

EXHIBIT C-1

User Manual

SENAO 



Wireless LAN Access Point SL-2000 AP

User's Manual

Before operating the unit, please read this manual thoroughly,
and retain it for future reference.



Manufactured by
ISO-9001
Certified Factories

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Chapter 1 Introduction

This chapter describes the general features, applications and network configurations of SL-2000 wireless LAN products.

1-1 Package Contents

The Access Point package contains the following items as shown in Figure 1-1

1. One Access Point (AP)
2. One PC Card
3. One mounting bracket
4. One desktop stand
5. One RS-232C null modem cable
6. One external antenna (dipole, omni-directional)
7. One power adapter
8. One AC power cord
9. One AP Management Utility diskette
10. One User's Manual
11. Three screws

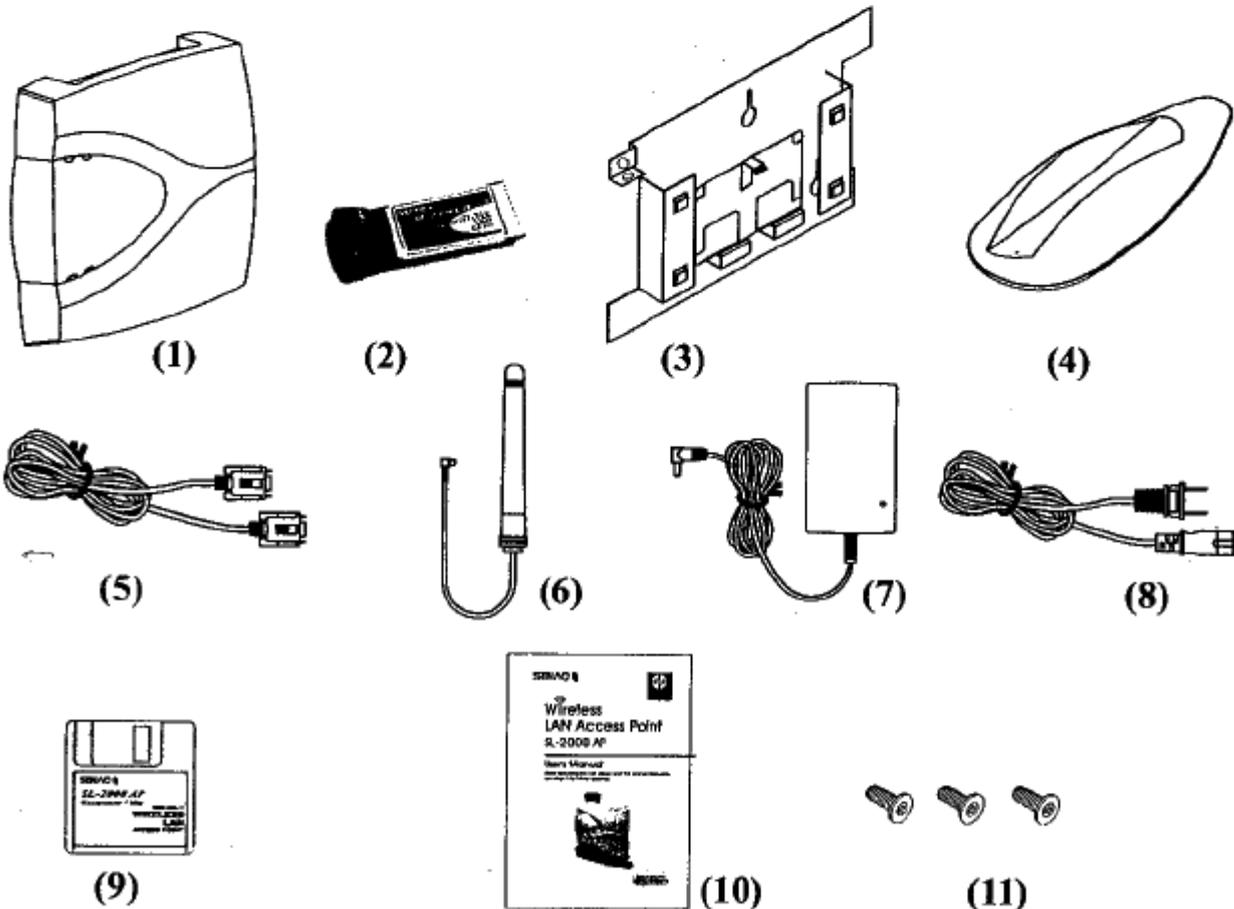


Figure 1-1 Package contents

1-2 System Requirements

Installation of the Access Point requires:

1. A Windows-based PC/AT compatible computer with an available RS-232 port to run the configuration program or with TCP/IP connection to the network.
2. A 10Base-T Ethernet cable drop (RJ-45 connectors).
3. An A/C power outlet (100~240V, 50~60Hz) which supplies the power for the Access Point.

1-3 Features

1. Comply with IEEE802.11 standard
2. Built-in 10BaseT Ethernet support
3. IP sharing for 56K/ISDN TA/Cable/xDSL modem
4. Sharing single Internet account
5. Natural firewall keeps hackers out
6. Remote Web/Telnet management/configuration support
7. DHCP server allocates up to 255 client IP addresses
8. NAT Support
9. Roaming Capability
10. Easy to install on a wall or desktop

1-4 Applications

The SL-2000 wireless LAN products are easy to install and highly efficient. The following list describes some of the many applications made possible through the power and flexibility of wireless LANs:

1. Difficult-to-wire environments

There are many situations where wires can not or not easily be laid. Historic buildings, older buildings, open areas and across busy streets make the installation of LANs either impossible or very expensive.

2. Temporary workgroups

Consider situations in parks, athletic arenas, exhibitions, disaster-recovery, temporary office and construction sites where one wants a temporary WLAN established and removed.

3. The ability to access real-time information

Doctors/nurses, point-of-sale employees, and warehouse workers can access real-time information while dealing with patients, serving customers and processing information.

4. Frequently changed environments

Show rooms, meeting rooms, retail stores, and manufacturing sites where frequently rearrange the workplace.

5. Small Office and Home Office (SOHO) networks

SOHO users need a cost-effective, easy and quick installation of a small network.

6. Wireless extensions to Ethernet networks

Network managers in dynamic environments can minimize the overhead caused by moves, extensions to networks, and other changes with wireless LANs.

7. Wired LAN backup

Network managers implement wireless LANs to provide backup for mission-critical applications running on wired networks.

8. Training/Educational Facilities

Training sites at corporations and students at universities use wireless connectivity to ease access to information, information exchanges, and learning.

1-5 Network Configurations

To better understand how the SL-2000 wireless LAN products work together to create a wireless network, it might be helpful to depict a few of the possible SL-2000 network configurations. The SL-2000 wireless LAN products can be configured as:

1. Ad-hoc (or peer-to-peer) for departmental or SOHO LANs.
2. Infrastructure for enterprise LANs.
3. IP Sharing for 56K/ISDN TA/Cable/XDSL Modem - Connect Internet and your SOHO network.

Ad-hoc (peer-to-peer) Mode

This is the simplest network configuration that several computers equipped with the PC cards that form a wireless network whenever they are within range of one another (Figure 1-2). In ad-hoc mode, each client, is peer-to-peer, would only have access to the resources of the other client and requires no the access point. This is the easiest and least expensive way for the SOHO to set up a wireless network.

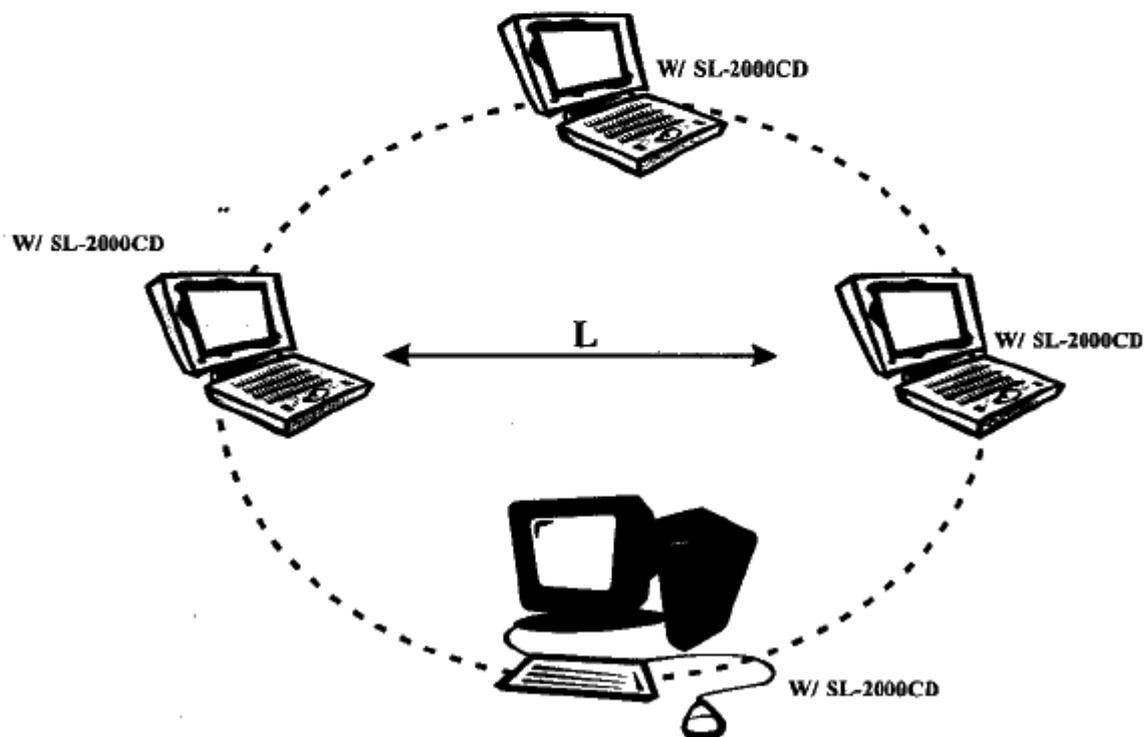


Figure 1-2 A wireless Ad-hoc network

Infrastructure Mode

The infrastructure mode requires the use of an access point (AP). In this mode, all wireless communications between two computers have to be via the AP no matter the AP is wired to Ethernet network or stand-alone. If used in stand-alone, the AP can extend the range of independent wireless LANs by acting a repeater, which effectively doubling the distance between wireless stations as shown in Figure 1-3.

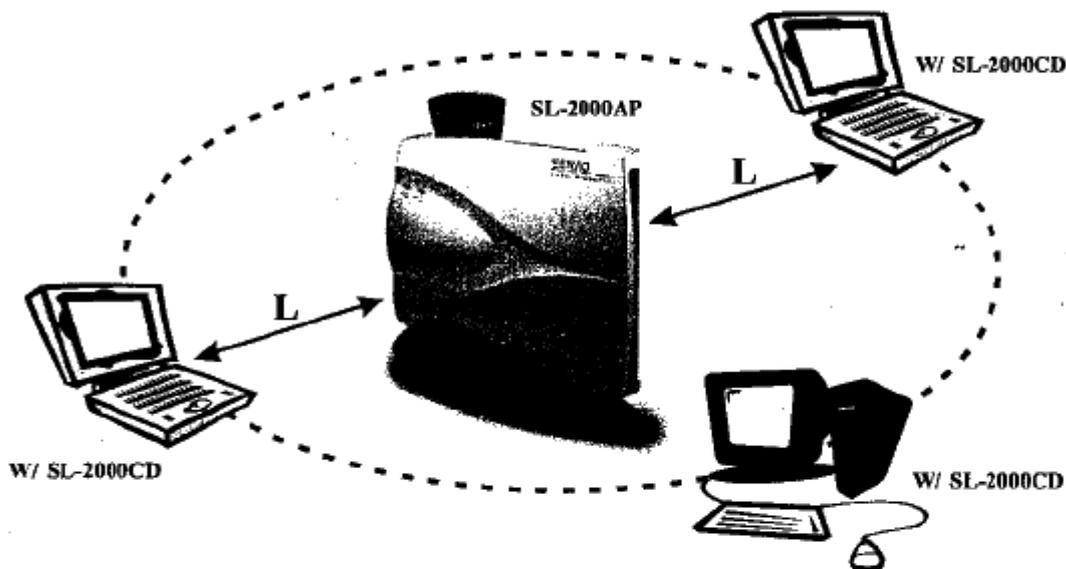


Figure 1-3 Extended-range independent WLAN using AP as repeater

If wired to an Ethernet network as shown in Figure 1-4, the AP serves as a bridge and provides the link between the server and the wireless clients. The wireless clients can move freely throughout the coverage area of the AP while remaining connected to the server. Since the AP is connected to the wired network, each client would have access to server resources as well as to other clients.

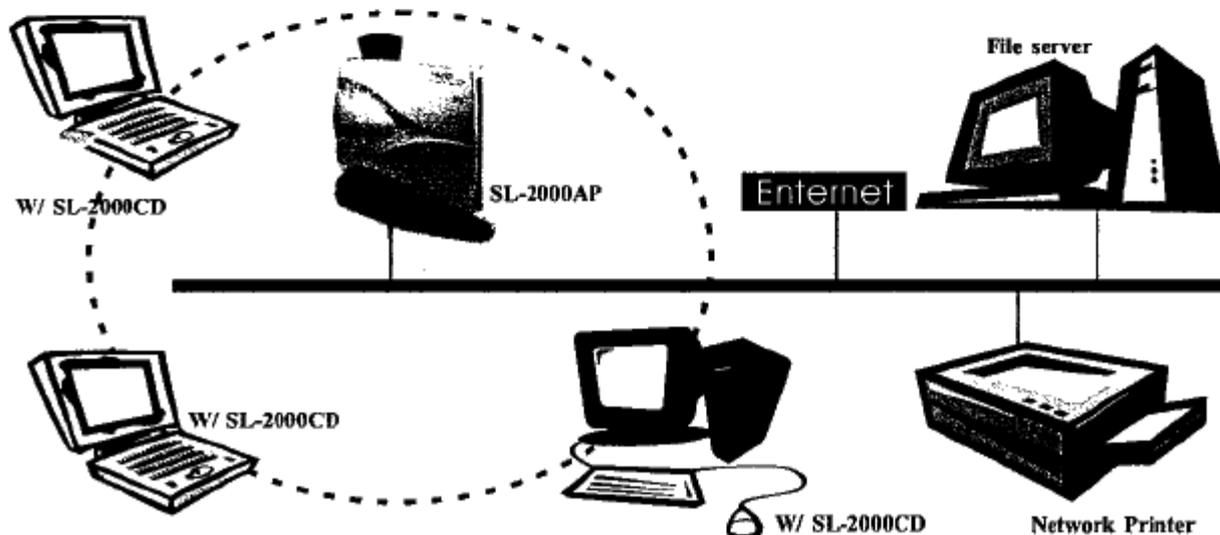


Figure 1-4 Single AP bridge

Access points have a finite range, on the order of 50 meters indoor and 100 meters outdoors. In a very large facility such as an enterprise, a warehouse, or on a college campus, it will probably be necessary to install more than one access point to cover an entire building or campus, as shown in Figure 1-5. In this scenario, access points hand the client off from one to another in a way that is invisible to the client, ensuring unbroken connectivity. Wireless clients can roam seamlessly between different coverage areas and remain connected to the network.

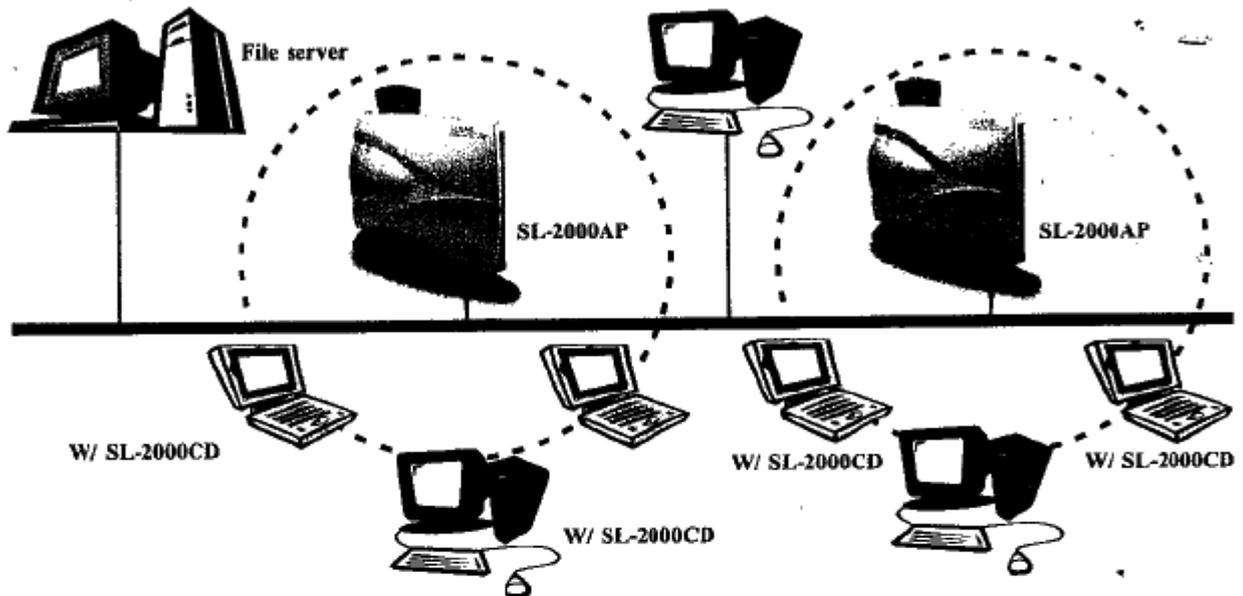


Figure 1-5 Multiple-AP and roaming

IP Sharing

In infrastructure mode, in addition to acting as a bridge between an Ethernet and wireless network, the AP can be configured as an IP sharing device for Internet access as shown in Figure 1-6. You don't have to buy an expensive router. Nor you have to buy several modems and setup phone lines. Just share one AP, one Modem, single dial-up account, and one phone line, dozens of network users can go surfing the Internet concurrently.

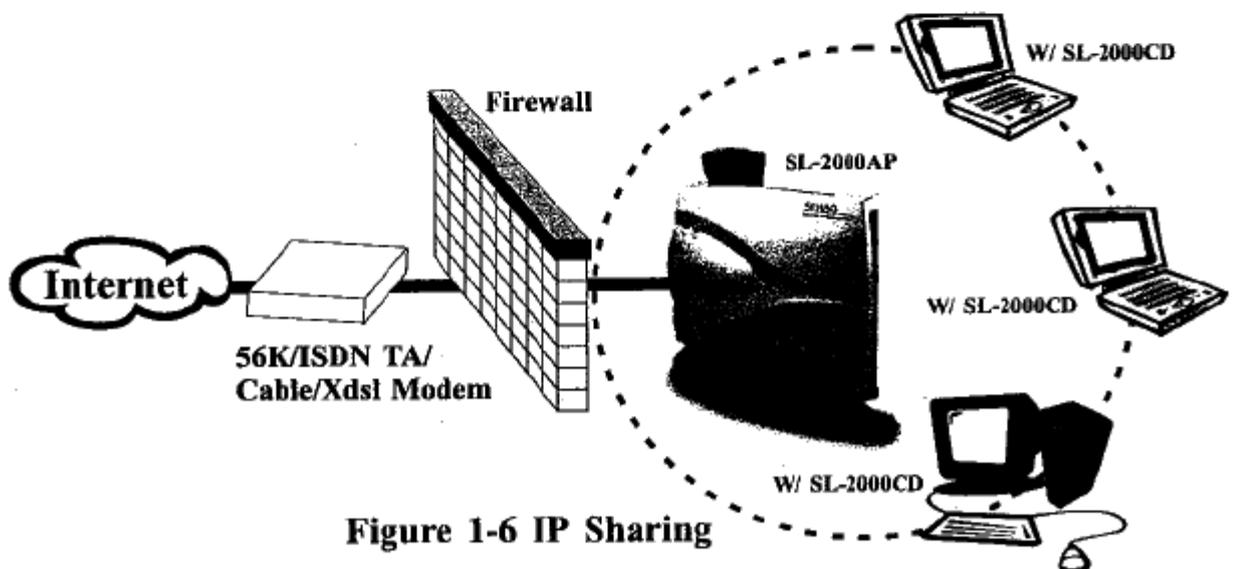


Figure 1-6 IP Sharing

Chapter 2 Hardware Installation

This chapter describes how to install the Access Point (AP) hardware.

2-1 Hardware Description

1. Radio Transmit/Receive LED

- ◆ Blinking — Receiving/transmitting wireless data
- ◆ Off — No wireless activity

2. Alert LED

- ◆ Solid Green — An error condition of PC Card
- ◆ Off — Normal operation

3. Power LED

- ◆ Solid RED — Power enabled
- ◆ Off — No power applied

4. Ethernet LED

- ◆ Blinking — Good LAN connection
- ◆ Off — No LAN connection

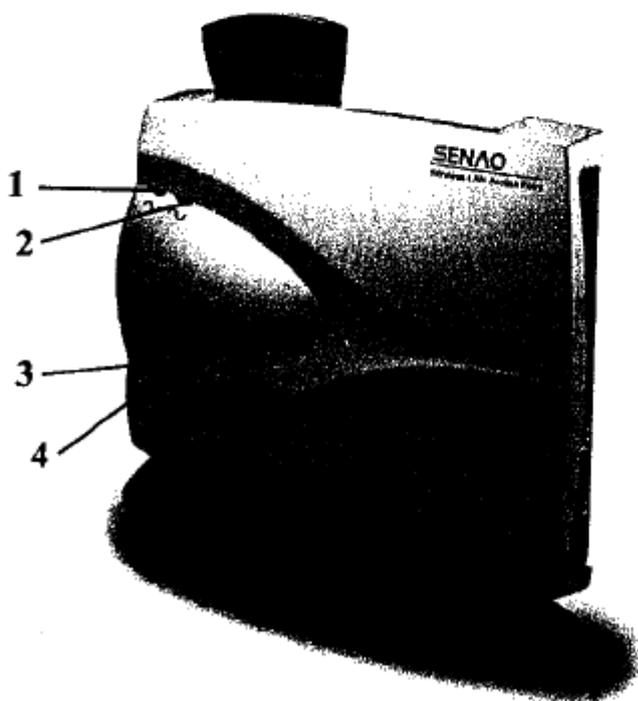


Figure 2-1 Front panel of the AP

1. PC Card Slot: The PC Card is inserted into the PCMCIA slot. Take care to ensure that the card is aligned correctly and pressed all the way into the slot.
2. RS-232 Port: The serial port connector is used to access various management functions and can also be used to dial up Internet with 56K modem/ISDN TA.
3. RJ-45 Connector: Connect to the 10 base-T Ethernet network and can also be used to dial up internet with Cable/xDSL modem.
4. DC IN Connector: The power connector is used to attach +6 VDC power adapter.

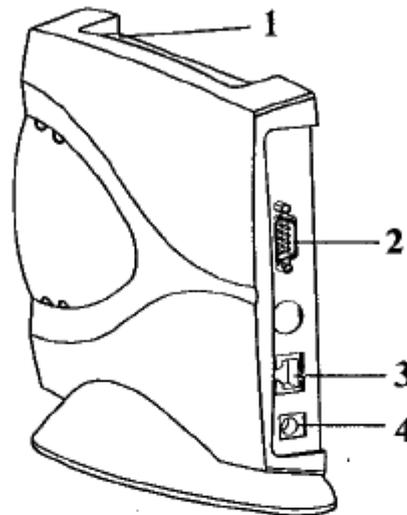


Figure 2-2 Side panel of the AP

2-2 Installing the Access Point (AP)

1. Site Selection

The AP can be mounted in any number of locations. You can place on a flat surface such as a table or cabinet or mount it on a wall. To place on a flat surface, you can put the AP in the desktop stand provided as shown in Figure 2-3. To mount on a wall, please refer to step 2.

Prior to placing or mounting it to a fixed location, we recommend you perform a site survey to determine a proper placement for your AP.

The site survey utilities program (which mentioned in PC card User's Manual, Chapter 4-2 Installing Driver Status Utility) will help you with site selection. The internal antenna of your PC Card can perform the best performance in an open environment with as few obstructions as possible.

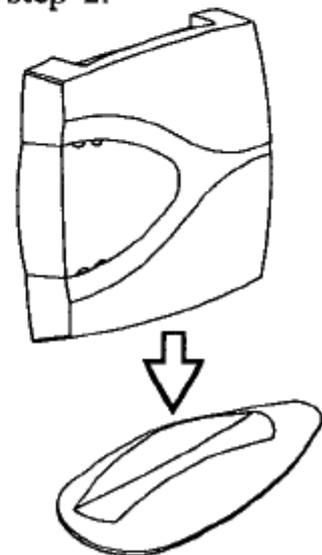


Figure 2-3 Placing on a flat surface

To ensure the best performance:

- ◆ Place the AP as high and as middle as possible (relative to the client station in the vicinity).
- ◆ Do not conceal the antenna.
- ◆ Connect an external antenna provided to the jack of your PC Card.

2. Mounting AP on a wall

- ◆ Use the three screws provided to fix the mounting bracket in the chosen position as shown in Figure 2-4. Leave the heads of the screws approximately 3 mm above the surface of the wall.

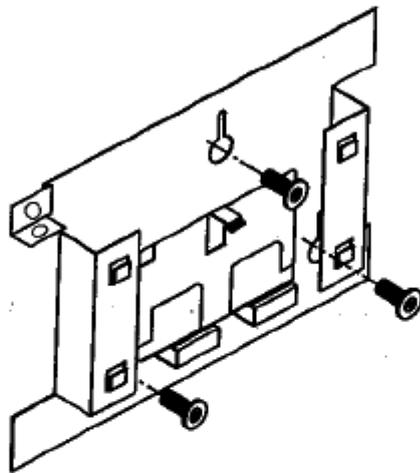


Figure 2-4 Mounting the bracket

- ◆ Connect the AC power cord to the power adapter and mount the power adapter at the mid section of the mounting bracket as shown in Figure 2-5.

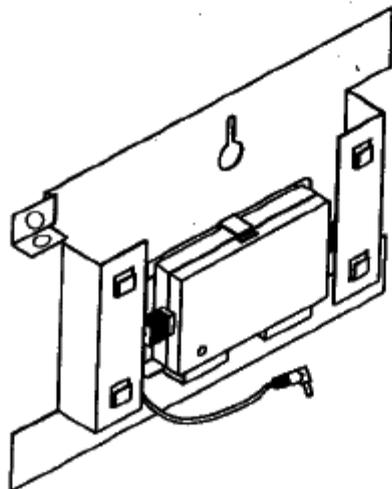


Figure 2-5 Mounting the power adapter

- ◆ Position the AP on the bracket, and slide the four recesses of the AP over the corresponding tabs on the mounting bracket as shown in Figure 2-6.

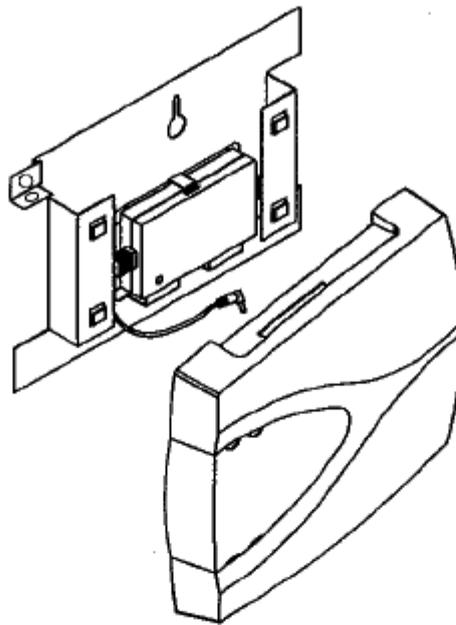


Figure 2-6 Attaching the AP

- ◆ Connect the DC power cable to the DC power inlet of the AP.
3. **Connecting the Ethernet cable and attaching the antenna**
- ◆ Insert the PC Card into the PC Card slot of the AP as shown in Figure 2-7.

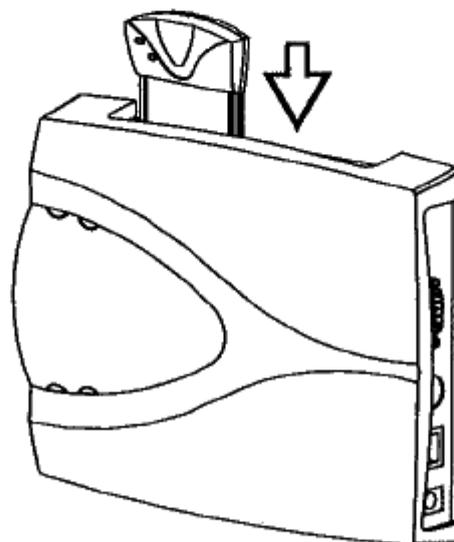


Figure 2-7 Inserting the PC Card

- ◆ Connect the Ethernet cable to the RJ-45 connector of the AP as shown in Figure 2-8.

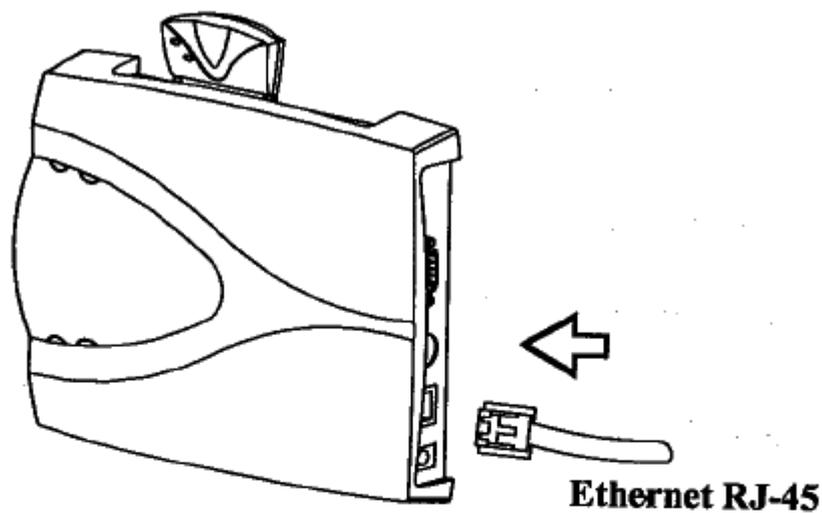


Figure 2-8 Connecting the Ethernet cable

- ◆ When you intend to use the AP with external antenna, insert the cable connector into the external antenna connector on your PC Card. Mount or place the external antenna into a vertical position to ensure optimal performance as shown in Figure 2-9.

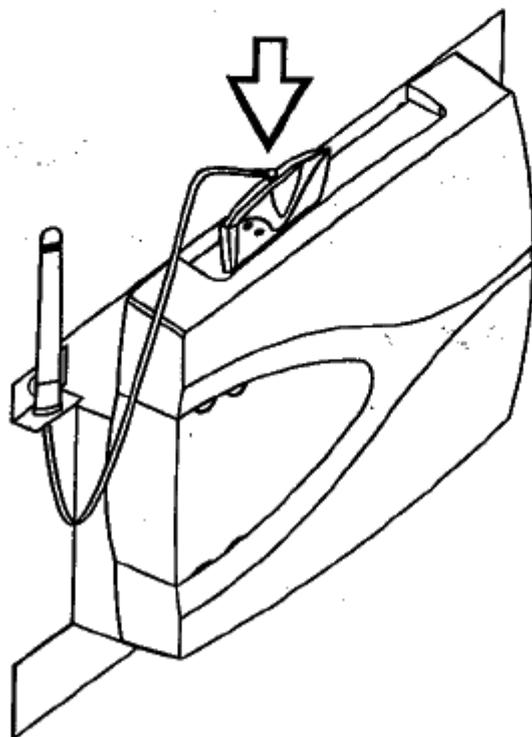


Figure 2-9 Connect the external antenna

- ◆ Plug the power cord into a power outlet.

Chapter 3 Initial Configuration

This chapter describes how to setup and configure the Access Point (AP) initially. The AP is shipped with configuration (default configuration is as a bridge) that can be utilized right out of the box. You simply need to attach the AP to your wired LAN. Detailed descriptions of the many configuration parameters and network requirements are described in Chapter 4.

3-1 Acting as a Bridge

Wireless LAN Settings

1. Install the AP as described in "Chapter 2 Hardware Installation", page 7.
2. Use the null modem cable provided to connect the COM1 of the computer to the RS-232 port of the AP. Default is COM1, you can change to COM2 with the "SL-2000AP Management Utility" diskette.
3. After finishing the computer connection with the AP, turn on the power of the computer to start Windows operating system.
4. Click "Start" button, then select "Run" to bring out "Run" dialog box. Insert the "SL-2000AP Management Utility" diskette into the floppy disk drive. Enter "A:\RSconfig.exe" at "Open" tab as shown in Figure 3-1. Then click "OK".

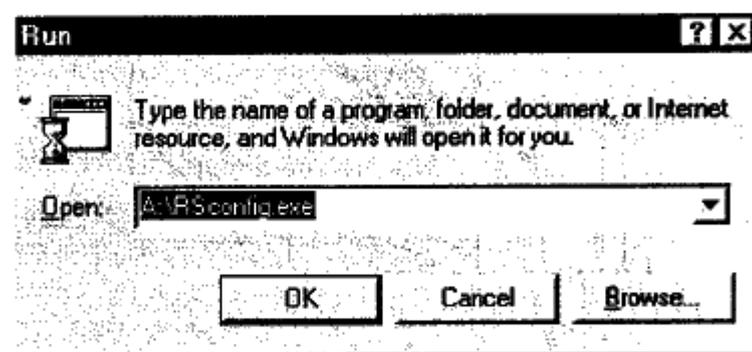


Figure 3-1

5. The computer will load the AP management utility from floppy drive A. In "SL-2000AP Management Utility" windows, select "WLAN Settings", then click "Read" to open the "Message Box" as shown in Figure 3-2.



Figure 3-2

6. Click "OK" to load the default wireless LAN settings of the AP as shown in Figure 3-3.

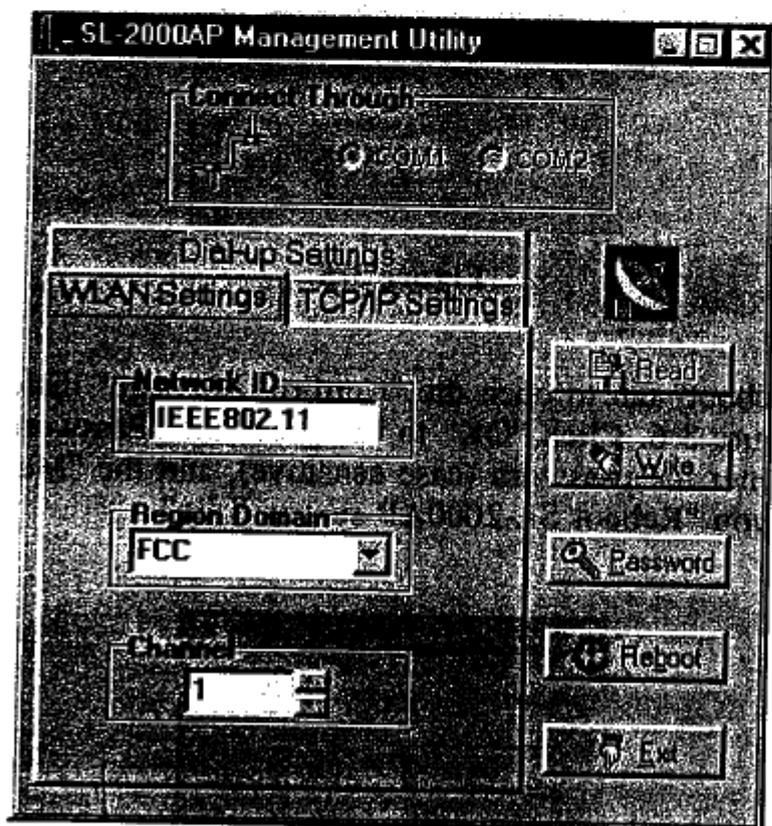


Figure 3-3

7. Enter the same "Network ID" name (case sensitive) as wireless clients which the AP will serve. Default "Network ID" is "IEEE802.11". If you would change to a new "Network ID" name, you have to click "Write" tab to bring out the "Password Box" dialog box as shown in Figure 3-4.

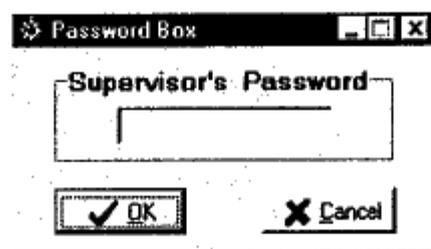


Figure 3-4

8. Enter the password (case sensitive, default is "default") at "Supervisor's Password", then click "OK" to open the "Message Box" dialog box as shown in Figure 3-5. Click "OK" to complete the data update.

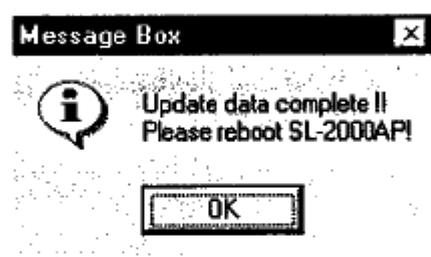


Figure 3-5

9. Click the "Reboot" tab to open the "Confirm Message" dialog box as shown in Figure 3-6. Click "OK" to bring out the "Password Box" dialog box again. Enter the password (case sensitive), and the "Message Box" will prompt you "Reboot SL-2000AP successfully".

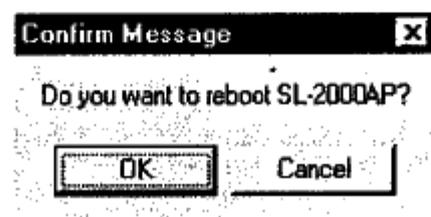


Figure 3-6

10. Click "OK" to return to "SL-2000AP Management Utility" dialog box. Then click "Exit" to complete the initial configuration for the AP.

TCP/IP Settings

1. Run "SL-2000AP Management Utility" program as described in "Chapter 3-1 Acting as a bridge—Wireless LAN Settings step 1 ~ step 4", page 12.
2. In "SL-2000AP Management Utility" windows, select "TCP/IP Settings", click "Read" to open the "Message Box".
3. Click "OK" to load the TCP/IP settings of the AP as shown in Figure 3-7.

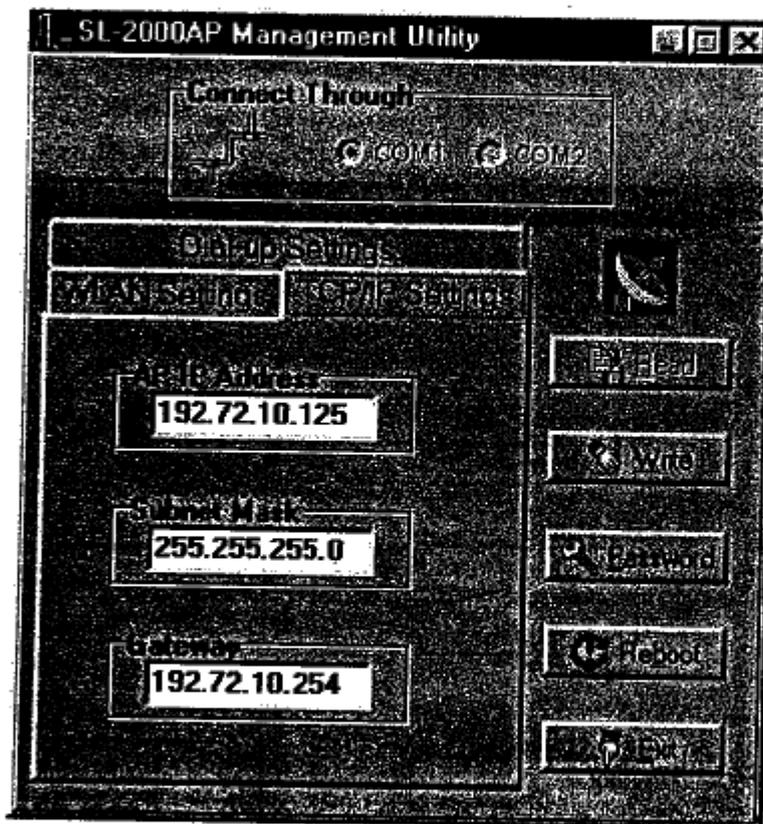


Figure 3-7

4. Enter the "AP IP Address", "Subnet Mark", and "Gateway". Click "Write" tab to bring out the "Password Box" dialog box.
5. Enter the password (case sensitive, default is "default") at "Supervisor's Password", then click "OK" to open the "Message Box" dialog box. Click "OK" to complete the data update.
6. Click the "Reboot" tab to open the "Confirm Message" dialog box. Click "OK" to bring out the "Password Box" dialog again. Enter the password (case sensitive), and the "Message Box" will prompt you "Reboot SL-2000AP successfully".
7. Click "OK" to return to "SL-2000AP Management Utility" dialog box. Then click "Exit" to complete the TCP/IP settings for the AP.

3-2 Acting as an IP Sharing SOHO Router

Dial-up Settings

1. Run "SL-2000AP Management Utility" program as described in "Chapter 3-1 Acting as a bridge—Wireless LAN Settings step 1 ~ step 4", page 12.
2. In "SL-2000AP Management Utility" windows, select "Dial-up Settings", then click "Read" to open the "Message Box".
3. Click "OK" to load the default dial-up settings of the AP as shown in Figure 3-8.

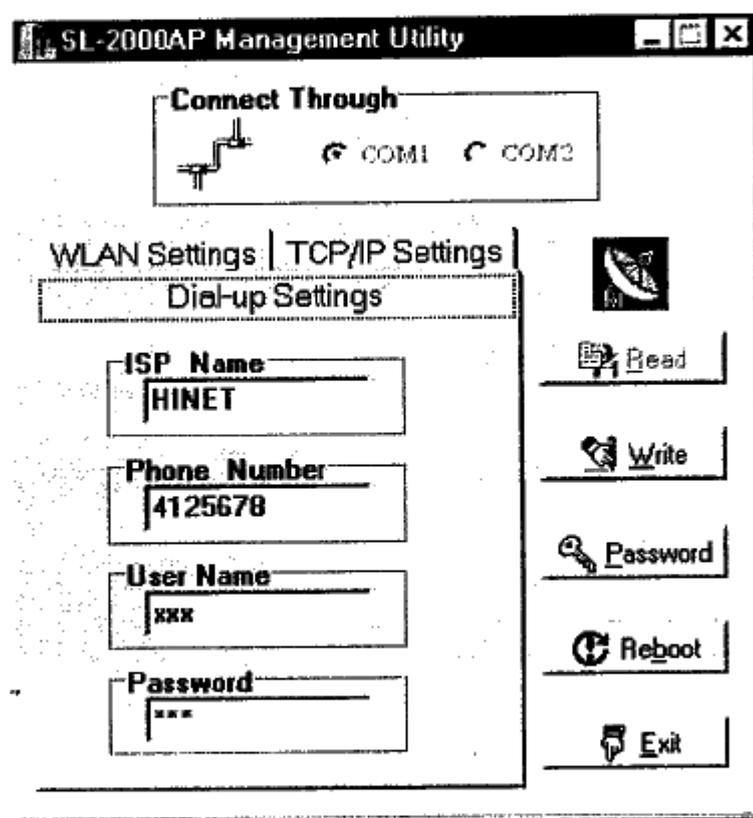


Figure 3-8

4. Enter the "ISP Name", "Phone Number", "User Name", and "Password". Click "Write" tab to bring out the "Password Box" dialog box.
5. Enter the password (case sensitive, default is "default") at "Supervisor's Password", then click "OK" to open the "Message Box" dialog box as shown. Click "OK" to complete the data update.

6. Click the "Reboot" tab to open the "Confirm Message" dialog box. Click "OK" to bring out the "Password Box" dialog again. Enter the password (case sensitive), and the "Message Box" will prompt you "Reboot SL-2000AP successfully".
7. Click "OK" to return to "SL-2000AP Management Utility" dialog box. Then click "Exit" to complete the dial-up settings for the AP.

Note:

1. The "Phone Number" has to be direct line phone number.
2. When the AP acts as an IP sharing SOHO router:
 - ◆ "Dial-up Mode" must be enabled via web browser as described in chapter 4-1 or Telnet session as described in chapter 4-2.
 - ◆ Gateway of TCP/IP settings must assign the same IP address as the field of the AP IP address.

Chapter 4 Advanced Functions

The AP is designed to operate as shipped from the factory without any special set-up. However, it has many options and parameters which can be changed if the user has special requirements. Most of management functions can be accessed using TCP/IP protocol. These functions are enabled by configuring the AP with its own IP address. You have to use the serial port on the AP and assign the IP address directly as described in Chapter 3-1 Acting as a bridge - TCP/IP Settings (page 15), and the IP functions will be enabled when the AP is restarted.

4-1 Web Browser Configuration

The user can use a LAN attached (wired or wireless) computer to configure the AP through using a web browser on a LAN attached computer. To use the web browser simply open a browser window using the IP address which has been assigned to the AP.

1. Start your web browser program from a LAN attached computer. To access the web interface of the AP, you have to disable "Access the Internet using a proxy server" function in View/Internet Options/Connection" as shown in Figure 4-1. Or enable the "Access the Internet using a proxy server" but "Bypass proxy server for local (AP IP address) addresses" (Do not use proxy server for AP IP address) as shown in Figure 4-2.

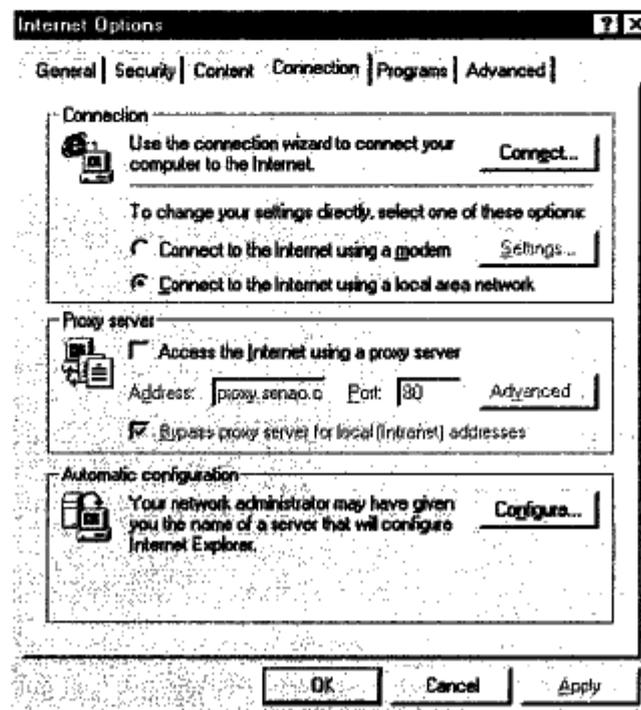


Figure 4-1

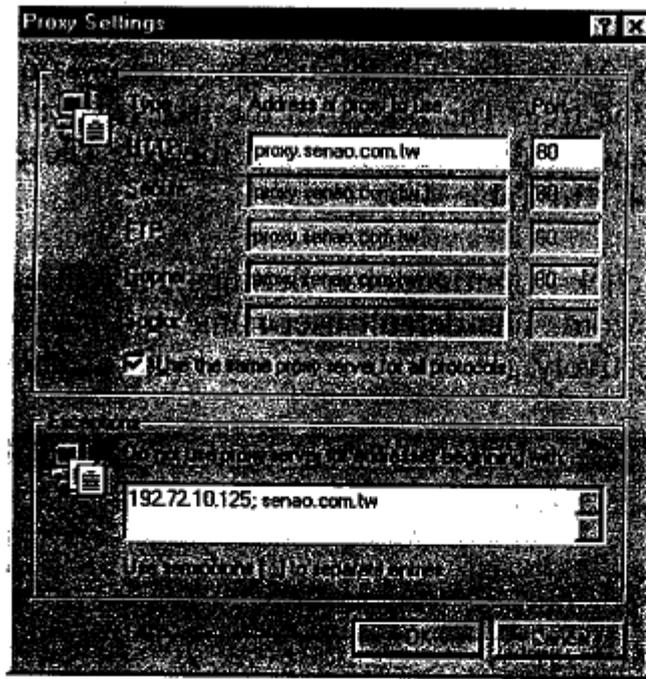


Figure 4-2

2. Click on the "address" or "URL" field, and enter the IP address of the AP you configured as described in "Chapter 3-1 Acting as a bridge - TCP/IP Settings", page 15.
3. In a few seconds the AP will respond with main screen of the web interface "SL-2000AP Management Utility" as shown in Figure 4-3.

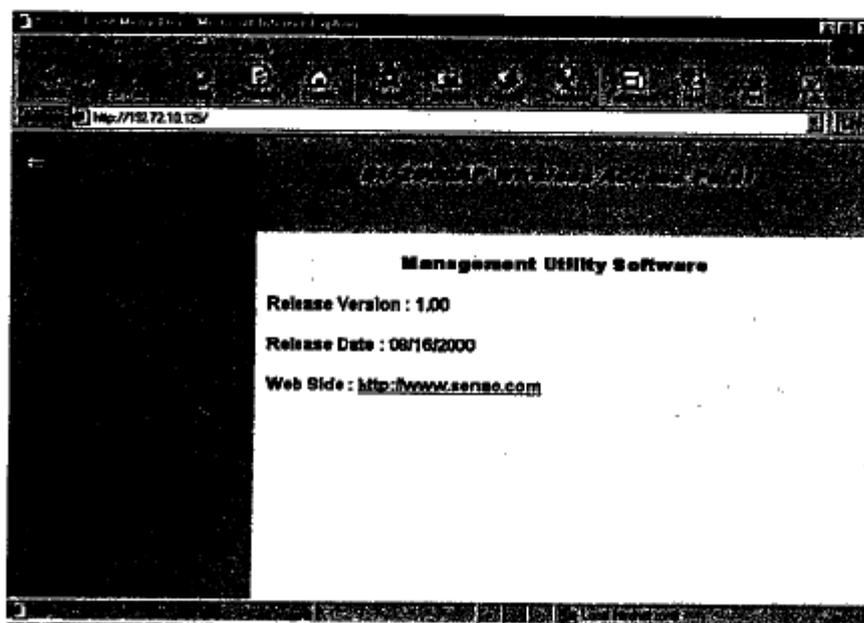


Figure 4-3

The left frame contains, in a tree structure, the contents of the AP web management system. Move through the tree by clicking on an icon to expand or collapse the tree. The nodes on the tree represent web pages that allow you to view and modify parameters in the AP. These parameters are explained in Table 4-1 to Table 4-4.

When first time to click "Configuration Settings", it will ask you to enter user name and password. The default user name and password are "default" and "default", respectively. (Both are case sensitive) as shown in Figure 4-4.

Enter Network Password

Please enter your authentication information.

Resource: SL-2000AP Management Utility

User name: default

Password: xxxxxx

Save this password in your password list

OK

Cancel

Figure 4-4

◆ WLAN Parameters, as shown in Figure 4-5

Access Point Home Top Microsoft Internet Explorer

File Edit View Go Favorite Help

Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit

Address http://192.72.10.125/ Links

Access Point

- Configuration Status
- WLAN Status
- TCP/IP Status
- Display Status
- Wireless Status List
- Configuration Setting
 - WLAN Setting
 - TCP/IP Setting
 - Display Setting

SL-2000AP Wireless Access Point

WLAN Status

In order to work normally in Access Point function. The relative parameters have to be set correctly. The following information is relative to wireless function. They include Network ID, and Channel. However, this information is only provided for browsing here.

Network ID	EEEE02 11
Channel	1

Date Local Intranet zone

Figure 4-5

Parameter	Description	Default Value
Network ID	Wireless LAN service area identifier of the AP (case sensitive)	IEEE802.11
Channel	The operating radio frequency channel for the AP	1

Table 4-1

◆ **TCP/IP Parameters, as shown in Figure 4-6.**

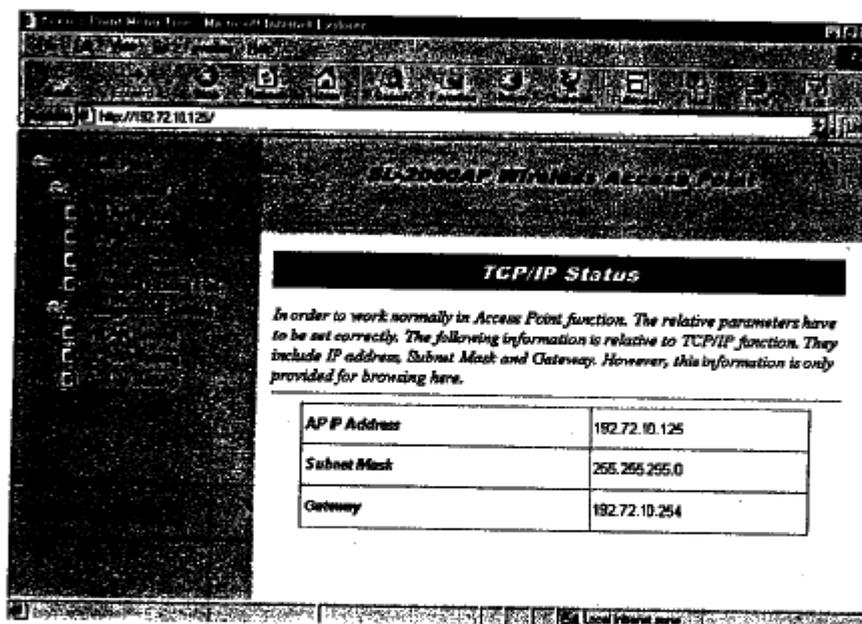


Figure 4-6

Parameter	Description	Default Value
AP IP address	IP address of the Access Point. The user can use a LAN attached (wired or wireless) computer to configure the AP through a web browser or Telnet program on a LAN attached computer.	192.72.10.125
Subnet Mask	Consists of four sets of digits that help divide a network into sub-networks and simplify routing and data transmission	255.255.255.0
Gateway	Default route when TCP/IP filtering. Note: When the AP acts as an IP sharing SOHO router, this field must assign the same IP address as the field of the AP IP address	192.72.10.254

Table 4-2

◆ Dial-up Parameters, as shown in Figure 4-7

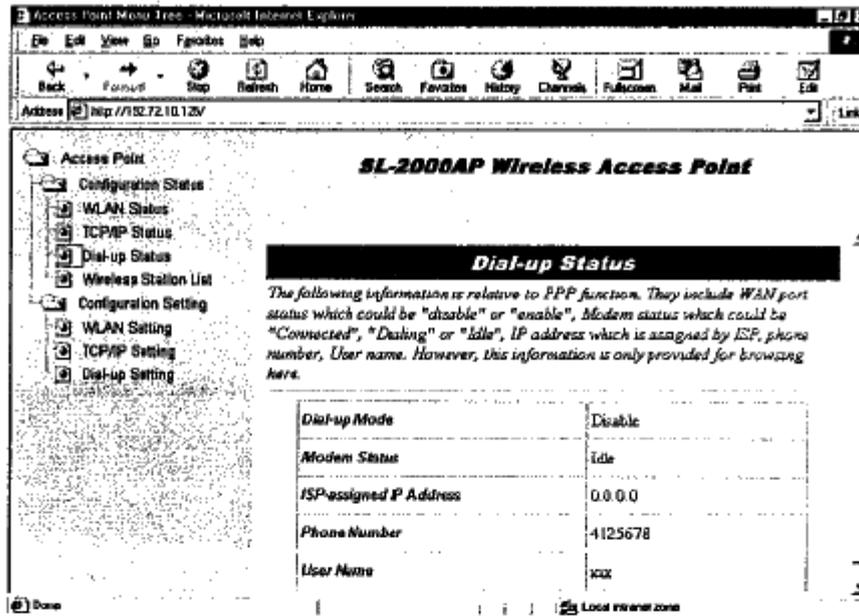


Figure 4-7

Parameter	Description	Default Value
Dial-up Mode	Enable RS-232 port to initialize Modem - Enable: 1 - Disable: 0 Note: Once RS-232 port is enabled, you can not configure the AP through RS-232 port. Therefore, you must record the TCP/IP settings for future configuring the Access Point.	0
Modem Status	Shows the modem is in "Connected", "Dialing", or "Idle" status.	Idle
ISP-assigned IP Address	The IP address that is assigned by your ISP.	0.0.0.0
Phone Number	The phone number that is used to call your ISP Note: The phone number must enter direct line phone number.	4125678
User Name	The user name used to login ISP	xxx
Password	The password used to login ISP	
Dial-up Time-out (secs)	Cancel the dial if not connected within this period	50
Dial-up Retry Interval (secs)	Number of seconds to wait between dialing	3

Table 4-3

◆ **Station List**, as shown in Figure 4-8.

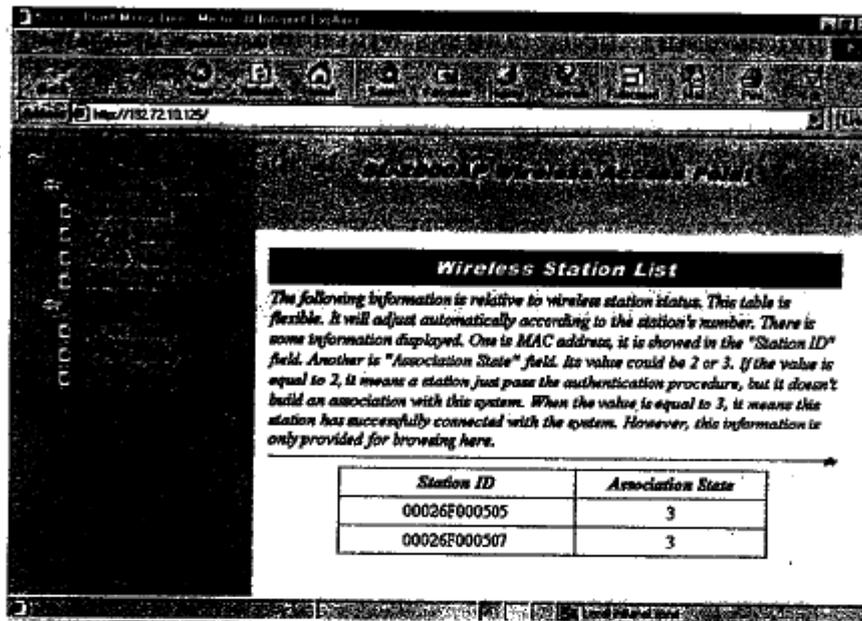


Figure 4-8

Parameter	Description	Default Value
Station ID	Shows the MAC address of each wireless station (or the PC Card)	-
Association State	Its value could be "2" or "3". - "2" means a wireless station is just pass the authentication procedure, but it does not build an association with the system. - "3" means the wireless station has successfully connected with the system.	3

Table 4-4

4-2 Telnet Configuration

The user can use a LAN attached computer to configure the AP through using a Telnet session on a LAN attached computer. To use the Telnet session simply open a Telnet window using the IP address which has been assigned to the AP.

1. Click "Start" button, select "Run" to open the "Run" dialog box. Enter "command" at "Open" tab. Then click "OK" as shown in Figure 4-9.

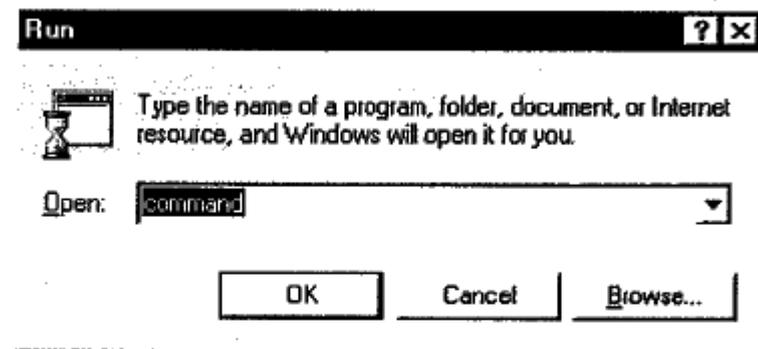


Figure 4-9

2. In "MS-DOS Mode" window, enter "telnet IP address" which has been assigned to the AP as described in "Chapter 3-1 Acting as a bridge - TCP/IP Settings", as shown in Figure 4-10.



Figure 4-10

3. In "Telnet" window, enter the supervisor password, default is "default" (case sensitive), to prompt "Wireless LAN SL-2000AP Management Utility" as shown in Figure 4-11. Select the option you want to modify or execute.

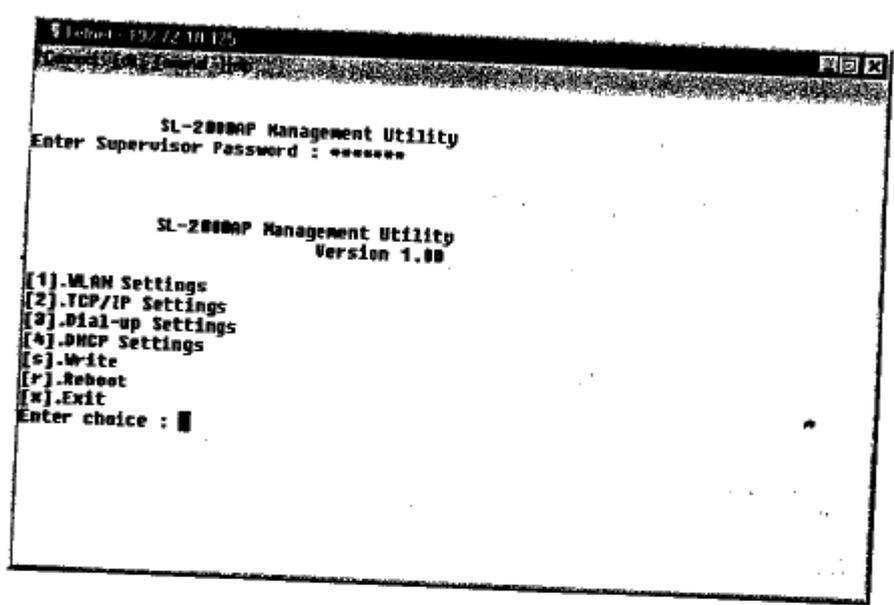


Figure 4-11

There are seven options on the screen for the AP. Just enter the letter in the bracket to modify the corresponding parameters. These are:

- ◆ **WLAN Settings**
Configuring the AP for wireless LAN.
- ◆ **TCP/IP Settings**
Configuring the general TCP/IP parameters regarding the AP.
- ◆ **Dial-up Settings**
Configuring the AP for Internet accessing.
- ◆ **DHCP Settings**
Configuring the AP to assign dynamic IP addresses to wireless stations.
- ◆ **Write**
Write the updated parameters back to the AP.
- ◆ **Reboot**
Restart the AP once the parameters of the AP are changed.
- ◆ **Exit**
Disconnecting the computer from the AP.

WLAN Settings

1. Return to Main Menu, press "1" to enter "WLAN Settings" submenu.
2. Select the number in the brackets to modify the corresponding parameter as shown in Figure 4-12. The parameters in the WLAN Settings submenu are explained in Table 4-5.
3. Press "x" to return Main Menu.

```
telnet: 192.72.10.125
Connect EdR Terminal Help

SL-2000AP Management Utility
Enter Supervisor Password : *****

SL-2000AP Management Utility
Version 1.00

[1].WLAN Settings
[2].TCP/IP Settings
[3].Dial-up Settings
[4].DHCP Settings
[5].Write
[r].Reboot
[x].Exit
Enter choice :

WLAN Settings

[1].Network ID:IEEE802.11
[2].Channel
[3].DataRate:2Mbps
[x].Return to Main Menu
Enter choice : █
```

Figure 4-12

Parameter	Description	Default Value
Network ID	Wireless LAN service area identifier of the AP (case sensitive)	IEEE802.11
Channel	The operating radio frequency channel for the AP	1
Data Rate	Wireless transmission/receiving speed - 2Mbps: 1 - 1Mbps: 0	1

Table 4-5

TCP/IP Settings

1. Return to Main Menu, press "2" to enter "TCP/IP Settings" submenu.
2. Select the letter in the brackets to modify the corresponding parameter as shown in Figure 4-13. The parameters in the TCP/IP Settings submenu are explained in Table 4-6.
3. Press "x" to return Main Menu.

```
Telnet - 192.72.10.125
Connect Edit Terminal Help
SL-2000AP Management Utility
Version 1.00

[1].WLAN Settings
[2].TCP/IP Settings
[3].Dial-up Settings
[4].DHCP Settings
[s].Write
[r].Reboot
[x].Exit
Enter choice :

      \TCP/IP Settings

[1].AP IP Address:192.72.10.125
[2].Subnet Mask:255.255.255.0
[3].Gateway:192.72.10.254
[4].Domain Name:senao.com.tw
[5].Primary DNS:192.72.9.46
[6].Secondary DNS:192.72.9.47
[7].Telnet Port Number:23
[8].NAT Setting:Enable
[9].AP Setting Password:*****
[x].Return to Main Menu
Enter choice : █
```

Figure 4-13

Parameter	Description	Default Value
AP IP address	IP address of the AP. The user can use a LAN attached (wired or wireless) computer to configure the AP through using a web browser or telnet program on a LAN attached computer.	192.72.10.125
Subnet Mask	Consist of four sets of digits that help divide a network into sub-networks and simplify routing and data transmission.	255.255.255.0
Gateway	Default route when TCP/IP filtering. Note: When the AP acts as an IP sharing SOHO router, this field must assign the same IP address as the field of the AP IP address.	192.72.10.254
Domain Name	Domain name for SOHO router	senao.com.tw
Primary DNS	Primary DNS IP address	192.72.9.46
Secondary DNS	Secondary DNS IP address	192.72.9.47
Telnet Port	The port number for Telnet program	23
NAT (Network Address Translation) Setting	Enables a LAN to use one set of IP addresses for internal traffic and a second set of addresses for external traffic - Enable: 1 - Disable: 0 Note: The NAT function is only effective to RS-232 port.	1
AP Setting Password	The password to modify the parameters of the AP (case sensitive)	default

Table 4-6

Dial-up Settings

1. Return to Main Menu, press "3" to enter "Dial-up Settings" submenu.
2. Select the number/letter in the brackets to modify the corresponding parameter as shown in Figure 4-14. The parameters in the Dial-up Settings submenu are explained in Table 4-7.
3. Press "x" to return Main Menu.

```

Telnet - 192.72.10.125
Connect Edit Terminal Help
[x].Exit
Enter choice :

      \Dial-up Settings

[1].Dial-up Mode:Disable
[2].ISP Name:HINET
[3].Phone Number:4125678
[4].User Name:xxx
[5].Password:*****
[6].Modem Type:MODEM
[7].Link Type:DialUp Mode
[8].Line Speed:115200
[9].Modem Initial String:ATL1
[a].Hang Up String:ATH
[b].Dial-up Retry Interval(sec):3
[c].Dial-up Timeout(sec):50
[d].Connection Idle Timeout(min):10
[e].Modem Status:Idle
[f].IP Type:Dynamic
[g].ISP-assigned IP Address:0.0.0.0
[h].Subnet Mask:255.255.255.0
[i].Gateway:0.0.0.0
[x].Return to Main Menu
Enter choice : █
  
```

Figure 4-14

Parameter	Description	Default Value
Dial-up Mode	Enable RS-232 port to initialize Modem - Enable: 1 - Disable: 0 Note: Once RS-232 port is enabled, you can not configure the AP through RS-232 port. Therefore, you must record the TCP/IP settings for future configuring the Access Point.	0
ISP Name	A company that provides access to the Internet	HINET
Phone Number	The phone number that is used to call your ISP Note: The phone number must enter direct line phone number.	4125678
User Name	The user name used to login ISP	xxx
Password	The password used to login ISP	

Parameter	Description	Default Value
Modem Type	Select the type of the Modem - Analog Modem: 1 - ISDN TA: 2	1
Link Type	Specify the type of link with Internet - Disable: 0 - Dial-up: 1 - Leased: 2	1
Line Speed	Connection speed with internet	115200bps
Modem Initial String	Parameters to initialize Modem	ATL1
Hang Up String	Parameters to hang up Modem	ATH
Dial-up Retry Interval (secs)	Number of seconds to wait between dialings	3
Dial-up Time-out (secs)	Cancel the dial if not connected within this period	50
Connection Idle Timeout (mins)	Disconnect a call if idle more than this period	10
Modem Status	Show the connection status of the AP to Internet - Idle - Connecting - Connected	Idle
IP Type	Specify the IP type when connecting with internet. For dial-up link type, IP type is set as "Dynamic" mode. For leased link type, IP type is set to be "Fixed" mode. - Dynamic: 0 - Fixed: 1	0
ISP-assigned IP Address	If IP Type is set as "Dynamic" mode, it will show the IP address get from ISP. If IP Type is set as "Fixed" mode, you have to assign an IP address to the AP.	0.0.0.0
Subnet Mask	Consist of four sets of digits that help divide a network into sub-networks and simplify routing and data transmission.	255.255.255.0
Gateway	For Leased link type only	0.0.0.0

Table 4-7

DHCP Configuration

DHCP (Dynamic Host Configuration Protocol) allows dynamic assignment of IP addresses from the Access Point. With dynamic addressing, a wireless station can have a different IP address every time it connects to the network.

Dynamic addressing simplifies network administration because the software keeps track of IP addresses rather than requiring an administrator to manage the task. This means that a new wireless station can be added to a network without the hassle of manually assigning it a unique IP address.

1. Return to Main Menu, press "4" to enter "DHCP Configuration" submenu.
2. Select the number in the brackets to modify the corresponding parameter as shown in Figure 4-15. The parameters in the DHCP Configuration submenu are explained in Table 4-8.
3. Press "x" to return Main Menu.

```
Telnet - 192.72.10.125
Connect Edit Terminal Help

SL-2000AP Management Utility
Enter Supervisor Password : *****

SL-2000AP Management Utility
Version 1.00

[1].WLAN Settings
[2].TCP/IP Settings
[3].Dial-up Settings
[4].DHCP Settings
[5].Write
[r].Reboot
[x].Exit
Enter choice :

\DHCP Settings

[1].DHCP Mode:Enable
[2].IP Start At:192.72.10.200
[3].IP Count:20
[x].Return to Main Menu
Enter choice :
```

Figure 4-15

Parameter	Description	Default Value
DHCP Mode	Enable/Disable automatic IP address assignment to wireless stations. - Enable: 1 - Disable: 0	1
IP Start At	IP Starting Address	192.72.10.200
IP Count	Number of IP address that the AP provides	20

Table 4-8

Chapter 5 Troubleshooting

This chapter describes the problems and corresponding solutions that may occur when installing the AP. After the AP resets and hardware is initialized, it performs an EDO RAM test. If the test passes, Power, Radio, and Ethernet LED turn on. If the test fails, only Power LED turns on.

Symptom	Solution
The AP does not power up	<p>You may be experiencing one of the following:</p> <ul style="list-style-type: none"> ◆ Faulty AP power supply ◆ Failed AC supply ◆ Electrical Management System (EMS) operating outlet
No Operation	<ul style="list-style-type: none"> ◆ Verify AP setting via Telnet, Web Browser or RS-232. Review procedures for Ethernet connection of the AP. ◆ Verify network setting by ensuring that there are no duplicate IP addresses. Power down the device in question and ping the assigned address of the device. Ensure no other device responds to that address.
Dial-up no operation	<ul style="list-style-type: none"> ◆ Check that modem is OK and properly connected. ◆ Verify AP dial-up setting via Telnet, Web Browser. ◆ Ensure to enable "Dial-up Mode" and to assign the same IP address of the AP to the Gateway of the AP.
AP powered on but has no connection to the wired network	<p>Check connections for proper wiring.</p>
Verify network wiring and configuration for proper setting	<ul style="list-style-type: none"> ◆ Check that the cables used have proper pinouts connectors. ◆ Verify wireless station operation. ◆ Confirm AP operation. ◆ Confirm AP and wireless station Network ID. ◆ Check that the radio driver loaded properly.
Slow or erratic performance	<ul style="list-style-type: none"> ◆ Check wireless station and Therefore communications range. ◆ Check antenna, connectors and cabling. ◆ Check to see that the wired network does not exceed 10 broadcast messages per second. ◆ Verify wired network configuration and setting.

Appendix A Specifications

Radio Characteristics

Operating Frequency	2.412~2.484GHz
Number of Channels	14
Number of selectable sub-channels	North America (FCC) 11 Europe (ETS) 13 France (FR) 4 Japan (JP) 1 Other Countries (FCC) 11
RF Technology	Direct Sequence Spread Spectrum
Data Rate	1 or 2Mbps
Modulation Type	DBPSK/DQPSK
Spread Code	11 chips barker code
Chipping Rate	11 Mcps
Normal Output Power	15dBm
RX Sensitivity@FER=0.08	-88dBm
Range (Office Environment)	50 meters
Range (Open Space)	250 meters

Physical and Power Specifications

Dimensions (L x W x H)	221 x 166 x 33 mm
Weight	920 grams
Voltage	6 V
Current	1 A
Power consumption	6 W
Temperature	Typical indoor environment 0~55 C
Relative humidity	20% to 90%

Regulations

Country	Regulation
USA	FCC Part15B
Canada	IC RSS-210

Network Information

Network Protocol	IEEE802.11(Wireless LAN)
	IEEE802.3(Ethernet)
	Point to Point Protocol (PPP) for Dial-Up network
	Network Address Translation protocol(NAT) for IP Sharing
	Dynamic Host Configuration Protocol(DHCP) server function for automatic IP address management
Network Connection	PCMCIA Type II (Wireless LAN)
	10BaseT (Ethernet)
	Serial Port (Dial-Up networking for internet connection)
Wireless Protocol	IEEE802.11
Seamless Roaming	Compliant with IEEE802.11
Media Access Protocol	Carrier Sense Multiple Access /Collision Avoidance
Error Detection	CRC32

Configuration and Management

Local Configuration	RS-232 port of host station via local configuration software
Telnet Configuration	Any wired or wireless LAN station via Telnet configuration software
Web Based configuration	Any wired or wireless LAN station via Web Browser

Appendix B Regulatory Compliance Information

Radio Frequency Interference Requirements

This device complies with Part 15 of FCC Rules and Canada RSS-210.

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.

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 and Regulation. 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 instruction manual, may cause harmful interference to nearby TV's, VCR's, radio, computers, or other electronic devices. To minimize or prevent such interference, this equipment should not be placed or operated near these devices. If interference is experienced, moving the equipment away from them will often reduce or eliminate the interference.

However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ◆ Re-orient 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 which the receiver is connected.
- ◆ Consult the dealer or an experienced radio/TV technician for help.

SENAO International is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this IEEE802.11 Genie LAN kit, or substitution or attachment of connecting cables and equipment other than specified by SENAO International. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

Appendix C Limited warranty

HARDWARE

SENAO International ("SENAO") warrants its products to be free from defects in workmanship and materials, under normal use and service, for the following length of time from the date of purchase from SENAO or its authorized reseller:

- ◆ One (1) year for the PC Cards.
- ◆ One (1) year for the Access Points

If a product does not operate as warranted during the applicable warranty period, SENAO will, at its option and expense, repair the defective product or part, or deliver to Customer an equivalent product or part to replace the defective item. All products that are replaced will become the property of SENAO. Replacement products or parts may be new or reconditioned. SENAO warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.

SOFTWARE

Software and documentation materials are supplied "as is" without warranty as to their performance, merchantability, or fitness for any particular purpose. However, SENAO warrants the media containing software against failure for a period of ninety (90) days from the date of purchase from SENAO or its authorized reseller.

OBTAINING WARRANTY SERVICE

Customer must contact a SENAO Corporate Service Center or an Authorized SENAO Service Center within the applicable warranty period to obtain warranty service authorization. Dated proof of purchase from SENAO or its authorized reseller may be required. Products returned to SENAO's Corporate Service Center must be pre-authorized by SENAO with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid, and packaged appropriately for safe shipment, and it is recommended that they be insured or sent by a method that provides for tracking of the package. Responsibility for loss or damage does not transfer to SENAO until the returned item is received by SENAO. The repaired or replaced item will be shipped to the Customer, at SENAO's expense, not later than thirty (30) days after SENAO receives the defective product, and SENAO will retain risk of loss or damage until the item is delivered to the Customer. SENAO shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to SENAO for repair, whether under warranty or not.

WARRANTIES EXCLUSIVE

If a SENAIO product does not operate as warranted above, Customer's sole remedy for breach of that warranty shall be repair, replacement, or refund of the purchase price paid, at SENAIO's option. To the full extent allowed by law, the foregoing warranties and remedies are exclusive and are in lieu of all other warranties, terms, or conditions, express or implied, either in fact or by operation of law, statutory or otherwise, including warranties, terms, or conditions of merchantability, fitness for a particular purpose. SENAIO neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale, installation, maintenance or use of its products.

SENAIO shall not be liable under this warranty if its testing and examination disclose that the alleged defect or malfunction in the product does not exist or was caused by the Customer's or any third party's misuse, neglect, improper installation or testing, unauthorized attempts to open, repair or modify the product, or any other cause beyond the range of the intended use, or by accident, fire, lightning, or other hazards.

LIMITATION OF LIABILITY

To the full extent allowed by law, SENAIO also excludes for itself and its suppliers any liability, whether based in contract or tort (including negligence), for incidental, consequential, indirect, special, or punitive damages of any kind, or for loss of revenue or profits, loss of business, loss of information or data, or other financial loss arising out of or in connection with the sale, installation, maintenance, use, performance, failure, or interruption of its products, even if SENAIO or its authorized reseller has been advised of the possibility of such damages, and limits its liability to repair, replacement, or refund of the purchase price paid, at SENAIO's option. This disclaimer of liability for damages will not be affected if any remedy provided herein shall fail of its essential purpose.



SENAO

SENAO INTERNATIONAL CO., LTD.
2FL., NO. 531, CHUNG CHENG RD., HSIN TIEN CITY, TAIPEI, TAIWAN, R.O.C.

P/N: 670901163000