

# Lesson 23 Remote Control - Introduction to WEBUI (Recommended)

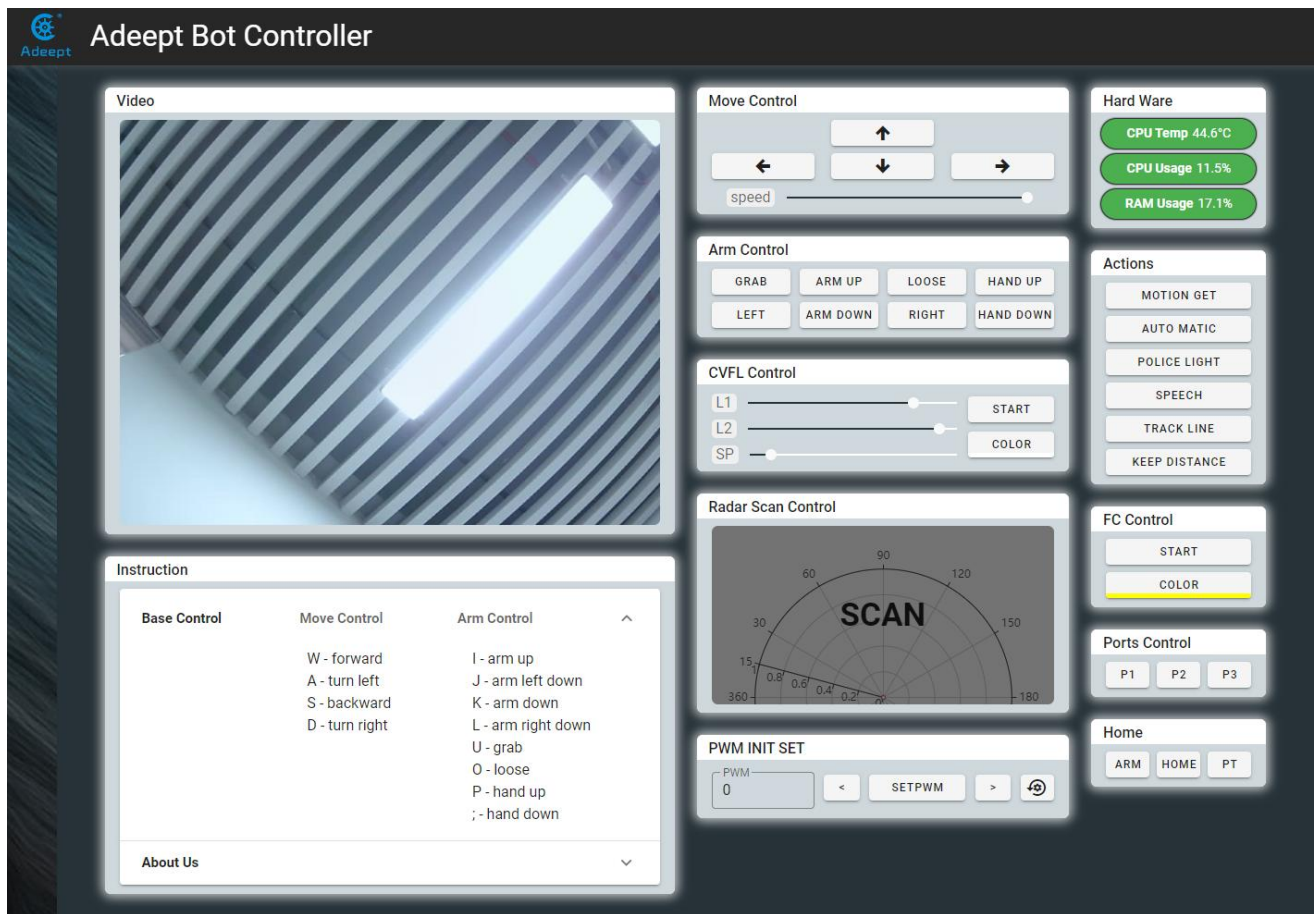
## 23.1 Overview

In this lesson, we will explore the Web - based User Interface (WEBUI) for remote - controlling a robot. This WEBUI provides a convenient and intuitive way to interact with the robot, enabling users to control various aspects such as movement, arm operations, and sensor - based functions.

## 23.2 Getting Access to Web Controller

- A web controller is a web interface to control the robot product to perform various actions and it can be applied on any device that is able to run a browser, including PC, mobile phones, tablets, etc.
- If you've completed all installations based on the instructional document, it will be quite easy to open a web controller.
  1. Check that your device is under the same LAN with the Raspberry Pi.
  2. Obtain the Raspberry Pi's IP address.
  3. Open a web browser (recommended to use Chrome in case of any possible incompatibility with other browsers), enter the Raspberry Pi's IP address with the port :5000, for instance:  
**192.168.3.31:5000**

Then the web controller will be loaded into the browser.

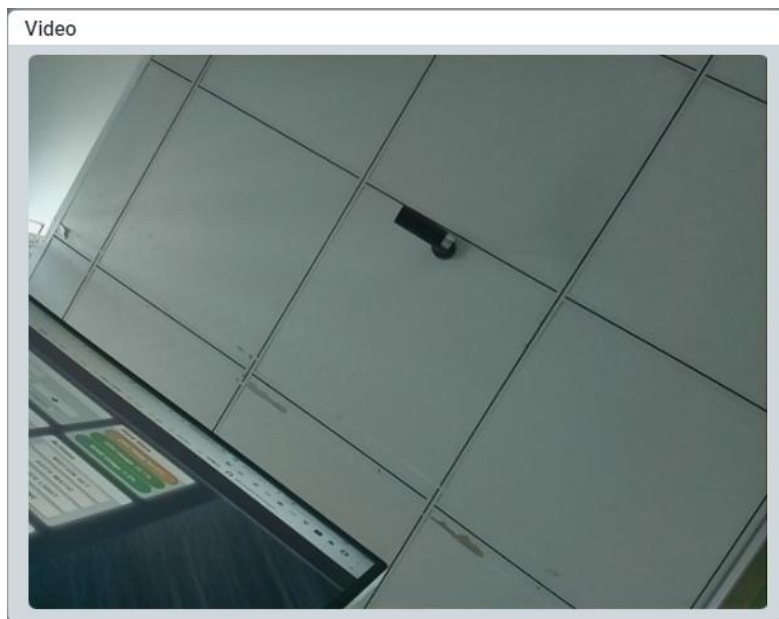


**Modules on the web controller may vary from products.** Most of them are explained below with the method for application. You can check modules on your web controller accordingly to better understand their functions and how to use them.

## 23.3 Principle Introduction

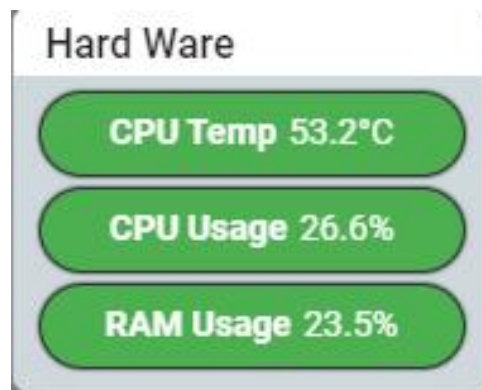
### 1. Video Module

Display the image captured by the camera.



## 2. Hard Ware Module

Display the CPU temperature, as well as the usage of CPU and RAM in real time.



## 3. Move Control Module

Control the movement of the robot towards the front, back, left, and right.



## 4. Arm Control Module

Control the movement of the robotic arm.



## 5. Actions Module

The switches for some functions, such as motion detection, automatic obstacle avoidance, warning lights, speech recognition, and line tracking.



## 6. FC Control Module

Control the color detection function on/off and color setup.



## 7. PWM INIT SET Module

Adjust the angle of the servo motor.

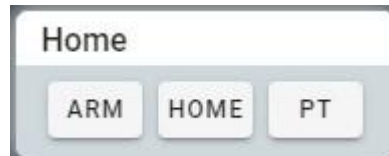


## 8. Ports Control Module

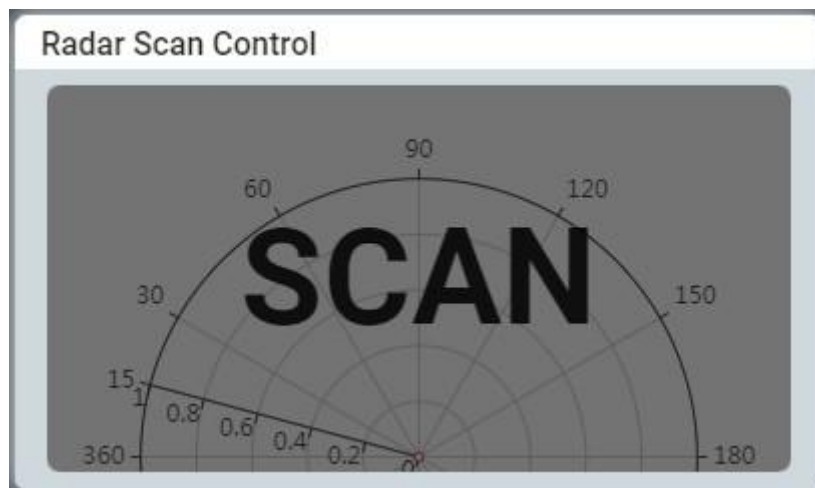
Control the on/off of three LED lights.



## 9. Home Module



## 10. Radar Scan Control Module ( Ultrasonic mode )



The operation instructions are as follows:

	Button	Instruction	Describe
Move Control	UP/The <b>W</b> key on the keyboard	forward/DS	move forward
	DOWN/The <b>S</b> key on the keyboard	backward/DS	move backward
	LEFT/The <b>A</b> key on the keyboard	left/TS	turn left

	RIGHT/The <b>D</b> key on the keyboard	right/TS	turn right
	speed	wsB X	Adjusting speed
Arm Control	GRAB/The <b>U</b> key on the keyboard	grab/stop	Grasp with the claw
	ARM UP/The <b>I</b> key on the keyboard	armup/armstop	The robotic arm moves upwards
	LOOSE/The <b>O</b> key on the keyboard	loose/stop	Loose with the claw
	HAND UP/The <b>P</b> key on the keyboard	handup/HAsstop	The robotic hand moves upwards
	LEFT/The <b>J</b> key on the keyboard	lookleft/LRstopjj	The robotic arm turns left
	ARM DOWN/The <b>K</b> key on the keyboard	armdown/armstop	The robotic arm moves downwards
	RIGHT/The <b>L</b> key on the keyboard	lookright/LRstop	The robotic arm turns right
	HAND DOWN/The <b>;</b> key on the keyboard	handdown/HAsstop	The robotic hand moves downwards
CVFL Control	START	CVFL/stopCV	Switch video tracking line function
	COLOR	CVFLColorSet 0/CVFLColorSet 255	Switch to search for white lines on black or black lines on white.
	L1	CVFL1 X	Set the height of L1 auxiliary line

	L2	CVFLL2 X	Set the height of L2 auxiliary line
Radar Scan Control	SCAN	scan	Used to perform the ultrasound scan function and display the scan results
PWM INIT SET	NUM		Servo connection channel number
	<	SiLeft X	Click the button to control the x-channel servo to rotate clockwise.
	>	SiRight X	Click the button to control the x-channel servo to rotate counterclockwise
	SETPWM	PWMMS X	Click the button to control the x-channel servo to 90 degrees
Hard Ware	CPU Temp		Shows the temperature of the Raspberry Pi CPU
	CPU Usage		Shows the usage of the Raspberry Pi CPU
	RAM Usage		Shows the usage of the Raspberry Pi memory
			Switch to monitor mode, the robot

Actions	MOTION GET	motionGet/stopCV	stops moving and reacts to the moving objects detected by the camera, which are framed in the video module.
	AUTO MATIC	automatic/automaticOff	Switch to automatic obstacle avoidance mode
	POLICE LIGHT	police/policeOff	Make the WS2812 LED lights on the robot flash alternately in red and blue.
	TRACK LINE	trackLine/trackLineOff	Implement line tracking function using a 3-channel infrared module.
	SPEECH	speech/speechOff	<p>Speech recognition requires downloading the <b>sherpa-ncnn</b> library to the <b>home</b> directory.</p> <p>After the voice recognition function is activated, you can say commands such as "forward", "left", "right", "backward", or "stop", and the vehicle will execute the corresponding</p>



			actions.
	KEEP DISTANCE	KeepDistance/keepDistanceOff	Move forward or backward following the object ahead
FC Contorl	START	findColor/stopCV	Turn on/off the color detection function.
	COLOR	{'title': 'findColorSet', 'data': [r,g,b]}	Select the color to be detected
Ports Control	P1	Switch_1_on/Switch_2_off	Control the LED1 light to turn on and off
	P2	Switch_2_on/Switch_2_off	Control the LED2 light to turn on and off
	P3	Switch_3_on/Switch_3_off	Control the LED3 light to turn on and off
Home	ARM	AR	In this mode, the three functions of "SCAN", "Find Color", and "AUTO MATIC" cannot be used
	HOME	home	Returning all servos to their initial positions.
	PT	PT	All functions can be used in this mode