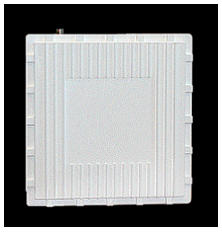
Part Number 68568r1

Installation and Management

Tsunami MP.11 and MP.11a

Version 2.1

Installation and Management



Outdoor: BSU

Indoor

Outdoor: SU

PROXIM WIRELESS NETWORKS

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FCC COMPLIANCE

This document provides regulatory information for the following wireless outdoor 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
- Tsunami MP.11/a Ruggedized BSU, Tsunami MP.11/a Ruggedized SU

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 your 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), you are 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 1.12 meters from all persons during normal operation.

Contents

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)
- A “ruggedized” version that can be placed outside, close to the antenna, to significantly improve range and ease of installation

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

Chapter 1 “Overview” (this chapter)
Provides 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 9
Provides detailed installation instructions for the MP.11/a.

Chapter 3 “Management Overview” on page 23
Explains how to access the MP.11/a for configuration and maintenance.

Chapter 4 “Basic Management” on page 32
Explains the most common settings used to manage the MP.11/a.

Chapter 5 “Web Interface” on page 43
Depicts the Web Interface in a hierarchical manner, so you can easily find details about each item.

Chapter 6 “Command Line Interface” on page 94
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.

IN THIS RELEASE

- Ruggedized, outdoor version of Tsunami MP.11/a
- Antenna alignment tool with audio support
- Reporting and logging of internal unit temperature
- Transmit Power Control support enhanced:

Tsunami MP.11 Version 2.0	*Tsunami MP.11 Version 2.1*
Full (-0 dB)	-0 dB
Half (-3 dB)	-3 dB
Quarter (-6 dB)	-6 dB
Eighth (-9 dB)	-9 dB
Minimum (-10 dB)	-12 dB
	-15 dB
	-18 dB (minimum TPC level)

WIRELESS NETWORK TOPOLOGIES

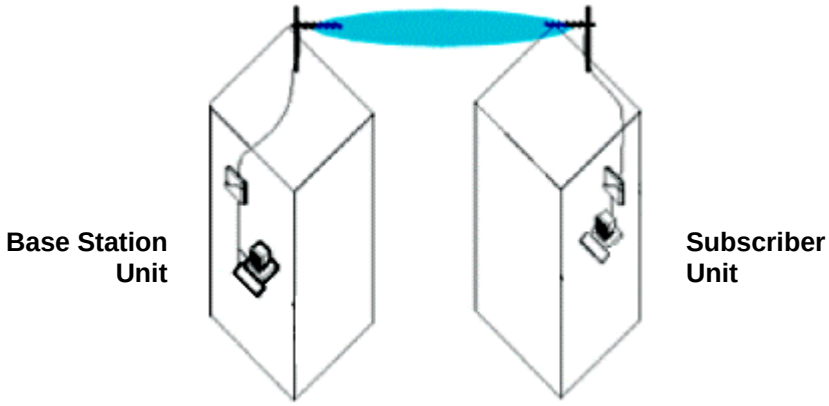
You can use the MP.11/a to set up the following types of topologies:

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

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

Point-to-Point Link

With a Base and a Subscriber Unit (or a QuickBridge 11 kit), it is easy to set up a wireless point-to-point link as depicted in the following figure.

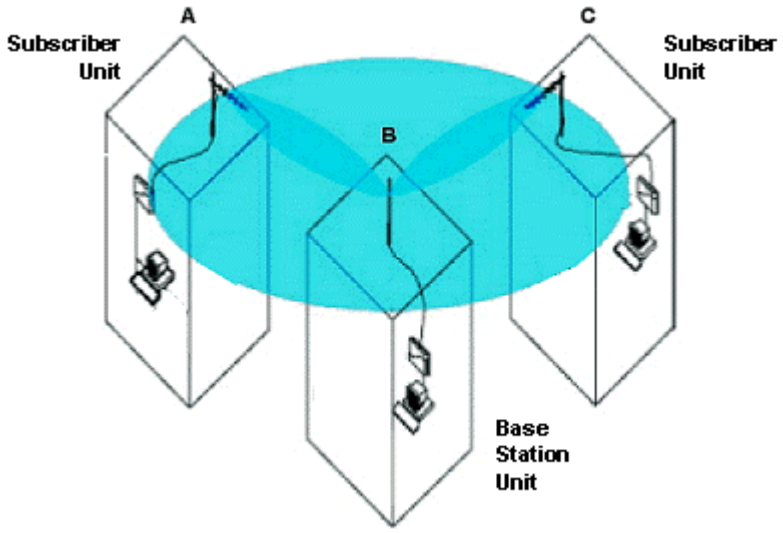


A point-to-point link lets you set up a connection between two locations as an alternative to:

- Leased lines in building-to-building connections
- Wired Ethernet backbones between wireless access points in difficult-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 station and multiple Subscriber Units, as depicted in the following figure.



Up to 250 Subscriber Units (SUs) can be connected to a Base Station. If a Base Station already has 250 SUs or RSUs, a new SU cannot be connected to the Base. In this figure, the system is designed as follows:

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

ACTIVE ETHERNET

The MP.11/a is equipped with an 802.3a/f-compliant Active Ethernet module. Active Ethernet delivers both data and power to the radio over a single Ethernet cable. If you use Active Ethernet, there is no difference in operation; the only difference is the power source. The ruggedized (or outdoor) unit has only an Active Ethernet connection with an integrated power injector.

- The Active Ethernet integrated module receives –48 VDC over a standard Cat 5 Ethernet cable.
- 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.
- For the indoor MP.11/a:
    - You must have an Active Ethernet hub (also known as a power injector) connected to the network to use Active Ethernet,. 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.

IDENTIFYING NETWORK TOPOLOGY AND EQUIPMENT

The MP.11/a can be used in various network topologies and combinations. The required equipment depends upon the wireless network topology you want to build. Make sure all required equipment is available before installing the MP.11/a.

The "ruggedized" MP.11/a is designed for outdoor placement. You can connect the MP.11/a 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: The Tsunami MP.11/a **Configure System** window provides a selectable **Country** field that automatically provides the allowed bandwidth and frequencies for the selected country as well as, where applicable, Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC).

European installers should not add an antenna or an amplifier until the MP.11a **Country** is selected 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 44).

Chapter 2. Installation

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

- Installing the Indoor MP.11/a below
- Installing the Ruggedized MP.11/a on page 16
- Installing Documentation and Software on page 21

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.

INSTALLING THE INDOOR MP.11/a

The indoor 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 following installation procedure 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 Indoor MP.11/a Product Package

Each indoor 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* manual*, Antenna Installation Guides*)
  - 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).

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.

Indoor Installation Procedure

To install the indoor 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

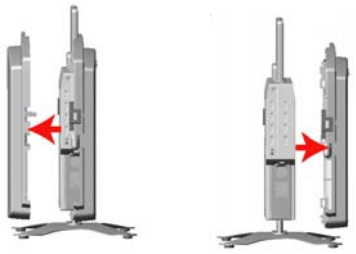
The shipment also includes the *Tsunami MP.11/a Quick Install Guide*.

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 Indoor MP.11/a” on page 12 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.

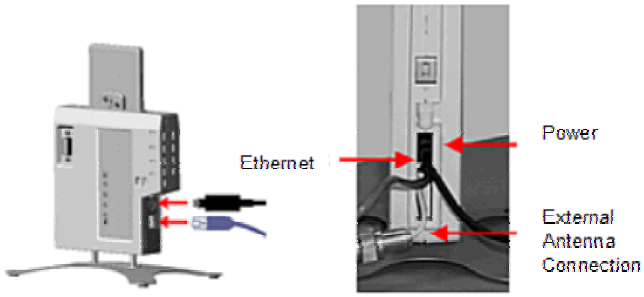
5. Remove the front cover from the unit (the side with the LED indicators, shown in the figure on left); then remove the back cover (figure on right).



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

7. Connect one end of an Ethernet cable (not supplied) 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.



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 Indoor MP.11/a" below 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 .

Mounting the Indoor 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 "Indoor Installation Procedure" on page 10.

Wall Mounting

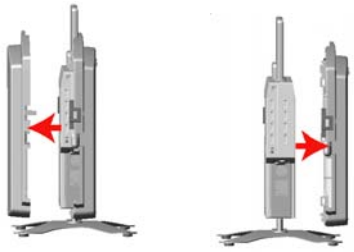
Follow these steps to mount the MP.11/a on a wall:

1. Identify the location at which you intend to mount the unit.
2. If the MP.11/a's power supply is plugged in, unplug it,
3. Use a Phillips screwdriver to remove the metal base from the underside of the MP.11/a (if you have not already done so).

4. Press down on the cable cover lock to release the cable cover .

5. Remove the cable cover from the unit.

6. Remove the front and back covers from the unit.



7. Place the back cover on the mounting location and mark the center of the three mounting holes.

8. Remove the cover from the wall and drill a hole at each of the locations you marked. Each hole should be wide enough to hold a mounting plug (6 mm x 35 mm).
9. Insert a plug into each hole.
   (Four 6 mm x 35 mm plugs are provided; you need to use only three of these for wall mounting.)
10. Insert a screw into each of the mounting holes molded into the back cover.
    (Four 3.5 mm x 40 mm pan-head screws are provided; you need to use only three of these for wall mounting.)
11. Insert the screws into the wall plugs; use a screwdriver to tighten the screws and attach the back cover to the wall.
12. Attach Ethernet and power cables to the MP.11/a unit, as necessary.
13. Snap the unit into the back cover, replace the front cover, and replace the cable cover.
14. Turn on the MP.11/a (see “Switching On the Indoor MP.11/a” on page 14).

Ceiling Mounting

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

1. If the MP.11/a's power supply is plugged in, unplug it.
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 "Indoor Installation Procedure" on page 10 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/a's metal base to the ceiling.

Switching On the Indoor MP.11/a

The MP.11/a can be powered by a power supply (just plug the power cord of the power supply into an AC power outlet), or by Active Ethernet (connect an 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 LEDs when the MP.11/a is operational (the fourth LED is only used during Dynamic Frequency Selection on a Base Station; flashing green indicates scanning).

Power	
OFF	Power is not present or is 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 125.	

Continue with “Installing Documentation and Software” on page 21.

INSTALLING THE OUTDOOR MP.11/a

The outdoor MP.11/a radio contains a state-of-the-art wireless access point, high gain performance flat panel antenna, and Power-over-Ethernet (the sole means of power for the outdoor MP.11/a). For further protection, the Power-over-Ethernet connection has a built-in surge arrestor.

The installation procedure on page 17 provides instructions for attaching the Ethernet connector. An antenna cable is required only when you use an optional external antenna.

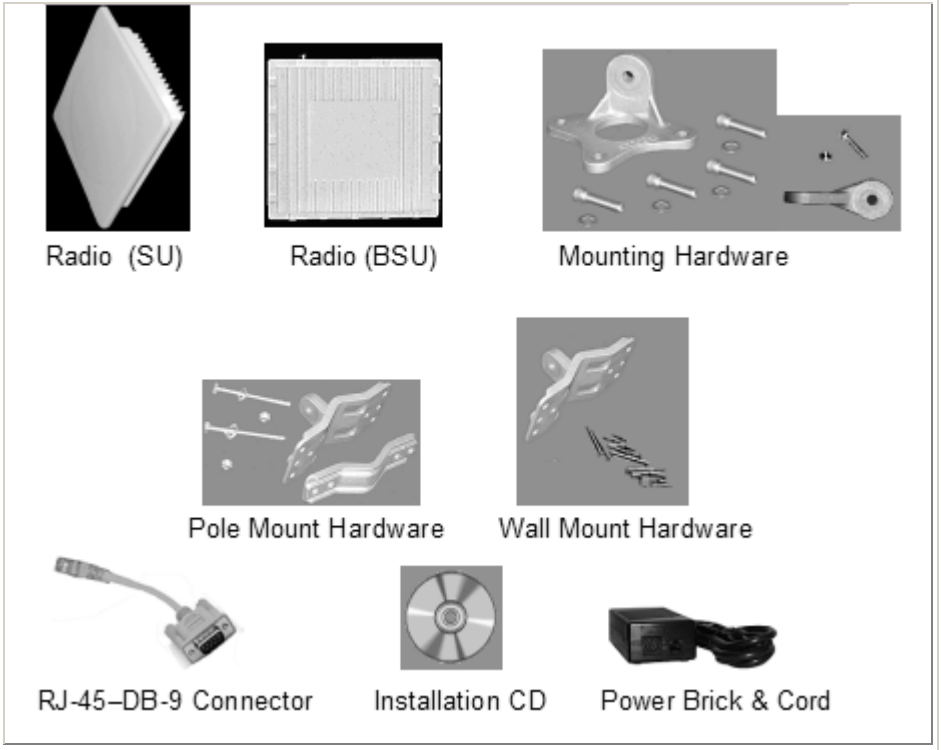
WARNING

To ensure proper grounding, use the hole on the back of each radio and the provided grounding screws to attach a ground wire to each radio. Use proper wire grounding techniques in accordance with your local electrical codes. You also can mount the radios on tall, multi-section poles with guide wires. For these types of installations, you should consult professionals with experience.

The Outdoor MP.11/a Product Package

Each outdoor MP.11/a comes with the following, as well as a printed copy of the *Tsunami MP.11/a Quick Install Guide*.

1. One MP.11/a Ruggedized Radio with integrated antenna (SU) or with an external antenna connection (BSU)
2. Mounting hardware to attach to radio for mounting
3. Hardware for pole mounting
4. Hardware for wall mounting
5. One RJ11 to DB9 connector for serial connection
6. One Tsunami MP.11/a Version 2.1 Installation CD containing:
   - Installation Package
   - Documentation
   - ScanTool
   - FTP Server
7. Power Brick and cord



Notes:

- 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.
- Cables are not provided with the MP.11/a.

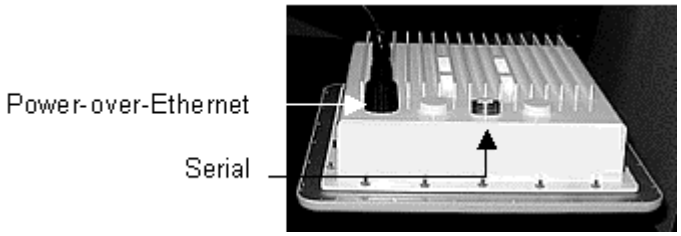
Outdoor MP.11/a Installation Procedure

Before mounting the MP.11/a, note the MAC address and the serial number of the unit along with the name of the site at which the unit was installed. Keep this information in a safe place. The MAC address is required to add the Subscriber Unit to a Base Station database; the serial number is required to obtain support from Proxim.

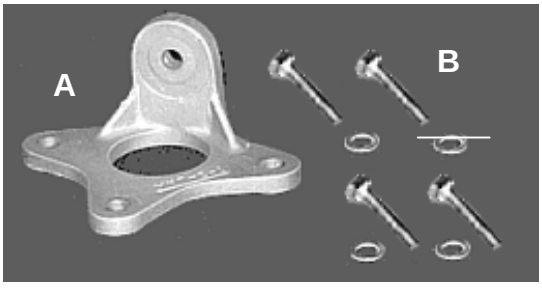
The outdoor MP.11/a is designed to directly mount to a pole. Using the supplied brackets and hardware, you can mount the radio to a 1-1/4 inch to 3-inch pole (outside diameter). Using just one of the pole mounting brackets, you can mount the radio to a wall or other flat surface.

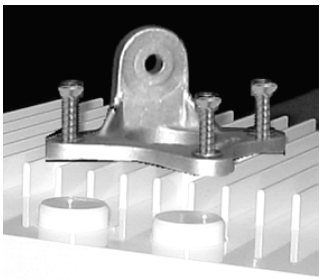
To install the outdoor MP.11/a:

1. Unpack the unit and accessories from the shipping box.
2. Attach a Cat5e cable (not provided) to the Power-over-Ethernet port on the back of the radio (see the following figure).

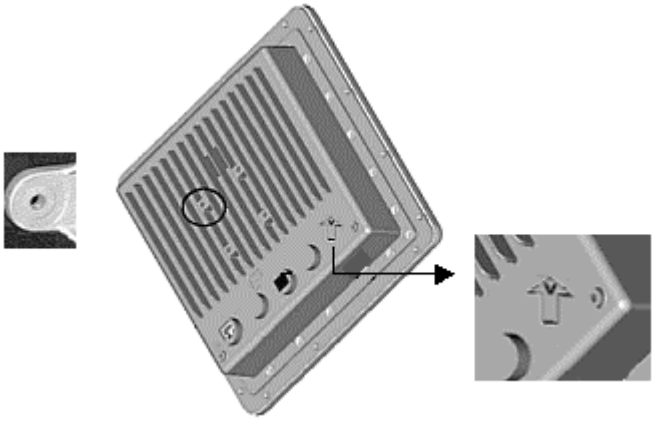


3. Screw mounting piece (A) to the back of the radio unit with screws and washers (B) as shown:

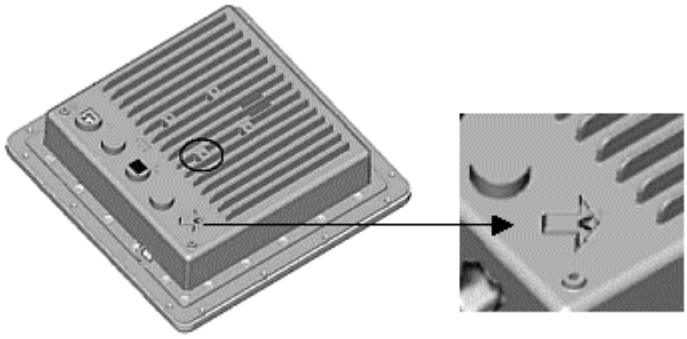




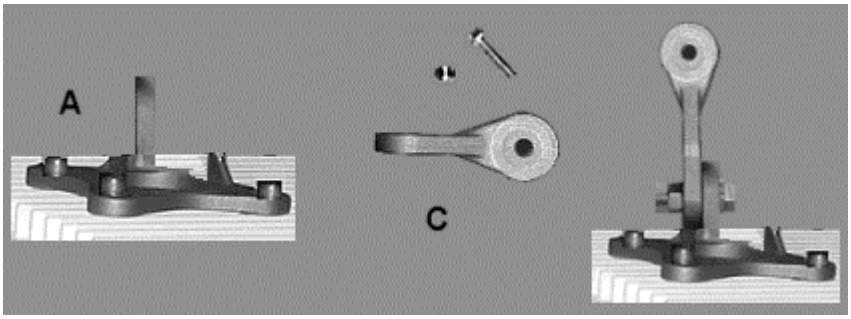
There is an arrow on the back of the radio that indicates the direction to mount for vertical polarization. Mount the radio with the following portion of the bracket in the position circled in the following figure for vertical alignment.



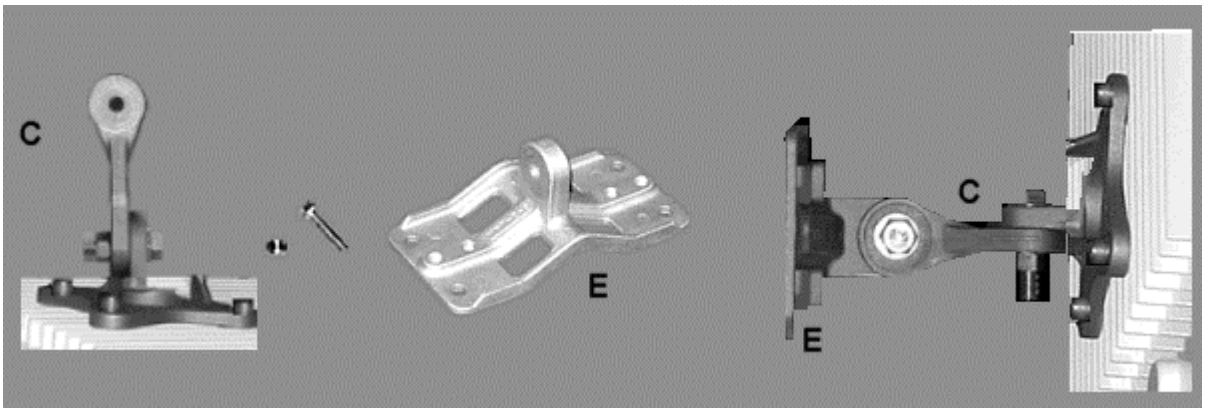
For horizontal alignment, mount the radio as shown below:



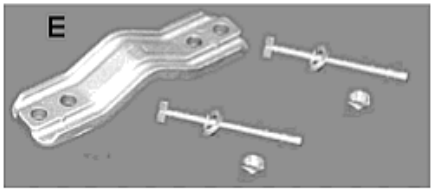
4. Attach bracket connector (C) to mounting piece (A) with the screw provided, as shown below. This extension piece gives the radio more possible tilt, letting you more accurately adjust for elevation.

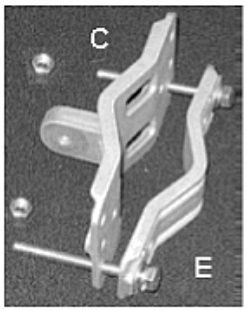


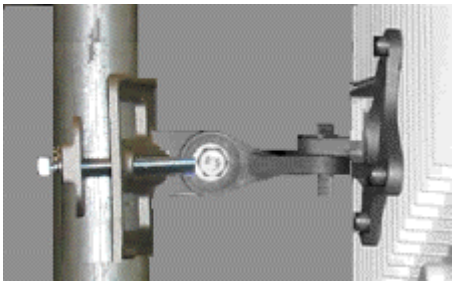
5. Attach bracket connector (C) to bracket (E) with the nut and screw provided.



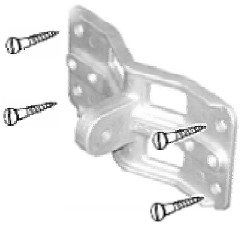
6. To mount to a pole, insert screws through bracket F and fasten around pole to bracket E and secure.







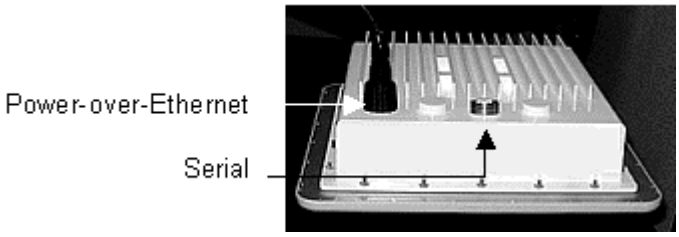
To wall-mount the outdoor MP.11/a, mount bracket (E) to wall using 4 screws provided, as shown:



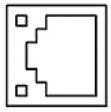
Switching On the Outdoor MP.11/a

You can power on the outdoor MP.11/a by 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 complete, the LEDs show the operational state of the MP.11/a (see the following figure).



LEDs—Power / Ethernet and Wireless Connections



Power & Ethernet Link	
GREEN	Power is on, the radio is up, and the Ethernet link is also up..
BLINKING GREEN	Power is on, the radio is coming up and the Ethernet is down.
RF (Wireless) Link	
GREEN	A wireless link has been established..
BLINKING GREEN	A wireless link is being established..

Recommended Power and Ethernet Cable

Recommended Cable	
Function	Power (DC) and Ethernet connection
Type	Cat 5e, UV shielded
Impedance	100 ohms
Recommended cables	4 UTP, 24 AWG, UL rated
Maximum Distance	330 feet / 100 meters
Connector type, radio end	RJ-45 female, weatherized using weatherproof connector
Connector type, power & Ethernet adapter end	8-pin DIN male connector with solder cup/cover or crimp pins to power & Ethernet adapter

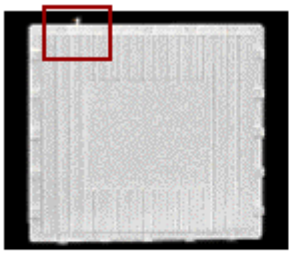
Serial Connection

The serial connection is made with an RJ-11 to DB-9 connector (also referred to as a “dongle”). Connect the RJ-11 end to the radio and connect the serial (DB-9) end to your PC to assist you in aligning the antenna and to issue CLI commands.

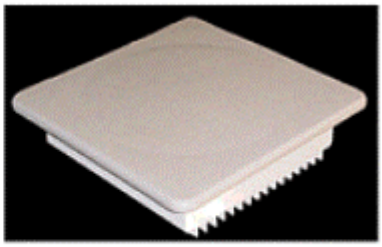
External Antenna Connection

The integrated antenna is supported on Subscriber Units only; the Base Station has an external antenna connector and no integrated antenna. For more information about external antennas, see the *Tsunami MP.11 Antenna Installation Guide* and *Tsunami MP.11a Antenna Installation Guide*.

Note: The window antenna documented in the antenna installation guides does not apply to the outdoor MP.11/a.



Base Station Unit
with external antenna connection



Subscriber Unit with Integrated Antenna

Continue with “Installing Documentation and Software.”

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.

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 24 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.

ALIGNING THE ANTENNA

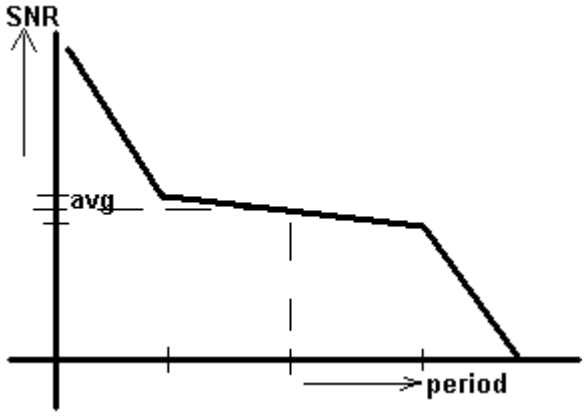
Antenna alignment is a process to physically align the antenna of the radio receiver or the transmitter to have the best possible radio link established between them. The antenna alignment process usually is performed during installation and after major repairs.

The outdoor MP.11/a has an audible antenna alignment tool that can be activated by plugging in the supplied serial dongle (supplied with every Base Station) or by issuing the CLI command for antenna alignment. The CLI command causes both audible and numerical feedback as the CLI shows the running SNR values twice a second.

The output from the beeper for antenna alignment consists of short beeps with a variable interval. The interval changes with the SNR level to assist in correctly aligning the antenna. An increase in signal level is indicated by a shorter interval between beeps; a reduction in signal level results in beeps further apart.

To allow for precise antenna alignment, small changes in SNR result in large changes in the beep period. The alignment process averages the SNR, which is represented by an average length beep. When a higher SNR is received, the beep period is made shorter, dependent upon the difference to the average. A lower SNR results in a longer period between beeps.

The first five steps are represented by a large change and all following steps are a small change. This acts as if a magnifying glass is centered around the average SNR and the values next to the average are significantly different.



When the antenna is aimed, the beep can easily be heard if the SNR is rising (shorter period, higher frequency) or falling (longer period). When the position of the antenna has been changed, the SNR averaging settles at the new value and the beeping returns to the average length so the antenna can again be aimed towards rising SNR.

Aiming is complete if moving in any direction results in a falling SNR value, which can be heard as longer periods between beeps.

Notes:

- Antenna alignment for the Base Station is useful only for a point-to-point link.
- The range of the average SNR must be limited to values from 0 to 48. Anything over 48 is capped at 48.
- AAD is automatically disabled 30 minutes after it is enabled to remove the load of extra messages on the wireless interface. The default telnet timeout is 900 seconds (15 minutes). If AAD must run for the entire 30 minutes, change the default telnet timeout value greater than 30 minutes (greater than 1800 seconds). This restriction is for telnet connections only and not for the serial interface. The serial interface never times out.

Antenna Alignment Commands

`set aad enable local`

Enables display of the local SNR. Local SNR is the SNR measured by the receiver at the near end.

`set aad enable remote`

Enables display of the remote SNR. Remote SNR is the SNR as measured by the receiver at the far end.

`set aad enable average`

Enables display of the average SNR. The average SNR is the average of the local and remote SNR.

`set aad disable`

Disables Antenna Alignment Display (Ctrl-C also disables AAD).

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

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

Command Line Interface

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 60 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 31).

MP.11/a IP ADDRESS

Because each network is different, an IP address suitable for your network must be assigned to the MP.11/a. You must have the IP address of the MP.11/a to configure and manage it through its Web Interface, SNMP, or the CLI. You can manage other basic parameters can be managed as well. ScanTool is included on the documentation and software CD-ROM to assist you in determining and changing the MP.11/a's IP address.

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.

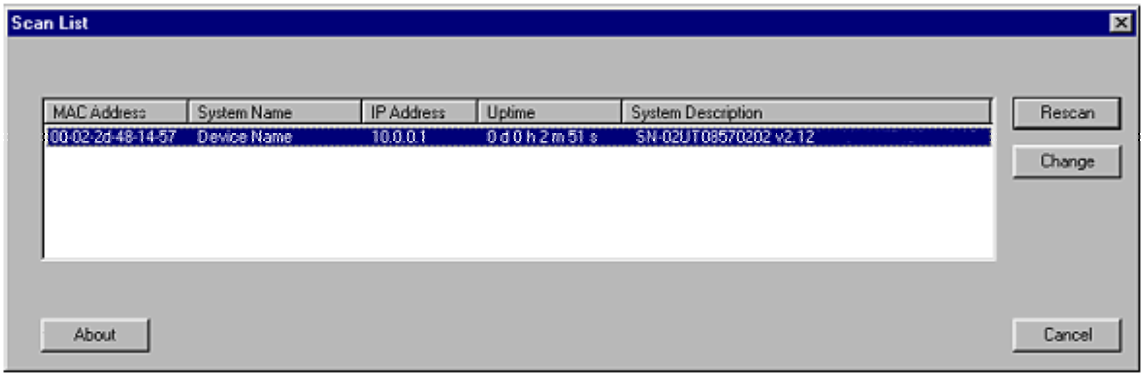
The MP.11/a either obtains its IP address automatically through DHCP or it must be set manually. With ScanTool, you can find out the current IP address of the MP.11/a and, if necessary, change it so that is appropriate for your network. The MP.11/a is shipped with the static IP address 10.0.0.1 configured.

Setting the IP Address

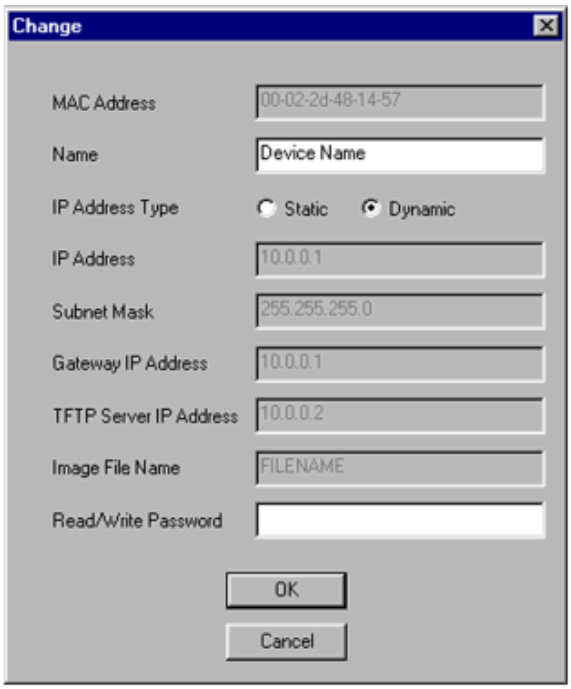
If you want to set the IP address:

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. To set the IP address ***manually***, 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.

   To set the IP address ***dynamically***, ensure that **Dynamic** 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.

4. 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.

WEB INTERFACE OVERVIEW

The Web Interface provides a graphical user interface through 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 32 and "Chapter 5. Web Interface" on page 43.

To use the Web Interface, you need only the IP address of the MP.11/a. (See "MP.11/a IP Address" on page 23 for details.)

Note: If the connection is slow or you are not able to connect, use the Internet Explorer **Tools** option to ensure 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.

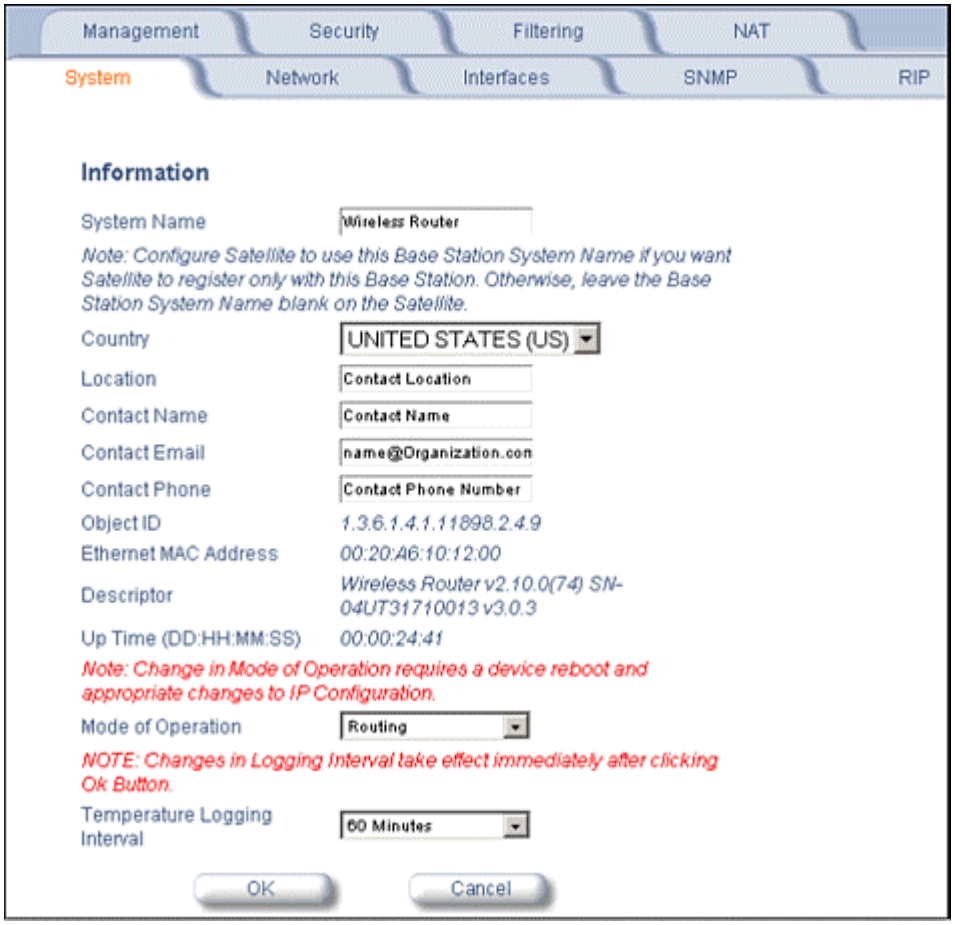
Do not fill in the **User Name**, enter only the password and click **OK**. The default password is **public**.

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 MP.11/a Web Interface.

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 COUNTRY OPTIONS

Selecting a Country

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

MP.11/a 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.11/a 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 from the **Country** drop-down box.

Continue configuring settings as desired; then click the **Commands** button and the **Reboot** tab to save and activate the settings. Alternatively, if you want to save the configuration settings to the flash memory but not activate the settings, use the **save config** CLI command.

The Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) features are enabled automatically when you choose a country with a regulatory domain that requires them. The **Country** selection pre-selects and displays only the allowed frequencies for the selected country.

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 may take several minutes. Scanning is indicated by a flashing green LED (the fourth LED in the case of the Base Station; the Wireless LED for an SU). When the link is established, the fourth LED on the BSU goes off. The third LED on the SU continues flashing until it establishes a WORP link. After establishing a WORP link, the LED stops flashing and continues to glow green.

See “Dynamic Frequency Selection” on page 82 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.

By default, the Tsunami MP.11a lets you 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 radio’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 relevant 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

This shows that the output power is set at 20 dBm for the data rate 6, 9, 12, 18, or 24 Mbps or at 19 dBm when the selected data rate is 36 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.

See “Configure: 1) System” on page 45 to configure **Country**, **Dynamic Frequency Selection**, and **Transmit Power Control**.

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 94.

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

The CLI is accessible through the:

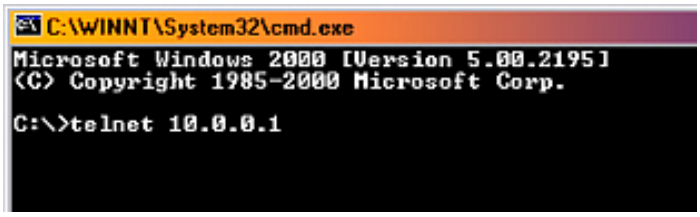
- Ethernet port connected through the network or with a cross-over Ethernet cable between the computer and the MP.11/a
- Serial port of the MP.11/a

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 23 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.



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 125.

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

- A serial 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 cable.

Note: For the outdoor MP.11/a, you can connect to the serial port by connecting the included RJ-11 to DB-9 connector from the radio (RJ-11 connection) to your computer's serial port (DB-9 connection).

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

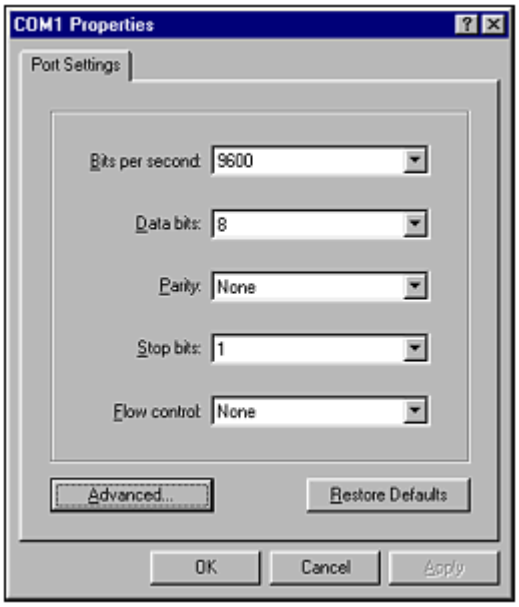
3. Press the RESET button on the indoor MP.11/a unit. For the outdoor MP.11/a unit, disconnect and reconnect power. The terminal program displays Power On Self Test (POST) messages. After approximately 90 seconds it displays:
   `Please enter password:`
4. Enter the password. The default password is **public**.

You can now use the CLI.

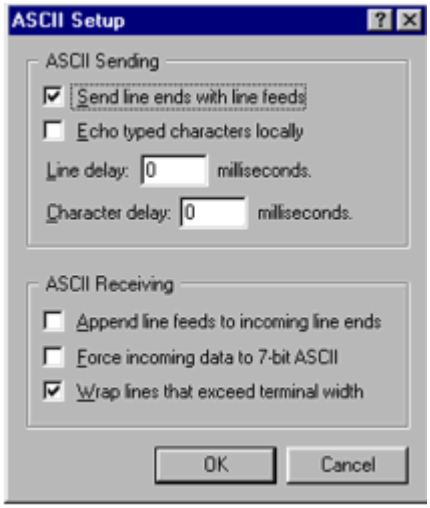
HyperTerminal Connection Properties

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 configure and monitor the basic features of the MP.11/a. In most cases, configuring these basic features is sufficient.

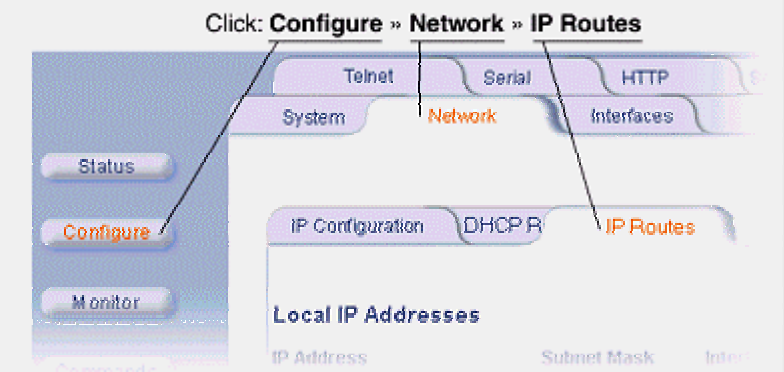
A full overview of the Web Interface is provided in "Chapter 5. Web Interface" on page 43; "Glossary" on page 137 provides a brief explanation of the terms used.

For CLI commands you can use for basic management, see "Command Line Interface" on page 94.

The following topics are discussed in this chapter:

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 23 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 21 for details).

REBOOTING AND RESETTING

All configuration changes require a restart unless otherwise stated. New features explicitly state whether a reboot is required or not. You can restart the MP.11/a I any one of the methods described in the following sub-sections.

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 34).

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.

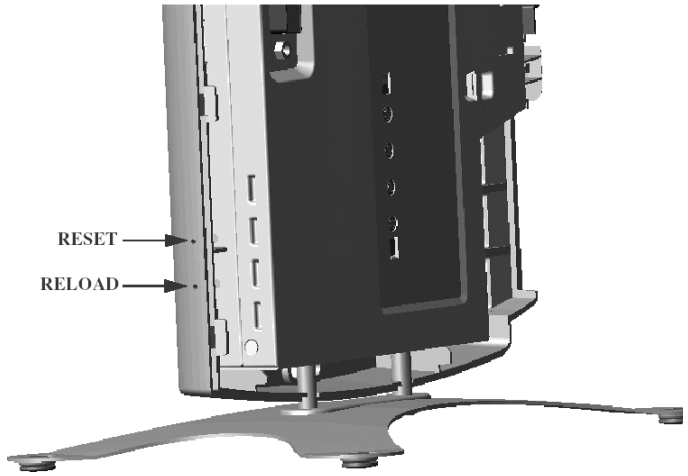
To reboot, click the **Commands** button, then the **Reboot** tab. Click the **Reboot** button.

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 indoor MP.11/a unit with, for example, a pencil. The following figure depicts the indoor MP.11/a. Use the **reset** command (see “Reset Command” on page 93 to reset the outdoor MP.11/a unit.



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:

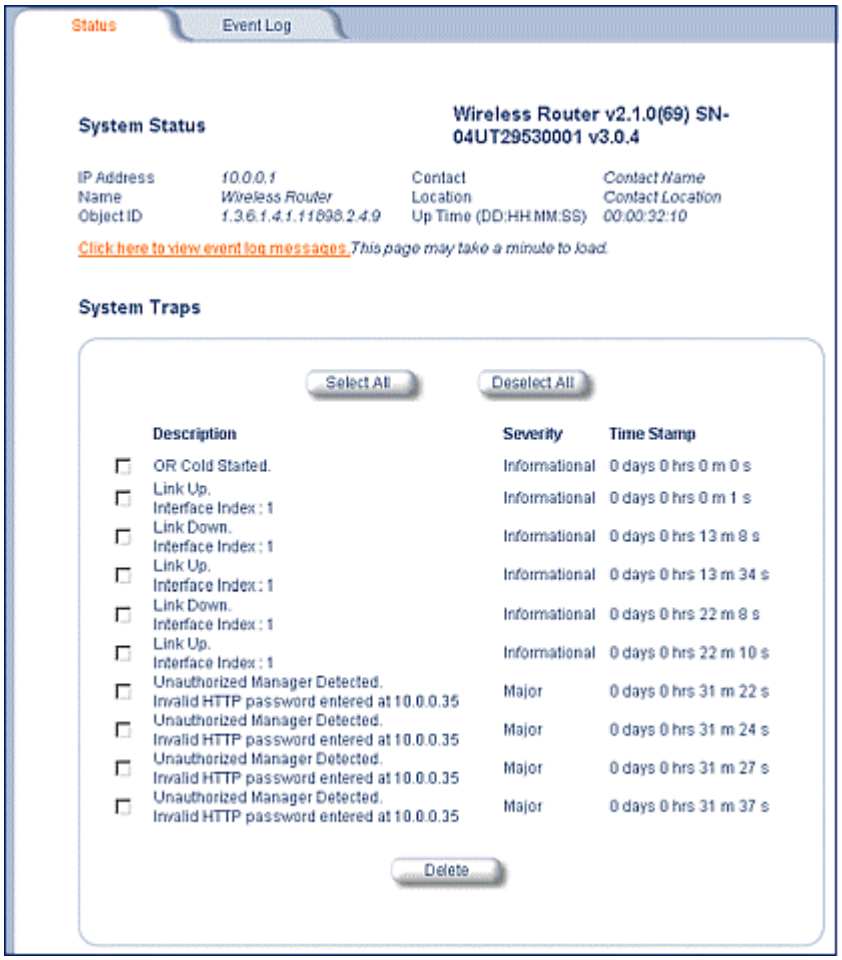
1. Click the **Commands** button, then the **Reset** tab.
2. Click the **Reset to Factory Default** button. The device configuration parameter values are reset to their factory default values.

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 125 as an alternative.

GENERAL SETTINGS

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.

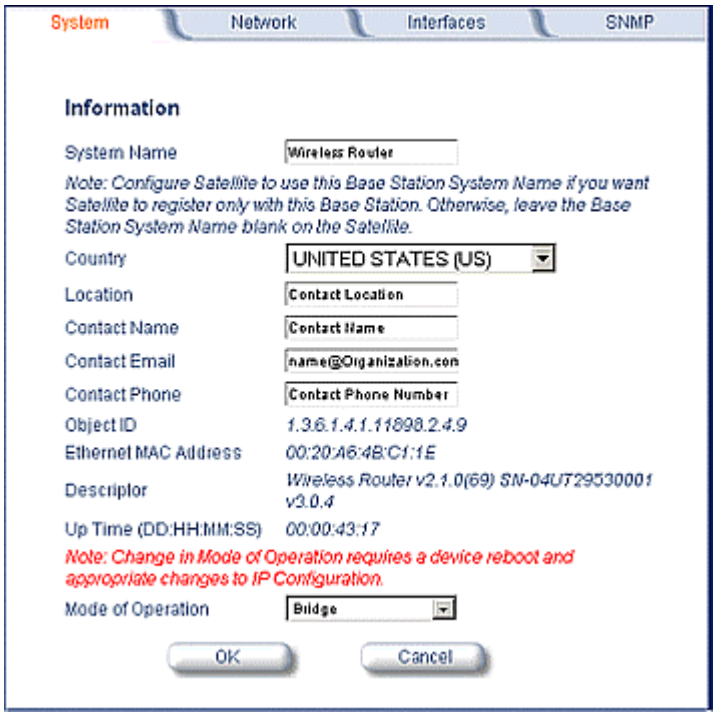


See “System Status” on page 43 for more information.

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 distinguish this MP.11/a from other routers, and let you know whom to contact in case of problems.

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

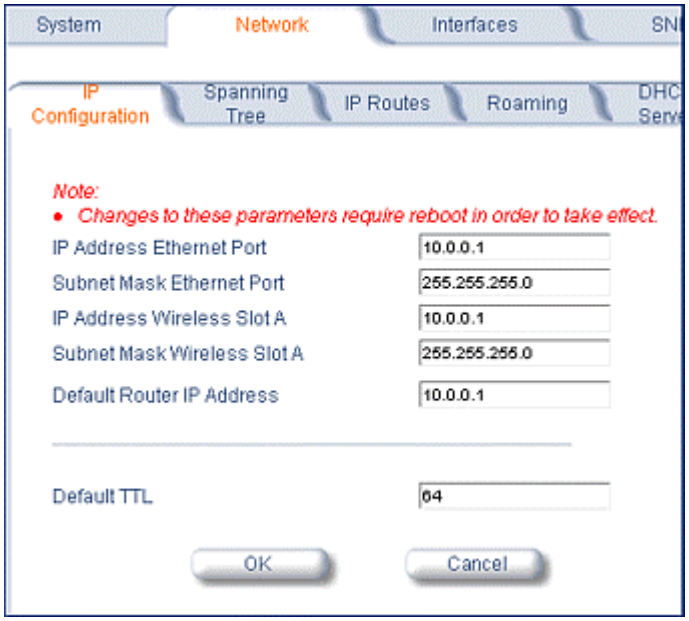


See "Configure 1) System" on page 45 for more information.

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 **Routing** mode.

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



See “IP Configuration” on page 47 for more information.

Interface Configuration

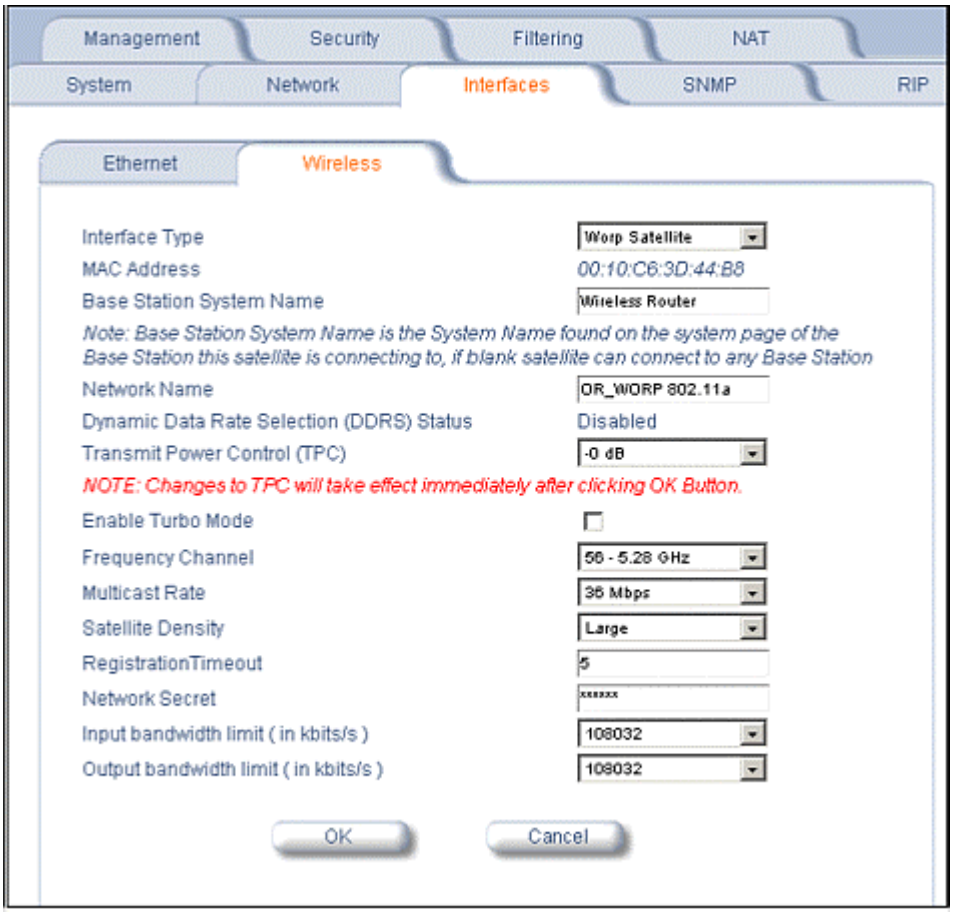
The **Interfaces** configuration pages let you change the MP.11/a Ethernet and wireless parameters. The **Wireless** tab is displayed by default when you click the **Interfaces** tab.

Wireless

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

For Base Station units, the wireless interface can be placed in either **WORP Base** or **WORP Satellite** mode (selected from the **Interface Type** drop-down box). Subscriber units can be placed only in **WORP Satellite** mode. (See “Wireless Outdoor Router Protocol” on page 83 for more information.)

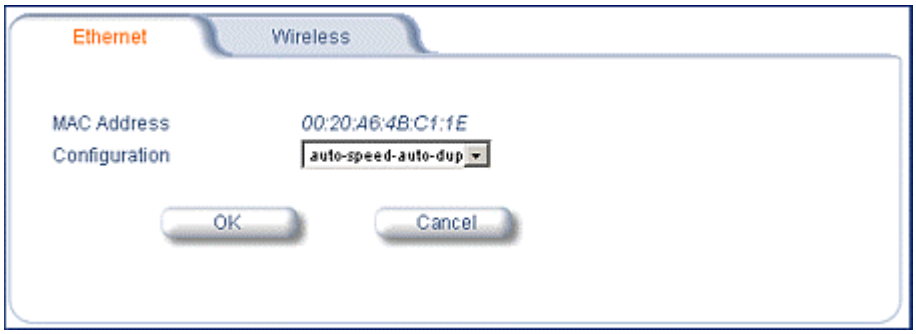
The wireless interface settings differ per mode.



For more information, see “Wireless” on page 55.

Ethernet Port

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



You can set the **Configuration** parameter from this tab. Select from the following settings for the type of Ethernet transmission.

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 lets both sides transmit.
Auto-duplex selects the best transmission mode for the given configuration.

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

See “Ethernet” on page 59 for more information.

MONITORING SETTINGS

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

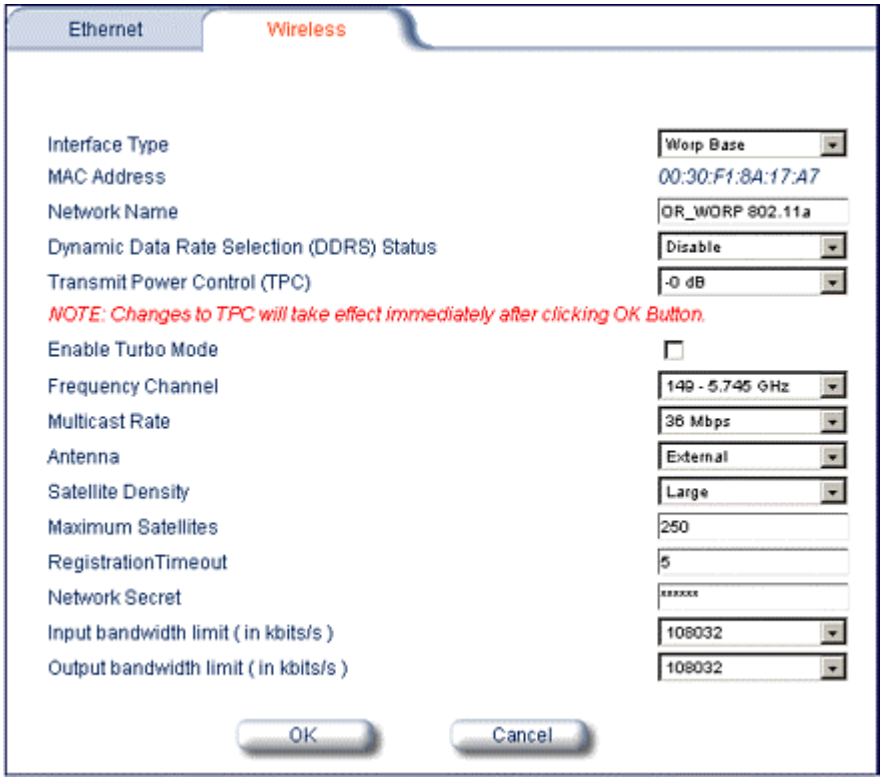
Wireless

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 subscriber interfaces.

To monitor the WORP registration/performance details, click the **Monitor** button, the **Wireless** tab, and the **Worp** sub-tab.

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.



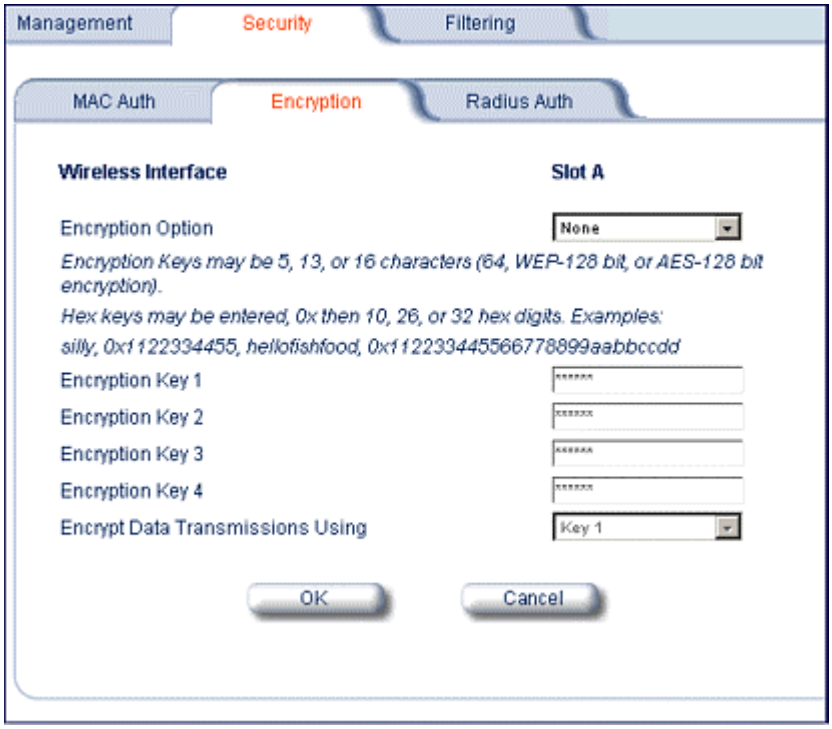
SECURITY SETTINGS

To prevent misuse, the MP.11/a provides wireless data encryption and password-protected access. Be sure 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.



You can set the following encryption parameters:

Encryption Option

This parameter enables either WEP or AES 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**. For better security it is recommended to change the default passwords to a value (6-32 characters) known only to you.

All passwords for the Telnet, HTTP (Web Interface), and SNMP interfaces are configured through the **Configure → Management → Passwords** tab.

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 **Management** tab.

Enter the new password in the Telnet **(CLI) 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 **Management** tab.

Enter the new password in the **HTTP (web)** 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 **Management** tab.
2. Enter the new password in the **SNMP Read Community Password** field or the **SNMP Read/Wire Community** 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.

Updating the embedded software is described in “Image File Download” on page 123. 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.

Notes:

- Only radios with Version 2.0 installed can be upgraded to Version 2.1.
- Upon upgrade from Version 2.0 to Version 2.1, the DFS scan can take up to 240 seconds.

To access all resolved problems in our solution database, or to search by product, category, keywords, or phrases, go to http://support.proxim.com/. You can also find links to drivers, documentation, and downloads at this link.

DOWNGRADING THE MP.11/a

Use the **Downgrade** command to downgrade to the specified version release number. The **Downgrade** command currently is supported only by Tsunami MP.11/a Version 2.0.1. See “Downgrade Command” for more information.

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 below
- Configure on page 45
- Monitor on page 84
- Commands on page 91

Help and Exit buttons also appear; click the Help button to access MP.11/a online help; click the Exit button to exit the application.

For an introduction to the basics of MP.11/a management, see “Chapter 4. Basic Management” on page 32.

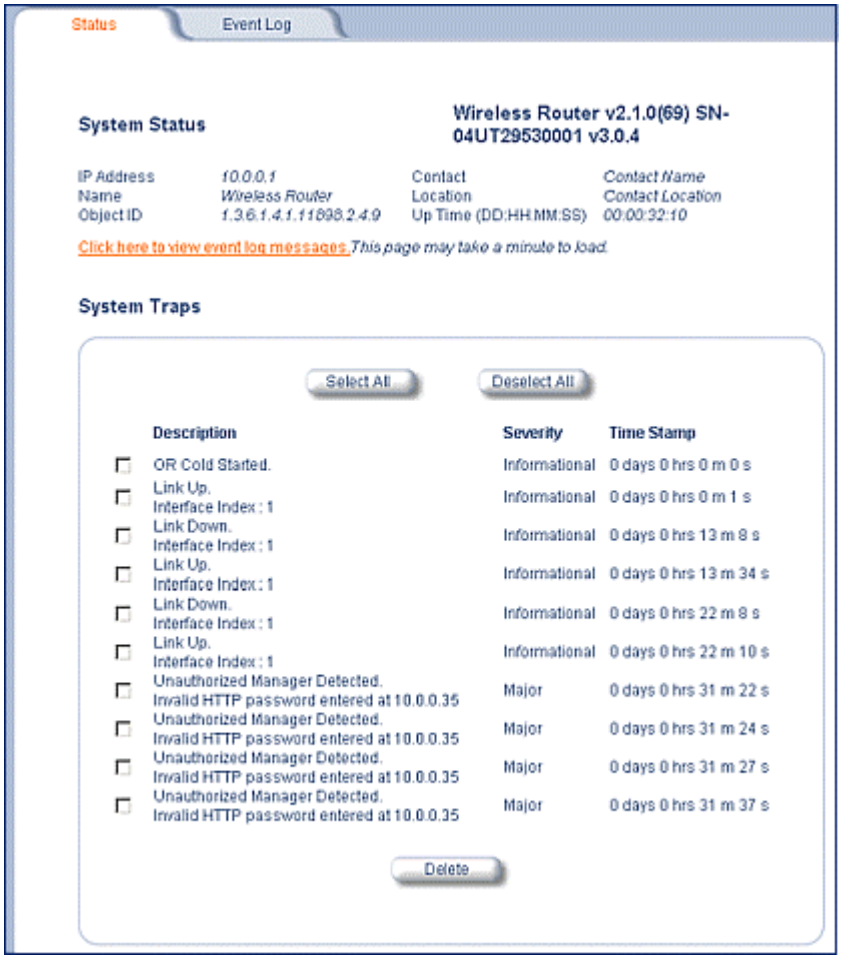
STATUS

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 the 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**.



System Status

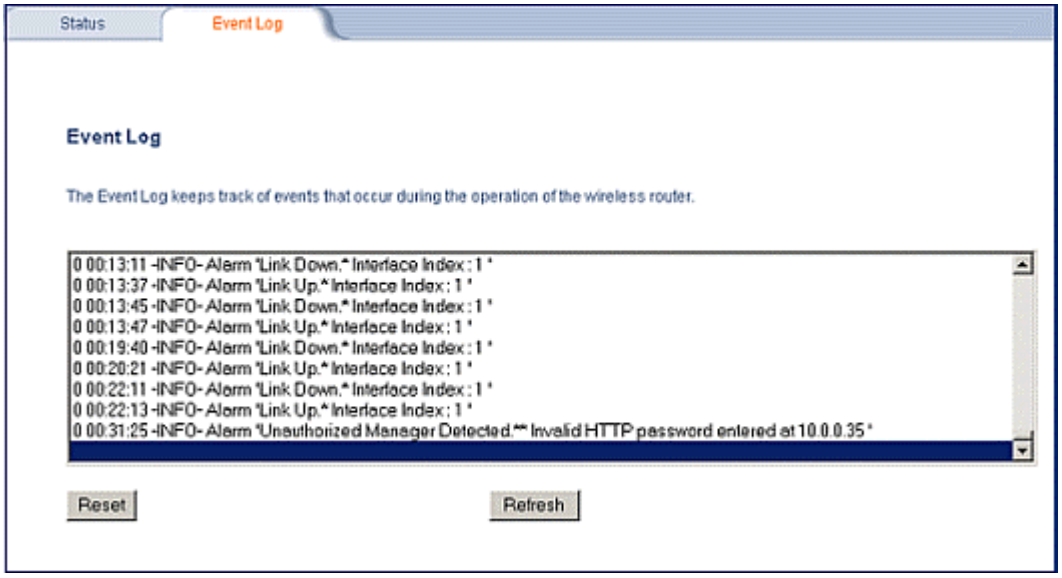
In this section, the basic system status is shown, including the version number of the embedded software.

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 Tsunami MP.11/a. The **Event Log** displays messages that may not be captured by System Traps, such as the **Transmit Power** for the **Frequency Channel** selected.



CONFIGURE

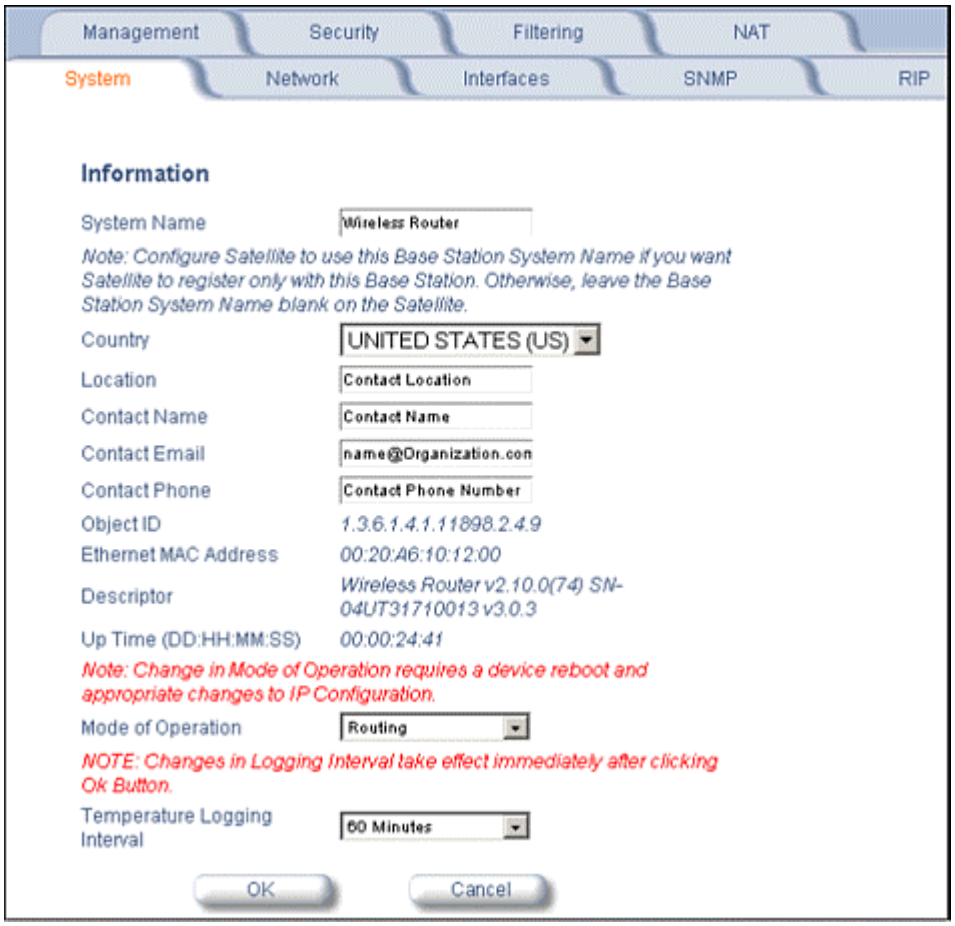
Use the **Configure** section to change the settings of the MP.11/a. There are 10 tabs in this section.

Note: The Intra-Cell Blocking tab is available for Base Stations in Bridge mode only. The NAT tab is available for SUs in Routing mode only.

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.



In this window, you can view or change the basic system information. **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 Base Station or SU.

Use the system name of a Base Station to configure the **Base Station System Name** parameter on an SU if you want the SU to register only with this Base Station. If the **Base Station System Name** is left blank on the SU, it can register with any Base Station that has a matching **Network Name** and **Network Secret**.

Country (Tsunami MP.11a units only)

The Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) features are enabled automatically when you choose a country with a regulatory domain that requires them. The **Country** selection pre-selects and displays only the allowed frequencies for the selected country. Click the **Configure** button, the **Interfaces** tab, and the **Wireless** sub-tab to see the channel/frequency list.

Note: MP.11a radios 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 can be configured. MP.11a radios sold outside of the United States and Canada support the selection of a **Country** by the professional installer.

Support for the 5.25 – 5.35 GHz and 5.725 – 5.825 GHz frequency bands is provided with a single country selection, **UNITED STATES (US)**, which does not provide DFS capability in these frequency bands.

For a non US-only device, the default country selected is **United Kingdom (GB)**.

Notes: (1) The channel center frequencies are not regulated; only the band edge frequencies are regulated.

(2) If, before upgrade, US was selected as a country for a non US-Only device (which is an incorrect configuration), the country is changed automatically to United Kingdom upon upgrade.

See “Dynamic Frequency Selection” on page 82 and “Transmit Power Control” on page 57 for more information. See “Country Code Table” on page 119 for a list of country codes.

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.

Temperature Logging Interval

This field lets you configure the temperature logging interval (in 5-minute intervals). See “Monitor: 12) Temperature Log” on page 89 for more information.

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

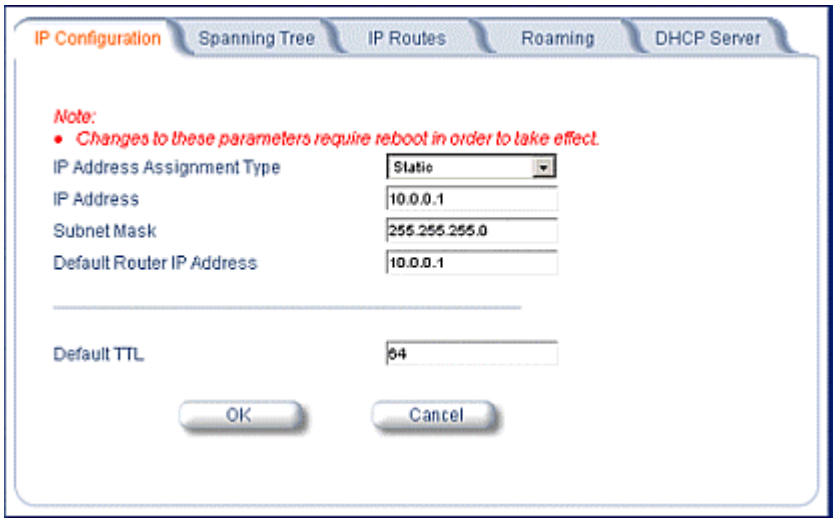
How long the device has been up and running since the last reboot.

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 **Routing** mode.

Click the **Configure** button, the **Network** tab, and the **IP Configuration** sub-tab to view and configure local IP address information. See "Setting the IP Address Manually" on page 24 for more information.



If the device is configured in **Bridge** mode, you can set the **IP Address Assignment Type** parameter:

- 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 24). In **Routing** mode, both Ethernet and Wireless interfaces require 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

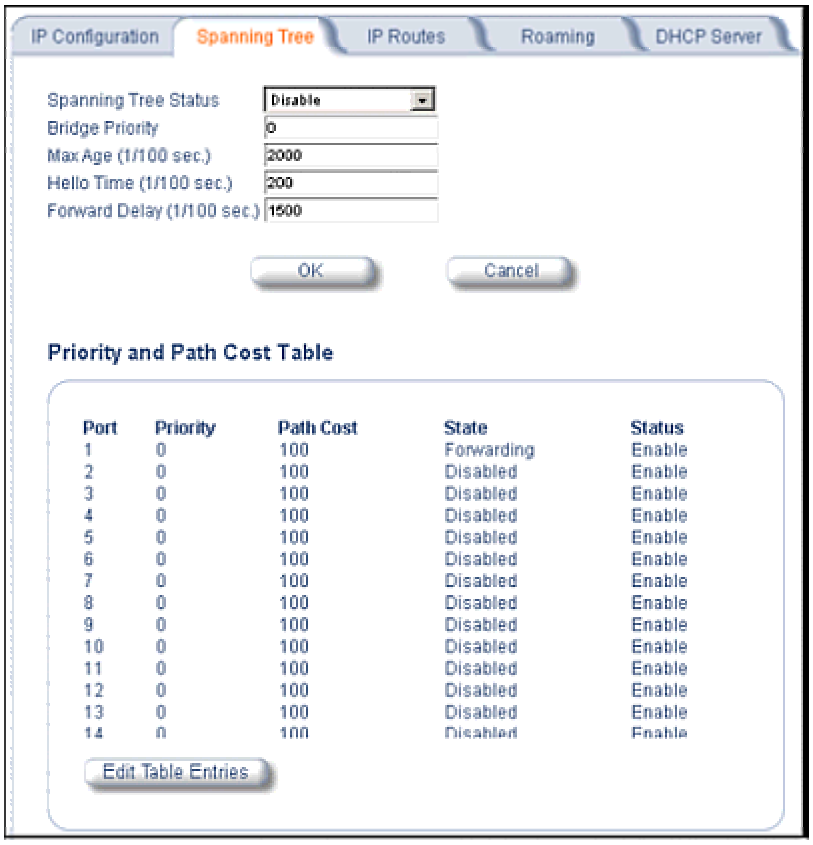
The IP address of the default gateway.

Default TTL

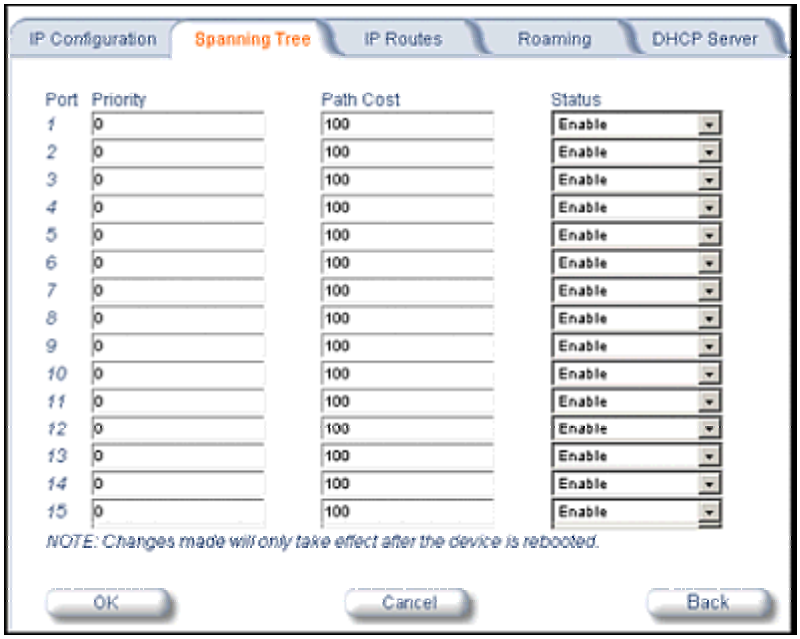
The default time-to-live value.

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.

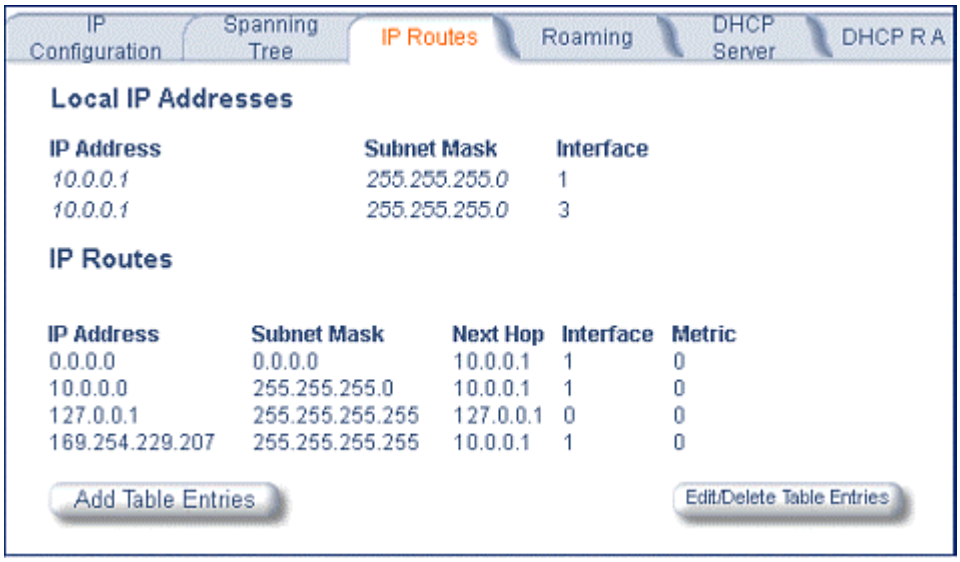


Click **Edit Table Entries** to make changes; enter your changes and click **OK**.

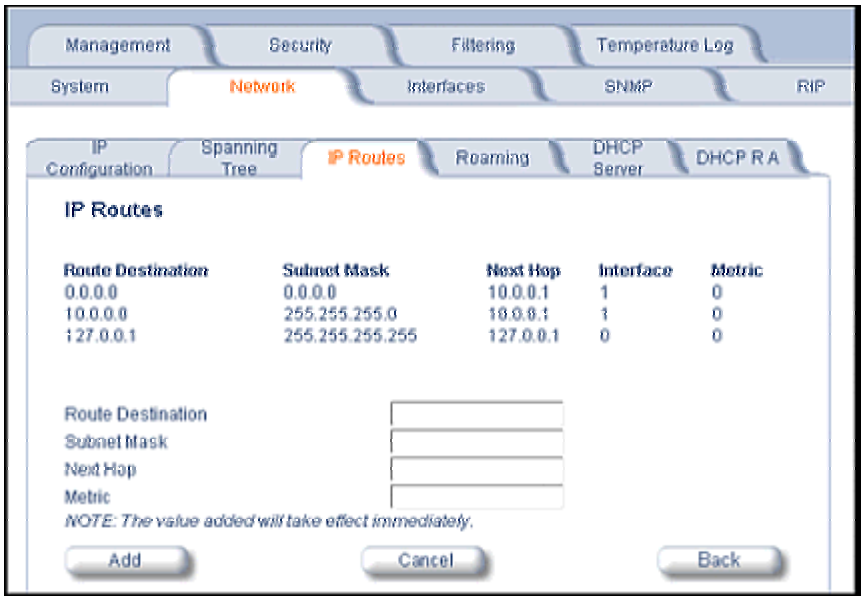


IP Routes (Routing Mode only)

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.

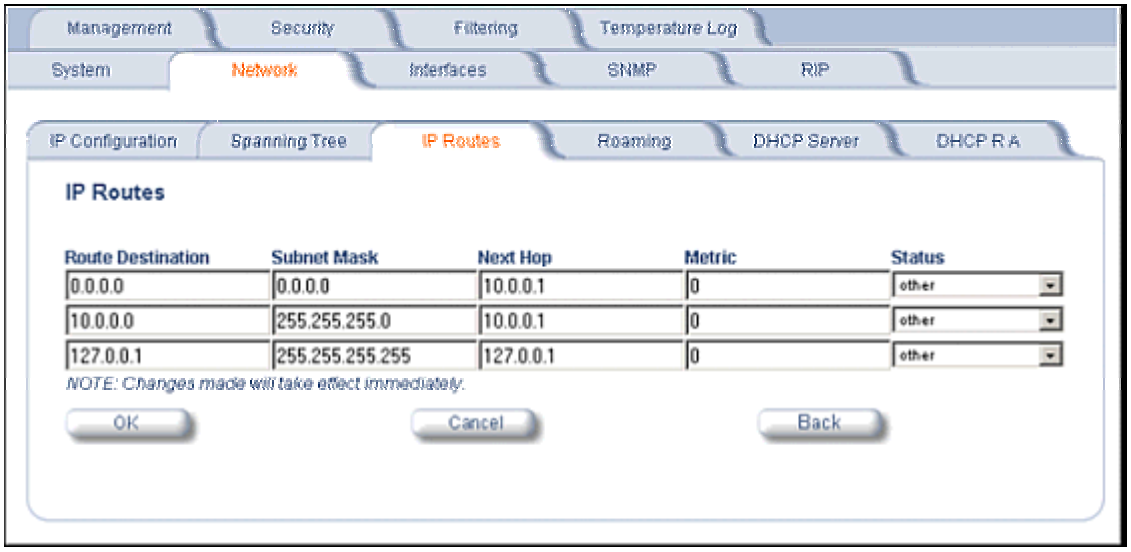


Click the **Add** button to add entries; a window such as the following is displayed:



Enter the route information and click **Add**. The **IP Address** and **Subnet Mask** combination is validated for a proper combination.

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

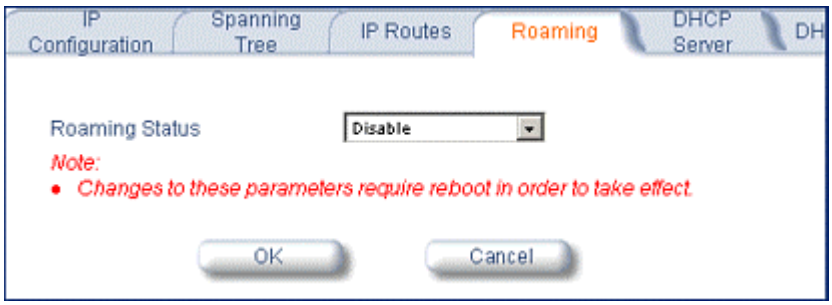


Edit the route information and click **OK**. The IP address and subnet mask combination is validated for a proper combination.

Roaming

Roaming is the procedure with which an SU terminates the session with the current Base Station and starts the registration procedure with another Base Station. Roaming provides MAC level connectivity to the SU that roams from one Base Station to another. Proxim does not guarantee that upper layer protocol sessions will survive.

Click the **Configure** button, the **Network** tab and the **Roaming** sub-tab to configure Roaming.



Enable or disable the Roaming feature in the **Roaming Status** drop-down box. The default value is disabled.

To configure the remaining Roaming parameters, use the CLI.

Note: To enable roaming, you must enable **Roaming Status** on both the Base Station and the SU.

The Roaming feature lets the SU monitor local SNR and data rate for all frames received from the current Base Station. As long as the average local SNR for the current Base Station is greater than the slow scanning threshold, and the number of retransmitted frames is greater than the slow scanning threshold given in percentage, the SU does not scan other channels for a better Base Station.

- The ***slow scanning*** procedure starts when the average local SNR for the current Base Station is less than or equal to the slow scanning threshold and the number of retransmitted frames is greater than the slow scanning threshold given in percentage. During the slow scanning procedure the SU scans the whole list of channels while maintaining the current session uninterrupted.
- ***Fast Scanning*** is the scanning procedure performed under emergency conditions, when the average local SNR for the current Base Station is very low, below the fast scanning threshold, and the number of retransmitted frames is greater than the fast scanning retransmission threshold give in %, so that the current session should terminate as soon as possible. During this procedure, the SU scans other channels as fast as possible.

Roaming can only occur if the slow scanning or fast scanning procedure is started, under the following conditions:

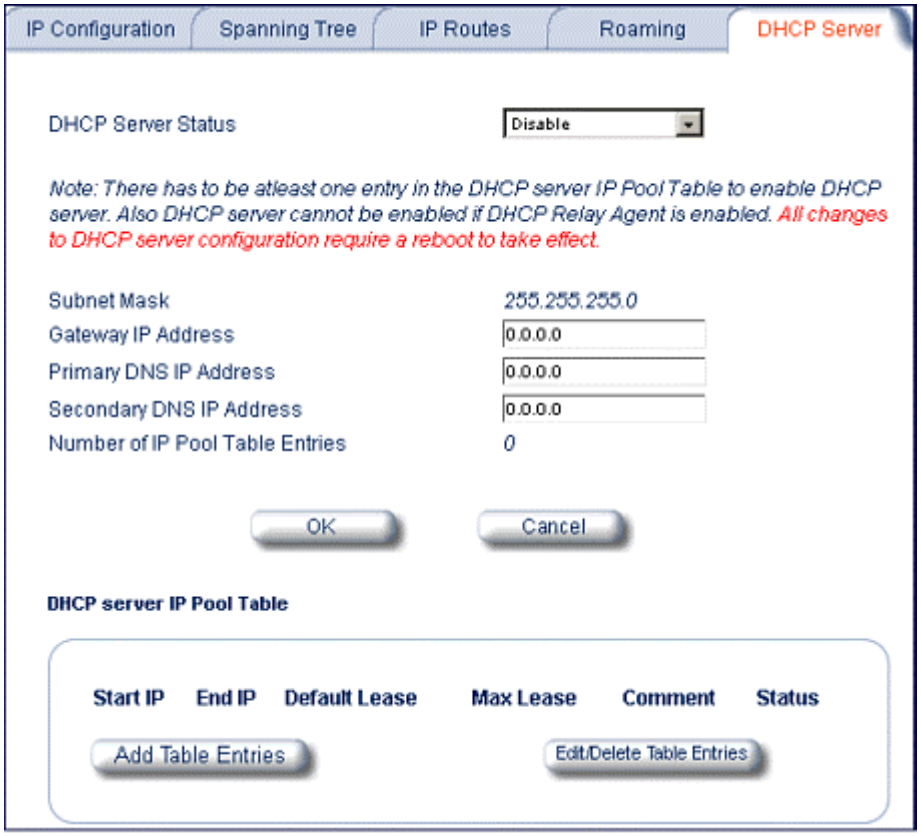
1. If the roaming is started from the slow-scanning procedure (when the slow scanning procedure has completed scanning all of the channels), the SU selects the Base Station with the best SNR value on all available channels. The SU roams to the best Base Station only if the SNR value for the current Base Station is still below the slow scanning SNR threshold, and best Base Station offers a better SNR value for at least roaming threshold than the current Base Station. During roaming, the SU first ends the current session and starts the registration procedure with the best Base Station.
2. If the roaming is started from the fast-scanning procedure (emergency conditions), the SU selects the first Base Station that offers better SNR than the current Base Station, and starts a new registration procedure with the better Base Station without ending the current session. The current Base Station automatically ends the session with the SU that roamed to another Base Station after 30 seconds.

DHCP Server

Click the **Configure** button, the **Network** tab, and the **DHCP Server** sub-tab to enable the MP.11/a DHCP Server.

When enabled, the DHCP server allows allocation of IP addresses to hosts on the Ethernet side of the SU or BSU. Specifically, the DHCP Server feature lets the SU or BSU respond to DHCP requests from Ethernet hosts with the following information:

- Host IP address
- Gateway IP address
- Subnet Mask
- DNS Primary Server IP address
- DNS Secondary Server IP address



DHCP Server Status

Verify that DHCP Relay Agent is disabled. After you have made at least one entry in the DHCP server IP Pool Table, enable DHCP Server by selecting Enable from the DHCP Server Status pull-down menu.

Note: There must be at least one entry in the DHCP server IP Pool Table to enable DHCP server. Also DHCP server cannot be enabled if DHCP Relay Agent is enabled.

Subnet Mask

The MP11/a supplies this subnet mask in its DHCP response to a DHCP request from an Ethernet host. Indicates the IP subnet mask assigned to hosts on the Ethernet side using DHCP.

Gateway IP Address

The MP11/a supplies this gateway IP address in the DHCP response. Indicates the IP address of a router assigned as the default gateway for hosts on the Ethernet side.

Primary DNS IP Address

The MP11/a supplies this primary DNS IP address in the DHCP response. Indicates the IP address of the primary DNS server that hosts on the Ethernet side uses to resolve Internet host names to IP addresses

Secondary DNS IP Address

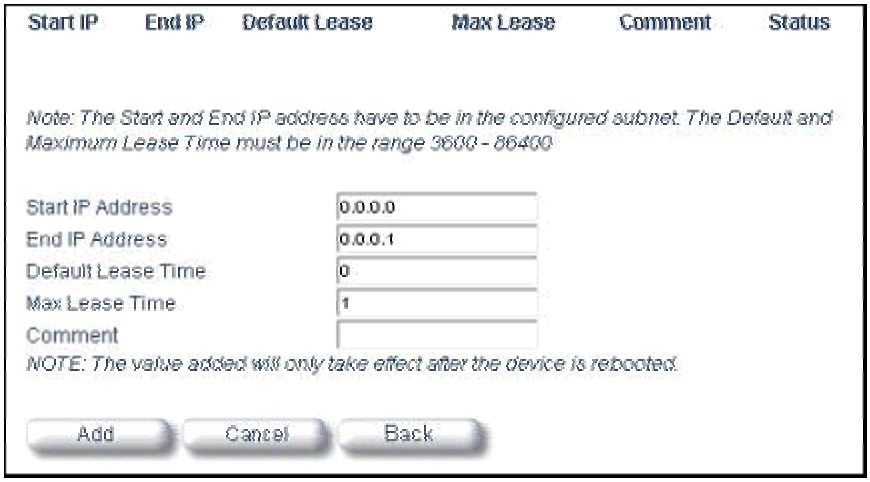
The MP11/a supplies this secondary DNS IP address in the DHCP response.

Number of IP Pool Table Entries

The number of IP pool table entries is a read-only field that indicates the total number of entries in the DHCP server IP Pool Table. See "DHCP Server IP Pool Table" below.

DHCP Server IP Pool Table

You can configure up to 20 entries in the IP Pool Table. An IP address can be added if the entry's network ID is the same as the network ID of the device. To add an entry click **Add Table Entries**.



Enter the following parameters and click **Add**.

Note: After adding entries, you must reboot the unit before the values take effect.

Start IP Address

Indicates the starting IP address that is used for assigning address to hosts on the Ethernet side in the configured subnet.

End IP Address

Indicates the ending IP address that is used for assigning address to hosts on the Ethernet side in the configured subnet.

Default Lease Time

Specifies the default lease time for IP addresses in the address pool. The value is 3600-86400 seconds.

Max Lease Time

The maximum lease time for IP addresses in the address pool. The value is 3600-86400 seconds.

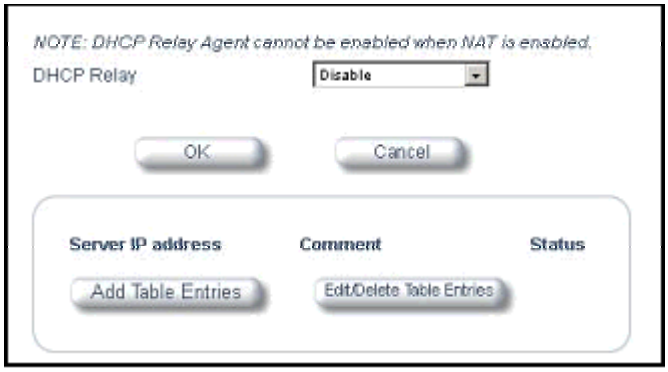
Comment

The comment field is a descriptive field of up to 255 characters.

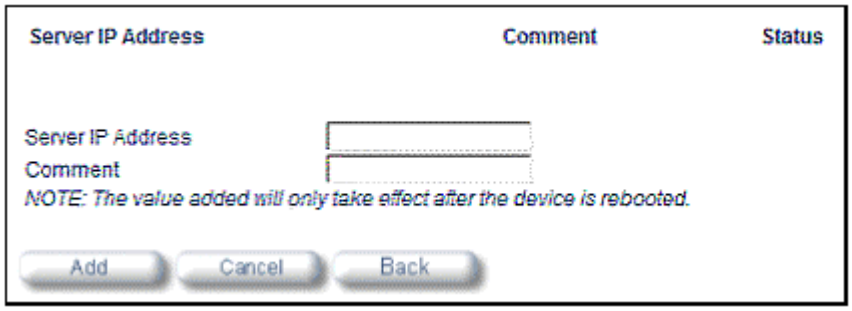
DHCP Relay Agent (Routing mode only)

Click the **Configure** button, the **Network** tab, and the **DHCP RA** 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.

Note that DHCP Relay Agent parameters are configurable only in **Routing** mode.



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



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**.

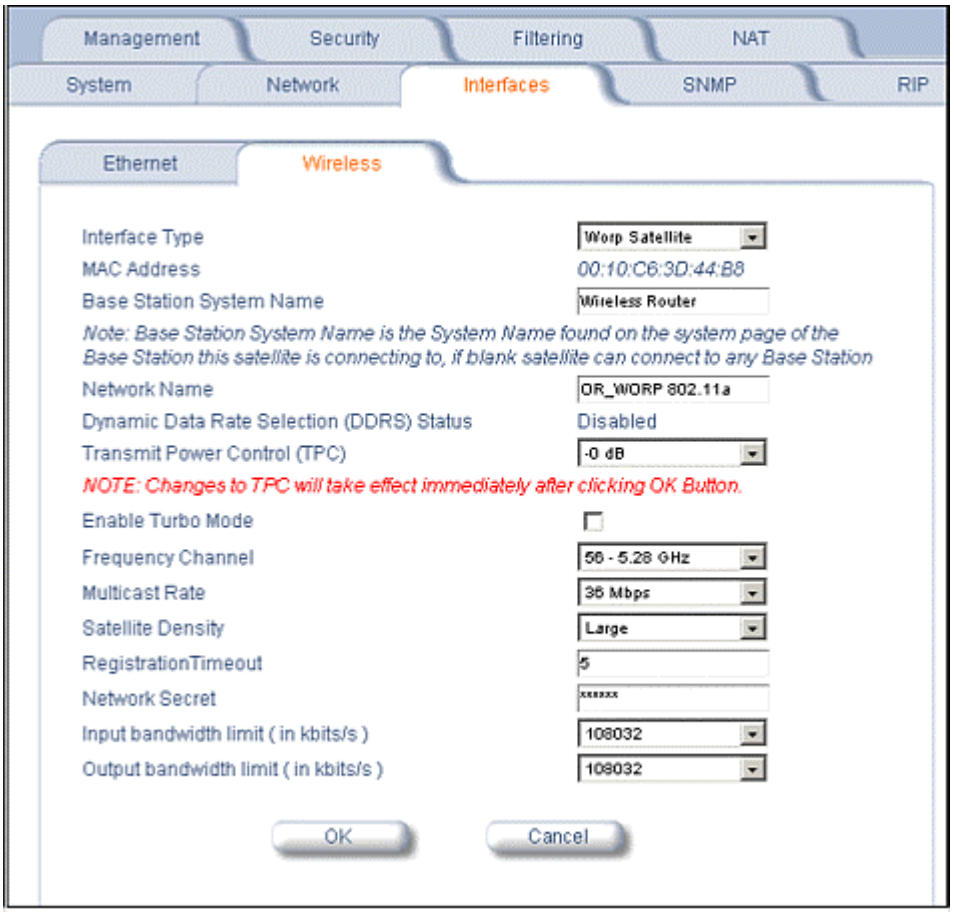
3) Interfaces

Wireless

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

For Base Station units, the wireless interface can be placed in either WORP Base or WORP Satellite mode (selected from the **Interface Type** drop-down box). SUs can be placed only in WORP Satellite mode. (See "Wireless Outdoor Router Protocol" on page 83 for more information.) The wireless interface settings differ per mode.

The following is an example of a WORP Base Mode – Non-US window:



Note: Turbo mode is available only in WORP Satellite Mode in the United States.

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

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

Note: Encryption can impact performance with lower throughput.

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 83.)

Base Station System Name

The name found on the system page of the Base Station to which this SU 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 an SU 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 SU, 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. An SU 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**.

Dynamic Data Rate Selection (DDRS) Status (Tsunami MP.11/a only)

The WORP **Dynamic Data Rate Selection (DDRS)** lets the Base Station and SUs monitor the remote average signal-to-noise ratio (SNR) and to adjust the data rate to an optimal value (to provide best possible throughput) according to the current communication conditions during run-time.

Each frame received in the WORP protocol reports the signal and noise level in dBm at which the sender received the previous frame from the receiver, and provides the values to calculate the signal to noise ratio (SNR) in dB. SNR is calculated then averaged:

SNR [dB] = signal level [dBm] – noise level [dBm]

This information lets the sender adjust the transmission data rate to the optimal level to provide the best possible throughput.

When you enable or disable WORP DDRS on the Base Station, the Base Station sends an announcement to SUs and the SUs enable or disable WORP DDRS automatically.

Note: DDRS threshold values must be configured in the Base Station and SUs separately.

Both the Base Station and the SU monitors the remote SNR. The Base Station monitors and calculates the average remote SNR for each SU that is registered. An SU monitors and calculates the average remote SNR for the Base Station.

The **DDRS Status** is configurable only for the **WORP Base Mode**. For **WORP Base Mode**, select the **DDRS Status** "**Enable**" or "**Disable**" from the drop-down box provided.

For the **WORP Satellite Mode**, **DDRS Status** is read-only parameter and its value is based upon the **WORP Base** to which this SU is associated.

WORP DDRS is not supported in Turbo Mode.

Transmit Power Control

By default, the Tsunami MP.11a lets you 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 or at 19 dBm when the selected data rate is 36 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:

-0 dB
-3 dB

-6 dB
-9 dB
-12 dB
-15 dB
-18 dB (minimum TPC level)

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.

If DDRS is enabled, turbo mode cannot be enabled. The reverse is also true.

Channel Spacing

Set channel spacing to **20 MHz**. (The channel spacing shows **40 MHz** when turbo mode is in effect.)

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 130).

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.

Frequency	Channels	36 Mbps	6-24 Mbps
5.47 – 5.70 GHz	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	17.4	17.4
5.25 – 5.35 GHz	56, 60, 64		

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 82 for more information.

Multicast Rate

The rate at which data is to be transferred. This drop down box is unavailable when DDRS is enabled.

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 9 Mbps 12 Mbps 18 Mbps 24 Mbps 36 Mbps	12 Mbps 18 Mbps 24 Mbps 36 Mbps

Antenna (Subscriber Units only)

Antenna displays the proper antenna port, **Internal** or **External**, for the wireless interface.

Antenna Gain (Base Station units only)

You can modify the sensitivity of the radio card when detecting radar signals in accordance with ETSI and FCC Dynamic Frequency Selection (DFS) requirements. Given the radar detection threshold is fixed by ETSI and the FCC and that a variety of antennas with different gains may be attached to the MP.11/a, you must adjust this threshold to account for higher than expected antenna gains and avoid false radar detection events. This can result in the units constantly changing frequency channels.

You can configure the threshold for radar detection at the radio card to compensate for increased external antenna gains.

The Antenna Gain value ranges from 0 to 35. The default value is 0.

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 83 for more information.

Registration Timeout

This is the registration process time-out of an SU on a Base Station. Default is 5 seconds.

Network Secret

A network secret is a secret password given to all nodes of a network. An SU can only register to a Base Station if it has the same Network Secret. The Network Secret is sent encrypted and can be used as a security option.

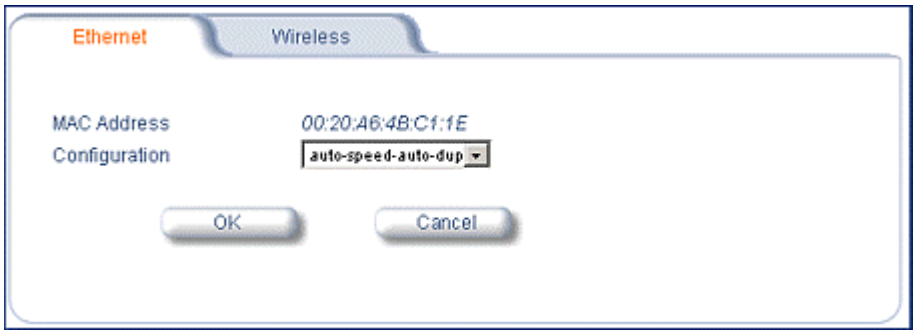
Input / Output Bandwidth Limit

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.

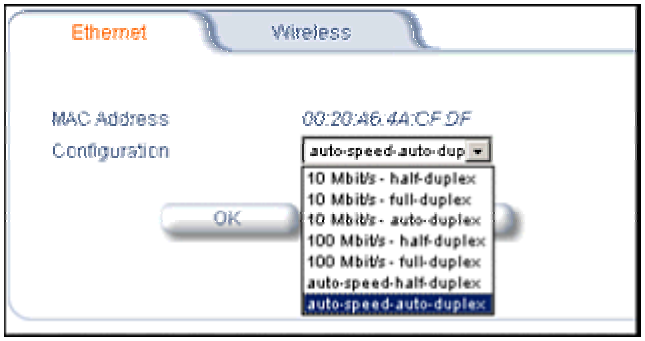
Ethernet

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.



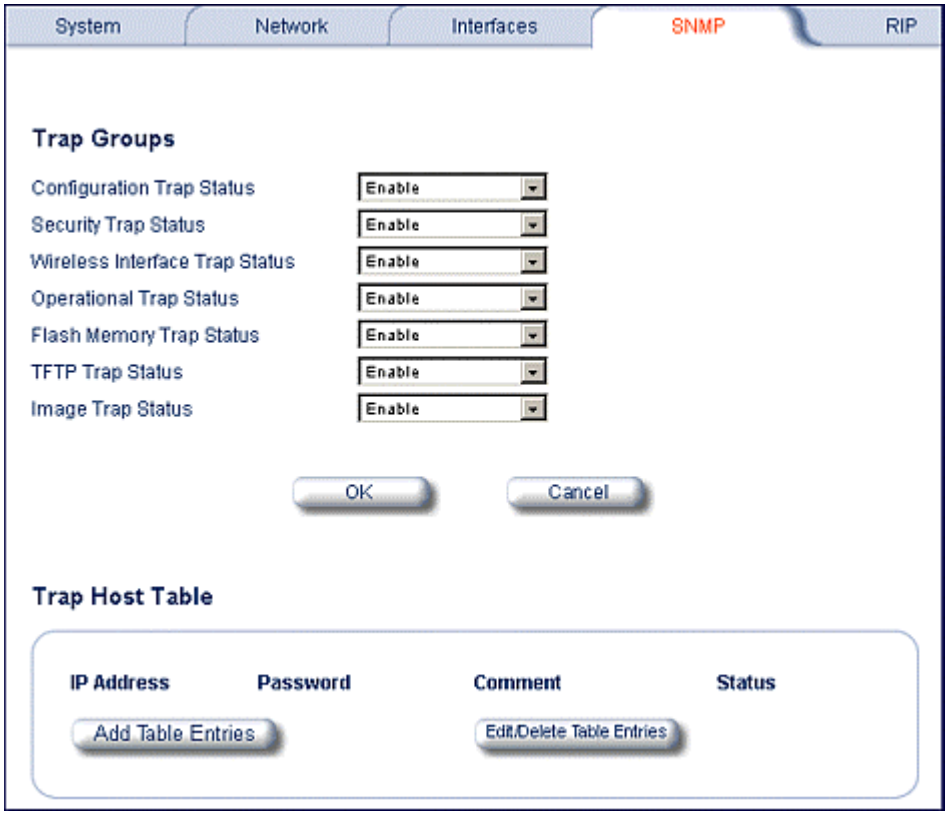
You can set the **Configuration** parameter. Select from these settings for the type of Ethernet transmission (**Configuration** drop-down box):



Half-duplex means that only one side can transmit at a time.
Full-duplex lets both sides transmit.
Auto-duplex selects the best transmission mode for the given configuration.

4) SNMP

Click the **Configure** button and the **SNMP** tab to enable or disable trap groups, and to configure the SNMP management stations to which the MP11/a sends system traps.



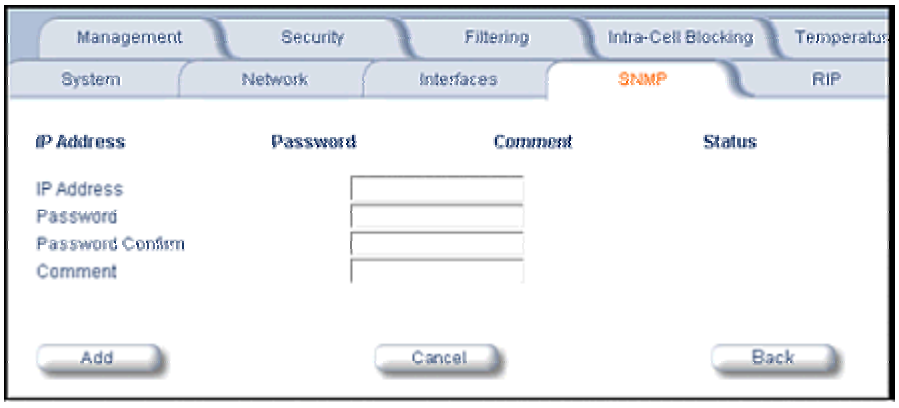
Trap Groups

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

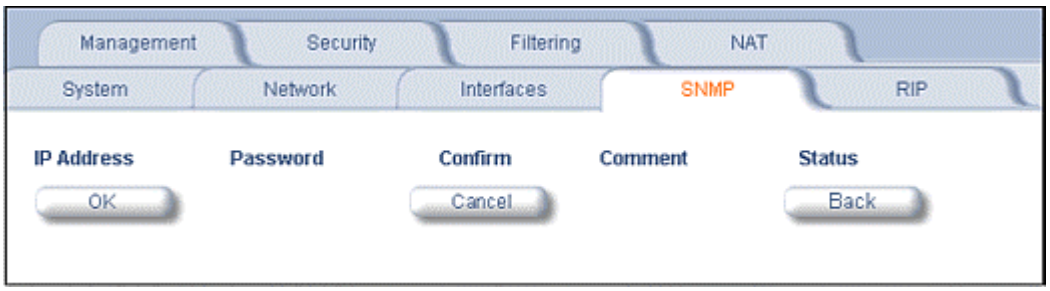
Trap Host Table

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

Click the **Add Table Entries** button to add entries to the Trap Host Table.



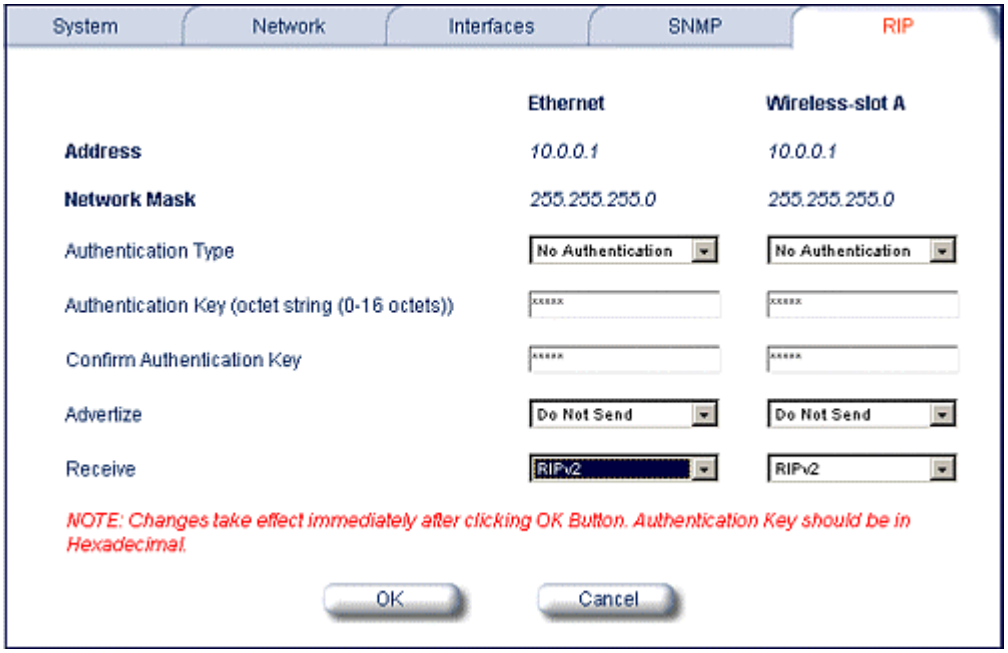
Click the **Edit/Delete Table Entries** button to make changes to or delete existing entries.



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 as 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.

Note: RIP does not work when Network Address Translation (NAT) is enabled.



Note the following:

- There is no option to turn off receiving RIP advertisements. Once the unit is in **Routing** 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.

Properties and Features of Supported RIP Versions		
RIPv1	**RIPv2**	**RIPv1 Compatible**
Broadcast	Multicast	Broadcast
No Authentication	Authentication	Authentication
Class 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

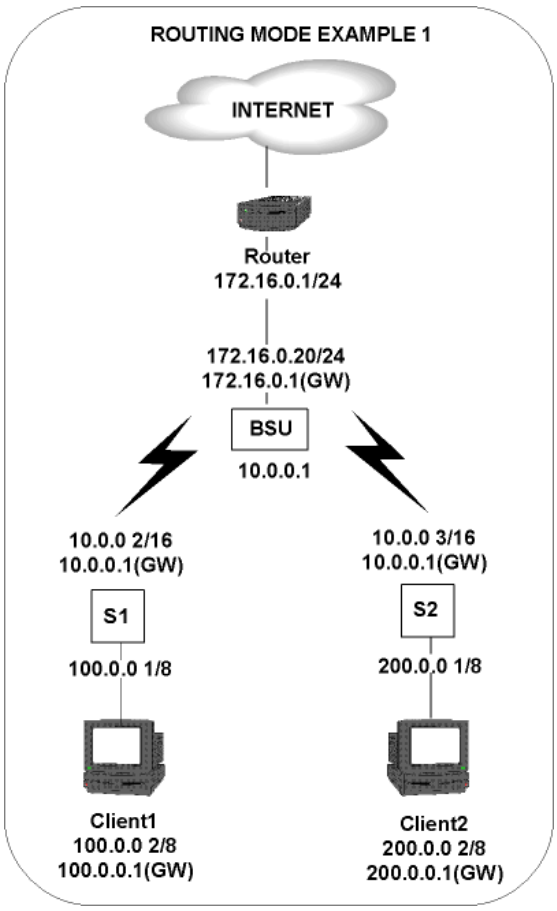
```
0.0.0.0       172.16.0.1    metric 1
172.16.0.0    172.16.0.20   metric 1
10.0.0.0      10.0.0.1      metric 1
100.0.0.0     10.0.0.2      metric 2
200.0.0.0     10.0.0.3      metric 2
```

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

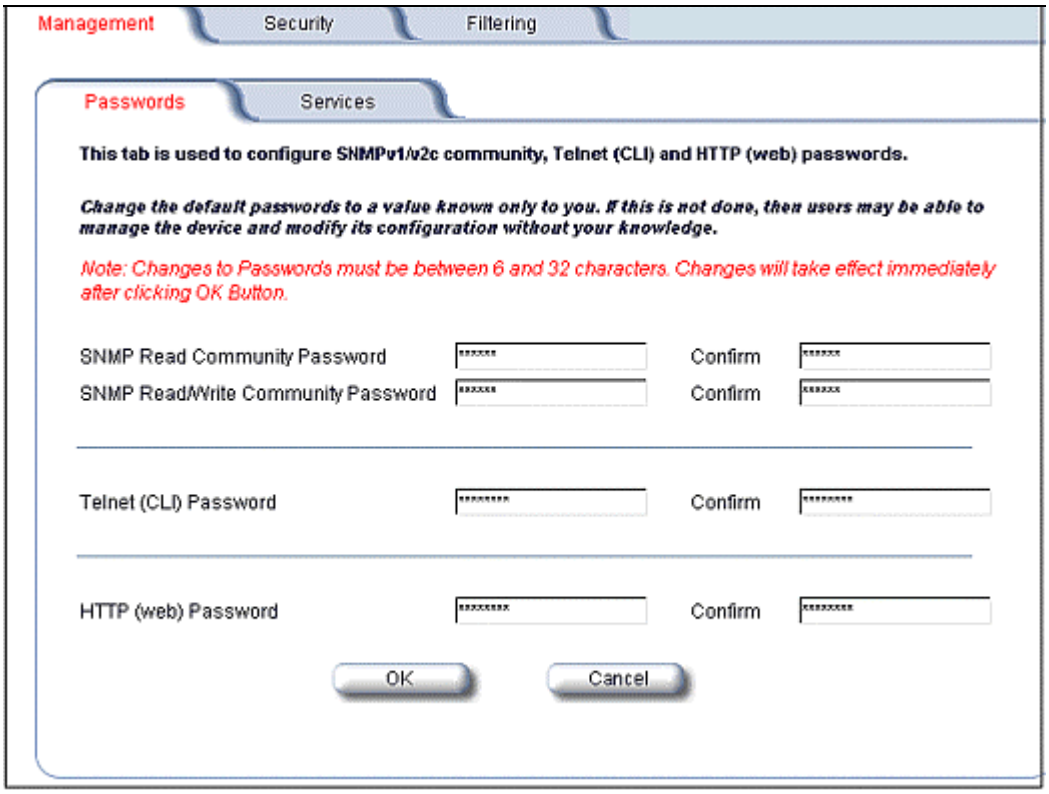
- Ensure that routers on the same physical network are configured to use the same version of RIP.
- Routing updates occur every 30 seconds. It may take up to 3 minutes for a route that has gone down to timeout in a routing table.
- RIP is limited to networks with 15 or fewer hops.

6) Management

When you click the **Management** button, Passwords is displayed automatically. The other tab under **Management** is the **Services** tab.

Passwords

The **Password** tab lets you configure the SNMP, Telnet, and HTTP (Web Interface) passwords.



SNMP Read Community Password

The password for read access to the MP.11/a using SNMP. Enter a password in both the **Password** field and the **Confirm** field. The default password is **public**.

SNMP Read/Write Community Password

The password for read and write access to the MP.11/a using SNMP. Enter a password in both the **Password** field and the **Confirm** field. The default password is **public**.

Telnet (CLI) Password

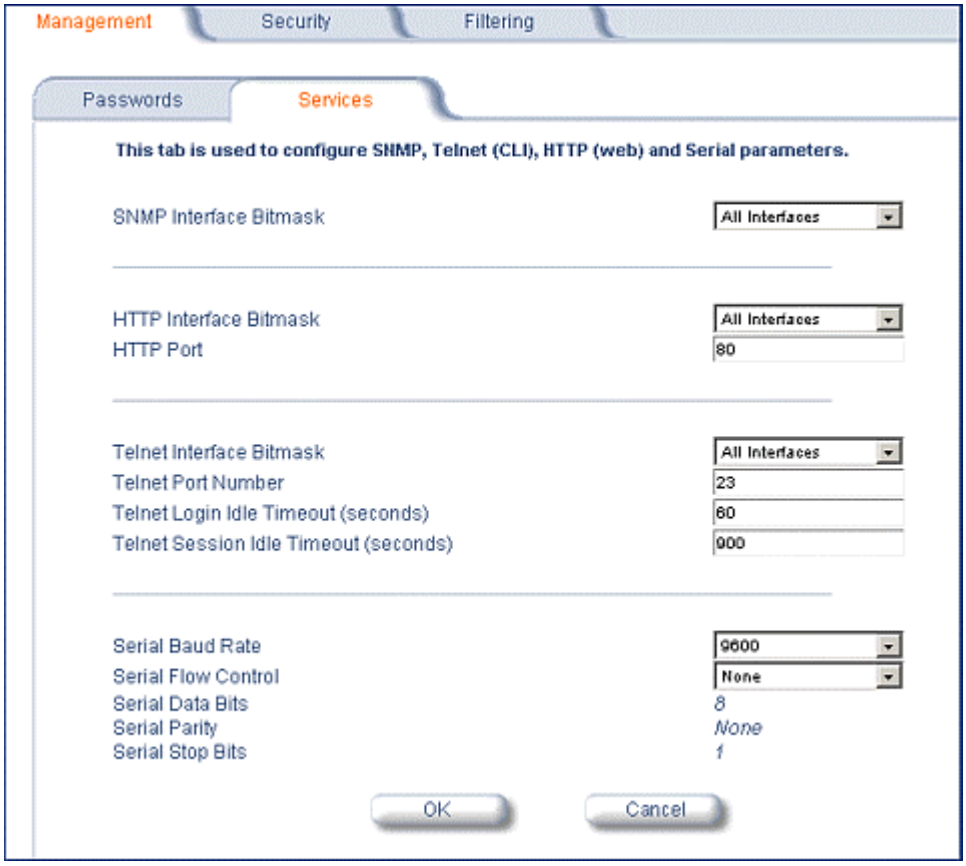
The password for the CLI interface (via serial or Telnet). Enter a password in both the **Password** field and the **Confirm** field. The default password is **public**.

HTTP (Web) Password

The password for the Web browser HTTP interface. Enter a password in both the **Password** field and the **Confirm** field. The default password is **public**.

Services

The **Services** tab lets you configure the SNMP, Telnet, and HTTP (Web Interface) parameters. Changes to these parameters require a reboot to take effect.



SNMP Configuration Settings

SNMP Interface Bitmask:

Configure the interface or interfaces (**Ethernet**, **Wireless**, **All Interfaces**) from which you will manage the MP.11/a using SNMP. You also can select **Disabled** to prevent a user from accessing the MP.11/a through SNMP.

HTTP Configuration Settings

HTTP Interface Bitmap

Configure the interface or interfaces (Ethernet, Wireless, All Interfaces) from which you will manage the MP.11/a through the Web interface. For example, to allow Web configuration through the Ethernet network only, set HTTP Interface Bitmask to Ethernet. You can also select **Disabled** to prevent a user from accessing the MP.11/a from the Web interface.

HTTP Port

Configure the HTTP port from which you will manage the MP.11/a through the Web interface. By default, the HTTP port is 80.