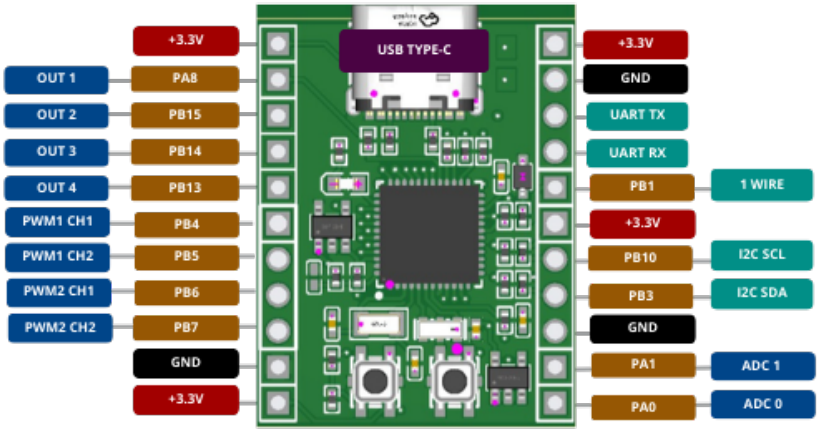
User Manual
R1BBIT PICO



Description

R1bbit Pico — The Simplest and Smallest Way to Automate Anything

R1bbit Pico is the tiniest and most minimalistic board in the R1bbit family — created for ultra-simple automation, basic sensor tasks, and compact embedded applications. It's designed for situations where every millimeter matters, yet you still want the power and convenience of the R1bbit ecosystem.

With its streamlined design, R1bbit Pico provides essential functionality for triggers, monitoring, and basic control tasks, making it ideal for micro-projects, compact gadgets, and cost-sensitive applications.

Key Features
Ultra-tiny form factor for the most space-restricted installations
Designed for basic automation, triggers, sensors, and lightweight control tasks
USB Type-C for simple power and configuration
Compatible with the R1bbit BASIC-like scripting language
Works seamlessly with the R1bbit mobile app, cloud platform, and online development tools
Minimal power consumption for long-life battery or standalone use
Simple. Efficient. Essential.
R1bbit Pico focuses on what matters most: fast setup and reliable operation. Connect it, upload a small script, and the Pico is ready to automate or monitor anything you need — from tiny mechanisms to discreet smart add-ons inside your existing devices.

Features

MCU
STM32F411RET6

Clock
100 MHz

Flash
512 kB

RAM
128KB SRAM

1. **R1BBIT PICO** 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 PICO** features a built-in programming language similar to BASIC, with the full power of a modern programming language, complete mathematical functionality, and very simple syntax for writing programs or scripts. The language is easy to understand for beginners and children.
3. **R1BBIT PICO** 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 of the board 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 PICO** supports direct USB connection to the R1BBIT mobile app.
6. **R1BBIT PICO** is powered via **USB Type-C**.
7. When operating over Wi-Fi, **R1BBIT PICO** devices can exchange variable values between each other, enabling coordinated operation within a unified ecosystem.
8. **R1BBIT PICO** provides multiple **+3.3V and +5V** output pins.
9. **OUT pins** allow control of various external devices according to the user's 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. **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. **R1BBIT PICO** 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.
15. **Autostart** function ensures automatic program execution when power is restored after outages.
16. The internal code interpreter ensures system stability — user program errors will not cause hardware damage, freezes, communication loss, or failures. Scripts can be stopped, corrected, reuploaded, and restarted within seconds.

1. The Board

Like other compact development boards, **R1BBIT PICO** 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 PICO** 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 PICO** 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**