

Quick Start Guide: QBot Platform

STEP 1 Check Components and Details

Make sure you have the following items ready before you begin:

	<p>Ensure your QBot Platform includes the following components</p> <ol style="list-style-type: none"> 1. QBot Platform 2. 2x 12V 7Ah LiFePO₄ (LFP) Batteries 3. Testing mat 4. Optimate LFP charger 5. Logitech F710 Wireless Joystick 6. 2x Wi-Fi antennas <p>Ensure your local computer has the following components</p> <ol style="list-style-type: none"> 1. Windows 10/11 operating system 2. MATLAB[®] 2023a or later installed w/ MATLAB[®] Coder & Simulink[®] Coder 3. QUARC 2023 SP3 or later installed
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STEP 2 Setup the Hardware

The steps below outline the instructions to setup the QBot Platform for testing:

<p>A Charge one or both LFP batteries using the provided charger to 100% as indicated.</p>	<p>B Access the QBot Platform battery bay by opening one of its wings (1). Place a charged battery in one of the QBot Platform battery bays (2). Connect the SAE battery connector to the QBot chassis connector (3). Close the wing.</p>
<p>C Ensure that your network is live using the router provided with the Mobile Robotics Lab or your own network.</p> <p>If using the provided router, the QBot will automatically connect to Quanser-UVS-5G. See the <i>Connectivity User Manual</i> for setting up your own Wi-Fi network.</p>	

D Turn ON the QBot Platform using the Power button. The QBot LEDs should turn solid **red** after a minute.



E Check the battery level and IP address of the QBot Platform on the LCD. If using a personal network, check the *Connectivity User Manual* for more information.



F Connect the Wi-Fi antennas near the power button and HDMI port



G Ensure you are connected to the QBot Platform by using the ping command from your local computer.

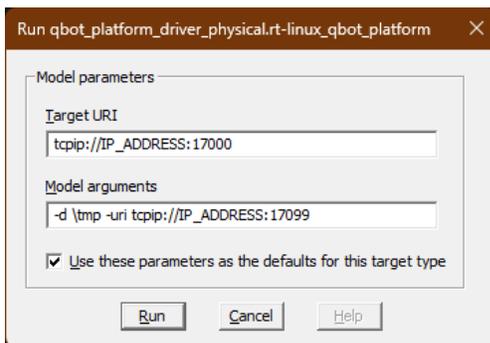
C:\Users\username>ping IP_ADDRESS -t

where **IP_ADDRESS** is the one you noted on the LCD in step 2E. You should get a response if connected.

STEP 3 Running an example

The steps below outline the instructions to run the Quick Start Example for MATLAB®/Simulink®:

A Browse to the Quick Start Guide directory and right click on the provided driver file **qbot_platform_driver_physical.rt-*** and find the option **Run on Target** (you may need to select "show more option" first). Use the following settings and click Run.



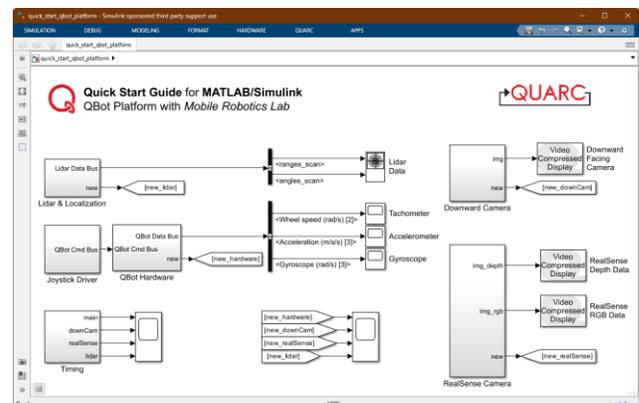
C Connect the Logitech F710 joystick's wireless dongle to a USB port on the QBot Platform.



B The LEDs on the QBot should start pulsing **white** slowly to indicate that the driver is running successfully.



D Launch MATLAB®/Simulink®, browse to the Quick Start Guide directory, and launch **quick_start_qbot_platform.slx**.



E

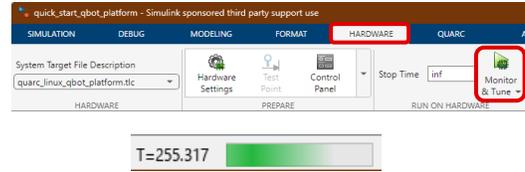
Access the Model settings by pressing **Ctrl+E**. Browse to **Code Generation > Interface** and set the **Mex-file arguments** to,

```
'-w -d /tmp -uri %u','tcpip://IP_ADDRESS:17001'
```

where **IP_ADDRESS** is the IP address of the QBot Platform displayed on its LCD screen in Step 2E. Click Apply to save changes.

F

Run the **quick_start_qbot_platform.slx** model by clicking the **Monitor & Tune** button in the hardware tab of the Simulink® model. Wait till the timestamps change.

**G**

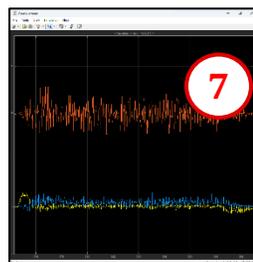
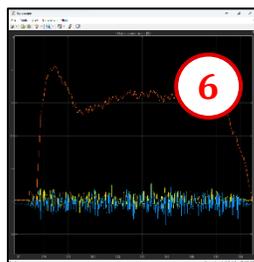
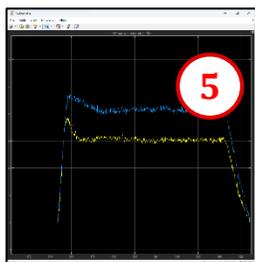
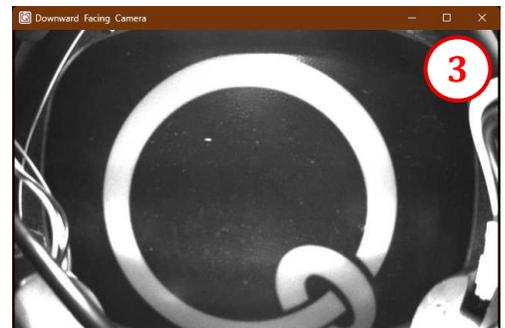
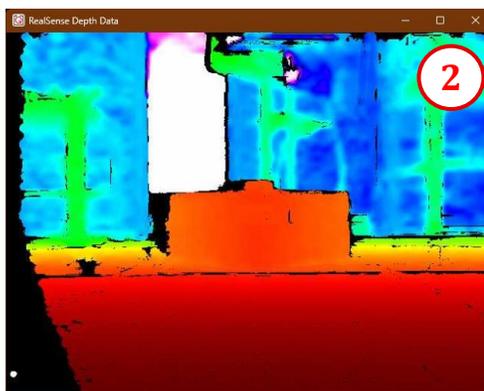
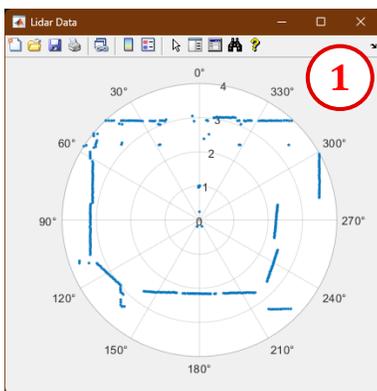
The LEDs on the QBot Platform should be steady **blue**, indicating a connection between the quick start application and the driver application you started earlier.

**H**

Press and hold the LB button on the joystick to arm the QBot Platform. The LEDs on the robot should be steady **green** indicating an armed status.



Use the left joystick stick-axis to steer the robot (left and right) and the right joystick stick-axis to drive the robot front and back. To stop at any time, let the sticks go. Monitor the live Lidar (1), RealSense RGB (2), RealSense Depth (3) and Downward camera (4) feeds as you drive the robot. Also check out the Tachometer (5), Accelerometer (6) and Gyroscope (7) data in the associated scopes.



J Stop the quick start application when done by pressing the RB button. The LEDs on the QBot should pulse white. Shut the QBot Platform down by pressing the power button. The LCD will display a shutting down message. The LEDs on the QBot should go completely OFF shortly after. Charge the batteries if required.

TROUBLESHOOTING

Common issues and possible solutions

The QBot Platform **LCD** shows a **LOW BATTERY** message

Ensure that the QBot Platform **batteries** have been **charged** before use. The Optimate charger should show a **green LED** next to the **check mark** at **full charge**.



The QBot Platform **LCD** does **not** show an **IP address**.

Ensure that the QBot Platform **network** has been **configured**. If using the provided router, ensure that it is turned ON. For your own network configuration, see the Connectivity User Manual.



The QBot Platform **LEDs** remain red when running the quick start model.

Ensure that the QBot Platform **driver** is **running** prior to running the quick start application. The LEDs should be **pulsing white**. When you run the quick start application, the LEDs will turn **blue**.



The QBot Platform does **not respond** to **joystick** commands to **drive**.

Ensure that the wireless joystick **dongle** is **plugged** into the QBot Platform's **USB ports**. Also ensure that the **toggle switch** at the back end of **joystick** is set to **X** and that the **MODE LED** is off.



The local computer **cannot find** or download models to the **QBot**.

Ensure that the QBot Platform and local computer are on the **same network**, the QBot Platform **has an IP**, and that a **ping test passes**. If issues persist, consider **rebooting** the QBot Platform.



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STILL NEED HELP

For further assistance from a Quanser engineer, contact us at tech@quanser.com

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