# ROTARY FLEXIBLE LINK

Study concepts of vibration analysis and resonance

The Rotary Flexible Link experiment is ideal for studying concepts related to control of vibration and resonance in large, lightweight structures with flexibilities. The experiment is also useful when modelling flexible links on robots or spacecraft.

The Rotary Flexible Link module consists of a stainless steel flexible link with a strain gage that detects the deflection of the link's tip. The module attaches to the Rotary Servo Base Unit, rotating the flexible link in a horizontal plane.

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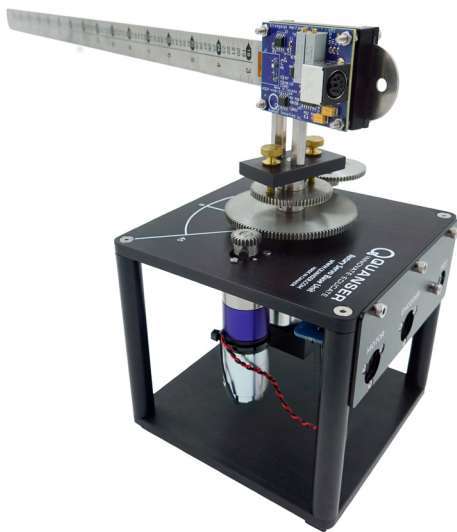
Precise
The system's inherent precision helps deliver accurate, repeatable results required for teaching & research labs.

Robust
A durable system able to accommodate enthusiastic undergraduate students.

Comprehensive Courseware
ABET-aligned courseware for MATLAB®/Simulink® or LabVIEW™ covers modelling, position, and speed control topics.
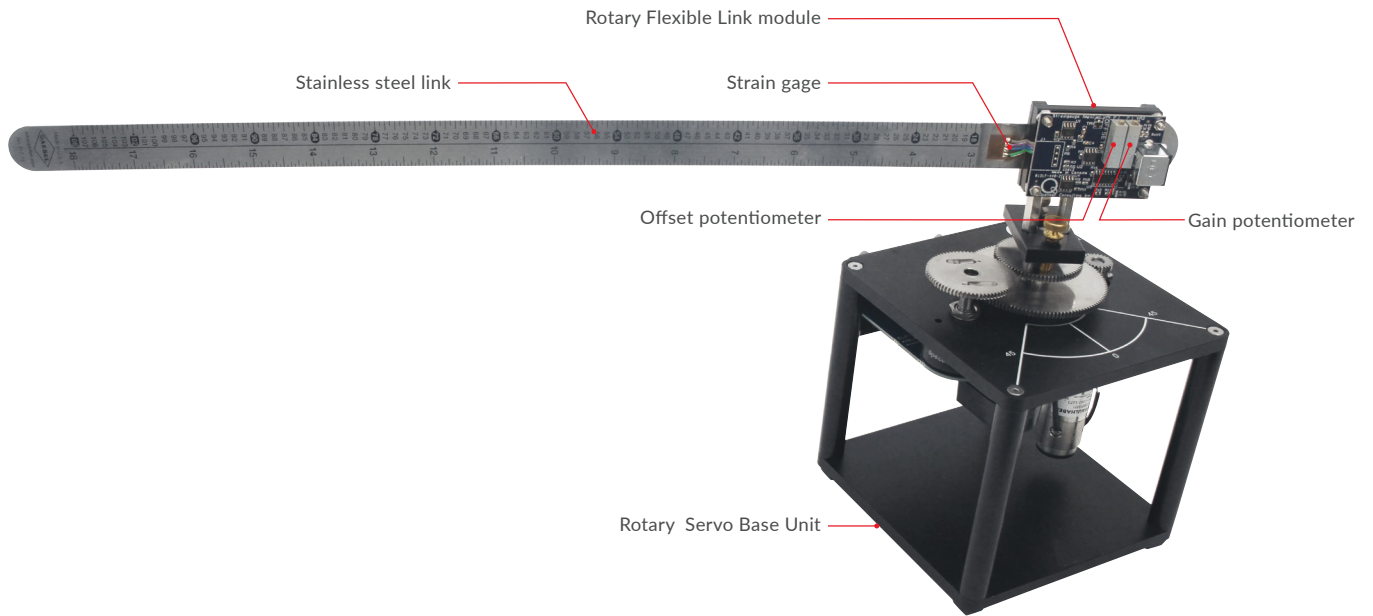
Expandable
Use the Rotary Servo Base Unit on its own, or add one of other nine modules[1] for experiments of varying complexity across a wide range of topics and disciplines.

Workstation Components

Plant	Rotary Servo Base Unit Rotary Flexible Link module
Data acquisition device	Quanser Q2-USB
Amplifier	Quanser VoltPAQ-X1
Control design environment	QUARC for MATLAB®/Simulink® QRCP for LabVIEW™

[1] The add-on modules are sold separately

Product Details

Rotary Flexible Link module

Stainless steel link

Strain gage

Offset potentiometer

Gain potentiometer

Rotary Servo Base Unit

Courseware

Modelling Topics
- Lagrange derivation
- State-space representation
- Model validation
- Parameter estimation

Control Topics
- State-feedback control
- Linear Quadratic Regulator
- Vibration control

Device Specifications

Dimensions of the Rotary Flexible Link module (L x H)	48 x 2 cm
Weight of the flexible link	0.065 kg
Flexible link length (strain gage to tip)	41.9 cm
Flexible link moment of inertia	0.0038 kg.m^2
Strain gage calibration gain	1/16.5 rad/V
Strain gage measurement range	± 5 V

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.