QBOT PLATFORM*

High-performance Autonomous Ground Robot for Indoor Labs

The Quanser QBot Platform is an innovative open-architecture autonomous ground robot, built on a differential mobile platform. This solution is ideal for teaching undergraduate and graduate mobile robotics as it is accompanied by comprehensive courseware and equipped with built-in sensors such as LiDAR, front-facing RealSense camera, downward-facing camera, gyroscope, and accelerometer, all powered by an onboard NVIDIA Jetson Orin Nano computer.

The QBot Platform provides an electromechanical prototyping bay for adding project components. It is also equipped with a reinforced landing pad for drones and additional cargo. The open control architecture allows users to seamlessly integrate off-the-shelf sensors and customize the QBot Platform for their research. The solution is well suited for designing and developing applications related to autonomy, navigation and control, machine learning, computer vision, multiagent heterogenous and swarm robotics, and more.

*Expected delivery – Feb 2024

Features

Product may not appear exactly as shown
Product shown with QArm Mini (sold separately)

Project-ready
Electromechanical prototyping bay and fully accessible 40-pin I/O header

Course-ready
Relevant lab content for courses tailored to both mobile & manipulator robotics

Research-ready
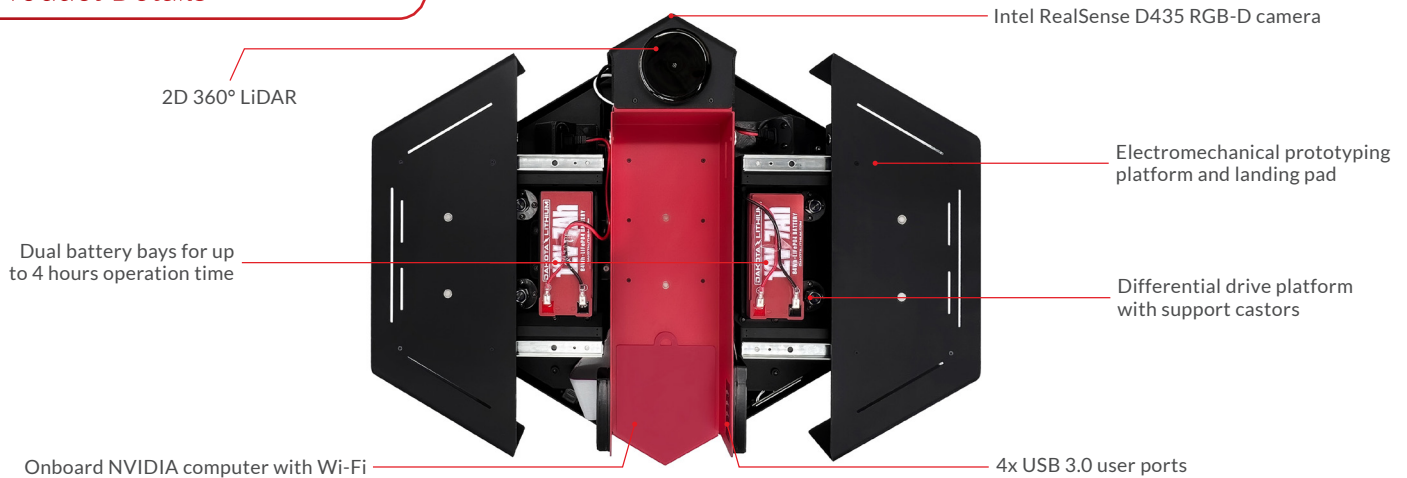Deploy applications via MATLAB ®, Simulink®, Python, C++ and ROS

Swarm-ready
Cost-effective pricing and bundle options allow multiple units in a lab

Suitable Exploration Pathways

- Forward and inverse differential kinematics
- Dead reckoning and odometric localization
- Path planning and obstacle avoidance
- Machine learning and deployment

- 2D mapping and LiDAR localization
- Image acquisition, processing, and reasoning
- Multi-agent control & industrial automation
- Vision-guided vehicle control

Product Details*

Intel RealSense D435 RGB-D camera

2D 360° LiDAR

Electromechanical prototyping platform and landing pad

Dual battery bays for up to 4 hours operation time

Differential drive platform with support castors

Onboard NVIDIA computer with Wi-Fi

4x USB 3.0 user ports

QBot Platform System Components

- QBot Platform ground robot
- QUARC complete license
- Reconfigurable warehouse automation map (12' x 12') (3.5m x 3.5m)

- High-performance router
- QArm Mini sold separately

Device Specifications*

Platform	2-wheel differential drive base with 4 support castors
Diameter	570 mm
Height	227 mm
Drivetrain sensing	Current sensing, optical encoders and and digital tachometer per wheel
Maximum motion	1.5 m/s speed and 1 m/s/s acceleration
Nominal motion	0.7 m/s speed and 0.5 m/s/s acceleration
Maximum payload @ maximum motion	20 kg
Maximum payload @ nominal motion	50 kg
Operation time	2 hours per battery
Power	Up to 2x 84 Wh LFP batteries w/ external charging
On-board computer	NVIDIA Jetson Orin Nano
Downward facing camera	Grayscale w/ global shutter – 640x400 @ 120Hz
Front facing camera	Intel RealSense D435 RGB-D camera
LiDAR	2D 360° lidar w/ 16,800 points per second
IMU	6-axis IMU w/ accelerometer and gyroscope
GPIO	40-pin header including SPI / I2C / UART / PWM
LEDs	User programmable LEDs
LCD	Character display module
Language support	MATLAB / Simulink / Python / ROS 2
USB ports	4x USB 3.0 user ports
HDMI	1 full HDMI port
Connectivity	IEEE 802.11ac Wi-Fi, Bluetooth 5.0, & Gigabit Ethernet port

* Subject to change

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 workstations to teach introductory, intermediate, or advanced controls to students in Electrical, Mechanical, Mechatronics, Robotics, Aerospace, Civil, and various other engineering disciplines.