

# embedded adventures

Device: MOD-1001

This document Version: 3

Matches hardware Version: [16 Dec 2012 v5]

Date: March 2013

Description: RTC Temp Sensor Module



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## Introduction

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The MOD-1001 is an i2c based Real Time Clock (RTC) and temperature sensor module.

## Features

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The MOD-1001 features M41T81S from ST, and a TMP75 or TMP275 from TI. The module makes both available over an I2C serial buss and includes pull-up resistors, battery backup from the RTC and 32.768kHz crystal.

## Hackability

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The MOD-1001 is 100% hackable.

At Embedded Adventures, we believe you have the most fun when you have the most control over your hardware. For the MOD-1001 we provide a datasheet, complete schematic and complete source code. After that, it's all up to you. We'd love to hear about the projects you're using it for – send us information and photos to [myproject@embeddedadventures.com](mailto:myproject@embeddedadventures.com)

## Construction

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Nothing to do! It's all prebuilt. Just add a header and plug in your microcontroller – and away you go!

## Connections

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The MOD-1001 has one connection port.

VCC	Positive supply. 3V – 5V.
SDA	I2C serial data
SCL	I2C serial clock
INT	Connected to RTC SQW output
GND	Ground (Vss) connection

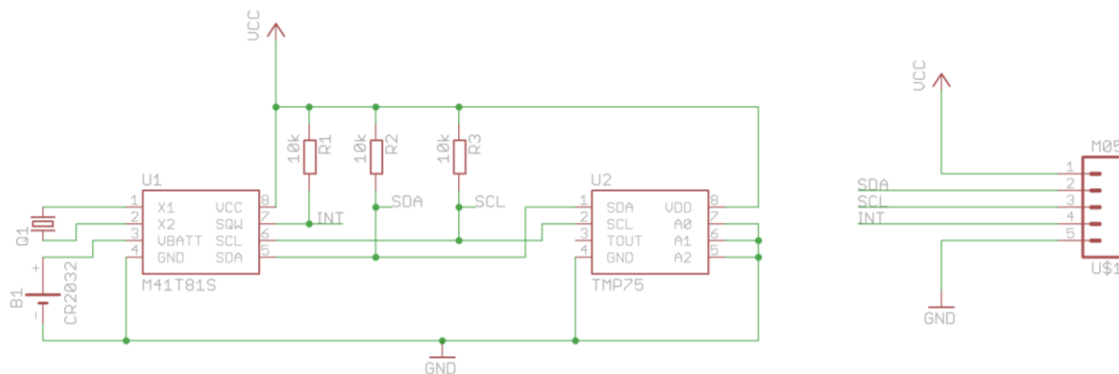
## Power

The MOD-1001 can be powered from 3V – 5V.

## Pull up resistors

I2C requires the use of pull-up resistors. If you are connecting to an existing I2C buss that already has pull-up resistors, or you are using internal pull-ups in your microcontroller, you can unsolder the existing pull up resistors.

## Schematic



The MOD-1001 schematic is a work of simplicity and grace. Well, in any case, there's not much to it.

The RTC used on the MOD-1001 board is the ST M41T81S.

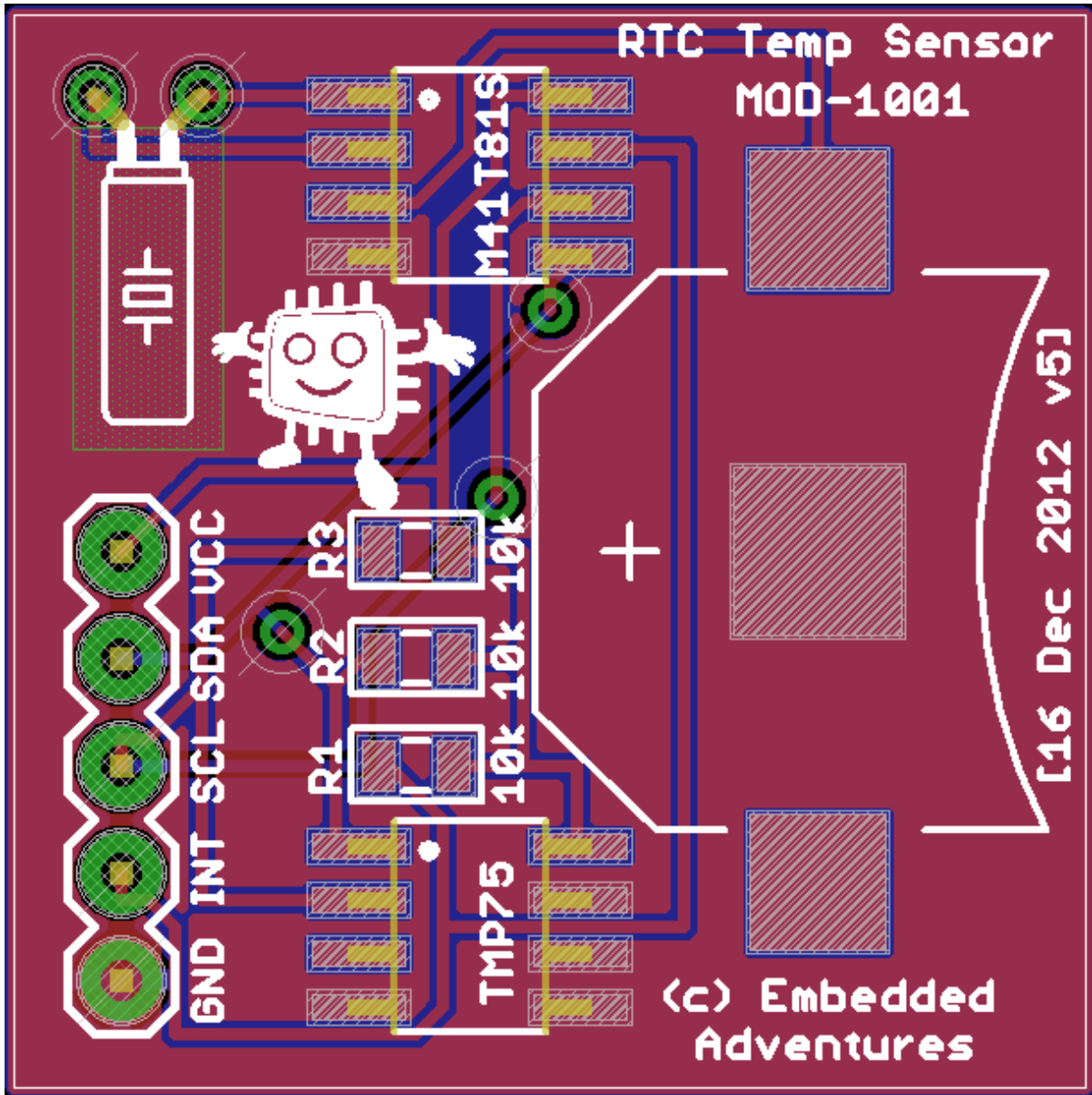
It's a great chip that has plenty of features worth playing with, including an alarm function. The SQW output is connected to the INT output and can be used as an interrupt source, for pulses each second or alarms. A battery powers the M41T81S when main power is removed. This should keep the RTC powered for the lifetime of the universe or about 10 years, whichever occurs first.

The RTC is clocked by a 32.768Khz crystal.

The TMP75 is a good value temperature sensor, and while it's not the most accurate chip available, it does a perfectly sufficient job for displaying the local temperature.

Over time we're replacing the TMP75 with the TMP275 – even more accuracy!

PCB



## Versions

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Version	Date	Comments
Version 1	30 July 2010	Initial Version for board v1.0
Version 2	7 March 2011	Updated version for hardware v3 <ul style="list-style-type: none"><li>- All surface mount components</li><li>- Prebuilt module 1 inch square</li></ul>
Version 3	2 March 2013	Updated version for hardware v5 <ul style="list-style-type: none"><li>- Redesigned with new smaller replaceable battery with surface mount container</li></ul>