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Quick Start Guide: QUBE-Servo 2 USB

MATLAB SIMULINK

STEP 1 — Check Components and Details

Make sure your QUBE-Servo 2 experiment includes the following components:

1. Quanser QUBE-Servo 2 with QFLEX 2 USB interface panel
2. Inertia disc module
3. Pendulum module
4. USB 2.0 A/B cable
5. 24V, 2.71A power supply
6. Power cable
7. QUBE-Servo 2 Workstation Resources*
(include controllers, User Manual, Quick Start Guide, Instructor and Student Workbooks, and other files)

NOTE: If you also received a QFLEX 2 Embedded interface panel, please refer to its data sheet and the QUBE-Servo 2 User Manual for instructions on how to replace the panel, and how to connect to an external controller.

*Download the Student version of the Workstation Resources from www.quanser.com/courseware. For the full Instructor version with problem solutions, contact instructors@quanser.com

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STEP 2 — Additional Components Required for Set Up

To complete the Quanser QUBE-Servo 2 USB set up, you will also need the following:

1. QUARC Real-Time Rapid Control Prototyping Software Installation DVD (QUARC software must be purchased separately)

STEP 3 — Install and Test QUARC

A. Make sure you have all required software, as listed in the QUARC Compatibility Table document located in the QUARC DVD folder.

B. See the QUARC Installation Manual for details on how to install the software.

C. Make sure you test the system using the Sine and Scope demo. You can access this by typing **qc_show_demos** in the Matlab prompt.
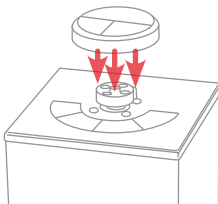
The steps below use the Quanser QUBE-Servo 2 USB. If you are using the QUBE-Servo 2 with the QFLEX 2 Embedded panel, please refer to its own data-sheet or the QUBE-Servo 2 User Manual for instructions on connecting to an external controller.
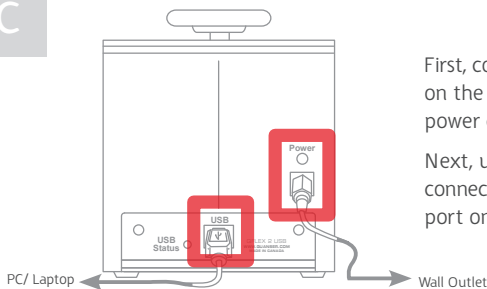
A   Place the QUBE-Servo 2 on a flat surface with enough space so that the modules will not be obstructed.

B   Connect the inertia disc module to the QUBE-Servo 2 base by aligning the inertia disc magnets with the magnets on the QUBE-Servo 2 module connector. The module should snap into place.
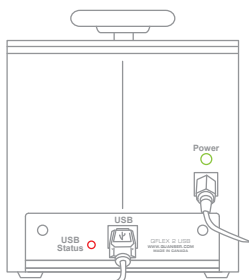
C   First, connect the supplied 24V power supply to the *Power* connector on the QUBE-Servo 2 and to a wall outlet using the appropriate power cable.

Next, using the supplied USB cable, connect the QUBE-Servo 2 USB connector on the QFLEX 2 USB panel to an enabled USB 2.0 (or higher) port on your desktop PC or laptop.
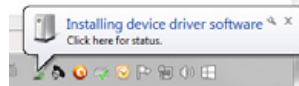
PC/ Laptop   Wall Outlet

D   The *Power* LED on the QUBE-Servo 2 should light up green, and the USB *Power* LED on the QFLEX 2 panel should light up red.
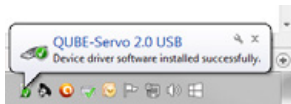
E   Windows[1] should automatically detect the presence of the QUBE-Servo 2 and attempt to install the driver.

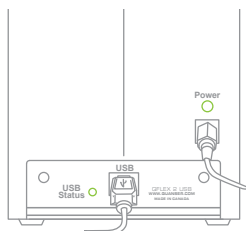**Note:** The installation process may take several minutes.

Installing device driver software
Click here for status.

F   Upon completion, Windows will notify you that the device is ready for use.

QUBE-Servo 2.0 USB
Device driver software installed successfully.

G   The *USB Power* LED on the QFLEX 2 USB panel should change from red to green.

[1]Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

Follow the procedure below to test your QUBE-Servo 2 experiment.

A   Make sure your PC is powered ON.

B   Download the QUBE-Servo 2 Workstation Resources from www.quanser.com/courseware and locate the **Quick Start** folder: QUBE-Servo 2 USB\Quick Start.

C   Open the Simulink model file (.mdl) found under the **Quick Start** folder on your hard drive.

D   Double-click on the HIL Initialize block and choose the panel that is installed in your system (e.g. qube_servo2_usb).

E   Click on the **Build Model** button on the Simulink model toolbar.

F   Once the model code has been compiled, click on the **Connect To Target** button.

G   Click on the **Run** button to start the QUARC real-time model.

H   The scopes should look similar to those shown here.

The measured servo angle (in purple) should be tracking the desired angle (in yellow) in the **Servo Angle (deg)** scope. The motor voltage is displayed in the **Motor Voltage (V)** scope. If not, consult the Troubleshooting section at the end of this guide.

Servo Angle (deg)   Motor Voltage (V)

I   Click on the Simulink **Stop** button to stop the running model

1. Check the connections outlined in Step 4 of this guide. Make sure you follow the order of the steps.

2. Make sure cables are firmly connected.

Getting an error when trying to build or run the Quick Start Simulink model (.mdl)

A. Type ver in the *Matlab Command Window* and verify that QUARC is on the list. If not, then go through the QUARC Quick Installation Guide to install QUARC. If it is listed, run *mex -setup* as described in the the QUARC Installation Guide.

You get an 'An operating system specific kernel-level driver for the specified card could not be found' message.

A. Make sure the QUBE-Servo 2 is connected to your PC/laptop with the supplied USB cable to an enabled USB port.

B. Ensure the green *Power* LED on the QUBE-Servo 2 is lit. If not, check that the power supply is operational and properly connected.

C. Ensure the *qube_servo2_usb* has been selected as the board type in the HIL Initialize block, as outlined in Steps 5D.

D. Verify that the QUBE-SERVO 2.0 USB item appear in Device Manager under the *Universal Serial Bus controllers item.*

E. Ensure the USB *Power* LED on the QFLEX 2 USB panel is lit green.

The Motor is not responding.

A. Ensure the green *Power* LED on the QUBE-Servo 2 is lit. If not, make sure the power supply is operational and properly connected.

STILL NEED HELP? For further assistance from a Quanser engineer, contact us at tech@quanser.com or call +1-905-940-3575.

LEARN MORE To browse and download the latest QUBE-Servo resources, visit www. quanser.com/courseware

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