Quick Installation Guide: QUARC™ on Microsoft® Windows®

| STEP 1	Install MATLAB® and Required Add-Ons

QUARC™ supports 64-bit Microsoft® Windows®.

Ensure one of supported MATLAB versions is installed on the computer with the following required add-ons accompanying the corresponding MATLAB version:

- **Simulink®**
- **Simulink Coder™**
- **MATLAB Coder™** (required by Simulink Coder)
- **Control System Toolbox™** (Optional add-on, but highly recommended as used by most of Quanser's control laboratories)

STEP 2	Install Microsoft Compiler

QUARC requires a MATLAB-supported C/C++ compiler
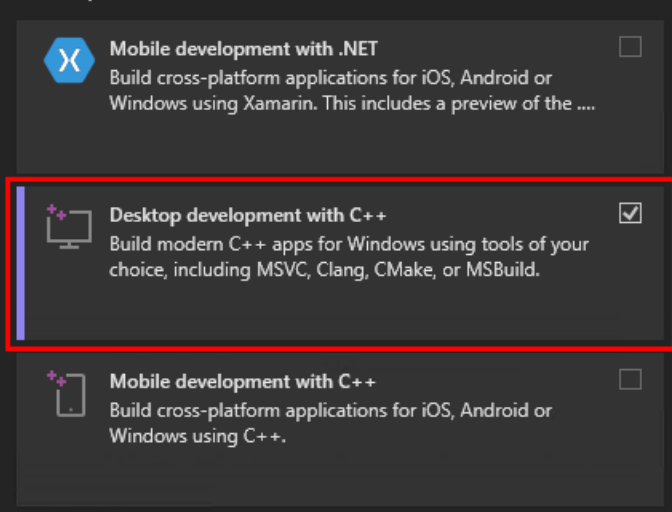
Depending on the MATLAB version used, ensure one of the following Microsoft compilers is installed:

- **Microsoft Visual Studio® 2017, 2019, or 2022 Professional Edition**
- **Microsoft Visual Studio 2017, 2019, or 2022 Community Edition**

The Microsoft Visual Studio 2022 Community Edition can be installed using the following Microsoft-provided link (you will need to sign-in using a Microsoft account in order to download older versions of Visual Studio): visualstudio.microsoft.com/downloads/

Ensure that the "Desktop development with C++" workload under "Desktop & Mobile" or "Windows" groupings is checked.

For details, refer to the online Compatibility Chart.

A
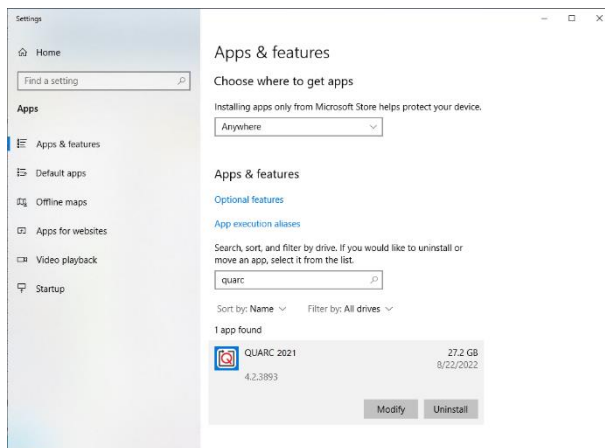
Uninstall any previous version of QUARC that may be present on the computer. Furthermore, if you have the QUBE-SERVO-USB, Q2-USB, or Q8-USB devices, you need to unplug them from the computer before uninstalling the earlier versions of QUARC.

Do so by launching the *Programs and Features* dialog or the *Apps & features* dialog depending on which Windows version you have.

B
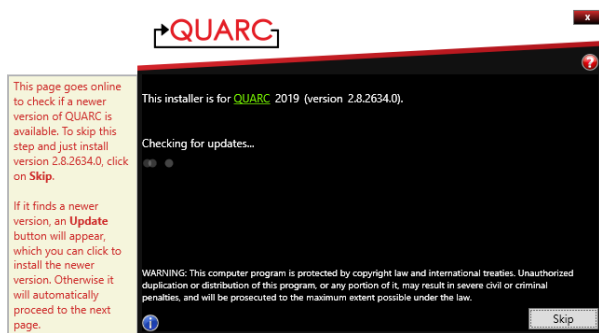
1. An internet connection is required during the QUARC installation process. Download the QUARC web installer executable using the link provided in the confirmation email that you received.

2. Run the QUARC installer (i.e., install_quarc.exe). The QUARC installation screen should appear.

The installer automatically checks if there is a newer update ready to download.

Tip: To find tips for each installation window, hover the mouse cursor
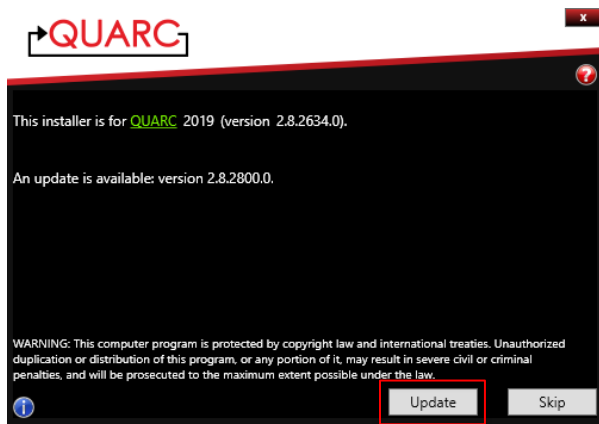
on the blue information icon on the lower left corner or

click the question mark icon on the upper right corner for more details from the installation guide.
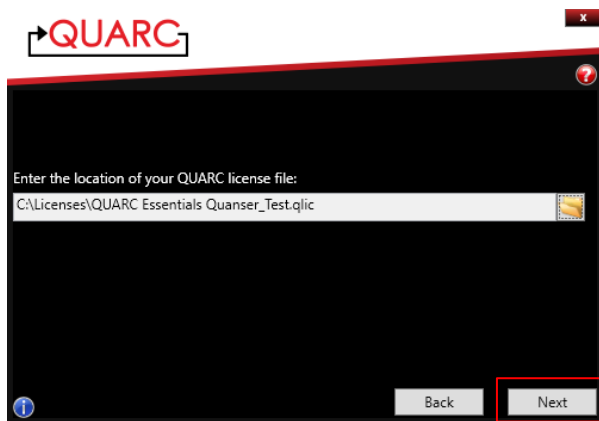
C

If an update is available, choose to *Update* to the latest version [for free].

D

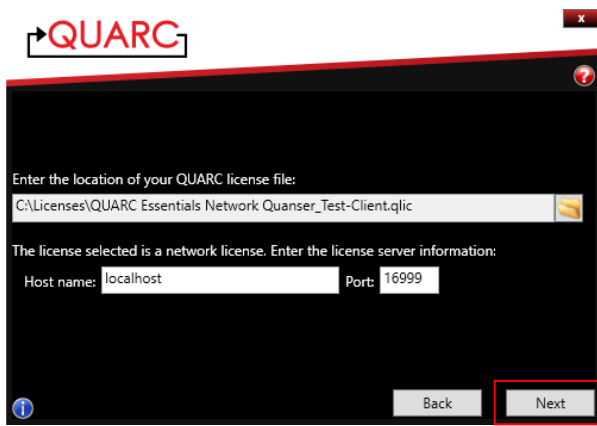Read over the license agreement displayed in the Quanser License Agreement window.

E

Enter the location of the QUARC license file provided in the confirmation email. If you have a network license file, go to Step G. Otherwise,

Click *Next* to continue.

F

If you are installing QUARC using network (multiple-user) licenses, note there are two license files. The license file ending with "-Server.qlic" must be used on the license server machine. The license file ending with "-Client.qlic" is used on the remote client computer(s). When installing the *License Manager* on the QUARC license server machine, enter *localhost* as *Host name*. Click *Next* to continue.

When installing QUARC on the license client computer(s), provide the host name and port number of the license server you wish to connect to. Click *Next* to continue.

G
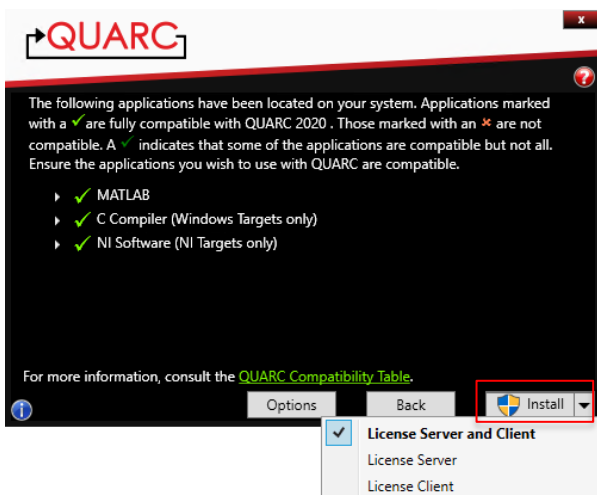
The installer will automatically scan the software environment on the host PC to ensure it meets the requirements for QUARC. Please consult with the *QUARC Compatibility Table* by clicking the link on the installation window for details. Your host must meet the requirements to continue the installation progress.

For single-user license, to start the installation immediately using the default settings click *Install* and skip to Step K. Otherwise click *Options* to customize the installation and skip to Step H.

For network license, to install the *License Manager* on the QUARC license server, start the installation with default settings by clicking the dropdown button next to the *Install* button and click *License Server*, then go to Step K.
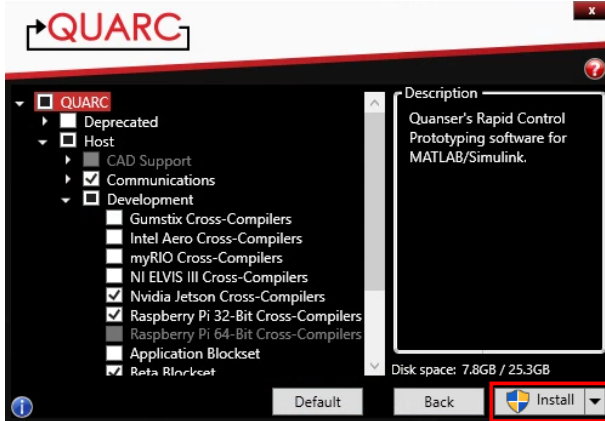
For network license, to install on the client computer(s), start the installation with default settings by clicking the dropdown button next to the *Install* button and click *License Client*, then go to Step K. Otherwise, click *Options* and continue to Step H.

H

Provide the destination folder where QUARC will be installed, and click *Next* to continue.

I

Choose the features to be installed. If you don't have the proper license required for a feature, the feature will be disabled and greyed out.

If you are using one of the devices below, please ensure the corresponding feature(s) is selected:

Device(s)	Feature(s)
Quanser QCar, QDrone2	Nvidia Jetson Cross-Compilers
Quanser QDrone	Intel Aero Cross-Compilers
Quanser QBot2e, QBot3	Raspberry Pi 32-Bit Cross-Compilers
Quanser QBot Platform Alpha	Raspberry Pi 64-Bit Cross-Compilers
Quanser QBot2, QBall 2+, QBall 2, QBot, QBall-X4, HiQ	Gumstix Cross-Compilers, Beta Blockset

For single-user license, click *Install* and go to Step K.
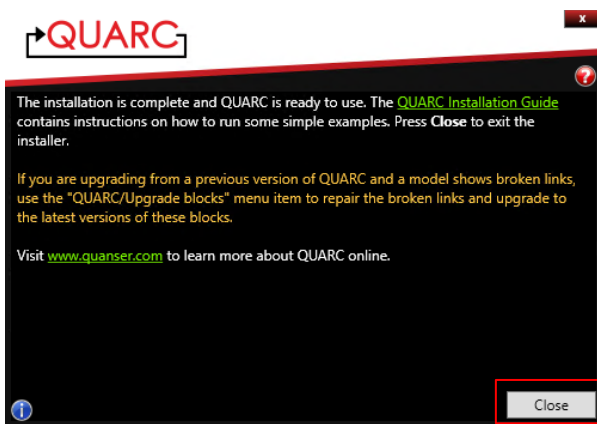
J
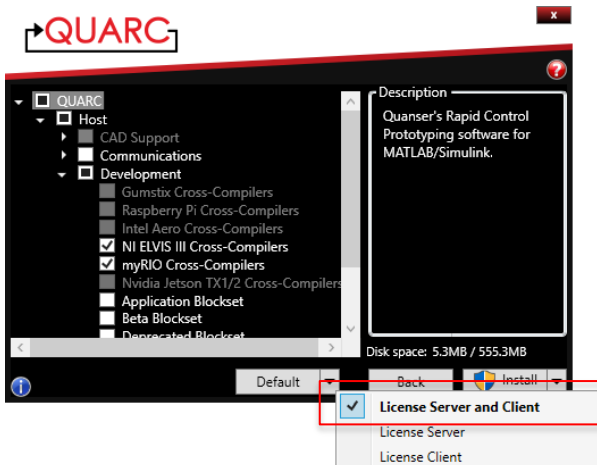
If you have a network license, please use the drop down menu next to the button *Default* to select the task of the current PC. By default, both **License Server** and **License Client** will be installed.
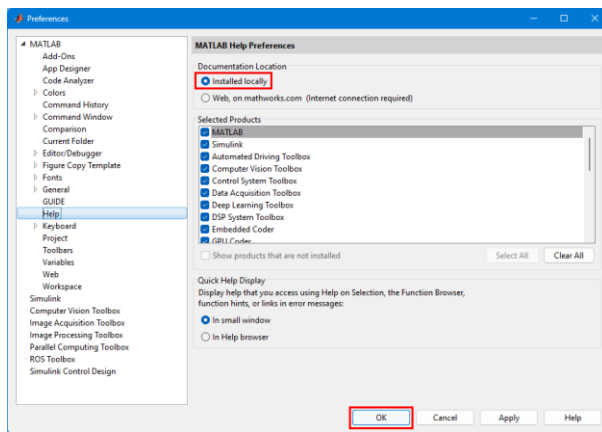
K

A progress bar and embedded video should appear on the installation screen.

L

The QUARC installer automatically configures the Quanser License Manager before completing the installation. But if you are using network license, you need to also setup the license server machine.

Start MATLAB, and go to *MATLAB Preferences*. Under the *Help* section, in the *Documentation Location* panel, select *Installed locally* (and for some MATLAB versions, click the *Install Documentation* button). Then click *OK*, and restart MATLAB.
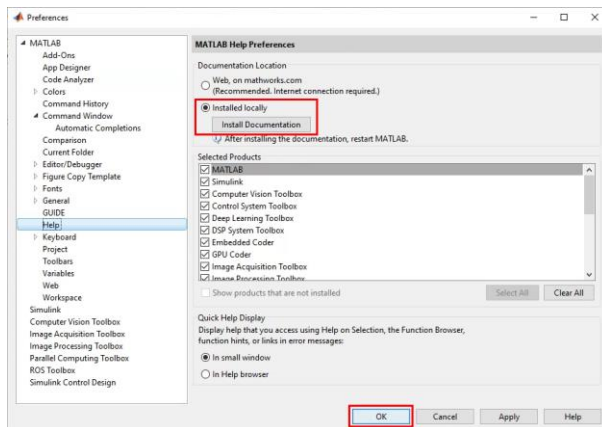
The *QUARC Sine and Scope Demo* used in this section is to confirm that QUARC has been installed properly.

A

- Open the QUARC built-in examples by typing **qc_show_demos** in the MATLAB Command Window.
- The *QUARC Demo Examples* Supplemental Software Help window should appear.
- Click on the **QUARC Sine and Scope Demo** under the *Basic Features* category to open the example page.
- On the top-right corner of the *QUARC Sine and Scope Demo* example page, click on **Open this model**.

B

- Click on the **Monitor & Tune** button on the Hardware tab of the Simulink Toolstrip.
- Double-click on the **Scope** block.
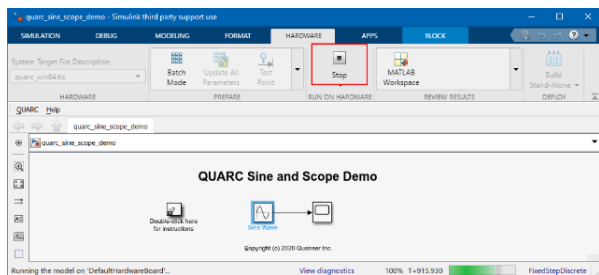- A sine wave of amplitude 1 should be plotted in real-time.

C
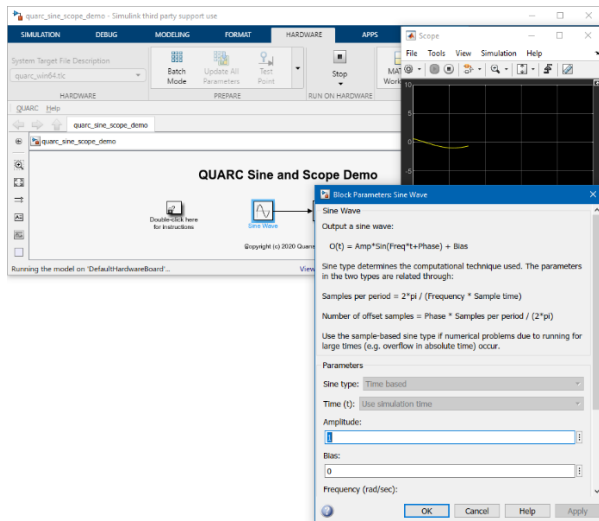
- Double-click on the **Sine Wave** block.
- Change the **Amplitude** to 5, then press the **Apply** button.
- The sine wave's amplitude would be changed to 5 in real-time.
- Change the **Frequency (rad/sec)** to 2, then press the **Apply** button
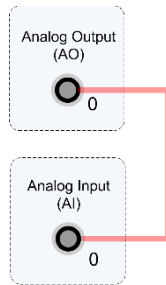- The sine wave's frequency would be doubled in real-time

D

Click on the **Stop** button on the Hardware tab of the Simulink Toolstrip to stop the running model.

The *QUARC Analog Loopback Demo* used in this section is to confirm QUARC has been installed properly. It also tests the data acquisition (DAQ) device on Windows.

A

Using the RCA cable supplied with the data acquisition device, connect the **Analog Output Channel #0** (AO #0) to the **Analog Input Channel #0** (AI #0).

B

- Open the QUARC built-in examples by typing **qc_show_demos** in the MATLAB Command Window.
- The *QUARC Demo Examples* Supplemental Software Help window should appear.
- Click on the **QUARC Analog Loopback Demo** under the *Using Hardware* category to open the example page.
- On the top-right corner of the *QUARC Analog Loopback Demo* example page, click on **Open this model**.

C
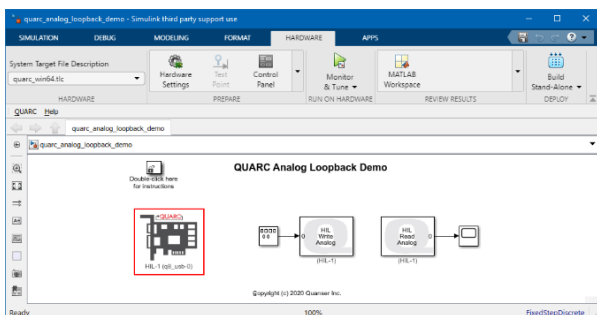
Double-click on the QUARC **HIL Initialize** block.

D
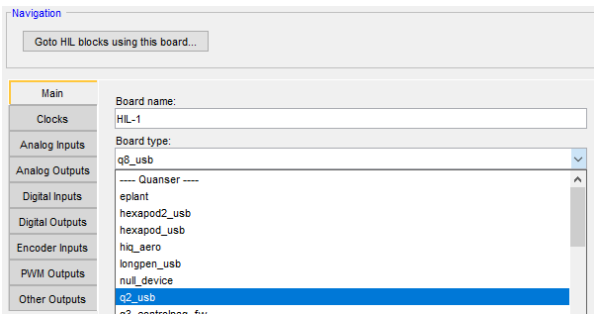
- In the *Board type* option list under the *Main* tab, select the data acquisition device that is installed on the computer (e.g. q2_usb).
- Click on the **OK** button to close the *HIL Initialize* dialog.

E

- Click on the **Monitor & Tune** button on the Hardware tab of the Simulink Toolstrip.
- Double-click on the **Scope** block.

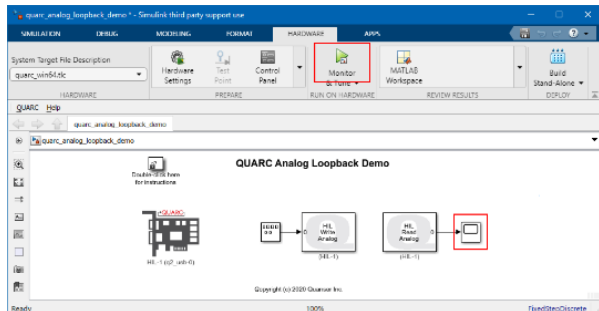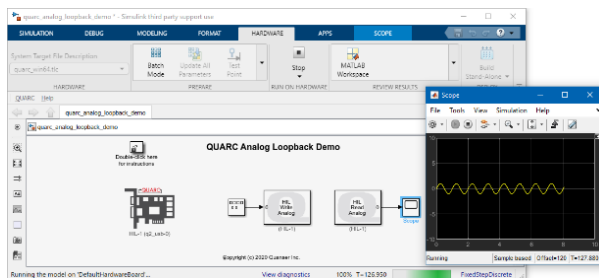## F

A 1-Hz half-wave rectified sine wave of amplitude 1 should be plotted in real-time. If not, go to the *Troubleshooting* section.

In the model, the Simulink Signal Generator block applies a 1-Hz sine wave signal of a 1-Volt amplitude to the selected DAQ analog output channel #0. Due to the RCA-cable connection, this signal is then acquired and read through the DAQ analog input channel #0.

G
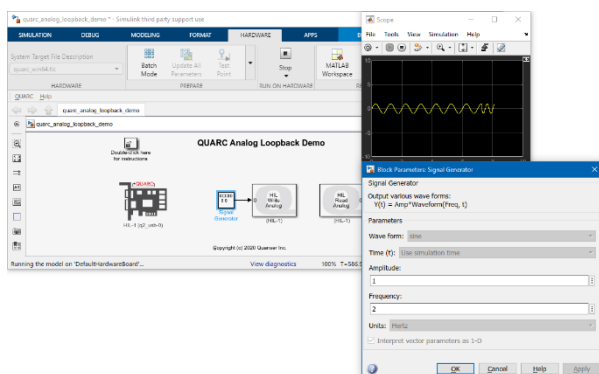
- Double-click on the **Signal Generator** block.
- Change the **Amplitude** to 2, then press the **Apply** button.
- The sine wave's amplitude would be changed to 2 in real-time.
- Change the **Frequency** to 2, then press the **Apply** button
- The sine wave's frequency would be doubled in real-time

Click on the **Stop** button on the Hardware tab of the Simulink Toolstrip to stop the running model.

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

Getting an '*Error configuring license*' message from the Licensing Registration tool.	• Open the provided QUARC license file with Microsoft WordPad. • Ensure your QUARC version is included within the range indicated by the license file *Minimum version:* and *Maximum version:* fields. • Close Microsoft WordPad. • Browse to the *Quanser QUARC yyyy* from Windows Start Menu (where yyyy is the version of QUARC that you have installed) and run the *License Registration* tool using a valid QUARC license file.
Getting error: '*Error occurred while executing External Mode MEX- file 'quarc_comm': An operating system specific kernel-level... driver for the specified card could not be found. The card or driver may not be installed...*' when running a model	• If using a USB device, ensure the USB cable is properly connected, and try a different USB port on the computer. • Verify the data acquisition (DAQ) device is properly connected to the computer. • If this is a National Instruments (NI) data acquisition device, ensure the NI DAQmx drivers are installed. The NI DAQmx installer is on a DVD that comes with the NI hardware; it can also be downloaded from https://www.ni.com/drivers/
When running the DAQ Test, the Scope does not display a sine wave.	• Ensure the RCA loopback connection is made on the data acquisition (DAQ) device, as described in Step 5A. • Verify that the proper DAQ device name was selected in the HIL Initialize dialog, as described in Step 5D.
Getting error: '*??? Model ... failed to download to target 'shmem://quarc-target:1'. The code being downloaded or run is not compatible with the type of target referenced by... the target URI. For example, 32-bit code cannot be downloaded to a 64-bit target or vice-versa. In Simulink, make sure the system target file selected in the model's active configuration is compatible with the target referred to by the target URI.*' when building a model	• Select the QUARC/Options… menu item from the Simulink model. • Under *Code Generation*, click on the **Browse…** button. • Select the system target file corresponding to your target computer (e.g. *QUARC Win64 Target*). • Click on the OK buttons to close the dialogs, and save the model.
Getting an error when trying to build the QUARC Sine and Scope Demo	• Type **ver** in the MATLAB Command Window. • QUARC should appear in the displayed list. • Depending on the compiler used, refer to Section 3 of the QUARC Installation Guide, and review your compiler installation steps. • Run **mex –setup** in the MATLAB Command Window, as described in the QUARC Installation Guide.

The QUARC license file has been registered successfully, but you get an '*Error configuring license*' message when trying to run a QUARC model.	● If you just reconfigure the license using the License Registration tool, please make sure to restart MATLAB for the license changes to take effect. ● Run the QUARC Sine and Scope Demo, as described in Step 4. ● If the QUARC Sine and Scope Demo runs as expected, then your QUARC license file does not allow some of the features used by your QUARC model. Contact Quanser's technical support for further information. ● Otherwise and if the same error message remains, first disable any antivirus software and Windows Firewall. Then browse to the *Quanser QUARC yyyy* from Windows Start Menu (where yyyy is the version of QUARC that you have installed) and run the *License Registration* tool, using a valid QUARC license file.