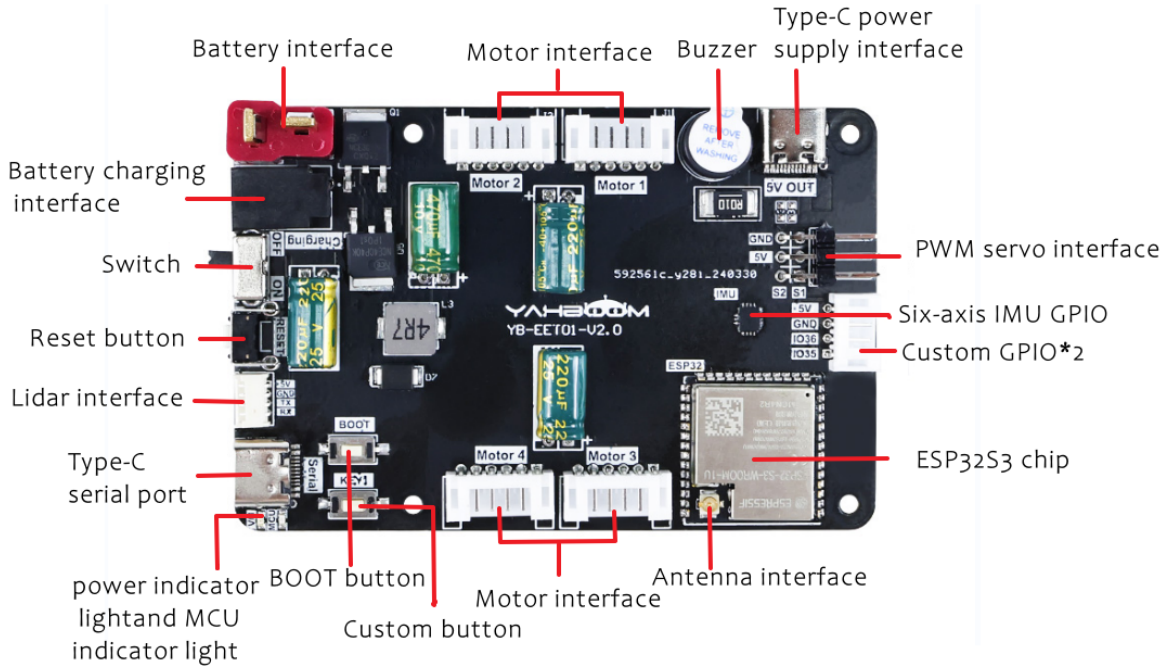
Introduction to microROS control board

The microROS control board is a lightweight ROS2 driver controller and an ESP32S3 dual-core development board. The board integrates ESP32S3 core module control unit, motor driver, servo driver, six-axis IMU attitude sensor and other important peripherals. It supports WiFi, Bluetooth, serial port and other communication functions, and supports four-way encoder motors and two-way PWM servos. , one laser radar and one PD power supply for Raspberry Pi 5. The peripheral driver firmware is shipped from the factory. Users can directly access the ROS2 environment for use. It is easy 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.

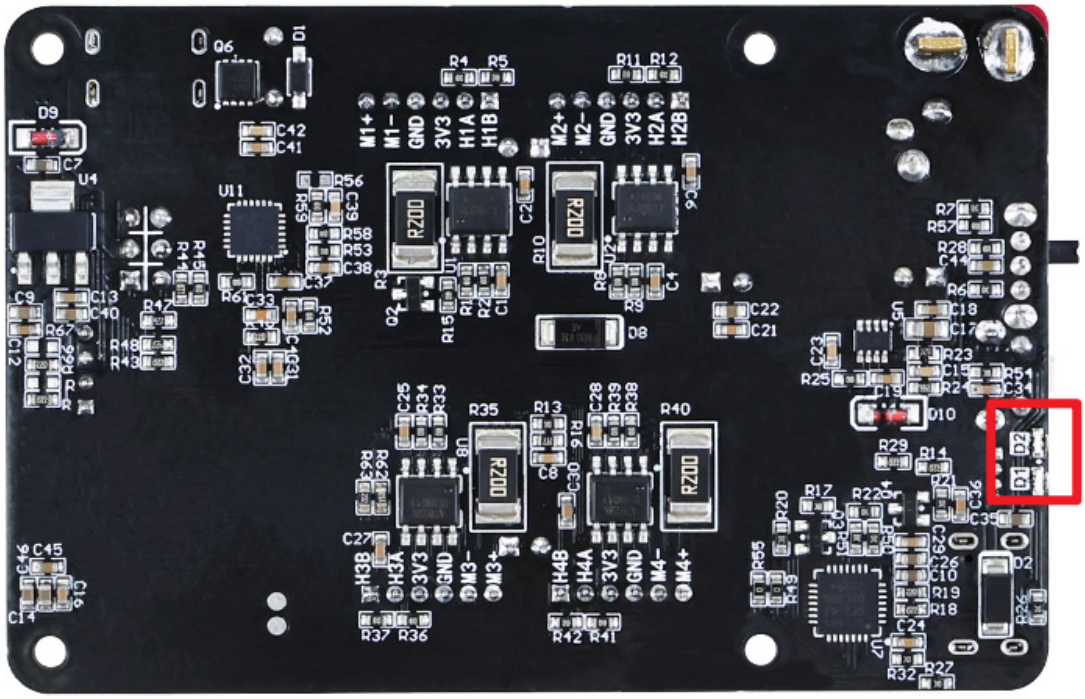
Custom GPIO: Programmable custom functions.

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

PWM servo interface: used to connect two PWM servos.

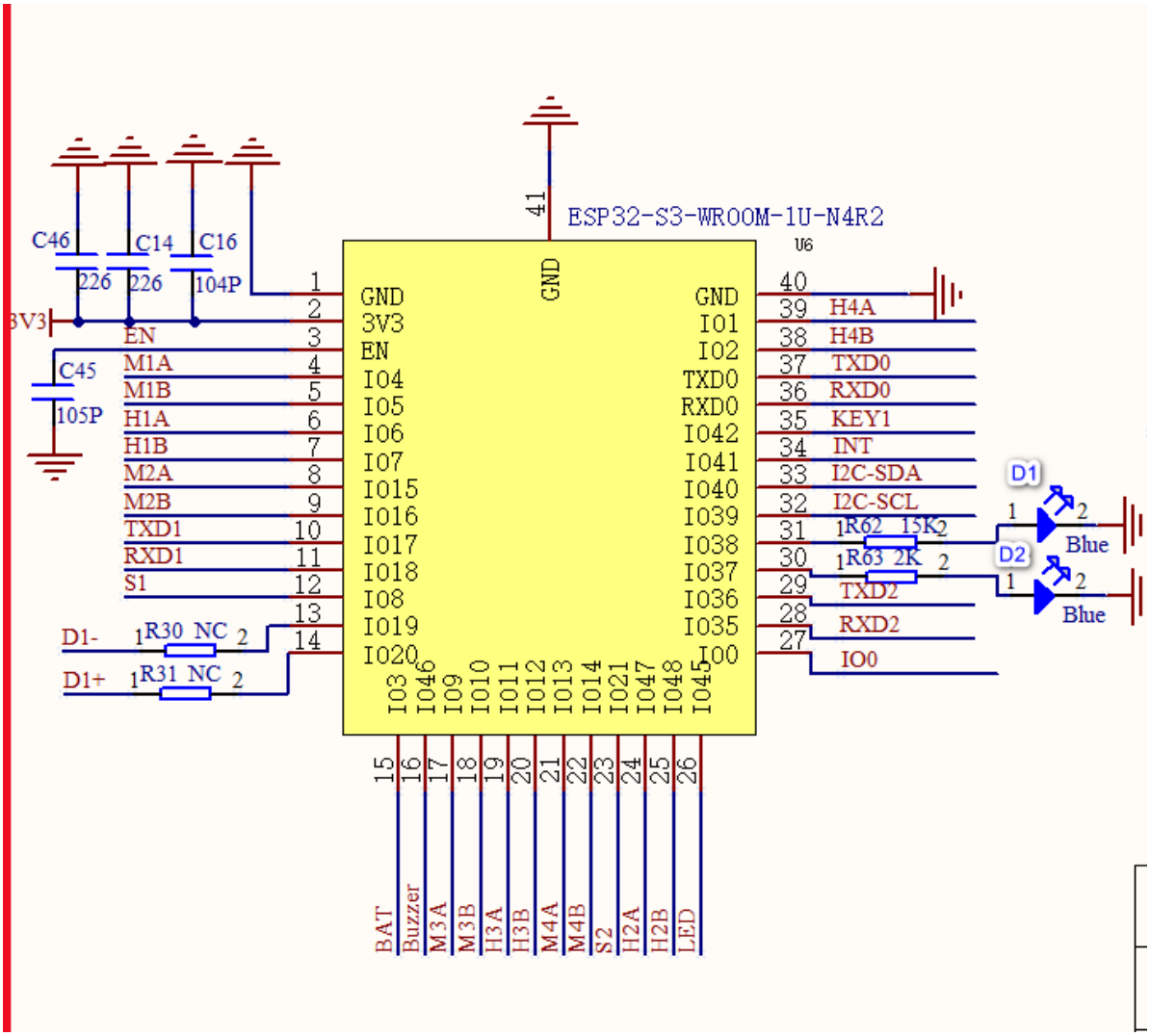
Type-C power supply interface: Connect to the Type-C interface of Raspberry Pi 5 to power Raspberry Pi 5.

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



D1 and D2: Custom indicators.

GPIO pin assignments


ESP32-S3-WROOM-1U-N4R2
U6
GND
3V3
EN
IO4
IO5
IO6
IO7
IO15
IO16
IO17
IO18
IO8
IO19
IO20
IO3
IO46
IO9
IO10
IO11
IO12
IO13
IO14
IO21
IO47
IO48
IO45
GND
IO1
IO2
TXD0
RXD0
IO42
IO41
IO40
IO39
IO38
IO37
IO36
IO35
IO0
C46
C14
C16
226
226
104P
C45
105P
M1A
M1B
H1A
H1B
M2A
M2B
TXD1
RXD1
S1
D1-
D1+
R30 NC
R31 NC
H4A
H4B
TXD0
RXD0
KEY1
INT
I2C-SDA
I2C-SCL
R62 15K2
R63 2K
TXD2
RXD2
IO0
D1
D2
Blue
Blue
BAT
Buzzer
M3A
M3B
H3A
H3B
M4A
M4B
S2
H2A
H2B
LED

Peripheral name	ESP32-S3-GPIO
Motor M1-PWM-M1A	GPIO4
Motor M1-PWM-M1B	GPIO5
Motor M1-Encoder-H1A	GPIO6
Motor M1-Encode-H1B	GPIO7
Motor M2-PWM-M2A	GPIO15
Motor M2-PWM-M2B	GPIO16
Motor M2-Encode-H2A	GPIO47
Motor M2-Encode-H2B	GPIO48
Motor M3-PWM-M3A	GPIO9
Motor M3-PWM-M3B	GPIO10
Motor M3-Encode-H3A	GPIO11
Motor M3-Encode-H3B	GPIO12
Motor M4-PWM-M4A	GPIO13
Motor M4-PWM-M4B	GPIO14
Motor M4-Encode-H4A	GPIO1
Motor M4-Encode-H4B	GPIO2
BOOT button-IO0	GPIO0
Customized keys-KEY1	GPIO42
Battery voltage detection-BAT	GPIO3
MCU indicator-LED	GPIO45
Buzzer-Buzzer	GPIO46
Servo interface-S1	GPIO8
Servo interface-S2	GPIO21
IMU interrupt-INT	GPIO41
IMU-I2C-SCL	GPIO39
IMU-I2C-SDA	GPIO40
Radar RX-serial port 1-TXD1	GPIO17
Radar TX-serial port 1-RXD1	GPIO18
TypeC burning serial port RX-TXD0	GPIO43
TypeC burning serial port TX-RXD0	GPIO44

Peripheral name	ESP32-S3-GPIO
Custom GPIO	GPIO35
Custom GPIO	GPIO36
Customized indicator light	D1
Customized indicator light	D2

Expansion board wiring diagram