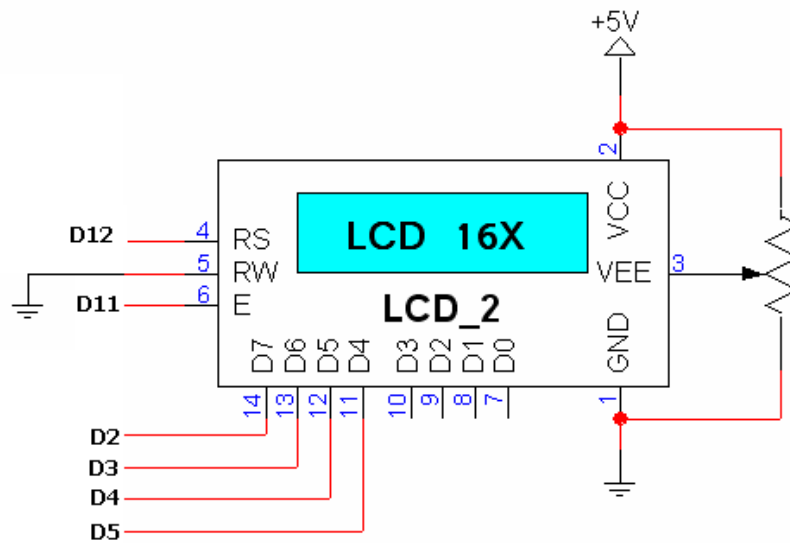


## Arduino กับ LCD



### โปรแกรม Hello World

```
#include <LiquidCrystal.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
  // Print a message to the LCD.
  lcd.print("hello, world!");
}

void loop() {
  // set the cursor to column 0, line 1
  // (note: line 1 is the second row, since counting begins with 0):
  lcd.setCursor(0, 1);
  // print the number of seconds since reset:
  lcd.print(millis()/1000);
}
```

### โปรแกรม Cursor กระพริบ

```
// include the library code:
#include <LiquidCrystal.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
```

```

// set up the LCD's number of columns and rows:
lcd.begin(16, 2);
// Print a message to the LCD.
lcd.print("hello, world!");
}

void loop() {
// Turn off the blinking cursor:
lcd.noBlink();
delay(3000);
// Turn on the blinking cursor:
lcd.blink();
delay(3000);
}

```

### โปรแกรม ปิด-เปิด Cursor

```

// include the library code:
#include <LiquidCrystal.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
// set up the LCD's number of columns and rows:
lcd.begin(16, 2);
// Print a message to the LCD.
lcd.print("hello, world!");
}

void loop() {
// Turn off the cursor:
lcd.noCursor();
delay(500);
// Turn on the cursor:
lcd.cursor();
delay(500);
}

```

### โปรแกรม แสดงและไม่แสดงตัวอักษร

```

// include the library code:
#include <LiquidCrystal.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
// set up the LCD's number of columns and rows:
lcd.begin(16, 2);
// Print a message to the LCD.

```

```

lcd.print("hello, world!");
}

void loop() {
  // Turn off the display:
  lcd.noDisplay();
  delay(500);
  // Turn on the display:
  lcd.display();
  delay(500);
}

```

### โปรแกรม แสดงการกำหนดตำแหน่ง Cursor

```

// include the library code:
#include <LiquidCrystal.h>

// these constants won't change. But you can change the size of
// your LCD using them:
const int numRows = 2;
const int numCols = 16;

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
  // set up the LCD's number of columns and rows:
  lcd.begin(numCols,numRows);
}

void loop() {
  // loop from ASCII 'a' to ASCII 'z':
  for (int thisLetter = 'a'; thisLetter <= 'z'; thisLetter++) {
    // loop over the columns:
    for (int thisCol = 0; thisCol < numCols; thisCol++) {
      // loop over the rows:
      for (int thisRow = 0; thisRow < numRows; thisRow++) {
        // set the cursor position:
        lcd.setCursor(thisRow,thisCol);
        // print the letter:
        lcd.print(thisLetter, BYTE);
        delay(200);
      }
    }
  }
}

```

### โปรแกรม อ่านค่าแรงดันด้วย A/D

```

// include the library code:
#include <LiquidCrystal.h>

```

```

int sensorPin = A0; // select the input pin for the potentiometer
int sensorValue = 0; // variable to store the value coming from the sensor
float volt = 0.0; // Convert from sensor

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
  // Print a message to the LCD.
  lcd.print("Power is");
  sensorValue = 0;
}

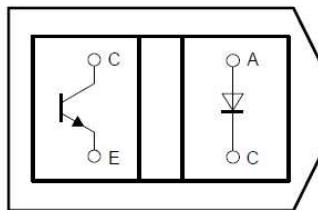
void loop() {

  sensorValue = analogRead(sensorPin); // read the value from the sensor:
  lcd.setCursor(0, 0); // set the cursor to column 1, line 1
  lcd.print("Digital is ");
  lcd.print(sensorValue);
  lcd.print(" ");
  lcd.setCursor(0, 1); // set the cursor to column 1, line 2
  lcd.print("Analog is ");
  volt = (float)((sensorValue*5.0)/1024.0);
  lcd.print(volt);
  //lcd.print((sensorValue*5)/1024);
  lcd.print(" ");
}

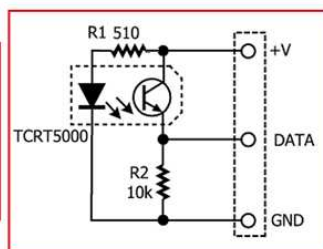
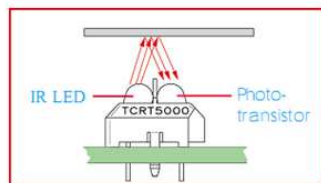
```

### Sensor [ZX-03 Infrared Reflector Board](#)

#### TCRT5000



[ZX-03 IR Sensor Resource Page](#)



โปรแกรม อ่าน Sensor แล้วเปรียบเทียบ

```

// include the library code:
#include <LiquidCrystal.h>

int sensorPin = A0; // select the input pin for the potentiometer
int ledPin = 13;    // select the pin for the LED
int sensorValue = 0; // variable to store the value coming from the sensor
int setting_value = 500;
#define led_on digitalWrite(ledPin, HIGH)
#define led_off digitalWrite(ledPin, LOW)

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
  // Print a message to the LCD.
  lcd.print("Power is");
  sensorValue = 0;
  // declare the ledPin as an OUTPUT:
  pinMode(ledPin, OUTPUT);
}

void loop() {

  sensorValue = analogRead(sensorPin); // read the value from the sensor:
  lcd.setCursor(0, 0); // set the cursor to column 1, line 1
  lcd.print("Sensor is ");
  lcd.print(sensorValue);
  lcd.print(" ");
  lcd.setCursor(0, 1); // set the cursor to column 1, line 2
  if(sensorValue > setting_value)
  {
    lcd.print("Sensor ON ");
    led_on;
  }
  else
  {
    lcd.print("Sensor OFF ");
    led_off;
  }
}

```