

2 DOF INVERTED PENDULUM/GANTRY

Explore advanced principles of robotics

The 2 DOF Inverted Pendulum/Gantry module is ideal to introduce students to more advanced principles of robotics. Demonstrate and explore real-world control challenges encountered in aerospace engineering applications, such as rocket stabilization during.

The 2 DOF Robot module consists of an instrumented 2 DOF joint with a pendulum rod. The rod is free to swing about two orthogonal axes. The 2 DOF joint is attached to the end-effector of a four bar linkage (2 DOF Robot module), mounted on two Rotary Servo Base Units. The configuration creates a planar manipulator robot system with two actuated and three unactuated revolute joints. Two encoders measure the angles of the pendulum rod angles.

Features



Precise

The system's inherent precision helps deliver accurate, repeatable results required for teaching & research labs.



Robust

A durable system able to accommodate enthusiastic undergraduate students.



Comprehensive Courseware

Complete dynamic model, pre-designed Simulink® and LabVIEW™ covers controllers and laboratory guide.



Expandable

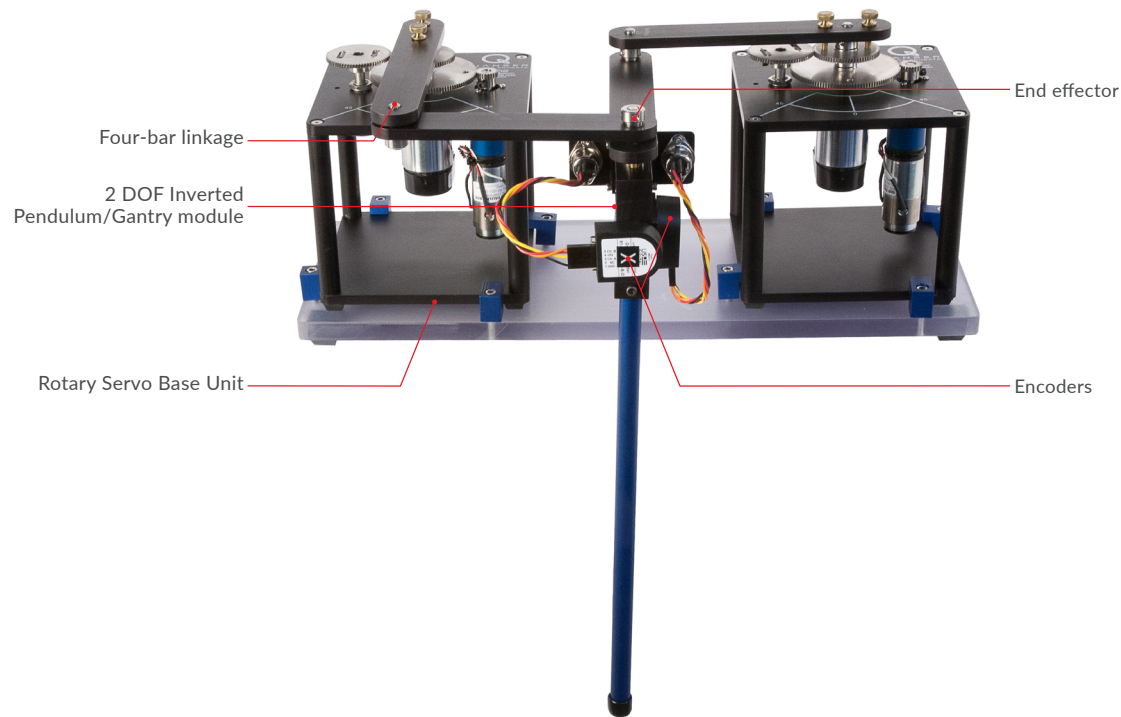
Use each Rotary Servo Base Unit on its own, or add one of other nine modules¹ for experiments of varying complexity across a wide range of topics and disciplines.

Workstation Components

Plant	Two Rotary Servo Base Units 2 DOF Inverted Pendulum
Data acquisition device	Quanser Q8-USB
Amplifier	Quanser VoltPAQ-X2
Control design environment	QUARC for MATLAB®/Simulink® QRCP for LabVIEW™

¹ The add-on modules are sold separately

Product Details



Courseware

Modelling Topics

- State-space representation

Control Topics

- Linear-quadratic regulator

Device Specifications

Length of a single linkage bar	12.7 cm
Mass of a single linkage bar	65 g
Pendulum length	33.65 cm
Pendulum mass	127 g
2 DOF joint encoder sensitivity	0.0879 deg/count

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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