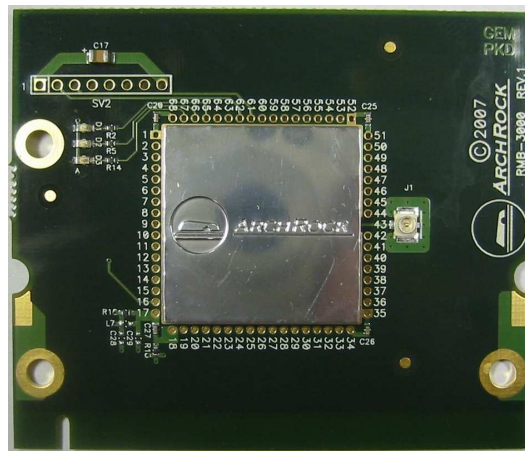


# **RMB-3000**

## **IEEE 802.15.4 Wireless Network interface**

# **User's Manual**



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# 1. Introduction

## ***Description***

The RMB-3000 is a 2.4 GHz, IEEE 802.15.4 compliant wireless network network interface. It operates in the 2.4 GHz spectrum using a direct sequence spread spectrum modem with a maximum data rate of 250kbps. The modulation technique used is O-QPSK.

The interface has a miniPCI Type III-A form factor which allows it to be installed anywhere a suitable miniPCI slot exists. However, it does not electrically connect to the PCI bus. Power and control of the device are provided through a separate 8-pin connector. Control is achieved using a simple UART serial protocol. A single U.FL connector is provided for attaching to an external antenna.

The RMB-3000 is intended for embedded and OEM applications requiring IEEE 802.15.4 connectivity.

## ***Features***

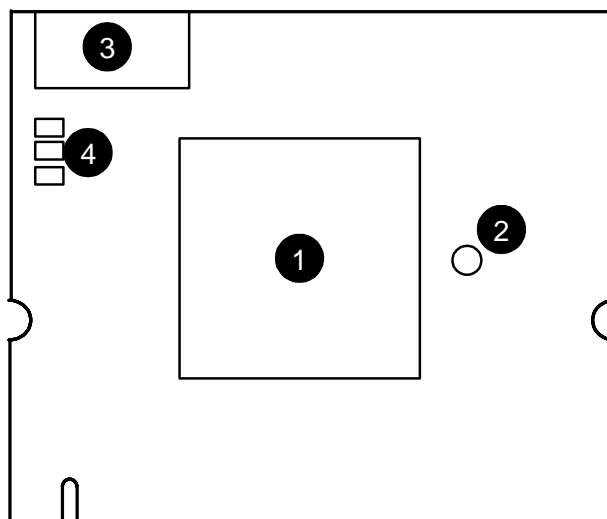
- 2.4 GHz IEEE 802.15.4 PHY Standard
- 250kbps data rate
- 3.3V operation
- Selectable Channels
- AES-128 CBC-MAC Security
- Transmission Power Control
- miniPCI Type IIIA mechanical form factor
- UART control/data interface

## ***Applications***

- Wireless Sensor Networking
- Embedded IEEE 802.15.4 connectivity
- OEM devices

## 2. Usage

### *Physical Layout*



1. Processor/Radio Core
2. U.FL Antenna connector
3. Power/control connector
4. LED indicators (optional)

### *Installation*

The RMB-3000 is designed to install into any free miniPCI slot on the host system. No driver installation is required. The RMB-3000 comes pre-programmed with the necessary firmware to operate.

#### Installation Steps:

1. Install the RMB-3000 into any available miniPCI Type III-A slot.
2. Attach the power/serial interface from the motherboard to the power/control connector

### *Control Connector Pinout*

Table 1 shows the pinout of the power/control connector on the RMB 3000. The RMB-3000 requires 3.3 V for normal operation.

**Table 1: Power/control connector pinout**

Pin	Signal
1	VCC
2	RX1
3	TX1
4	TCK <sup>1</sup>
5	RST# <sup>1</sup>
6	(N/C)
7	(N/C)
8	GND

Note1: For diagnostic/programming purposes

### 3. Specifications

Parameter	Value
Standards	2.4 GHz IEEE 802.15.4 PHY
Frequency Range	2.405 GHz ~ 2.480 GHz
Modulation Technique	O-QPSK
Interface Standards	Type III-A Mini PCI (mechanical form factor only) UART
Receiver Sensitivity	-90 dBm (minimum)
Operating Channels	11 (2.405 GHz) ~ 26 (2.480 GHz)
Data Rate	250 kbps
Security Features	AES-128 Encryption w/ CBC-MAC
Power Requirements	3.3V
Output Power	0 dBm max
Environmental Requirements	-40C ~ +85C
Dimensions	2.352" x 2.0" x 0.2" (5.974cm x 5.08cm x .508cm)
Weight	8.5 g
Compliance	FCC

## 4. Safety and Regulatory Notices

### FCC Statement

This device has been tested and found to comply with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and 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.

Unauthorized changes or modifications to the equipment could void the user's authority to operate the equipment.

### FCC RF Radiation Exposure Statement

To comply with the FCC and ANSI C95.1 RF Exposure limits, the antenna(s) for this device must comply with the following:

- The antenna must operate with a separation distance of at least 20 cm from all persons using this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter

End-users must be provided with specific operations for satisfying RF exposure compliance.

### OEM Requirement

The Original Equipment Manufacturer must ensure that FCC labeling requirements are met. This includes a clearly visible label on the outside of the final product that displays the contents shown in the figure below.

Contains FCC ID: U3SRMB3000R1

The enclosed 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.

OEMs must test final product to comply with unintentional radiators (FCC section 15.107 & 15.109) before declaring compliance of their final product to Part 15 of the FCC Rules.