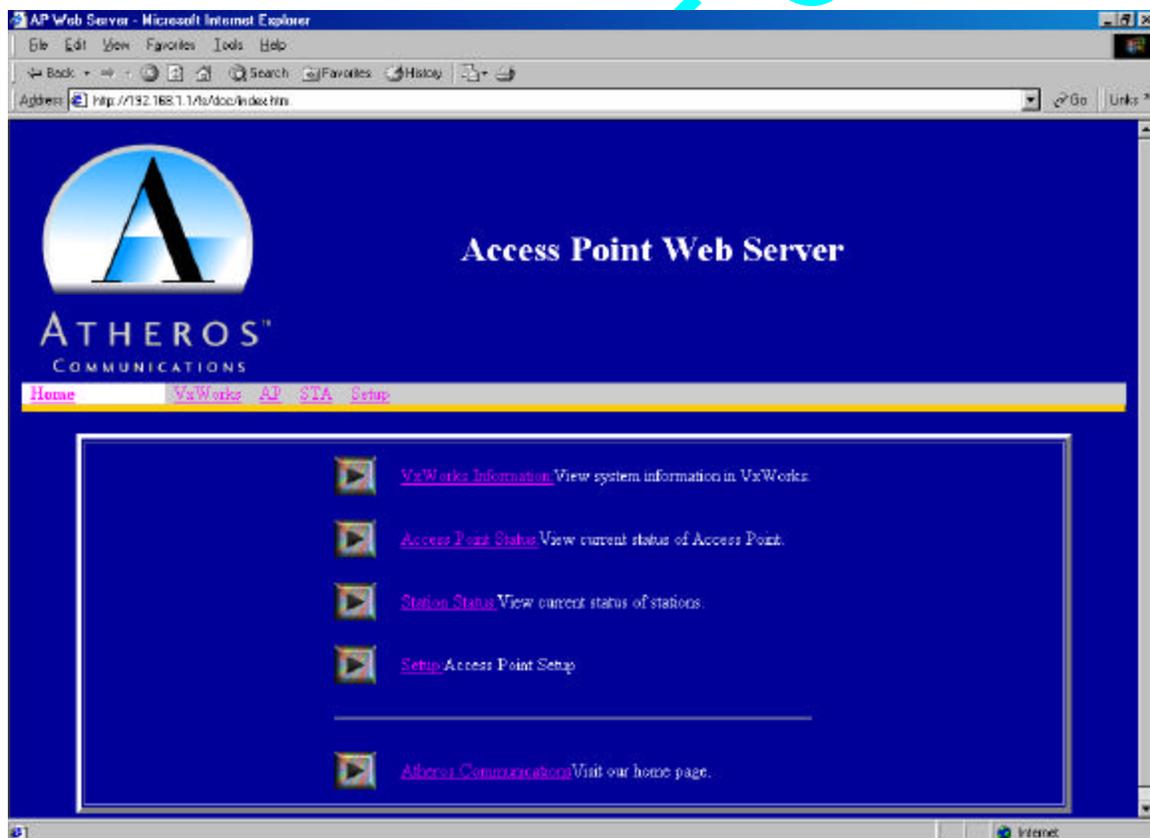
2. Click Setup. A dialog box appears that requests login authorization. When prompted, enter the following information to log in:

    Log in: Admin
    Password: 5up

    Click OK to complete the login process.

Subject to change without notice.

4. Optionally, you can also set up Wired Equivalent Privacy (WEP) for security purposes. To set up WEP, click WEP and the configuration screen appears. Refer to Appendix A for a detailed explanation of the WEP configuration options. Click Apply to save the settings.

Note that the Un-Encrypted Frames filter option (previously available in release 1.0) is now removed.

2.4.2 Command-Line Interface

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

1. After the AP boots and VxWorks loads, press Enter to invoke the AP login: prompt. When prompted, enter the following information to log in:

> Login: Admin
> Password: 5up

Press Enter to complete the login process.
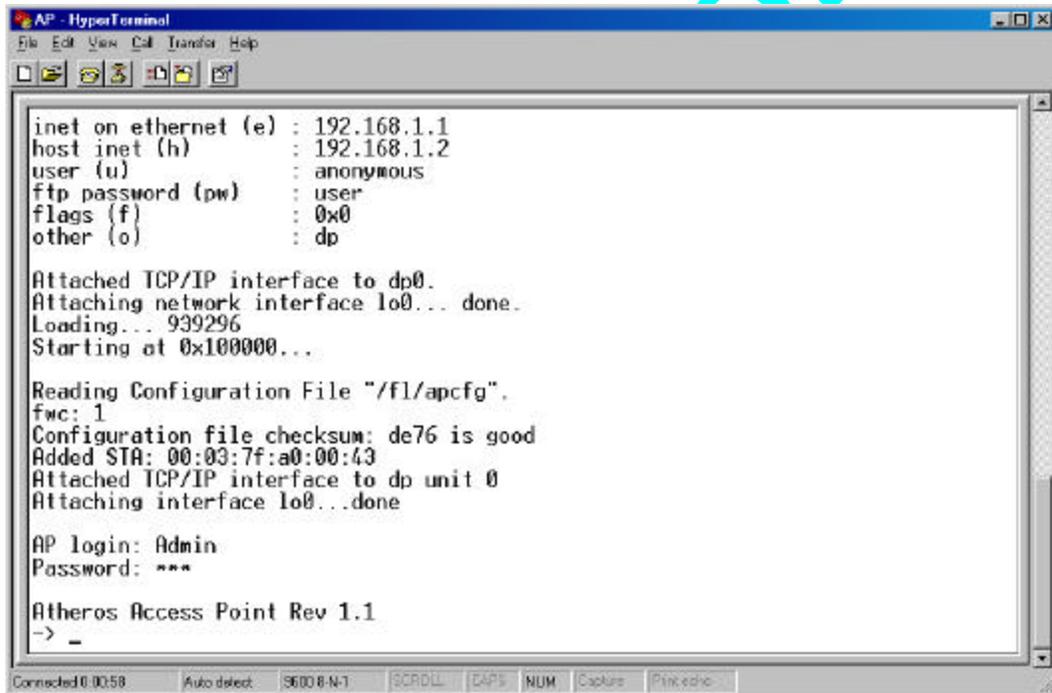
```
inet on ethernet (e) : 192.168.1.1
host inet (h)         : 192.168.1.2
user (u)              : anonymous
ftp password (pw)     : user
flags (f)             : 0x0
other (o)             : dp

Attached TCP/IP interface to dp0.
Attaching network interface lo0... done.
Loading... 939296
Starting at 0x100000...

Reading Configuration File "/fl/apcfg".
fwc: 1
Configuration file checksum: de76 is good
Added STA: 00:03:7f:a0:00:43
Attached TCP/IP interface to dp unit 0
Attaching interface lo0...done

AP login: Admin
Password: ***

Atheros Access Point Rev 1.1
-> _
```

2. Type "set ssid <SSID>" to change the SSID that you wish to specify. Type "set channel <channel>" to change the IEEE radio channel. You must type "reboot" and then press Enter, which reboots the AP, to make any changes effective.
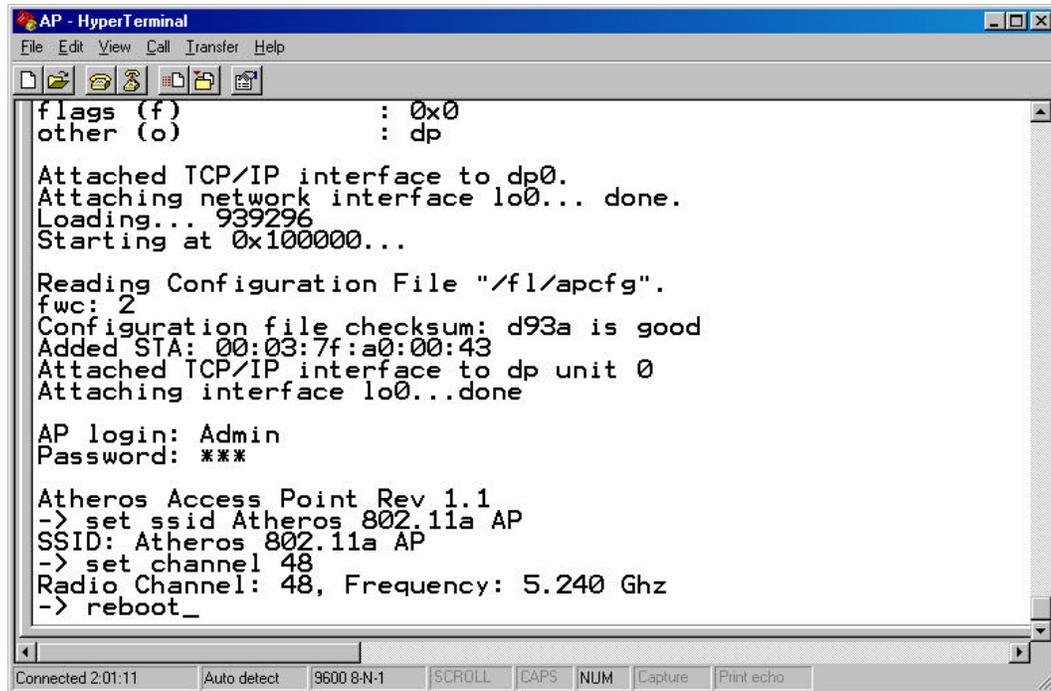
```
flags (f)              : 0x0
other (o)              : dp

Attached TCP/IP interface to dp0.
Attaching network interface lo0... done.
Loading... 939296
Starting at 0x100000...

Reading Configuration File "/fl/apcfg".
fwc: 2
Configuration file checksum: d93a is good
Added STA: 00:03:7f:a0:00:43
Attached TCP/IP interface to dp unit 0
Attaching interface lo0...done

AP login: Admin
Password: ***

Atheros Access Point Rev 1.1
-> set ssid Atheros 802.11a AP
SSID: Atheros 802.11a AP
-> set channel 48
Radio Channel: 48, Frequency: 5.240 Ghz
-> reboot_
```

3. To view CLI command options, log in and type "help" or refer to Appendix B for details about CLI options.

```
set factorydefault       -- Restore to Default Factory Settings
set fragmentthreshold    -- Set Fragment Threshold
set getsnmp              -- Modify Get SNMP Community Name
set gateway              -- Set Gateway IP Address
set hostipaddr           -- Set Host IP address
set ipaddr               -- Set IP Address
set ipmask               -- Set IP Subnet Mask
set key                  -- Set WEP Key
set login                -- Modify Login User Name
set password             -- Modify Password
set power                -- Modify Transmit Power
set rate                 -- Set Data Rate
set retrylimit           -- Set Transmit Retry Limit
set rtsthreshold         -- Set RTS/CTS Threshold
set setsnmp              -- Modify Set SNMP Community Name
set sntpserver           -- Set SNTP/NTP Server IP Address
set ssid                 -- Set Service Set ID
set systemname           -- Set Access Point System Name
set tzone                -- Set Time Zone Setting
set turbo                -- Set Turbo Mode
set wep                  -- Set WEP Mode
timeofday                -- Display Current Time of Day
version                  -- Software version
-> help
```

2.5   Regulatory Compliance Information

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 requires this product to be used indoors for the frequency range 5.15 to 5.25 GHz to reduce the potential for harmful interference to co-channel Mobile Satellite systems.
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 this device.

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. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, with can be determined by turning the equipment of and on, the user is encouraged to try to correct the interference by on or more of the following measures:

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

Modifications made to the product, unless expressly approved by Accton Technology Corp. Communications, could void the user's authority to operate the equipment.

RF Exposure Requirements
To ensure compliance with FCC RF exposure requirements, the antenna used for this device must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or radio transmitter. Installers and end-users must follow the installation instructions provided in this user guide.