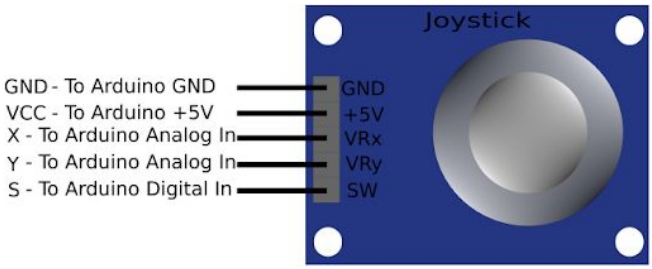
Joystick
(Technical Note)

What is a Joystick?

A joystick is a device to input x-y position coordinates into a computer. input device that rotates around a base. The angle at which it is rotated is reported to the device. For adding a low cost, game like feature to your system, joystick is one of that most affordable option. For X and Y measurements, the module has two potentiometers attached to it, Along with this, at top, an additional switch is attached to the module.

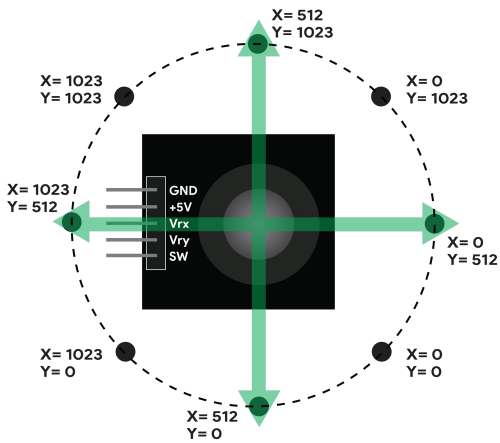
Applications

As the joystick has X-axis and Y-axis, the midpoints of these potentiometer are carried out as Rx and Ry. Which means, when the joystick is tilted along the horizontal axis, the voltage at Rx pin changes. Similarly, voltage at Ry alters with the change of joystick's position in vertical axis.



Controlling Machines

Cranes, trucks have joysticks attached to their controllers so as to control the movement of their arm. Thus, the main purpose of the machine is certainly solved not by the buttons but by having the free movement by the joystick.



Gaming Consoles:

Most common application we have seen in our childhood is in gaming consoles, these are used to control the movements of the character in the game. The movements are mapped by the reading of the potentiometer for X and Y axis.

Joystick
(Application Note)

Project

To display the current position of the joystick using Arduino

Components Required

Component	Z2M Part No.	Quantity
Joystick	EMS-00020-A	1
Arduino UNO	EMX-00001-A	1
Jumper Wires M-F	EDA-00001-A	5

Procedure

1. Connect the joystick to the Arduino as shown in the schematic.
2. Upload the code
3. Watch the monitor. Set the baud rate to 9600

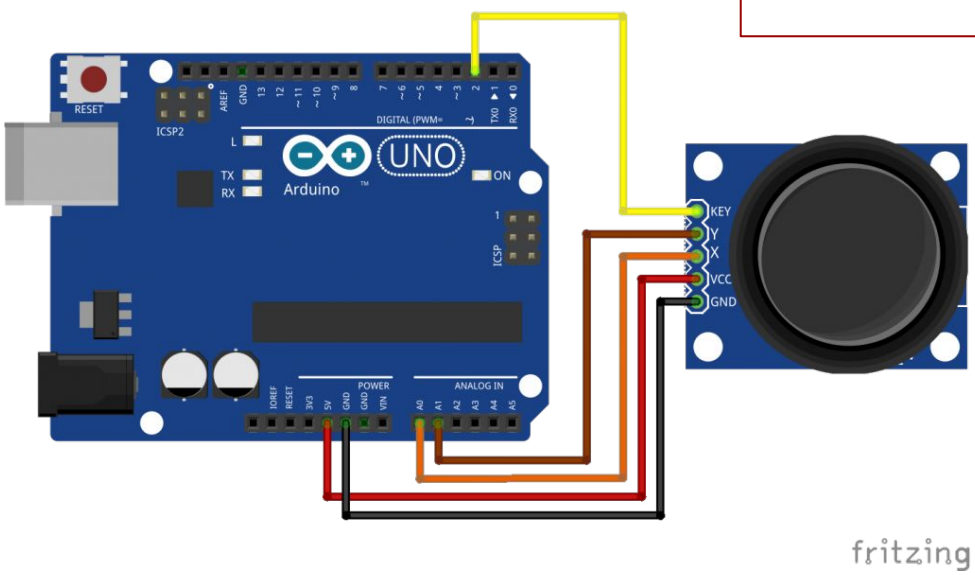
Code

```
/* Arduino pin numbers*/
const int SW_pin = 2;
/* digital pin connected to switch output*/
const int X_pin = A0;
/* analog pin connected to X output*/
const int Y_pin = A1;
/* analog pin connected to Y output*/

void setup()
{
  pinMode(SW_pin, INPUT);
  digitalWrite(SW_pin, HIGH);
  Serial.begin(9600);
}

void loop()
{
  Serial.print("Switch: ");
  Serial.print(digitalRead(SW_pin));
  Serial.print("\n");
  Serial.print("X-axis: ");
  Serial.print(analogRead(X_pin));
  Serial.print("\n");
  Serial.print("Y-axis: ");
  Serial.println(analogRead(Y_pin));
  Serial.print("\n\n");
  delay(500);
}
```

Schematic



Note: Different models of joystick may have different pin order or labels. But here is a list of equivalent labels:

Press switch, KEY or SW
Y axis out, Y or VRY
X axis out, X or VRX
Power, VCC or +5V
Ground, GND or RET

Challenge Yourself

1. **Video Game:** Make a display ball game using Joystick and 8X8 matrix.
2. **Menu Pointer:** Build a joystick based menu selector on I2C LCD display.