SENAO

SL-2511AP2 PLUS

Wireless LAN Access Point
User's Guide

1 Features

- Fully interoperable with IEEE 802.11b compliant products.
- High-Speed data transfer rate up to 11Mbps.
- 64-bit and 128-bit WEP Encryption.
- MAC Address and TCP/UDP/IP filtering.
- Web-Based Network Manager/Telnet for Configuring and Managing Your Access Points.
- SNMP MIB I and MIB II supported.
- Capable of acting as a DHCP Server.
- Remote Management supported.
- Firmware Upgrade via WEB/TFTP

2 Hardware Configuration

2.1 Hardware Configuration

1. **RJ-45 Ethernet connector**
   Provides 10/100 Mbps connectivity to a wired Ethernet LAN.
2. **Reset Button**
   By pressing this button for over 3 seconds, the AP will be reset with factory default configuration.
3. **Power Supply connector**
   It is for connecting to the power adapter.

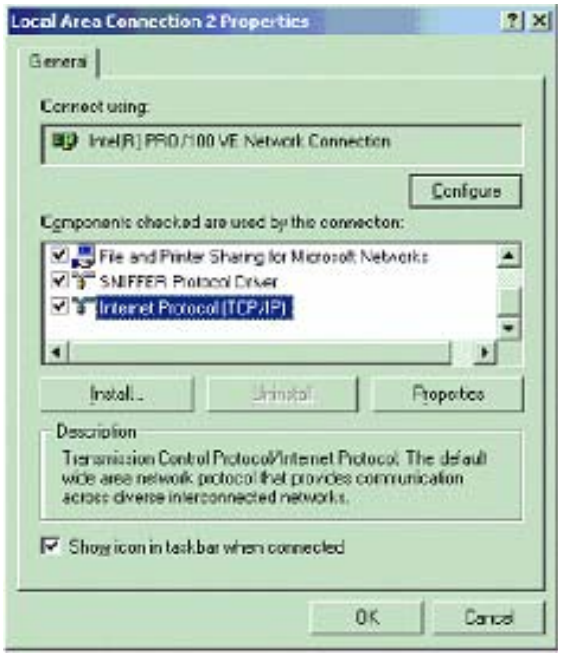
2.2 Hardware Installation

1. Configure your notebook or PC with Wireless LAN card.
2. For Wired LAN, connect your PCs' Ethernet port to any AP's LAN port by an Ethernet cable.

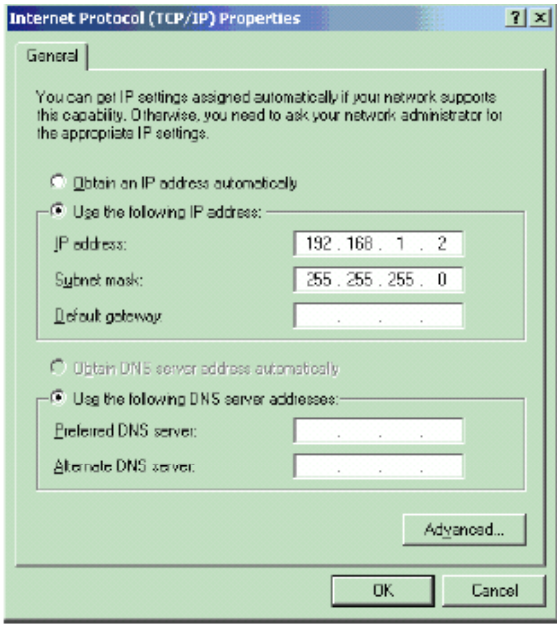
3. For WLAN, locate the AP to a proper position.
4. Plug the power cord into a power outlet.

3 Initial Software Installation and Configuration

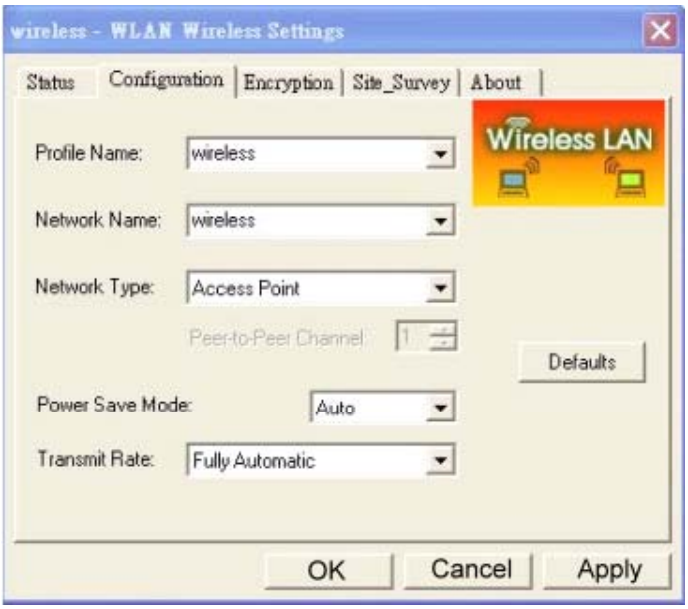
1. Change the TCP/IP setting of your managing computer. Select the TCP/IP line that has been associated to your network card. Click the **Properties** button.



2. Make sure the IP address of your computer and the AP are in the same subnet. The default IP address of the Access Point is 192.168.1.1 and the default subnet mask is 255.255.255.0.



3. For WLAN, open the WLAN client utility. Click **Configuration** tab. Type default SSID (default SSID: wireless) in the Network Name field. Choose “Access Point” for Network Type, then click **OK** button.
   Note: the default channel is 6.



4 Configuring the Access Point through Web Browser

The Access Point can be configured through your web browser with the Web-Based Utility. Open your web browser and type the default IP address of the AP in the address field (default IP: 192.168.1.1) and press **Enter**. Make sure the IP address of AP and your computer are in the same subnet.

After the connection is established, you will see the User Login page as shown below. Leave the password field blank when the first time you open the Web-Based utility. You can change the password on the "Administrator settings" page.

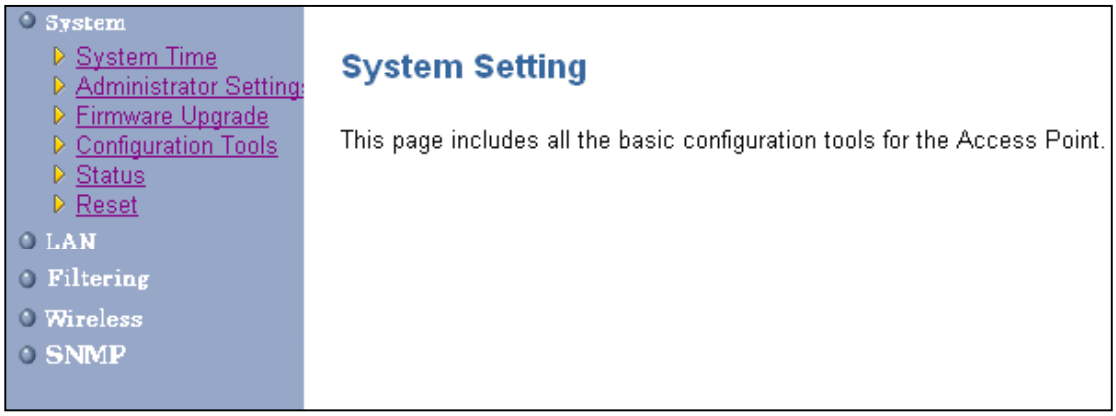
The system will be time out after idling about 1 minute. You have to login again to re-enter the main setting page. You can change the idle time out period on the "Administrator settings" page.

On any page, you can click **HELP** to obtain more descriptions and explanations. To clear any values you've entered on any page, click **CANCEL** and re-enter information.

There are three tabs on the upper right-corner of each page. To go back to the main setting page, press HOME tab. To log out of the web management, press EXIT tab. To complete any change you have made, press RESET tab after clicking APPLY button.

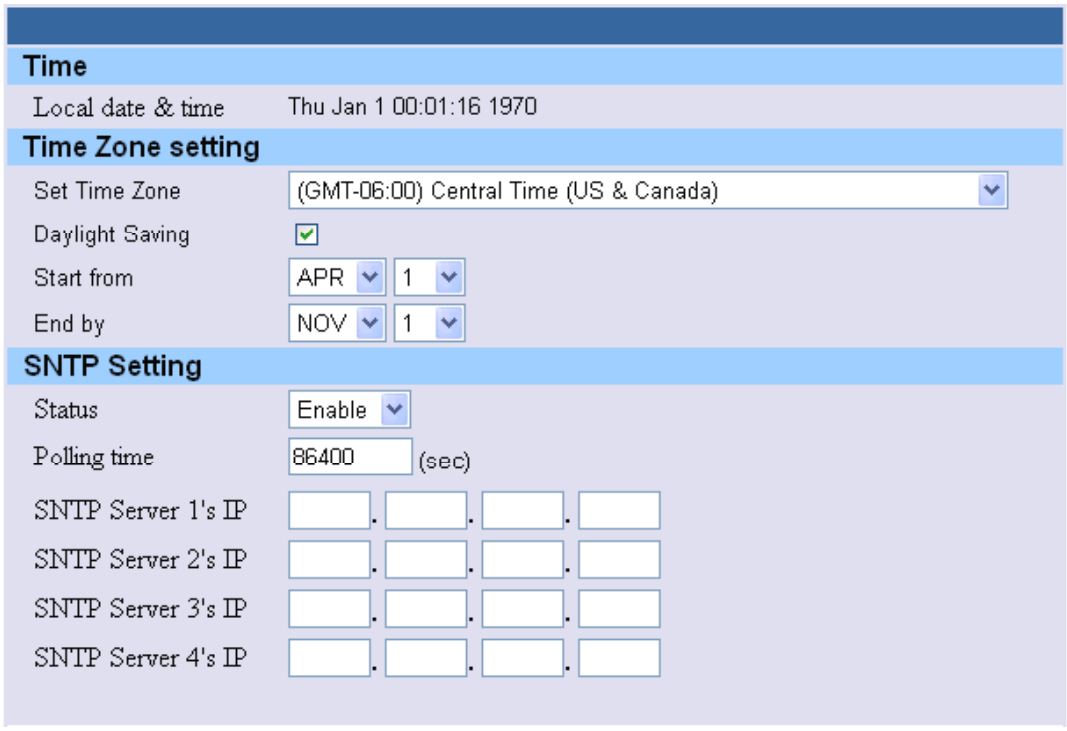
4.1 System Setting

The system setting contains all basic configuration of the Access Point. It includes System Time, Administrator Setting, Firmware Upgrade, Configuration Tools, Status, and Reset.



4.1.1 System Time

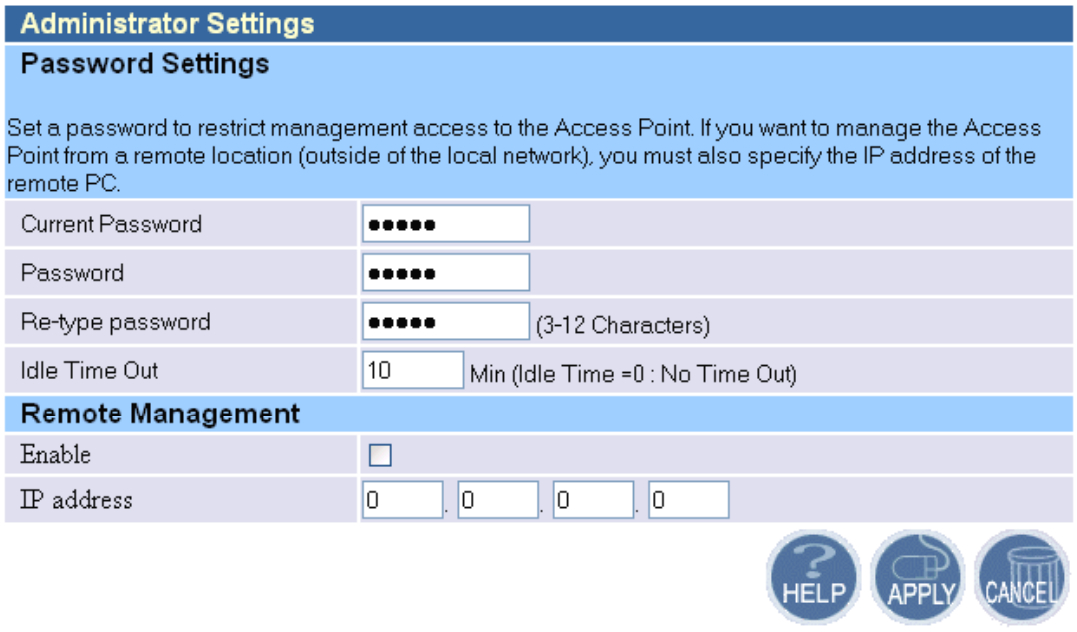
Connecting to a Simple Network Time Protocol (SNTP) server allows the AP to synchronize the system clock to the global internet. The synchronizes clock in the AP is used to control client filtering. The polling time is the time period that the AP sends requests for the correct time. Note



that the polling time can not be less than 3600 sec. Click **APPLY** to complete your change.

4.1.2 Administrator Setting

Set a password to restrict management access to the Access Point. If you want to manage the Access Point from a remote location (outside of the local network), you must also specify the IP



address of the remote PC.

Password Settings:

To change your password, enter your current password in the “Current Password” box. Enter new password in the “Password” box. Enter it again in the “Re-type password” box to confirm it. Click **APPLY** to complete your change.

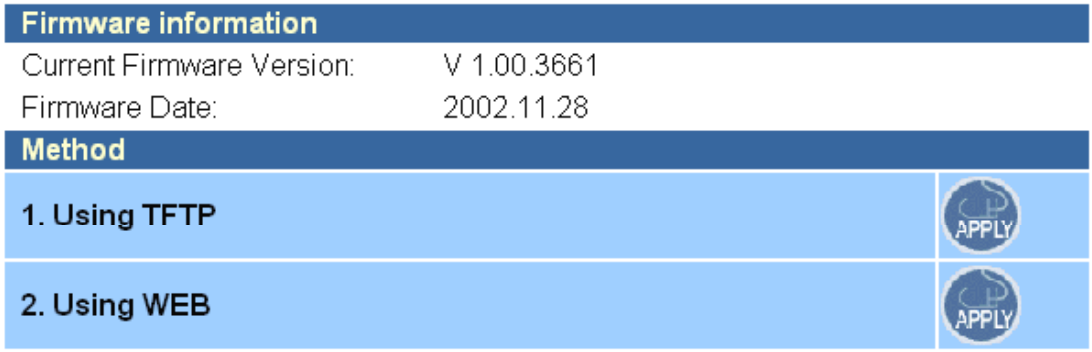
The “idle Time Out” is the amount of time of inactivity before the Access Point will automatically close the Administrator session. Set this to zero to disable it.

Remote Management:

By default, management access is only available to users on your local network. However, you can also manage the Access Point from a remote host. Just check the Enable check box and enter the IP address of an administrator to this screen.

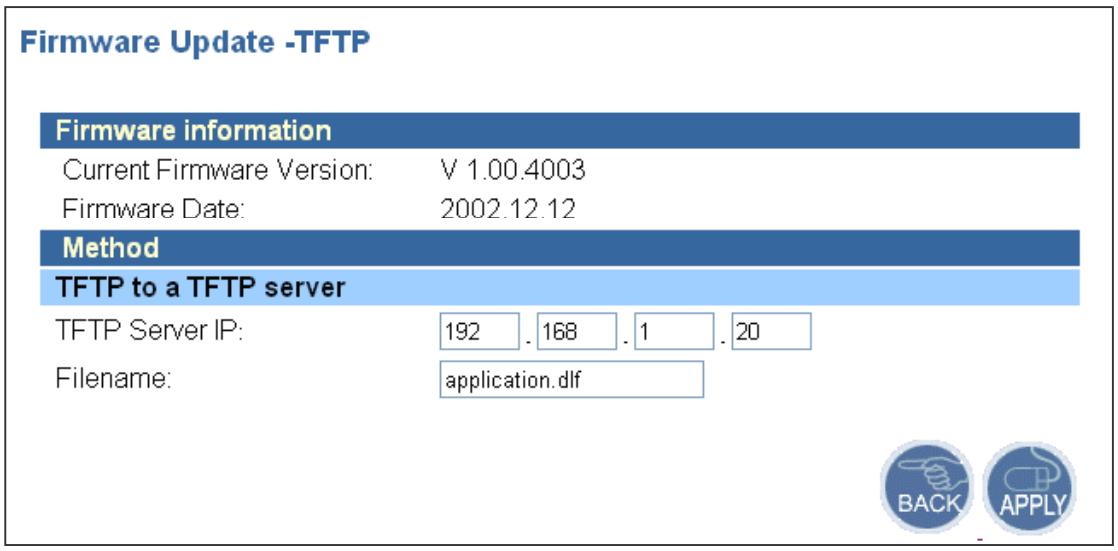
4.1.3 Firmware Upgrade

The firmware information is displayed on this page. You can find firmware version and firmware date here. There are two ways to upgrade the firmware: “Using TFTP” and “Using WEB”. Click **APPLY** to choose the one you want.



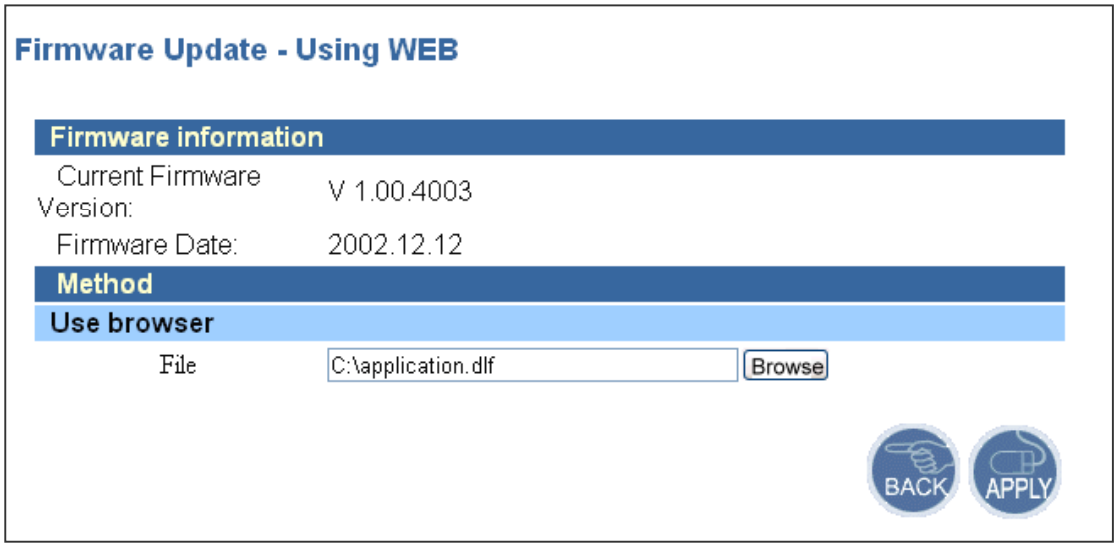
- **Using TFTP**

On the managed computer, run the TFTP Server utility. And specify the folder in which the firmware file resides. After running the TFTP server, enter the TFTP server IP and the filename on the following page. Click on **APPLY** to complete your change.



- **Using WEB**

Type the correct firmware file path and file name on the File field. You can click Browse to select the file location. Click on **APPLY** to complete your change.

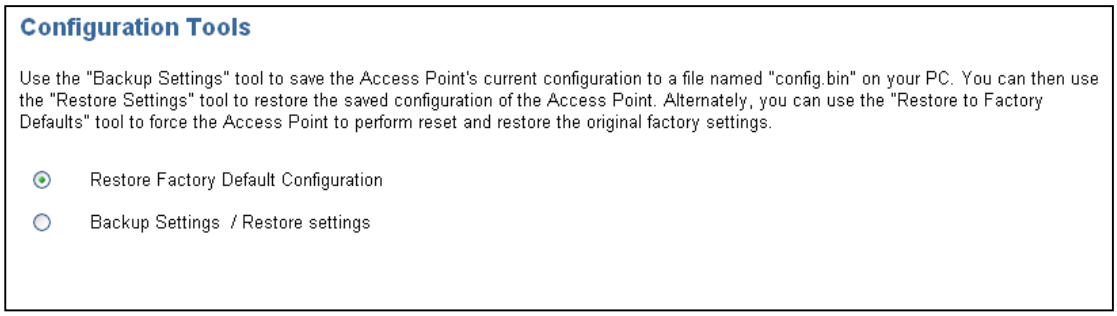


4.1.4 Configuration Tools

This tool can backup or restore the AP's configuration. It can also restore the original factory default settings.

- **Restore Factory default configuration:**

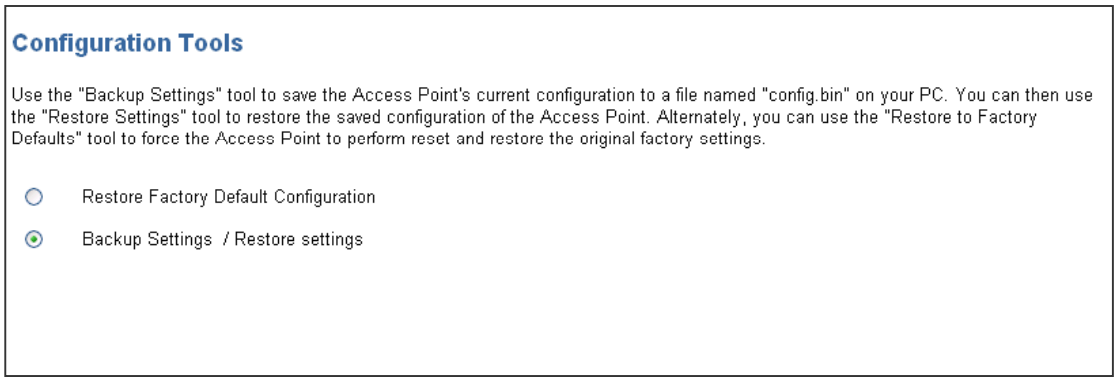
(1) Check the “Restore Factory Default Configuration” radio button then click **APPLY**.



(2) Click **Restore** button to force the Access Point to perform reset and restore the original factory settings.

- **Backup Setting/Restore Settings:**

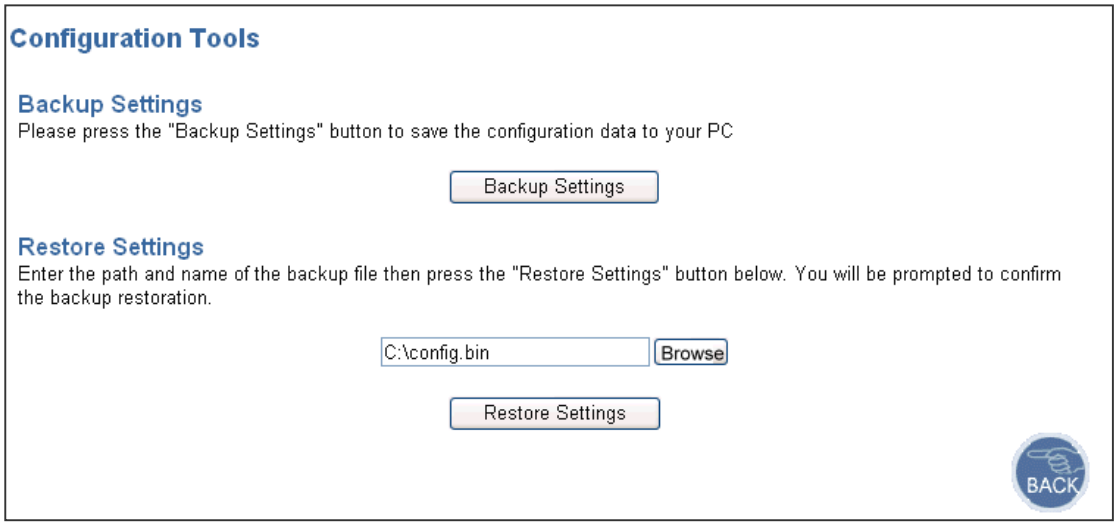
(1) Check the **“**Backup Settings/Restore Settings**”** radio button and click **APPLY**.



(2) To save the Access Point's current configuration to a file named "config.bin" on your PC, click **Backup Settings** button.

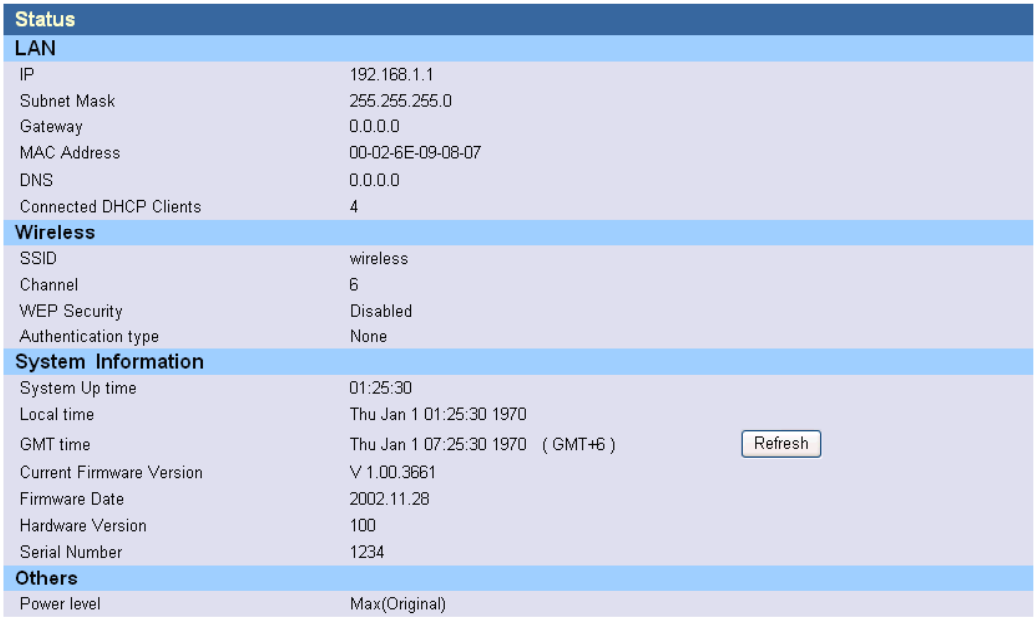
(3) To restore configuration, you can use the "Restore Settings" tool to restore the saved configuration of the Access Point.

(4) Enter the path and file name then click **Restore Settings** button. You can also click **Browse** to locate and select the previously saved backup file.



4.1.5 Status

The Status window displays current information and settings for your AP. It has four main parts - LAN, Wireless, System Information, and Others.



For LAN, it displays AP's IP address, MAC address, Subnet Mask, and Gateway. It also displays the IP address of the DNS and the number of clients connected by DHCP server.

For Wireless, it displays SSID, Channel, WEP security status, and Authentication type.

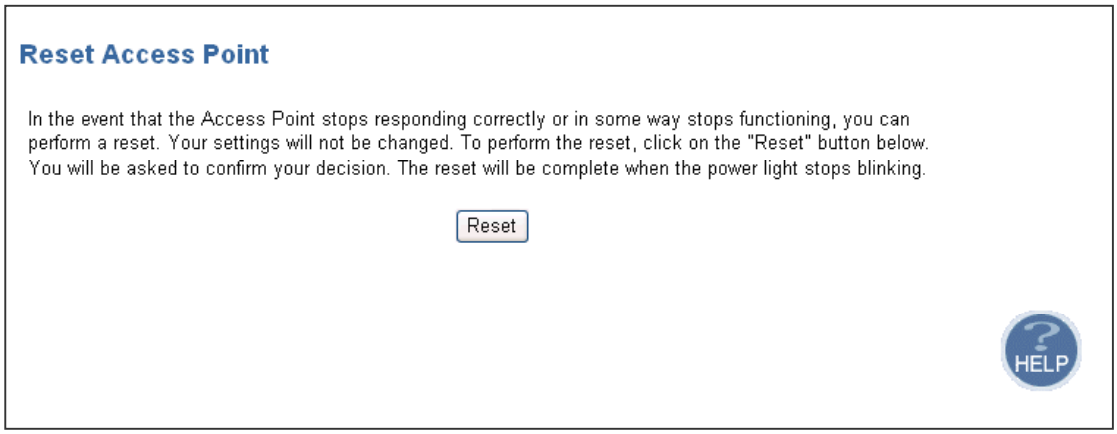
For System Information, it displays system time, firmware version, firmware date, hardware version, and serial number.

For Others, it displays the power level of the AP.

You can obtain the most up-to-date information by pressing the "Refresh" button.

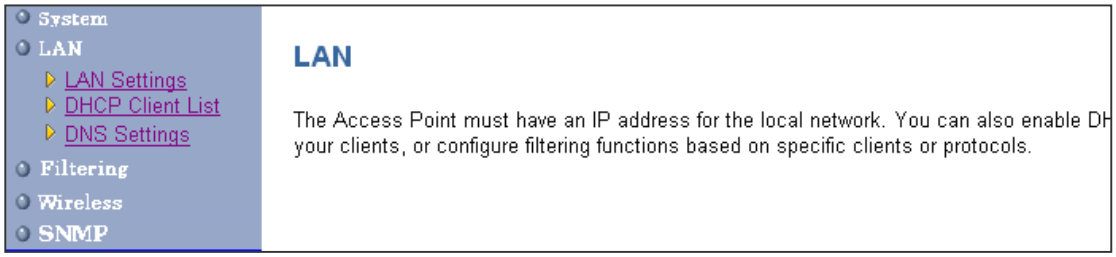
4.1.6 Reset

In the event that the Access Point stops responding correctly or in some way stops functioning, you can perform a reset. Your settings will not be changed. To perform the reset, click on the **Reset** button below. You will be asked to confirm your decision. The reset completes when the power light stops blinking.



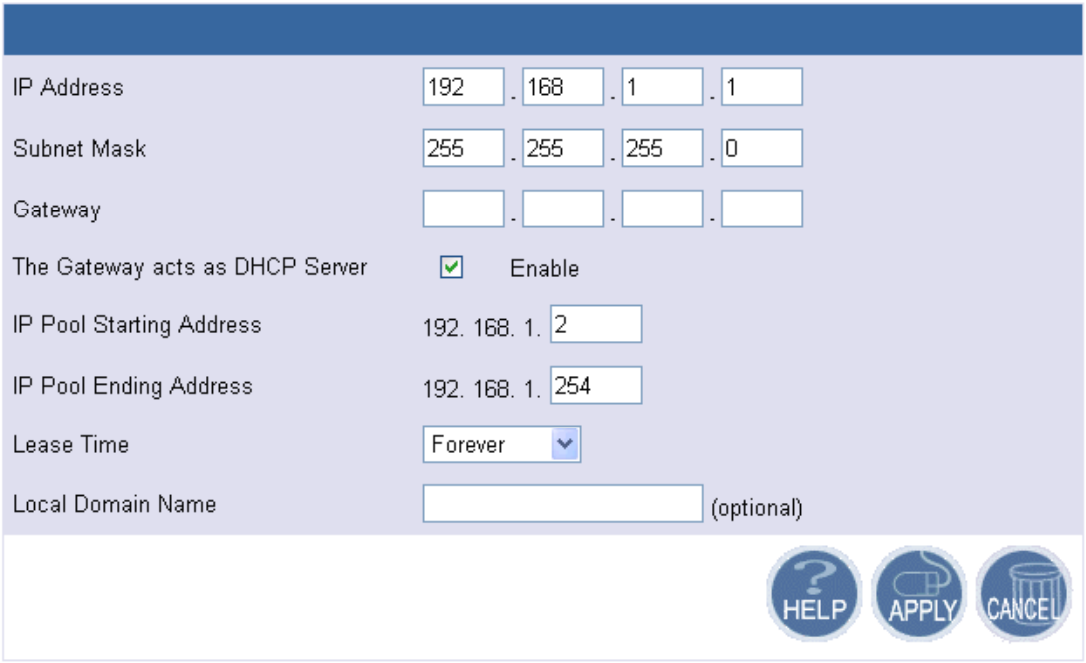
4.2 LAN Setting

The Access Point must have an IP address for the local network. You can enable DHCP service for dynamic IP address allocation to your clients, or configure filtering functions based on specific clients or protocols.



4.2.1 LAN Settings

You can change the basic settings of AP here, including IP address, Subnet mask, Gateway, IP Pool Address, Lease Time, and Local Domain Name. Click **APPLY** to complete your change.



(1) IP Address: The IP address of the AP. You should have a unique IP address to your network. The default value is 192.168.1.1.

(2) Subnet Mask: The Subnet Mask of your Access Point. The default value is 255.255.255.0.

(3) Gateway: It indicated the Network's Gateway. It's optional.

(4) The Gateway acts as the DHCP Server: By default, the AP can function as a DHCP server. The AP can automatically assign an IP address to a client. To disable this function, clear the "Enable" check box.

(5) IP Pool Starting Address & IP Pool Ending Address: The first and the last address in the IP address pool.

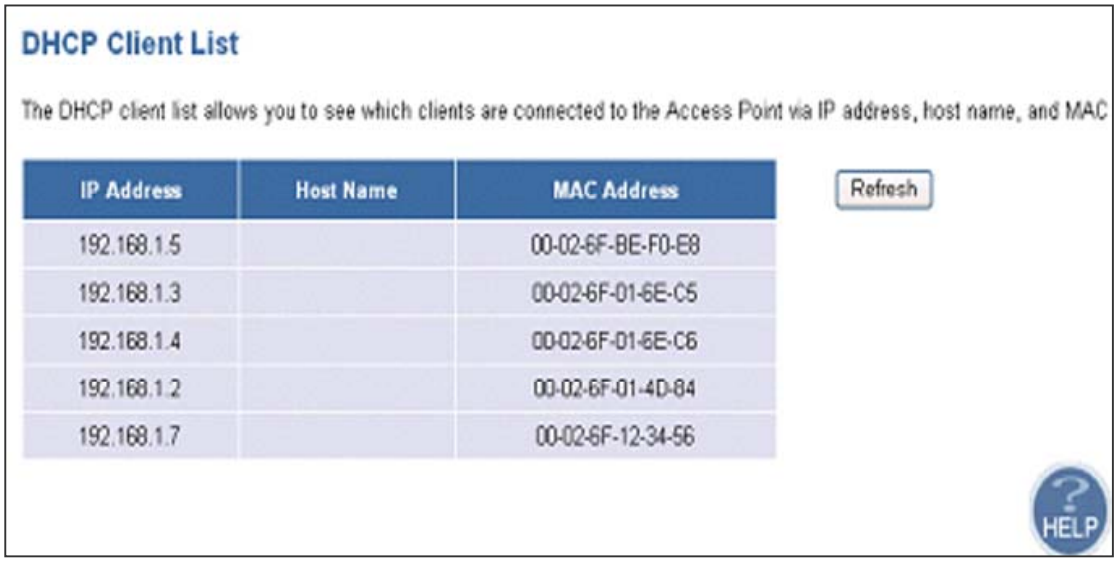
(6) Lease Time: The period client can have the IP address assigned by DHCP server.

(7) Local Domain Name: It's optional.

4.2.2 DHCP Client Lists

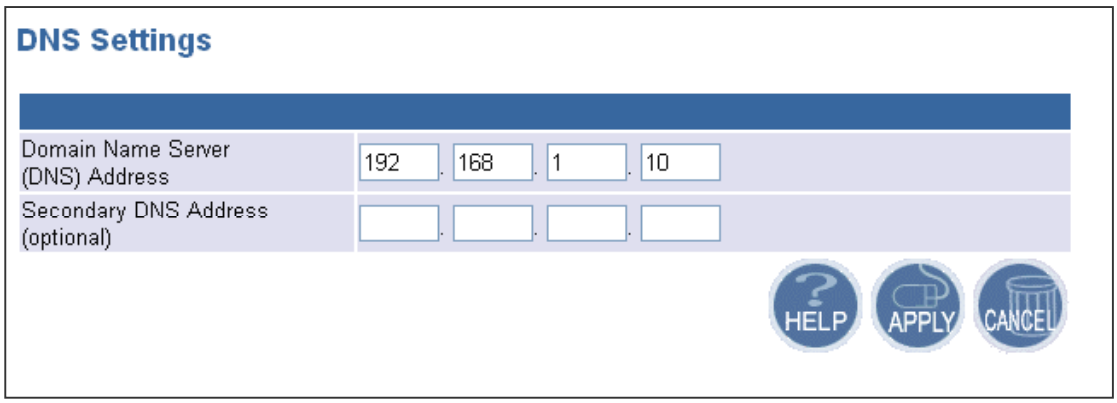
This page lists clients that are connected to the Access Point via IP address, host name, and MAC address. You can click **Refresh** button to obtain most up-to-date information.

Note: The DHCP server only serves wireless clients. So LAN users cannot get IP address through DHCP server.



4.2.3 DNS Settings

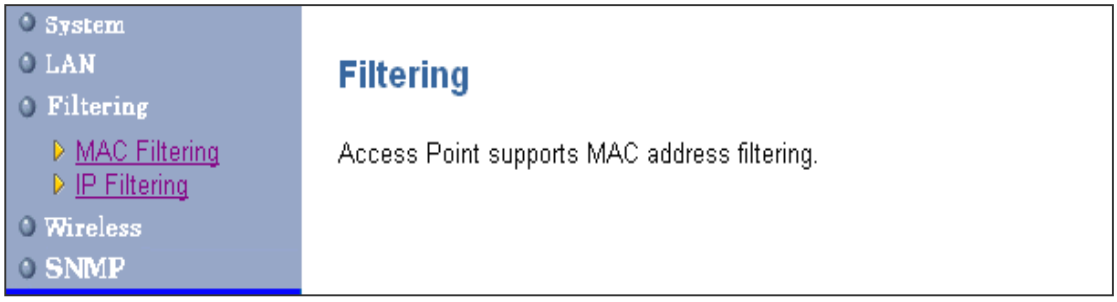
Domain Name Servers are used to map an IP address to the equivalent domain name. Your ISP should provide the IP address for one or more domain name servers. The Access Point can be a



DNS relay to send clients' request to the Domain Name Server. You can do a DNS lookup to find the IP address of some specific servers. Click **APPLY** to complete your change.

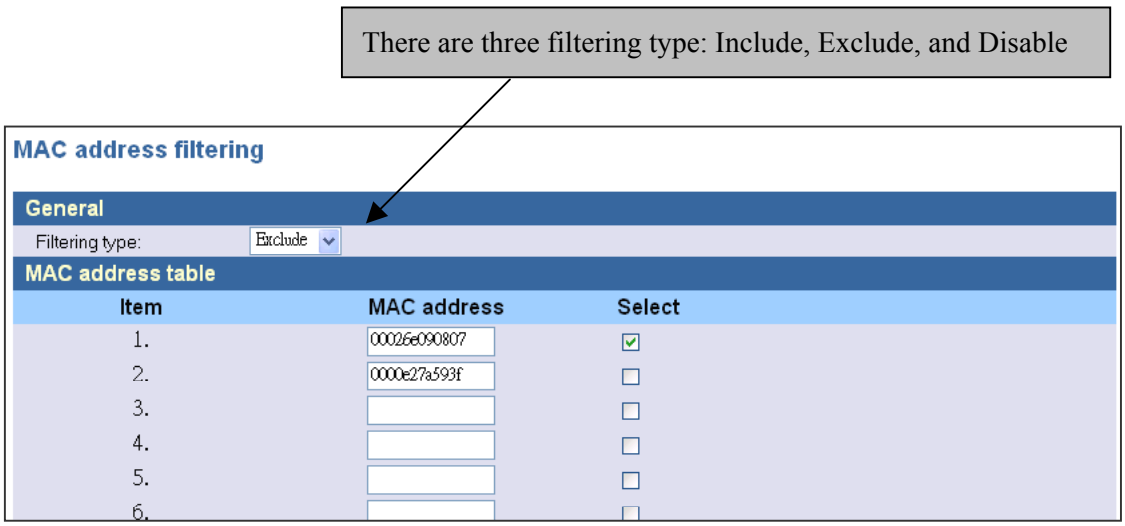
4.3 Filtering Setting

The Access Point provides filtering function via MAC address or IP address for wireless interface.



4.3.1 MAC Filtering

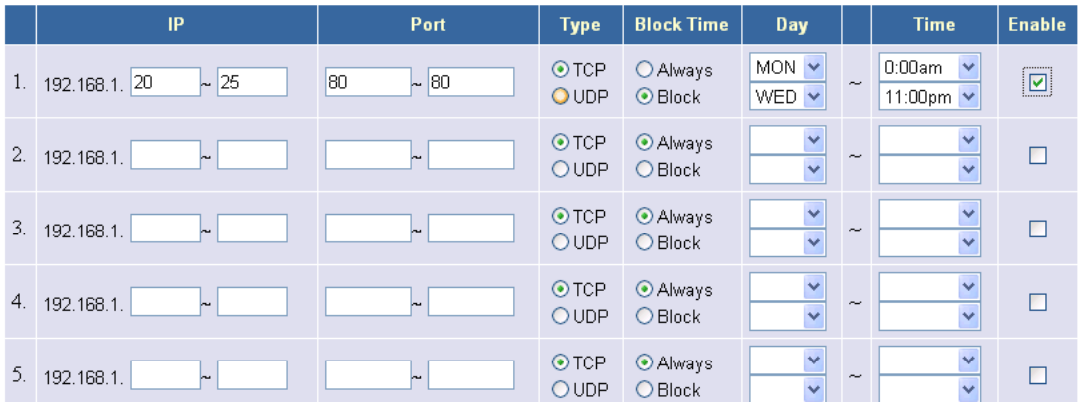
The maximum number of items is 64. Check the **select** check box to include or exclude corresponding items. The clients whose MAC addresses listed in the "MAC address table" cannot get associations to the AP while the "Filtering type" is chosen to **"**Include**".** On the other hand, only those clients' with MAC addresses listed in the "Exclude" filtering list can associate to the AP. The MAC address filtering function can be disabled by choosing the "Filtering type" to "Disable". Click **APPLY** to complete your change.

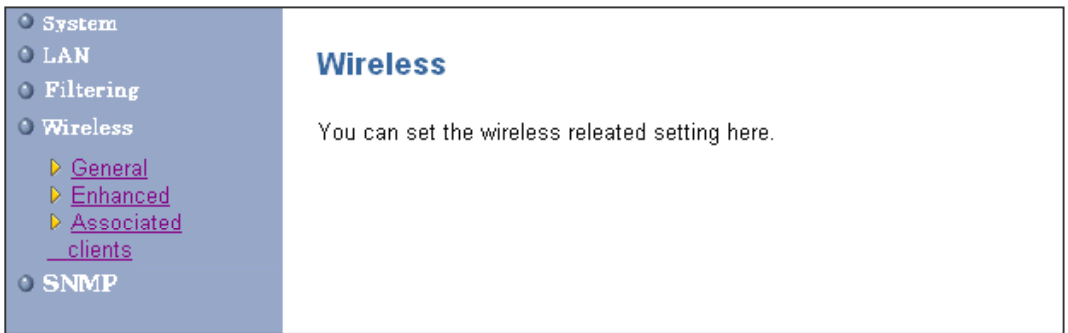


4.3.2 IP Filtering

You can block certain client PCs accessing the internet based on time. IP Filtering can filter the packets sent from clients. For example, you can ban WEB browsing by setting the port to “80”. Remember to select the Check box in the “Enable”. Click **APPLY** to complete your change.

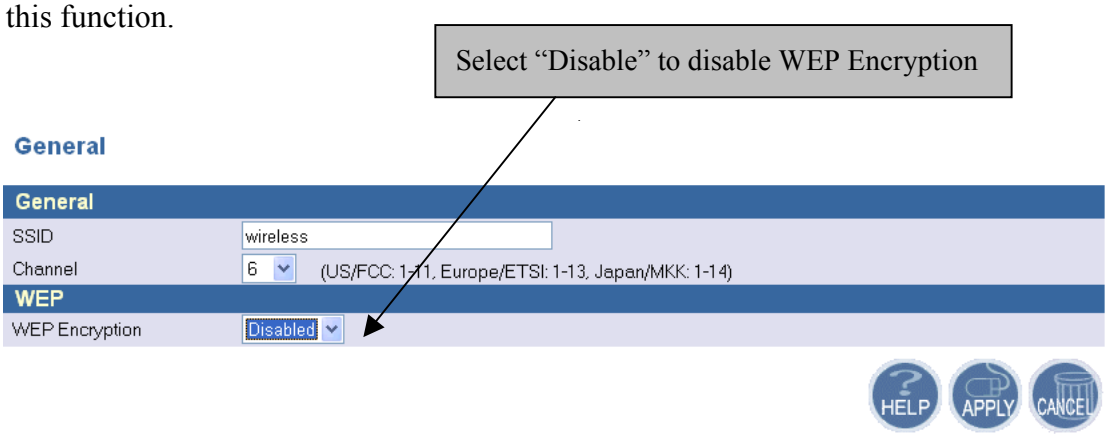
4.4





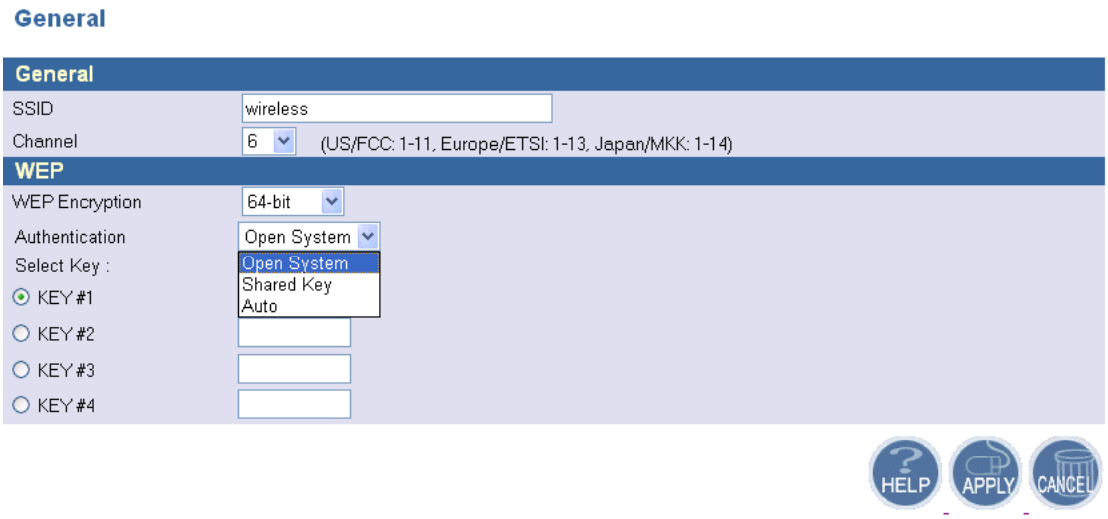
4.4.1 General

In this window you can make changes to the default wireless settings. For communicating, all computers on the network must be within the same IP Address range, and have the same settings for the Radio channel and SSID. If you don't want to utilize WEP Encryption, select "Disable" to disable this function.



(1) **SSID**: The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network. It is case sensitive and must not exceed 32 characters.

(2) **Channel**: The channel shared by all wireless devices. The range of channel is 1~14.



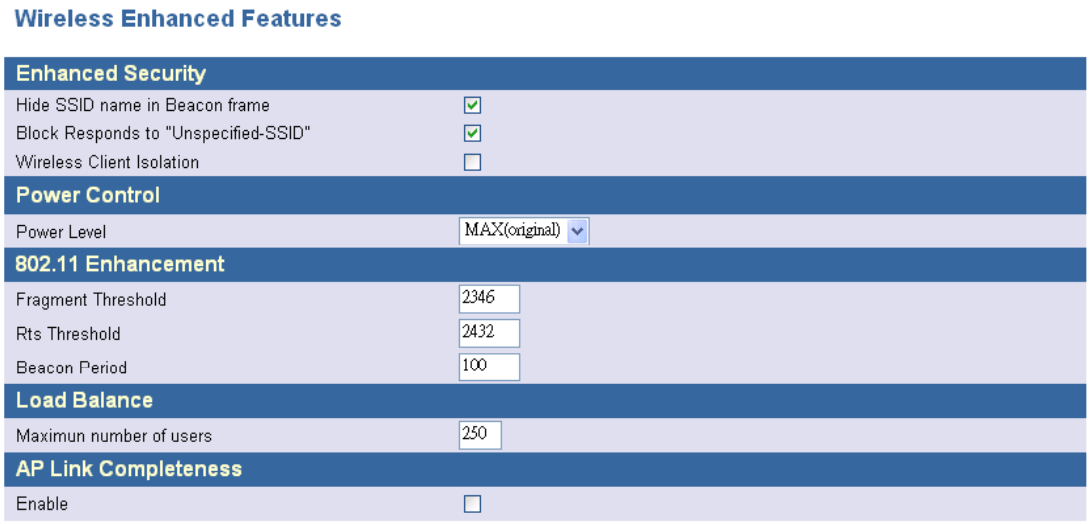
(3) **WEP**: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11b standard. WEP is designed to provide the same level of security as that of a wired LAN. Select **Disabled** to disable this function.

There are two WEP Encryption key length: 64-bit(10 hex digits) and 128 bit(26

hex digits). For Authentication type, you can choose between **Open System**[1]**, Shared Key**[2] **,** and **Auto**[3]**.** All station on your network must use the same authentication type. Check your wireless card's documentation to see what type to use.

[1] **Open System -** An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption.
[2] **Shared Key -** when both the sender and the receiver share a secret key. When "Shared Key" is checked, the AP sends an unencrypted challenge text string to any device attempting to communicate with the AP. The device requesting authentication encrypts the challenge text and sends it back to the access point. If the challenge text is encrypted correctly, the access point allows the requesting device to authenticate.
[3] **Auto** – No matter the authentication packets with encryption or not, the access point allows the requesting device to authenticate.

4.4.2 Enhanced Features



(1) **Enhanced Security:**

1. **Hide SSID name in Beacon frame:** By selecting this function , AP will not broadcast it's SSID in the beacon frame.
2. **Block Responds to "Unspecified-SSID"**: By selecting this function **,** AP will not respond wireless client's association requests using "ANY" as the AP's SSID.
3. **Wireless Client isolation**: By selecting this function , the AP will not forward uni-cast, multi-cast and broadcast packets to clients sent from any client.

(2) **Power Control:** If you select MAX(Original), **t**hen the power is the same as the network card's power.

(3) **802.11 Enhancement: The setting is listed below**.

Field	Ranges	Default value
Fragment Threshold	256 - 2346 (bytes)	2346
RTS Threshold	0 – 3000 (ms)	2432
Beacon Period	Up to 4095 ms	4095

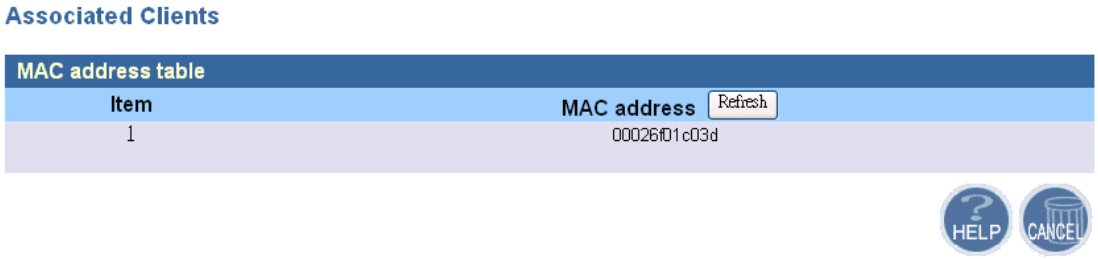
(4) **Load Balance:** This is the maximum number of users that can associate to this AP. The new client's association will not be accepted when the number of associated clients reaches this number.

(5) **AP Link Completeness:** If this function is enabled, the AP will disassociated all associated

clients and ban all new association requested when the LAN Ethernet port gets no signals (e.g. it is unplugged)..

4.4.3 Associated Clients

This page lists all the associated clients. Click **Refresh** to obtain the most up-to-date information.

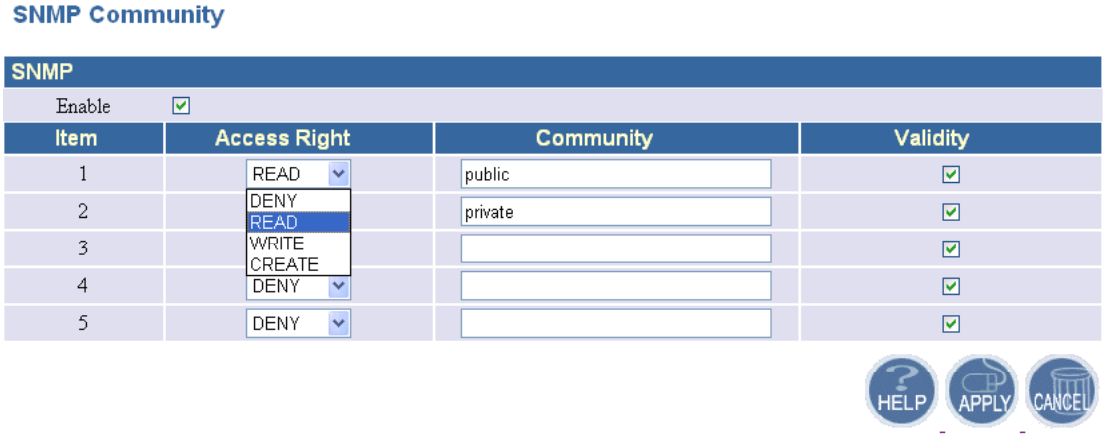


4.5 SNMP

Short for Simple Network Management Protocol, a set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.

4.5.1 SNMP Community

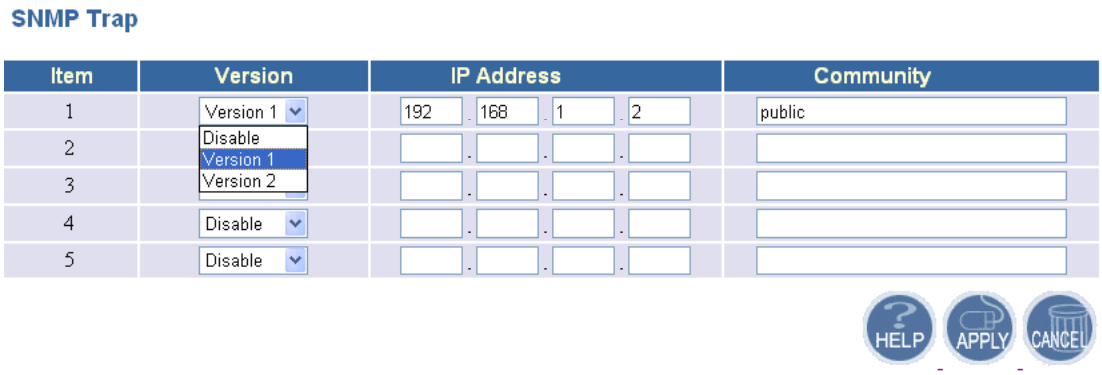
SNMP Community provides a simple kind of password protection. Access to the SNMP device is controlled through community names. The community name can be thought of as a password. If you don't have the correct community name you can't retrieve any data (get) or make any changes (sets). Multiple SNMP managers may be organized in a specified community. You can change your SNMP community settings on this screen. Check the "Enable" check box to enable the SNMP function. Click **APPLY** to complete your change.



Validity: You can enable or disable the SNMP function of the corresponding community item.
Access Right: Select a access right for the corresponding SNMP community (Deny[4]/Read[5]/Write[6]).
Community: Specify the name of community for the SNMP manager(Private/Public). By convention, "Public" community is with a read-only access right.

4.5.2 SNMP Trap

Traps can be used by network entities to signal abnormal conditions to management stations. SNMP TRAP message can be sent to a host. Click **APPLY** to complete your settings.



Version: Select the SNMP Version.
Select "Disable" to disable the snmp trap function of the corresponding item.
Version1: SNMP Version1
Version2: SNMP Version2
IP Address: Specify the IP Address of the SNMP Manager for SNMP Trap Report.
Community: Specify the type of community (public/Private) for SNMP manager.

Following are the traps supported in the access point:

Cold-start trap:

This trap indicates that the specified node's power has just come on. The cold-start trap is generated every time the access point is power-cycled. Cold-start traps are not generated until three seconds after the access point is power-cycled. This allows time for the hardware

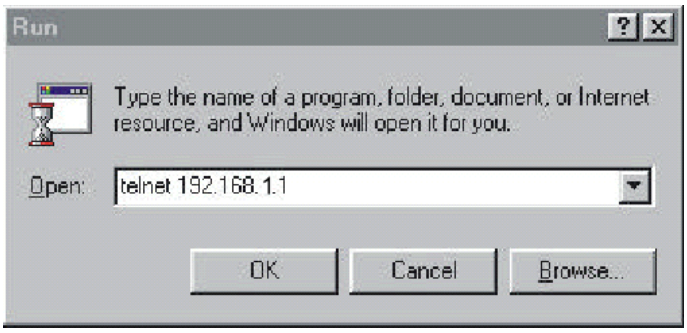
[4] Deny community will not allow a remote device to read information from a device or to modify settings on that device.
[5] Read-only community enables a remote device to retrieve "read-only" information from a device.
[6] Read-Write community allows a remote device to read information from a device and to modify settings on that device.

providing the low-level IP network interface to start up and stabilize before attempting to send a packet.

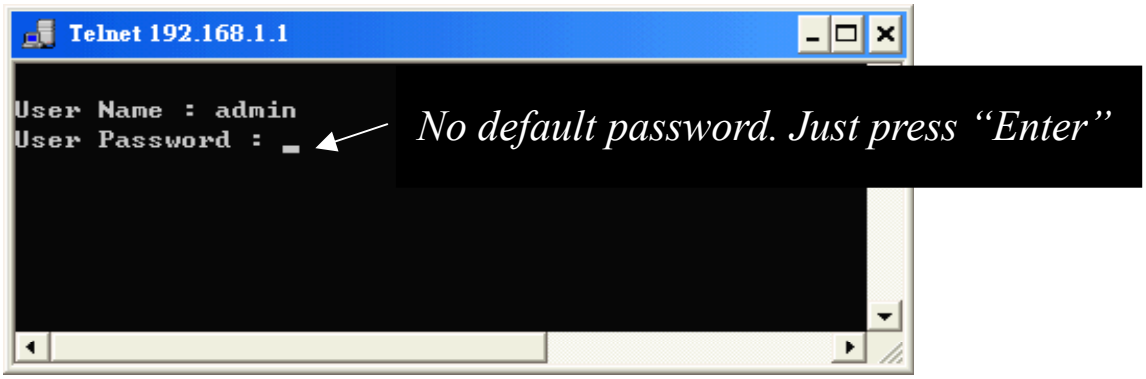
5 Configuring the Access Point through Telnet

5.1 Enter the Telnet session

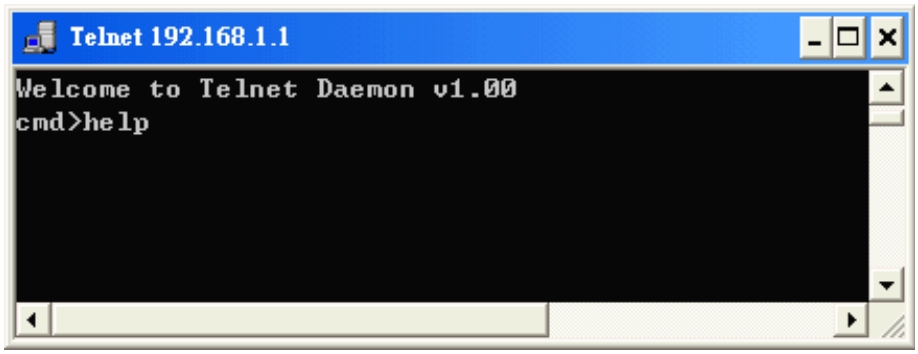
1. Click **Start** button, select **Run** to open the Run dialog box as shown below. Enter telnet **192.168.1.1** (default IP address of AP is 192.168.1.1) in the Open field. Then click **OK** button.



2. After entering the telnet session, enter the User Name and User Password as shown below. (Default User Name is **admin** and there is no default User Password).



3. After entering the telnet daemon, you can first type **help** to see the available commands.




```
                    Command Line Interface v 1.0
================================================================
====
time            : Get current system time.
        Usage: time
settime      : Set system time.
        Usage: settime <hh:mm:ss> [yy/mm/dd] [TZ(GMT +/- hour)]
help            : List all commands.
        Usage: help
ifShow        : Dispaly network interface.
        Usage: ifShow <ifname>
ipConfig    : Configure interface address and subnet mask.
        Usage: ipConfig [ifname] [ip] [subnet mask]
ping            : Ping a host..
        Usage: ping [ip]
routeShow : Show Route.
        Usage: routeShow
dhcpsStart: Start DHCP Server..
        Usage: dhcpsStart
dhcpsStop : Stop DHCP Server..
        Usage: dhcpsStop
exit            : exit this telnet session.
        Usage:    Exit
wlanShow    : Show the WLAN config.
        Usage: wlanShow
reset         : reset the system.
        Usage: reset
status        : Show the AP status.
          Usage: status
sysSet        : Change the System Configuration.
          Usage: sysSet ACTION [arg1], [agr2], ...
lanShow      : Show the LAN setting.
```

5.2 Command Line for Telnet daemon

1. “time” command shows current system time. Just type “time” at command line prompt.

```
cmd>time
Time zone:      GMT+6
Local time:     Thu Jan   1 00:59:10 1970
GMT time:       Thu Jan   1 06:59:10 1970
cmd>
```

2. Use “settime” to change the current system time.
   Usage: settime <hh:mm:ss> [yy/mm/dd] [TZ(GMT +/- hour)]

```
cmd>settime 15:50:00 2002/12/13
cmd>time
Time zone:        GMT+6
Local time:       Fri Dec 13 15:50:02 2002
GMT time:         Fri Dec 13 21:50:02 2002
cmd>
```

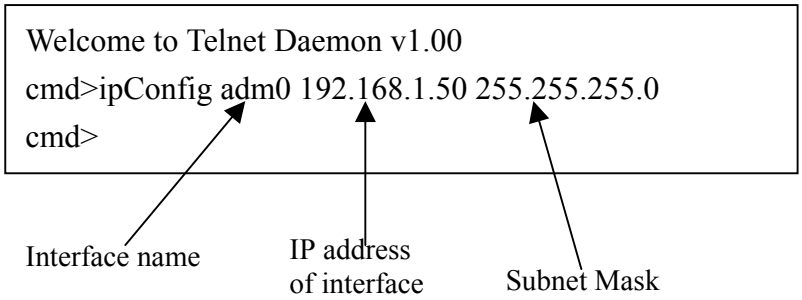
3. “ifShow” command shows all network interface information, including IP address, subnet mask, and information of packets.
   Usage: ifShow [ifname]
   To show all network interface, just type “ifShow” at command line prompt.

   lo - Loopback interface.
   adm – LAN interface.
   wlan – Wireless LAN interface.

```
cmd>ifShow
lo (unit number 0):
        Type: SOFTWARE_LOOPBACK
        Internet address: 127.0.0.1
        Netmask 0xff000000 Subnetmask 0xff000000
        Metric is 0
        Maximum Transfer Unit size is 1536
        0 packets received; 0 packets sent
        0 multicast packets received
        0 multicast packets sent
        0 input errors; 0 output errors
        0 collisions; 0 dropped
```

```
adm (unit number 0):
        Type: ETHERNET_CSMACD
        Internet address: 192.168.1.1
        Broadcast address: 192.168.1.255
        Netmask 0xffffff00 Subnetmask 0xffffff00
        Ethernet address is 00:01:02:03:04:05
        Metric is 0
        Maximum Transfer Unit size is 1500
        1016 packets received; 686 packets sent
        189 multicast packets received
        21 multicast packets sent
        0 input errors; 0 output errors
        0 collisions; 0 dropped
wlan (unit number 0):
        Type: ETHERNET_CSMACD
        Netmask 0x1114 Subnetmask 0x111c
        Ethernet address is 00:02:6f:01:c0:3f
        Metric is 0
        Maximum Transfer Unit size is 1500
        0 packets received; 209 packets sent
        0 multicast packets received
        0 multicast packets sent
        0 input errors; 0 output errors
        0 collisions; 0 dropped
cmd>
```

4. “ipConfig” command is used to configure interface address and subnet mask.
   Usage: ipConfig [ifname] [ip] [subnetMask]



5. “ping” command is used to ping a host.

Usage: ping [IP address]

```
cmd>ping 192.168.1.20
Start time 14671
Reply from 192.168.1.20
End time 14673
Ping statics for 192.168.1.20:
Packets: Sent = 1, Received = 1, Lost = 0
```

6. “exit” command exit the telnet session. Type “exit” at command line prompt.

```
cmd>exit
Exit this telnet session
```

7. “wlanShow” command shows the wireless LAN configuration, including SSID, Channel, WEP Encryption information, threshold information, and security information. Just type “wlanShow” at command line prompt.

```
cmd>wlanShow
------- AP configuration ---------
MAC address 00:02:6f:01:c0:3d
SSID: Candice
Channel: 6
WEP: Disable
Authentication algorithm: Open System
```

```
Default Wep key Id(1-4): 1
WEP key len: 64-bit
Key 1: 00000000000000000000000000
Key 2: 00000000000000000000000000
Key 3: 00000000000000000000000000
Key 4: 00000000000000000000000000
--- Wireless Enhanced Features ---
Power Level: MAX(original)
Fragment Threshold: 2346
RTS Threshold: 2432
Beacon Interval 100 (max: 4095 ms default :100ms)
Max associated stations: 250
Wireless Client Isolation: Disable
Hide SSID: Disable
Block Responds to 'Unspecified-SSID': Disable
AP Link Completeness: Disable
```

8.“reset” command can reboot the system. Just type ”reset” at command line prompt.

9. “status” shows current information and settings for your AP.

```
cmd>status
--------- LAN    -----------------
IP: 192.168.1.98
Subnet Mask: 255.255.255.0
Gateway: 0.20.247.208
LAN MAC Address: 00:01:02:03:04:10
Connected DHCP Clients: 1
--------- Wireless    -----------------
SSID: [(null)]
Channel: 6
Authentication type: None
Wireless MAC Address: 00:02:6f:01:c0:3dWireless MAC Address:
```

```
--------- System Information ----------------
System Up time: 01:26:55
Local time: Thu Jan    1 01:26:55 1970
GMT time: Wed Dec 31 17:26:55 1969
Current Firmware Version: [1.00.4455]
Firmware Date: [2003.01.06]
Hardware Version: [1]
Serial Number: [0000011118]
cmd>
```

10. “routeShow” shows the network routing table, host routing table and the ARP table.

```
cmd>routeShow

Net Routing Table:
Destination       Gateway           NetMask           Flags     Used Hops Interface
-------------------------------------------------------------------------------------------------
192.168.3.0       192.168.3.1       255.255.255.0     U     C   0       0       adm0

Host Routing Table:
Destination       Gateway           NetMask           Flags     Used Hops Interface
-------------------------------------------------------------------------------------------------
127.0.0.1         127.0.0.1                           U H       0       0       lo0

ARP Table:
Destination       Gateway           NetMask           Flags     Used Hops Interface
-------------------------------------------------------------------------------------------------
192.168.3.20      00:00:e2:7a:59:3f                   U H   L   3377 0        adm0
192.168.3.25      00:02:6f:01:c0:3d                   U H   L   3142 0        adm0
cmd>
```

11.“dhcpsStart” command enables the DHCP server function. The AP can function as a DHCP server and automatically assign an IP address to a client.

```
cmd>dhcpsStart
DhcpsStart: successful!
```

12. “dhcpsStop” command can stop the DHCP server function.

```
Welcome to Telnet Daemon v1.01
cmd>dhcpsStop
cmd>
```

13. "lanShow" command shows the LAN configuration and DHCP configuration, including IP address, Subnet Mask, DHCP status, and IP pool information.

```
cmd>lanShow
---==== LAN configuration ====---
IP Address: 192.168.1.98
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0
DHCP Server: Enabled
IP Pool Starting Address:    192.168.1.2
IP Pool Ending Address:    192.168.1.254
Lease Time:    One hour
Local Domain Name:
---==== DHCP configuration ====---
Item       IP                MAC Address           Host name
   1       192.168.1.2       00:02:6f:01:c0:3e     wlan-w2k
cmd>
```

14."filterShow" displays the MAC address filtering table, filtering type, and the information of IP filtering.

```
Welcome to Telnet Daemon v1.01
cmd>filterShow
---====== MAC control list ---======
Filtering type: Disabled (Any station can access)
Item       MAC                       Select
------------------------------------------
1          00:02:6f:01:c0:3f         Selected
2          00:00:00:00:00:00         Unselect
3          00:00:00:00:00:00         Unselect
4          00:00:00:00:00:00         Unselect
…..
…..
…..

---==== IP Filter Configuration ====---
------------------------------------
            IP            Port    Type    Block     Day          Time
     192.168.3.0-  0      0-  0   TCP   Always   N/A- N/A     N/A- N/A    Disable
     192.168.3.0-  0      0-  0   TCP   Always   N/A- N/A     N/A- N/A    Disable
     192.168.3.0-  0      0-  0   TCP   Always   N/A- N/A     N/A- N/A    Disable
     192.168.3.0-  0      0-  0   TCP   Always   N/A- N/A     N/A- N/A    Disable
```

```
      192.168.3.0-   0        0-   0   TCP   Always   N/A- N/A        N/A- N/A      Disable
      192.168.3.0-   0        0-   0   TCP   Always   N/A- N/A        N/A- N/A      Disable
      192.168.3.0-   0        0-   0   TCP   Always   N/A- N/A        N/A- N/A      Disable
      192.168.3.0-   0        0-   0   TCP   Always   N/A- N/A        N/A- N/A      Disable
cmd>
```

15. “snmpShow” shows SNMP configuration. It displays the information of SNMP Community and SNMP Trap. Type “snmpShow” at the command line prompt.

```
cmd>snmpShow
---==== SNMP Information ====---
SNMP Status: Enable
---==== SNMP Community info ====---
-------------------------------------------------------------------------
Item      Access Right      Community            Validity
1         WRITE             public               Enable
2         CREATE            private              Enable
3         DENY                                   Enable
4         DENY                                   Enable
5         DENY                                   Enable
```

```
---====   SNMP Trap info   ====---
Item      Version                IP              Community
-----------------------------------------------------
  1       version 1          192.168.1.2         public
  2       disable
  3       disable
  4       disable
  5       disable
```

Version of SNMP

IP address for SNMP Trap report

5.3 Configuring Wireless LAN through Telnet

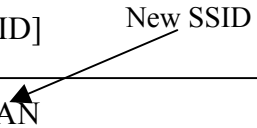
The command “wlanSet” can configure the Wireless LAN part. Type “wlanSet” and the action you want to perform. You need to know actions for the Wireless LAN setting.

Usage: wlanSet [ACTION] [arg1] [arg2] ….

ACTION	Description	Usage
ssid	Change the SSID	wlanSet ssid [SSID]
channel	Change the wireless channel[1-14]	wlanSet channel [channel number]
frag	Change the fragment Threshold	wlanSet frag [fragment threshold]
rts	Change the RTS Threshold	wlanSet rts [RTSThreshold]
keyid	Change the WEP default key id [1-4]	wlanSet keyid [defualt key id]
beacon	Change the beacon Period [0-4095ms]	wlanSet beacon [beacon period]
maxass	Change the max associated stations [1-300]	wlanSet maxass [number of stations]
wepkey	Change the WEP key	wlanSet wepkey [keyid] [key(hex format)]
wep	wlanSet wep [0|64|128]	wlanSet wep [0|64|128]
isolate	Change the Wireless Client Isolation: 0:disable, 1:enable	wlanSet isloate [0|1]
hidessid	Change the Hide SSID: 0:disable, 1:enable	wlanSet hidessid [0|1]
block	Change the Block Responds to 'Unspecified-SSID': 0:disable, 1:enable	wlanSet block [0|1]
power	Change the Outpower level: 0:Original, 1: 100mW, 2: 50mW, 3: 20mW	wlanSet power [0|1|2|3]
aplink	Change the AP Link Completeness: 0:disable, 1:enable	wlanSet aplink [0|1]
authalgo	Change Authentication	wlanSet authalgo [1|2|3]

ACTION	Description	Usage
	algorithm: 1:Open system, 2: Shared key, 3:Auto	

1. The “ssid” action can change the SSID
   Usage: wlanSet ssid [New SSID]




```
cmd>wlanSet ssid WirelessLAN
Old SSID: Wireless
New SSID (after reset): WirelessLAN
(Please remember to reset the Access Point if you made any change).
```

2. The “channel” action can change the wireless channel.
   Usage: wlanSet channel [New channel number]

```
cmd>wlanSet channel 5
Old Channel: 6
New Channel (after reset): 5
(Please remember to reset the Access Point if you made any change).
```

3. The “frag” action can change the frame’s fragment threshold.
   Fragment Threshold: 256~2346 bytes , default is 2346
   Usage: wlanSet frag [New fragment threshold]

```
cmd>wlanSet frag 2000
Old Fragment Threshold: 2346
New Fragment Threshold (after reset): 2000
(Please remember to reset the Access Point if you made any change).
```

4. The “rts” action can change the frame’s RTS threshold.
   RTS Threshold: 0~3000 ms, default is 2432
   Usage: wlanSet rts [Nes RTS threshold]

```
cmd>wlanSet rts 2500
Old RTS Threshold: 2432
New RTS Threshold (after reset): 2500
(Please remember to reset the Access Point if you made any change).
```

5. The “keyid” action can change the WEP default ID(the default is from 1 to 4).
   Usage: wlanSet keyid [New key default ID]

```
cmd>wlanSet keyid 2
Old WEP default key id: 0
New WEP default key id (after reset): 2
(Please remember to reset the Access Point if you made any change).
```

6. The “beacon” action can change the beacon period.
   Beacon Period: Default is 100 ms. The maximum is 4095.
   Usage: wlanSet beacon [New beacon period]

```
cmd>wlanSet beacon 3000
Old Beacon Period: 100
New Beacon Period (after reset): 3000
(Please remember to reset the Access Point if you made any change).
```

7. The “maxass” action can set the maximun number of users that can associate the AP.

```
cmd>wlanSet maxass 20
Old Maximum Assocated Stations: 250
New Maximum Assocated Stations (after reset): 20
(Please remember to reset the Access Point if you made any change).
```

8. The “wepkey” action can change the WEP key.
   Usage: wlanSet wepkey [keyid] [key(hex format)]

```
cmd>wlanSet wepkey 1 1122334455
CmdWlanSetKey() key 1122334455
Old Key 1: 0011223344
New Key 1: 1122334455
(Please remember to reset the Access Point if you made any change).
```

9. The action “wep” is for changing the WEP key length (0:disable/64 bit/128 bit).
   Usage: wlanSet wep [New key length]

Example:

```
cmd>wlanSet wep 128
Old WEP Encryption: 64-bit
New WEP Encryption (after reset): 128-bit
(Please remember to reset the Access Point if you made any change).
```

To disable the WEP key, type following command:

```
cmd>wlanSet wep 0
Old WEP Encryption: 64-bit
New WEP Encryption (after reset): Disabled
(Please remember to reset the Access Point if you made any change).
```

10. The “isolate” action can enable/disable the wireless client isolation function.
    0: Disable
    1: Enable
    Usage: wlanSet isolate [0|1]

```
cmd>wlanSet isolate 1
Old Wireless Client Isolation: Disable
New Wireless Client Isolation (after reset): Enable
(Please remember to reset the Access Point if you made any change).
```

11. The “hidessid” action can enable/disable the “Hide SSID in beacon frame” function.
    0: Disable
    1: Enable
    Usage: wlanSet hidessid [0|1]

```
cmd>wlanSet hidessid 1
Old Hide SSID: Disable
New Hide SSID (after reset): Enable
(Please remember to reset the Access Point if you made any change).
```

12. The “block” action can enable/disable the ”Block responds to Unspecified-SSID” function.
    0: Disable
    1: Enable
    Usage: wlanSet block [0|1]

```
cmd>wlanSet block 0
Old Block Responds to 'Unspecified-SSID': Enable
New Block Responds to 'Unspecified-SSID' (after reset): Disable
(Please remember to reset the Access Point if you made any change).
```

13. The “power” action can change the power level 0:Original, 1: 100mW, 2: 50mW, 3: 20mW
    0:Original
    1: 100mW
    2: 50mW
    3: 20mW
    Usage: wlanSet power [0|1|2|3]

```
cmd>wlanSet power 2
Old Power Level: MAX(original)
New Power Level (after reset): 50mW
(Please remember to reset the Access Point if you made any change).
```

14. The “aplink” action can change the AP Link Completeness. If enable this function, the WLAN interface will be disabled when plug off the cable of LAN interface,
    0: Disable
    1: Enable
    Usage: wlanSet aplink [0|1]

```
cmd>wlanSet aplink 1
Old AP Link Completeness: Disable
New AP Link Completeness (after reset): Enable
(Please remember to reset the Access Point if you made any change).
```

15. The “authalgo” action can change the authentication algorithm.

1: Shared key

2: Open system

3: Auto

Usage: wlanSet authalgo [1|2|3]

```
Welcome to Telnet Daemon v1.01
cmd>wlanSet authalgo
Current Authentication algorithm: Open System
cmd>wlanSet authalgo 3
Old Authentication algorithm: Open System
New Authentication algorithm (after reset): Auto
(Please remember to reset the Access Point if you made any change).
cmd>
```

5.4 Configuring LAN through Telnet

The command “lanSet” can configure the LAN part. Type “lanSet” and the action you want to perform. You need to know actions for the LAN setting.

Usage: lanSet [ACTION] [arg1] [arg2] ….

ACTION	Description	Usage
ip	Change the LAN’s IP and mask	LanSet ip [IP] [mask]
gateway	Change the AP IP, mask, Gateway, DHCP	lanSet gateway [gateway]
dhcp	Change the DHCP server setting.	lanSet dhcp ['disable'|start ip] [end ip] [lease time] [domain name]

1. The “ip” action can change the LAN’s IP address and Subnet Mask.

Usage: lanSet ip [IP] [mask]

Example:

```
cmd>lanSet ip 192.168.3.1 255.255.255.0
argc 3, ip [192.168.3.1] mask [255.255.255.0]
(Please remember to reset the Access Point if you made any change).
```

2. The “gateway” action can set the network’s gateway.
   Usage: lanSet gateway [gateway IP]
   Example:

```
cmd>lanSet gateway 192.168.3.47
Change gateway success.
(Please remember to reset the Access Point if you made any change).
cmd>
```

3. The “dhcp” action can change the dhcp server setting.
   Usage: lanSet dhcp ['disable' | start ip] [end ip] [lease time] [domain name]

Argument Description	Usage
'disable'|start ip	disable: to disable the DHCP server function start ip: the start IP address of the IP pool
end ip	The ending IP address of the IP pool
lease time: The period client can have the IP address assigned by DHCP server.	0: Half hour, 1: One hour, 2: Two hours, 3:Half day, 4: One day, 5: Two days, 6: One week, 7:Two weeks 8: Forever
domain name: the domain name (needed by some applications)	

Usage: To disable the dhcp server, type: lanSet dhcp 'disable'
To enable the dhcp server, type:
lanSet dhcp ['disable' | start ip] [end ip] [lease time] [domain name]

Example:

```
cmd>lanSet dhcp disable
disable the DHCP server
(Please remember to reset the Access Point if you made any change).
cmd>
```

```
cmd>lanSet dhcp 55 66 1 domainname
LAN set DHCP ok!
(Please remember to reset the Access Point if you made any change).
cmd>
```

5.5 Configuring System through Telnet

The command “sysSet” can change the settings of system, including time and administrator settings. Type “sysSet” and the action you want to perform. You need to know actions for filter setting.

Usage: sysSet [ACTION] [arg1][arg2]…..

ACTION	Description	Usage
passwd	Change the password.	sysSet passwd
idletime	Change the IdleTimeOut.	sysSet idletime [idle time (mins)]
remote	Change the Remote Management status	sysSet remote [0|1][IP]
fwupgrade	firmware upgrade.	sysSet fwupgrade [IP] [file]
setdefault	Set to default system configuration.	sysSet setdefault
reset	reset the system.	sysSet reset
sntppoll	Change the SNTP polling time	sysSet sntppoll
sntp	Change the SNTP setting	sysSet sntp [0|1] [IP]
sntpchangeip	Change a SNTP server's IP.	sysSet sntpchangeip [INDEX] [IP], index: 1-4

1. The “passwd” action can change the system password.
   Usage: sysSet passwd

Example:

```
Welcome to Telnet Daemon v1.01
cmd>sysSet passwd
**** Change password ****
Please enter current password:
Please enter new password: ****
Please re-enter new password: ****
```

2. The “idletime” action can change the system idle time out.
Usage: sysSet idletime [idle time(min)]

```
cmd>sysSet idletime 98
New Idle time value out is 98 min(s)
(Please remember to reset the Access Point if you made any change).
cmd>
```

3. The “remote” action can enable or disable the remote management function. You can enter the IP address of the remote manager.

Usage: sysSet remote [0|1] [IP of remote manager]

0: disable

1: enable

Example:

```
cmd>sysSet remote
Current Remote Management status: Disabled
cmd>sysSet remote 1 192.168.3.25
New Remote Management status: Enabled
(Please remember to reset the Access Point if you made any change).
cmd>
```

4. The ”fwupgrade” action can do the firmware upgrade.

Usage: sysSet fwupgrade [IP] [file]

Example:

```
Welcome to Telnet Daemon v1.01
cmd>sysSet fwupgrade 192.168.3.20 application.dlf
Current Firmware Version: 1.00.4431
Firmware Date: 2003.01.02
TFTP download start
TFTP download successed
(Please remember to reset the Access Point if you made any change).
```

5. The “setdefault” action can reset system to factory default configuration. This command is the same as the “Restore Factory Default Configuration” function of the Web-Based utility.
   Usage: sysSet setdefault

   Example:

```
Welcome to Telnet Daemon v1.01
cmd>sysSet setdefault
Load default system configuration
Load default system configuration finished
```

   Note: You have to reset system to let this change effective.

6. The “reset” action can reboot the system and refresh the AP’s connection.
   Usage: sysSet reset

7. The “sntppoll” action can change the SNTP pooling time.
   Usage: sysSet sntppoll [polling time(sec)]

   Example:

```
cmd>sysSet sntppoll
Current SNTP polling time value is 86400 second(s)
cmd>
```

```
Welcome to Telnet Daemon v1.01
cmd>sysSet sntppoll 11000
New SNTP polling time value is 11000 second(s)
(Please remember to reset the Access Point if you made any change).
cmd>
```

8. The “sntp” action can change SNTP function and set SNTP server.
   Usage: sntp [0|1] [IP]
   0: Disable
   1: Enable

Example:

```
cmd>sysSet sntp 0
New SNTP status: Disabled
(Please remember to reset the Access Point if you made any change).
cmd>sysSet sntp 1 192.168.3.20
New SNTP configuration
Usage: sntp [0|1] [IP], 0:disable, 1:enable

---==== SNTP configuration ===---
Status: Enable
Polling time: 86400 seconds
Server #1's IP: 192.168.3.20
Server #2's IP: 0.0.0.0
Server #3's IP: 0.0.0.0
Server #4's IP: 0.0.0.0
(Please remember to reset the Access Point if you made any change).
```

9. The “sntpchangeip” action can change SNTP server’s IP.
   Usage: sntpchangeip [Index] [sntp server’s IP]
   index: 0-4

Example:

```
cmd>sysSet sntpchangeip 1 192.168.3.25
New setting:

---==== SNTP configuration ===---
Status: Enable
Polling time: 86400 seconds
Server #1's IP: 192.168.3.25
Server #2's IP: 0.0.0.0
Server #3's IP: 0.0.0.0
```

5.6 Configuring Filtering through Telnet

The command “filterSet” can change the settings of MAC filtering and IP filtering. Type “filterSet” and the action you want to perform. You need to know actions for filter setting.

Usage: filterSet [ACTION] [arg1][arg2]…..

ACTION	Description	Usage
macshow	Show the MAC filtering setting.	filterSet macshow
mac	Change the MAC address filtering.	filterSet mac ….
ip	Show the IP filtering setting.	filterSet ip ….
ipdaytime	Change the daytime part	filterSet ipdaytime
ipstatus	Enable or Disable the IP filtering function.	filterSet ipstatus

1. The “macshow” action shows the filtering type and MAC address table of MAC filtering.
   Usage: filterSet macshow

```
cmd>filterSet macshow
---====== MAC control list ---======
Filtering type: Disabled (Any station can access)
Item       MAC                          Select
-------------------------------------------
1          00:02:6f:01:c0:3f            Unselect
2          00:00:00:00:00:00            Unselect
3          00:00:00:00:00:00            Unselect
4          00:00:00:00:00:00            Unselect
……
……
……
```

2. “mac” action can change the settings of MAC address filtering. You can change filtering type. You can select ,unselect or clear those MAC address item.

Description	Usage
Set filtering type to 'disable'	filterSet mac disable
Set filtering type to 'include'	filterSet mac include
Set filtering type to 'exclude'	filterSet mac exclude
Set mac address	filterSet mac setmac [index] [MAC address] index: 1...1291632, MAC address format : 00-00-01-02-03-04-05
Select a mac address	filterSet mac select [index] index: 1...64
Unselect a mac address	filterSet mac unselect [index] index: 1...64
Clear a mac address	filterSet mac clear [index] index: 1...64
Clear all mac addresses	filterSet mac clearall

3. The “ip” action can set the IP and port to be block. You can set the protocol type to be block.
Usage: filterSet ip [Index] [Start IP] [End IP] [Start port] [End port] [Protocol]

Argument	Description
index: the (index)th item to be modified	index : 1 .. 8
Start IP	the last byte of the Start IP
End IP	the last byte of the End IP
Start port	the first port being blocked
End port	the last port being blocked
Protocol: the protocol type	Type “tcp” or “udp”

Example:

```
cmd>filterSet ip 2 45 78 21 21 udp
Set to index 2 Source IP Start: 45 Source IP end: 78 PortStart 21 PortEnd 21 pro
tocol 2
Ok
```

4. The “ipdaytime” can set the day and time to block the IP address.

Usage: filterSet ipdaytime index [Start day] [End day] [Start hour] [End hour]

Example: filterSet ipdaytime 1 MON FRI 9am 6pm

Argument Description	Usage
index: the (index)th item to be modified	index : 1 .. 8
Start day: the day start to block	SUN, MON, TUE, WED, THU, FRI, SAT
End day: the day stop to block	SUN, MON, TUE, WED, THU, FRI, SAT
Start hour: the time start to block	0am, 1am, 2am, 3am, 4am, 5am, 6am, 7am, 8am, 9am, 10am,11am, 12am, 1pm, 2pm, 3pm, 4pm, 5pm, 6pm, 7pm, 8pm, 9pm,10pm, 11pm
End hour: the time stop to block	0am, 1am, 2am, 3am, 4am, 5am, 6am, 7am, 8am, 9am, 10am 11am, 12am, 1pm, 2pm, 3pm, 4pm, 5pm, 6pm, 7pm, 8pm, 9pm,10pm, 11pm

5. The “ipstatus” action can enable and disable the IP filtering function.

Usage: filterSet ipstatus [index] [status]

Example: filterSet ipstatus 1 2

Argument Description	Usage
index: the (index)th item to be modified	index : 1 .. 8
status	0: disable, 1:enable, 2:always block, 3:block on time

Note: If you choose 3 (block on time) for status, you have to indicate the day and time by using the “ipdaytime” action.

5.7 Configuring SNMP through Telnet

The command “snmpSet” can change the settings of SNMP. Type “snmpSet” and the action you want to perform. You need to know actions for snmp setting.

Usage: snmpSet [ACTION] [arg1] [arg2]…..

ACTION	Description	Usage
comstatus	Enable or disable the SNMP community function	snmpSet comstatus [0|1]
community	Change the SNMP community setting.	snmpSet community [index] [access right] [community] [validatiy]
trap	Change the SNMP trap setting.	snmpSet trap [index] [version] [IP] [community]

1. The “comstatus” action can enable or disable the community status.
   Usage: snmpSet comstatus [0|1]
   0: Disable
   1: Enable
2. The “community” action can change the settings of SNMP community.
   Usage: snmpSet community [item] [Access Right] [Community] [Validity]

Argument Description	Usage
item	item: 1 .. 5
Access Right: Select a access right for the corresponding SNMP community	Type “deny”, “read”, “write”, “create” for different access right
Validity: enable or disable the SNMP function of the corresponding community item.	0:disable, 1:enable

Example:

```
Welcome to Telnet Daemon v1.01
cmd>snmpSet community 1 read public 1
SNMP community set ok.
(Please remember to reset the Access Point if you made any change).
```

3. The “trap” action can change the settings of SNMP trap.
   Usage: snmpSet trap [item] [version] [ip] [community]

Argument Description	Usage
item	item: 1 .. 5
Version: the version of SNMP	0:disable, 1: Version 1, 2: Version 2

Example:

```
cmd>snmpSet trap 3 2 192.168.1.1 public
SNMP trap set ok.
(Please remember to reset the Access Point if you made any change).
```

5.8 Upgrading Firmware through Telnet

If problem happens during firmware upgrading (e.g.. Power off abnormally), the AP may not work normally. If this is the case, the AP will start a Telnet Daemon on the LAN interface. After that, user can telnet to the AP and make a firmware upgrade using TFTP method. By doing so, user can make AP works again.

1. You will see the warning message shown as below:

```
Verifying product code.....FAIL

***** WARNING *****

Need to reprogram the Flash. Telnet init
Enter into daemon : Telnet listen Port 23
```

2. Connect the managed computer and the AP's **LAN** port with an Ethernet cable.

3. Telnet to the AP. Make sure the AP's IP Address is the one when problem happened.

```
***** WARNING *****
Need to reprogram the Flash!
User Name :
```

4. Type the fixed User Name and Password (User Name: root / Password: tftp) to enter the telnet session.

```
***** WARNING *****
Need to reprogram the Flash!
User Name : root
User Password : tftp
```

5. Type **help** to list all command.

```
cmd>help
                    Command Line Interface v 1.0
================================================
time          : Get current system time.
        Usage: time
help          : List all commands.
        Usage: help
tftp          : tftp download.
        Usage: tftp [IP] [file]
ipConfig    : Configure interface address and subnet mask.
        Usage: ipConfig [ifname] [ip] [subnet mask]
ifShow       : Dispaly network interface.
        Usage: ifShow <ifname>
reset         : reset the system.
        Usage: reset
ping          : Ping a host..
        Usage: ping [ip] [ms]
```

6. On the managed computer, run the TFTP Server utility. Make sure to specify the folder in which the firmware files reside.

7. To perform the firmware upgrade, use **tftp** command.
   Usage: tftp [IP Address] [File Name]

```
Welcome to Telnet Daemon v1.00
cmd>tftp 192.168.1.20 application.dlf
```

IP address of TFTP server Firmware file name

8. After downloading successfully, the AP will be reset and start running normally.
   Telnet session will be closed after downloading successfully.

```
Welcome to Telnet Daemon v1.00
cmd>tftp 192.168.1.20 application.dlf
TFTP download start
TFTP download succeed
cmd>
```

6 Change History

Date	Subject/Comment	Old Version	New Version
12/16/02		N/A	V1.0
12/16/02	WEP(auto), FW upgrade through telnet	V1.0	V1.01
1/03/02	Telnet	V1.01	V1.02
1/06/03		V1.02	V1.03
1/07/03	correction	V1.03	V1.04

7 Statement

Federal Communication Commission 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: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. 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 undesired operation.

IMPORTANT NOTE:
FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.