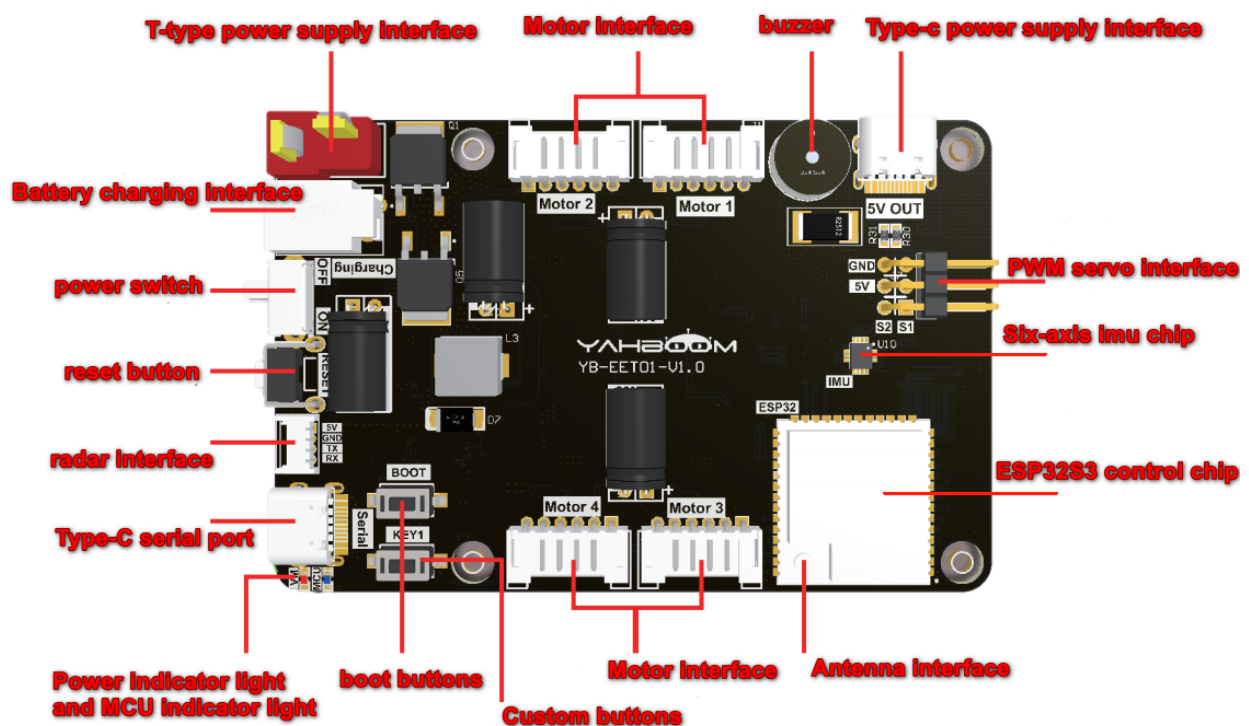


The microROS control board is a lightweight ROS2 driver controller and an ESP32S3 dual-core development board. The board integrates important peripherals such as the ESP32S3 core module control unit, motor driver, steering gear driver, and six-axis IMU attitude sensor. It supports WiFi, Bluetooth, serial port and other communication functions, supports four encoder motors, two PWM servos and one laser radar. It also has a PD power supply powered by Raspberry Pi 5. The peripheral driver firmware comes with the factory, and users can directly access the ROS2 environment for use. It is convenient to operate, simple and efficient to use.

## Onboard resource description



Battery power supply interface: Connect a 7.4V battery (T-shaped interface) to power the robot.

Battery charging interface: Connect the DC8.4V charger to charge the robot.

Power switch: main power switch of the robot.

Reset button: The reset button of the ESP32S3 control chip.

Radar interface: connect to MS200 laser radar.

Type-C serial port: used for burning firmware, configuring parameters, serial communication and other functions.

Power indicator light and MCU indicator light: indicate the current status of the product.

BOOT button: The BOOT button of the ESP32S3 control chip can also be used as a custom button.

Custom buttons: GPIO of ESP32S3 control chip, programmable custom functions.

Motor interface: connect to 310 encoder motor.

Antenna interface: connect external antenna.

ESP32S3 control chip: The main control chip of the microROS control board, which is responsible for managing all peripheral functions on the board.

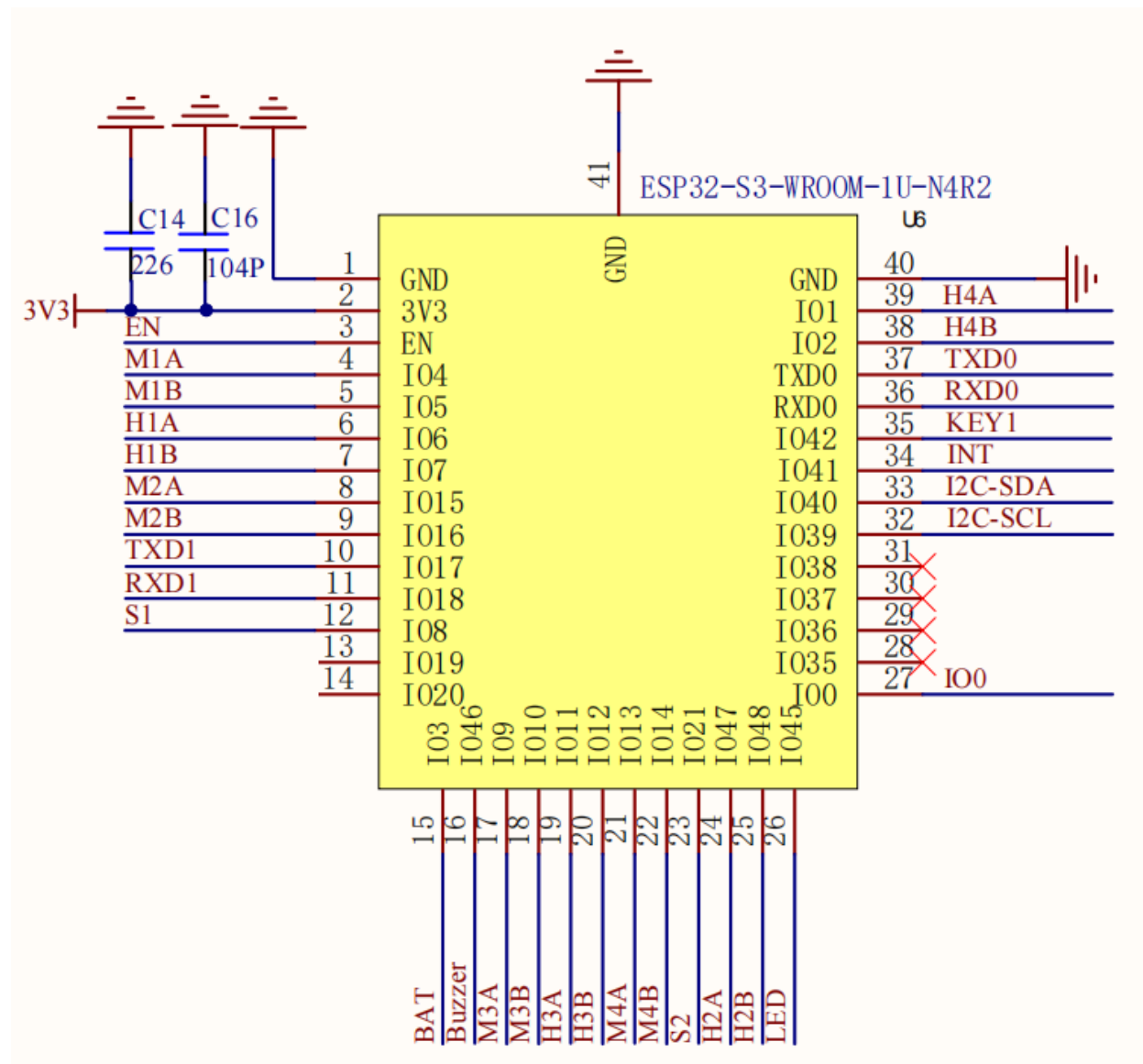
Six-axis IMU chip: Provides the current attitude information of the robot.

PWM servo interface: used to connect two PWM servos.

Type-C power supply interface: Connect to the Type-C interface of Raspberry Pi 5 to power Raspberry Pi 5.

Buzzer: active buzzer, used for low voltage alarm prompts.

## GPIO pin assignments



Peripheral name	ESP32-S3-GPIO
Motor M1-PWM-M1A	GPIO4
Motor M1-PWM-M1B	GPIO5
Motor M1-Encoder-H1A	GPIO6
Motor M1-Encoder-H1B	GPIO7
Motor M2-PWM-M2A	GPIO15
Motor M2-PWM-M2B	GPIO16
Motor M2-Encoder-H2A	GPIO47
Motor M2-Encoder-H2B	GPIO48
Motor M3-PWM-M3A	GPIO9
Motor M3-PWM-M3B	GPIO10
Motor M3-Encoder-H3A	GPIO11
Motor M3-Encoder-H3B	GPIO12
Motor M4-PWM-M4A	GPIO13
Motor M4-PWM-M4B	GPIO14
Motor M4-Encoder-H4A	GPIO1
Motor M4-Encoder-H4B	GPIO2
BOOT button-IO0	GPIO0
Custom buttons-KEY1	GPIO42
Battery voltage detection-BAT	GPIO3
MCU indicator light-LED	GPIO45
Buzzer	GPIO46
Servo interface-S1	GPIO8
Servo interface-S2	GPIO21
IMU interruption-INT	GPIO41
IMU-I2C-SCL	GPIO39
IMU-I2C-SDA	GPIO40
Radar RX-serial port 1-TXD1	GPIO17

Peripheral name	ESP32-S3-GPIO
Radar TX-serial port 1-RXD1	GPIO18
TypeC flash serial port RX-TXD0	GPIO43
TypeC flash serial port TX-RXD0	GPIO44