

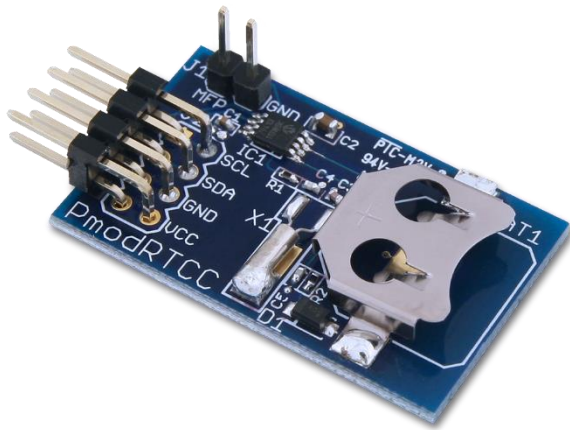
## PmodRTCC™ Reference Manual

Revised May 24, 2016

This manual applies to the PmodRTCC rev. A

### Overview

The PmodRTCC is a real-time clock/calendar powered by the [Microchip® MCP79410](#). Through the I<sup>2</sup>C interface, users may configure up to two alarms that can be triggered at a wide variety of possible times.



*The PmodRTCC.*

Features include:

- Real-time clock/calendar with lithium coin cell back-up
- Multi-function pin output that can generate a square wave
- Two available alarms
- 128 bytes EEPROM
- 64 bytes SRAM
- Small PCB size for flexible designs 1.3" × 0.8" (3.3 cm × 2.0 cm)
- 2×4-pin connector with I<sup>2</sup>C interface
- Follows [Diligent Pmod Interface Specification](#)
- Library and example code available in [resource center](#)

## 1 Functional Description

The PmodRTCC can communicate using I<sup>2</sup>C via the 8-pin header J2. Digilent boards implement several different I<sup>2</sup>C interfaces.

## 2 Interfacing with the Pmod

All communications with the device must specify whether to write to the EEPROM or the RTCC registers/SRAM, as well as a register address and a flag indicating whether the communication is a read or a write. This is followed by the actual data transfer.

The PmodRTCC responds to two I<sup>2</sup>C addresses. Address '1010111' is used for access to the EEPROM, and address '1101111' is used for access to RTCC registers/SRAM.

The device is configured by writing to the registers within the device. The time registers can be set to specific values and a control register sets their functionality.

Pin	Signal	Description
1 & 5	SCL	Serial Clock
2 & 6	SDA	Serial Data
3 & 7	GND	Power Supply Ground
4 & 8	VCC	Power Supply (3.3V/5V)

Table 1. Pinout description table.

A full list of registers and their functionality, as well as communication specifications, can be found in the MCP79410 datasheet available at the Microchip website.

The I<sup>2</sup>C interface standard uses two signal lines. These are I2C data (SDA) and serial clock (SCLK). These signals map to the serial data (SDA) and serial clock (SCLK) on the MCP79410.

## 2.1 Power Back-up

The PmodRTCC has a holder for a 12mm lithium coin cell to power the RTCC and SRAM if VDD should ever fall below the operating point. In order to enable this power back-up, the VBATEN bit must be set in the RTCC registers. Compatible coin cells include BR1216, CR1216, BR1220, CL1220, CR1220, and BR1225.

Connector J1 – MFP Header		
Pin	Signal	Description
1	MFP	Multi-Function Pin
2	GND	Power Supply Ground

Table 2. MFP header.

## 2.2 Multi-Function Pin (MFP)

The MFP can be accessed via the 2-pin header J1. The MFP has an open drain output. To use it, an external 3.3V 2-10K-ohm pull-up resistor is required.

The MFP can have several different functions including user-controllable output, alarm output, and clock frequency output, depending on the settings in the RTCC registers. Settings and functions are described in the MFP section of the MCP79410 datasheet.

## 2.3 Alarms

The MCP79410 has two alarms. Each can be set to trigger an alarm interrupt flag at a particular time, driving the MFP high or low depending on how the polarity bit is set.

## 2.4 Calibration

The Calibration register in the MCP79410 can calibrate the device to correct for inaccuracies of the input clock source. It can add or subtract up to 254 clocks from the RTCC counter every minute. For more information, see the Calibration section of the MCP79410 datasheet.