

Combined System Documentation

1D Platform pre-requirements:

<https://github.com/Image-X-Institute/6-DoF-Robotic-Motion-Phantom/blob/main/Documentation/1DoF/1D%20Hardware%20Guide.pdf>

1. Install Visual Studio.
2. Install Arduino IDE.
3. Use a USB-TypeB to USB-TypeA to connect the pc and the Arduino board. If the electrical circuit is correct, the LED will turn on

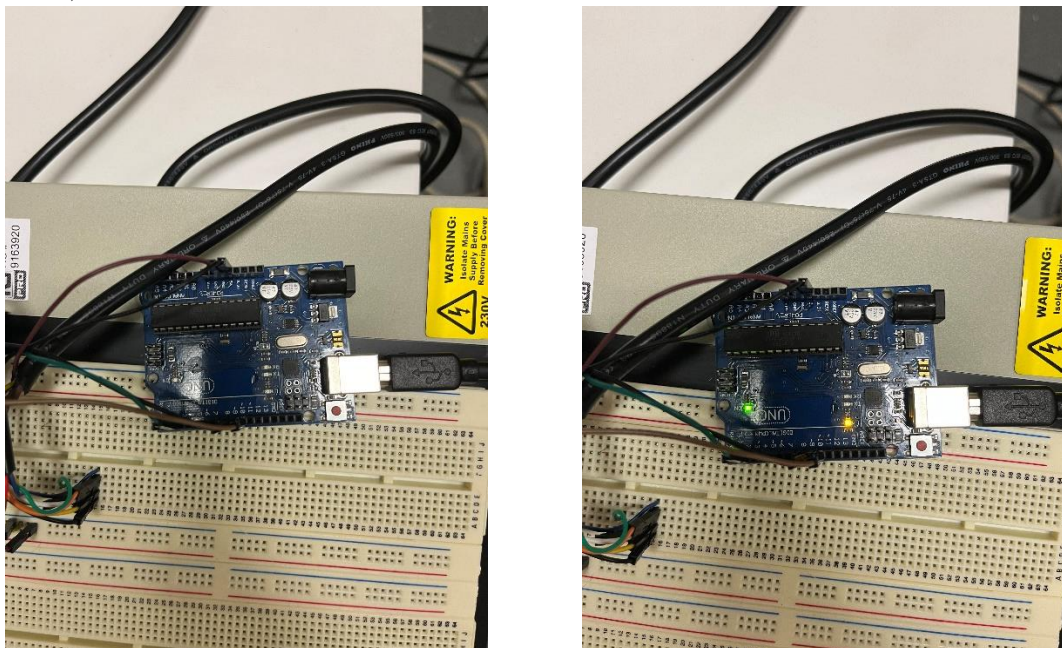


Figure 1: Arduino board

4. Select the correct COM port then download and upload from GitHub the Arduino_V3 code. (Close the motion control software if opened)

6DoF Platform pre-requirements:

<https://github.com/Image-X-Institute/6-DoF-Robotic-Motion-Phantom/blob/main/Documentation/6DoF/Getting%20Started.pdf>

1. Remove any already installed plates on the main platform.
2. Align the moveable screw holes to line up with UR3 base platform.
3. Align the UR3 base platform in the desired position.
4. Get 4x ___ screws and place them in the screw holes.
5. Use a hex key to tighten all 4 screws.
6. Apply pressure in different directions to ensure the base plate is correctly mounted.
7. Now unpack and place the UR3 6DOF robot into position, lining up the 4 screw holes with the holes in the base plate.
8. Get 4x ___ screws and place them in each hole, tighten with a hex key.
9. Confirm stability of robot.
10. Connect robot controller unit to power.

11. Connect UR3 Robot to the robot controller unit.
12. Turn on the Robot controller unit and release the emergency stop button.
13. Wait for software to initialize.
14. Once asked, go to the initialization screen and begin initialization.
15. Hold the black button at the top of the tablet, this will release the joint brakes on the robot which will allow for the free movement and adjustment of the robot arm.
16. Physically move the robot to the desired start position,
17. Connect the Robot controller to the host PC via a CAT5 to USB connection.

Motion platform software:

<https://github.com/Image-X-Institute/6-DoF-Robotic-Motion-Phantom/tree/11a27f635b2a17efd6fa9714bb2f995d4249ea14/Program%20Files>

1. If this is the first time or new connection to the PC, Go to Control Panel à Network and Internet à View network status and tasks à Click on the ethernet connection à Properties à Internet Protocol Version 4 (TCP/IPv4) à Use the following IP address, and set the IP address to '192.168.94.11' or '192.168.94.12' if the former doesn't work. NOTE if this IP doesn't work then go into the Phantom Control program à Settings under 6D Motion and the IP address needed to establish connection to the robot is there.
2. Click on the subnet mask field which should automatically set to '255.255.255.0' then click OK.
3. Click OK again and exit out of this window.
4. Now load out the Phantom Control Program and go into the Settings tab and select Both under Robot Selection section.
5. Go into the Motion Control tab and click on 'Set Start Position'
6. Click on Home.
7. Click on LOAD TRACE (6DOF) and select a 6DoF motion input file. The trace file should load up and you can see the plot on the right-hand side by clicking on "RESET ZOOM."
8. Click on LOAD TRACE (1DOF) and select a 1DoF motion input file.
9. Click on Play Motion, the status bar should start progressing, the "Play Motion" button should turn to "Stop Motion" and the plot should start moving/tracing.
10. Once the motions are over, press "Stop Motion"
11. Press home.

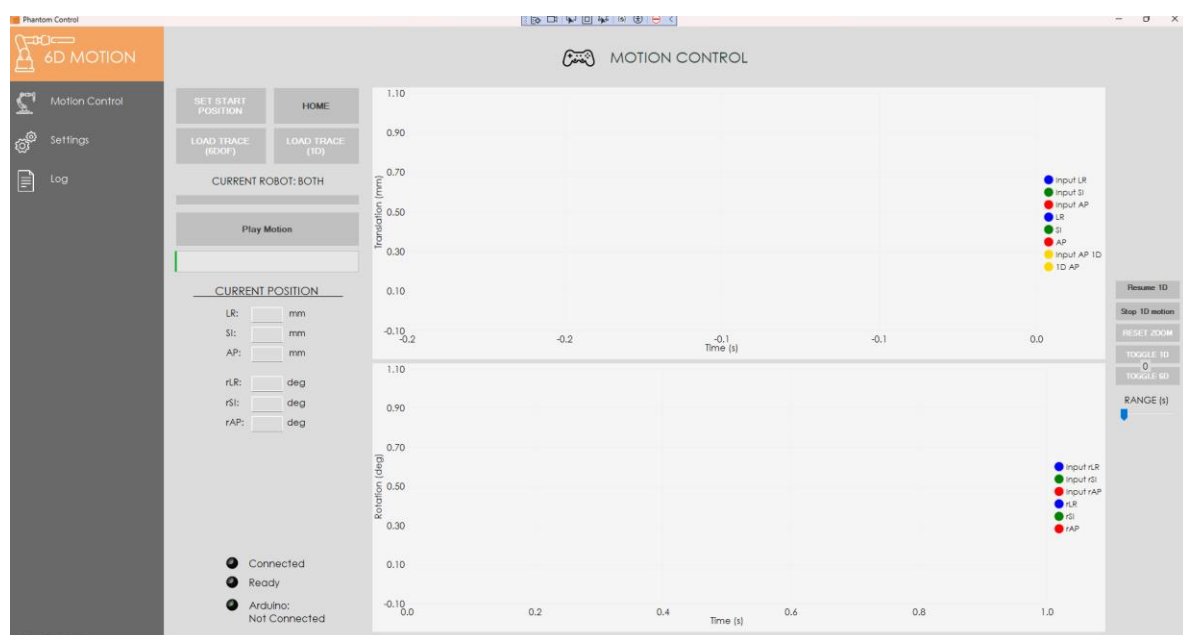


Figure 2: Motion control software

