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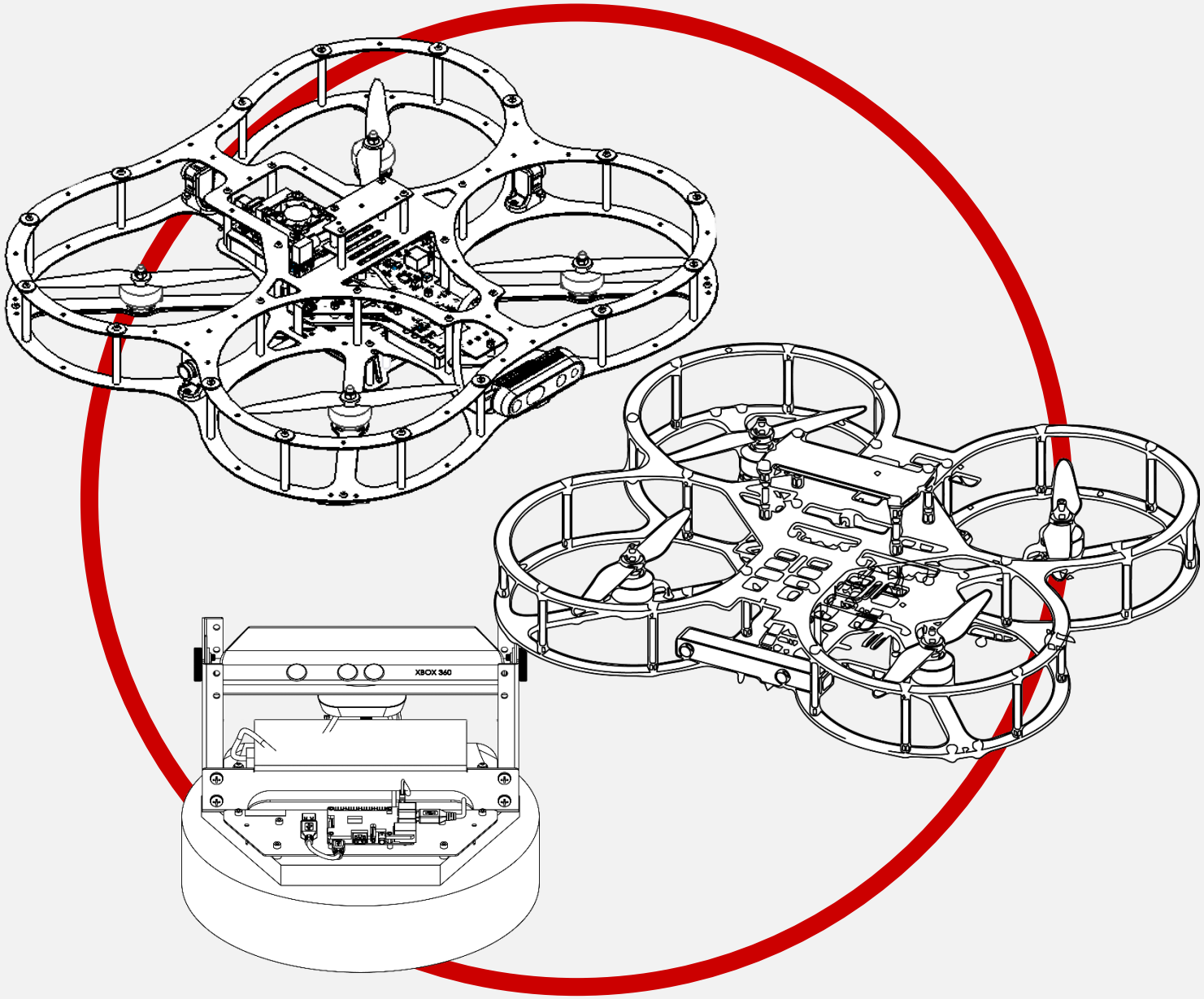

Autonomous Vehicles Research Studio

Setup Guide – Introduction

v 2.0 – 18*th April* 2023

For more information on the solutions Quanser offers,
please visit the web site at: http://www.quanser.com

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This equipment is designed to be used for educational and research purposes and is not intended for use by the public. The user is responsible for ensuring that the equipment will be used by technically qualified personnel only. **NOTE:** While the GPIO, and USB ports provides connections for external user devices, users are responsible for certifying any modifications or additions they make to the default configuration.

Waste Electrical and Electronic Equipment (WEEE)

This symbol indicates that waste products must be disposed of separately from municipal household waste, according to Directive 012/19/EU of the European Parliament and the Council on waste electrical and electronic equipment (WEEE). All products at the end of their life cycle must be sent to a WEEE collection and recycling center. Proper WEEE disposal reduces the environmental impact and the risk to human health due to potentially hazardous substances used in such equipment. Your cooperation in proper WEEE disposal will contribute to the effective usage of natural resources.

During flight QDrone 2 sound pressure level has been measured at 92 dBA at 1m away from the QDrone 2 and it is considered hazardous. Users shall ensure that they are not exposed to a sound level greater than the hazardous level as defined by the local authority. Use protective earpieces during operation.

The Intel RealSense D435 RGB-D camera is classified as a Class 1 Laser Product under the IEC 60825-1, Edition 3 (2014) internationally and EN 60825-1:2014+A11:2021 in Europe. The camera complies with FDA performance standards for laser products except for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019.
Do not power on the product if any external damage is observed. Do not open or modify any portion of any laser product as it may cause the emissions to exceed Class 1. Invisible laser radiation when opened. Do not look directly at the transmitting laser through optical instruments such as a magnifying glass or microscope. Do not update laser product firmware unless instructed by Quanser.

Table of Contents

A. What's Covered?

This series consists of steps that will ensure that your **Autonomous Vehicles Research Studio** is fully set up and functional. There are numerous checkpoints during the process to improve the workflow. Ensure that each step is followed carefully. You can track your progress reading each guide and completing each checkpoint using the checklist in the table below.

Go through this guide and the steps in order for the first time setting up the studio. Always start with the word document, if there is software you need to run, the guide will walk you through it. If you only have one type of vehicle, certain guides are separated by vehicle, for example step 2 – batteries. You only have to read the one referring to your vehicle.

Step	Section / Step	Read?	Checkpoint	Done?
1	Workspace with Nets & Mats	☐	Setup Picture	☐
2	Vehicle Batteries	☐	No	N/A
3	Mount OptiTrack Cameras	☐	Camera Setup Picture	☐
4	Ground PC Setup	☐	PC Connection Picture	☐
5	Software Licensing and Testing	☐	Sine Scope Demo	☐
6	Joystick Testing	☐	Visualization Demo	☐
7	Router – PC Connection	☐	No	N/A
8	Vehicle Communication	☐	TCP/IP Demo	☐
9	Camera Orientation	☐	Reference View Screenshot	☐
10	Camera Calibration	☐	Captured Volume Screenshot	☐
11	Rigid Body Definition	☐	Optitrack Visualization Demo	☐
12	Vehicle I/O Check	☐	IO/Check	☐
13	QDrone 1/2 Hover Test	☐	Hover Test	☐

B. File Naming Scheme and Length Limits

The autonomous vehicle examples are separated by product. For more recent products, like the QDrone 2, Simulink files are named as follows:

shortenedProductName_File_associatedExample_fileMatlabVersion.slx

So for example, the QDrone 2(product) Mission Control (File) for Position Control (example), saved in MATLAB/Simulink 2021a is named **QD2_MissionCtrl_Position_2021a.slx**

Windows requires that the path for files are shorter than 256 characters, so file names were shortened due to this limit. However, Simulink will need files from folders that will get generated when building the file and path limits could still be exceeded.

If you try to build a file and the Diagnostic Viewer returns an error due to path length, move the folder where your file is located somewhere else in your computer that will create a shorter path length.

So for example, if the file you are trying to run is located in the folder

```
C:\Users\yourName\Documents\QUANSER\examples\autonomous_vehicles\multivehicle
\swarm_qdrone_1\non_toolchain\swarm_qdrones\2qdrones
```

Move the folder perhaps to

```
C:\Users\yourName\Documents\swarm_qdrone1\2qdrones
```

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