

Real-Time Clock (RTC) Modules

DT Workshop Equipment Reference — D&T / STEM resource for school workshops | Sensors & Modules

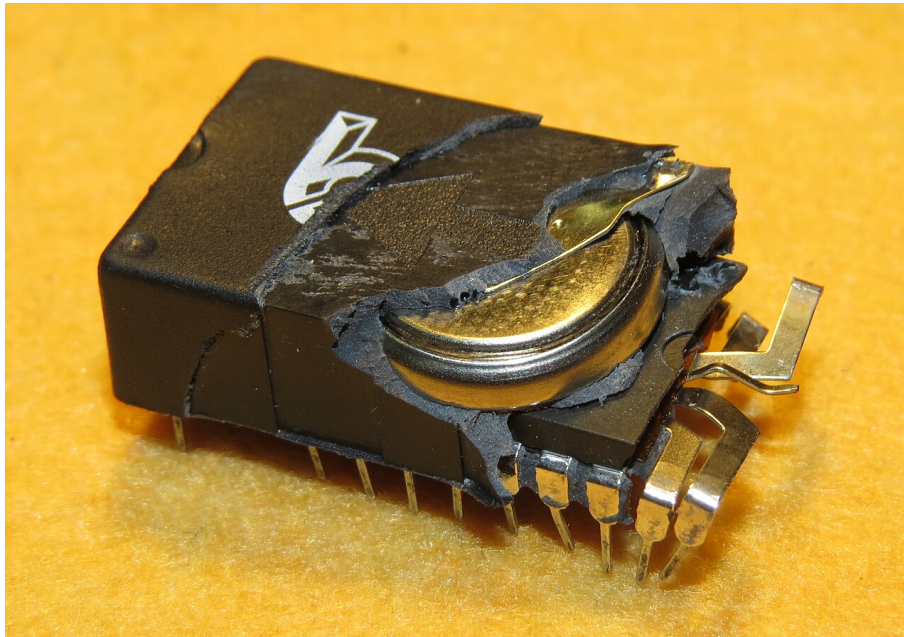


Photo: Sergei Frolov, Soviet Digital Electronics Museum, www.leningrad.su/museum/ — CC BY-SA 4.0 — via Wikimedia Commons (Inside_the_Real-time_clock_IC_vnutri_u_nei_neonka.jpg)

An RTC module keeps accurate time with a quartz crystal and battery backup, reporting the current date and time over I2C even when the microcontroller is off. Clocks, loggers and timers use it so projects know the real time.

Key Features

- DS1307 and DS3231 chips common
- I2C interface
- Coin cell battery backup
- Accuracy to a few seconds per month
- 32 kHz crystal on board

Typical Uses in the Workshop

- Timestamp data logging
- Build clocks, timers and alarms
- Schedule actions at set times
- Maintain time across power loss

Safe Operation

1. Set the time once with the library
2. Wire VCC, GND, SDA and SCL
3. Replace the coin cell when weak
4. Read hours, minutes and seconds in code
5. Re-set the clock after long power loss

SAFETY NOTES

- Keep coin cells away from young children
- Check the cell polarity when fitting
- Do not short the module pins
- Handle delicates with ESD care
- Store modules in antistatic bags

Maintenance & Consumables

- Check the backup battery yearly
- Verify the time against a reference
- Clean the pins and solder joints
- Keep spare coin cells
- Replace failing crystal modules

Specification & Buying Notes

DS3231 modules are worth the small extra cost over DS1307 - they keep accurate time in the classroom. Buy with a battery installed and a socket. Quality modules drift seconds, not minutes.