



Tank Bot ESP32



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Summary

A web-controlled tank robot built with ESP32 and L298N motor driver, featuring a web interface with speed control.

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TankBot - ESP32 Web-Controlled Tracked Robot

A web-controlled tank robot built with ESP32 and L298N motor driver, featuring a responsive web interface with speed control.

The bot broadcasts its own wifi, connect with any device and it will automatically open the control page.

Assemble the electrical components to the 3d printed parts, then attach to the chassis.

Hardware Components

Microcontroller: ESP32 DevKit (38-pin, CP2102, USB-C)

Motor Driver: L298N H-Bridge

Motors: 2x 33GB-520-18.7F DC motors (included with chassis)

Chassis: TP101 Tank-style chassis (**widely available**)

Power: 2x 18650 lithium batteries (7.4V nominal) (holder included with chassis)

Fasteners: 12x M3x6 Screws

Wiring Diagram

ESP32 to L298N Connections

ESP32 Pin	L298N Pin	Function
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P16	IN1	Left motor direction
P17	IN2	Left motor direction
P18	IN3	Right motor direction
P19	IN4	Right motor direction
P25	ENA	Left motor speed (PWM)
P26	ENB	Right motor speed (PWM)
GND	GND	Common ground

L298N Setup

1. **Remove the jumpers** from ENA and ENB pins on the L298N
2. Connect ENA to P25 and ENB to P26 as shown above
3. Connect your battery power to the L298N power input
4. Connect motors to OUT1/OUT2 (left) and OUT3/OUT4 (right)

Power Connections

The TP101 chassis includes a dual 18650 battery holder with a power switch. Wire the power as follows:

1. **Battery to L298N:**

Connect battery holder red wire (+) to L298N 12V input

Connect battery holder black wire (-) to L298N GND

2. **L298N to ESP32:**

Connect ESP32 5V pin to L298N 5V input (this powers the L298N's logic circuitry)

Connect L298N GND to ESP32 GND (common ground)

The ESP32 is powered via USB during programming, or via a barrel plug connector tapped from the battery wires during operation

3. **Important Notes:**

The dual 18650 setup provides 7.4V nominal (8.4V fully charged)

The batteries power the L298N's motor outputs via the 12V input

The ESP32's 5V pin powers the L298N's logic circuitry

Always connect common ground between all components

During operation, power the ESP32 with a barrel plug connector from the battery wires

Software Setup

Installation

Installation instructions and software available at [GitHub](#).

How to Use

1. **Power on the robot** - Connect battery and power up the ESP32

2. **Connect to WiFi:**

SSID: TankBot

Password: tankbot2025

3. **Open web interface:**

Open browser and go to: <http://tank.local>

4. **Control the robot:**

Button Mode (default): Arrow buttons for Forward, Backward, Left, Right

Press and hold buttons to move, release to stop

Red STOP button for emergency stop

Joystick Mode: Click "JS" (top-left) to toggle joystick control

Drag joystick to control direction and turning simultaneously

Forward/backward movement + left/right steering

Release joystick to stop

Adjust speed slider for 3 speed levels: Slow, Medium, Fast (works in both modes)

5. Calibrate steering (if robot drifts to one side):

Click the ⚙️ (gear) icon in the top-right corner to open Settings

Drive forward and observe which direction it drifts

Adjust the "Steering Trim" slider in the settings popup:

If drifting LEFT: Move slider to the RIGHT

If drifting RIGHT: Move slider to the LEFT

Fine-tune until robot drives straight

Close the settings popup (trim is automatically saved)

Features

WiFi Access Point: Robot creates its own WiFi network

Captive Portal: Auto-popup control interface when connecting

Responsive Web UI: Works on phones, tablets, and computers

Dual Control Modes: Toggle between button controls and joystick

Button mode: Discrete directional controls (Forward, Backward, Left, Right)

Joystick mode: Analog control with simultaneous forward/back and turning

Speed Control: 3 speed levels (Slow: 160, Medium: 220, Fast: 255)

Steering Trim: Compensate for uneven track tension (-20 to +20 adjustment)

Trim value is saved to flash memory and persists between power cycles

Automatically loaded on startup

Works in both button and joystick modes

Real-time Feedback: Status updates on web interface

Touch Support: Works with touch screens for mobile control

mDNS Support: Access via <http://tank.local>

Troubleshooting

Robot doesn't move

Check battery is charged and connected

Verify all wiring connections

Check that jumpers are removed from ENA/ENB

Use serial monitor to see debug output

Can't connect to WiFi

ESP32 might still be booting (wait 10-15 seconds)

Check password is correct: tankbot2025

Move closer to the robot

Restart ESP32

Motors run at full speed regardless of setting

Ensure jumpers are removed from ENA and ENB

Verify P25 and P26 are connected to ENA and ENB

Web page doesn't load

Verify you're connected to TankBot WiFi

Try <http://192.168.4.1> directly

Clear browser cache

Check serial monitor for ESP32 IP address

Model files



pt101-tank-electronics-mount.stl



pt101-tank-aux-mount.stl



pt101-tank-mount-spacer.stl



spacer-6x3x3-v2.stl

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