

Quick Start Guide: QBot 2e

STEP 1 Check Components and Details

Make sure your QBot 2e robot package includes the following components:

1



2



3



4



5



1. QBot 2e mobile platform
2. QBot 2e power supply
3. WiFi router with power adapter
4. Ethernet cable
5. QBot 2e technical and curriculum resources*

*Provided in digital form

www.quanser.com/resources

STEP 2 Install and Test QUARC™

1. Make sure you have all required software, as listed in the QUARC Compatibility Table included in the installation software and [online](http://www.quanser.com) at www.quanser.com.
2. Follow the QUARC installation guide for further installation and configuration instructions. You must install QUARC 2018 SP1 ver. 2.7.2582 (or later).

STEP 3 Setup the network

The QBot 2e comes with an independent network to ensure reliable communications between the PC and the robot.

A

Plug in the power adapter supplied with the wireless router. Switch on the wireless router.

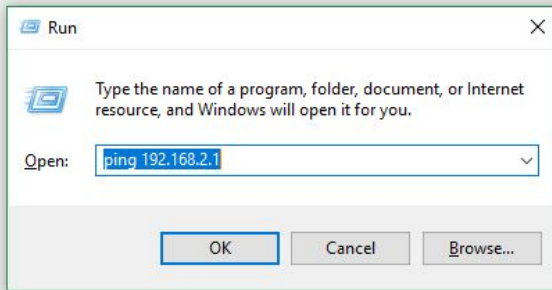
B

Connect your PC to any of the Ethernet/LAN ports on the router with the provided ethernet cable.

C

Using the *Windows Network* system icon in the taskbar, open **Network & Internet Settings**. Click on **Change adapter options**. Right-click on the **Ethernet** icon for your connection to the router, *Unidentified network connection*, and click **Properties**. Under *This connection uses the following items*: select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**. Select *Use the following IP address*: and enter the following settings: **IP address**: 192.168.2.10, **Subnet mask**: 255.255.255.0

D

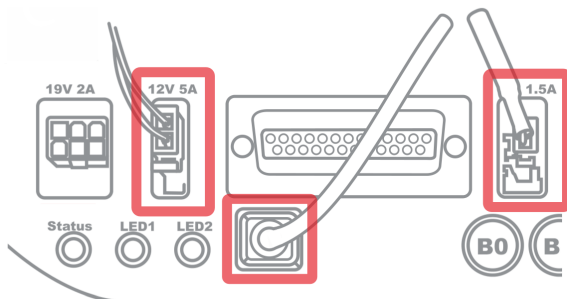


Ping the router by typing ping **192.168.2.1** in the *Run* box in Windows (Go to the Start menu and search for *Run* and click **Run**). If the connection is successful you will see the ping replies in the command window. If you cannot ping the router, check network connectivity and your IP address.

STEP 4 Setup the Hardware

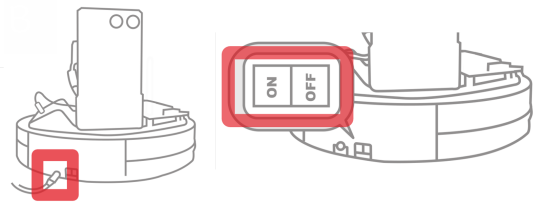
To set up your QBot 2e, please read the following instructions carefully.

A



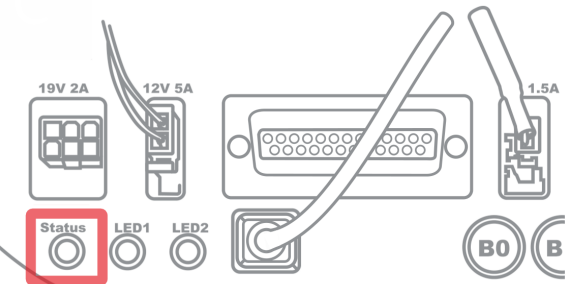
Ensure that the connections to the QBot 2e base are secure.

B



Plug the power supply into the QBot 2e and a wall outlet and switch on the QBot 2e. Let the QBot 2e charge until the battery is full. The status LED blinks while the QBot 2e is charging.

C



The status LED turns solid when the robot is fully charged.

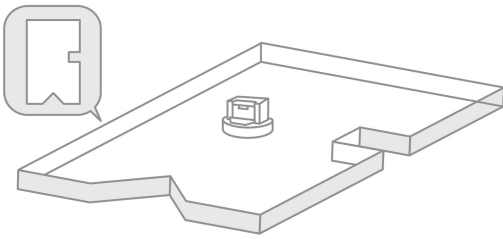
D

When the robot is fully charged, you can ping the robot by typing *ping [IP of the QBot 2e]* into the *Run* window similar to instruction D in Step 3. If you do not get a response from the QBot 2e, then power cycle the QBot 2e and wait for 60 seconds to ensure that the robot has initialized.

STEP 5 Test the QBot 2e

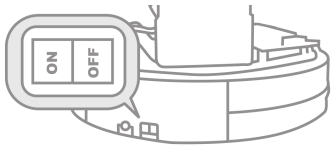
Follow the procedure below to test the QBot 2e and confirm that it is fully functional.

A



Place the QBot 2e in a clear space of at least 2m x 2m with several walls and/or obstacles strategically placed around the robot. Do not place any objects more than 5m away if you want to use them for testing.

B

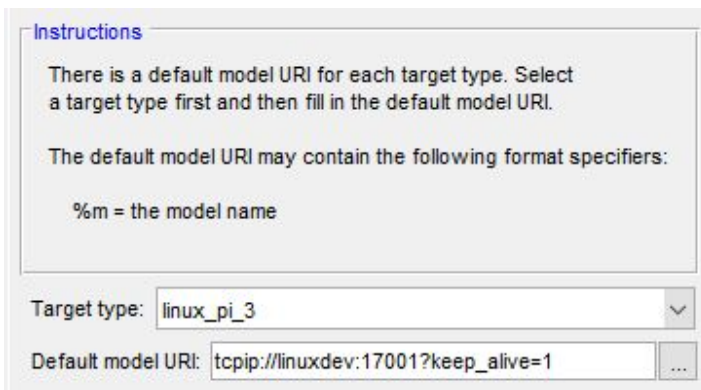


Make sure the QBot 2e is powered ON using the switch on the side.

C

If you have not already, download the courseware and technical resources from www.quanser.com/resources, and open the Technical Resources folder. Locate and open the Quick Start folder, and then open the Simulink® model file: *Quick_Start_QBot 2e.mdl*.

D



Open the *QUARC* menu from the menu bar in the Simulink menu, and then choose *Preferences*. Make sure *Target type* is set to *linux_pi_3*

In the *Default model URI* field replace the word *linuxdev* with the IP address to the one for your QBot 2e. For example, if your QBot 2e has an IP address of 192.168.2.20 then *Default model URI* should be set to:

tcpip://192.168.2.20:17001?keep_alive=1

E



Click on the *Build Model* button in the Simulink toolbar.

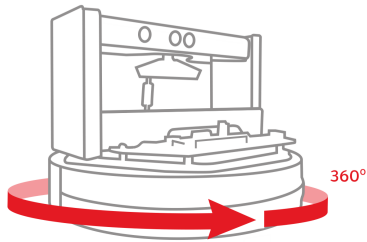
F

Once the compilation of the real-time code for the model is complete, open the *QUARC* menu from the menu bar and choose *Start*.

G

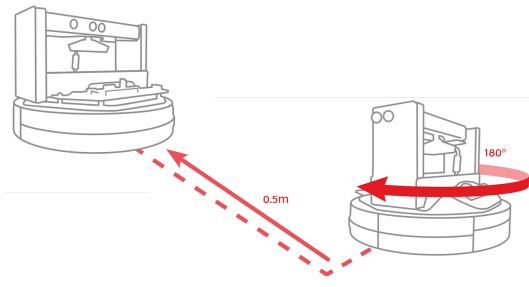
You should hear a startup chime when the robot initialization sequence is complete. Two windows will appear in Simulink showing the RGB video feed from the camera and depth data plotted on a 2D map. If the windows do not appear, you can manually open them by clicking on the two *Video Compressed Display (RGB)* and *Video Display (Map)* blocks in the Simulink model.

H



After 5 seconds, enable the model using the manual switch highlighted in blue. The robot will begin to rotate slowly as shown.

I



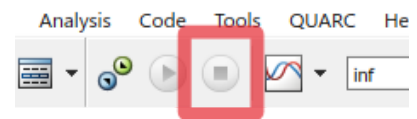
After a complete rotation, the robot will move forward 0.5m, make a 180° turn, and then return to the starting point.

J



The generated map should look similar to the image shown here. Compare your generated map to the area around the robot to ensure the operation was successful.

K



Click on the *Stop* button in the Simulink toolbar to stop the model.

TROUBLESHOOTING

Review the following recommendations before contacting Quanser's technical support engineers.

1. Check the connections outlined in Step 4 of the guide making sure the cables are firmly connected.
2. If you fix a connection, restart the robot before testing again.

The model will not compile properly.

- A. Verify that the correct MATLAB version and toolboxes are installed.
- B. QUARC has been installed and configured correctly according to the Installation Instructions.

The model compiles but you cannot correct to the target.

- A. Make sure that you are connected to the QBot 2e using the provided wireless network and you can ping the robot.
- B. Ensure that the robot is charged and powered on.

The model runs but you do not get any RGB video data.

- A. Make sure that the Kinect sensor is attached and the status light is blinking.
- B. Ensure that the robot is charged and turned on.

STILL NEED HELP?

For further assistance from a Quanser engineer, contact us at tech@quanser.com or call +1-905-940-3575.