



Using Servos with Your CEENBot

Nebraska Robotics Expo Teachers Workshop

January 20, 2018

Meg Harms, Prairie STEM

Overview

What are servos and where do I find them?

How to attach and configure one servo motor?

Multiple Motors

Thinking creatively with servos

Questions





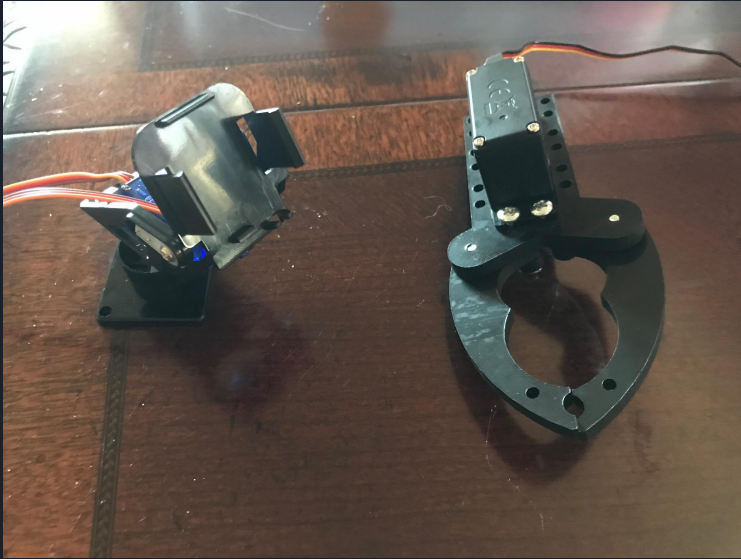
What are servo motors?

Servo motors are DC (direct current) motors that, due to an additional data feed, allow for greater control of the motors position and velocity.

In hobby electronics (and robotics) they are attached to various peripherals to provide controllable moving parts.



Examples





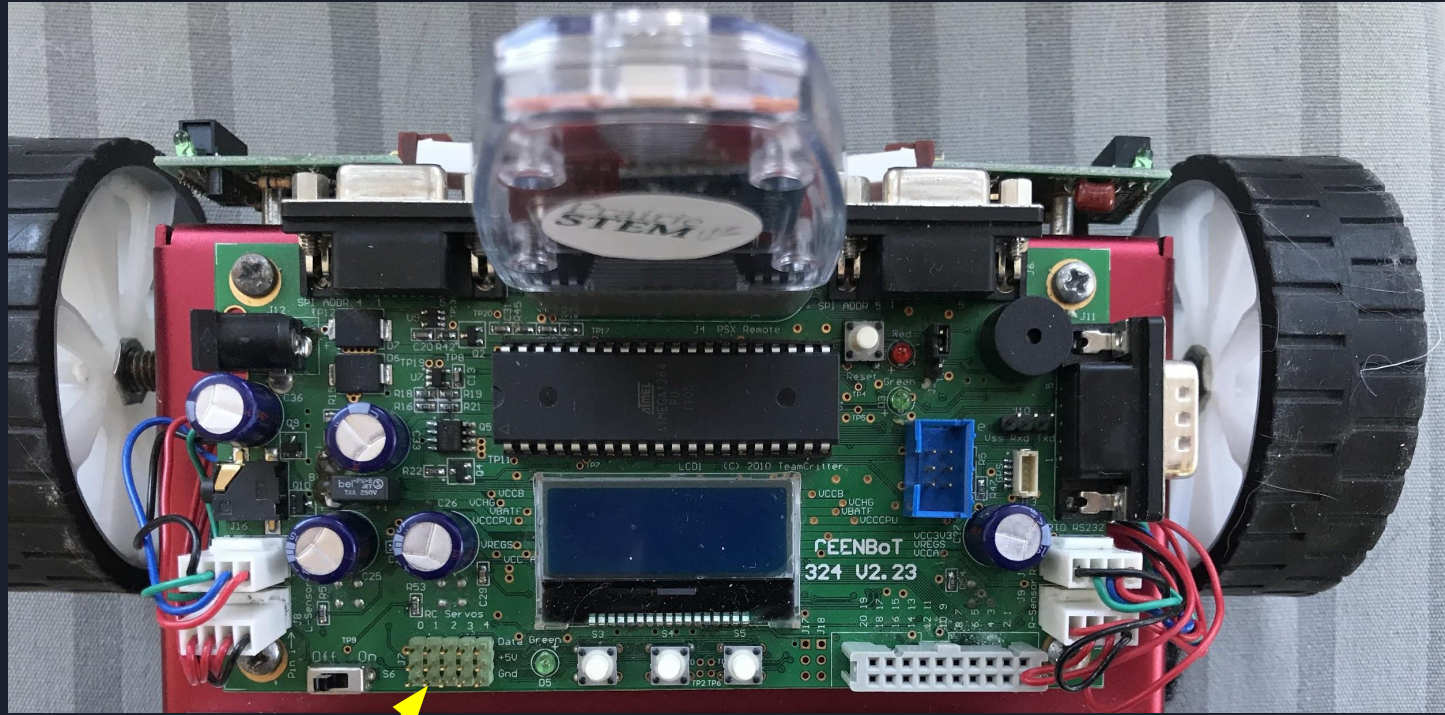
Where to find servos

You'll find servos at any hobby electronics shop and many larger retailers. Some ideas:

[SparkFun](#) - includes great tutorials

[Amazon](#) - faster shipping, less guidance

Installing One Servo - attaching servo to bot

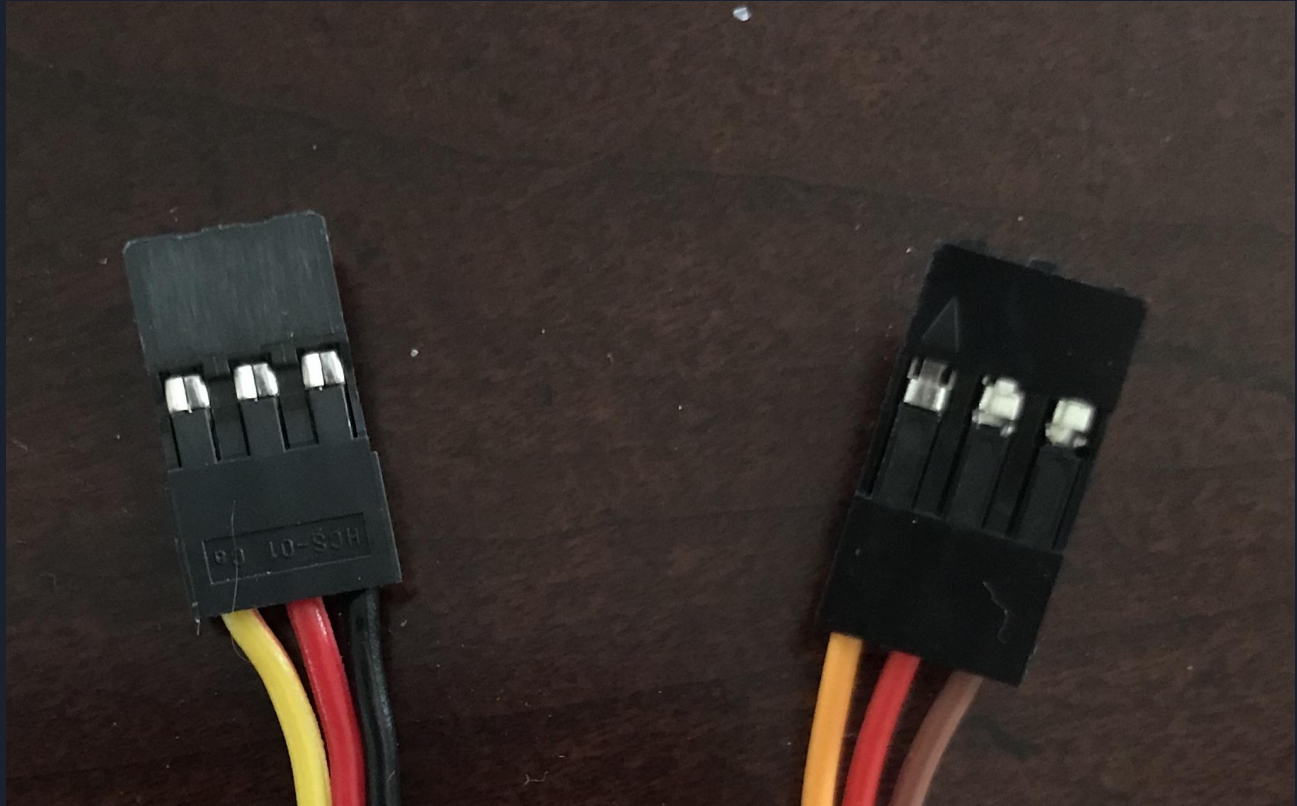


Installing One Servo - attaching servo to bot

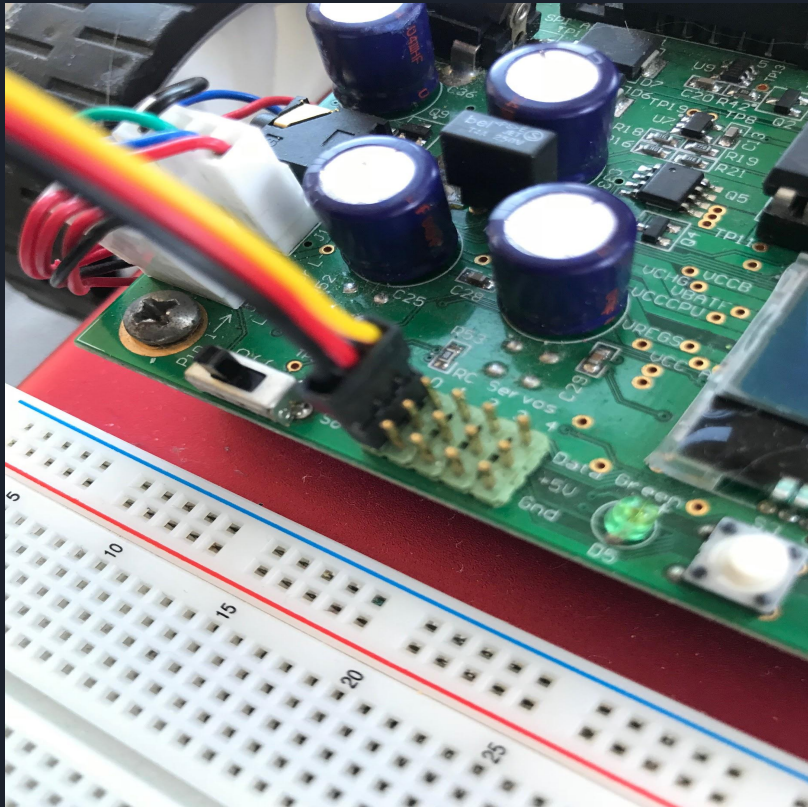


Installing One Servo - attaching servo to bot

Red - Positive
Dark - Ground
Other - Data

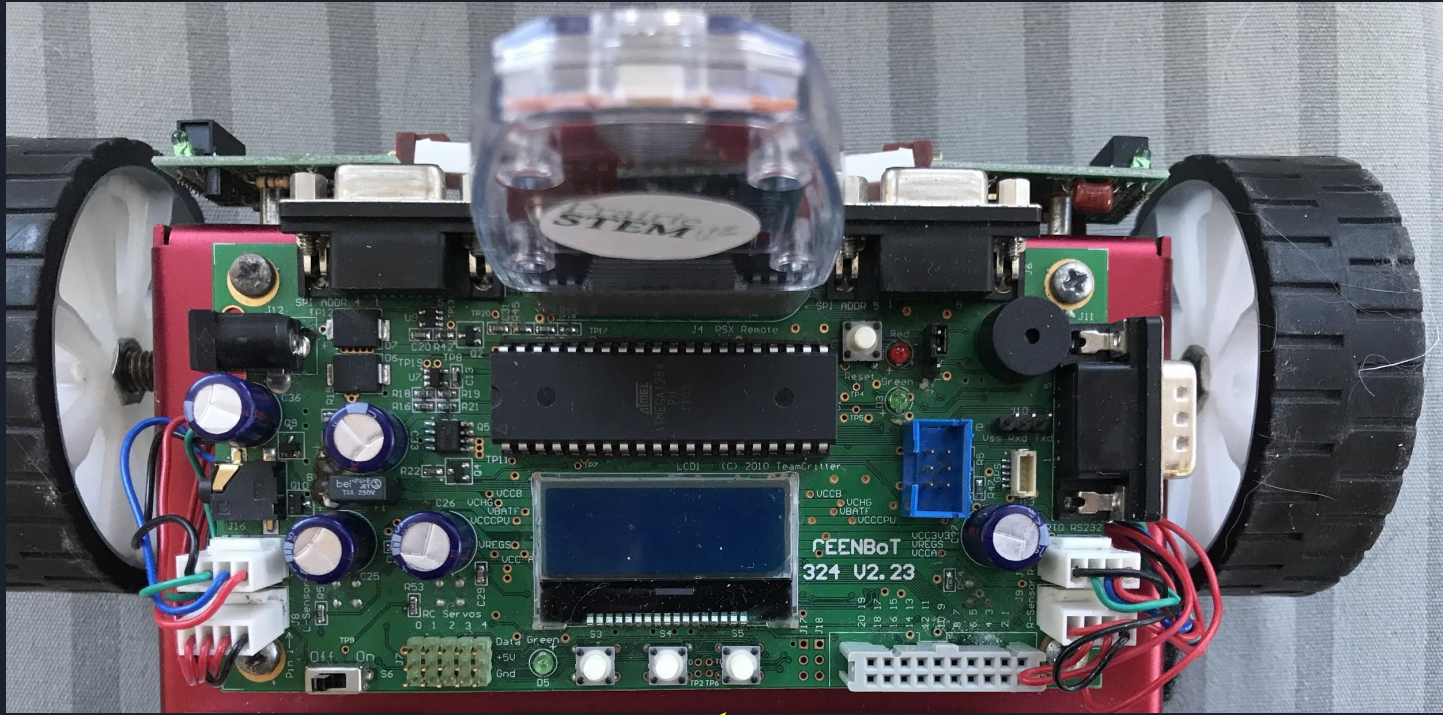


Installing One Servo - attaching servo to bot



Note: Because the positive pin is in the middle, you will not damage your servo if you plug it in the wrong way. If you struggle to figure out which way is correct, you may try both and see which seems to power the robot.

Installing One Servo - configuring the servo

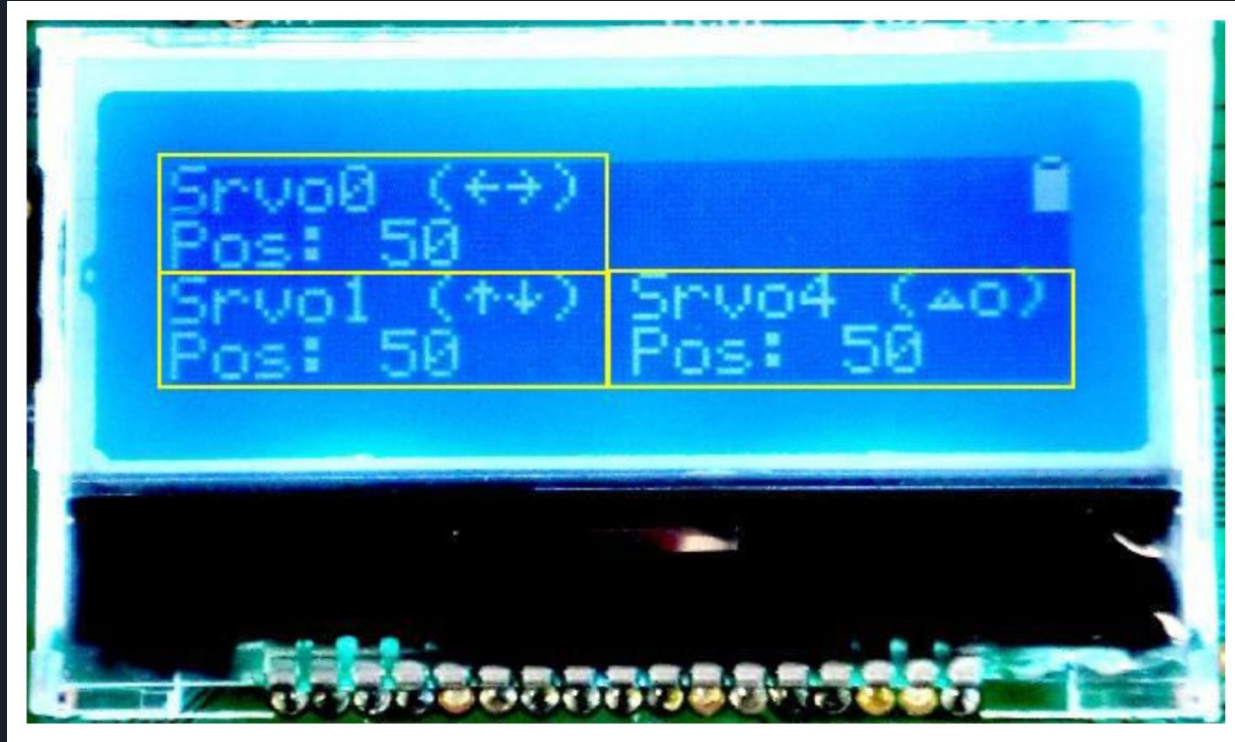


Click four times to get to servo screen

Installing One Servo - configuring the servo

Press S4
(center
button) once
to access
servos 2, 3,
and 4.

Press twice
to access
configuration
screen

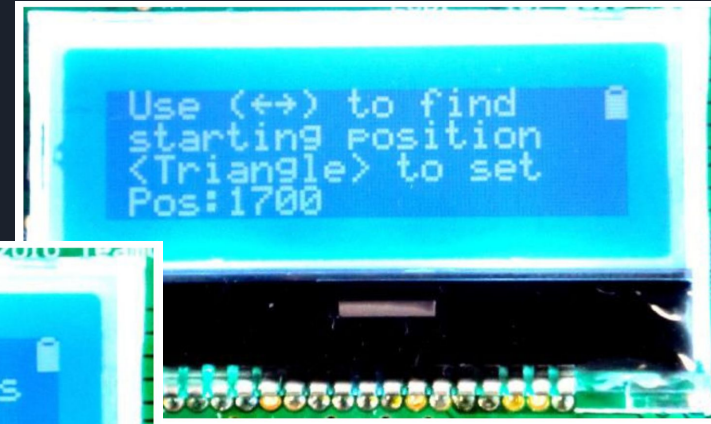
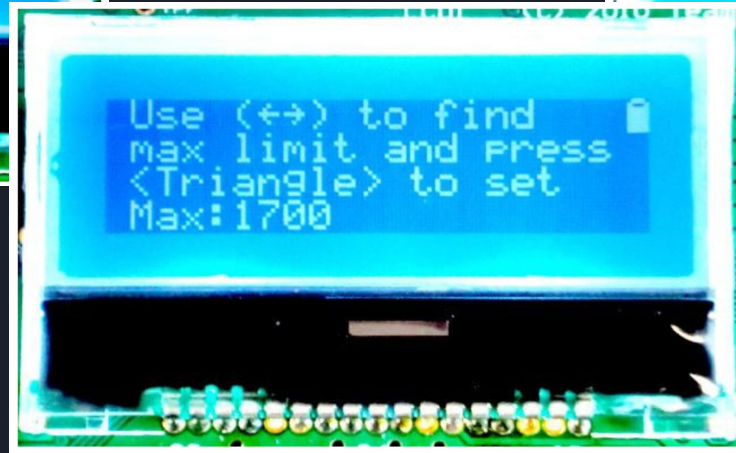
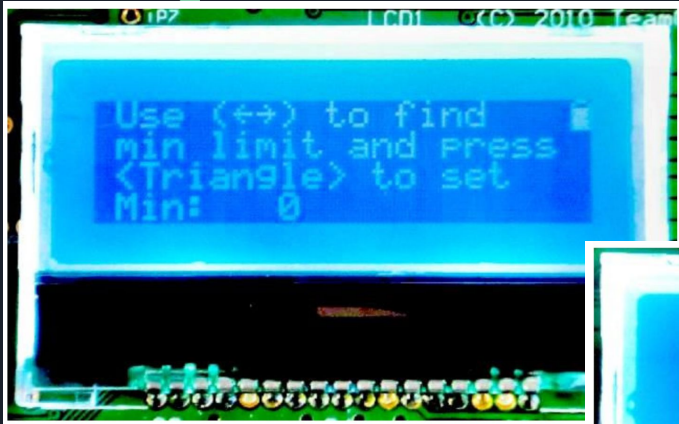


Installing One Servo - configuring the servo

From this screen you can scroll through which servo # you are configuring using S3 and S5.



Installing One Servo - configuring the servo





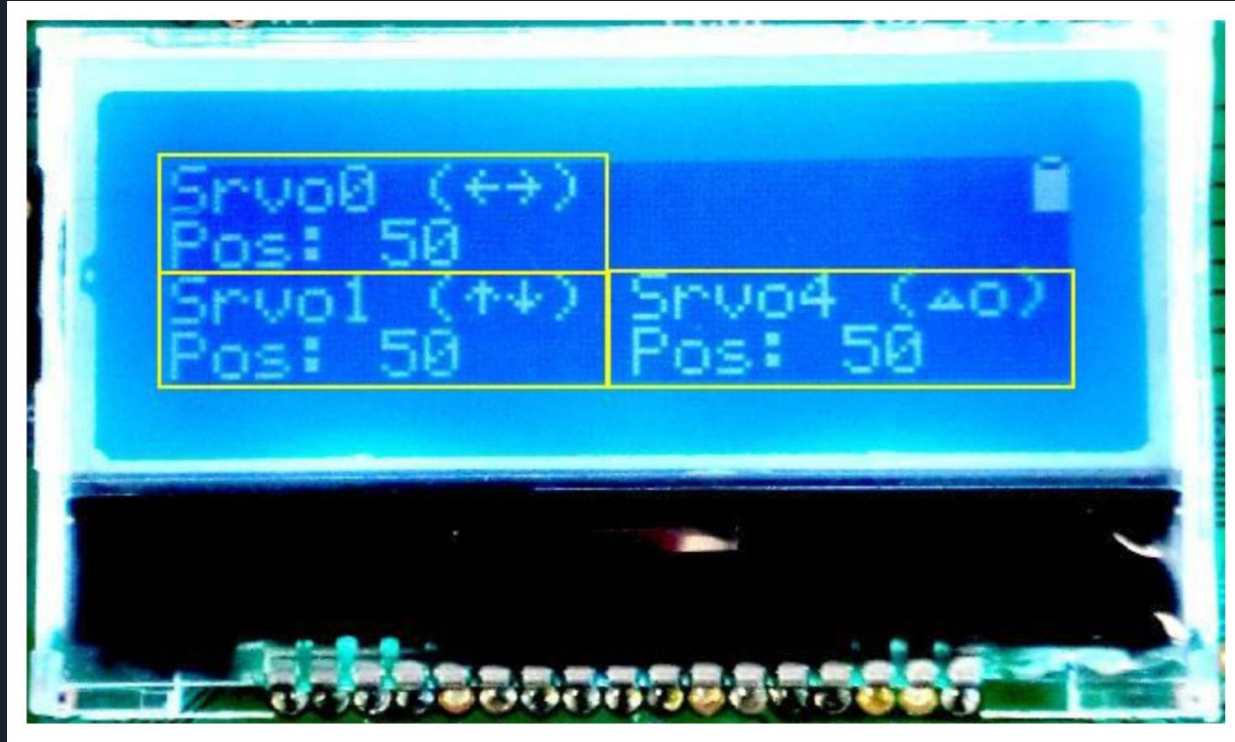
After Configuration

Once you've completed these three steps, your servo will be fully operational using the ←→ buttons.

You can also control the speed of your servo using the start and select buttons. This will play the same “speed up” and “speed down” sounds as L2 and R2.

Installing Two Servos

Notice that servo 0 is controlled with \leftrightarrow while servo 1 is controlled with \updownarrow

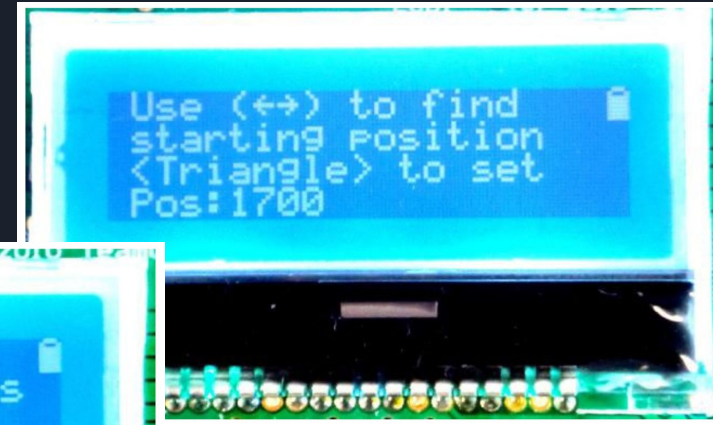
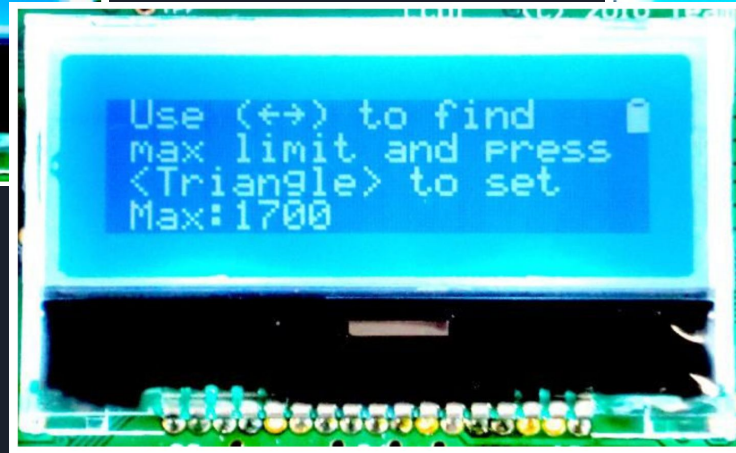
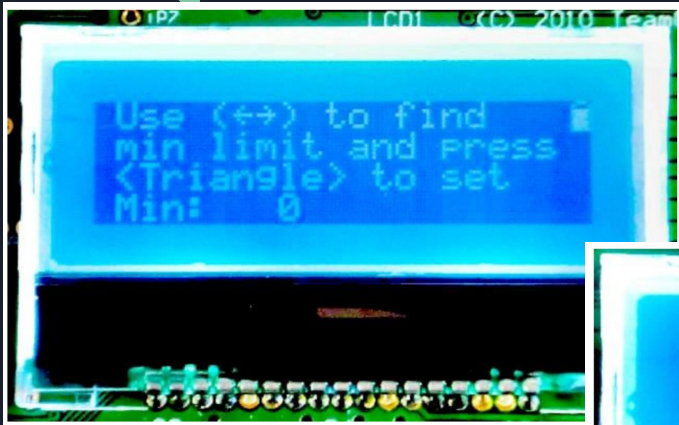


Installing Two Servos

After you configure the first servo (#0), use S5 to access servo #1.



Installing Two Servos





After Configuration

At this point, you will now have two servos, both fully accessible from the controller.

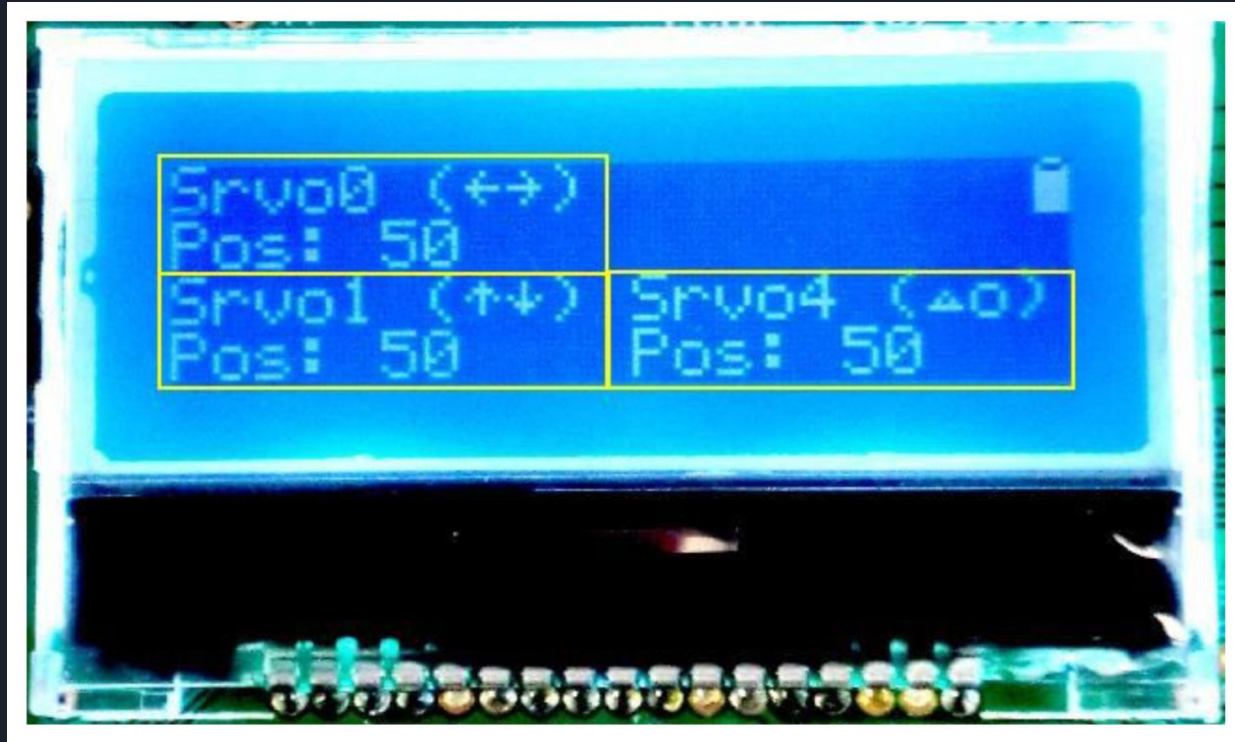
Make sure that you have chosen axes that make the most sense for your servo configuration - e.g. pan and tilt.



Three Servos (and more?!)

- A third servo may be added to slot #4 and configured in the same way.

Installing Two Servos





Three Servos (and more?!)

- A third servo may be added to slot #4 and configured in the same way
- This servo will be controlled by the triangle and circle keys on the controller
- In order to add fourth and fifth servos (in slots 2 and 3), you would need to change the servo information screen (using S4) to access them.



Thinking creatively

- A servo to do exactly what you want may or may not be available at your price point.
- Think of ways to adjust the servo you can afford -- erector set? Great design challenge for kids.
- Jumper cables can be useful for extending the reach of a servo motor.



Questions?

meg.r.harms@gmail.com

