Adjustable speed fan

1. Learning target

1.1 In this course, we will learn how to use pins of the Raspberry Pi Pico board.

1.2 How to use potentiometer module, motor drive module and motor fan make a Adjustable speed fan.

2. Preparation

Raspberry Pi Pico board *1

Pico sensor expansion board *1

PC *1

USB data cable *1

Potentiometer module *1

Motor drive module *1

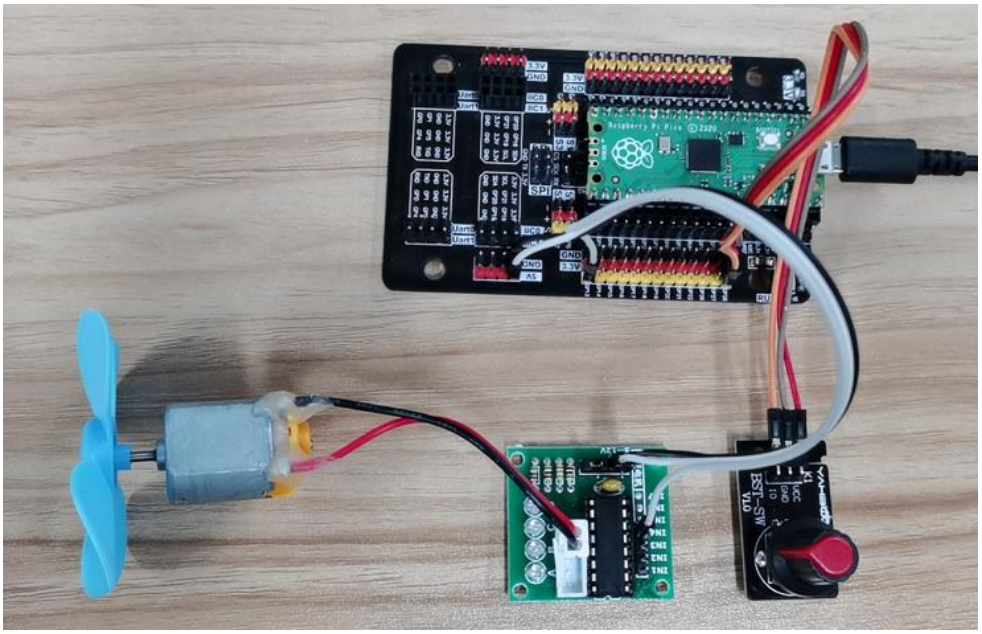
Motor fan *1

Male-to-male DuPont line *6

3. About wiring

Potentiometer module	Pico sensor expansion board
IO	GP28
VCC	3.3V
GND	GND

Motor drive module	Pico sensor expansion board
+	5V
IN4	GP13
-	GND



4. About code

Thonny programming

About how to using ThonnyIDE, please check the tutorials in【2.Development environment】.

```
from machine import Pin, PWM, ADC
import utime

#Initialize the potentiometer pin
rp = ADC(28)

#PWM output initialization, motor pin
pwm1 = PWM(Pin(13))
pwm1.freq(1000) #Set frequency

#Numerical conversion parameters
conver_100 = 101 / (65536)

#Numerical remapping
def my_map(x, in_min, in_max, out_min, out_max):
    return int((x - in_min) * (out_max - out_min) / (in_max - in_min) + out_min)


#Set speed of fan, speed=[0, 100]
def pwm_motor(speed):
    if speed > 100 or speed < 0:
        print('Please enter a limited speed value of 0-100')
        return
    pulse = my_map(speed, 0, 100, 0, 65535)
    print(pulse)
    pwm1.duty_u16(pulse)

while True:
    # Convert the read potentiometer value into [0, 100]
    val_rp = int(rp.read_u16() * conver_100)
    utime.sleep(.1)
    # print(val_rp)
    pwm_motor(val_rp)
```

5. Phenomenon

Click the green run button  of Thonny IDE to start running the program. Click the red stop button  to stop the program. When the program is running, turn the potentiometer by hand, you can see that the speed of the small motor fan will change.