

PAJ7620U2 Gesture Sensor

Introduction

PAJ7620U2 Gesture Sensor,gesture recognition function with general I2C interface into a single chip. It can recognize 9 gestures including move up, move down, move left, move right, etc with a simple swipe of your hand.

Features

- Based on PAJ7620U2 sensor, directly recognizes 9 basic gestures, supports gesture interrupt output
- Embedded infrared LED and optical lens, be able to work in low-light even dark environment
- I2C interface, requires only two signal pins to control
- Onboard voltage translator, compatible with 3.3V/5V logic level

Specification

- Operating voltage: 3.3V/5V
- Communication interface: I2C
- Recognition distance: 5cm ~ 15cm
- Supported gestures: up, down, left, right, forward, backward, clockwise, anticlockwise, shake
- Recognition rate: 240Hz
- Recognition angle: 60° (diagonal)
- Ambient light immunity: <100k Lux
- Dimensions: 20mm × 20mm
- Mounting hole size: 2.0mm

Interface

PIN	SYMBOL	Description
1	VCC	3.3V/5V

2	GND	Ground
3	SDA	I2C data pin
4	SCL	I2C clock pin
5	INT	External interrupt pin

How to use it

We provide demo codes for easy testing, you can download the demo codes from [#Resources](#)

Unzip the archive downloaded to get the codes.

Raspberry Pi

- Insert the Micro SD card of Raspberry Pi to host PC.
- Copy the RaspberryPi folder to boot directory of the micro SD card.
- Start your Raspberry Pi with the Micro SD card
- You can find that the RaspberryPi codes are saved in the BOOT directory.

```

pi@raspberrypi:~$ ls /boot/
bcm2708-rpi-0-w.dtb  bcm2710-rpi-3-b.dtb  config.txt  fixup_x.dat  kernel.img  start_cd.elf
bcm2708-rpi-0-w.dtb  bcm2710-rpi-3-b-plus.dtb  COPYING.Linux  FSC00000.REC  LICENSE.broadcom  start_db.elf
bcm2708-rpi-b-plus.dtb  bcm2710-rpi-cm3.dtb  fixup_cd.dat  FSC00001.REC  LICENSE.oracle  start_elf
bcm2708-rpi-cm.dtb  bootcode.bin  fixup.dat  issue.txt  overlays  start_x.elf
bcm2709-rpi-2-b.dtb  cmdline.txt  fixup_db.dat  kernel7.img  RaspberryPi  System Volume Information

```

- Copy the folder to home directory

```

sudo cp -r /boot/RaspberryPi/ ./
sudo chmod 777 -R RaspberryPi/
cd RaspberryPi

```

```

pi@raspberrypi:~$ sudo cp -r /boot/RaspberryPi/ ./
pi@raspberrypi:~$ ls
code  libcode  RaspberryPi  RPiLib  ubuntu  usbdisk
pi@raspberrypi:~$ sudo chmod 777 -R RaspberryPi/
pi@raspberrypi:~$ ls
code  libcode  RaspberryPi  RPiLib  ubuntu  usbdisk

```

```
pi@raspberrypi:~ $ cd RaspberryPi
pi@raspberrypi:~/RaspberryPi $ ls
Light Sensor Servo Driver test web_Python
pi@raspberrypi:~/RaspberryPi $ █
```

Install libraries

- BCM2835:

```
wget http://www.airspayce.com/mikem/bcm2835/bcm2835-1.64.tar.gz
sudo tar zxvf bcm2835-1.64.tar.gz
cd bcm2835-1.64
sudo ./configure
sudo make
sudo make check
sudo make install
```

- Install wiringPi

```
sudo apt-get install git
sudo git clone git://git.drogon.net/wiringPi
cd wiringPi
sudo ./build
```

- Install python

```
sudo apt-get install python-pip
sudo pip install RPi.GPIO
sudo pip install spidev
sudo apt-get install python-imaging
sudo apt-get install python-smbus
sudo apt-get install python-serial
```

Enable I2C

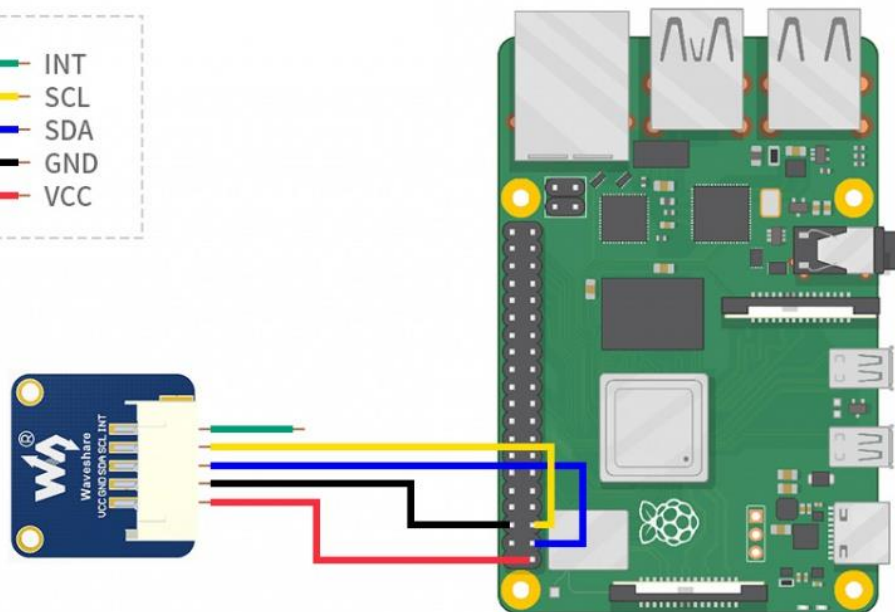
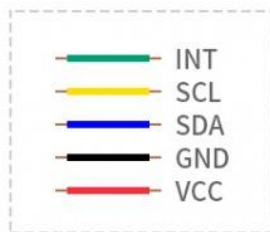
```
sudo raspi-config
```

- Choose Interfacing Options -> I2C -> Yes

Hardware connection

The colors of wires may be different, please connect it according to the silk screen printing.

Gesture Sensor	Raspberry Pi (Board)	Raspberry Pi(BCM2835)
VCC	3.3V	3.3V
GND	GND	GND
SDA	3	P2
SCL	5	P3



Run the codes

- BCM2835 codes

```
cd ~/RaspberryPi/bcm2835/  
cd Gesture  
sudo make  
sudo ./PAJ7620U2
```

- wiringPi codes

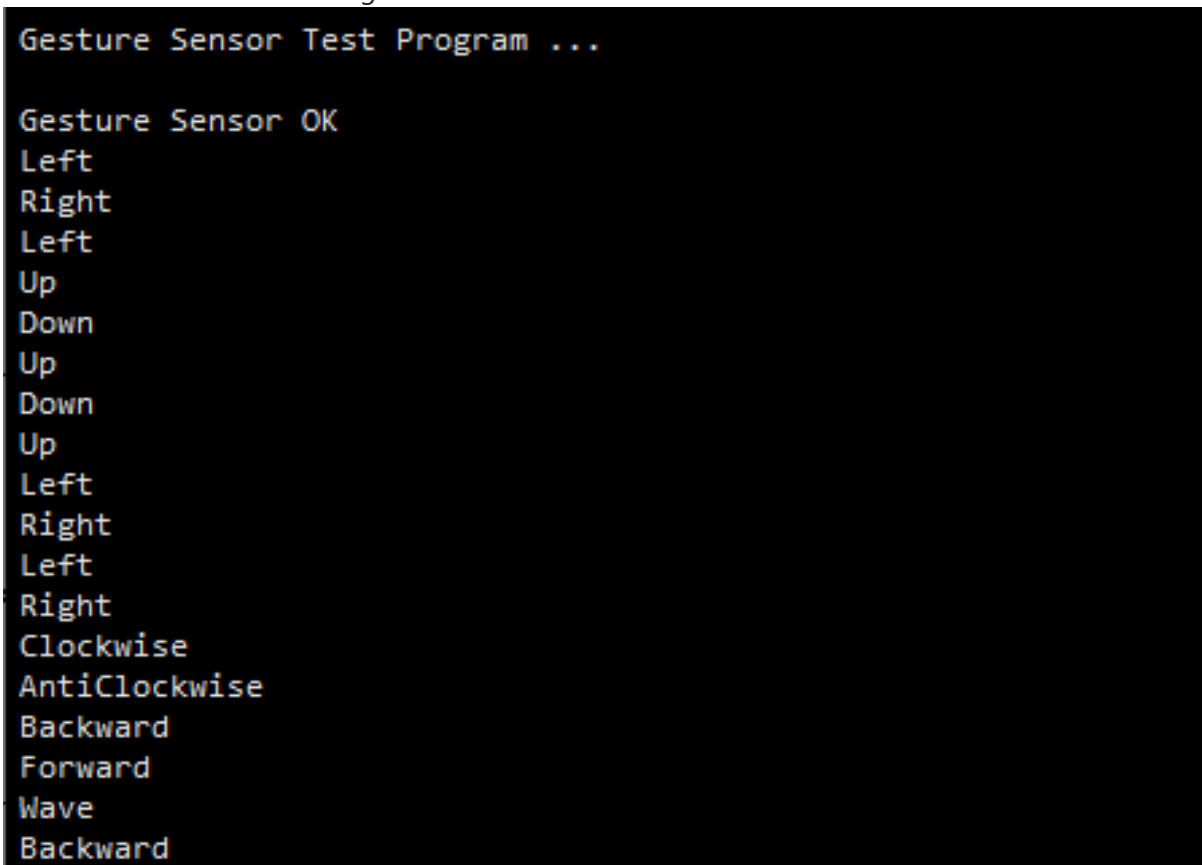
```
cd ~/RaspberryPi/wiringPi
cd Gesture
sudo make
sudo ./PAJ7620U2
```

- Python codes

```
cd ~/RaspberryPi/python
cd Gesture
sudo python PAJ7620U2.py
```

Expecture result

- Gesture detecting



```
Gesture Sensor Test Program ...
Gesture Sensor OK
Left
Right
Left
Up
Down
Up
Down
Up
Left
Right
Left
Right
Clockwise
AntiClockwise
Backward
Forward
Wave
Backward
```

- Object detecting

```
Object brightness = 146 ,Object size = 96
Object brightness = 122 ,Object size = 66
Object brightness = 122 ,Object size = 66
Object brightness = 113 ,Object size = 46
Object brightness = 113 ,Object size = 70
Object brightness = 131 ,Object size = 70
Object brightness = 210 ,Object size = 352
Object brightness = 210 ,Object size = 352
Object brightness = 43 ,Object size = 81
Object brightness = 43 ,Object size = 81
Object brightness = 55 ,Object size = 180
Object brightness = 59 ,Object size = 206
Object brightness = 59 ,Object size = 206
Object brightness = 61 ,Object size = 217
Object brightness = 61 ,Object size = 217
Object brightness = 60 ,Object size = 206
Object brightness = 60 ,Object size = 219
Object brightness = 60 ,Object size = 219
Object brightness = 55 ,Object size = 174
Object brightness = 55 ,Object size = 174
Object brightness = 58 ,Object size = 3
Object brightness = 58 ,Object size = 3
Object brightness = 206 ,Object size = 235
```

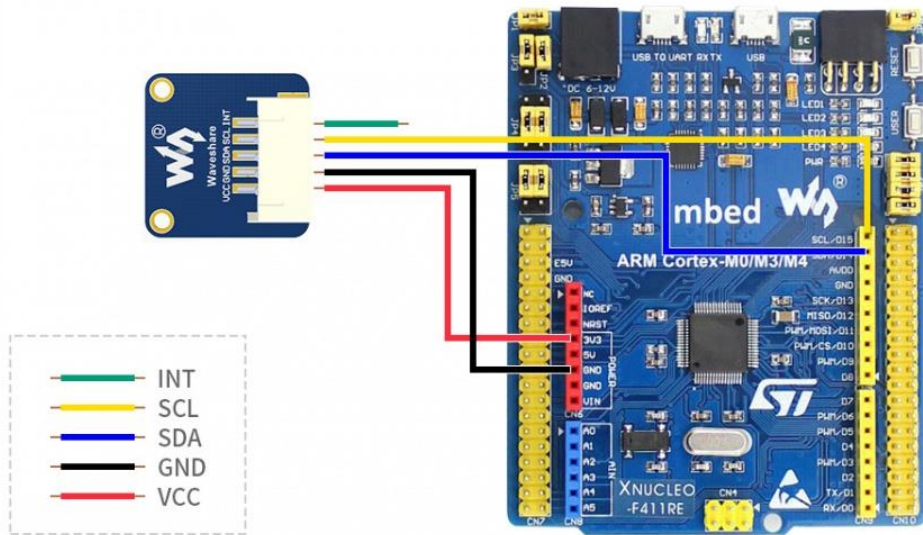
STM32 examples

The STM32 examples is based on Waveshare XNUCLEO-F103RB whose chip is STM32F103RB, HAL libraries.

Hardware connection

Connect the sensor to STM32 board according the table, then connect USB to UART interface of XNUCLEO board to host PC.

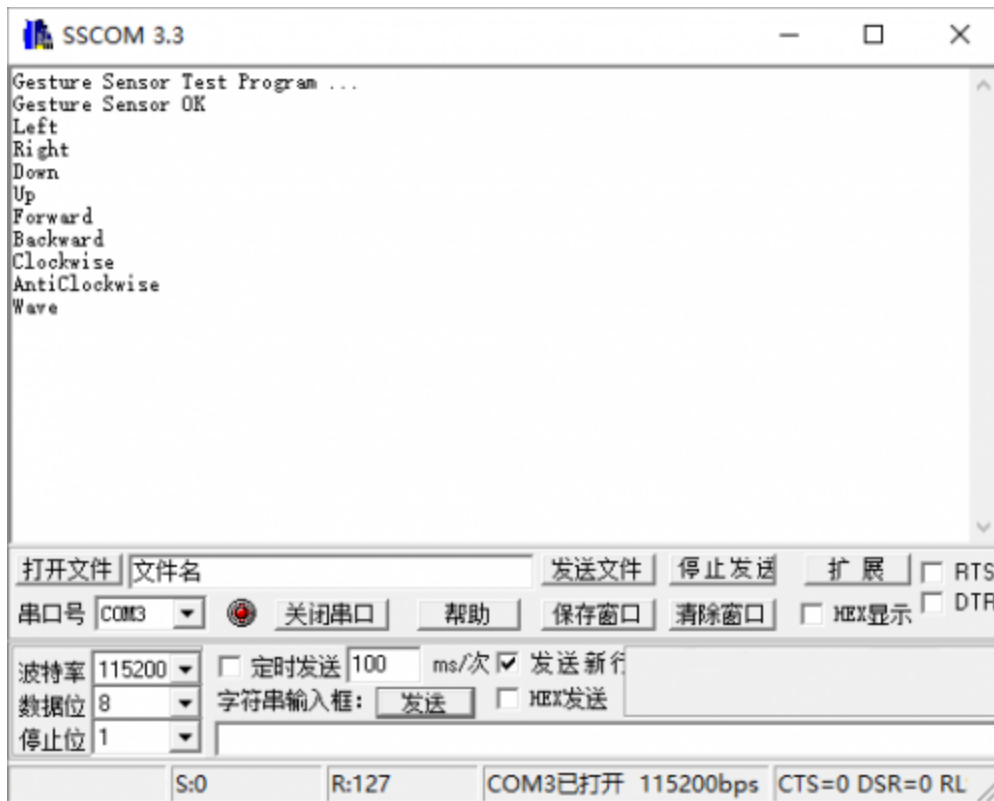
Gesture Sensor	STM32
VCC	3.3V/5V
GND	GND
SDA	PB9
SCL	PB8



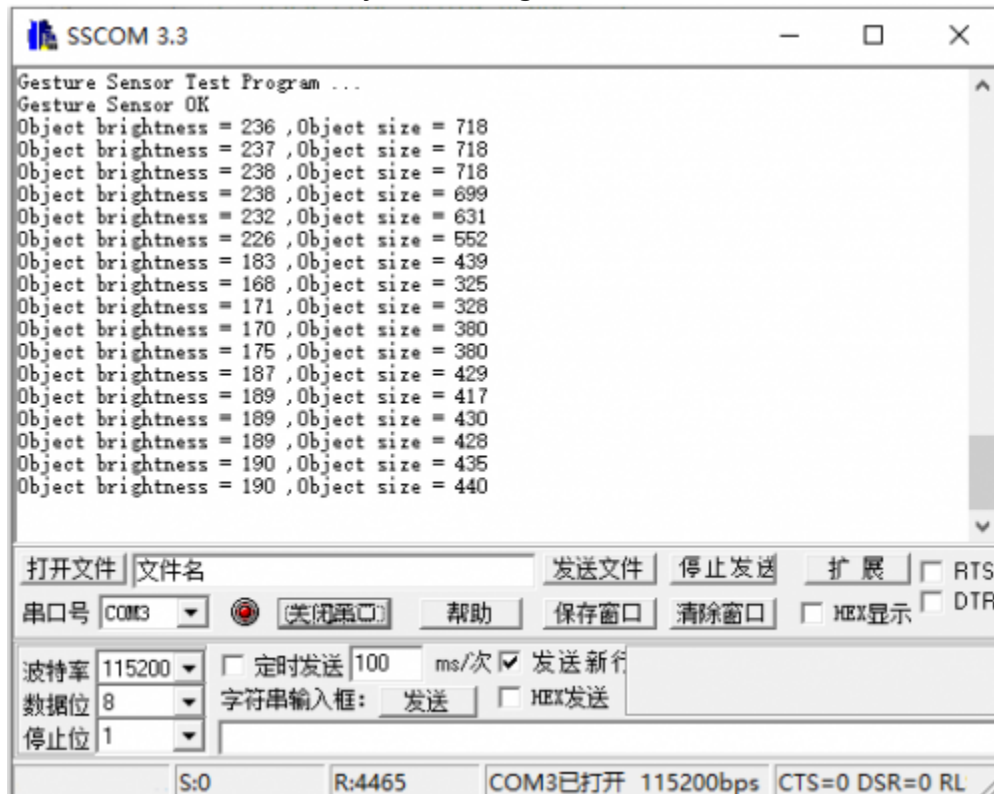
- Open the project (STM32 demo codes) with Keil software
- Compile it and program to board

Expectre result

- Run serial assistance software, set bard rate to 115200
- Gesture Detecting:



- Object detecting:

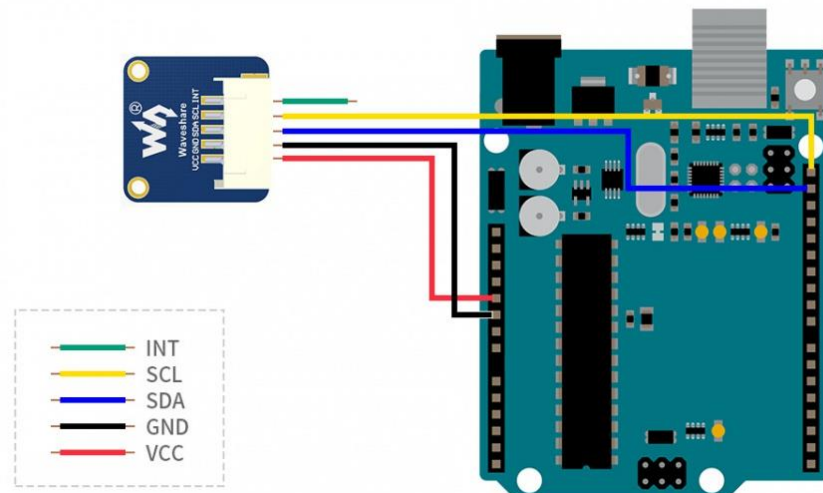


Arduino

The demo codes provide is based on the Arduino UNO

Hardware connection

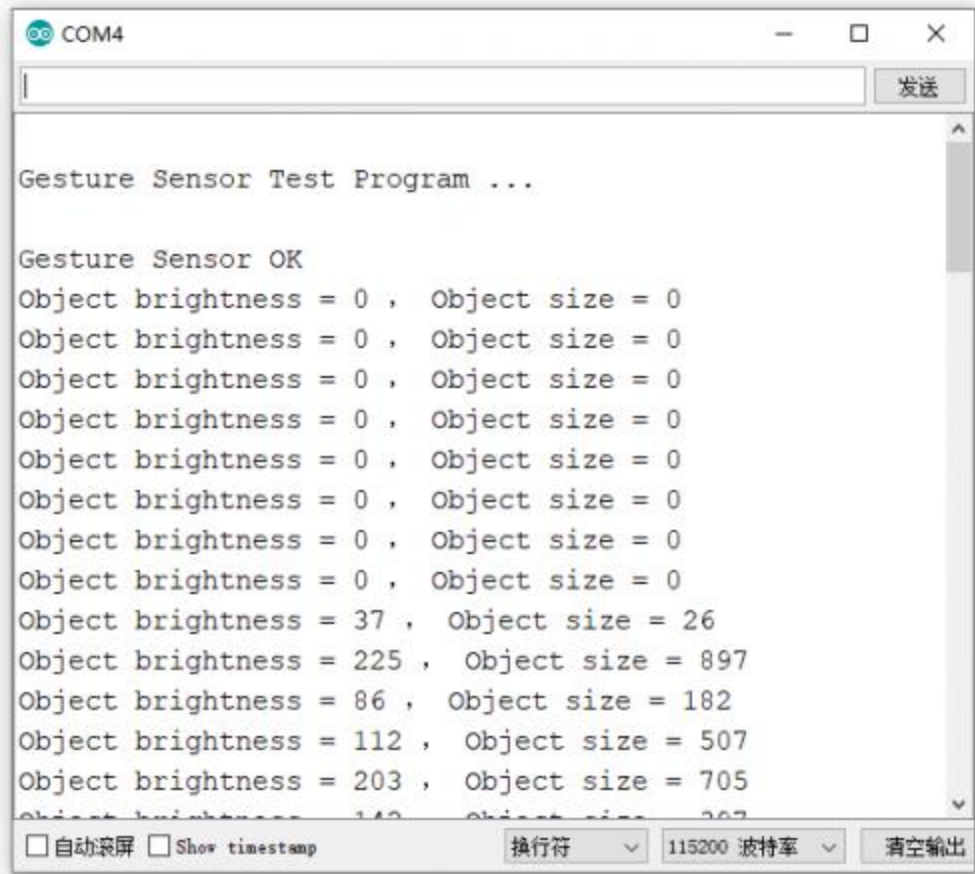
Gesture Sensor	Arduino
VCC	5V
GND	GND
SDA	SDA
SCL	SCL



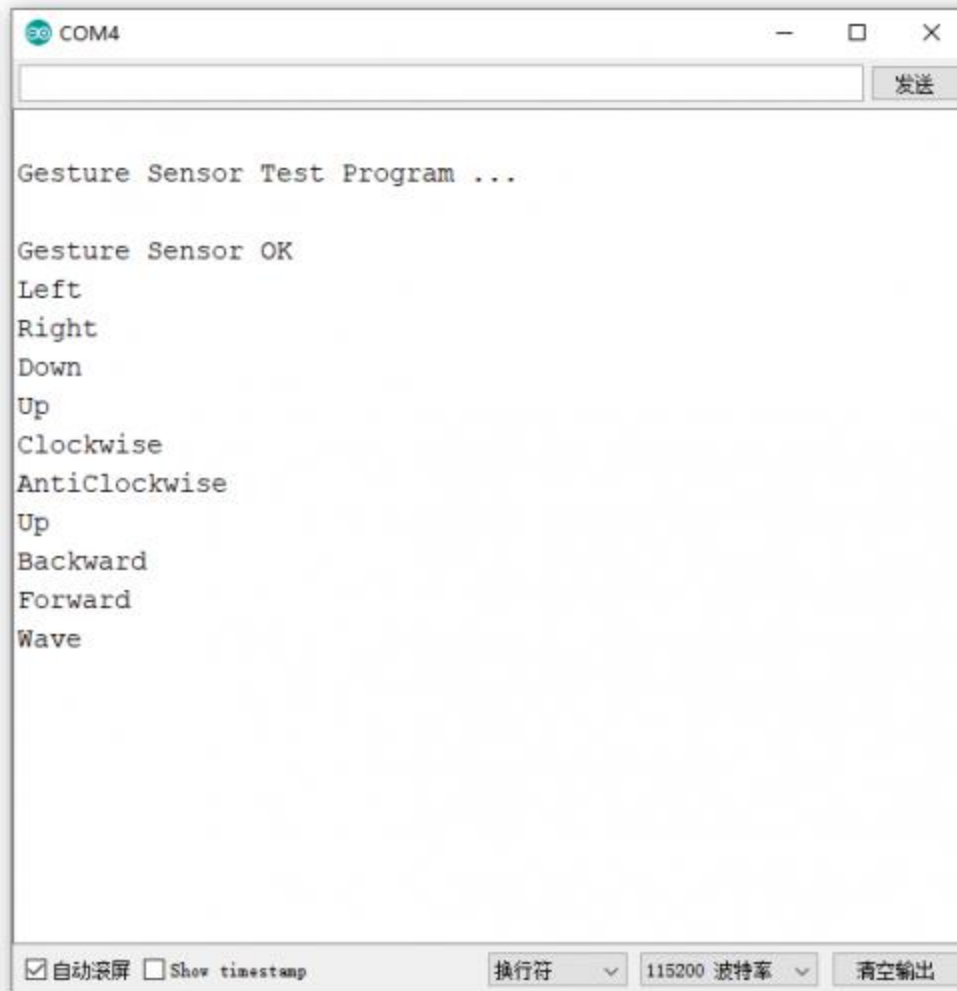
- Open the codes by Arduino IDE
- Compile and upload to Arduino Board

Expected result

- Gesture detecting



- Object detecting



Resources

- [Schematic](#)
- [Demo Code](#)
- [Datasheets](#)