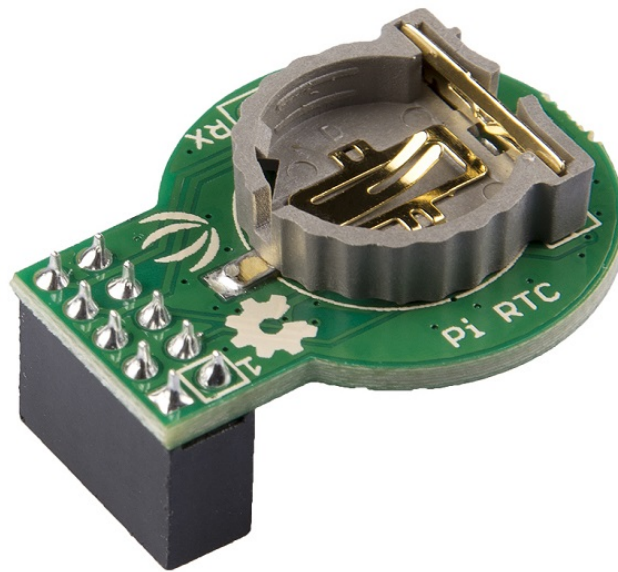# DS1307 RTC (Real Time Clock) for Raspberry Pi

The Pi RTC is based on the clock chip DS1307, it can provide a real-time clock(RTC) for raspberry pi via the I2C interface. Real-time clock of this module counts seconds,minutes, hours, date of the month,month, day of the week, and year with leap-year compensation valid up to 2100. The clock operates in either the 24-

hour or 12-hour format with AM/PM indicator. If you want to keep this module timing when the Raspberry Pi is powered off, you need to put a 3-Volt CR1225 lithium cell in the battery-holder.

Get One Now 🛒

[https://www.seeedstudio.com/Grove-Step-Counter-(BMA456)-p-3189.html]

> ✏️ **Note**
> The battery is not included.

Features

- Support Raspberry Pi 2/ 3 B/B+/4/Zero

- Suport seconds,minuutes,hours,day of week,month, year

- Support 24-hour or 12-hour format with AM/PM indicator

- 56-byte, battery-backed, nonvolatile (NV) RAM for data storage

- Two-wire serial interface

- Programmable squarewave output signal

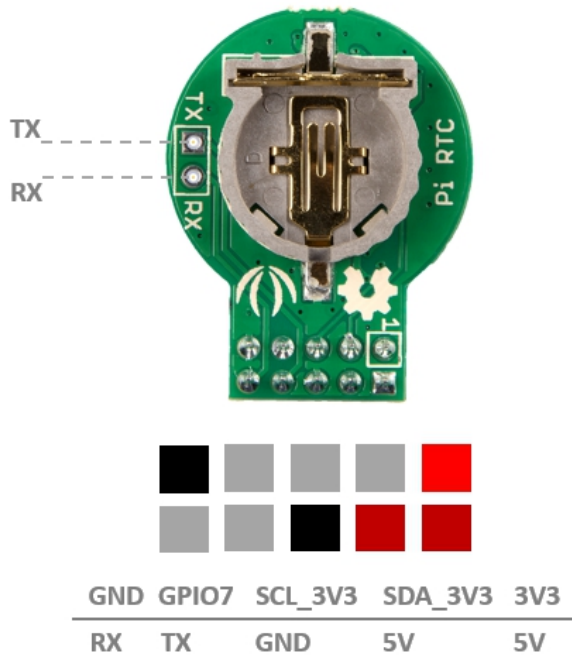- Automatic power-fail detect and switch circuitry

Specification

Item	Value
Operating Voltage	5V
Interface	I2C
I2C Address	0x68

Typical applications

Any applications need Real Time on Raspberry.

Pin Out

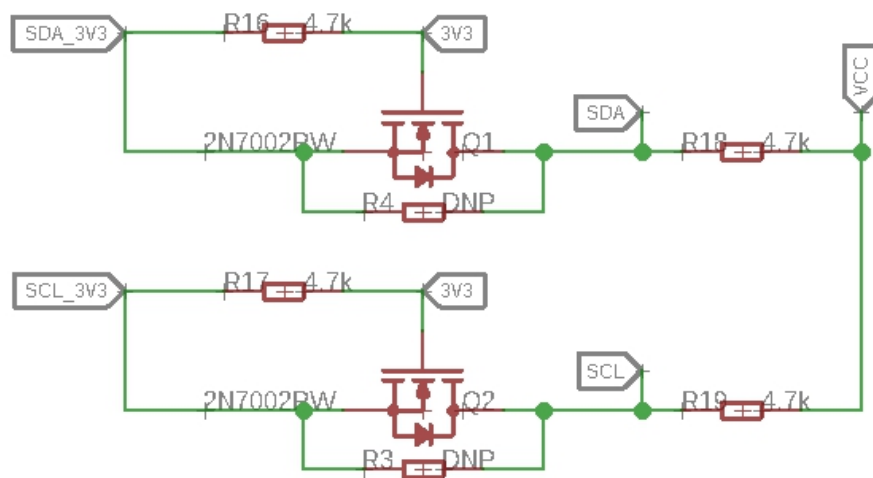| GND	GPIO7	SCL_3V3	SDA_3V3	3V3
RX	TX	GND	5V	5V

✏️ **Note**

RX/TX is not used in this module, but the 5x2 header takes up the RX/TX pin of the Raspberry Pi, so we bring the RX/TX out and come with a 2pin header.
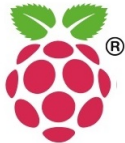
Schemaitc

Bi-directional level shifter circuit

This is a typical Bi-directional level shifter circuit to connect two different voltage section of an I^{2}C bus. The I^{2}C bus of Raspberry Pi uses 3.3V, however the chip DS1307 works at 5V, so this circuit will be needed. In the schematic above, **Q1** and **Q2** are N-Channel MOSFET 2N7002A [https://files.seeedstudio.com/wiki/Grove-I2C_High_Accuracy_Temperature_Sensor-MCP9808/res/2N7002A_datasheet.pdf], which act as a bidirectional switch. In order to better understand this part, you can refer to the AN10441 [https://files.seeedstudio.com/wiki/Grove-I2C_High_Accuracy_Temperature_Sensor-MCP9808/res/AN10441.pdf]

Platforms Supported

Arduino	Raspberry Pi		

Getting Started

Materials required

Raspberry Pi	Pi RTC(DS1307)
Get One Now [https://www.seeedstudio.com/Raspberry-Pi-3-Model-B-p-2625.html]	Get One Now [https://www.seeedstudio.com/Seeee V4.2-p-2517.html]

> ✏️ **Note**
> Please plug the USB cable gently, otherwise you may damage the port.
> Please use the USB cable with 4 wires inside, the 2 wires cable can't
> transfer data. If you are not sure about the wire you have, you can click
> here [https://www.seeedstudio.com/Micro-USB-Cable-48cm-p-1475.html]
> to buy

Install

The driver we provide only applied for Raspbian Jessie/Stretch.

> 🔥 **Tip**
> If you do not know how to use a raspberry pi, please check here
> [https://www.raspberrypi.org/documentation/] before start.

- **Step 1. Driver Installation**

Tap the following command in your terminal

```
git clone https://github.com/Seeed-Studio/pi-hats.git
```

When the download finish, tap the following command in your
terminal

```
1  cd pi-hats
2  sudo ./install.sh -u rtc_ds1307
```

- **Step 2. Power off Raspberry Pi**

```
sudo shutdown -h now
```

- **Step 3. Insert the HAT to Raspberry Pi**

Please make sure plug the pin 1 of this hat into the pin 1 of raspberry GPIO, just like the picture above.

- **Step 4. Power up Raspberry Pi**

Usage

Now you can use the command to check whether the driver is installed successfully.

```
./install.sh -l
```

If you want uninstall the driver you can use the command below:

```
sudo ./install.sh -u
```

Now let's see what the RTC module can do:

Read hardware clock and print result

```
sudo hwclock -r
```

Set the system time from the hardware clock

```
sudo hwclock -s
```

Set the hardware clock from the current system time

```
sudo hwclock -w
```

More usage

```
hwclock --help
```

Schematic Online Viewer

Resources

- **[Zip]** Pi RTC(DS1307) Eagle Files
  [https://files.seeedstudio.com/wiki/Pi_RTC-
  DS1307/res/Pi%20RTC%20(DS1307).zip]

- **[http]** Seeed Pi RTC Library [https://github.com/Seeed-
  Studio/pi-hats]

- **[PDF]** Datasheet DS1307
  [https://files.seeedstudio.com/wiki/Pi_RTC-

DS1307/res/DS1307.pdf]

Project

This is the introduction Video of this product
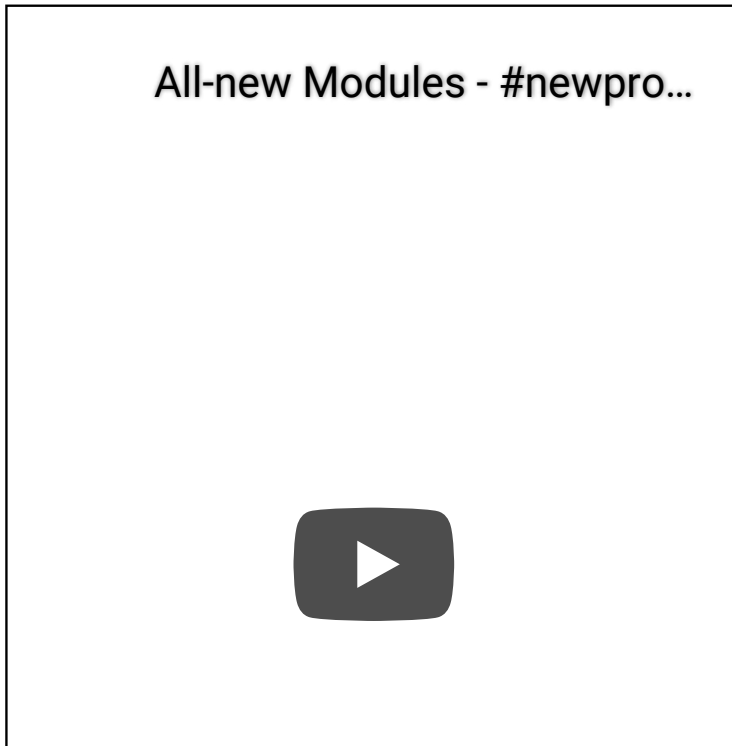
Tech Support

Please do not hesitate to submit the issue into our forum
[https://forum.seeedstudio.com/]

[https://www.seeedstudio.com/act-4.html?
utm_source=wiki&utm_medium=wikibanner&utm_campaign=newpr
oducts]