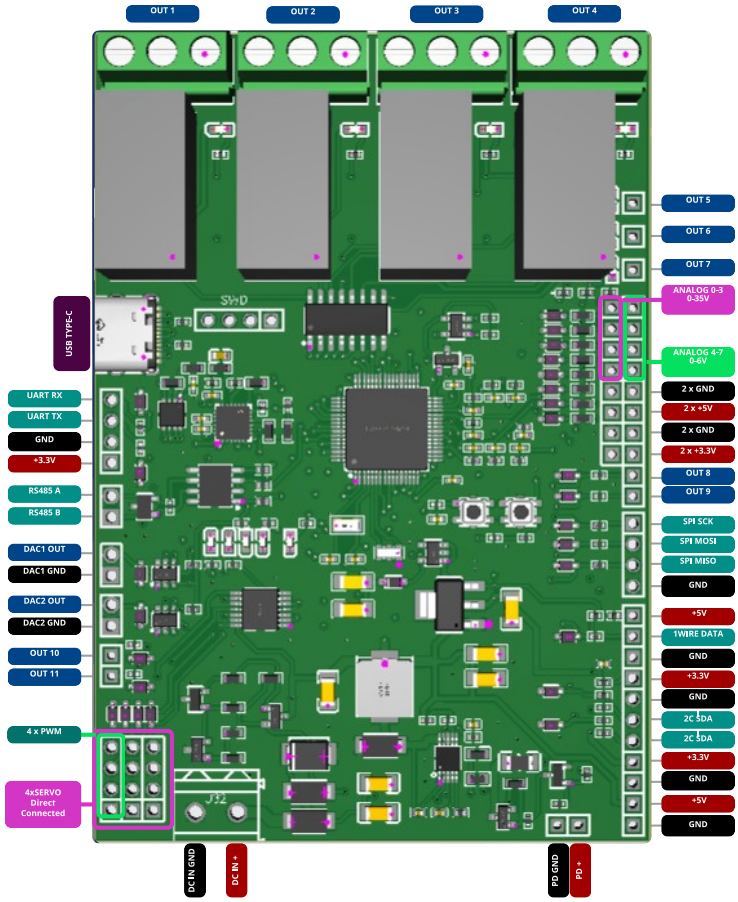
User Manual
R1BBIT ONE



Description

R1BBIT ONE is a next-generation universal development platform designed for engineers, makers, and professionals who need a compact, reliable, and highly capable solution for building electronic systems of any complexity. The board combines strong performance, flexible connectivity, and advanced power management, making it ideal for prototyping, integration, and commercial product development.

R1BBIT ONE supports a broad range of modern interfaces, including Wi-Fi, Bluetooth, and wired communication via USB Type-C, ensuring seamless connection to smartphones, laptops, and workstations running Windows or macOS. With built-in USB-C Power Delivery support, the board automatically negotiates optimal power levels with the power source, delivering stable operation in any scenario—from power banks and wall adapters to USB ports on computers. It also provides multiple regulated output voltages (6V, 9V, 12V, and 18V) for powering external modules and peripherals without additional converters.

A key strength of R1BBIT ONE is its built-in lightweight scripting language (BASIC-like). You can write scripts directly on the device with real-time syntax checking and color highlighting for keywords and data, making coding and debugging intuitive even for beginners. This capability is powerful enough that a full Software section will be dedicated to the language, its commands, and how scripts interact with the board and run on-device.

The platform also offers easy control from a mobile app or desktop software, providing a smooth user experience whether you're developing locally or managing multiple devices.

For remote projects, R1BBIT ONE includes cloud data storage and remote access, allowing you to store logs and sensor data on a server and control or monitor the board from anywhere in the world.

Designed as a flexible computing module with high-quality components, R1BBIT ONE ensures long-term stability even under continuous load. It is ideal for automation systems, IoT solutions, robotics, research equipment, test benches, and advanced consumer electronics.

Clear architecture, detailed documentation, and broad compatibility with modern development tools allow users to get started within minutes. R1BBIT ONE is made for creators who value power, stability, and thoughtful engineering at every stage of their project.

Features

MCU
STM32F411RET6

Clock
100 MHz

Flash
512 kB

RAM
128KB SRAM

1. **R1BBIT ONE** 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 ONE** 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 ONE** 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 ONE** supports direct USB connection to the R1BBIT mobile app.
6. **R1BBIT ONE** can be powered via **USB Type-C** or from an external **DC power supply from +8V to +50V**, making it ideal for industrial and automation systems.
7. When operating over Wi-Fi, **R1BBIT ONE** devices can exchange variable values between each other, enabling coordinated operation within a unified ecosystem.
8. **R1BBIT ONE** provides multiple **+3.3V and +5V** output pins for powering sensors and modules.
9. **Eleven digital OUT pins** allow control of 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.
12. **Eight ADC inputs** enable processing of analog signals and voltage measurements.
13. **Two DAC outputs** allow generation of analog voltage signals.
14. **1-Wire interface** supports various sensors such as DHT20/21, up to 8 DS18B20 temperature sensors, air quality sensors, and more.
15. **SPI interface** enables connection of high-quality color displays, including models with capacitive touch (touch via I²C).
16. **Four high-voltage relays** are built in, supporting loads up to **250V AC / 10A**, allowing direct control of powerful electrical equipment.
17. **USB Power Delivery (PD) module** allows users to dynamically set different voltage levels on the PD output pins when using a PD-compatible power supply.
18. The board supports direct connection of up to **four 9g servo motors**, simplifying robotics and motion projects.

19. **RS485 interface** enables communication with industrial and long-distance devices, greatly expanding application possibilities.
20. **R1BBIT ONE** includes non-volatile flash memory where users can store up to 30 variables that remain available after power restoration.
21. **Autostart** ensures automatic program execution when power is restored after an outage.
22. 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 ONE** does not include a built-in battery charger. The board can be powered via **USB Type-C** or through its power pins.

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2. Application Examples

Weather Station

Using **R1BBIT ONE** 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 ONE** 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**