The WL11000SA-N

Wireless Access Point

WL11000SA-N Access Point is an 11 Mbps wireless device that seamlessly integrates with existing Ethernet networks to support applications such as mobile users or temporary conferences. This solution offers fast, reliable wireless connectivity with considerable cost savings over wired LANs (which include long-term maintenance overhead for cabling.) Just install enough wireless access points to cover your network area, plug wireless cards into your notebooks or install wireless adapters into your desktops, and start networking.

Using this device in conjunction with WL11000/WL11000P Wireless PC/PCI Cards, you can create an instant network that integrates seamlessly with 10 Mbps Ethernet LANs. Moreover, moving or expanding your network is as easy as moving or installing additional access points, no wires!

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Package Checklist

WL11000SA-N Wireless Access Point package includes:

✧   1 WL11000SA-N Wireless Access Point

✧   1 Antenna (dipole, omni-directional)

✧   1 DC power adapter

✧   1 Utility diskette

✧   1 Quick Installation Guide

✧   1 This User Guide

Please inform your dealer if there are any incorrect, missing or damaged parts. If possible, retain the carton, including the original packing materials. Use them again to repack the product in case there is a need to return it for repair.

Hardware Description

The WL11000SA-N Wireless Access Point serves as a Media Access Control (MAC) bridge between your wired Local Area Network (LAN) and one or more Wireless Local Area Networks (WLANs) (including wireless clients or other access points). Just attach the access point anywhere along your Ethernet LAN to provide wireless stations within its area of coverage with transparent access to the local wired and wireless LAN.

The WL11000SA-N Wireless Access Point supports an 11 Mbps half-duplex connection to Ethernet networks for each active channel. It is fully compliant with 2.4 GHz DSSS CSMA/CA Wireless networking as defined in IEEE 802.11b, and 10 Mbps Ethernet as defined in IEEE 802.3

Applications

The WL11000SA-N Wireless products offer a fast, reliable, cost-effective solution for wireless client access to the network in applications such as:

✧ **Remote access to corporate network information**
E-mail, file transfer and terminal emulation

✧ **Difficult-to-wire environments**
Historical or old buildings, asbestos installations, and open areas where wiring is difficult to employ,

✧ **Frequently changing environments**
Retailers, manufacturers and banks that frequently rearrange the workplace and change location

✧ **Temporary LANs for special projects or peak time**
Trade shows, exhibitions and construction sites, which need temporary setup for a short time period. Retailers, airline and shipping companies who need additional workstations for a peak period.

✧ **Access to databases for mobile workers**
Doctors, nurses, retailers, white-collar workers who need access to databases while being mobile in the hospital, retail store or office campus.

✧ **SOHO (Small Office and Home Office) users**
SOHO users who need easy and quick installation of a small computer network functions.

LED Indicators

The WL11000SA-N Wireless Access Point includes five status LED indicators, as described in the following figure and table.
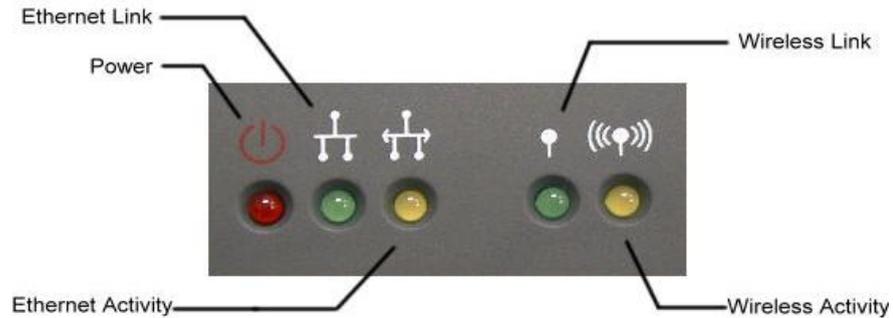
| LED	Status	Description
Power	ON Red	Indicates the power is being supplied.
Ethernet Link	On Green	Indicates a valid Ethernet cable link.
Ethernet Activity	Flashing Yellow	Indicates that the access point is transmitting or receiving data on the Ethernet LAN.
Wireless Link	Flashing Green	Indicates valid wireless station links. The rate of flashing increases with the number of links
Wireless Activity	Flashing Yellow	Indicates that the access point is transmitting or receiving data through wireless links

System Requirements

Before you install the WL11000SA-N Wireless Access Point, be sure you can meet the following requirements:

✧ An A/C power outlet (100~240V, 50~60Hz) which will supply power for the access point
✧ An available RJ-45 (UTP) port on a 10BASE-T or 10/100BASE-T Ethernet hub or switch.
✧ 802.11 compliant Wireless Ethernet adapters with TCP/IP compatible protocol installed.
✧ Web Browser for configuration.

Installation

1.   Select the Site - Choose a proper place for your WL11000SA-N Access Point. In general, the best location to place the access point is at the center of your wireless coverage area, within line of sight to all your mobile stations.

2.   Attach the Antenna - Screw the antenna into the antenna connector (ANT) on the back panel. Proper placement will improve performance. Try to place the access point in a position that can best cover its BSS. Normally, the higher you place the antenna, the better the performance.
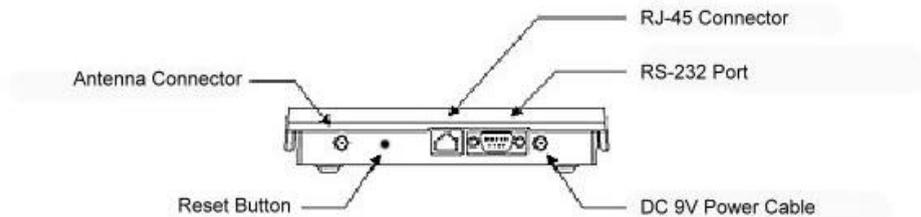
3.   Connect the Ethernet Cable - The WL11000SA-N can be wired to a 10 or 10/100 BASE-T Ethernet with a network device such as a hub or a switch. Connect into the RJ-45 connector socket on the back panel with category 3, 4 or 5 UTP Ethernet cable and an RJ-45 connector.

4.   Connect the Power Cable - Connect the power adapter cable to the 9V DC power Socket on the rear panel.

Warning: **ONLY USE the power adapter supplied with the WL11000SA-N. Otherwise, the product may be damaged.**

Note: **The RS-232 Port is a reserve port for future function. There is no any function or configure interface in currently model.**

Configuration

The diskette labeled "Utility Diskette", that comes with the package contains a utility program for the WL11000SA-N Wireless Access Point. Any updates can be downloaded from Teletronics International Inc web site at:
http://www.teletronics.com.

Warning: Backup your utility diskette and use the copy as the working diskette to protect the original from accidental damage.

The WL11000SA-N can be configured over an Ethernet network using RJ-45 cable or wireless device that link to this AP. You may connect the WL11000SA-N to a network device such as a hub or switch. Then, run the utility program, and configure the WL11000SA-N remotely as described below.

Windows NT/95/98/ME/2000 Installation

1. Insert the WL11000SA-N utility disk into the floppy drive on your PC, and then enter the following command: A:\utility\setup.exe. Follow the on-screen instructions to install the utility program.
2. When you run the installed utility click on "AP" and then select "Scan" from the menu, the program will then detect all the WL11000SA-Ns wired to the Ethernet network
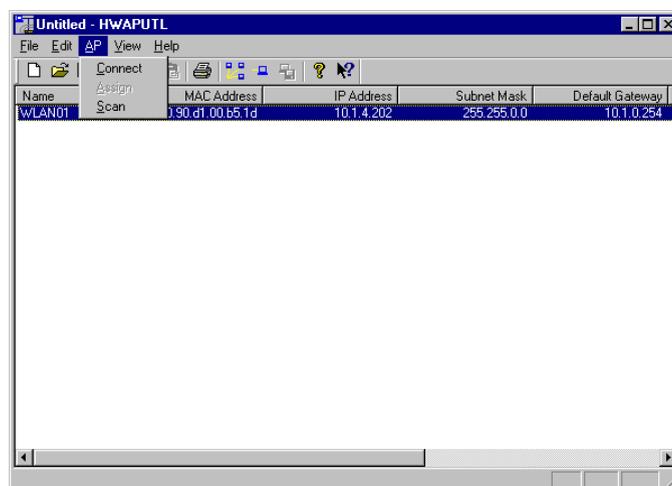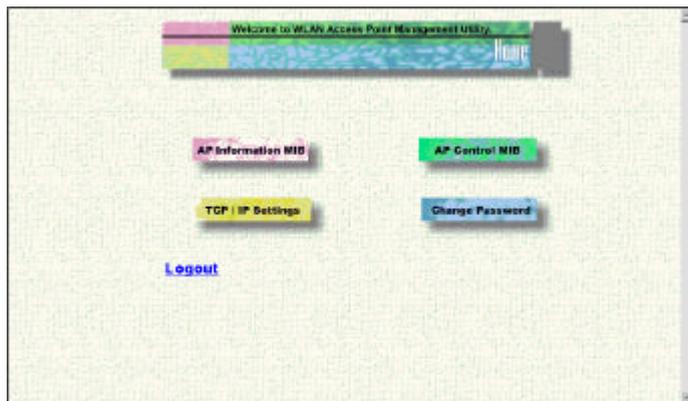
3. From the list of detected WL11000SA-Ns, select and double click on the unit you want to configure. The web browser page will appear as follows:

4. Enter the user name "default" and password "WLAN_BRIDGE" This will take you to the home page.

   NOTE: The AP firmware doesn't check the field of User name. User can hit any string except the "default" to login into the home page.
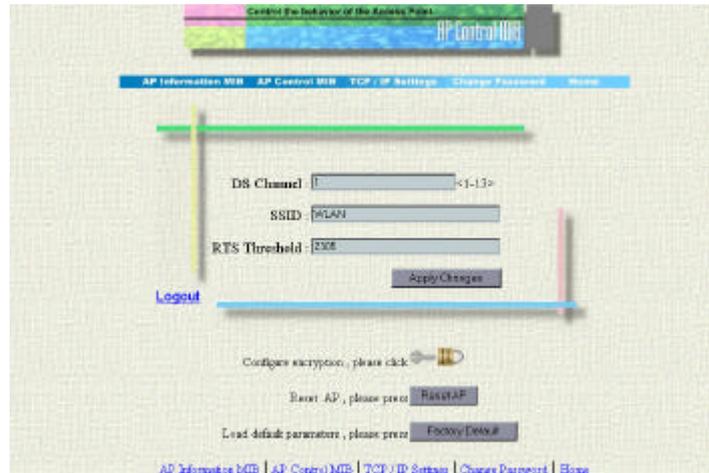

5. Click on "AP Information MIB", "AP Control MIB", "TCP/IP Settings" or "Change Password" to select the page required.

The AP Information MIB screen displays the categories of information shown below.
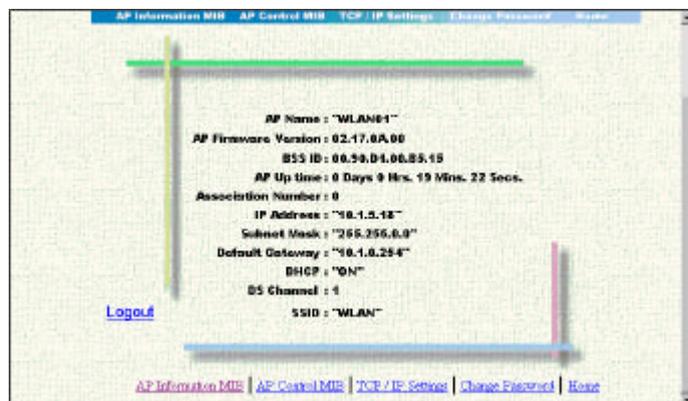
In the AP Control MIB page set the parameters and the click on "Apply Changes" to implement the settings.

6. **DS Channel** – Set the wireless channel number as the operating radio channel.

    Note1:   *Corresponds the available channel setting (region) will be displayed in the field of right corner.*

    FCC/IC: 1-11, ETSI: 1-13, MKK: 1-14, France: 10-13 and Spain: 10-11.

    Note2:   *If you have several wireless LAN networks with different SSID on one floor, the transfer speed may be affected when communicating with other wireless networks. This is because radio waves with the same frequency are being used (Close frequencies used on adjacent channels may interfere with each other also).*

    To avoid this problem, set a different frequency (wireless channel) for each wireless LAN network.

7. **SSID** - This SSID (ESS-ID) is an identification code required for communication in a wireless LAN. (Default: "WLAN")

    Note: *The SSID is upper/lower case sensitive and can consist of up to 32 alphanumeric characters.*

8. **RTS Threshold** - Set the RTS Threshold to enable the RTS/CTS mechanism. (Default: 2,305, the maximum values and means Disabled)

For more security setting, click on the Configure encryption icon, and the Encryption page will show as below

9. **WEP** - For more secure data transmission, set the "WEP" to "WEP_128" or "WEP_64" to ensure wireless network security. The advanced Wired Equivalent Privacy (WEP) is implemented in this device to prevent unauthorized access. The 128 bits setting gives a higher level of security but the setting must be the same as other clients in your wireless network. (Default: Disabled)

10. **Key Entry** –This field can be set to "Passphrase" or "Manual Entry".
    Select the "Passphrase" means the KEY ID value will be auto generated by the internal algorithm according the string defined in Passphrase field.
    Select the "Manual Entry" means the KEY ID values allow/need user key in by manually. (2 characters of hex in each block)

11. **Pass Phrase** - The security key for WEP encryption is generated from your pass phrase so it should be the same as all the other stations in your network

64-Bit Manual Entry:

12. **Key 1~4 -** Key ID value, each Key ID contains 10 hex digits. Wireless devices can communicate to each other depend on this Key ID element values are exactly the same

13. **Default Key ID -** Choose which Key ID value would be using to encrypt the data, the value could be choose from 1 to 4.
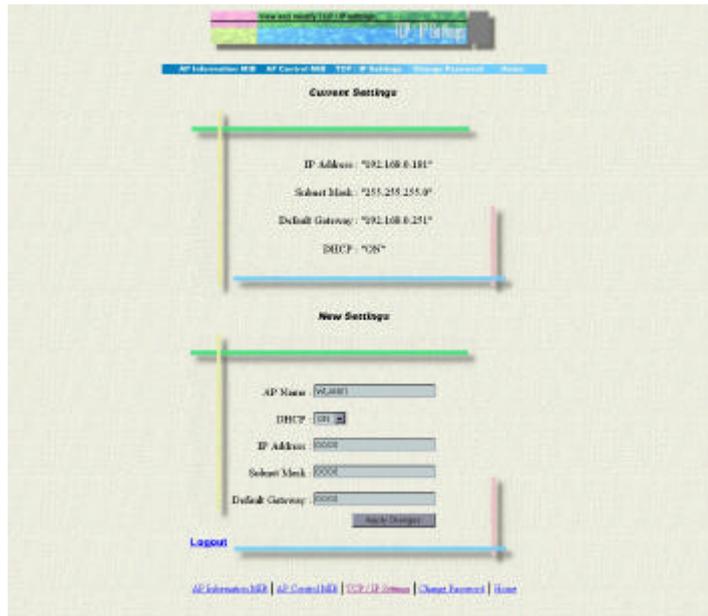
128-Bit Manual Entry:

14. **Key 1 -** Key ID value, each Key ID contains 26 hex digits. Wireless devices can communicate to each other depend on this Key ID element values are exactly the same

The TCP / IP Setting page displays the categories of information and the parameters setting shown below.

NOTE: WL11000SA-N build in the DHCP Client function, it means the AP will get all the IP address, subnet mask and default gateway values from DHCP server while AP powers on the network.

If you want to set these yourself, please enter the new IP address, subnet mask and default gateway properly in the "New Settings" section of the "TCP/IP Settings" screen then click on "Apply Changes"

For the convenient of identification, the WL11000SA-N Access Point could be assigned an alias name in the "AP Name" field.

A password is required to configure the WL11000SA-N Access Point. We suggest changing your password from the default value to ensure network security.
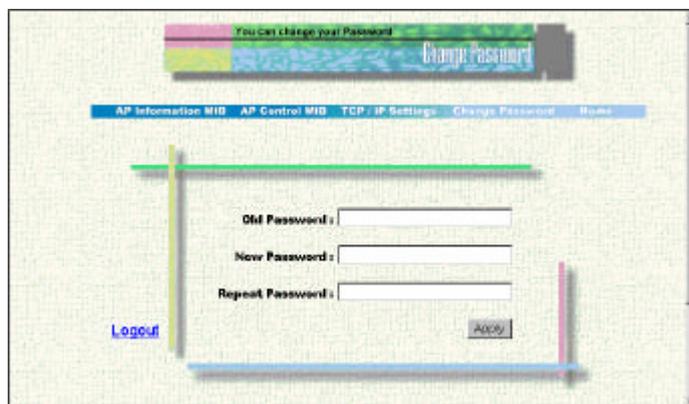
Network Configuration and Planning

WL11000SA-N Wireless Solution supports a stand-alone wireless network configuration, as well as an integrated configuration with 10Mbps Ethernet LANs.

The WL11000/WL11000P wireless network cards and adapters can be configured as:

✧   Ad hoc for departmental or SOHO LANs

✧   Infrastructure for enterprise LANs

Network Topologies

Ad Hoc Wireless LAN

An ad hoc wireless LAN consists of a group of computers, each equipped with a wireless adapter, connected via radio signals as an independent wireless LAN. Computers in a specific ad hoc wireless LAN must therefore be configured to the same radio channel.

An ad hoc wireless LAN can be used for a branch office or SOHO operation.

Infrastructure Wireless LAN

The WL11000SA-N can provide access to a wired LAN for wireless workstations. An integrated wired and wireless LAN is called an Infrastructure configuration. A Basic Service Set (BSS) consists of a group of wireless PC users, and an access point that is directly connected to the wired LAN. Each wireless PC in this BSS can talk to any computer in its wireless group via a radio link, or access other computers or network resources in the wired LAN infrastructure via the access point.

The infrastructure configuration not only extends the accessibility of wireless PCs to the wired LAN, but also doubles the effective wireless transmission range for wireless PCs by passing their signal through one or more access points.

A wireless infrastructure can be used for access to a central database, or for connection between mobile workers, as shown in the following figure.
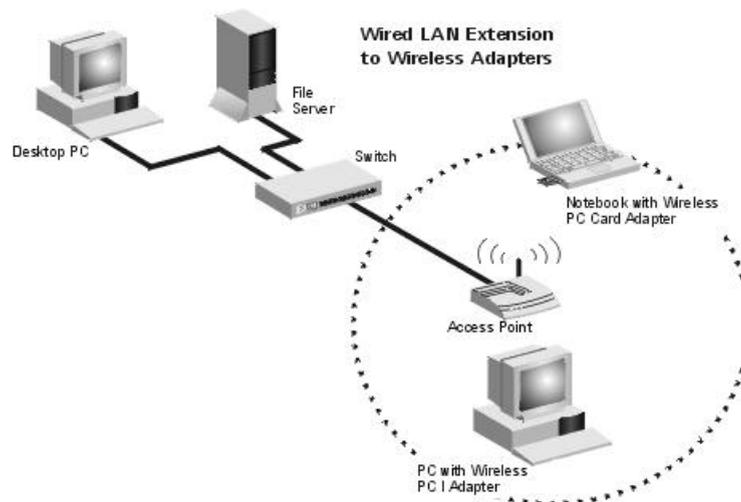
Setting the Communication Domain

Stationary Wireless PCs

The Basic Service Set (BSS) is the communication domain for each WL11000SA-N access point. For wireless PCs that do not need to support roaming, set the domain identifier (SSID) for the wireless card to the BSS ID of the access point you want to connect to. Check with your administrator for the BSS ID of the WL11000SA-N access point he wants you to connect to.

Roaming Wireless PCs

A wireless infrastructure can also support roaming for mobile workers. More than one access point can be configured to create an Extended Service Set (ESS). By placing the access points so that a continuous coverage area is created, wireless users within this ESS can roam freely. All wireless network cards and adapters and WL11000SA-N access points within a specific ESS must be configured with the same SS ID.
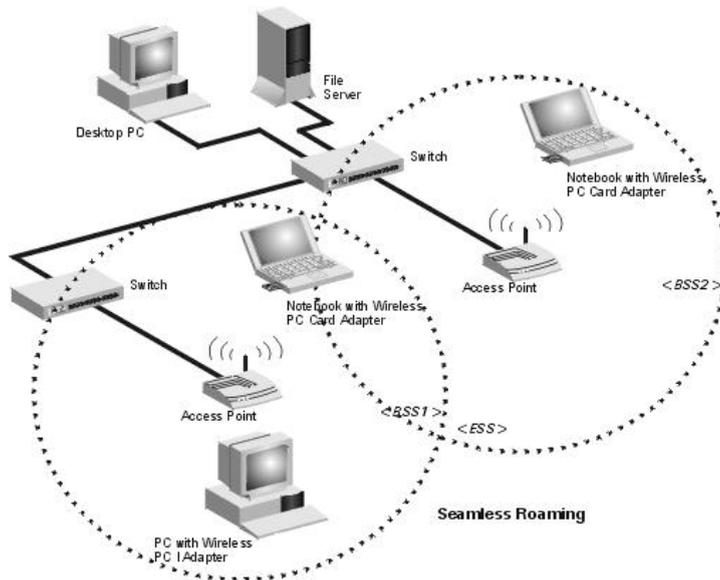
Troubleshooting

Check the following items before contacting Technical Support.

1. If mobile users do not have roaming access to the WL11000SA-N access point, check the following:

    ✧   Make sure that all the WL11000SA-Ns and stations in the ESS in which the WLAN mobile users can roam are configured to the same WEP Pass Phrase, SSID and authentication algorithm.

2. If the WL11000SA-N cannot be configured using the web browser:

    ✧   Remove power from the WL11000SA-N.

    ✧   Do a hard reset (or load the AP's setting to the Factory Default Setting) by inserting a paper clip into the reset socket at the back of the WL11000SA-N. Connect the power while holding the paper clip in place. Remove paper clip after 5 seconds.

    The following table shows the supported LED patterns and functions:

Function	RF Link LED	RF Activity LED	Action
0	OFF	OFF	- No Action, will boot normally
1	OFF	ON	- Revert to Factory Default settings.
2	ON	OFF	- Force boot from Primary code image
3	ON	ON	- Reserved, (for now will boot normally)

Compliances

FCC Class B Certification

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning!   This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

This device requires a radio license, unless it (including antenna) is installed totally inside a building. (User must obtain this license from Industry Canada).

CSA Statement (Canada)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of Industry Canada.

CE Mark Declaration of Conformance

This is to certify that this product complies with ISO/IEC Guide 22 and EN45014. It conforms to the following specifications:
EMC: EN55022 (1988)/CISPR-22 (1985) Class B

IEC 61000-4-2(2000)	4kVCD/8kVAD
IEC 61000-4-3(2000)	3V/m
IEC 61000-4-4(2000)	1kV- (power line)
IEC 61000-4-6(2000)	3Vrms
IEC 61000-4-11(2000)	3Vrms

Specifications

Model

WL11000SA-N

Maximum Channels

US & Canada: 11, Europe (ETSI): 13, Japan: 14

Maximum Clients

64

Operating Range

100ft (30m) at 11 Mbps, 300ft (100m) at 5.5 Mbps or lower

Cell Separation (for roaming clients) 200ft (60m) between access points

Data Rate

1, 2, 5.5, 11 Mbps per channel

Network Configuration

LAN to access point to wireless card, access point to wireless card

Operating Frequency

USA, Canada & Europe (ETSI): 2.400-2.4835 GHz,

Japan: 2.400-2.497 GHz

Sensitivity

1, 2, 5.5 Mbps: -80 dBm, 11 Mbps: -76 dBm typical

Modulation

CCK, BPSK, QPSK

Power supply

Input: 100-240 AC, 50-60 Hz

Output: 9 VDC, 1A

Output Power

+13 dBm minimum

Physical Size

5.12 x 7.09 x 1.58 in, (13 x 18 x 4 cm)

Weight

12.9 oz, (365 grams)

LED Indicators

Power, Ethernet Link, Ethernet Activity, Wireless Link, Wireless Activity

Network Management

HTML web-browser interface

Windows 95/98/ME/NT/2000 utility

Operating Systems

Windows 95/98/ME, Windows NT/2000

Temperature

Operating: 32 to 122   (0 to 50   )

Storage:

32 to 158   (0 to 70   )

Humidity

5% to 8% (non-condensing)

Compliances

CE Mark

EN55022 Class B

EN55024

IEC 61000-42/3/4/6/11

Emissions

FCC Part 15.247

ETS 300 328

ETS 300 826

RCR STD-33A

RCR STD-T66

Safety

CSA/NTRL (CSA 22.2 No. 950 & UL 1950)

EN60950 (T/GS)

Vibration/Shock/Drop

IEC 68-2-34/IEC 68-2-32

Standards

IEEE 802.3 10BaseT, IEEE 802.11b

Terminology

The following is a list of terminology that is used in this document.

1. **Access Point**   An internetworking device that seamlessly connects wired and wireless networks.

2. **Ad-Hoc**   An Ad-Hoc wireless LAN is a group of computers each with LAN adapters, connected as an independent wireless LAN.

3. **Backbone**   The core infrastructure of a network. The portion of the network that transports information from one central location to another central location where it is unloaded onto a local system.

4. **Base Station**   In mobile telecommunications, a base station is the central radio transmitter/receiver that maintains communications with the mobile radiotelephone sets within its range. In cellular and personal communications applications, each cell or micro-cell has its own base station; each base station in turn is interconnected with other cells' bases.

5. **Bridge**   An internetworking function that incorporates the lowest 2 layers of the OSI network protocol model.

6. **BSS**   BSS stands for "Basic Service Set". It is an Access Point and all the LAN PCs that associated with it.

7. **ESS**   ESS (ESS-ID, SSID) stands for "Extended Service Set". More than one BSS is configured to become Extended Service Set. LAN mobile users can roam between different BSSs in an ESS (ESS-ID, SSID).

8. **Ethernet**   A popular local area data communications network, originally developed by Xerox Corp., which accepts transmission from computers and terminals. Ethernet operates on a 10 Mbps base band transmission rate, using a shielded coaxial cable or over shielded twisted pair telephone wire.

9. **Infrastructure**   An integrated wireless and wired LAN is called an Infrastructure configuration.

10. **PCMCIA**   The Personal Computer Memory Card International Association (PCMCIA), develops standards for PC cards, formerly known as PCMCIA cards. These cards are available in three types, and are of about the same length and width as credit cards. However, the different width of the cards ranges in thickness from 3.3 mm (Type I) to 5.0 mm (Type II) to 10.5 mm (Type III). These cards can be used for

various functions, including memory storage, landline modems and wireless modems.

11. **Roaming -** A wireless LAN mobile user moves around an ESS and enjoys a continuous connection to the Infrastructure network.

12. **RTS Threshold –** Transmitters contending for the medium may not be aware of each other. RTS/CTS mechanism can solve this " Hidden Node Problem". If the packet size is smaller than the preset RTS Threshold size, the RTS/CTS mechanism will NOT be enabled.

13. **WEP –** " wired equivalent privacy" (WEP), which is based on the use of 64-bit keys and the popular RC4 encryption algorithm. Users without knowledge of the current key (password) will find themselves excluded from network traffic.