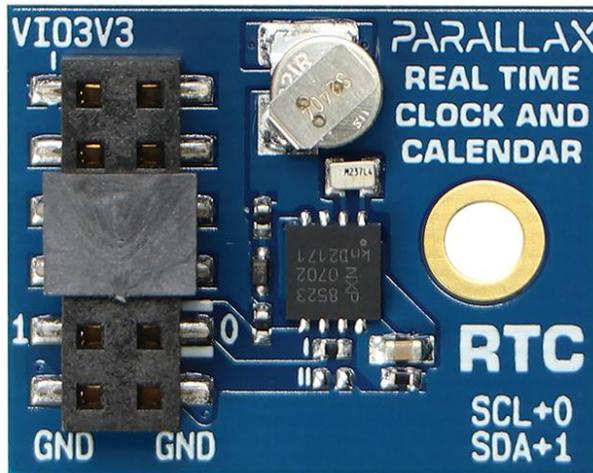# P2 RTC Add-on (#64013)

The P2 RTC Add-On Board provides a real time clock with calendar and alarm functionality to the Propeller 2 (P2X8C4M64P) multicore microcontroller. The small RTC board includes a rechargeable lithium battery that is kept charged while the RTC is powered and will allow the RTC to keep time while power is disconnected.

This add-on board is compatible with any standard single Parallax P2 accessory socket found on most P2 development boards. The connector is a standard 2x6-way 0.1" pitch socket, and the board could be used with a wide range of microcontrollers employing 3.3 V signal levels.

The P2 RTC Add-on extends the timekeeping capabilities of the Parallax P2 multicore microcontroller, and enables date and timestamp capabilities that are important in many projects, including data and file system management, user display, control and IoT integration.

Features

- Based on the PCF8523 CMOS Real-Time Clock (RTC) with calendar
- Optimized for low power consumption
- Data is transferred serially via an I2C-bus with a data rate up to 1000 kbit/s
- Alarm and timer functions
- Events can generate a wake-up signal on an interrupt pin
- Offset register allows fine-tuning of the clock
- Backup battery switchover circuit detects power failures and automatically switches to the battery supply when a power failure occurs
- 2x6-pin female socket with 0.1" spacing compatible with the standard Parallax P2 single Accessory sockets

Key Specifications

- Supply voltage: +3.3 VDC
- Control interface: I2C bus (100, 400, 1000 kHz)
- Battery: built-in rechargeable lithium metal cell (Seiko MS421R)
  - Nominal capacity: 1.5mAh
  - Standard mass: 0.11g
- Low backup current: typical 150 nA
- Interface: Open-drain interrupt or clock output pins
- Form factor: dual 2x6-pin female passthrough headers with 0.1" spacing
- Mounting hole: 3.2 mm diameter
- Operating temperature: -4 to +140 °F (-20 to +60 °C)
- PCB dimensions: 0.8 x 1 in (20.32 x 25.4 mm)

Pin Connections

| Accessory header pin	RTC board function	Function	
VIO3V3	3V3	Supply voltage; 3.3V voltage required to power the RTC board and trickle-charge the on-board battery	
+7	-	Not connected	
+6	-	Not connected	
+5	-	Not connected	
+4	-	Not connected	
+3	-	Not connected	
+2	-	Not connected	
+1	SDA	I2C Serial Data Input/Output Pin	
+0	SCL INT CLKOUT	I2C Serial Data Clock Pin (Input) Interrupt signal (Output) CLKOUT signal (Output)	**Shared feature IO pin, refer to Code Tip below!**
GND	GND	Common Ground reference connection	

Refer to the PCF8523 RTC datasheet for full details, available from www.nxp.com   .

Code Tip

The SCL, INT and CLKOUT functions share a single IO pin.

- To use the I2C SCL function, set the I2C output mode to use 3.3 k-ohm pull-up.
- To use the INT or CLKOUT functions, first configure them with I2C instructions according to the RTC datasheet API, then disable I2C and set the P2 Smartpin (or equivalent) input mode to 150 k-ohm pull-up.

Board Dimensions
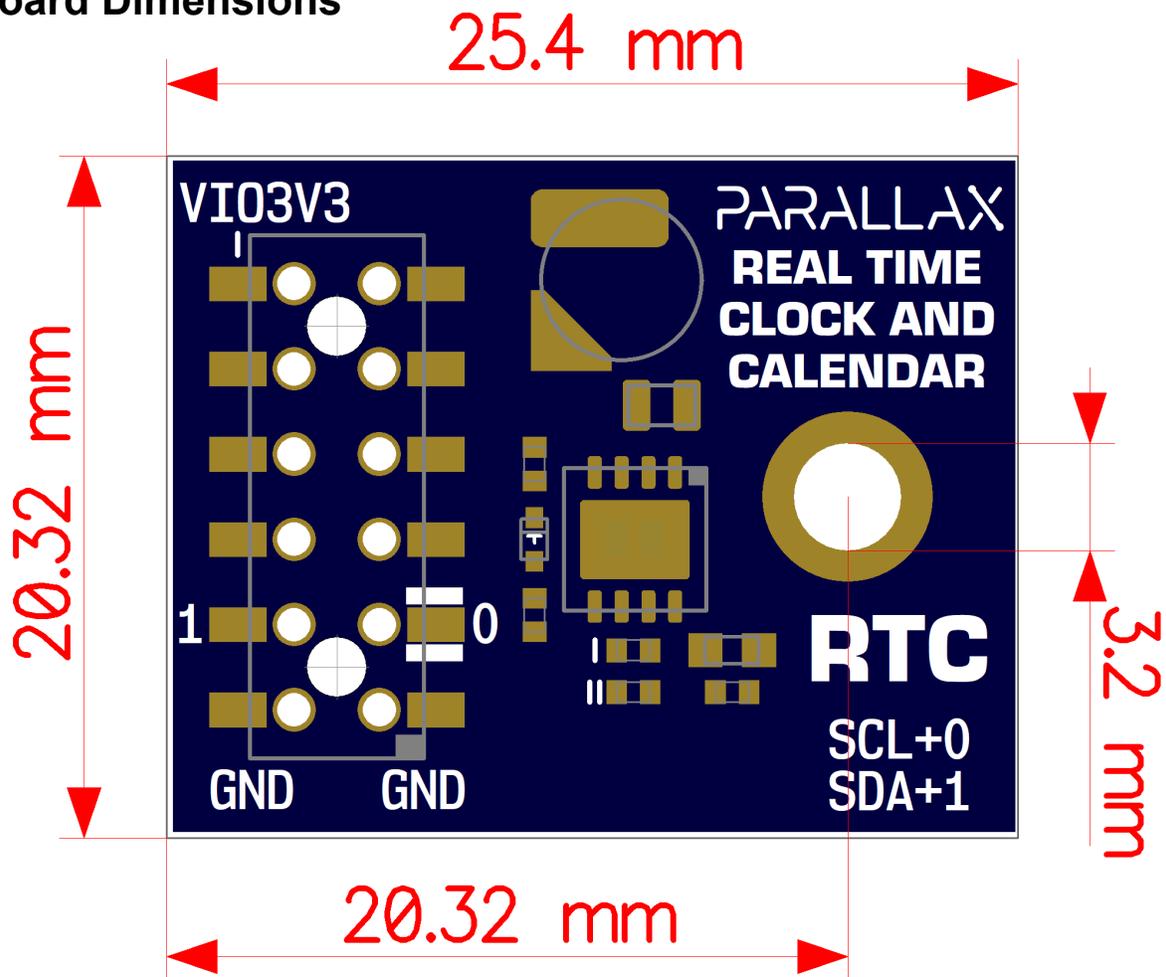
Resources and Downloads

Check for the latest version of this document, schematics and example code from the P2 RTC Add-on product page. Go to www.parallax.com and search for 64013.

Lithium Battery

This product has a built-in (non-removable) lithium battery that corresponds to the category of lithium metal batteries with a lithium content of 1 g or less and meet the requirements of UN Manual of Tests and Criteria, Part III, sub-section 38.3, so they can be transported as Class 9 Dangerous Goods. Refer to the Seiko MS421R datasheet at https://www.sii.co.jp/en/ for more information.

Revision History

Version 1.0: Original release.