AA012　LCD1602 Yellow Green Backlight

Product Description

This is a dot matrix LCD module that can be used exclusively for displaying letters, numeric elements, symbols, etc. It can display 2 lines, 16 characters per line, and the LCD screen displays black characters on a yellow background. When used, it is divided into 4-bit and 8-bit two kinds of data transmission mode. The module provides internal power-on automatic reset circuit, when the external power supply voltage exceeds +4.5V, it will automatically initialise the module and set the module to the default display working state.

Product Parameters

Logic Operating Voltage (Vdd): DC +4.8 ~ +5.2V

LCD Drive Voltage (Vdd-Vo): DC +3.0 ~ +5.0V

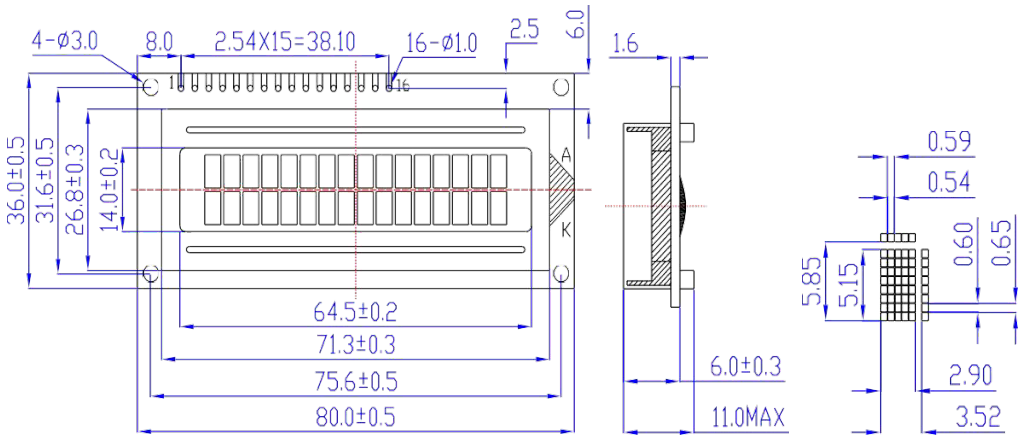
Operating Temperature: -20 ~ +70° C (Wide Temperature)

Storage Temperature: -30 ~ + 80℃ (Wide Temperature)

Operating current (except backlight):1.7mA(max)

Operating Current (Backlight):24.0mA(max)

Display colour: black characters on yellow background

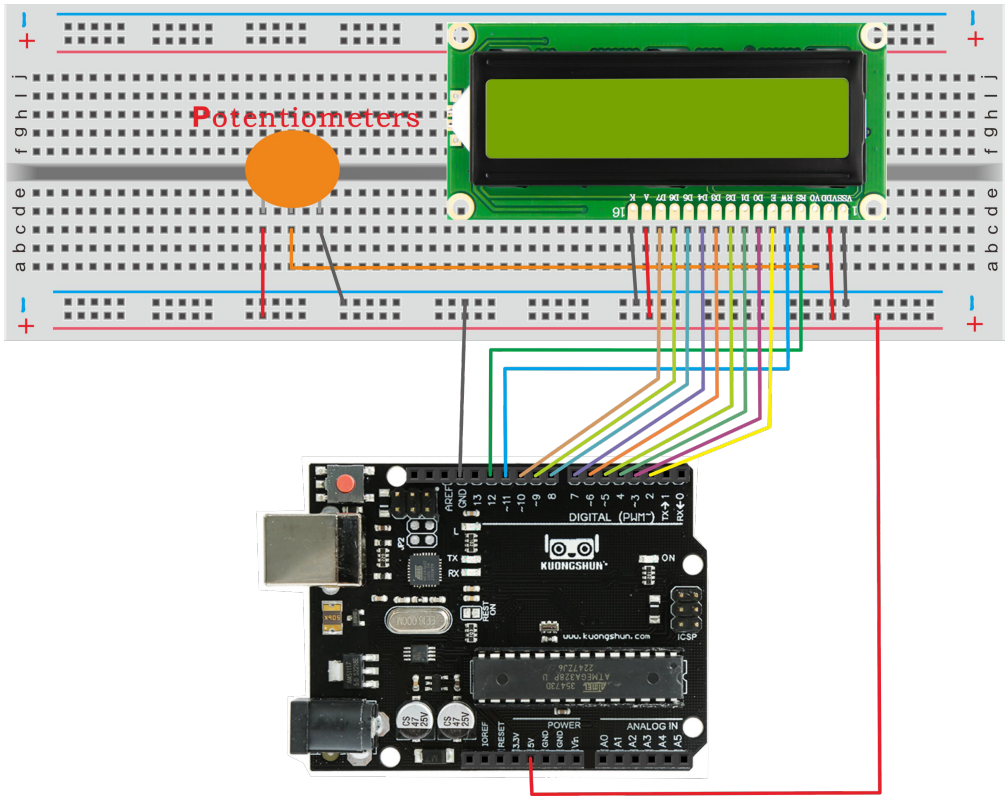


Pin Description

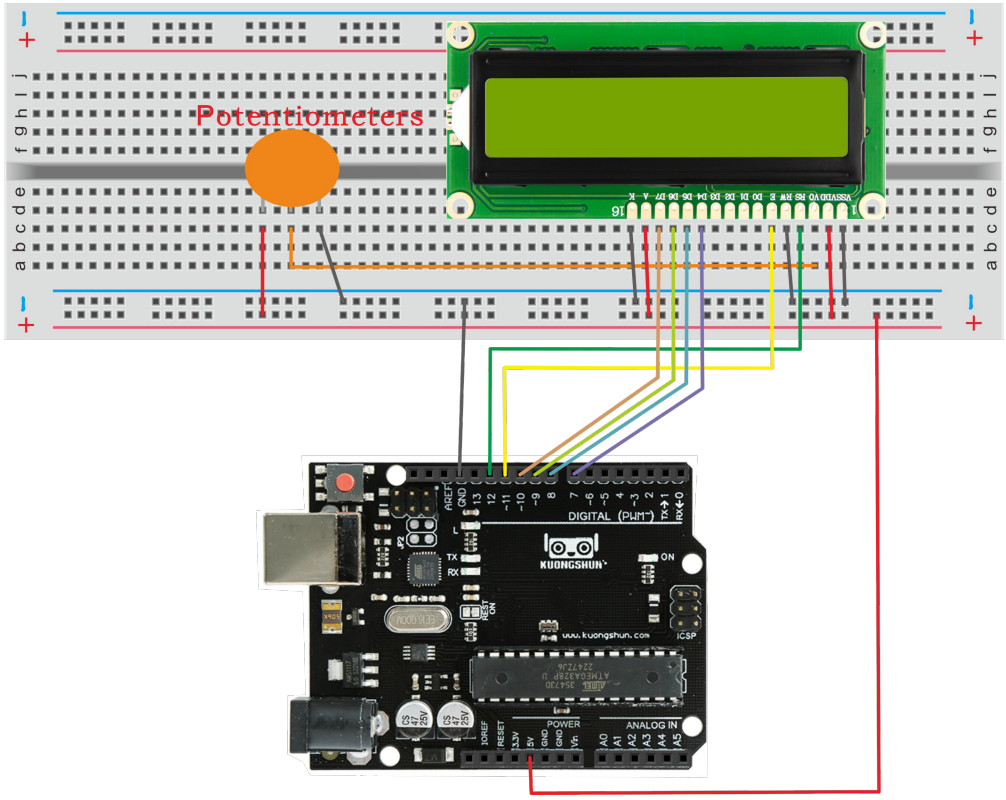
Pin NO.	Symbol	I/O	Description
1	GND	- -	Power GND(0V)
2	VDD	- -	Power positive(5V)
3	V0	- -	LCD voltage bias signal
4	RS	I	Select data/command(V/L)
5	RW	I	Select read/write(H/L)
6	E	I	Enable signal
7	DB0	I/O	Date 0
8	DB1	I/O	Date 1
9	DB2	I/O	Date 2
10	DB3	I/O	Date 3
11	DB4	I/O	Date 4
12	DB5	I/O	Date 5
13	DB6	I/O	Date 6
14	DB7	I/O	Date 7
15	BL1	- -	Back light power positive (5V)
16	BL2	- -	Back light power negative(0V)

Connection Diagram

Eight-bit Connection Method



Four-bit Connection Method



Sample Code

Eight-bit Connection Code

```
/*
```

```
https://www.kuongshun-ks.com/
*/
int DI = 12;
int RW = 11;
int DB[] = {3, 4, 5, 6, 7, 8, 9, 10};// use array to select pin for bus
int Enable = 2;

void LcdCommandWrite(int value) {
// define all pins
int i = 0;
for (i=DB[0]; i <= DI; i++) // assign value for bus
{
    digitalWrite(i,value & 01);// for 1602 LCD, it uses D7-D0( not D0-D7) for signal identification; here, it'
s used for signal inversion.
    value >>= 1;
}
digitalWrite(Enable,LOW);
delayMicroseconds(1);
digitalWrite(Enable,HIGH);
delayMicroseconds(1);    // wait for 1ms
digitalWrite(Enable,LOW);
delayMicroseconds(1);    // wait for 1ms
}

void LcdDataWrite(int value) {
// initialize all pins
int i = 0;
digitalWrite(DI, HIGH);
digitalWrite(RW, LOW);
for (i=DB[0]; i <= DB[7]; i++) {
    digitalWrite(i,value & 01);
    value >>= 1;
}
digitalWrite(Enable,LOW);
delayMicroseconds(1);
digitalWrite(Enable,HIGH);
delayMicroseconds(1);
digitalWrite(Enable,LOW);
delayMicroseconds(1);    // wait for 1ms
}

void setup (void) {
int i = 0;
for (i=Enable; i <= DI; i++) {
```

```
    pinMode(i,OUTPUT);
}
delay(100);
// initialize LCD after a brief pause
// for LCD control
LcdCommandWrite(0x38);    // select as 8-bit interface, 2-line display, 5x7 character size
delay(64);
LcdCommandWrite(0x38);    // select as 8-bit interface, 2-line display, 5x7 character size
delay(50);
LcdCommandWrite(0x38);    // select as 8-bit interface, 2-line display, 5x7 character size
delay(20);
LcdCommandWrite(0x06);    // set input mode
                          // auto-increment, no display of shifting
delay(20);
LcdCommandWrite(0x0E);    // display setup
                          // turn on the monitor, cursor on, no flickering
delay(20);
LcdCommandWrite(0x01);    // clear the scree, cursor position returns to 0
delay(100);
LcdCommandWrite(0x80);    //    display setup
                          //    turn on the monitor, cursor on, no flickering

delay(20);
}

void loop (void) {
   LcdCommandWrite(0x01);    // clear the scree, cursor position returns to 0
   delay(10);
   LcdCommandWrite(0x80);
   delay(10);
   // write in welcome message
   LcdDataWrite('h');
   LcdDataWrite('t');
   LcdDataWrite('t');
   LcdDataWrite('p');
   LcdDataWrite(':');
   LcdDataWrite('/');
   LcdDataWrite('/');
   LcdDataWrite('w');
   LcdDataWrite('w');
   LcdDataWrite('w');
   LcdDataWrite('.');
   LcdDataWrite('k');
   LcdDataWrite('u');
```

```
    LcdDataWrite('o');
    LcdDataWrite('n');
    LcdDataWrite('g');
    delay(10);
    LcdCommandWrite(0xc0);    // set cursor position at second line, second position
    delay(10);
    LcdDataWrite('s');
    LcdDataWrite('h');
    LcdDataWrite('u');
    LcdDataWrite('n');
    LcdDataWrite('-');
    LcdDataWrite('k');
    LcdDataWrite('s');
    LcdDataWrite('.');
    LcdDataWrite('c');
    LcdDataWrite('o');
    LcdDataWrite('m');
    LcdDataWrite('/');
    LcdDataWrite(' ');
    LcdDataWrite(' ');
    LcdDataWrite(' ');
    LcdDataWrite(' ');
    delay(5000);
    LcdCommandWrite(0x01);    // clear the screen, cursor returns to 0
    delay(10);
    LcdDataWrite('I');
    LcdDataWrite(' ');
    LcdDataWrite('a');
    LcdDataWrite('m');
    LcdDataWrite(' ');
    LcdDataWrite('h');
    LcdDataWrite('u');
    LcdDataWrite('n');
    LcdDataWrite('t');
    LcdDataWrite('e');
    LcdDataWrite('r');
    LcdDataWrite('!');
    delay(3000);
    LcdCommandWrite(0x02); // set mode as new characters replay old ones, where there is no new ones
remain the same
    delay(10);
    LcdCommandWrite(0x80+5); // set cursor position at first line, sixth position
    delay(10);
    LcdDataWrite('t');
```

```
  LcdDataWrite('h');
  LcdDataWrite('e');
  LcdDataWrite(' ');
  LcdDataWrite('w');
  LcdDataWrite('o');
  LcdDataWrite('r');
  LcdDataWrite('l');
  LcdDataWrite('d');
  LcdDataWrite('!');
  delay(5000);
}
```

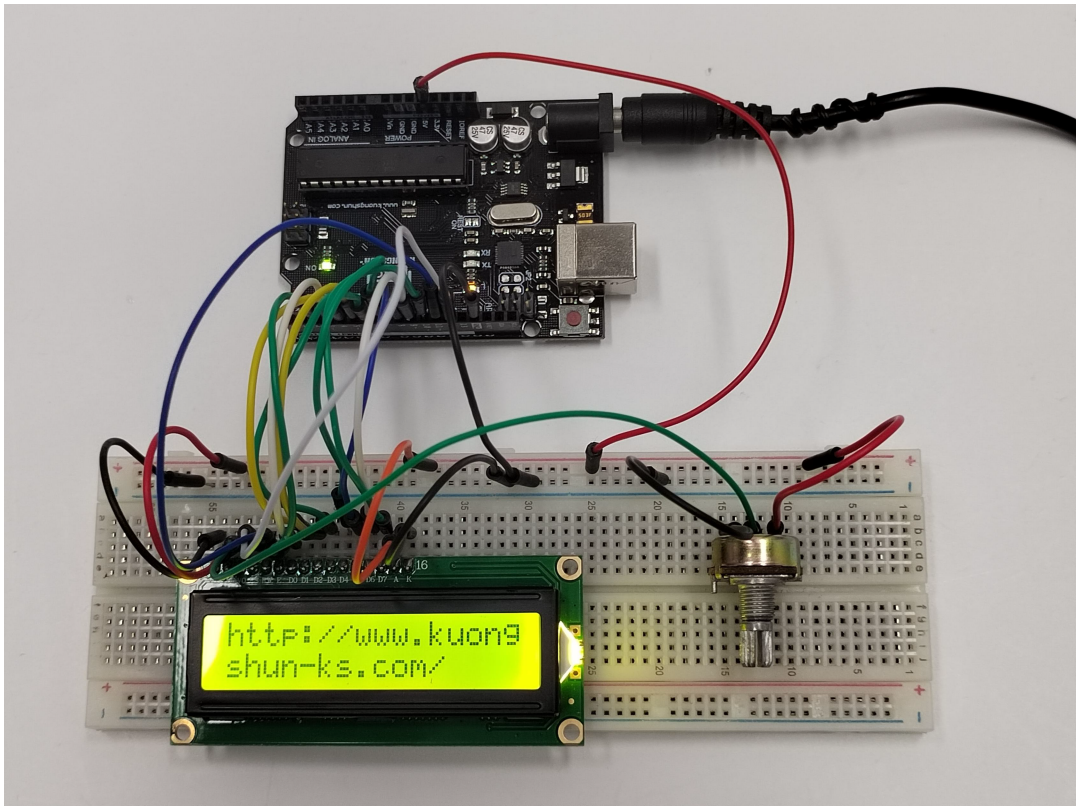
Four-bit Connection Code

```
/*
https://www.kuongshun-ks.com/
*/
#include <LiquidCrystal.h>
// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 7, 8, 9, 10);
void setup() {
  // set up the LCD's number of columns and rows
  lcd.begin(16, 2);
  // Print a message to the LCD.
 lcd.setCursor(0,0);
 lcd.print("http://www.kuong");
 lcd.setCursor(0,1);
 lcd.print("shun-ks.com/");}
void loop() {
}
```

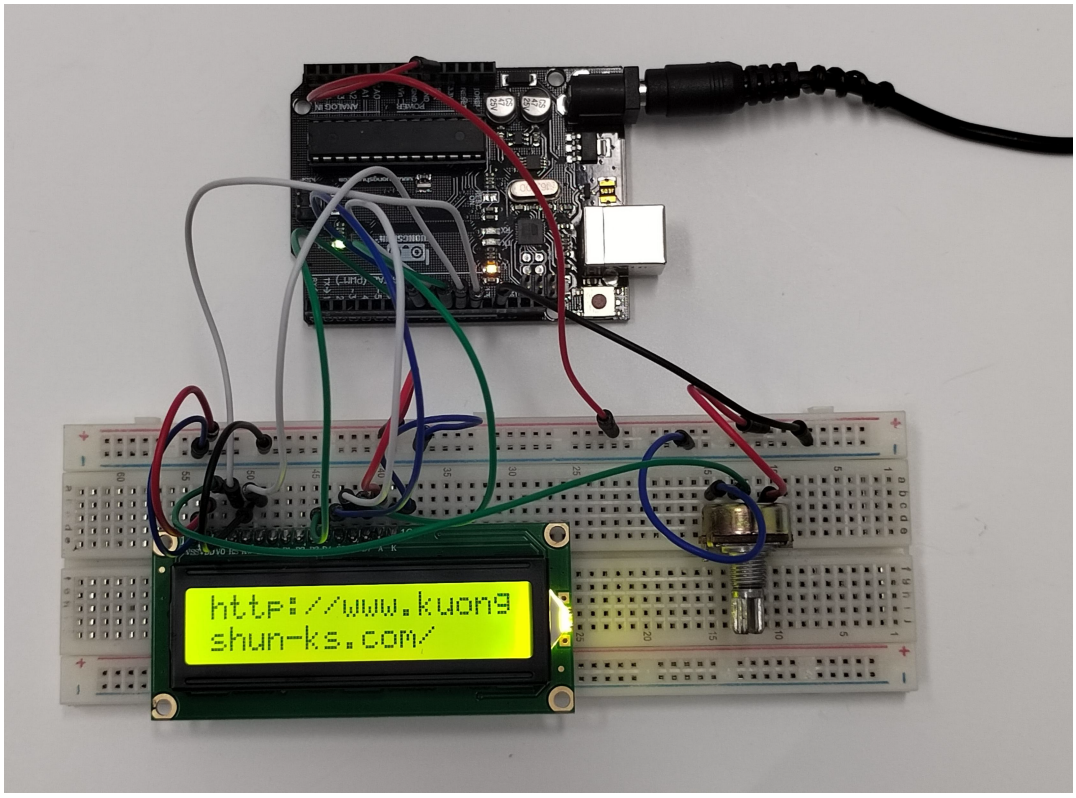
Test Result

Regardless of the four-bit connection or eight-bit connection, after the control board uploads the programme successfully, the first line of the display will show "http://www.kuong" characters, and the second line will show "shun-ks.com/" characters.

The eight-bit connection method is shown in the following figure：



The four-bit connection method is shown in the following figure：



Note: If you can't read the words clearly, you can turn the potentiometer on the breadboard to adjust the contrast.

Resources

Related code and library files are linked below: