Detect light intensity

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 light sensor module.

2. Preparation

Raspberry Pi Pico board *1

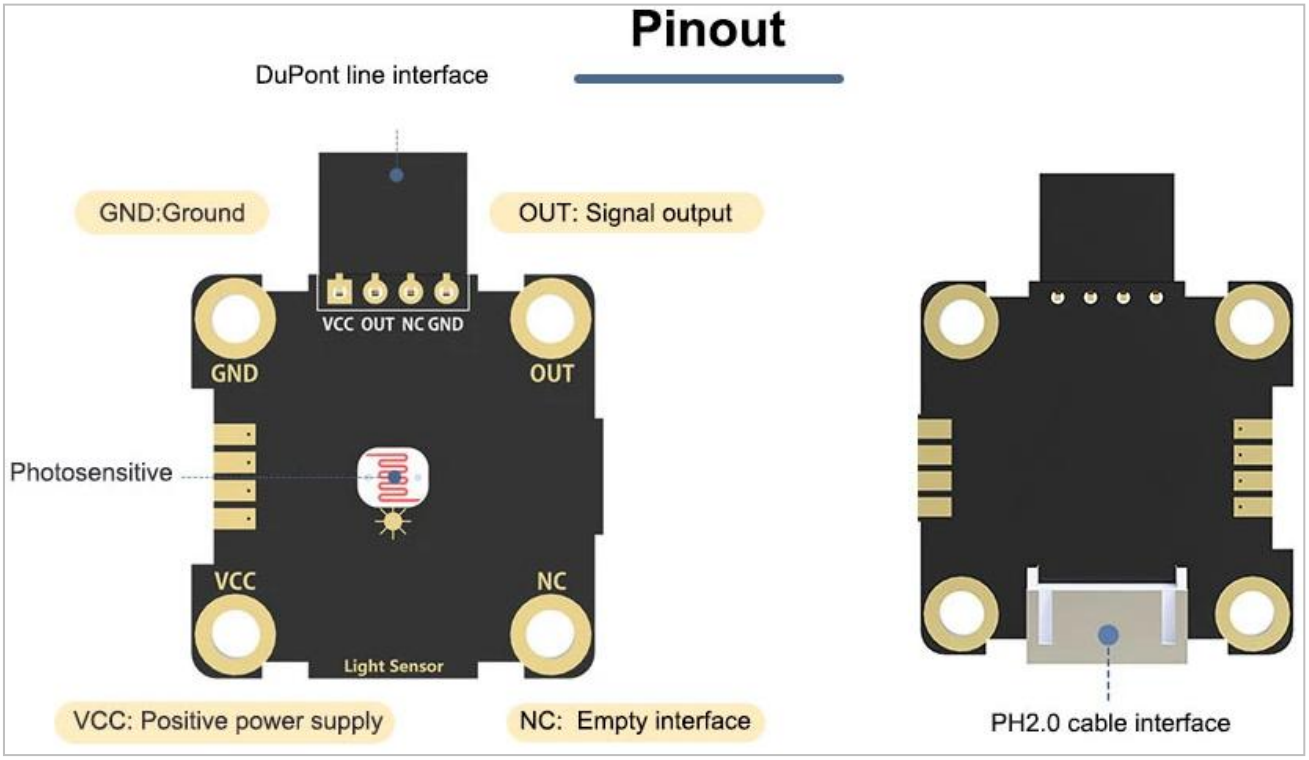
Pico sensor expansion board *1

PC *1

USB data cable *1

Light sensor module *1

Female-to-male DuPont line *3



Working principle:

Photosensitive sensors are one of the most common sensors. They are mainly used in: photocells, photo-multiplier tubes, photo-resistors, photo-transistors, solar cells, infrared sensors, ultraviolet sensors, fiber optic sensors, color sensors, CCDs, and CMOS image sensor, etc.

This module is a photosensitive resistor as a sensor, which convert an optical signal into an electrical signal by photo-resistor.

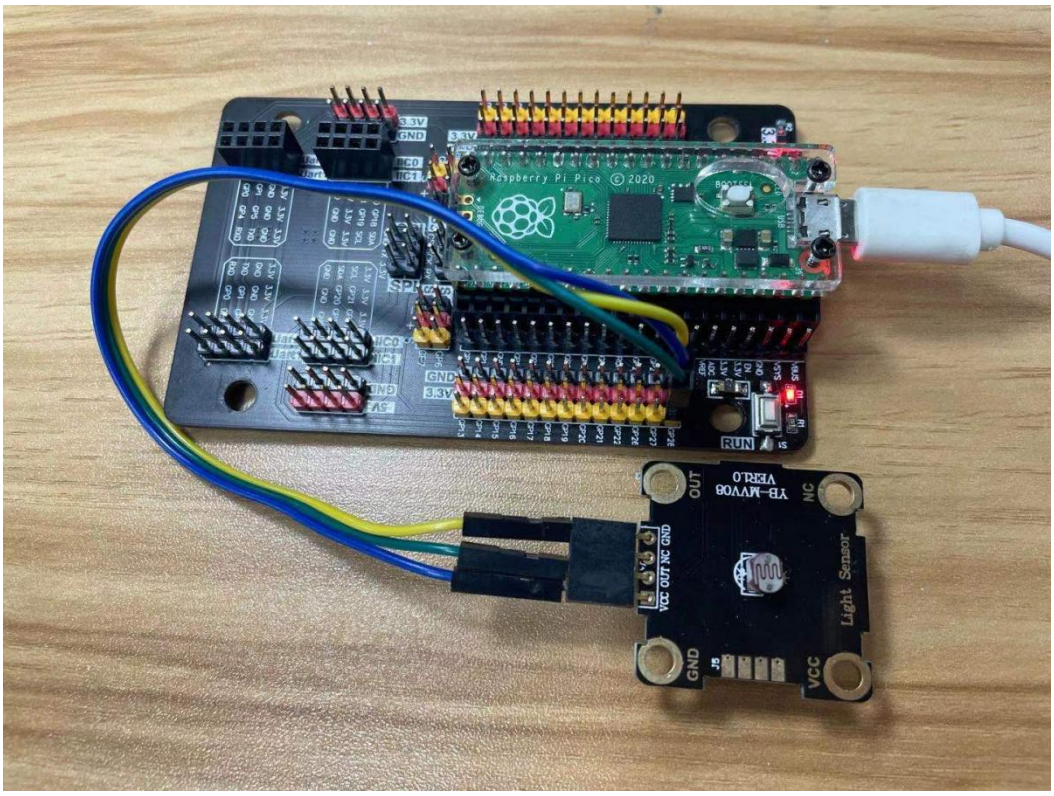
The analog value of the photosensitive module output ranges from 0 to 1023. The stronger the light intensity, the OUT will output smaller the analog value. When the light intensity is weak, the OUT will output bigger the analog value.

Module parameters:

VCC: power supply interface, can be connected to 3.3V, 5V
GND: ground
NC: empty interface, no connection required
OUT: analog signal output
Module size: 29.4mm*36mm
Working voltage: 3.3V/5V
Interface mode: Alligator clip interface, DuPont line interface, PH2.0 cable interface

3. About wiring

Human infrared module	Pico sensor expansion board
OUT	GP28
GND	GND
VCC	3.3V



4. About code

Thonny programming

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

```
from machine import ADC
import utime
# Initialize the photosensitive sensor pin to GP28 (ADC function)
light = ADC(28)

# Read the current analog value of the photosensitive sensor, range [0, 100]
def get_value():
    return int(light.read_u16() * 101 / 65536)

# Print the current value of the photosensitive sensor cyclically, value=[0, 100]
# The stronger the light intensity, the smaller the value.
while True:
    value = get_value()
    print(get_value())
    utime.sleep(.1)
```

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, the shell window of Thonny IDE will print the current analog value of the photosensitive sensor. The stronger the light intensity, the smaller the read analog value.