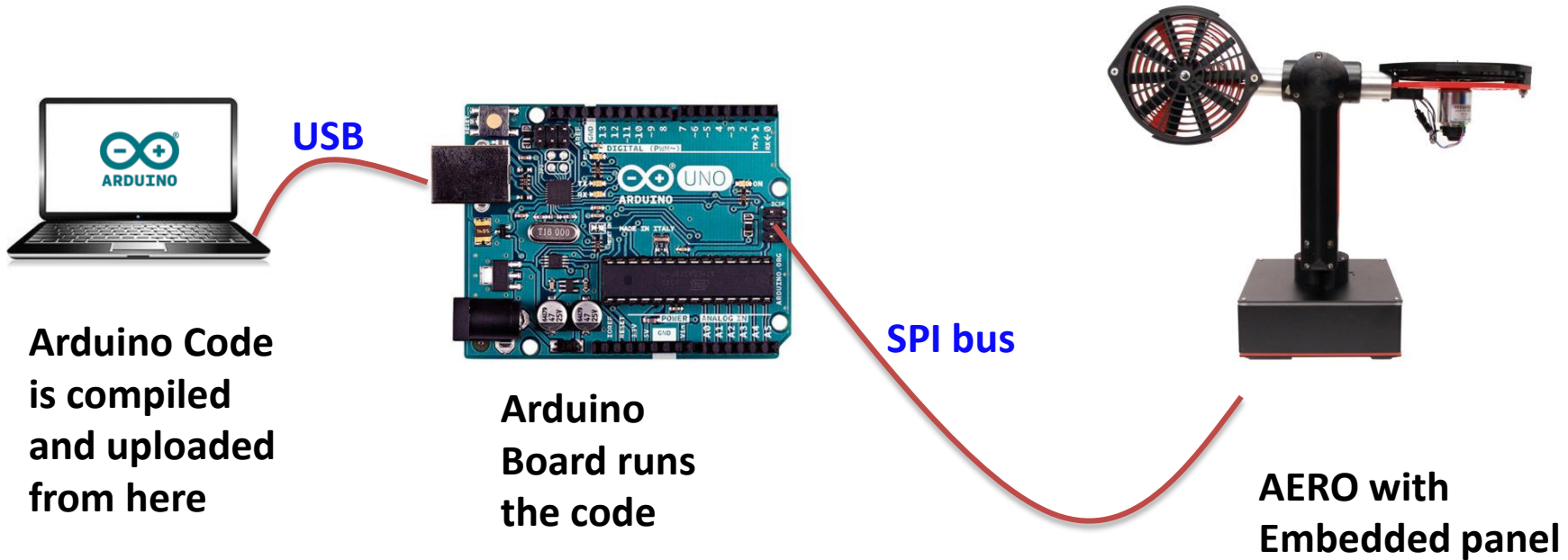# Running
Quanser Aero with
Arduino

Agenda:

After Installing and testing Arduino IDE software, follow these steps:

1. Configure the Quanser AERO as 2DOF helicopter with QFLEX 2 embedded panel.

2. Make the wiring between Arduino and AERO.

3. Run the Arduino demo.

Experiment overview

USB

SPI bus

**Arduino Code
is compiled
and uploaded
from here**

**Arduino
Board runs
the code**

**AERO with
Embedded panel**

1. Install the Embedded Panel in the Quanser AERO

- Refer to the AERO User manual and if necessary exchange QLEX 2 panels.

- For this experiment**, QFLEX 2 Embedded Panel** is required.

- Place the Quanser AERO on flat surface with enough space so that the body can rotate freely in both degrees of freedom
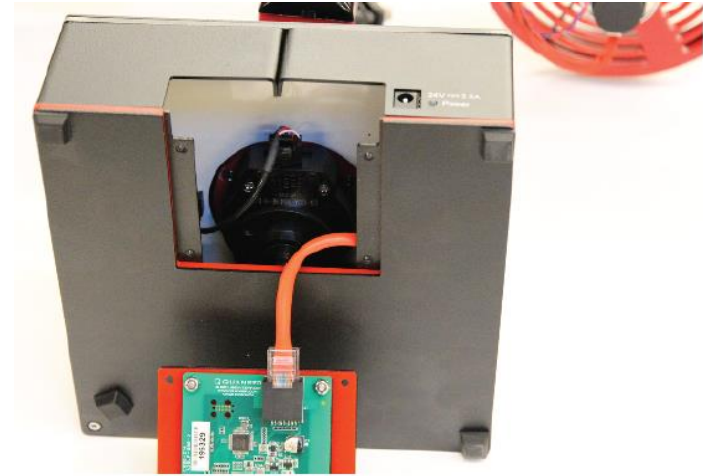
Quanser Aero with QFLEX panel detached.

QUANSER

Configure the AERO as 2DOF helicopter
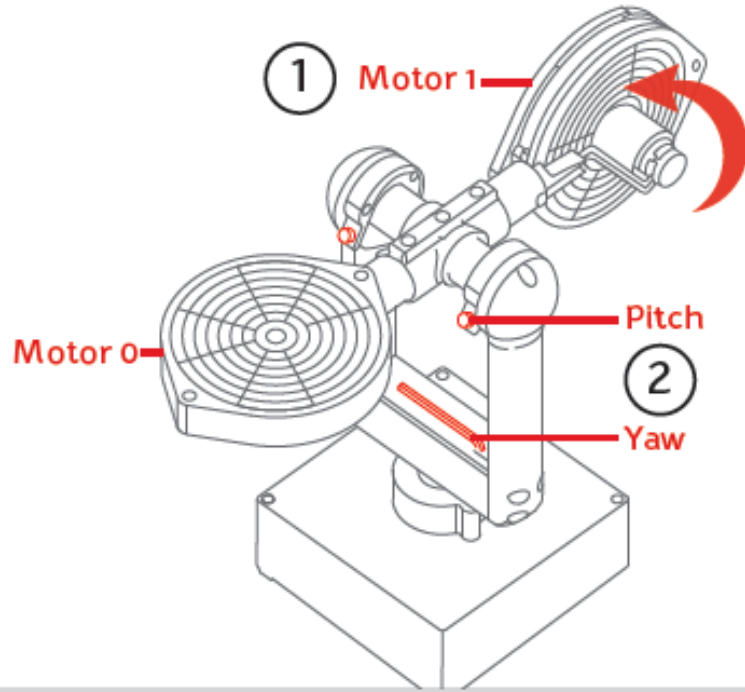
1. Rotate the thruster modules so that **Motor 0** thrusts vertically and **Motor 1** thrusts horizontally.

2. Ensure that both the **Pitch** and **Yaw** locks are disengaged. Refer to the Quanser AERO User Manual for information on how to adjust the thrusters and attitude locks.

2. Wiring Arduino - Aero

Connections on Embedded panel side

1. **Make sure both Arduino board and Quanser Aero is powered OFF.**

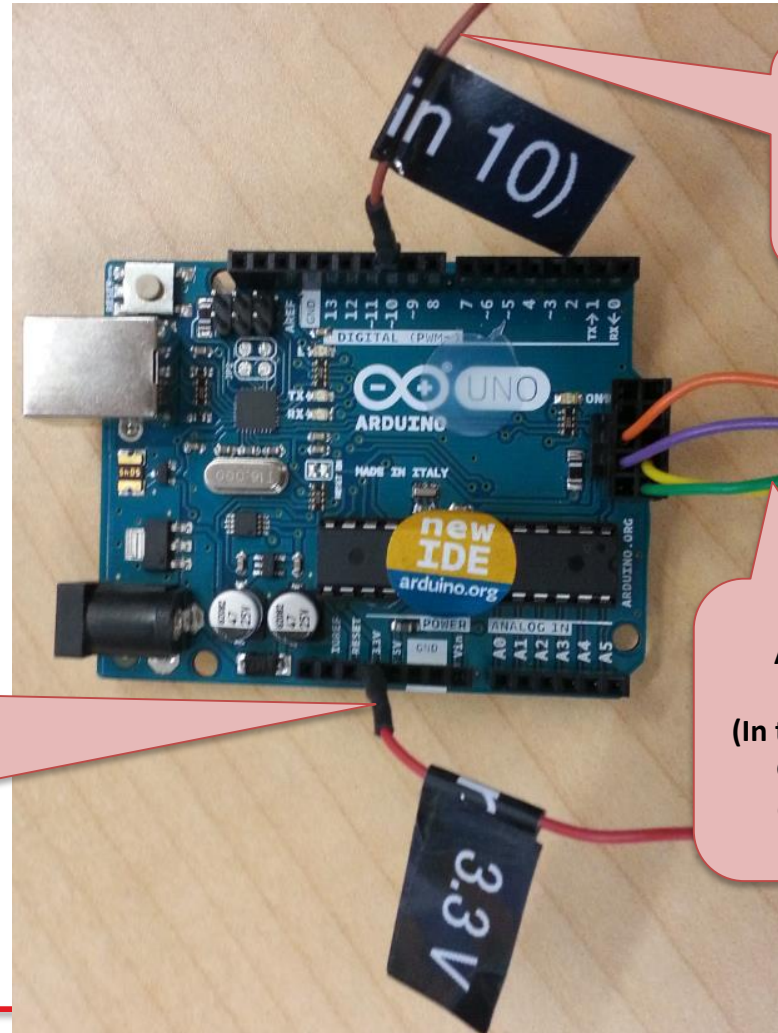2. **Connect the SPI cable to the Embedded panel.**
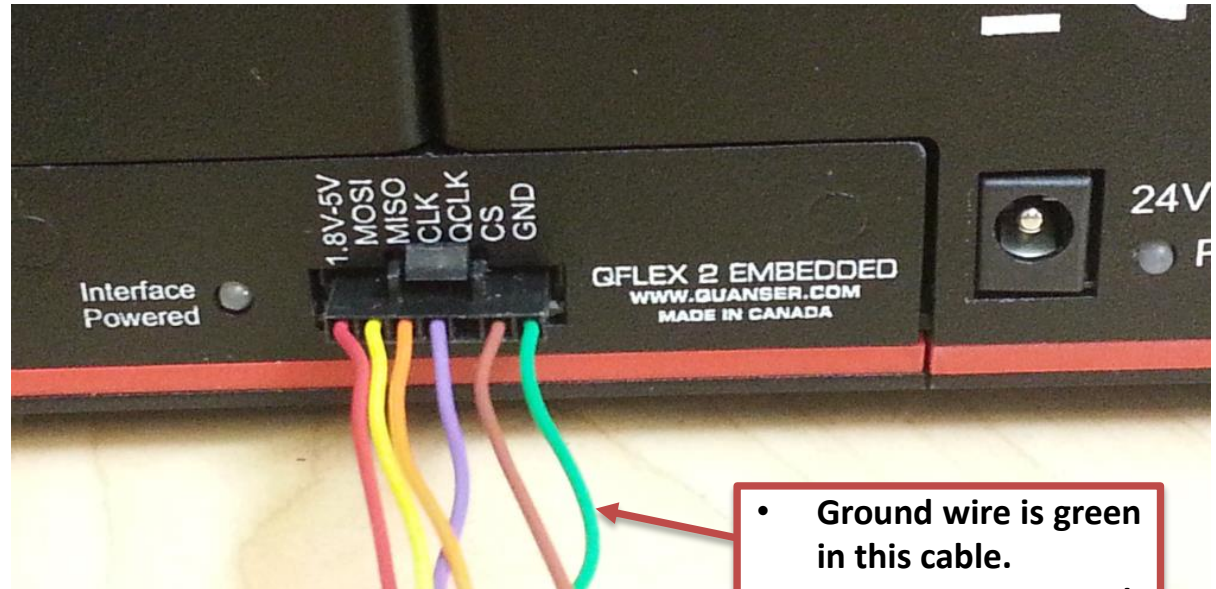
- Ground wire is green in this cable.
- QCLK not used, reserved for future use

Connections on Arduino Headers

3. Connect the **power wire** to either +5V or 3.3V pin on the Arduino Header

4. Connect wire labelled as *"Pin 10"* to pin #10 on Arduino header.

5. Identify the Ground Pin and Connect the SPI cable to the ICSP header
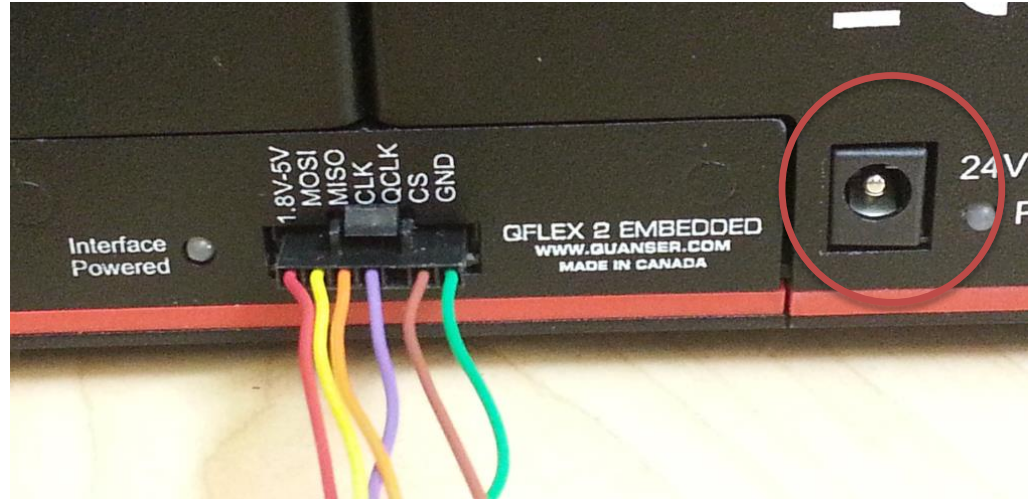

Brown wire goes to Pin 10

4 wires go to Arduino ICSP header
(In this Example the Green wire is connected to Ground)

Red or power wire goes to either + 5V or + 3.3 V pin
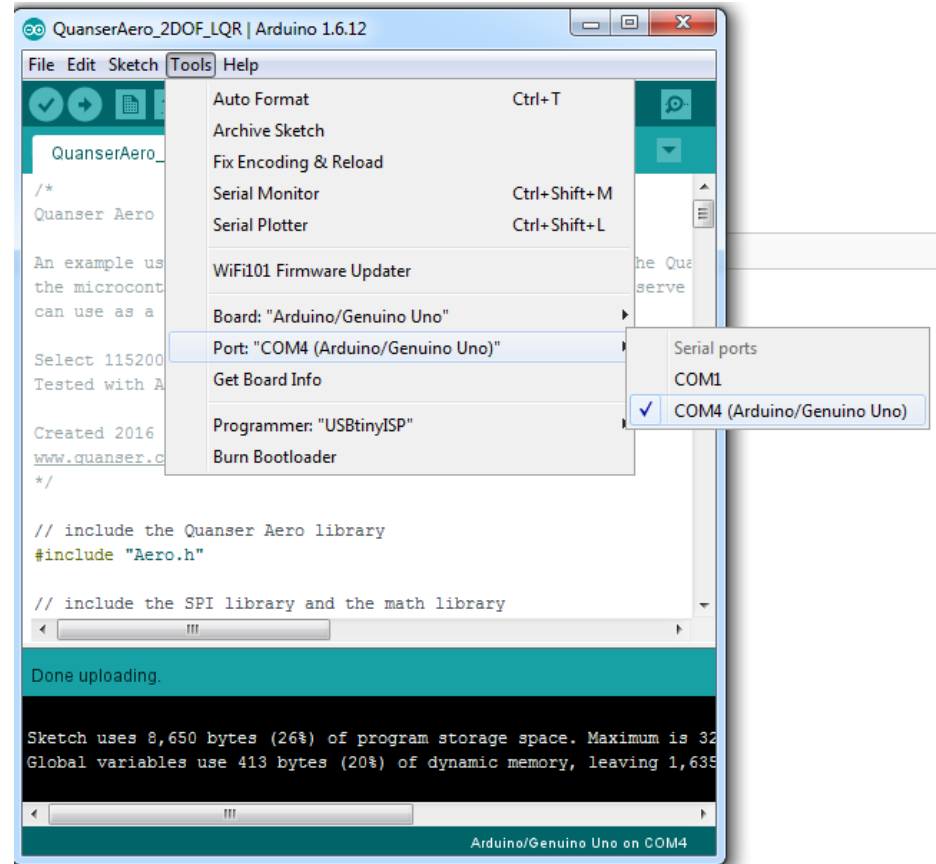
QUANSER

3. Running the demo

Running the AERO demos

1. **Open Arduino IDE.**

2. **Connect the Arduino to the USB port.**

3. **Do NOT connect the 24 VDC Power supply to the AERO yet.**
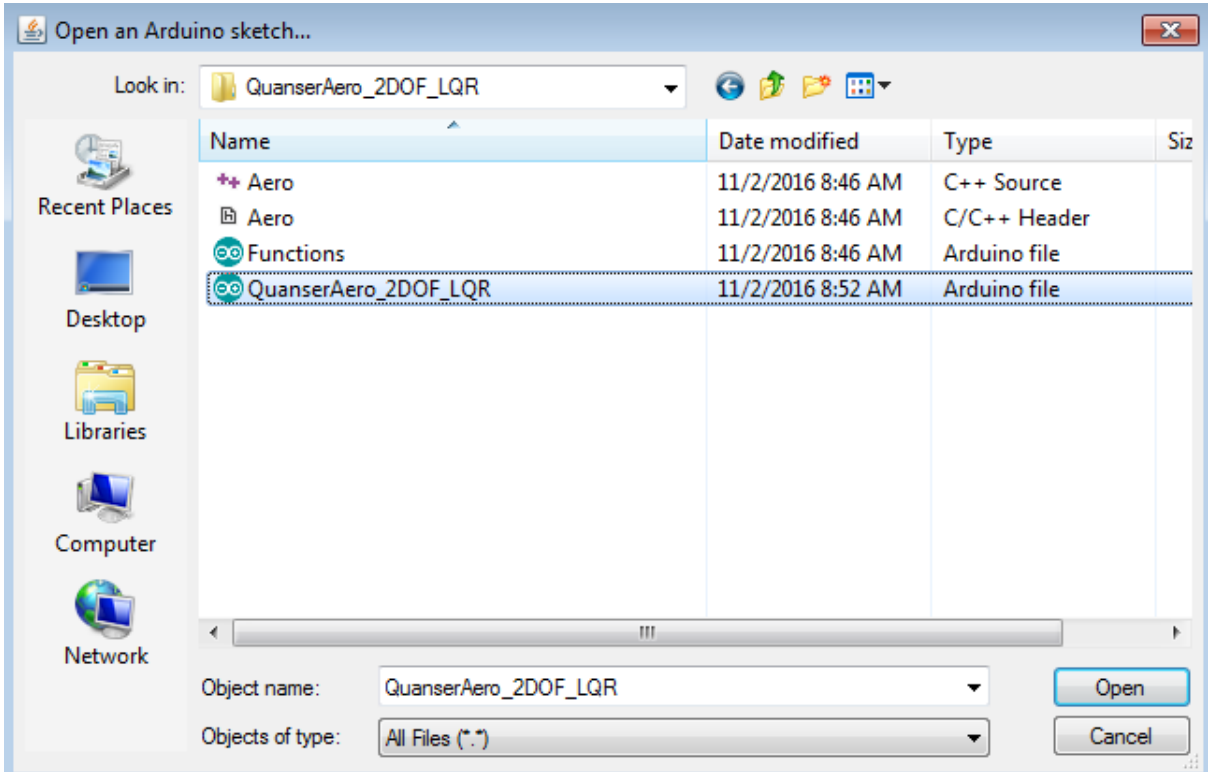
Running the demos

4. **Select the Board:** *in this example "Arduino UNO"*

5. **Go to *Tools*** and select the serial port as seen in *Control Panel / Device manager/.* **(e.g. COM4)**.

6. Go to *File | Open* and select the demo you wish to run.
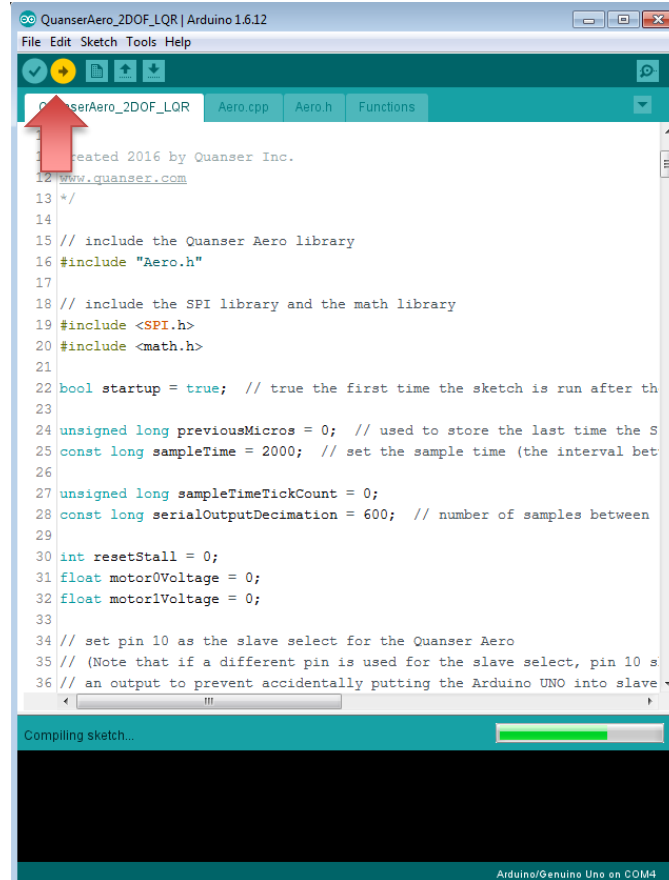**In this Example:**
"*QuanserAero2DOF_LQR*"

Running the demos

5. Make sure the Quanser Aero is in 2DOF helicopter configuration. (*see User manual or AERO Quick Start guide for details* **). The Aero body must be in horizontal position and able to move freely around both axes.**

5. Upload the code to the Arduino board. Once uploaded, the code starts running.

6. Finally, connect the 24 VDC power adaptor to the Quanser Aero

Once powered, the Aero will move in both axes.