

Quanser Interactive Labs (QLabs) User Manual

This document shows how to install and run the Quanser Interactive Labs (QLabs) software and gives an overview of the software settings available. QLABs has two versions:

- **QLabs Controls:** Self-contained software with virtual representations of the Quanser hardware. No external software is needed.
- **QLabs Virtual Experiments:** Virtual representation of Quanser hardware that is interfaced through MATLAB Simulink.

System Requirements:

QLabs Controls:

- Desktop version: **Windows 10 (64-bit)** and **macOS Mojave 10.14.6**.
- Mobile version: **Android 5** or later and **iOS 11.3** or later

QLabs Virtual Experiments:

- **Windows 10 64-bit**
- **MATLAB and Simulink R2020a to R2022a** (not included).

See details and most up to date requirements at: <https://www.quanser.com/products/qlabs-controls/#productdetails>

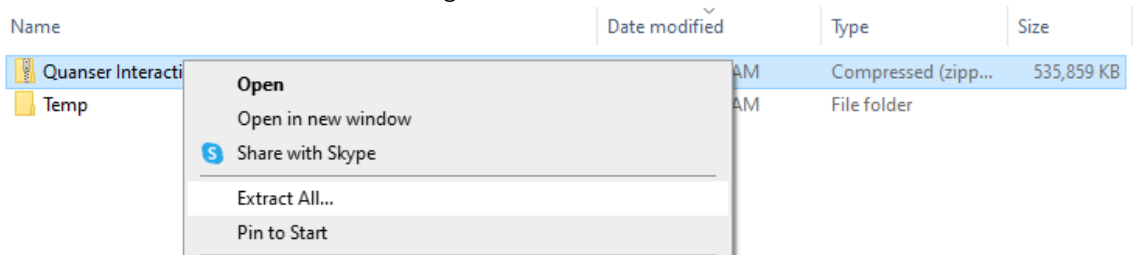
Installing and Running QLABs

STEP 1 Download Software

1. Go to the Quanser Academic Portal: <https://portal.quanser.com/Downloads>
2. Download the stand-alone **QLabs Controls** software or the Simulink-based **QLabs Virtual Experiments**.
QLabs Controls Users: Download either the **Windows 10** or **MacOS** version of the software and/or go to the **Apple App Store** or **Google Play** for the mobile version.

STEP 2 Install Software

1. Extract the **Quanser Interactive Labs** file. Right-click on the file and select "Extract All".



2. Extract the contents of the file.

← Extract Compressed (Zipped) Folders

Select a Destination and Extract Files


Files will be extracted to this folder:

D:\Downloads\Quanser Interactive Labs

Browse...

☐ Show extracted files when complete

3. *Qlabs Virtual Experiment Users:* Make sure MATLAB® /Simulink® is installed **before** installing the QLABs software.
4. Go to the *Quanser Interactive Labs* folder and run the **Install QLABs** application.

Name	Date modified	Type	Size
 Install QLABs	1/5/2021 11:35 AM	Application	536,118 KB

5. Follow the prompt to install the software.

STEP 3 Create your QLABs Account

1. Run the **Quanser Interactive Labs** software.



1. Click on "Register as a new user" using your e-mail (e.g. University e-mail account).

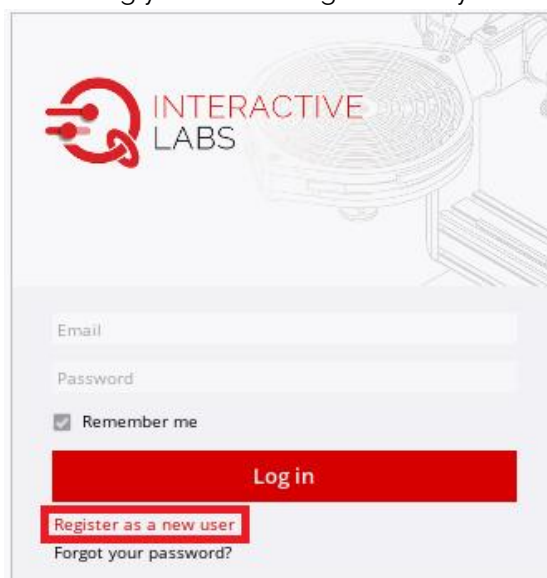
The screenshot shows the Quanser Interactive Labs login and registration page. At the top is the Quanser Interactive Labs logo. Below it are input fields for "Email" and "Password". There is a checkbox labeled "Remember me". A prominent red button labeled "Log in" is in the center. Below the "Log in" button is a link labeled "Register as a new user" which is highlighted with a red box. At the bottom is a link labeled "Forgot your password?".

Figure 2: Create your QLABs account

2. This will load the registration page on the Quanser Academic Portal. Enter your e-mail (i.e. University e-mail account), password, and other information.

Register

Email

Password

Confirm Password

First Name (Optional)

Last Name (Optional)

-- Please select a country -- (Optional) ▾

☐ I agree to the [Terms and Conditions](#)

☐ I agree to the [Privacy Policy](#)

☐ I am at least 16 years of age

☐ We sometimes email our customers to let them know about changes to the platform or to ask for help making our tools and features better. If you are willing to receive occasional, non-critical emails from us, please tick the box. We really appreciate the help!


Register

- Go to the confirmation e-mail to finalize the registration.

Note: The e-mail may have been sent to your Junk or Spam box.

STEP 4 Running QLABs

- Run the Quanser Interactive Labs software.
- Enter the e-mail and password you registered.

 INTERACTIVE LABS

Email

Password

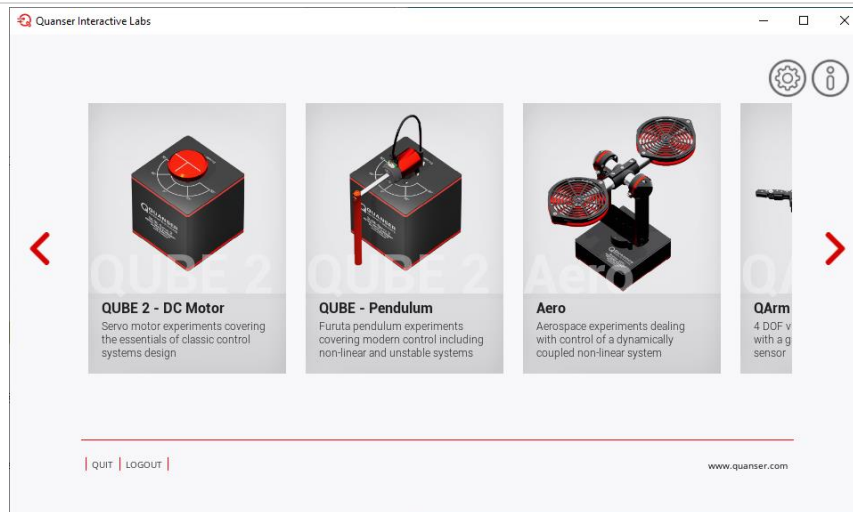
☒ Remember me

Log in

[Register as a new user](#)

[Forgot your password?](#)

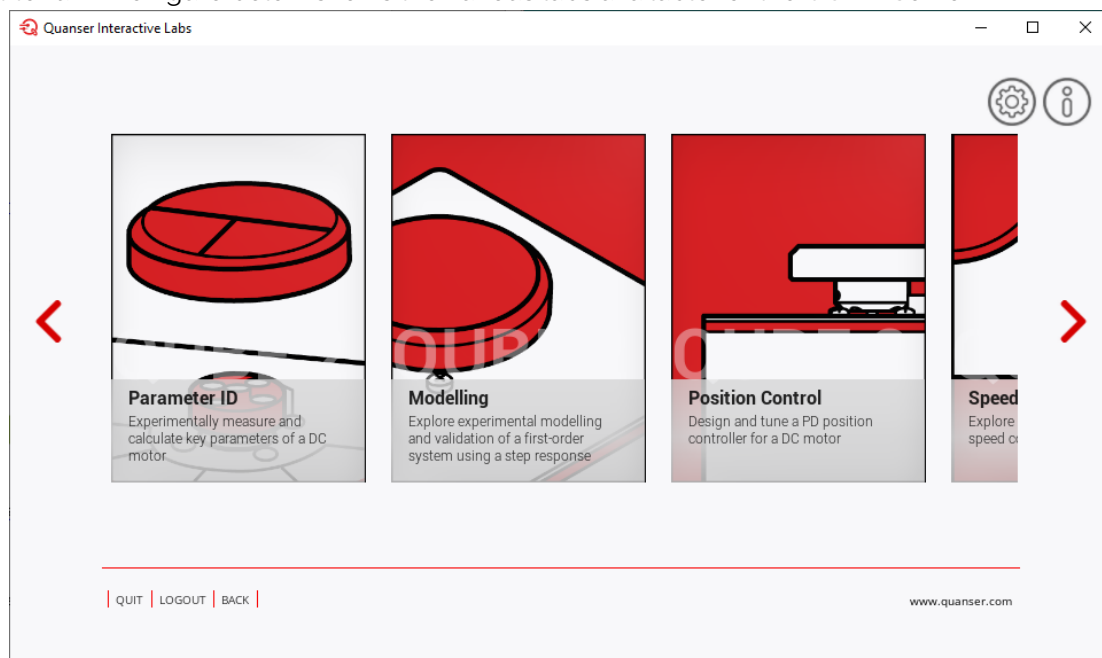
- Select the appropriate virtual system for your lab, e.g. QUBE 2 – DC Motor.



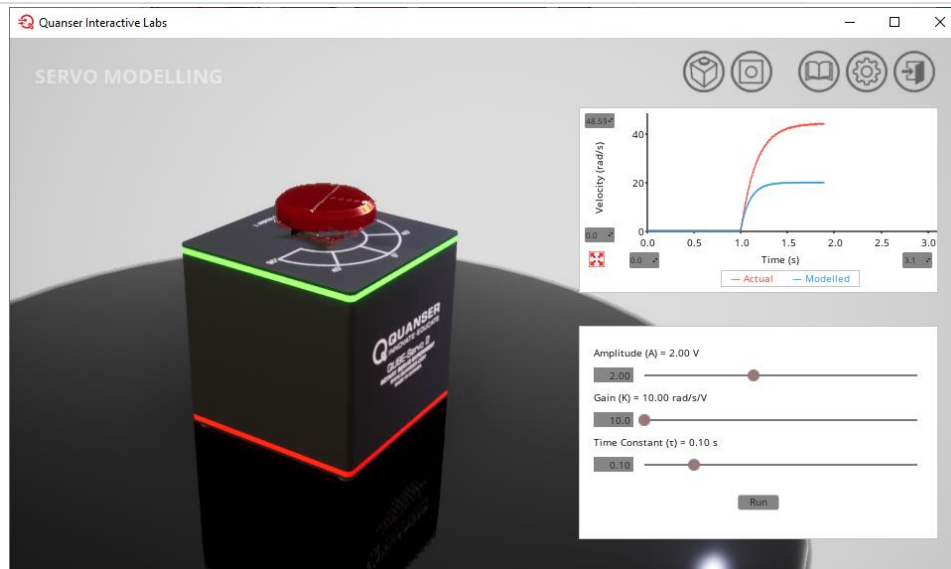
4. **Qlabs Controls Users:** Go to Step 5 for instructions on how to run a lab using the self-contained QLABs Controls software.
5. **Qlabs Virtual Experiment Users:** Go to Step 6 for instructions on how to run a QLABs Virtual Experiment using Simulink®.

STEP 5 Using QLABs Controls Standalone Software

1. The QUBE-Servo 2 DC Motor, Pendulum, and AERO all have their own self-contained labs. Click on the lab you want to run. The figure below shows the various labs available for the QUBE-Servo 2.

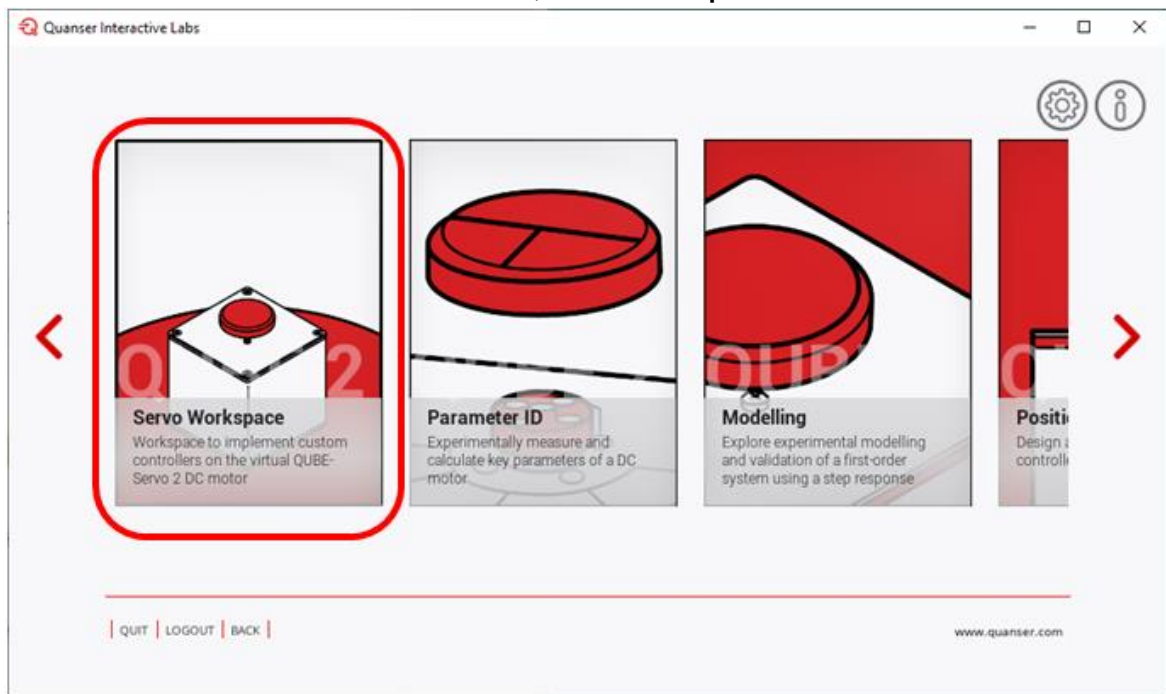


2. Run the lab. The example below shows the **Modelling** lab when the simulation is running.

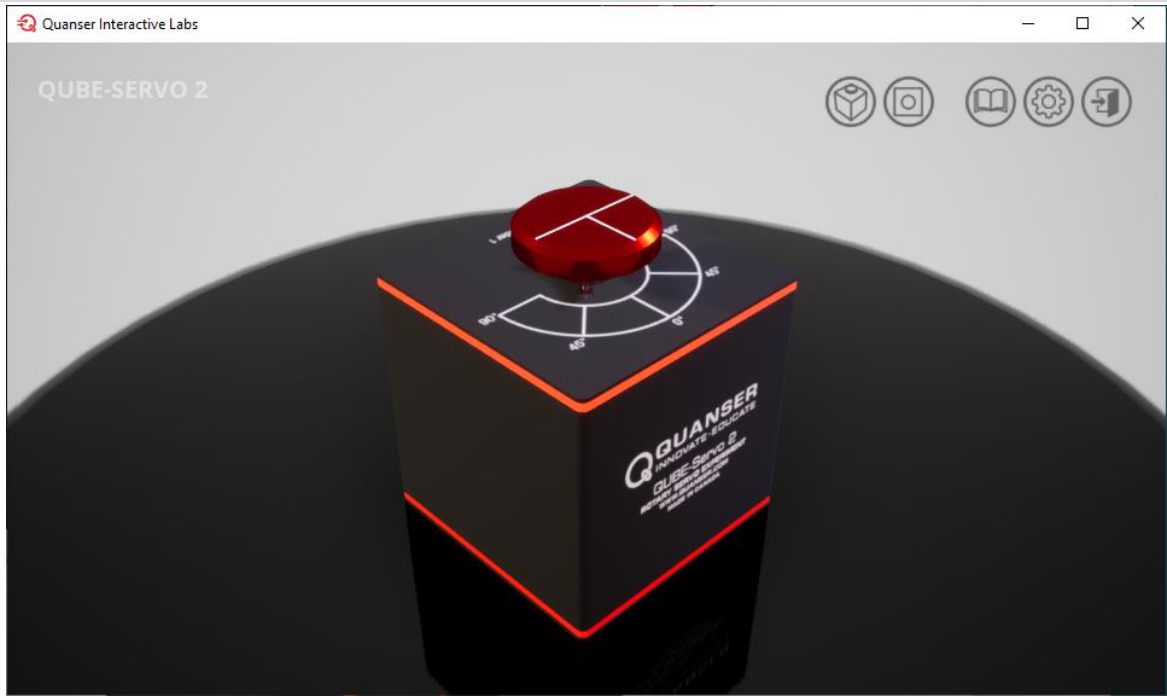


STEP 6 Running Virtual Experiment through Simulink

1. Launch the MATLAB® software
2. Select the **Workspace** of the appropriate virtual experiment. For example, to run on the QUBE-Servo DC Motor Simulink models select **QUBE 2 – DC Motor | Servo Workspace** as shown below.



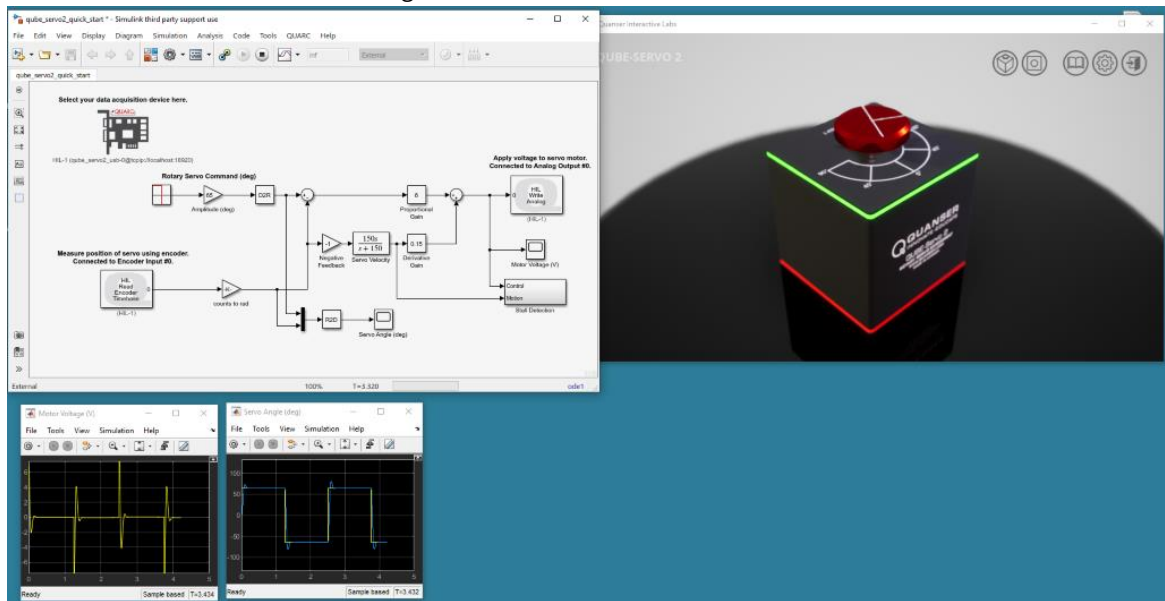
3. The virtual workspace of the system will load and allow you to conduct experiments through Simulink. The Servo Workspace is shown below.



4. Run the **Quick Start Controller** to test the system. To access this:
 - a. Click on the **Open content** button to download the resources for the virtual system.

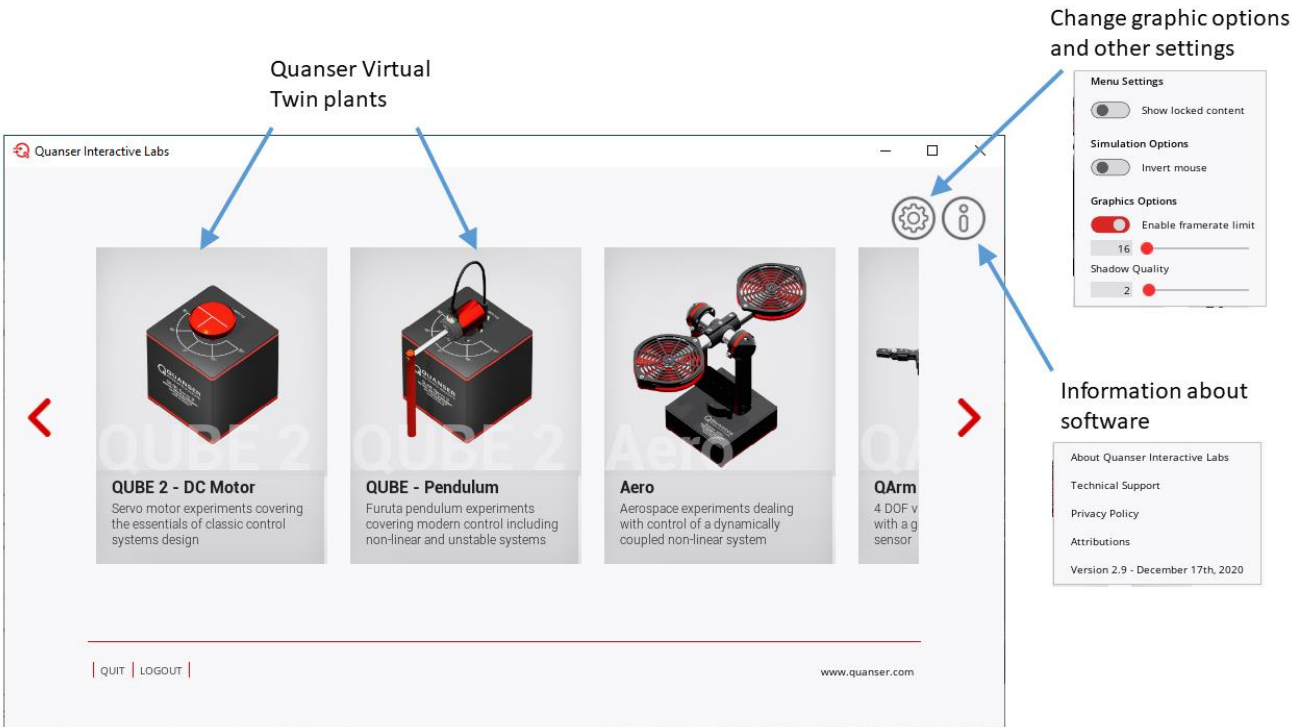


- b. Your default browser should load and automatically download the content.
Note: If the browser does not respond, try opening a different browser and clicking on the **Open content** button again.
 - c. Unzip the contents of the **QLabs Resources** file.
 - d. Open the **Quick Start Guide** PDF in the *Technical Resources* | *Quick Start* folder.
 - e. Follow the instructions in the Quick Start Guide to test your system. The example below shows the QUBE-Servo 2 DC Motor running the Quick Start Controller.

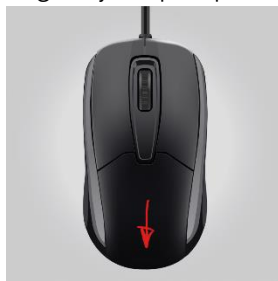


QLabs Software Interface and Settings

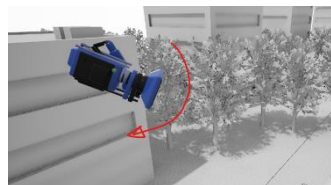
1. The QLABs navigation panel, shown below, displays the different QLABs Systems that are available to the user.



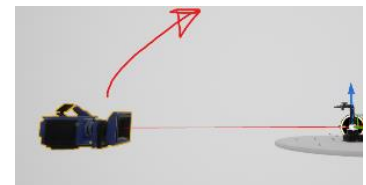
2. The **Menu Settings** button allows you to configure the following:
 - a. **Show locked content:** Displays menu content that you are licensed for, but is not available on the current platform (e.g. MacOS) and content that you are unlicensed for (with a lock icon).
 - b. **Simulation options:**
 - i. **Invert mouse:** Inverts the pitch motion of the camera when controlled by the mouse. By default, pulling the mouse down pitches the camera down or orbits the camera up depending on your perspective, as shown below.



Pulling the mouse down

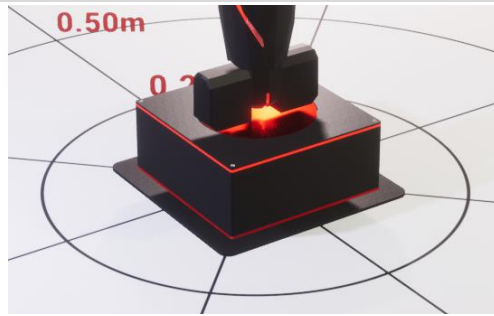


Pitches camera view down

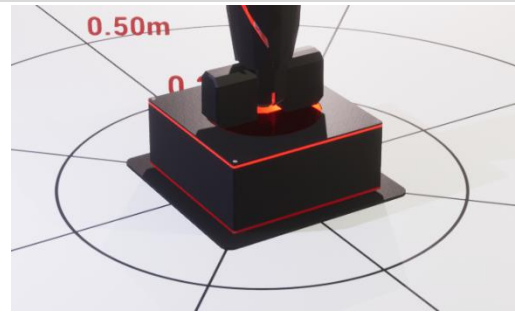


Orbits camera up

- c. **Graphic Options:**
 - i. **Enable framerate limit:** Sets Frames Per Second (FPS) limit on the graphic rendering of the virtual system. Using a lower limit slows down the graphics and uses less GPU and CPU resources. If you are running a laptop on battery, a lower framerate will reduce your battery consumption. *Note:* This setting affects the maximum framerate that simulations using image processing can capture images at.
 - ii. **Shadow Quality:** Affects the number and accuracy of shadows in the visualization. Increasing the setting results in a higher number shadows and more accurate shadows but it also increases the GPU load. Default is low quality. Shadows are one of the highest loads on the GPU.



Lower shadow setting

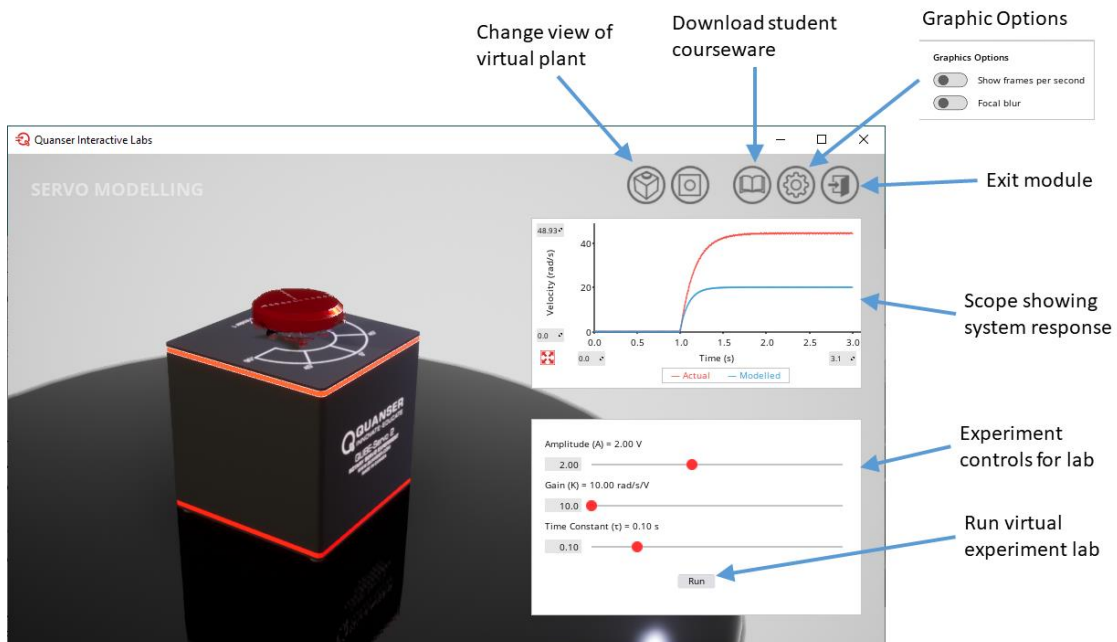


Higher shadow setting

3. The **Information** button allows you to access the following:
 - a. **About Quanser Interactive Labs:** Information about software.
 - b. **Technical Support:** Goes to the FAQ on the Quanser Academic Portal Support page.
 - c. **Privacy Policy:** Goes to the Quanser Privacy Policy page.
 - d. **Attributions:** List of companies and people that contributed to the QLABs software.
 - e. **Software version / build information:** Shows version and build date of QLABs software that is currently installed.
4. **Quit:** Closes the QLABs software.
5. **Logout:** Logs user off QLABs account.

Lab Quanser Interactive Lab Interface Settings

1. The various settings for the QLABs software experiment are summarized below.



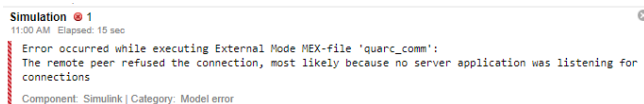
2. **Profile view:** Default view as shown above. This is a free-moving view that allows users to zoom in/out using the mouse wheel and change viewing angles by pressing the left mouse button and moving the mouse up/down. See the images shown in the **Invert Mouse** setting description above.
3. **Top view:** Adjust the camera to view the system from above, i.e. top-down view.
Note: there are different viewing options for each virtual experiment. These settings are used in the rotary-based Virtual System.
4. **Open Content:** Downloads the resources for the QLABs Virtual System. The resources supplied depend on the type of system:
 - a. QLABs Controls: Includes the student-version of the labs that can be performed.
 - b. QLABs Virtual Experiment: Includes the *Courseware Resources* and *Technical Resources*.

- i. Courseware Resources: the student-version of the workbook documents and Simulink models.
 - ii. Technical Resources: Quick Start Guide and controller and the User Manual of the hardware-based system.
- 5. **Options:** Graphic Options
 - a. **Show frames per second:** displays the frames per second (FPS) of the 3D graphic rendering.
 - b. **Focal blur:** add blur around the outer edge of the virtual experiment platform.
- 6. **Exit to the main menu:** Goes back to the main menu.

Troubleshooting

Review the following recommendations before contacting Quanser's technical support engineers

Getting "remote peer refused the connection" error.



- A. Make sure the correct HIL Board type and HIL Port # has been selected in the HIL Initialize block, as described in Table 1.
- B. Ensure the QLABs application is running and the correct Workspace model is selected.

Virtual model is running slowly compared to the simulation results, e.g. QUBE-Servo 2 Disc does not rotate as fast as measurement.

- A. Verify that your PC/laptop satisfies the QLABs software system requirements. Go to <https://www.quanser.com/digital/quanser-interactive-labs/>, select your virtual product and look under **Product Details** for the recommended system requirements.

For more technical support information and additional resources

- A. See the support page on the Quanser Academic Portal at: <https://portal.quanser.com/Support>

Still Need Help? For further assistance from a Quanser engineer, contact us at tech@quanser.com