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2023-24





eYRC 2023-24: Hologlyph Bots



Forum



🚨 Battery Maintenance 🚨

- LiPo Battery maintenance is a critical matter and should not be taken lightly both for safety reasons and for longer life. For this, a Battery Checker and Balance charger is provided in the kit.
- Familiarize yourself with how to use the LiPo Balance Charger and LiPo Battery tester.
- IMPORTANT: A LiPo cell should **NEVER** be discharged below **3.0V**.
- Discharging a LiPo cell lower than 3.0V causes a usually permanent degradation of the cell's ability to absorb and retain a charge.
- Proper LiPo Storage Voltage = 3.8V per cell
- If the LiPo battery is not going to be used for a long time, it must be stored with all individual cells at around 3.8V.
- It's important that the cells are **BALANCE** charged and not unevenly charged or discharged for multiple reasons.
- In short, use the cell checker frequently to make sure the LiPo battery is in a healthy condition. And use only a balance charger to charge the batteries.
- While using the battery one must ofcourse charge it upto **4.2V** per cell.

1. Battery Testing

This test requires only 2 components:

- The battery (Orange 2200mAh Li-Po Battery)
- 1-8S Li-Po Battery Voltage Tester

Now, connect them as shown in the image below. The black part should be attached at leftmost pin. When you do so, you will hear a beep sound and the voltage tester will display the total voltage of the battery, followed by voltage values of individual cells.



A nice feature of this checker is to set a minimum threshold (from 2.7V to 3.8V per cell) using the button on top. The tester will start beeping if any cell goes below this voltage.

2. Charging a Lipo Battery:

- Plug-in the charger in a socket and turn the switch on.
- When the battery is not connected, all 3 LEDs on the charger will be lit green with red light flashing in intervals.
- Now connect the battery, the LEDs will turn red.
- When the battery is charged, the LEDs turn green to indicate that you can remove the battery now.
- If you notice red blinking in all LEDs during charging, that means the battery is not charging, and there's some issue with the charger.



an image of the connection

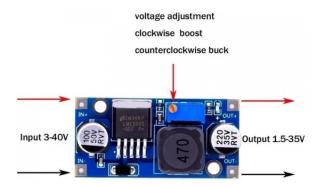
You can ofcourse use other balance chargers you have access to. But as mentioned early only **balance chargers** must be used.

3. Buck Converter Testing

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You will require a **breadboard** and a **multimeter** for this test. **These are NOT provided in the kit and will need to be arranged by the team.** (you may be able to skip the breadboard for this test, but will need it for the 4th section/test as well)

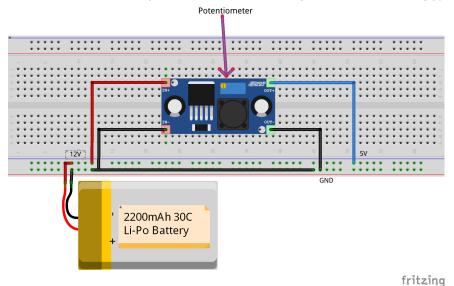
The LM2596 buck converter is a step-down voltage regulator that takes input voltage between **3-40V** and generates an output voltage ranging between **1.5 - 35V**. It comes with a potentiometer on-board to adjust the output voltage.



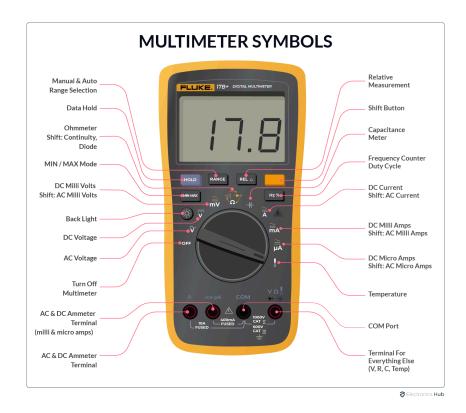
Before we can test the buck converter, we will need to solder the 4 male berg pins provided in the kit to each terminal on the buck converter.

Now perform the steps shared below:

• Step 1: Make the following connections as shown in the circuit diagram below.



• Step 2: Take a multimeter, and turn the dial on the DC voltage symbol



• Step 3: Now, take the multimeter probes and make contact with the IN+ and IN- terminals on the buck converter. The voltage should be around 12.2 volts for a fully charged battery. Now check the voltage at the OUT+ and OUT- terminals. Our goal is to achieve an output of 5 volts. If the reading is more than 5V, take a screw and slowly rotate the potentiometer screw in counterclockwise direction until the reading shows 5V. Similarly, if the voltage reading is less than 5 volts, rotate the screw clockwise.

Once you do that, you're ready for the next test!

Next Read: ESP32 and Servo Motor Testing