OLED Display & Joystick

Joysticks, while commonly associated with video games, actually have many uses as input devices. They have a small physical footprint, an intuitive feel, can provide very quick yet precise control, and they are relatively simple to use from both a hardware and software standpoint.

In fact, we've already interfaced with all of the individual parts that make up a standard joystick, like the mini-stick included in the kit.

If you press down on the joystick it clicks, just like other small sticks you might have used that can be used to select something, fire, jump, etc. Looking at the board that the stick is connected to, you can see that it is simply engaging a button just like the ones we have been using in other sections.
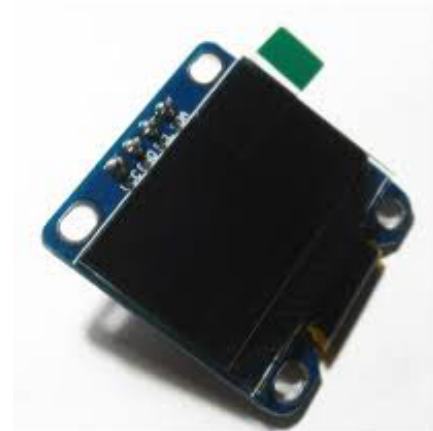
Likewise, if you look at the base of the stick, you will see two items that look an awfully lot like oversized trimpots. And that's what they are — two potentiometers. One handles the up and down motion, and the other the left and right. When properly joined mechanically, they can both be actuated at the same time.

Connection is just what you might expect, power and GND, plus a line for the switch, one for X and one for Y. Connect the X and Y to an analog pins on the Nano and read from it and you'll get the same varying values we did with the full-sized pot earlier.
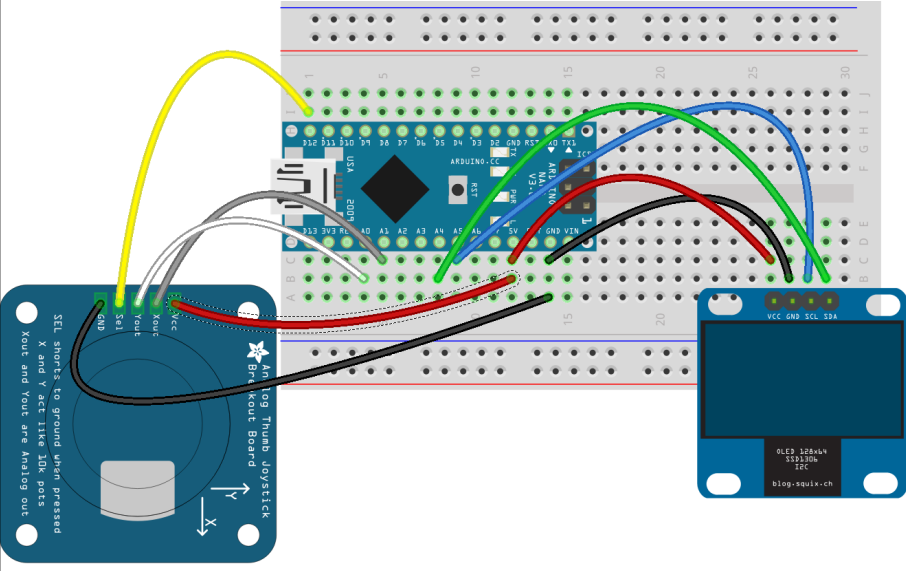
Many pieces had to come together to make the joystick, plastic, metal, springs to center the stick, etc. As such each joystick is slightly different than the next in terms of what values for X and Y it reports at the center and at the edges. To use it effectively we will need to either scale the numbers or calibrate each stick — or both.

There are multiple sample programs for this session, one for calibrating the stick, one demonstrating the graphics and text display capabilities of the display, and possibly others you will be informed of by your instructor.

Take a look at each one to see how it works, then try changing the display's output, maybe by adding in one of the sensors you have just learned about and using the display as the output — and the joystick as input. Additional ideas and options will be discussed after you have explored the basics.

Experiment: The Joys of a nice display

Components	Wiring Diagram
✓Nano ✓SSD-3306 OLED Display ✓mini joystick w/ button ✓Whatever else you want	

Connection Instructions
The display and the joystick both require 5V and GND. The display should be used in the breadboard as shown for stability. The joystick is best attached with some of the longer M to F jumpers. The display MUST be connected with SDA going to A4 and SCL going to A5. The X and Y of the Joystick can go to any Analog input you desire, though the sample code uses A0 and A1. Likewise, the button (SW) can go to any other GPIO pin, though the sample code uses 12.

Sketch(es)	JoyCal.ino displayDemo.ino

Analysis Questions

Programming Tasks
Verify and understand operation of both the supplied sample programs. Try using the display and/or Joystick in conjunction with some of the other devices we have used previously.