

Horizontal Sliding Mechanism using Rack & Pinion and MG995 Servo

Step 1: Components Required

- MG995 Servo motor
- Rack & Pinion gear set
- Arduino / CPX + Crickit controller
- Jumper wires and breadboard
- Power supply (5–6V, 2A for servo)
- Mounting base (wood/acrylic)

Step 2: Connect Components

- Fix the rack horizontally on a mounting base.
- Attach the pinion gear to the MG995 servo horn.
- Connect the servo motor to the Arduino/CPX controller.

Step 3: Code



The screenshot shows the Adafruit CircuitPython code editor interface. The top bar has icons for Mode, New, Load, Save, Serial, Plotter, Zoom-in, Zoom-out, Theme, Check, Tidy, Help, and Quit. The code editor window displays the following Python script:

```
code.py
1 import time
2 from adafruit_crickit import crickit
3
4 ss = crickit.seesaw
5
6 # Pin definitions
7 L1 = crickit.SIGNAL1 # Limit switch 1 (fully open)
8 L2 = crickit.SIGNAL8 # Limit switch 2 (fully closed)
9
10 # Set pin modes
11 ss.pin_mode(L1, ss.INPUT_PULLDOWN)
12 ss.pin_mode(L2, ss.INPUT_PULLDOWN)
13
14 print("Lift Door with Limit Switch Control - Open <-> Close")
15
16 # Servo control
17 STOP_VALUE = -0.05 # adjust if servo creeps when stopped
18
19 def motor_stop():
20     crickit.continuous_servo_1.throttle = STOP_VALUE
21     print("Motor STOP")
22
23 def motor_reverse(): # opening
24     crickit.continuous_servo_1.throttle = -0.7
25     print("Motor FORWARD (OPENING)")
26
27 def motor_forward(): # closing
28     crickit.continuous_servo_1.throttle = 0.7
29     print("Motor REVERSE (CLOSING)")
30
31 # Start stopped
32 motor_stop()
```

```
while True:
    # Start opening
    print("Opening door...")
    motor_reverse()

    # Keep opening until fully open (L1 triggered)
    while ss.digital_read(L1) == 1:
        time.sleep(0.01)

    # Door is fully open → stop
    motor_stop()
    print("Door fully open → waiting")
    time.sleep(2)

    # Start closing
    print("Closing door...")
    motor_forward()

    # Keep closing until fully closed (L2 triggered)
    while ss.digital_read(L2) == 1:
        time.sleep(0.01)

    # Door fully closed → stop
    motor_stop()
    print("Door fully closed → waiting")
    time.sleep(2)
```

Step 4: Save & Run

- Save the code as an Arduino sketch and upload to the controller.
- Observe the servo turning the pinion gear to slide the rack horizontally.
- The rack will move left, right, and stop at middle position.