

airBridge

User Manual

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Contents of the package

- 1 airBridge hardware
- 1 Ethernet Cable 1.5 meter long
- 1 airBridge Setup Software and User Manual CD
- 1 External Antenna fixed to the airBridge
- 1 Quick Install Guide
- 1 AC Adapter
- 1 Two Pin Plug for AC inlet for AC Adapter



Fig 1.1 airBridge kit items

Note :

Unpack the airBridge kit and make sure that all the items are present. Please Contact your supplier in case of any damage or missing items.

Getting Started

Introduction

Thank you for purchasing smartBridges airBridge wireless Ethernet Client.

The airBridge provides instant high speed wireless network connectivity for practically any PC equipped with ethernet based network card to a wireless Access Point. The air Bridge provides a complete solution to customers who require mobility and freedom in a wireless Local Area Network and wireless Internet connectivity through a gateway .

The airBridge connects directly to the PC through the Ethernet port . airBridge Setup Software ensures easy installation and configuration through the Ethernet port . airBridge draws power from the wide range AC Adapter provided.

airBridge Provides the user

- Wireless connectivity for any PC with TCP /IP configured active network card and ethernet port to the wireless network. (Infrastructure Mode)
- Wireless Connectivity between standalone PCs. (Adhoc Mode) . airBridge can communicate with PC's equipped with PCMCIA to RF client or USB to RF client or Ethernet to RF client in ADHOC mode .

airBridge Setup Software

Setup Software is a proprietary software developed by smartBridges for the easy installation and configuration of airBridge . It consists of,

- a. simpleMonitor – used to configure and set operational parameters of airBridge
- b. FWUpgrade – used to upgrade the firmware residing inside the internal flash memory of airBridge.

Minimum PC configuration required for Installation / Configuration of airBridge using setup Software.

- An IBM compatible PC
- Pentium processor (166 MHz or above)
- Microsoft Windows 98 / 98 SE/ NT4 (SP6)/ 2000 / ME / XP
- Memory Win 98 / 98 SE - 10 MB or higher
Win 2000 / ME / XP – 10 MB or higher
- Free Space on Hard disc – 10 MB required
- SVGA Display (800x600 minimum).
- A CD ROM drive
- Ethernet port with the functioning network card configured with TCP / IP .

Installing airBridge

Installing hardware :

Take out the airBridge from its packing and place it on the desk .Connect the AC adapter to the mains inlet . If the mains inlet is of different Type use necessary adapter . Plug the output cord of the AC adapter into The airBridge's 12V DC IN socket .

- Please do not use other AC adapters because the polarity could be reverse or the current rating may not be adequate .

Once the airBridge is powered the Orange LED PWR lights up indicating the device is powered . Now connect the Ethernet port of airBridge to the Ethernet port of the computer through the Ethernet cable provided .

On the airBridge the Orange LED shows POWER, Green LED indicates Ethernet activity, Blue LED indicates RF Link.

By default the airBridge should automatically associate and work with the available Access Point on the network. If you want to select a specific Access Point or configure the additional parameters (like WEP Keys) please install the setup Software.

Installing setup Software :

1. Insert the CD into the CDROM drive of the PC, the CD will autorun,
If it does not autorun , browse the CD and run **setup . exe**
2. The installation will create the shortcuts in your program Menu at smartBridges/airBridge.
 - Firmware upgrade utility allows upgrades in firmware.
 - simpleMonitor which allows configuration of the airBridge.
 - Documentation shows the user guide in HTML version.
 - Uninstall the Setup Software.

The factory default parameters for the airBridge are

- IP address – 192.168.0.22
- Subnet mask - 255.255.255.0
- Administrator Password : public
- User password : public
- authentication type : open key
- WEP keys - None
- Operating Channel : 11
- Regulatory Domain : ETSI.

Note : The administrator should change his password so that configuration settings are not modified by unauthorized personnel, User password allows User to view the config settings but doesn't allow to Change . Only administrator has the authority to change config setting.

Hardware restoration of factory settings :

Press the “reset” key on the back of the airBridge continuously for 15 seconds to restore back to the factory settings in case of any error or forgotten password. During restoration process the blue LED changes brightness .

After restoring the factory settings reconfigure the airBridge again.

Configuring the airBridge

The setup software installed on the windows PC will allow the user to modify the configuration and operating parameters of the airBridge and upgrade the latest firmware.

It consists of 2 parts.

- simpleMonitor – used to modify the configuration and operational parameters of airBridge.
- FWUpgrade – used to upgrade the firmware residing inside the airBridge.

At the time of installation the shortcuts for the simpleMonitor and FWUpgradeManager are created on your PC.

The simpleMonitor

The **simpleMonitor Utility** is provided to allow the user to configure the airBridge through the Ethernet connection.

Linux/Unix Users: *Though these operating systems are not supported by simpleMonitor, the airBridge works in these environments and it can be configured under these operating systems using SNMP. A configurable Management Information Base file (MIB) named WAdapterMIB.mib can be found on the Setup CD Linux Folder. This file is for Linux/Unix users only, and is not necessary for any Windows installation.*

□ **Setting the Temporary IP Address**

To use the simple Monitor for configuring airBridge, you must assign a temporary IP address to your computer as below :

1. Start -> **Settings** -> **Control Panel**, then **Network**.
2. Click on the network adapter associated with the TCP/IP and click **Properties**.
3. Note your current settings in order to restore your TCP/IP configuration.
4. Select **Specify an IP address** and enter the following values as per your Network Configuration:
for example

IP – 192.168.0.30, Subnet Mask- 255.255.255.0

Note :

The default IP of the airBridge is set as 192.168.0.22 , and the default Subnet Mask as 255.255.255.0 . If you have changed it to some other values, while configuring previously, please assign the suitable setting to the network card.

5. Click **OK** and click **OK** again in the Network window.
6. Restart the computer if asked.

Once you have completed the airBridge Configuration, you can set the PC back to its previous mode.

□ **Restoring the Original IP Configuration**

To restore your original IP address configuration, follow the steps below:

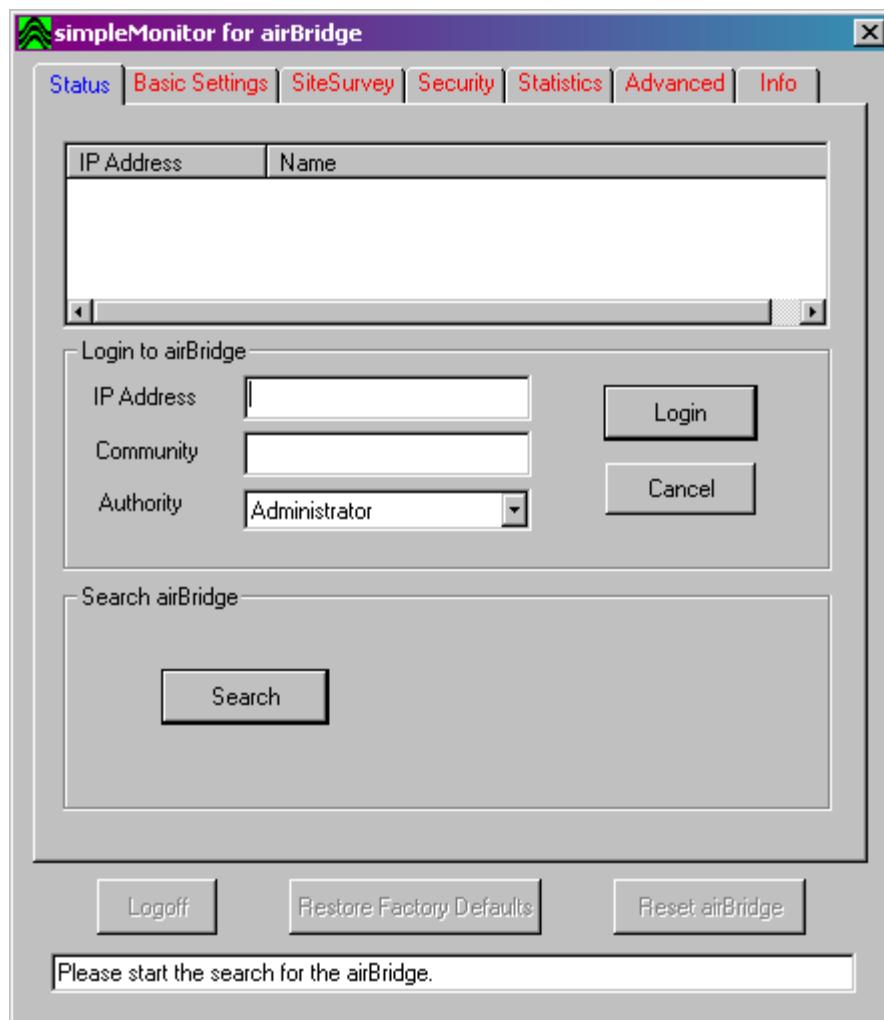
1. Follow steps 1 and 2 in the instructions above.
2. Select either **Specify an IP address** or **Obtain IP address automatically** and enter in the original values you noted earlier.
3. Click **OK** and click **OK** again in the Network window.
4. Restart your computer.

□ **Connecting airBridge to the PC**

Connect the airBridge to the Network Cards's RJ45 connector using the given cable,
Make sure the power to the airBridge is ON.

□ **Starting simple Monitor**

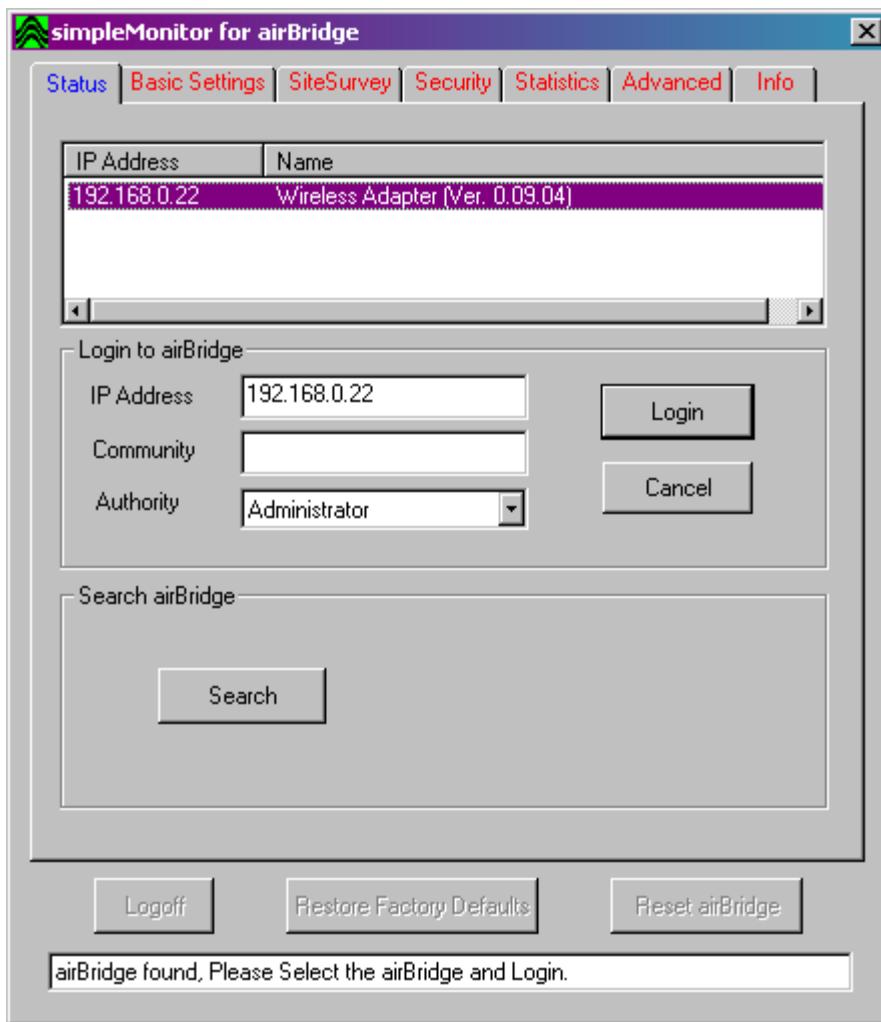
Start the simple Monitor from the shortcut provided on the Program Menu. as
smartbridges/airBridge/simpleMonitor. simpleMonitor window will open.



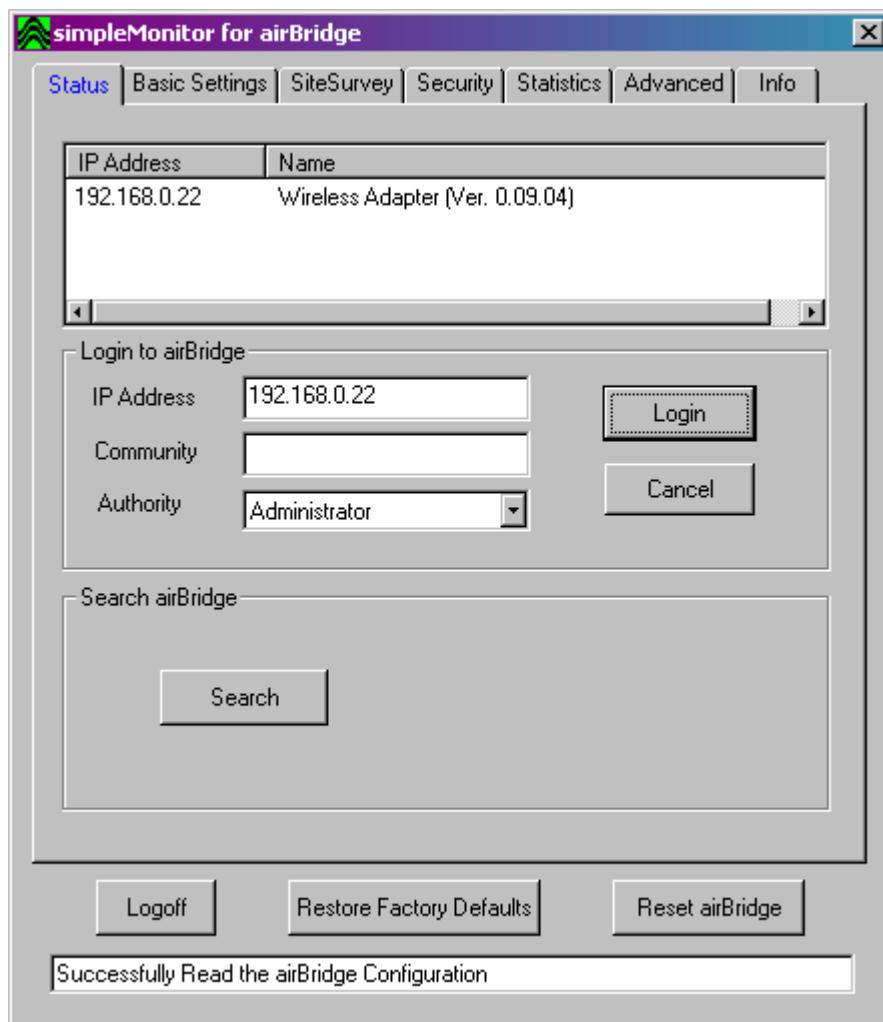
Click on Search to find the airBridge you have connected.

If the airBridge is found then it will show the airBridge Entry and request you to select and

Login. Click on IP address of the desired device and Key in the community name (Default is "public") and desired Authority (User/Administrator) and Click Login button to log in to airBridge.

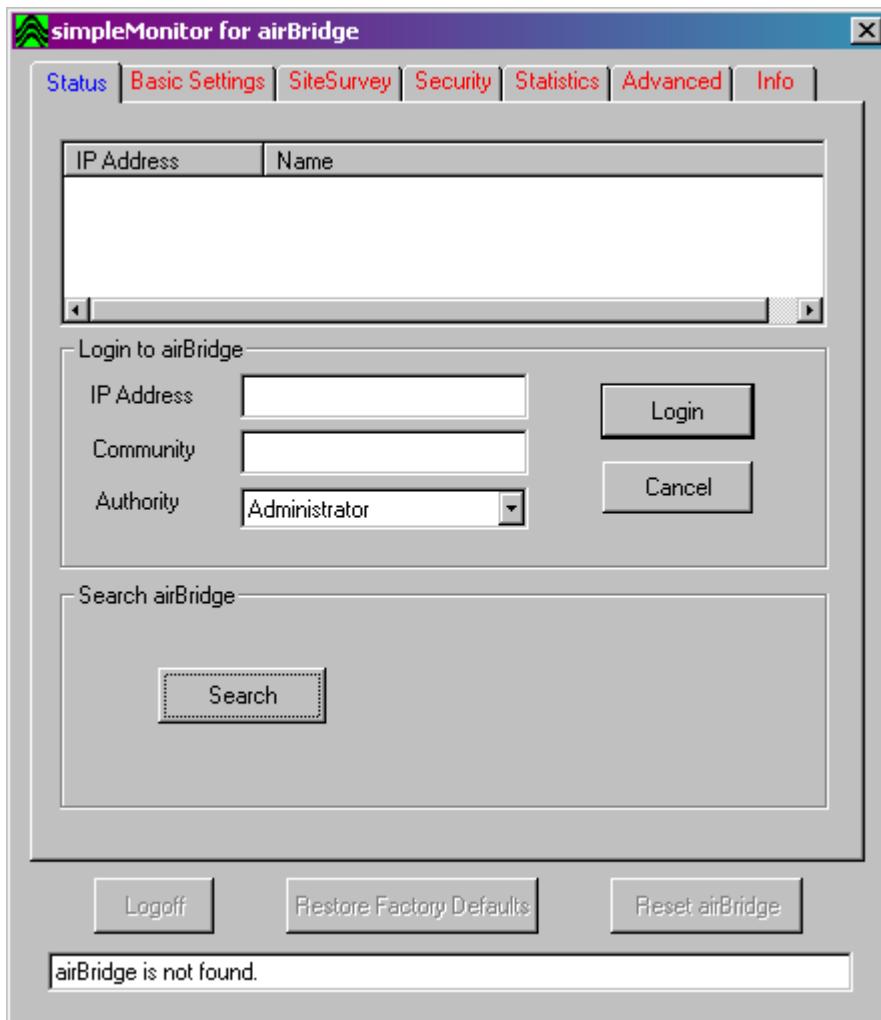


In case of a successful connection to the airBridge, simpleMonitor acknowledges by enabling all the tabs.



In case of an unsuccessful connection simpleMonitor puts out a message airBridge not found in the message box as in the picture below .

Under this condition the user should look for connections to the airBridge , power ON and temporary IP setting to correct the situation .



Once the Connection is Established with the airBridge then user has access to most of the Settings.

You can reset the airBridge by clicking “Reset airBridge” Button. This is equivalent to power ON/OFF of a device.

You can restore the factory default values of the airBridge. If you mess around with the setting, and can not connect any more, use this option to restore the Factory Defaults.

The factory defaults include

IP Address : 192.168.0.22

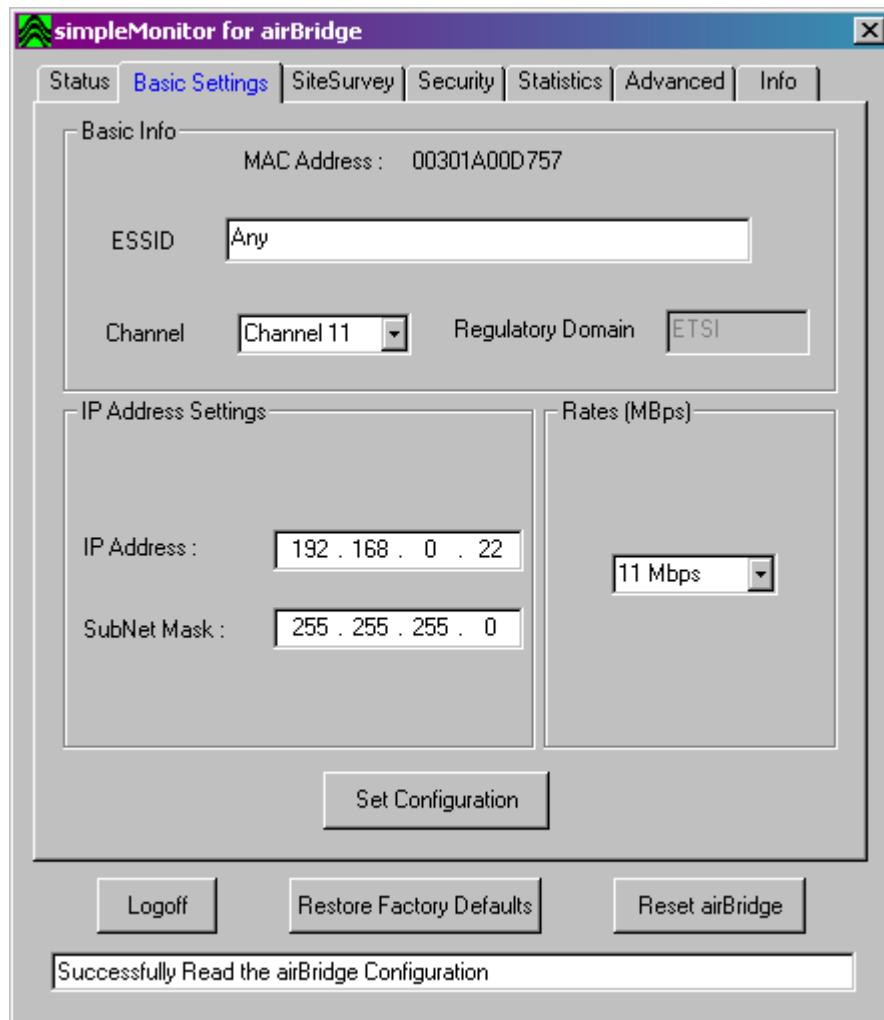
Mask : 255.255.255.0

Once the default values are restored you need to login again into airBridge.

- **Configuring airBridge**

As soon as the connection has been established, you are able to start viewing or setting the airBridge parameters.

Basic Setting Tab



- **MAC Address->** Unique 48-bit, hard-coded Media Access Control address known as the station identifier. (User can not change it).

- **ESSID:** The ESSID or SSID is the unique name shared among all points in a wireless network. The ESSID must be identical for all points in the network. It is case sensitive and must not exceed 30 characters. Make sure that all points in the network are given the same ESSID. It is used to identify a WLAN that prevents the unintentional merging of two co-located WLANs or intrusion of outsider.

- **Channel:** There are 14 channels available. The channels differ from country to country. Select the channel to be used in your Country.

The list of different Channels allowed in different Domains as follows.

Regulatory Domain	Channels Allowed
FCC	1-11
DOC	1-11
ETSI	1-13
SPAIN	10,11
FRANCE	10,11,12,13
MKK	14
MKK1	1-14

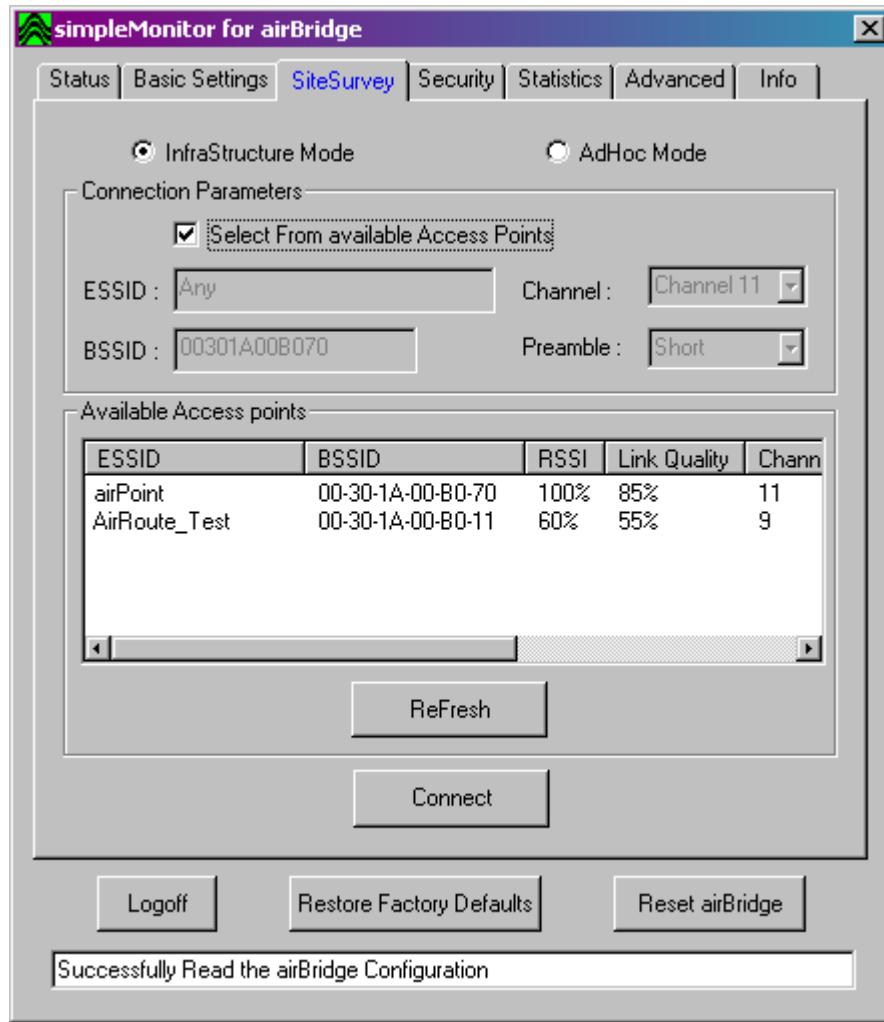
- **Regulatory Domain:** The value of this field is already set and can not be modified here, please refer to Advanced Tab for modification of this tab

- **IP Address** -> Network-assigned Internet Protocol address of the airBridge.
- **IP Mask** ->Four sets of three digits that divide a network into subnetworks.
- **Rates:** By default the unit adaptively selects the highest possible rate for transmission. Select the basic rates to be used among the following options 1 - 2 - 5.5 - 11 (Mbps)- all.

If any changes are made in the above configuration, you need to Click on
“Set Configuration” in order to save them.

If you change the IP address of the airBridge then you need to login again into the airBridge.

SiteSurvey Tab



This tab allows you to associate the airBridge with the Access Points available on the LAN and the different Access Point Clients.

- InfraStructure Mode

For Associating with Access Points use the Infrastructure Mode.

3 different Methods are Possible in this selection.

a. Automatic Association :

Check the Preferred BSSID

Enter the following strings

ESSID = Any

BSSID = 000000000000

Click on “Connect”

The airBridge will automatically search the available Access Points on the LAN and associates with the best possible Access Point for you. If the available Access Point is working with the shared Key then you need to enter the same Key in airBridge(Please refer to Security Tab for keying in the WEP encryption Key).

b. Known Access Point Association.

Check the Preferred BSSID

Enter the values of ESSID, BSSID, Channel, Preamble for the known Access Point.

Click on “Connect”

The airBridge will try to associate with the Access Point, and gives the suitable message as whether associated or not.

c. Unknown Access Points Association.

If you don't know the Access Points then go for this option

Uncheck the Preferred BSSID

It will show the available Access Points, select one of them and Click “Connect”, else double click on the Entry of the Access Point.

The airBridge will try to associate with the Access Point, and gives the suitable message as whether associated or not.

- **AdHoc Mode**

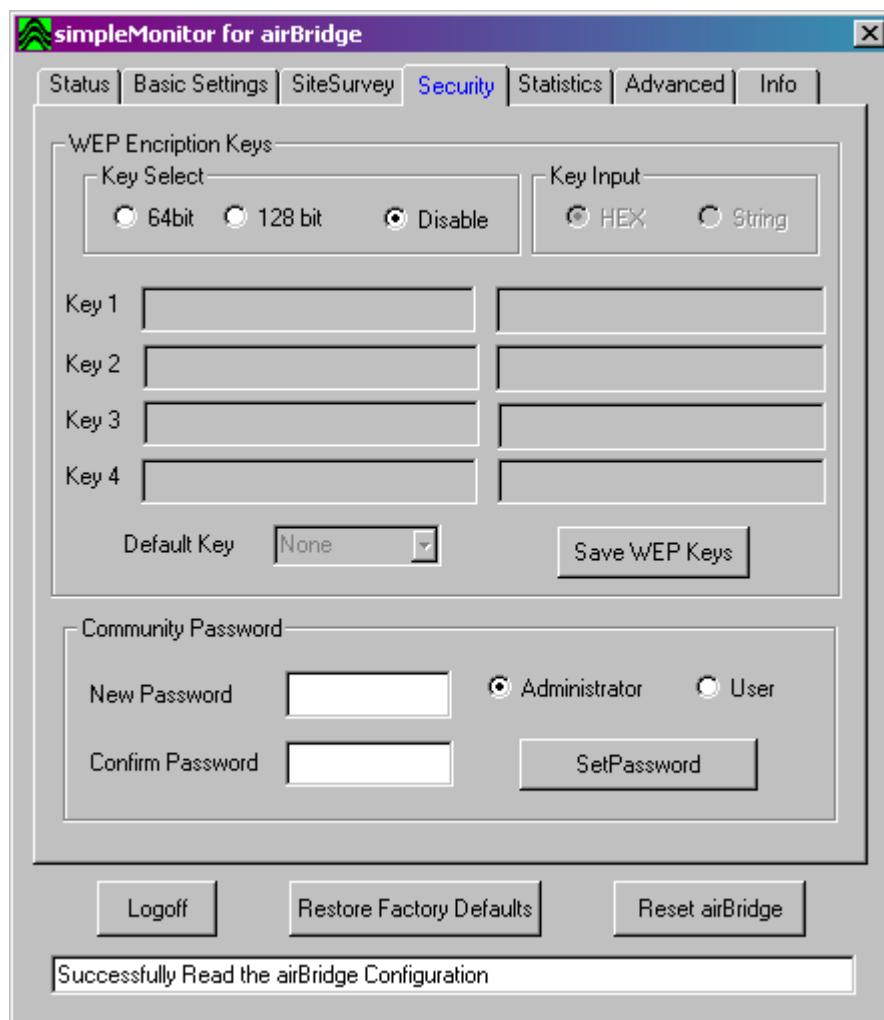
For Association with Access Point Client use the Adhoc Mode

Enter the values of ESSID, BSSID, Channel, Preamble for the known Access Point Client.

Click on “Connect”

The airBridge will automatically connect to the Known Access Point Client. You must make sure that if the other client is using the WEP encryption Keys, then the same keys are keyed in the airBridge.

Security Tab



There are four 5 digit encryption keys available if you select 64bit WEP or there are four 13 digit encryption keys available if you select 128bit WEP.

Both String and HEX Keys are provided, but String Based Keys are for smartBridges specific products. For interoperability with other vendors please use the HEX Keys. The key is enabled only if you select it in the “Default key” option in the Enable the WEP (Wired Equivalent Privacy) option in order to activate WEP encryption for transmissions between the stations and access points.

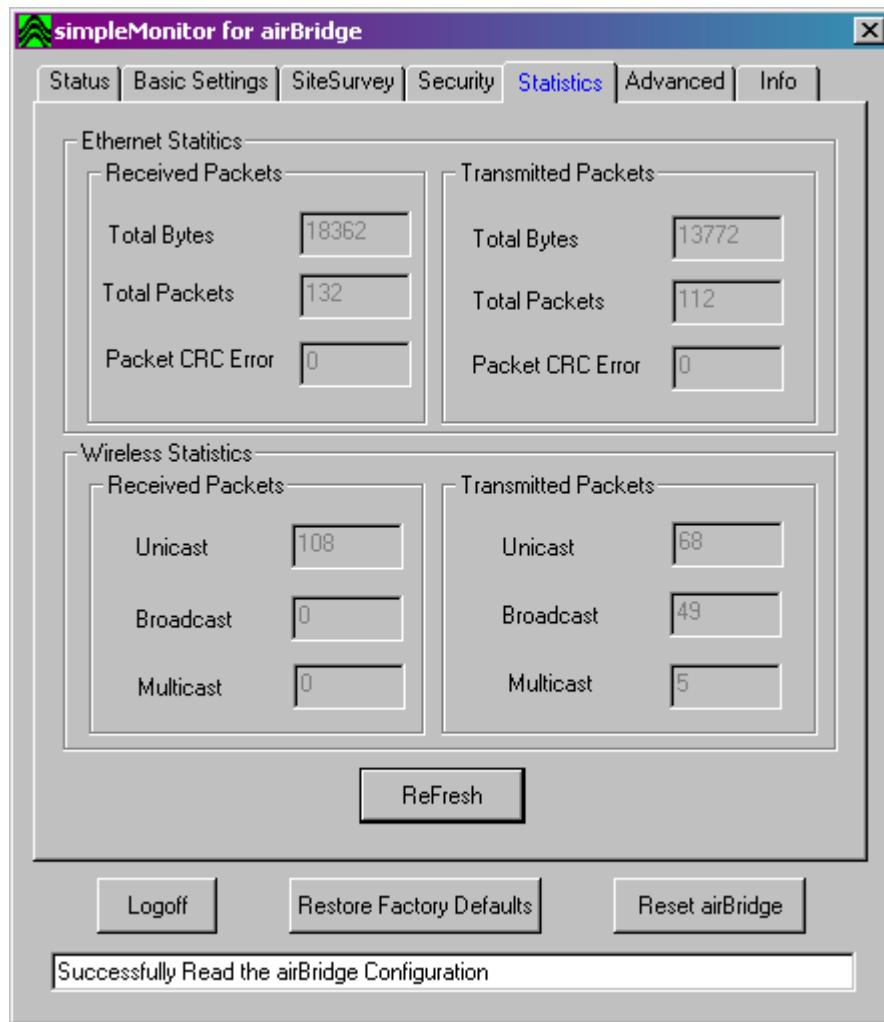
WEP is an authentication algorithm which protects authorized Wireless LAN users against Eavesdropping.

If any changes are made in the above configuration, you need to Click on “Save WEP Keys” in order to save them.

Note: The Authentication type must be the same on the Access Point Clients and on the Access point. All shared keys on the wireless station must be the same as those on the Access point with which the airbridge is associated.

The Administrator can change the passwords which refer to the community field for the User and the Administrator Authority. Only by entering these passwords , administrator can change the settings. So it is highly recommended that You should change them from factory defaults . Default passwords for both USER and ADMINISTRATOR are “public”.

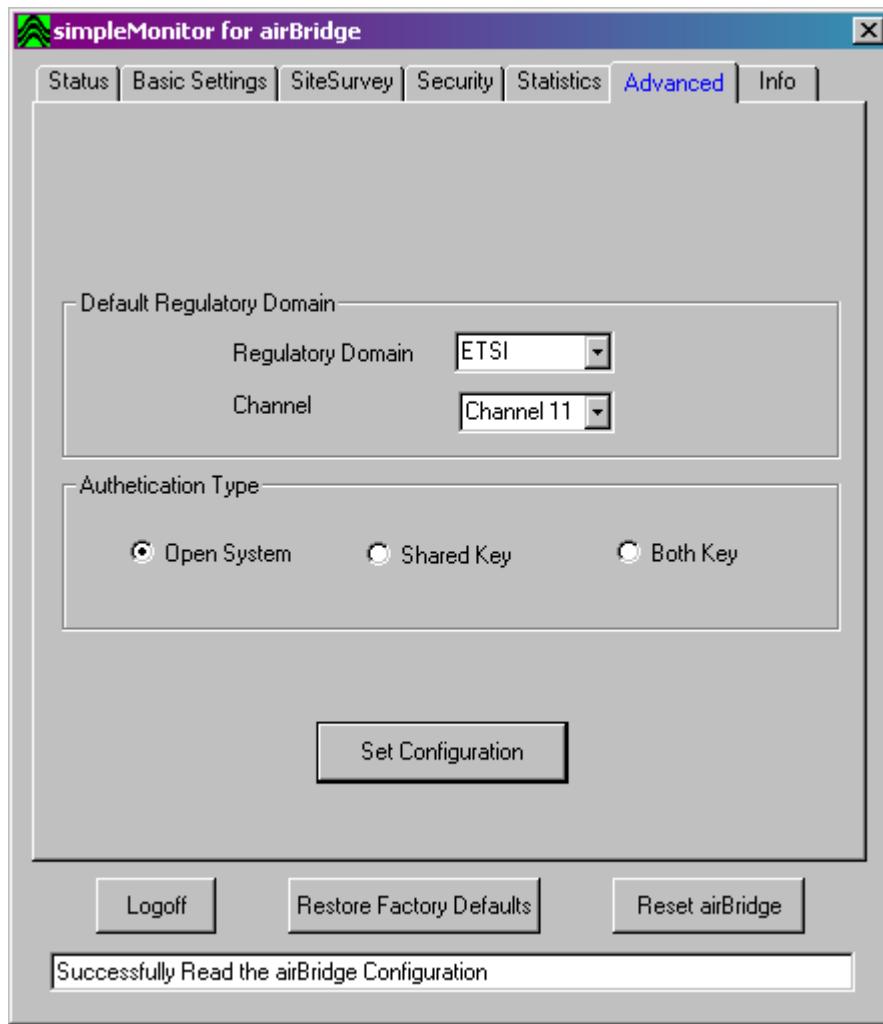
Statistics Tab



Wireless statistics reports the statistics concerning the airBridge's Wireless activity.

Ethernet statistics reports the statistics concerning the airBridge's Ethernet port activity

Advanced Tab



This tab provides the advanced settings.

Default Regulatory Domain can be set along with the channel. Be careful to set the proper domain for your country.

- **Authentication Type.** The authentication type defines configuration options for the sharing of wireless networks to verify identity and access privileges of roaming wireless network cards.

Open System: With this setting any station in the WLAN can associate with an Access Point and receive and transmit data (null authentication).

Shared Key: With this setting only stations using a shared key encryption identified by the Access Point are allowed to associate with it.

Both: With this setting stations communicate with the access point either with or without data encryption

If any changes are made in the above configuration, you need to Click on “Set Configuration” in order to save them.

Info Tab

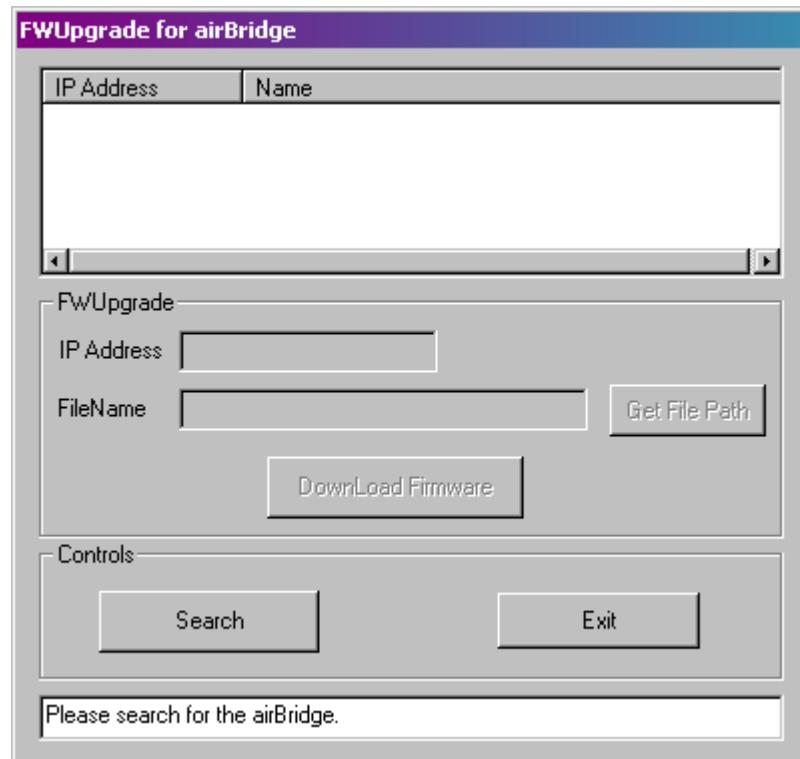


The information about the simpleMonitor and Firmware are shown here. smartBridges website can be accessed from here, and you will be able to write to us at support@smartbridges.com for any issues you face.

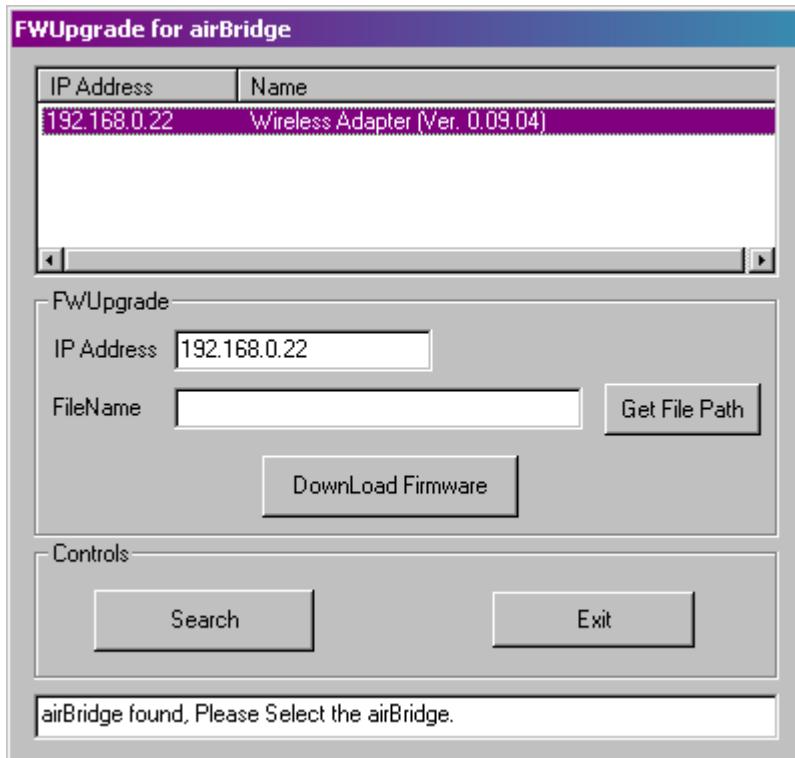
The FWUpgrade

airBridge Firmware upgrade can be done through the Ethernet port by using the FWUpgrade utility.

Start the FWUpgrade from the shortcut provided on the Program Menu. as smartbridges/airBridge/FWUpgrade. FWUpgrade window will open.



Search for the airBridge by clicking on Search button, if it finds the airBridge then it shows



if it doesn't find the airBridge then check the ethernet and Power connections to airBridge.

Browse for the appropriate file (e.g.bridge . rom) by pressing the "Get File Path" button . Finally press the " Download Firmware" button to download the firmware.

The Firmware download will be completed successfully if a message in the right bottom corner appears indicating "Firmware Download has been completed" .

If you receive the message "Timed Out" , during the download procedure, you need to check if the airBridge is powered on and if it has a valid IP address . In order to check the validity of the airBridge you must ping airBridge

If you receive the message "Flash Programming in progress" during firmware download process you should not power off the airBridge.

Note : If the download procedure has not been completed successfully you must try again, but before starting the download you need to confirm that you using the correct firmware file.

Uninstall Setup Software

In order to uninstall the Setup Software choose
Start -> Programs ->smartBridge -> airBridge->Uninstall.

Understanding Wireless Networking

Getting familiar with the airBridge Wireless Ethernet Client

airBridge conforms to the IEEE standard 802.11b and operates in the 2.4 GHz ISM band. It has data rate of up to 11Mbps, which makes it one of the fastest Wireless Adapters on the market today. airBridge can operate in either Ad-Hoc mode (providing Peer-to-Peer network connection without Access Point) or Infrastructure mode (providing network connection using Access Point). It can communicate with any Wi-Fi compliant Wireless Access Point, Wireless Client Adapter and Residential Gateway.

airBridge is capable of 64-bit and 128-bit WEP (Wired Equivalent Privacy) Encryption to provide secure network connection. It allows secure sharing of data, DVD/CD-ROM drives, Zip drives, printers and high-speed Internet access over the Wireless Network. The powerful built-in antenna ensures strong and consistent signals over a long range. airBridge is equipped with a Ethernet port, an optional external Antenna, AC Adapter and 3 LED indicators.



airBridge has a high-powered **Antenna** which is sufficient for transmission over long ranges.

There is a **Ethernet port** at the back of airBridge.. One end of the Ethernet cable is plugged into this port and the other end is plugged into Ethernet port of the host PC .

Plug the AC Adapter to the 12V DC in socket of the airBridge .AC adapter itself should be plugged into the mains socket .

the status of Power, Ethernet Link & RF Link

Power indicates that the airBridge has been powered up.

Ethernet Link indicates that airBridge is properly installed and ready for use.

RF Transmission indicates the flow of data over wireless media.



Getting familiar with Wireless LANs

If you have experience working with wired LAN, you won't find Wireless LAN (WLAN) much different from it, except that WLAN offers unmatched flexibility, mobility, scalability and convenience. WLAN can be easily used to extend your existing wired LAN or quickly set up a new LAN environment. Computers in a wireless LAN need to be configured to share the same radio channel.

There are two modes of Wireless Network operation:

In this mode of operation, peer-to-peer (or point-to-point) connectivity is established between two PCs for Internet sharing, file sharing applications etc. Each PC is equipped with the Wireless client Adapter and they can talk to each other without an Access Point



Infrastructure mode

In this mode of operation, multiple wireless network Adapters can connect to an Access Point to form a complete Wireless network similar to a Wired LAN. Also, in this mode, the Access Point can act as a bridge between the Wireless and Wired LAN.



Troubleshooting

Frequently Asked Questions

About AirBridge

Q: How fast is airBridge ?

A: airBridge is capable of a data rate of up to 11Mbps.

Q: How do I connect airBridge to my PC ?

It is connected to the Ethernet port of the PC. Please refer the user guide for detailed installation procedure.

Q: Can I use airBridge with my laptop ?

Yes. airBridge can be used with any computer which has a built in Ethernet card

Q: What standard does airBridge conform to ?

A: IEEE802.11b for wireless.

Q: Where can I find additional information about airBridge ?

A: You can refer to the manual on the simpleManager CD, or check out our online User Guide.

Q: Can it work with any Wireless Access Point ?

A: Yes. It can work with any IEEE802.11b compliant Wireless Access Point.

Q: Would the Internet connection speed be affected if I connect more than one Client at the same time ?

A: There might be a slight loss in the speed but it will be very insignificant.

Q: What do the different lights (LEDs) on the airBridge case indicate ?

A: Orange indicates Device Power On, AC Adapter connected.

Green indicates Ethernet Link is OK Data flows into the LAN smoothly.

Blue indicates Device is in Wireless Transmit mode.

Q: What operating systems are supported by airBridge ?

A: Windows 98,98 SE, NT, 2000, ME, XP

Q: Will I be able to see other computers on LAN ?

A: Yes. airBridge allows you to connect to other computers on your network.

Q: Is the Wireless Connection secure ?

A: Yes. airBridge is capable of providing 64/128-bit WEP encryption.

Q: What are the minimum computer requirements for the proper Installation of airBridge?

- An IBM compatible PC
- Pentium processor (166 MHz or above)
- Microsoft Windows 98SE/2000/Me/XP
- CD-ROM drive
- A Spare Ethernet port

Q: How do I uninstall airBridge from my PC ?

A: In order to uninstall airBridge from your computer, follow the following steps:

- Click on Start -> Programs -> smartBridges
- Select and click on “**Uninstall Wireless Tools**”. A dialog box will pop up to confirm that you want

to uninstall simpleMonitor. Click “**Yes**”.

General

Q: What is WEP ?

A: Wired Equivalent Privacy (WEP) is an encryption scheme used to protect wireless data communication. It is part of the system security behind the wireless IEEE 802.11 protocol, and its goals are to provide confidentiality and data integrity, and to protect access to the network infrastructure by rejecting all non-WEP packets.

Q: What is an Access Point ?

A: It is a hardware device that converts a wired LAN port/outlet to a wireless port typically for Infrastructure mode.

Q: What is AdHoc mode ?

A: Peer-to-Peer networking mode usually used for sharing local resources between wireless Networked PCs.

Q: What is Infrastructure mode ?

A: Infrastructure Mode allows a wireless network to be integrated into an existing, wired network through an Access Point, permitting roaming between Access Points while maintaining a connection to all network resources.

Q: What is IEEE 802.11 standard ?

A: It is a standard set by Institution of Electrical Electronics & Engineers for standardizing the wireless networking hardware so that they are interoperable.

Q: What is ISM band ?

A: The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the ISM (Industrial, Scientific and Medical) band. The ISM band comprises of frequencies in the vicinity of 2.4 GHz.

Q: What is Direct-Sequencing Spread Spectrum (DSSS) ?

A: Wireless LAN products are available in three different technologies – Direct Sequencing Spread Spectrum (DSSS), Frequency Hopping Spread-Spectrum (FHSS) and Infrared. DSSS and FHSS are spread-spectrum techniques that operate over the radio airwaves in the unlicensed ISM band (Industrial, Scientific, and Medical). DSSS uses radio transmitter to spread data packets over a fixed range of frequency band.

Q: How does the Wireless LAN connect the PCs ?

A: The Wireless LAN uses Radio Frequency (RF) to transmit data. In this respect, it is similar to radio stations and cordless phones. Devices “tune in” to different signals on specific frequency bands and ignore others, allowing the devices to co-exist and PCs to communicate securely over the Wireless LAN.

Q: Will Wireless LAN interfere with other RF devices like cordless phones?

A: Use of DSSS and FHSS techniques eliminate the interference between different RF devices.

Common Problems and Solutions

Q: I can't connect to the Client.

- Make sure that the AC Adapter is powered on and the airBridge-Wireless Ethernet Client is

properly connected.

- Make sure that your Client Adapter is configured on the same channel, SSID, and WEP as the AirPoint.

Q: LEDs are flickering.

- **Orange** should be continuously on. If it flickers, make sure that USB cable is securely plugged into the USB port.
- **Green** should be flickering, the Ethernet port is carrying signal. If it does not flicker check whether the Access point is installed with proper IP address etc.
- **Blue** should flicker, indicating that the radio is alternating between transmit & receive modes.

Q: LEDs do not light up at all.

A: Make sure that the AC adapter is powered on.

Q: airBridge does not work when connected through a Ethernet hub.

A: Please ensure that the Ethernet Hub has power connection. airBridge is a AC Adapter powered device. It consumes more than 360mA when in operating mode. Check the IP settings and subnet mask .

Appendix A

Specifications

General Characteristics

Type	Wireless Ethernet Client
Compatibility	<ul style="list-style-type: none"> IEEE 802.11b (High Rate) Wi-Fi Ethernet (IEEE 802.3 - 10/100)
Media Access Protocol	CSMA/CA with ACK & RTS/CTS (Carrier Sense Multiple Access / Collision Avoidance with Acknowledgment)
Data Rates	High Rate: 11Mbps (CCK) Medium Rate: 5.5Mbps (CCK) Standard Rate: 2Mbps (DQPSK) Low Rate: 1Mbps (DBSK)
Network Operating System	Microsoft Windows Networking Novell Client 3.x, 4.x
Host Operating System	Windows 98,98SE, ME, 2000, XP
LEDs	Power, Ethernet Link, RF Link

Radio Characteristics

Frequency Band	2.4 GHz ISM Band (2.4 - 2.4835 GHz)
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Number of Selectable Channels (Overlapping)	North America (FCC)	11
Modulation Techniques	DSSS (Direct Sequence Spread Spectrum): <ul style="list-style-type: none"> • CCK (Complimentary Code Keying), for High and Medium Transmit Rates • DQPSK (Differential Quadrature Phase Shift Keying) for Standard Transmit Rate • DBPSK (Differential Binary Phase Shift Keying) for Low Transmit Rate 	
Security	64-bit & 128-bit WEP encryption	
Spreading Sequence	11 chip Barker Sequence	
Frame Error Rate	Better than 8%	
Output Power	100 mW	
Regulations	<ul style="list-style-type: none"> • Europe: ETS 300-328, CE Marked • USA: FCC 47 CFR Part 15C, Section 15.247 • Canada: RSS 139 • Japan: MPT Radio Regulations • Singapore: iDA approved 	

Power Characteristics

Power Consumption	350 mA at 12V DC
Power Supply	12V DC Through AC Adapter (100 V ~ 264 V / 50 ~60 Hz AC IN 12V DC OUT)

Physical Characteristics

Dimensions	L 122mm; W 42mm; H 118mm
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Appendix B

Warranty Information

smartBridges warrants product to be free of defects, and agrees to repair or replace the product that proves defective. AirBridge is warranted for one year from date of purchase. This warranty does not cover accidents, misuse, neglect, unauthorized product modification, or acts of nature.

Please visit customer support area of smartBridges web site for making warranty claims. smartBridges may elect to exchange the product or refund the full purchase price of the unit.

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smart**Bridges**
to the future ...
<http://www.smartbridges.com/>

Appendix c

Declaration of Conformity and Regulatory Information

DECLARATION OF CONFORMITY TO FCC REGULATIONS, Part 15

smartBridges declares that the equipment described in this document is within the requirements of the Code of Federal Regulations, Title 47, concerning the compliance of the airBridge plug and play Network Adapter to the above standards. smartBridges has determined that airBridge units will continue to meet these requirements if the following conditions are met: 1. If no changes are made to the equipment and if the equipment is properly maintained and operated. These units are identical to the units that were tested and found to be in compliance. 2. If changes are made to the equipment and if the equipment is properly maintained and operated. These units are identical to the units that were tested and found to be in compliance. smartBridges continues to reflect that the units being produced under this Declaration of Conformity, within the variation that can be expected, will continue to meet the applicable technical standards.

FCC Rules and Regulations - Part 15

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference, which may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device. 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 interference is determined to be present, 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 separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment.

In order to maintain compliance with FCC regulations, standard network cables must be used with this equipment. Operation with non-standard cables or interfaces, such as a powerline adapter, may result in interference to radio and TV reception. 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. Operation of this equipment in a residential installation may cause harmful interference in a residential installation.

CANADIAN DEPARTMENT OF COMMUNICATION, INDUSTRY CANADA STATEMENT

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 the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques.
Ministère des Communications du Canada.

EUROPEAN COMMUNITY CE MARK, DECLARATION OF CONFORMITY

smartBridges Pte. Ltd. declares that the equipment described in this document is in conformance with the requirements of the European Union Directive 2004/108/EC.

smart**Bridges**
to the future ...
<http://www.smartbridges.com/>



User Manual

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Contents of the package

- 1 airPoint hardware
- 1 Ethernet Cable 1.5 meter long
- 1 airPoint Setup Software CD
- 1 External Antenna fixed to airPoint
- 1 Quick Install Guide
- 1 AC Adapter
- 1 Two Pin Plug for AC inlet for AC Adapter



Fig 1.1 airPoint Kit Items

Note :

Unpack the airPoint kit and make sure that all the items are present . Please Contact your supplier in case of any damage or missing items.

Getting Started

Introduction

Thank you for purchasing smartBridges airPoint wireless Access Point. airPoint provides instant high speed network connectivity to a host of Wireless clients .The airPoint provides a complete solution to customers who require mobility and freedom in a wireless Local Area Network and wireless Internet connectivity through a gateway .

airPoint connects directly to the wired network through the Ethernet port and setup Software ensures easy installation , configuration and firmware upgrades through the Ethernet port . airPoint draws power from the widerange AC Adapter provided.

airPoint allows you to

- Provide wireless connectivity for the client adapters to the wired network

airPoint Setup Software

Setup Software is a proprietary software developed by smartBridges for the easy installation and configuration of airPoint . It consists of,

- a. **simpleMonitor** – used to configure the configuration and operational parameters of airPoint.
- b. **FW Upgrade** – used to upgrade the firmware residing inside the internal flash memory of airPoint.

- **Minimum PC configuration required for Installation / Configuration of airPoint using setup Software.**
- An IBM compatible PC
- Pentium processor (166 MHz or above)
- Microsoft Windows 98 / 98 SE/ 2000 / ME / XP
- Memory Win 98 / 98 SE - 10 MB or higher
Win 2000 / ME / XP – 10 MB or higher
- Free Space on Hard disc – 10 MB required
- SVGA Display
- A CD ROM drive
- Ethernet port with the network card

Installing airPoint

Installing hardware :

Take out the airPoint from its packing and place it on the desk .Connect the AC adapter to the mains inlet . If the mains inlet is of different type use necessary adapter . Plug the output cord of the AC adapter into The airPoint's 12V DC IN socket .

Please do not use other AC adapters because the polarity could be reverse or the current rating may not be adequate .

Once the airPoint is powered the orange LED PWR lights up indicating the device is powered . Now connect the Ethernet port of airPoint to the existing LAN through the Ethernet cable provided .

On the airPoint the Orange LED shows POWER, Green LED indicates Ethernet activity, Blue LED indicates RF Link.

By default the airPoint should automatically associate and work with the available Clients on the network. If you want the additional parameters to be configured (like WEP Keys), or connect the airPoint to the network directly please install the setup Software And run the configuration

Installing setup Software :

1. Insert the CD into the CDROM drive of the PC, the CD will autorun, if it doesn't browse the CD and run **setup . exe**
2. The installation will create the shortcuts in your program Menu at smartBridges/airPoint.
 - Firmware upgrade utility allows upgrades in firmware.
 - simpleMonitor which allows configuration of the airPoint.
 - Documentation shows the user guide in HTML version.
 - Uninstall the Setup Software.

The factory default parameters for the airPoint are

- IP address – 192.168.0.20
- Subnet mask - 255.255.255.0
- Default Gateway - 192.168.0.1
- Administrator Password : public
- User password : public
- authentication type : open key

- • WEP keys - None
- • Operating Channel : 11
- • Regulatory Domain : ETSI.

Note : The administrator should change his password so that configuration settings are not modified by unauthorized personnel, User password allows User to view the config settings but doesn't allow to Change . Only administrator has the authority to change config setting.

Hardware factory Restore Defaults :

Press the “reset” key on the back of the airPoint continuously for 15 seconds (when the restoring is in progress the Blue LED for Tx/Rx will blink) to restore back to the factory settings in case of any error or forgotten password.

After restoring the factory settings reconfigure the airPoint again.

Configuring the airPoint

The setup software installed on the windows PC will allow the user to modify the configuration and operating parameters of the airPoint and upgrade the latest firmware.

It consists of 2 parts.

- • simpleMonitor – used to configure the configuration and operational parameters of airPoint.
- • FWUpgrade – used to upgrade the firmware residing inside the internal flash memory of airPoint.

At the time of installation the shortcuts for the simpleMonitor and FWUpgradeManager are created on your PC.

The simple Monitor

The **airPoint simple Monitor Utility** is provided to allow the user for customization of the airPoint through the Ethernet/Wireless connection.

Linux/Unix Users: Though these operating systems are not supported by simpleMonitor, the AirPoint works in these environments and it can be configured under these operating systems using SNMP. A configurable Management Information Base file (MIB) named AT76C510.MIB can be found on the Setup CD Linux Folder. **This file is for Linux/Unix users only, and is not necessary for any Windows installation.**

Setting the Temporary IP Address

To use the simple Monitor for configuring AirPoint, you must assign a temporary IP address to your computer.

1. This can be done at **Start -> Settings -> Control Panel**, then **Network**.
2. Click on the network adapter associated with the TCP/IP and click **Properties**.
3. Note your current settings in order to restore your TCP/IP configuration.
4. Select **Specify an IP address** and enter the following values as per your Network Configuration : for example
IP – 192.168.0.30, Subnet Mask- 255.255.255.0 Gateway- 192.168.0.1

Note :

The default IP of the AirPoint is set as 192.168.0.20 ,the default Subnet Mask as 255.255.255.0 and default Gateway as 192.168.0.1. If you have changed it to some other values, while configuring previously, please assign the suitable setting to the network card.

5. Click **OK** and click **OK** again in the Network window.
6. Restart the computer when asked.

Once you have completed the IP Address Configuration, you can set the PC back to its previous settings.

Restoring the Original IP Configuration

To restore your original IP address configuration, follow the steps below:

1. Follow steps 1 and 2 in the instructions above.
2. Select either **Specify an IP address** or **Obtain IP address automatically** and enter in the original values you noted earlier.
3. Click **OK** and click **OK** again in the Network window.
4. Restart your computer.

Connecting airPoint to the PC/LAN

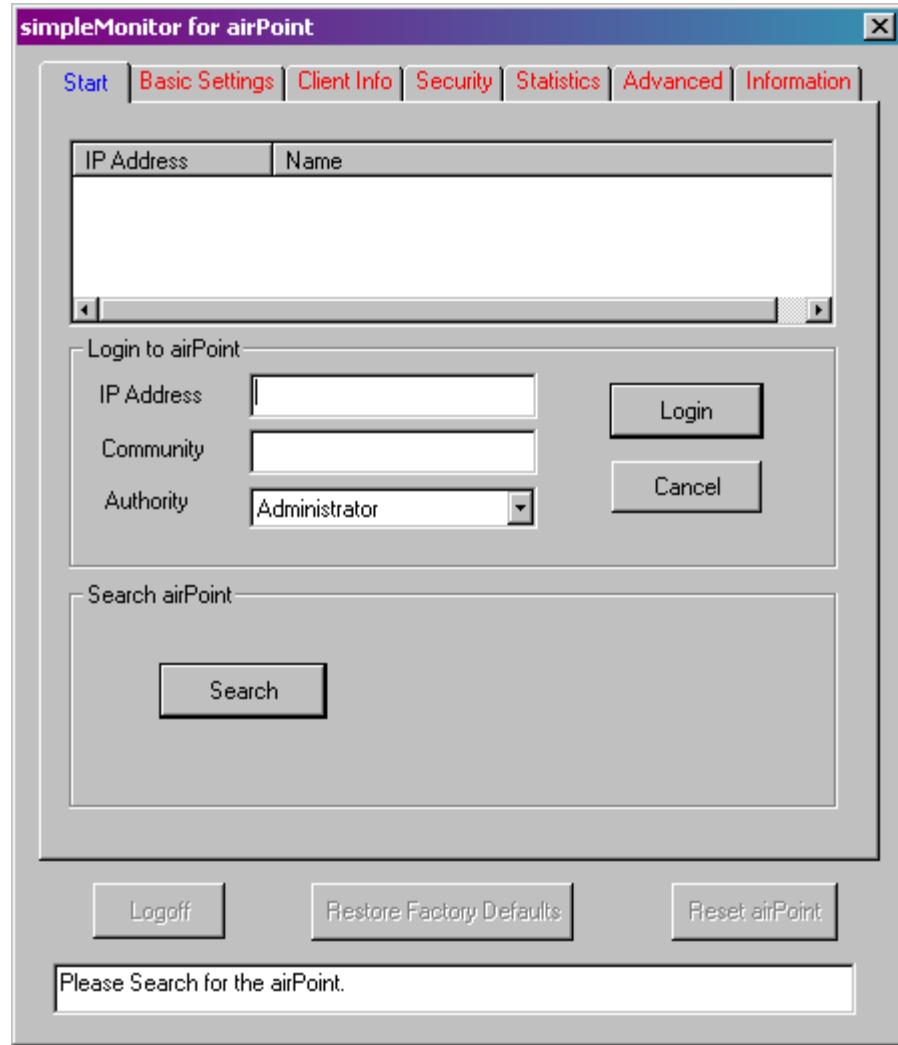
Either connect the airPoint to the Network Cards's RJ45 connector using the cross cable, Or Connect it on your normal LAN. Make sure the power to the airPoint is ON.

Starting simple Monitor

For starting simple Monitor

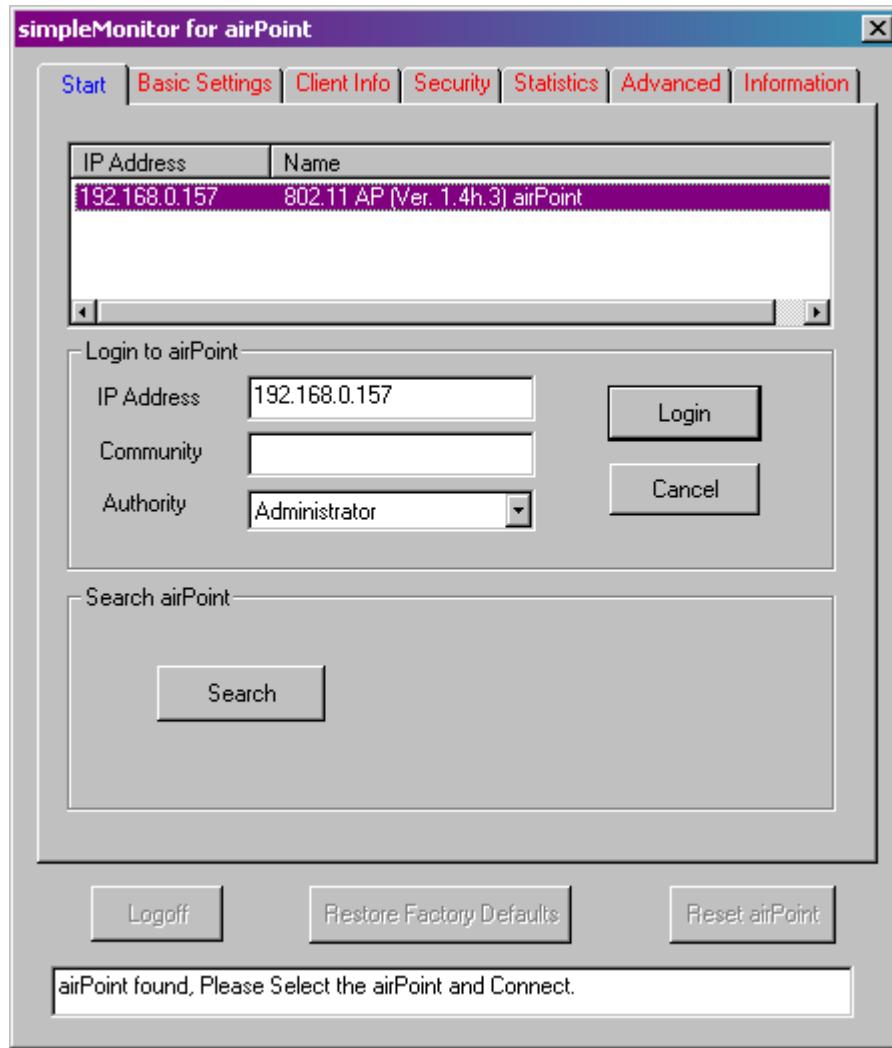
Click on Start, Programs, smartBridges, airPoint, **simple Monitor**. simpleManager Window will open.

Connecting to AirPoint

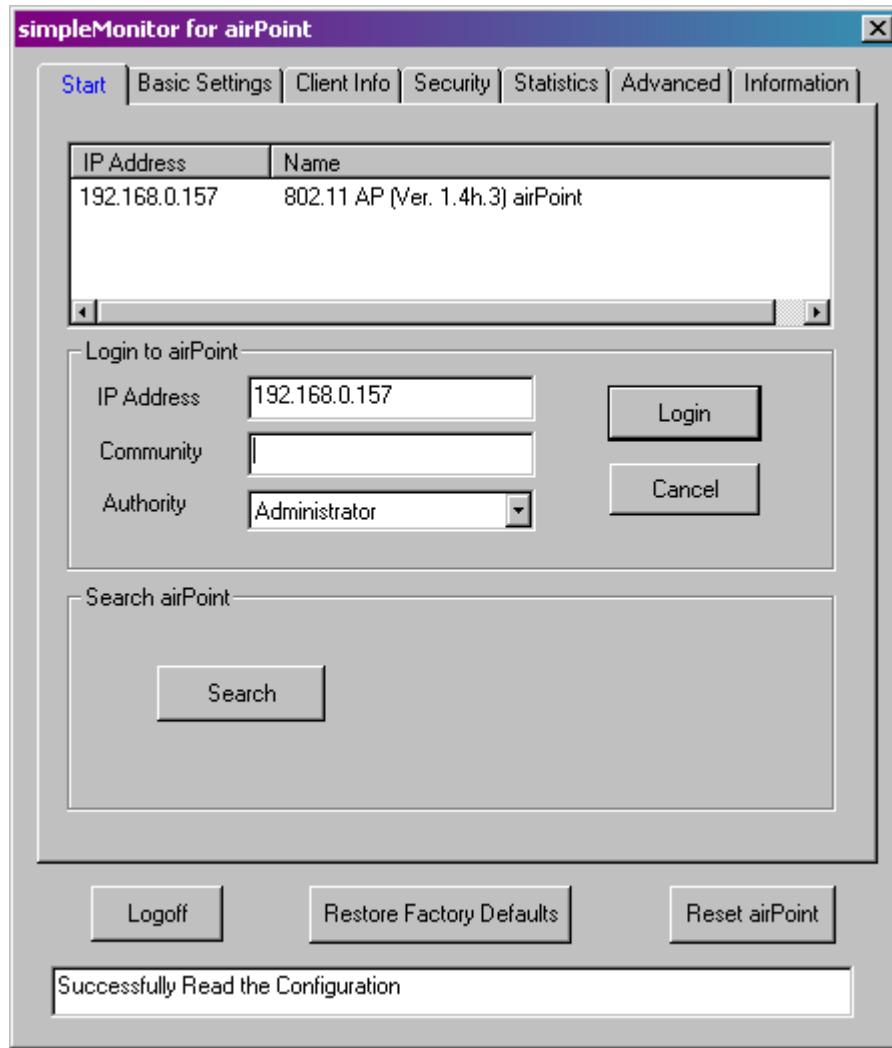


Click on Search to find the airPoint you have connected.

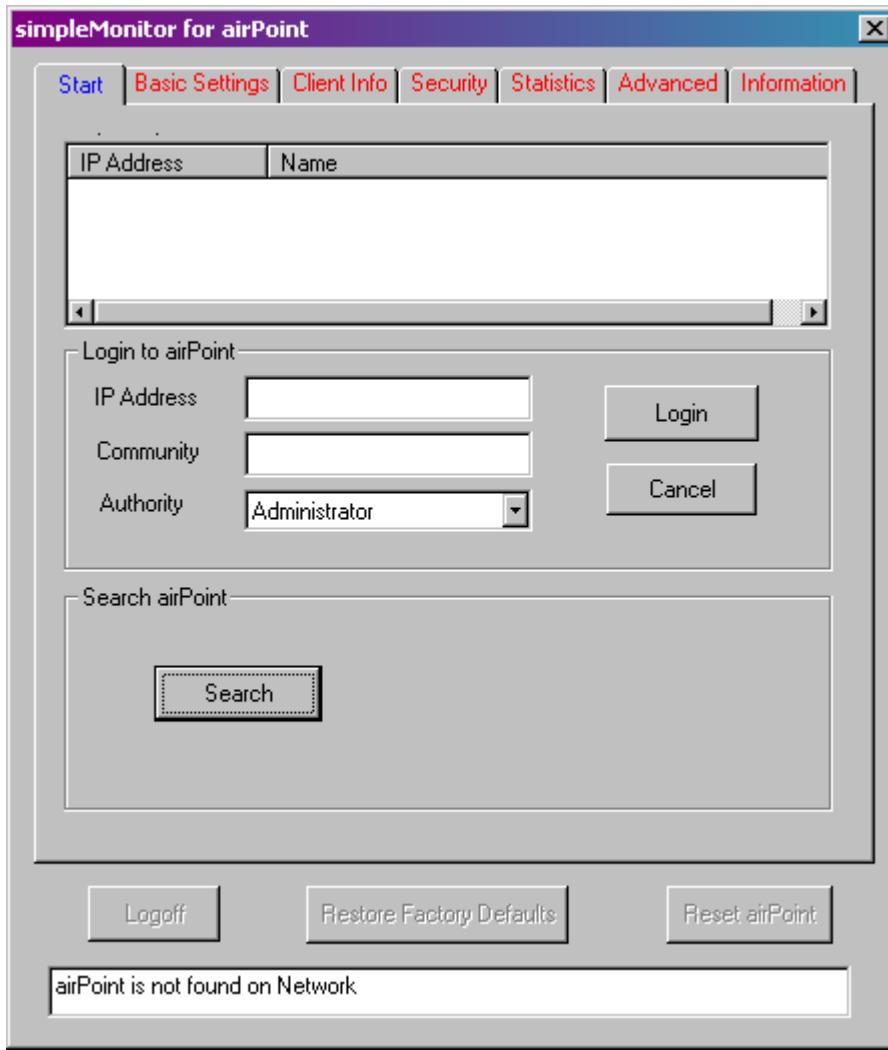
If the airPoint is found then it will show the airPoint Entry and request you to select and Login. Click on IP address of the desired device and enter the community name (Default is "public") and desired Authority (User/Administrator) and Press Login button to log in to airPoint.



In case of a successful connection to the airPoint, simple Monitor acknowledges by enabling all the tabs.



In case of an unsuccessful connection simple Monitor acknowledges as, airPoint not found on Network . In this situation please check the power supply connection to the airPoint and Ethernet cable connection .



Once the Connection is Established with the airPoint then user gets an access to most of the Settings.

You can reset the airPoint by clicking “Reset airPoint” Button. This action takes place after a user makes configuration changes in order to initiate the changes. This is also equivalent to power ON/OFF of a device.

You can restore the factory default values of the airPoint. If you mess around with the setting, and can not connect any more, use the button “Restore Factory Defaults”

The factory defaults are

IP Address : 192.168.0.20
Mask : 255.255.255.0
Gateway : 192.168.0.1

The Factory Defaults can also be restored by pressing the “Reset Switch” on the airPoint, The correct Method for Restoring the defaults is

1. Press the Button with some pointed device and keep it Pressed.
2. Observe the Tx/Rx LED, it will stop blinking for a while and again it will start blinking.
3. Once it start blinking again the defaults are restored.

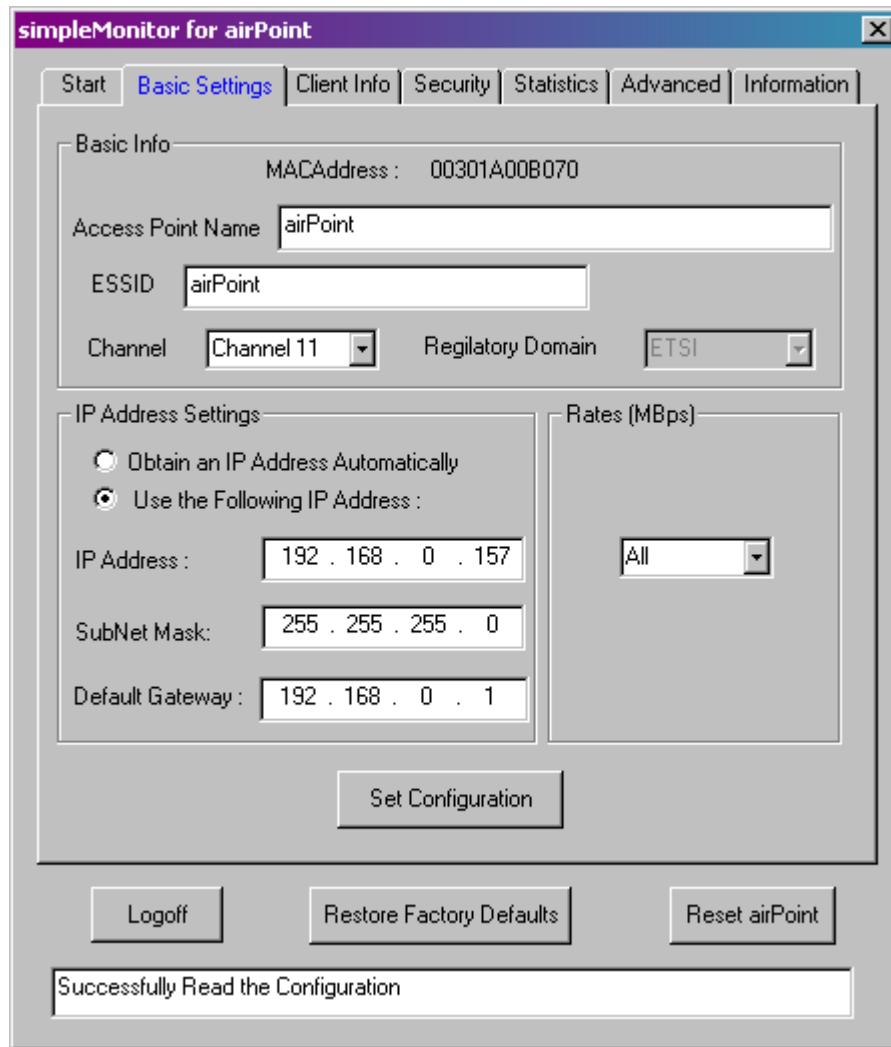
Once the default values are restored you need to login again into airPoint.

The connection with airPoint can be terminated by pressing “Logoff” Button.

Configuring airPoint

As soon as the connection to the airPoint has been established, you are able to start viewing or setting the airPoint's parameters.

Basic Setting Tab



MAC Address-> Unique 48-bit, hard-coded Media Access Control address known as the station identifier. (User can not change it).

The Access Point Name can be entered and changed (Max. Length 32 Characters).

ESSID: The ESSID or SSID is the unique name shared among all points in a wireless network. The ESSID must be identical for all points in the network. It is case sensitive and must not exceed 30 characters. Please make sure that all points in the network are assigned the same ESSID. It is used to identify a WLAN that prevents the unintentional merging of two co-located WLANs.

- **Channel:** There are 14 channels available. The channels differ from country to country. Select the channel to be used in your Country.

The list of different Channels allowed in different Domains are as follows.

Regulatory Domain	Channels Allowed
FCC	1-11
DOC	1-11
ETSI	1-13
SPAIN	10,11
FRANCE	10,11,12,13
MKK	14
MKK1	1-14

- **Regulatory Domain:** The value of this field is already set and can not be modified here, please refer to Advanced Tab for modification of this tab

IP Address -> Network-assigned Internet Protocol address of the AirPoint

Subnet Mask ->Four sets of three digits that divide a network into subnetworks.

Gateway -> Gateway on the network.

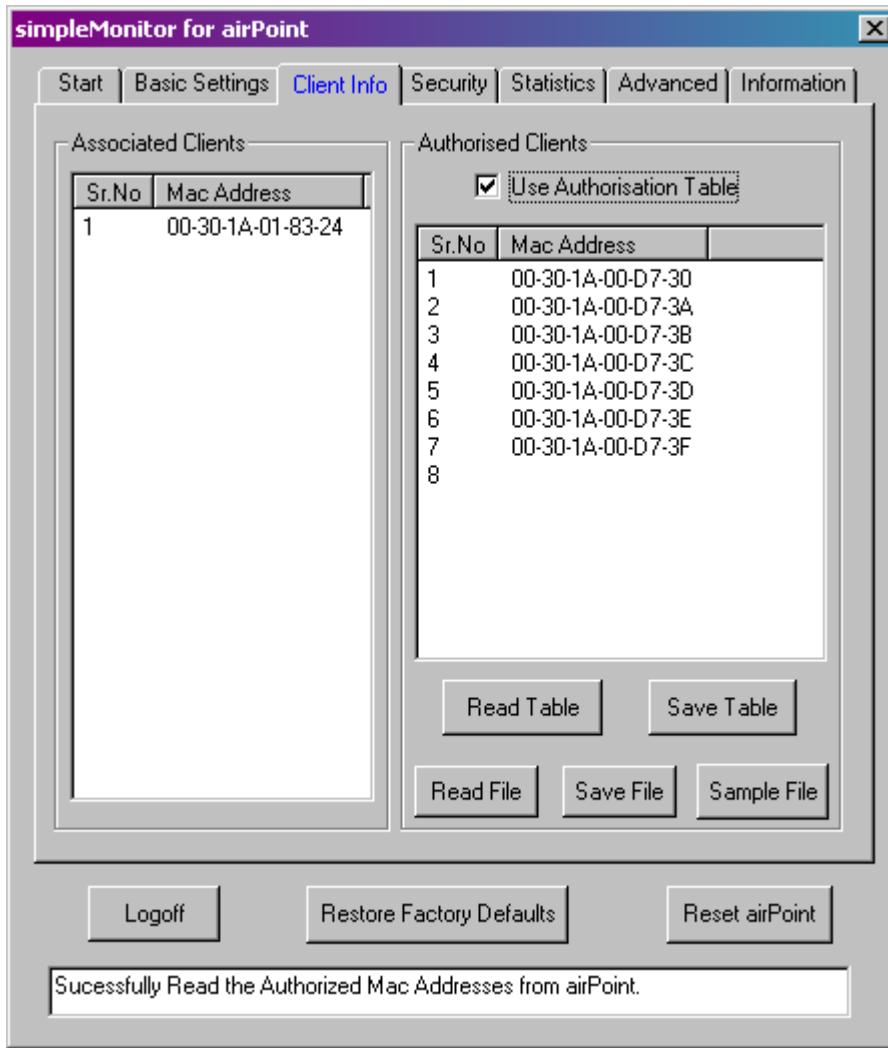
The DHCP client can run on the AirPoint. If you wish to use the DHCP client then select **“Obtain IP Address Automatically”** Otherwise you have to manually enter the IP Address, Subnet Mask and Gateway values.

- **Rate:** By default the unit adaptively selects the highest possible rate for transmission. Select the basic rates to be used among the following options 1 - 2 - 5.5 - 11 (Mbps) - all.

If any changes are made in the above configuration, you need to Click on “Set Configuration” in order to save them.

If you change the IP address of the airPoint then you need to login again into the airPoint.

ClientInfo Tab



This tab allows you to know the clients which are associated with the airPoint.

The Authorized Clients option allows the airPoint to associate with the certain clients for which the MAC Addresses are known.

The **“Read file”** button is used to load the MAC Addresses stored in a file (say MAC.TXT).

To create a text file (e.g. MAC.TXT) use Notepad or another text editor.

Enter the 12 digit MAC address of each adapter that you wish to authorize communication with the airPoint. ONE PER LINE!!!!!!

[Note : You can have a look at the sample file by clicking “Sample File” button]

Save the file. Be sure to note the full path to the saved file.

Click the Read File button.

A screen will pop-up prompting you to browse for the file (e.g. MAC.TXT). Once you have located the file, highlight it and click **Open**.

All the MAC addresses that you entered into the text file should now appear in the window.

You can save the MAC Addresses on the screen into a file by clicking “Save File” option.

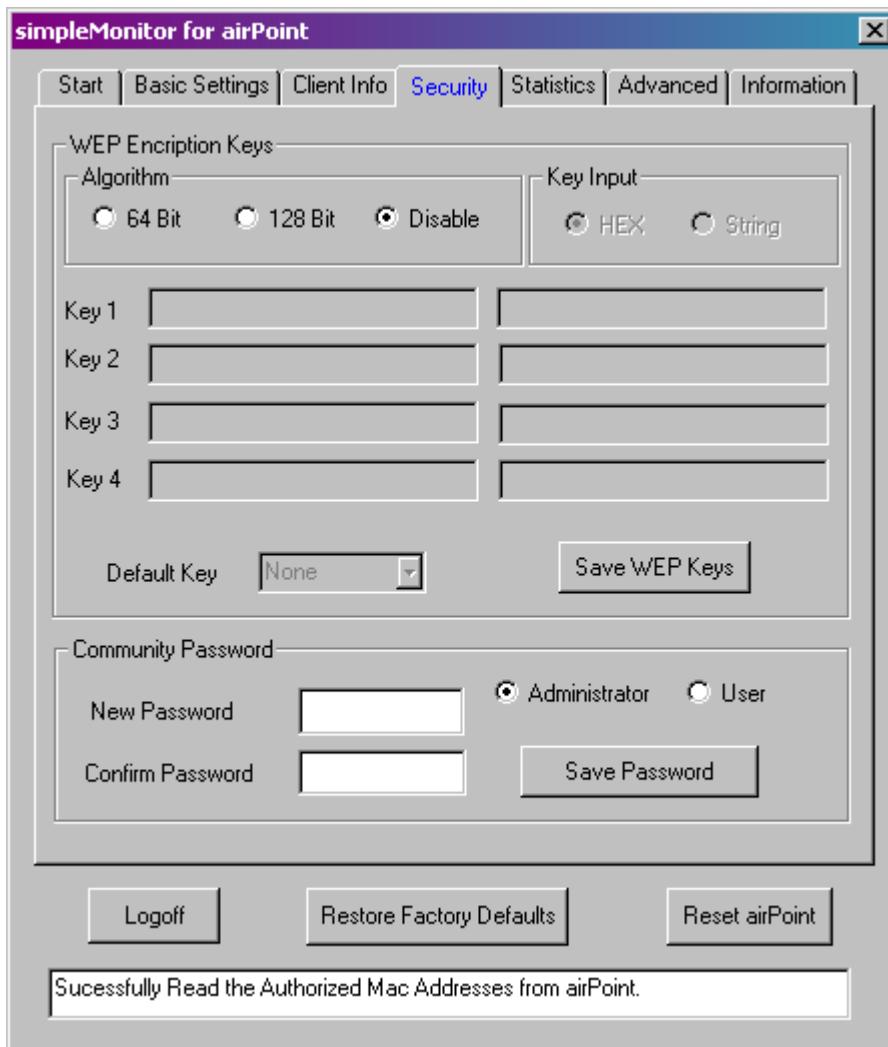
You can change the MAC address or Add more MAC addresses by double clicking on the Individual entry. A popup screen will be displayed as below which will allow you to change the value.



The “Save Table” button in order to download the Authorized MAC Address to the airPoint.

The “Read Table” button in order to get from the airPoint, the Authorized MAC Addresses.

Security Tab



There are four 5 digit encryption keys available if you select 64bit WEP or there are four 13 digit encryption keys available if you select 128bit WEP. Both String and HEX Keys are provided, but String Based Keys are for smartBridges specific products. For interoperability with other vendors please use the HEX Keys. The key is enabled only if you select it in the “Default key” option in the Enable the WEP (Wired Equivalent Privacy) option in order to activate WEP encryption for transmissions between the stations and AirPoint.

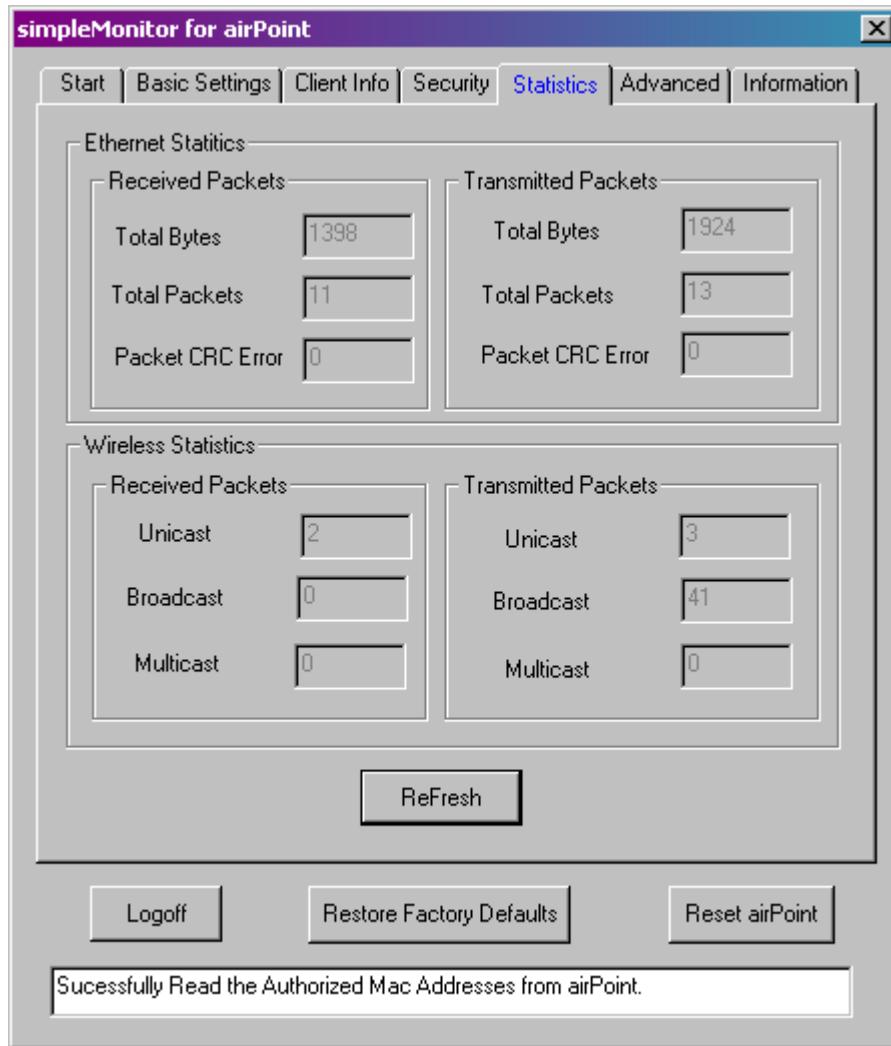
WEP is an authentication algorithm which protects authorized Wireless LAN users against Eavesdropping.

If any changes are made in the above configuration, you need to Click on “Save WEP Keys” in order to save them.

Note: The Authentication type must be the same on the airPoint Clients and on the airPoint. All shared keys on the wireless station must be the same as those on the airPoint with which the airPoint is associated.

The Administrator can change the passwords which refers to the community field for the User and the Administrator Authority. By putting these passwords only authorized persons can change the settings. So it is highly recommended that You should change it while installing the airPoint. Default values for both USER and ADMINISTRATOR are “public”.

Statistics Tab

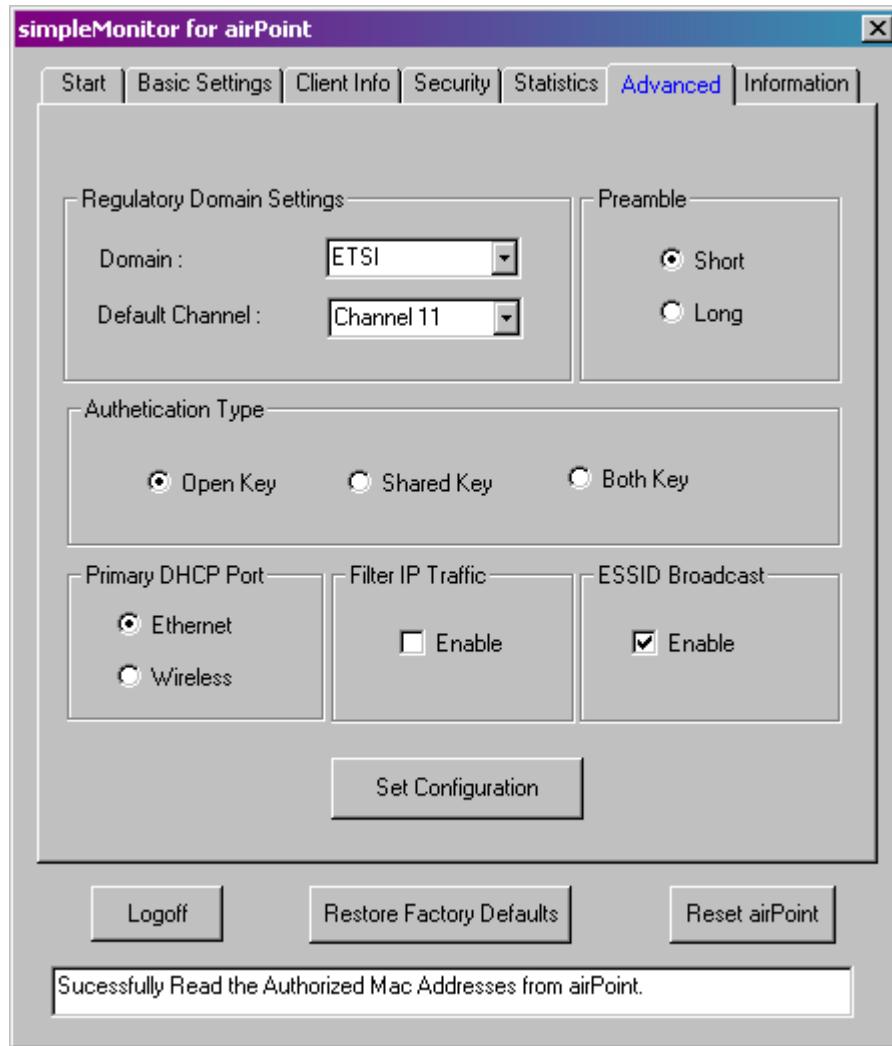


Wireless statistics reports the statistics concerning the airPoint's Wireless activity.

Ethernet statistics reports the statistics concerning the airPoint's Ethernet port activity

“ReFresh” button with refresh the screen and display the latest statistics.

Advanced Tab



This tab provides the advanced settings.

Default **Regulatory Domain** can be set along with the channel. Be careful to set the proper domain for your country.

- **Preamble Type (Short/Long):** Preamble is the first subfield of PDU, which is the appropriate frame format for transmission to PHY (Physical layer). There are two options, Short Preamble and Long Preamble. The Short Preamble option improves throughput performance.

- **Authentication Type.** The authentication type defines configuration options for the sharing of wireless networks to verify identity and access privileges of roaming wireless network cards.

Open System: With this setting any station in the WLAN can associate with an airPoint and receive and transmit data (null authentication).

Shared Key: With this setting only stations using a shared key encryption identified by the airPoint are allowed to associate with it.

Both: With this setting stations communicate with the airPoint either with or without data encryption

You can select the **Primary Port** of the device which is the interface that determines the DHCP server.

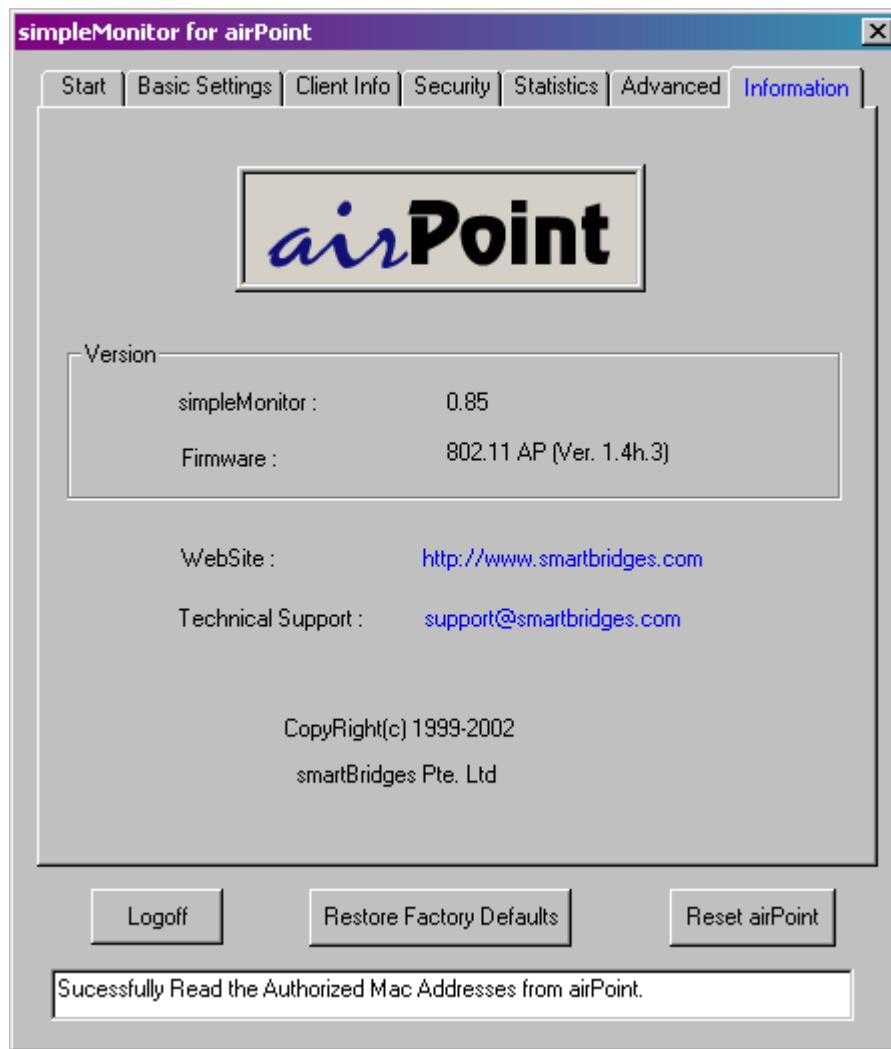
If the **IP Routing** is enabled, only the IP protocol packets will pass through the airPoint and any other protocol will be filtered out.

SSID of the airPoint will be broadcasted if ESSID broadcast option is enabled.

If any changes are made in the above configuration, you need to Click on "Set Configuration" in order to save them.

If the Regulatory domain is changed then you need to restore the factory defaults.

Info Tab



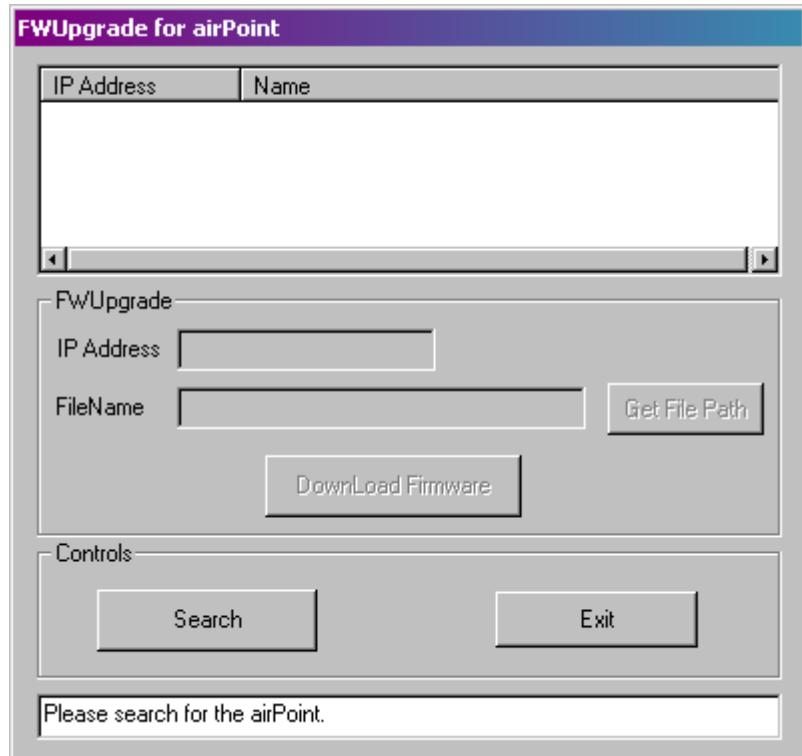
The information about the simpleMonitor and Firmware are shown here.

smartBridges website can be accessed from here, and you will be able to write to us at support@smartbridges.com for any issues you face.

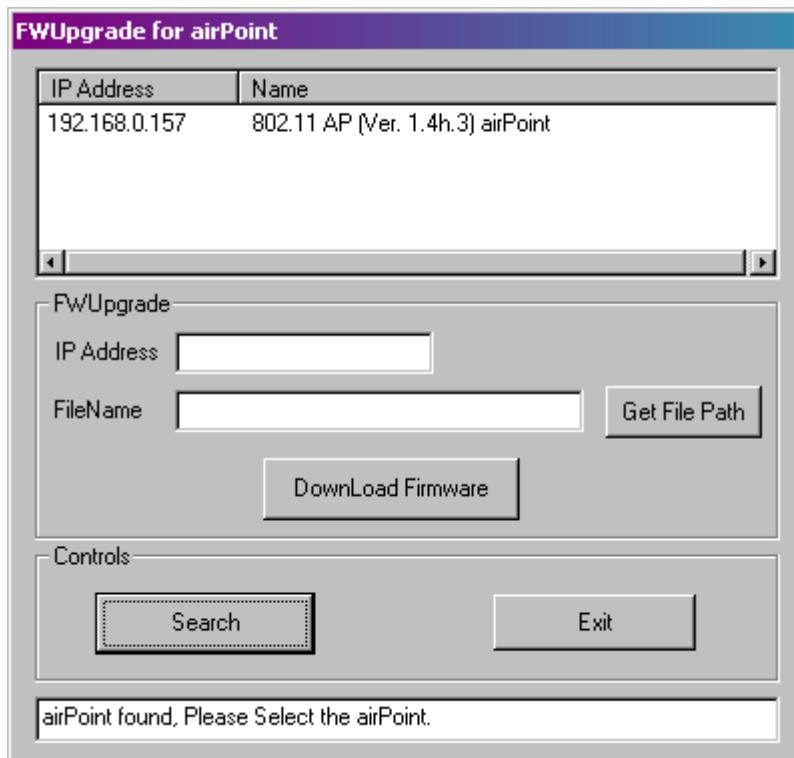
The FWUpgrade

airPoint Firmware upgrade can be done through the Ethernet/Wireless port by using the FW Upgrade utility.

Start the FW Upgrade from the shortcut provided on the Program Menu. as smartbridges/airPoint/FWUpgrade. FW Upgrade window will open.



search for the airPoint by clicking on Search button, if it finds the airPoint then it shows



if it doesn't find the airPoint then check the ethernet and Power connections to airPoint.

Browse for the appropriate file (e.g.bridge . rom) by pressing the "Get File Path" button . Finally press the " Download Firmware" button to download the firmware.

The Firmware download will be completed successfully if a message in the right bottom corner appears indicating "Firmware Download has been completed" .

If you receive the message "Timed Out" , during the download procedure, you need to check if the airPoint is powered on and if it has a valid IP address . In order to check the validity of the airPoint you must ping airPoint.

If you receive the message "Flash Programming in progress" during firmware download process you should not power off the airPoint.

Note : If the download procedure has not been completed successfully you must try again, but before starting the download you need to confirm that you using the correct firmware file.

Uninstall Setup Software

In order to uninstall the Setup Software choose
Start - > Programs - >smartBridge -> airPoint->Uninstall.

Troubleshooting

Frequently Asked Questions

About airPoint

Q: How fast is airPoint?

A: airPoint is capable of a data rate of up to 11Mbps.

Q: How do I connect airNIC to my PC ?

It is connected to the USB port of the PC. Please refer the user guide for detailed installation procedure.

Q: Can I use airNIC with my laptop ?

Yes. airNIC can be used with any USB-ready computer.

Q: What standard does airNIC conform to ?

A: IEEE802.11b for wireless.

Q: Where can I find additional information about airNIC ?

A: You can refer to the manual on the simpleConnect CD, or check out our online User Guide.

Q: Can it work with any Wireless Access Point ?

A: Yes. It can work with any IEEE802.11b compliant Wireless Access Point.

Q: Would the Internet connection speed be affected if I connect more than one PC at the same time ?

A: There might be a slight loss in the speed but it will be very insignificant.

Q: What do the different lights (LEDs) on the airNIC case indicate ?

A: Orange indicates Device Power On, USB cable connected.

Green indicates Link is OK, Channel is clear for use.

Red indicates Device is in Wireless Transmit mode.

Q: What operating systems are supported by airNIC ?

A: Windows 98, 2000, ME, XP

Q: Will I be able to see other computers on LAN ?

A: Yes. airNIC allows you to connect to other computers on your network.

Q: Is the Wireless Connection secure ?

A: Yes. airNIC is capable of providing 64/128-bit WEP encryption.

Q: How can I find out if my PC supports USB?

- Right-click on "My Computer" on your desktop
- Click "Properties"
- Click "Device Manager"
- Click "Universal Serial Bus Controller". If USB is enabled on your PC, you will see the entry for PCI Universal Open Host Controller.

Q: What are the minimum computer requirements for the proper operation of airNIC?

- An IBM compatible PC
- Pentium processor (166 MHz or above)
- Microsoft Windows 98SE/2000/Me/XP
- CD-ROM drive
- A Spare USB port

Q: How do I uninstall airNIC from my PC ?

A: In order to uninstall airNIC from your computer, follow the following steps:

- Click on Start -> Programs -> smartBridges
- Select and click on **“Uninstall Wireless Tools”**. A dialog box will pop up to confirm that you want to uninstall simpleConnect. Click **“Yes”**.

General

Q: What is WEP ?

A: Wired Equivalent Privacy (WEP) is an encryption scheme used to protect wireless data communication. It is part of the system security behind the wireless IEEE 802.11 protocol, and its goals are to provide confidentiality and data integrity, and to protect access to the network infrastructure by rejecting all non-WEP packets.

Q: What is an Access Point ?

A: It is a hardware device that converts a wired LAN port/outlet to a wireless port typically for Infrastructure mode.

Q: What is AdHoc mode ?

A: Peer-to-Peer networking mode usually used for sharing local resources between wireless Networked PCs.

Q: What is Infrastructure mode ?

A: Infrastructure Mode allows a wireless network to be integrated into an existing, wired network through an Access Point, permitting roaming between Access Points while maintaining a connection to all network resources.

Q: What is IEEE 802.11 standard ?

A: It is a standard set by Institution of Electrical Electronics & Engineers for standardizing the wireless networking hardware so that they are interoperable.

Q: What is ISM band ?

A: The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the ISM (Industrial, Scientific and Medical) band. The ISM band comprises of frequencies in the vicinity of 2.4 GHz.

Q: What is Direct-Sequencing Spread Spectrum (DSSS) ?

A: Wireless LAN products are available in three different technologies – Direct Sequencing Spread Spectrum (DSSS), Frequency Hopping Spread-Spectrum (FHSS) and Infrared. DSSS and FHSS are spread-spectrum techniques that operate over the radio airwaves in the unlicensed ISM band (Industrial, Scientific, and Medical). DSSS uses radio transmitter to spread data packets over a fixed range of frequency band.

Q: How does the Wireless LAN connect the PCs ?

A: The Wireless LAN uses Radio Frequency (RF) to transmit data. In this respect, it is similar to radio stations and cordless phones. Devices "tune in" to different signals on specific frequency bands and

ignore others, allowing the devices to co-exist and PCs to communicate securely over the Wireless LAN.

Q: Will Wireless LAN interfere with other RF devices like cordless phones?

A: Use of DSSS and FHSS techniques eliminate the interference between different RF devices.

Common Problems and Solutions

Q: I can't connect to the Access Point.

- Make sure that the notebook or desktop is powered on and the airNIC-Wireless USB Client is properly connected.
- Make sure that your Network Adapter is configured on the same channel, SSID, and WEP as the other computers in the Infrastructure configuration.

Q: LEDs are flickering.

- Orange** should be continuously on. If it flickers, make sure that USB cable is securely plugged into the USB port.
- Green** should be continuously on. If it flickers, the device may not have booted properly or there may be a strong interfering signal. Disconnect and connect the device again.
- Red** should flicker, indicating that the radio is alternating between transmit & receive modes.

Q: LEDs do not light up at all.

A: Make sure that the USB cable is properly connected and the PC is powered on.

Q: Windows seems to hang when reconnecting airNIC.

A: Windows takes some time to enumerate USB devices when it is connected to the computer. Wait about 20 seconds between disconnecting and connecting devices to give Windows time to update the internal registry settings.

Q: All the USB ports on my PC are already connected to other USB devices.

A: Use a self-powered USB hub. It is possible to connect up to 128 USB peripherals to a PC by using the USB hub.

Q: airNIC does not work when connected through a USB hub.

A: Please ensure that the USB Hub has power connection. airNIC is a USB powered device. It consumes more than 360mA when in operating mode. Therefore, it cannot be used downstream of an un-powered hub. airNIC may enumerate correctly, but the Operating System will prevent it from becoming fully functional.

Appendix A

Specifications

General Characteristics

Type	Wireless Access Point
Compatibility	<input type="checkbox"/> IEEE 802.11b (High Rate) <input type="checkbox"/> Wi-Fi <input type="checkbox"/> Ethernet (IEEE 802.3 - 10/100)
Media Access Protocol	CSMA/CA with ACK & RTS/CTS (Carrier Sense Multiple Access / Collision Avoidance with Acknowledgment)
Data Rates	High Rate: 11Mbps (CCK) Medium Rate: 5.5Mbps (CCK) Standard Rate: 2Mbps (DQPSK) Low Rate: 1Mbps (DBSK)
Network Operating System	Microsoft Windows Networking Novell Client 3.x, 4.x
Host Operating System	Windows 95,98,98SE, ME, 2000, XP
LEDs	Power, Ethernet Link, RF Link

Radio Characteristics

Frequency Band	2.4 GHz ISM Band (2.4 - 2.4835 GHz)	
Number of Selectable Channels (Overlapping)	North America (FCC)	11
	Europe (ETS)	13
	France (FR)	4
	Japan (JP)	14
	Singapore (iDA)	4
	Other Countries	FCC 11, ETS 13

Modulation Techniques	<p>DSSS (Direct Sequence Spread Spectrum):</p> <ul style="list-style-type: none"> <input type="checkbox"/> CCK (Complimentary Code Keying), for High and Medium Transmit Rates <input type="checkbox"/> DQPSK (Differential Quadrature Phase Shift Keying) for Standard Transmit Rate <input type="checkbox"/> DBPSK (Differential Binary Phase Shift Keying) for Low Transmit Rate
Security	64-bit & 128-bit WEP encryption
Spreading Sequence	11 chip Barker Sequence
Frame Error Rate	Better than 8%
Output Power	100 mW
Regulations	<ul style="list-style-type: none"> <input type="checkbox"/> Europe: ETS 300-328, CE Marked <input type="checkbox"/> USA: FCC 47 CFR Part 15C, Section 15.247 <input type="checkbox"/> Canada: RSS 139 <input type="checkbox"/> Japan: MPT Radio Regulations <input type="checkbox"/> Singapore: iDA approved

Power Characteristics

Power Consumption	350 mA at 12V DC
Power Supply	12V DC Through AC Adapter (100 V ~ 264 V / 50 ~60 Hz AV IN 12V DC OUT)

Physical Characteristics

Dimensions	L 122mm; W 42mm; H 118mm
Weight	120 gms
Operating Temperature	0° to 40° C
Storage Temperature	-25° to 60° C
Humidity	Operating: 0 to 70% (non-condensing) Storage: 10 to 90% (non-condensation)

Supported Frequency sub-bands (in MHz)

Channel number	FCC countries	ETS countries	France	Japan	Singapore
1	2412	2412	Not allocated	2412	Not allocated
2	2417	2417	Not allocated	2417	Not allocated
3	2422	2422	Not allocated	2422	Not allocated
4	2427	2427	Not allocated	2427	Not allocated
5	2432	2432	Not allocated	2432	Not allocated
6	2437	2437	Not allocated	2437	Not allocated
7	2442	2442	Not allocated	2442	Not allocated
8	2447	2447	Not allocated	2447	Not allocated
9	2452	2452	Not allocated	2452	Not allocated
10	2457	2457	2457	2457	2457
11	2462	2462	2462	2462	2462
12	Not allocated	2467	2467	2467	2467
13	Not allocated	2472	2472	2472	2472
14	Not allocated	Not allocated	Not allocated	2484	Not allocated

NOTE:

- FCC countries adhere to the regulations as defined by the U.S. Federal Communications Commission (FCC).
- ETS countries adhere to the regulations as defined by the European Telecommunications

Standards Institute (ETSI).

Range

Distance in meters (feet)	11Mbps	5Mbps	2Mbps	1Mbps
Outdoor Open Space	500 (1640 ft)	700 (2296 ft)	1000 (3280 ft)	1200 (3936 ft)
Semi-Open Office	50 (164 ft)	70 (230 ft)	90 (295 ft)	110 (360 ft)
Closed Office	30 (98 ft)	40 (131 ft)	45 (147 ft)	50 (164 ft)

NOTE:

The range of values listed in the table above are typical distances measured at smartBridges' premises. These represent indicative values and may vary according to actual radio conditions at the location where the airNIC will be used.

- The range of your wireless devices can be affected when they are placed near metal surfaces and solid high-density materials like concrete walls, wood constructions, steel structures etc.
- Range is also affected by "obstacles" in the signal path of radio. These obstacles may either absorb or reflect the radio signal.

Environments can be described as follows:

- **Outdoor Open Space** environment: Devices are in Radio Line of Sight (RLOS) and there is no physical obstruction between them.
- **Semi-Open Office** environment: Workspace is divided by shoulder-height, hollow (glass, plastic) wall elements; airNIC is placed at desktop level.
- **Closed Office** environment: Workspace is divided by high-density solid wall structures.

Appendix B

Warranty Information

smartBridges warrants product to be free of defects, and agrees to repair or replace the product that proves defective. airNIC is warranted for one year from date of purchase. This warranty does not cover accidents, misuse, neglect, unauthorized product modification, or acts of nature.

Please visit customer support area of smartBridges web site for making warranty claims. smartBridges may elect to exchange the product or refund the full purchase price of the unit.

Except as expressly provided above, smartBridges makes no warranties or conditions, express, implied, or statutory, including without limitation, the implied warranties of merchantability and fitness for a particular purpose or infringement of any patent, copyright or other intellectual property right. smartBridges shall not be liable for damage to other property caused by any defects in this product, damages based upon inconvenience, loss of use of the product, loss of time or data, commercial loss, or any other damages, whether special, incidental, consequential, or otherwise, whether under theory of contract, tort (including negligence), indemnity, product liability, or otherwise. smartBridges products are not intended for use in medical, life saving, or life sustaining applications. In no event shall smartBridges' liability exceed the normal purchase price for this product.

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Appendix C

Declaration of Conformity and Regulatory Information

DECLARATION OF CONFORMITY TO FCC REGULATIONS, Part 15

smartBridges declares that the equipment described in this document is within the requirements of the Code of Federal Regulations - Title 47 Part 15, Subpart B, Class B for a digital device. This declaration is based upon the compliance of the airNIC plug and play Network Adapter to the above standards. smartBridges has determined that airNIC has been shown to comply with the applicable technical standards if no unauthorized changes are made to the equipment and if the equipment is properly maintained and operated. These units are identical to the units tested and found acceptable with the applicable standards. Records maintained by smartBridges continue to reflect that the units being produced under this Declaration of Conformity, within the variation that can be expected due to quantity production and tested on a statistical basis, continue to comply with the applicable technical standards.

FCC Rules and Regulations - Part 15

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference and, 2. This device must accept any interference received, including interference that may cause undesired operation. 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 separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

In order to maintain compliance with FCC regulations, standard network cables must be used with this equipment. Operation with non-approved equipment or non-standard cables is likely to result in interference to radio and TV reception. 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.

CANADIAN DEPARTMENT OF COMMUNICATION, INDUSTRY CANADA STATEMENT

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 the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

