1. Learning target

In this course, we will earn how to use Raspberry Pi and laser ranging module to achieve ranging.

2. Preparation

2.1 The laser ranging module uses I2C communication, and connect the SDA and SCL of the module to the SDA and SCL pins of the Raspberry Pi board. VCC and GND are respectively connected to 5V and GND of the Raspberry Pi.

!Tip: Raspberry Pi needs to enable I2C service.

Raspberry Pi GPIO Header + PoE Header

Pin#	NAME		NAME	Pin#
01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I²C)		DC Power 5v	04
05	GPIO03 (SCL1 , I²C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I²C ID EEPROM)		(I²C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40

01	TR01		TR00	02
03	TR03		TR02	04

2.2 After the Raspberry Pi I2C is enabled, input command **lmusb** in the terminal to check whether the I2C is successfully started.

```
videobuf2_dma_contig    20480  1 bcm2835_codec
videobuf2_vmalloc       16384  1 bcm2835_v4l2
videobuf2_memops        16384  2 videobuf2_dma_contig,videobuf2_vmal
videobuf2_v4l2          24576  3 bcm2835_codec,bcm2835_v4l2,v4l2_mem
videobuf2_common        45056  4 bcm2835_codec,bcm2835_v4l2,v4l2_mem
videodev               200704  6 bcm2835_codec,v4l2_common,videobuf2
media                   36864  2 videodev,v4l2_mem2mem
argon_mem               16384  0
uio_pdrv_genirq         16384  0
uio                     20480  1 uio_pdrv_genirq
fixed                   16384  0
i2c_dev                 16384  0
i2c_bcm2708             16384  0
snd_bcm2835             24576  2
snd_pcm                102400  1 snd_bcm2835
snd_timer               32768  1 snd_pcm
snd                     73728  7 snd_timer,snd_bcm2835,snd_pcm
ip_tables               24576  0
x_tables                32768  1 ip_tables
ipv6                   450560  26
pi@raspberrypi:~/speech $
```

2.3 Download i2c-tools, the software can monitor the usage and faults of hardware devices.
Input command: **sudo apt-get install i2c-tools**
Input command: **i2cdetect -y -a 1** in the terminal.
Check if there is an IIC device: 0x52 or 0x29

3. About code

3.1 Transfer this file into Raspberry Pi system

3.2 Input following command to enter VL53L0X folder.
cd VL53L0X
3.3 Input following command to compile this file.
make
3.4 Input following command to enter python folder.
cd python
3.5Input command to run program
python VL53L0X_example.py

4. Phenomenon

After the program is downloaded successfully, the program will be automatically initialized and calibrated according to the current environment.
Then, the module continuously tests and prints 100 test results through the serial port, the unit is mm and cm.