A8 Configuration Professional Manual

Version 4.1

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Radio Frequency Interference Requirements

This device complies with Part 15 of FCC Rules.
Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.
3. This device should not be co-located or operating in conjunction with any other antenna or transmitter.

Interference Statement

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, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

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

FCC Caution: To assure continued compliance, (example – use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Warning

The user must keep apart from the base-station and antenna with at least 45cm when the base-station is in operation.

Table of Content

1 INTRODUCTION

This manual is to summarize how to perform basic configuration for the ASTRI A8 through console connection and web-admin.

2 A8 MODEL AND FIRMWARE VERSION

This manual is applicable for the following models, hardware and firmware version:

Product name : **A8 802.11ab/g AP BS/Bridge AC**
Model number: **WA8011A-A**

Product name : **A8 802.11b/g AP BS AC**
Model number: **WA8011A-B**

Hardware Platform	Firmware Version	Remark
R1	**1.1.1.9**	N/A
R2	**1.2.0.5**	N/A
	1.2.4.2	Web-admin for 802.11b/g
	1.2.5.1	N/A
	1.2.5.4	N/A
	1.2.6.3	Web-admin for 802.11a

3 CONFIGURATION BY CLI (COMMAND LINE INTERFACE)

3.1 CONSOLE CONNECTION

The A8 can be connected and configured through the console connection.

1. Connect the A8 with the PC serial port via the console cable.
2. Run the "HyperTerminal" program, under **`Start`** > **`Programs`** > **`Accessories`** > **`Communications`** > **`Hyperterminal`**
3. Select the serial port and then set the properties of connection as below (Figure 1).
   - `Baud rate = 115200`
   - `Data bits = 8`
   - `Parity = None`
   - `Stop bits = 1`
   - `Flow control = None`
4. Click OK to login to A8.

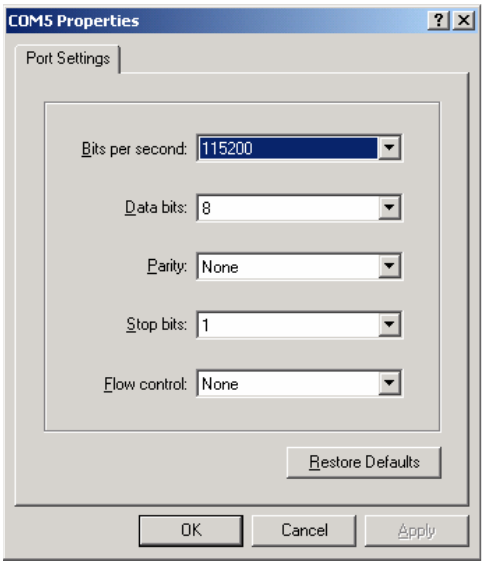

Figure 1. Serial COM port setting in hyperterminal

3.2 TELNET CONNECTION

An alternative is using telnet to login to the BTS, as shown in Figure 2.

Figure 2. Telent Login

3.3 USER LOGIN

After connecting to the A8, the user needs to enter a user name and password to login. Please contact astri for the details if required.

You could change the login name and password in web-admin, as shown in Section 5.1.

The login name and password could be reset to the default settings in CLI (in Section 3.9) or in BootRom (in Section 9.1).

3.4 BASIC CONFIGURATION

The channel frequency, TX power, ACL can be configured through command line interface (CLI).
There are two basic commands:

1. **`GET`** : This command is used to retrieve the settings or parameters in A8.
   Example : **`get channel`**
   The above command is to retrieve the current channel configured in A8.

2. **`SET`** : This command is used to configure the A8.
   Example : **`set channel 1`**
   The above command is to configure the A8 to operate at Channel 1.

An example is shown in Figure 3.

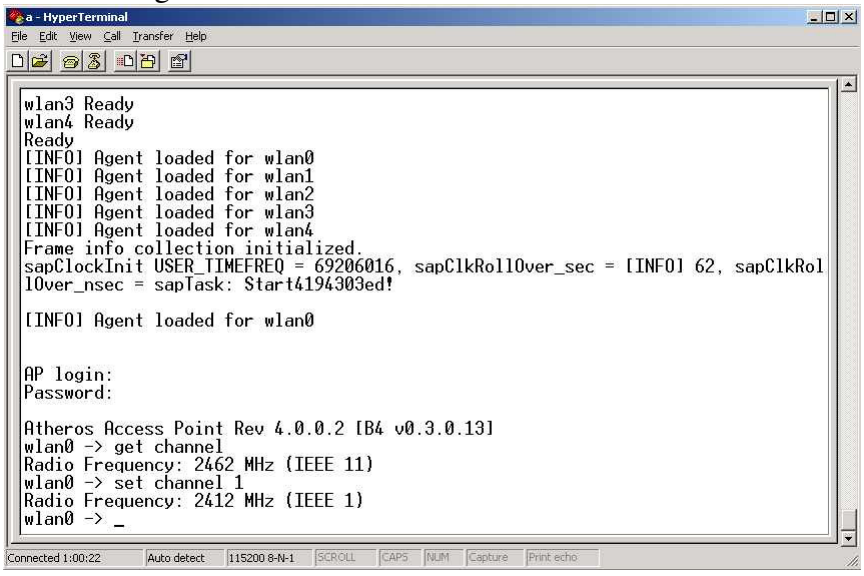

Figure 3. An example in CLI

3.5 NETWORK CONFIGURATION

3.5.1 Static IP Setting

Command line syntax of setting IP:

```
set ip <ip address of A8>
set ipmask <subnet mask>
set gateway <ip address of gateway>
reboot
```

You must reboot the A8 to activate this setting.

Example:

```
set ip 192.168.0.30
set ipmask 255.255.255.0
set gateway 192.168.0.1
reboot
```

PARAMETER	RANGE	COMMAND EXAMPLE
ipaddr	<ip address>	Set ip 192.168.0.30
ipmask	<subnet mask>	Set ipmask 255.255.255.0
gateway	<ip address>	Set gateway 192.168.0.1
Dhcpc	Enable / disable	Set dhcpc enable

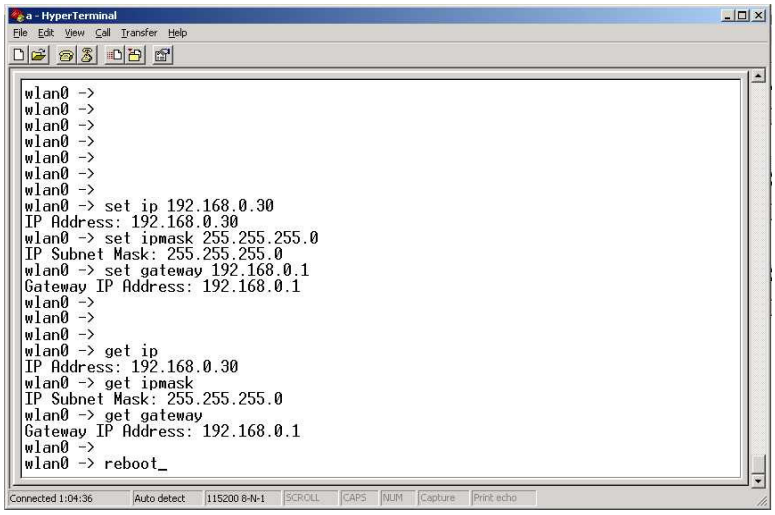

Figure 4. An example of setting IP address

3.5.2 Dynamic IP Setting

The A8 can acquire a dynamic IP address from a DHCP server by the following command:

```
set dhcpc enable
reboot
```

This function can be disabled by the following command:

```
set dhcpc disable
reboot
```

You must reboot the A8 to activate this setting.

3.6 RADIO CONFIGURATION

The following parameters related to radio interface will be discussed.

PARAMETER	RANGE	COMMAND EXAMPLE
channel	1 – 11	Set channel 11
power	0 – 18	Set power all 21
ssid	(name of SSID)	Set ssid B4
ssidsuppress	enabled / disabled	Set ssidsuppress enabled

3.6.1 Channel

Command line syntax of setting the channel:

set channel *<channel number>*

where channel number: 1 - 11

Example:

```
set channel 11
```

3.6.2 Transmit Power

Command line syntax of setting transmit power:

set power *<sector> <power level>*

where sector: all, 0, 1, 2, 3
power level: 0 to 18, integer number in dBm

Note:
You could set the power level for a particular sector 0, 1, 2, 3 at different power level. Also, you could set all sectors having the same power level. It is recommended to set all sectors at 21dBm; i.e. sector = all, power = 21.

Example:

```
set power all 21
```

The above command sets all sectors transmitting at an output transmit power of 21dBm.

```
set power 2 17
```

The above command sets Sector 2 transmitting at an output transmit power of 17dBm.

Note: In order to comply with the FCC and Industry rules, please refer to Section 11 for the guideline of power setting.

3.6.3 SSID & SSIDsuppress

Command line syntax of setting SSID:

set ssid *<ssid>*

where <ssid>: max. 10 alphanumeric characters

Example:

```
set ssid testing
```

Command line syntax of suppressing SSID:

set ssidsuppress enable
reboot

You must reboot the A8 to activate this setting.

3.7 ADVANCED CONFIGURATION

More A8 Settings

PARAMETER	RANGE	COMMAND EXAMPLE
Factory	<none>	Set factory
SNTPServer	<ip address>	Set sntpserver 10.0.0.5
TZONE	-12 to +14	Set tzone +8
Time	<none>	Get time
acl	Strict	Set acl strict
acl	Allow	Set acl allow 00:01:22:f4:56:e8
acl	Del	Del acl 00:22:33:44:55:66
Config Virtual	0 to 7	Config virtual 2
Active	Enable / Disable	Set active enable

3.7.1 NTP (Network Time Protocol)

Command line syntax of collecting clock information from a NTP server:

```
set sntpserver 10.5.5.100
set tzone +8
reboot
```

where 10.5.5.100 is the NTP's IP address

Note: You must reboot the A8 to activate this setting. You could check the clock by:

```
get time
```

3.7.2 ACL Configuration

Command line syntax of setting the ACL:

```
set acl strict
set acl <allow or deny> <client wlan card mac address>
reboot
```

An entry in the ACL can be removed as follows:

```
del acl <client wlan card mac address>
reboot
```

You must reboot the A8 to activate this setting.

Example:

```
set acl strict
set acl allow 00:20:A6:34:5E:23
del acl 00:02:20:30:44:55
reboot
```

3.7.3 Encryption (WEP)

Command line syntax of setting the WEP:

```
set encryption enable
set auth <open/shared/auto/WPA/WPA-PSK/WPA2/WPA2-PSK/WPA-AUTO/WPA-AUTO-PSK>
set keyentry <HEX/ASCII>
set key <1/2/3/4> <40/104/128> <KEY#>
reboot
```

You must reboot the A8 to activate this setting.

Example:

```
Set encry enable
Set auth shared
Set keyentry hex
Set key 1 40 1234567890
reboot
```

Note: It is easier to configure encryption in web-admin interface. Please refer to section 5.4.4 for the details.

3.7.4 VAP (Virtual AP)

With the default settings, only virtual AP 0 is enabled. You could enable and configure VAPs by the following CLI:

```
Config virtual <VAP#>
set active <enable/disable>
```

where <VAP#> is from 0 to 7, default is 0.

Note: A Reboot is not required to active this function. You could configure the corresponding SSID, ACL, etc… under this virtual AP number.

Example:

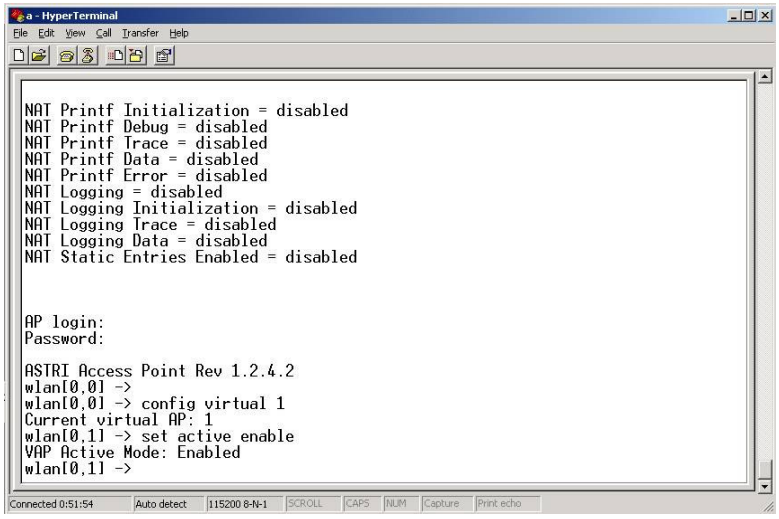

Figure 5. VAP configuration in CLI

3.8 802.11A BRIDGE

802.11a function is an optional function requiring hardware to support. Only an A8 BTS having a connector at the 'a' port can support this function, as shown in Figure 6.

Figure 6. A8 BTS with 802.11a bridge hardware – "a" port

The 802.11a bridge function is configured via WLAN 6 and is enabled in the default setting. It is also set to transmit at maximum output power. You could use the following command to check its state.

```
Config wlan 6
get wlan
get wirelessmode
```

Example:

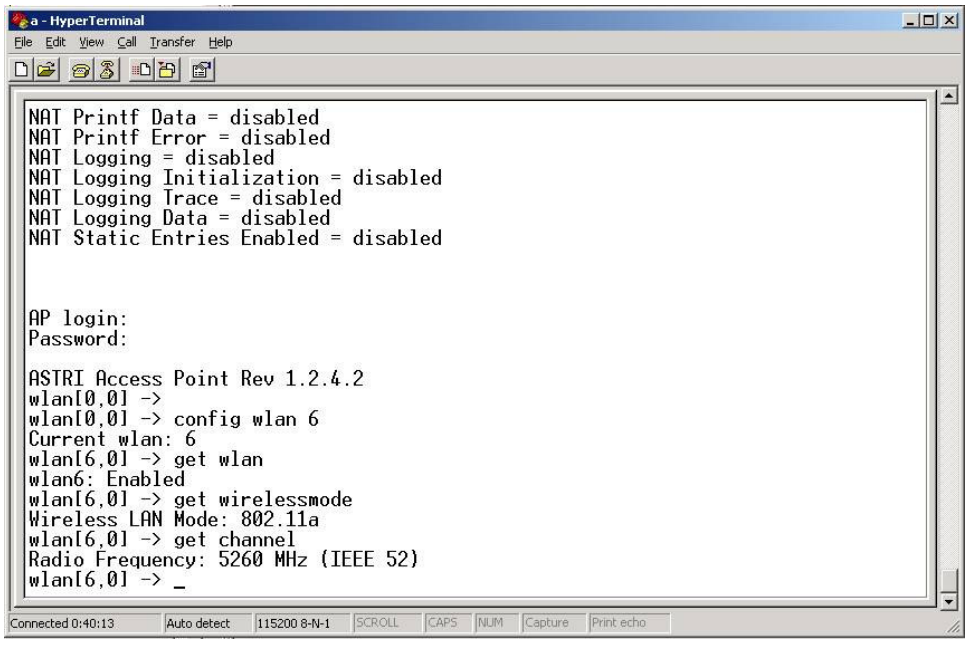

Figure 7. 802.11a in A8 BTS

PARAMETER	RANGE	COMMAND EXAMPLE
Config wlan	0 or 6	Config wlan 6
Wlan	Enable / disable	Set wlan enable
Channel	5180, 5200, 5220, 5240, 5260, 5280, 5300, 5320, 5745, 5765, 5785, 5805, 5825	Set channel 5765
PowerReduction	0 – 17 (1dB per unit)	Set powerreduction 10
RemoteWbr	(MAC address of remote bridge)	Add remotewbr 00:02:6F:23:12:34

The 802.11a output power is set to maximum value, which is 17dBm. The parameter PowerReduction is used to reduce the output power relative to the maximum value. So, the default value of PowerReduction = 0. If you want to reduce the 802.11a output power by 5dB, you could type the following command in CLI:

Set Powerreduction 5

The following command is used to add or delete the remote bridge:

Add remotewbr <WBR MAC address>
Del remotewbr <WBR MAC address>
reboot

where <WBR MAC address> is the MAC address of the remote wireless bridge.

You could also view the number of remote wireless bridges configured with this A8:

Get association

Example:
Assuming you are trying to connect two A8's with the following MAC address information:

A8_BTS_1 : 00:02:6f:23:41:EE
A8_BTS_2 : 00:02:6f:23:41:FF

In the CLI of A8_BTS_1:

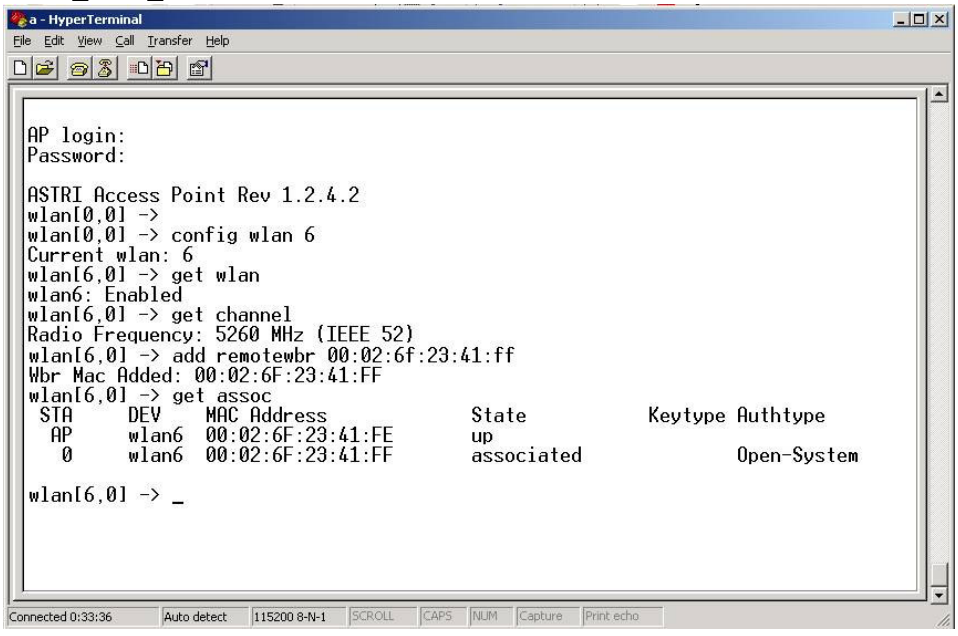

Figure 8. Example – add remote wireless bridge

Repeat the setting in A8_BTS_2. You may need to reboot the BTS to make the setting effective.

Note: Since the 802.11b/g and 802.11a radios are sharing the same IP address, no additional IP address is required. Please note that 802.11a turbo A mode is not supported by the hardware at this moment.

3.9 RESTORE CONFIGURATOIN TO DEFAULT SETTING

Command line syntax of restoring A8 to its default setting:

```
set factory
reboot
```

After the A8 rebooted, all parameters will be restored to its default values, except ***IPAddr***, ***IPMask*** and ***Gateway***.

Note: You must "**reboot**" to restore the default settings. Don't make any parameter changes after typing the command "set factory" in CLI before allowing the unit to reboot.

4 SOFTWARE UPGRADE VIA THE CLI

4.1 FIRMWARE UPGRADE

The firmware upgrade procedure is shown below:

1. Store the new firmware in the FTP Server. The name of the new firmware should be **B4.img**.
2. Create a user profile in the FTP server.
3. Connect the FTP server and the A8 onto the network; check the connection between the A8 and FTP server (e.g. by ping).
4. AT the A8 CLI, login to the FTP server and then download the new firmware from the FTP server into the A8. Figure 10 shows an example.
   For this example the settings are:
   - `A8 IP address : 192.168.0.30`
   - `FTP Server IP : 192.168.0.67`
   - `Username in FTP Server : a (your ftp user name)`
   - `New firmware filename : B4.img`
5. Wait until the download is completed. Check if the firmware has successfully downloaded by using the command **`ls`** in the CLI.
6. Reboot the A8 with the command **`reboot`**.
7. After rebooting, login to the A8 and check if the new firmware is successfully loaded using the command **`version`**.

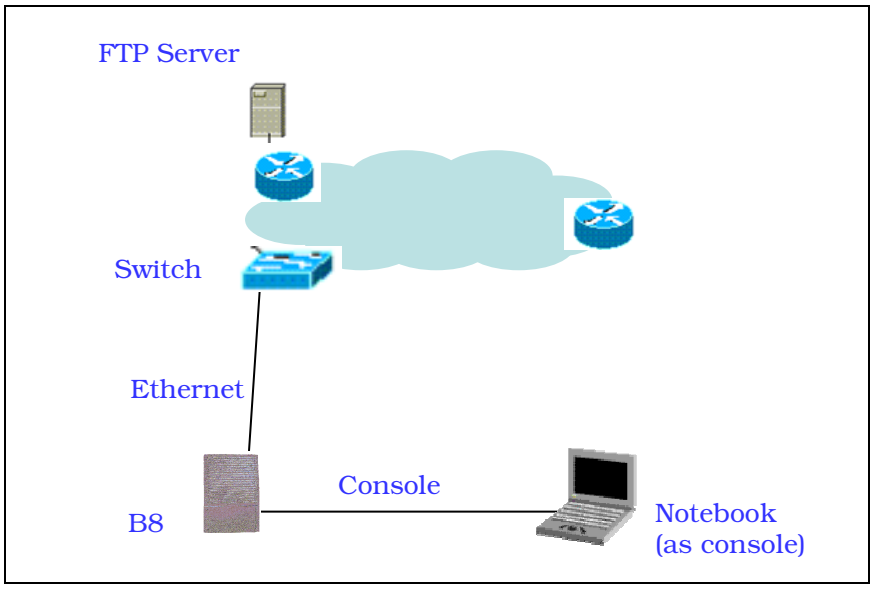

Figure 9. Setup for firmware transfer and upgrade

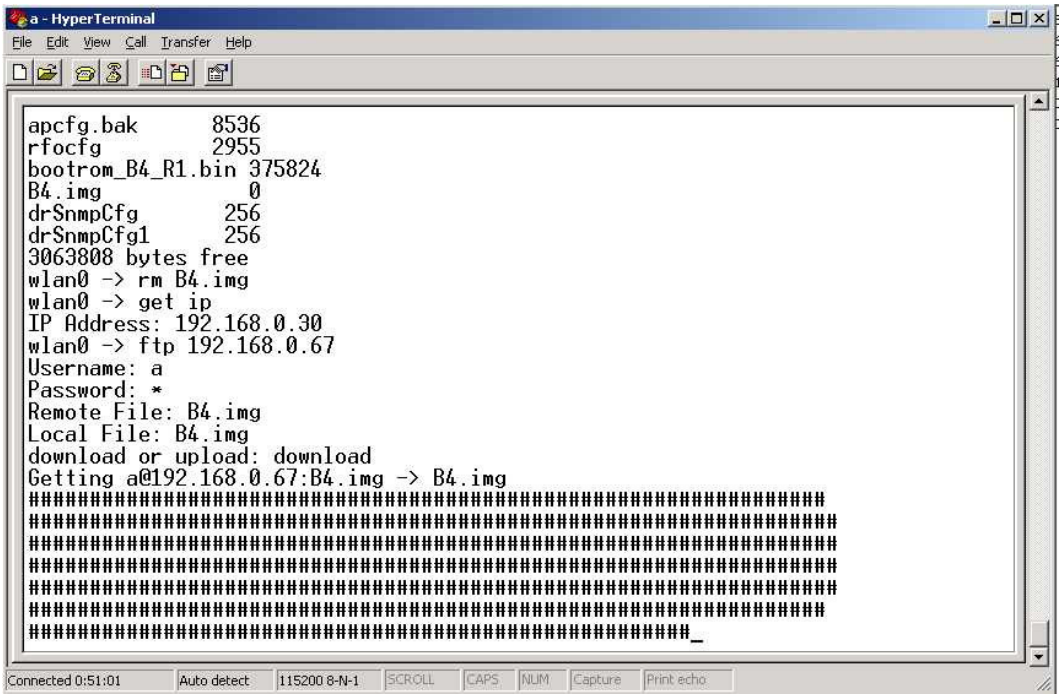

Figure 10. Downloading new firmware from FTP Server

4.2 FPGA UPGRADE

The FPGA upgrade procedure is similar to Section 4.1, except that the FPGA file name is **fpga.hex**.

Warning: The A8 BTS will not be working properly if there is some mistaken in the upgrade process. You are not advised to perform firmware or FPGA upgrade if you have no received any training from ASTRI or its partners.

5 CONFIGURATION BY WEB-ADMIN

5.1 IE CONNECTION

The A8 can be accessed through Internet Explorer (IE).

1. Open an IE session and type the ip address of the A8. Example: https://10.6.48.119, where 10.6.48.119 is the A8's IP address. The ***default IP address*** is ***192.168.1.222***.
2. A window will pop up. Enter the user name and password, which are the same as for the CLI.
3. A login page in IE appears, as shown in Figure 12. A **Tool Bar** is located on the left hand side of the IE window. You can access different functions through the tool bar.

Figure 11. Enter User name and password

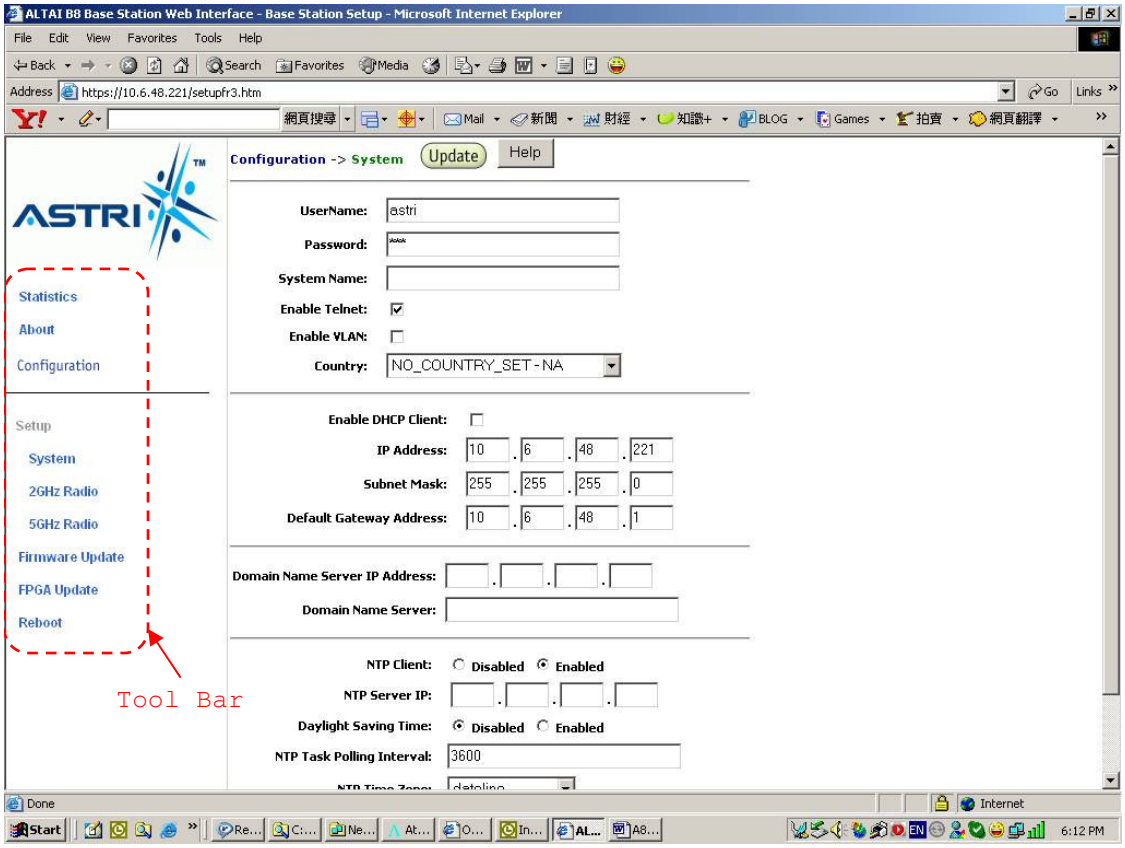

Figure 12. Web-admin Login Page

5.2 CHECKING THE A8 FIRMWARE VERSION

The running version can be checked by selecting **About** in the menu bar. In Figure 13, the firmware version is 1.2.6.3. FPGA version is 45. SAP BSP stands for Smart Access Point Board Support Package, which is hardware related version number.

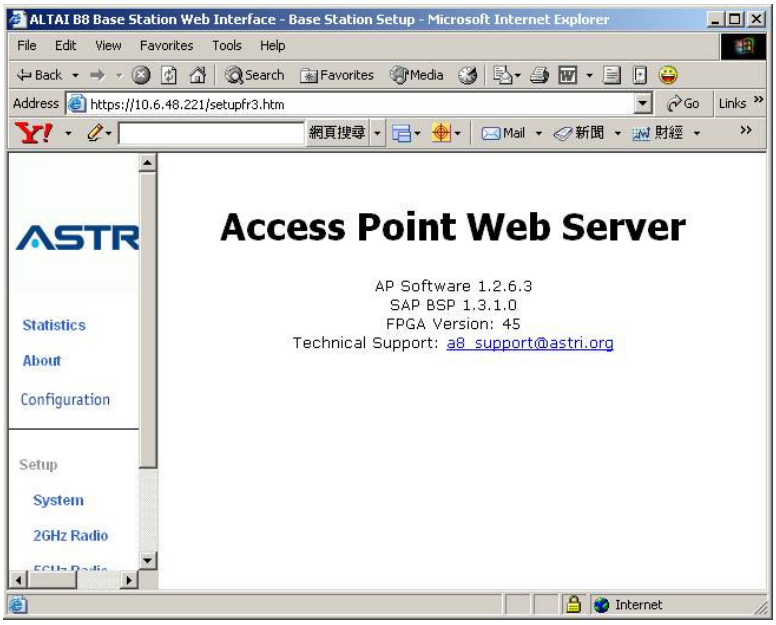

Figure 13. Firmware Version

5.3 SETUP – IP ADDRESS

The user can configure the IP address by selecting **System** in the tool bar, as shown in Figure 14. By clicking the box of **Enable DHCP Client** and button **Update**, the A8 BTS will acquire a dynamic IP address from the DHCP server after reboot.

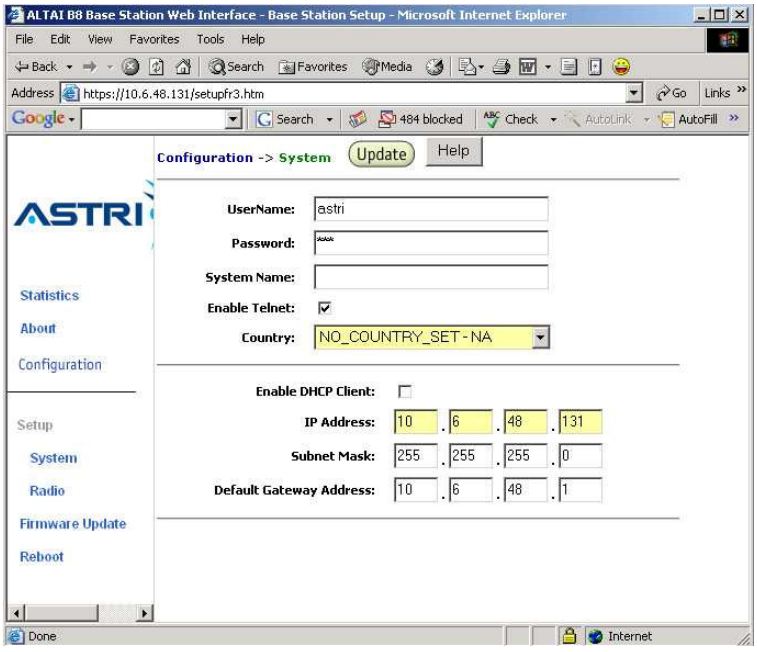

Figure 14. IP Address Configuration

5.4 SETUP – RADIO PARAMETER

The *Channel*, *Output Power*, *SSID*, and *VAP* (Virtual AP) can be configured by selecting **Radio** in the tool bar, as shown in Figure 15.

5.4.1 Output Power

You can set the power for each sector in this area. You may also turn ON or OFF any sector individually by selecting **Disabled** or **Enabled** in State.

5.4.2 SSID & VAP

For the VLAN, a single VAP is enabled in the default settings. The enabled VLAN, or **VAP ID**, is indicated by the **Up** State, as shown in Figure 15.

The user can alter the individual VAP setting (including SSID) by selecting SSID. The setting of each VAP is shown in Figure 16.

5.4.3 ACL

The ACL can be enabled by selecting **Strict** in the **Access Control List** in Figure 16. Clicking **Edit ACL Settings**, a window, as shown in Figure 17, is shown to add MAC address (allow or deny).

5.4.4 Encryption & Authentication

The encryption can be enabled by clicking the **Enabled** button in Figure 18.

After selecting **Open-System** or **Shared-Key**, the WEP key settings can be defined by clicking the button **Edit Cipher Settings**, as in Figure 19.

WPA can be enabled by selecting **WPA** in Figure 18. The related settings are shown in Figure 20.

Note: Click the button **Update** to store the WEP or WPA settings.

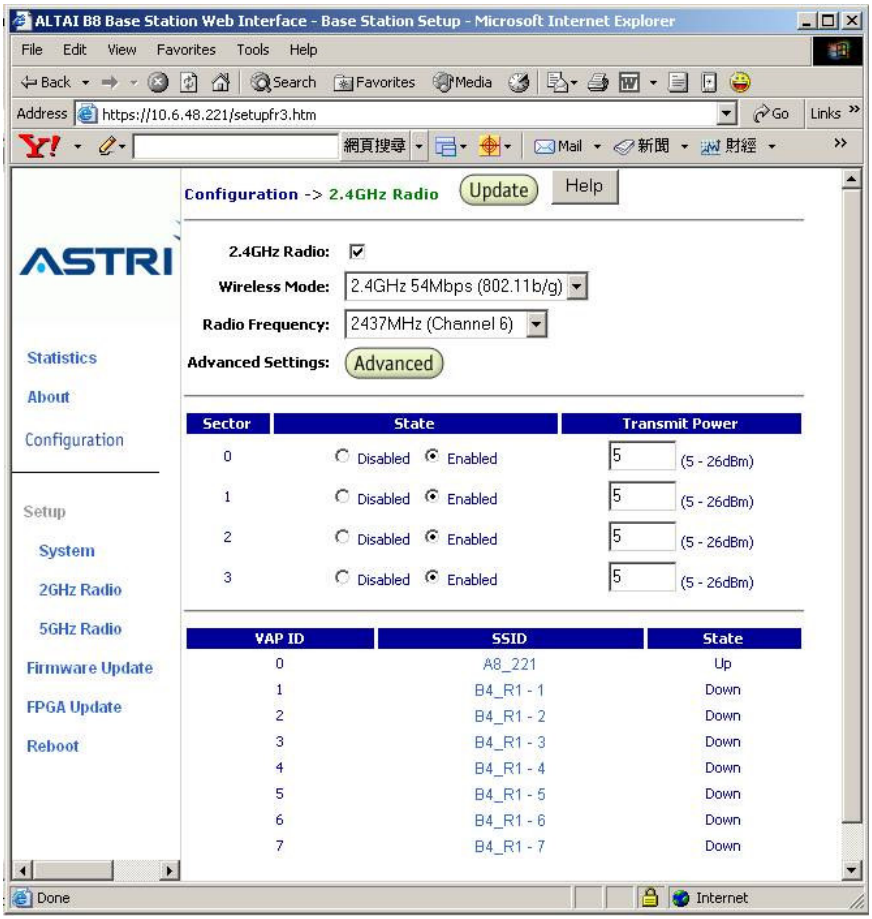

Figure 15. Radio Parameter Configuration

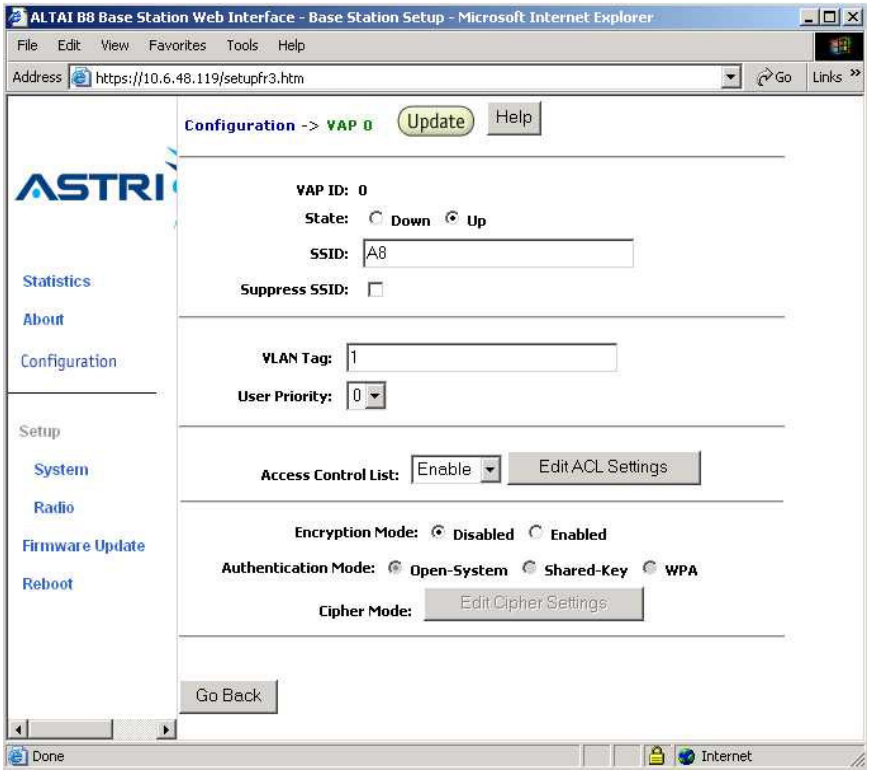

Figure 16. VAP Setting

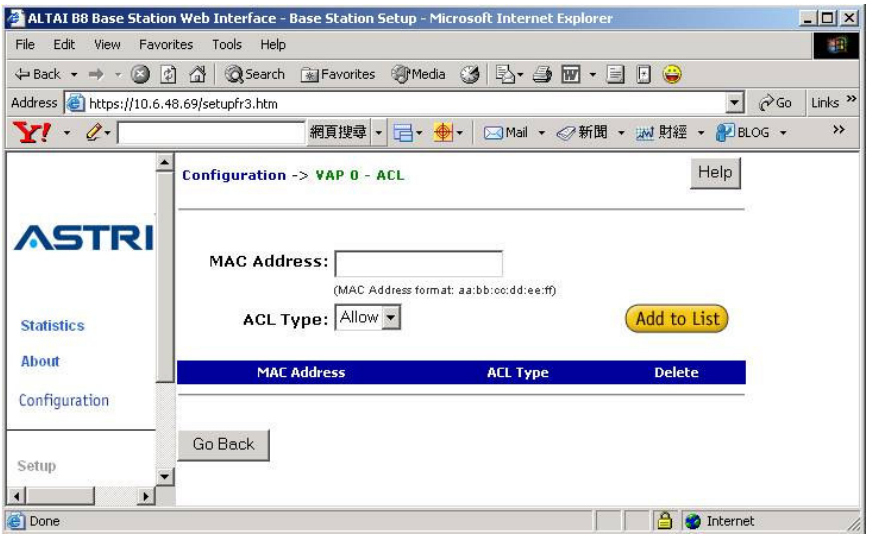

Figure 17. adding MAC list

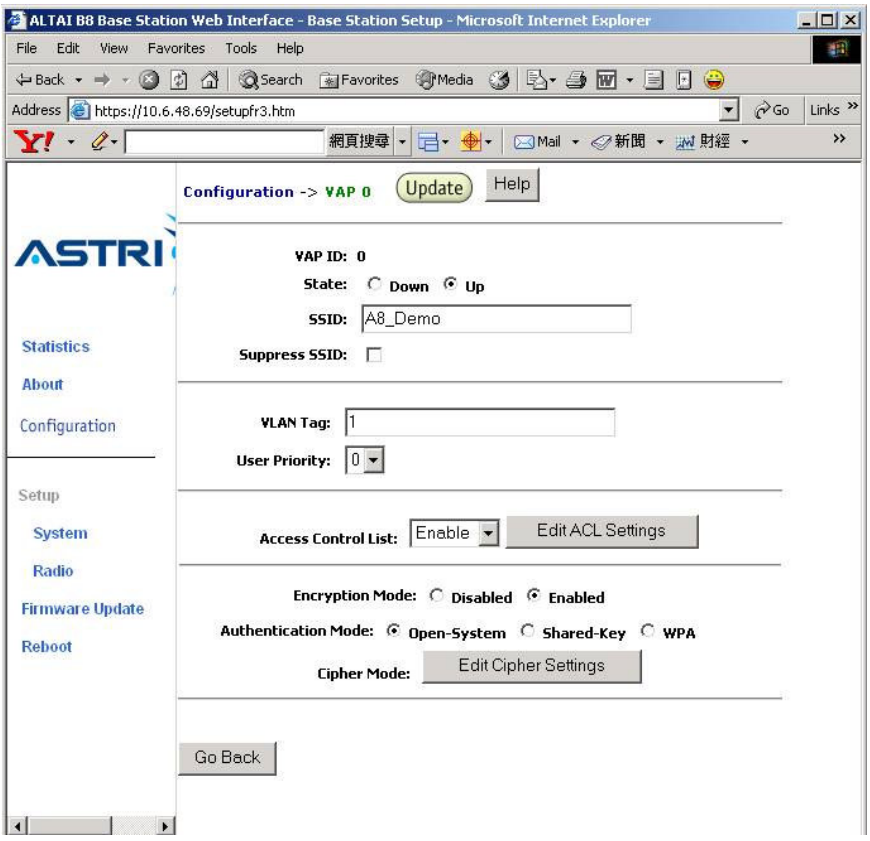

Figure 18. Enabling Encryption Mode

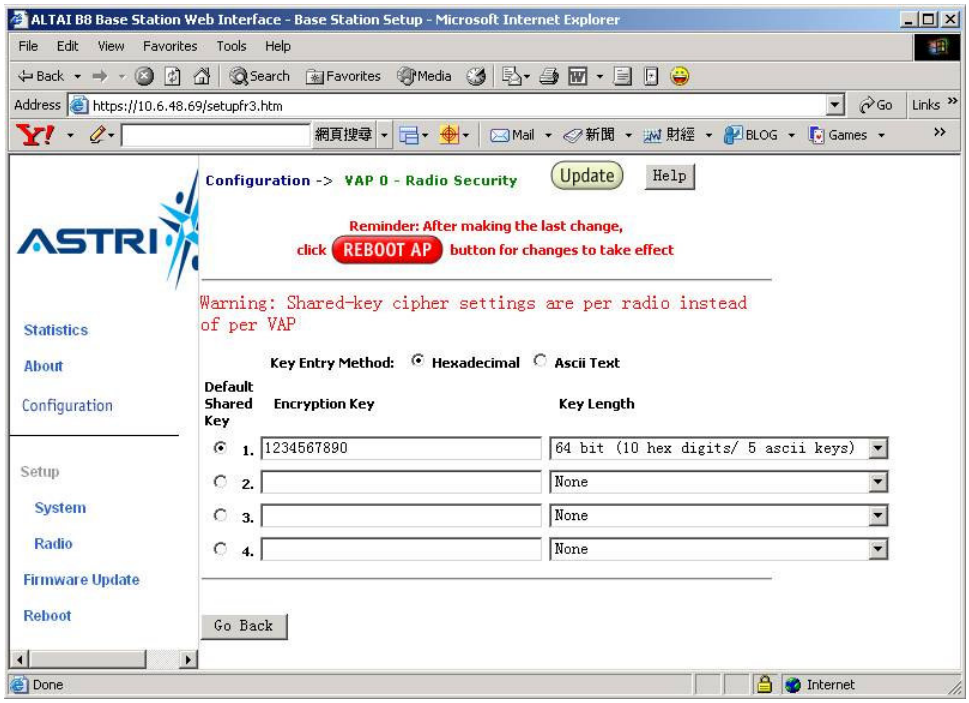

Figure 19. WEP Key Settings

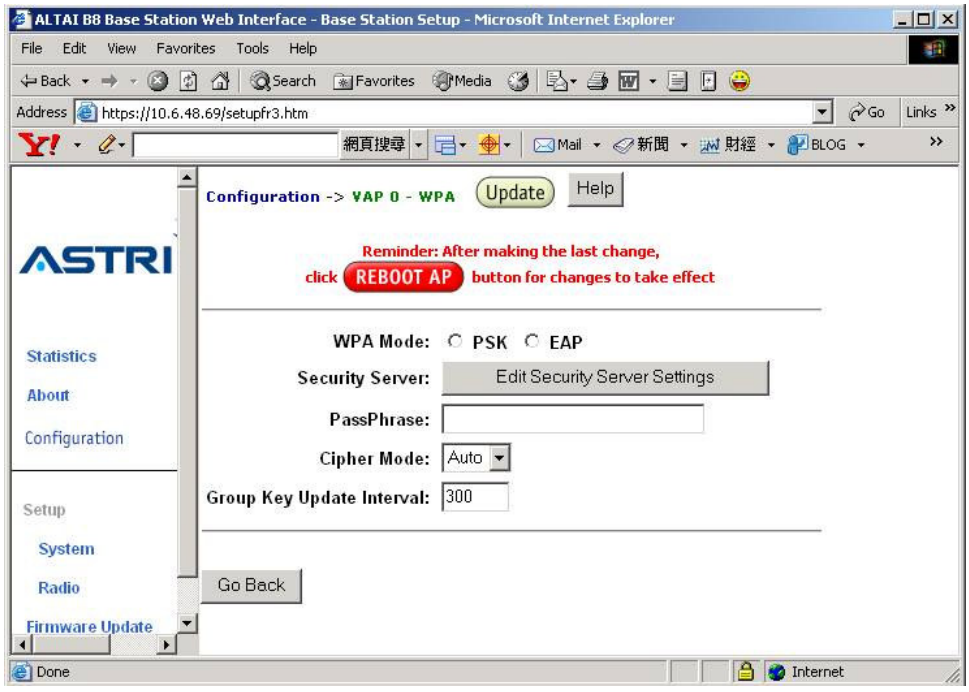

Figure 20. WPA Settings