

# AEROSPACE DYNAMICS AND CONTROL

## Take your program to new heights

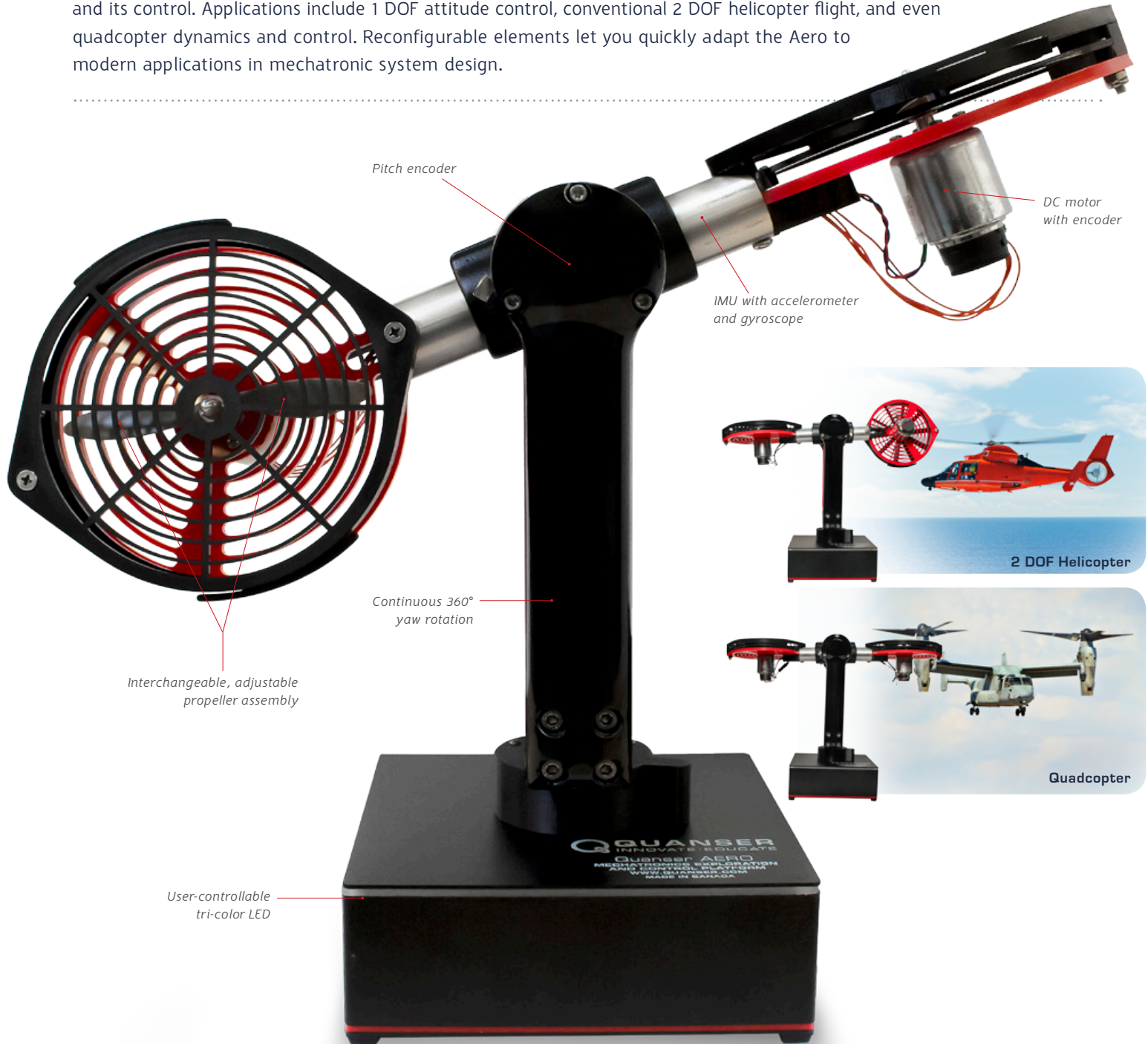
Quanser offers a unique line of products designed explicitly to introduce undergraduate and graduate students to the core dynamic, control, and mechatronic challenges of modern flight systems.



# Quanser AERO

## for Essential Dynamics and Control Concepts

The Quanser Aero is a unique platform that allows students to explore and gain insight into the dynamic complexities of flight applications. At its core, the Aero is a high-precision, plug and play physical system plant to study helicopter flight motion and its control. Applications include 1 DOF attitude control, conventional 2 DOF helicopter flight, and even quadcopter dynamics and control. Reconfigurable elements let you quickly adapt the Aero to modern applications in mechatronic system design.



### Compact, highly responsive system

- Reconfigurable 1 and 2 DOF applications
- Equipped with optical encoders, current and voltage sensors
- Slip ring allows for continuous 360° yaw rotation
- Inertial measurement unit (IMU) with accelerometer and gyroscope

### QFLEX technology for easy I/O configurations

- USB: interfaces to Quanser's control software running on your lab's PC
- Embedded: interfaces to your microcontroller [not included] via SPI connection





# Quadcopter Systems

The quadcopter or quadrotor configuration is a principal configuration for modern autonomous flying vehicle design. Quanser's unique line of products take you from first principles to actual quadcopter flight.



## 3 DOF Stationary Quadcopter

**Study flight dynamics and control of quadcopters and vertical lift-off vehicles.**

**Designed for reliable, repeatable results**

- Propellers driven by high-quality Pittman DC motors
- High-resolution optical encoders for precise position measurements
- Slip ring allows infinite motion about the yaw axis

**Integrate easily into your current curriculum**

- Quanser developed lab guide, and resources
- Fully compatible with MATLAB®/Simulink® and LabVIEW™
- Open architecture design, allowing users to design their own controller

## QBall 2 UVS

**Open-architecture unmanned aerial vehicle (UAV) solution optimized for advanced mission research in indoor environments.**

**High performance, open and customizable platform**

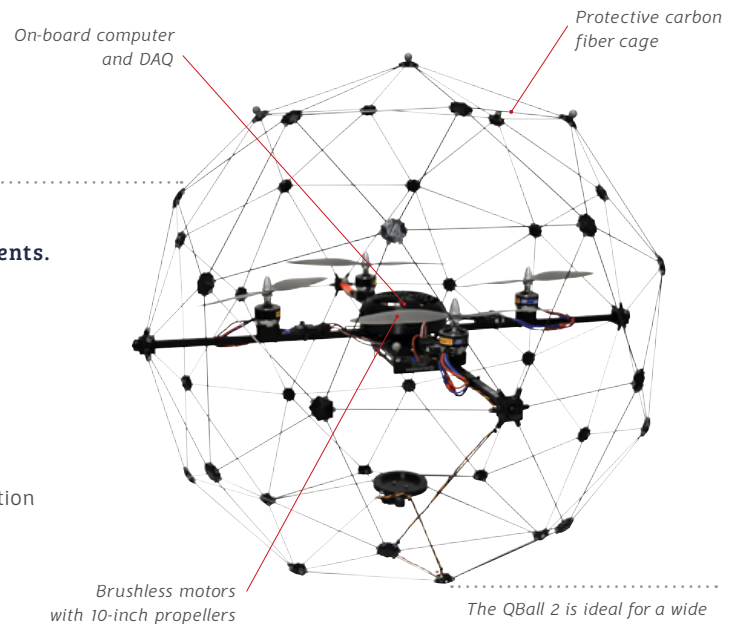
- High-resolution inertial measurement unit and avionics I/O DAQ
- Customizable with add-on digital and analog sensors supported by QUARC®

**Indoor environment research platform**

- Light-weight, protective carbon fiber cage
- Synchronized infrared OptiTrack cameras provide accurate localization
- Link to Quanser Qbot 2 ground robot for multivehicle applications

**Save time and resources**

- Fully compatible with MATLAB®/Simulink®
- Real-time in-flight parameter tuning



*The QBall 2 is ideal for a wide variety of unmanned vehicle research applications*



## Comprehensive Product Line for Aerospace Dynamics

Quanser offers the most complete range of products for hands-on labs for Aerospace Engineering departments. Quanser systems offer the precision and deterministic dynamics to support the theory. The robustness and flexible architecture of the products also make them ideal motion validation platforms for research.



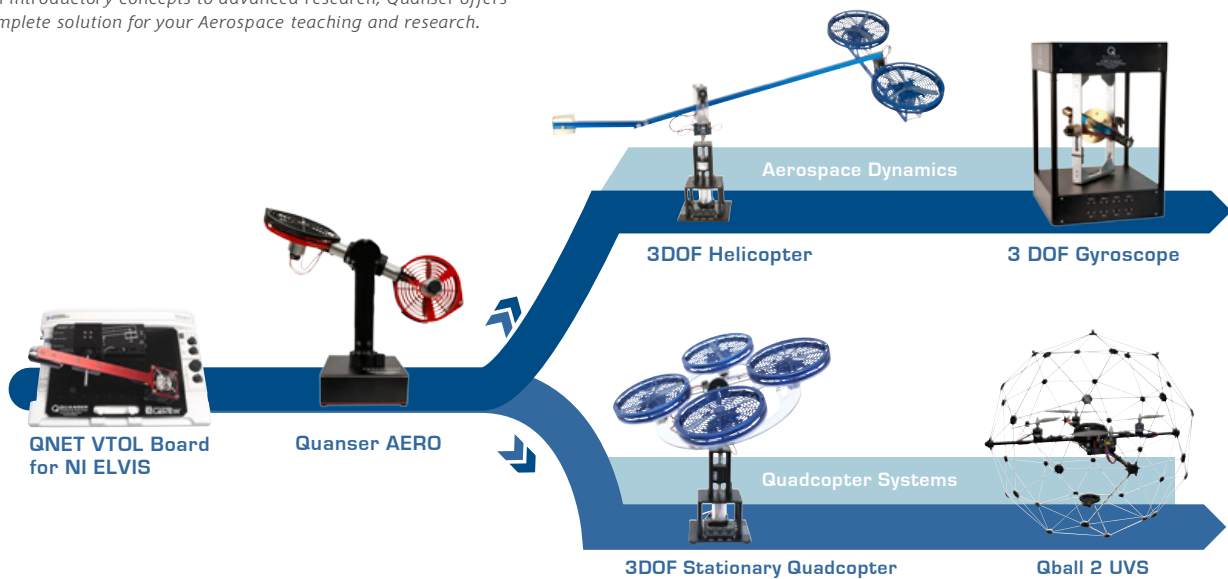
3 DOF Gyroscope



3 DOF Helicopter

## Aerospace Solutions

*From introductory concepts to advanced research, Quanser offers a complete solution for your Aerospace teaching and research.*



*The plants pictured here are not to scale. For accurate dimensions and system specifications, please request a product information sheet at [info@quanser.com](mailto:info@quanser.com)*

### 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.

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