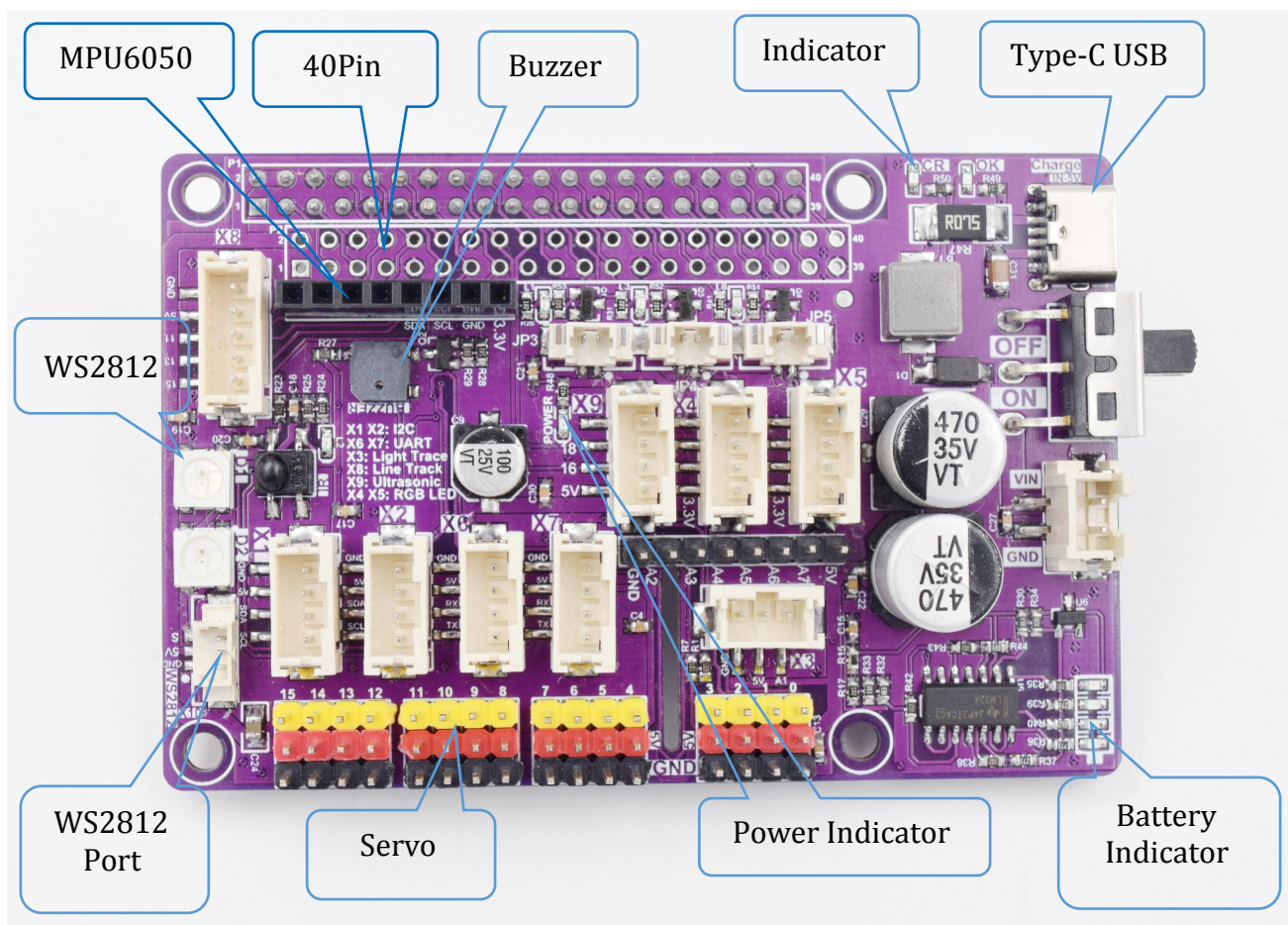
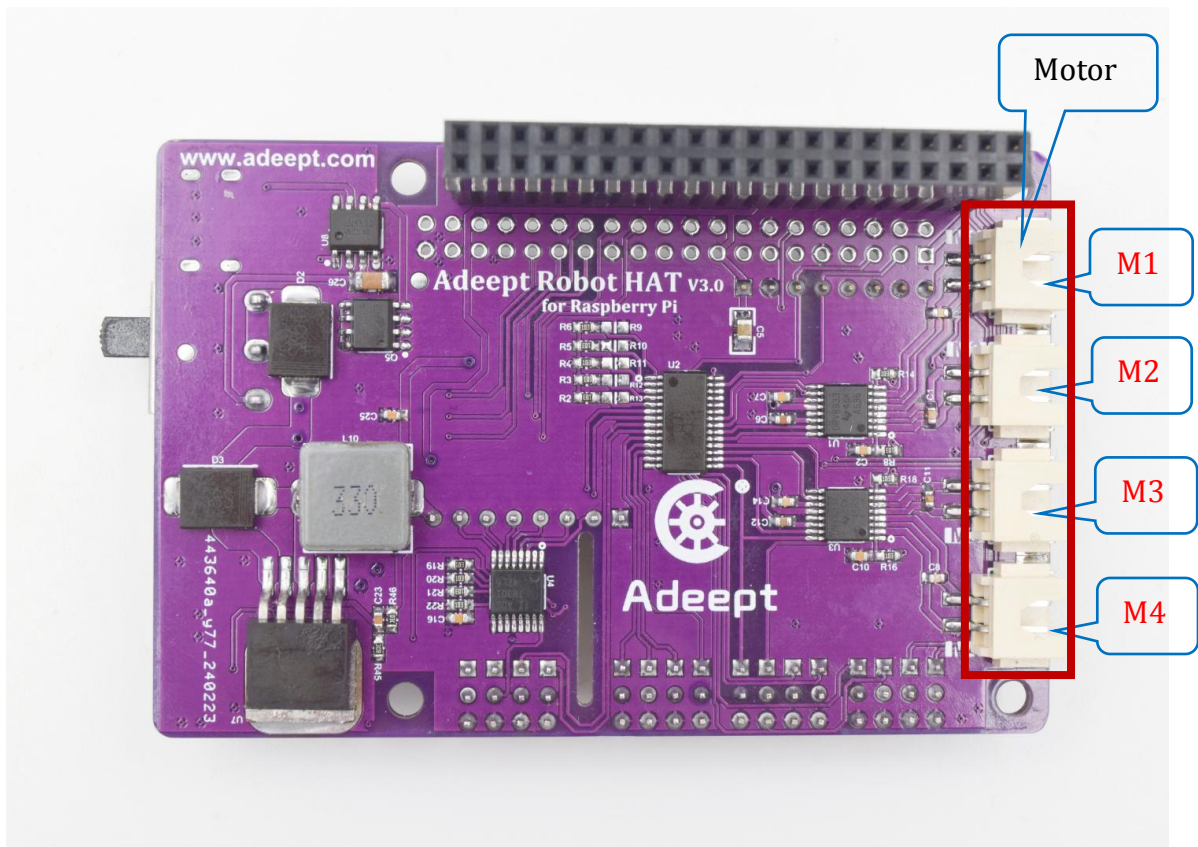
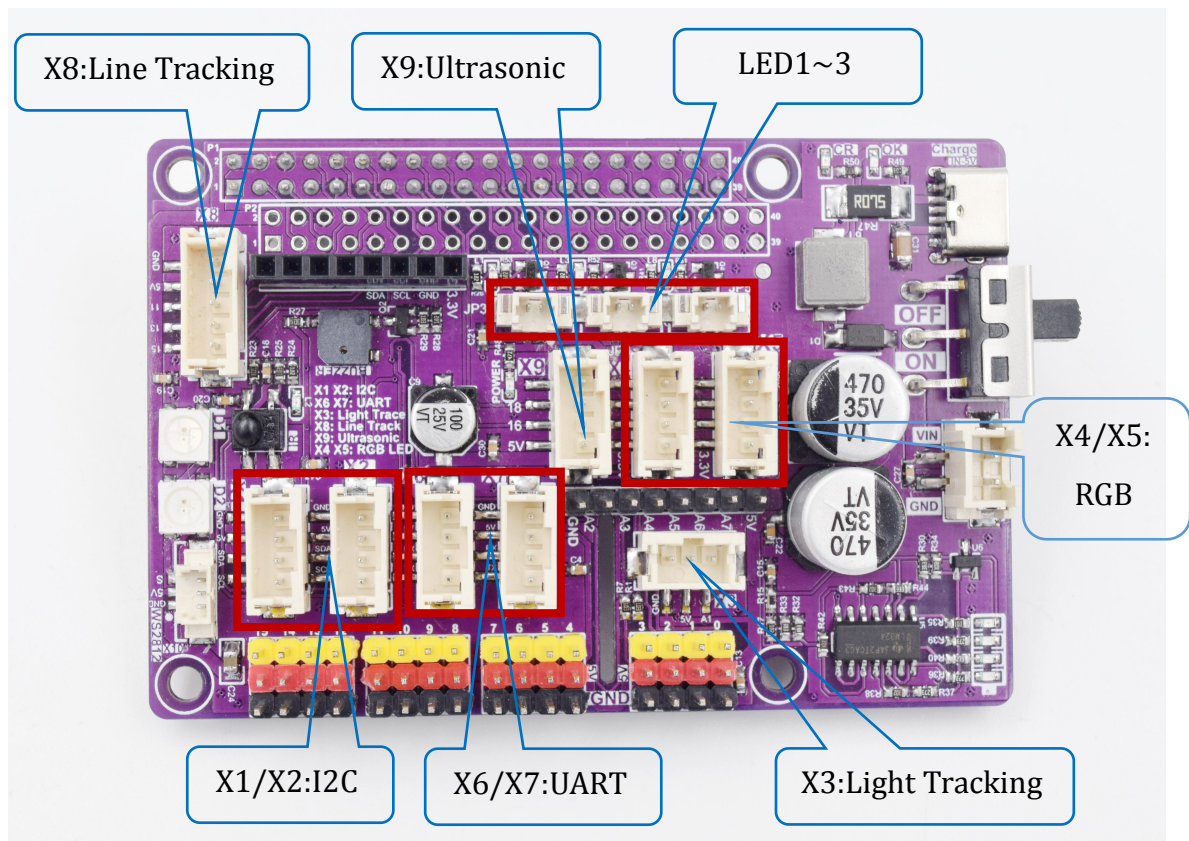


## Lesson 2 Introduction to the AdeepT Robot HAT V3.1

### 2.1 Introduction to the AdeepT Robot HAT V3.1

When you get the robot product, you will see a board with its name printed onside: AdeepT Robot HAT V3.1, which is an important part of the robot. There are many interfaces on the AdeepT Robot HAT V3.1. You can connect sensors and electronic hardware modules to the board by those interfaces to realize more functions. Let's first get to know the AdeepT Robot HAT V3.1.





Name	Description
Power	The Power interface is an interface for external power supply.
Switch	The switch is used to turn the Adeept Robot HAT V3.1 ON/OFF.
Type-C USB	It is used to power the motherboard or charge the battery.
Buzzer	Onboard passive buzzer.
IR	Onboard IR receiver.
40Pin	This interface corresponds to the Raspberry Pi 40Pin and can be used to expand the interface.
MPU6050	I2C interface for installing MPU6050 module.
WS2812	2 onboard WS2812 LEDs.
WS2812 Port	The WS2812 extension port is used to expand the number of WS2812 LEDs.
Servo port	Servo interface.
Motor	Used to connect motors. 4 motor ports M1, M2, M3, M4.
X1/X2: I2C	The I2C interface can be used to connect I2C devices, such as OLED displays.
X3: Light Tracking	Used to connect Light Tracking module.
X4/X5: RGB	Connect the RGB LED module.



X6/X7: UART	Uart interface.
X8: Line Tracking	The pin interface of Line Tracking Module.
X9: Ultrasonic	Ultrasonic interface.
LED1~3	There are three LED lights on board. Each LED is connected to a switch interface, which can be used to connect LED and other equipment.
Indicator	The battery charging indicator light: The red light is on when the battery is connected and being charged. The green light is on when the battery is either not connected or fully charged.
Battery indicator	Four LEDs, each representing around 25% battery level. The last LED light is red. When there is only the last red light, it means the battery is low.
Power Indicator	It lights up when Adeept Robot HAT V3.1 is connected to power. Controlled by switch.

## 2.2 Precautions for Using the Adeept Robot HAT V3.1

When you are performing software installation, structural assembly or program debugging, you can use a USB cable to power the Raspberry Pi. If the Raspberry Pi is equipped with Adeept Robot HAT V3.1, you can connect the USB cable to the USB port on the Adeept Robot HAT V3.1, and it will power the Raspberry Pi through the GPIO interface.

Different Raspberry Pi models have distinct current requirements. For instance, the early Raspberry Pi 3B needs at least 2A of current to boot up, and the Raspberry Pi 4 requires 3A for normal startup. The Raspberry Pi 5, with its enhanced hardware performance, has even more stringent power supply demands. Equipped with a more powerful processor and rich interface functions, it has a significantly increased demand for current stability when operating at full load.

Officially, a power adapter with an output current of at least 5A is recommended for the Raspberry Pi 5. This ensures stable startup and normal operation in complex computation and multi - device connection scenarios, preventing abnormal device operation, system crashes, or

hardware damage due to insufficient power supply. When using a power adapter for the Raspberry Pi 5, carefully check its specifications to confirm it meets the requirements. If the output current is lower than the recommended value, the Raspberry Pi 5 may fail to start normally. Even if it does start, issues like screen flickering, slow device response, and data transmission interruptions may occur during operation, severely affecting the user experience.

When Adeept Robot HAT V3.1 is connected to a load, such as a motor or a few servos, a high-current power supply is required to connect to Vin on the Adeept Robot HAT V3.1. You can use two high-current 18650 batteries for power supply. The Adeept robot provides a dual 18650 battery box with a 2-pin interface for you to supply power to the Adeept Robot HAT V3.1.

If your robot reboots automatically after booting, or disconnects and reboots at the moment it starts to move after normal booting, it is likely that your power supply does not provide enough current as the robot automatically runs the program to control all servos to rotate to the center position when booting – it then drops the voltage on the Raspberry Pi and causes a reboot.

We've tested when powering with 7.4V, the peak current of the robot would be around 3.75A, which means you need to connect batteries with a 4A output.

You may also power the Adeept Robot HAT V3.1 with high energy li-ion battery; Adeept Robot HAT V3.1 can be supplied by a power source under 15V.