mini PCI High Power MIMO IEEE 802.11 a/b/g/n

RF Module User's Guide

NOTICE:

The information in this document has been carefully reviewed
and is believed to be accurate. Nonetheless, this document is subject to change without notice, and Proxim Wireless Corporation (Proxim) assumes no responsibility for any inaccuracies that may be contained in this document and makes no commitment to update or to keep current the contained information, or to notify a person or organization of any updates. Proxim reserves the right to attempt to supply the best product possible. Proxim dos not represent the products described herein are free from patent infringement or from any other third party right.

Subject to change without notice.

PROXIM MAKES NO WARRANTIES OF ANY KIND WITH REGARD TO THE CONTENT OF THIS DOCUMENT, IN NO EVENT SHALL PROXIM BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL SPECULATORY OR CONCEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION, EVEN IF ADVISED OF THE POSIBILITY OF SUCH DAMAGES. IN PARTICULAR PROXIM SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA TRANSMITTED OR OTHERVWISE USED WITH THE PRODUCT, INCLUDING THE COST OF REPARING, REPLACING, INTERGATING, INSTALLING OR RECOVERING SUCH HARDWARE, SOFTWARE OR DATA.

This document use information provided by Atheros Communications Inc. (Atheros), Atheros radio and chipsets user manuals, technical specifications, and Atheros regulatory manual.

INTRODUCTION

The Proxim PROXMB82 miniPCI module implements an IEEE
802.11a/b/g/n wireless LAN (WLAN) Master or Slave function. MIMO operation is implemented
using three transmit and three receive chains per the 802.11n standard.

The device will be marketed under brand name: PROXMB and model: PROXMB82.

This module may be installed in PC and host processor systems using approved external antennas.
The module may be configured for 2.4 GHz or 5 GHz operation USING THE Web Server function
provided by Atheros Communications Inc. Please, refer to Atheros' driver User Manual instructions
for details.

CONFIGURATION

This section provide procedures for connecting and configuring
the AP. Configuration can be performed either from a web browser accessing the build-in web server,
or by entering commands using the command line interface (CLI). For detailed information on using
the server refer to "AP Web Server and for using CLI, refer to detailed operational guide provided by
Atheros for the chipset.

AP Initial Configuration

Configure the AP for its Service Set Identifier (SSID) unique to the application. This configuration
can be done either through a web browser with access to the build-in AP web server, or by
commands using the command line interface (CLI).

WEB Browser

3. Select the Access Point Web Server hotlink.
4. A dialog box appears requesting login authorization. When prompted, enter the following

   Follow these steps to configure the channel frequency and SSID using a web browser:

   1. Launch a web browser (Netscape Navigator or Internet Explorer are examples of
       commonly used web browsers).

   2. From the HPC, enter the IP address that is assigned to the AP as the URL address, for
       example http://192.168.1.1.

information to log in:

Login: **Admin** (case-sensitive) Password: 5up

5. Click OK to complete the login process. The 5 GHz Statistics window will appear.

6. Select the Configuration hotlink from the navigation menu. The system Configuration window will
appear.

7. Enter the SSID (name or address) for the AP in the SSID field. The SSID must be 132 characters in
length.

To configure a single SSID to have more then one AP in a single SSID, specify a unique System Name for each AP within that single SSID. Note that range of available channels will be automatically determined by factory settings.

Note that the radio channel is specified using the IEEE 802.11 a standard. For example, channel 48 is the equivalent of 5.240 GHz. The channel number is derived as:

$$\text{Channel Number} = \frac{\text{Channel Frequency (in MHz)} - 5000 \text{ MHz}}{5 \text{MHz}}$$

1   Click Update to commit the changes.

2   After all configuration changes are complete, reboot the AP to enable them. To reboot AP, click on the REBOOT AP button that appears.

For detailed information on using the server refer to "AP Web Server" and for using CLI refer to "AP Command-Line Interface" provided in Appendixes A and B of Atheros MPCI Module User's Guide.

FCC Requirements for Operation in the United States

This device is restricted to **indoor** use only due to its operation in 5150 to 5250 MHz and 5470 to 5725 MHz frequency ranges in accordance with latest FCC regulations.

Host systems using Porxim Firmware with this 802.11 a/b/g/n 3x3 MIMO nimiPCI module to be sold in the United States do not have country code settings and are factory configured to only operate on the channels allowed by the FCC.
Master devices with a US SKU that contain the 802.11 a/b/g/n Radio module are limited to

the following operating channels:

?   1 -11 (2412 to 2462 MHz) in the 2.4 GHz band
?   36 – 50 (5180 to 5250 MHz) in the 5150 to 5250MHz band
?   149 – 165 (5745 to 5825 MHz) in the 5725 to 5825 MHz band

 Slave devices with a US SKU that contain the 802.11a/b/g/n Radio module are limited to
the following operating channels:
?   1 -11 (2412 to 2462 MHz) in the 2.4 GHz band
?   36 – 50 (5180 to 5250 MHz) in the 5150 to 5250MHz band
?   52 - 64 (5260 to 5320 Mhz) in the 5250 to 5350MHz band
?   100 – 116 (5500 to 5580 MHz) and 132 – 140 (5660 to 5700 MHz) in the 5470 to 5725 MHz band
?   149 – 165 (5745 to 5825 MHz) in the 5725 to 5825 MHz band

High power radars may use the 5250 to 5350 MHz and 5470 to 5725 MHz frequency ranges in your area. Such radar stations can cause interference and damage to this device.

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.

RF Exposure
To ensure compliance with FCC RF exposure requirements, the antennas used for this device **must** be installed to provide a separation distance of at least 20 cm from all persons.

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

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

This device is going to be operated in 5.15~5.25GHz frequency range, it is restricted in indoor environment only.

FCC NOTICE: To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

IMPORTANT NOTE:
FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

IMPORTANT NOTE:
This module is intended for OEM integrator only and limited to host with brand: Tsunami/ORiNOCO and model list. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for a population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:
In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

LABEL OF THE END PRODUCT:
The final end product must be labeled in a visible area with the following " Contains TX FCC ID: HZB-PROXMB92 ". The FCC part 15.19 statement below has to also be available on the label: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

IC Statement
This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil numérique de la classe B est conforme á la norme NMB-003 du Canada.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p) is not more than that permitted for successful communication.

This device has been designed to operate with the antennas listed below, and having a maximum gain of [30] dB. Antennas not included in this list or having a gain greater than [30] dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

The device could automatically discontinue transmission in case of absence of information to transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems.

The maximum antenna gain permitted (for devices in the band 5725-5825 MHz) to comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate, as stated in section A9.2(3).

IMPORTANT NOTE:
IC Radiation Exposure Statement:
This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

IMPORTANT NOTE:
This module is intended for OEM integrator only and limited to host with brand: Tsunami/ORiNOCO and model list. The OEM integrator is still responsible for the IC compliance requirement of the end product, which integrates this module.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the IC RSS-102 radiation exposure limits set forth for a population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:
In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. IC statement is required to be available in the users manual: This Class B digital apparatus complies with Canadian ICES-003. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT:
The final end product must be labeled in a visible area with the following " Contains TX IC: 1856A-PROXMB92 ".

Model list:

Product Series	Models	Description

Tsunami™ Point-to-Multipoint series	MP-8ABC-ZZZ-YYY-XX
	MM-8ABC-ZZZ-YYY-XX
		A - Represents number of radios (1, 2)
		B - Represents the operating frequency band of the first radio
		C - Represents the frequency band of the second radio
		    Example:
		      0 - Dual band and connectorized
		      2 - 2Ghz band with integrated antenna
		      5 - 5Ghz band with integrated antenna
		
		ZZZ - Represents the type of the network unit
		    Example:
		      CPE - Customer Premise Equipment
		      BSU - Base Station Unit
		      SUA - Subscriber Unit with external antenna
		      SUR - Subscriber Unit with Integrated antenna
		      EPR - End Point with Integrated antenna
		      EPA - End Point with external antenna
		      LNK - Link consisting of two End Points
		
		YYY - Represents the bandwidth limit of the network unit and optionally a letter at the end representing the device configuration
		    Example:
		      5, 12, 25, 50, 100 - Bandwidth limits in Mbps

Tsunami™ QuickBridge Point to Point series	QB-8ABC-ZZZ-YYY-XX	100i - 100Mbps indoor unit
		      100c - 100Mbps unit with external antenna
		      100a - 100Mbps unit with Integrated Antenna
		XX - Represents the regulatory domain
		    Example:
		      US - Compliant to FCC
		      WD - Complaint to ETSI/CE and IC

ORiNOCO® Access Points	AP-810M-xx	Indoor AP with single radio and Mesh Capability	XX - Represents the regulatory domain
	AP-8100M-xx	Indoor AP with dual radio and Mesh Capability	Example:
	AP-820MR-xx	Outdoor AP with single radio and Mesh Capability	US - Compliant to FCC
	AP-822MR-xx	Outdoor AP with single radio and Mesh Capability, Integrated 2.4GHz Panel Antenna	WD - Complaint to ETSI/CE and IC
	AP-810MR-xx	Outdoor AP with single radio and Mesh Capability	
	AP-812MR-xx	Outdoor AP with single radio and Mesh Capability, Integrated 2.4GHz Sector Antenna	
	AP-8100MR-xx	Outdoor AP with dual radio and Mesh Capability	