Serial LCD1602 module dynamic display screen experiment

LCD1602 introduction

LCD1602 is a character LCD module for displaying letters, Numbers and symbols. It is widely used in industries such as electronic clocks and temperature displays. Most character LCDS on the market are based on HD44780 character LCD chips, with the same control principle. "1602" means 2 lines and 16 characters per line. The LCD1602 Display, with a transfer board, USES an IIC interface and saves a lot of I/O ports. The 1602 liquid Crystal Display (1602Liquid Crystal Display, thereafter referred to as 1602 LCD) is a common character liquid Crystal Display, so named because it can Display 16*2 characters. Normally we use a 1602LCD with a font chip integrated in it. Through the API provided by LiquidCrystal, we can easily display English letters and symbols using 1602LCD. Before we can use the 1602 LCD, we need to connect it to the Arduino.

In the package, we use the IIC LCD1602 module to integrate the IIC I/O extension chip PCA8574, making the use of the LCD1602 easier. Through the IIC bus of two-wire system (serial clock line SCL, serial data line SDA), Arduino can realize the purpose of controlling LCD 1602 display. It not only simplifies the circuit, but also saves the I/O port, so that Arduino can realize more functions. The potentiometer on the module can also adjust the contrast of the LCD display. You can also set the address: 0x20-0x27 by setting the jumper. Make Arduino can control several LCD 1602.

A blue potentiometer can be seen on the back of the module, which can be rotated to adjust the contrast of the 1602 LCD. The wiring pins on the back are GND, VCC, SDA, SCL (SDA and SCL are respectively iic communication data line and clock line) LCD1602 physical diagram:

The experimental principle

Through Arduino UNO R3 main control board and serial LCD1602 LCD screen, I2C communication is used to control LCD1602 LCD screen to display characters.

The experiment purpose

Arduino UNO R3 main control board controls LCD1602 LCD to display characters.

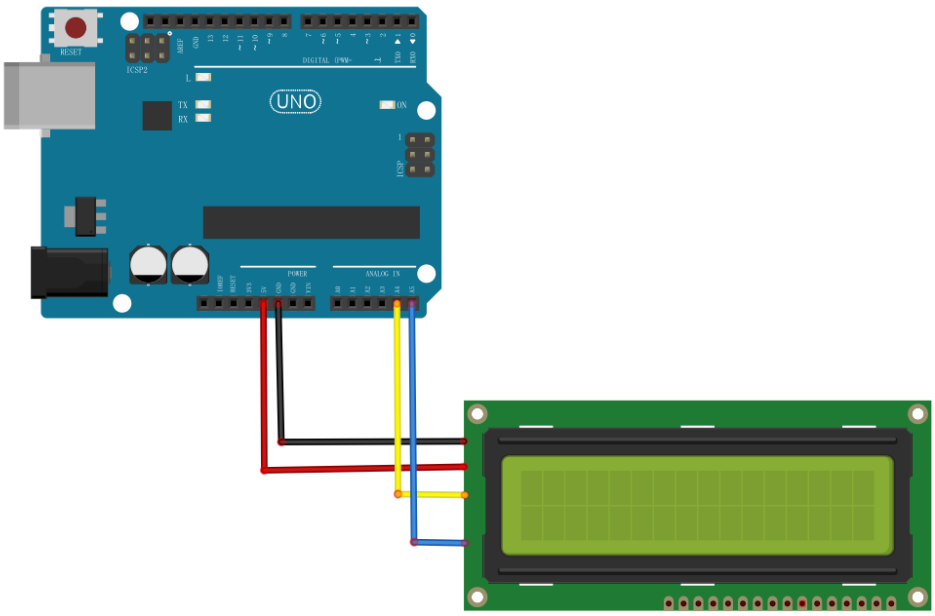
The component list

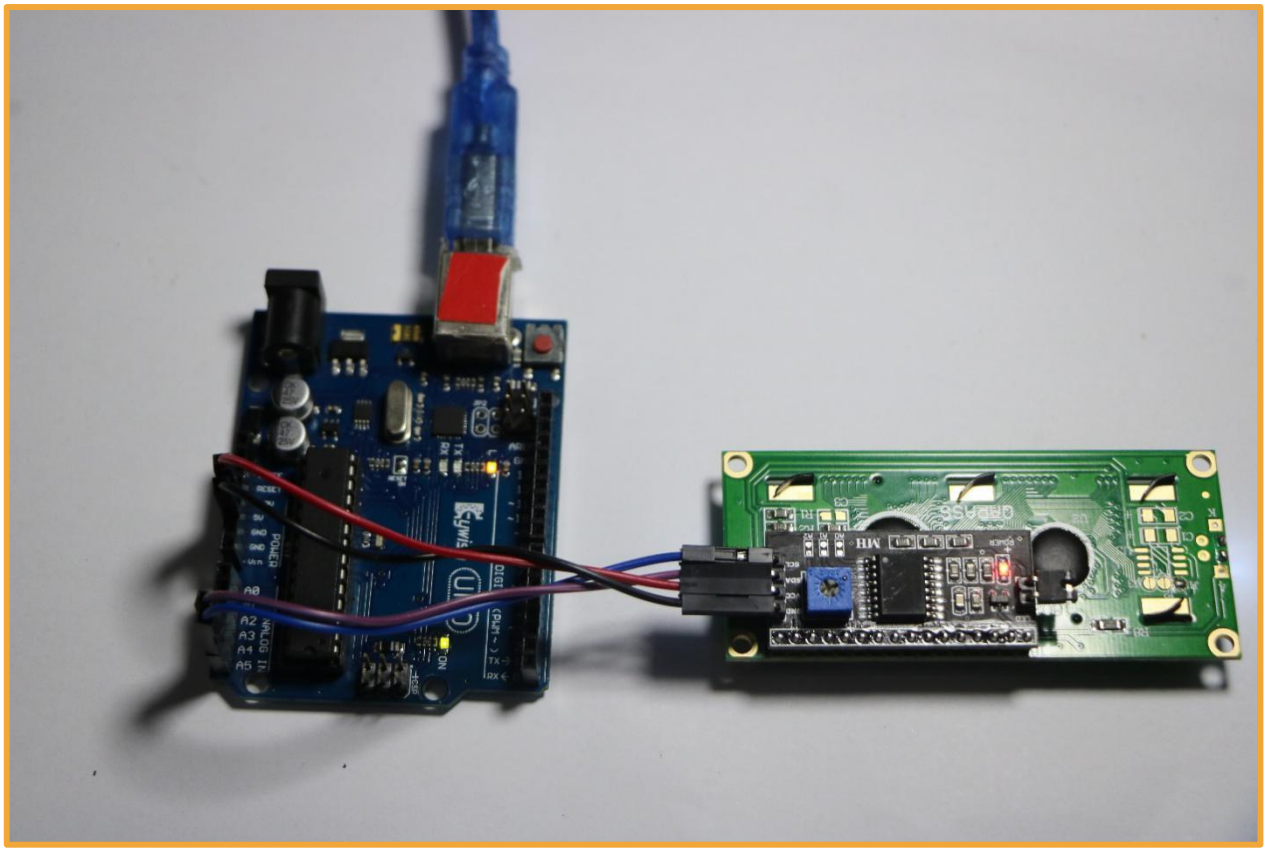
- Arduino Uno R3 motherboards
- Breadboard
- USB cable
- LCD1602 display with switchboard
- Jumper wires

Wiring the circuit

First, the adapter board is welded to the LCD display

LCD1602	**Arduino**
GND	GND
VCC	5V
SDA	A4
SCL	A5


UNO

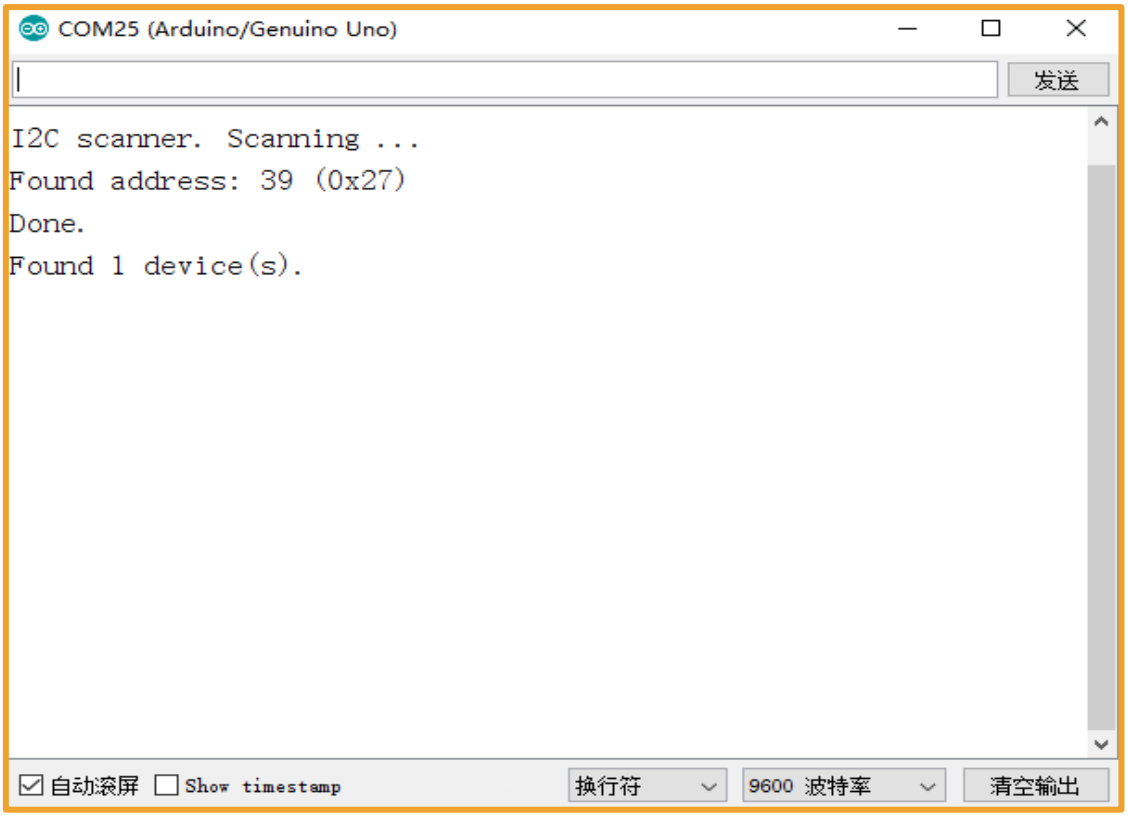


Code

Scan the I2C address

Copy the following code to the Arduino IDE and execute.Then select the tool -> serial port monitor, change the baud rate in the lower right corner to 9600, you can read the I2C address, the procedure is as follows, many I2C switchboard default address is 0x27, but in order to be able to confirm their own I2C switchboard address, it is best to scan yourself, in order to prevent the following experiments wrong.

```
#include <Wire.h>
void setup() {
    Serial.begin (9600); // Leonardo: wait for serial port to connect
    while (!Serial) { }
    Serial.println ();
    Serial.println ("I2C scanner. Scanning ...");
    byte count = 0;
    Wire.begin();
    for (byte i = 8; i < 120; i++) {
        Wire.beginTransmission (i);
        if (Wire.endTransmission () == 0) {
          Serial.print ("Found address: ");
          Serial.print (i, DEC);
          Serial.print (" (0x");
          Serial.print (i, HEX);
          Serial.println (")");
          count++;
          delay (1); // maybe unneeded?
        } // end of good response
    } // end of for loop
    Serial.println ("Done.");
    Serial.print ("Found ");
    Serial.print (count, DEC);
    Serial.println (" device(s).");
} // end of setup
void loop() {}
```

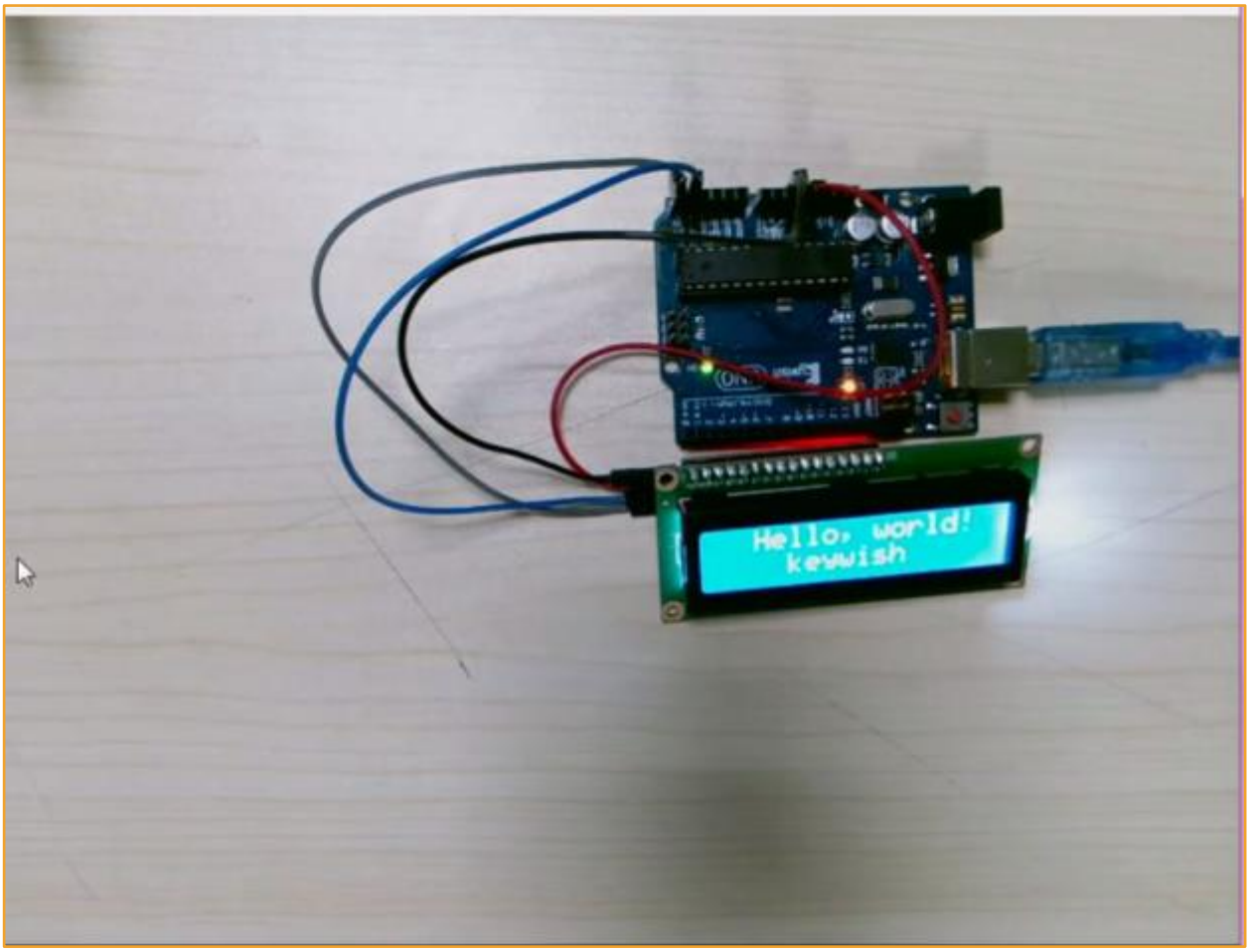


I2C address scanned by serial port monitor is 0x27

Burn display character program

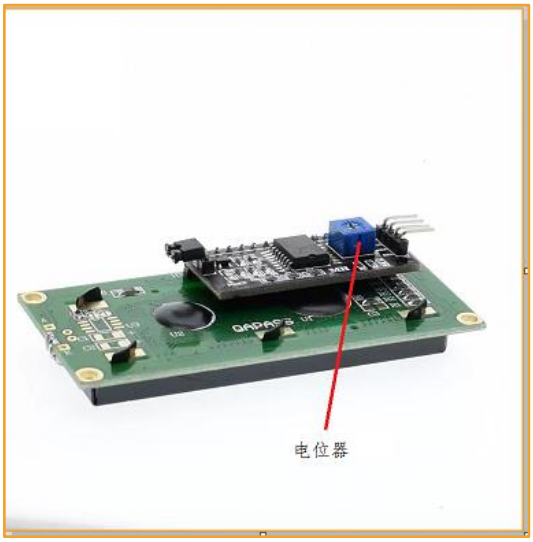
```
#include <Wire.h>
#include "LiquidCrystal_I2C.h"

LiquidCrystal_I2C lcd(0x27,16,2);  // set the LCD address to 0x27 for a 16 chars and 2 line display

void setup()
{
    lcd.init();                    // initialize the lcd
    // Print a message to the LCD.
    lcd.backlight();
    lcd.setCursor(2,0); // go to start of 2nd line
    lcd.print("Hello, world!");
    lcd.setCursor(4,1); // go to start of 2nd line
    lcd.print("keywish");
}

void loop()
{
}
```

Experiment Result



LCD1602 dispaly common problems and solutions

1 If you have a problem with the background light coming on after you upload the program, but it doesn't show characters, try adjusting the potentiometer behind the adapter board to adjust the brightness and display.



If the background light is on after uploading the program, but only some characters are displayed, this is caused by the different versions of the chips used. Some chips are PCF8574 chips, while others are PCF8574AT chips, so the interface address is different. The default address of PCF8574 is 0x27.

Mblock programming program

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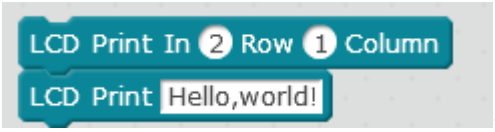
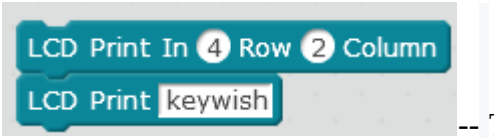
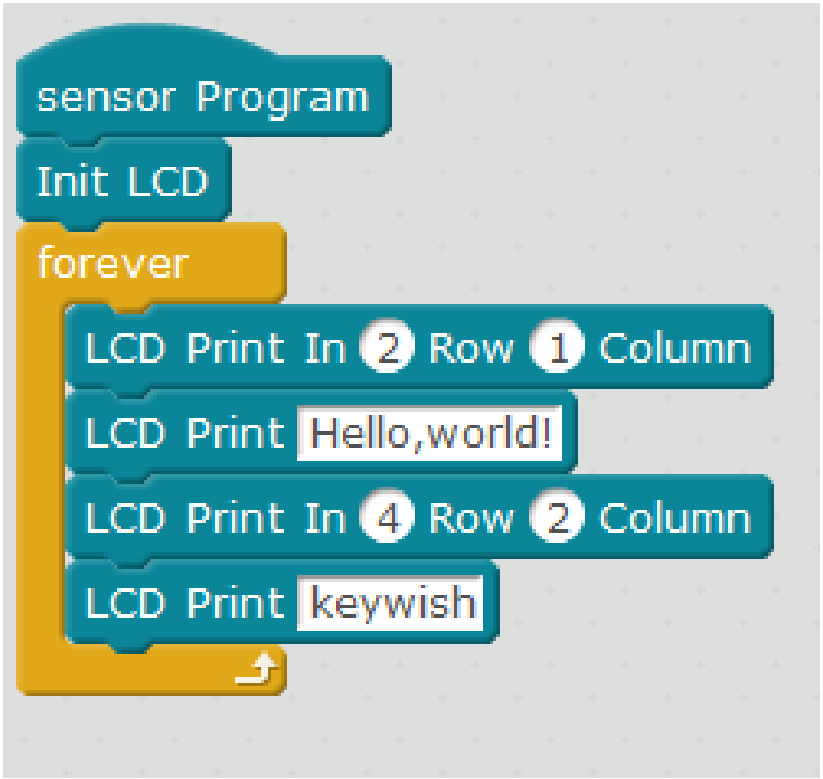
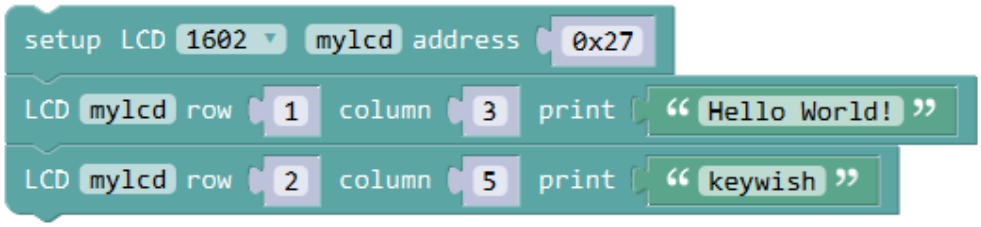
--Initialize the LCD1602 display pin
- 

-- In the first column of the first row on the LCD display the character Hello, world!;
- 

-- The second row and third column displays the keywish on the LCD screen;



Mixly graphical programming program



MagicBlock graphical programming program