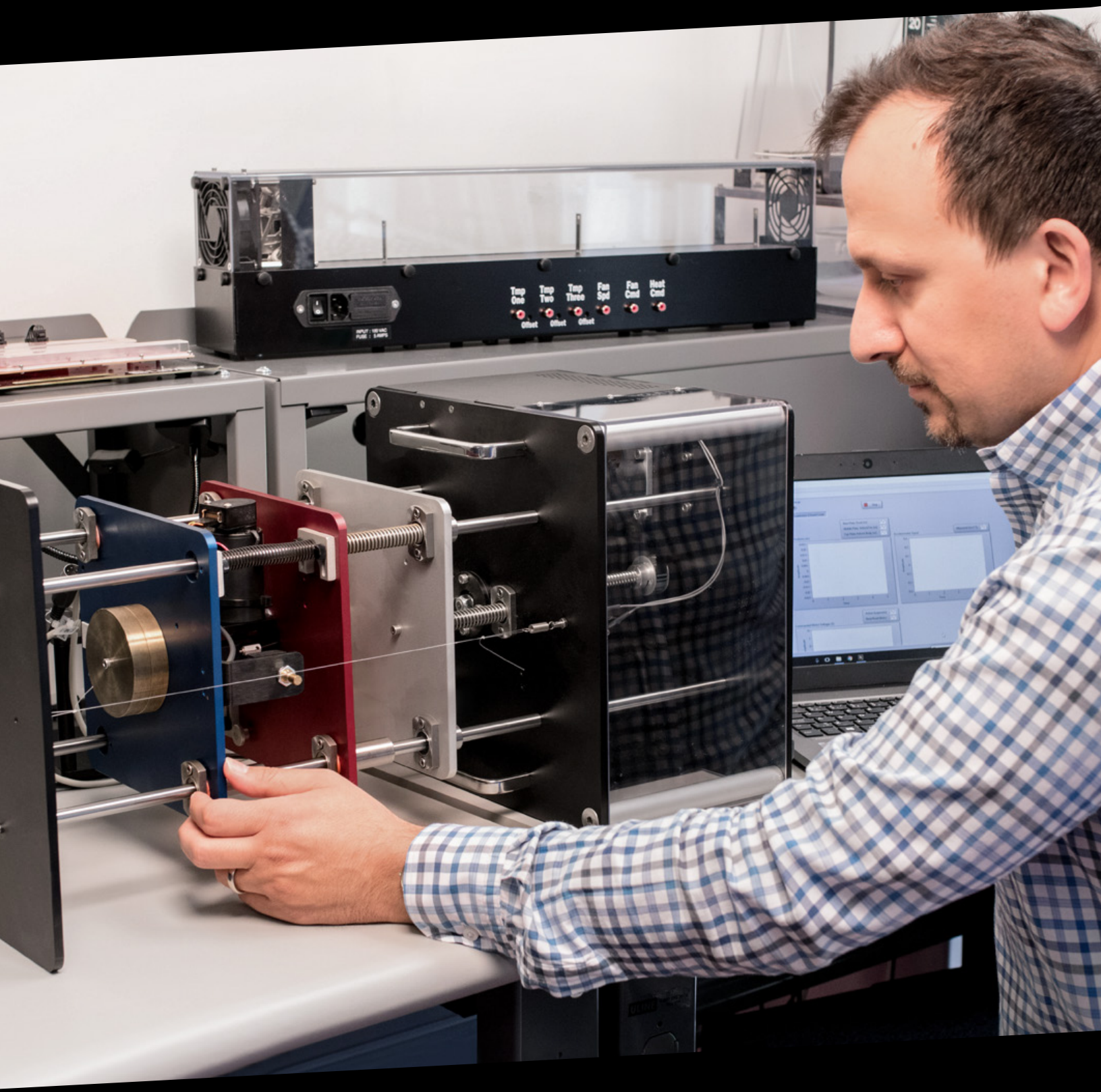


Control
Lab Solutions

QUANSER
INNOVATE · EDUCATE

Control systems lies at the core of the most exciting emerging technological breakthroughs of the modern age. From drones and reusable rockets, to advanced robotics and self-driving vehicles, the fundamentals of control systems design and implementation are a critical skill for engineers to compete and innovate in the modern workforce. Quanser offers modeled, repeatable, and reliable control plants that offer students hands-on experience using modern control tools and approaches to solve control problems that are analogous to typical modern industrial challenges.

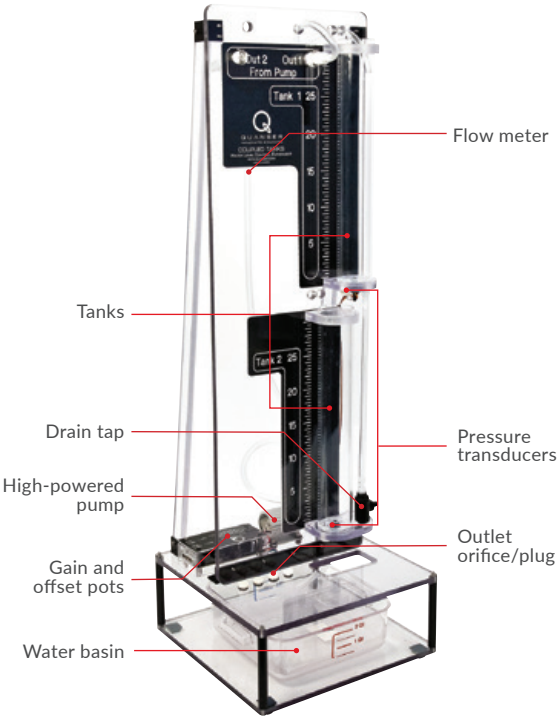
PROCESS CONTROL

The modern industrial systems that are fundamental to modern automation and manufacturing processes require specialized control systems to perform and manage their daily operations. Quanser offers a variety of plants that can be used to teach the key elements of modern process control including cascade control with the Maglev and Ball and Beam systems, regulator design with the Coupled Tanks, and the control of systems with slower dynamics with the Heatflow.

Ball and Beam

Magnetic Levitation

Heatflow



Coupled Tanks

CLASSIC SYSTEM CONTROL

The classic progression of control systems education begins with the fundamentals of modeling and designing control plants for linear systems. Quanser offers a diverse collection of plants that can be used as ideal platforms to offer students experience using classic control principles. These plants offer basic dynamics that range from rotary and linear motion through to temperature control using the QNET HVAC.

QUBE-Servo 2

Linear Servo Base Unit

QNET HVAC Board

QNET DC Motor Board

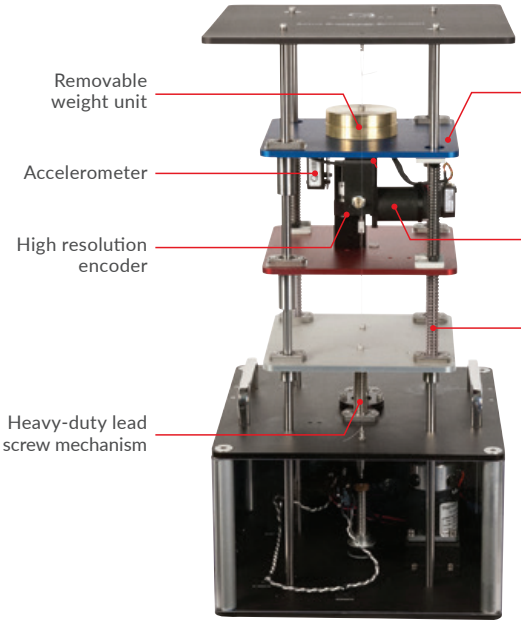
Rotary Servo Base Unit with Inertia Loads

MODERN SYSTEMS CONTROL

The modern approach to control systems takes a state space approach to the design of control systems. Quanser has a collection of plants that can be used to show how a modern approach to control systems allows for the creation of precise controllers for complex systems with higher order dynamics. These plants include both dynamically complex plants such as the linear inverted pendulum, and double pendulum, as well as plants such as the active suspension that require the use of both state space modelling to express the complex coupled dynamics of the system.

Rotary Flexible Joint

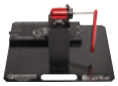
Linear Pendulum



Active Suspension

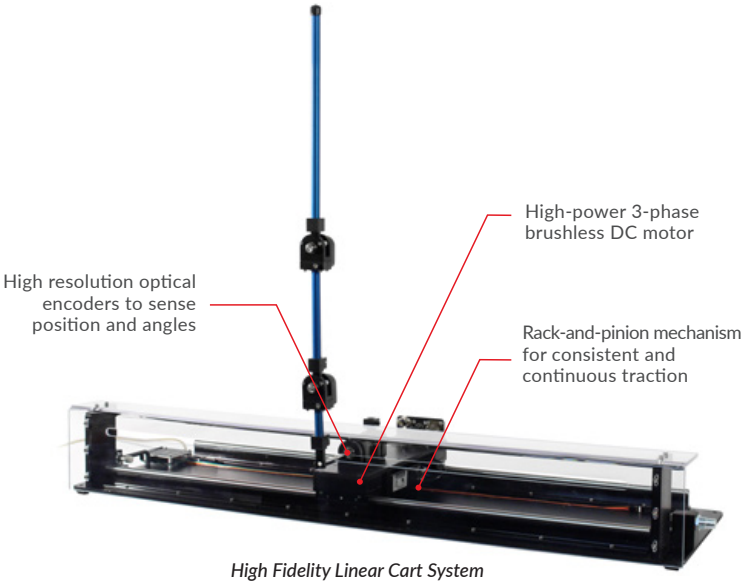
UNSTABLE SYSTEMS

Some of the most exciting emerging technologies from bipedal walking robots to reusable rockets requires the design of controllers for unstable systems. Quanser offers several plants that offer students an experience creating control systems for directly analogous dynamic systems including single and double inverted pendulums.



QNET Rotary Pendulum Board

Rotary Double Inverted Pendulum



High Fidelity Linear Cart System

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App available on Android and iOS.