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

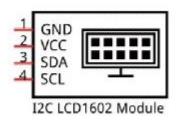
Product description:





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 ¶llel-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)



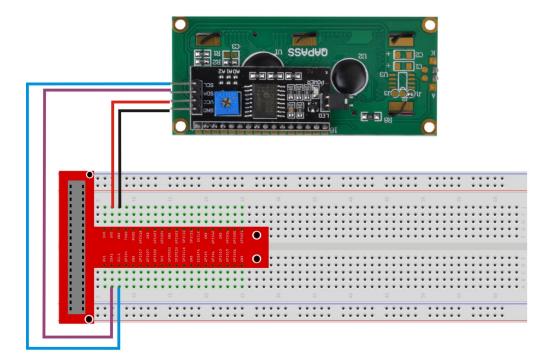
Technical Parameters:

Voltage: 3.3V or 5V

Display 2-lines X 16-characters

I2C Address: 0x27 or 0x3f

Wiring diagram:



Step 1: Enable I2C

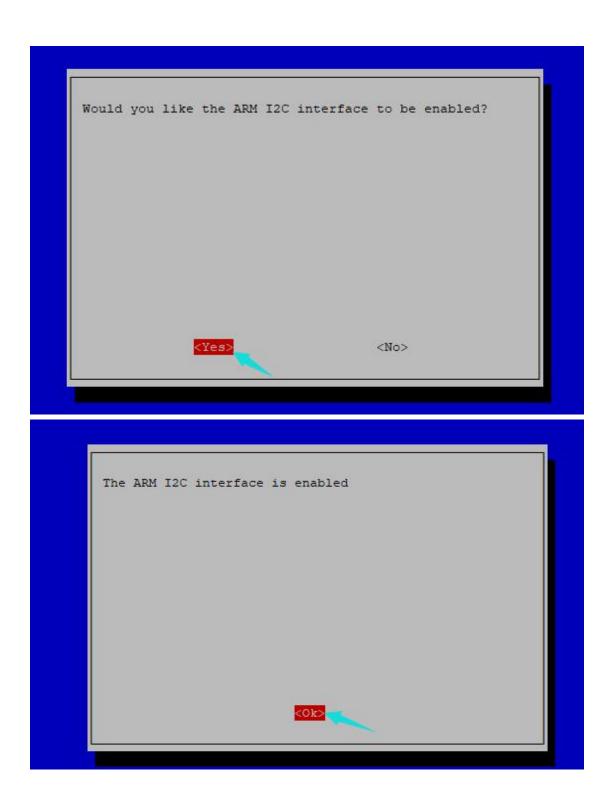
In terminal, type the following command:

sudo raspi-config

Follow these steps to open I2C

```
Raspberry Pi 3 Model B Rev 1.2
         Raspberry Pi Software Configuration Tool (raspi-config)
    1 Change User Password
                                    Change password for the current u
    2 Network Options
                                    Configure network settings
    3 Boot Options
                                    Configure options for start-up
    4 Localisation Options
                                   Set up language and regional sett
    5 Interfacing Options
                                  Configure connections to peripher
    6 Overclock
                                  Configure overclocking for your P
                                   Configure advanced settings
    7 Advanced Options
    8 Update
                                    Update this tool to the latest ve
    9 About raspi-config
                                    Information about this configurat
                     <Select>
                                                 <Finish>
```

```
Raspberry Pi Software Configuration Tool (raspi-config)
Pl Camera
                                Enable/Disable connection to the
P2 SSH
                                Enable/Disable remote command lin
P3 VNC
                                Enable/Disable graphical remote a
P4 SPI
                                Enable/Disable automatic loading
P5 I20
P6 Serial
                                Enable/Disable shell and kernel m
P7 1-Wire
                                Enable/Disable one-wire interface
P8 Remote GPIO
                                Enable/Disable remote access to G
                 <Select>
                                              <Back>
```



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:

```
1smod | 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.



