

QDrone 2 – Hardware Test

LEDs

What to expect in the LEDs Test?

This document will guide you through running the tests to confirm user programmable LEDs are working properly and how to change them if needed for your application.

QDrone 2 LEDs

QDrone 2 has two user programmable LEDs at the front of the drone marked as LED1 and LED 2 as shown in figure 1. During most flight models they are set up to show the state of the drone, however, they can be changed for whatever the user deems fit. Each of the RGB LEDs can not only just be on or off but can be defined to be different brightness levels.



Figure 1. Location of user programmable LEDs

LED Tests – MATLAB/Simulink

Open the QD2_LED_2021a.slx file from the same folder containing this file.

INSTRUCTIONS

1. Turn the **QDrone 2 ON** by pressing the red button on the PCB once. The LCD screen should turn on.
2. Ensure that a connection to the drone is established by pinging it. See the [Research Studio Setup](#) documentation (step 8 - **Vehicle Comms**).
3. Open the **Hardware Settings** under the **HARDWARE** menu.
4. Under the **Code Generation > Interface** tab, on the External mode configuration, enter the following MEX-file arguments
`'-w -d /tmp -uri %u', 'tcpip://192.168.2.4:17001'`
where **192.168.2.4** is the IP address of the QDrone2 found on the LCD screen.
5. Place the drone inside the flight space and make sure that from afar you are able to see LED 1 and 2 (top right side of the PCB)
6. Ensure that the **ESC disable** switch on the drone's PCB has a **green LED**, that is, the ESCs are enabled. This means the motors will not be disabled, so for safety reasons, keep the drone inside the flying space.
7. Under the **HARDWARE** menu, click on **Monitor & Tune**.
8. You will hear a series of beeps (which indicates that the model has started running on the QDrone).
9. See the LEDs change colors as you change the **switch constant** to the different colors already set up as option 1, 2 or 3. If you want to test any specific LED color, the commands use RGB percentages so 0 to 1 for each of the colors.
10. Ensure that the **Low Battery?** display shows 0 (as in your new Battery is not low. The low battery threshold is set to 14V)
11. When you're done with the tests, Click the **'Stop'** button under the **HARDWARE** tab to stop the model.

Quanser Autonomous Vehicles Research Studio  QDrone 2 LEDs

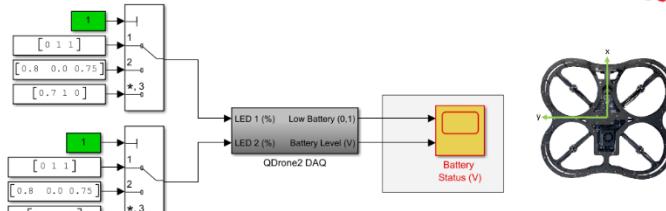


Figure 2. Motors Measurement model

Follow the instructions on the left of the Simulink model (figure 2). For the LEDs to work, the ESC switch must be enabled (green light). This means that the motors are not disabled, for safety, remove props or keep the drone inside the test flight area.

Change the input to the switch in the model highlighted in green. This will change the LEDs as one of the 3 specified colors in RGB when the green input is changed between 1, 2 and 3. This will validate that the LEDs are working correctly and can be changed individually.

Feel free to change the constant block values to any other set of RGB values to test it out. Values for RGB of each LED can be any number between 0 and 1.