

QBOT 3

High-performance Autonomous Ground Robot for Indoor Labs

The Quanser QBot 3 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 3 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.

A reinforced landing platform and cargo plate also functions as an electromechanical prototyping platform for use in design projects. The open-architecture control structure allows users to add other off-the-shelf sensors and customize the QBot 3 for their research in areas such as vehicle navigation and control, autonomous vehicles control, machine learning, and computer vision, multi-agent heterogenous and swarm robotics, and more.

Features



Relevant

Curriculum and lab exercises for robotics and mechatronics courses



Diverse

Deploy applications via Simulink, Python and/or ROS



Ready to use

Wide range of sensors including bumpers, wheel-drop and cliff sensors, 3-axis gyroscope, Intel RealSense D415 RGBD camera



Versatile

Electromechanical prototyping platform and landing pad for use with UAVs



Open

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



Customizable

Support for off-the-shelf sensors and actuators using fully accessible 40-pin I/O header and Pi HATs

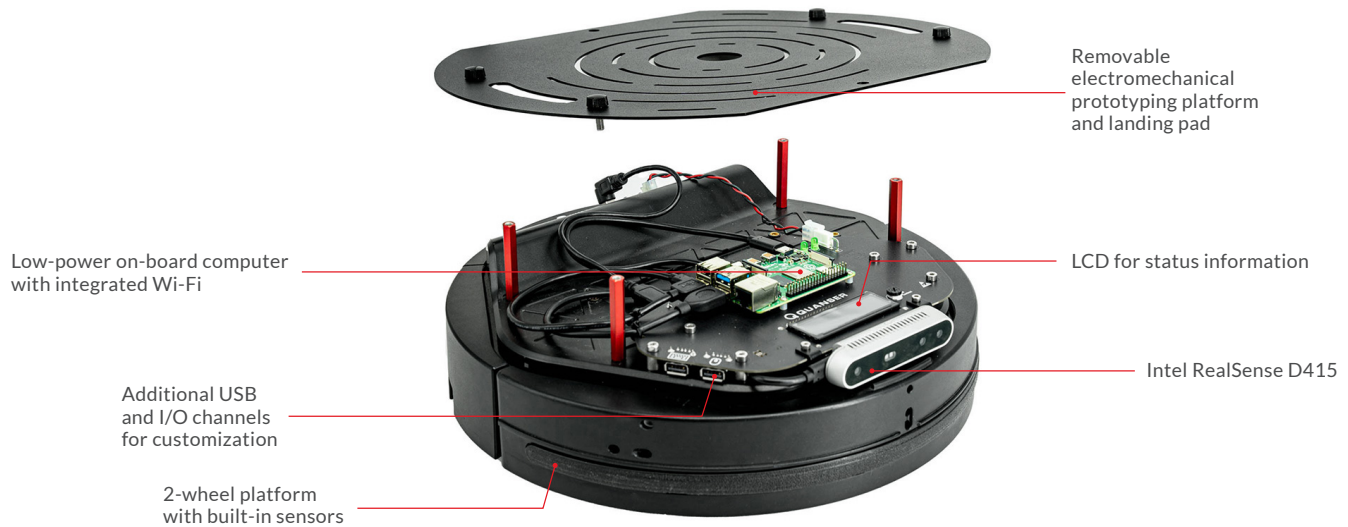
Courseware

- Forward and inverse differential 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 3 Bundle Components

- QBot 3 ground robot
- QUARC Autonomous License
- Wireless router

Product Details



Device Specifications

Platform	2-wheeled Kobuki base from Yujin Robot	
QBot 3 diameter	35 cm	
QBot 3 height	16 cm	
Maximum linear speed	0.7 m/s	
Available payload	App. 4.5 kg	
Battery life	Maximum 3 hours	
On-board computer	Raspberry Pi 4B 4GB	
Camera resolution	1080p @ 30Hz, 720p @ 30Hz, 480p @ 60Hz	
Depth resolution	720p @ 30Hz, 480p @ 60Hz	
Depth range	0.5 to 12 m	
LCD module	32 characters (16 per line)	
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 multicolor programmable LEDs 18 IR dock sensors (dock not included)	2 encoders 3 digital buttons 2 over current sensors 1 battery voltage sensor 1 Intel RealSense D415 sensor 1 charger 1 speaker
Additional I/O channels	28 reconfigurable digital I/O channels, including, 2 SPI bus channels 1 I2C serial bus channel 2 PWM output channels 1 UART serial port (interface 3.3 V serial device)	
Additional Connectivity	2 USB 3.0 user ports 4 USB 2.0 user ports 1 MIPI DSI display port for touch screen	1 gigabit Ethernet port 1 MIPI CSI camera port 40-pin I/O header

About Quanser:

For 30 years, Quanser has been the world leader in innovative technology for engineering education and research. With roots in control, mechatronics, and robotics, Quanser has advanced to the forefront of the global movement in engineering education transformation in the face of unprecedented opportunities and challenges triggered by autonomous robotics, IoT, Industry 4.0, and cyber-physical systems.

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