LCD1602 introduction

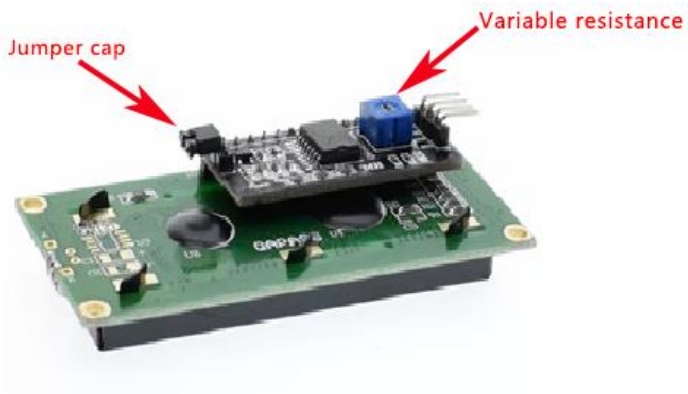
LCD1602 is a character LCD module designed to display letters, Numbers, and symbols.It is widely used in industries such as electronic clocks and temperature displays.The character LCD on the market is mostly based on HD44780 character LCD chip, the control principle is exactly the same."1602" means 2 lines and 16 characters per line.The LCD1602 Display, which USES an IIC interface and saves a lot of I/O ports, is a common character liquid Crystal Display (1602Liquid Crystal Display (hereinafter referred to as 1602 LCD), named for its ability to Display 16*2 characters.The 1602LCD we normally use has a font chip integrated in it. Using the API provided by LiquidCrystal class library, we can easily use 1602LCD to display letters and symbols.Before using the 1602 LCD, we need to connect it to the Arduino.

n the package, we use the IIC LCD1602 module to integrate the IIC I/O extension chip PCA8574, making the use of LCD1602 easier.Through a two wire IIC bus (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 contrast of LCD display can be adjusted by potentiometer on module.You can also set the address: 0x20-0x27 by setting the jumper.Enable Arduino to control multiple 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 behind are GND, VCC, SDA, SCL (data line and clock line of iic communication respectively for SDA and SCL) and physical diagram of LCD1602:

Note: If the LCD light is too dim, you can adjust the blue variable resistor on the back of the LCD

(Note: Connect the jumper cap on the back)



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

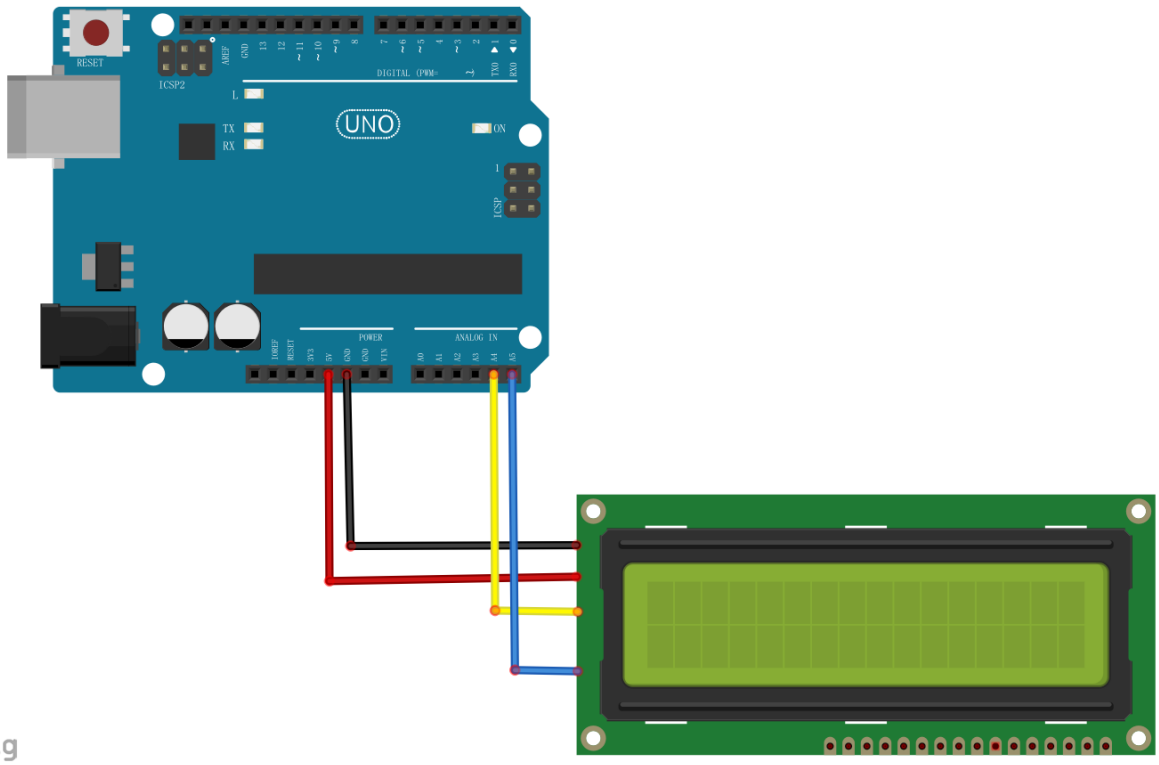
Arduino UNO R3 main control board controls LCD1602 LCD to display characters.

The component list

- Arduino Uno R3 motherboards
- Bread plate
- USB cable
- LCD1602 display with switchboard
- A number of jumpers

Wiring

LCD1602	Arduino
GND	GND
VCC	5V
SDA	A4
SCL	A5

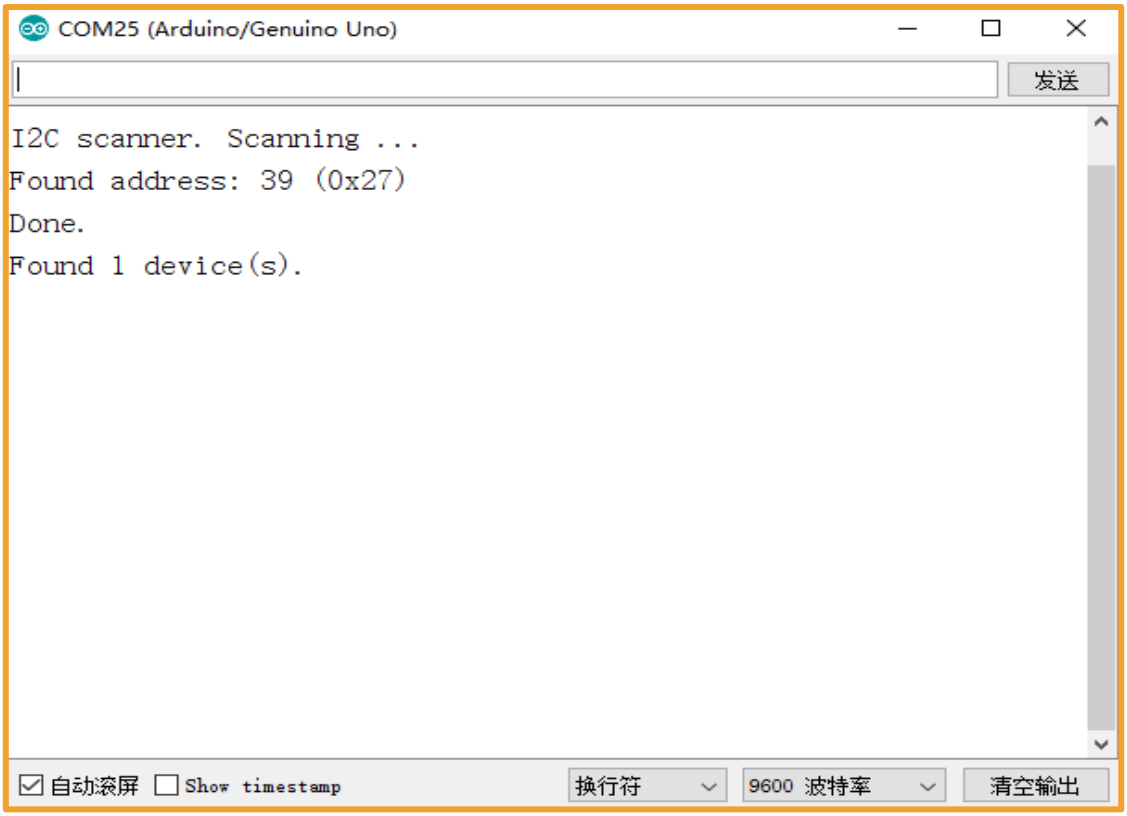


Code

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() {}
```



Burn display character program

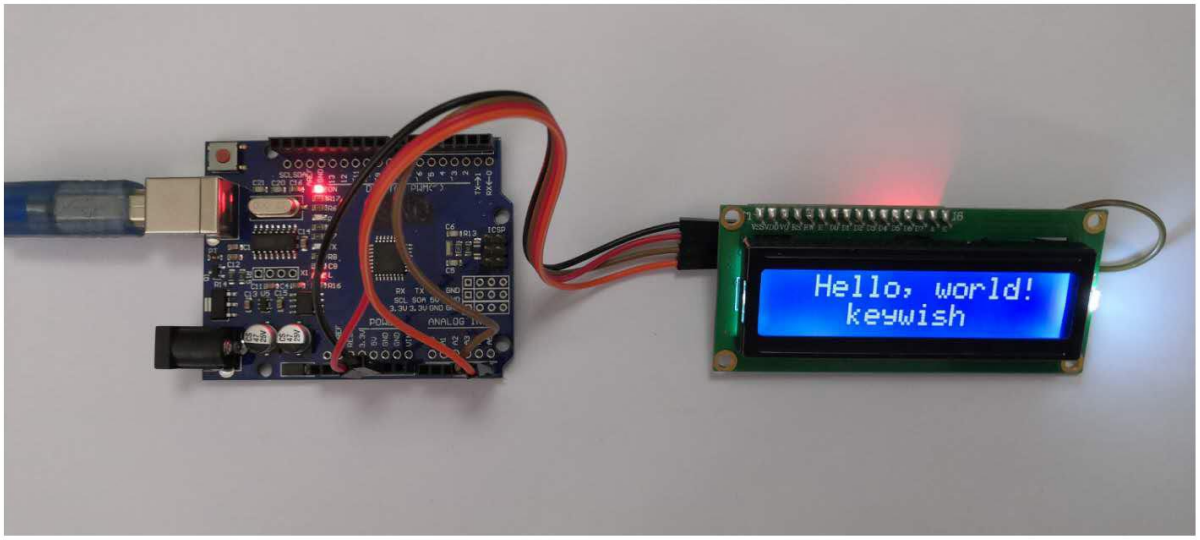
```
#include <Wire.h>
#include "LiquidCrystal_I2C.h"

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



Mlock programming program

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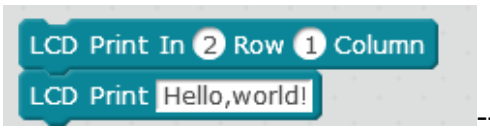
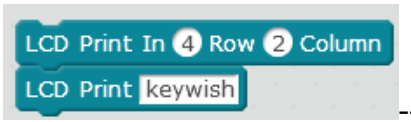
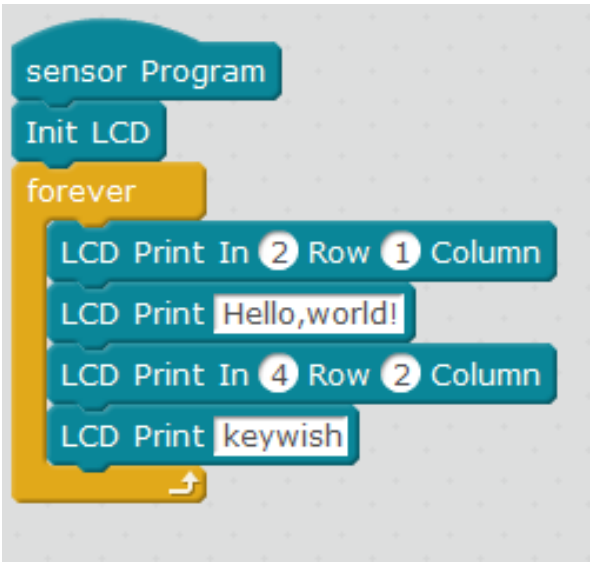
--Initialize the LCD1602 display pin
- 

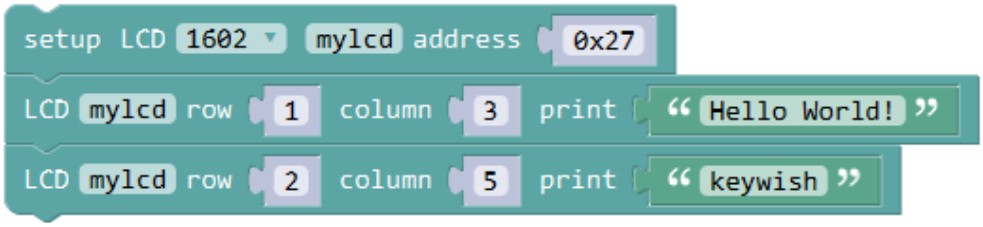
-- In the first column of the first row on the LCD display the character Hello, world!;

- 

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



Mixly graphical programming



MagicBlock graphical programming program

MagicBlock writes a serial LCD dynamic display experiment program as shown in the figure below: