Bluetooth communication

1. Overview

This tutorial provides a step-by-step guide on connecting and configuring a Bluetooth module for your AESC. The goal is to enable wireless communication, allowing you to use the VESC Tool mobile app to configure motor parameters, monitor real-time data, and perform basic control—all without a physical USB cable.

Core Features:

- Automatic motor parameter identification (Field-Oriented control(FOC))
- Controller parameter adjustment (PID, current, voltage, speed limits)
- Device-Specific settings (input mode, wheel diameter, etc.)
- Firmware version check and wireless updates
- Real-Time data monitoring (speed, voltage, current, temperature, etc.)
- Operational data logging and export
- Direct motor control function

2. Software Preparation

- **Download VESC Tool: https://vesc-project.com/vesc_tool**
- **You can find the download tutorial here:**

Figure 1: AESC configuration tutorial QR code

- **Run the VESC Tool software**

3. Hardware Preparation

3.1.Required Components

- AESC motor controller (e.g., AESC V4, AESC V6.7,AESC V4 Pro,AESC V6.7 Pro)
- BLDC motor (e.g.,5065,6374,63100)
- Li-ion battery pack/LiPo battery pack/DC power supply(e.g.,32V,36V,48V)
- Mobile phone(Android / iOS)
- Bluetooth module (e.g., Autoro BT Nano)

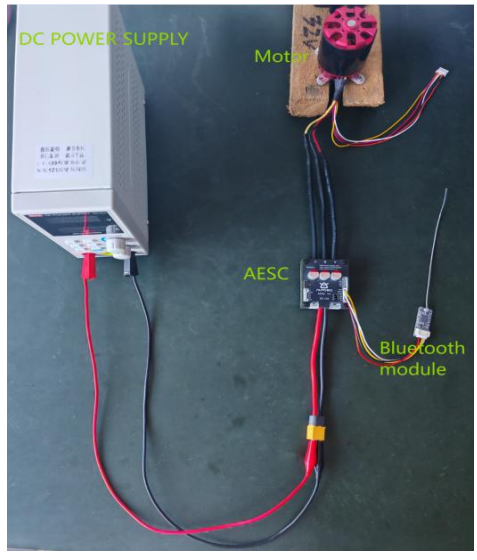

Figure 2: Overall hardware connection diagram

3.2.Hardware Connections

a. Power down everything

- Ensure all components are disconnected from power sources before making any connections. This is a critical safety precaution.

b. Connect motor to AESC

- Connect the three motor phase wires (A, B, C) to the AESC's phase outputs (A/B/C) . The order may be corrected later during software setup.

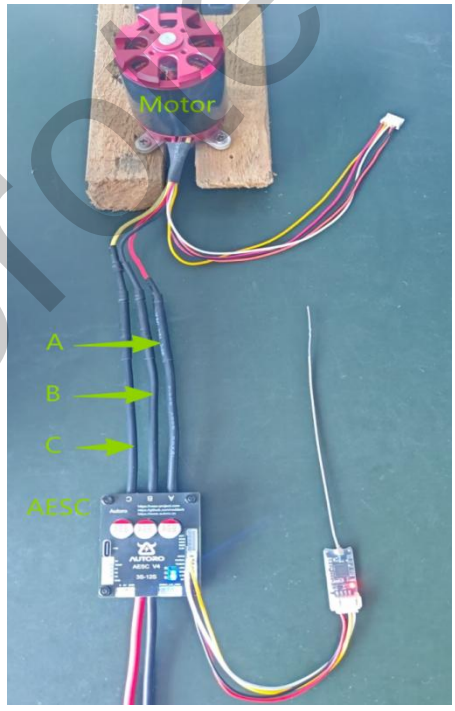

Figure 3: Motor phase wires connected to AESC terminals

c. Verify Power System Compatibility

- **Before connecting the battery,** it is **critica**l to ensure your power source (battery) is compatible with both your AESC and your motor.
- **Voltage Check:** Confirm that your battery's **nominal voltage** and **fully-charged voltage** are within the **input voltage range** specified in your AESC's user manual. Exceeding the maximum voltage will permanently destroy the controller.
- **Current Check:** Ensure your battery can supply enough **continuous current** to meet the demands of your motor and AESC setup. The battery's current output (in Amps) should be greater than the **maximum current** you plan to draw.
- **Motor Compatibility:** The power system must be able to drive your specific motor at its required voltage and current.

d. Connect battery to AESC

- **Warning: Observe Polarity**! Connect the battery's **positive (+)** wire to the AESC's **polarity+** input and the **negative (-)** wire to the **polarity-** input. Reverse polarity will instantly destroy the controller.

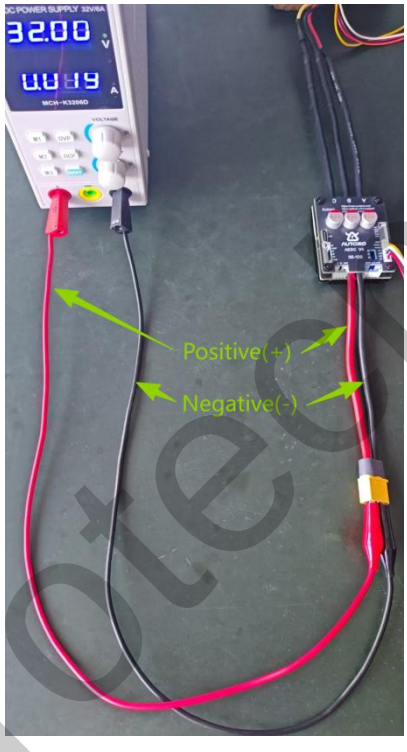

Figure 4: Correct power supply polarity connection

e. Connect Bluetooth module

Warning: ALWAYS verify the Bluetooth module's required input voltage (typically 3.3V or 5V) before connecting.

- Connect the module's **TX** pin to the AESC's **RX** pin.
- Connect the module's **RX** pin to the AESC's **TX** pin.
- Connect the module's **VCC** (or **3.3V**) pin to the AESC's **3.3V/5V** power output pin.
- Connect the module's **GND** pin to the AESC's **GND** pin.

3.3.Final connection check

- Visually double-check all connections for correctness and secureness, especially battery polarity.
- Ensure there are no loose wires or potential short circuits.

3.4.Apply power

- Once all connections are confirmed correct, connect the battery to power up the AESC.
- You should see status LEDs light up on both the **controller** and the **Bluetooth module** when powered on.

4. Bluetooth Communication

a. Turn on the Bluetooth function on the mobile phone.

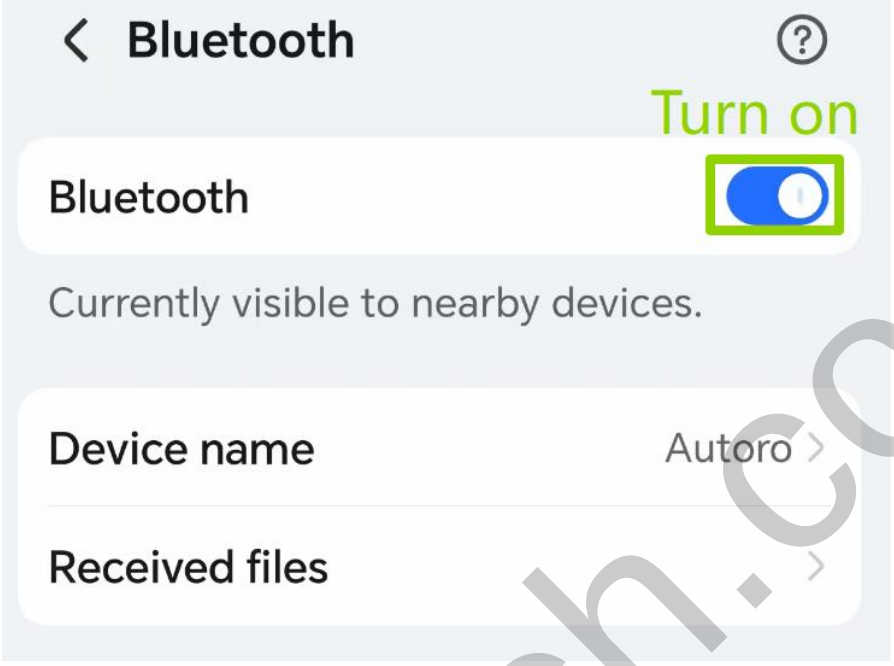

Figure 5: Turn on Bluetooth

b. Run app and scan BLE.

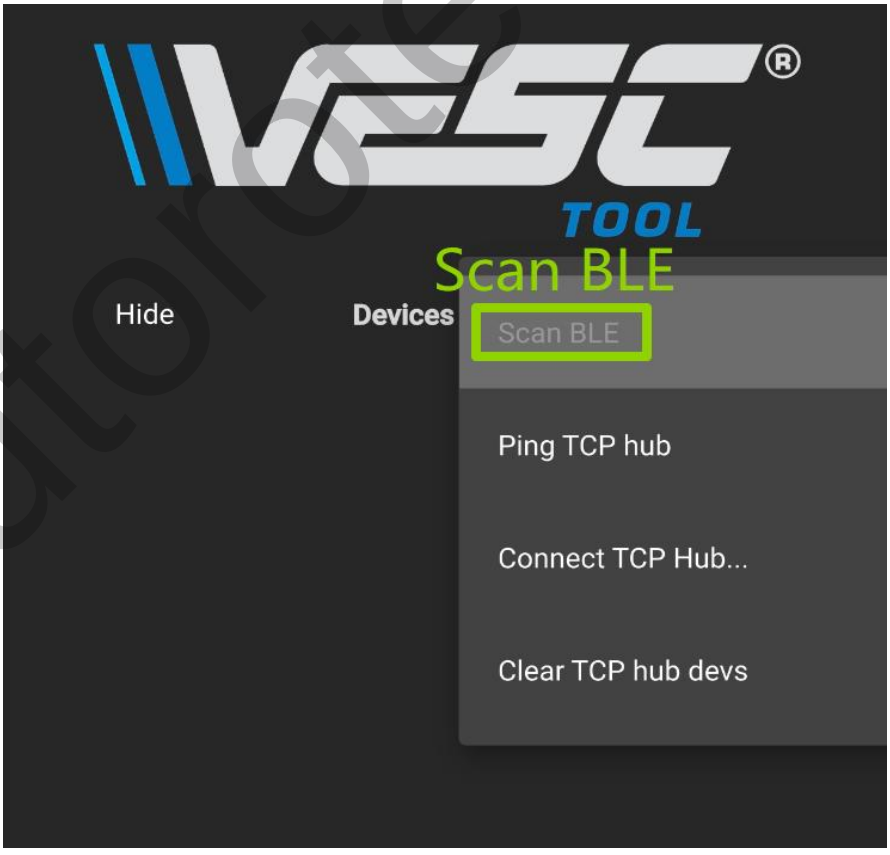

Figure 6: Scan BLE

c. Connect Bluetooth.

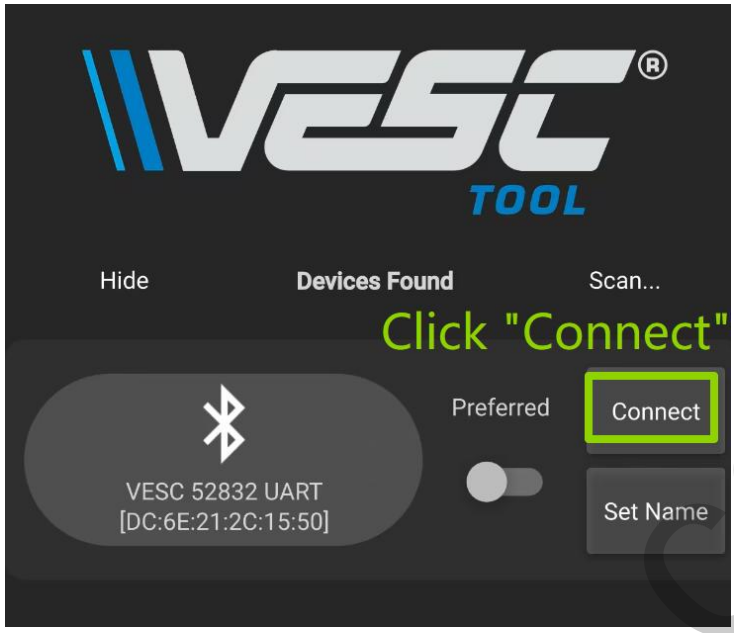

Figure 7: Connect

d. Bluetooth connected successfully.

Figure 8: VESC Tool

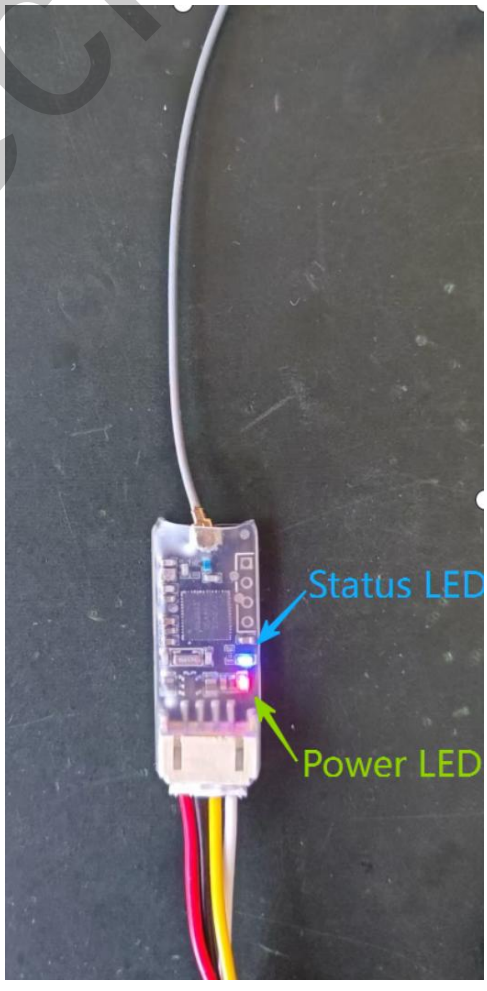

Figure 9: Power LED and status LED

e. Function introduction.

Figure 10: Start screen

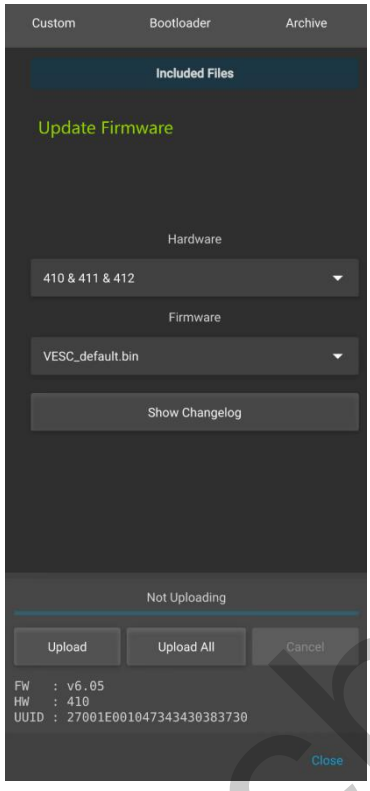

Figure 11: Update firmware

Figure 12: Real-time data

Figure 13: Motor configuration

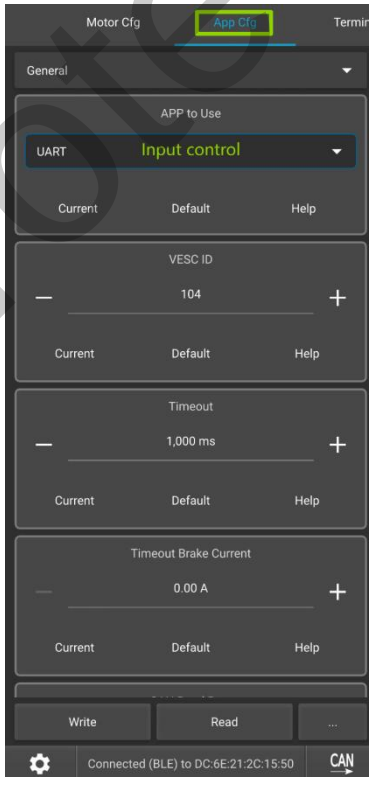

Figure 14: APP configuration

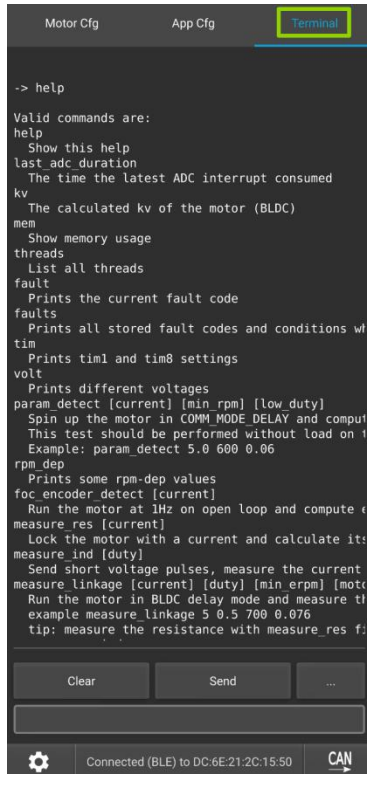

Figure 15: Terminal

5. Troubleshooting

5.1. Bluetooth Module Not Discoverable

- **Problem:** The phone cannot scan or find the Bluetooth module during pairing.
- **Solution:**
  - Ensure the Bluetooth module is properly powered (correct voltage).
  - Verify secure pin connections (**TX→RX, RX→TX, GND**).
  - Confirm the module is in discoverable/pairing mode (check indicator light status).
  - Restart the phone's Bluetooth or reboot the phone.

5.2. VESC Tool Connection Issues

- **Problem:** VESC Tool fails to connect or disconnects immediately after connection.
- **Solution:**
  - Check serial wiring between the module and AESC (**TX/RX** must be cross-connected).
  - Ensure stable power supply to the AESC motor controller.

5.3. Motor Control Failure

- **Problem:** The motor does not respond to control commands via VESC Tool.
- **Solution:**
  - Check firm connection of motor three-phase wires to the AESC.
  - Validate motor parameter configuration in VESC Tool and ensure successful motor detection/calibration.
  - Confirm the AESC's power voltage is sufficient to drive the motor.

5.4. Unstable Bluetooth Connection

- **Problem:** The Bluetooth connection is unstable and frequently drops.
- **Solution:**
  - Ensure the distance between module and device is within 15 meters and avoid obstructions.
  - Check for strong 2.4GHz wireless interference (e.g., multiple Wi-Fi routers).

6. Contact & Support

For technical support,contact : Autoro.service@hotmail.com

Website : https://www.autorotech.com