

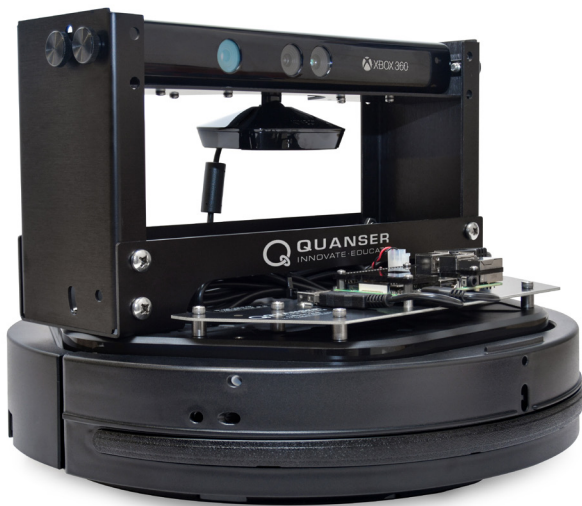
# QBot 2e

## High-performance Autonomous Ground Robot for Indoor Labs

The Quanser QBot 2e is an innovative open-architecture autonomous ground robot, built on a 2-wheel mobile platform. Equipped with built-in sensors, a vision system, and accompanied by extensive courseware, the QBot 2e is ideally suited for teaching undergraduate and advanced robotics and mechatronics courses. The courseware laboratory exercises are organized in a set of independent modules, allowing professors to select and adapt them easily for an existing course, or build a new course.

The open-architecture control structure allows users to add other off-the-shelf sensors and customize the QBot 2e for their research in areas such as vehicle navigation and control, autonomous vehicles control, machine learning and computer vision, artificial intelligence high-level control architecture of mobile robots, swarm robotics, and more.

### Features



#### Course Resources

Curriculum and lab exercises for robotics and mechatronics courses included



#### Ready to Use

Wide range of sensors including: bumper sensor, wheel drop sensor, cliff sensor, 3-axis gyroscope, Kinect® RGBD sensor



#### Customizable

Ability to add off-the-shelf digital sensors using SPI, UART, and I<sup>2</sup>C



#### Open

Open architecture design with fully documented system models and parameters provided

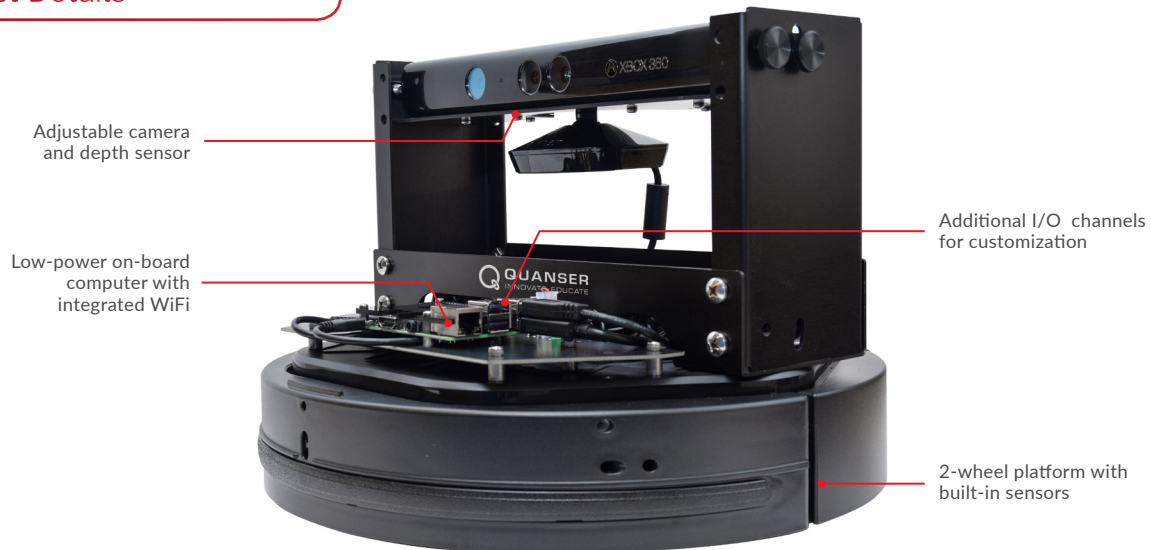
### Courseware

- Differential drive kinematics
- Forward and inverse kinematics
- Dead reckoning and odometric localization
- Path planning and obstacle avoidance
- 2D mapping and occupancy grid map
- Image acquisition, processing and reasoning
- High level control architecture of mobile robots
- Vision-guided vehicle control

### QBot 2e Bundle Components

- QBot 2e ground robot
- QUARC Autonomous License
- Wireless router

## Product Details



## Device Specifications

Platform	2-wheeled Kobuki base from Yujin Robot	
QBot 2e diameter	35 cm	
QBot 2e height (with Kinect mounted)	27 cm	
Maximum linear speed	0.7 m/s	
Available payload	App. 4.5 kg	
Battery life	Maximum 3 hours	
On-board computer	Raspberry Pi™ with integrated WiFi	
Camera resolution	640 x 480	
Depth sensing	11 bit	
Depth sensor range	0.5 - 6 m	
On-board sensors	3 digital bump sensors 2 digital wheel drop sensors 3 cliff sensors 1 3-axis gyroscope 2 analog motor current sensors 1 Z-axis angle measurement (heading) 2 multi-color programmable LEDs 18 IR dock sensors (dock not included)	2 wheel encoders 3 digital buttons 2 over current sensors 1 battery voltage sensor 1 Kinect RGBD sensor 1 charger 1 speaker
Additional I/O channels available	28 reconfigurable digital I/O channels, including: 1 SPI bus channel 1 I <sup>2</sup> C serial bus channel 2 PWM output channels 1 UART serial port (interface 3.3 V serial device)	
Additional connectivity	4 USB 2.0 host ports 1 MIPI DSI display port for touch screen	1 gigabit Ethernet port 1 MIPI CSI camera port

### About Quanser:

Quanser is the world leader in education and research for real-time control design and implementation. We specialize in outfitting engineering control laboratories to help universities captivate the brightest minds, motivate them to success and produce graduates with industry-relevant skills. Universities worldwide implement Quanser's open architecture control solutions, industry-relevant curriculum and cutting-edge work stations to teach introductory, intermediate or advanced controls to students in Electrical, Mechanical, Mechatronics, Robotics, Aerospace, Civil, and various other engineering disciplines.

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