



**RANGELAN2 Extension Point  
Models 7540 and 7541**

*User's Guide*

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Whether such damages be direct, indirect, consequential, special or otherwise and whether such damages are incurred by the person to whom this warranty extends or a third party.

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Rev. D

## **Warranty Return Policy**

If you have a problem with your RangeLAN2 product, please call Proxim Technical Support at 408-731-2640. Proxim Technical Support will assist with resolving any technical difficulties you may have with your Proxim product.

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## **FCC WARNING**

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

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

## **EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE**

### **Statement of Compliance Information to User**

This equipment has been tested and found to comply with the European Telecommunication Standard ETS 300.328. This standard covers Wideband Data Transmission Systems referred to in the CEPT recommendation T/R 10.01. This type of accepted equipment is designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

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# 1. Introduction

Congratulations on your purchase of the RangeLAN2 754x Extension Point, a member of the RangeLAN2 family. The Extension Point will allow you to wirelessly extend the coverage of your existing RangeLAN2 network. It includes features like Smart Attach™ and 10BaseFree™. Smart Attach™ is a combination of parameters including Preferred Master Lists, the Error Domain, and the Backbone Search Timer which enable easy configuration of the Extension Point devices. With Proxim's 10BaseFree™ two-radio architecture, one radio supports data traffic from mobile clients, much like the radio in a standard Access Point. The second radio creates a data link replacing the wired Ethernet or Token Ring connection. Since client and backbone traffic each use their own radio, transmissions occur concurrently with minimum latency and maximum throughput.

Today, Proxim is the leading supplier of spread spectrum radio networking technology for local area environments. Proxim's unmatched spread spectrum networking expertise, combined with the company's extensive experience serving the communications needs of the mobile computing user, have kept Proxim at the forefront of the emerging wireless LAN market.

Proxim also manufactures ProxLink. ProxLink is a family of RS-232 cable replacement products. If you would like more information on ProxLink, please contact Proxim's Sales Department at 800-229-1630.

## The RangeLAN2 Family

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RangeLAN2 Extension Point is part of a family of high-performance products that provides a complete wireless networking solution.

- RangeLAN2 7400** is a wireless LAN adapter which fits into a PCMCIA Type II slot on a portable notebook, laptop or pen-based computer.
- RangeLAN2 7100** is a wireless LAN adapter that fits into a standard PC/AT ISA bus slot.

- ❑ **RangeLAN2 7510/752x** is a wireless access point which allows for easy expandability of your wireless network increasing range and facilitating mobility applications. It operates at the Data Link level (layer 2) of the OSI model, providing protocol-independent access for RangeLAN2 computer users into existing wired Ethernet LANs.
- ❑ **RangeLAN2 753x** is a wireless access point which allows for easy expandability of your wireless network increasing range and facilitating mobility applications. It operates at the Data Link level (layer 2) of the OSI model, providing protocol-independent access for RangeLAN2 computer users into existing wired Token Ring LANs.
- ❑ There are two choices of the RangeLAN2 Extension Point -- the **7540** and **7541**. The **7540** has 100 mW output power, while the **7541** has 500 mW output power from each of the two antennas.

## **Extension Point Radios**

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There are two radios on an Extension Point: the BSA and the Backbone radio.

- ❑ The BSA (Basic Service Area) radio is configured as a Master. It creates a wireless cell for clients or other Extension Points to synchronize with. It is labeled BSA Antenna on the Extension Point.
- ❑ The Backbone radio is configured as a Station and synchronizes to another Extension Point or a Master 7510/752x/753x Access Point which is in turn connected to the network backbone. It is labeled BB Antenna on the Extension Point.

## **System Requirements**

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To begin using your Extension Point, you need the following minimum system requirements:

- A RangeLAN2 7510/752x/753x Access Point with V1.3 software attached to the network backbone
- A terminal or PC with a terminal emulation software package and a null modem cable

*OR*

a computer running a TCP/IP telnet client and a BOOTP server to assign the IP address

## **The Product Package**

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Each Extension Point comes with:

- One Extension Point
- One Extension Point User's Guide
- One power adapter

If any of these items are missing or damaged, please contact your reseller or Proxim Customer Service.

**You will need to purchase two antennas in addition to this product package in order to put the unit in service.**



*Figure 1*  
*Extension Point components*

## 2. Quick Installation

You may follow the quick installation steps if the following conditions are true:

- There will only be one Extension Point on this network
- You will use all the software default values
- You do not need to configure an IP address for the Extension Point and do not intend to manage it via telnet
- You will not be setting Security IDs on your network

If your installation meets the preceding criteria, proceed with the following instructions:

1. Attach each of the antennas onto the antenna connectors on the back panel of the Extension Point.

### Note

*Government regulatory agencies mandate that the antenna not be alterable. Therefore, the Extension Point uses a custom antenna connector. Use only antennas that Proxim has certified for use with this unit. Contact Proxim Sales to discuss your antenna configuration.*

2. Mount the antennas so that the directional antenna for the BSA radio points towards the desired coverage area, and the Backbone antenna points towards the 7510/752x/753x Access Point or Extension Point supporting the link. You may want to use the Antenna Pointing Tool.
3. Plug the power cable into the back of the Extension Point and into an AC power outlet. Since there is no On/Off switch on the box, the unit will turn on as soon as power is applied and search for a Master radio with which to synchronize.
4. The default settings for the BSA created by the Extension Point are Domain 0, Channel 2, Subchannel 2, Master Name of EP\_MASTER.



## 3. Physical Installation

### Antenna Options

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The Extension Point requires two antennas that are purchased separately. Most installations are well served by one directional (for the Backbone radio) and one omnidirectional (for the BSA radio) antenna. Each of these antennas ships with installation and mounting instructions. For information on additional antenna options, please contact your Proxim Sales Representative.

### Outdoor Packaging and Mounting Options

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If the Extension Point is to be used outdoors, you may want to purchase optional outdoor packaging. For outdoor packaging options, please contact your Proxim Sales Representative.



*Figure 2*  
*Outdoor Packaging*

## Indoor Mounting Options

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The Extension Point was designed to sit on a desktop. You may optionally purchase a mounting hardware bracket to attach it to a cubicle or a wall.



*Figure 3*  
*Wall Mount*



*Figure 4*  
*Cubicle Mount*



## 4. Wireless Topologies

There are many wireless topologies that can be created using one or several Extension Points. This chapter explains One-Hop, Multiple Linear, Tree and Building-to-Building topologies. You can combine topologies to create larger, more complex networks. This chapter also describes roaming and how it affects the number and configuration of Extension Points.

### Planning and Maintaining the Installation

---

For optimum performance, pre-installation planning is critical, especially if you have more than one Extension Point.

There are two radios in the Extension Point. The Backbone (BB) radio, configured as a Station, synchronizes with a 7510/752x/753x Access Point that is attached to the network backbone. It can also synchronize with another Extension Point BSA radio. The Basic Service Area (BSA) radio, configured as a Master, provides an attachment point for wireless clients, which ultimately allows them to attach to the network backbone.

- ❑ Determine Domains, Channels, Subchannels, and Master Names for each Master on the network. Remember to include all 7510/752x/753x Access Points and BSA radios on all Extension Points.
- ❑ You can configure Backbone radios on each unit to establish a preferred Master and fallback Masters. Map out preferred and fallback Masters for each Extension Point.
- ❑ If you plan to segment your wireless network using Domains, determine how many Domains you need. 7510/752x/753x Access Points and Extension Points on different Domains cannot communicate so you should plan each Domain as a separate network.
- ❑ Select Channels for each 7510/752x/753x Access Point and BSA radio of the Extension Point in the network. Avoid using the same Channel for adjacent or nearby cells.

After initial implementation of the wireless components of the network, additional Extension Points can be added, although those additions should be planned as carefully as the initial installation.

Exercise caution when removing an Extension Point from an operational network. Units you remove may carry active backbone traffic from other cells, and if valid fallback Masters are not configured and available, that traffic will be disrupted.

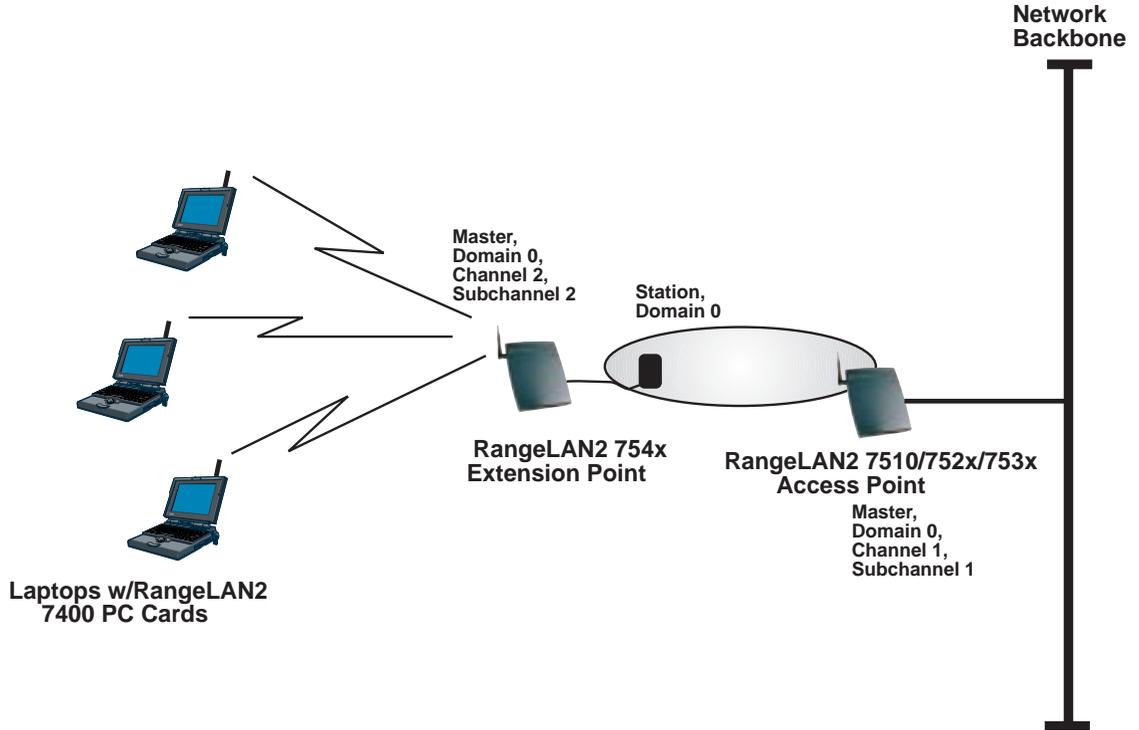
## One Hop

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The single hop architecture is the simplest to plan and install.

In this topology, if the 7510/752x/753x Access Point is set to default Domain, Channel, Subchannel, and Security ID, the Extension Point may need no configuration. It will turn on, search for the Master on Domain 0, synchronize with it, and create the BSA for its wireless clients.

The next figure illustrates the default Domain, Channel and Station Type settings in which the Extension Point will need no configuration. The 7510/752x/753x Access Point is a Master configured on Domain 0, Channel 1. The Backbone radio on the Extension Point is configured (by default) as a Station on Domain 0 and synchronizes with this 7510/752x/753x Access Point. The BSA radio creates a link for the wireless clients as a Master on Domain 0, using a different Channel than that of the 7510/752x/753x Access Point.



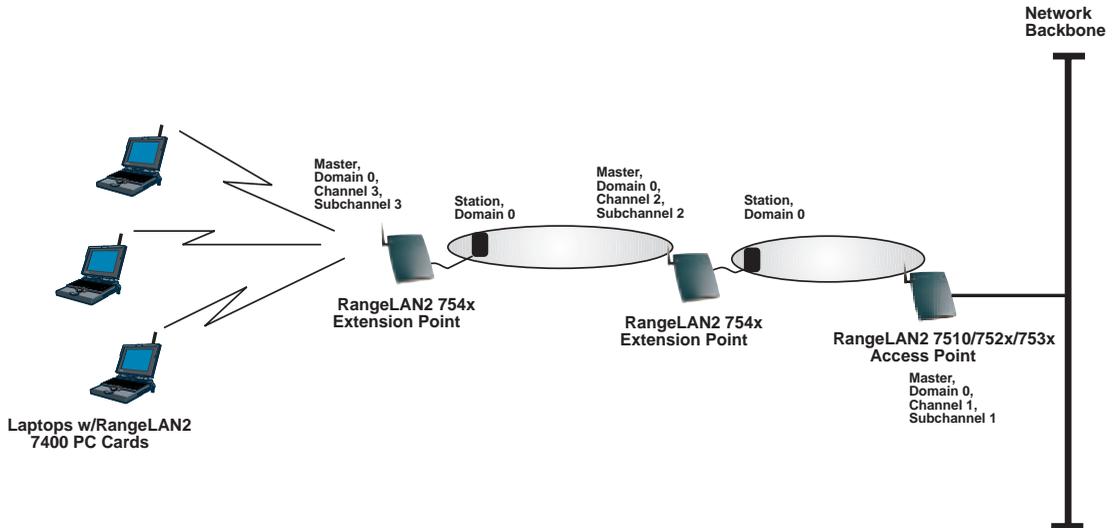
*Figure 5*  
*One Hop Topology*

## Multiple Linear

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The multiple linear (or multiple hop) architecture involves the use of two or more Extension Points communicating with one another, with the final unit communicating with the 7510/752x/753x Access Point. Note that as more Extension Points are installed in a line, performance to the end wireless clients may decrease. **The maximum recommended hop length is 3 Extension Points.**

The figure below illustrates a two-hop topology. Each Extension Point is further from the wired 7510/752x/753x Access Point, allowing the final wireless clients to communicate at greater distances. Note that each Master, while on the same Domain, uses a unique Channel to create an independent 1.6 Mbps pipe, as described in Chapter 6.



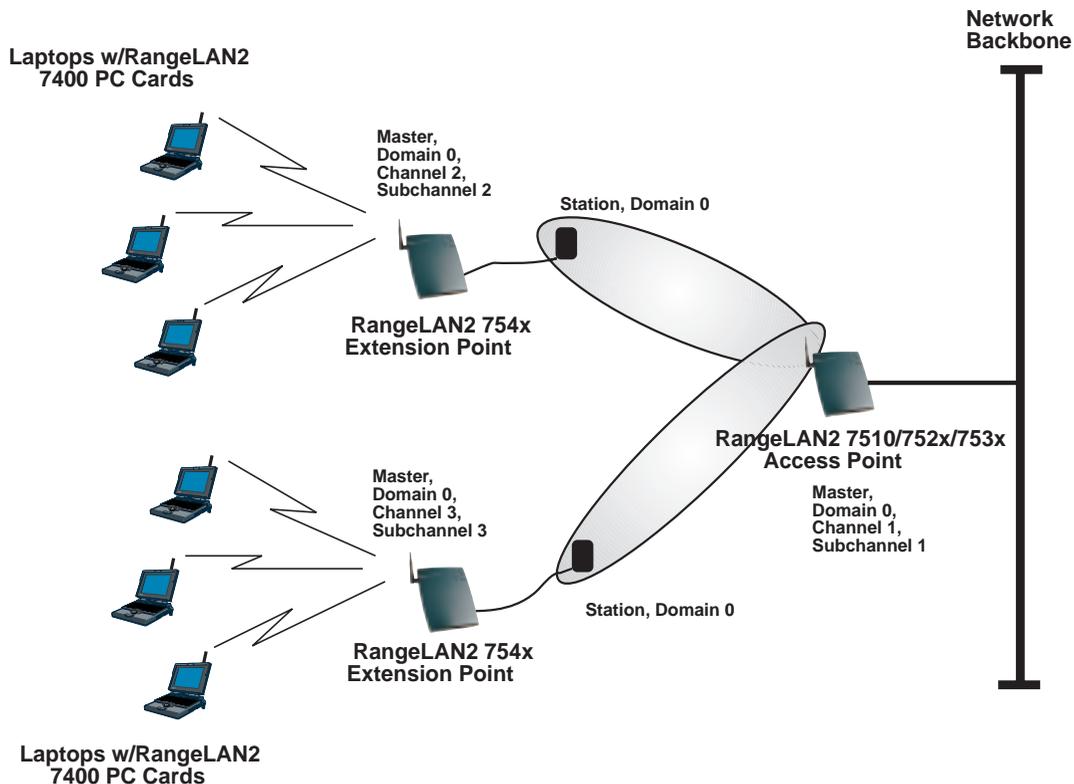
*Figure 6*  
*Multiple Linear Topology*

## Tree

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A tree topology is created when there are two or more Extension Points communicating directly with the same 7510/752x/753x Access Point. Each of the Extension Points can support wireless clients. **The maximum recommended tree width is 3 Extension Points.**

The next figure shows two Extension Points, each supporting three wireless clients. Again, note that each Master, while on the same Domain, uses a unique Channel to create an independent 1.6 Mbps pipe.

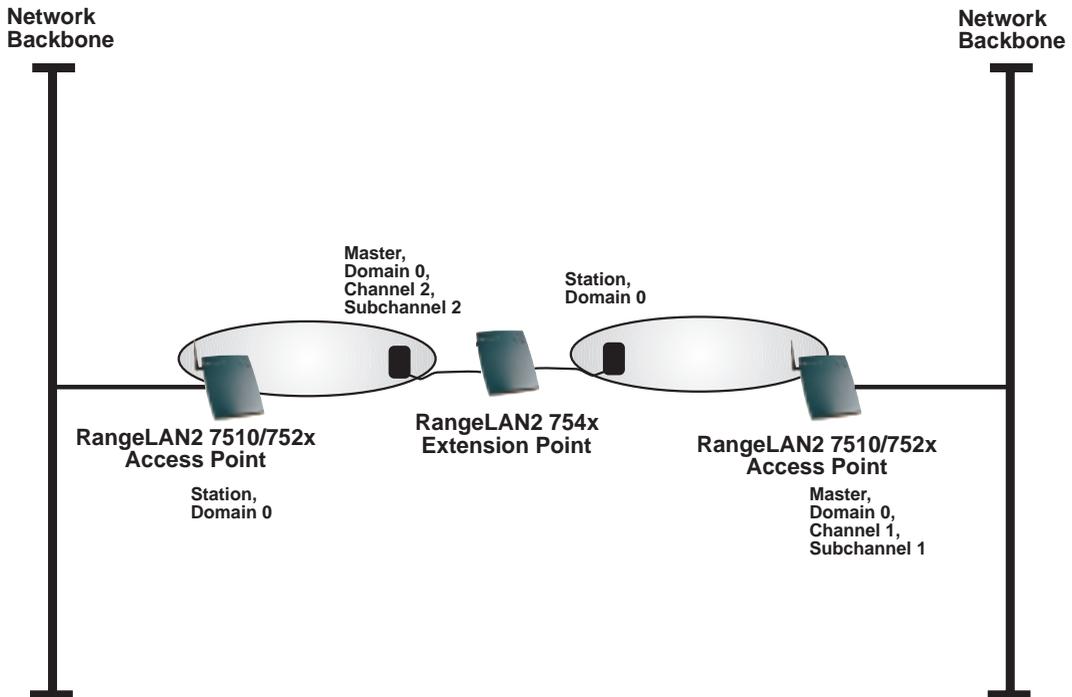


*Figure 7*  
*Tree Topology*

## Building-to-Building

The Extension Point can be used to extend the range of a Building-to-Building link created using two 7510/752x Access Points. One of the 7510/752x Access Points is configured as a Master; the other as a Station. The BSA radio of the Extension Point communicates with the Station 7510/752x Access Point; the Backbone radio communicates with the Master 7510/752x Access Point.

All radios are configured on the same Domain, and each Master radio has a unique Channel. The next figure illustrates this configuration.



**Figure 8**  
**Building-to-Building Topology**

## Roaming

---

For seamless roaming, all RangeLAN2 devices in the network (7510/752x/753x Access Points, Extension Points, and PC Cards) must be configured with the same Domain and Security ID. For best performance, all radios configured as Masters in the network (7510/752x/753x Access Points and BSA radios in each Extension Point) should use different Channels when possible. If Channels must be reused, try to avoid using the same Channel in two adjacent cells.

The user can move freely between the Extension Points and 7510/752x/753x Access Points in the network. When the roaming PC leaves the transmission range of one Access Point or Extension Point, the software automatically polls the other Access Points or Extension Points in the same Domain to continue the network connection.

**Note:**

*If the roaming PC must remain connected to the network, cells must overlap for continuous coverage without gaps.*

*Roaming stations will only roam among Access Points and Extension Points with the same Domain and Security ID.*

## **Roaming Scenarios**

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The following roaming scenarios are supported by the Extension Point:

- Roaming among Extension Points
- Roaming among Extension Points and 7510/752x/753x Access Points
- Backbone radios of Extension Points themselves roaming among Extension Points and 7510/752x/753x Access Points

## **How to Configure 7510/752x/753x Access Points When Using Extension Points**

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The **Repeating Enabled** setting on the 7510/752x/753x Access Point defaults to False. If a tree topology is desired, all 7510/752x/753x Access Points must change that setting to True. If the default False setting is used, Extension Points will only be able to communicate in a linear (one hop, multiple linear, building to building) topology.

You must have V1.3 or greater software on the 7510/752x/753x Access Point. Note that the Access Point software version number is visible in the upper right corner of the menu.



## 5. Configuration

You need to configure the Extension Point if:

- There is more than one Extension Point on this network
- The 7510/752x/753x Access Point or Extension Point to which this Extension Point will synchronize is not configured at default Domain or Channel
- You need to change the software default values, including IP addresses
- You want to set Security IDs on your network

There are four ways to configure the Extension Point:

- Locally via a null modem cable and a terminal or terminal emulation package
- Remotely across the network using a telnet session
- Remotely across the network using an SNMP management package
- Remotely across dial-up modems

### Locally (Out-of-band)

---

You may use the DB-9 Local Management Port on the back of the Extension Point to configure the unit. To locally configure the Extension Point, you need a null modem RS-232 cable with a nine pin female connector on the Extension Point side and a terminal or PC with an available serial port running a terminal application package.

#### **Note:**

*If you use a terminal application that has the option to check for the CD signal before establishing a connection, configure the software to ignore CD. Alternatively, verify that your null modem cable is a full handshake cable and pulls CD high.*

1. Connect the null modem RS-232 cable between the Extension Point Local Management Port and a free serial port on your terminal or PC.
2. Configure the terminal or terminal emulation package for 9600 bps N81 operation. If you are using a terminal emulation package, choose TTY as the terminal type.
3. Apply power to the Extension Point. During the boot process messages will be displayed on the terminal screen. When they are completed and you see the “Initialization Complete” message, press <Enter> to enter the software configuration menu. If the unit was already turned on, you can press <Enter> to display the menu.

## Remotely (In-band)

---

The second configuration option is remote configuration across the wired network.

### Note:

*The Extension Point is not manufactured with a default IP address. In order to telnet to the Extension Point, you must first assign it a valid IP address for your network using null modem cable configuration or a BOOTP server.*

1. From a wired or wireless client on your network, open a telnet session to the Extension Point. A wireless client must have some link to the Extension Point in order to open a telnet session. Either it is directly synchronized to the BSA radio on the Extension Point, or it is synchronized to a device that contains a wireless communications link through several other Extension Points.

### Note:

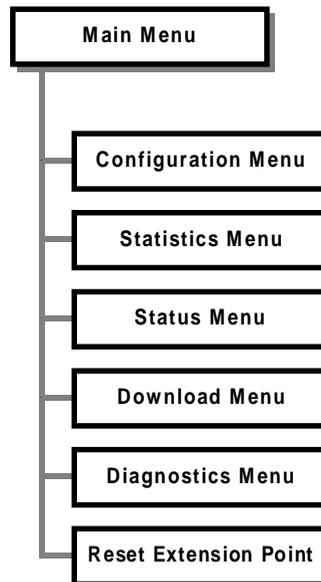
*You cannot open more than one simultaneous telnet session, nor can you telnet to an Extension Point that is currently being configured locally.*

2. You will be prompted for a password if you enabled this option through the TCP/IP Configuration Menu.
3. You will enter the configuration menu.

## Main Menu

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After using one of the above two methods, you will see the following software menu whose choices will be described in the next chapters:



### Note:

*Depending on the current settings of the Extension Point, the order of the options in the menu tree may change slightly.*

## SNMP Management

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You may configure and monitor the Extension Point using an SNMP management package. The Extension Point supports the following MIBs:

- MIB-II (RFC 1213)
- IEEE 802.1d Bridge MIB (RFC 1493)

## ❑ Proxim Enterprise MIB

The Proxim Enterprise MIB is supplied in ASN.1 format. It is available on the Proxim BBS and Web site. The filename is AP7540.MIB. Follow the instructions in your SNMP management package for incorporating enterprise-specific MIBs.

## **Modem Support**

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The Extension Point may be remotely configured via a dial-up modem. To allow for this type of configuration:

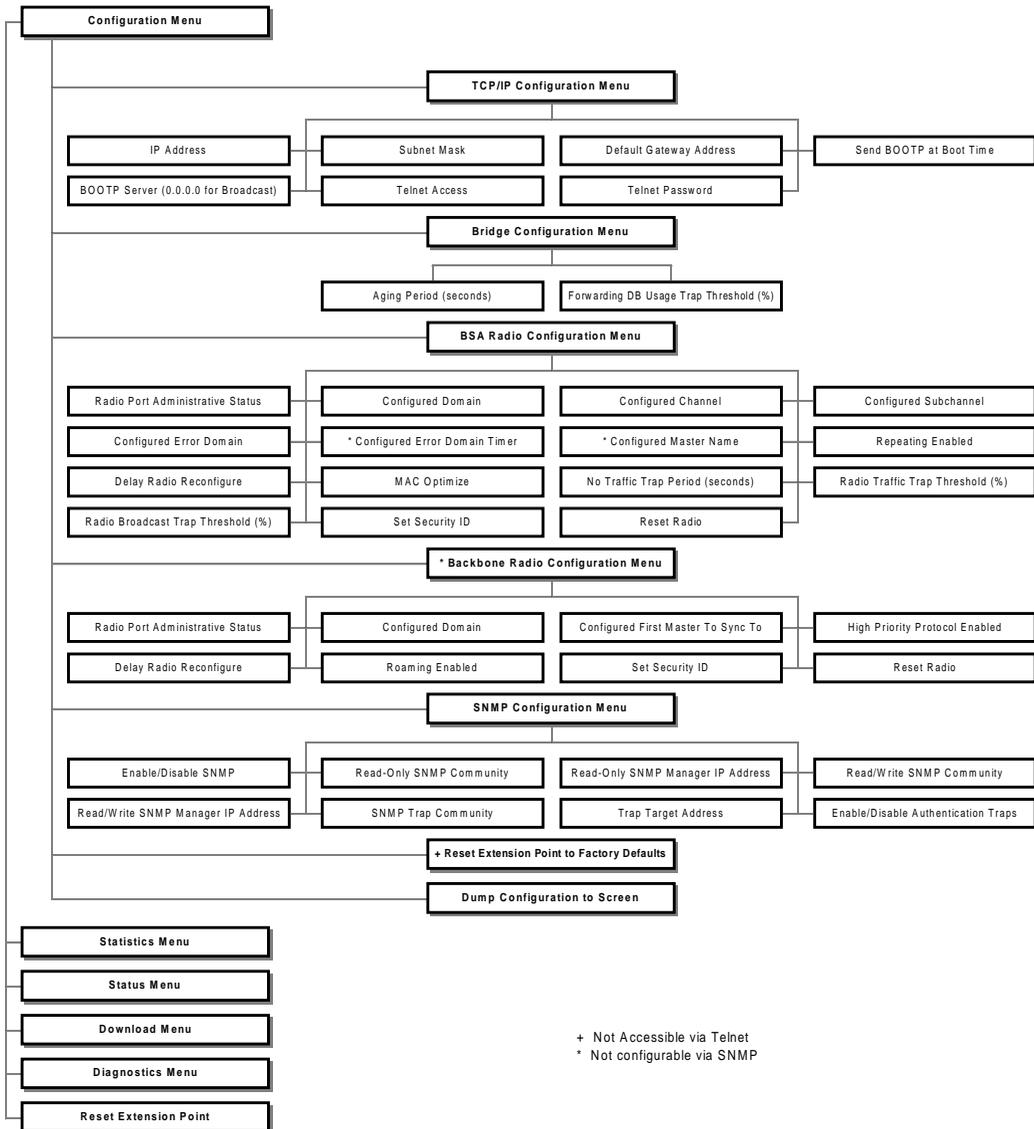
1. Configure the modem from a terminal or terminal emulation program at 9600 bps.
2. Issue the following commands to the modem:

ATS0=1	(Auto-answer after 1 ring)
AT&D0	(Ignore DTR)
ATE0	(No local echo)
ATQ1	(Suppress result codes)
AT&W0	(Store configuration in non-volatile memory)

3. Attach the modem via a straight-through cable to the Extension Point.
4. From a remote modem, dial the phone number of the modem connected to the Extension Point.
5. After the Extension Point's modem has answered the phone, press <Enter> on the terminal connected to the remote modem until you see the configuration menu tree.

## 6. Configuration Parameters

To configure the Extension Point, pick the Configuration option from the Main Menu. The following diagram illustrates the software tree:



# TCP/IP Configuration Menu

---

Use this option to change the TCP/IP parameters of the Extension Point.

Parameter Name	Range	Default
IP Address	-	0.0.0.0
Subnet Mask	-	0.0.0.0
Default Gateway Address	-	0.0.0.0
Send BOOTP at Boot Time	True/False	True
BOOTP Server Address	-	0.0.0.0 *
Telnet Access	Enabled/Disabled	Enabled
Telnet Password	-	-

\* 0.0.0.0 is used to send a broadcast

**IP Address** indicates the IP address that will be assigned to the Extension Point. It must be a unique number on the network. This parameter will not change until the Access Point is reset.

**Subnet Mask** indicates the mask that will be used to determine what network the Extension Point is on. This parameter will not change until the Extension Point is reset.

If a packet is destined for an IP host or node belonging to a different IP subnet, the Extension Point will send IP packets to the **Default Gateway** (usually a router) for the packets to be routed to the proper destination. This parameter will not change until the Extension Point is reset.

You can enable or disable the Extension Point's ability to request its IP address from a BOOTP server at boot time, and you can supply the IP address of that server.

You can enable or disable the ability to open a telnet session to the Extension Point and set a password to control telnet access.

## Bridge Configuration Menu

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Parameter Name	Range	Default
Aging Period (seconds)	10-1,000,000	300
Forwarding DB Usage Trap Threshold	0-100 (%)	100

The **Aging Period** parameter specifies the time after which the learned physical address of the network node, which is stored in the Forwarding Database, is discarded. This data is dynamically acquired by the Extension Point so that it can forward packets properly.

The **Forwarding DB Usage Trap Threshold** parameter specifies the percentage of learned database entries after which an SNMP trap will be sent. The Extension Point can hold up to 2048 entries.

## BSA Radio Configuration Menu

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Parameter Name	Range	Default
Radio Port Administrative Status	Enabled/Disabled	Enabled
Domain	0-15	0
Channel	1-15	2
Subchannel	1-15	2
Error Domain	0-15	13
Error Domain Timer (seconds)	2 - 255	55
Master Name	11 characters	EP_MASTER
Repeating Enabled	True/False	False
Delay Radio Reconfigure	True/False	True
MAC Optimize	Auto, Very Light, Light, Normal	Auto
No Traffic Trap Period (seconds)	0-10,000,000	0
Radio Traffic Trap Threshold (%)	10-100	100 *
Radio Broadcast Trap Threshold (%)	10-100	100 *
Security ID	0-20 characters	blank

\* a value of 100  
disables this  
trap

This option allows you to change the various wireless parameters for the BSA radio.

**Radio Port Administrative Status** is used for SNMP. It corresponds to the SNMP MIB-II Administrative status parameter and can be used to bring the BSA radio interface back up after it has been disabled by an SNMP manager. It can also be used to put the radio into a mode in which it no longer transmits or receives packets.

In order to establish communications, all communicating radios must be configured with the same **Domain** number. Radios on different Domains cannot communicate with each other. The Domain is a software filter which does not affect the actual radio frequency or the frequency hop sequence.

In order for the wireless clients to roam between Extension Points and 7510/752x/753x Access Points, all radios must be configured to the same Domain.

Each Master can select one of 15 **Channels** to establish communications with Stations. Each Channel number sets a unique frequency hopping sequence allowing for multiple subnetworks with higher data rate transmission capability in the same air space. You may think of the Channel as a pipe. In order to communicate, there must be one (and only one) Master that provides the timing for that Channel.

There are 15 independent Channels. This means that there are 15 different sequences of frequency hops. Each Channel is at a different frequency at a different time. For networks with multiple Masters (such as in a roaming environment), set each Master to a different channel. All Stations will determine their channel by the Master to which they are synchronized.

The **Subchannel** is a software code that is appended to each radio packet. It does not affect the frequency hopping sequence like a Channel does. Use a Subchannel if you need more than 15 Masters in the same coverage area and, therefore, all the Channels are used.

For example, you can use Channel 1, Subchannel 1 for Network A and Channel 1, Subchannel 2 for Network B. The two networks will not communicate with one another. They are, however, still sharing the 1.6 Mbps pipe since they are both using Channel 1.

The **Error Domain** is the Domain used by the BSA radio if the Backbone radio loses synchronization with all the Masters in its list. It will switch to this Domain after the amount of time specified in the **Error Domain Timer** parameter has passed without finding an acceptable Master.

The **Master Name** parameter specifies an alphanumeric name to simplify the identification of each Master in your network. This parameter is case sensitive.

**Repeating Enabled** controls the ability for the Extension Point to **repeat** signals coming from one Station and destined for another Station. These two Stations must be out of range of one another but both in range of and synchronized to the Extension Point for repeating to occur.

The **Delay Radio Reconfigure** parameter allows you to delay radio parameter changes from taking effect. You might want to enable this feature so that you do not lose communication when a parameter is changed .

The **MAC Optimize** parameter can help improve throughput for small networks. The default setting of Auto causes the Extension Point to determine the number of units synchronized to it and adjust this parameter accordingly. Alternately, you may force the parameter to one of the other settings. If you have 0 or 1 wireless nodes communicating with an Extension Point, use the Very Light setting. If you have between 2 and 7 wireless nodes communicating with an Extension Point at the same time, use Light. (You can have more than 7 nodes synchronized to an Extension Point but between 2 and 7 communicating at the same time for the Light parameter setting.) In networks with more than 7 concurrent wireless users, use Normal.

The **No Traffic Trap Period** specifies the number of seconds after which a No Traffic trap is sent via SNMP.

The **Radio Traffic Trap Threshold** specifies a percentage of radio traffic after which a Radio High Usage trap is sent via SNMP.

The **Radio Broadcast Trap Threshold** specifies a percentage of radio broadcast traffic after which a Radio High Usage trap is sent via SNMP.

To further improve the security of a wireless subnetwork, each unit requires the same **Security ID** to establish communication. The Security ID is used on all RangeLAN2 products and all Station Types. This ID is encrypted and stored in the Extension Point itself, not in software. It cannot be accessed but you may change it. If you do change it, however, you will need to change the Security ID on all other radios with which this one was communicating. The Security ID parameter can be up to 20 characters and is an empty string by default. It is case sensitive.

**Reset Radio** allows you to reset the BSA radio contained in the Extension Point without resetting the entire unit. This will cause any changes to the radio parameters which have not yet taken effect (because the **Delay Radio Reconfigure** parameter is set) to take effect.

## Backbone Radio Configuration Menu

---

Parameter Name	Range	Default
Radio Port Administrative Status	Enabled/Disabled	Enabled
Domain	0-15	0
First Master To Sync To	11 characters	blank
High Priority Protocol Enabled	True/False	True
Delay Radio Reconfigure	True/False	True
Roaming Enabled	True/False	True
Security ID	0-20 characters	blank

This menu allows you to change the various wireless parameters for the Backbone radio. The parameters with the same name as those under BSA Radio Configuration will not be described again except to note changes.

The **First Master To Sync To** parameter names the Master with which this Extension Point will synchronize. If this field is filled in, there will be another choice, **Second Master To Sync To**. If the first Master is unavailable to the Extension Point, it will look to the second Master. Similarly, if the second choice is filled in, a **Third Master To Sync To** field will be visible. If none of these fields is filled in, the radio will continually look for the best Master. These parameters are case sensitive.

When **High Priority Protocol Enabled** is set to true, the Backbone radio is given an advantage over wireless clients for use of the Channel, and thus is able to transmit more packets than a wireless client. If you have three or more Extension Points in the same BSA, set this parameter to False.

You may enable or disable the ability for the Backbone radio to roam when it loses synchronization with its Master via the **Roaming Enabled** parameter. If the list of **First Master To Sync To**, **Second Master To Sync To**, and **Third Master To Sync To** is configured, this parameter is ignored. If the list is not configured and the **Roaming Enabled** field is set, the radio will search for any available Master. When the list is not configured and roaming is disabled, the radio will never roam.

## **SNMP Management**

---

SNMP Management is described in Chapter 9.

## **Reset Extension Point to Factory Defaults**

---

Use this option to reset all the parameters to default values. This option is only visible when configuring the Extension Point via a terminal, not via telnet or SNMP.

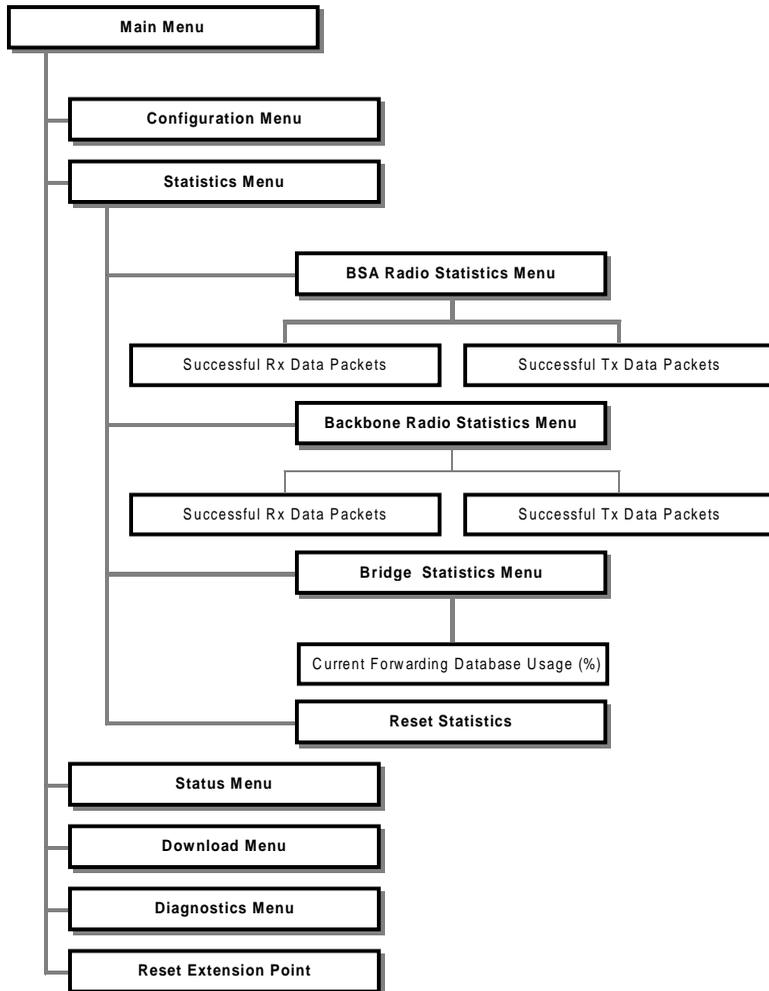
## **Dump Configuration to Screen**

---

This parameter displays the current configuration of the Extension Point to the screen. Using a screen snapshot program you can save these settings. A member of the Proxim Technical Support Department may ask you to print out this snapshot for troubleshooting purposes.

## 7. Statistics Menu

You can view statistics about the Extension Point from the Statistics Menu. The following diagram illustrates the software tree:



## **BSA Radio Statistics Menu**

---

This menu displays the number of successfully transmitted and received packets through the BSA radio interface of the Extension Point.

## **Backbone Radio Statistics Menu**

---

This menu displays the number of successfully transmitted and received packets through the Backbone radio interface of the Extension Point.

## **Bridge Statistics Menu**

---

This menu has one option which shows the percentage of the bridge's forwarding table that is used by learned node addresses. You can view this table through the Status Menu, discussed in the following pages.

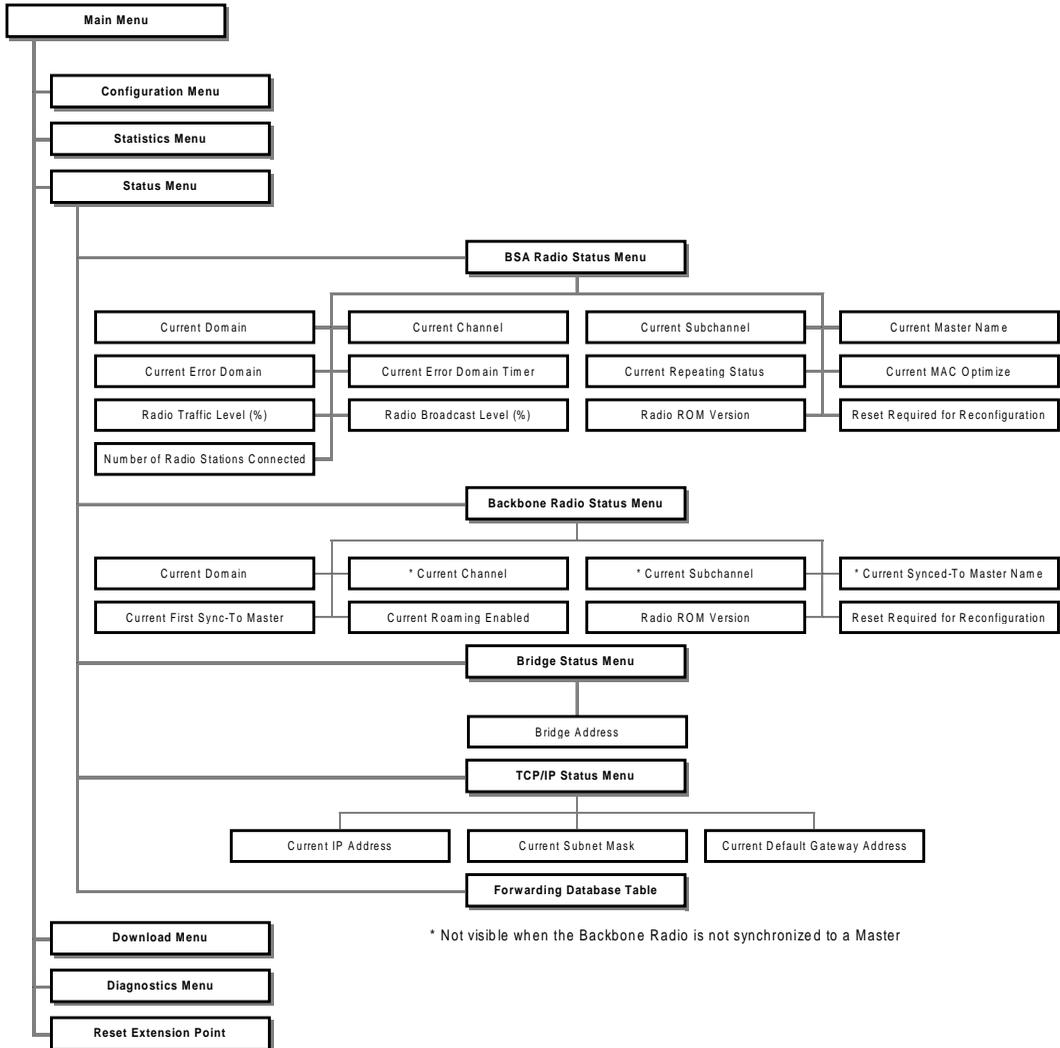
## **Reset Statistics**

---

You may reset the Extension Point statistics from this menu option.

## 8. Status Menu

The Status Menu shows you the current state of Extension Point parameters. The following diagram illustrates the software tree:



## BSA Radio Status Menu

---

The current Extension Point BSA radio parameters are displayed in this menu option. These will match those in the Configuration Menu with the exception of **MAC Optimize**. If **MAC Optimize** is configured as Auto, it will still appear in the Status Menu as Very Light, Light or Normal, depending on the current number of synchronized radios.

The **Radio Traffic Level** and **Radio Broadcast Level** parameters show the current values of these parameters which may cause an SNMP trap.

The **Radio ROM version** of the radio contained inside the BSA port of the Extension Point is available for viewing.

If there is a parameter that will not take effect until the Extension Point or BSA radio is reset, the **Reset Required for Reconfiguration** parameter will be set to “true.” For example, after changing the radio Channel through the Configuration Menu, this parameter would be set to “true.”

The **Number of Radio Stations Connected** parameter displays a count of the current RangeLAN2 devices that are synchronized to this Extension Point and have communicated within a specified time period. This time period is defined by the **Aging Period** parameter, which can be configured under the Bridge Configuration Menu.

## Backbone Radio Status Menu

---

The current Extension Point Backbone radio parameters are displayed in this menu option.

The **Channel** and **Subchannel** refer to those of the Master to which it is synchronized. These parameters are not visible when the Backbone radio is not synchronized to a Master.

**Synced-To Master Name** is the name of the Master to which the Backbone radio is synchronized. This parameter is not visible when the Backbone radio is not synchronized to a Master.

The **First Sync To** parameter lists the name of the Master to which this Extension Point will first look to synchronize. If programmed, there will also be parameters for **Second Sync To** and **Third Sync To**.

The **Roaming Enabled** parameter can differ from its configured value if any Sync To parameters are set. The Roaming Enabled parameter is set to “false” if one or more of these are programmed, even if the Configuration Menu indicates it is “true.”

If there is a parameter that will not take effect until the Extension Point or Backbone radio is reset, the **Reset Required for Reconfiguration** parameter will be set to “true.” For example, after changing the radio Channel through the Configuration Menu, this parameter would be set to “true.”

## **Bridge Status Menu**

---

The **Bridge Address** is the MAC address of the Extension Point.

## **TCP/IP Status Menu**

---

The current IP Address, Subnet Mask and Default Gateway are displayed.

## **Forwarding Database Table**

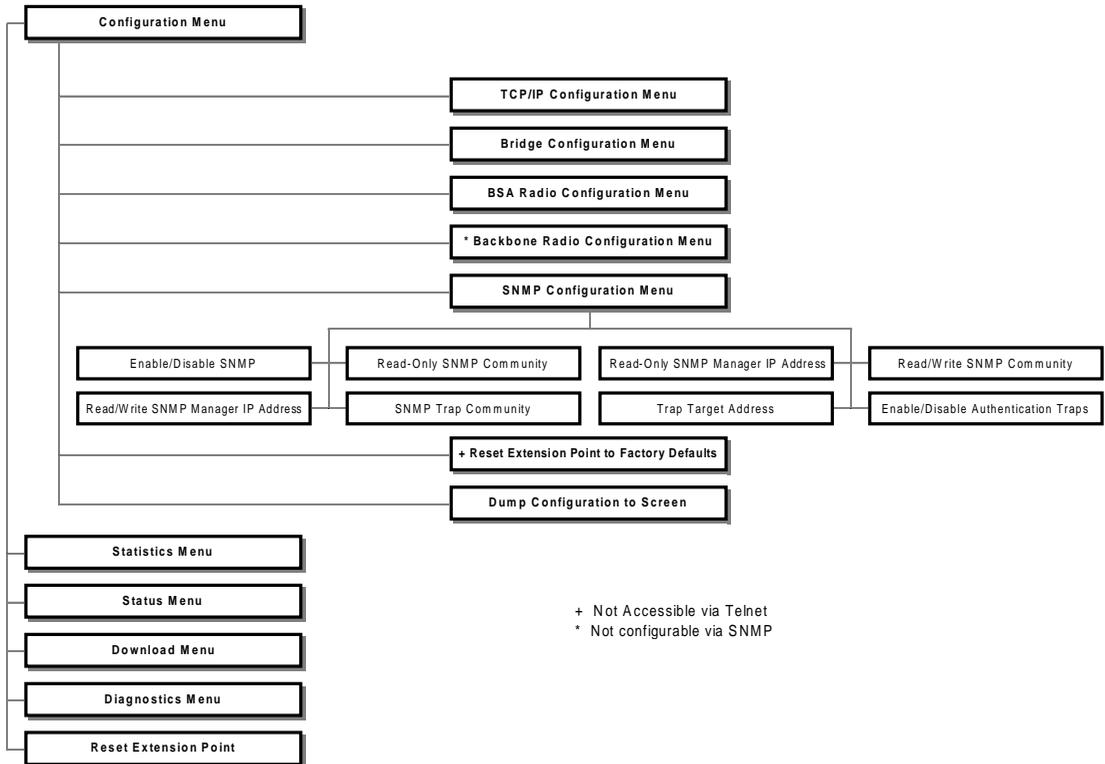
---

The Extension Point is a learning bridge. Over time, from watching the packets on the network, the Extension Point determines where the nodes on the network are -- on the BSA or Backbone side of the Extension Point. You can view the table of nodes known to the Extension Point. This table can hold a maximum of 2048 entries.



## 9. SNMP Management

You may configure and monitor the Extension Point using an SNMP management package. The following illustrates the software menu:



The Extension Point supports the following MIBs:

- MIB-II (RFC 1213)
- IEEE 802.1d Bridge MIB (RFC 1493)
- Proxim Enterprise MIB

The Proxim Enterprise MIB is supplied in ASN.1 format. It is available on the Proxim BBS and Web site. The filename is AP7540.MIB. Follow the instructions in your SNMP management package for incorporating enterprise-specific MIBs.

**Note:**

*The Extension Point is not manufactured with a default IP address. In order to SNMP manage the Extension Point, you must first assign it a valid IP address for your network using null modem cable configuration or a BOOTP server.*

You may choose to configure the Extension Point through the menu trees (in-band or out-of-band) to set SNMP parameters before using an SNMP manager.

**Enable/Disable SNMP** allows you to enable or disable SNMP management of the Extension Point.

The **Read-Only SNMP Community** parameter specifies a community supported by the Extension Point. Actions permitted by this community are “read-only” (GET and GET-NEXT). SET attempts using this community will result in rejection of the attempt with a general error response and the generation of an authentication trap (if so enabled).

The **Read-Only SNMP Manager IP Address** specifies the IP address of the SNMP manager which is permitted to use the Read-Only SNMP Community. An address of 0.0.0.0 indicates any manager may use this community.

The **Read/Write SNMP Community** parameter specifies the community supported by the Extension Point. Actions permitted by this community are “read-write” (GET, GET-NEXT, and SET).

The **Read/Write SNMP Manager IP Address** specifies the IP address of the SNMP manager which is permitted to use the Read/Write SNMP Community. An address of 0.0.0.0 indicates any manager may use the community.

The **SNMP Trap Community** parameter specifies the community that will be used by the Extension Point when generating TRAP PDUs (Protocol Data Units) to remote managers.

The **Trap Target Address** specifies the IP address of the device to which generated TRAP PDUs will be sent. A value of 0.0.0.0 disables trap generation.

**Authentication Traps** are sent to the Trap Target Address whenever anyone attempts to SNMP manage the Extension Point with an invalid community or from an invalid community. You may enable or disable the sending of these traps.

## **SNMP Supported Traps**

---

The following traps are supported by the Extension Point and are sent to the SNMP manager defined by the Trap Target Address when they occur.

### **MIB II Traps**

**Cold Start** - Sent when the Extension Point powers on or reboots.

**Link Up** - Sent by each interface at start-up or after coming back up.

**Link Down** - Sent when the Extension Point software cannot initialize or communicate with either interface.

**Authorization** - Sent to the network manager when someone tries to manage an Extension Point with an invalid community.

## Enterprise Specific Traps

**No Traffic** - Sent when set to a non-zero value and when the Extension Point does not receive any traffic from other radios for the configured period of time. The time may be configured in the BSA Radio Configuration Menu.

**Broadcast Threshold** - Sent if the radio broadcast traffic exceeds the limit set by the BSA Radio Configuration parameter, Radio Broadcast Trap Threshold.

**Cache Table High Usage** - Sent when the cache table usage percentage has exceeded the limit set by the Bridge Configuration parameter Forwarding DB Usage Trap Threshold. For example, if this limit were set to 50%, when the Extension Point knows 1024 (out of the 2048 possible) entries, it will send this trap message.

**Radio High Usage** - Sent if the radio traffic has crossed the limit set by the BSA Radio Configuration parameter Radio Traffic Threshold.

**Serial Port Down** - Sent when the serial port of the Extension Point is not working. The status of this port is checked only at boot time.

## 10. Performance Hints

This section provides the user with ideas as to how to increase performance and network satisfaction on a wireless network.

### **Microwave Ovens**

---

Microwave ovens operate in the same frequency band as RangeLAN2. Therefore, if you use a microwave within range of RangeLAN2 (about 10') you may notice network performance degradation. However, both your microwave and your RangeLAN2 network will continue to function.

### **Range**

---

Every environment is unique with different obstacles, barriers, materials, etc. and therefore, it is difficult to determine the exact range that will be achieved without testing. The site survey tool and antenna aiming tools were developed to aid in this process. Additionally, Proxim has developed guidelines to estimate the range that users will see when the product is installed in their facility, but there are no hard and fast specifications.

Radio signals may reflect off of some obstacles or be absorbed by others depending on their construction. For example, with two RangeLAN2 radios using our lowest gain antennas, you may achieve up to 1000' in open space outdoors where the two antennas are line of sight, meaning they see each other with no obstacles. However, the same two units will only achieve up to 500' of range when they have to travel through the cubicles usually used in modern offices. If there are office walls to penetrate, the signal range may decrease even further to up to 300'.

If you are interested in antenna options, contact your Proxim Sales Representative about antenna kits.



## 11. Site Survey, Antenna Pointing Tool, and Master Search Tool

The Extension Point has three mechanisms to determine proper placement of radios and antennas: a site survey tool which displays the quality of the wireless link between the BSA radio and its wireless clients; an antenna pointing tool to aim the Backbone radio's antenna; and a Master search tool which displays information on all visible Masters.

A network administrator might use these tools when diagnosing user performance problems. A network installer use them to aid in determining placement of the Extension Point and wireless client antennas.

These tools are accessible from the **BSA** and **Backbone Radio Diagnostics Menus**. The site survey tool shows the MAC addresses, Link Quality and RSSI of each wireless node that is connected to the BSA radio of the Extension Point. The **Antenna Pointing Tool** measures throughput between the Extension Point radio and the 7510/752x/753x Access Point (or other Extension Point) to which it is synchronized as packets per second and kilobits per second. The **Master Search Tool** (available on the **Backbone Radio Diagnostics Menu** only) displays configuration information on all Masters within range of the Extension Point.

To perform a site survey, first choose the **Run Broadcast Site Survey** option and let the Extension Point scan for a period of time that you specify. Then look at the list of MAC addresses found, Link Quality and RSSI data. The results will show an average value for each parameter over the time period for which the site survey was run. If you check the data before the full time has elapsed, you will see values that are an average of the time thus far elapsed.

```

BSA Radio Diagnostics Menu                                EP 1.1-B1

Selection      Description                                Current Value
-----      -
1             Run Broadcast Site Survey
2             Run Directed Site Survey
3             Run Antenna Pointing Tool
3             Run Antenna Pointing Tool

Enter a selection number or <ESC> for previous menu -> 1

Site Survey Duration (seconds)  [10]
Enter new value->

Warning -- Site survey results for power-managed wireless nodes may not
accurate.  Perform a directed site survey for these nodes.

Hit <ESC> to terminate and any other key for intermediate results
.....

Site Survey Completed

Site Survey Table

Address                Link Quality (1=poor, 5=strong)  RSSI
-----                -
00:20:a6:30:f1:11      4                                148
00:20:a6:30:e1:17      5                                152
00:20:a6:30:80:7d      4                                139
Hit any key to continue ...

```

*Figure 9*  
*Broadcast Site Survey*

The higher the Link Quality number from a particular node, the better the link. A Link Quality number of 0 indicates that the node is no longer responding at all. This is the most important parameter to watch to verify that you will be able to maintain a reliable wireless connection. **Note that the Link Quality number of RangeLAN2 7200 and 7400 adapters may be low if those adapters are in their doze mode when being surveyed. As these adapters wake up, the Link Quality number may change, so this number may not always be accurate.**

Received signal strength (RSSI) indicates how strong a signal was received from a particular node.

After using the Broadcast Site Survey, you can choose the **Run Directed Site Survey** to check the packets per second and bytes per second measurements between the Extension Point and the node you select.

```
Site Survey Table

Address                Link Quality (1=poor, 5=strong)  RSSI
-----                -
00:20:a6:30:f1:11     4                                  148
00:20:a6:30:e1:17     5                                  152
00:20:a6:30:80:7d     4                                  139

Index of the Node to Perform a Directed Site Survey on [1]
Enter new value-> 2

Packet Size (Bytes) [1500]
Enter new value->

Site Survey Duration (seconds) [10]
Enter new value->

Performing Site Survey
Hit <ESC> to terminate and any other key for intermediate results
.....

Site Survey Completed

Node Address                00:20:a6:30:e1:17
Packets Per Second          35
Bytes Per Second            52500
Average RSSI                169
Average Latency (mS)        41
Maximum Latency (mS)        132
Standard Deviation of Latency (mS) 24
Hit any key to continue ...
```

**Figure 10**  
**Directed Site Survey**

On the BSA radio, the **Antenna Pointing Tool** prompts for MAC address, packet size and sample interval. Enter the MAC address of any Station which is synchronized with the BSA radio. If there is only one Station synchronized to the BSA radio, its MAC address will be listed by default.

```

Selection      Description                               Current Value
-----
1              Run Broadcast Site Survey
2              Run Directed Site Survey
3              Run Antenna Pointing Tool
4              Radio ROM Version                       V1.9EB

Enter a selection number or <ESC> for previous menu -> 3

Target Node Address [00:20:a6:00:1b:d5]
Enter new value->

Packet Size (Bytes) [1500]
Enter new value->

Sample Interval [Once per second]
    1. Twice per second
    2. Once per second
    3. Every five seconds
Enter a selection number or <ESC> ->

Press any key to end Antenna Pointing Tool
MAC: 00:20:a6:00:1b:d5  pps: 36  kBps: 54  RSSI: 169
MAC: 00:20:a6:00:1b:d5  pps: 32  kBps: 48  RSSI: 169
MAC: 00:20:a6:00:1b:d5  pps: 22  kBps: 33  RSSI: 169
MAC: 00:20:a6:00:1b:d5  pps: 40  kBps: 60  RSSI: 169
MAC: 00:20:a6:00:1b:d5  pps: 32  kBps: 48  RSSI: 169
MAC: 00:20:a6:00:1b:d5  pps: 26  kBps: 39  RSSI: 169

Antenna Pointing Tool complete.

Hit any key to continue ...

```

**Figure 11**  
**Antenna Pointing Tool on the BSA Radio**

On the Backbone radio, the **Antenna Pointing Tool** prompts for packet size and sample interval, as well as whether or not you want to permit roaming during the test. The MAC address of the current Master is displayed. If roaming is enabled, you can move the Backbone radio antenna and synchronize with a different Master. The last parameter displayed indicates if the Backbone radio is synchronized to a Master.

After answering all prompted questions, the tool will run until stopped so that you can experiment with various placements of the antenna until the optimum location is determined.

The **Master Search Tool**, under **Backbone Radio Diagnostics**, searches for Master units within range of the Backbone radio. After running, a directed site survey is immediately launched. The **Master Search Tool** prompts for both length of time to run the tool and length of time to run the site survey.

The **Master Search Tool** displays the MAC address, Master Name, Channel, and Subchannel of all Masters it finds. The site survey displays the Kbytes/sec and RSSI values between the Backbone radio and the Master.

```

Master Search Duration (seconds) [20]
Enter new value->

Site Survey Duration (seconds) [10]
Enter new value->

Searching for masters.

Press <ESC> to terminate Master Search Tool, or any other key to proceed
to site survey.

Found MASTER1(0020a6306493) on Channel 1 Subchannel 1
Found DRWY(0020a6316fe9) on Channel 4 Subchannel 1
Found HALLWAY(0020a630733d) on Channel 13 Subchannel 1
Found MASTER2(0020a634fed7) on Channel 9 Subchannel 1

Found Masters Table

Name                Address                Channel  Sub
----                -
MASTER1             00:20:a6:31:64:93     1         1
DRWY                 00:20:a6:31:6f:e9     4         1
HALLWAY              00:20:a6:30:73:3d    13        1
MASTER2              00:20:a6:34:fe:d7     9         1
Press [ESC] to terminate Site Survey

Performing Site Survey on MASTER1      .....

Master Search Results Table

Name                Address                Channel  Sub    KBytes/sec  RSSI
----                -
MASTER1             00:20:a6:31:64:93     1         1      53          153
DRWY                 00:20:a6:31:6f:e9     4         1      42          170
HALLWAY              00:20:a6:30:73:3d    13        1      56          138
MASTER2              00:20:a6:34:fe:d7     9         1      44          140
Hit any key to continue ...

```

**Figure 12**  
**Master Search Tool**

## 12. Troubleshooting

The Extension Point is designed to be very easy to install and operate. If you do experience difficulties, however, use the information in this chapter to help diagnose and solve the problem. If you cannot resolve the problem, contact Proxim, as described in Appendix F, “How to Reach Technical Support.”

### **How to Obtain Help with Your LAN Installation**

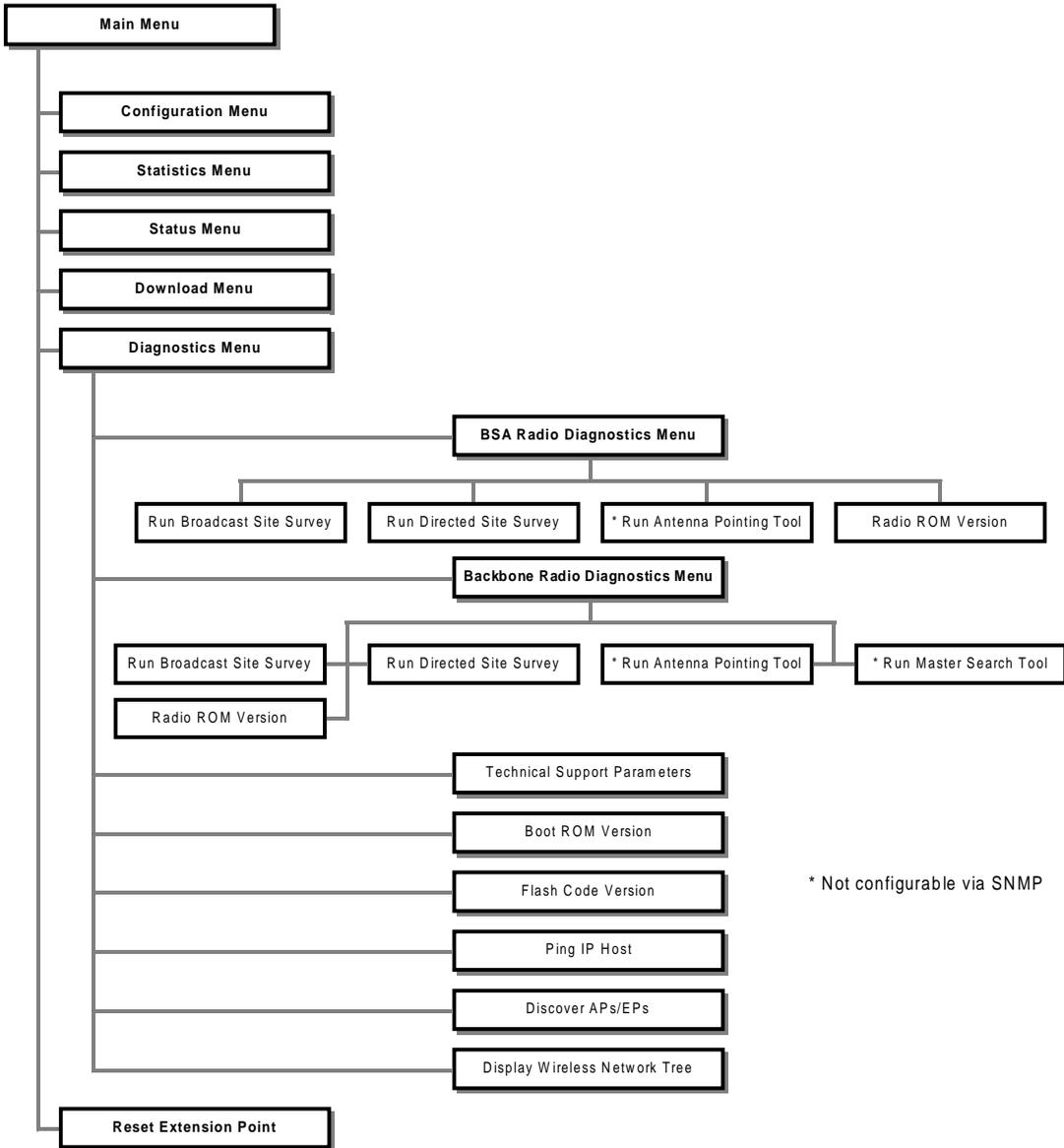
---

If you require assistance to install your LAN, Proxim can put you in touch with a RangeLAN2 Reseller in your area. The reseller is an expert in the design, installation, and maintenance of LANs and will be able to examine your needs and recommend the most cost-effective solution for your LAN whether you are installing a new LAN or adding on to an existing one. For the location of the RangeLAN2 reseller nearest you, contact Proxim at 800-229-1630 and ask for the Sales Department.

### **Diagnostics Menu**

---

There are diagnostic tools built into the Extension Point that will assist you and your reseller or Proxim Technical Support in solving problems. The following diagram illustrates the software tree:



## **Versions**

---

You can read the **ROM version** of each radio in the Extension Point. You can also read the **Boot ROM version** and **Flash Code version**.

## **Technical Support Parameters**

---

If you call Proxim Technical Support, they may ask you to enable the **Technical Support Parameters** to perform more detailed diagnostics on the unit.

## **Ping IP Host**

---

From the Diagnostics Menu, you can cause the Extension Point to **Ping** any **IP Host** on the network. This might be useful in isolating which side of the Extension Point is not working properly.

## **Discover APs/EPs**

---

The Extension Point will display all 7510/752x/753x Access Points and Extension Points that it is able to discover along with their configuration.

Discovered APs/EPs Table

MAC Address	IP Address	Domain	Channel	Subchannel	Master
00:20:a6:30:66:0c	19.10.205.20	9	1	1	HALLWAY
00:20:a6:30:a0:aa	19.10.40.2	2	2	2	DRWAY
00:20:a6:31:ad:42	19.10.205.26	11	1	10	MASTER1
00:20:a6:30:f1:e1	19.1.37.1	2	3	1	MASTER2
00:20:a6:30:10:05	19.1.60.3	2	4	1	CLOSET
00:20:a6:30:90:1d	19.10.30.2	2	12	1	2ND_FLR
00:20:a6:30:99:e6	19.1.30.2	2	1	1	MFG
00:20:a6:31:65:fa	19.10.225.63	2	1	1	JOE
00:20:a6:31:62:76	19.10.150.173	12	1	1	MASTER
00:20:a6:31:c1:82	19.10.41.43	0	2	2	HOP

*Figure 13*  
*Discover APs/EPs*

## Display Wireless Network Tree

---

The Extension Point will display the tree of all 7510/752x/753x Access Points and Extension Points that it is able to discover along with their relationship to one another, i.e. who is synchronized to whom. Each indentation indicates a hop.

The Extension Point from which the tree is being built will be listed with asterisks (\*\*\*) next to its name.

```
Enter a selection number or <ESC> for previous menu -> 8

Discovering...
Wireless Network Tree:
00:20:A6:30:F0:F7 (Master AP - AP2)
    00:20:A6:31:89:61 (EP - EP_MASTER***)
        00:20:A6:31:87:79 (EP - HALLWAY)
00:20:A6:30:B1:32 (Master AP - DRWAY)
00:20:A6:30:F1:15 (Master AP - 1STFLR)
    00:20:A6:31:C9:72 (EP - 1_EP)
00:20:A6:30:F7:01 (Master AP - 2NDFLR)

Hit any key to continue ...
```

*Figure 14*  
*Display Wireless Network Tree*

**Power Outages / Brownouts**

---

If there are power problems in an Extension Point installation, verify that as the tree comes back up, each Extension Point is synchronized to the unit you desire and expect, and make sure the wireless clients have a proper path to the network backbone.

## Installation Checklist

---

In case of installation difficulties, verify the following:

- ❑ All 7510/752x/753x Access Points must have V1.3 or later software. Note that the software version is listed in the upper right corner of the menu.
- ❑ All Masters that are using the same Domain and Security ID should have unique Channels wherever possible. If there are more than 15 Masters, reuse Channels on Masters that are not geographically adjacent. Use the **Discover APs/EPs** command from the Diagnostics menu to view all the Masters.
- ❑ Verify there is a link to the wired Ethernet backbone using the **Display Wireless Network Tree** command from the Diagnostics menu.
- ❑ Use the **Antenna Pointing Tool** or the **Run Directed Site Survey** option from the **Backbone Radio Diagnostics Menu** to ensure optimum antenna placement, especially of directional antennas. Antennas should be no closer than 6' apart.
- ❑ In a tree topology, repeating must be enabled on the 7510/752x/753x Access Point that is connected to the network backbone, as well as all Extension Points.
- ❑ In order to ensure seamless roaming, use the same Domain and Security ID on all Master 7510/752x/753x Access Points and Extension Point BSA radios.
- ❑ Verify all Masters listed in the **First Master To Sync To**, **Second Master To Sync To**, and **Third Master To Sync To** configuration parameters are within range of the Backbone radio by using the **Master Search Tool** and are listed correctly.

# Commonly Asked Technical Support Questions

---

Problem/Symptom/Question	Possible Solution/Answer	Chapter in User's Guide
Is the Extension Point fully booted?	The status LED changes from steady yellow to steady green	12
I can't connect to the network from wireless client.	<ol style="list-style-type: none"> <li>1. Verify the wireless connection using the Site Survey Tool of the Extension Point or of the client.</li> <li>2. Verify that the Extension Point's Backbone radio has a path to the wired network via 7510/752x/753x Access Points and other Extension Points.</li> <li>3. Verify that the 7510/752x/753x Access Point connected to the network backbone is not filtering out the kind of traffic the client is trying to pass.</li> </ol>	# 1 - 11 # 2 - 4
Why is the Status LED flashing yellow?	The Backbone port of the Extension Point cannot synchronize to a Master. Verify it is still in range of the one of the Masters listed as First, Second or Third Master to Sync To using the site survey tools. If there are no Masters listed, verify that Roaming Enabled is set to True.	11
I can't ping or telnet to my brand new Extension Point.	There is no default IP address. The first time you use the Extension Point, set an IP address using a terminal and null modem cable or a BOOTP server.	5
How can I tell which side of the Extension Point a client is on?	View the Forwarding Database in the Status Menu. Units on the BSA port are synchronized to or bridged through the Extension Point.	8
How can I tell to which 7510/752x/753x Access Point my Extension Point is synchronized?	Use the Display Wireless Network Tree or the Current Sync-To Master Name in the Backbone Radio Status Menu.	12, 8
I can't configure the Extension Point locally via the serial port.	Verify you are using a null modem cable and that the terminal is set to 9600 N81.	5
I can't establish a wireless connection with the Extension Point.	Verify that the client is set to the same Domain and Security ID of the BSA port of the Extension Point and that the client is configured as a Station.	6
The throughput seems slow.	To achieve maximum throughput, verify your antennas are well-placed, not behind metal, and there are not too many obstacles. If you move the antenna closer to the client and throughput increases, you may want to consider adding additional 7510/752x/753x Access Points or Extension Points.	10
How long does my Extension Point Backbone take to start searching for alternate Masters when the first one is unavailable?	50 seconds	
When the Extension Point is not connected with the network, how can I communicate with it?	Either via the serial port using a terminal emulation program, or a telnet session from a wireless client that is configured on the Error Domain.	5
How do I know that I have selected the best position for my directional antenna.	Either use the Antenna Pointing Tool or perform a Direct Site Survey to verify optimum connection.	11
How do I disable the Error Domain?	Set it to the same Domain number as the Configured Domain.	
The status LED on the Extension Point is steady red.	Call Technical Support	F

## LED Indicators

---

There are three LEDs on the front of the Extension Point:

- ❑ The cornermost LED, called the **System LED**, changes from yellow to green to indicate the Extension Point is functional. It changes from yellow to red if there is a hardware problem with the unit. If this LED does turn red, contact Proxim Technical Support. The LED will blink yellow if the Extension Point has entered the Error Domain because it cannot find a Master on the Backbone with which to synchronize.
- ❑ The center orange LED, called the **BSA LED**, flashes when the Extension Point is forwarding packets to its Basic Service Area (BSA).
- ❑ The third green LED, called the **Backbone LED**, flashes when the Extension Point is transmitting through the Backbone (BB) radio.



*Figure 15*  
*Front Panel LEDs*

The following table illustrates the state of the LEDs during power-up:

State	System LED	BSA LED	Backbone LED
Unit off	Off	Off	Off
Power-On Diagnostics	Yellow	Off	Off
Diagnostics Failed	Red	Off	Off
Normal	Green	Blinking Yellow	Blinking Green
Cannot Synch to Backbone	Blinking Yellow	Off	Off

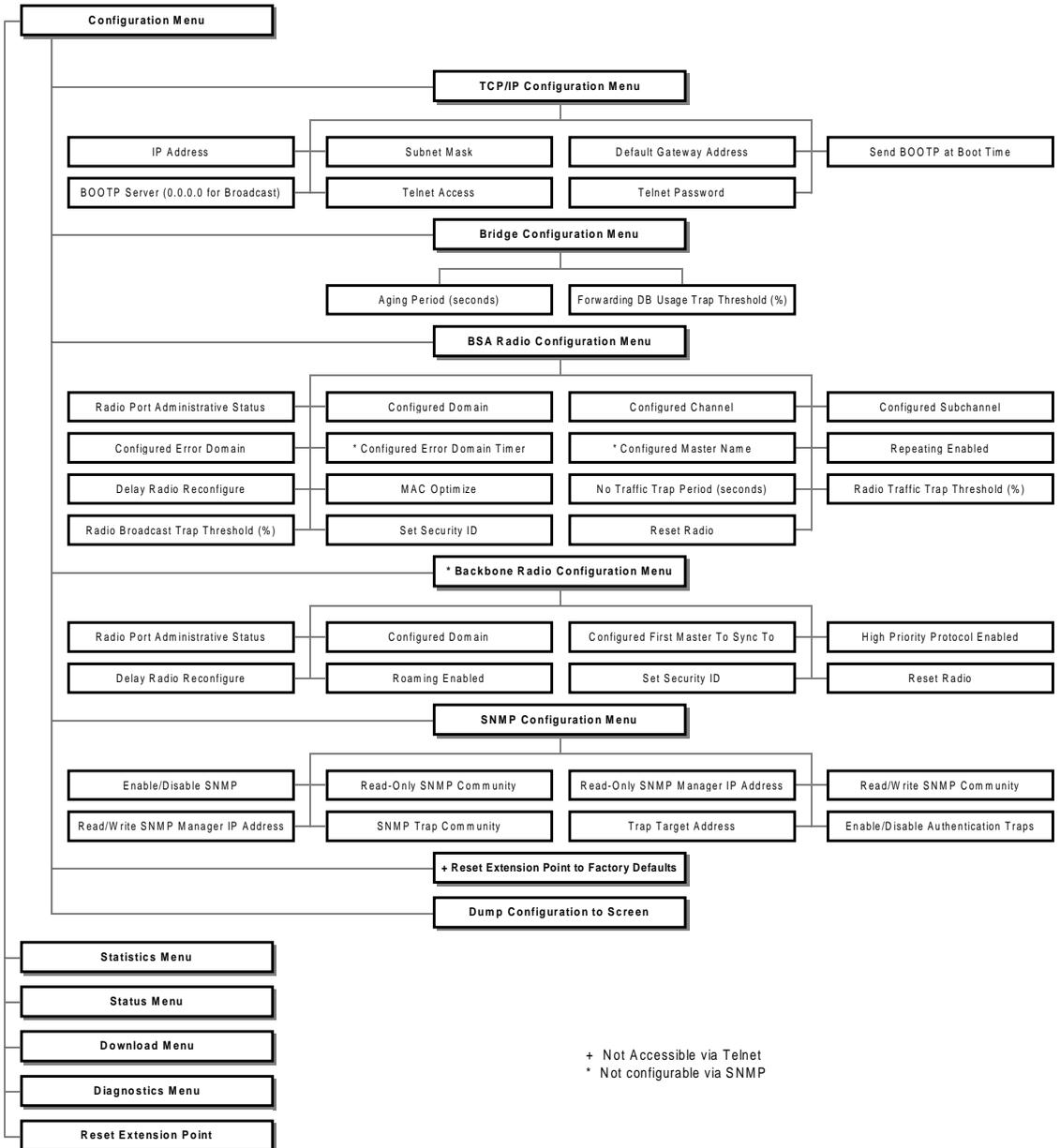
There are two functional LEDs on the back panel of the Extension Point:

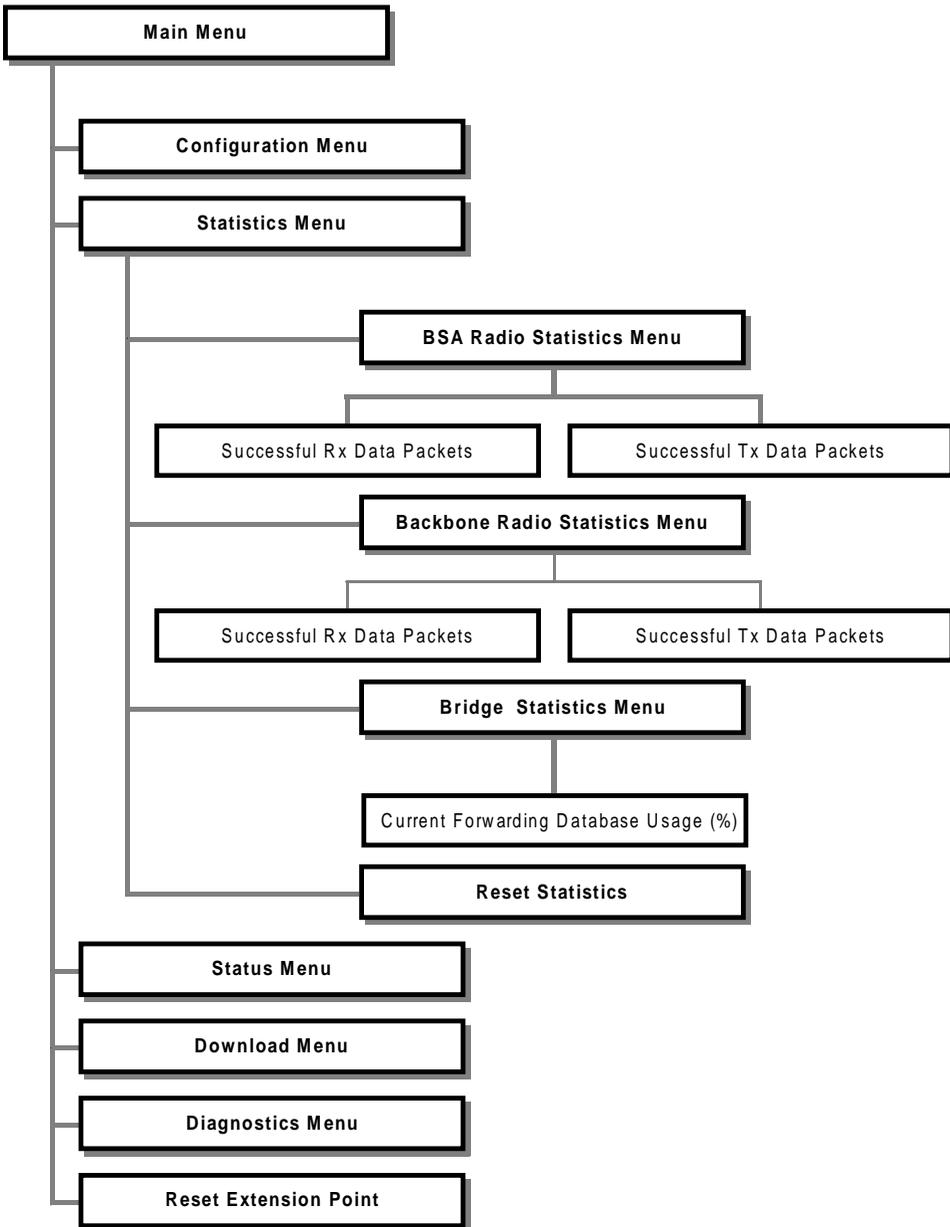
- The green LED next to the BSA Antenna is on steady when the BSA radio is acting as a Master.
- The yellow LED next to the BB Antenna is on steady when the Backbone radio is synchronized to a Master.
- The yellow LED next to the BSA Antenna and the green LED next to the BB antenna have no current functionality.

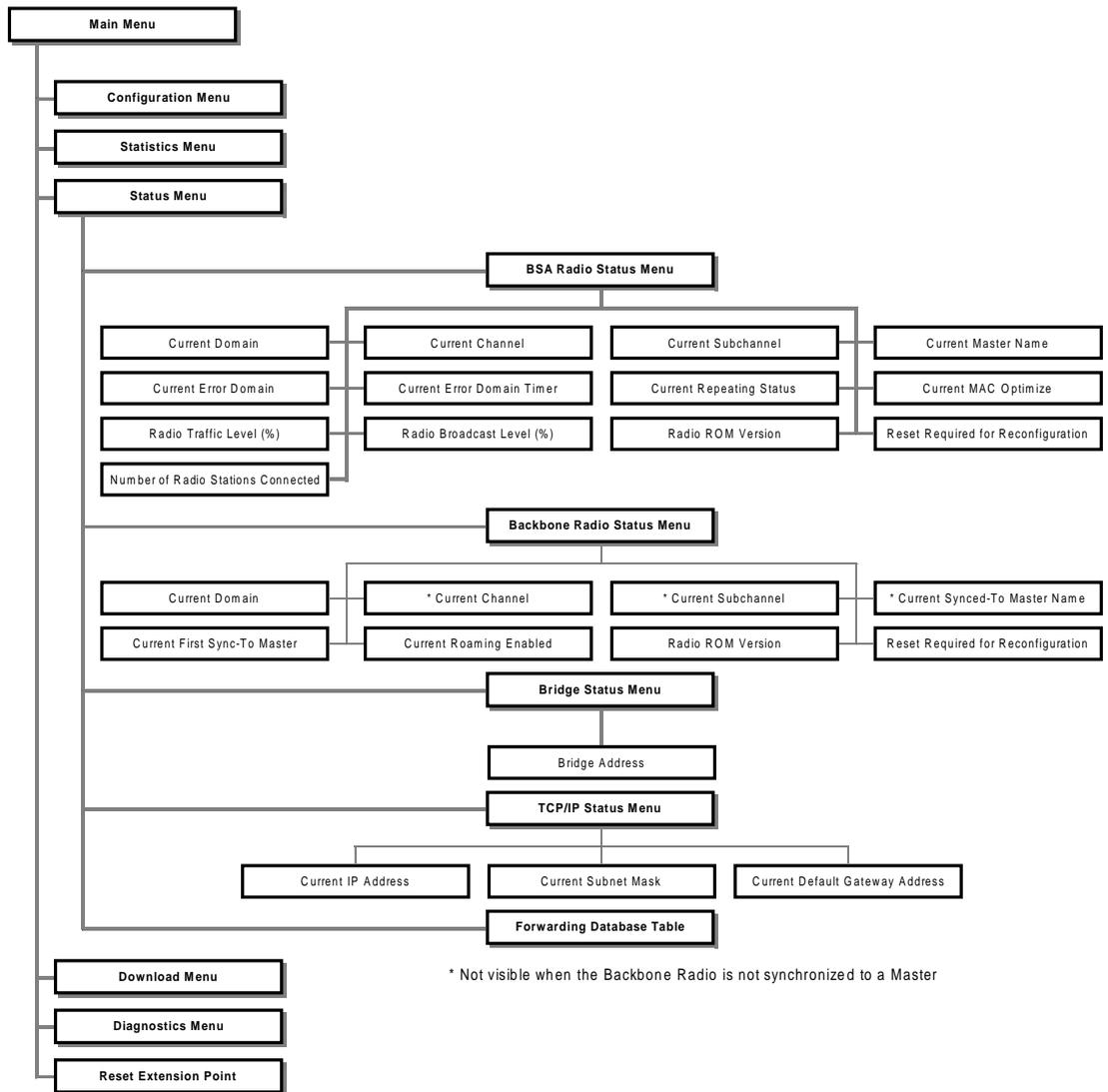


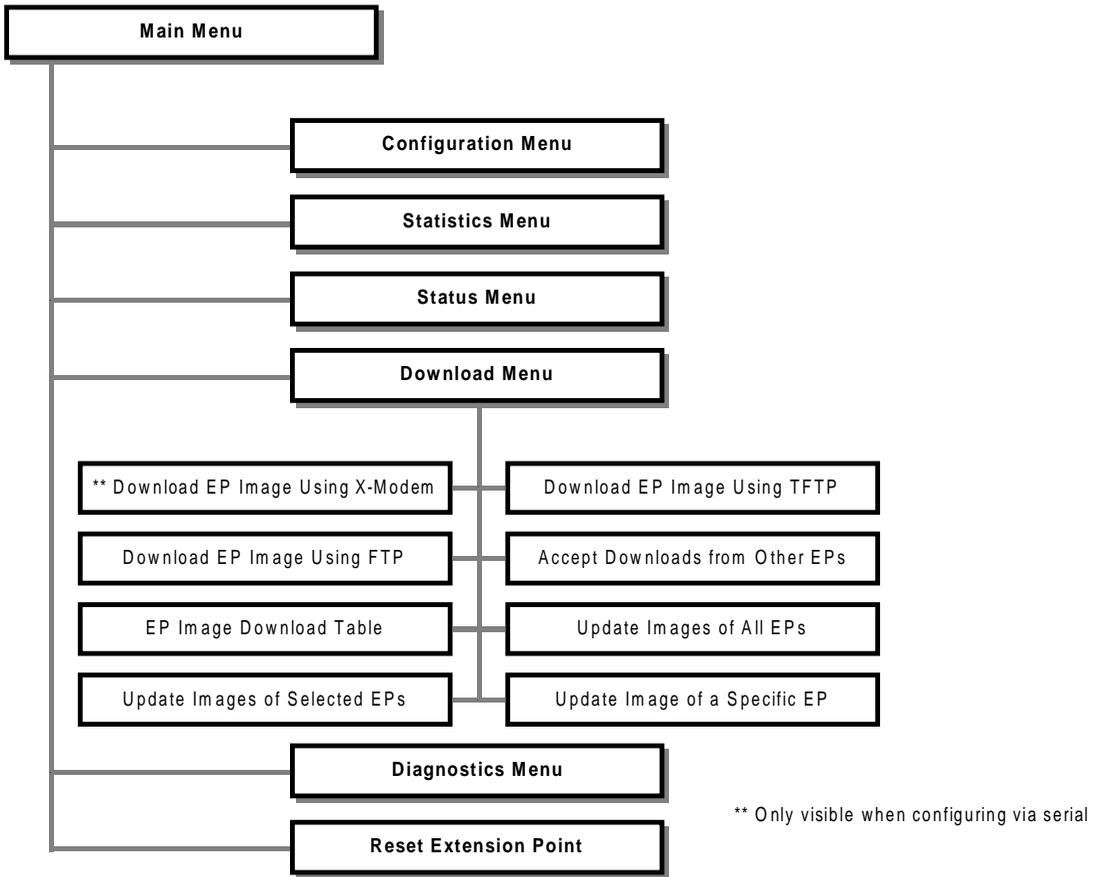
*Figure 16*  
*Back Panel LEDs*

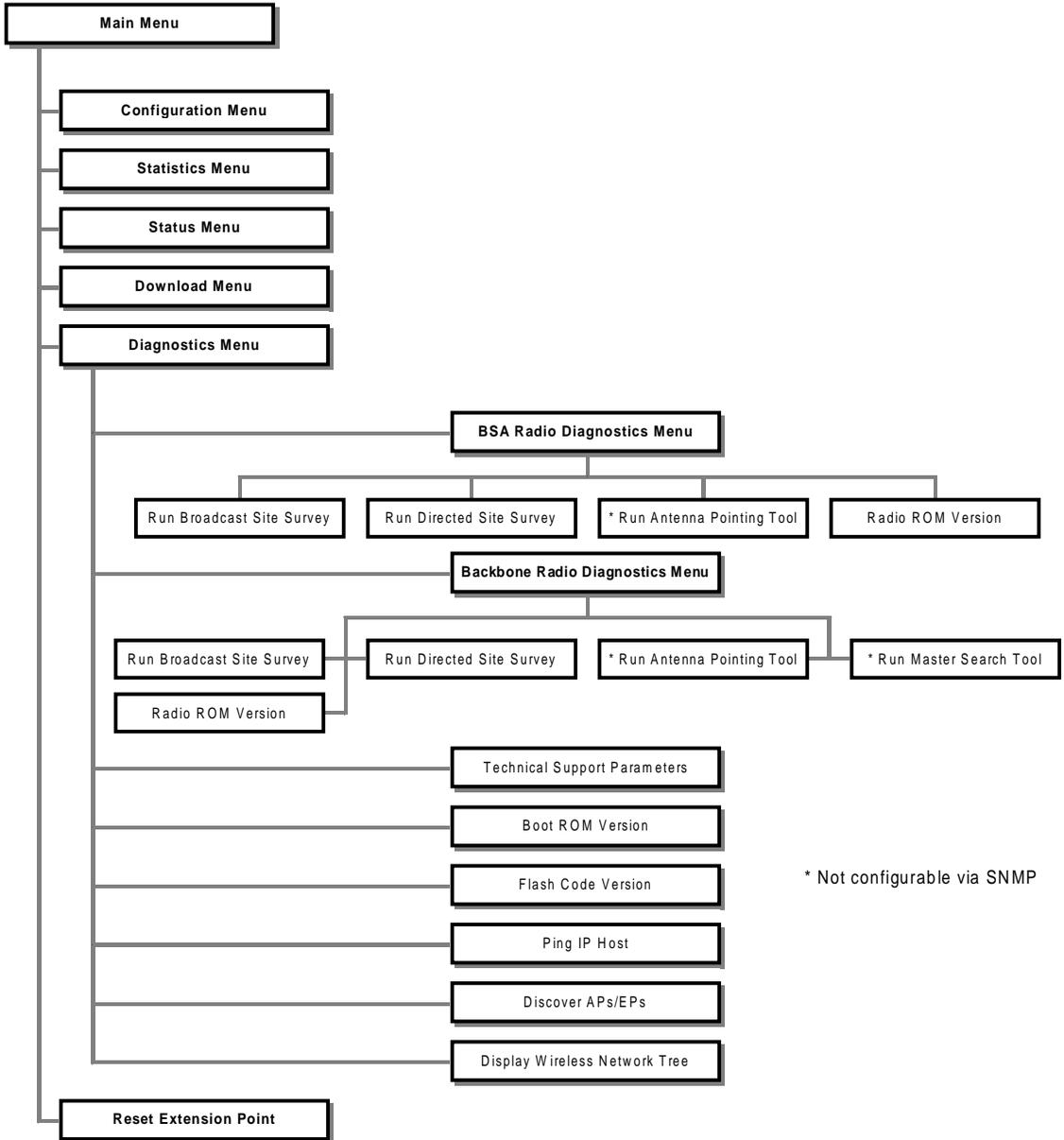
# A. Menu Structure





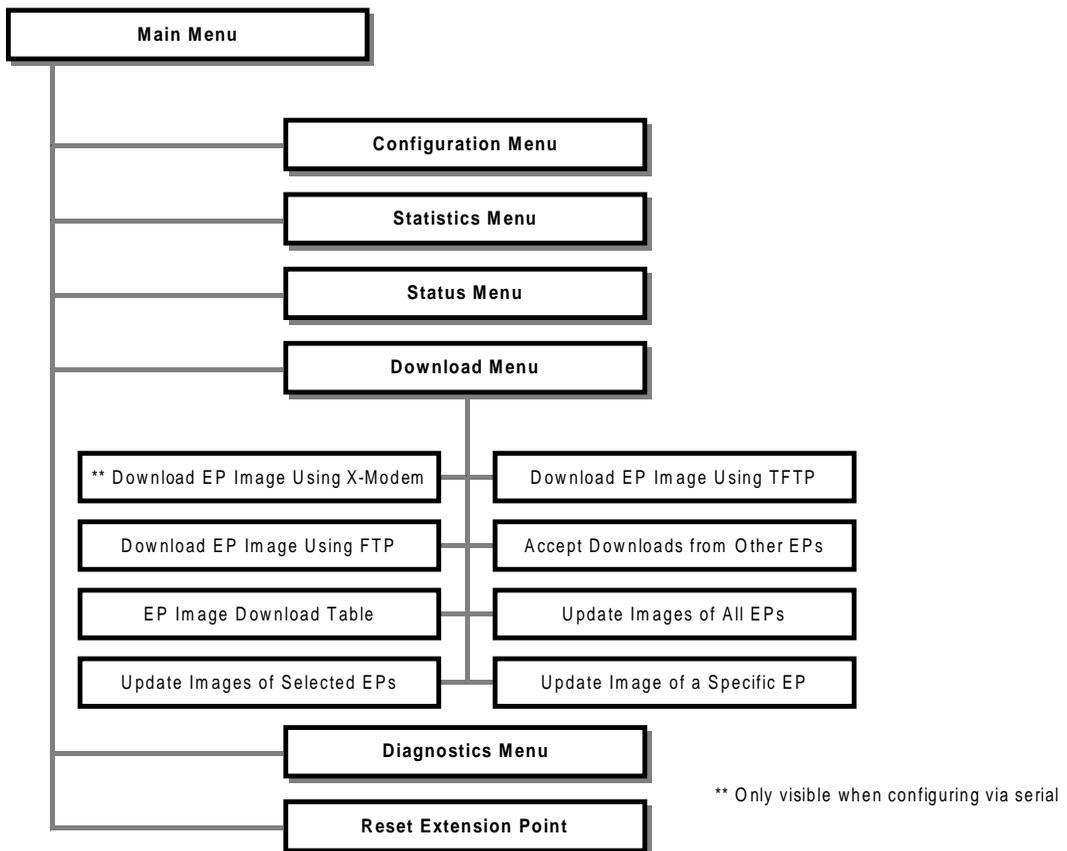






## B. Download Menu

At some point in the future, you may need to upgrade the Extension Point software. To do this, choose the Download Menu option. Then you can choose to download a new image. When configuring the Extension Point through the serial port you may download using Xmodem, TFTP, or FTP. When configuring via telnet, you will not have the Xmodem option. The following diagram illustrates the software tree:



The steps for downloading a new image are:

1. Choose a method of download (Xmodem, TFTP, FTP) and place the image file on that hard drive, floppy diskette, server, etc.

When performing an Xmodem download, use the Xmodem or Xmodem CRC protocols.

2. Bring up the menu on the Extension Point via a terminal with a null modem cable or a telnet session.
3. Choose the Download Menu off the Main Menu.
4. Choose the Download type, i.e. Download EP Image Using Xmodem, etc.
5. Answer the on-screen prompts for server IP address, username, etc.
6. When download is successful, the Extension Point will automatically reboot and load the new image.

The Extension Point also has the ability to update other Extension Points' software. You can choose to **Update Images of All EPs** or **Update Images of Selected EPs**. In these two cases, the Extension Point will first discover other Extension Points. The difference between these two options is the ability to exclude certain units from receiving the new image. If you know the IP address of a specific Extension Point that you would like to update, choose the **Update Image of a Specific EP** option and provide the IP address when prompted. If you do not want an Extension Point to receive an updated image, disable the **Accept Downloads from Other EPs** parameter.

To view the status of downloads on other Extension Points, see the **EP Download Table**.

## C. Glossary

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

**Bandwidth** — The size (in Hertz) of the frequency range that a signal transmission occupies. Typical narrow band signals occupy a 25 KHz bandwidth. The RangeLAN2 signal occupies a 1 MHz bandwidth.

**BB (Backbone)** — The Station radio of the Extension Point that synchronizes with a Master to attach to the network backbone.

**BOOTP (Bootstrap Protocol)** — A protocol used to assign IP addresses.

**BSA (Basic Service Area)** — A virtual cell created by the Master radio on the Extension Point. RangeLAN2 Stations synchronize with the BSA radio.

**Channel** — In RangeLAN2 networks, the Channel refers to the frequency hopping sequence the card follows.

**CSMA/CA** — (Carrier Sense Multiple Access/Collision Avoidance) — CSMA is a protocol in which each node senses whether or not a channel is in use before attempting to transmit information. CA is an optimization by which channel time is reserved to avoid collisions.

**Download Image** — A software file that is used to upgrade the software code running on the Extension Point.

**Frequency Hopping** — A spread spectrum technique by which the band is divided into a number of frequencies and the transmissions hop from frequency to frequency in a pre-specified sequence.

**Interference** — A situation that occurs when an unwanted RF signal occupies the same frequency band as a desired signal.

**IP Address (Internet protocol address)** — A 32-bit address assigned to TCP/IP hosts.

**Spread Spectrum** — A radio data transmission modulation technique by which the transmitted signal is spread over a bandwidth wider than the information bandwidth. In the U.S., Spread Spectrum bands are designated by the FCC and require no user license.

**SNMP (Simple Network Management Protocol)** — A protocol used to manage network nodes.

**TCP/IP** — Transmission Control Protocol/Internet Protocol. A suite of protocols developed under DARPA sponsorship for internetworking.

## D. Parameters

### TCP/IP Parameters

---

Parameter Name	Range	Default
IP Address	-	0.0.0.0
Subnet Mask	-	0.0.0.0
Default Gateway Address	-	0.0.0.0
Send BOOTP at Boot Time	True/False	True
BOOTP Server Address	-	0.0.0.0 *
Telnet Access	Enabled/Disabled	Enabled
Telnet Password	-	-

\* 0.0.0.0 is used to send a broadcast

### Bridge Parameters

---

Parameter Name	Range	Default
Aging Period (seconds)	10-1,000,000	300
Forwarding DB Usage Trap Threshold	0-100 (%)	100

## BSA Radio Parameters

---

Parameter Name	Range	Default
Radio Port Administrative Status	Enabled/Disabled	Enabled
Domain	0-15	0
Channel	1-15	2
Subchannel	1-15	2
Error Domain	0-15	13
Error Domain Timer (seconds)	2 - 255	55
Master Name	11 characters	EP_MASTER
Repeating Enabled	True/False	False
Delay Radio Reconfigure	True/False	True
MAC Optimize	Auto, Very Light, Light, Normal	Auto
No Traffic Trap Period (seconds)	0-10,000,000	0
Radio Traffic Trap Threshold (%)	10-100	100 *
Radio Broadcast Trap Threshold (%)	10-100	100 *
Security ID	0-20 characters	blank

\* a value of 100  
disables this  
trap

## Backbone Radio Parameters

---

Parameter Name	Range	Default
Radio Port Administrative Status	Enabled/Disabled	Enabled
Domain	0-15	0
First Master To Sync To	11 characters	blank
High Priority Protocol Enabled	True/False	True
Delay Radio Reconfigure	True/False	True
Roaming Enabled	True/False	True
Security ID	0-20 characters	blank

## E. U.S. Specifications

The following technical specification is for reference purposes only. Actual product's performance and compliance with local telecommunications regulations may vary from country to country. Proxim, Inc. will only ship products that are type approved in the destination country.

<b>Data Rate (per port)</b>	1.6 Mbps
<b>Media Access Protocol</b>	RangeLAN2 CSMA/CA
<b>Frequency Band</b>	2.4-2.5 GHz Worldwide (Depends on country) (spread spectrum frequency hopping)
<b>Independent Channels</b>	15
<b>Output Power</b>	100 mW or 500 mW (Depends on country and model)
<b>ETSI Testing</b>	For purposes of ETS 300 328 type testing, the Extension Point was tested over a temperature range of -20 C to +55 C.
<b>Operating Temperature</b>	-20 C to +60 C
<b>UL Listed Power Supply</b>	The Extension Point requires an external power supply. If you have elected not to purchase the external power supply from Proxim or need a replacement, you must use only a UL listed, Class 2 power supply, rated min. 1A at 12VDC.
<b>FCC Notice</b>	Warning! It is the responsibility of the installer of these antennas, as well as the responsibility of the user of this product, to guarantee that each antenna is operated at least 20 cm (8 inches) from any person. This is necessary to ensure that the product is operated in accordance with the RF Guidelines for Human Exposure which have been adopted by the Federal Communications Commission.

## F. How to Reach Technical Support

If you're having a problem using an Extension Point and can't resolve it with the information in Chapter 12, gather the following information and contact Proxim Technical Support:

- What kind of network are you using?
- What were you doing when the error occurred?
- What error message did you see?
- Can you reproduce the problem?
- What version of the Extension Point firmware and software are you using?

You can reach Proxim Technical Support by voice, fax, email, or mail:

Tel: 800-477-6946 or 408-731-2640

Fax: 408-731-3676

Web: <http://www.proxim.com>

Email: [support@proxim.com](mailto:support@proxim.com)

Proxim, Inc.

Attn: Technical Support

510 DeGuigne Drive

Sunnyvale, CA 94086

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