# 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
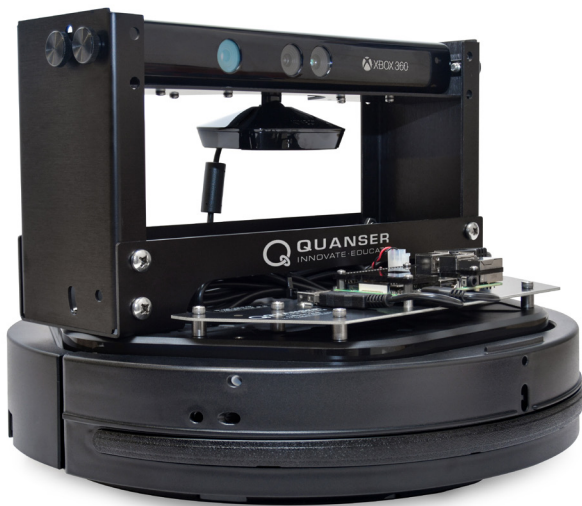
Course Resources

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^2C

Open

Open architecture design with fully documented system models and parameters provided
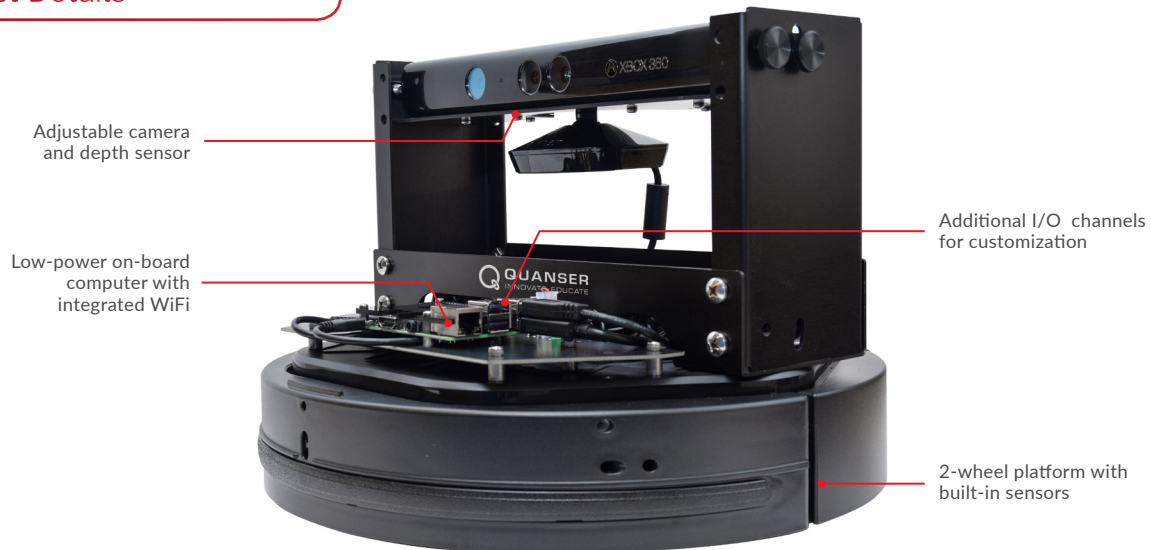
Courseware

- 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

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Explore Quanser App available on Google Play and the App Store

Product Details

Adjustable camera and depth sensor

Low-power on-board computer with integrated WiFi

Additional I/O channels for customization

2-wheel platform with built-in sensors

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 wheel encoders
	2 digital wheel drop sensors	3 digital buttons
	3 cliff sensors	2 over current sensors
	1 3-axis gyroscope	1 battery voltage sensor
	2 analog motor current sensors	1 Kinect RGBD sensor
	1 Z-axis angle measurement (heading)	1 charger
	2 multi-color programmable LEDs	1 speaker
	18 IR dock sensors (dock not included)	

Additional I/O channels available	28 reconfigurable digital I/O channels, including:
	1 SPI bus channel
	1 I²C 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 gigabit Ethernet port
	1 MIPI DSI display port for touch screen	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.