

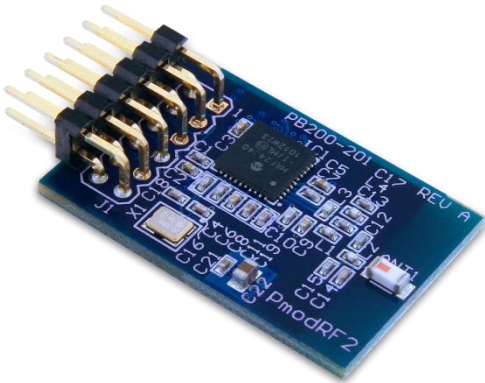
## PmodRF2™ Reference Manual

Revised May 24, 2016

This manual applies to the PmodRF2 rev. A

### Overview

The PmodRF2 adds RF communication through the [Microchip® MRF24J40](http://www.microchip.com/wireless) IEEE 802.15.4™ 2.4GHz RF transceiver module. By communicating with the device through SPI, users can transmit data at speeds up to 625 kbps through the ZigBee®, MiWi™, and MiWi P2P software stacks all available for download at the Microchip website: [www.microchip.com/wireless](http://www.microchip.com/wireless).



*The PmodRF2.*

Features include:

- IEEE 802.15-compliant RF transceiver
- Supports ZigBee, MiWi and MiWi P2P wireless networking protocols
- ISM band 2.405-2.48 GHz operation
- Integrated 20 MHz and 32.768 oscillator circuitry
- Small PCB size for flexible designs 1.2" × 0.8" (3.0 cm × 2.0 cm)
- 12-pin Pmod connector with SPI interface
- Follows [Digilent Pmod Interface Specification](#) Type 2A

## 1 Functional Description

The PmodRF2 provides RF support for applications at data rates of 250kbps (IEEE 802.15) or 625kbps (Turbo mode). It is designed for use with the Microchip microcontroller families (PIC18, PIC24, dsPIC33, and PIC32) and the ZigBee®, MiWi™, and MiWi P2P software stacks all available for download at the Microchip website: [www.microchip.com/wireless](http://www.microchip.com/wireless).

## 2 Interfacing with the Pmod

The primary communications interface with the PmodRF2 is an SPI bus on J1. The PmodRF2 is implemented as a slave device in SPI mode (0, 0), which requires SCK to idle in a low state and the ~CS pin to be held low during communication. An RST pin provides the host with an active low, asynchronous hardware reset for the PmodRF2. The PmodRF2 also provides a configurable polarity interrupt (default active low) indicator pin (INT), which is

asserted by the PmodRF2 when data is available for the host device. The INT line is de-asserted after the INTSTAT register is read.

Connector J1 – SPI Communications		
Pin	Signal	Description
1	~CS	Chip Select
2	SDI	Serial Data In
3	SDO	Serial Data Out
4	SCK	Serial Clock
5	GND	Power Supply Ground
6	VCC	Power Supply (3.3V)
7	INT	Interrupt Output
8	~RST	Hardware Reset
9	WAKE	Hardware Wake
10	NC	Not Connected
11	GND	Power Supply Ground
12	VCC	Power Supply (3.3V)

Table 1. Interface connector signal description.

The SPI interface standard uses four signal lines. These are chip select (~CS), serial data in (SDI), serial data out (SDO), and serial clock (SCK). These signals map to the following signals on the MRF24J40: ~CS corresponds to the Chip Select signal (~CS), SDI corresponds to Serial Data Input (SDI), SDO corresponds to Serial Data Output (SDO), and SCK corresponds to the Serial Clock signal (SCK).

### 3 Power Supply

The PmodRF2 is designed to work with Digiilent microcontroller boards that have 12-pin header connectors.

The PmodRF2 requires a 2.7V-3.6V supply voltage. A 3.3V power supply voltage is available on all Digiilent system boards and is provided as part of the 12-wire Pmod interface standard.

Digiilent system boards with Pmod interface connectors allow jumper selection of the power supply voltage to be provided to the Pmod.

**WARNING:** Ensure that the system board is jumpered to provide 3.3V to the module before applying power to the board.

For more information on the MRF24J40, see the MRF24J40 datasheet at the Microchip web site.