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Guides and Resources: Hardware - QBot 2e

Embedded Compute Module

This document provides information on the QBot 2e's Embedded Compute module and expansion DAQ.

Embedded Computer - Raspberry Pi 3

The Raspberry Pi 3 is a small-scale embedded computer that runs the QUARC® runtime. With QUARC® installed, code generated from Matlab® Simulink® is cross-compiled, downloaded, and executed directly on the Raspberry Pi 3. The Raspberry Pi 3 is connected directly to the QBot 2e base, as well as the Kinect sensor. It is powered by the base through the PCB via the USB port.

Table 1: Raspberry Pi 3 Model B+ specifications	
Item	**Description**
Processor	ARM Cortex-A53 (ARMv8) 1.40 GHz
Memory	1-GB LPDDR2 SDRAM
Wifi	IEEE 802.11.b/g/n/ac

The Raspberry Pi 3 comes with integrated 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN to allow wireless connection between the target Raspberry Pi 3 and the host computer and/or other vehicles. It also has a 40-pin extended GPIO header that allows additional modules, such as sensors, as well as CSI connector for Raspberry Pi camera, to be attached to the QBot 2e. Below are the full specifications of the Raspberry Pi 3 Model B+:

• Broadcom BCM2837B0, Cortex-A53 (ARMv8) 64-bit SoC @ 1.4GHz

• 1GB LPDDR2 SDRAM

• 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN, Bluetooth 4.2, BLE

• Gigabit Ethernet over USB 2.0 (maximum throughput 300 Mbps)

• Extended 40-pin GPIO header

• Full-size HDMI

• 4 USB 2.0 ports

• CSI camera port for connecting a Raspberry Pi camera

• DSI display port for connecting a Raspberry Pi touchscreen display

• 4-pole stereo output and composite video port

• Micro SD port for loading your operating system and storing data

• 5V/2.5A DC power input

• Power-over-Ethernet (PoE) support (requires separate PoE HAT)

For further information on the Raspberry Pi 3 Model B+ refer to:

https://www.raspberrypi.org/products/raspberry-pi-3-model-b-plus/.

Quanser Printed Circuit Board (PCB) Card

The QBot 2e Printed Circuit Board (PCB) provides the mounting surface, as well as regulated power, to the Raspberry Pi 3. Figure 1 shows the QBot 2e PCB

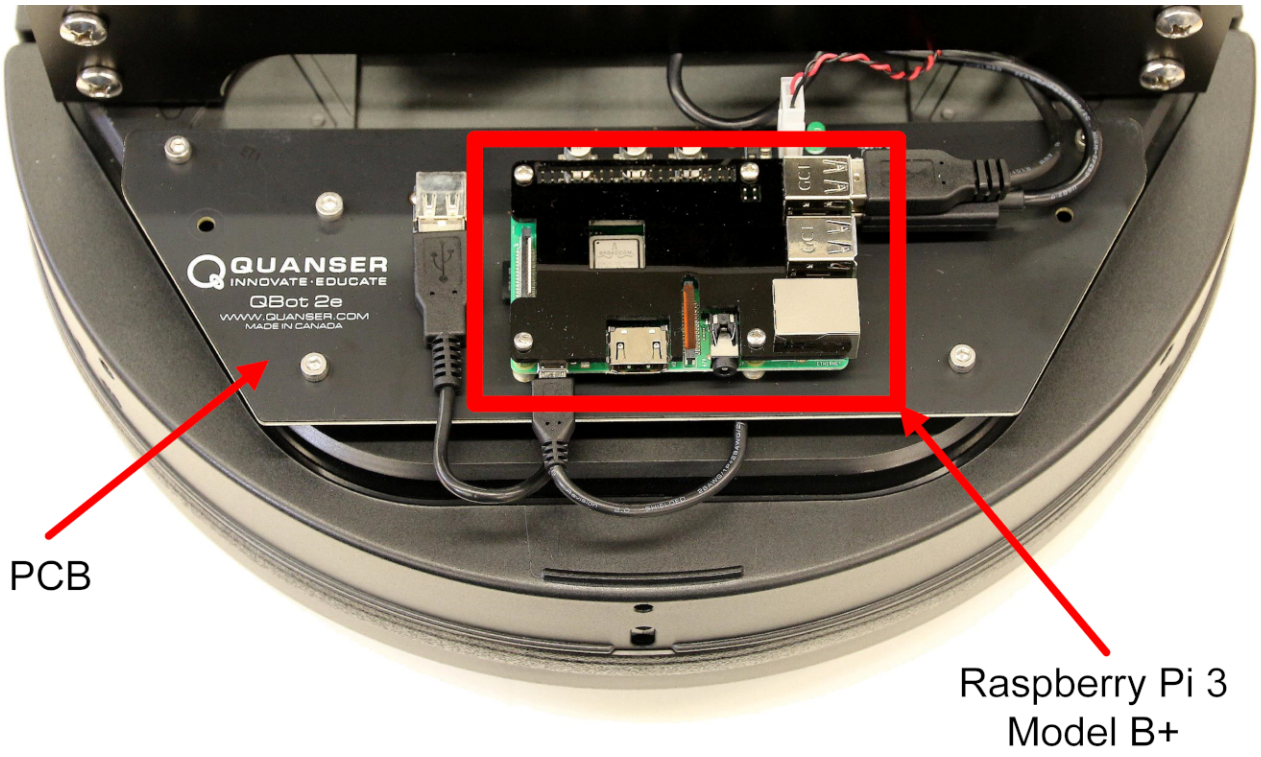

Figure 1 - The QBot 2e PCB