IEEE 802.11b Outdoor Wireless Client Bridge

User Manual

November 03, 2004 Version 1.00



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

Contents

CHAPTI	ER 1. INTRODUCTION	
1.1 1.2	INTRODUCING THE WIRELESS CLIENT BRIDGE	
1.3	PACKAGE CONTENTS	
1.4	SYSTEM REQUIREMENTS	
1.5	INLINE POWER INJECTOR (POE)	
CHAPTI	ER 2. INSTALLATION AND BASIC CONFIGURATION.	
2.1	BEFORE YOU START	
2.2	LOCATE THE WIRELESS CLIENT BRIDGE AND INLINE POWER INJECTOR	OR
PORTS		
2.3	PREPARING INSTALLATION	
2.4	BASIC CONFIGURATION	
2.4.1	√	
2.4.2	J. G	
2.4.3 2.4.4	20 Sin time the free lines, give	
2.4.4	, , , - y ,	
2.4.6		
2.4.7		
2.4.8	10	
CHAPTI	ER 3. NETWORK TOPOLOGIES	22
3.1	WIRELESS CLIENT BRIDGE-TO-CENTRAL WIRELESS BRIDGE	23
3.2	WIRELESS CLIENT ROUTER-TO-CENTRAL WIRELESS BRIDGE	
3.3	WIRELESS CLIENT BRIDGE-TO-CENTRAL WIRELESS ROUTER	
3.4	WIRELESS CLIENT ROUTER-TO-CENTRAL WIRELESS ROUTER	20
CHAPTI	ER 4. NETWORK PARAMETERS	28
4.1	IP CONFIGURATION	28
4.2	CONFIGURE SNMP	28
4.2.1		
4.2.2		
4.3	CONFIGURE WIRELESS RELATED PARAMETERS	
4.4	UTILITY	
4.4.1	- ~ J · · · · · · · · · · · · · · · · · ·	
4.4.2		
CHAPTI Version 1.		3'

5.1	System Information	
5.2	STATISTIC INFORMATION	
5.3	SITE SURVEY	
5.4	WIRELESS LINK INFORMATION	
СНАРТ	TER 6. SPECIFICATIONS	42
6.1	HARDWARE SPECIFICATIONS	42
6.2	SOFTWARE SPECIFICATIONS	44
СНАРТ	TER 7. DEFAULT SETTINGS	45
7.1	GENERAL CONFIGURATION	45
7.1		
7.1		
7.1	1.3 Wireless LAN	46
7.2	UTILITY	48
7.2		
7.2		
СНАРТ	TER 8 REGULATORY COMPLIANCE I	NEORMATION 49

Chapter 1. Introduction

1.1 Introducing the Wireless client bridge

The Wireless client bridge is a fully interoperable with IEEE 802.11b compliant Outdoor Wireless Last-mile product. The Wireless client bridge operates in remote bridge mode, and connects Outdoor Wireless Router Bridge to construct point-to-point as well as point-to-multipoint topologies, for maximum flexibility in configuring building-to-building networks to WISP.

1.2 Product Features

- ✓ Outdoor enclosure in compliance with IP67
- ✓ RF transmit power 100mW (20dBm) with -85dBm Rx sensitivity
 @ 11Mbps data rate
- ✓ Embedded 9dBi patch directional antenna
- ✓ Support 24VDC 0.8A Power-over-Ethernet
- ✓ NAT/NAPT and Virtual Server Mapping support
- ✓ MIB-II and Private MIB support
- ✓ MAC address based access control

1.3 Package Contents

The product package contains the following items.

- One (1) Wireless client bridge Outdoor Wireless Client Bridge unit
- 2. One (1) 100~240VAC, 50~60Hz AC/DC adapter with wall-mount plug and DC plug power cord
- 3. One (1) 24VDC, 830mA Inline Power Injector (PoE)
- 4. Three (3) water protect kit consists of 3 of components
- 5. One (1) 1.8m grounding wire
- 6. One (1) User manual CD-disc
- 7. One (1) wall/mast mounting kit, including one (1) band clamp

Version 1.02 ii Version 1.02 1

1.4 System Requirements

Installation of the Outdoor Wireless Client Bridge requires the following:

- A Windows-based PC/AT compatible computer or Ethernet data device with an available RJ-45 Ethernet port to run the configuration program or with TCP/IP connection to the Ethernet network.
- 2. A 10/100Base-T Ethernet RJ-45 Ethernet cable is connected to Ethernet network.
- **3.** A RS-232 consol port cable is connected to PC/AT compatible computer.
- **4.** An AC power outlet (100~240V, 50~60Hz) supplies the power.

1.5 Inline Power Injector (PoE)

The Wireless client bridge is equipped with an Inline Power Injector module. The Inline Power Injector (PoE) delivers both data and power to Wireless client bridge unit via a signal Ethernet cable, and gives the following benefits to improve the performance vs. installation cost ratio.

- 1. This works great in areas where you may not have power and/or Ethernet easily accessible, like house roof.
- 2. This also allows you to place the Wireless client bridge unit closer to the antenna, more easily thus reducing signal loss over antenna cabling.
- **3.** Ethernet signal travels well over CAT 5 cable but 2.4GHz signal doesn't do as well over antenna cabling.
- **4.** Ethernet cabling is much cheaper than Antenna cabling.

Chapter 2. Installation and Basic Configuration

This chapter describes the procedures of installing the Wireless client bridge.

2.1 Before You Start

After unpacking the system, make sure the following items are present and in good condition.

- 1. Wireless client bridge Outdoor Wireless Client Bridge unit
- 2. AC/DC adapter 100~240VAC, 50~60Hz with wall-mount plug and DC plug power cord
- 3. Inline Power Injector (PoE) 24VDC, 830mA
- 4. Water protect kit consists of three of components
- 5. Grounding wire 1.8m
- 6. User manual CD-disc
- 7. Wall/mast mounting kit, including one (1) band clamp



Version 1.02 2 Version 1.02 3

2.2 Locate the Wireless client bridge and Inline Power Injector Ports

- Interface on the Wireless client bridge Unit
 - ✓ Ethernet Port 1 for connecting the RJ-45 CAT-5 Ethernet cable.
 - ✓ RS-232 Console Port 2 for connecting the 1.8m RS-232 null modem console cable.

NOTE: The RJ-45 Ethernet cable is not provided in Wireless client bridge shipping package as an accessory. User can find one from computer store in accordance with the length required for outdoor deployment.

NOTE: How to make up Water protect kit



PS: 1. Red line is RJ-45 cable
2. Use dryer blew Ardent shrink casing pipe

Before

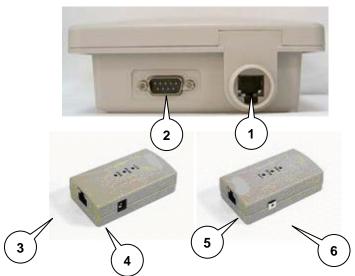




Interface on the Inline Power Injector

- ✓ **Data Input Port** 3 for connecting cross-over Ethernet Cable to PC or straight Ethernet cable to Hub Switch Router.
- ✓ 110~240VAC, 50~60Hz AC/DC power adapter **DC Input Port**
- ✓ **Power & Data Output Port 5** for connecting the 30m RJ-45 CAT-5 Ethernet Cable.
- ✓ Grounding Port 6.

NOTE: The cross-over or straight type Ethernet cable is not provided in Wireless client bridge shipping package as an accessory. User can find one from computer store in accordance with the length required for indoor deployment.



■ Mount Wireless client bridge on A Wall/Pole

The Wireless client bridge can be mounted on the wall, you can use the Wall Mount kit to mount the Wireless client bridge as shown in **Figure 2.2.1**.

Version 1.02 4 Version 1.02 5

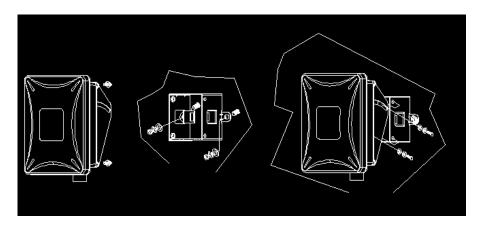


Figure 2.2.1

You can also mount the Wireless client bridge to the mast as shown in **Figure 2.2.2**.

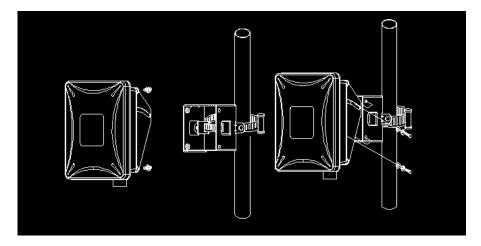
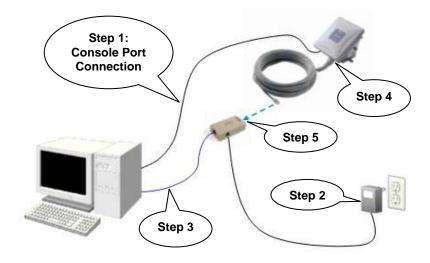


Figure 2.2.2

2.3 Preparing Installation

Before installing Wireless client bridge for the outdoor application in a hard-to-reach location, we recommend to configure and test all the devices first.

For configuring the Wireless client bridge, please follow the quick steps below to power up the Wireless client bridge.



- Step 1 Attach the 1.8m RS-232 null modem console cable to the Console Port on the Wireless client bridge unit (refer to page 4), and the other end (DB9 female type) to a terminal or a PC running a terminal emulation program.
- Step 2 Plug the DC plug of the AC/DC power adapter into the DC Input

 Port of Inline Power Injector and the wall-mount plug into a power
 outlet or power strip (refer to page 4). The Power LED on the Inline
 Power Injector will light up.
- Step 3 Run the cross-over type uplink Ethernet cable from Data Input Port (refer topage 4) to the Ethernet port on a PC

Version 1.02 6 Version 1.02 7

- **NOTE:** This connection is required for setting up initial configuration information. After configuration is completed, the RS-232 null modem console cable shall be removed, and run a cross-over Ethernet cable from **Data Input Port** to PC, or a straight Ethernet cable to LAN connection, e.g. Hub.
- Step 5 Attach one straight Ethernet cable to the **Power & Data Output**Port on the Inline Power Injector(refer to page 5).
- Step 6 Plug the other end of the straight Ethernet cable to the **Ethernet**Port (refer to page 5) on the Wireless client bridge.

When the Wireless client bridge receives power over the Ethernet cable, the Wireless client bridge will start its boot sequence and the **Active** LED on the Inline Power Injector will light up.

You can configure the Wireless client bridge via HTML browser, such as Microsoft Internet Explorer or Netscape Navigator from a remote host or PC.

2.4 Basic Configuration

2.4.1 What you need to know

The Wireless client bridge can be configured into two operation roles, including **Wireless Client Bridge** and **Wireless Client Router**.

The Wireless client bridge is shipped with default configuration to function as a client bridge between an Ethernet and Wireless network by attaching Wireless client bridge to the wired LAN simply. If user would configure Wireless client bridge, please refer to the following procedures.

2.4.2 Basic Configuration Steps

This section describes a five-step configuration procedure to setup Wireless client bridge workable upon your topology requirement.

- **Step 1** Select an operation mode for Wireless client bridge on the web page "/**General Config/System/**", and click **FINISH** to refresh this page.
- Step 2 Modify the factory-default parameters on the web page "/General Config/System/", and click FINISH to save the changes.
- Step 3 Modify the factory-default parameters on the web page "/General Config/Wireless/", and click FINISH to save the changes.
- Step 4 (Optional) Modify other parameters on the web page "/General Config/", and click FINISH to save the changes.
- Step 5 Move to page "/Utility/Administration/", select the then Restart and then click FINISH to take effect on the previous configuration changes.

Version 1.02 8 Version 1.02 9

2.4.3 Login into the Web Interface

The Wireless client bridge supports access to the configuration system through the use of an HTTP Interface.

Web Configuration

Before configuring Wireless client bridge, user needs to know the IP Address assigned to the unit. When shipped from the factory, the IP Address 192.168.5.99 was assigned to the Wireless client bridge by default. To start a web connection, use http://192.168.2.1

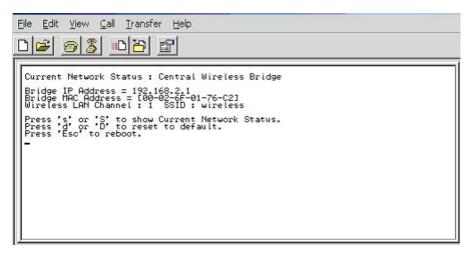
Identify the IP Address assigned to the unit

However, user may change the IP Address later and cannot connect the unit by using the default IP Address. In this case, it is a must to identify the Wireless client bridge current IP Address before configuring. To identify the IP Address, user can use the serial port (refer to page 4) to gain access of the current network status.

To start a Serial Port connection by following the steps below.

- Step 1 Attach the RS-232 null modem console cable (refer to page 4 and page 6) to the RS-232 Console Port on Wireless client bridge. Connect the other end to a terminal or a PC running a terminal emulation program.
- Step 2 Set the terminal to 115200 baud rate, None Parity, 8 data bits, 1 Stop bit, and ANSI compatible.
- **Step 3** Run a terminal emulation program on PC, such as **Hyper Terminal**, and set the following connection properties.
 - Step 3.1 Click the Start icon > Program > Accessories > Communication > Terminal.
 - Step 3.2 Create a new connection file, and select a Com Port <COM1, COM2, etc., depending on PC> with 115200bps / 8-bits / 1-stop.
 - Step 3.3 Click the properties icon in the Tool Bar > setting > select Emulation terminal VT100 > ok.

- **Step 4** Reboot Wireless client bridge.
- **Step 5** When the Wireless client bridge is powered up, the "Current **Network Status**" will be displayed as shown below.



Web Access Procedures

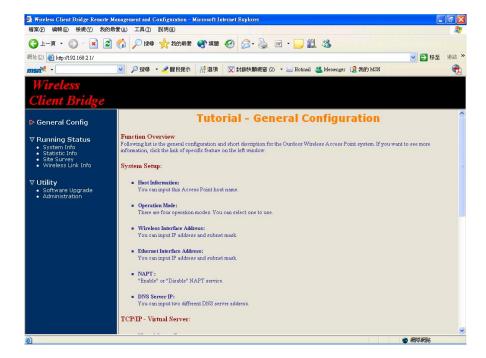
Once you identify the IP Address assigned to Wireless client bridge, use web browser to configure Wireless client bridge through the HTTP Interface. The following procedure explains how to configure each item.

- **Step 1** Open your browser and enter the IP Address
- **Step 2** Press **<ENTER>** key and the Wireless client bridge **Login** screen appears as shown below.



Version 1.02 10 Version 1.02 11

Step 3 Enter "root" in the User Name and the Password fields, and click OK to enter the web configuration user interface screen as shown below.



■ Web Configuration Structure

The web configuration user interface is grouped into a tree structure, and contains the following settings or information.

□ General Configuration

- System
- TCP/IP
 - SNMP
- Wireless

∇ Running Status

- System Info
- Statistic Info

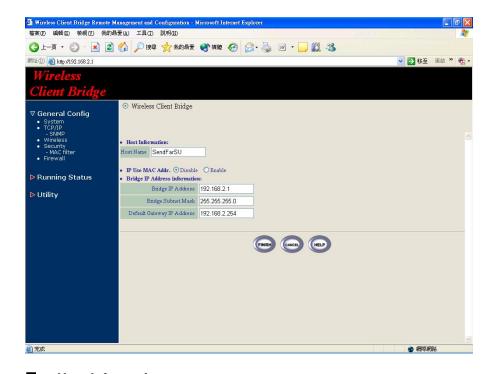
- Site Survey
- Wireless Link Info

∀ Utility

- Software Upgrade
- Administration

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 viewing and modifying the parameters.

2.4.4 Set IP Address, Subnet Mask, Default Route IP



Host Information

The Host Name is not an essential setting, but it helps to identify the device in network. Use this setting to assign a name to the device.

Version 1.02 12 Version 1.02 13

■ IP Use MAC Addr.

You can choice Enable or Disable. If you choice Enable , it will set IP = 10.X.X.X that used to last 3 MAC Address ID.

For example:

MAC Addr = 00:47:55:43:43:49 => IP = 10.67.67.73(43hex=67decimal) If you choice Disable you need setting **Bridge IP Address Information**.

Bridge IP Address

Use this setting to assign or change the Wireless client bridge IP address.

■ Bridge Subnet Mask

Enter an IP subnet mask to identify the sub network so the IP address can be recognized on the LAN.

Default Gateway IP Address

Enter the default Gateway IP Address, and click **FINISH** at the bottom of this page to complete the modification of this page.

2.4.5 Set Wireless Encryption for Wireless Interface

The Wireless client bridge supports 64-bit and 128-bit WEP encryption.

For **64-bit** WEP encryption, an encryption key is 10 hexadecimal characters (0-9 and A-F) or 5 ASCII characters.

For **128-bit** WEP encryption, an encryption key is 26 hexadecimal characters or 13 ASCII characters.

Modify the WEP encryption parameters on the web page "/General Config/Woreless/". Enter 1~15 characters into the WEP Key field, and click **KeyGen** to generate the WEP64 or WEP128 key patterns.

2.4.6 Change Supervisor Account & Password

Enter the **Utility > Administration** page. The figure below shows the **Utility/ Administration** page.



■ Supervisor Account

Change the supervisor's user name and password in the **Supervisor Account** field, and click **FINISH** to take effect on the previous configuration changes.

■ Apply the New Settings

- Step 1 Enter the Utility > Administration page, select the Save then Restart to apply the new configuration settings.
- **Step 2** Click **FINISH** to take effect on the previous configuration changes.

Hint: It takes about 10 seconds, to complete the restart process.

Version 1.02 14 Version 1.02 15

2.4.7 Upgrade the Firmware

Setup your TFTP Server

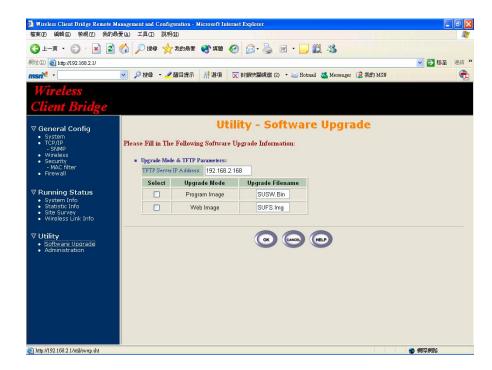
The Trivial File Transfer Protocol (TFTP) Server allows you to transfer files across a network. You can download the firmware files for Wireless client bridge upgrades.

After the TFTP Server is installed, make sure you have the proper TFTP Server IP address, the proper Wireless client bridge firmware files, and the TFTP Server is operational.

Update the Firmware using the TFTP method

- Step 1 Enter the Utility > Software Upgrade page as shown in the figure below, and can use TFTP to upgrade Wireless client bridge. Here, user must specify the TFTP server IP and select which file you want to upgrade it (Program image, Web image), then click OK button to start the TFTP upgrade process.
- **Step 2** If the upgrade process is success, the Wireless client bridge will apply the new settings and start rebooting right away.

Hint: You must set up a TFTP Server and this server must contain the latest new image files.

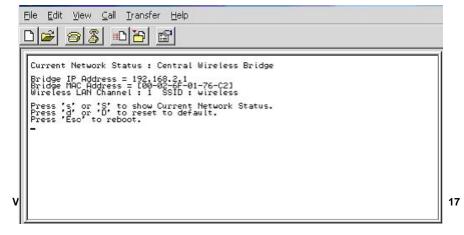


■ Upgrade the Firmware using RS-232 console

Please refer to <u>Provision 2.4.3</u> that introduces how to use RS-232 console port.

Identify the IP Address assigned to the unit.

Step 1 If the connection is normal, when the Wireless client bridge is powered up, the "Current Network Status" will be displayed as



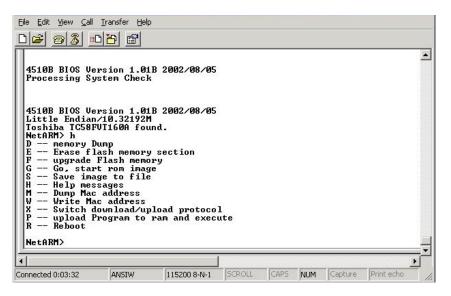
Version 1.02 16

shown below.

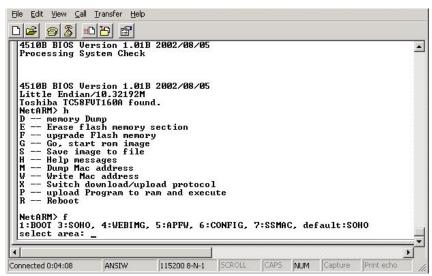
Step 2 Press **<Esc>** keystroke to reboot the Wireless client bridge. Press **<x>** key during the boot process, and it will display prompt character **NetARM>** as the figure shown in the next page.

```
Packet Filter Rules Initialized !!!
RUNTASK id=11 httpd_timer_task...
RUNTASK id=12 hting Multitask...
Software Version : HWLAN 1.31.201RC2
Current Network Stat= 192.168.2.1
Bridge MAC Address = [00-02-6F-01-76-C2]
Wireless LAN Chterface IP = 192.168.10.1
Press 's' or 'S' to show Current Network Status.
Press 'Esc' to reboot.
hwlan_shut
hwlan shut
LOOPBACK device O SHUTDOWN!
now rebooting... ng System Check.
4510B BIOS Version 1.01B 2002/08/05
Little Endian/10.32192M
Toshiba TCx
Now, switch to [Xmodem] protocol!!
NetARM>
```

Step 3 Press "h" keystroke, it will display related commands as the figure shown below.



Step 4 Select "F -- upgrade Flash memory" and it will display upgrade items for selection as the figure shown below.



- **Step 5** Select "**3: SOHO**" and select "**4: WEBIMG**" to update the firmware files one by one.
- **Step 6** While the window starts to display "C" character continuously, click **Transfer** and select the new firmware files <soho.bin> file, press "**OK**" to start to transfer file to Wireless client bridge.
- **Step 7** Select "**4**" to upgrade WEBIMG file. The procedures are the same with upgrading SOHO file (go back to step 5), but should select <pfs.img> file correctly for WEBIMG file upgrade.
- **Step 8** After the upgrade completes, remember to press "R" keystroke to reboot the system.

Note: The default transfer protocol is using "Xmodem", so please make sure you select correct protocol to download/upload files when you try to upgrade the Wireless client bridge's firmware files.

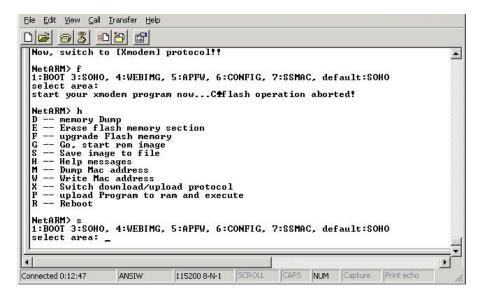
Version 1.02 18 Version 1.02 19

2.4.8 Back-up the Wireless client bridge's Configuration Files

After configuring Wireless client bridge, user can back-up the configuration files. User can upload the latest back-up files and recover the Wireless client bridge configuration to the settings specified in the back-up files.

Downloading Configuration Files

Just being the same with firmware upgrade procedures. After the prompt character **NetARM>** is displayed, select "**S – Save image to file**", and then select "**6: CONFIG**" to back-up the Wireless client bridge configuration as the figure shown below. The back-up file will be saved as <CONFIG.IMG> file.



Uploading Configuration Files

To upload an configuration file to Wireless client bridge, user should select "F -- upgrade Flash memory" and then select "6: CONFIG". While the window starts to display "C" character continuously, click **Transfer** and select the preferred <CONFIG.IMG>, then press **OK** to start transferring file to Wireless client bridge.

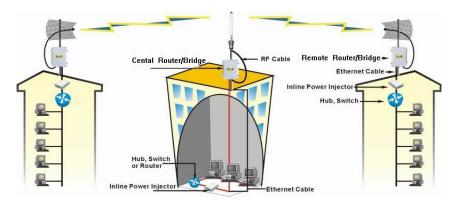
```
4510B BIOS Version 1.01B 2002/08/05
Little Endian/10.32192M
Toshiba TC58FVT160A found.
NetARM> f
1:BOOT 3:SOHO, 4:WEBIMG, 5:APFW, 6:CONFIG, 7:SSMAC, default:SOHO
select area: 6
start your zmodem program now...CCCCCCCCCCCCC
erasing 0x30000.... done!
programming...... done!
1:BOOT 3:SOHO, 4:WEBIMG, 5:APFW, 6:CONFIG, 7:SSMAC, default:SOHO
select area: 6
start your zmodem program now...CCCCCCCCCCCCCCCCCC65536
ata recieved ok.
start flash operation? (y/[N]) y
erasing 0x30000.... done!
programming...... done!
NetARM>
```

Note: Remember to press "R" to reboot the system after you upload the configuration file to the Wireless client bridge

Version 1.02 20 Version 1.02 21

Chapter 3. Network Topologies

This chapter describes several main types of installations implemented by using the Outdoor Wireless System commonly. This is by no means intended to be an exhaustive list of all possible configurations, but rather shows examples of some of the more common implementations. The Wireless client bridge can only be configured into Wireless Client Router/Bridge to accomplish the broadband wireless point-to-point, point-to-multipoint systems with Central Bridge as the figure shown below.

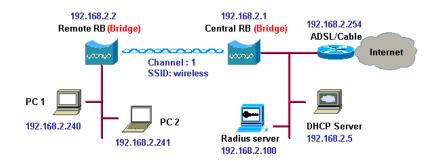


The Wireless client bridge performs in either router or bridge mode. In a Point-to-Multipoint topology, all communication between network systems is done through a centralized agent. Among the Outdoor Wireless Router/Bridge products, the centralized agent is Central Router or Central Bridge and the individual network notes may be Wireless Client Router or Bridge .

To show the available Point-to-Multipoint topologies, the following examples are provided.

- 1. Wireless Client Bridge-to-Central Wireless Bridge
- 2. Wireless Client Router-to-Central Wireless Bridge
- 3. Wireless Client Bridge-to-Central Wireless Router
- 4. Wireless Client Router-to-Central Wireless Router

3.1 Wireless Client Bridge-to-Central Wireless Bridge



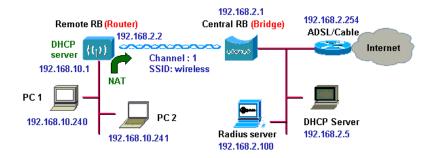
- Step 1 Set the Central Outdoor Unit *1 (hereinafter, "COU") to perform a bridge (bridge IP address: 192.168.2.1).
- Step 2 Set Wireless parameters on COU: Channel (1) and SSID (wireless)
- Step 3 Set the Remote Outdoor Unit *2 (hereinafter, "ROU") to perform a bridge (bridge IP address: 192.168.2.2).
- Step 4 Set Wireless parameters on ROU: Channel (1) and SSID (wireless), and these parameters must be the same with COU.
- **Step 5** Left side subnet is transparent to the right side.
- **Step 6** DHCP server assign IP address to PC1 and PC2

Remarks:

- *1 COU refers to Outdoor Wireless Router Bridge
- *2 Both and Wireless client bridge could function the role of ROU

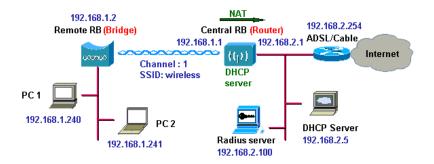
Version 1.02 22 Version 1.02 23

3.2 Wireless Client Router-to-Central Wireless Bridge



- **Step 1** Set the COU to perform a bridge (**bridge IP address:** 192.168.2.1).
- Step 2 Set Wireless parameters on COU: Channel (1) and SSID (wireless).
- Step 3 Set the ROU to perform a Router (Wireless Interface IP: 192.168.2.2, Ethernet Interface IP: 192.168.10.1). It is a must to enable NAT on Wireless Interface (default route is 192.168.2.254).
- **Step 4** Set Wireless parameters on ROU: **Channel (1)** and **SSID** (wireless), these parameters must same with COU.
- **Step 5** Set the DHCP server service on the ROU and apply it on Ethernet Interface.
- Step 6 The ROU assigns IP addresses to PC1 and PC2

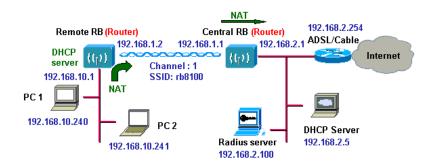
3.3 Wireless Client Bridge-to-Central Wireless Router



- Step 1 Set the COU to perform a Wireless Router (Wireless Interface IP: 192.168.1.1, Ethernet Interface IP: 192.168.2.1). It is a must to enable NAT on Ethernet interface (default route: 192.168.2.254).
- Step 2 Set Wireless parameters on COU: Channel (1) and SSID (wireless)
- **Step 3** Set the DHCP server service on the COU and apply it on Wireless Interface.
- **Step 4** Set the ROU to perform a Bridge (**Bridge Interface IP:** 192.168.1.2).
- Step 5 Set Wireless parameters on ROU: Channel (1) and SSID (wireless), and these parameters must be the same with the COU.
- **Step 6** The COU assigns IP addresses to PC1 and PC2.
- **Step 7** The operator can also disable NAT behavior on COU to make the two subnets transparent.

Version 1.02 24 Version 1.02 25

3.4 Wireless Client Router-to-Central Wireless Router



- Step 1 Set the COU to perform a Wireless Router (Wireless Interface IP: 192.168.1.1, Ethernet Interface IP: 192.168.2.1, default route: 192.168.2.254).
- Step 2 Set Wireless parameters on COU: Channel (1) and SSID (wireless).
- Step 3 Set the ROU to perform a Wireless Router (Wireless Interface IP: 192.168.1.2, Ethernet Interface IP: 192.168.10.1, default route: 192.168.1.1).
- Step 4 Set Wireless parameters on ROU: Channel (1) and SSID (wireless), and these parameters must be the same with COU.
- **Step 5** Set the DHCP server service on the ROU and apply it on Ethernet Interface.
- Step 6 The ROU assigns IP addresses to PC1 and PC2.

The operator can also disable NAT behavior on COU and enable NAT behavior on ROU (**enable NAT on Wireless Interface**). In this case, any outgoing packets will transfer to **192.168.1.2**.

The operator can also enable NAT behavior on COU (enable NAT on Ethernet interface) and enable NAT behavior on ROU (enable NAT on Wireless Interface).

Version 1.02 26 Version 1.02 27

Chapter 4. Network Parameters

4.1 IP Configuration

■ Wireless Client Bridge

- Step 1 Enter the IP Address manually into the Bridge IP Address field.
- Step 2 Use Bridge IP Address setting to assign or change the bridge's IP address.
- **Step 3** Click **FINISH** at the bottom of this page to complete the modification of IP address.

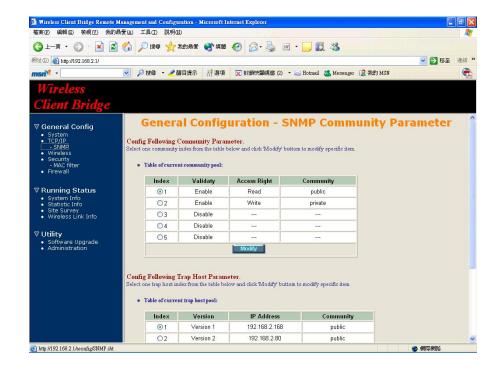
4.2 Configure SNMP

Select the "/General Config/ TCP/IP/SNMP", and the SNMP screen appears. The figure below shows the current SNMP community pool and trap host pool.

4.2.1 Configure Community Pool

The SNMP Community Pool has five entries.

 To modify the entry, click the select button beside the entry index number and click Modify. The configuration page appears as the figure shown below.



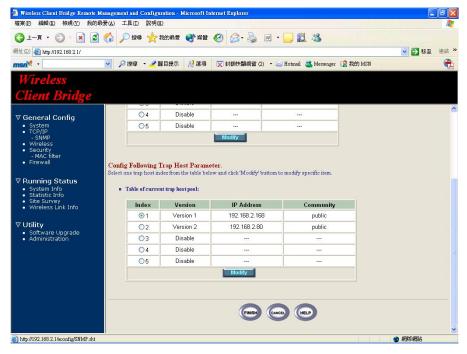
- 2. Specify the Validity, Access Right and Community field.
 - ✓ Validity. Select Enable or Disable to control this community.
 - ✓ Access Right. Select a command from the pull down menu for this field.
 - ✓ Community. Enter the password related the Access Right in this field.
- 3. Click **OK** to refresh the current community pool.
- **4.** To modify another community entry to the current community pool, repeat step 1 through step 3.
- 5. When you have modified all the entries preferred, click FINISH.

Version 1.02 28 Version 1.02 29

4.2.2 Configure Trap Host Pool

The Trap Host Pool has five entries.

1. To modify a entry, click the select button beside the entry index number and click **Modify**. The configuration page appears as following figure.



- 2. Specify the Version, IP Address and Community field.
 - ✓ Version. Select Disable, Version 1 or Version 2 to control this trap host.
 - ✓ IP Address. Enter the Trap Host IP Address.
 - ✓ Community. Enter the password in this field.

- 3. Click **OK** to refresh the current trap host pool.
- **4.** To modify another trap host entry to the current trap host pool, repeat step 1 through step 3.
- 5. When you have modified all the entries preferred, click **FINISH**.

Version 1.02 30 Version 1.02 31

4.3 Configure Wireless related parameters

Step 1 Select "/General Config/Wireless" and the Wireless LAN information page appears as the figure shown below.



Step 2 In the Wireless LAN information page, set the following parameters suitable for your radio network.

- ✓ rts Threshold (default parameter: 60)
- √ frag Threshold (default parameter: 2346)
- ✓ SSID (default parameter: wireless)
- ✓ **Station Name** (default parameter: **ap**)

Step 3 Click radio button to disable WEP or enable 64/128 bit WEP services (default parameter: disable). If WEP is enabled, input corresponded Default Key index and WEP Key and then click KeyGen to generate the WEP64 & WEP128 key patterns.

Step 4 Click **FINISH** at the bottom of this page to complete the modification.

The following gives more info about the parameters set in the Wireless LAN information page to users.

rts Threshold

The setting determines the packet size, ranging from **0** to **2339** bytes, at which the bridge issues a request to send (RTS) before sending the packet. A low RTS Threshold setting can be useful in areas where many client devices are associating with the access point, or in areas where the clients are far apart and can detect only the bridge and not each other.

frag Threshold

The setting determines the size, ranging from **256 to 2338** bytes, at which packets are fragmented (sent as several pieces instead of as one block). Use a low setting in areas where communication is poor or where there is a great deal of radio interference.

SSID

The **Service Set ID (SSID)** can be any alphanumeric, case-sensitive entry from **2 to 32** characters long. This string functions as a password to join the radio network.

Station Name

Enter any alphanumeric, case-sensitive entry.

■ WEP Key

Enter 1~15 characters for 64 and 128 bits WEP KEY encryption, and then click **KeyGen** to generate the WEP64 & WEP128 key patterns automatically.

■ WEP

User can **Disable** or **enable** 64/128 bit WEP services here.

Default Key

Select an encryption key from the pull down menu.

■ WEP64 Key1~4 & WEP128 Key1~4

The keys in these fields can be generated automatically by **KeyGen** function. For 40-bit encryption, enter **10** hexadecimal digits; for 128-bit encryption, enter **26** hexadecimal digits. Hexadecimal digits include the

Version 1.02 32 Version 1.02 33

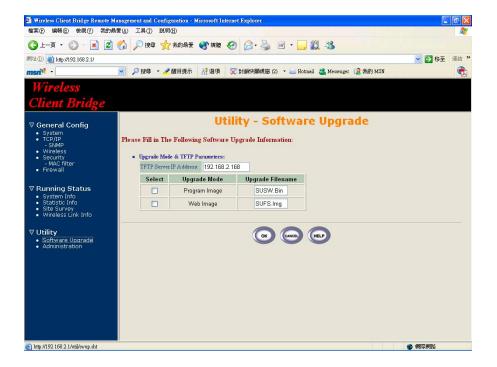
numbers **0 through 9** and the letters A through F. The 40-bit WEP keys can contain any combination of 10 of these characters; the 128-bit WEP keys can contain any combination of 26 of these characters. The letters are not case-sensitive.

4.4 Utility

4.4.1 Software Upgrade

- Step 1 Click Utility, select Software Upgrade page as the figure shown below, and then use TFTP to upgrade AP. In the Utility Software Upgrade page, user must specify the TFTP server IP and select by which file to upgrade (Program image, Web image), then click OK button to start the TFTP upgrade process.
- **Step 2** If the upgrade process is success, the AP will apply the new settings and start rebooting right away.

Hint: You must set up a TFTP server and this server must contain one latest new image.



Version 1.02 34 Version 1.02 35

4.4.2 Administration

Step 1 Click **Utility**, **Administration**. The following figure shows the **Utility – Administration** page.



- ✓ Supervisor Account. Change the supervisor's user name & password in the Supervisor Account field, and Click FINISH to take effect on the previous configuration changes.
- ✓ Apply the New Settings. Click Utility, Administration, select the Save then Restart to apply the new configuration settings.
- Step 2 Click FINISH to take effect on the previous configuration changes.

Hint: It takes about 10 seconds, to complete the restart process.

Chapter 5. Monitor Information

User can find the system running status and other information on this window. Click the **Running Status** link on the left window, use can choose which function that he wants to monitor.

■ General System Information

The following information can be found in this block.

- ✓ Product Model
- ✓ Host Name
- ✓ Software Version
- ✓ Build (Built by)
- ✓ Boot Code Version
- ✓ Web Version
- ✓ System Uptime

■ General System Status

The following information can be found in this block.

- ✓ Operation Mode
- ✓ Bridge IP Address
- ✓ Bridge Subnet
- ✓ Wireless SSID

Services Information

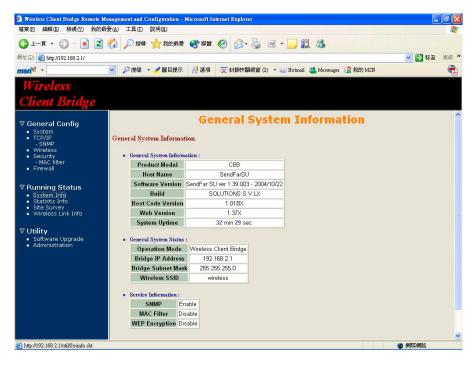
This block shows whether the following services are enabled or disabled.

- ✓ NAPT
- ✓ SNMP
- ✓ MAC Filter
- ✓ WEP encryption.

Version 1.02 36 Version 1.02 37

5.1 System Information

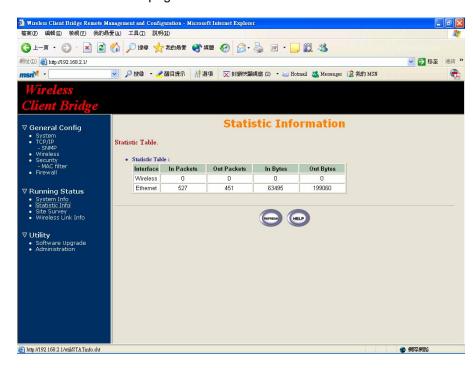
By selecting "Running Status/System Info", enter the System Information page as the figure shown below.



In this page, user can find the system information and most of the running parameters.

5.2 Statistic Information

By selecting "Running Status/Statistic Info", the figure below shows the Statistic of Interface page.



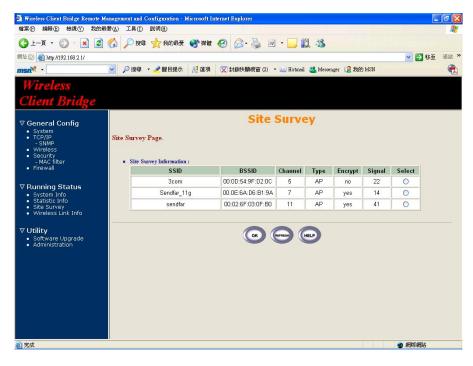
In this page, user can find the packet statistic of each interface, Wireless and Ethernet. This statistic table includes the following information.

- √ In Packets
- ✓ Out Packets
- ✓ In Bytes
- ✓ Out Bytes.

Version 1.02 38 Version 1.02 39

5.3 Site Survey

By selecting "Running Status/Site Survey", enter the Site Survey page as the figure shown below



In this page, user can click **REFRESH** find the AP near Wireless client bridge. This statistic table includes the following information.

- ✓ SSID
- ✓ BSSID
- ✓ Channel
- ✓ Type
- ✓ Encrypt
- ✓ Signal

5.4 Wireless Link Information

This item only displayed on ROU mode.

By selecting "Running Status/Wireless Link Info", the figure below shows the Radio Link Information page.



In this page, user can find the following information about the radio link.

- ✓ Link Status
- ✓ Current SSID
- ✓ SNR(C/I)
- ✓ RSL
- ✓ Noise Level
- Current Channel
- ✓ Current Tx Rate

Version 1.02 40 Version 1.02 41

Chapter 6. Specifications

6.1 Hardware Specifications

■ General

Radio Data Rate	11, 5.5, 2 and 1 Mbps, Auto Fall-Back	
Client Interface	10/100Base-T Ethernet	
Range	300m @ 11 Mbps	
(Open environment)	400m @ 5.5Mbps	
	500m @ 2 Mbps	
	800m @ 1 Mbps	
Regulatory & Safety	FCC Part 15	
Certifications	EN 300 328-1	
	EN 300 328-2	
	EN 301 489-1	
	EN 301 489-17	
	EN 60950	
	IP67	
	DGT	
Compatibility	Fully interoperable with IEEE802.11b	
	compliant products	
Power Supply	Input: 100~240V, 50~60Hz	
(AC/DC Power Adaptor)	Output: 24V, 830mA	

■ Network Information

Network Architecture	Infrastructure (with Wireless client bridge)	
Access Protocol	CSMA/CA	
Roaming	IEEE802.11b compliant	
Security	64-/128-bit data encryption	

Radio Specifications

Frequency Band	2.4 – 2.484 GHz
Radio Type	Direct Sequence Spread Spectrum (DSSS)
Modulation	CCK (11, 5.5Mbps) DQPSK (2Mbps)

	DBPSK (1Mbps)	
Operation Channels	North America: 11	
	Japan: 14	
	Europe: 13	
	Spain: 2	
	France: 4	
ransmit Power 10dBm (ETSI)		
	19dBm (FCC)	
Antenna External 5dBi dipole antenn		
	Embedded 9dBi patch antenna	
Sensitivity @ FER=0.08	11 Mbps < -85dBm	
	5.5 Mbps < -88dBm	
	2 Mbps < -91dBm	
	1 Mbps < -93dBm	

Environmental

Temperature Range	Operating: 0 to 55°C
	Storage: -20 to 75°C
Humidity (non-condensing)	5% to 95% typical

■ Physical Specifications

Dimensions	138.7mm x 104.0mm x 38.0mm	
Weight	500g	

Version 1.02 42 Version 1.02 43

6.2 Software Specifications

Protocol	TCP/IP
	DHCP Client
	802.1d Transparent Bridging
Security	64-/128-bit WEP encryption
	MAC address based access control
Management	Web-based Manager
	Console (RS-232) configuration
	SNMP v1
	SNMP MIB-II
	Private MIB
Firmware upgrade	TFTP (Trivial FTP)
	Xmodem, 1K Xmodem
	Zmodem

Chapter 7. Default Settings

7.1 General Configuration

7.1.1 System

Parameter	Description	Default Value
Host Name	Host name for the RB	ISP
IP Use MAC Addr.	You can choice IP produced method.	Disable
Bridge IP Address	For Wireless Client Bridge with Operation Mode	192.168.2.1
Bridge Subnet Mask		255.255.255.0
Default Gateway IP Address	IP address of the gateway for default route when TCP/IP filtering	192.168.2.254

7.1.2 SNMP

7.1.2.1 Table of SNMP Community Pool

Parai	meter	Description	Default Value
Index 1		Enable or disable the function of the corresponding community index	Enable
Index 2			Enable
Index 3	Validity		Disable
Index 4			Disable
Index 5			Disable
Index 1		Select the access right	Read
Index 2		Write	
Index 3	Access Right	SNMP Manager	
Index 4	rtigrit		
Index 5			
Index 1		Specify the type of community	public
Index 2		(public or private) for SNMP	private
Index 3	Community	Manager	
Index 4			
Index 5			

Version 1.02 44 Version 1.02 45

7.1.2.2 Table of SNMP Trap Community Host Pool

Parai	neter	Description	Default Value
Index 1		Select or disable the SNMP Version	Version1
Index 2			Version2
Index 3	Version	Version 1: MIB1	
Index 4		Version 2: MIB2	
Index 5			
Index 1		Specify the IP address of the	192.168.2.100
Index 2		SNMP Manager for SNMP Trap	192.168.2.100
Index 3	IP Address	Report	
Index 4			
Index 5			
Index 1		Specify the type of community	public
Index 2		(public or private) for SNMP	public
Index 3	Community	Manager	
Index 4			
Index 5			

7.1.3 Wireless LAN

Parameter	Description	Default Value
RTS Threshold	Set RTS (Request To Send) threshold value	60
Fragmentation Threshold	Set fragmentation threshold value	2346
SSID	Wireless LAN service area identifier of the RB (case sensitive)	wireless
Station Name	Show the name of the AP	ар
WEP Key	Push the "KeyGen" button to generate the WEP key patterns automatically	wepkey
WEP	 WEP128 WEP64 Disable 	Disable
Default Key	Select a WEP key to encrypt each frame transmitted from the radio using one the of the 4 Keys from the Key Panel	1

Key Panel	When you use WEP to communicate with the other wireless clients, all the wireless devices in this network must have the same encryption key or pass phrase. Note: each key must consist of hex digits, it means that only digit 0 -9 and letters A-F are valid entries. If entered incorrectly, program will not write keys to a driver.	
-----------	---	--

Version 1.02 46 Version 1.02 47

7.2 Utility

7.2.1 Software Upgrade

Parameter	Description	Default Value
TFTP Server IP Address	Specify the IP address of the TFTP server to upgrade the firmware of the RB	192.168.2.100
Upgrade Filename	Program Image	SUSW.Bin
	Web Image	SUFS.Img

7.2.2 Administration

Parameter	Description	Default Value
Supervisor ID	Supervisor's identity code	root
Supervisor Password	Supervisor's password	root
Password Confirm	Confirm the password again	root

Chapter 8. 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:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

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 20 cm between the radiator & your body.

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

■ Interference Statement

This equipment has been tested and found to comply with the limits for a Class C 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.

Version 1.02 48 Version 1.02 49

Professional Installation

Per the recommendation of the FCC, the installation of high gain directional antenna to the system, which are intended to operated solely as a point-to-point system and whose total power exceeds +30dBm EIRP, require professional installation. It is the responsibility of the installer and the end user that the high power systems are operated strictly as a point-to-point system.

Systems operating as a point-to-multipoint system or use non directional antennas cannot exceed +30dBm EIRP power requirement under any circumstances and do not require professional installation.

Information to User

The user manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Declaration of Conformity

Declares that the product:

Date: November 18, 2003

Model Number: Wireless client bridge Equipment Type: Wireless Access Bridge

Made in Taiwan

Complies with Part 15 Class C 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.

■ European Community – CE Notice

Marking by the symbol:



Indicates compliance with the essential requirements of **Directive 1999/5/EC**. Such marking is indicative that this equipment meets or exceeds the following technical standards:

- ✓ EN 300 328-2
- ✓ EN 301 489-1
- ✓ EN 301 489-17
- ✓ EN 60950

Marking by the symbol:

C € 0560 ①

Indicates compliance with the essential requirements of R&TTE Directive 99/5/EC, and the product is permitted to be used in the following EC countries, including Germany, UK, The Netherlands, Belgium, Norway, Sweden, Denmark, Finland, France, Italy, Spain, Austria, Iceland, Ireland, Portugal, Switzerland, Greece and Luxembourg.

■ 中華民國交通部電信總局低功率射頻電機型式認證

型式認證標籤式樣:

圓電波93LP0030

依據交通部電信總局『低功率輻射性電機管理辦法』第十四條規定,經型式 認證合格之低功率射頻電機,非經許可,公司、商號或使用者均不得擅自變 更頻率、加大功率或變更原設計之特性及功能。

依據交通部電信總局『低功率輻射性電機管理辦法』第十七條規定,低功率 射頻電機之使用不得影響飛航安全及干擾合法通信;經發現有干擾現象時, 應立即停用,並改善至無干擾時方得繼續使用。前項合法通信,指依電信法 規定作業之無線電信。低功率射頻電機須忍受合法通信或工業、科學及醫療 用電波輻射性電機設備之干擾。