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Tsunami MP.11 and MP.11a

Installation and Management Guide



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FCC COMPLIANCE

This document provides regulatory information for the following wireless base station products:

- Tsunami MP.11 2411 BSU, Tsunami MP.11 2411 SU, Tsunami MP.11 2411 RSU
- Tsunami 2411 QuickBridge 11
- Tsunami MP.11a BSU, Tsunami MP.11a SU, Tsunami MP.11a RSU

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference
- (2) This device must accept any interference received, including interference that may cause undesired operation.

This device must be professionally installed.

Changes or modifications not expressly approved by Proxim Corporation could void the user's authority to operate the equipment.

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 attempt 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 receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

This device must be professionally installed. Antennas used for the MP.11a product must be fix-mounted on permanent structures with a separation distance of at least 2 meters from all persons during normal operation.

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Chapter 1. Overview

The Tsunami MP.11 and MP.11a are flexible wireless outdoor routers that let you design solutions for point-to-point links and point-to-multipoint networks.

The Tsunami MP.11 and MP.11a are product families comprising several products (such as the MP.11 2411 Base Station and the MP.11 2411 Residential Subscriber Unit). For simplification:

- All products that are part of the MP.11 Product Family are referred to as MP.11.
- All products that are part of the MP.11a Product Family are referred to as MP.11a.
- MP.11/a is used in this book when referring to both the Tsunami MP.11 and MP.11a product families.

Some of the key features of the MP.11/a are:

- The use of a highly optimized protocol for outdoor situations
- Routing and bridging capability
- Asymmetric bandwidth management
- Management through a Web Interface, a Command Line Interface (CLI), or Simple Network Management Protocol (SNMP)

Before installing and using the MP.11/a, Proxim recommends you review the following chapters of this manual first:

Chapter 1 “Overview” (this chapter)

This chapter gives an overview of the content of this manual as well as wireless network topologies and combinations that can be built with the MP.11/a.

Chapter 2 “Installation” on page 8

This chapter gives detailed installation instructions for the MP.11/a.

Chapter 3 “Management Overview” on page 19

This chapter explains how to access the MP.11/a to manage it for configuration or maintenance.

Chapter 4 “Basic Management” on page 27

This chapter explains the most common settings used to manage the MP.11/a.

Chapter 5 “Web Interface” on page 42

This chapter depicts the Web Interface in a hierarchical manner, so you can easily find details about each item.

Chapter 6 “Command Line Interface” on page 80

The Command Line Interface (CLI) is an alternative to the Web Interface. This chapter tells you how to obtain help about commands and how to handle strings, tables, and so on.

The remaining chapters contain supplementary information you may not need immediately.

If you are already familiar with this type of product, you can use the “Quick Install Guide” to install the MP.11/a.

WIRELESS NETWORK TOPOLOGIES

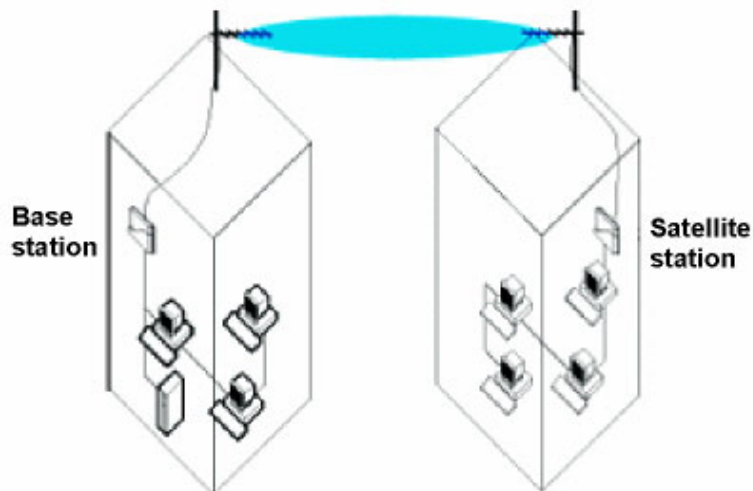
You can use the MP.11/a to set up the following types of topologies:

- Point-to-Point Link ([below](#))
- Point-to-Multipoint Network ([on page 7](#))

A link between two locations always consists of a Base and a Satellite station. A station is a radio set up as either a Base Station or a (Residential) Subscriber Unit. A Base station can, depending upon its configuration, connect to one or more Satellite stations. A Satellite station, however, can connect only to one Base station.

Point-to-Point Link

With a Base and a Satellite station or a QuickBridge 11 kit, it is easy to set up a wireless Point-to-Point link as depicted in the following figure.

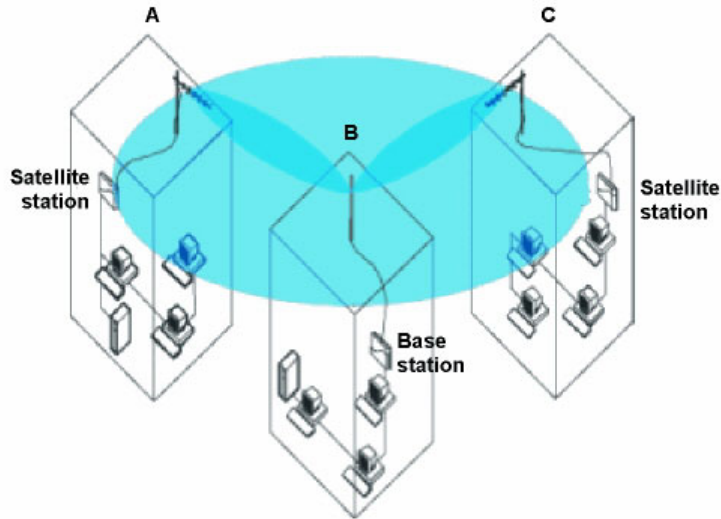


A point-to-point link lets you set up a connection between two locations as an alternative to:

- Leased lines in building-to-building connections
- Wired Ethernet backbones between wireless access points in "hard-to-wire" environments

Point-to-Multipoint Network

If you want to connect more than two buildings, you can set up a single Point-to-Multipoint network with a single Base interface and multiple Satellite interfaces, as depicted in the following figure.



In this figure, the system is designed as follows:

- The central building **B** is equipped with a Base interface, connected to either an omni-directional, or a wide angle antenna.
- The two other buildings **A** and **C** are both equipped with a Satellite interface connected to a directional antenna.

ACTIVE ETHERNET

The MP.11/a is equipped with an 802.3af-compliant Active Ethernet module. Active Ethernet delivers both data and power to the radio over a single Ethernet cable. If you choose to use Active Ethernet, there is no difference in operation; the only difference is the power source.

- The Active Ethernet integrated module receives –48 VDC over a standard Cat 5 Ethernet cable.
- To use Active Ethernet, you must have an Active Ethernet hub (also known as a power injector) connected to the network. The Active Ethernet hub is not a repeater and does not amplify the Ethernet data signal.
- The cable length between the Active Ethernet hub and the radio should not exceed 100 meters (approximately 325 feet).
- If connected to an Active Ethernet hub and an AC power supply simultaneously, the radio draws power from Active Ethernet.
- Maximum power supplied to an MP.11 is 11 Watts; maximum power supplied to an MP.11a is 36 Watts. The units typically draw less than 7.5 Watts.

Chapter 2. Installation

This chapter describes the steps required to install the MP.11/a installation steps, such as:

- Identifying Network Topology and Equipment below
- Finding a Suitable Location on page 9
- Installing the MP.11/a on page 10
- Switching On the MP.11/a on page 15
- Installing Documentation and Software on page 15
- Mounting the MP.11/a on page 16

Note: The installation does not cover the mounting and connection of antennas. See the applicable *Antenna Installation Guide* (MP.11 or MP.11a).

If you are already familiar with this type of product, you can use the *Quick Install Guide* for streamlined installation procedures.

IDENTIFYING NETWORK TOPOLOGY AND EQUIPMENT

The MP.11/a can be used in various network topologies and combinations. You can find more details in “Wireless Network Topologies” in Chapter 1 on page 6. Make sure all equipment is available before installing the MP.11/a. The required equipment depends upon the wireless network topology that you want to build.

The MP.11/a is designed for indoor placement. You can connect the MP.11 to an outdoor antenna installation with an optional antenna kit. See the appropriate *Antenna Installation Guide* for details.

WARNING! *If you want to connect the MP.11/a to an outdoor antenna system, consult the appropriate manufacturers' documentation for additional regulatory information, safety instructions, and installation requirements.*

FINDING A SUITABLE LOCATION

To make optimal use of the MP.11/a, you must find a suitable location for the hardware. The radio range of the MP.11/a largely depends upon the position of the antenna. Proxim recommends you do a site survey, observing the following requirements, before mounting the MP.11/a hardware.

- The location must allow easy disconnection of the unit from the power outlet if necessary.
- The unit must not be covered and the air must be able to flow freely around the unit.
- The unit must be kept away from vibration, excessive heat, and humidity, and kept free from dust.
- The installation must conform to local regulations at all times.

Note: For this reason, European installers should not add an antenna or an amplifier until the MP.11a **Country** is selected (using the Web interface, click the **Configure** button and the **System** tab) and the unit is rebooted. The output power level of the final channel selected by DFS scan can be found in the Event Log (see “Event Log” on page 43).

- If you do not use Active Ethernet, the unit must be connected to proper grounding using the Faston plug on the metal case (regular 6.3 mm width plug).



Note: Whether Power-over-Ethernet or local power is used, the metal case must ALWAYS be grounded, either through the Faston connector or a ground wire connected to the metal case in another manner. (The Faston is the regular 6.3 mm width plug.)

INSTALLING THE MP.11/a

The MP.11/a supports two power methods—an AC power outlet and Active Ethernet. The power supply accepts an input AC voltage in the range of 100-240 VAC.

The installation procedure on page 11 provides instructions for attaching both the power and Ethernet connectors. In situations without an external antenna (for example, during a desk tryout), the antenna cable is not required.

WARNING!

For your own safety, use only the power cord supplied with the unit. The metal case of the MP.11/a must be grounded through the ground connection that is provided on the metal case. The antenna grounding, the surge arrestor, and the MP.11/a housing must be bonded together and grounded in one location to avoid ground current loops.

The Product Package

Each MP.11/a comes with the following:

- One metal base for ceiling or desktop mounting (includes two screws)
- Mounting hardware
 - Four 3.5 mm x 40 mm screws
 - Four 6 mm x 35 mm plugs
- One power supply
- One Tsunami MP.11/a Installation CD-ROM containing:
 - Software Installation Package (starts automatically when CD is inserted in CD-ROM drive; can be started by double-clicking SETUP.EXE).
 - Online Help
 - Documentation (*Quick Install Guide, Installation and Management Guide, Antenna Installation Manual*)
 - ScanTool (a utility with which you can obtain or set the IP address of the MP.11/a for access; see “ScanTool” for more information).
 - TFTP Server (which lets you transfer files across the network). You can download configuration files as well as image files for embedded software upgrades, and you can upload files from the MP.11/a for backup. Here *downloading* means transferring files to the MP.11/a and *uploading* means transferring files in the opposite direction.

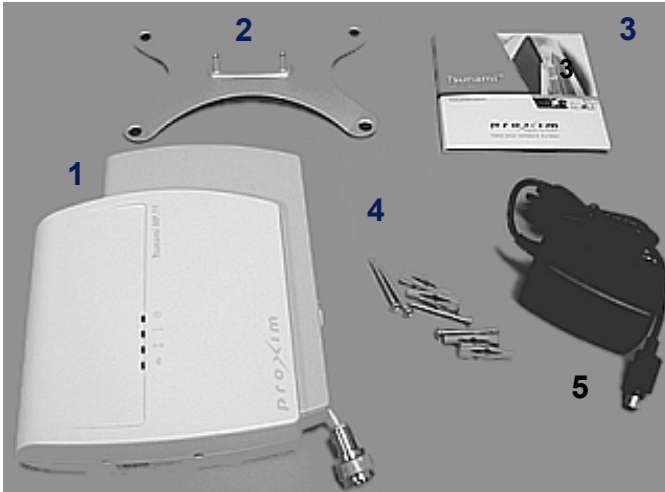
Note: All software CD-ROMs that come with your Tsunami products include a **readme.txt** or **readme.html** file. This file contains information about the software version and drivers. You are advised to print and read the **readme** file prior to installing your Tsunami products, as it may contain additional information that was not available when this document was printed.

Installation Procedure

To install the MP.11/a:

1. Unpack the unit and accessories from the shipping box.

The MP.11/a kit contains the following items:

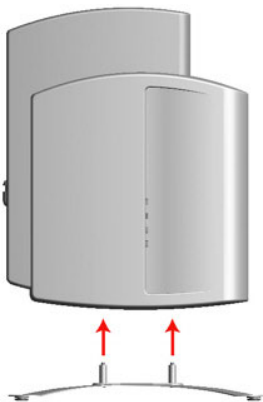


Shown in picture:

- 1 Tsunami MP.11/a unit
- 2 Mounting Stand
- 3 Documentation and Software CD-ROM
- 4 Wall mounting hardware
- 5 Power supply with power cord

The shipment also includes the *Tsunami MP.11/a Quick Install Guide* and the *Tsunami MP.11/a Release Notes*.

2. If you intend to install the unit free-standing, or if you intend to mount it to the ceiling, use a Phillips screwdriver to attach the metal base to the underside of the unit. The metal base and screws are provided (see "Mounting the MP.11/a" on page 16 for more information).



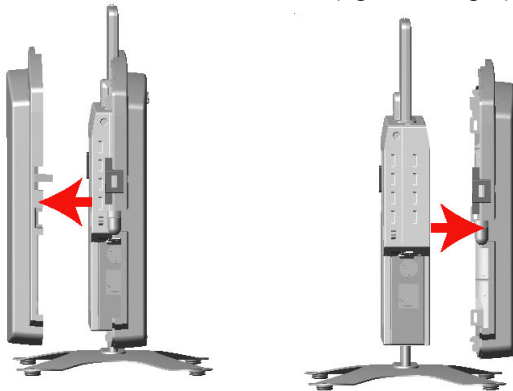
3. Unlock the unit's cable cover. To release the cable cover, press down on the cable cover lock located in the front center of the unit.



4. Remove the cable cover.



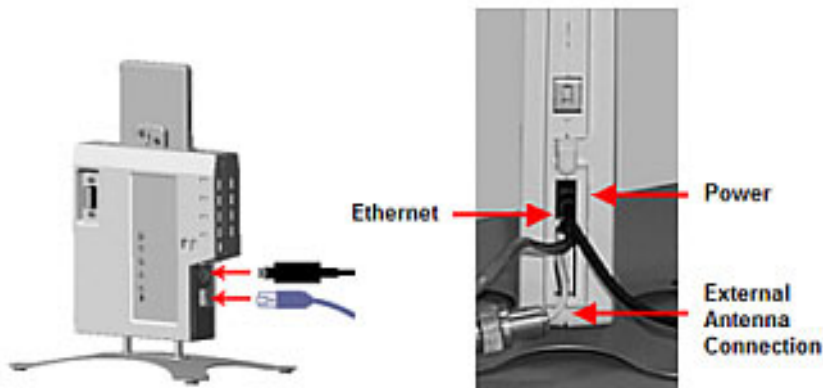
5. Remove the front cover from the unit (the side with the LED indicators, shown in the figure on left); then remove the back cover (figure on right).



6. Connect the grounding wire to the MP.11 using the Faston plug on the metal case, next to the power plug.



7. Connect one end of an Ethernet cable to the Ethernet port. The other end of the cable should not be connected to another device until after installation is complete.
 - Use a straight-through Ethernet cable if you intend to connect the MP.11/a to a hub, switch, patch panel, or Active Ethernet power injector.
 - Use a cross-over Ethernet cable if you intend to connect the MP.11/a to a single computer.
8. If you are not using Active Ethernet, or you want to connect the MP.11/a to Active Ethernet and AC power simultaneously, attach the AC power cable to the MP.11/a's power port.



Once attached, the power cable locks into place. To disconnect the power cable, slide back the black plastic fitting and gently pull the cable from the connector.

9. Connect the free end of the Ethernet cable to a hub, switch, patch panel, Active Ethernet power injector, or an Ethernet port on a computer.
10. If using AC power, connect the power cord to a power source (such as a wall outlet) to turn on the unit.

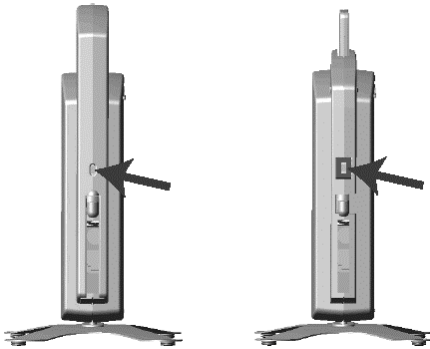
11. Place the unit in the final installation location (see “Mounting the MP.11/a” on page 16 for details).
12. Replace the back cover, front cover, and cable cover. Be careful to avoid trapping the antenna, power, and Ethernet cables when replacing the cable cover.

Attaching a Kensington Security Lock (Optional)

If so desired, you can attach a Kensington lock to secure the cable cover into place. This protects the unit from unauthorized tampering.

The MP.11/a enclosure includes a Kensington Security Slot for use with a Kensington locking mechanism. When properly installed, a Kensington lock can prevent unauthorized personnel from stealing the MP.11/a. In addition, the Kensington lock secures the cable cover in place, which prevents tampering with the Ethernet and power cables.

The Kensington Security Slot is shown in the following figures (the figure on the left shows the slot with the cable cover attached; the figure on the right shows the slot with the cable cover removed).



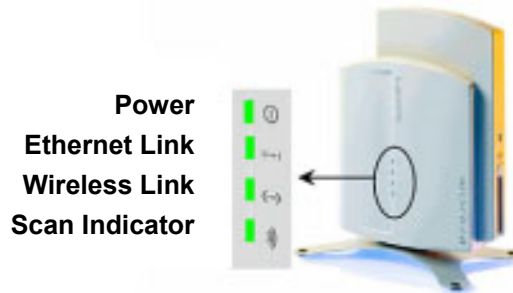
For information about Kensington security solutions, go to <http://www.kensington.com> .

SWITCHING ON THE MP.11/a

The MP.11/a can be powered by a power supply or by Active Ethernet through an Active Ethernet splitter. Depending upon the powering method, you can switch the MP.11/a on by:

- Plugging the power cord of the power supply into an AC power outlet
- Connecting the Active Ethernet splitter to the Ethernet cabling

When the power is switched on, the MP.11/a performs startup diagnostics. When startup is completed, the LEDs show the operational state of the MP.11/a (see the following figure).



The following table shows the status of the four LEDs when the MP.11/a is operational (the fourth LED is unused).

Power	
OFF	No power is present or malfunctioning.
GREEN	Power is present; the unit is operational.
AMBER	The unit is initializing after reboot (less than two minutes); it cannot get a dynamic IP address or is in Forced Reload state when Ethernet LED also is amber.*
RED	A fatal error in the unit.
Ethernet Link	
OFF	Not connected.
GREEN	Connected at 10 Mbps.
BLINKING GREEN	Data is being sent.
AMBER	Connected at 100 Mbps, in Forced Reload state when Power LED also is amber*, or the unit is initializing after reboot (less than two minutes).
BLINKING AMBER	Data is being sent.
RED	An error in data transfer.
Wireless Link	
OFF	Wireless interface is up properly but no wireless link established.
GREEN	Immediately after connecting a wireless link.
BLINKING GREEN	Data is being sent or the wireless interface is initializing after reboot (less than two minutes).
RED	There is a fatal error on the wireless interface.
* See "Forced Reload" on page 107.	

INSTALLING DOCUMENTATION AND SOFTWARE

The MP.11/a also comes with documentation and software on a CD-ROM.

To install the documentation and software on a computer or network:

1. Place the CD-ROM in a CD-ROM drive. The installer normally starts automatically. You can also start the installer manually by running the **setup.exe** program in the root directory of the CD-ROM.
2. Click the **Install Help and Software** button and perform the necessary steps.

The CD-ROM contains the following documentation and software:

Online help

This is the help for the Web Interface. It is stored on your computer or network so it is always available. The help is launched by clicking the question mark button in the Web Interface.

Documentation

Documentation also is available in an electronic (PDF) form, including the *Tsunami MP.11/a Installation and Management Guide*, *Tsunami MP.11/a Antenna Installation Guide*, and *Tsunami MP.11/a Quick Install Guide*.

ScanTool

The ScanTool program is a utility with which you can obtain or set the IP address of the MP.11/a for management access. See “Setting the IP Address Manually” on page 20 for details.

TFTP server

The TFTP (Trivial File Transfer Protocol) server lets you transfer files across the network. You can download configuration and license files, as well as image files for embedded software upgrades, and you can upload files from the MP.11/a for backup. Here *downloading* means transferring files to the MP.11/a and *uploading* means transferring files in the opposite direction.

MOUNTING THE MP.11/a

The following are the mounting options for the MP.11/a:

- Desktop Mount
- Wall Mount
- Ceiling Mount

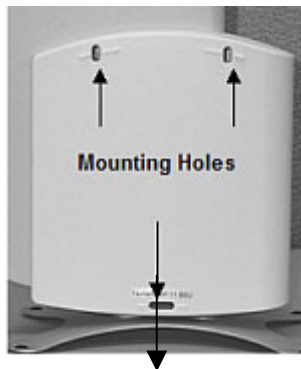
Desktop Mounting

This procedure consists of attaching the metal base to the MP.11/a unit. See “Installation Procedure” on page 11.

Wall Mounting

Follow these steps to mount the MP.11/a on a wall.

1. Identify the location where you intend to mount the unit.
2. Unplug the MP.11/a's power supply, if necessary.
3. Use a Phillips screwdriver to remove the metal base from the underside of the MP.11/a, if necessary.
4. Press down on the cable cover lock to release the cable cover (see "Installation Procedure" on page 11 for illustrations for this and the next 3 steps).
5. Remove the cable cover from the unit.
6. Remove the front cover from the unit.
7. Remove the back cover from the unit.
8. Place the back cover on the mounting location and mark the center of the three mounting holes.



9. Remove the cover from the wall and drill a hole at each of the locations you marked above. Each hole should be wide enough to hold a mounting plug (which is 6 mm x 35 mm).
10. Insert a plug into each hole. The MP.11/a comes with four 6 mm x 35 mm plugs; you only need to use three of these when wall-mounting the unit.
11. Insert a screw into each of the mounting holes molded into the back cover. The MP.11/a comes with four 3.5 mm x 40 mm pan-head screws; you only need to use three of these when wall-mounting the unit.
12. Insert the screws into the wall plugs. Use a screwdriver to tighten the screws and attach the back cover to the wall. In the following example, the back cover is mounted upside down (the two holes are at the bottom).
13. Attach Ethernet and power cables to the MP.11/a unit, as necessary.
14. Snap the unit into the back cover, replace the front cover, and replace the cable cover.
15. Turn on the MP.11/a (see "Switching On the MP.11/a" on page 15).

Ceiling Mounting

Follow these steps to mount the MP.11/a to a ceiling.

1. Unplug the MP.11/a's power supply, if necessary.
2. Use a Phillips screwdriver to attach the metal base to the underside of the MP.11/a, if you have not already done so. See "Installation Procedure" on page 11 for an illustration.
3. Feed a mounting screw through each of the four rubber feet. The MP.11/a comes with four 3.5 mm x 40 mm pan-head screws.



4. Remove the screws from the rubber feet.
5. Turn the MP.11/a upside down and position the base against the ceiling where you want to mount the unit.
6. Mark the center of the four mounting holes in the rubber feet.
7. Set the MP.11/a aside and drill a hole at each of the locations you marked above. Each hole should be wide enough to hold a mounting plug (6 mm x 35 mm).
8. Insert a plug into each hole. The MP.11/a comes with four 6 mm x 35 mm plugs.
9. Insert the screws into the holes you made previously in the rubber feet.
10. Insert the screws into the mounting plugs. Use a screwdriver to tighten the screws and attach the MP.11's metal base to the ceiling.

Chapter 3. Management Overview

This chapter describes how to gain access to the MP.11/a for configuration and management. Three interfaces are provided for viewing or changing the MP.11/a's settings:

Web Interface on page 22

The Web Interface is a graphical interface based upon Web pages from a built-in Web server.

Command Line Interface on page 23

The Command Line Interface (CLI) is a text-based interface using typed commands.

SNMP

You also can use the Simple Network Management Protocol (SNMP) to configure and manage the MP.11/a. See "SNMP" on page 55 for setup procedures.

Connecting to the MP.11/a requires a direct physical connection with an Ethernet cross-over cable, a serial RS-232C cable, or a connection through the network.

For the serial connection, you can use only the CLI to configure and manage the MP.11/a. The other connections allow the use of the Web Interface, SNMP, and the CLI. These other connections require the IP address of the MP.11/a before you can use the Web Interface, SNMP, or the CLI. See "MP.11/a IP Address" below for more information.

You can also manage the MP.11/a without an IP address by accessing the MP.11/a through the serial port with a terminal program such as HyperTerminal (see "HyperTerminal Connection Properties" on page 26).

Note: The MP.11/a includes integrated management that makes the OR Manager obsolete. The OR Manager is suitable only for the OR-500, OR-1000, and OR-1100.

MP.11 IP ADDRESS

Because each network is different, an IP address suitable for your network must be assigned to the MP.11/a. You will need the IP address of the MP.11/a to use its Web Interface, SNMP, or the CLI for configuration and management. Other basic parameters can be managed as well. ScanTool is included on the documentation and software CD-ROM.

The MP.11/a can use either a static or dynamic IP address.

Static IP address

The MP.11/a uses the IP address you have set manually.

Dynamic IP address

The MP.11/a receives its IP address from a DHCP server when it is switched on or rebooted.

The MP.11/a either obtains its IP address automatically through DHCP or it must be set manually. With ScanTool, you can find out the current IP address of the MP.11/a and, if necessary, change it so that is appropriate for your network.

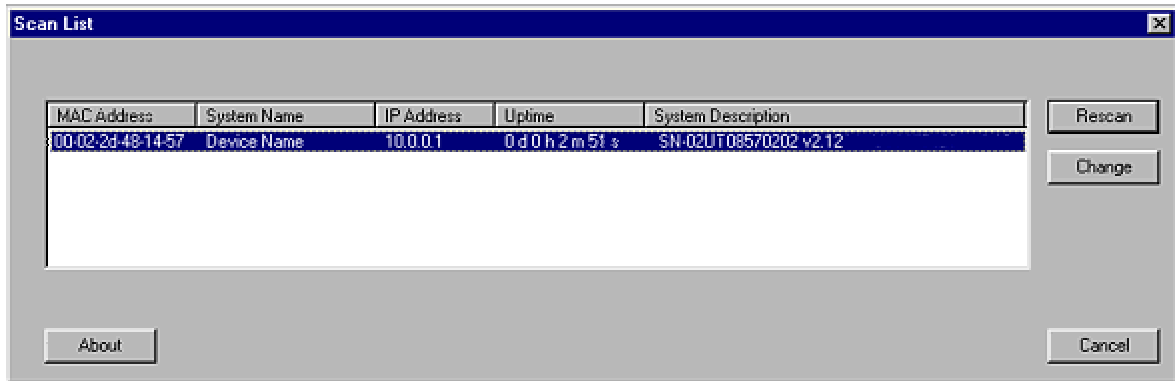
The MP.11/a is shipped with the static IP address 10.0.0.1 configured.

Setting the IP Address Manually

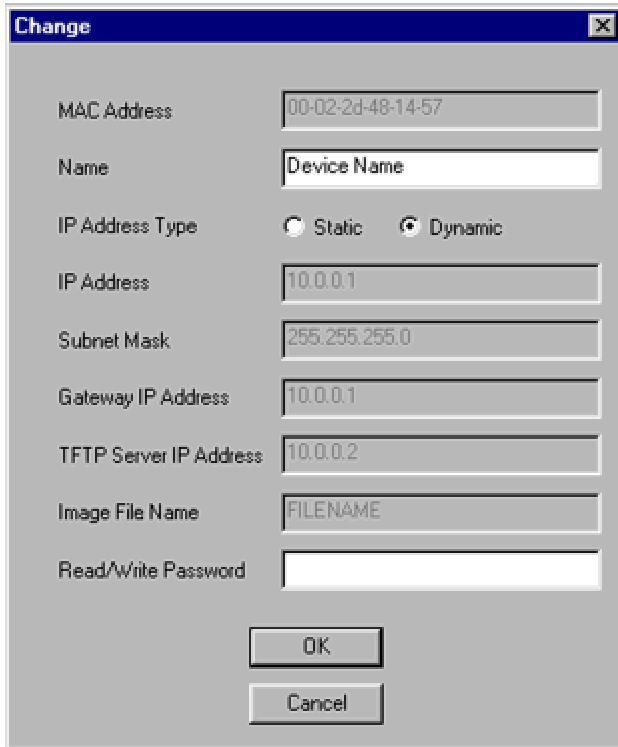
If you want to set the IP address manually:

1. Run ScanTool on a computer connected to the same LAN subnet as the MP.11/a, or directly connected to the MP.11/a with a cross-over Ethernet cable.

ScanTool scans the subnet for MP.11/a units and displays the units it finds in the main window. The following figure shows an example of the main window. If necessary, click **Rescan** to re-scan the subnet and update the display.



2. Select the MP.11/a for which you want to set the IP address and click **Change**. The **Change** dialog window is displayed, as shown in the following window.



3. Ensure that **Static** is selected as the **IP Address Type** and fill in the **IP Address** and **Subnet Mask** suitable for the LAN subnet to which the MP.11/a is connected.

Enter the **Read/Write Password** (the default value is **public**) and click **OK** to confirm your changes. The respective MP.11/a reboots to make the changes effective.

Note: The asterisks displayed when you enter the password are a set number that does not necessarily equal the number of characters in the actual password string. This is intended for added security.

Dynamic IP Address with DHCP

To obtain the IP address:

1. Run ScanTool on a computer connected to the same LAN subnet as the MP.11, or directly connected to the MP.11/a with a cross-over Ethernet cable.
2. Locate the MP.11/a for which you want to obtain the IP address. You can find the current IP address in the **IP Address** column.

The MP.11/a initially is set with a static IP address of 10.0.0.1.

WEB INTERFACE OVERVIEW

The Web Interface provides a graphical user interface with which you can easily configure and manage the MP.11/a. This section describes only how to access the Web Interface; the Web Interface itself described in “Chapter 4. Basic Management” on page 27 and “Chapter 5. Web Interface” on page 42.

To use the Web Interface, you need only the IP address of the MP.11/a. See “MP.11/a IP Address” on page 19 for details.

Note: If the connection is slow or you are not able to connect, ensure (using the Internet Explorer **Tools** option) that you are not using a proxy server for the connection with your Web browser.

To access the MP.11/a with a Web browser, start your Web browser and enter the IP address of the MP.11/a. The Web address should appear as **http://<ip address>** (for example, <http://10.0.0.1>). A window such as the following is displayed.

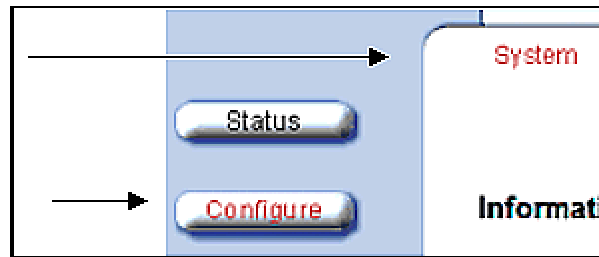


Do not fill in the **User Name**, enter only the password and click **OK**. The default password is **public**.

Note: The asterisks displayed when you enter the password are a set number that does not necessarily equal the number of characters in the actual password string, which is intended for added security.

The **System Status** window of the Web Interface is displayed. You now have access to the Web Interface of the MP.11/a with which you can configure and manage it.

To view or change basic system information, click the **Configure** button on the left side of the Web interface window, then click the **System** tab.



MP.11A OPTIONS

Selecting a Country

The Tsunami MP.11a provides a selectable **Country** field that automatically provides the allowed band and frequencies for the selected country as well as, where applicable, Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC).

MP.11a kits sold in the United States are pre-configured to scan and display only the outdoor frequencies permitted by the FCC. No other **Country** selections, channels, or frequencies may be configured. MP.11a kits sold outside of the United States and Canada support the selection of a **Country** by the professional installer.

Click the **Configure** button and the **System** tab; then select the appropriate country for your regulatory domain.

Continue configuring settings as desired; then click the **Commands** button and the **Reboot** tab to save and activate the settings.

Dynamic Frequency Selection

A country selection with DFS enabled causes the MP.11a Base Station to come up in scan mode. It scans the available frequencies and channels to avoid radar and select a channel with the strongest signal.

Note: Scanning is performed only on the frequencies allowed in the regulatory domain of the country selected, when it is required for radar detection and avoidance.

The MP.11a Subscriber Unit also comes up in scan mode to scan all available frequencies to find a Base Station with which it can register. Scanning, indicated by a flashing green LED (the fourth LED in the case of the Base Station and the third LED for a Subscriber Unit), may take several minutes. When the link is established, this LED turns off.

See “Dynamic Frequency Selection” on page 68 for more information.

Transmit Power Control

Transmit Power is a manual configuration selection to reduce the output power in the radio. The output power level for the operating frequency can be found in the **Event Log** of the MP.11a embedded software.

For more information about Transmit Power Control, see “Interface Configuration: Wireless Slot” on page 34.

COMMAND LINE INTERFACE OVERVIEW

The Command Line Interface (CLI) is a text-based interface with which you can configure and manage the MP.11/a by entering commands. This section describes only how to access the CLI; the interface itself is described in “Chapter 6. Command Line Interface” on page 80.

The CLI can be used as an alternative to the Web Interface. You can, for example, quickly change the settings of the MP.11 by running commands in a batch.

The CLI is accessible through the:

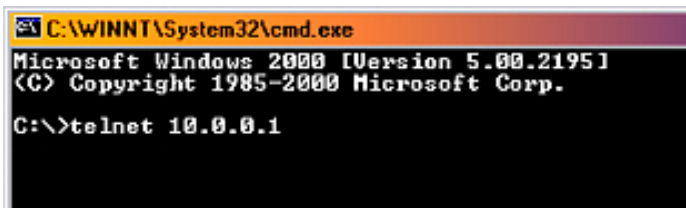
- Ethernet port connected through the network or with a cross-over Ethernet cable between the computer and the MP.11/a
- Serial port of the MP.11/a

Ethernet Port

To use the CLI through the Ethernet port, you must have a telnet program and the IP address of the MP.11/a. On most computers, the telnet program is called **telnet**. See “MP.11/a IP Address” on page 19 for details.

To access the MP.11/a through Ethernet:

1. From the Windows **Start** menu, select **Run**; enter **cmd** and click **OK**.
2. Enter **telnet** followed by the IP address, as shown in the following sample **DOS** command window.



```
C:\WINNT\System32\cmd.exe
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\>telnet 10.0.0.1
```

3. You are prompted for your password:
Please enter password:
4. Enter the password (the default password is **public**).

You can now use the CLI.

Serial Port

You can also use the CLI through the serial port of the MP.11/a with a terminal program such as HyperTerminal. You can use this method for cases in which other access methods cannot be used, or when the IP address of the MP.11/a cannot be set or retrieved. Also see “Hard Reset to Factory Default” on page 107.

To use the CLI through the serial port of the MP.11/a the following items are required:

- A serial RS-232C cable with a male and a female DB-9 connector. The serial cable must have a minimum of the following connections:

Male Connector	Female Connector
Pin 2 ----->	Pin 2
Pin 3 ----->	Pin 3
Pin 5 ----->	Pin 5

- An ASCII terminal program, such as HyperTerminal.

Proxim recommends you switch off the MP.11/a and the computer before connecting or disconnecting the serial RS-232C cable.

To access the MP.11/a through the serial port:

1. Start your terminal program.
2. Set the following connection properties; then connect:

COM port	(For example, COM1 or COM2, to which the MP.11/a serial port is connected.)
Bits per second	9600
Data bits	8
Stop bits	1
Flow control	none
Parity	none
Line ends	carriage return with line feed

3. Press the RESET button on the MP.11/a unit. The terminal program displays Power On Self Test (POST) messages. After approximately 90 seconds it displays:

Please enter password:

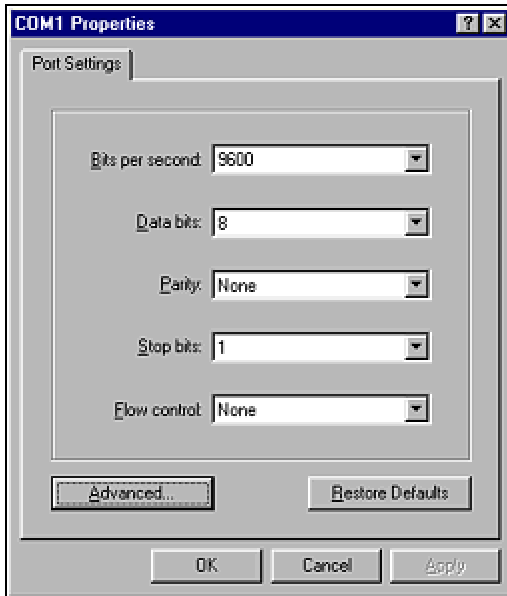
4. Enter the password. The default password is **public**.

You can now use the CLI.

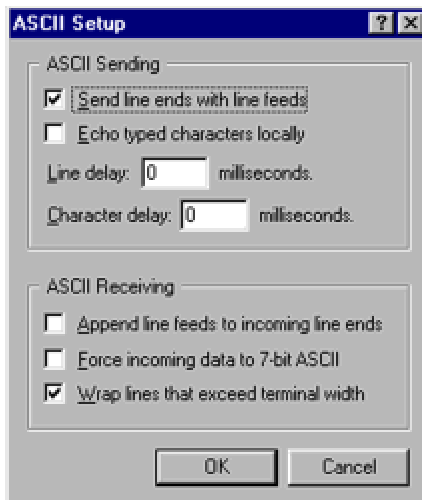
HyperTerminal Connection Properties

The serial connection properties can be found in HyperTerminal as follows:

1. Start HyperTerminal and select **Properties** from the **File** menu.
2. In the **Connect using:** drop-down list, select **Direct to Com1** (depending upon the COM port you use) and click **Configure...**; a window such as the following is displayed.



3. Make the necessary changes and click **OK**.
4. From the Hyperterminal **Properties** window, click the **Settings** tab; then click **ASCII Setup...**; a window such as the following is displayed.



5. Ensure that **Send line ends with line feeds** is selected and click **OK**.
6. Click **OK** again to exit the **Properties** window.

HyperTerminal is now correctly configured.

Chapter 4. Basic Management

This chapter describes the initial setup of the MP.11/a, which lets you set up and monitor the basic features of the MP.11/a. In most cases, setting up these basic features is sufficient.

A full overview of the Web Interface is provided in “Chapter 5. Web Interface” on page 42; “Glossary” on page 119 provides a brief explanation of the terms used.

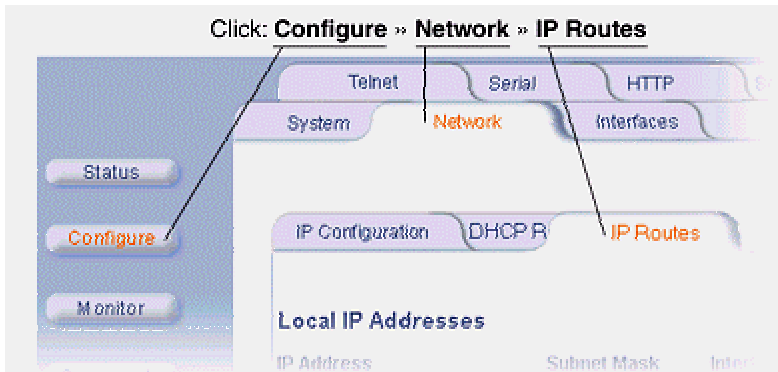
For CLI commands you can use for basic management, see “Command Line Interface” on page 80.

The following topics are discussed in this chapter:

- Rebooting and Resetting on page 28
- General Settings on page 29
- Monitoring Settings on page 38
- Security Settings on page 40
- Upgrading the MP.11 on page 41

To use the Web Interface for configuration and management, you must access the MP.11/a. With ScanTool you can determine the unit’s current IP address. Then enter <http://<ip address>> in your Web browser. See “Chapter 3. Management Overview” on page 19 for details.

The Web Interface consists of Web page buttons and tabs. A tab can also contain sub-tabs. The following figure shows the convention used to guide you to the correct tab or sub-tab.



The Web Interface also provides online help, which is stored on your computer (see “Installing Documentation and Software” on page 15 for details). Launch help by clicking the question mark button in the Web Interface.

REBOOTING AND RESETTING

All configuration changes require a restart unless otherwise stated. There are several ways to restart the MP.11/a, which are described in the following sub-sections.

Applying Changes

Most changes you make become effective only when the MP.11/a is rebooted. A reboot stores configuration information in non-volatile memory and then restarts the MP.11/a with the new values (see “Soft Reset to Factory Default” on page 29).

In some cases, the MP.11/a reminds you that a reboot is required for a change to take effect. You need not reboot immediately; you can reboot after you have made all your changes.

Note: Saving of the MP.11/a configuration occurs only during a controlled reboot or by specifically issuing the CLI **Save** command. If you make changes to settings without a controlled reboot (command) and you have not issued the **Save** command, a power outage would wipe out all changes since the last reboot. For example, entering static routes takes effect immediately; however, the routes are not saved until the unit has gone through a controlled reboot. Proxim strongly recommends saving your settings immediately when you finish making changes.

Rebooting

When you reboot, the changes you have made become effective and the MP.11/a is restarted. The changes are saved automatically in non-volatile memory before the actual reboot takes place.

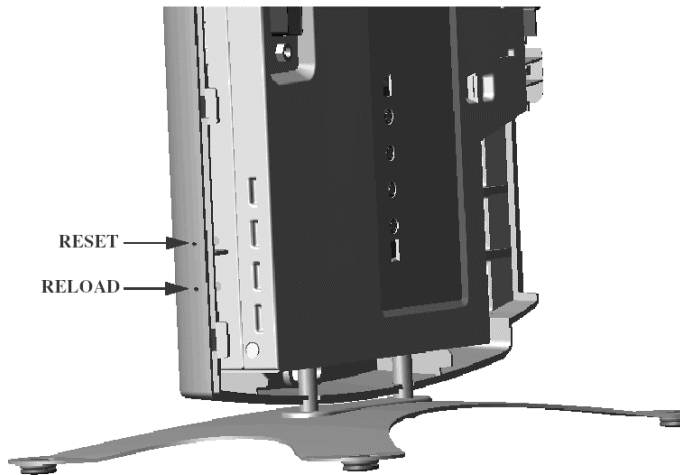
To reboot:

1. Click the **Commands** button, then the **Reboot** tab.
2. Click the **Reboot** button. The MP.11/a restarts the embedded software. During reboot, you are redirected to a page showing a countdown timer, and you are redirected to the **Status** page after the timer counts down to 0 (zero). The CLI is disconnected during reboot. This means that a new telnet session must be started.

Resetting Hardware

If the MP.11/a does not respond for some reason and you are not able to reboot, you can restart by means of a hardware reset. This restarts the MP.11/a hardware and embedded software. The last saved configuration is used. Any changes that you have made since then are lost.

To reset the hardware, press and release the **RESET** button on the MP.11/a unit with, for example, a pencil.



Soft Reset to Factory Default

If necessary, you can reset the MP.11/a to the factory default settings. This must be done only when you are experiencing problems. Resetting to the default settings requires you to again configure the MP.11/a.

To reset to factory default settings:

1. Click the **Commands** button, then the **Reset** tab.
2. Click the **Reset to Factory Default** button. The device configuration parameter values are reset to their factory default values.

If you do not have access to the MP.11/a, you can use the procedure described in “Hard Reset to Factory Default” on page 107 as an alternative.

SYSTEM STATUS

To view the current system status, click the **Status** button. The **Status** window is the first page you see when you log in.

The screenshot shows the 'Status' window of the Tsunami management interface. At the top, there are two tabs: 'Status' (selected) and 'Event Log'. Below the tabs, the 'System Status' section displays the following information:

System Status		Wireless Router v1.2.0(42) SN-03AT17590434 v3.0.4	
IP Address	10.0.0.1	Contact	Contact Name
Name	Wireless Router	Location	Contact Location
Object ID	1.3.6.1.4.1.11898.2.4.9	Up Time (DD:HH:MM:SS)	00:00:03:55

Below the system status information, there is a link: [Click here to view event log messages.](#) This page may take a minute to load.

The 'System Traps' section is visible below, featuring a table with columns for 'Description', 'Severity', and 'Time Stamp'. Above the table are two buttons: 'Select All' and 'Deselect All'. Below the table is a 'Delete' button.

SYSTEM CONFIGURATION

The system configuration page lets you change the MP.11/a's system name, location name, and so on (see the following **System Configuration** window). These details help you to distinguish this MP.11/a from other routers, and lets you know whom to contact in case of problems.

To go to this page, click the **Configure** button and the **System** tab.

The screenshot shows the 'System Configuration' window with the following details:

- System Name:** Wireless Router
- Country:** UNITED STATES (US)
- Location:** Contact Location
- Contact Name:** Contact Name
- Contact Email:** name@Organization.com
- Contact Phone:** Contact Phone Number
- Object ID:** 1.3.6.1.4.1.11898.2.4.9
- Ethernet MAC Address:** 00:20:A6:4B:5E:46
- Descriptor:** Wireless Router v1.2.0(42) SN-03AT17590434 v3.0.4
- Up Time (DD:HH:MM:SS):** 00:00:06:33
- Mode of Operation:** Bridge

These settings do not influence the operation of the MP.11/a, with the exception of **Mode of Operation**, which sets the MPI.11/a as **Bridge** (layer 2) or **Router** (layer 3).

You can enter the following details:

System Name

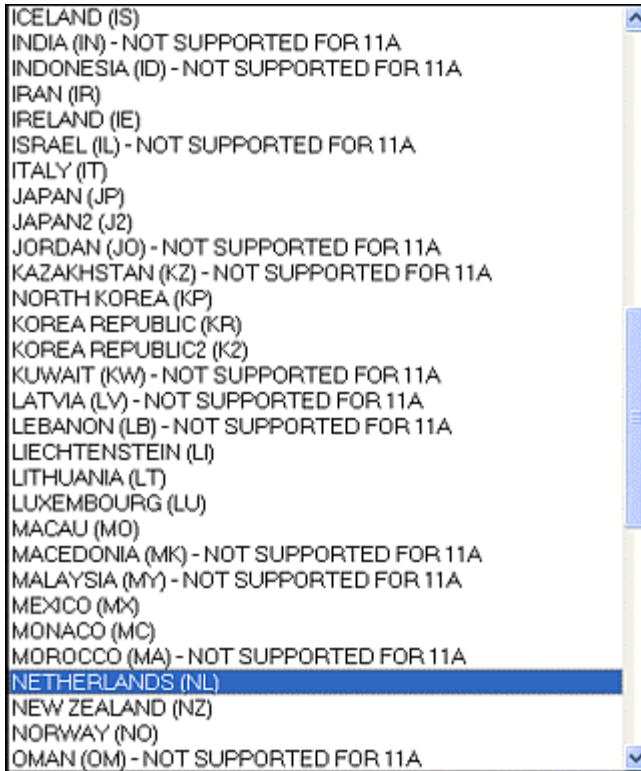
This is the system name for easy identification of the MP.11/a. Use the system name of this Base Station to configure the **Base Station System Name** parameter on a satellite if you want the satellite to register only with this Base Station. If the **Base Station System Name** is left blank on the satellite, it can register with any Base Station that has a matching **Network Name** and **Network Secret**.

Country (Tsunami MP.11a units only)

This field is available on Tsunami MP.11a units only; when you choose a country with a regulatory domain that requires Dynamic Frequency Selection (DFS) or Transmit Power Control (TPC), they are enabled automatically. The Country selection pre-selects and displays only the allowed frequencies for that country. Click the **Configure** button, the **Interfaces** tab, and the **Wireless** sub-tab to see the channel/frequency list.

MP.11a kits sold in the United States are pre-configured to scan and display only the outdoor frequencies permitted by the FCC. No other **Country** selections, channels, or frequencies may be configured. MP.11a kits sold outside of the United States and Canada support the selection of a **Country** by the professional installer.

See “Dynamic Frequency Selection” on page 68 and the **Transmit Power Control** field under “Interface Configuration” (page 34) and for more information. The **Country** selections are as follows:



Location

This field can be used to describe the location of the MP.11/a, for example “Main Lobby.”

Contact Name, Contact Email, and Contact Phone

In these fields, you can enter the details of the person to contact.

Mode of Operation

This field lets you choose one of two operating modes for your device: **Bridge** mode or **Routing** mode.

See “Configure 1) System” on page 44 for more information.

IP CONFIGURATION

The **IP Configuration** window lets you change the MP.11/a IP parameters. These settings differ when the MP.11/a is in **Route** mode.

To go to this page, click the **Configure** button, the **Network** tab, then the **IP Configuration** sub-tab.

If the device is configured in **Bridge** mode, you can set the following parameter:

IP Address Assignment Type

Select **Static** if you want to assign a static IP address to the MP.11/a; select **Dynamic** to have the device run in DHCP client mode, which gets an IP address automatically from a DHCP server over the network. If you do not have a DHCP server or if you want to manually configure the IP settings, set this parameter to **Static**.

You can set the following remaining parameters only when the **IP Address Assignment Type** is set to **Static**.

IP Address

The static IP address of the MP.11/a (default IP address is 10.0.0.1).

Subnet Mask

The mask of the subnet to which the MP.11/a is connected (default subnet mask is 255.0.0.0).

Default Router IP Address

The IP address of the default gateway.

Default TTL

The default time-to-live value.

INTERFACE CONFIGURATION

The **Interfaces** configuration pages let you change the MP.11/a Ethernet and wireless parameters. The **Wireless** tab is displayed by default when you click the **Interfaces** tab.

Wireless

To configure the wireless interface, click the **Configure** button followed by the **Interfaces** tab; then click the **Wireless** sub-tab.

The wireless interface can be placed in either WORP Base or WORP Satellite mode (selected from the **Interface Type** drop-down box). (See “Wireless Outdoor Router Protocol” on page 69 for more information.)

The wireless interface settings differ per mode.

The screenshot shows a web-based configuration window for the 'Wireless' interface. The window has tabs for 'System', 'Network', 'Interfaces', 'SNMP', and 'RIP'. Under 'Interfaces', there are sub-tabs for 'Ethernet' and 'Wireless'. The 'Wireless' sub-tab is active, showing the following configuration options:

- Interface Type: Worp Base (dropdown)
- MAC Address: 00:30:F1:8A:17:E5
- Network Name: OR_WORP 802.11a
- Transmit Power Control (TPC): Full (-0 dB) (dropdown)
- NOTE: Changes to TPC will take effect immediately after clicking OK Button.*
- Enable Turbo Mode:
- Frequency Channel: 149 - 5.745 GHz (dropdown)
- Data Rate: 35 Mbps (dropdown)
- Satellite Density: Large (dropdown)
- Maximum Satellites: 100
- Registration Timeout: 5
- Network Secret: *****
- Input bandwidth limit (in kbits/s): 108032 (dropdown)
- Output bandwidth limit (in kbits/s): 108032 (dropdown)

At the bottom of the window are 'OK' and 'Cancel' buttons.

The list of parameters to configure for registration of the SU on a Base Station are:

- o Network Name
- o Base Station System Name (when used)
- o Frequency Channel
- o Encryption (when used)
- o Network Secret

Note: Encryption can impact performance with lower throughput.

The fields that can be changed on this window are described in the following text.

Interface Type

The interface type can be **Worp Satellite** or **Worp Base**. *See “Wireless Outdoor Router Protocol” on page 38.)

Base Station System Name

The name found on the system page of the Base Station to which this satellite is connecting. This parameter can be used as an added security measure, and when there are multiple Base Stations in the network and you want a satellite to register with only one when it may actually have adequate signal strength for either.

If the **Base Station System Name** is left blank on the satellite, it can register with any Base Station with a matching **Network Name** and **Network Secret**.

Network Name

A **Network Name** is name given to a network so that multiple networks can reuse the same frequency without problems. A satellite can only register to a base if it has the same **Network Name**. The **Network Name** is one of the parameters that allow a Subscriber Unit to register on a Base Station. The **Base Station System Name** and **Frequency Channel** also are parameters to guide the SU to the proper Base Station on the network, but they provide no security. Basic security is provided through encryption, as it causes none of the messages to be sent in the clear. Further security is provided by mutual authentication of the Base Station and Subscriber Unit using the **Network Secret**.

Transmit Power Control (Tsunami MP.11a units only)

By default, the Tsunami MP.11a lets users transmit at the maximum output power for the country or regulatory domain and frequency selected. However, with Transmit Power Control (TPC), you can adjust the output power of the unit to a lower level in order to reduce interference from neighboring devices or to use a higher gain antenna without violating the maximum radiated output power allowed for your country. Also, most countries in the ETSI regulatory domain require the transmit power to be set to a 6 dB lower value than the maximum allowed EIRP when link quality permits. You can see your unit’s current output power for the selected frequency in the event log.

The event log shows the selected power for all data rates, so you must look up the proper data rate to determine the actual power level. For example, the event log shows:

```
0 00:00:08-INFO- Final Power 6 Mb 20 dBm, MaxRD 30 dBm, MaxEdge 31 dBm, -TPC Scale 0 dBm – Ant Red 0 dBm*
```

```
0 00:00:09-INFO- 20 dBm | 20 dBm | 20 dBm | 20 dBm | 20dBm | 19 dBm | 17 dBm | 14 dBm |
```

The above shows that the output power is set at 20 dBm for the data rate 6, 9, 12, 18, or 24 Mbps; at 19 dBm for 36 Mbps, at 17 dBm for 48 Mbps, or at 14 dBm when the selected data rate is 54 Mbps. The first line shows that 6 Mbps is selected, so the transmit power is 20 dBm.

Note: This feature only lets you decrease your output power; it does not let you increase your output power beyond the maximum allowed defaults for your frequency and country.

Select one of the following options and click **OK** at the bottom of the window. Your original output power is adjusted relative to the value selected. The new setting takes effect immediately without rebooting.

- Full (0 dB)
- Half (-3 dB)
- Quarter (-6 dB)
- Eighth (-9 dB)
- Minimum (-10 dB)

Enable Turbo Mode

Check this box to enable **Turbo Mode**. **Turbo Mode** currently is supported only in the United States. **Turbo Mode** utilizes two adjacent channels for wireless data transfer.

Frequency Channel

The frequency channel the MP.11 (802.11b) uses for communicating with remotes. This frequency channel can be set in the range 1 to 11 for the USA and Canada, or 1 to 13 for Europe, or 1 to 14 for Japan (see “Radio Specifications” on page 111).

For the MP.11a (802.11a), when DFS is enabled for the selected country, the **Frequency Channel** field appears as follows:

Frequency Channel – DFS, Auto selected 5.47 – 5.7 GHz

You can monitor the DFS scan, if enabled, by refreshing the Web page.

The channels and frequencies scanned when DFS is enabled are listed in the following table.

Output Power Table for ETSI					
Frequency	Channels	54 Mbps	48 Mbps	36 Mbps	6-24 Mbps
5.47 – 5.70 GHz	100, 104, 108, 112, 116, 120, 124, 128, 132, 136	14.5	15.5	17.4	17.4

For countries in which DFS is not enabled, the **Frequency Channel** list displays only the channels and frequencies allowed for the selected country. See “Dynamic Frequency Selection” on page 68 for more information.

Data Rate

The rate at which data is to be transferred. The default data rate is 36 Mbps. The SU must never be set to a lower data rate than the Base Station because timeouts will occur at the Base Station and communication will fail.

Selections for Data Rate are as shown in the following table.

Date Rate	Date Rate, Turbo Enabled
6 Mbps	12 Mbps
9 Mbps	18 Mbps
12 Mbps	24 Mbps
18 Mbps	36 Mbps
24 Mbps	48 Mbps
36 Mbps	72 Mbps
48 Mbps	96 Mbps
54 Mbps	108 Mbps

Satellite Density

The Satellite Density setting is a valuable feature for achieving maximum bandwidth in a wireless network. It influences the receive sensitivity of the radio interface. Selections are **Large**, **Medium**, **Small**, **Mini**, and **Micro**. See "Satellite Density" on page 69 for more information.

Registration Timeout

This is the registration process time-out of a satellite on a base. Default is 5 seconds.

Network Secret

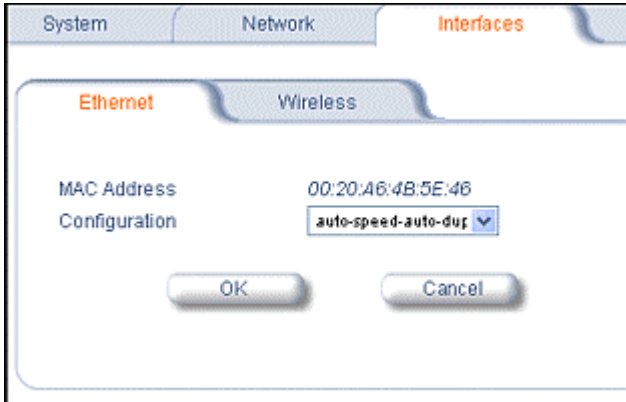
A network secret is a secret password given to all nodes of a network. A satellite can only register to a base if it has the same Network Secret. The Network Secret is sent encrypted and can be used as a security option. Also see "Network Name."

Input / Output Bandwidth Limit

These parameters limit the data traffic received on the wireless interface and transmitted to the wireless interface, respectively. Selections are in steps of 64 Kbps from 64 to 108,032 kbps.

Ethernet Port

To configure the Ethernet interface, click the **Configure** button, the **Interfaces** tab, and the **Ethernet** sub-tab.



You can set the following parameter from this tab.

Configuration

Select from the following settings for the type of Ethernet transmission (**Configuration** drop-down box):

- 10 Mbit/s – half-duplex
- 10 Mbit/s – full-duplex
- 10 Mbit/s – auto-duplex
- 100 Mbit/s – half-duplex
- 100 Mbit/s – full-duplex
- autospeed-half-duplex
- autospeed-auto-duplex

Half-duplex means that only one side can transmit at a time.

Full-duplex allows both sides to transmit.

Auto-duplex selects the best transmission mode for the given configuration.

The recommended setting is **auto-speed-auto-duplex**.

MONITORING SETTINGS

The MP.11/a offers various facilities to monitor its operation and interfaces. Only the most significant monitoring categories are mentioned here.

Wireless

To monitor the wireless interfaces, click the **Monitor** button and the **Wireless** tab.. This tab lets you monitor the general performance of the radio and the performance of the WORP Base or WORP Satellite interfaces.

Wireless	
ICMP	
Radius	
Per Station	
General	
Worp	
Wireless-	
Transmitted Fragment Count	841478
Multicast Transmitted Frame Count	841476
Failed Count	0
FCS Error	738
Multicast Received Frame Count	0
Received Fragment Count	788
WEP Undecryptable Count	0

Interfaces

To monitor transmission details, click the **Monitor** button and the **Interfaces** tab.. The **Interfaces** tab provides detailed information about the MAC-layer performance of the MP.11/a interface.

Link Test	
Interfaces	
IP ARP Table	
IP Routes	
Ethernet	
Wireless	
Type	802.11a
Description	WORP Interface
MIB Specific Definition	0.0
Physical Address	00:30:F1:8A:17:E5
Time Since Last Change(DD:HH:MM:SS)	00:14:04:58
Operational Status	down
Admin Status	Up
Speed	0
Maximum Packet Size	1504
In Octets (bytes)	0
In Unicast Packets	394
In Non-unicast Packets	0
In Discards	0
In Errors	416
Unknown Protocols	0
Out Octets (bytes)	0
Out Unicast Packets	1
Out Non-unicast Packets	0
Out Discards	0
Out Errors	0
Output Queue Length	0

SECURITY SETTINGS

To prevent misuse, the MP.11/a provides wireless data encryption and password-protected access. It is important to set the encryption parameters and change the default passwords.

Encryption

You can protect the wireless data link by using encryption. Encryption keys can be 5 (64-bit), 13 (WEP 128-bit), or 16 (AES 128-bit) characters in length. Both ends of the wireless data link must use the same parameter values. *Advanced Encryption Standard (AES) encryption is supported on the MP.11a only.*

To set the encryption parameters, click the **Configure** button, the **Security** tab, and the **Encryption** sub-tab.

The screenshot shows a web interface for configuring security settings. At the top, there are tabs for 'Telnet', 'Serial', 'HTTP', and 'Security'. Under 'Security', there are sub-tabs for 'MAC Auth', 'Radius Auth', and 'Encryption'. The 'Encryption' sub-tab is active, showing configuration for 'Slot A'. The 'Encryption Option' is set to 'None'. Below this, there is a note: 'Encryption Keys may be 5, 13, or 16 characters (64, WEP-128 bit, or AES-128 bit encryption). Hex keys may be entered, 0x then 10, 26, or 32 hex digits. Examples: silly, 0xf122334455, hellofishfood, 0xf12233445566778899aabbccdd'. There are four input fields for 'Encryption Key 1' through 'Encryption Key 4', each containing six asterisks. Below these is a dropdown menu for 'Encrypt Data Transmissions Using' set to 'Key 1'. At the bottom are 'OK' and 'Cancel' buttons.

You can set the following encryption parameters:

Encryption Status

This parameter enables or disables WEP encryption.

Encryption Key 1 – 4

These WEP encryption keys require an alphanumeric string. The length of the string determines the key length. Correct string lengths are 5 or 13 alphanumeric characters, or 10 or 26 hexadecimal digits.

Encrypt Data Transmissions Using

This parameter determines which encryption key is used.

Passwords

Access to the MP.11/a is protected with passwords. The default password is **public**.

Note: The asterisks displayed when you enter a password are a set number that does not necessarily equal the number of characters in the actual password string, which is intended for added security.

Changing the Telnet Password

To change the telnet password, click the **Configure** button and the **Telnet** tab.

Enter the new password in the **Password** field; repeat it in the **Confirm** field and click **OK**.

Changing the Web Interface Password

To change the password of the Web Interface, click the **Configure** button and the **HTTP** tab.

Enter the new password in the **Password** field; repeat it in the **Confirm** field and click **OK**.

Changing the SNMP Password

You can set a read and a read-and-write password for SNMP. The password used during login determines the type of access.

You can change these passwords as follows:

1. Click the **Configure** button and the **SNMP** tab.
2. Enter the new password in the **Password** field.
3. Repeat the new password in the **Confirm** field.
4. Click **OK** when you are done.

UPGRADING THE MP.11/a

The MP.11/a is equipped with embedded software that can be updated when new versions are released. Updates can be found on our website. Go to <http://www.proxim.com/>, choose **Tsunami MP.11** from **Products**, and click **Downloads**.

Updating the embedded software is described in "Image File Download" on page 105. A TFTP server is provided on the Tsunami MP.11/a Documentation and Software CD-ROM; the server is required to transfer the downloaded file to the MP.11/a.

Chapter 5. Web Interface

This section covers the Web Interface of the MP.11/a. The interface is described hierarchically according to these buttons, which appear on the left side of the Web page:

- Status
- Configure on page 44
- Monitor on page 70
- Commands on page 77

For an introduction to the basics of MP.11/a management, see “Chapter 4. Basic Management” on page 27.

STATUS

When you click the **Status** button, System Status is displayed automatically. The other tab under **Status** is the **Event Log** tab.

System Status

The **Status** tab showing System Status is displayed automatically when you log into the Web Interface. It also is the default window displayed when you click the **Status** button on the left side of the window.

The **Status** tab shows the **System Status** and the **System Traps**.

The screenshot shows the 'Status' tab selected in the web interface. The 'System Status' section displays the following information:

System Status		Wireless Router v1.2.0(42) SN-03AT17590434 v3.0.4	
IP Address	10.0.0.1	Contact	Contact Name
Name	Wireless Router	Location	Contact Location
Object ID	1.3.6.1.4.1.11898.2.4.9	Up Time (DD:HH:MM:SS)	00:00:03:55

Below the table, there is a link: [Click here to view event log messages.](#) This page may take a minute to load.

The 'System Traps' section is visible below, with buttons for 'Select All', 'Deselect All', and 'Delete'. The table headers for 'System Traps' are 'Description', 'Severity', and 'Time Stamp'.

System Status

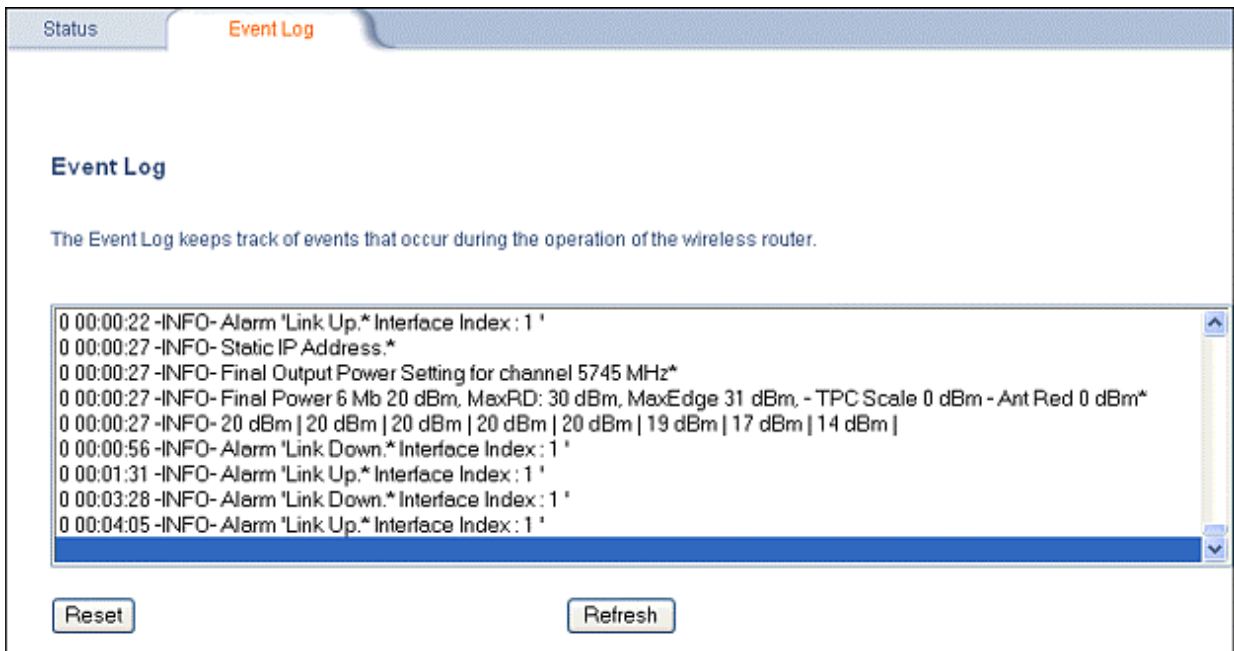
In this section, the basic system status is shown, including the version number of the embedded software.

Systems Traps

This section shows the status of system traps. System traps occur when the MP.11/a encounters irregularities. Deleting system traps has no effect on the operation of the MP.11/a. System traps also are sent to an SNMP manager station (if so configured).

Event Log

Click the **Status** button and the **Event Log** tab to view the contents of your Event Log. The **Event Log** keeps track of events that occur during the operation of the wireless router. The **Event Log** displays messages that may not be captured by System Traps, such as the **Transmit Power** for the **Frequency Channel** selected.



The screenshot shows a web interface with two tabs: "Status" and "Event Log". The "Event Log" tab is active. Below the tabs, the text "Event Log" is displayed. A descriptive sentence reads: "The Event Log keeps track of events that occur during the operation of the wireless router." Below this is a scrollable text area containing the following log entries:

```
0 00:00:22 -INFO- Alarm 'Link Up.* Interface Index: 1 '  
0 00:00:27 -INFO- Static IP Address:*  
0 00:00:27 -INFO- Final Output Power Setting for channel 5745 MHz*  
0 00:00:27 -INFO- Final Power 6 Mb 20 dBm, MaxRD: 30 dBm, MaxEdge 31 dBm, - TPC Scale 0 dBm - Ant Red 0 dBm*  
0 00:00:27 -INFO- 20 dBm | 20 dBm | 20 dBm | 20 dBm | 20 dBm | 19 dBm | 17 dBm | 14 dBm |  
0 00:00:56 -INFO- Alarm 'Link Down.* Interface Index: 1 '  
0 00:01:31 -INFO- Alarm 'Link Up.* Interface Index: 1 '  
0 00:03:28 -INFO- Alarm 'Link Down.* Interface Index: 1 '  
0 00:04:05 -INFO- Alarm 'Link Up.* Interface Index: 1 '
```

At the bottom of the interface, there are two buttons: "Reset" and "Refresh".

CONFIGURE

Use the **Configure** section to change the settings of the MP.11/a. There are ten tabs in this section.

1. System below
2. Network on page 46
3. Interfaces on page 51
4. SNMP on page 55
5. RIP on page 56
6. Telnet on page 58
7. Serial on page 59
8. HTTP on page 59
9. Security on page 60
10. Filtering on page 62

1) System

The System Configuration page lets you change the MP.11/a's System Name, Location, and so on. These details help you to distinguish the MP.11/a from other routers and let you know whom to contact in case you experience problems.

Click the **Configure** button and the **System** tab; the following window is displayed.

The screenshot shows a web interface with four tabs: System (selected), Network, Interfaces, and SNMP. The System tab is active, displaying the following information:

- System Name:** Wireless Router
- Note:** Configure Satellite to use this Base Station System Name if you want Satellite to register only with this Base Station. Otherwise, leave the Base Station System Name blank on the Satellite.
- Country:** UNITED STATES (US)
- Location:** Contact Location
- Contact Name:** Contact Name
- Contact Email:** name@Organization.com
- Contact Phone:** Contact Phone Number
- Object ID:** 1.3.6.1.4.1.11898.2.4.9
- Ethernet MAC Address:** 00:20:A6:4B:5E:46
- Descriptor:** Wireless Router v1.2.0(42) SN-03AT17590434 v3.0.4
- Up Time (DD:HH:MM:SS):** 00:00:06:33
- Mode of Operation:** Bridge

At the bottom of the form are two buttons: OK and Cancel.

In this section, you can enter or view the basic system information. These settings do not influence the operation of the MP.11/a, with the exception of **Mode of Operation**. **Mode of Operation** sets the MP.11 as **bridge** (layer 2) or as **router** (layer 3).

You can enter the following details:

System Name

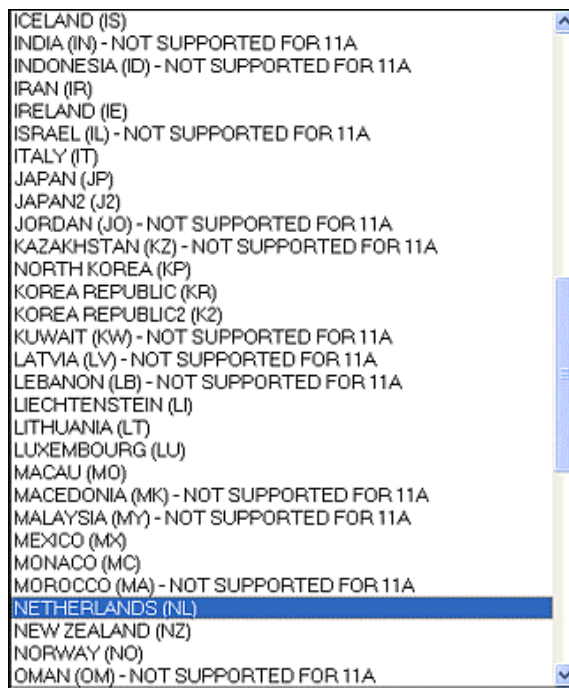
This is the system name for easy identification of the MP.11/a. Use the system name of this Base Station to configure the **Base Station System Name** parameter on a satellite if you want the satellite to register only with this Base Station. If the **Base Station System Name** is left blank on the satellite, it can register with any Base Station that has a matching **Network Name** and **Network Secret**.

Country (Tsunami MP.11a units only)

This field is available on Tsunami MP.11a units only; when you choose a country with a regulatory domain that requires Dynamic Frequency Selection (DFS) or Transmit Power Control (TPC), they are enabled automatically. The **Country** selection pre-selects and displays only the allowed frequencies for that country. Click the **Configure** button, the **Interfaces** tab, and the **Wireless** sub-tab to see the channel/frequency list.

MP.11a kits sold in the United States are pre-configured to scan and display only the outdoor frequencies permitted by the FCC. No other **Country** selections, channels, or frequencies may be configured. MP.11a kits sold outside of the United States and Canada support the selection of a **Country** by the professional installer.

See “Dynamic Frequency Selection” on page 68 and the **Transmit Power Control** field under “Interface Configuration” (page 34) and for more information. The **Country** selections are as follows::



Location

This field can be used to describe the location of the MP.11a, for example “Main Lobby.”

Contact Name, Contact Email, and Contact Phone

In these fields, you can enter the details of the person to contact.

Mode of Operation

This field lets you choose one of two operating modes: **Bridge** mode or **Routing** mode.

The static fields on this window are described as follows:

ObjectID

This field shows the OID of the product name in the MIB.

Ethernet MAC Address

The MAC address of the Ethernet interface of the device.

Descriptor

Shows the product name and firmware build version.

Up Time

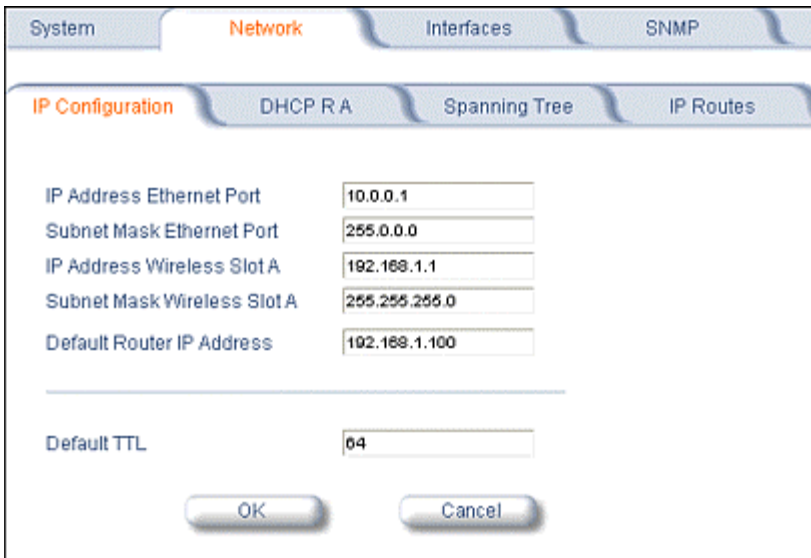
How long the device has been up and running since the last reboot.

2) Network

IP Configuration

The IP Configuration window lets you change the MP.11/a IP parameters. These settings differ when the MP.11/a is in **Router** mode.

Click the **Configure** button, the **Network** tab, and the **IP Configuration** sub-tab to view and configure local IP address information.



If the device is configured in **Bridge** mode, you can set the following parameter:

IP Address Assignment Type

Select **Static** if you want to assign a static IP address to the MP.11; select **Dynamic** to have the device run in DHCP client mode, which gets an IP address automatically from a DHCP server over the network. If you do not have a DHCP server or if you want to manually configure the IP settings, set this parameter to **Static**.

When the MP.11/a is in **Bridge** mode, only one IP address is required. This IP address also can be changed with ScanTool (see “Setting the IP Address Manually” on page 20). In **Router** mode, both Ethernet and Wireless interfaces required an IP address.

You can set the remaining parameters only when the **IP Address Assignment Type** is set to **Static**.

IP Address

The static IP address of the MP.11/a (default IP address is 10.0.0.1).

Subnet Mask

The mask of the subnet to which the MP.11/a is connected (the default subnet mask is 255.0.0.0).

Default Router IP Address

The IP address of the default gateway.

Default TTL

The default time-to-live value.

The static fields on this window are described as follows:

ObjectID

This field shows the OID of the product name in the MIB.

Ethernet MAC Address

The MAC address of the Ethernet interface of the device.

Descriptor

Shows the product name and firmware build version.

Up Time

The length of time the device has been up and running since the last reboot.

DHCP Relay Agent

Click the **Configure** button, the **Network** tab, and the **DHCP R A** sub-tab to enable the MP.11/a DHCP relay agent. When enabled, the DHCP relay agent forwards DHCP requests to the set DHCP server.

The screenshot shows the configuration interface for the DHCP Relay Agent. The 'Network' tab is selected, and the 'DHCP R A' sub-tab is active. The 'DHCP Relay' dropdown menu is set to 'Disable'. Below this are 'OK' and 'Cancel' buttons. At the bottom, there is a table with columns 'Server IP address', 'Comment', and 'Status'. Below the table are 'Add Table Entries' and 'Edit/Delete Table Entries' buttons.

To add entries to the table of DHCP Relay Agents, click **Add Table Entries**; the following window is displayed.

The screenshot shows the 'Add Table Entries' dialog box. It has a title bar with 'IP Configuration' and 'DHCP R A'. The dialog contains a table with columns 'Server IP Address', 'Comment', and 'Status'. Below the table are input fields for 'Server IP Address' and 'Comment'. A note states: 'NOTE: The value added will only take effect after the device is rebooted.' At the bottom are 'Add', 'Cancel', and 'Back' buttons.

Enter the **Server IP Address** and any optional comments; click **Add**.

To edit or delete entries in the table, click **Edit/Delete Table Entries**; make your changes and click **OK**.

Spanning Tree

The Spanning Tree Protocol (STP) can be used to create redundant networks (“hot standby”) and to prevent loops. If enabled, Spanning Tree prevents loops by disabling redundant links; if a link fails, it can automatically enable a backup link.

The screenshot shows the configuration page for Spanning Tree. The 'Spanning Tree' tab is selected. The configuration fields are as follows:

- Spanning Tree Status: Disable (dropdown menu)
- Bridge Priority: 0
- Max Age (1/100 sec.): 2000
- Hello Time (1/100 sec.): 200
- Forward Delay (1/100 sec.): 1500

Buttons for 'OK' and 'Cancel' are visible below the configuration fields.

Priority and Path Cost Table

Port	Priority	Path Cost	State
1	0	100	Forwarding
2	0	100	Disabled
3	0	100	Disabled
4	0	100	Disabled
5	0	100	Disabled
6	0	100	Disabled
7	0	100	Disabled
8	0	100	Disabled
9	0	100	Disabled
10	0	100	Disabled
11	0	100	Disabled
12	0	100	Disabled

IP Routes

Click the **Configure** button, the **Network** tab and the **IP Routes** sub-tab to configure IP routes. You cannot configure IP Routes in **Bridge** mode. In **Routing** mode, the **Add Table Entries** and **Edit/Delete Table Entries** buttons are enabled.

The screenshot shows the 'IP Routes' configuration page. It features a navigation bar with 'System', 'Network', 'Interfaces', 'SNMP', and 'RIP'. Under 'Network', there are sub-tabs for 'IP Configuration', 'DHCP R A', 'Spanning Tree', and 'IP Routes'. The 'IP Routes' sub-tab is active, displaying two tables: 'Local IP Addresses' and 'IP Routes'. Below the tables are buttons for 'Add Table Entries' and 'Edit/Delete Table Entries'. A warning message at the bottom states: 'System is not in routing mode. The above parameters are only configurable if the system is in routing mode. Make sure the system has been rebooted after changing from bridge to routing mode.'

IP Address	Subnet Mask	Interface
10.0.0.1	255.255.255.0	1
10.0.0.1	255.255.255.0	3

IP Address	Subnet Mask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	10.0.0.1	0	0
10.0.0.0	255.255.255.0	10.0.0.1	0	0
127.0.0.1	255.255.255.255	127.0.0.1	0	0
172.16.0.20	255.255.255.255	10.0.0.1	0	0

Click the **Add** button to add entries; a window such as the following is displayed:

The screenshot shows the 'Add IP Route' dialog box. It features a navigation bar with 'System', 'Network', 'Interfaces', 'SNMP', and 'RIP'. Under 'Network', there are sub-tabs for 'IP Configuration', 'DHCP R A', 'Spanning Tree', and 'IP Routes'. The 'IP Routes' sub-tab is active, displaying a table with columns for 'Route Destination', 'Subnet Mask', 'Next Hop', and 'Metric'. Below the table are input fields for 'Route Destination', 'Subnet Mask', 'Next Hop', and 'Metric'. The 'Add' button is highlighted.

Route Destination	Subnet Mask	Next Hop	Metric
0.0.0.0	0.0.0.0	10.0.0.1	0
10.0.0.0	255.255.255.0	10.0.0.1	1
127.0.0.1	255.255.255.255	127.0.0.1	0

Route Destination:

Subnet Mask:

Next Hop:

Metric:

NOTE: The value added will take effect immediately.

Add **Cancel** **Back**

Enter the route information and click **Add**.

Click the **Edit/Delete Table Entries** button to make changes to or delete existing entries.

3) Interfaces

Wireless

To configure the wireless interface, click the **Configure** button followed by the **Interfaces** tab; then click the **Wireless** sub-tab.

The wireless interface can be placed in either WORP Base or WORP Satellite mode (selected from the **Interface Type** drop-down box). (See “Wireless Outdoor Router Protocol” on page 69 for more information.) The wireless interface settings differ per mode.

The screenshot shows a web-based configuration interface for a wireless interface. The main tabs are System, Network, Interfaces (selected), SNMP, and RIP. Under the Interfaces tab, there are sub-tabs for Ethernet and Wireless (selected). The configuration fields are as follows:

Interface Type	Worp Base
MAC Address	00:30:F1:8A:17:E5
Network Name	OR_WORP 802.11a
Transmit Power Control (TPC)	Full (-0 dB)
<i>NOTE: Changes to TPC will take effect immediately after clicking OK Button.</i>	
Enable Turbo Mode	<input type="checkbox"/>
Frequency Channel	149 - 5.745 GHz
Data Rate	36 Mbps
Satellite Density	Large
Maximum Satellites	100
RegistrationTimeout	5
Network Secret	*****
Input bandwidth limit (in kbits/s)	108032
Output bandwidth limit (in kbits/s)	108032

At the bottom of the configuration window are two buttons: OK and Cancel.

You can change the following parameters:

Interface Type

The interface type can be **Worp Satellite** or **Worp Base**. *See “Wireless Outdoor Router Protocol” on page 69.)

Base Station System Name

The name found on the system page of the Base Station to which this satellite is connecting. This parameter can be used as an added security measure, and when there are multiple Base Stations in the network and you want a satellite to register with only one when it may actually have adequate signal strength for either.

If the **Base Station System Name** is left blank on the satellite, it can register with any Base Station with a matching **Network Name** and **Network Secret**.

Network Name

A **Network Name** is name given to a network so that multiple networks can reuse the same frequency without problems. A satellite can only register to a base if it has the same **Network Name**. The **Network Name** is one of the parameters that allow a Subscriber Unit to register on a Base Station. The **Base Station System Name** and **Frequency Channel** also are parameters to guide the SU to the proper Base Station on the network, but they provide no security. Basic security is provided through encryption, as it causes none of the messages to be sent in the clear. Further security is provided by mutual authentication of the Base Station and Subscriber Unit using the **Network Secret**.

The list of parameters to configure for registration of the SU on a Base Station are:

- o Network Name
- o Base Station System Name (when used)
- o Channel Frequency
- o Encryption (when used)
- o Network Secret

Note: Encryption can impact performance with lower throughput.

Transmit Power Control (Tsunami MP.11a only)

By default, the Tsunami MP.11a lets users transmit at the maximum output power for the country or regulatory domain and frequency selected. However, with Transmit Power Control (TPC), you can adjust the output power of the unit to a lower level in order to reduce interference from neighboring devices or to use a higher gain antenna without violating the maximum radiated output power allowed for your country. Also, most countries in the ETSI regulatory domain require the transmit power to be set to a 6 dB lower value than the maximum allowed EIRP when link quality permits. You can see your unit's current output power for the selected frequency in the event log.

The event log shows the selected power for all data rates, so you must look up the proper data rate to determine the actual power level. For example, the event log shows:

```
0 00:00:08-INFO- Final Power 6 Mb 20 dBm, MaxRD 30 dBm, MaxEdge 31 dBm, -TPC Scale 0 dBm – Ant Red 0 dBm*
```

```
0 00:00:09-INFO- 20 dBm | 20 dBm | 20 dBm | 20 dBm | 20dBm | 19 dBm | 17 dBm | 14 dBm |
```

The above shows that the output power is set at 20 dBm for the data rate 6, 9, 12, 18, or 24 Mbps; at 19 dBm for 36 Mbps, at 17 dBm for 48 Mbps, or at 14 dBm when the selected data rate is 54 Mbps. The first line shows that 6 Mbps is selected, so the transmit power is 20 dBm.

Note: This feature only lets you decrease your output power; it does not let you increase your output power beyond the maximum allowed defaults for your frequency and country.

Select one of the following options and click **OK** at the bottom of the window. Your original output power is adjusted relative to the value selected. The new setting takes effect immediately without rebooting.

Full (0 dB)
 Half (-3 dB)
 Quarter (-6 dB)
 Eighth (-9 dB)
 Minimum (-10 dB)

Enable Turbo Mode (MP.11a ONLY)

Check this box to enable **Turbo Mode**. **Turbo Mode** currently is supported only in the United States. **Turbo Mode** utilizes two adjacent channels for wireless data transfer.

Frequency Channel

The frequency channel the MP.11 (802.11b) uses for communicating with remotes. This frequency channel can be set in the range 1 to 11 for the USA and Canada, or 1 to 13 for Europe, or 1 to 14 for Japan (see “Radio Specifications” on page 111).

For the MP.11a (802.11a), when DFS is enabled for the selected country, the **Frequency Channel** field appears as follows:

Frequency Channel – DFS, Auto selected 5.47 – 5.7 GHz

You can monitor the DFS scan, if enabled, by refreshing the Web page.

The channels and frequencies scanned when DFS is enabled are listed in the following table.

Output Power Table for ETSI					
Frequency	Channels	54 Mbps	48 Mbps	36 Mbps	6-24 Mbps
5.47 – 5.70 GHz	100, 104, 108, 112, 116, 120, 124, 128, 132, 136	14.5	15.5	17.4	17.4

For countries in which DFS is not enabled, the **Frequency Channel** list displays only the channels and frequencies allowed for the selected country. See “Dynamic Frequency Selection” on page 68 for more information.

Data Rate

The rate at which data is to be transferred. The default data rate for the MP.11 is 11 Mbps; the default data rate for the MP.11a is 36 Mbps. The SU must never be set to a lower data rate than the Base Station because timeouts will occur at the Base Station and communication will fail.

Selections for Data Rate are as shown in the following table.

Date Rate	Date Rate, Turbo Enabled
6 Mbps	12 Mbps
9 Mbps	18 Mbps
12 Mbps	24 Mbps
18 Mbps	36 Mbps
24 Mbps	48 Mbps
36 Mbps	72 Mbps
48 Mbps	96 Mbps
54 Mbps	108 Mbps

Satellite Density

The Satellite Density setting is a valuable feature for achieving maximum bandwidth in a wireless network. It influences the receive sensitivity of the radio interface. Selections are **Large, Medium, Small, Mini, and Micro**. See “Satellite Density” on page 69 for more information.

Registration Timeout

This is the registration process time-out of a satellite on a base. Default is 5 seconds.

Network Secret

A network secret is a secret password given to all nodes of a network. A satellite can only register to a base if it has the same Network Secret. The Network Secret is sent encrypted and can be used as a security option. Also see “Network Name.”

Input / Output Bandwidth Limit

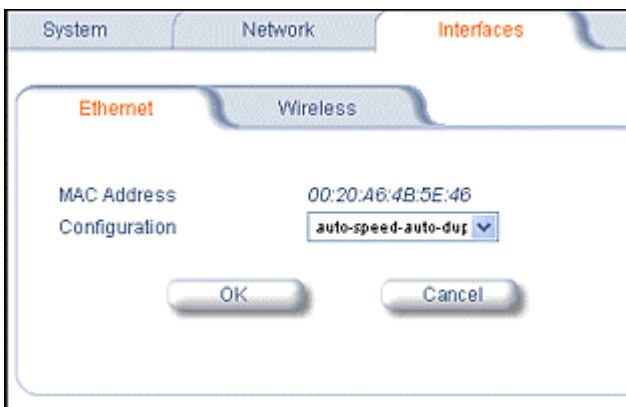
These parameters limit the data traffic received on the wireless interface and transmitted to the wireless interface, respectively. Selections are in steps of 64 Kbps from 64 to 108,032 kbps.

Ethernet

You can set the desired speed and transmission mode from this tab. The recommended setting is **auto-speed-auto-duplex**.

To set the Ethernet speed, duplex mode, and input and output bandwidth limits, click the **Configure** button, the **Interfaces** tab, and the **Ethernet** sub-tab.

Note: Current software always does **auto-speed auto-duplex** regardless of user selection.



You can set the Configuration parameter:

Select from these settings for the type of Ethernet transmission (**Configuration** drop-down box):

- | | |
|--------------------------|--------------------------|
| 10 Mbit/s – half-duplex | 100 Mbit/s – full-duplex |
| 10 Mbit/s – full-duplex | autospeed – half-duplex |
| 10 Mbit/s – auto-duplex | autospeed – auto-duplex |
| 100 Mbit/s – half-duplex | |

Half-duplex means that only one side can transmit at a time.

Full-duplex allows both sides to transmit.

Auto-duplex selects the best transmission mode for the given configuration.

4) SNMP

Click the **Configure** button and the **SNMP** tab to set passwords, set trap host IP addresses, and limit access to the MP.11/a management interface. You can enable: **All Interfaces, Only Ethernet, Only Slot A**, or **None**.

Trap Groups

You can enable or disable different types of traps in the system. By default, all traps are enabled.

Trap Host Table

This table shows the SNMP management stations to which the MP.11/a sends system traps.

5) RIP

Routing Internet Protocol (RIP) is a dynamic routing protocol you can use to help automatically propagate routing table information between routers. The Tsunami MP.11/a can be configured to use either RIPv1, RIPv2, RIPv1 Compatible, or a combination of all three versions, while operating in **Routing** mode. In general, the Tsunami MP.11/a RIP module is based upon RFC 1389.

	Ethernet	Wireless-slot A
Address	10.0.0.1	10.0.0.1
Network Mask	255.255.255.0	255.255.255.0
Authentication Type	Simple Password	No Authentication
Authentication Key (octet string (0-16 octets))	*****	*****
Confirm Authentication Key	*****	*****
Advertise	Do Not Send	Do Not Send
Receive	Do Not Send	RIPv2

NOTE: Changes take effect immediately after clicking OK Button.

Note the following:

- There is no option to turn off receiving RIP advertisements. Once the unit is in **Router** mode, it receives RIP updates when there is another RIP-enabled device advertising on your network. Although it receives and processes these updates, it does not further propagate these updates unless configured to advertise RIP.
- The ability to enable or disable default route propagation is not user configurable. Once initialized, the Tsunami MP.11/a uses its static default route and does not advertise this route in RIP updates. If another router on your network is configured to advertise its default route, this route overwrites the static default route configured on the Tsunami MP.11/a. The Tsunami MP.11/a then also propagates the new dynamic default route throughout the network.

Be aware that, once a dynamic default route is learned, it behaves just as any other dynamic route learned through RIP. This means if the device sending the default route stops sending RIP updates, the default route times out and the unit has no default route to the network. Workarounds for this condition include rebooting or re-entering a static default route. In general, the best approach is to disable the propagation of default routes on the other routers in your network unless you understand the risks.

The following table describes the properties and features of each version of RIP supported in the Tsunami MP.11/a.

Table 1 Properties and Features of Supported RIP Versions

RIPv1	RIPv2	RIPv1 Compatible
Broadcast	Multicast	Broadcast
No Authentication	Authentication	Authentication
Classful routing	Classless routing (VLSM)	Classless routing (VLSM)
Distance-vector protocol	Distance-vector protocol	Distance-vector protocol
Metric-Hops	Metric-Hops	Metric-Hops
Maximum Distance 15	Maximum Distance 15	Maximum Distance 15
IGP	IGP	IGP

RIP Example

In the following example, assume that both the BSU and the SUs all are configured in Routing mode with RIP enabled to send and receive on both the Ethernet and Wireless interfaces. The network converges through updates until each unit has the following routing table:

BSU

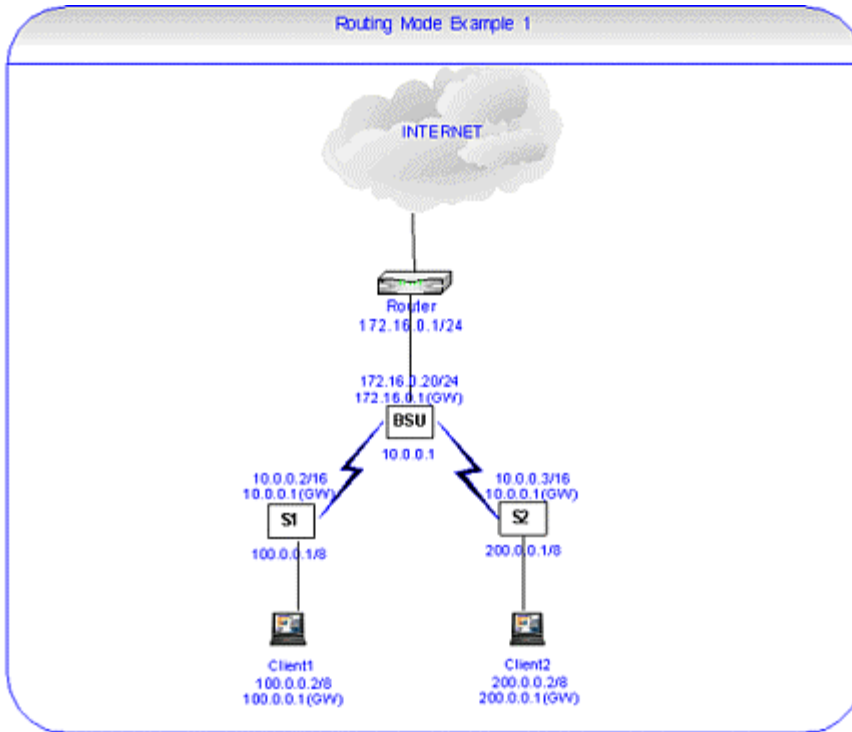
```
0.0.0.0      172.16.0.1  metric 1
172.16.0.0  172.16.0.20 metric 1
10.0.0.0    10.0.0.1   metric 1
100.0.0.0   10.0.0.2   metric 2
200.0.0.0   10.0.0.3   metric 2
```

SU1

```
0.0.0.0      10.0.0.1   metric 1
10.0.0.0     10.0.0.2   metric 1
100.0.0.0    100.0.0.1  metric 1
172.16.0.0   10.0.0.1   metric 2
200.0.0.0    10.0.0.2   metric 2
```

SU2

```
0.0.0.0      10.0.0.1   metric 1
10.0.0.0     10.0.0.3   metric 1
200.0.0.0    200.0.0.1  metric 1
172.16.0.0   10.0.0.1   metric 2
100.0.0.0    10.0.0.2   metric 2
```



RIP Notes

- Ensure that routers on the same physical network are configured to use the same version of RIP.
- Routing updates occur every 30 seconds. It may take up to 3 minutes for a route that has gone down to timeout in a routing table.
- RIP is limited to networks with 15 or fewer hops.

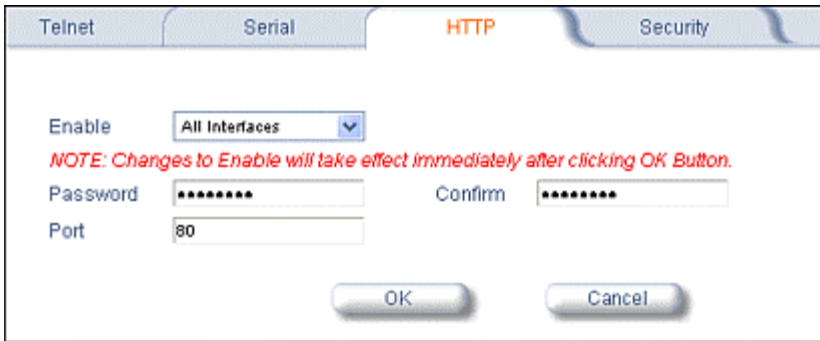
6) Telnet

Click the **Configure** button and the **Telnet** tab to manage telnet parameters, including **password** and **timeout**.

Note: To use HyperTerminal for CLI access, make sure to check “Send line ends with line feeds” in the ASCII Setup window (click **Properties** from the HyperTerminal window; select **Setup**, then **ASCII Setup**. See “HyperTerminal Connection Properties” on page 26 for more information).

7) Serial

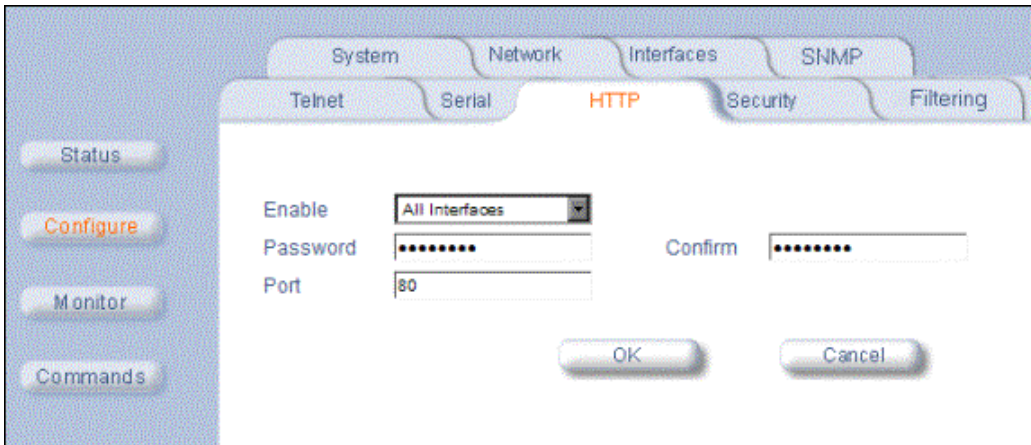
Click the **Configure** button and the **Serial** tab to change the serial port settings.



The screenshot shows a configuration dialog box with four tabs: Telnet, Serial, HTTP, and Security. The 'Serial' tab is selected. The 'Enable' checkbox is checked, and a dropdown menu next to it is set to 'All Interfaces'. Below this, a red note reads: "NOTE: Changes to Enable will take effect immediately after clicking OK Button." There are two password fields labeled 'Password' and 'Confirm', both containing seven asterisks. The 'Port' field is set to '80'. At the bottom, there are 'OK' and 'Cancel' buttons.

8) HTTP

Click the **Configure** button and the **HTTP** tab to view or change Web Interface parameters, including **password** and **timeout**.



The screenshot shows a configuration dialog box with tabs for System, Network, Interfaces, SNMP, Telnet, Serial, HTTP, Security, and Filtering. The 'HTTP' tab is selected. On the left side, there is a vertical menu with buttons for 'Status', 'Configure' (highlighted in orange), 'Monitor', and 'Commands'. The 'Enable' checkbox is checked, and a dropdown menu next to it is set to 'All Interfaces'. Below this, there are two password fields labeled 'Password' and 'Confirm', both containing seven asterisks. The 'Port' field is set to '80'. At the bottom, there are 'OK' and 'Cancel' buttons.

9) Security

MAC Authentication

Click the **Configure** button, the **Security** tab, and the **MAC Auth** sub-tab to build a list of authorized wireless stations that can register at the MP.11/a and access the network.

The screenshot shows the 'Security' tab selected in the top navigation bar. Underneath, the 'MAC Auth' sub-tab is active. The configuration area includes two dropdown menus: 'MAC Access Control Status' set to 'Disable' and 'MAC Access Control Operation' set to 'Allow'. Below these are 'OK' and 'Cancel' buttons. A section titled 'Wireless MAC Access Control Table' contains a table with columns for 'MAC Address', 'Comment', and 'Status'. Below the table are two buttons: 'Add Table Entries' and 'Edit/Delete Table Entries'.

This feature is supported on the wireless interface and only wireless MAC addresses should be entered in the list. For example, build a list of the wireless MAC addresses on the Base Station for the authorized satellites.

To add table entries, click the **Add Table Entries** button; a window such as the following is displayed:

The screenshot shows a dialog window titled 'MAC Access Control Table'. It has a table with columns for 'MAC Address', 'Comment', and 'Status'. Below the table are two input fields: one for 'MAC Address' and one for 'Comment'. A note below the fields reads: 'NOTE: The value added will only take effect after the device is rebooted.' At the bottom of the dialog are three buttons: 'Add', 'Cancel', and 'Back'.

Enter the MAC address and any comment, then click **Add**.

To edit or delete table entries, click the **Edit/Delete Table Entries** button; make your corrections in the window displayed and click **OK**.