

# PmodRTCC™ Reference Manual

**Revision:** October 17, 2011

**Note:** This document applies to REV A of the board.



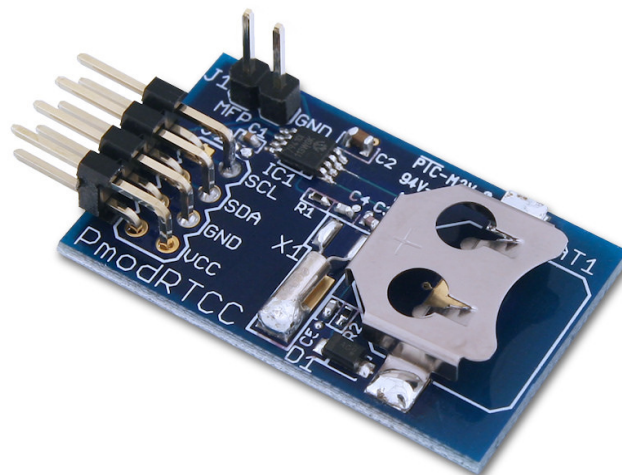
1300 NE Henley Court, Suite 3  
Pullman, WA 99163  
(509) 334 6306 Voice | (509) 334 6300 Fax

## Overview

The PmodRTCC is a real-time clock/calendar powered by the Microchip MCP79410.

Features include:

- a real-time clock/calendar with lithium coin cell back-up
- an I<sup>2</sup>C interface
- multi-function pin output that can generate a square wave
- two available alarms
- 128 bytes EEPROM
- 64 bytes SRAM



## Functional Description

The PmodRTCC can communicate using I<sup>2</sup>C via the 8-pin header J2. Diligent boards implement several different I<sup>2</sup>C interfaces. For more information, see the *Connecting I<sup>2</sup>C Interfaces* document available at [www.digilentinc.com](http://www.digilentinc.com).

### Interface

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.

**Connector J2 – I<sup>2</sup>C Communications**

Pin	Signal	Description
1, 2	SCL	I <sup>2</sup> C Clock
3, 4	SDA	I <sup>2</sup> C Data
5, 6	GND	Power Supply Ground
7, 8	VCC	Power Supply (3.3V)

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 I<sup>2</sup>C data (SDA) and serial clock (SCLK). These signals map to the serial data (SDA) and serial clock (SCLK) on the MCP79410.

### 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

## 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.

## 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.

## 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.

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Contact Us :

➤ Address :

401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd  
Minhang District, Shanghai , China

➤ Sales :

Direct    +86 (21) 6401-6692  
Email     amall@ameya360.com  
QQ        800077892  
Skype     ameyasales1 ameyasales2

➤ Customer Service :

Email     service@ameya360.com

➤ Partnership :

Tel        +86 (21) 64016692-8333  
Email     mkt@ameya360.com