I2C 1602

Overview

In this chapter, we will learn a display screen, LCD1602.

Experimental Materials:

Raspberry Pi *1

T-type expansion board *1

Breadboard*1

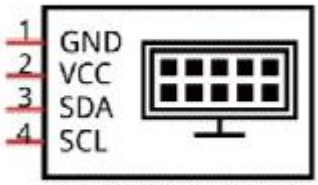
Some DuPont lines

I2C 1602 *1

Product description：

LCD1602 can display 2 lines of characters in 16 columns. It can display numbers, letters, symbols, ASCII code and so on.

I2C LCD1602 integrates a I2C interface, which connects the serial-input &parallel-output module to LCD1602. We just use 4 lines to the operate LCD1602 easily. The serial-to-parallel chip used in this module is PCF8574, and its default I2C address is 0x27(0x3F)



I2C LCD1602 Module

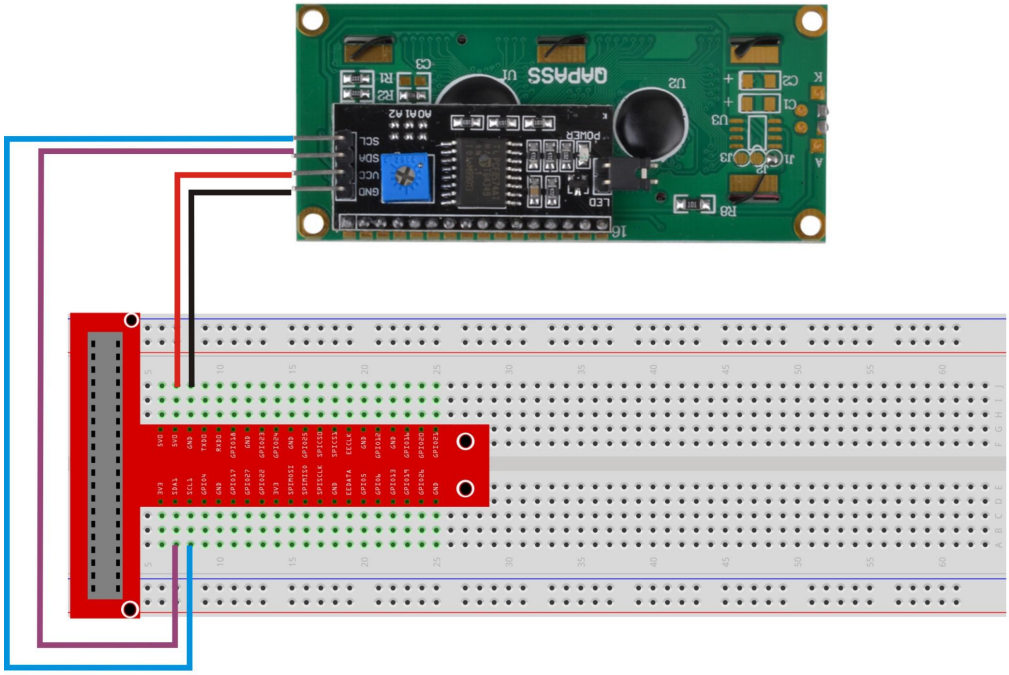
Technical Parameters:

Voltage: 3.3V or 5V

Display 2-lines X 16-characters

I2C Address: 0x27 or 0x3f

Wiring diagram：

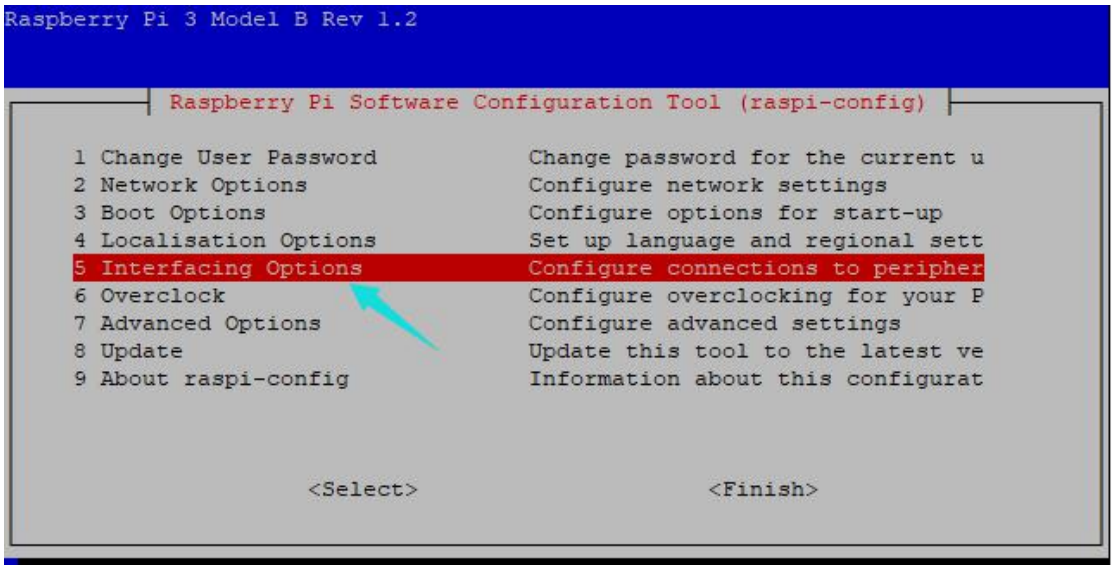


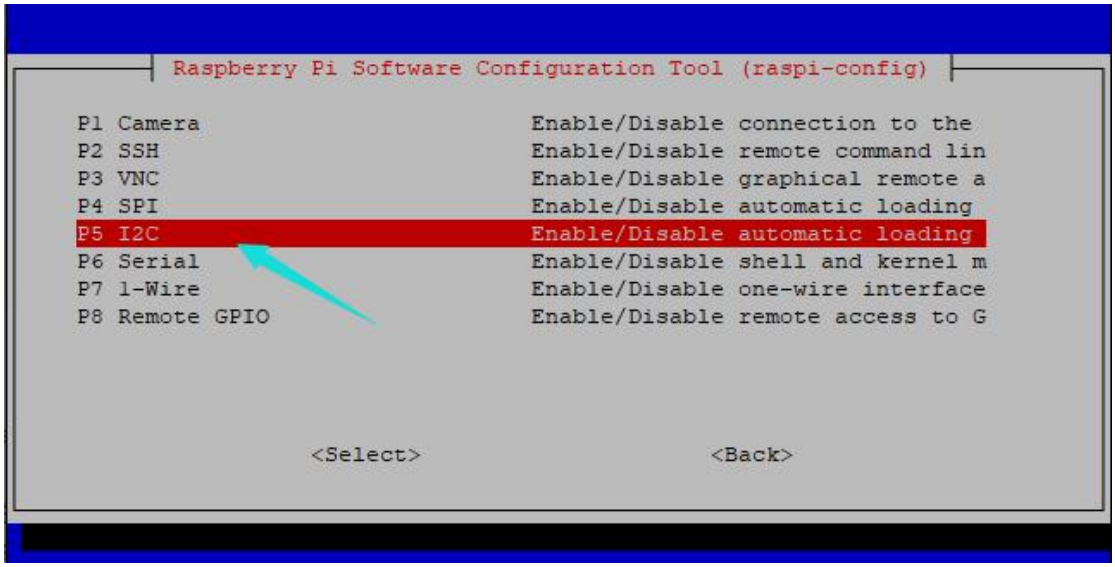
Step 1: Enable I2C

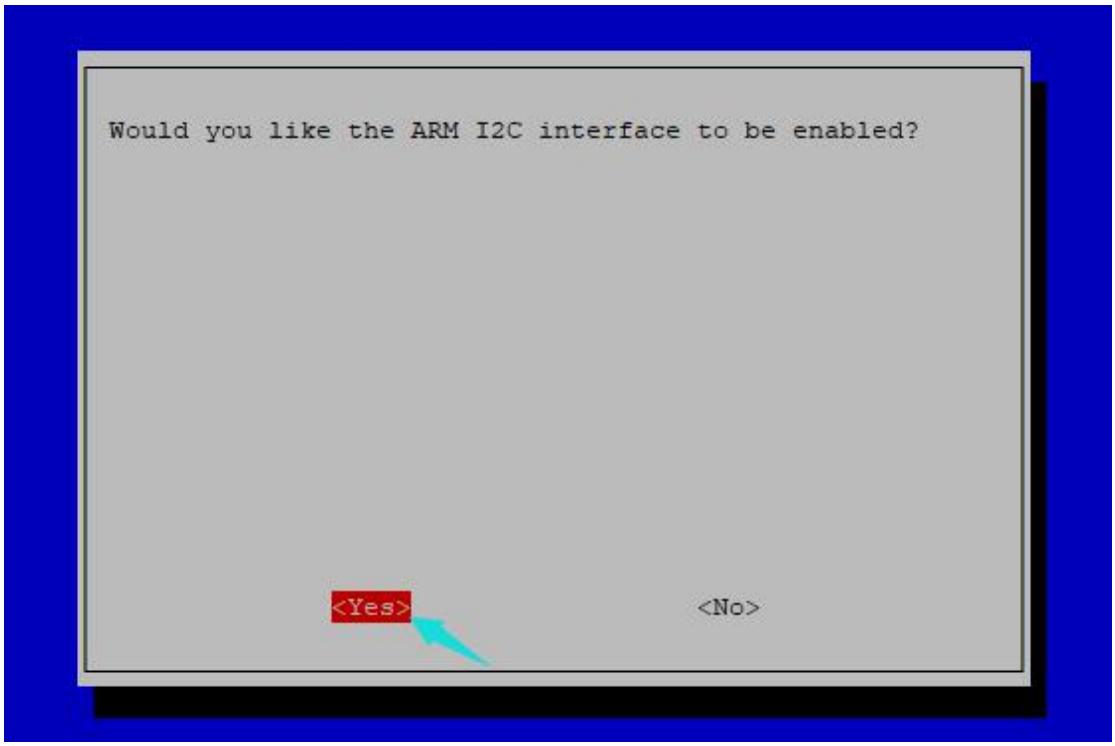
In terminal, type the following command:

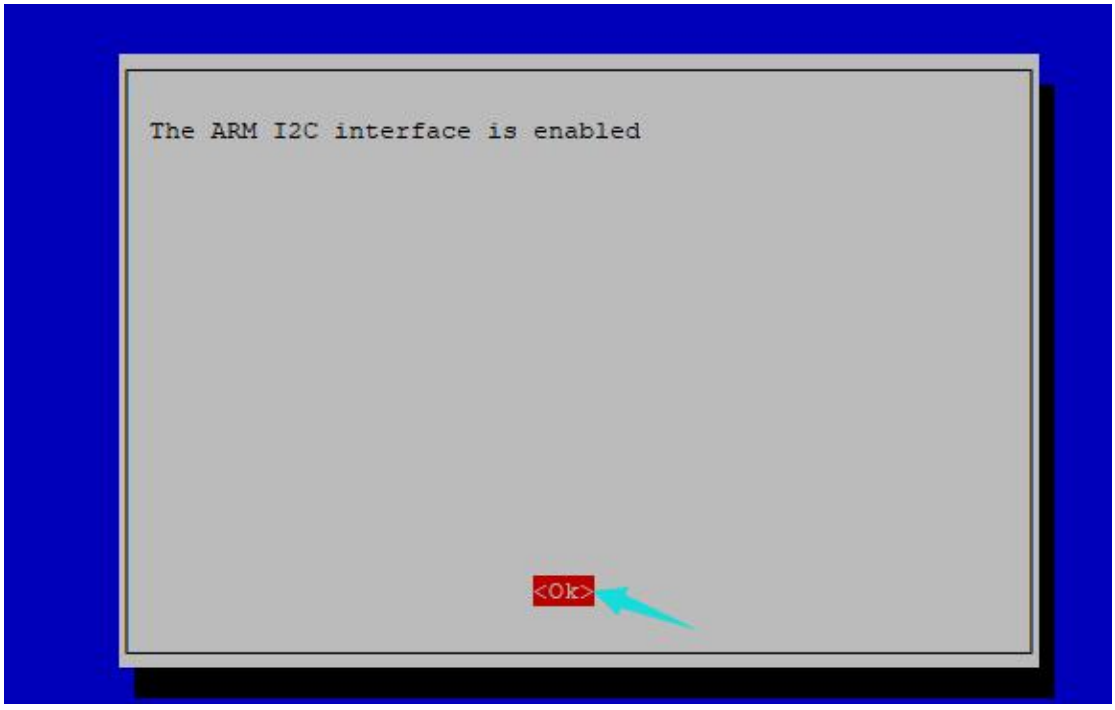
sudo raspi-config

Follow these steps to open I2C









Step 2：we need to modify the module’s config file. Type the following command in terminal:

```
sudo nano /etc/modules
```

Add following two lines in modules file if they do not exist:

```
i2c-bcm2708
i2c-dev
```

After the modification, press the key combination “ctrl+X”, then press Y, and finally press the Enter key.

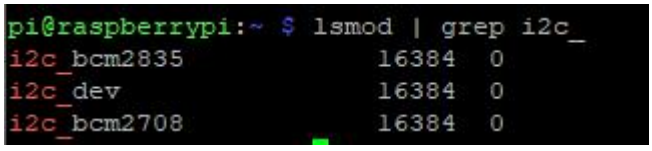
Step 3:Install smbus and i2c python library

```
sudo apt-get update
sudo apt-get install -y python-smbus i2c-tools
sudo reboot
```

After rebooting the system, type the following command in order to check software installation:

```
lsmod | grep i2c_
```

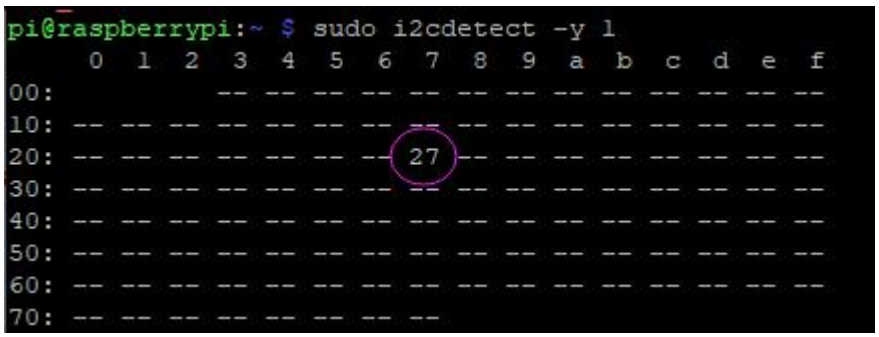
You should see i2c_bcm2708 in a list, this means the library has been installed successfully.



Step 4:Testing Hardware

Type the following command in terminal:

```
sudo i2cdetect -y 1
```



27 is the address of the I2C1602 I tested. The address of I2C1602 may be 3F. Please pay attention to this command.

Experimental results:

In the directory where the code file is located, execute the following command

C:

The address is 3F.

```
gcc -Wall -o I2CLCD1602A I2CLCD1602A.c -lwiringPi -lwiringPiDev
sudo ./I2CLCD1602A
```

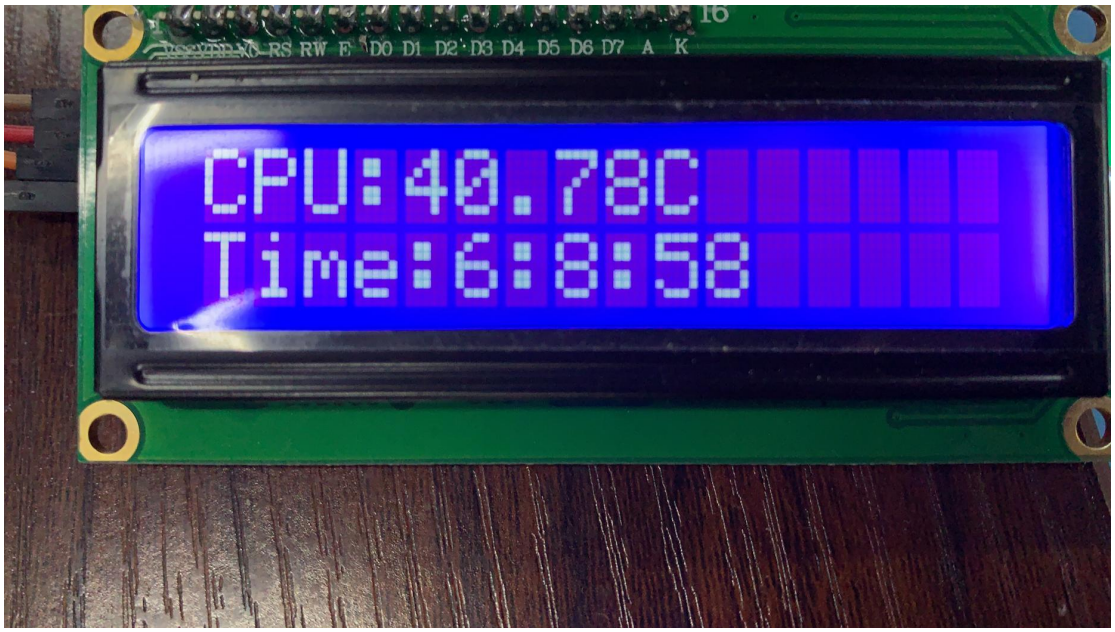
The address is 27.

```
gcc -Wall -o I2CLCD1602B I2CLCD1602B.c -lwiringPi -lwiringPiDev
sudo ./I2CLCD1602B
```

Python:

```
python I2CLCD1602.py
```

After the program is executed, LCD1602 screen will display current CPU temperature and system time. If there is no display or the display is not clear, adjust potentiometer of PCF8574 module to adjust the contrast of LCD1602 until the screen can display clearly.


RS RW E D0 D1 D2 D3 D4 D5 D6 D7 A K
CPU:40.78C
Time:6:8:58