Installing the Extricom WLAN System

This chapter provides instructions for unpacking and installing the Extricom WLAN system.

Unpacking the Extricom WLAN System

The Extricom WLAN system is shipped with the following:

- One Extricom switch.

- CD which contains The Extricom WLAN System User Guide and Release Notes.

- APs (the number of APs is based on customer order and provided in separate boxes) are shipped as part of the overall order.

- One power cable.

Additional Equipment Needed

The following additional equipment is required for installing the Extricom WLAN system:

- One CAT-5e/6 cable for each AP.

- One CAT-5e/6 cable for connecting the WLAN switch uplink to the LAN switch.

- One EXRE-10 Range Extender for any AP that will be located over 100 meters from the WLAN switch.

- Two stainless steel pan head 8x1-1/4" self-tapping Phillips screws for mounting each AP (optional).

-

Determining the Location of the Extricom Access Points

Before installing the switch and access points, plan the placement of the APs. Before permanently mounting the APs, it is recommended to test the network (using a laptop client) to identify potential coverage holes. If such a problem exists, relocate an AP or add additional APs to resolve the coverage hole.

The APs should be placed in a stable, secure location, such as on top of a closet or bookshelf, or mounted on a wall.

The switch should be placed near the distribution point of the LAN line. This is usually in the communications closet of your enterprise.

The Extricom EXSW800/1200/2400/8000 Switch

The Extricom EXSW800 switch has 10 connectors and 4 LED types on the front panel (refer to *Figure 10*).

The Extricom EXSW-1200 switch has 15 connectors and 4 LED types on the front panel (refer to Figure 11).

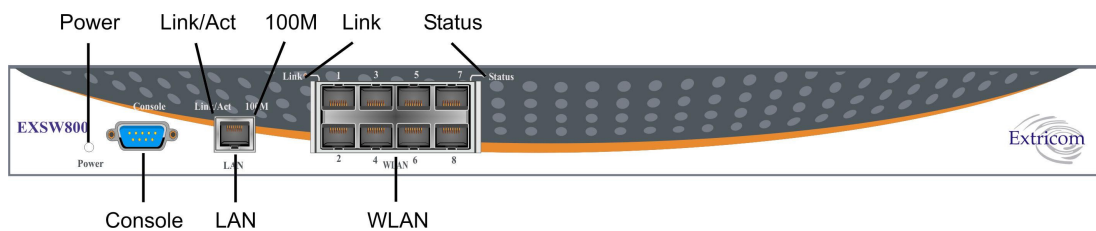The Extricom EXSW-2400 switch has 27 connectors and 4 LED types on the front panel (refer to *Figure 12*).
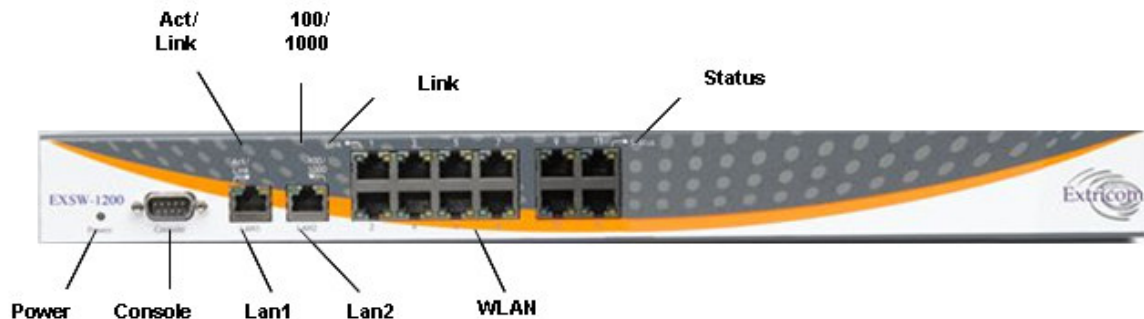

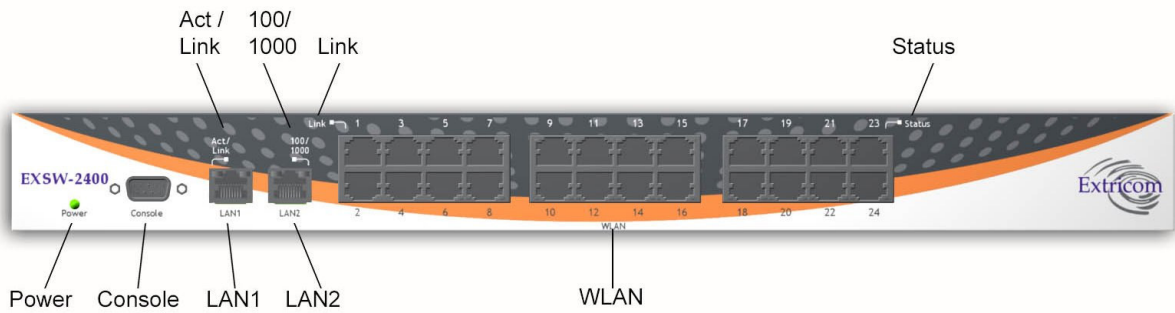*Figure 10. Extricom EXSW800 Switch*

Figure 11 Extricom EXSW 1200 Switch

Figure 12. Extricom EXSW-2400 Switch

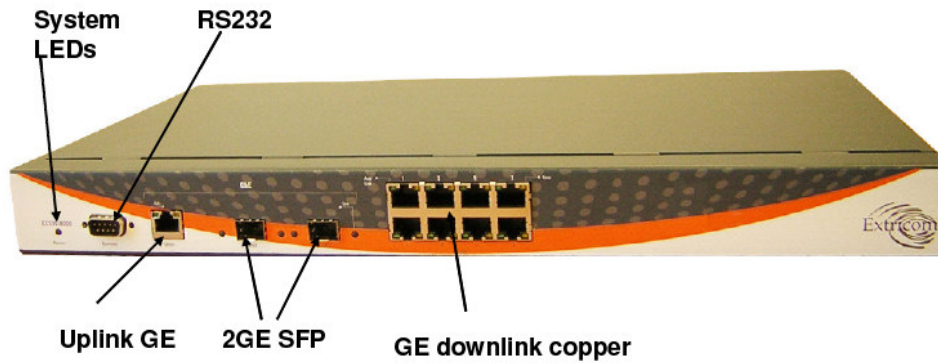*Table 1* describes the front panel and connectors of Extricom EXSW800/1200/2400 switches.
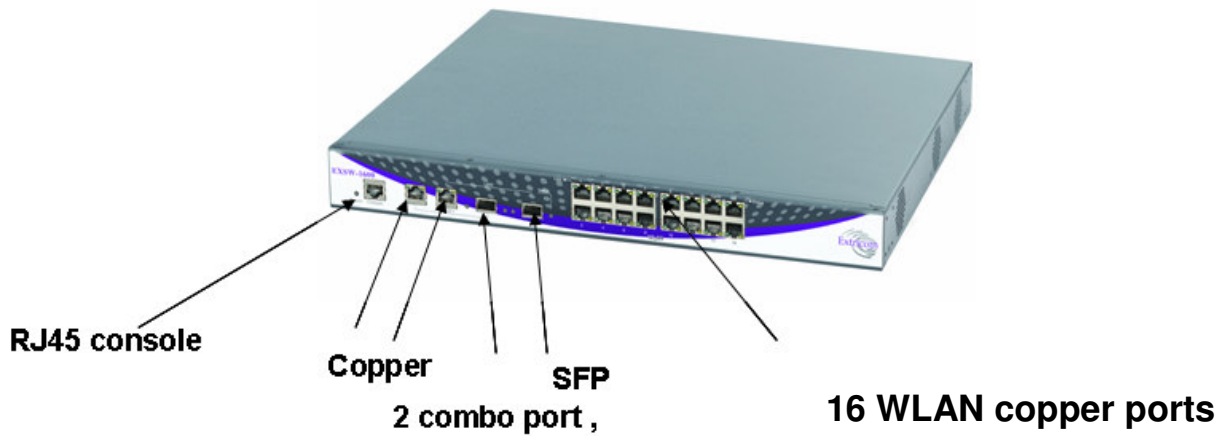

Figure 13 Extriocm EXSW-8000 switch

Figure 14 Extriocm EXSW-1600 switch

Table 1. Extricom EXSW800/1200/2400/8000/1600 Switch Connectors

Connectors	Description
Console	Serial connector – only to be used by, or as instructed by, Extricom personnel for troubleshooting, support, or maintenance. Can be accessed using a Null modem cable. (RJ45 in case EXSW-1600)
EXSW800 LAN **EXSW-1200/2400** LAN1, LAN2	RJ-45 connectors – used to connect the switch to the wired LANs. On EXSW-1200/2400 these connectors provide redundancy and load sharing between them. ✐ LAN2 is not currently active pending future development.
EXSW-1600 LAN1,LAN2	2 copper or SFP GBE combo ports , no mix copper/fiber is allowed
WLAN	RJ-45 connectors – used to connect Extricom APs to the switch. ▬ ***Do not connect any device other than Extricom APs to the WLAN ports.*** These ports provide 802.3AF PoE compatible power. Maximum current: 270 mA, 48 volts.

Table 2 describes the front panel LEDs of Extricom EXSW800/1200/2400 switches.

Table 2. Extricom EXSW800/1200/2400 Switch LEDs

LEDs	Color	Description
Power	Green	On/off (blinking system not ready in EXSW-1600)
LAN, LAN1, LAN2		
Link/Act	Green	• *On* indicates connection to the LAN network • *Blinking* indicates activity in the LAN network connection • *Off* indicates no connection to the LAN network
EXSW800 100M	Orange	• *On* – 100Mbps full duplex • *Off* – 10Mbps
EXSW-1200/2400 100/1000M	Orange	• *On* – 100Mbps full duplex • *Blinking* – 1000Mbps full duplex ✐ 1000Mbps is not currently active pending future development.
EXSW-1600	Orange	*Link status*
WLAN		
Link	Green	• *On* indicates connection to the WLAN AP • *Blinking* indicates activity over the connection to the WLAN AP • *Off* indicates no connection to the WLAN AP

Extricom EXRP-20/40 EXRP-20/40 Access Points

Extricom APs have two connectors located on the side of the device and four LEDs located on the top of the device.
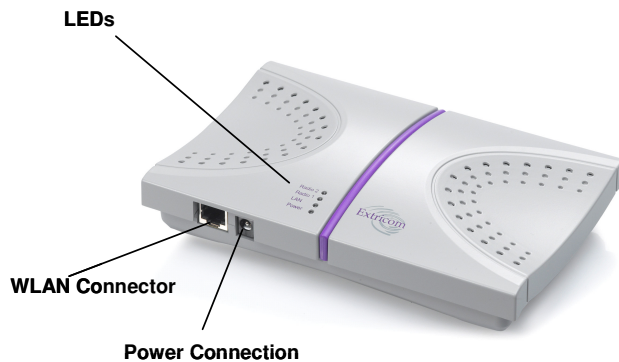

Figure 15. Extricom EXRP-20/40 AP

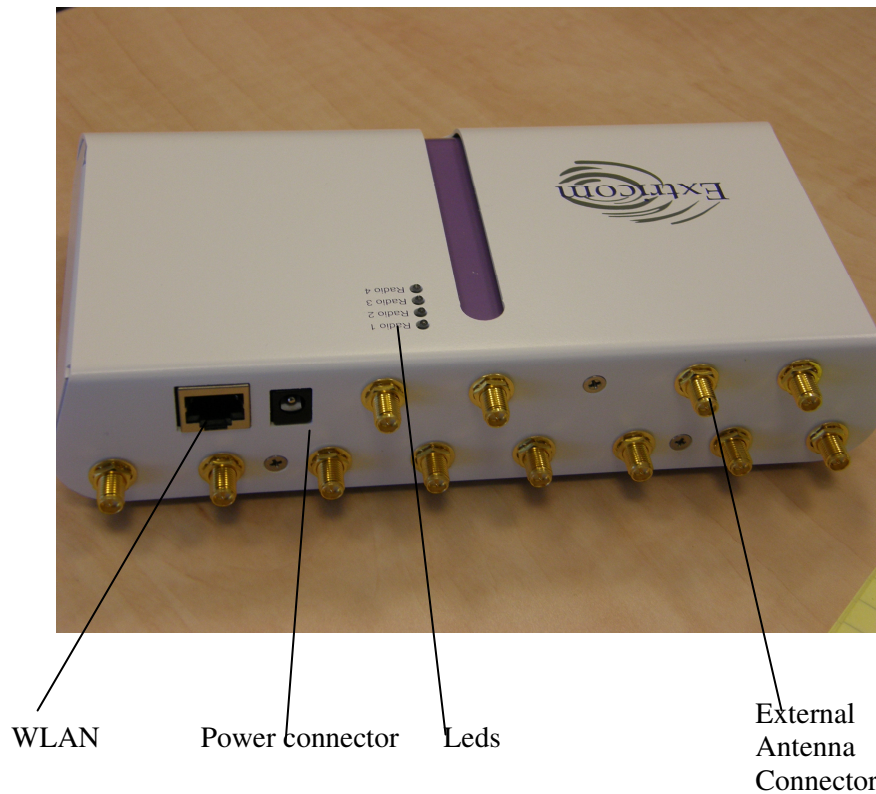Table 3 describes the Extricom Access Point connectors.

WLAN   Power connector   Leds   External Antenna Connector

Table 3. Extricom AP Connectors

Connectors	Description
Power	✍ External power is not required for most applications. Power is supplied through the Ethernet (PoE). In case of an external power requirement by the application, use a UL Listed LPS (Limited Power Source) or NEC Class II adapter. Rating – Input: 90-240VAC 0.8A max. Output: 48VDC 0.56A max. **– *Due to regulatory requirements and pending certification process for the power supply connector - external power supply should not be used.***
WLAN	RJ-45 connector – used to connect the Extricom AP to the Extricom switch. Power is provided by the Extricom switch to the AP when directly connected to it.

Table 4. Extricom EXRP-20 AP LEDs

LEDs	Color	Description
Radio 1	Green	1st Radio is active
	Red	1st Radio is malfunctioning
	Off	1st Radio is off
Radio 2	Green	2nd Radio is active
	Red	2nd Radio is malfunctioning
	Off	2nd Radio is off
LAN	Green (flashing)	Connection to Extricom switch is active
	Off	Not active
Power	Green	On/Off

Table 5 Extricom EXRP-40 AP LEDs

LEDs	Color	Description
Radio 1	Green	1st Radio is active
	Red	1st Radio is malfunctioning
	Off	1st Radio is off
Radio 2	Green	2nd Radio is active
	Red	2nd Radio is malfunctioning
	Off	3rd Radio is off
Radio 3	Green	3rd Radio is active
	Red	3rd Radio is malfunctioning
	Off	3rd Radio is off
Radio 4	Green	4th Radio is active
	Red	4th Radio is malfunctioning
	Off	4th Radio is off

The EXRP-20/EXRP-20 and EXRP-40/EXRP-40 are virtually identical in appearance. Please double-check the label on the underside of the unit to make sure you have the right type of AP for your deployment.

Connecting the Switch and Access Points

Extricom's switch is connected to the wired LAN and the APs that are located throughout the enterprise.

To connect the switch and access points:

1. Using a CAT-5e/6 100/1000Mbps cable, connect the switch RJ-45 LAN connector (located on the front panel of the switch, (refer to *Figure 12*) to the LAN switch.

2. Using a CAT-5e/6 cable, connect each AP (refer to *Figure 12*) to one of the switch's RJ-45 WLAN connectors. For those APs located over 100 meters from the switch, an Extricom EXRE-10 Range Extender should be used.

3. Connect the power cable to the power connector located on the rear panel of the switch, and plug the other end of the power cable into a power source.

4. Verify that the Power LEDs on both the switch and connected APs are green.

> ✍ Additional APs can be connected/disconnected while the switch is active.

Mounting the Access Points (Optional)

Extricom APs can be mounted on the wall. To mount the APs, you will need two stainless steel pan head 8x1-1/4" self-tapping Phillips screws.

To mount the Access Points:

1. Place the installation template (refer to *Access Point Mounting Template* on page 70) on the wall where you want to mount the AP.

2. Mark the "Point for Drilling" locations on the wall.

3. Screw the two stainless steel pan head 8x1-1/4" self-tapping Phillips screws into the wall leaving enough of the screws protruding to enable you to hook the AP over the screw.

4. Align the holes on the back of the AP with the screws and slip the AP into place.

> ✍ Position the AP so that the connectors are on the bottom left corner of the AP.

Configuring the Extricom WLAN System

After connecting the switch and AP, configure the Extricom WLAN system through Extricom's web configuration GUI using a terminal or PC connected to the same LAN as the switch.

To access the Extricom web configuration pages:

1. In your Web browser, enter the following: `https://<IP address of the switch>`

    where `<IP address of the switch>` is the IP address of the switch provided with your purchase (for example, the URL should be https://1.2.3.4 if the IP address of the switch is 1.2.3.4).

> ✍ If you did not receive a switch IP address with the switch, the factory default value for the switch IP address is 192.168.1.254.

> ✍ If you are using the default IP settings, do not place a router between the user PC and the switch.

The *Login* page appears.
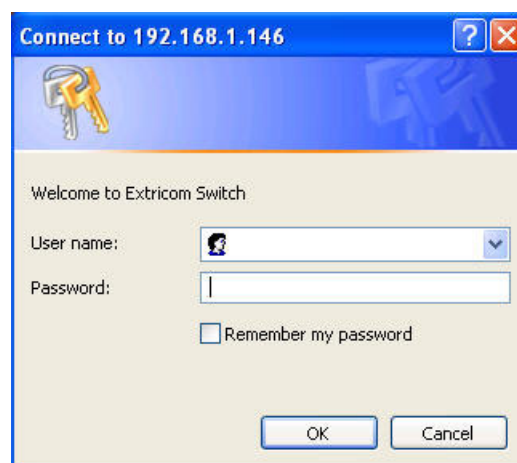
Figure 16. Login Page

2. Enter your user name and password (as provided by your system installer) and click **OK**. The *Summary* page appears.

	If you did not receive a user name and password with your switch, use the following factory default user name and password:
✍	**user name:** *admin*
	password: *Switch1*
	The user name and password are case-sensitive.

Using the Extricom Web Configuration Pages

The Extricom Web configuration pages have three main areas:

- The navigation tree

- The menu bar

- The work area

Figure 17. Typical Web Configuration Page

The *navigation tree* provides access to the following Extricom Web configuration pages:

- *LAN Configuration* – used for configuring LAN parameters as well as Events and Statistics.
- *WLAN Configuration* – used for configuring WLAN parameters .
- *SSID & Security* – used for configuring SSID and security parameters and/or passwords and external RADIUS servers and their timeouts for redundancy.
- *Advanced Features*– used for configuring redundancy, TrueReuse, 802.11d, IDS, SNMP and Rogue AP detection parameters.
- *Centralized Configuration* – used for configuration and control of remote switches from a Master switch
- *Access Points* – used for powering and activating/deactivating connected APs.
- *Utilities* – used for viewing the system configuration file, or to restore system default settings, upgrade the switch firmware, set the time and date manually or automatically, and reboot the switch.
- *Password Management* – used for changing system passwords.
- *Reports & Events* – used for viewing system events and performance reports.
- *Summary* – provides a comprehensive summary of the system configuration.
- *About* – provides basic information about the Extricom WLAN system firmware versions.

✍	Alternatively, you can access the: • *Summary* page by clicking **Summary** in the menu bar. • *About* page by clicking **About** in the menu bar.

The *work area* displays the configuration pages selected in the navigation tree. Use this area to configure the Extricom parameters.

After changing the values of the configuration parameters on a web configuration page, you must click **Update** to save the new configuration. An update status message appears at the top and bottom of the page informing you if the update was successful (refer to *Figure 18*). If the update was not successful, a description of the problem is displayed (refer to *Figure 19*).

✔ Updated Successfully   ❗ Error: Select At Least 1 Basic Rate

Figure 18. Successful Update Message   *Figure 19. Unsuccessful Update Message*

✍	The new configuration only takes effect after rebooting the switch (refer to *Rebooting the Extricom Switch* on page 56).

Configuring the LAN Parameters

In the *LAN Configuration* page, you can configure the following:

- The LAN IP address and network mask, as well as a backup address and mask.

- The LAN interface and management VLAN tag IDs.

- The default gateway.

- The address of the System Log and how often (if at all) the log is written to.

- The address of the Monitor Log and how often (if at all) the log is written to.

.

To configure LAN parameters:

1. Click **LAN Configuration** in the navigation tree. The *LAN Configuration* page appears (refer to *Figure 20*).

Figure 20. LAN Configuration Page

2. Configure the LAN parameters. Refer to *Table 6* for a description of the LAN parameters.

Table 6. LAN Configuration Parameters

Field	Description
IP Address	Enter the main IP address of the Extricom Switch.
Network Mask	Enter the network mask address.
VLAN	Management VLAN tag ID for VLAN access to manage the switch.
2nd IP Address	Enter the backup IP address of the Extricom Switch.
2nd Network Mask	Enter the backup network mask address.
2nd VLAN	2nd Management VLAN tag ID.
Default Gateway	Enter the default gateway address. ✍ The default gateway must be on the same subnet as 1st or 2nd IP address.
Switch name	A textual descriptor of the switch. Up to 32 characters.
Monitor On	The Monitor Log is only relevant for a dedicated network status monitoring tool that is not provided with the switch. By default, this option should not be checked. ✍ Check this option only if you are using the Extricom dedicated network monitoring tool, otherwise unnecessary data packets are sent through the Ethernet.
Monitor Address	Enter the address of the Monitor Log if using the Extricom dedicated network monitoring tool.
Monitor Interval (sec)	Specify how often information is sent to the Monitor Log. If using the dedicated network status monitoring tool, 1 second is the recommended interval. ✍ Configure this parameter only if using the dedicated network monitoring tool.
Syslog On	Check the *Syslog On* option to record system information in the System Log. ✍ In most common operational scenarios, this option should be unchecked (unless used for troubleshooting).
Syslog Address	Enter the IP address of the computer to which to send the System Log.

Field	Description
Syslog Interval (sec)	Specify how often information is sent to the System Log. 3600 seconds is the recommend default interval.

> ✍ If you detect a problem, you can decrease the *Syslog Interval* to receive updates more frequently.

3. Click **Update** to save the configuration.

> ✍ The new configuration only takes effect after rebooting or reconfiguring the switch (refer to *Rebooting the Extricom Switch* on page 56).

Configuring WLAN Parameters

In the *WLAN Configuration* page, one can configure the following WLAN parameters for each Radio (Radio 1 or Radio 2):

- Channel options.
- Data rates.
- SSIDs.

> ✍ There are up to 16 different SSIDs per channel, 32 SSIDs per system.

> ✍ Refer to *Configuring SSIDs* on page 32 for an explanation of the relationships between radios, channels, SSIDs, and VLANs.

To configure WLAN parameters:

1. Click **WLAN Configuration** in the navigation tree. The *WLAN Configuration* page appears (refer to *Figure 21*).

2. Select the "Country / Regulatory Domain" which meets your locale from the list.

3. Click the Radio tab for which you want to configure the WLAN parameters.

4. Configure the WLAN parameters. Refer to Table 7 for a description of the WLAN parameters.

Figure 21. WLAN Configuration Page

	EXRP-40 - Radio 3 and 4 currently are not supported and do not appear in the Web Configuration GUI.

Table 7. WLAN Configuration Parameters

Field	Description
Channel Options	
Enable	Check this box if you want to enable the radio.

WLAN Mode	Select the WLAN mode. Possible options are:
	● 802.11a
	● 802.11b
	● 802.11g for pure mode
	● 802.11b/g for mixed mode
	
	✍ Since the Extricom solution can support two simultaneous channels in the same frequency band, selecting the WLAN mode enables the Extricom solution to offer *same band* capability. This means that both radios can be set to:
	
	  1. 802.11a & 802.11a
	  2. 802.11b & 802.11b
	  3. 802.11b & 802.11g
	  4. 802.11g & 802.11g
	  5. 802.11b/g & 802.11b/g
	
	And any other combination.

Channel	Select the channel. The options available are based on the country and WLAN mode.
Maximum Retries	Select the number of times to try to resend a packet if the transmission of the packet fails.
Allow Rate Adaptation	Check this box if you want to enable rate adaptation. ✍ All enabled rates participate in the rate adaptation..

Field	Description
Rate Configuration	For each of the data rates listed, select whether the rate is *Basic*, *Optional*, or *Disabled*.
	When configuring the data rates, you should consider the data rate capabilities of the wireless devices in your enterprise.
	• *Basic* – The *Basic* data rates are usually the data rates that the vast majority of your wireless devices can support. Only wireless devices that support all the *Basic* data rates will be connected to the WLAN system. Therefore, it is recommended that you configure a minimal number of *Basic* data rates that the vast majority or all your wireless devices can support. When working in Mixed Mode, there should be at least one *Basic* data rate from the 802.11b rates.
	• *Optional* – If you configure a data rate as *Optional*, the network will provide that data rate to wireless devices that can support it.
	• *Disabled* – *Disabled* data rates are not available to wireless devices.
	✍ Since the Extricom WLAN system allows for dense deployment of APs, it is recommended, where applicable, to disable low data rates. Not doing so could possibly lead to an "edge user" effect, in which a client reduces aggregate network throughput by moving to the edge of the coverage area.
Short Preamble:	This option becomes available only when selecting 802.11b as the WLAN mode. In this case, mark the checkbox to allow a short preamble.
Setup SSIDs	
Assigned SSIDs	Displays the list of SSIDs assigned to the channel.
Remove from Channel	To remove an SSID from the channel, select an SSID and check the *Remove from Channel* option. The SSID is removed from the *Assigned SSIDs* list, and appears on the *Unassigned SSIDs* list after clicking **Update**. ✍ In the Extricom WLAN system, a single channel can support up to 16 different SSIDs (system limit of 32).

Field	Description
Other SSIDs	Displays the list of SSIDs configured but not assigned to the channel.
Add to Channel	To add an unassigned SSID to the channel, select an SSID from the *Other SSIDs* list and check the *Add to Channel* option. The selected SSID is removed from the *Other SSIDs* list and added to the *Assigned SSIDs* list after clicking **Update**.
New SSID	To create a new SSID and assign it to the selected channel, enter a unique SSID name and check the *Create and Assign* option. The new SSID is added to the *Assigned SSIDs* list after clicking **Update**. ✍ The character Space may be used in SSID name.
Create and Assign	Check to assign the new SSID. The new SSID is added to the *Assigned SSIDs* list after clicking **Update**.
All SSIDs	Displays a list of all SSIDs configured for the switch. (assigned/unassigned)
Delete Permanently	To delete an SSID from the switch, select an SSID from the *All SSIDs* list and check the *Delete Permanently* option. The SSID is removed from any list on which it appears after clicking **Update**.

5. Click **Update** to save the configuration.

✍ The new configuration only takes affect after rebooting or reconfiguring the Extricom Switch (refer to *Rebooting the Extricom Switch* on page 56).

6. To configure WLAN parameters for another radio, click the tab for that radio, configure the WLAN parameters, and click **Update** to save the configuration.

7. To configure SSID and security settings, click **Edit SSID & Security Setting**. Refer to *Configuring SSIDs* on page 32, and *Configuring Security Definitions* on page 37.

✍ To configure SSID and security settings, you can also click **SSID & Security** in the navigation tree.

Configuring SSIDs

An *SSID* (Service Set Identifier) is the name of the network. Wireless devices must connect to a specific SSID which determines the pre-defined set of privileges, settings, and limitations (such as security definitions, access privileges, VLAN assignments, etc.) of the network. Each channel can support multiple SSIDs, thus creating "virtual" networks on the same channel.

The following is the data structure used by the Extricom system:

- Each radio is assigned one channel.

- Each channel can support up to 16 different SSIDs.

- Each SSID can be associated with a VLAN tag.

- The same SSID name cannot be repeated for different channels.

Table 8 shows this data structure with an example of possible channel, SSID and VLAN tag assignments.

<p align="center">*Table 8. Data Structure Example*</p>
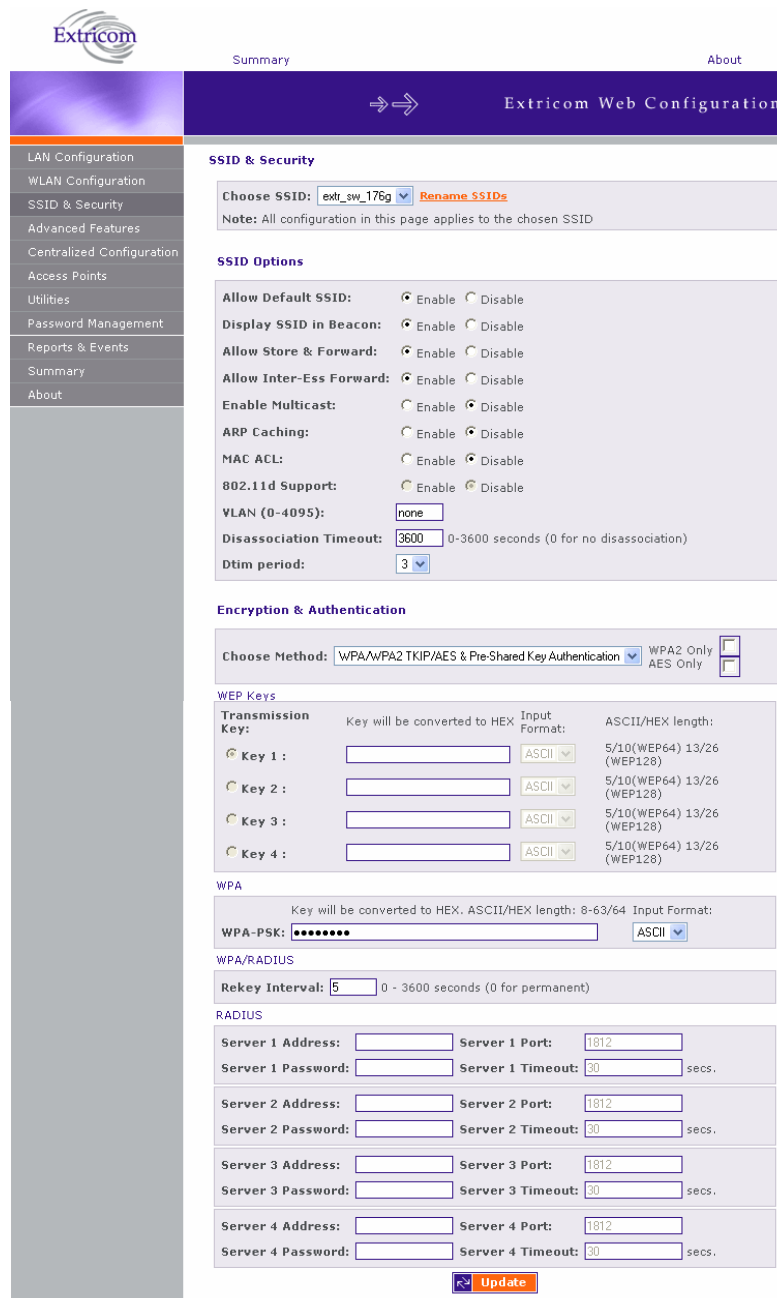
Access Point	Channel	SSID	VLAN tag
First Radio	1	Network1	1
		Network2	2
		…	…
		…	…
		Network15	15
		Network16	16
Second Radio	6	Network17	17
		Network18	18
		…	…
		…	…
		Network31	31
		Network32	32

In the *SSID & Security* page, *SSID Options* section, the following SSID parameters can be configured to:

- Allow Default SSID.

- Display SSID in Beacon.

- Allow Store & Forward.

- Allow Inter-Ess Store & Forward

- Enable Multicast

- ARP Caching

- Assign a VLAN to the SSID.

- Set a disassociation timeout.

- Set DTIM period.

To configure SSID parameters:

1. Click **SSID & Security** in the navigation tree. The *SSID & Security* page appears (refer to *Figure 22*).

Figure 22. SSID & Security Page

2. Configure the SSID parameters. Refer to *Table 9* for a description of the SSID parameters.

Table 9. SSID Parameters

Field	Description
SSID	
Choose SSID	Select an SSID from the *Choose SSID* dropdown list.
	To add/remove SSIDs from this list, click *WLAN Configuration* (refer to Table 7).
SSID Options	
Allow Default SSID	If this option is *enabled*, a wireless device will be allowed to connect even without requesting a specific SSID (i.e., "default" or "any" SSID) to the Extricom WLAN. If this option is *disabled*, then a wireless device needs to connect to a specific SSID in the Extricom WLAN.
Display SSID in Beacon	This option provides an additional (though limited) level of security. The AP sends out a beacon with information about the network. If this option is enabled, the SSID appears in the beacon. If disabled, the SSID does not appear in the beacon.
Allow Store & Forward	If this option is *enabled*, two wireless devices connected to the Extricom WLAN with the same SSID can communicate and transfer data to each other. Traffic between wireless devices will not be forwarded to the LAN switch.
	If this option is *disabled*, all traffic goes through the LAN switch. . This could be used by IT managers to apply security settings or various policies in the LAN network.
	✎ Disabling *Allow Store & Forward* disables the *Allow Inter-Ess Forward* option.

Field	Description
Allow Inter-Ess Forward	If this option is *enabled*, two wireless devices connected to the Extricom WLAN with different SSIDs will be able to communicate with each other without going through a router. Traffic between wireless devices will not be forwarded to the LAN switch.
	✍ This option must be enabled on both SSIDs. In order for wireless devices, associated to different SSIDs, to be able to communicate with each other, the SSIDs must be defined on the same VLAN (or no VLAN at all).
	If this option is *disabled*, all traffic goes through the LAN switch. This could be used by IT managers to apply security settings or various policies in the LAN network.
Enable Multicast	This option, when enabled, provides support of multicast and broadcast packets for the selected SSID. Multicast and/or broadcast packets shall be transmitted from all APs.
ARP Caching	This option, when enabled, provides an immediate response to ARP requests directed towards WLAN stations associated with the selected SSID. The Switch answers on behalf of the WLAN stations.
MAC ACL	This option, when enabled, allows a user to add a MAC access list to the specific SSID. Only clients with MAC address included in this list are allowed to access the network.
802.1d Support	Enables support of the 802.11d standard .The purpose of this standard is to provide regulation domains for each country in a predefined list. The regulation domains and Country information are provided as part of Beacons & Probe response.
VLAN	Enter a VLAN tag to assign to the SSID. Assigning a VLAN to an SSID enables you to control a wireless devices' privileges through the existing wired network definitions.
Disassociation Timeout	Enter the amount of time (in seconds) a wireless device can remain inactive (no data sent to or from the wireless device) before automatically disconnecting from the network.

Field	Description
DTIM Period	The period of time after which broadcast and multicast packets are transmitted to mobile clients in the Active Power Management mode.
	Select the DTIM period for the selected SSID. This is relevant for clients that want to utilize the power management capability. The possible values are 1-5. The default is 3.
	✍ A high DTIM value may cause these clients to lose connection with the network.

✍ The remaining parameters in the *SSID & Security* page are described in *Configuring Security Definitions* on page 37).

3. Click **Update** to save the configuration.

✍ The new configuration only takes affect after rebooting the switch (refer to *Rebooting the Extricom Switch* on page 56).

Configuring Security Definitions

In the *SSID & Security* page *Encryption & Authentication section* (refer to *Figure 22*), the following security definitions can be configured:

- Type of encryption.

- Type of authentication.

✍ With some configurations, you can use encryption without authentication. However, for a higher level of security, it is recommended to use both encryption and authentication.

✍ Extricom system eases the configuration of the SSID security parameters by providing a list of available combinations of Encryption and Authentication protocols

Security definitions are configured for each SSID individually.

To configure the security definitions:

1. Click **SSID & Security** in the navigation tree. The *SSID & Security* page appears (refer to *Figure 22*).

2. Select the SSID from the *Choose SSID* dropdown list for which you want to configure the security definitions.

3. Configure the security definitions for the selected SSID. Refer to *Table 10* for a description of the Security parameters.

Table 10. Security Definition Parameters

Field	Description
Encryption & Authentication	
Choose method	Define the method of encryption and authentication.
	A combination of encryption and authentication methods may be selected from the options detailed in the drop-down list.
	Encryption cipher
	There are three types of encryption ciphers available:
	• *WEP64* – Wired Equivalent Privacy (802.11 encryption protocol). This is a very basic encryption level. (AKA WEP40)
	• *WEP128* – This encryption is similar to WEP64, but the WEP keys are longer. (AKA WEP104)
	• *TKIP* – Temporal Key Integrity Protocol. This is a more secure and more advanced method of encryption as a part of the WPA standard.
	• *AES (CCMP)* – Advanced Encryption Standard.(Cipher Block Chaining Message Authentication Code Protocol) is currently the most advanced and secured method of WiFi encryption and is part of 802.11i (WPA2) standard.
	Authentication method
	Authentication is used to identify if a wireless device is authorized to connect to the WLAN, and verifies the wireless device's identity. Authentication methods (such as specific EAP methods available in the *WPA/WPA2 (RADIUS)* option) also verify that the association process is secured. Authentication utilizing WPA/WPA2 (RADIUS) can also support encryption key changes.
	The following methods are available:
	• *802.1x* – if the cipher is WEP or WEP104
	• *WPA/WPA2-PSK* or *WPA/WPA2 (RADIUS)* – if the cipher is TKIP or AES
	• *Supported protocols: EAP, TLS, TTLS, PEAP, LEAP and MD5*
	✎ When choosing the encryption cipher and authentication methods, one should take into account wireless devices' capabilities.
	✎ The Extricom system supports "WPA2 Mixed Mode". This mode permits the coexistence of WPA and WPA2 clients on the same SSID. WPA2 mixed mode allows "Old" WLAN clients with "New" WLAN clients on the same SSID during transition period.

Field	Description
	Any security combination (Encryption and Authentication) can be selected by the user as a combination of the list and the check boxes.
WEP Keys	The *WEP Keys* area is only enabled if the cipher selected in the **Choose Method** field is WEP or WEP104. In the WEP Keys area, you define the WEP Key that is used for encrypting or decrypting. You can define all four WEP keys. For each key you define, select the input format (ASCII or HEX) and enter the key according to the following table: {table}

Table inside WEP Keys row:

Cipher	ASCII	HEX
WEP64 (or WEP64+802.1x)	5 characters	10 digits
WEP128 (or WEP128+802.1x)	13 characters	26 digits

Field	Description
Transmission Key	Select the WEP64/WEP128 key to be used for transmitting the data from the AP.
WPA	The WPA area is only enabled if the cipher selected in the **Choose Method** field is WPA/WPA2 TKIP/AES.
WPA-PSK	If WPA/WPA2 with Pre-Shared key authentication is used, the WPA-PSK field is enabled. In this case, select one of the following input formats, and enter the corresponding key listed: ● For ASCII, enter 8-63 characters. ● For HEX, enter 64 digits.
WPA/RADIUS	
Re-key Interval	Enter the amount of time (in seconds) that elapses before the Group Key is changed.
RADIUS	Define the RADIUS servers parameters if: ● The cipher is WEP64/WEP128, and the 802.1x authentication method is selected. ● The cipher is TKIP/AES, and the WPA/WPA2 (RADIUS) authentication method is selected.
Server Address	Enter the address of the RADIUS server. ✍ Use Server # 1 if only one server is used. Use consecutive servers if several servers are used.
Server Port	Enter the RADIUS server port.
Server Password	Enter the RADIUS server password.
Server Timeout	Enter the time which the Extricom switch waits for the RADIUS server response.

Encryption and Authentication methods.

The "Choose Method" drop down list in "Encryption & Authentication" displays the following items for user selection:

- None
- WEP64 (Open)
- WEP128 (Open)
- WEP64 & 802.1x Authentication
- WEP128 & 802.1x Authentication
- WPA/WPA2 TKIP/AES & Pre Shared Key Authentication
- WPA/WPA2 TKIP/AES & 802.1x Authentication

When the "WPA2 Only" is checked, only Clients with WPA2 support are allowed access to the WLAN.

When the "AES Only" is checked, only Clients with AES support are allowed access to the WLAN.

Cisco LEAP protocol (not CMIC & CKIP) is supported under "*WEPxxx & 802.1x Authentication*".

Multiple RADIUS and RADIUS redundancy

RADIUS is a common authentication protocol utilized by the 802.1x security standard (often used in wireless networks). Although RADIUS was not initially intended to be a wireless security authentication method, it improves the WEP encryption key standard, in conjunction with other security methods such as EAP-PEAP.

In an enterprise environment, several RADIUS servers may be used for backup and also for serving different geographical locations. Up to four different RADIUS servers can be defined for each SSID. RADIUS redundancy is based on the assumption that the user database is identical in all RADIUS servers and that users are listed in all servers with the same credentials.

Switchover from one RADIUS server to another takes place after consecutive failures of the server. The order of priorities is 1 to 4.

4. Click **Update** to save the configuration.

> ✍ The new configuration only takes affect after rebooting or reconfiguring the switch (refer to *Rebooting the Extricom Switch* on page 56).

Advanced Configuration of the Extricom WLAN Architecture

The advanced configuration page of Extricom WLAN includes the following tabs:

- TrueReuse
- Advanced
- Rogue
- IDS

Advanced Tab

The **Advanced** tab includes the capability to configure the following:

- Redundancy parameters.
- SNMP parameters.
- 802.1d parameters

In redundancy mode, two identical switches (H/W and configuration) are installed with the same number of connected APs.

One of the switches is configured as the Main switch, while the second is in Stand-by mode, and can switch over as soon as the switch-over conditions are met.
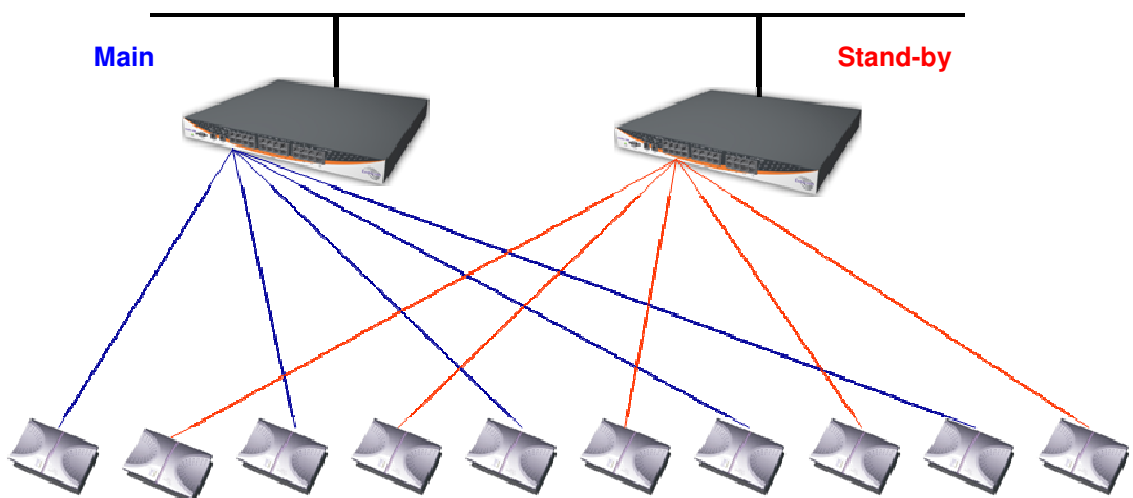
Figure 23. Redundancy deployment

To configure the Advanced Features parameters:

1. Click **Advanced Features** in the navigation tree. The *Advanced* configuration page appears (refer to *Figure 24*).

2. Select **Advanced** tab for configuring redundancy, TrueReuse and/or SNMP and/or 802.11d parameters

3. Configure the redundancy, and SNMP parameters. Refer to *Table 11* for a description of the Advanced Features configuration information.

4. Select **Rogue** tab for configuring Rogue AP detection and parameters (refer to *Figure 25*).

5. Configure Rogue AP parameters. Refer to *Table 12* for a description of the Rogue AP configuration information.

Figure 26 Advanced Features

Table 12. Advanced Configuration Tab

Field	Description
True Reuse	Select True Reuse in the appropriate Radio checkbox if you wish to use this mechanism.
	TrueReuse technology multiplies the bandwidth of a standard 802.11 channel by dynamically optimizing the reuse of each frequency. Within a channel blanket, up to three APs are permitted to simultaneously transmit on the same channel, when the TrueReuse algorithm determines that they can do this without causing each other co-channel interference
Redundancy Status	Enables designating pairs of switches, one as active and one as standby.
Monitored IP	The IP address of the other switch.
Reference IP	The IP address of a reference network element. This is used to test connectivity to the LAN.
Keep Alive Interval	The interval in mSec between the Keep Alive packets.
Keep Alive Check Threshold	The number of lost keep-alive packets before switching to the stand-by switch.
SNMP	
Enable Traps	Check this option to enable SNMP traps.
Community name	Enter the community name.
Manager IP	Enter the manager's IP address.
802.1d	
All ESSID	Enabled for all SSIDs
Per SSID	For a specific SSID , you need to enable this option then go to SSID & Security to set the 802.1d option for that SSID.

At present, the following Traps are sent from the Extricom switch to the device on the LAN running the SNMP manager.

1. ***Client <Client MAC> has associated to <SSID> -*** This trap is sent after successful association with the client MAC address and the SSID the client associated to.
2. ***Client <Client MAC> has disassociated from <SSID>. Reason: <Reason>*** - This trap is sent after client disassociation/disconnection from an SSID. The reason code is an 802.11 reason code.
3. ***Key error! Client: <Client MAC> - SSID: <SSID> - Cipher suite: <Cipher>*** - This trap is sent in case of any key error during four-way handshake (MIC error) or as a result of any key error when receiving data from client..
4. ***New Rogue Detected <BSSID><Port><Radio><Channel><RSSI>*** - This trap is sent when a new Rogue AP is detected. The trap includes the AP's BSSID, the switch port which detected the Rogue AP, the channel of the Rogue AP and the Rogue AP signal level (RSSI).
5. ***Rogue Updated <BSSID><Port><Radio><Channel><RSSI>*** - This trap is sent when an existing previously detected Rogue AP is re-detected with change in one of its parameters. The

trap includes the AP's BSSID, the switch port which detected the Rogue AP, the channel of the Rogue AP and the Rogue AP signal level (RSSI).

6. ***Rogue Removed <BSSID><Port><Radio><Channel><RSSI>*** - This trap is sent when a new Rogue AP is detected. The trap includes the AP's BSSID, the switch port which detected the Rogue AP, the channel of the Rogue AP and the Rogue AP signal level (RSSI).

7. ***RADIUS Timeout <ESSID><# of timeouts>*** - This trap is sent when the RADIUS timeout had elapsed and includes the ESSID and the number of timeouts that occurred.

8. ***RADIUS Redundancy Selection Changed <ESSID><#of RADIUS>to<# of RADIUS>*** - This trap is sent when the RADIUS selection has been changed from one server to another, and includes the ESSID, the number of the previous server and the number of the new server.

9. ***No RADIUS <ESSID>*** - This trap is sent when the last RADIUS server failed and includes the ESSID.

10. ***Configured and connected APs of channel [<channel number>]*** - This trap provides a summary of all APs and their status. This trap is typically sent after an event of AP removal or connection from/to the switch.

11. ***AP <ap number in hex base> has been connected*** - This trap is typically sent after an event of connecting an AP to the switch.

12. ***AP <ap number in hex base> has been disconnected*** - This trap is typically sent after an event of disconnecting an AP from the switch.

13. ***Reference Host is up*** – This trap is sent when the Reference host is up and active. Sent by the Main switch.

14. ***Reference Host is down*** - This trap is sent when the Reference host is down. Sent by the Main Switch.

15. ***Standby Switch is up*** - This trap is sent when the Standby Switch is up & active.

16. ***Standby Switch is down*** - This trap is sent when the Standby Switch is down.

17. ***Inactive - Reference Host is down*** - This trap is sent when the Reference host is down, and hence the Main switch becomes inactive.

18. ***Inactive Standby Switch*** - Main Switch is up - This trap is sent when the Main Switch becomes active again and hence the Standby Switch becomes inactive (Switch over).

19. ***Main Switch is active again*** - This trap is sent when the Main Switch changes status from inactive to active and regains the Main switch status.

20. ***Failure detected in Main Switch*** - Switching Over. - This trap is sent when the Main Switch is about to go down and the Standby Switch is becoming Active.

Rogue Tab

A "Rogue" AP is an AP which is connected to an organization's wired LAN without proper authorization. Such an AP represents a security hazard since the organization cannot control that AP's over-the-air security measures.
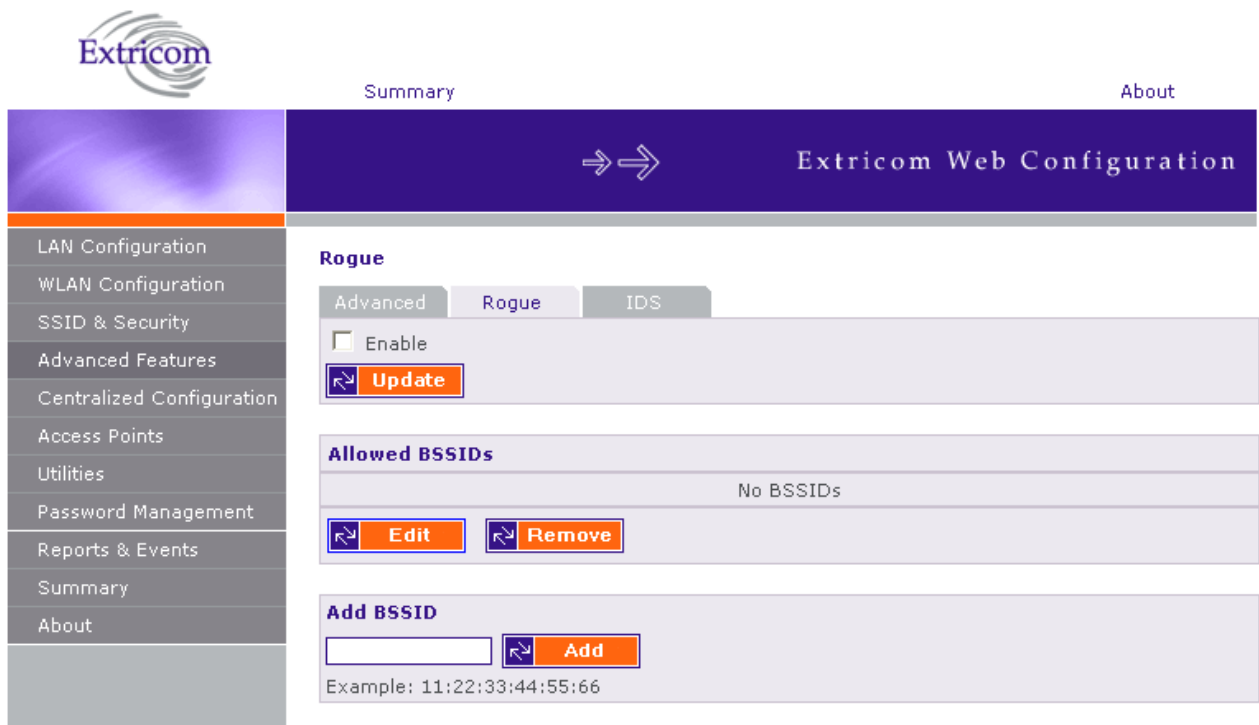
Rogue APs pose threats to the enterprise. These threats vary and may include any of the following:

- WEP key cracking.

- Password hijacking.

- IP and MAC spoofing.

- Channel jamming.

To configure Rogue AP detection parameters refer to *Table 13* and *Figure 27*

Table 13: Rogue AP Tab

Field	Description
Enable	Enables Rogue AP detection function
	✍ When Rogue AP detection is enabled the 2nd radio is not used for service.
Allowed BSSIDs	
	Displays a list of authorized APs (White List)
Remove	Removes checked BSSIDs from the white list.
Edit	Provides capability of editing the white list
Add BSSID	
Add	Adds the BSSID in the text box to the white list. BSSIDs may be added from events log.

Figure 27: Rogue AP configuration.

IDS Tab

Intrusion detection system (IDS): Malicious WLAN clients can cause a denial of service by flooding the WLAN network. Denial of services is identified through attack signatures or other factors, most of which are well-known. The IDS tab allows the user to enable this mechanism, set thresholds for identifying an attack and choose type of attack to be detected. The IDS mechanism detects 802.11 duration attack and 802.11 management messages flooding attacks. Upon attack detection, the system sends a Trap message notifying the event and when applicable provides attacker details (i.e. MAC address). Network administrator can use this information to take action and block malicious users.

Figure 28: IDS Configuration

Table 14: IDS Tab

Field	Description
Enable	Enables Intrusion detection
Duration Attack	
Enable	Enable - tick duration attack check box
Duration Attack	WLAN devices reserve the channel for a particular period of time and then start using the radio channel. This reservation of channel is for a particular period of time. This time period is the Network Allocation Vector (NAV) in the 802.11 .By using high NAV values an attacker can prevent other WLAN devices to utilize the wireless network.
Check box 11b/g , 11a	The Max NAV period after which attack is discovered.
Flood attacks	
Malicious users can flood the WLAN with 802.11 management messages	
Events thresholds	Number of events per second
Per station	Number of time a specific event is allowed during the event threshold. Each of the possible attack types listed below is assigned a limit **per station.**
All station	Number of times a specific event is allowed during the event threshold. Each of the possible attack types listed below is assigned with a limit to **all stations**
Authentication Flood	Flooding the WLAN with authentication requests
De-Authentication Flood	Flooding the WLAN with De-authentication requests
Association Flood	Flooding the WLAN with association requests
Dis-Association Flood	Flooding the WLAN with Dis-association - requests
Invalid Authentication Request	Flooding the WLAN with Invalid authentication requests
EAPOL Start	Flooding the WLAN with EAP authentication "EAPOL Start"
EAPOL Logoff	Flooding the WLAN with EAP authentication "EAPOL Logoff"

Centralized Configuration Settings

Centralized Configuration allows managing a group of identical Extricom switches (*slaves*) from one single *master* switch. The user should decide which switch will act as *master*. Extricom Switches have a built-in mechanism to discover the presence of other switches. In addition, the user is given the ability to manually configure the entries in the table of switches.

Configuration changes on the *master* switch are propagated to the *slave* switches via a secured mechanism. For this authentication scheme to work, the *slave switches* need to obtain a copy of the *master*'s public key prior to the centralized configuration. This is done in the initial phase of the switch's configuration by first retrieving the *master*'s public key and then uploading it to the designated *slave switches*.

Figure 29. Central Configuration Page

To configure Centralized Configuration parameters:

Initial Setup

1. Configure the LAN settings on the *Master* switch

2. Generate an SSH key pair on the *Master* switch. This is done by clicking on the **Update** button next to the generate New SSH Keys.

3. Retrieve the SSH public key from the *Master* switch and save it in a file on your PC.

4. Manually configure each of the *Slave* switches' LAN settings, and continue by uploading the previously saved master's public key on every *Slave* you wish to manage. This allows the *Slave* switch to be configured only by the *Master* switch which generated the public key.
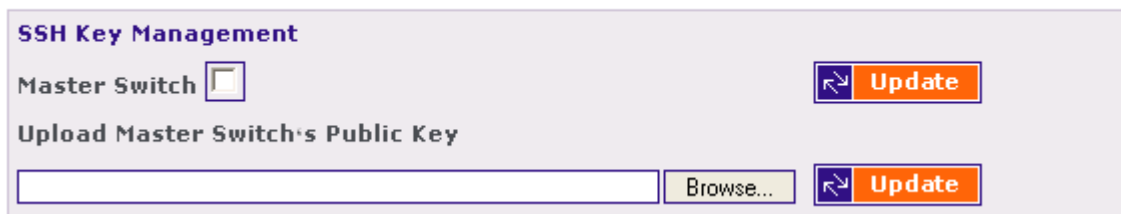
Figure 30. Central Configuration Page

Slave Switch Configuration

1. On the *Master* switch, open the Centralized Configuration web page and click on the **Update** button in the Switches Table section. This will retrieve and generate the *Slave* switches' information and all the relevant dialog boxes will be populated with data.

2. *Slave* switches can be added to the switches table by creating a new entry. Simply enter the new switch name and its IP address, and continue by clicking on the **Update** button.

3. Configure a slave switch, i.e. Copy the configuration file of the master with appropriate changes to the slave.
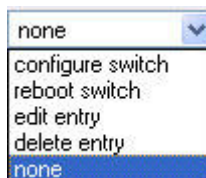
Figure 31. Action options

4. Reboot the *Slave* switches.

Access Point Powering

The only configuration required for APs in the Extricom WLAN architecture is activation or deactivation of specified AP ports..

To access the Access Points page:

● Click on the **Access Points** in the navigation tree. The APs configuration page appears (refer to *Figure 32*).

Figure 32. APs Configuration Page

To configure APs:

● Configure the APs and click **Update**. Refer to *Table 15* for a description of the APs configuration information.

Table 15. AP Configuration Page

Field	Description
Active APs	Checked boxes indicate ports with attached and configured APs. If a port is "powered" but not "active", the AP is malfunctioning. This field is read-only.
Powered APs	Checked boxes indicate ports with attached and powered-on APs. Un-checking a box will turn off the power on the AP. The box must be re-checked to enable the port.

> ✍ You do not need to reboot the switch for changes in AP configuration to take effect.

> ✍ The Access Points page of the EXSW800 displays 8 check boxes. The Access Points page of the EXSW-1200 displays 12 check boxes.

Configuration of the Extricom WLAN Architecture Utilities

The utilities page includes two tabs and serves the following function:

- Viewing the System Configuration File.

- Uploading a new Configuration File (replace existing).

- Upgrading Extricom Firmware.

- Reconfiguring the Extricom system

- Rebooting the Extricom switch.

- Setting the Time and Date (separate tab).

To access the Utilities configuration pages:

- Click **Utilities** in the navigation tree. The *Utilities* configuration page appears (refer to *Figure 33*).
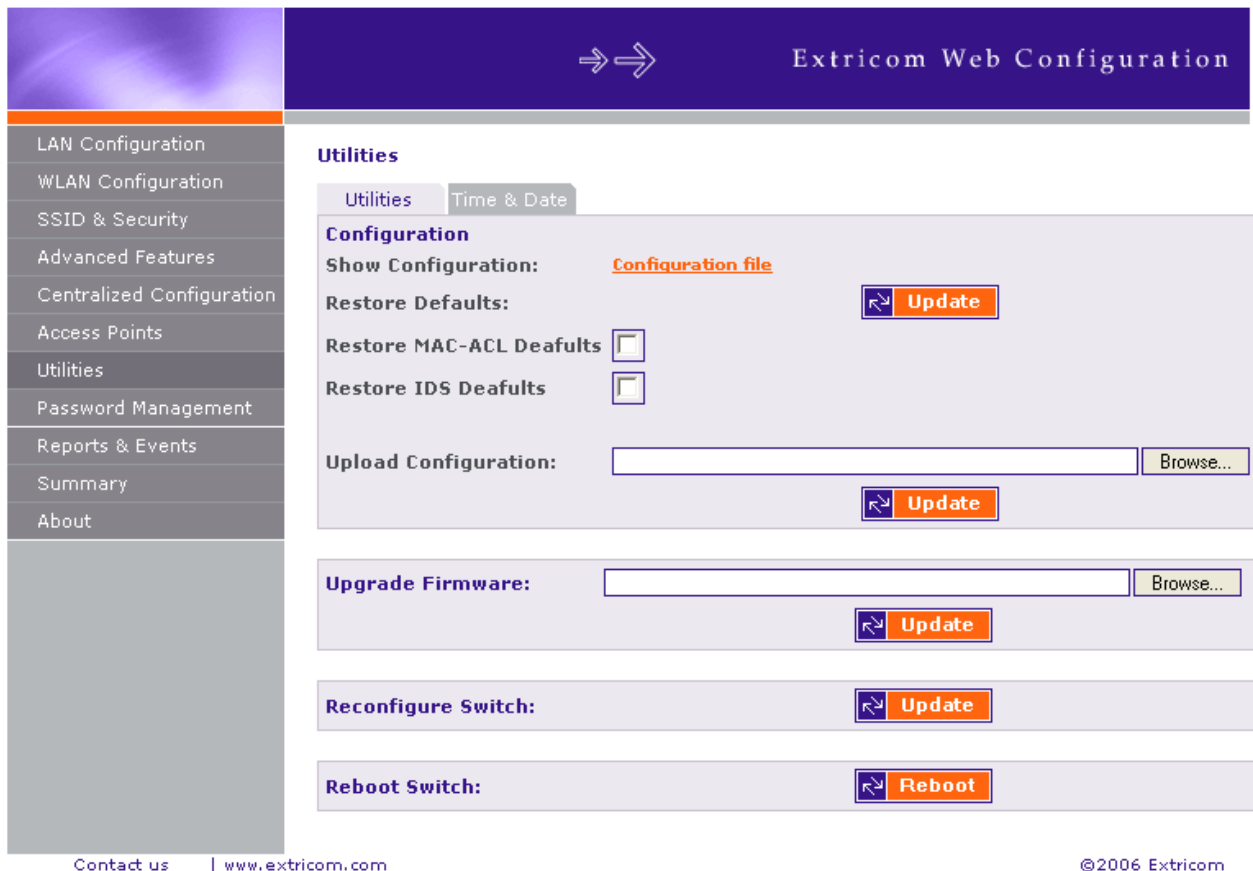
Figure 33. Utilities Configuration Page

Viewing the System Configuration File

The system configuration file contains all of the parameters that are configurable through the configuration utility.

To view the system configuration:

1. In the *Configuration* section of the *Utilities* configuration page, click *Configuration file*. The system configuration file appears in your Web browser.

2. Review the configuration in the XML file.

> ✍ To return to the Extricom web configuration pages, click **Back** in your Web browser.

Configuration File Backup

You can create a backup file of the current configuration to upload in the future. This is an optional procedure.

To back up a configuration file:

1. In the *Show Configuration* section of the *Utilities* page, right-click *Configuration file* and select *Save Target As*. The *File Download* dialog box opens, and then the *Save As* dialog box opens.

2. Select the location in which to save the configuration file and click **Save**. The configuration file will be saved to the selected location.

Uploading a New Configuration File

A previously saved configuration file can be uploaded (e.g., a file saved for backup purposes).

To upload a new configuration file:

1. Backup the current XML configuration.

2. In the *Upload Configuration* section of the *Utilities* configuration page, click **Browse** and browse to the location of the configuration file that you want to upload. The file's path appears in the Upload Configuration field.

3. Click **Update** to update the configuration.

4. Click **Reboot** at the bottom of the page to reboot the switch.

> ✍ Make sure that you are uploading a valid configuration file.

Restoring System Defaults

Restores the switch to its default configuration.

To restore system defaults:

- In the *Utilities* page, *Configuration* section *Restore Defaults*, click **Update**. The switch's defaults are restored. You can also choose to restore MAC ACL and IDS Defaults by choosing the appropriate box.

Upgrading the Extricom Firmware

Extricom firmware can be easily upgraded using *Upgrade Firmware*.

To upgrade the Extricom firmware:

1. Download the upgrade to your computer from the CD supplied with your purchase.
   or
   Obtain an upgrade file from your authorized Extricom reseller or distributor

2. Create a backup of the XML file that contains the current configuration.

3. In the *Upgrade Firmware* section of the *Utilities* configuration page, click **Browse** and browse to the location of the upgraded firmware. The file's path appears in the Upgrade Firmware field.

4. Click **Update** to upgrade the firmware.

5. Reboot the switch (refer to *Rebooting the Extricom Switch* on page 56).

> ✍ The firmware upgrade file is GNU zipped (gzip). Some Internet browsers are configured to automatically unzip files when downloading. Verify that this option is disabled so that the upgrade file remains zipped after downloading.

Rebooting the Extricom Switch

You must reboot the switch to activate any changes you make to the switch configuration.

To reboot the Extricom switch:

1. In the *Reboot Switch* section of the *Utilities* configuration page, click **Reboot**.

2. A new screen opens, prompting you "Are you sure you want to reboot?".

3. Click **Reboot** to reboot.

Reconfigure Switch - Smart Configuration

Not every change in the Extricom switch's configuration requires system reboot. Some parameters can be changed and will take effect immediately. This button checks whether a full reboot is required. In case reboot is not required, the update will take effect immediately.

Setting the Time and Date

Extricom system supports two ways of setting Date and Time (refer to *Figure 34*)

To manually set the time and date on your Extricom Switch:

1. In the *Set Time & Date* tab of the *Utilities* configuration page, select **Manually**.

2. Enter the time and date in the format hh:mm:ss dd-mm-yy.

3. Click **Update** to save the configuration.

To set the time and date on your Extricom Switch using NTP protocol:

1. In the *Set Time & Date* section of the *Utilities* configuration page, enter the time and date in the format hh:mm:ss dd-mm-yy.

2. Click **Update** to save the configuration.

Figure 35. Setting Date and Time

Setting Passwords in the Extricom Switch

Passwords are set according to user levels. Refer to *Table 16* for a description of the user access levels and their default passwords.

Table 16. Default Passwords

User Access Level	Privileges	Default Password
admin	Accessing the Web configuration.	Switch1

> ✍ The "operator" and "root" passwords are used when accessing the switch for maintenance and service purposes. Changing these passwords should be performed only by an Engineer authorized by Extricom.

> **!** *For security purposes, it is important that all the passwords (including operator and root passwords) be changed from the default values when the switch is first installed, as well as periodically updated.*

> **!** *Record all passwords and store them in a safe location.*

To set and change a password for the Extricom switch:

1. Click **Password Management** in the navigation tree to open the **Password Management** page.

2. Enter the user access level whose password you want to change.

3. Enter the current password.

4. Enter the new password.

5. Re-type the new password.

Viewing Reports and Events Log

The *Reports & Events* page provides performance reports and list of events.

To view Reports & Events:

1. Click **Reports & Events** in the navigation tree.

2. Select **Reports** tab to view TrueReuse performance. The screen is updated every second.

3. Select **Events** tab to view events. Hit refresh in order to see new events.

Viewing a Summary of the Updated Configuration

The *Summary* page provides a summary of the current configuration.

To view a summary of the updated configuration:

1. Click **Summary** in the navigation tree.
   or
   Click **Summary** in the menu bar.
   The *Summary* page appears (refer to *Figure 36*).

Figure 36. Summary Page

Refer to *Table 17* for a description of the summary information.

Table 17. Summary Page

Field	Description	
Date	Displays the date and time the summary was created.	
Uptime	Displays the amount of time the switch has been active.	
LAN Configuration		
IP Address	Displays the IP address of the switch.	
MAC address	Displays the base MAC address of the switch near the MAC address.	
Regulatory Domain	Displays the regulatory domain name currently in use by the switch.	
Network Mask	Displays the network mask.	
Default Gateway	Displays the default gateway IP address.	
SNMP Server	Displays the IP address of the SNMP server.	
Syslog Server	Displays the IP address of the syslog server.	
WLAN Configuration		
	Radio 1	*Radio 2*
Wlan mode	Displays the WLAN mode for Radio 1 (802.11a, 802.11b, or 802.11g).	Displays the WLAN mode for Radio 2 (802.11a, 802.11b, or 802.11g).
Channel	Displays the channel for Radio 1.	Displays the channel for Radio 2.
SSIDs (vlan)	Displays the SSIDs and their related VLANs, defined and assigned to Radio 1.	Displays the SSIDs and their related VLANs, defined and assigned to Radio 2.
True Reuse	Displays TrueReuse status	
Other SSIDs	Displays other SSIDs that are defined but are not assigned to a specific Radio.	
Access Points (1-8/24)		
Active Access Points	List of the active APs.	
Power-On Access Points	List of APs powered via Power over Ethernet.	

Viewing Extricom Information

Information about firmware versions currently installed in the Extricom Wireless LAN system can be viewed in the *About* page.

To view Extricom information:

- Click **About** in the navigation tree.
  or
  Click **About** in the menu bar.
  The *About* page appears.

Troubleshooting

Table 18 lists possible problems you may encounter with your WLAN and provides possible solutions. If after trying the solutions you are still experiencing difficulties, contact Extricom Customer Support.

Table 18. Troubleshooting

Problem	Solution
The AP Power LED is not lit.	• Verify that the AP Ethernet cable is connected to the switch and to the AP. The APs get PoE from the switch. • Verify that the AP is not turned off in the *Access Points* Web configuration page (refer to *page 63*).
A wireless device can't associate a specific SSID	• Verify that the wireless device supports the same 802.11 standard as configured for the SSID (802.11/a/b/g). • Verify that the wireless device is set to connect to the specific SSID. • Verify that the wireless device supports the security standard used by the SSID, e.g., WEP. • Verify that the security settings are configured to use the same authentication method. • If the Radius Server is used, verify that the wireless device is registered and has the necessary authorization.
Cannot connect to the Extricom web configuration pages	• Verify that the switch is connected to the LAN. • Verify that the correct IP address is used.
Low data rates	• Verify that the switch was not mistakenly configured to use low data rates. • Verify that there is no additional cause of interference (e.g., an additional WLAN network in the same proximity using the same frequencies as the Extricom WLAN, or that there are no cordless phones using the same frequencies, or microwave oven interference).

Problem	Solution
Wireless devices disconnect in a specific location	• Verify that there is no additional cause of interference (e.g., an additional WLAN network in the same proximity using the same frequencies as the Extricom WLAN, or that there are no cordless phones using the same frequencies, or microwave oven interference). • Add an additional AP to cover the area. Plug another AP into the switch, or relocate an existing Access Point.
Cannot access the switch's Web configuration GUI	• Verify that the workstation on which the Web browser is running is connected to the same LAN as the switch. • Verify that the URL entered for the switch begins with `https`.

Specifications

Extricom Switch Specifications

Standards	
WLAN	IEEE 802.11a, 5GHz
	IEEE 802.11b, 2.4GHz (short/long preamble support)
	IEEE 802.11g, 2.4GHz (pure mode)
	IEEE 802.11b/g, 2.4GHz (mixed mode)
	IEEE 802.11d
Ethernet	IEEE 802.3x, full/half duplex
	IEEE 802.1q, VLAN tagging
Interfaces	
APs	• EXSW-2400 – 24x 100BaseT Ethernet with IEEE 802.3af PoE (out of band)
	• EXSW-1200 – 12x 100BaseT Ethernet with IEEE 802.3af PoE (out of band)
	• EXSW800 – 8x 100BaseT Ethernet with IEEE 802.3af PoE (out of band)
	• EXSW-8000 - Recommended SFP modules:
	Optech OP6C-MX5-85-C
Wired LAN	• EXSW-1200/2400 – 2x 1000/100BaseT Ethernet
	✍ LAN2 and 1000Mbps are not currently active pending future development.
	• EXSW800 – 1x 100/10BaseT Ethernet
	• EXSW-1600 – GBE - 2x combo ports Copper or Fiber (no Mixed allowed)

Wireless Performance	
Channels	Up to 2 simultaneous WLAN channels
Capacity	Up to 108Mbps Aggregate WLAN connection-rate (2 channel blankets, each with 54 Mbps)
Inter-AP handoff	0 ms intra-switch

Management	
User Interface	Secure Web-based Graphical User Interface (GUI)
SNMP	Traps, using SNMP Version 2c
Logging	Remote and local SYSLOG
Upgrades	Firmware upgrade through Web from anywhere in the LAN.

Security	
Encryption	WEP-64
	WEP-128
	WPA-TKIP/AES (CCMP)
	WPA2-TKIP/AES (CCMP)
Authentication	802.1x (RADIUS)
	WPA/WPA2 pre-shared key
	MAC Address-based ACL
	EAP, TLS, TTLS, LEAP, PEAP, MD5

SSID & VLAN	
SSID	16 SSIDs per channel (maximum of 32 per system)
VLANs	4095 Ethernet VLANs
	SSID to VLAN mapping

Regulations Approval	
Safety	UL 60950-1
	EN 60950-1
	IEC 60950-1
	ANATEL Resolution 237
EMC	FCC Part 15 Class B
	EN 300386 Part B
	VCCI Technical Requirements, V-3/2001.04
	ANATEL Resolution 238

Physical Properties	
Installation options	Rackmount (19" 1U)
	Desktop

LEDs	Power
	LAN Activity
	WLAN Port Activity
Power	*EXSW800: 100-240VAC ,50-60Hz, 2A max*
	EXSW-1200/2400: 100-240VAC ,50-60Hz, 5A max
	EXSW-8000: 100-240VAC ,50-60Hz, 3A max
	PoE (IEEE 802.3af) to WLAN ports: 15W for each port

Environmental	
Operational	*Temperature:* 0°C to 45°C (32°F to 122°F)
	Humidity: 0% to 90%, non-condensing
Storage	*Temperature:* - 20°C to +70°C (-49°F to 185°F)
	Humidity: 0% to 90%, non-condensing

Extricom Access Point Specifications

WLAN Standards	
	IEEE 802.11a, 5GHz
	IEEE 802.11b, 2.4GHz (short/long preamble support)
	IEEE 802.11g, 2.4GHz (pure mode)
	IEEE 802.11b/g, 2.4GHz (mixed mode)

Spectrum	
Number of simultaneous channels	Up to two in EXRP-20 and up to four in EXRP-40
	In the current release of EXRP-40, Radios 3 and 4 are inactive.
802.11a	5.15-5.25 GHz
	5.25-5.35 GHz
	5.505-5.725 GHz
	5.725-5.850 GHz
	Available channels limited by local regulation
802.11b	2.400-2.497 GHz
	Available channels limited by local regulation
802.11g	2.400-2.483 GHz
	Available channels limited by local regulation

Transmission Power	
802.11a	*Max:* 17 dBm (limited by local regulation)
802.11b	*Max:* 17 dBm

802.11g	*Max:* 15 dBm

Supported Rates

802.11a	6, 9, 12, 18, 24, 36, 48 and 54 Mbps
802.11g	6, 9, 12, 18, 24, 36, 48 and 54 Mbps
802.11b	1, 2, 5.5, and 11 Mbps

Receive Sensitivity

802.11a:	6 Mbps: -88 dBm
	9 Mbps: -87 dBm
	12 Mbps: -86 dBm
	18 Mbps: -84 dBm
	24 Mbps: -81 dBm
	36 Mbps: -77 dBm
	48 Mbps: -73 dBm
	54 Mbps: -69 dBm
802.11b/g	1 Mbps: -91 dBm
	2 Mbps: -88 dBm
	5.5 Mbps: -87 dBm
	11 Mbps: -85 dBm
	6 Mbps: -89 dBm
	9 Mbps: -88 dBm
	12 Mbps: -87 dBm
	18 Mbps: -85 dBm
	24 Mbps: -82 dBm
	36 Mbps: -79 dBm
	48 Mbps: -74 dBm
	54 Mbps: -71 dBm

Regulations Approval

Safety	UL 60950
	EN 60950
	IEC 60950
EMC	FCC Part 15 sub part B
	EN 301
	EN 300328
	EN 300440
	ENV 301893
	EN 300386 Part B
	VCCI V-2/2001.04

Access (including modular approval)	FCC Part 15 C
	FCC Part 15 E
	EN 300 328
	EN 301 893
	EN 300 489
	Japan Type Certificate: Article 2, clause 1, Items 19, 19-2, 19-3, 19-13
Physical Properties	
Dimensions (W x H x D)	195mm x 150mm x 50mm (7.67" x 5.9" x 2")
Weight	400gr (0.8 lb.)
Installation options	Horizontal (desktop)
	Vertical (wall mount)
LEDs	Power
	LAN Activity
	2 x WLAN Activity (2 colors)
Power	*PoE (IEEE 802.3af):* 15W
	Power Supply (optional): 48VDC @ 400mA
Environmental	
Operational	*Temperature:* 0°C to 45°C (32°F to 122°F)
	Humidity: 0% to 90%, non-condensing
Storage	*Temperature:* - 20°C to +70°C (-49°F to 185°F)
	Humidity: 0% to 90%, non-condensing

Access Point Mounting Template

Point for Drilling

4.25 inches

10.7 cm.

Important Note: Due to variations in printers, when printing this page, printer Page Scaling should be set to "None" or diagram may be automatically reduced in size. As a double-check, make sure distance between drill points is as indicated above.
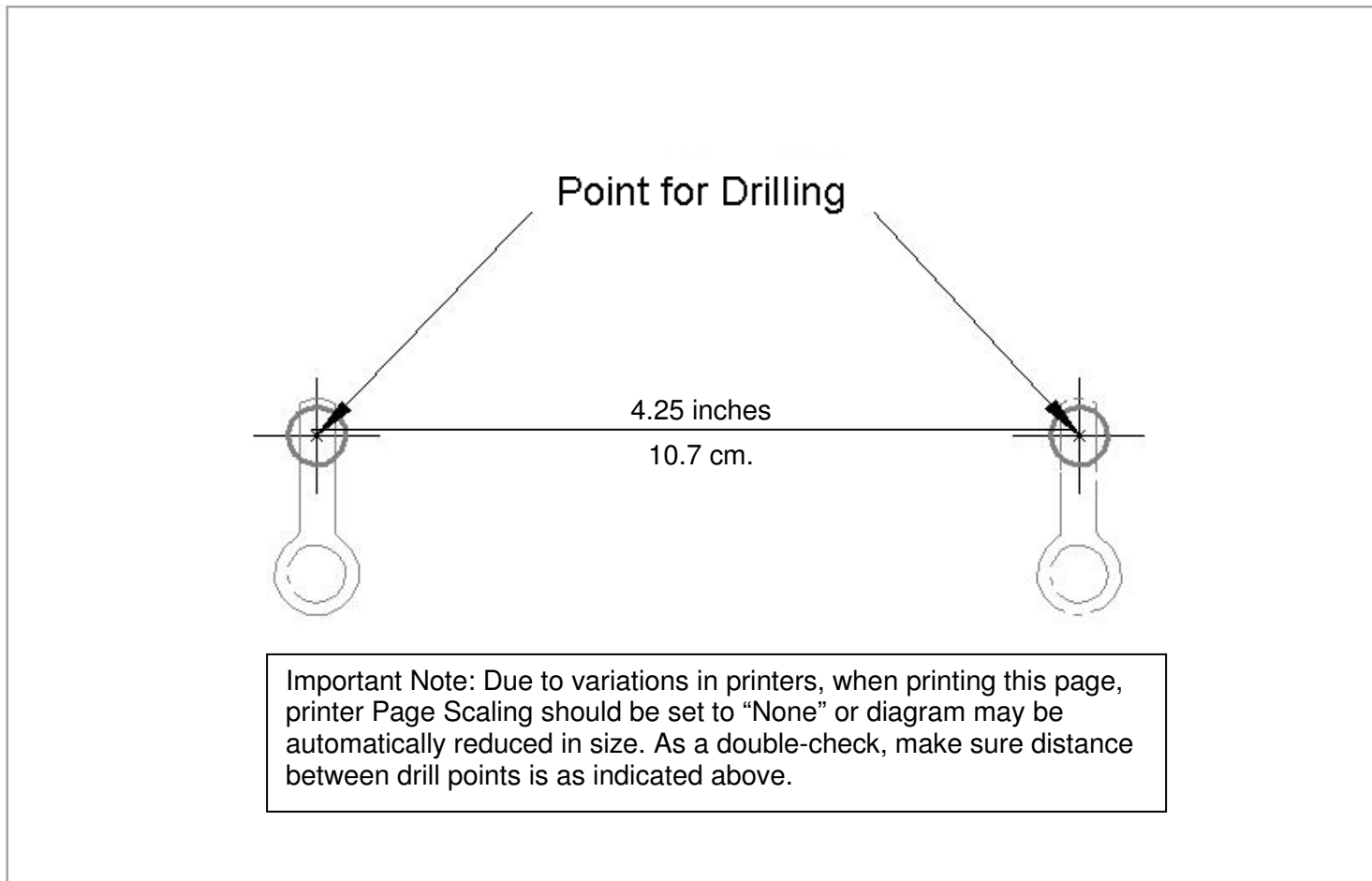
Figure 37. Access Point Mounting Template