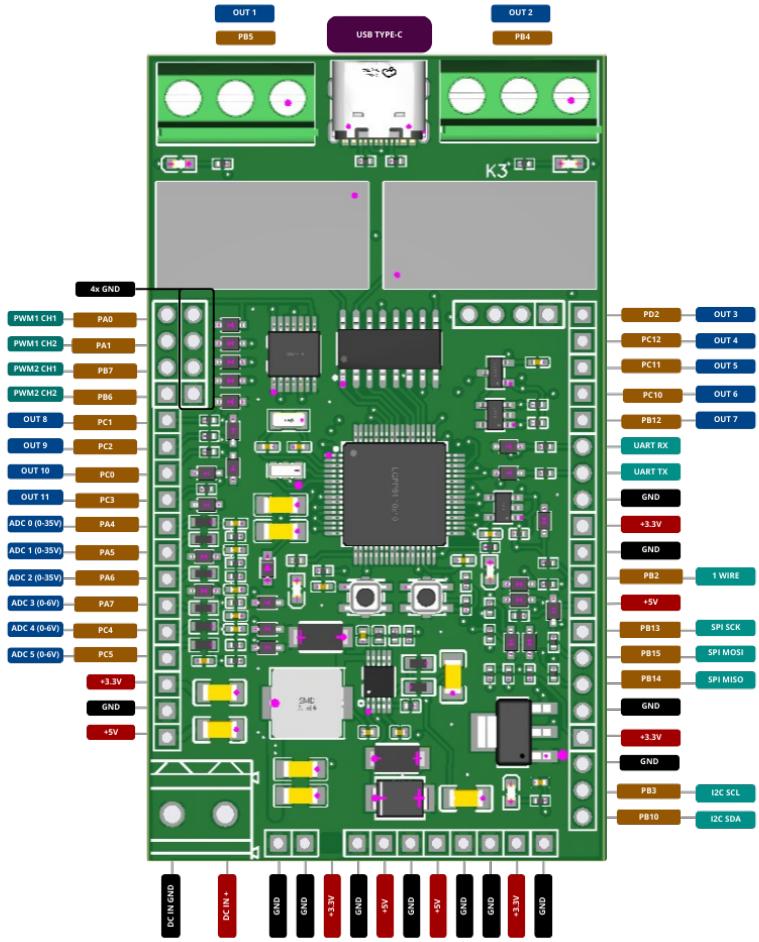
User Manual
R1BBIT MINI



Description

R1bbit Mini — Small Board, Big Possibilities

R1bbit Mini is a compact and affordable development board designed for quick experiments, small projects, and learning the basics of electronics and automation. Despite its tiny size, it provides powerful features, flexible connectivity, and an easy-to-use workflow that makes prototyping faster than ever.

Perfect for beginners, students, and hobbyists, R1bbit Mini works seamlessly within the R1bbit ecosystem — mobile app, cloud platform, and web-based development tools — allowing you to control, program, and monitor your projects from anywhere.

Key Features
Ultra-compact design for tight spaces and portable projects
Full compatibility with the R1bbit scripting language (BASIC-like)
USB Type-C for power and data

Built-in communication interfaces (Wi-Fi/Bluetooth)*
Cloud access for remote control, monitoring, and data storage
Mobile app support for fast configuration and control
Ideal for sensors, automation tasks, robotics modules, and IoT experiments
Made for Learning & Prototyping
R1bbit Mini helps users go from idea to working prototype in minutes. No complex setup, no deep programming knowledge — just connect, write a small script, and watch your project come to life.

Features

MCU
STM32F411RET6

Clock
100 MHz

Flash
512 kB

RAM
128KB SRAM

1. **R1BBIT MINI** works via **USB Type-C** with Windows and macOS computers through the Google Chrome browser and can also connect directly to a smartphone with full access through the mobile app. The smartphone powers the device during this connection.
2. **R1BBIT MINI** features a built-in programming language similar to BASIC, combining the power of a modern programming language with full mathematical functionality and very simple syntax. It is easy to understand for beginners and children.
3. **R1BBIT MINI** includes a **UART port** for connecting an ESP32 module, giving the board access to our cloud service: https://cloud.r1bbit.com/. Internet connectivity enables full remote control from anywhere in the world via the R1BBIT mobile app or cloud platform.
4. The **UART port** also supports Bluetooth modules, allowing local smartphone control without cloud services.
5. **R1BBIT MINI** supports direct USB connection to the R1BBIT mobile app.
6. **R1BBIT MINI** can be powered via **USB Type-C** or from an external **DC power supply from +8V to +50V**, making it suitable for industrial and automation applications.
7. When operating over Wi-Fi, **R1BBIT MINI** devices can exchange variable values between each other, enabling coordinated operation within a unified ecosystem.
8. **R1BBIT MINI** provides multiple **+3.3V and +5V** output pins for powering sensors and modules.
9. **Eleven digital OUT pins** allow control of various external devices according to user-defined program logic.
10. **PWM outputs** generate signals with user-selectable frequencies.
11. **I²C interface** allows connection of displays and sensors that use this protocol.
12. **Six ADC inputs** enable processing of analog signals and voltage measurements.
13. **1-Wire interface** supports various sensors, such as DHT20/21, up to 8 DS18B20 temperature sensors, air quality sensors, and more.
14. **SPI interface** enables connection of high-quality color displays, including models with capacitive touch. The touch controller operates via **I²C**.
15. **Two high-voltage relays** are built in, supporting loads up to **250V AC / 10A**, allowing direct control of powerful electrical devices.
16. **R1BBIT MINI** includes non-volatile flash memory where users can store up to 30 variables that remain available after power restoration. This is useful for calibration data, access codes, or other runtime-generated values.
17. **Autostart** ensures automatic program execution when power is restored after an outage.

18. The internal code interpreter ensures system stability — user program errors will not cause hardware damage, system freezes, communication loss, or device failure. Scripts can be stopped, corrected, reuploaded, and restarted within seconds.

1. The Board

Like other compact development boards, **R1BBIT MINI** does not include a built-in battery charger. The board can be powered via **USB Type-C** or through its power pins.

---

2. Application Examples

Weather Station

Using **R1BBIT MINI** with environmental sensors and an OLED display, you can build a compact weather station that sends temperature, humidity, and other data directly to your smartphone or cloud service.

Air Quality Monitor

Air quality significantly affects health. By combining **R1BBIT MINI** with air quality sensors and a display, you can monitor indoor air conditions. When connected to an IoT service, the system provides real-time environmental data.

Recommended Operating Conditions

Description	Min	Max
Conservative thermal limits for the entire board	**- 40 °C**	**+70 °C**