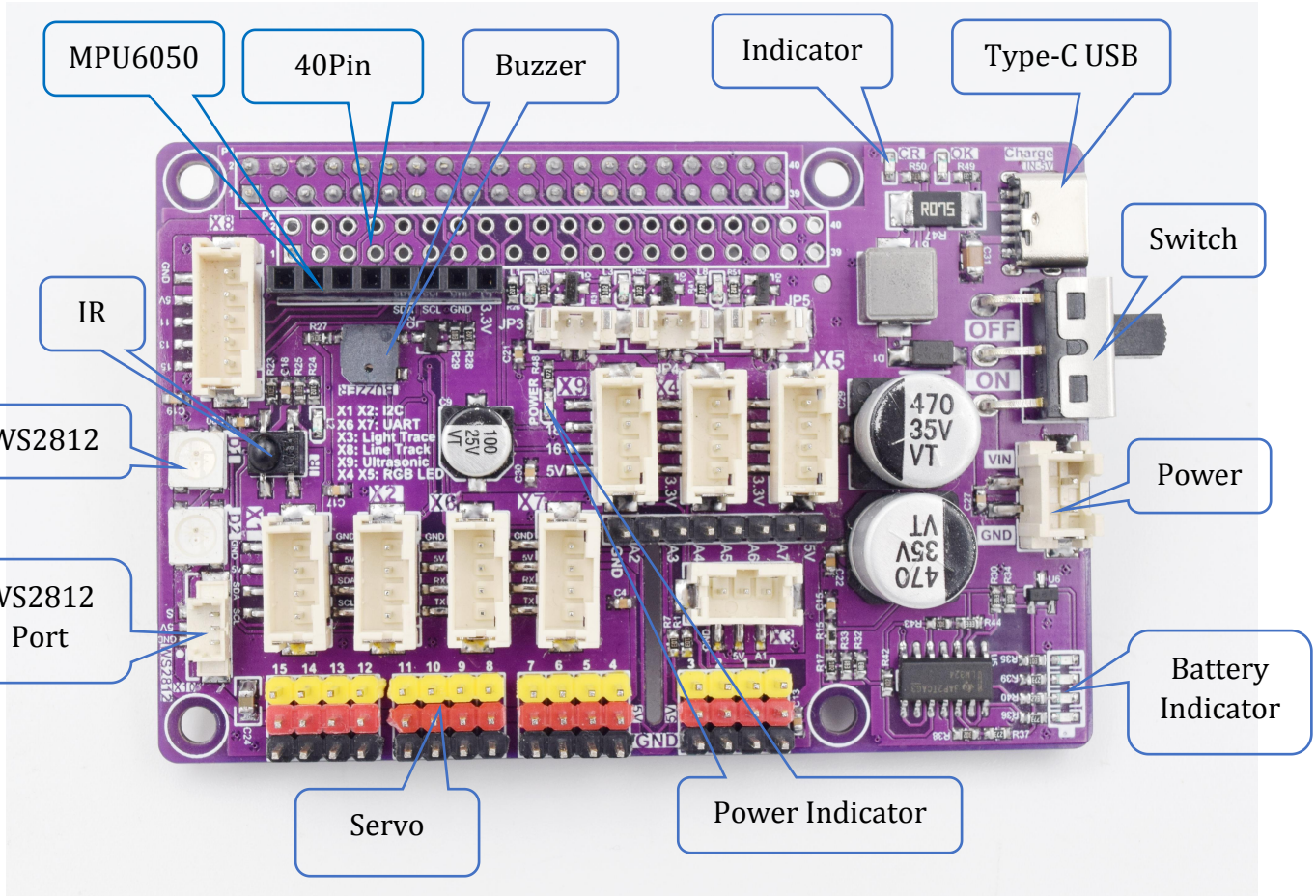
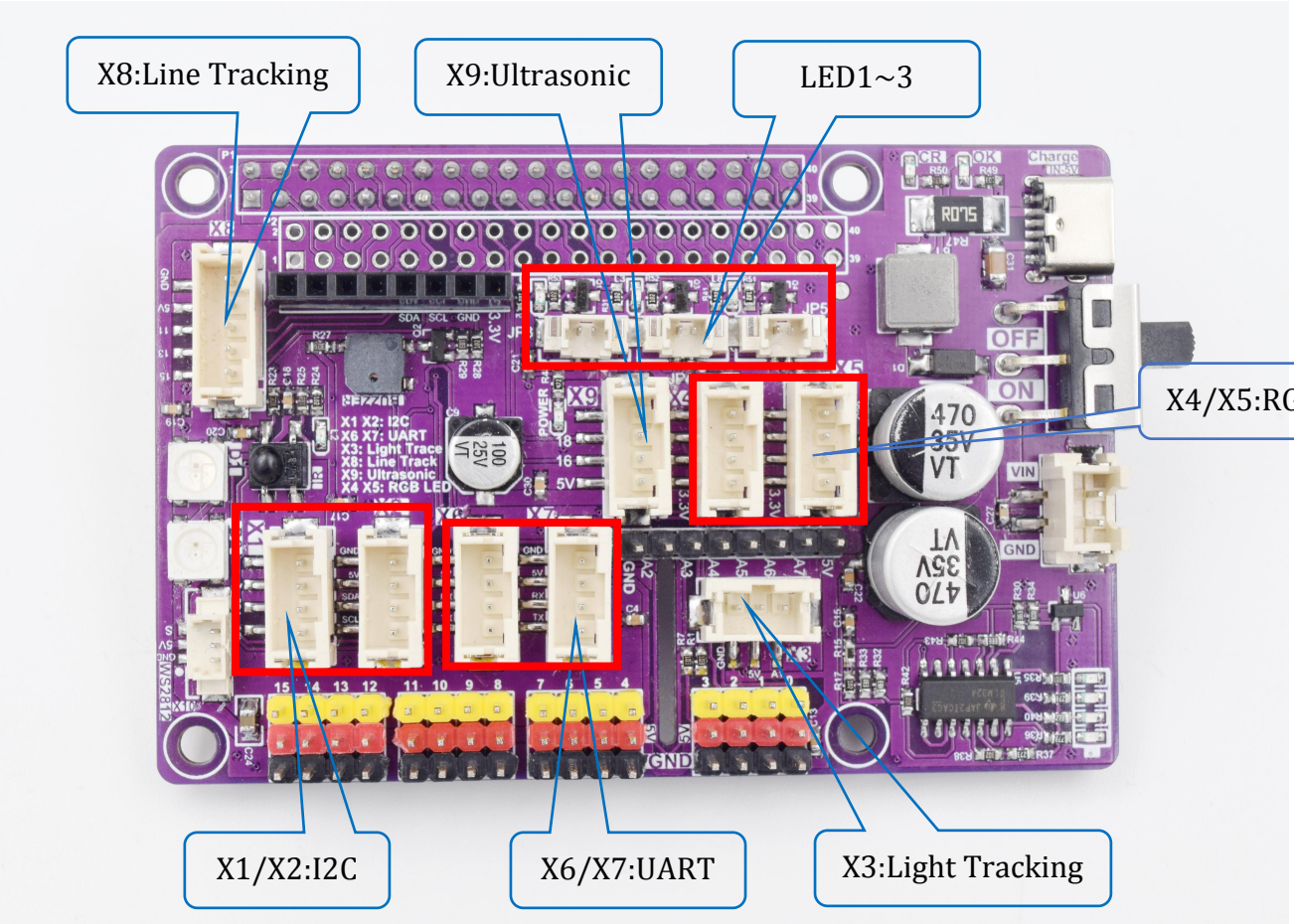
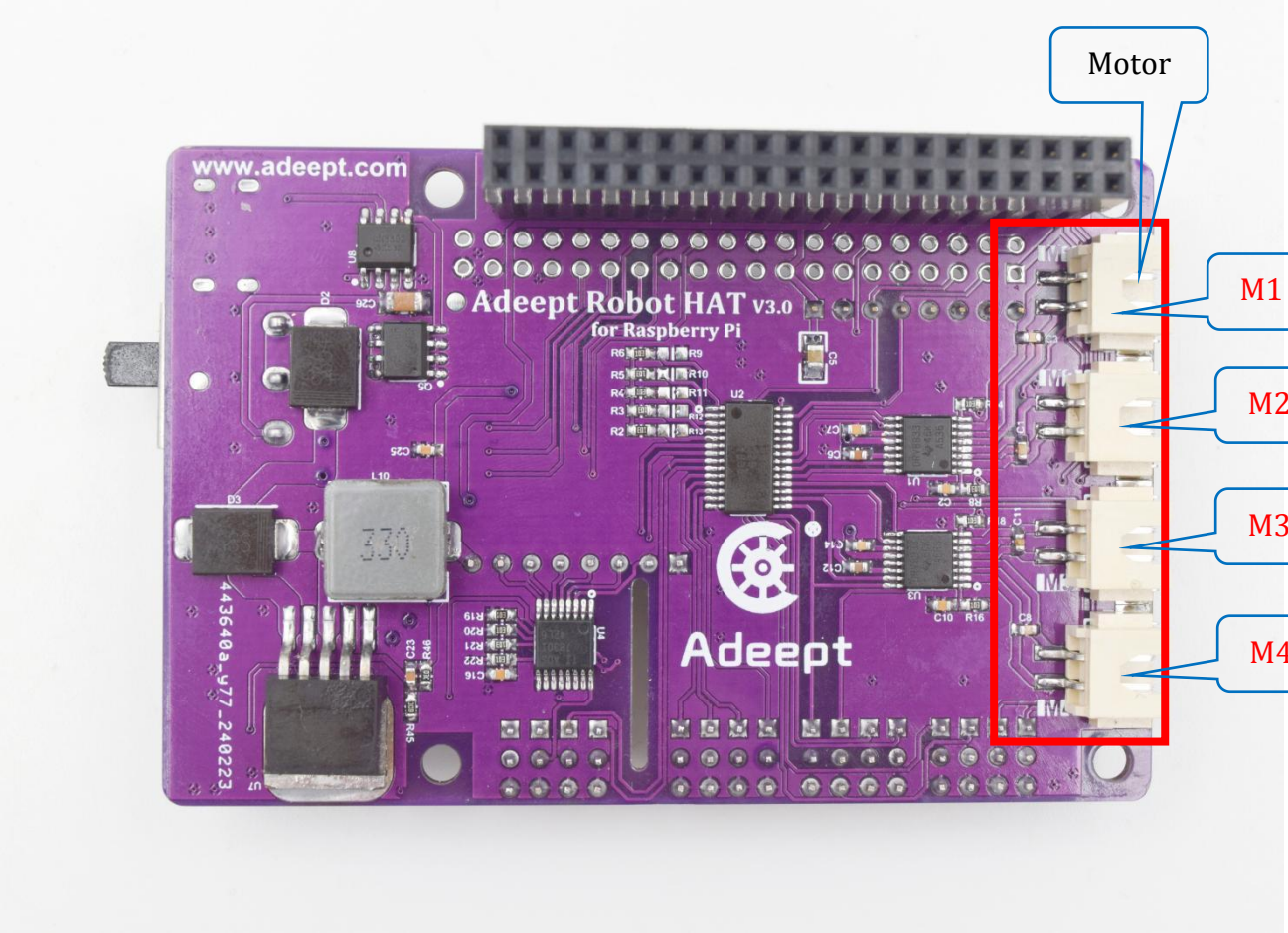
Lesson 2 Introduction of Adeept Robot HAT V3.1

2.1 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. This robot works on the Raspberry Pi. Let's first get to know the Adeept Robot HAT V3.1.




X8:Line Tracking
X9:Ultrasonic
LED1~3
X4/X5:RGB
X1/X2:I2C
X6/X7:UART
X3:Light Tracking



Name	**Description**
Power	The Power interface is an interface for external power supply.
Switch	Switch is to turn the Adeept Robot HAT V3.1 ON/OFF.
Type-C USB	Used to power the motherboard or charge the battery.
Buzzer	Onboard passive buzzer.
IR	Onboard IR receiver.
40Pin	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	WS2812 extension port. 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	I2C interface, can connect I2C devices, such as OLED
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	Battery charging indicator light, red light is on when the battery is connected and charging. Green light is on when the battery is not connected or the battery is 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 will power the Raspberry Pi by the GPIO interface.

Different Raspberry Pi models have specific requirements for current. For example, the Raspberry Pi 3B needs at least 2A to boot up, yet the Raspberry Pi 4 needs 3A to boot normally. When you use the power adapter to power the Raspberry Pi, you can check the specifications on your power adapter.

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 batterie 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.

When assembling the servo rocker arm, you can use a USB cable to power the Adeept Robot HAT V3.1. After the Raspberry Pi with the robot software is installed, it will control the Adeept Robot HAT V3.1 to set all the servo ports to output a signal of rotating to the center position. You can connect the servo to any port. The servo shaft will rotate to the center position, and then you can install the servo rocker arm at the specified angle. After the rocker arm is assembled, you can disconnect the servo from the Adeept Robot HAT V3.1. To connect the rocker arm for another servo, just wire the servo to any servo port on the Adeept Robot HAT V3.1.