Quanser & Arduino Simulink Setup Instructions.

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1 Introduction

This document explains how to set up an environment that will allow you to create, monitor, and adjust control systems in real time using Simulink and an Arduino. We'll first cover the installation of the prerequisite packages in Simulink/Matlab, then move on to setting up your hardware, and finally we'll setup and cover an example system and controller.

2 Matlab and Simulink Toolboxes

The following are the necessary (Some maybe not as necessary, but recommended!) toolboxes that you should have installed to get the most out of this.

Toolboxes:

- Simulink
- Simulink Support Package for Arduino Hardware
- Control System Toolbox
- Simulink Control Design
- Signal Processing Toolbox

If you're unfamiliar with the installation of these toolboxes, this can be done by selecting the "Add-Ons" drop-down in the "Home" tab in MATLAB as shown in **Figure 1**, and selecting "Get Add-Ons".

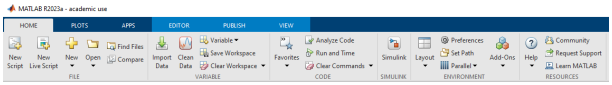

Figure 1: MATLAB Home tab with Add-Ons drop-down

From here, another window will open with a search bar at the top. In this search bar, enter the name of the program or toolbox that you would like to install. an example of this window/search bar is shown in **Figure 2**.

Figure 2: Add-Ons window and search bar

As an example, I'll search for the Aerospace toolbox. After entering "Aerospace Toolbox" **(You should enter what you're looking for instead)** into the search bar, selecting the magnifying glass next to it, and clicking on the desired toolbox, you should see the name of your desired toolbox as in **Figure 3**. You should also see a few tabs with information and, moist importantly, a button that says "install". Select this button to install your program/toolbox.

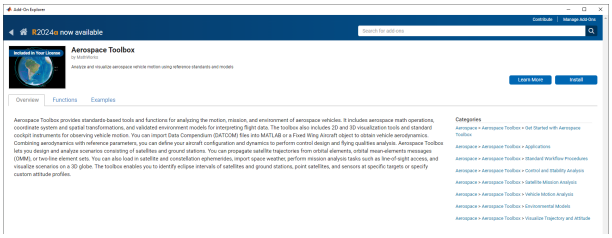

Figure 3: Add-Ons window and search bar

With your first program/toolbox installed, continue this process until all of the bulleted items above are installed. Now, onto setting up the hardware!

3 Hardware Setup

Setting up the hardware simply consists of "Plugging-in" the appropriate cables from the controller to the appropriate places on the Quanser. The male 4-pin DIN connector is the power cable and should be connected to the appropriate female 4-pin DIN connector. The large male 5-pin DIN connector is the encoder, and the 6-pin mini-DIN goes to the potentiometer.

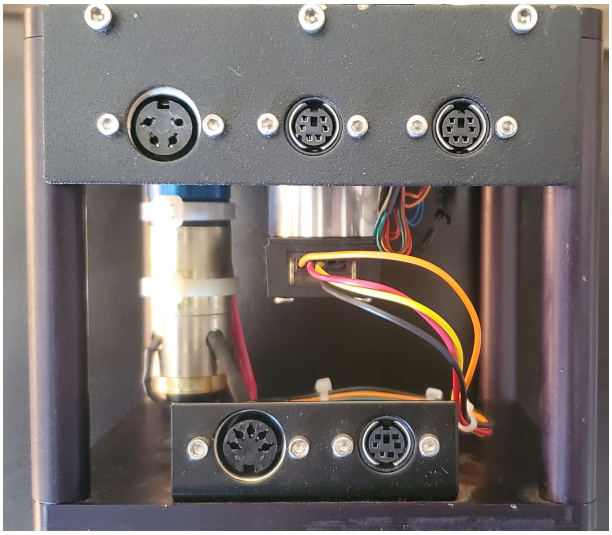

Figure 4: DIN connectors on Quanser Plant