

# Robot Arm Factory Test Routine

## **Factory Test Procedure**

Begin with a visual check, do the joints move freely and is the gripper parallel with the desk.

Place the arm on its acrylic jigsaw base on top of the Robot Arm Mat.

Connect the Arm to a 12V Matrix power supply and USB to a computer

Wait for the LEDs to stop flashing.

## **Bluetooth Test**

Using a mobile phone scan for Bluetooth devices, there should be a device present called Matrix Arm.

## **WIFI Test**

Using a mobile phone scan for WIFI devices, there should be a network present called MatrixArm.

## **Servo Motor (gripper) Calibration**

Go into the SCADA Apps folder and run the Open Basic Control program.

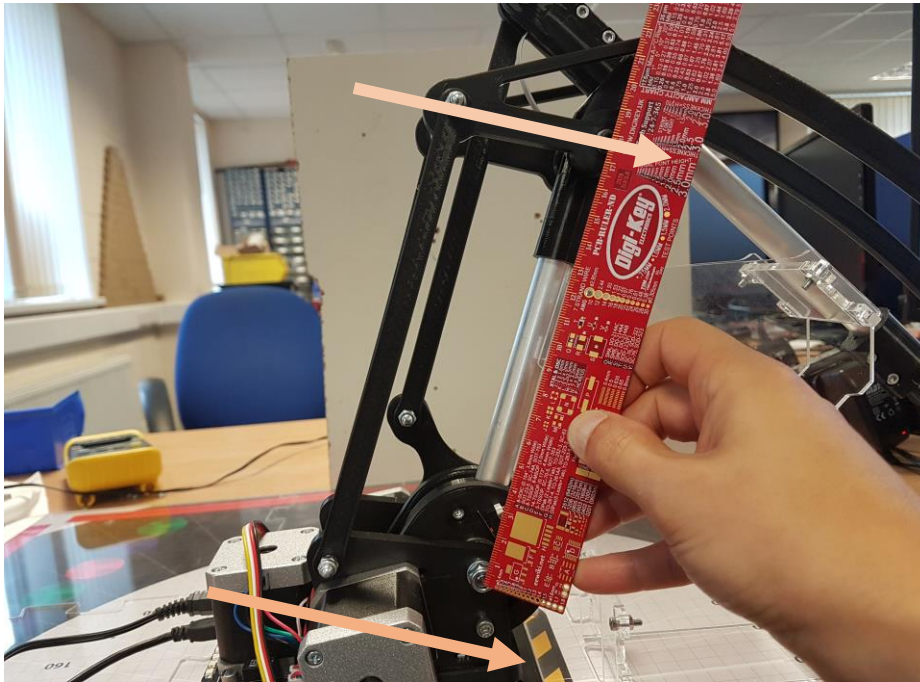
Click the Go button and the Communications should light up Green

Click the Home / Enable motors button to home the robot. Ensure this works ok and is repeatable. You can keep pressing the Home button to retest.

The gripper servo motor should now be fully open, the gripper can now be attached with a jaw spacing of approx. 20mm

Close the basic control application.

## Arm Calibration



Measure and record the length of the shoulder, centre of main pivot to centre of bolt  
– The default is 176.0



Measure and record the length of the elbow, centre of bolt to centre of bolt  
– The default is 189.0

## Entering Calibration

Run the Open Configure program.

Click the Go button and the Communications light should turn green

Click the Set Kinematics Lengths button and enter the lengths you recorded during calibration

Click the Motor Enable and Home button and the arm should go to the 90 degree position on the mat at around coordinates 0, 300, 5.

## Calibrating Base Angle

If the centre of the gripper is off the 90 line then work out the angle difference.

Click the Set Motor Base Angle button and enter the angle difference. A little goes a long way try increments of 0.2.

The Arm should move to show the new position.

Once you have centered the arm on the line use the Motor Enable and Home button to sanity check that the value is stored and the setting is ok.

(Note from the initial start angle you cannot go back more then **-2.0** degrees, you may need to back off the base motor limit switch if you cannot go back far enough.)

## Calibrating Shoulder and Elbow

Now we have the gripper centered over the X0 axis line it's time to calibrate the shoulder and elbow.

Click the Y-/Y+ Z-/Z+ buttons until the center of the gripper is over the Y300 line and 5mm from the surface of the jigsaw plastic mat. A 5mm spacer can be used to help get this accurate.

Once the gripper is in position click the Store Calibration button to calculate and store the calibration.

Click the Position 2 button

Using a ruler measure the offset from the central line, left of the line is positive, right of the line is negative.

Click the Set Drift button and enter the offset in mm.

Click the Position 2 button again to check we are now on the central line.

Close the Configure application

### **Final Test – Sanity Check**

Place counters in each of the slots on the mat and ensure the colour sensor is connected to the Grove socket nearest the central motor.

Run the Scan And Sort program and click the Go button.

The arm should be able to pick up the counters, scan then and deliver them to the correct place on the mat. **You only need the first counter to be placed ok for the test to pass.**