

# CircuitCo:RTC Cape

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## Contents

- [1 Descriptions](#)
- [2 Revision Changes](#)
  - [2.1 Revision A1](#)
- [3 Software Support & Compatibility](#)
- [4 Getting Started](#)
- [5 Helpful Links](#)
- [6 Specifications](#)
  - [6.1 Mechanical Specifications](#)
- [7 Signal Usage](#)
- [8 Distributors](#)
- [9 Product Images](#)
- [10 Documentations](#)
  - [10.1 RTC Cape Revision A1](#)

## Descriptions



The RTC Cape provides time tracking capability for the BeagleBone Black even when the power is lost. This cape features the DS1338 I2C-based real-time clock/calendar and a holder for a coin battery type CR2032. Setup, reading, and setting up time is easy with the provided device tree overlay.

# Revision Changes

## Revision A1

Initial release of RTC Cape.

## Software Support & Compatibility

- All revisions are compatible with BeagleBone and BeagleBone Black using 3.8 kernel.

## Getting Started

The instructions below are performed on Debian release 2014-05-14 (Linux beaglebone 3.8.13-bone50 #1 SMP Tue May 13 13:24:52 UTC 2014 armv7l GNU/Linux).

- Connect your BeagleBone Black to the internet, log in as root, download the device tree files and extract them to /lib/firmware of your BBB:

```
cd /lib/firmware
wget https://github.com/CircuitCo/RTC-Cape/raw/docs/BBB-RTC-01-00A1.tar.gz
tar xvzf BBB-RTC-01-00A1.tar.gz
```

- Load the device tree overlay for your RTC Cape:

```
echo BBB-RTC-01:00A1 > /sys/devices/bone_capemgr*/slots
```

- Check to ensure the overlay is loaded. In the messages below, the DS1338 is registered as rtc1:

```
dmesg | tail
[ 5721.844355] bone-capemgr bone_capemgr.9: slot #7: 'Override Board Name,00A1,Override Manuf,BBB-RTC-01-00A1'
[ 5721.844607] bone-capemgr bone_capemgr.9: slot #7: Requesting part number/version based 'BBB-RTC-01-00A1.dtbo'
[ 5721.844656] bone-capemgr bone_capemgr.9: slot #7: Requesting firmware 'BBB-RTC-01-00A1.dtbo' for board-name 'Override Board Name', version '00A1'
[ 5721.902076] rtc-ds1307 2-0068: rtc core: registered ds1338 as rtc1
[ 5721.847380] bone-capemgr bone_capemgr.9: slot #7: dtbo 'BBB-RTC-01-00A1.dtbo' loaded; converting to live tree
[ 5721.848460] bone-capemgr bone_capemgr.9: slot #7: #3 overlays
[ 5721.860065] omap_i2c 4802a000.i2c: bus 2 rev0.11 at 100 kHz
[ 5721.902076] rtc-ds1307 2-0068: rtc core: registered ds1338 as rtc1
[ 5721.902147] rtc-ds1307 2-0068: 56 bytes nvram
[ 5721.902274] omap_i2c 4802a000.i2c: unable to select pin group
```

```
[ 5721.902468] bone-capemgr bone_capemgr.9: slot #7: Applied #3 overlays.
```

- Read the time from the RTC chip. It should look like something below since the time has not been set:

```
hwclock -r -f /dev/rtc1  
Sat 01 Jan 2000 12:06:17 AM UTC -1.004531 seconds
```

- Update the system time of the BeagleBone Black (internet connection required) and write that to the RTC chip using hwclock command:

```
ntpdate -b -s -u pool.ntp.org  
hwclock -w -f /dev/rtc1
```

- Read the time again. This time it should have been updated.

```
hwclock -r -f /dev/rtc1  
Fri 16 May 2014 10:57:12 PM UTC -0.755959 seconds
```

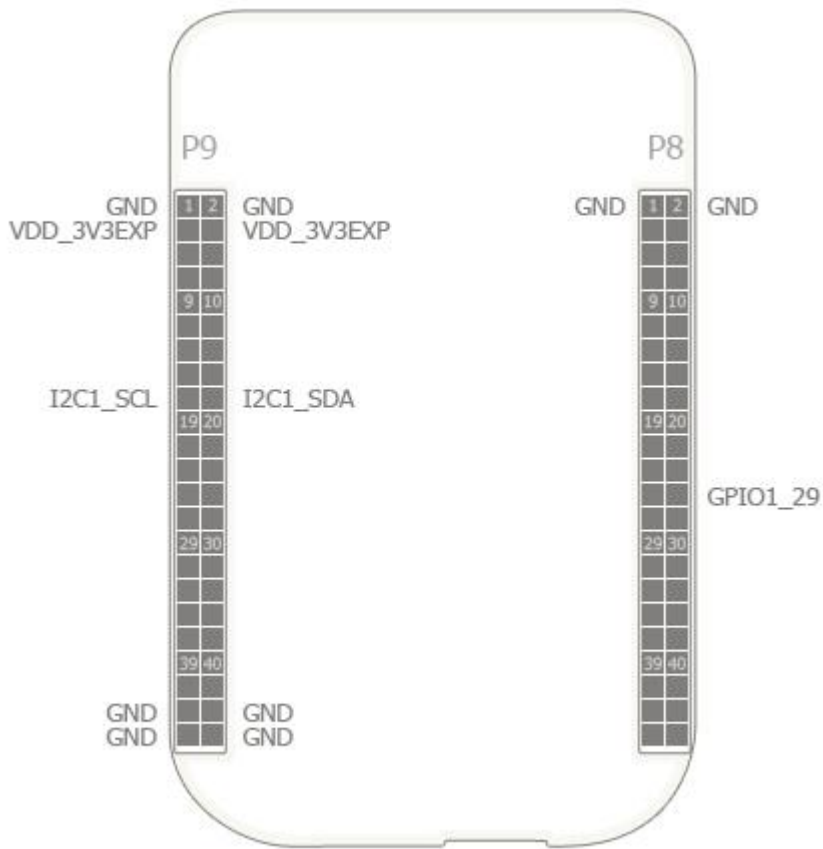
## Specifications

Followings are some specifications of the RTC Cape:

### Mechanical Specifications

Size	2.15" x 2.825"
Layers	2
PCB Thickness	.062"
RoHS Compliant	Yes

# Signal Usage



Power	VDD_3V3EXP
I2C	I2C1_SCL
	I2C1_SDA
Squarewave Output Pin	GPIO1_29