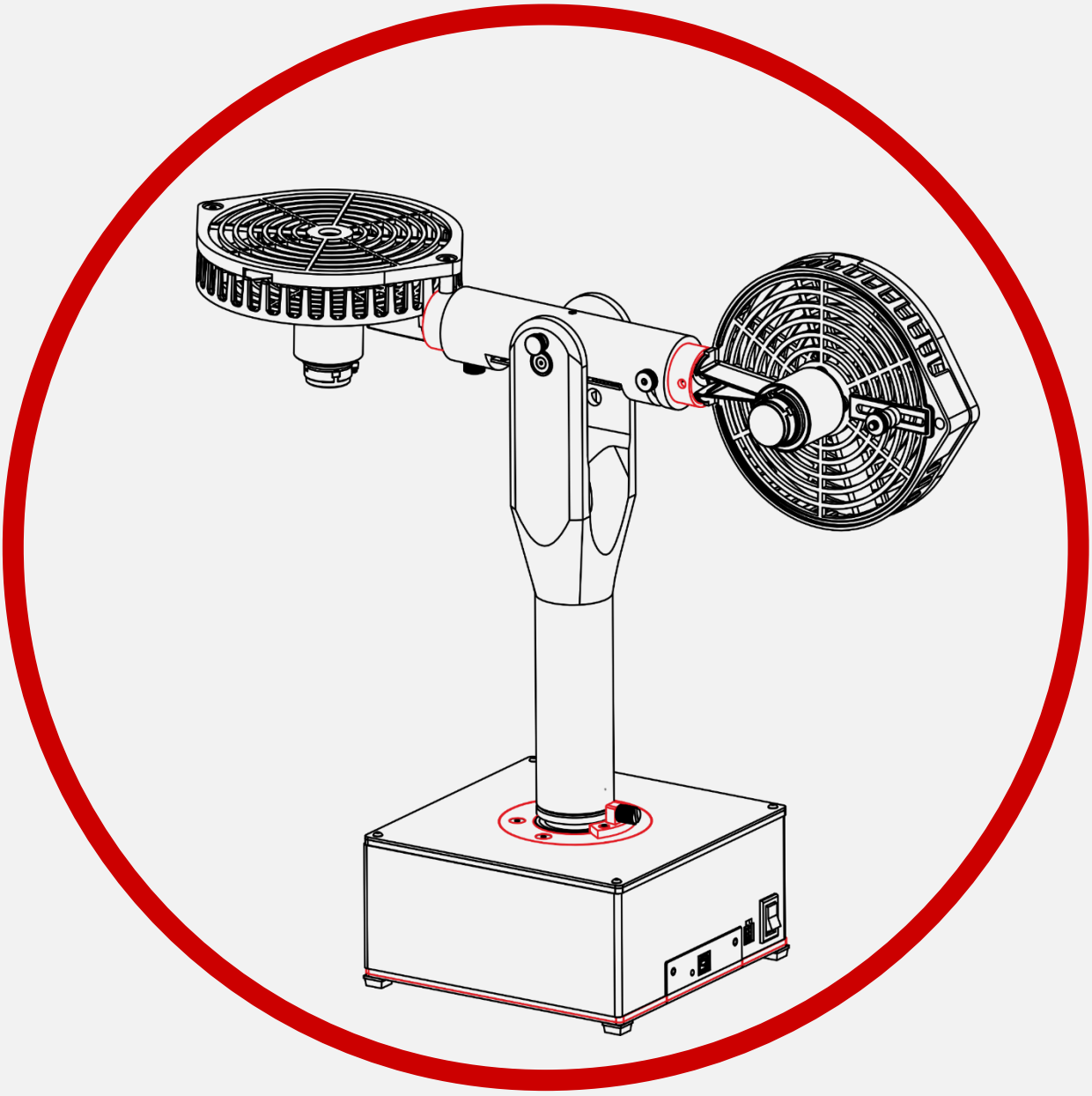
QUANSER
INNOVATE·EDUCATE



Aero 2

Measurement and Filtering

V1.0 – 14th February 2025

Aero 2 – Application Guide

Measurement and Filtering

Why Explore Measurement and Filtering?

It is important to measure the pitch of a flying system accurately for the control system to work. Using encoders on the Quanser Aero 2 provides a very good measurement of the pitch, but it isn't realistic because vehicles in flight lack an unmoving base from which such encoder measurements can be made.

In a realistic scenario, an Inertial Measurement Unit (IMU) is used, which is a combination of an accelerometer and a gyroscope with coincident axes. Measuring the acceleration in each linear axis along with the angular velocity about those axes allows for a complete description of the altitude of the sensor.

In this lab, you will be utilizing the Inertial Measurement Unit (IMU) on the Aero 2 to estimate its pitch angle, as well as pitch and yaw angular rates of motion.

Please read the following concept reviews before this lab for relevant information.

- Filtering
- Sensor Noise
- Inertial Measurement Units