

## 2 DOF ROBOT

### Introduce and explore fundamental concepts of robotics

The 2 DOF Robot module is ideal to introduce students to the fundamental and intermediate principles of robotics. You can use it to demonstrate real-world control challenges, such as pick-and-place robots used in manufacturing lines and explore kinematic problems encountered in the control of other parallel mechanisms with singularities.

The 2 DOF Robot module consists of a four-bar linkage system: two powered arms coupled through two non-powered arms. The linkage is connected to two Rotary Servo Base Units mounted at a fixed distance. That creates a planar system with two actuated and three unactuated revolute joints.

### 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

Courseware for MATLAB®/Simulink® or LabVIEW™ covers modelling and control topics.



#### Expandable

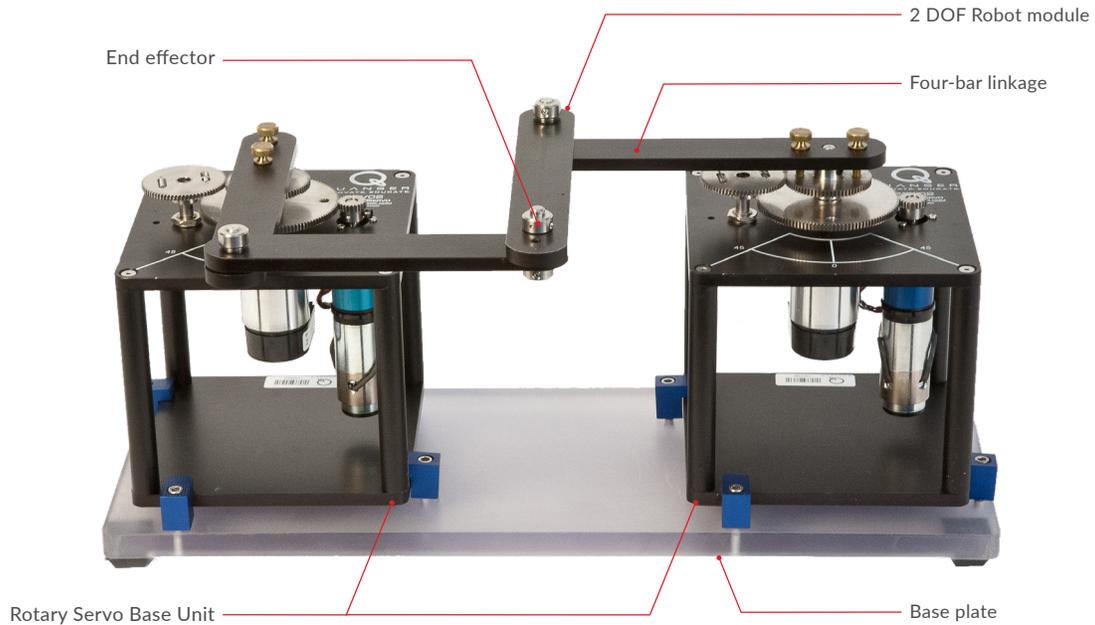
Use each Rotary Servo Base Unit on its own, or add one of other nine modules<sup>1</sup> for experiments of varying complexity across a wide range of topics and disciplines.

### Workstation Components

|                            |   |
|----------------------------|---|
| Plant                      | Two Rotary Servo Base Units<br>2 DOF Robot module |
| Data acquisition device    | Quanser Q2-USB                                    |
| Amplifier                  | Quanser VoltPAQ-X2                                |
| Control design environment | QUARC for MATLAB®/Simulink®<br>QRCP for LabVIEW™  |

<sup>1</sup> The add-on modules are sold separately

## Product Details



## Courseware

### Modelling Topics

- Transfer function representation
- Kinematics

### Control Topics

- PD control
- Joint space control
- Workspace control

## Device Specifications

|  |                                      |
|--|--------------------------------------|
| 2 DOF Robot overall dimensions (L x W x H) | 40 x 20 x 30 cm                      |
| 2 DOF Robot total mass                     | 4 kg                                 |
| Length of a single link                    | 12.7 cm                              |
| Mass of a single link                      | 65 g                                 |
| Link moment of inertia about cog           | $8.74 \times 10^{-5} \text{ kg.m}^2$ |
| Link moment of inertia about pivot         | $4.41 \times 10^{-4} \text{ kg.m}^2$ |

### 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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