QUANSER
INNOVATE·EDUCATE

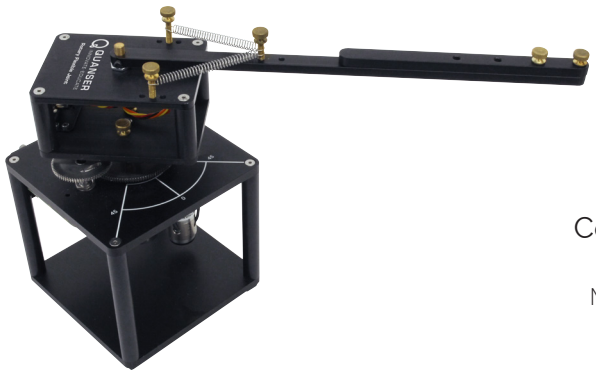
ROTARY FLEXIBLE JOINT

Model flexible joints in robotic arms

The Rotary Flexible Joint experiment is ideal for studying concepts encountered in large geared robot joints with flexibility exhibited in the gearbox, as well as concepts related to control of vibration and resonance, and modelling flexible joints on robots or spacecraft.

The Rotary Flexible Joint module consists of a rigid link with adjustable length mounted on a flexible joint , and an encoder measuring the deflection of the joint. The module attaches to the Rotary Servo Base Unit, rotating the rigid link in a horizontal plane. The link rotation is counteracted by two extension springs, resulting in an instrumented flexible joint. The module is supplied with three types of springs with different stiffness.

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

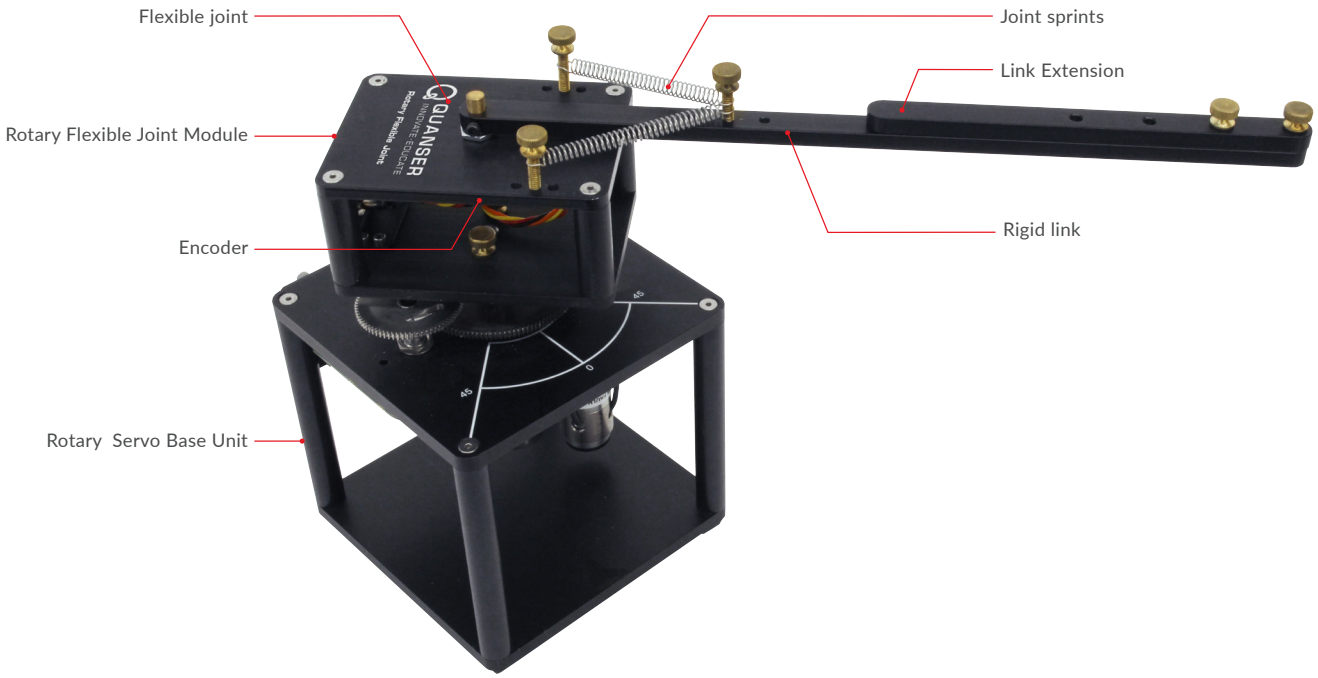
Use the Rotary Servo Base Unit on its own, or add one of other nine modules[1] for experiments of varying complexity across a wide range of topics and disciplines.

Workstation Components

Plant	Rotary Servo Base Unit Rotary Flexible Joint 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



Courseware

Modelling Topics

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

Control Topics

- State-feedback control using pole placement
- Vibration control

Device Specifications

Dimensions of the Rotary Flexible Joint module (L x W x H)	10 x 8 x 5 cm
Weight of the Rotary Flexible Joint module	0.3 kg
Rigid link length	29.8 cm
Link extension length	15.6 cm
Encoder resolution (in quadrature)	4096 counts/rev
Spring 1 stiffness	187 N/m
Spring 2 stiffness	313 N/m
Spring 3 stiffness	565 N/m

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.