Photo Interrupter Sensor

- Infrared detection, eliminating the interferences of external stray light
- Schmitt trigger, stable waveform, and signals
- Signal output indicator (while breaking the beam, outputs a low level, the indicator lights up)

Specification

- Power: 3.3V ~ 5V
- Dimension: 26.8mm × 15mm × 18.7mm
- Mounting holes size: 3mm
- Gap width: 6mm

Pinouts

PIN	Description
DOUT	Digital data output
GND	Power ground
VCC	3.3V-5V

Get Started at Pico

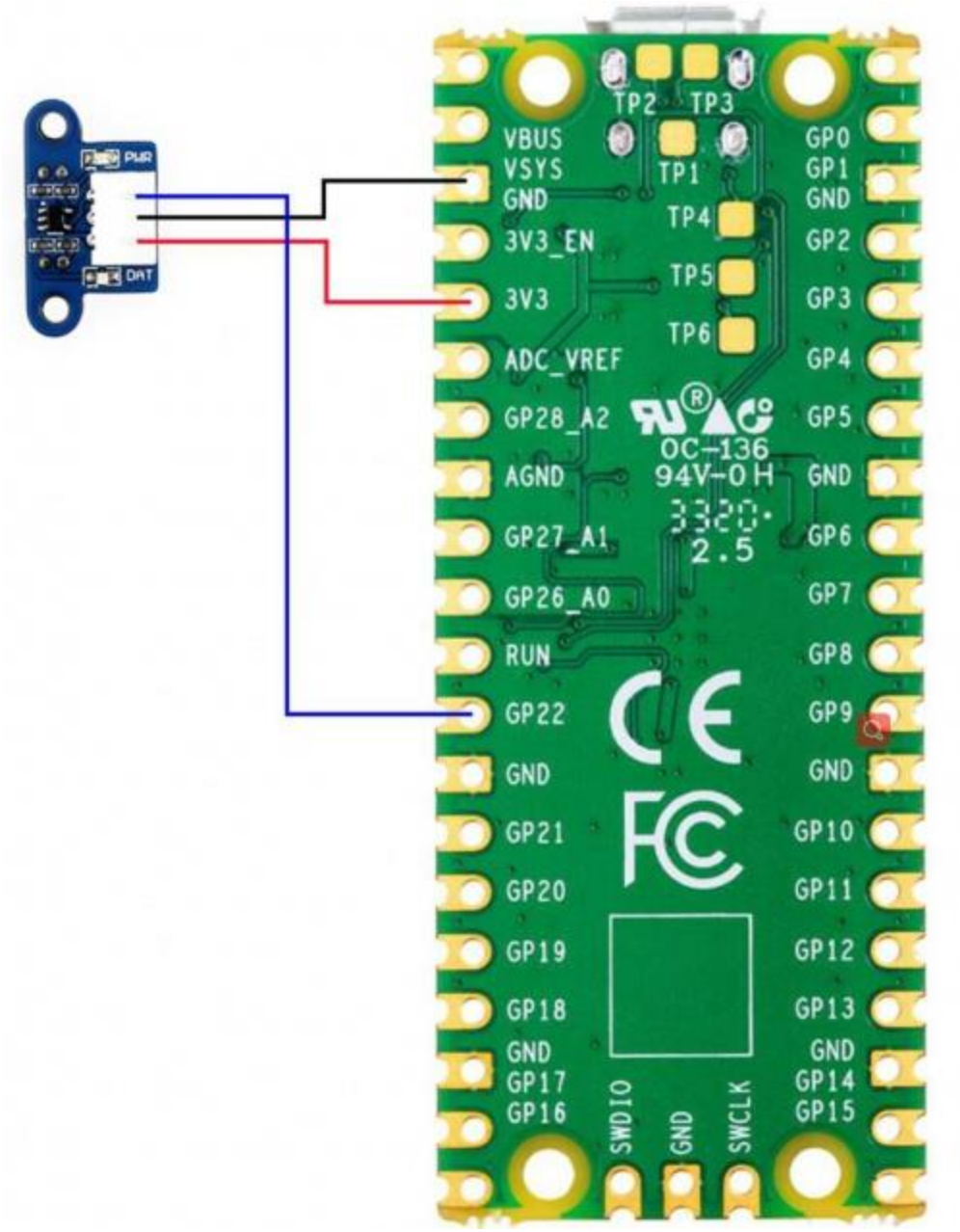
If you are the first time o use the Pico, you need to first learn how to get started at the Pico before you run other examples.
The Pico supports C and the Micropython which requires different firmware.
In most of the examples archives (Demo codes), we provide a Micropython firmware (uf2 file), we recommend you to use the provided firmware to test the board. Because the codes may run abnormally with different firmware.
If the board is tested to be workable, you can also download the newest firmware from Raspberry Pi and do further programming.

- If you want to use C codes, please refer to the C/C++ Guides
    - Raspberry Pi Pico C/C++ SDK
- If you want to use Micropython codes, please refer to the Micropython Guides.

    - Raspberry Pi Pico Python SDK
- The link of the newest Micropython firmware of Pico
    - Micropython firmware of Raspberry Pi Pico
- Official Guides of Raspberry Pi Pico
    - Document of Raspberry Pi Pico

Hardware Connection

Sensor	Pico	Description
VCC	3.3V	Power input
GMD	GND	Power ground
DOUT	GP22	Digital data output



Download examples

Use the Raspberry Pi as the host device. Open a terminal and run the following commands to download the example.

```
sudo apt-get install p7zip-full
cd ~
sudo wget https://www.waveshare.ncom/w/upload/f/f6/Photo_Interrupter_Sensor_Demo.7z
7z x Photo_Interrupter_Sensor_Demo.7z -o./Photo_Interrupter_Sensor_Demo
```

Examples

C codes

- go into the c directory

```
cd ~/Photo_Interrupter_Sensor_Demo/Pico/c/build
```

- Add the path of SDK

```
export PICO_SDK_PATH=../../pico-sdk
```

Note that if the path of your SDK is different, you need to modify the command and use the correct path to export

- Generate Makefile and build

```
cmake ..
make -j9
```

- After building, a uf2 file is generated
- Press and hold the button of Pico, connect it to Raspberry Pi then release the button.
- Copy/Drag the uf2 file to the portable disk (RPI-RP2) recognized

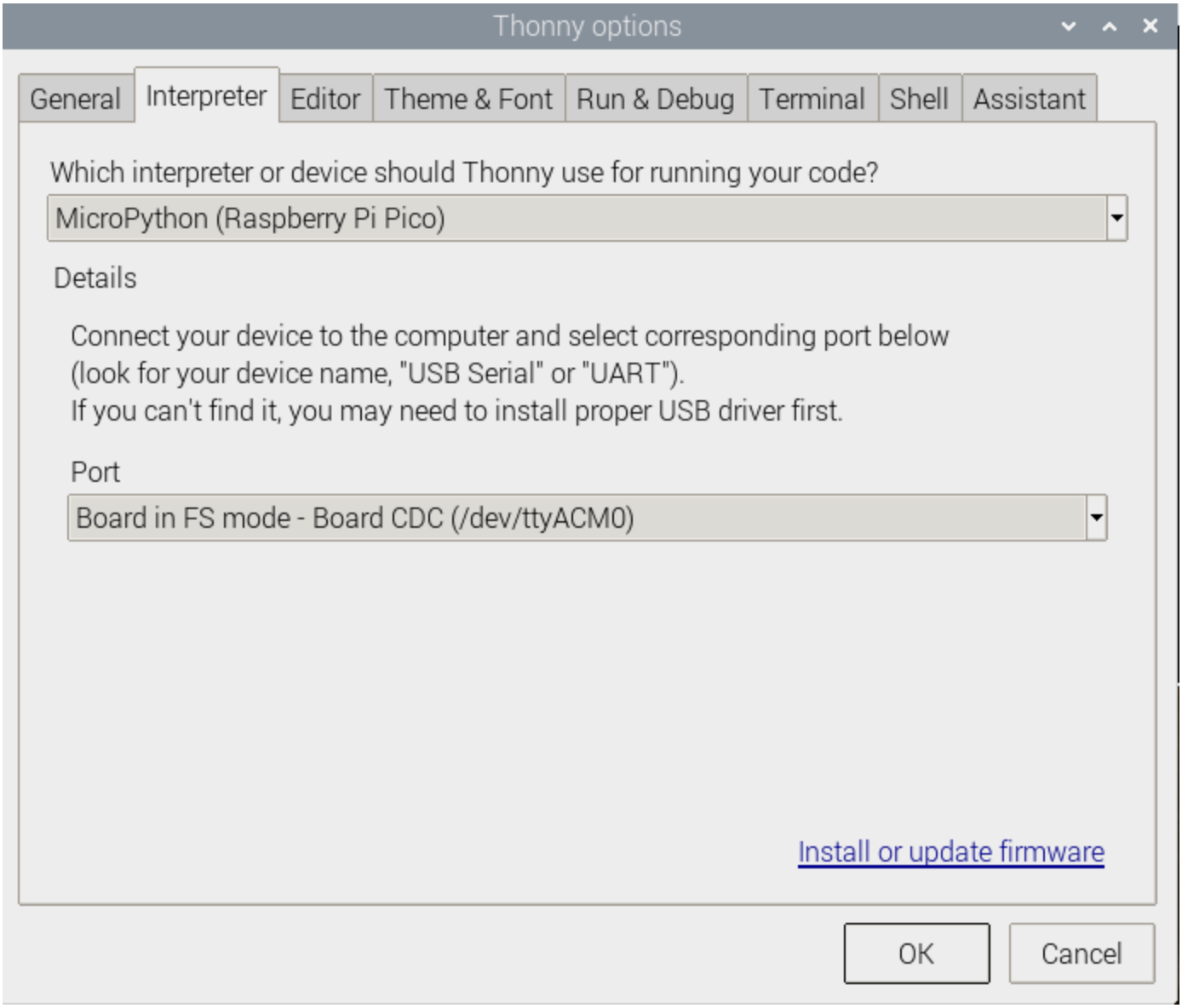
```
cp main.uf2 /media/pi/RPI-RP2/
```

Micropython codes

- Flash the Micropython firmware first
- Open the Thonny IDE (Menu->Programming->Thonny Python IDE).
- 【Optional】If the Thonny IDE in the Raspberry Pi is not the new version that supports Pico, please upgrade it first.

```
sudo apt upgrade thonny
```

- Configure Interpreter, choose Tools->Options... -> Interpreter, choose MicroPython(Raspberry Pi Pico) and the ttyACM0 port.



- Click File -> Open.. and browser the Micropython codes (Photo Interrupter Sensor.py) to run the codes

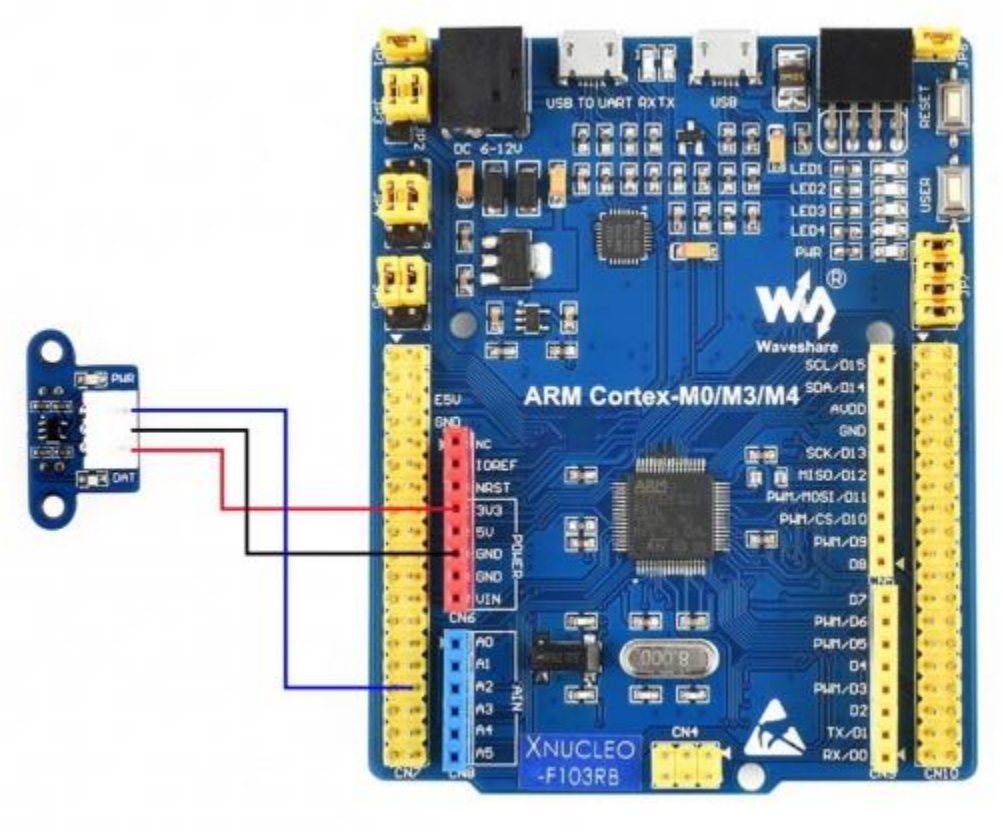
Expected result

When a barrier is placed above the sensor, the signal indicator will turn on and serial port will say "ON" or else the serial port will say "OFF".

The STM32 examples are based on the STM32F103RBT6 and the STM32H743. The connection provided below is based on the STM32F103RB. If you need to use other STM32 boards, you may need to change the hardware connection and port the code yourself.

Hardware connection

Sensor	STM32	Description
VCC	3.3V	Power input
GMD	GND	Power ground
DOUT	PA4	Digitial data output



Examples

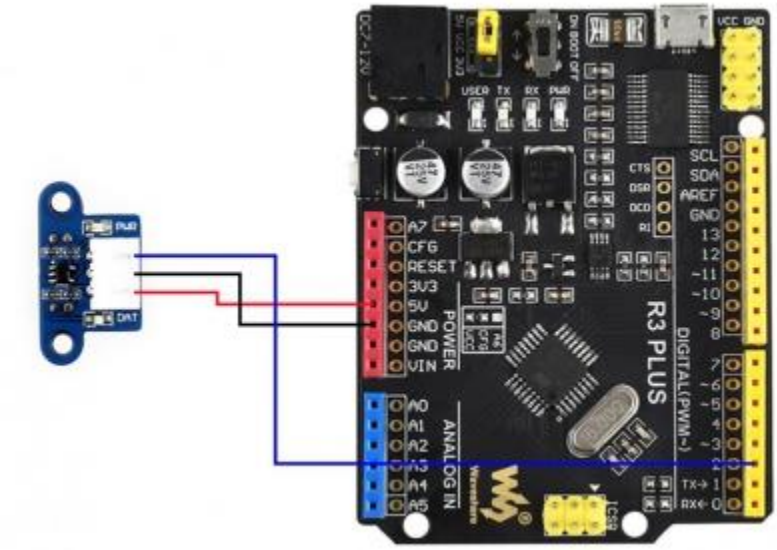
The examples are developed based on the HAL libraries. Download the Demo codes archive to your PC. Unzip and find the STM32 project from Photo_Interrupter_Sensor_Demo\STM32\STM32F103RB\MDK-ARM.

- Open the Photo Interrupter Sensor.uvprojx file by Keil
- Build and the project
- Program the project to your STM32 board.
- Connect the UART1 of your STM32 board to the PC and check the serial data by SSCOM software.

The Arduino example is written for the Arduino UNO. If you want to connect it to other Arduino boards, you may need to change the connection.

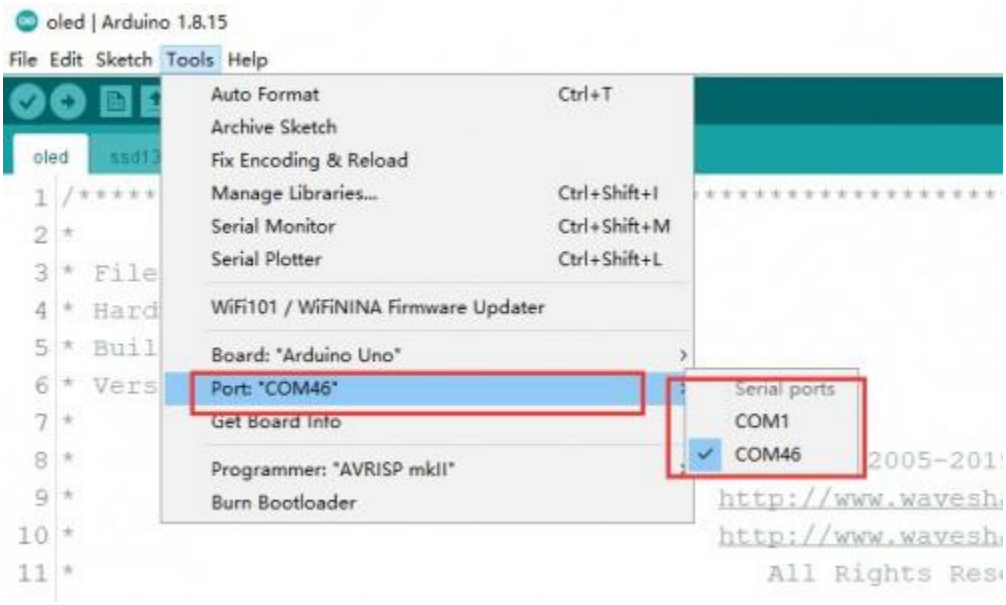
Hardware connection

Sensor	Arduino	Description
VCC	5V	Power input
GMD	GND	Power ground
DOUT	D2	Digital data output



Examples

- Download the demo codes to your PC and unzip
- Install the Arduino IDE in your PC
- Go into Photo_Interrupter_Sensor_Demo/Arduino/Photo_Interrupter_Sensor
- Run the Photo_Interrupter_Sensor .ino file
- Select the correct Board and the Port



- Build the project and upload it to the board.
- Open the serial monitor of the Arduino IDE or the SSCOM software and check the serial data.

Resources

- Schematic
- sn74lvc1g126_EN Datasheet
- Demo code
- PuTTY for serial debugging