

DS1302 RTC Real Time Clock Module without Battery – For Arduino and Microcontrollers

The **DS1302 RTC Real Time Clock Module** is a reliable and cost-effective solution for keeping accurate time in your electronics projects. Designed for use with **Arduino, Raspberry Pi, ESP8266, ESP32, and other microcontrollers**, this module provides precise tracking of seconds, minutes, hours, days, dates, months, and years.

Unlike relying solely on a microcontroller's internal clock, which resets every time the power is disconnected, the **DS1302 RTC module** ensures that your project can continue to keep track of time consistently. This particular version of the module comes **without a built-in battery**, which means you will need to attach an external **CR2032 coin cell battery** if you require timekeeping when power is off.

Compact, efficient, and widely supported in the maker community, the DS1302 is ideal for projects that require **real-time tracking, alarms, scheduling, or data logging**.



Key Features

- **Real Time Clock (RTC):** Tracks time in seconds, minutes, hours, days, dates, months, and years.
- **Leap-Year Compensation:** Automatically adjusts for months with fewer days, including leap years.
- **Low Power Consumption:** Designed for efficient power use when a backup battery is connected.
- **3-Wire Interface:** Uses a simple serial communication interface for easy connection to microcontrollers.
- **Expandable Memory:** Includes **31 bytes of general-purpose RAM** for user data storage.
- **Compact Module Design:** Lightweight and easy to integrate into DIY and professional projects.
- **Battery Slot:** Supports an external **CR2032 coin cell** for backup timekeeping.
- **Wide Compatibility:** Works seamlessly with **Arduino IDE libraries** and other development platforms.



Applications

The **DS1302 RTC Real Time Clock Module** is a versatile component that can be used in countless applications, including:

1. Time-Based Automation

- Smart home devices with scheduled operations
- Timed relay control for electrical appliances
- Automatic street lighting or irrigation systems

2. Data Logging Projects

- Weather stations with time-stamped recordings
- Environmental monitoring systems
- Industrial process data tracking

3. Clocks and Alarms

- Digital wall clocks and desk clocks
- Arduino-based alarm clocks
- Countdown and timer-based projects

4. IoT and Embedded Systems

- Remote monitoring systems where accurate time is required
- IoT devices that need synchronized timestamps
- Access control and logging systems



Technical Specifications

- **Model:** DS1302 RTC Real Time Clock Module
- **Operating Voltage:** 2.0V – 5.5V
- **Communication Interface:** 3-wire serial interface
- **Timekeeping Elements:** Seconds, minutes, hours, date, month, day, year

- **Leap Year Support:** Up to year 2100
- **Data Retention RAM:** 31 bytes general-purpose memory
- **Battery Support:** CR2032 coin cell (not included)
- **Dimensions:** Compact module for easy breadboard or PCB integration
- **Temperature Range:** 0°C to +70°C (standard operating conditions)

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DS1302 RTC Real Time Clock

Module without Battery[/caption]

How It Works

The **DS1302 RTC module** is based on the Dallas Semiconductor DS1302 integrated circuit, which combines a real-time clock/calendar with a small amount of RAM. The RTC maintains time information through its crystal oscillator, and when a backup battery is connected, it continues timekeeping even when the main power is off.

- **With Arduino:** You can connect the module using just a few wires (VCC, GND, CLK, I/O, and CE).
- **Libraries:** Popular Arduino libraries like `RTClib` make it easy to set and read the time.
- **Backup Feature:** Without a battery, the module resets its clock when power is removed. By adding a CR2032 battery, it preserves the time even during power loss.



Advantages of the DS1302 RTC Module

1. **Accurate Timekeeping:** Keeps reliable time with minimal drift.
2. **User Memory Storage:** Extra 31 bytes of RAM for project data.
3. **Simple Integration:** Works with standard Arduino libraries.
4. **Low Power Design:** Efficient operation with backup battery support.
5. **Affordable:** Budget-friendly option for students, hobbyists, and professionals.

Example Use Case

Imagine you are building a **data logging weather station** using Arduino. With the **DS1302 RTC module**, you can timestamp each reading of temperature, humidity, and pressure. Even if the device is disconnected from power, attaching a small coin cell battery ensures that the clock keeps running, so the data remains accurate and synchronized.

Similarly, in a **smart irrigation system**, the module ensures water pumps turn on and off at scheduled times daily, regardless of system restarts.

Why Choose This Module?

The **DS1302 RTC Real Time Clock Module without Battery** is perfect for learning, prototyping, and professional electronics projects. It provides **accurate and reliable timekeeping** at a very affordable price. Its **compatibility with Arduino and Raspberry Pi**, along with strong library support, makes it one of the most popular RTC modules in the maker community.

Conclusion

The **DS1302 RTC Real Time Clock Module** is a must-have component for projects that require precise time tracking. With its simple serial interface, support for backup battery, and extra RAM storage, it is widely used in **Arduino-based clocks, data loggers, IoT systems, and automation projects**. Though this version comes **without a built-in battery**, adding an external CR2032 cell ensures uninterrupted timekeeping.

If you are looking for a **low-cost, accurate, and easy-to-use RTC module**, the DS1302 is an excellent choice.