I2C-RTC™ I²C Real-time Clock
User Manual

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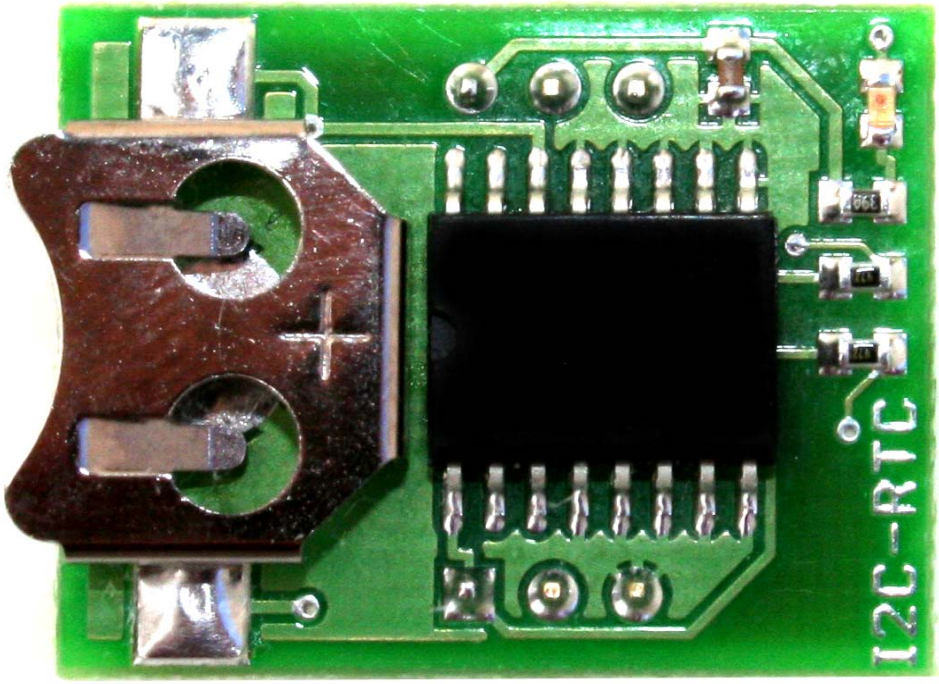

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Description

The I2C-RTC board is a 6-pin CMOS Real-time Clock device using I²C bus. There are no external components required. Only two signal lines SDA and SCL plus supply voltage and ground are required to be connected. This makes it perfect for embedded systems that require real-time clock.

This board features innovations that set it apart from other real-time clock module. Innovations feature like on-board pull-up resistors, battery holder and power LED. The module can be quickly connected directly on to the breadboard. The board is small and compact in size 0.80 x 1.05 inches.

The I2C-RTC is designed base on DS1340-33 IC. It is a real-time clock (RTC)/calendar including the software clock calibration. The device additionally provides a lower timekeeping voltage, and an oscillator STOP flag. The device is capable of block access for the register map. Two additional registers, which are accessed individually, are required for the trickle charger and flag. The clock/calendar provides seconds, minutes, hours, day, date, month, and year information. A built-in power-sense circuit detects power failures and automatically switches to the backup supply. Reads and writes are inhibited while the clock continues to run.

Features

- Software clock calibration
- RTC counts seconds, minutes, hours, day, date, month and year
- Automatic power-fail detect and switch circuitry
- Low timekeeping voltage down to 1.3V
- Oscillator stop flag
- Stand alone module, no external components required
- On-board I²C pull-up resistors, battery holder and power LED
- Decoupling supply voltage
- Design easy for breadboard
- High quality double sided PCB
- All SMT components
- Small and compact in size 0.80 x 1.05 inches
- Dual row 0.6” width, 0.1” pitch header pins
- Support Fast (400kHz) I²C interface
- Flexible operating power supply voltage range of 2.97V to 5.5V
- Suitable for 3.3V or 5.0V microcontroller

Applications

- Portable Instruments
- Electronic Projects
- Telecommunications
- Security Systems
- And much more…

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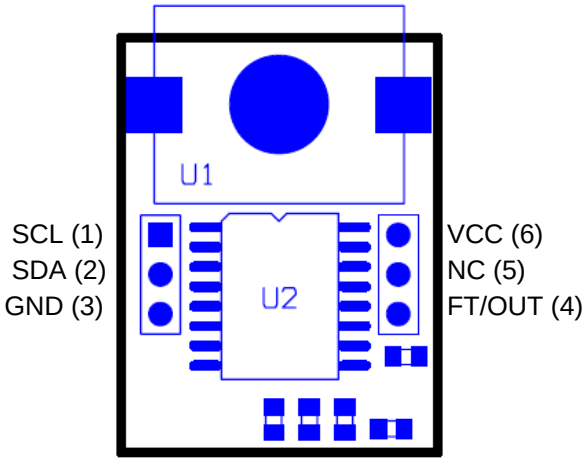
Pin Configuration



Pin No.	Name	Type	Description
1	SCL	Input	Serial clock line
2	SDA	I/O	Serial data line
3	GND	PWR	Supply ground
4	FT/OUT	Output	Frequency Test/Output
5	NC	NC	No connect
6	VCC	PWR	Supply voltage

Interfaces

Power:

The I2C-RTC board needs an external 2.97VDC – 5.5VDC supply.

- **VCC:** is an input power 2.97VDC – 5.5VDC to I2C-RTC board.
- **GND:** is a common ground for every pin. This pin MUST be connected to ground of the external power supply.

I²C pins:

The I2C-RTC operates as a slave on the I²C bus. Only two signal lines SDA and SCL are required for I²C bus. Please refer to I²C specification for more information.

FT/OUT pin:

This pin is used to output either a 512Hz signal or the value of the OUT bit. When the FT bit is logic 1, the FT/OUT pin toggles at a 512Hz rate. When the FT bit is logic 0, the FT/OUT pin reflects the

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value of the OUT bit. This open-drain pin requires an external pull-up resistor, and operates with either VCC or VBACKUP applied.

Battery holder:

This is a backup power source. 3V coin battery is required to hold the data when there is no power applies to VCC. The compatible coin cell batteries are BR1216, CR1216, BR1220, CL1220, CR1220 and BR1225. The battery voltage must be in between 1.3V to 3.7V for proper operation.

Insert the battery into holder with positive side up.

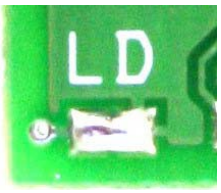
I²C address:

Write = 0xD0
Read = 0xD1

Module Configuration

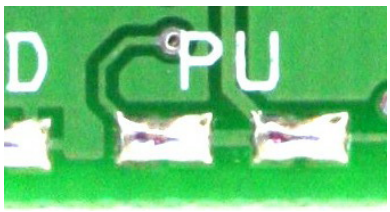
Power-on LED:

The green LED on the module is illuminating when the power applied. The power-on LED is enabled from the manufacture. It can be disabling for light sensitive or low current requirement application by remove the solder bridge on “LD” at the bottom of the module.

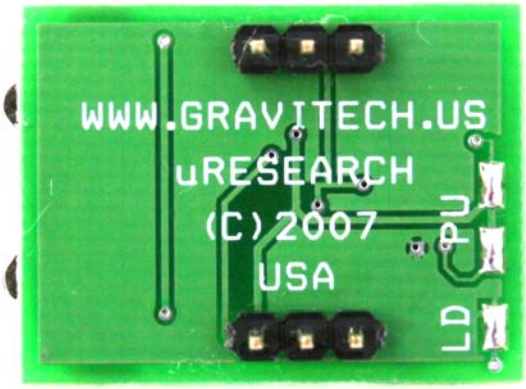


I²C pull-up resistors:

I²C bus specification required to have pull-up resistors on SDA and SCL pin. I2C-RTC come with these two pull-up resistors enabled from the manufacture. It can be disabling when connect to I²C bus that already have pull-up resistors by remove the solder bridge on the “PU” at the bottom of the module.



Below are the default settings from the manufacture.



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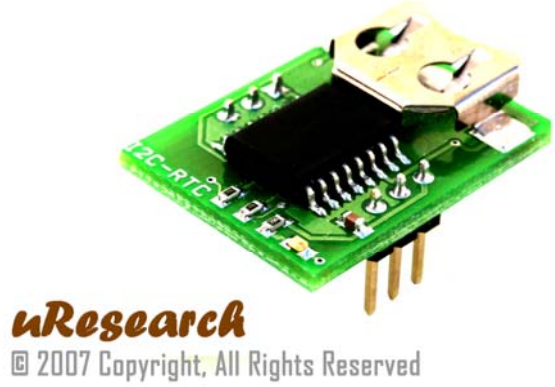
Accessories

All of the accessories are available for purchase via our website. If you don't see the item you need, please contract our sales department at sales@gravitech.us

- CR1220

  Nominal Voltage: 3V
  Nominal Capacity: 550 mAh
  Low self-discharge rate
  Wide temperature usage range: -20°C ~ +60°C
  Nominal Weight: 0.6g
  Storage temperature range: -25°C to 65°C



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