

Outdoor Workgroup Bridge ***Outdoor Ethernet Client***

User's Guide

Version A2
March 2004

Packing List

Your Outdoor Workgroup Bridge or Outdoor Ethernet Client package should contain the following items:

- One Outdoor Workgroup Bridge or Outdoor Ethernet Client
- One DC injector with RJ-45 LAN and ODU (outdoor unit) jacks
- One power adapter for the DC injector
- One mounting kit
- One 25-meter Category 5 waterproof cable with RJ-45 plug and ODU connector
- One 30cm Reverse N(M)-N(M) RG400 Cable (for 200mW AIO) or One 1.5M Reverse N(M)-N(M) RG400 Cable (for 200mW and 1W)
- WLAN Management System software and outdoor workgroup bridge/outdoor Ethernet client user's guide in electronic form (one CD-ROM)

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Introduction

Congratulations on choosing an outstanding wireless product. This guide gives comprehensive instructions on installing and using the Outdoor Workgroup Bridge (WWB), the Outdoor Ethernet Client (WEC) and also explains how to install and use the WLAN Management System software.

Related Products

11-Mbps wireless products provide an integrated solution to your wireless networking requirements.

- Indoor applications: Access Point, Wireless Workgroup Bridge (WWB), Wireless Ethernet Client (WEC), and wireless adapters with various bus interfaces (PCMCIA, USB, and PCI).
- Outdoor applications: outdoor bridges, outdoor access points, outdoor workgroup bridge, outdoor Ethernet clients, and high-gain directional and omni-directional antennas to increase transmission range.
- Management tools: The WLAN Management System, a sophisticated software package for discovering, configuring, and managing all your 11-Mbps wireless networking devices conveniently and efficiently, regardless of network size or complexity.

WLAN Management System

WLAN Management System is a powerful network management system that is fully compatible with the industry-standard SNMP (Simple Network Management Protocol). It features:

- Speedy detection of all compatible devices on the network — a layer-3 auto-discovery function for all compatible devices on the same TCP/IP subnet as the management station, and a layer-2 “kick start” function for all compatible devices on the same physical network.
- Local and remote management of compatible devices, both individually and in batch mode. Batch-mode functions include device monitoring, firmware upgrade, device restart, factory reset, and configuration download and upload. Batch mode greatly simplifies the task of managing a large network containing multiple compatible products.
- A friendly user interface with a consistent look and feel.

Automatic Discovery of Compatible Devices

A powerful automatic-discovery algorithm is built into the WLAN Management System. With a simple click on the “Auto Discovery” icon, all compatible devices on the same TCP/IP subnet as the management station will be discovered. This discovery feature is based on the following techniques:

- **DHCP Client and IP recovery:** The Outdoor WWB or WEC has a built-in DHCP client and will request an IP address from a DHCP server so that SNMP (Simple Network Management Protocol) can be further applied. Should there be a failure of the DHCP server, when it recovers, the Outdoor WWB or WEC will automatically negotiate for a new IP address.
- **Auto-IP:** When the Outdoor WWB or WEC cannot get an IP address from a DHCP server, it will auto-assign an IP address of 169.254.x.x , and a subnet mask of 255.255.0.0.

A Windows OS PC originally configured as a DHCP client will follow the same algorithm to assign itself an IP address in the same subnet. Users may need to renew the IP settings (see the following section), otherwise Windows may continue to use the previous IP address instead of executing the Auto-IP procedure.

Renewing IP Settings in Windows 95/98/ME

Click **Start/Run**, type *winiipcfg*, and click **OK**

step1. The *IP Configuration* dialog box will open

step2. Select the network adapter you use to connect to the Outdoor WWB or WEC. Click **Release**

step3. Click **Renew** to retrieve a new IP address, subnet mask, and default gateway address from the Outdoor WWB or WEC. Click **OK** to save the changes and exit the program

Renewing IP Settings in Windows NT 4.0

- step1.** Click *Start/Programs/Command Prompt*. Type “*ipconfig /release*” and press *Enter*
- step2.** Type “*ipconfig /renew*”, and press *Enter* to retrieve a new IP address, subnet mask, and default gateway address from the Outdoor WWB or WEC
- step3.** Type *Exit*

Renewing IP Settings in Windows 2000/XP

- step1.** Click *Start/Programs/Accessories/Command Prompt*. Type “*ipconfig /release*” and press *Enter*
- step2.** Type “*ipconfig /renew*”, and press *Enter* to retrieve a new IP address, subnet mask, and default gateway address from the Outdoor WWB or WEC
- step3.** Type *Exit*

Kick Start

The Kick Start function will detect all compatible wireless devices on the same physical network as the management station regardless of their current TCP/IP settings. This is especially useful when a new device has been added and its IP settings are not suitable for SNMP management. The Kick Start utility can be launched from the main WLAN Management System window, and lets you quickly assign any compatible device TCP/IP settings suitable for full-function configuration and management through WLAN Management System.

WLAN Management System Hardware and Software Requirements

System requirements for installing and using the WLAN Management System are:

- A PC running Windows 95/98/Me/NT4.0/2000/XP
- Microsoft Internet Explorer 4.01 or later is required
- A 10-Mbps or 100-Mbps connection via unshielded or shielded twisted-pair (UTP or STP) cable to an Ethernet network

Operating System Requirements:

1. On a Windows 95 computer, Microsoft DCOM95 must be installed. You may obtain DCOM95 for Windows 95 from the following Microsoft web location: <http://www.microsoft.com/com/dcom/dcom95/download.asp>
DCOM95.exe is also available on the Microsoft Visual Basic 5.0 CD-ROM (Enterprise, Professional, and Standard editions) in the \Pro\Tools\DCOM95 directory.
2. On a Windows 98 computer (Windows 98SE already includes this component), Microsoft DCOM98 must be installed. Use the following link to download it from Microsoft's DCOM98 download site:
<http://www.microsoft.com/com/dcom/dcom98/download.asp>
3. On Windows NT4.0, service pack 4 or later must be installed.

Terminology Used in this Guide

BSSID/MAC ID

BSSID (Basic Service Set ID) is an ID unique to each wireless networking device. It is factory set and is identical to the MAC ID (Media Access Control ID). It allows each device to be identified on the network.

SSID

A “Domain” is most commonly used to refer to a group of computers whose hostnames share a common suffix. The domain is usually defined by the network administrator as a segment/subnet of a large network and may be made up of overlapping wireless cells. Wireless nodes can roam freely within the same domain without disconnecting from the network.

Roaming

The concept is similar to that of a cellular phone moving from one base station (one AP) to another. The Outdoor WWB or WEC offers built-in high performance seamless roaming capabilities.

Regulatory Domain

11-Mbps wireless products use the unlicensed ISM (Industrial, Scientific, Medical) band to communicate through radio waves. Different countries offer different radio frequencies to be used as the ISM band. There are four frequency bands defined by IEEE 802.11: Japan (2.471GHz – 2.497 GHz), USA, Extended Japan, Canada, and Europe (2.4 GHz – 2.4835 GHz), Spain (2.445 GHz – 2.475 GHz), and France (2.4465 GHz – 2.4835 GHz). To use 11-Mbps wireless products in a country not listed above, check with your government’s regulating body to find the correct frequency band to use. All 11-Mbps wireless products are supplied preset to the country of sale’s frequency band.

WEP

WEP stands for Wired Equivalent Privacy. It is an encryption scheme that provides secure wireless data communication. WEP uses a 64-bit or 128-bit key to encrypt data. In order to decode the data transmission, each wireless client on the network must use identical keys.

How to Use this Guide

The User's Guide gives complete instructions for installing and using the Outdoor Workgroup Bridge (WWB), and the Outdoor Ethernet Client (WEC). The Outdoor Workgroup Bridge supports up to 16 Ethernet devices. An access table is provided by the Outdoor WWB to allow 16 Ethernet devices' MAC addresses to be registered. The Outdoor Ethernet Client supports one Ethernet attached device.

The Outdoor WWB and Outdoor WEC are supplied with factory-set default network settings. Before connecting the Outdoor WWB or WEC to an existing network, you may wish to change its settings to make it compatible with the network. You can do this with WLAN Management System.

WLAN Management System is an easy-to-use yet extremely powerful SNMP-based utility for centralized on-line configuration and management of compatible wireless devices. Auto-detection of local devices is provided, and devices can be managed remotely (across TCP/IP subnets) if appropriately configured. A trap management program is also provided for monitoring of compatible devices and diagnosis of network problems.

Read through the next section 'Plan the Network', in order to get the best possible performance from the wireless network.

Step 1: Plan the wireless network	Refer to Plan the Network for details
Step 2: Install the Outdoor WWB or WEC into the Ethernet network	Refer to Hardware Pre-Configuration for details.
Step 3: Make online configuration and manage the Outdoor WWB or WEC via the WMS utility	Refer to Install the WLAN Management System, and Using the WLAN Management , for details

Plan the Network

Infrastructure Network Types

An infrastructure network is formed by several stations (WWBs or WECs) and one or more Access Points (APs), with the stations (WWB or WEC) within a set distance from the AP. Figure 1 depicts a typical infrastructure network topology.

There are three infrastructure network setups that are commonly used. It is a good idea to understand the possible network setups and configuration requirements before planning your wireless network.

Type 1. The simplest wireless infrastructure network is composed of one AP and a few wireless stations communicating via radio waves (Figure 1). This setup enables mobile stations to communicate with each other. The main benefit of this type of network is to extend the range of the network. If an AP is placed between the stations, the radio transmission distance is effectively doubled since Wireless Computer-1 can talk to Wireless Computer-2 through the AP. The drawback of this configuration is that the effective bandwidth is halved since all communication is relayed by the AP.

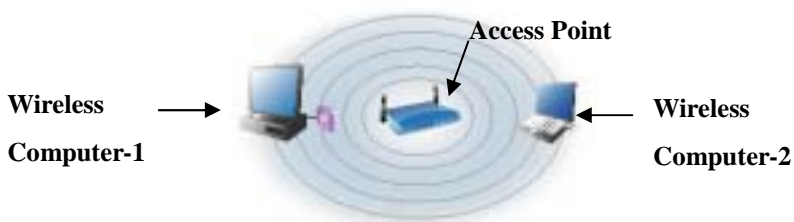


Figure 1. Simple Wireless Infrastructure Network

Type 2. The next simplest wireless network is very similar to the Type 1 network. This time the AP is connected to a wired Ethernet network as a node. In this configuration the AP operates as a bridge between the wired Ethernet network and the wireless networks (Figure 2).

Wireless users have the same access to the network resources as they would have if they were wired. This type of network is usually used to extend an existing network into a difficult to wire or a roaming environment.

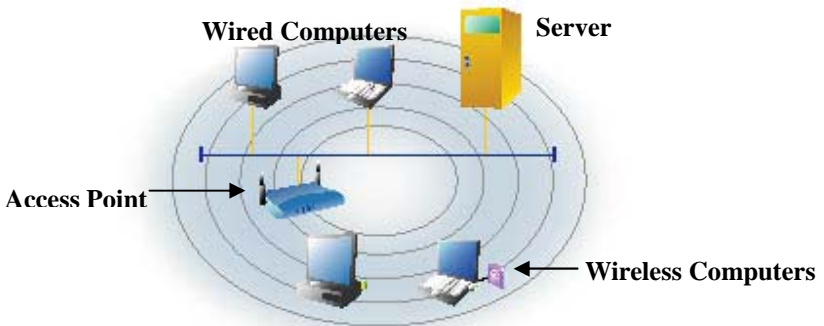


Figure 2. Single AP Network

Type 3. The third type of network is composed of multiple Access Point's and multiple stations (Figure 3).

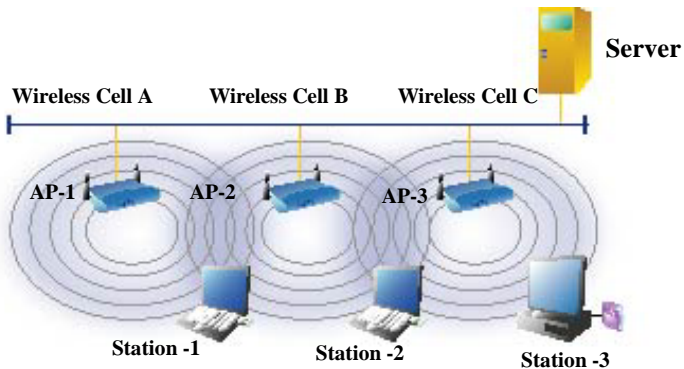


Figure 3. Multiple AP Network

The reasons for having multiple APs installed are:

1. To increase bandwidth in order to boost overall network performance
2. To extend the coverage range

Any other type of configuration is usually a mix of these commonly used types.

Planning Outdoor WWB and WEC for your wireless network

The Outdoor WWB may be used together with a hub or switch, and wirelessly associates to the existing network backbone via compatible APs. It can connect up to 16 users (per bridge) for temporary meeting areas, classrooms, etc.

The Outdoor WEC needs no extra drivers or wireless LAN configuration for wireless operation. It may be connected to most Ethernet-ready equipment, such as Industrial PCs, scanners, etc.

Planning an Infrastructure Network

This section explains some of the things you need to consider in planning an Infrastructure network. Setting up is a two-step process.

1. Install and configure the wireless products
2. Decide the best physical location of the wireless products so as to optimize performance

The following section gives quick guidelines for these two steps. First, decide whether to have a single AP wireless network or a multiple AP network.

Single AP Installation

If you are setting up a simple network with only one AP and a few stations (a Type 1 or Type 2 network configuration as described in Infrastructure Network Types), all you need to do is make sure the AP and all the wireless stations hold the same ‘Domain Name’ (SSID) & Security (WEP) setting in their configuration.

Adding a new station to an existing Infrastructure Network is easy. Again, all you need to do is to set the newly added station’s ‘Domain Name’ (SSID) & Security (WEP) setting to the same as that of the AP’s.

Multiple AP Installation

Install multiple APs in the same network (or Domain) with an overlapping signal

- Use the same Domain Name (SSID) & security (WEP) settings
- Enable the roaming function in the station if roaming is required

Note: A station will automatically connect to whichever AP in the same domain is offering the best signal.

Roaming

Wireless stations can roam freely within an infrastructure domain composed of multiple APs with overlapping signal coverage (as in the Type-3 network configuration described in the previous section). For example, roaming enables Station-1 to move from the AP-1 signal coverage area to the AP-2 signal coverage area without disconnecting from the network. The handover is achieved transparently; the Station-1 user would not realize he had moved from AP-1 to AP-2.

The requirements for a roaming environment are:

- a) Multiple APs with overlapping signal coverage (see Multiple AP Installation)
- b) The APs must be configured to have the same Domain name (SSID) & security (WEP) setting (see Config Window – Filter)
- c) The mobile stations must have the same domain name (SSID) & security settings (WEP) as those of the APs

It is advisable that APs on different TCP/IP subnets be given different domain names to avoid roaming confusion (see the note below).

Note: If you want to move your mobile PC between different APs without terminating the existing networking link, you need to enable the roaming function on the station. The APs that a mobile station will roam to must be configured with the same domain name. If a station detects that the signal quality with the current linked AP is weak, it will search for an AP in the same domain with a better signal quality and automatically establish a new connection with it. When a station is roaming, it will always use the same IP address. The TCP/IP router will not route information packets to a mobile station if it associates with an AP that is in a different TCP/IP subnet. In other words, if your network consists of two subnets connected by a router, a mobile station may roam to a different subnet with the same domain name and then fail to communicate with other network devices via TCP/IP. To avoid running into such an awkward situation, you must assign different domain names to different TCP/IP subnets.

Hardware Description

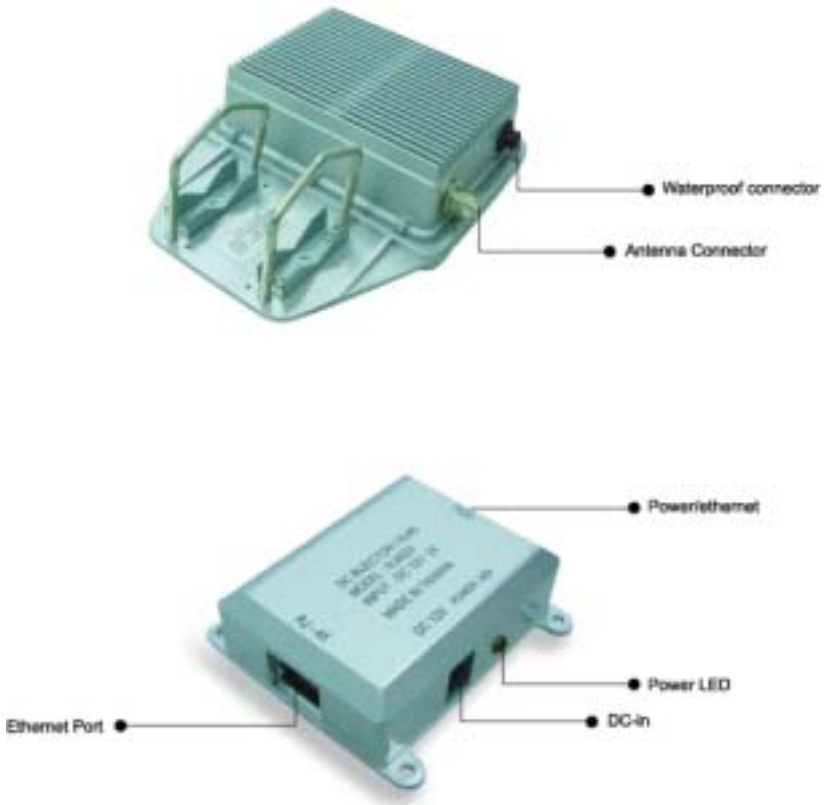


Figure 4. Outdoor WWB or WEC and DC Injector

Outdoor WWB or WEC

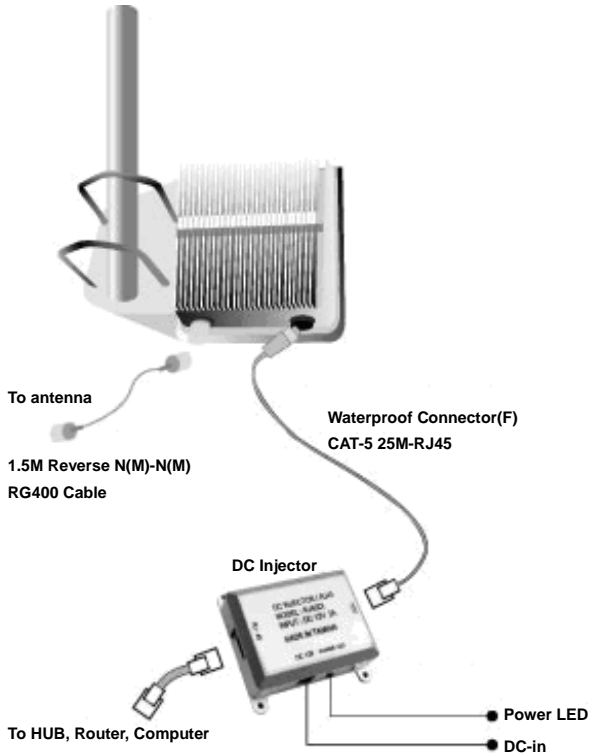


Figure 5. Outdoor WWB or WEC Installation

Hardware Pre-Configuration

Before adding the Outdoor Workgroup Bridge (WWB) or Outdoor Ethernet Client (WEC) to an existing Ethernet network, you may need to set basic parameters — SSID, security (WEP), WWB/WEC name, and IP address — to make the Outdoor WWB or WEC compatible with the existing network.

Pre-configuration can also be carried out through WMS. As long as the Outdoor WWB or WEC and the management station are on the same physical Ethernet LAN, WMS's **Kick Start** function will find the Outdoor WWB or WEC and let you set basic parameters. Make connections as follows:

- step1.** Using CAT5 waterproof cable, connect the waterproof connector port of the Outdoor WWB or WEC to the ODU jack of DC Injector.
- step2.** Using Category 3 or higher UTP or STP crossover cable, connect the RJ-45 jack of DC Injector to a 10- or 10/100-Mbps Ethernet hub or switch, and connect the management station to a hub or switch on the same LAN.
- step3.** Connect the output code of power adapter to the DC Injector's DC input jack, and plug it into an AC outlet to power up the Outdoor WWB or WEC.

Install the WLAN Management System

step1. Insert the CD-ROM in the CD-ROM drive and wait a few seconds while the drive spins up. A window such as that shown below will appear automatically.



Figure 6. Main Menu of Installation CD-ROM

step2. Choose *Install Wireless Management System*. A welcome message will then appear.



Figure 7. Welcome window

step3. Click *Next*.



Figure 8. Important issues message

step4. Older operating systems may need to update some system files to function correctly with the WLAN Management System. If required, follow the on-screen instructions to download the required file. Click *Next* to open the *Choose Destination Location* window.



Figure 9. Choose Destination Location window

step5. Click *Next*. Follow all on-screen instructions until the *Setup Complete* window appears.



Figure 10. Setup Complete window

- step6.** Check *I would like to launch the Management System* (Figure 10) and click ***Finish***.

Using the WLAN Management System

Once the Outdoor WWB or WEC is connected to an Ethernet network, a network administrator can connect to it from any PC on the same network via the WLAN Management System (WMS) utility.

WLAN Management System is a Windows-based SNMP management tool, allowing network administrators to remotely configure and monitor the Outdoor WWB or WEC through both an Ethernet and a wireless connection. To launch the WLAN Management System, double-click its icon on the desktop, or follow the command path **Start > Programs > WLAN > Management System > WLAN Management System**. The main WLAN Management System window will appear.



Figure 11. WLAN Management System main window

Kick Start Function

If for any reason the Outdoor WWB or WEC does not yet have a reachable IP address, it can be discovered, and suitable IP settings assigned to it, using WLAN Management System's Kick Start function. After starting up WLAN Management System, run Kick Start as follows:

- step1.** Click the Kick Start icon (a human figure with one leg extended) in the top toolbar (or press Alt+s and then k). The **WLAN Kick Start** window will appear.

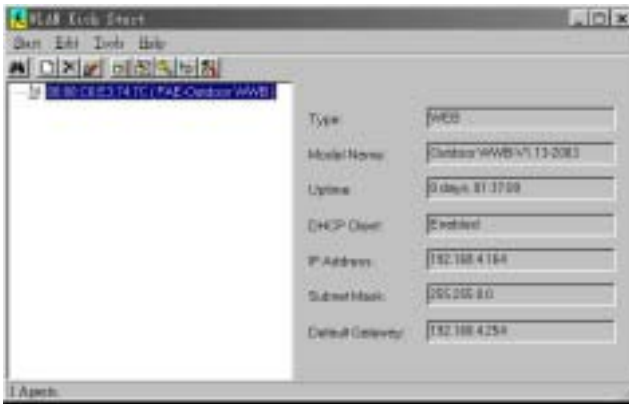


Figure 12. WLAN Kick Start window

- step2.** Open the **WLAN Kick Start** window's **Start** menu and choose **Find**, or click the Find icon (a pair of binoculars), or press F5. After a few seconds the MAC addresses of all Kick Start-compatible wireless devices on the network will appear.
- step3.** Select the device to be configured, open the **Tools** menu and choose **Change IP Settings** (or click the Change IP Settings icon).

This window's **Tools** menu also lets you ping-test, reboot, or reset the selected device, or change its password.

Note: The Outdoor WWB's or WEC's factory-set password is the five-letter string *admin*.

The **Edit** menu is for manually adding and removing devices in the display. The **Start** menu, in addition to letting you initiate Kick Start discovery, lets you set preferences for the Kick Start and ping functions (timeout periods, number of tries, etc.).

Auto Discovery

A powerful service discovery protocol has already been built into *WMS* utility program. This Discovery Protocol can easily discover all the Outdoor WWBs and WECs connected to the Ethernet backbone within the same subnet. Click the “Auto Discovery” Binoculars icon. All compatible operating devices will be automatically discovered and shown on the *Hosts View* screen.

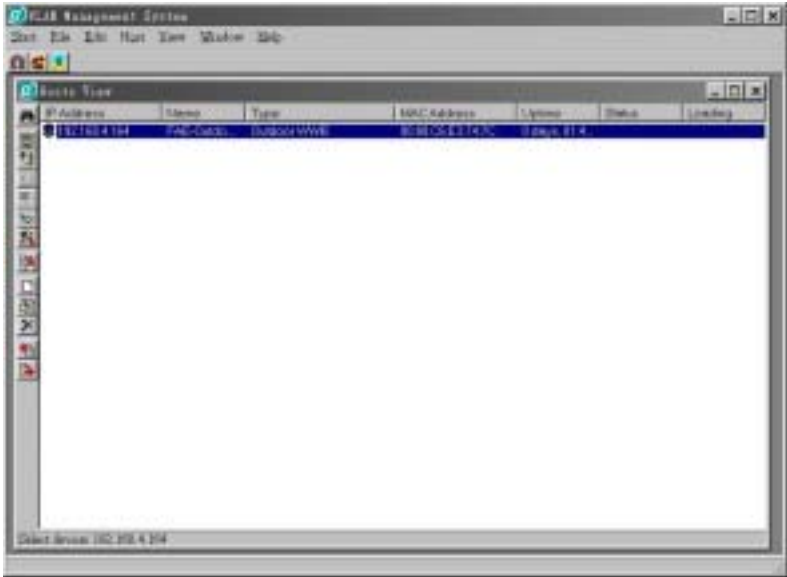


Figure 13. The Host View window after auto-discovery

Select one of the wireless devices in the table. The buttons on the left toolbar will be enabled. Right-clicking on a particular device will open a popup menu offering the same functions as the toolbar (Figure 14).

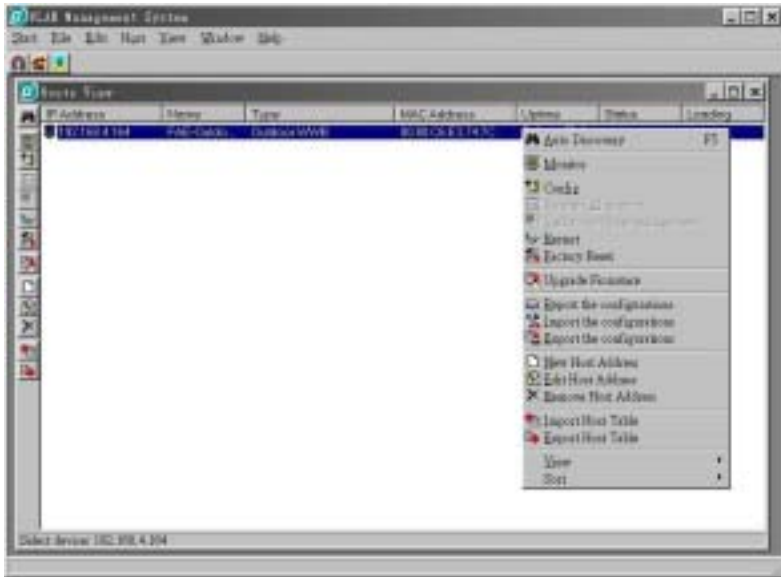


Figure 14. Popup Menu

The Status bar at the bottom of the screen shows the number of connecting wireless devices. When the bar shows *Ready*, *Associated* will appear on the bar along with the IP address of the associated Outdoor WGB or WEC.

Configuration

- step1.** Select the device on the *Hosts View* screen (Figure 13)
- step2.** Right-click the device to open the popup menu (Figure 14)
- step3.** Click *Config* to go to the configuration window (Figure 15)



Figure 15. Config window – IP panel

Config Window – IP Panel

IP Address Setting: A DHCP Client is built into Outdoor WWB and WEC. They will automatically ask the DHCP Server to assign them an IP address. An administrator can assign a fixed IP address to an Outdoor WWB or WEC by un-checking the *Obtain IP Settings Automatically (by DHCP)* box (Figure 16). You may also configure a subnet mask and add a default gateway.

If you assign a fixed IP address to an Outdoor WWB or WEC, make sure that all WWBs and WECs within the same network have the same TCP/IP subnet address.

Obtain IP Settings Automatically (by DHCP)	Automatically retrieves an IP address to the Outdoor WWB or WEC from a Dynamic Host Configuration Protocol (DHCP) server. This option is enabled by default
IP Address	Manually assigns an IP address to the Outdoor WWB or WEC
Subnet Mask	Manually assigns a subnet mask to the Outdoor WWB or WEC
Default Gateway	Specifies the default gateway IP address (if required)

Note: An Outdoor WWB or WEC will directly transfer SNMP respond packets (confirmation packets) to a WMS PC if it is within the same LAN (the same subnet mask). If an SNMP respond packet from an Outdoor WWB or WEC is destined for a WMS PC on another LAN, then the SNMP respond packet needs to go through a router-gateway. The default gateway is the path to that router. If you set the correct default gateway, then you can use a WMS manager (i.e. a PC running WMS) physically located in a different subnet to manage this Outdoor WWB or WEC.

If you wish to change the defaults, set each WWB or WEC to its new IP address before introducing it to the open network. All WWBs and WECs within the same network must have the same TCP/IP subnet address.



Figure 16. IP panel - Static IP Configuration

Config Window – Filter Panel

The next tab on the dialog box is *Filter* (Figure 17). This is a one-way protocol filtering mechanism that prevents the Outdoor WWB or WEC from transmitting specified protocols from a wired Ethernet LAN into the wireless LAN. If you do not require particular protocols on the wireless part of your network, you can save bandwidth by enabling the protocol filter.



Figure 17. Config window – Filter panel

From the *Filter* card, some, all, or none of the protocols listed may be selected for filtering out:

- IP Protocol
- IPX Protocol
- NetBEUI Protocol
- AppleTalk Protocol
- Other Protocols
- Internet Multicast Frames

Config Window – Wireless Panel

The *Wireless* panel (Figure 18) provides access to the Wireless settings.



Figure 18. Config window – Wireless panel

To establish radio communication, the following parameters should be properly set.

<i>Name</i>	Assigns a unique human-friendly name that allows the Outdoor WVB or WEC to be easily identified.
<i>SSID</i>	This is commonly called the Domain Name and is defined in the IEEE 802.11b Wireless Standard as SSID. Stations, WVBs, WECs, and APs in the same group must use the same Domain Name.
<i>Transmission Rate</i>	Sets the transmission rate at which the data packets are transmitted by the Outdoor WVB or WEC.

<i>Basic Rates</i>	<p>This value determines the basic rates used and reported for this BSS by the Outdoor WWB or WEC. The highest rate specified would be the rate that the Outdoor WWB or WEC will use when transmitting broadcast/multicast and management frames.</p> <p>Available options are:</p> <ul style="list-style-type: none"> • 1 and 2Mbps • All (1, 2, 5.5, and 11Mbps)
<i>Regulatory Domain</i>	<p>Identifies the country where the Outdoor WWB or WEC is used. Each country has defined its available channel numbers and transmission power (see 錯誤! 找不到參照來源。)</p>

Config Window – Ethernet Panel

The Outdoor WWB can support up to 16 Ethernet PCs. The Outdoor WEC can support only one Ethernet PC.

- Ethernet Access Control: Only an Ethernet device whose MAC address is pre-registered on this list is allowed to connect to an Outdoor WWB or WEC.



Figure 19. Ethernet panel – Fixed Address

1. *Auto Detect*: The Outdoor WWB or WEC will automatically sense Ethernet devices connected to it. The maximum number of Ethernet devices for Outdoor WWB is 16, and for Outdoor WEC is 1.
2. *Fixed Address*: This option allows users to specify Ethernet MAC addresses for devices that are allowed to pass traffic through the Outdoor WWB or WEC. The maximum number of Ethernet clients for Outdoor WWB is 16. MAC addresses are 6 bytes long and are controlled by the IEEE. Also known as an *Adapter address*. Only hexadecimal characters (the numbers 0-9 and letters a-f) are acceptable.

Idle Time

An Outdoor WWB or WEC can expire an Ethernet client when there is no traffic from the client within a set period. Specify an aging time to expire an idle client, or disable this function by checking “Always Connect”. Click **OK**.



Figure 20. Ethernet panel – Idle Time

Config Window – Encryption Panel

Data encryption provides secure wireless data communications. Click the *Encryption* tab to setup/change the security settings (Figure 21).



Figure 21. Encryption panel

The default setting of the *Method* control is *WEP: Disable*. When this setting is in effect, no key input boxes appear on the right side of the panel. Key input boxes appear, and the other controls in this panel are enabled, when the *Method* control is set to *WEP: Enable*.

Key Generation: There are two ways to generate a WEP key or keys. The first is by entering any text in the *Passphrase* field and clicking the *Generate* button. For 64-bit WEP, four keys will be generated. To select the key to be used on the network, select a number from the *Default Key* drop-down list box. For 128-bit WEP, only one key will be generated. Click *OK* to send the settings to the bridge. Another WEP key generation method is to enter the key values directly from the keyboard in hexadecimal notation. Type the desired values into the key input boxes on the right, select the desired key (if using 64-bit WEP) from the *Default Key* list, and click *OK* to send the settings to the bridge.

Config Window – SNMP Access Control Panel

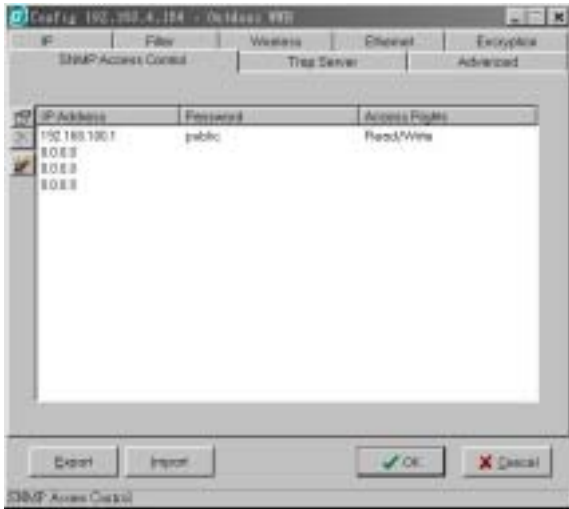


Figure 22. SNMP Access Control panel

The Outdoor WWB or WEC contains an SNMP access table to limit access to its configurations. The first time this box is opened, the table will be empty. This means that there are no restrictions on who can access and reconfigure the Outdoor WWB or WEC. To avoid chaos on the network, access to the Outdoor WWB or WEC configuration should be restricted to only those for whom it is necessary.

When you select SNMP Access Control, the system will display four blank wireless devices for setting (maximum of 4 SNMP devices can be set).

Right-click on a device in the list and click **Edit Address**. The *New/Edit Address* screen will open (Figure 23).



Figure 23. New/Edit Address dialog box

Two levels of access may be assigned.

Read	Read-only rights. The user may read everything except the Access Control settings, but cannot alter anything
Read/Write	The user may read and alter all settings

Note: Do not set all the stations in the Access Control table to Read. Once this is set and enabled, it will be impossible to modify the Outdoor WWB or WEC settings via WMS. Should this situation occur, you need to reset the Outdoor WWB or WEC to the factory configuration using Kick Start. (See Troubleshooting for details).

To set a station's access rights, enter a station's IP address and community string (the community string is used as a password to access the Outdoor WWB or WEC) and choose *Read* or *Read/Write*.

Config Window – Trap Server Panel

When an Outdoor WWB or WEC is powered on, or its Ethernet port becomes active, an event log will be generated indicating the time, the IP address of the reporting Outdoor WWB or WEC, and the event.

To assign a trap server, click *Trap Server* (Figure 24).

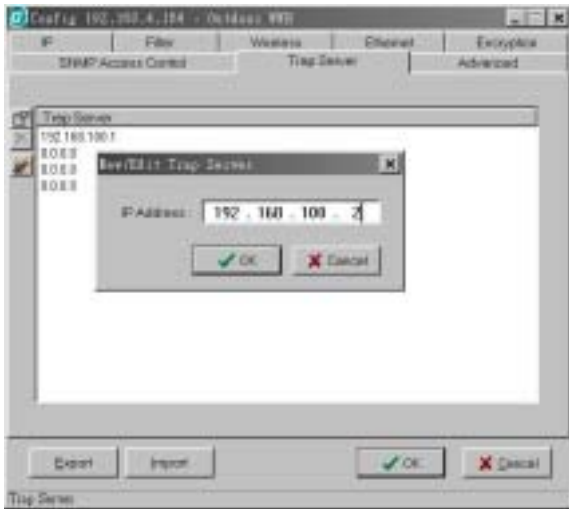


Figure 24. Trap Server panel

Assign a station as a trap server by entering its IP address and network port type. Click *Edit Address*. To remove a trap server from the list, highlight it and click *Clear Address*. Click *Delete all address* to remove all assigned trap servers from the list.

To view trap log information, click the *Start Trap View* icon (a ringing telephone) in the upper left corner of the WLAN Management System’s main window. A window such as that shown below will appear (Figure 25).

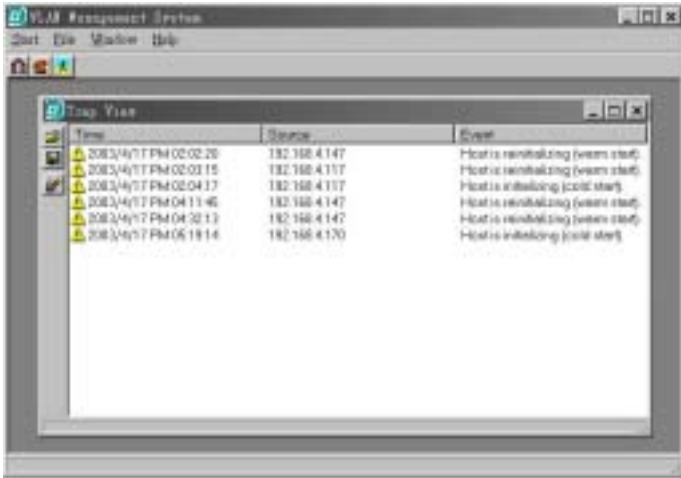


Figure 25. Trap View window

The log shows when a compatible device was powered on, or an Ethernet port became active, and the IP address of the reporting device. You can save, open, and delete log files through the *File* menu.

Config Window – Advanced Panel



Figure 26. Advanced window

The Advanced panel lets you set two parameters:

- *RTS Threshold*: the number of bytes a packet must contain to trigger RTS/CTS (Request to Send/Clear to Send) handshaking
- *Fragmentation Threshold*: the number of bytes a packet must contain to trigger “fragmentation” (intentional splitting up) into multiple packets before wireless transmission.

These values need to be changed only in unusual situations.

Important:

Once all configurations have been completed, click **OK**. You will be reminded that a reset is required to make the changes effective. Click **Yes**.

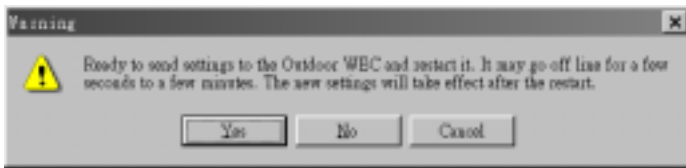


Figure 27. Warning before Outdoor WEC reset

Monitor Device Operation

The Monitor tool allows the Outdoor WWB’s or WEC’s status, Ethernet statistics, Wireless statistics, client list, and other configuration information to be viewed/monitored.

On the *Hosts View* screen, select a device and click the **Monitor** button on the toolbar or on the popup menu.

Monitor Window – Identity Information Panel

The *Identity Information* screen will open (Figure 28). The information shown is read-only.

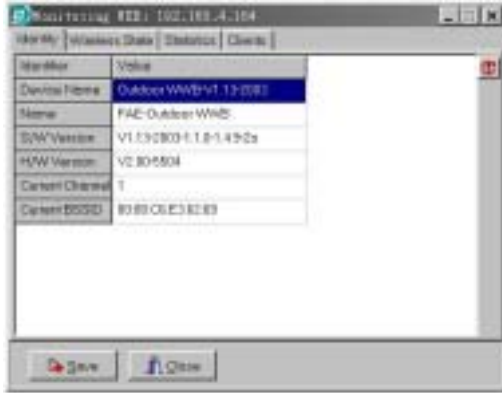


Figure 28. Monitor window – Identity panel

Device Name	Default name used by the WLAN Management System
Name	Human-friendly name assigned by the user for easier identification
S/W Version	Shows the device software version number
H/W Version	Shows the device hardware version number
Current Channel	Shows the wireless channel currently in use on the device
Current BSSID	Shows the BSSID of the device (same as the device’s MAC address)

Monitor Window – Wireless State Panel

Click *Wireless State* for current wireless status.

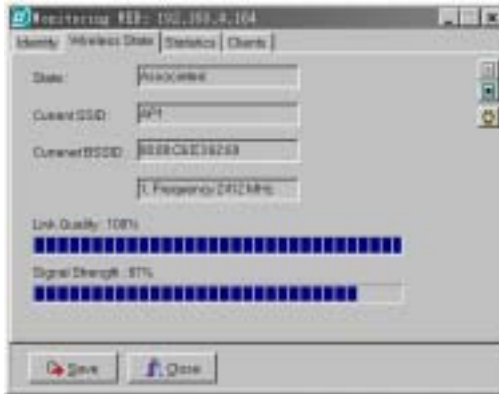


Figure 29. Monitor window – Wireless State panel

Monitor Window – Statistics Panel

These statistics will be lost when the Outdoor WWB or WEC reboots or is reset. To refresh the statistics, click on the ► button to continually refresh information. Click on the ■ button to stop update information.

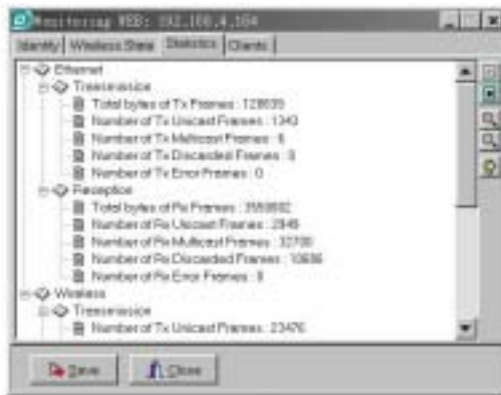


Figure 30. Monitor window – Statistics panel

Monitor Window – Clients Panel

The *Clients* window lists all the currently connected Ethernet devices.

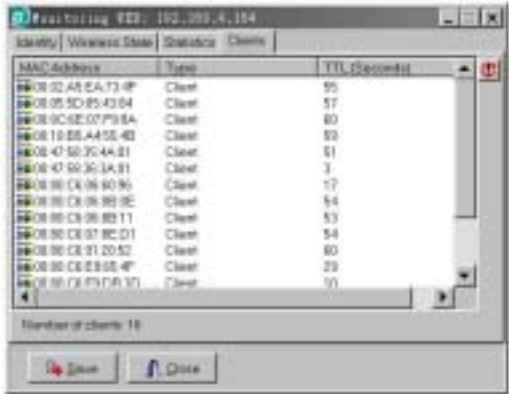


Figure 31. Monitor window – Clients panel

Upgrade Firmware

The Outdoor WWB's or WEC's embedded software (firmware) is burned into the flash ROM. However, an updated firmware can be installed over your LAN via the WMS program. Click on *Upgrade Firmware*. The *Upgrade Firmware* dialog box will open (Figure 32).

Use the *Browse* button to choose the file to be uploaded to the Outdoor WWB or WEC, or type the file name and path in the *Select File* field.

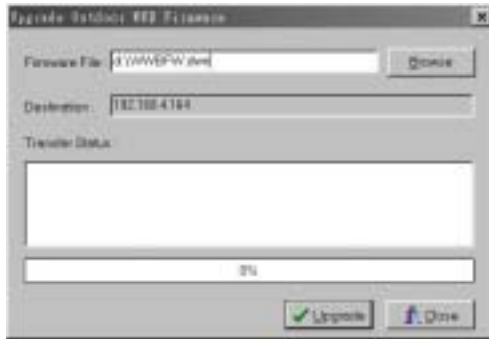


Figure 32. Upgrade Firmware

The *Upgrade* button will then become enabled. Click *Upgrade* to start uploading the file to the Outdoor WWB or WEC. The WMS and the Outdoor WWB's or WEC's built-in Trivial File Transfer Protocol (TFTP) command will upload the new executable into the Outdoor WWB's or WEC's flash memory area. If the upload activity fails, an error message will be shown on the message box. When the file transfer is complete, click *Close* to close the window.

Restart

Resetting the Outdoor WWB or WEC will take about 30 seconds. During this time, the WMS utility will not be able to query the Outdoor WWB or WEC via the SNMP protocol and the Outdoor WWB or WEC will not be available to other stations. If you try to access it, the WMS utility will display a "No response from the WEB" or from the WEC message.



Figure 33. Warning before Outdoor WWB or WEC restart

Factory Reset

Clicking *Factory Reset* if you want to return the Outdoor WWB or WEC to its factory default settings. A warning message will appear (Figure 34).

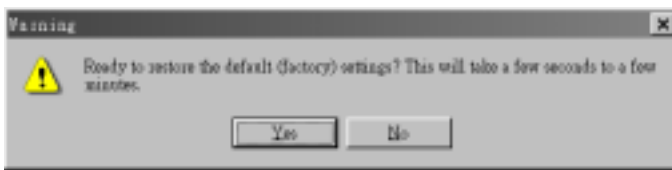


Figure 34. Warning before factory defaults are loaded

Click *Yes* to return the Outdoor WWB or WEC to the factory default settings.

Note: The Outdoor WWB or WEC will be reset to complete the 'Factory Reset' operation.

Advanced Setting

Batch mode operation

In order to maximize the efficiency of wireless LAN management, the user can apply batch mode operation to manage the selected Outdoor WWBs or WECs. You can sort managed devices by the device type first. Then select the multiple Outdoor WWBs or WECs you would like to manage. Click the right mouse button to open the popup menu. Then choose the tool you would like to work on these specific Outdoor WWBs or WECs with.

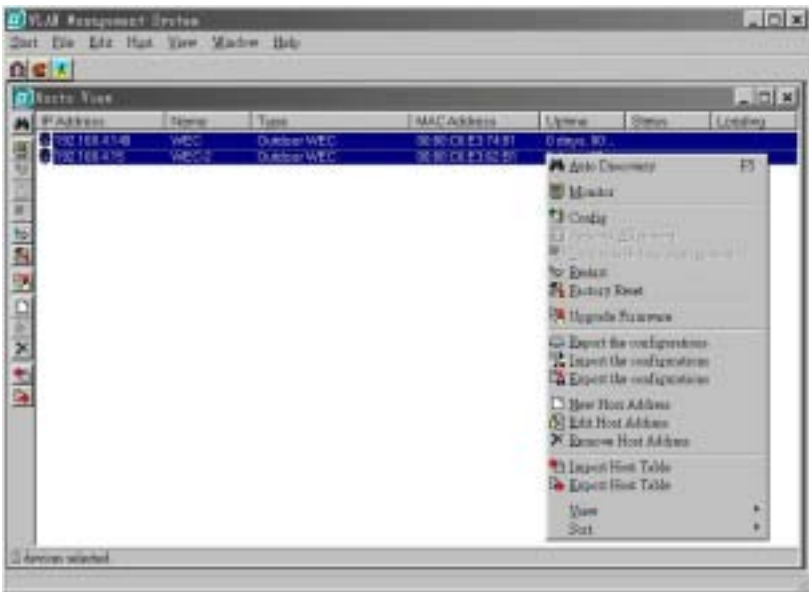


Figure 35. Batch Mode Operation List

Manage the WMS Host Table

Partition the network according to the physical location

The Host Table is a very powerful function to support the massive deployment of wireless products. You may combine several Outdoor WWBs and WECs together with compatible devices to form a group with a specific Host Table name so that you can divide the wireless network into many small groups. A group can be any size, and a wireless network can be divided into as many or as few groups as you wish.

Create a Host Table via Automatic Discovery

Click “Automatic Discovery” to find all compatible devices. Select the desired Outdoor WWBs and WECs and other devices. Click the right mouse button to open the popup menu. Choose “Export Host table” to save the Host Table to a file (for convenience you could save the Host table on a network disk for ease of access).

Import Host Table to check device’s availability

Import the Host Table from a file (for convenience you could retrieve the Host table from a network disk for ease of access). Once the Host Table has been imported, the WMS will automatically check the availability of Outdoor WWBs and WECs listed on the Host Table. This is an extremely powerful feature as Auto-Discovery can only find the devices when they are alive. A failed device will not be found via Auto-Discovery. The devices listed in the Host Table should be available and provide a service. If they do not exist, the WMS can report their absence immediately so that the system administrator can take immediate action.

New/Edit/Remove a host address in a host table

Choose *New Host Address* from the Edit menu or from a device’s shortcut menu to open the New/Edit Address dialog box (Figure 36). All you need to enter is an IP address. The WLAN Management System will automatically detect Outdoor WWBs’ or WECs’ and other compatible devices’ hardware addresses and device types.



Figure 36. New/Edit Address dialog

From here you can also select any Outdoor WWB or WEC in the table. Edit it or delete it when it is no longer necessary. This table can be saved and retrieved from the WMS utility so that you don’t need to create it again.

Export a Configuration profile to a File

The configuration file can be saved to a text file and safely kept. This configuration file can also be imported to recover an Outdoor WWB’s or WEC’s lost settings.

The profile can also be copied to other Outdoor WWB or WEC devices of the same kind. To do this, first click the *Export* button on the *Configuration* screen. Enter the file name for the configuration profile to be saved to (Figure 37).

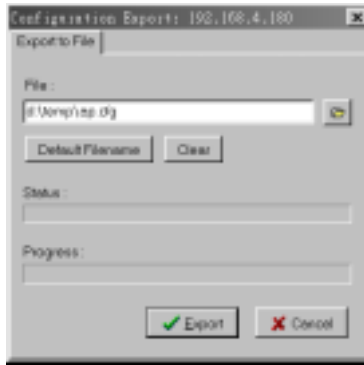


Figure 37. Export the configuration profile to a file

Import the Configuration Profile from a File

The configuration file may be imported to recover an Outdoor WWB's or WEC's original settings. The profile can also be copied to other Outdoor WWB or WEC devices of the same kind. To do this, first click the *Import* button on the *Configuration* screen. Enter the file name for the configuration profile to be imported from. The user can also pre-select the session of the network profile to be imported and over-written before clicking the *Import* button.



Figure 38. Importing a configuration profile from a file (1)



Figure 39. Importing a configuration profile from a file (2)



Figure 40. Importing a configuration profile from a file (3)

Encryption

The configuration file does not contain the security key settings. The attributes of security keys are externally **write-only** and cannot be saved into the configuration file. If encryption is set in the session you select to be imported, an Encryption dialog box will appear before the Step 3 dialog box shown above, and you will have to enter the security key or keys manually.



Figure 41. Encryption dialog before a profile is imported

Troubleshooting

This section provides you with some troubleshooting information should you encounter installation or operation problems. If you still cannot resolve a problem after going through the troubleshooting section, contact your network equipment supplier for assistance (see “Technical Support,”).

<i>Symptom</i>	<i>Suggested Solutions</i>
<i>The Outdoor WWB or WEC is switched ON, but the Power LED on the Outdoor WWB or WEC is OFF.</i>	<ol style="list-style-type: none"> 1. Make sure the power adapter is firmly connected to the power outlet and the Outdoor WWB's or WEC's power connector. 2. The power adapter or Outdoor WWB or WEC is defective.
<i>The WMS utility cannot detect an Outdoor WWB or WEC on the same network.</i>	<ol style="list-style-type: none"> 1. Make sure the Outdoor WWB or WEC is powered on and connected to an Ethernet work. 2. Check the IP addresses assigned to the WMS terminal PC. They should be in the same subnet and unique. For example, if the Outdoor WWB's or WEC's IP address is 192.168.1.5 with a mask of 255.255.255.0, then the PC's IP address should be 192.168.1.x with a mask of 255.255.255.0.
<i>The Outdoor WWB or WEC powers up, but the Ethernet Link LED is OFF (no connection to an Ethernet network).</i>	<p>Make sure:</p> <ol style="list-style-type: none"> 1. The Ethernet cable is connected firmly to both the Outdoor WWB or WEC and Hub/Switch. 2. The Hub/Switch is powered on.
<i>The Status LED on the Outdoor WWB or WEC panel is Red and flashing.</i>	Restart (power cycle) the Outdoor WWB or WEC and check the Status LED again. If it is still flashing, you need to return the Outdoor WWB or WEC to the reseller for repair.

<i>Symptom</i>	<i>Suggested Solutions</i>
<i>Transmission performance is slow or erratic.</i>	<ol style="list-style-type: none"> 1. Move your Outdoor WWB or WEC closer to the AP to find a better signal. If the signal is still weak, change the direction of the antenna slightly. 2. There may be interference, possibly caused by a microwave oven, 2.4GHz wireless phone, or metal objects. Move these interference sources or change the location of the wireless PC or AP. 3. Change the wireless channel on the AP. 4. Check the Outdoor WWB's or WEC's antenna, connectors, and cabling are firmly connected
<i>The AP and Outdoor WWB or WEC are working, but the PC cannot connect to the Ethernet network via the AP.</i>	<ol style="list-style-type: none"> 1. The AP's MAC access control function is enabled and the Outdoor WWB or WEC is denied access. 2. The Protocol Filter has blocked required protocols, e.g. TCP/IP to the PC. Uncheck these protocols from the filtering list. See Figure 17. 3. The IP settings on the PC are not correct.
<i>How do I set the Outdoor WWB or WEC back to its factory default settings?</i>	<p>You can apply <i>Factory Reset</i> option from the menu of the WLAN Management System (WMS) or use <i>Kick Start</i> function by the following way:</p> <ol style="list-style-type: none"> 1. Connect the Outdoor WWB or WEC to your PC. Please make sure the Ethernet connection is normal. 2. Open WLAN Management System (WMS) application and click Kick Start icon. 3. Click <i>Find</i> icon from WLAN Kick Start window or press <F5> key to search the Outdoor WWB or WEC. 4. Right-click the Outdoor WWB or WEC that you want to reset and select <i>Restore Default</i> option.

Technical Support

If assistance is required, your network equipment supplier may be able to help. Have the following information ready before you make the call:

- the behavior of the LEDs from power-up to the point where assistance is required
- device details (such as firmware version)
- a brief description of the network structure
- details of any recent configuration changes

If it appears that more in-depth support is required, have the following information on hand before seeking assistance:

- what you were doing when the error occurred
- what error message or messages you saw
- whether the problem can be reproduced
- the device's firmware version
- debugging information from the management software (if available)

From time to time updated firmware may be released. Contact your network equipment supplier for details.