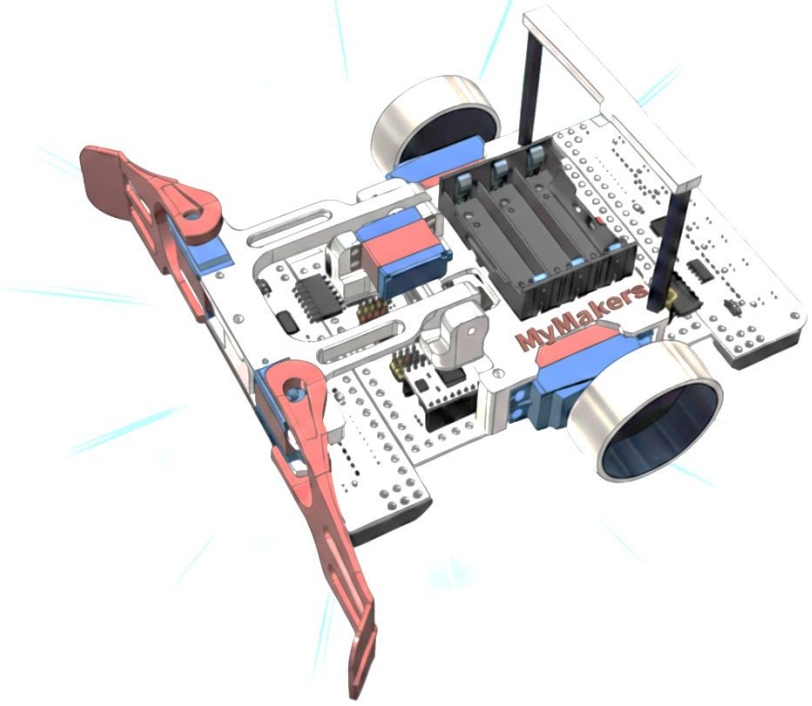
MY RP-PRO V 2.0

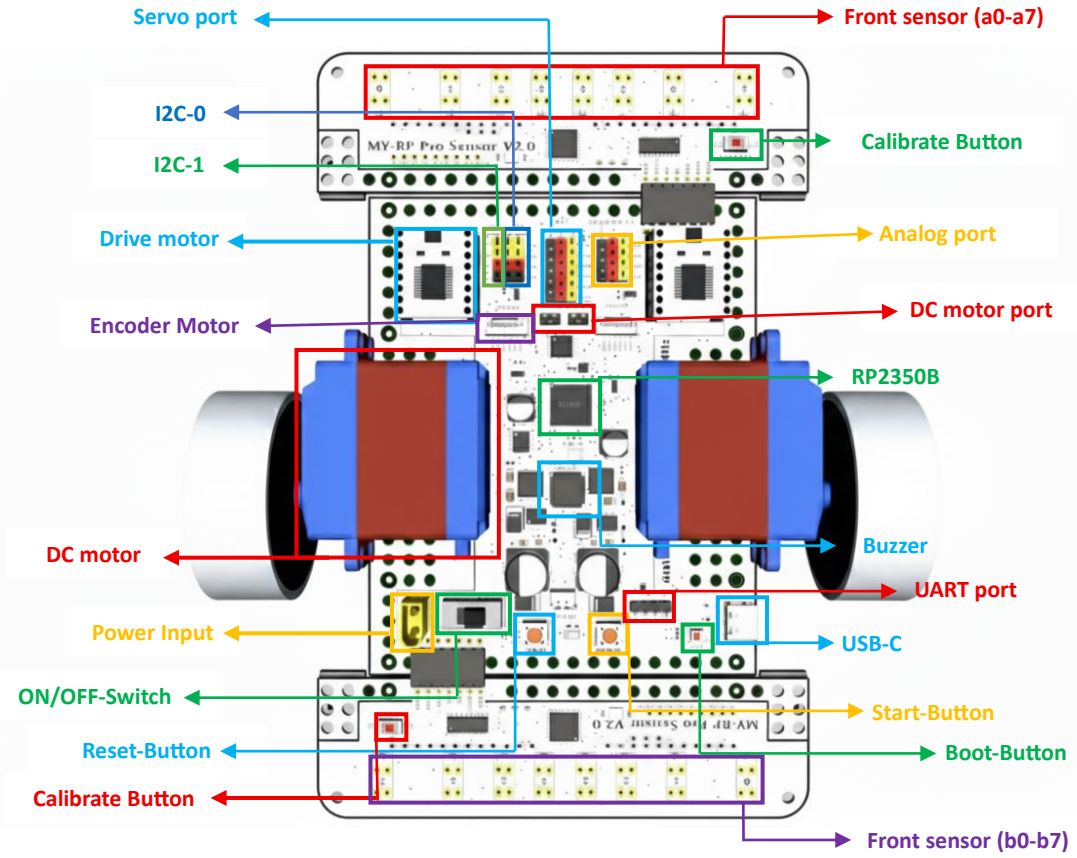
"Advanced Line-Following Robot for Beginners"

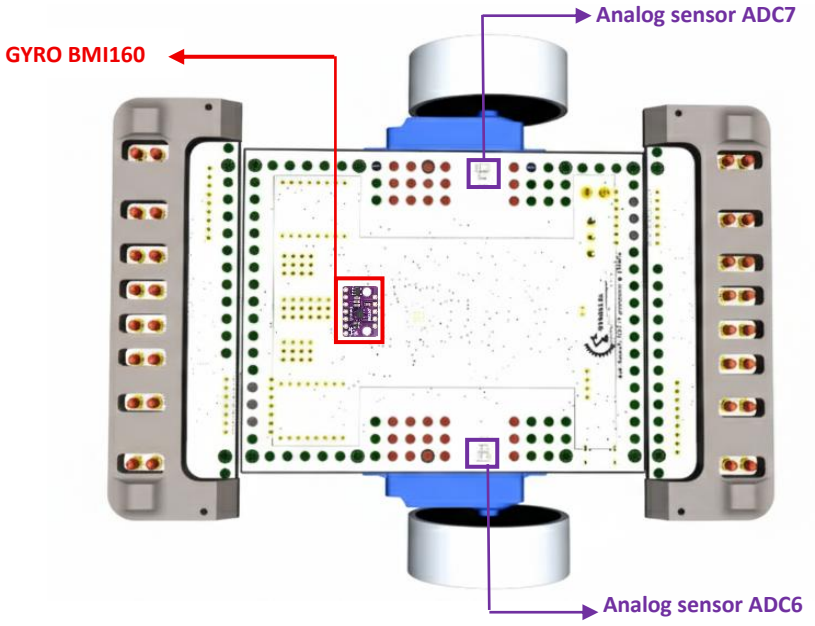


Datasheet

July 2025

1. BOARD LAYOUT & FUNCTION





Function	Description
Power Input	External DC power connector 3.6V-16V Can use three external Li-ION batteries or four AA batteries.
ON/OFF-Switch	Turn On/Off the power.
Reset-Button	A button used to reset the microcontroller to its default state.
Start-Button	It is a push button (Tactile Switch) that connects to the board, such as GPIO 39, to command the robot to start moving, turn on sensors, or run a specified code.
Boot-Button	The button used to enter bootloader mode to upload or reset firmware. (Press and hold the Boot button while USB is connected or reset the board to put the RP2350B into USB Mass Storage mode (appears as an "RP2350" drive on the computer)).
UART port	Serial communication channel used for sending and receiving data between the board and other devices such as computers, sensors, or other modules.
USB-C	The port is used to connect the board to a computer or power supply. It plays a crucial role in powering, uploading code, and communicating data.
DC motor port	A port or pin used to connect and control a DC (Direct Current Motor) motor to drive the robot, such as turning wheels or other mechanisms.
Encoder Motor	(Rotation sensor) To detect the speed, direction, or number of revolutions of the motor, allowing the robot to move more precisely, such as in line-following or obstacle-avoiding robots. Motor_L **Channel A: GPIO pins, such as GP10** **Channel B: GPIO pins, such as GP11** Motor_L **Channel A: GPIO pins, such as GP7** **Channel B: GPIO pins, such as GP2** VCC/GND: Connect to the board's 3.3V/GND
Drive motor	Circuit used to control the direction and speed of the motor Uses the TB6612FNG as a DC motor driver chip. Supports direction and speed control via digital signals and PWM signals from the microcontroller. **AIN1, AIN2 / GP22, GP23** control the direction of motor A. **BIN1, BIN2 / GP21, GP20** control the direction of motor B. **PWMA, PWMB/ GP26, GP3** control the speed with PWM signals.

Function	Description
DC motor	DC Motor HM-500MG (12V Coreless Motor) - All Metal Housing
Analog port	A port or pin used to read analog signals (Analog Input), often used to receive data from sensors such as light, temperature, or potentiometer sensors. ADC0 → GPIO40 ADC1 → GPIO41 ADC2 → GPIO42 ADC3 → GPIO43 ADC6 → GPIO46 ADC7 → GPIO46
Servo port	A port or pin used to control a servo motor, which is a motor that can rotate at a specified angle (such as 0-180 degrees) with high precision. Signal (Orange/Yellow): Connects to the GPIO pin set to PWM (GPIO34, GPIO35, GPIO36, GPIO37, GPIO38, GPIO39). VCC (Red): Connects to the 5V power supply.
I2C -0	I2C (Inter-Integrated Circuit) communication channel 0 is a serial communication protocol used to connect devices such as sensors, OLED displays, or other I2C-enabled modules. **SDA (Serial Data)**: GPIO4 **SCL (Serial Clock)**: GPIO5
I2C -1	The first I2C (Inter-Integrated Circuit) communication channel, one of two I2C controllers (I2C-0 and I2C-1) supported by the RP2350B, is used to connect to devices such as sensors, OLED displays, or other modules that use the I2C protocol. **SDA (Serial Data)**: GPIO26 **SCL (Serial Clock)**: GPIO27
Front sensor (a0-a7)	External ADC converts analog signals to digital with a resolution of 10 bits (0-1023).Eight analog channels (CH0-CH7) are available for connecting sensors via the SPI (Serial Peripheral Interface) communication line. read_sensorA(0) - read_sensorA(5)
Front sensor (b0-b7)	External ADC converts analog signals to digital with a resolution of 10 bits (0-1023).Eight analog channels (CH0-CH7) are available for connecting sensors via the SPI (Serial Peripheral Interface) communication line. read_sensorB(0) - read_sensorB(5)
Calibrate Button	Button for sensor calibration

Function	Description
Buzzer	An audio signal device connected to the board to produce sounds such as alarms, confirmation sounds, or signals in a robot. Connect the **GPIO32** that supports PWM to generate audio frequencies.
RGB LEDs	An LED that can display red, green, and blue colors by mixing them to create different colors. It is used for status indication or decoration in robots. Red → **GPIO25** GREEN → **GPIO24** BLUE → **GPIO28**

DIMENSION