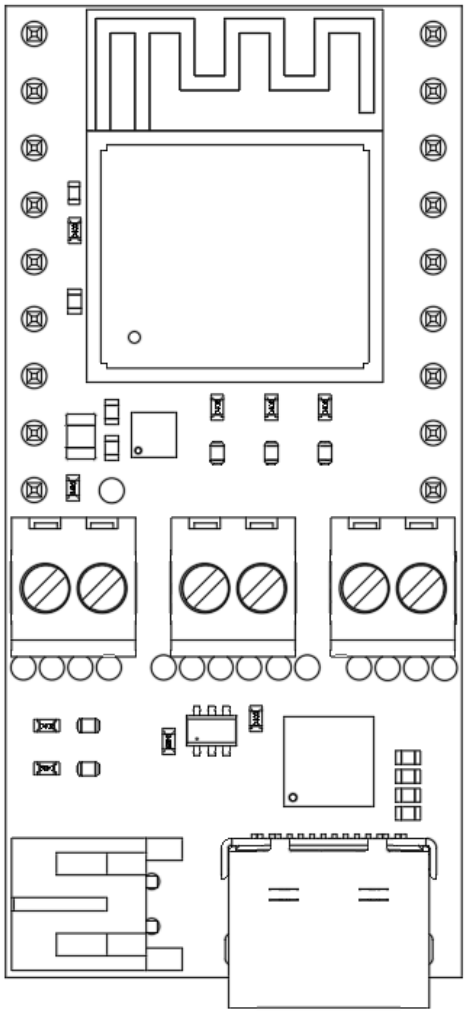
TITAN CORE
QUICKSTART GUIDE

Wideband, High-Definition (HD)
prototyping platform for electronic devices



Product: TITAN CORE Dev board V2.1
Product ID: TC-153286-B

Revised: 06/27/2025

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TITAN Core Quickstart Guide

1. Introduction

1.1 Overview

The **TITAN Core Haptics Development Board** is a compact, production-ready hardware platform designed for rapid prototyping and seamless integration of haptic feedback into consumer electronics. It features ESP32 PICO-MINI-02, 3 independent motor channels, and wireless connectivity in a small footprint.

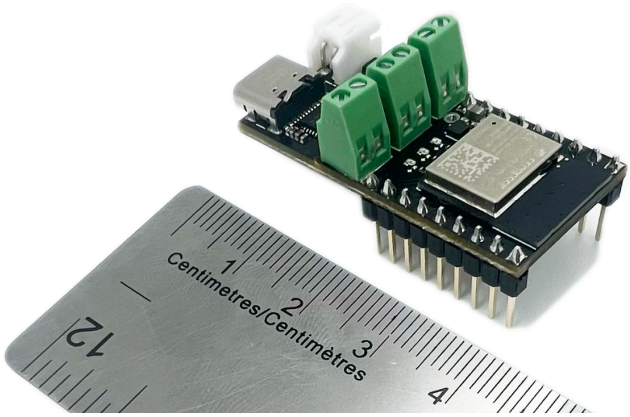


Figure 1.1. TITAN Core Haptics Development Board

1.2 Block Diagram

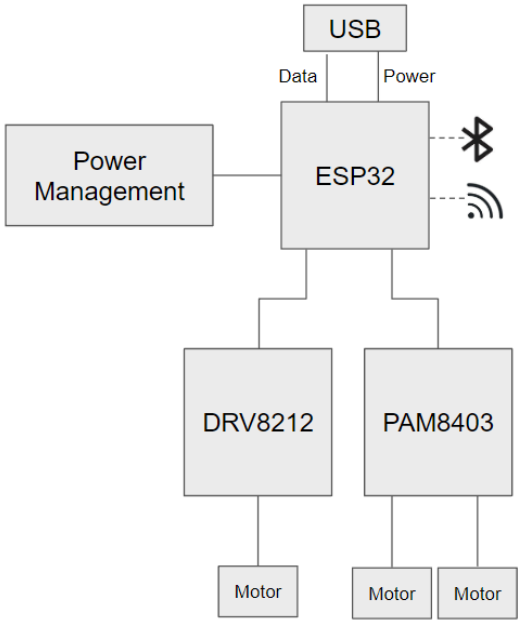
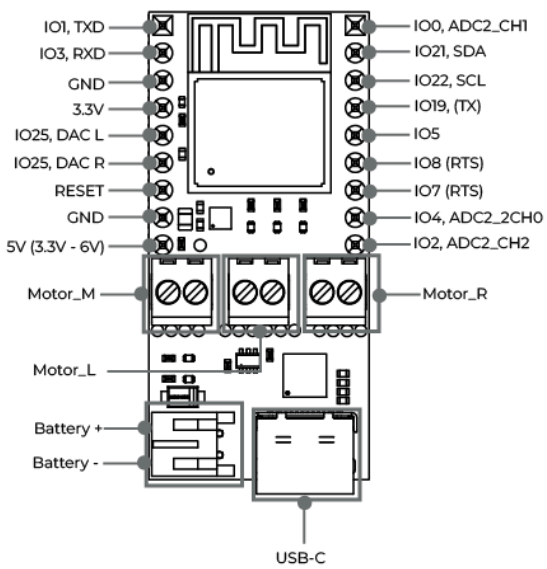
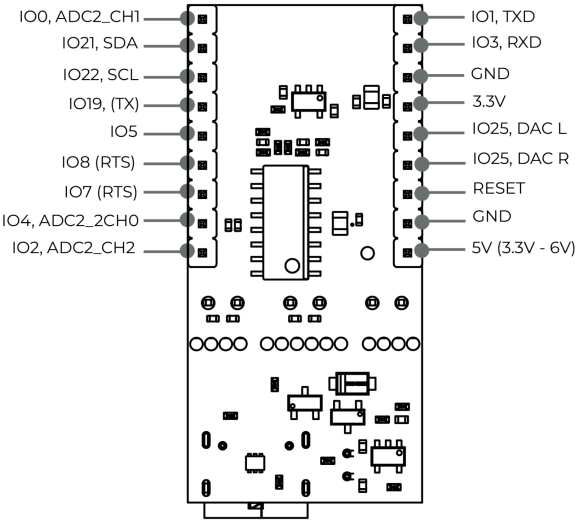


Figure 1.2. Block Diagram of TITAN Core

1.3 Board Overview





2. Hardware

2.1 Dev Kit Components:

A. TITAN CORE
B. DRAKE TacHammer Motors
C. Pin jumper
D. Screwdriver

Figure 2.1. Dev Kit Components

2.2 Power Source

One or more of the following:

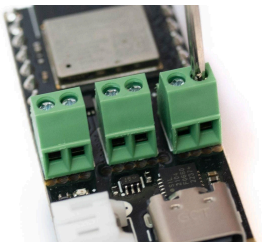
1. USB-C Cable connected to a PC or power source
2. 3.3-6v Power Supply
3. 1S lipo with JST-PH2 male connector

3. Setup

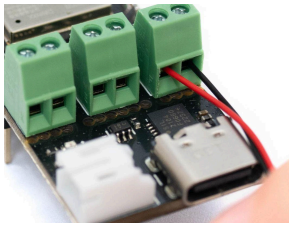
3.1 Connecting the Motor(s)

Connecting TacHammer motor(s) to TITAN Core

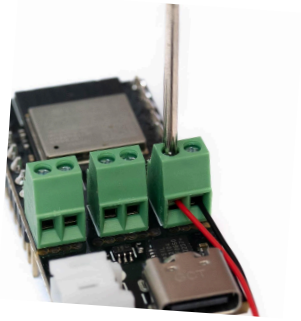
1. Loosen the terminal screws with the supplied screwdriver until the slot fits the motor wire.



2. Insert the red (+) and black (–) motor leads into any of the three channels (L, R, M). Polarity is labeled on the board underside.



3. With the wires inserted, tighten the screws clockwise. Ensure the metal wires maintain good contact with the terminal conductive piece.

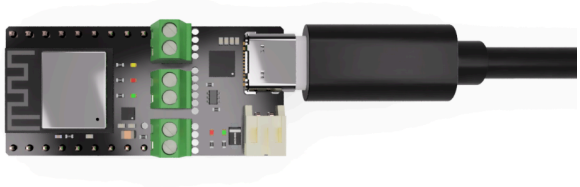


3.2 Power

The TITAN Core can be powered by one or more sources indicated below:

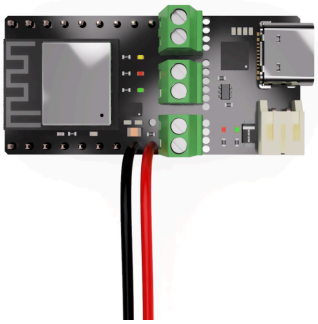
1. USB-C

Connect a USB-C cable from the board to any powered USB source.



2. Bench Power Supply

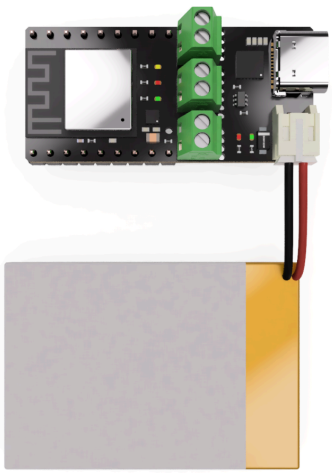
Connect 3.3-6V bench power supply by wiring the supply's positive lead to VIN and the negative lead to GND.



3. Battery

Power the board by plugging a 1S LiPo (JST-PH2) into the battery port.

Note: The TITAN Core automatically charges a connected LiPo battery to 4.2V when a powered USB-C source is connected.



4. Operating Modes

The TITAN CORE will boot into one of three operating modes. Use the included pin jumper to switch between the modes. Ensure that your TITAN Core is connected to a power supply.

4.1 Effect Loop Mode

To activate “Effect Loop” mode, jump IO21 and IO22 using the pin jumper provided.

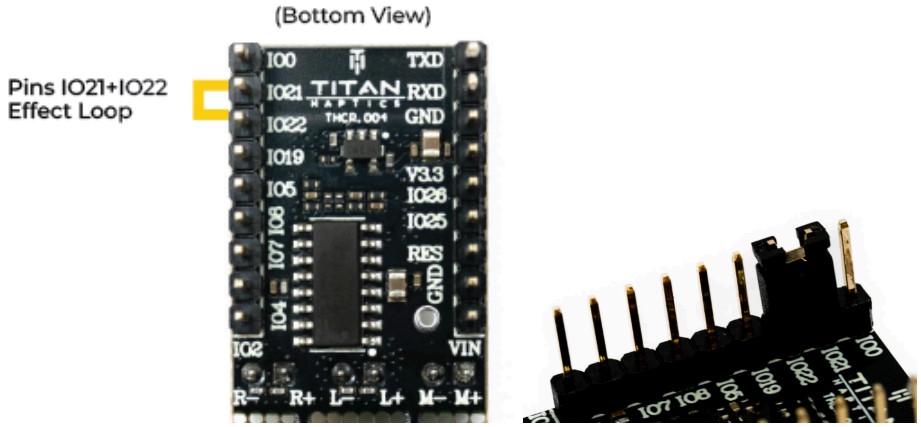


Figure 4.3. Pin Jumper Placement for Effect Loop Mode

This mode plays different effects in a loop. Once the pin jumper has been attached, the haptic effects in the loop will be played automatically. To view the name of each effect, connect your TITAN CORE to a computer using a USB-C cable and open the serial monitor with a baud rate of 115200. In this mode, all three channels are used.

4.2 Bluetooth Mode

To activate “Bluetooth” mode, jump IO19 and IO22 using the pin jumper provided or jumper wires.

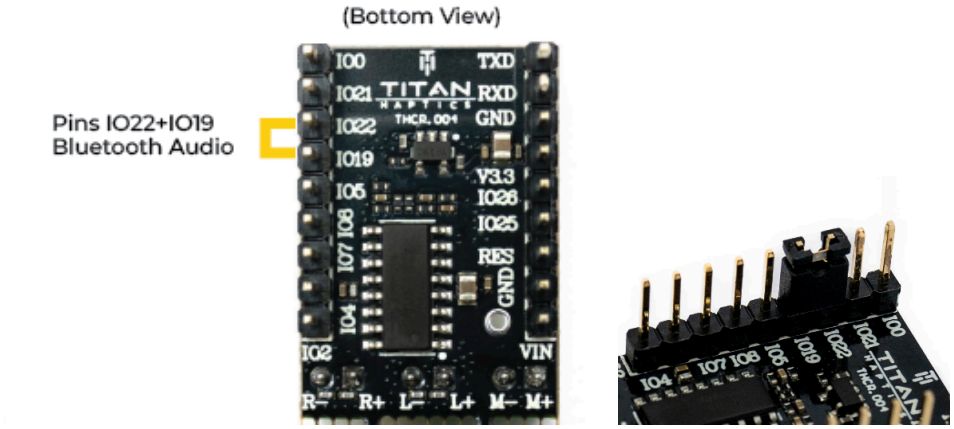


Figure 4.2. Pin Jumper Placement for Bluetooth Mode

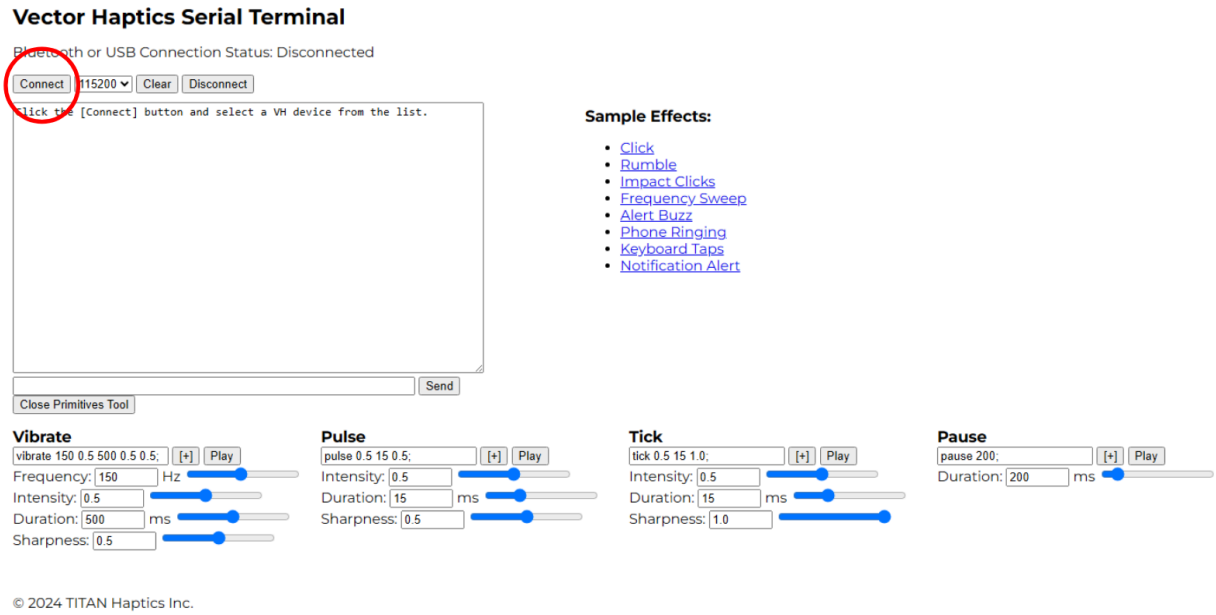
Once the pin jumper has been attached, your TITAN Core will be discoverable (VHDevice*number*) and you can now connect to it via bluetooth. Your TITAN Core will be capable of receiving bluetooth signals from your device and you can test this out by playing audio on YouTube/Spotify. Only the L and R channels are used in this mode.

4.3 Serial Command Mode

The serial monitor mode requires no pin jumpers to be connected. Connect the TITAN Core via USB-C to the computer.

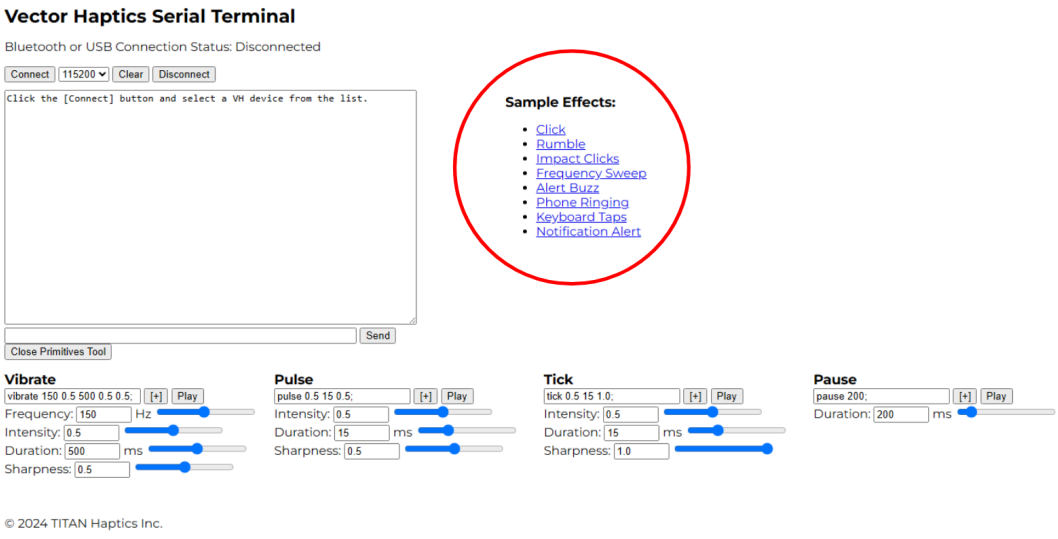
Go to the VH Terminal website: https://vhterminal.titanhaptics.com. If prompted, allow necessary permissions for device connections. No additional software installation is needed.

Hit “Connect” (top left) on the VH Terminal website.



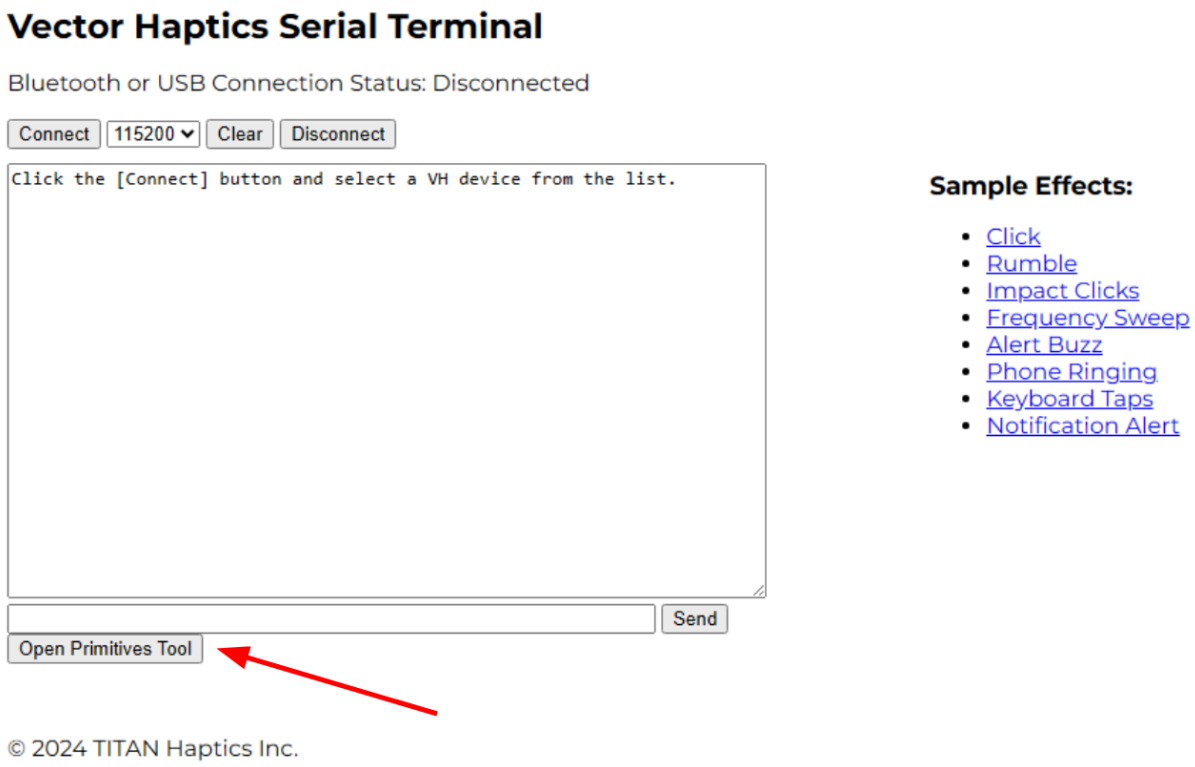
Select the VHDevice and connect to it.

Hit one of the sample effects on the right-hand side to test the board. You should feel a haptic effect play.



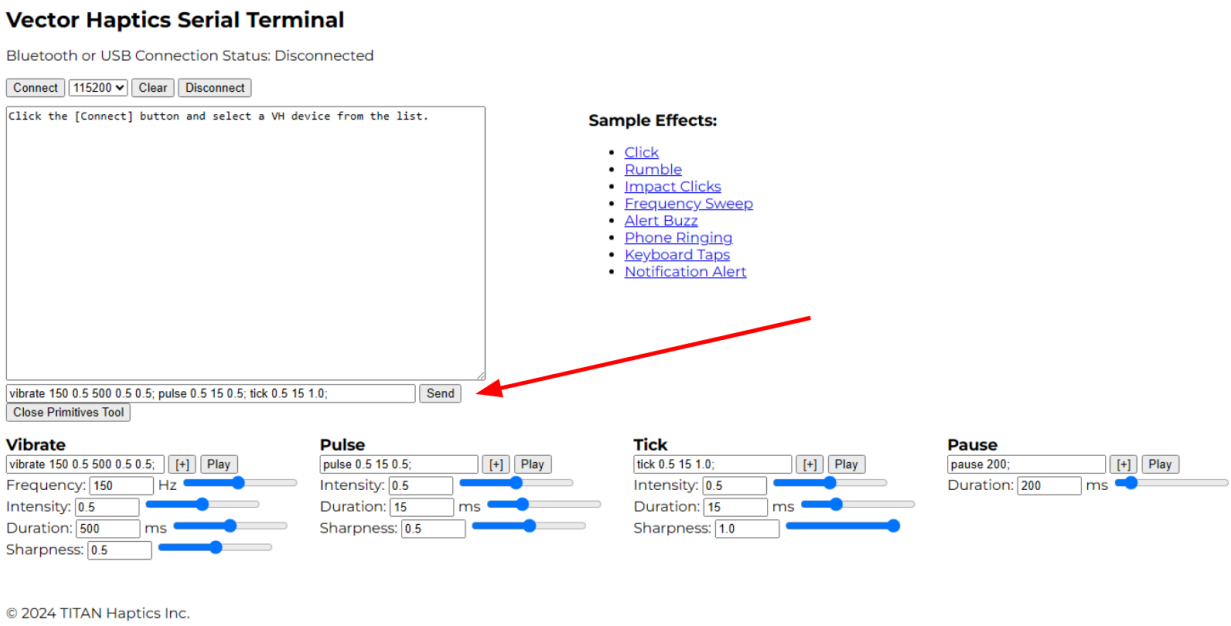
You can also use the "Sample Effects" section to test different signals on your device, including subtle clicks, low rumbles, frequency changes, alert buzzes, phone ringing, keyboard tap feedback, and notification alerts.

Select from pre-configured haptic patterns or create custom patterns using the “Open Primitives Tool”.



Adjust parameters like frequency, amplitude, and duration for your desired primitive and hit either the “+”icon to add it to a queue of commands or hit play for an instant haptic effect.

String together multiple primitives using the “+” icon and hit “Send” to feel your composed effect.



Multiple commands strung together using the "+" button

Commands

Vibrate

Continuous vibration (alerts, textures)

- `vibrate <frequency> <intensity> <duration> <sharpness>;`
- Example: `vibrate 150 0.5 500 0.5;`

Pulse

Soft impulse (bumps, wobbles)

- `pulse <intensity> <duration> <sharpness>;`
- Example: `pulse 0.5 15 0.5;`

Tick

Sharp impulse (clicks, taps)

- `tick <intensity> <duration> <sharpness>;`
- Example: `tick 0.5 15 1.0;`

Pause

Pauses haptics

- `pause <duration>;`
- Example: `pause 200;`

For a complete list of commands, visit Primitive and Syntax Usage Guide (requires TITTAN Haptics Developer Program account).

5. Troubleshooting

PROBLEM	PROBABLE CAUSES	SOLUTION
Board is unresponsive		Disconnect and reconnect the power source(s).
The battery is not charging	Battery may not be properly plugged in	Make sure the battery is firmly plugged to the onboard battery port with the polarities matching the printed polarity sign.
Bluetooth not connecting	Bluetooth function is not enabled	Make sure the correct pins are connected to enable bluetooth mode.
Motors not working	Bad wire connection	Check circuit continuity from screw terminal connectors to the motor wires; adjust and tighten down if necessary.
	Pin jumper in the wrong position (in default modes)	Double-check if the pin jumper has been plugged into the right pins. (see “default modes”).
	Power voltage deficiency	Make sure the board is being powered via USB or an appropriate voltage (3.3 - 6V).
No Serial Reading	Incorrect baud rate	Make sure to set the serial baud rate to 115200.
	USB cable not capable of data transferring	Use a data-capable USB cable instead of a power-only cable.
Only one motor is working during bluetooth mode	Motor is not plugged into the correct channel	Only L and R channels are used in this mode. Ensure that your motors are connected to the correct channels.

6. Next Steps and Additional Resources

Requires a TITAN Haptics Developer Program account.

- Primitive Syntax and Usage Guide
- Integration Guide
- Carlton Datasheet
- Drake Datasheet
- Carlton Mount STL

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