[Final Draft—Nortel Confidential]

Part No. 214853-A
April 2003

4655 Great America Parkway
Santa Clara, CA 95054

Using the Nortel Networks Wireless LAN Access Point 2220

NORTEL NETWORKS™

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FCC Caution: To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

CAUTION STATEMENT:
FCC Radiation Exposure Statement

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters (8 inches) between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
this device is going to be operated in 5.15 ~5.25GHz frequency range, it is restricted in indoor environment only.

Industry Canada - Class B

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: “Appareils Numériques,” NMB-003 édictée par le ministère des Communications.

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Preface

Introduction

The Nortel Networks Wireless LAN Access Point 2220 (Access Point 2220) is an access point that provides transparent, wireless high-speed data communications between the wired LAN and fixed, portable or mobile devices equipped with an 802.11a/802.11b (or A only card or B only card) wireless adapter employing the same radio modulation.

This solution offers fast, reliable wireless connectivity with considerable cost savings over wired LANs (which include long-term maintenance overhead for cabling). Using 802.11a,11b technology, the Access Point 2220 can easily replace a 10 Mbps Ethernet connection or seamlessly integrate into a 10/100 Ethernet LAN.

Package Checklist

The Access Point 2220 package includes:

- One Access Point 2220
- Driver & Utility CD
- Documentation CD

Hardware Description

Ethernet Compatibility

The Access Point 2220 can attach directly to 10BASE-T/100BASE-TX (twisted-pair) Ethernet LAN segments. These segments must conform to the IEEE 802.3 specification.

The access point appears as an Ethernet node and performs a routing function by moving packets from the wired LAN to remote workstations on the wireless infrastructure.

Radio Characteristics

For the A radio, the Access Point 2220 uses a radio modulation technique known as Orthogonal Frequency Division Multiplexing (OFDM), and a shared collision domain (CSMA/CA). It operates at the 5GHz Unlicensed National Information Infrastructure (UNII) band with turbo mode. Data is transmitted over a half-duplex radio channel operating at up to 108 Megabits per second (Mbps) in turbo mode. The default mode is 54 Mbps.

Power over Ethernet

The Access Point 2220 supports Power over Ethernet (PoE). You need not configure anything to access power from a IEEE 802.3af-draft-compliant switch.

To use PoE to power your Access Point 2220, plug in a cable to the RJ-45 port on the back of the Access Point 2220 and connect the other end of the RJ-45 cable to a switch that delivers IEEE 802.3af-draft-compliant power.

When you are using PoE, you do not require separate AC power. The Access Point 2220 draws 8.5 W.

The Access Point 2220 uses both spare and signal RJ-45 power pairs.

LED Indicators

The Access Point 2220 includes four status LED indicators, as described in the following figure and table.

Figure 1 LED indicators

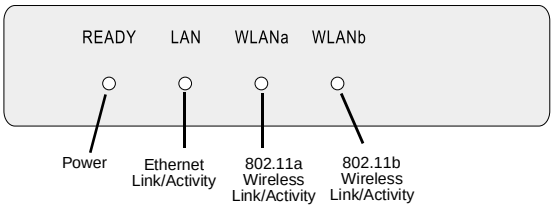


Table 1 LED Indicators

LED	Status	Description
Ready	On	Indicates that power is being supplied.
	Flashing	Indicates - • running a self-test • loading software program system errors (refer to Chapter 4, “Troubleshooting” for details)
LAN	On	Indicates a valid 10/100 Mbps Ethernet cable link.
	Flashing	Indicates that the access point is transmitting or receiving data on a 10/100 Mbps Ethernet LAN. Flashing rate is proportional to your network activity.
WLANa	On	Indicates a valid 802.11a wireless link.
	Very Slow Flashing	Searching for network association.
	Slow Flashing	Associated with network but no activity.
	Fast Flashing	Indicates that the access point is transmitting or receiving data through wireless links. Flashing rate is proportional to network activity.
WLANb	On	Indicates a valid 802.11b wireless link.
	Very Slow Flashing	Searching for network association.
	Slow Flashing	Associated with network but no activity.
	Fast Flashing	Indicates that the access point is transmitting or receiving data through wireless links. Flashing rate is proportional to network activity.

System Requirements

Before you install the Access Point 2220, be sure you can meet the following requirements:

- An A/C power outlet (100~240 V, 50~60 Hz) which will supply power for the access point (Alternatively, you can plug into a switch that delivers Power over Ethernet to power the Access Point 2220.)
- 802.11a or 802.11b compliant (or dual-compliant) wireless Ethernet adapters with TCP/IP compatible protocol installed
- Web browser for configuration

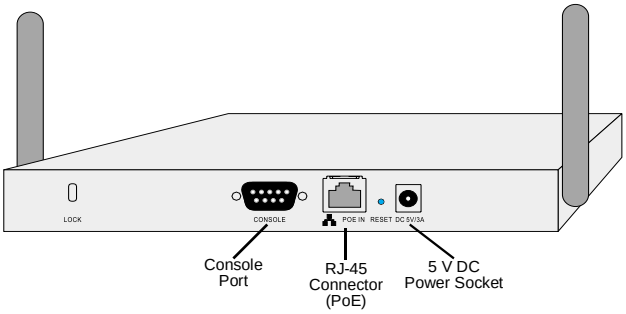
  Alternatively, you can connect an RS-232 cable to the console port and use the command line interface (CLI). For more information on the CLI, refer to *Run Time Console Specifications.*

  Optivity* NMS also works with the Access Point 2220.

Chapter 1
Hardware Installation

1 Placement of the Access Point 2220 – Choose a proper place for your Access Point 2220. In general, the best location is at the center of your wireless coverage area, within line of sight of all wireless devices. Try to place the access point in a position that can best cover its BSS. Normally, the higher you place the access point, the better the performance. (Refer to Appendix B, "Template for placing the Access Point 2220," for information on mounting the Access Point 2220.)

Figure 2 Rear Panel



2 Connect the Console Port – Connect the console cable to the RS-232 console port for accessing the command-line interface. (Refer to "Run Time Console Specifications" for complete information on the CLI.) You can manage the access point through this console connection, or the Web management interface (refer to "System Configuration" on page 19.)

3 Connect the Ethernet Cable – The Access Point 2220 can be wired to a 10/100 Mbps Ethernet through a network device such as a hub or a switch. Connect to the RJ-45 connector socket on the back panel with category 3, 4, or 5 UTP Ethernet cable and an RJ-45 connector.

4 If you are not using PoE, use the separately orderable power adapter – Connect the power adapter cable to the 5 VDC power socket on the rear panel.

Warning: Use ONLY the power adapter supplied by Nortel Networks for this product. Otherwise, the product may be damaged. Contact your Nortel Networks representative to order the power adapter.

Chapter 2
System Configuration

The Access Point 2220 can be configured by any Java-supported Web browser including Internet Explorer 4.0 or above, or NetScape Navigator 4.0 or above. Using the Web management interface, you may configure the Access Point 2220. You can also use the command line interface (CLI) to manage the Access Point 2220. (Refer to “Run Time Console Specifications“ for complete information on the CLI.)

To initially manage the Access Point 2220, you must configure the network settings of the computers on your wireless LAN to use the same IP subnet as the Access Point 2220. The default network settings assuming there is no external DHCP server for this device are:

Access Point IP Address: 192.168.168.10
Gateway IP Address: 192.168.168.254
Subnet Mask: 255.255.255.0

The IP address of the connected client PC from which system configuration is to be performed should be 192.168.168.x (where x means 1–9, 11–253).

If DHCP is enabled, (default setting is “Enable,” page 41) and a DHCP server is located on the network, then the access point will automatically be assigned an IP address when booted.

To access the Access Point 2220’s management interface, enter the IP address of the device in your Web browser:

http://192.168.168.10

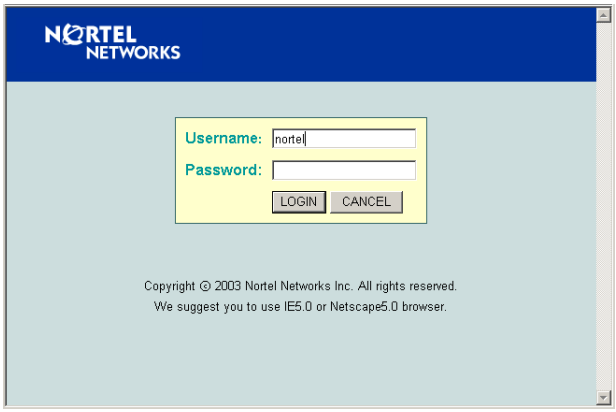
The Web management window will appear.

Setup Wizard

1 To access the management interface, enter the username “nortel” and click “LOGIN.”

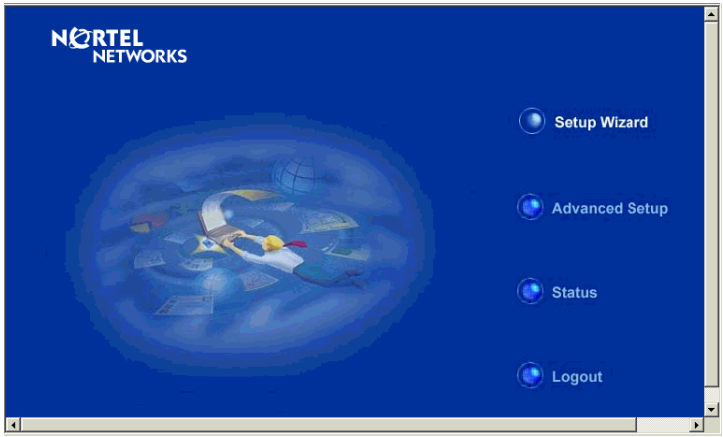
Note: There is no password by default.

Figure 3 Login screen



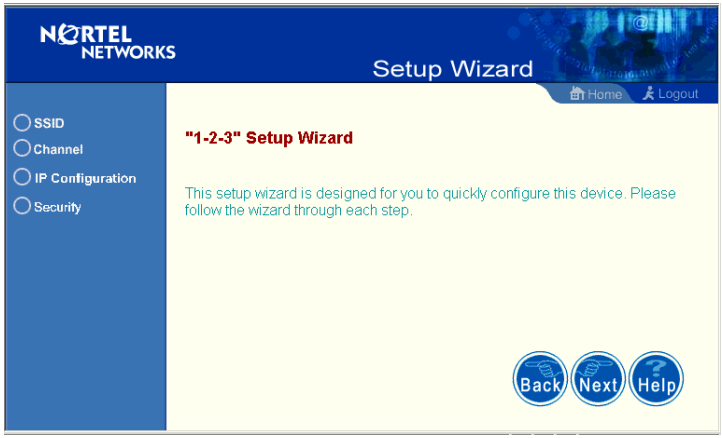
2 The home page displays the Main Menu.

Figure 4 Main Menu



3 Click “Setup Wizard” to open the “1-2-3” Setup Wizard.

Figure 5 Setup Wizard screen

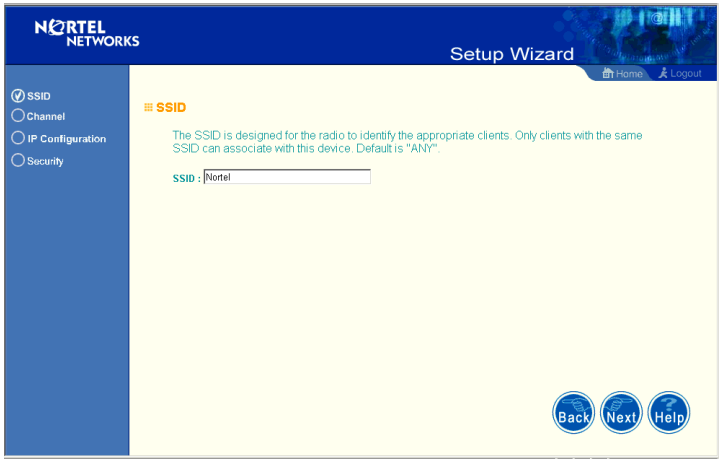


4 Click the “Next” button to start basic configuration.

SSID – The Service Set ID. This should be set to the same value as other wireless devices in your network.
(Default: Nortel)

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

Figure 6 SSID screen



Channel

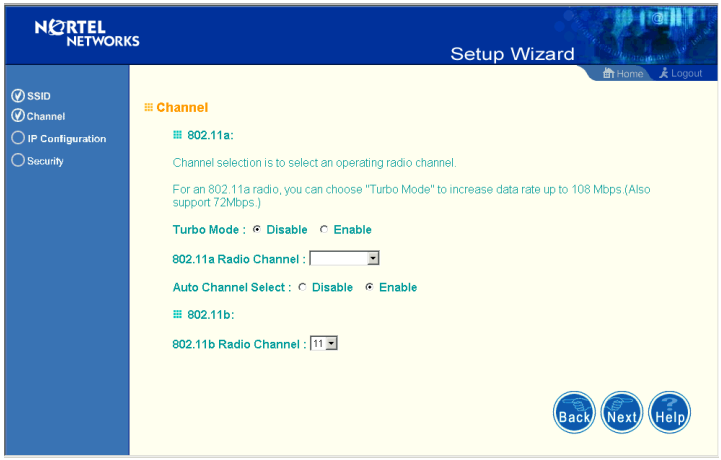
802.11a: – If you select “Enable” the access point will operate in *Turbo mode* with a data rate of up to 108 Mbps. By default, the Access Point 2220 operates at 54 Mbps. If you enable *Turbo mode*, the Access Point 2220 operates up to 108 Mbps. (*Turbo mode* default: Disable)

Auto Channel Select: Selecting “Enable” allows for automatic radio channel detection. (Default: “Enable”)

802.11b: – Set the operating radio channel number (Default: 11)

Note: Available channel settings are limited by local regulations which determine which channels are available. (Refer to “Radio Channel” on page 39.)

Figure 7 Channel screen



IP Configuration

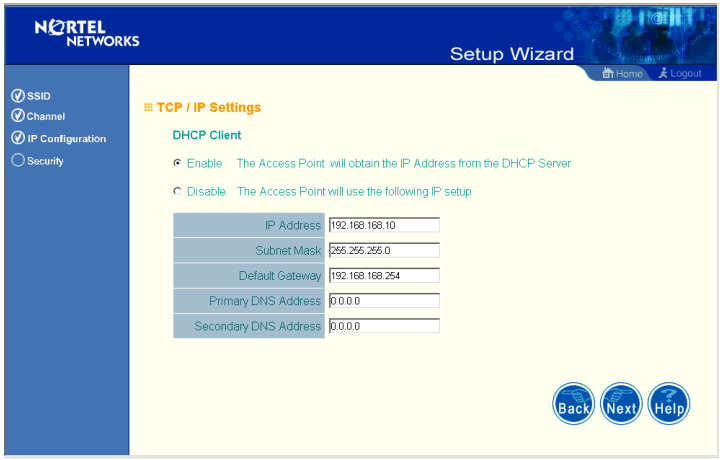
DHCP Client: With DHCP (Dynamic Host Configuration Protocol) Client enabled, the IP address, subnet mask and default gateway can be dynamically assigned to the access point by an external network DHCP server on the network. This device implements a DHCP client but not a DHCP server.

(Default: Enable)

Note: If there is no DHCP server on your network, then the access point will automatically start up with its default IP address, 192.168.168.10.

DNS (Domain Name Servers) map domain name (e.g.,nortel.com) to the equivalent numerical IP addresses. Your network administrator should provide the IP address of one or more domain name servers. Enter those addresses on the following screen.

Figure 8 TCP/IP Settings screen



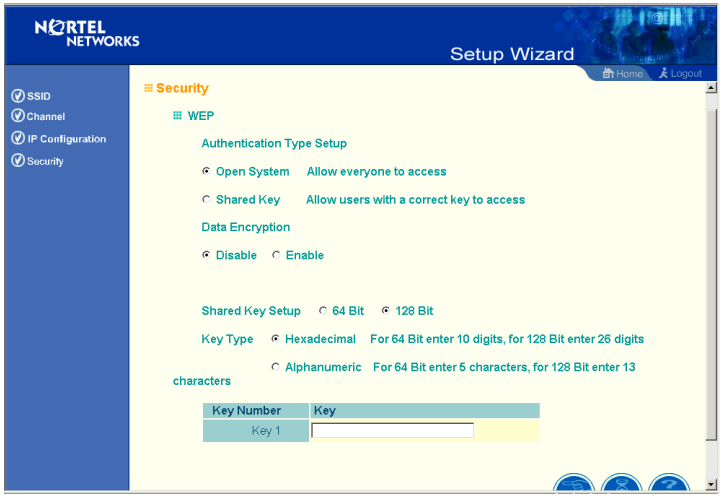
Security

WEP – Wired Equivalent Privacy (WEP) is implemented in this device to prevent unauthorized access to your wireless network.

Authentication Type: Click on the “Shared Key” radio button to start filtering the frames with the addresses defined in the “Shared Key Setup” field. (Default: Open System)

Shared Key Setup: For more secure data transmission, check the “Enable” radio button in the “Data Encryption” field. Then select one shared key size and the key number. (WEP Default: Disable)

Figure 9 Security screen



The Access Point 2220 supports “Shared Key” encryption with key lengths of the standard 64-bit and industry standard 128-bit. The bit key can be in alphanumeric characters, or hexadecimal numerals (0~9, A~F, e.g., D7 0A 9C 7F E5.) All wireless devices must have the same Key ID values to communicate.

64-Bit Manual Entry

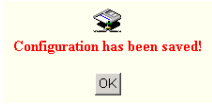
Key 1~4 - Each Key ID contains 10 HEX digits, or 5 alphanumeric characters.

128-Bit Manual Entry

Key ID contains 26 HEX digits, or 13 alphanumeric characters.

1 Click “Finish.”

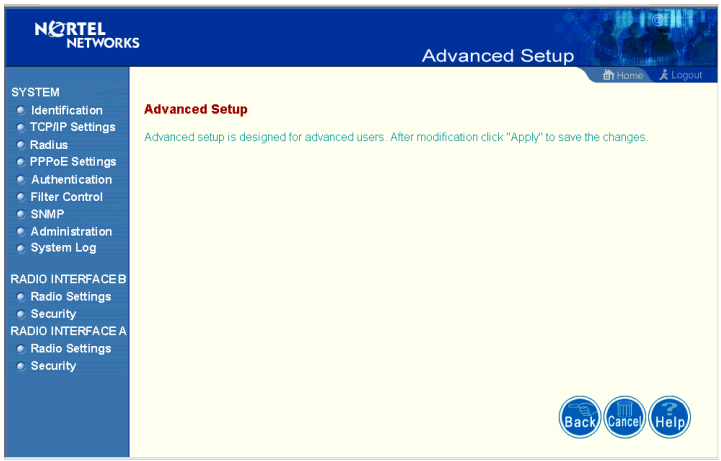
2 Click the “OK” button to restart the access point.



Advanced Setup

Click “Advanced Setup” on the Home page to open the Advanced Setup page. (See the screen on page 20.)

Figure 10 Advanced Setup screen



Note: The “Advanced Setup” screen allows you to view and change the current configuration of the access point. After modifying the configuration parameters, you must click on the “Apply” button to save the changes.

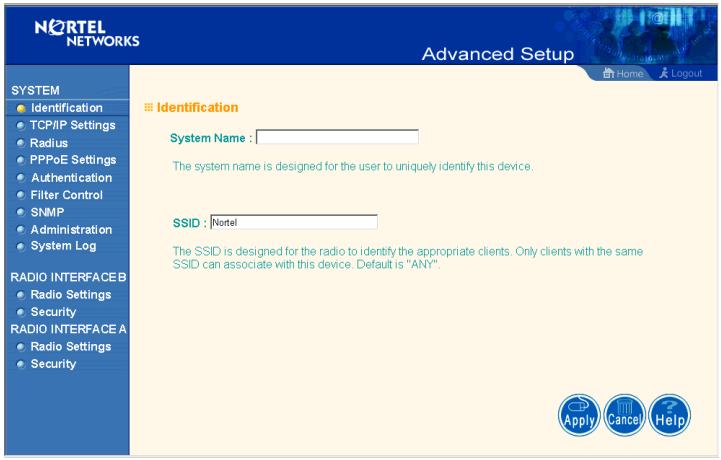
System

Identification

System Name: You can easily identify the access point by providing a descriptive name. Enter a maximum of 32 characters in the System Name field.

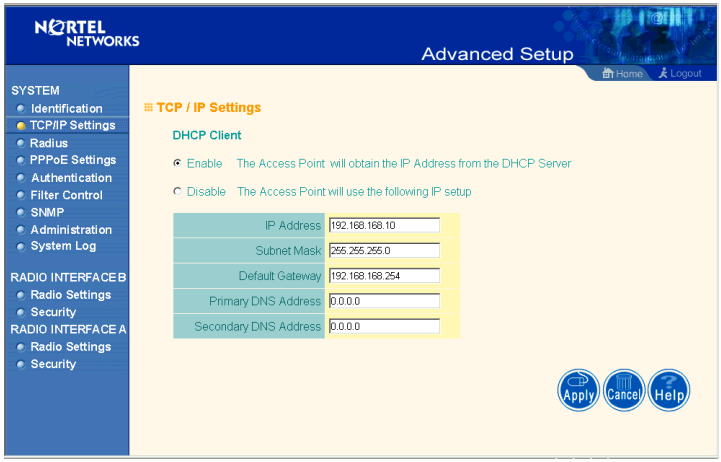
SSID: The SSID (Service Set Identification) is the name of a basic service set provided by an access point. Clients that want to connect to the wireless network via an access point must set their SSIDs to the same as that of the access point. (SSID Default: Nortel). (The default system location is the MAC address.)

Figure 11 Identification screen



TCP / IP Settings

Figure 12 TCP/IP Settings screen



Note: You must turn off DHCP for the manual TCP/IP to be accepted.

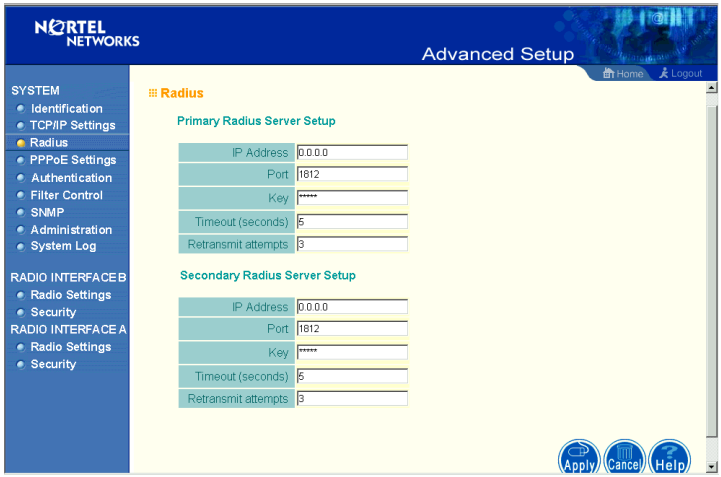
DHCP Client: With DHCP (Dynamic Host Configuration Protocol) Client enabled, the IP address, subnet mask and default gateway can be dynamically assigned to the access point by the network DHCP server. (Default: Enable)

Note: If there is no DHCP server on your network, then the access point will automatically start up with its default IP address, 192.168.168.10.

DNS (Domain Name Servers) map numerical IP addresses to the equivalent domain name (e.g., www.nortelnetworks.com). Your network administrator should provide the IP address of one or more domain name servers. Enter those addresses on this screen.

Radius

Figure 13 Radius screen



Remote Authentication Dial-in User Service (RADIUS) is a logon authentication protocol that uses software running on a central server to control access to RADIUS-compliant devices on the network. It allows a wireless access point to send the connection parameters to a RADIUS server. Enter the required parameters as shown on the screen, which includes the RADIUS server IP address, controlled port number, per-client unicast session key, timeout value (in seconds), and retransmit attempts number.

The following RADIUS servers are supported by the Access Point 2220:

- Microsoft IAS: Windows 2000 Server Build 2195 Service Pack 2: TLS, Mac Radius
- Funk Odyssey Server (Version 1.0): TTLS, TLS

IP Address – Address of authentication server. (Default: 0.0.0.0)

Port – Network (UDP) port of authentication server used for authentication messages (Range: 1-65535; Default: 1812)

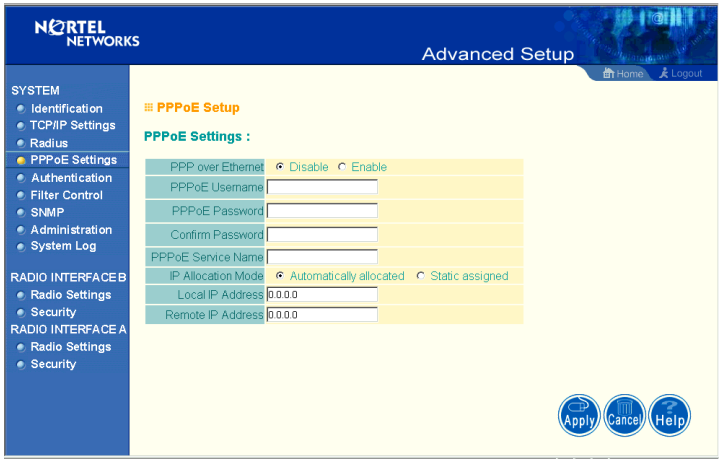
Key – Encryption key used to authenticate logon access for client. Do not use blank spaces in the string. (Maximum length: 255 characters)

Timeout – The number of seconds the access point waits for a reply from the RADIUS server before it resends the request. (Range: 1-60; Default: 5)

Retransmit attempts – Number of times the access point will try to authenticate logon access via the authentication server. (Range: 1-30; Default: 3)

PPPoE Settings

Figure 14 PPPoE Setup screen

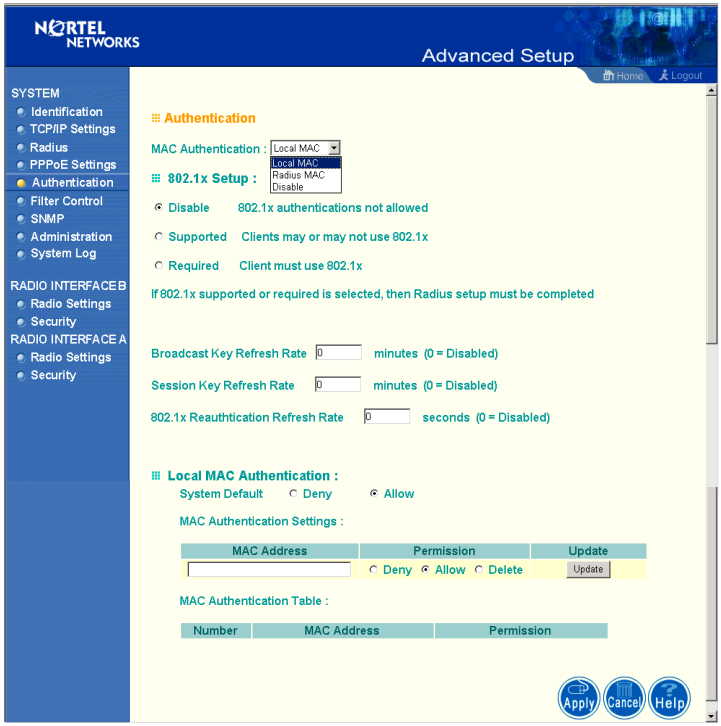


Enter the PPPoE user name and password assigned by your Service Provider. The Service Name is normally optional, but may be required by some service providers.

Some xDSL Internet Service Providers may assign a fixed (static) IP address. If you have been provided with this information, click on the “Static assigned” for the “IP Allocation Mode,” and enter the assigned “Local IP Address” and “Remote IP addresses.”

Authentication

Figure 15 Authentication screen



Management access will be checked against the authentication database stored on the access point. If a remote authentication server is used, you must specify the authentication sequence and the corresponding parameters (see “Radius” on page 28) for the remote authentication protocol.

MAC Authentication (Default: Local MAC)

Selecting the MAC authentication allows you to define access permission and precedence. For Local MAC Authentication go to page 32. For Radius MAC Authentication see the following page.

Note: Be sure to set up the Radius MAC authentication for the client on the Radius server before using the Radius MAC service.

802.1x Setup

Click the “Supported” or “Required” radio button on the 802.1x Setup field when using the Radius MAC authentication.

Table 2 802.1x Setup

Field	Defaults	Description
Broadcast Key Refresh Rate	0 (in minutes)	Defines how long the radius server will refresh the primary broadcast key
Session Key Refresh Rate	0 (in minutes)	Defines how long the radius server will dynamically re-assign a session key to a connected client station.
802.1x Reauthentication Refresh Rate	0 (in seconds)	Defines how long the radius server will dynamically re-assign session keys to the all connected client stations.

Local MAC Authentication

Client computers can be filtered using the unique MAC address of their IEEE 802.11 network card. To secure an access point using local MAC address filtering, you must enter a list of allowed/denied client MAC addresses into the filtering table. (See “Finding the MAC address of a Network Card” on page 51.)

Table 3 Local MAC Authentication

Parameter	Description
System Default	Define the default filtering setting as “Deny” or “Allow.”
MAC Address	Manually type in the MAC address of a client for the access control
Permissions	Allows/Denies access of devices matching a specified source IP address in the list to connect to the access point.
Update	Click the “Update” button to refresh the settings.

Filter Control

Figure 16 Filter Control screen

Note: The current screen displays “Deny” rather than “ON,” and “allow” rather than “OFF.”

Local Bridge Filter

Using this filter function prevents direct node-to-node connection for more secure wireless network. (Default: Disable)

AP Management Filter

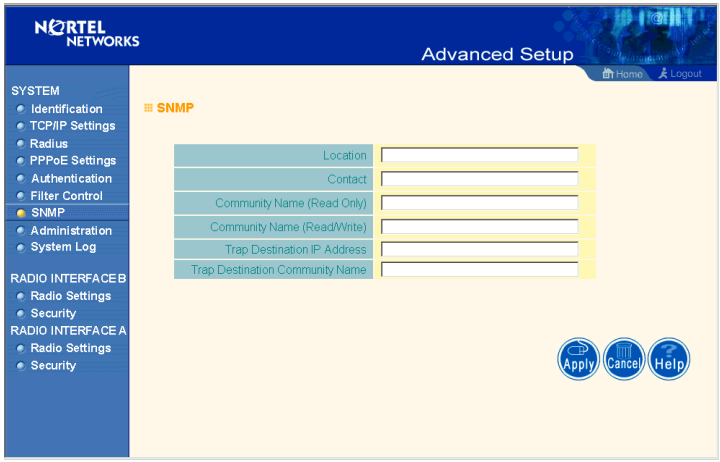
The administration management can be protected with AP Management Filter. (Default: Enable)

Ethernet Type Filter

Use the “Ethernet Type Filter” table to filter out Ethernet packet frames matching Ethernet protocol type. (Default: Disable)

SNMP

Figure 17 SNMP screen



Use this screen to display and enter a community string for the Simple Network Management Protocol (SNMP). To communicate with the access point, the SNMP agent must first be enabled, and the Network Management Station must submit a valid community string for authentication.

Location - Specifies the access point location

Contact - Set the system location string, that describes the system location. (Maximum length: 255 characters)

Community Name (Read Only) - Specifies a community string with read-only access. Authorized management stations are only able to retrieve MIB objects. (Maximum length: 23 characters)

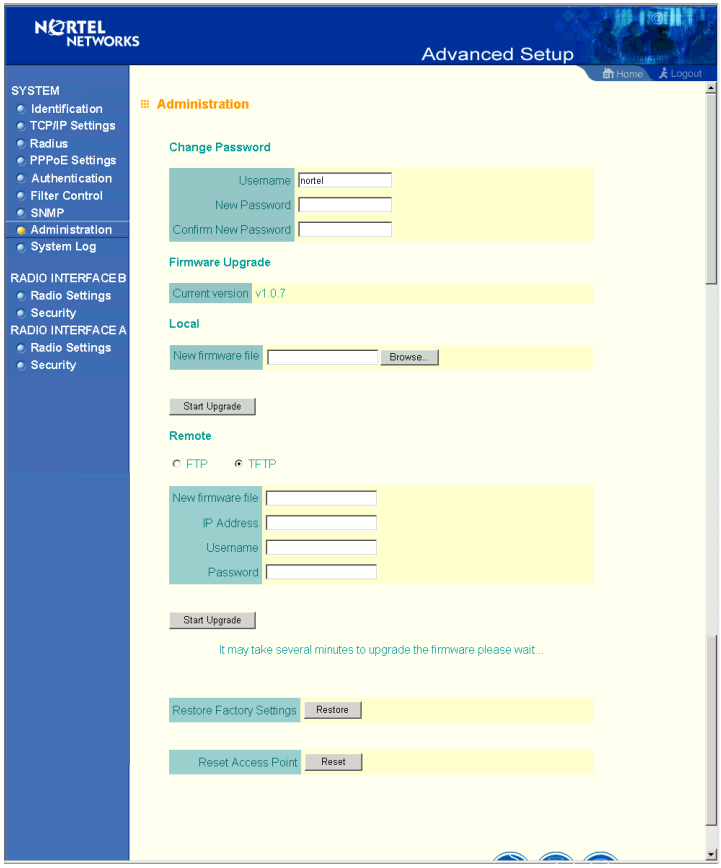
Community Name (Read/Write) - Specifies a community string with read-write access. Authorized management stations are able to both retrieve and modify MIB objects. (Maximum length: 23 characters)

Trap Destination IP Address - Fill in the IP address box for a trap manager that will receive these messages.

Trap Destination Community Name - Fill in the community string box for a trap manager that will receive these messages. (Maximum length: 23 characters)

Administration

Figure 18 Administration screen



Change Password

Use this section to change the password on the access point.

Firmware Upgrade

Local - Click “Browse” to locate the downloaded firmware file and click “Start Upgrade” to start the upgrade process.

Remote - Select FTP or TFTP, and enter firmware file name, the host IP address, user name, and password. Click “Start Upgrade” to start the upgrade process.

For latest firmware version information, visit Nortel’s Web site at: **www.nortelnetworks.com** and click Software Downloads under the Support heading.

Restore Factory Settings

Click the “Restore” button to load the factory default configuration and reboot this device. Note that all user configured information will be lost. You will also have to re-enter the default user name (nortel) to regain management access to this device.

Reset Access Point

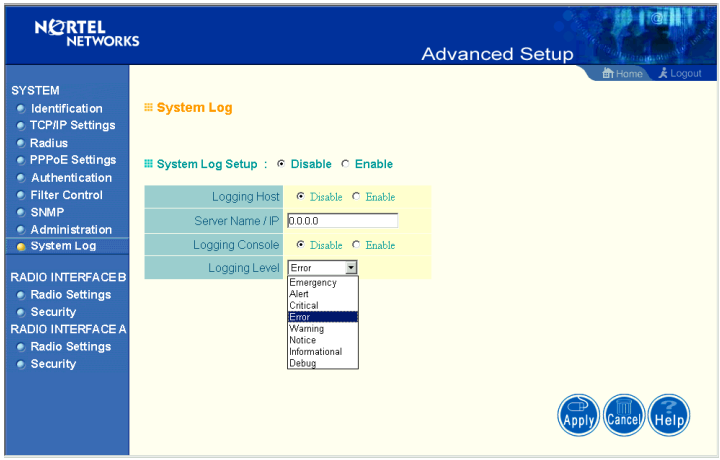
Clicking on the “Reset” button to perform a hardware reset of the access point.

Note: Current configurations will not be changed.

System Log

New screen coming with SNTP enhancements.

Figure 19 System Log screen

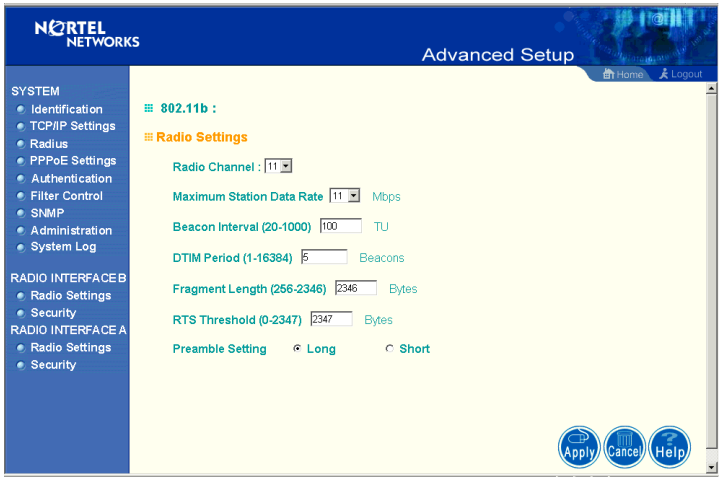


The System Log allows you to setup a log server with various logging level (as shown on the above screen). (Default: Disable)

Radio Interface B

Radio Settings

Figure 20 Radio Settings screen



Radio Channel

The radio channel through which the access point communicates to PCs in its BSS. (Default: “11”) Note that the client channel for wireless users is automatically set to the same as that used by the access point to which it is linked.

Note: The available channel settings are limited by local regulations, which determine the number of channels that are available.

- FCC: 11 channels

- MKK: 14 channels

Maximum Station Data Rate

Select the appropriate data rate from the drop-down list for the data transfer speed running on your network. (Default: 11 Mbps)

Beacon Interval (20-1000)

Sets the beacon signal interval. The beacon signals allow the wireless devices to maintain contact with each other. They may also carry power-management information. (Default: 100 TU)

DTIM Period (1-16384)

Sets the Delivery Traffic Indication Map (DTIM) packet interval value. The DTIM indicates how often the MAC layer forwards multicast traffic. This parameter is necessary to wake up stations that are using Power Save mode.

The DTIM is the interval between two synchronous frames with broadcast information. If you set the value to 2, the access point will save all multicast frames for the BSS and forward them after every second beacon. Having smaller DTIM intervals delivers multicast frames in a more timely manner, causing stations in Power Save mode to wake up more often and drain power faster. Having higher DTIM values reduces the power used by stations in Power Save mode, but delays the transmission of multicast frames. (Default: 5 Beacons)

Fragment Length (256-2347)

The “Fragment Length” can be set between 256 and 2,346. If the packet size is smaller than the preset Fragment size, the packet will not be segmented.

Fragmentation of the PDUs (Package Data Unit) can increase the reliability of transmissions because it increases the probability of a successful transmission due to smaller frame size. If there is significant interference present, or collisions due to high network utilization, try setting the fragment size to send smaller fragments. This will speed up the retransmission of smaller frames. However, it is more efficient to set the fragment size larger if very little or no interference is present because it requires overhead to send multiple frames. (Default: 2347)

RTS Threshold (0-2347)

Set the RTS (Request to Send) frame length. You may configure the access point to initiate an RTS frame sequence always, never, or only on frames longer than a specified length. If the packet size is smaller than the preset RTS threshold size, the RTS/CTS mechanism will NOT be enabled

The access point sends Request to Send (RTS) frames to a particular receiving station to negotiate the sending of a data frame. After receiving an RTS frame, the station sends a CTS (Clear to Send) frame to acknowledge the right of the sending station to send data frames. The access points contending for the medium may not be aware of each other. The RTS/CTS mechanism can solve this “Hidden Node Problem.” (Default: 2347)

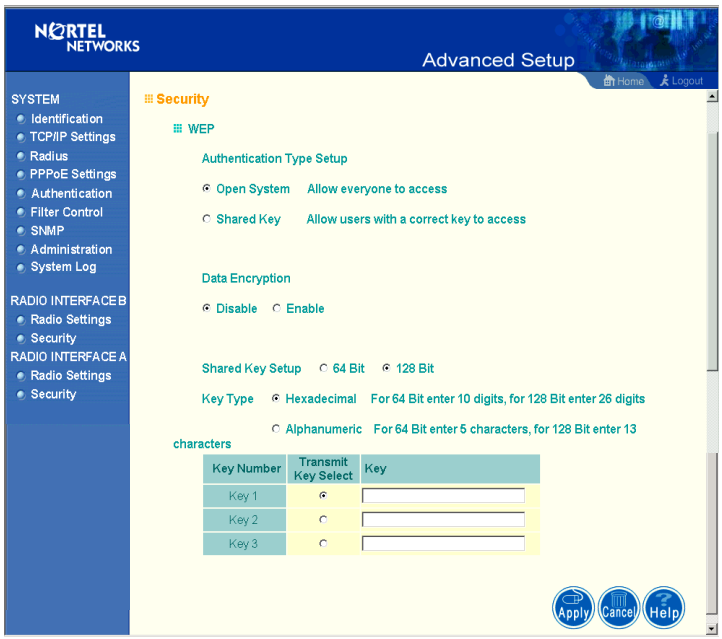
Preamble Setting

The access points and client card drivers have a radio setting for RF Preamble. Set it to short for better throughput; although this setting may cause interoperability issues with the NIC. (Default: Long)

Security

WEP (Wired Equivalent Privacy)

Figure 21 Security screen



WEP is implemented in this device to prevent unauthorized access to your wireless network. The WEP setting must be the same on each client in your wireless network.

Authentication Type Setup

You may choose either “Open System” or “Shared Key.”
(Default: Open System)

If Shared Key is enabled, WEP should be enabled and at least one shared key should be defined.

Data Encryption

You may choose “Enable” to enhance your network security with WEP data encryption
(Default: Disable)

If Shared Key is enabled, WEP should be enabled and at least one shared key should be defined.

Standard Key Setup (WEP Default: 128)

Default Shared Key – Choose the Shared Key that has the encryption string you prefer (Key 1~3).

The access point supports “Shared Key” encryption with key lengths of the standard 64-bit and industry standard 128-bit. The bit key can be in alphanumeric characters, or hexadecimal numerals (0~9, A~F, e.g., D7 0A 9C 7F E5.)

64-Bit Manual Entry

Key 1~3 - Each Key ID contains 10 HEX digits, or 5 alphanumeric characters.

128-Bit Manual Entry

Key ID contains 26 HEX digits, or 13 alphanumeric characters.

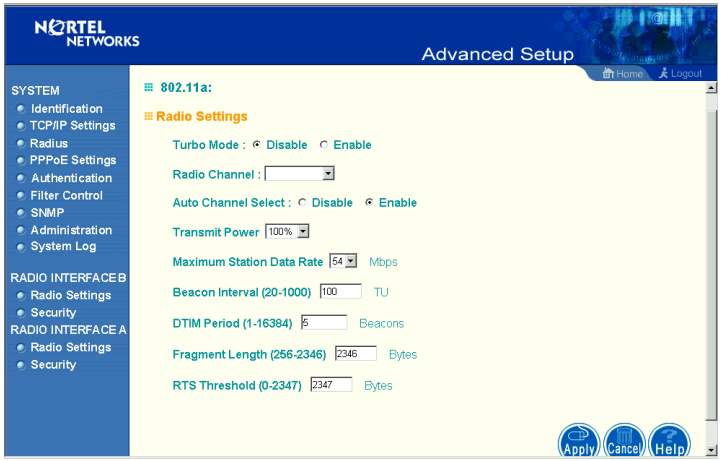
Note: All wireless devices must have the same Key ID values to communicate.

1. Select a unique key (1~3)
2. Enter the encryption key and select the key size.
3. Be sure to click the “Apply” button on the bottom of the page to make the settings take effect.

Radio Interface A

Radio Settings

Figure 22 Radio Settings screen



Turbo Mode

You may either “Enable” or “Disable” the “Turbo Mode.”
(Default: Disable)

“Turbo Mode” is the enhanced wireless LAN operating mode (not regulated in the standard IEEE 802.11a) that can provide a higher data rate. The “Normal Mode” of the 802.11a access point provides connections up to 54 Mbps. Enabling “Turbo Mode” on the 802.11a access point allows the access point to provide connections up to 108 Mbps.

In “Normal Mode,” the channel bandwidth is 20MHz. In “Turbo Mode,” the channel bandwidth is increased to 40MHz. However, there will only be three channels available when “Turbo Mode” is enabled (only 1 channel in Japan).

Radio Channel

The radio channel through which the access point communicates to PCs in its BSS. Note that the client channel for wireless users is automatically set to the same as that used by the access point to which it is linked.

Note: The available channel settings are limited by local regulations, which determine the number of channels that are available.

- FCC: 12 channels

- MKK: 5 channels

Auto Channel Select

Selecting “Enable” allows for automatic radio channel detection.
(Default: “Enable”)

Transmit Power

Set the signal strength transmitted from the access point. The longer the transmission distance, the higher the transmission power required. (Default: 100%)

Maximum Station Data Rate

Select the appropriate data rate from the drop-down list for the data transfer speed running on your network. (Default: 54 Mbps)

Beacon Interval (20-1000)

Sets the beacon signal interval. The beacon signals allow the wireless devices to maintain contact with each other. They may also carry power-management information. (Default: 100 TU)

DTIM Period (1-16384)

Sets the Delivery Traffic Indication Map (DTIM) packet interval value. The DTIM indicates how often the MAC layer forwards multicast traffic. This parameter is necessary to wake up stations that are using Power Save mode.

The DTIM is the interval between two synchronous frames with broadcast information. If you set the value to 2, the access point will save all multicast frames for the BSS and forward them after every second beacon. Having smaller DTIM intervals delivers multicast frames in a more timely manner, causing stations in Power Save mode to wake up more often and drain power faster. Having higher DTIM values reduces the power used by stations in Power Save mode, but delays the transmission of multicast frames. (Default: 5 Beacons)

RTS Threshold (0-2347)

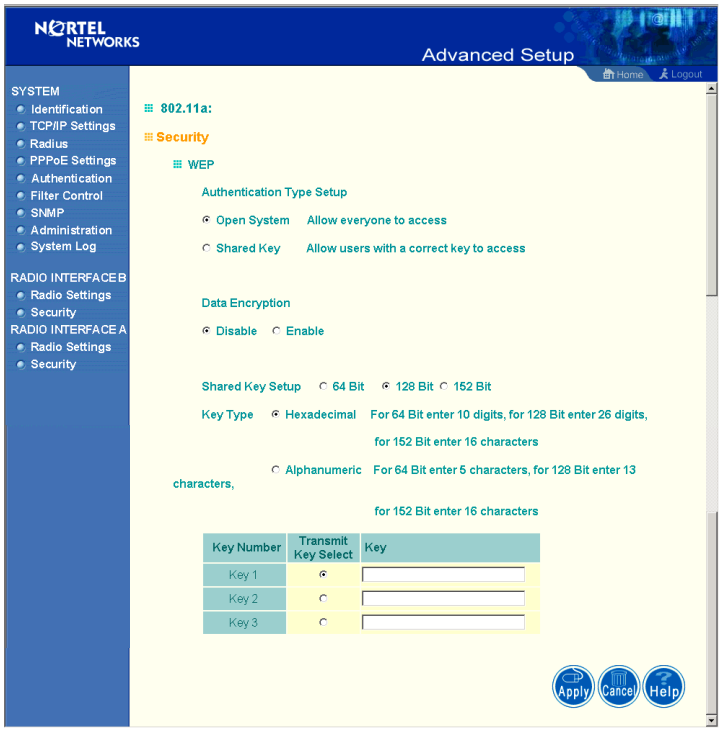
Set the RTS (Request to Send) frame length. You may configure the access point to initiate an RTS frame sequence always, never, or only on frames longer than a specified length. If the packet size is smaller than the preset RTS threshold size, the RTS/CTS mechanism will NOT be enabled

The access point sends Request to Send (RTS) frames to a particular receiving station to negotiate the sending of a data frame. After receiving an RTS frame, the station sends a CTS (Clear to Send) frame to acknowledge the right of the sending station to send data frames. The access points contending for the medium may not be aware of each other. The RTS/CTS mechanism can solve this “Hidden Node Problem.” (Default: 2347)

Security

WEP (Wired Equivalent Privacy)

Figure 23 Security screen



Authentication Type Setup

You may choose either “Open System” or “Shared Key.”
(Default: Open System)

If Shared Key is enabled, WEP should be enabled and at least one shared key should be defined.

Data Encryption

You may choose “Enable” to enhance your network security with WEP data encryption
(Default: Disable)

If Shared Key is enabled, WEP should be enabled and at least one shared key should be defined.

Standard Key Setup (WEP Default: 128)

Default Shared Key – Choose the Shared Key that has the encryption string you prefer (Key 1~3).

The access point supports “Shared Key” encryption with key lengths from the standard 64-bit, industry standard 128-bit, to the extended 152-bit. The bit key can be in alphanumeric characters, or hexadecimal numerals (0~9, A~F, e.g., D7 0A 9C 7F E5.)

64-Bit Manual Entry

Key 1~3 - Each Key ID contains 10 HEX digits, or 5 alphanumeric characters.

128-Bit Manual Entry

Key ID contains 26 HEX digits, or 13 alphanumeric characters.

152-Bit Manual Entry

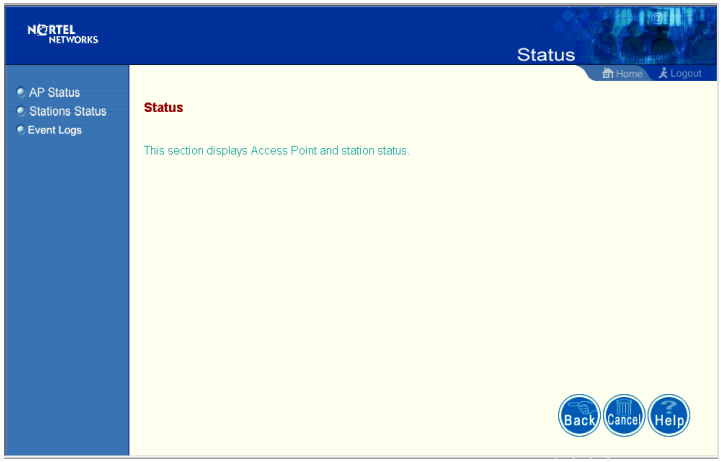
Key ID contains 32 HEX digits, or 16 alphanumeric characters.

Note: All wireless devices must have the same Key ID values to communicate.

1. Select a unique key (1~3)
2. Enter the encryption key and select the key size.
3. Be sure to click the “Apply” button on the bottom of the page to make the settings take effect.

Status

Figure 24 Status screen



Clicking on the “Status” radio button on the home page displays additional information about the access point status and station status as shown in the following section.

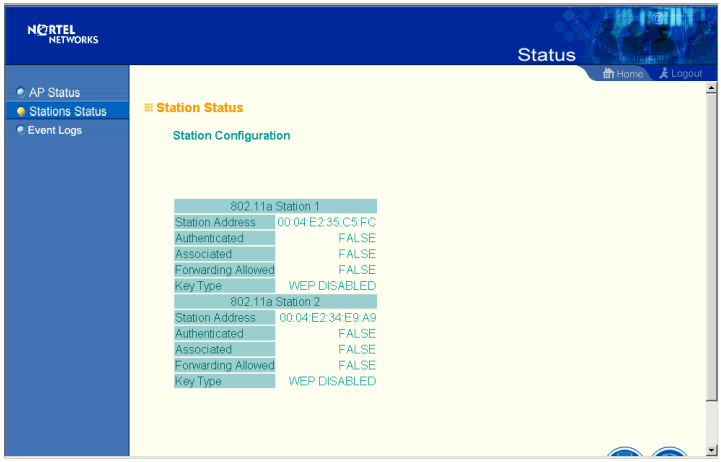
Access Point Status

Figure 25 AP Status screen

On the Status page, click “AP Status” to view the access point system configuration and access point wireless configuration.

Station Status

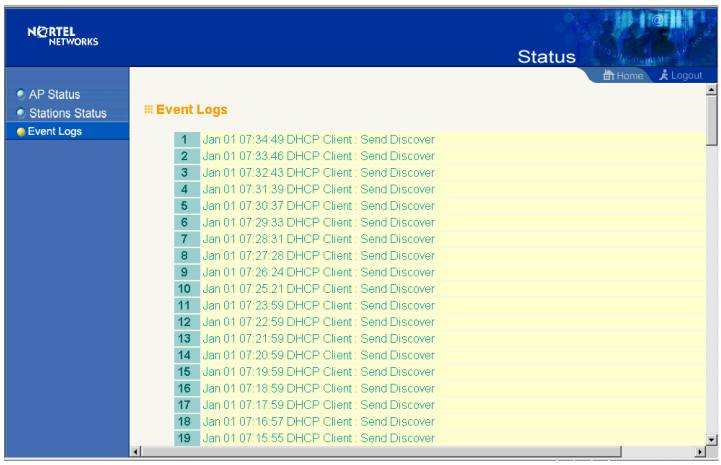
Figure 26 Station Status screen



Click “Station Status” to view connected station configuration. The “Station Statistics” page displays basic connection information for all associated stations. The page is automatically refreshed every five seconds.

Event Logs

Figure 27 Event Logs screen



Click “Event Logs” to display the activity logs of the access point.

Finding the MAC address of a Network Card

Windows 98/ME

Click “Start/Run”. Type “winipcfg” and press ENTER.

The MAC address is in the “Adapter Address” section.

Windows 2000/XP

At the command prompt, type “ipconfig /all” and press ENTER.

The MAC address is listed as the “Physical Address.”

Chapter 3
Network Configuration and Planning

The wireless solution supports a stand-alone wireless network configuration as well as an integrated configuration with 10/100 Mbps Ethernet LANs.

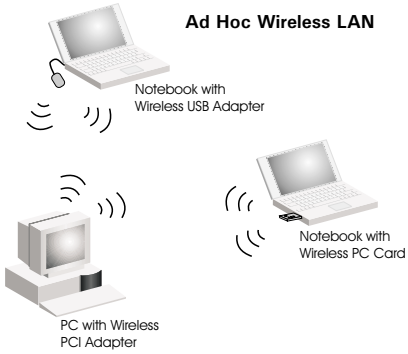
The wireless network cards, adapters, access points and wireless access point can be configured as:

- Ad hoc for departmental or SOHO LANs
- Infrastructure for wireless LANs
- Infrastructure wireless LAN for roaming wireless PCs

Network Topologies

Ad Hoc Wireless LAN
(no AP or Bridge)

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.

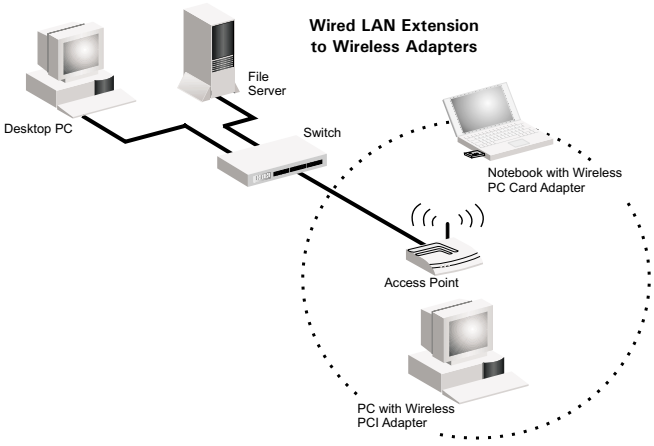


Infrastructure Wireless LAN

The access point can also provide access to a wired LAN for wireless workstations. An integrated wired/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 increases 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.

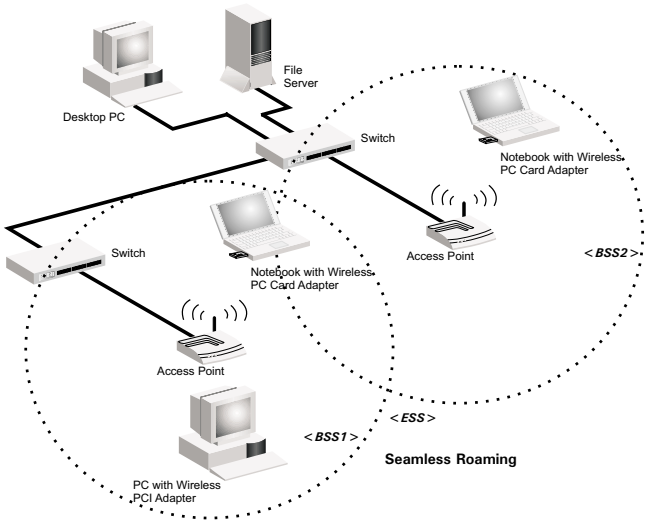


Infrastructure Wireless LAN for Roaming Wireless PCs

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

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 Nortel Networks Wireless LAN--Series 2200 wireless network cards and adapters and Access Point 2220 wireless access points within a specific ESS must be configured with the same SSID

.



Chapter 4
Troubleshooting

Check the following items before you contact Nortel Technical Support.

1. If mobile users do not have roaming access to the Access Point 2220, check the following:

   Make sure that all the access points and wireless devices in the ESS in which the WLAN mobile users can roam are configured to the same WEP setting, SSID, and authentication algorithm.

2. If the access point cannot be configured using the Web browser:

   - Turn off power to the access point.
   - Push in the reset button located on the back of the access point to restore the factory default settings.
   - Reconnect the power to the access point.

Appendix A
Specifications

Reviewers: This material is being double-checked.

This appendix provides technical specifications for the Access Point 2220.

Maximum Channels

802.11a

US & Canada: 12 (normal mode), 5 (turbo mode)
Japan: 5 (normal mode), 1 (turbo mode)

802.11b

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

Maximum Clients

64

(Default: 64) (Range 0 - 2007)

Operating Range

Up to 500 m (1640 ft)

Data Rate

Normal Mode: 6, 9, 12, 18, 24, 36, 48, 54 Mbps per channel
Turbo Mode: 12, 18, 24, 36, 48, 72, 96, 108 Mbps per channel

Operating Frequency

5.15 ~ 5.25 GHz (lower band) US/Canada, Japan
5.25 ~ 5.35 GHz (middle band) US/Canada
5.725 ~ 5.825 GHz (upper band) US/Canada

Power supply

Input: 100-240 AC, 50-60 Hz;

Output: 5 VDC, 3 A

Output Power

16 dBm minimum

Physical Size

20.5 x 13.6 x 4 cm, (8.07 x 5.35 x 1.58 in)

Weight

700 grams (1.5 lbs.)

LED Indicators

Ready (Power), LAN (Ethernet Link/Activity), WLANa and WLANb (Wireless Link/Activity)

Management

HTML Web-browser interface,

Temperature

Operating: 0 to 50 ^{o}C (32 to 122 ^{o}F)
Storage: 0 to 70 ^{o}C (32 to 158 ^{o}F)

Humidity

5% to 95% (non-condensing)

Compliances

IEC 61000-4-2/3/4/6/11

Emissions

FCC Class B
RCR STD-33A

Safety

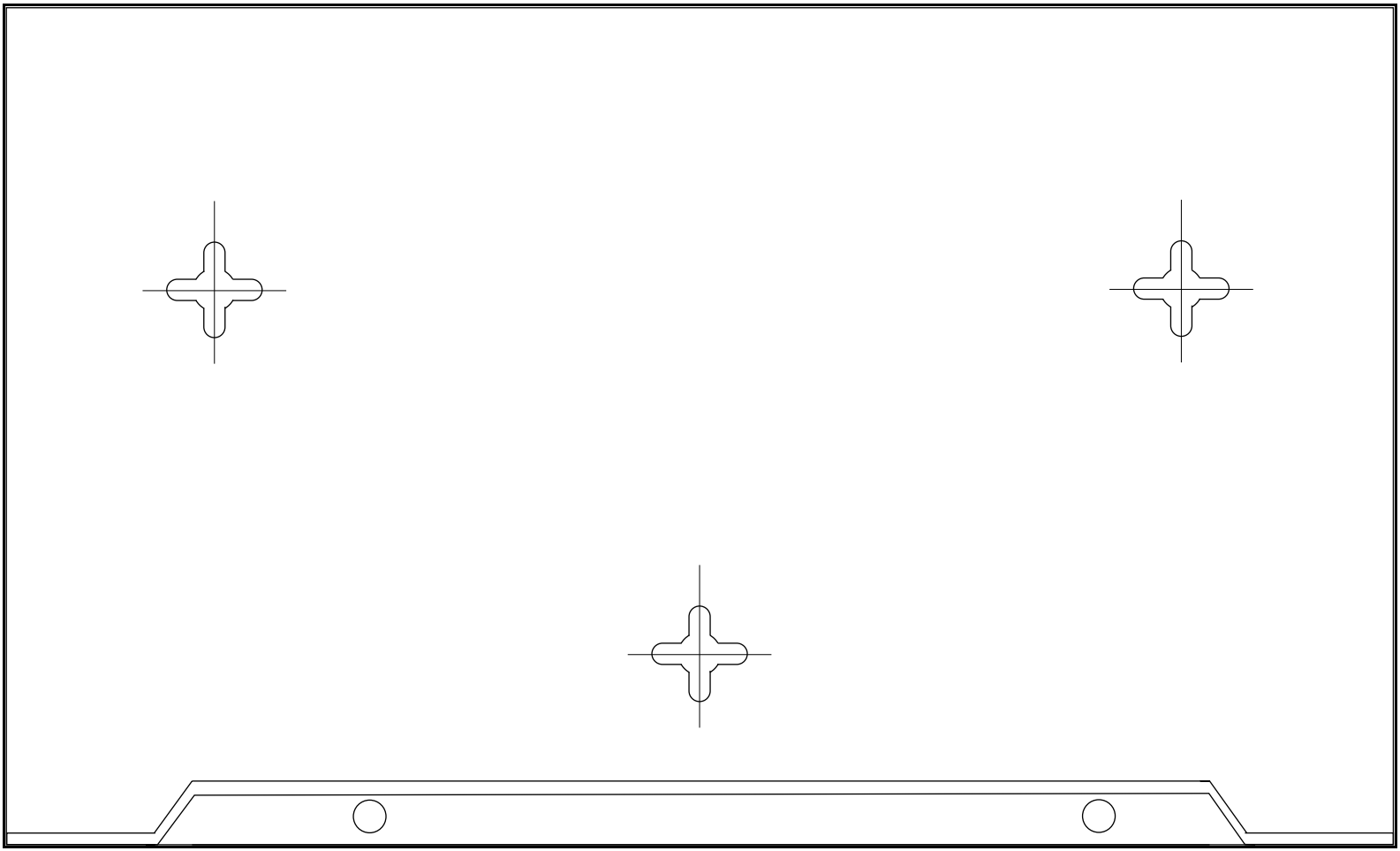
UL/CUL (UL60950 & CSA 22.2 NO. 60950-00)
EN60950, IEC60950 (CB)

Standards

IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX, IEEE 802.11a/b

Warranty

Limited Lifetime

Appendix B
Template for placing the Access Point 2220

The template on the next page can be used to assist in positioning the Access Point 2220. Mark where the wall-mount screws should go.