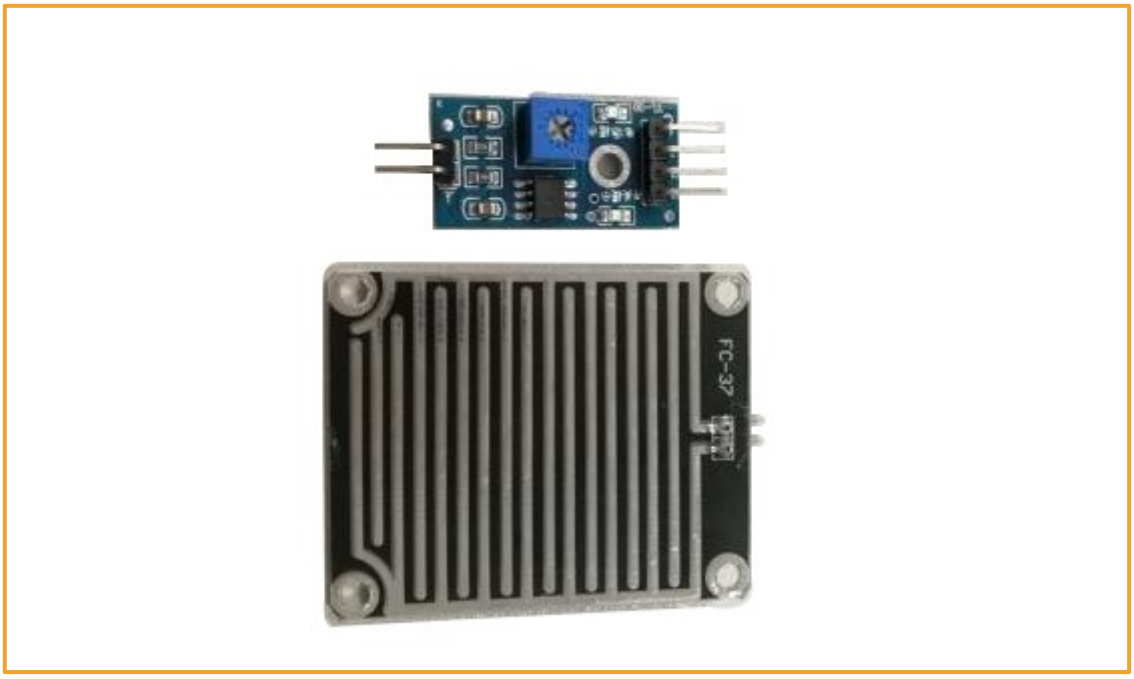
Raindrop Sensor

Introduction



Arduino rain sensor are used in a variety of weather monitoring circumstances, and it can be translated into digital signals and AO output.

1, The sensor adopts the high quality FR-04 double material, large area of 5.0*4.0 cm, and nickel plating treatment surface. It has anti-oxidation, electrical conductivity and more outstanding durability performance;

2, The comparator output, clean signal , superb waveform, strong driving ability, for more than 15 mA;

3, With a potentiometer to adjust the sensitivity;

4, The working voltage is from 3.3 V to 5 V;

5, The output form: digital value output (0 and 1) and analog value AO voltage output;

6, Using the LM393 wide voltage comparator.

We use a potentiometer during the experiment.

Function Introduction

When the sensor is connected to 5v power supply, the power light will be on, and there is no water droplet on the sensory boards, the DO output is at high level and the switch light is

off. When dropping a droplet, the DO output is at low level, the switch light will be on. If we brush off the water droplets, the output will return to high level state. AO analog output can be connected to the AD interface on the microcontroller to detect the size of raindrop above. DO digital output can also be connected the microcontroller to detect whether there is rain or not.

Experimental Principle

We connect the circuit and burn the program. When we drip onto the sensor, the sensor will transfer the data into arduino through analog interface on the potentiometer. After the process, the current size of rain will be displayed on the LCD1602. When there is no rain or after we brush the raindrop, the LCD1602 will show that the current raindrop is zero.

Component List

- Keywish Arduino UNO R3 Mainboard
- Breadboard
- USB cable
- LCD1602 * 1
- The rain sensor suite * 1
- Potentiometer* 1
- Several breadboard jumpers

The Wiring

1, VCC: connect to positive power supply(3-5 v)

2, GND: connect to negative power supply

3, DO: digital signal output

4, AO: analog signal output

Connecting RS LCD, E, D4, D5, D6, D7 to 12, 11, 5, 4, 3, 2 pin in due order

Connecting Vss and RW to GND, Vdd to + 5 v

Connecting the middle pin of potentiometer (adjusting the brightness of the LCD fonts) to Vo among them, the remaining two pins, one to 5 v, the other to GND.

1, VCC: positive (3-5 v)

2, GND: connect power negative

3, DO: digital signal output

4, AO: analog signal output

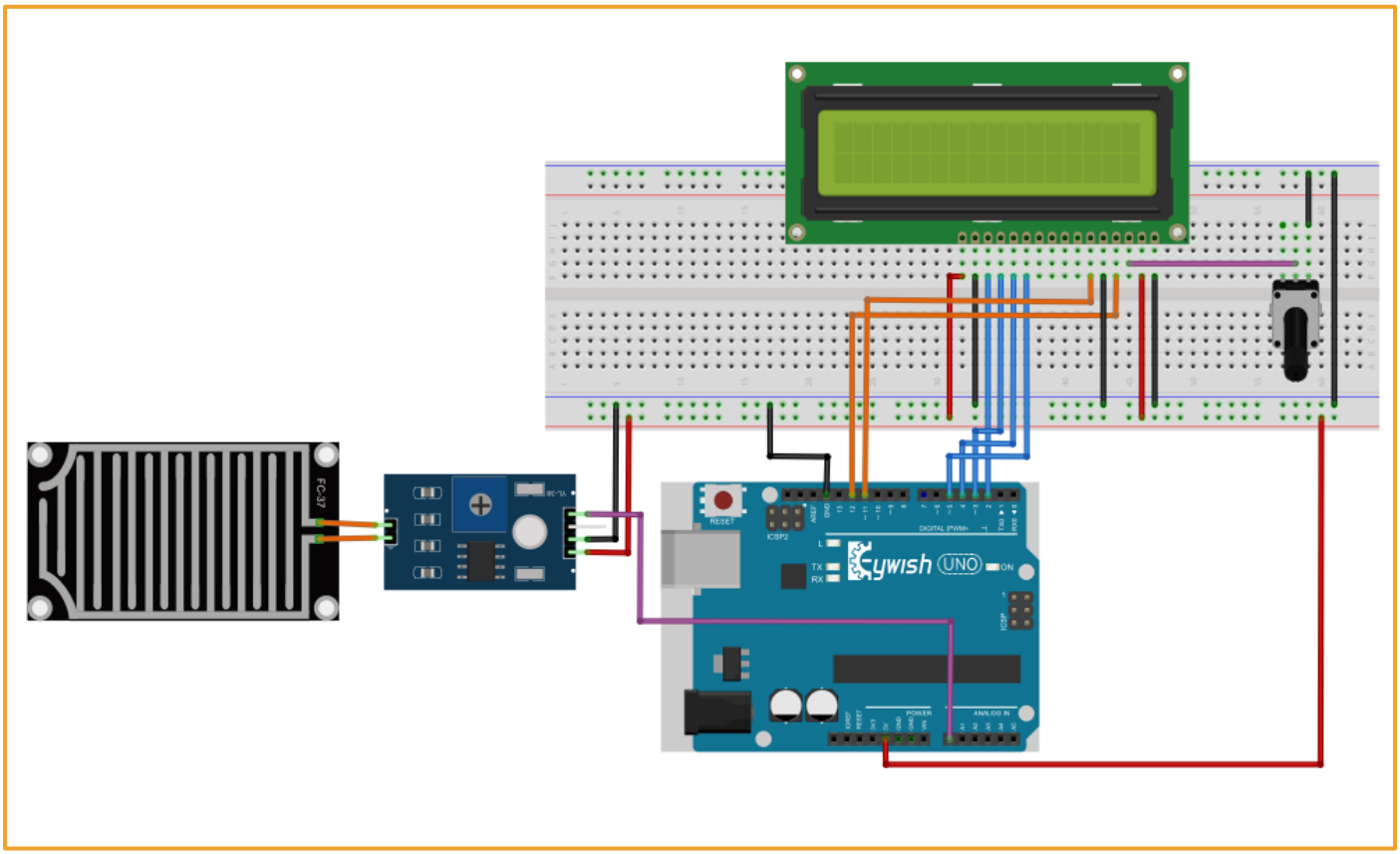
Connecting RS, E, D4, D5, D6, D7 to 12, 11, 5, 4, 3, 2 pins in due order

Connecting Vss and RW to GND, Vdd to + 5 v

Connceting Vo to the middle pin of potentiometer (adjusting the brightness of the LCD fonts), the remaining two pins, one to 5 v, the other to GND.

Wiring of Circuit

arduino Uno	lcd1602
5	11(DB4)
4	12(DB5)
3	13(DB6)
2	14(DB7)
11	6(E)
12	4(RS)



Code

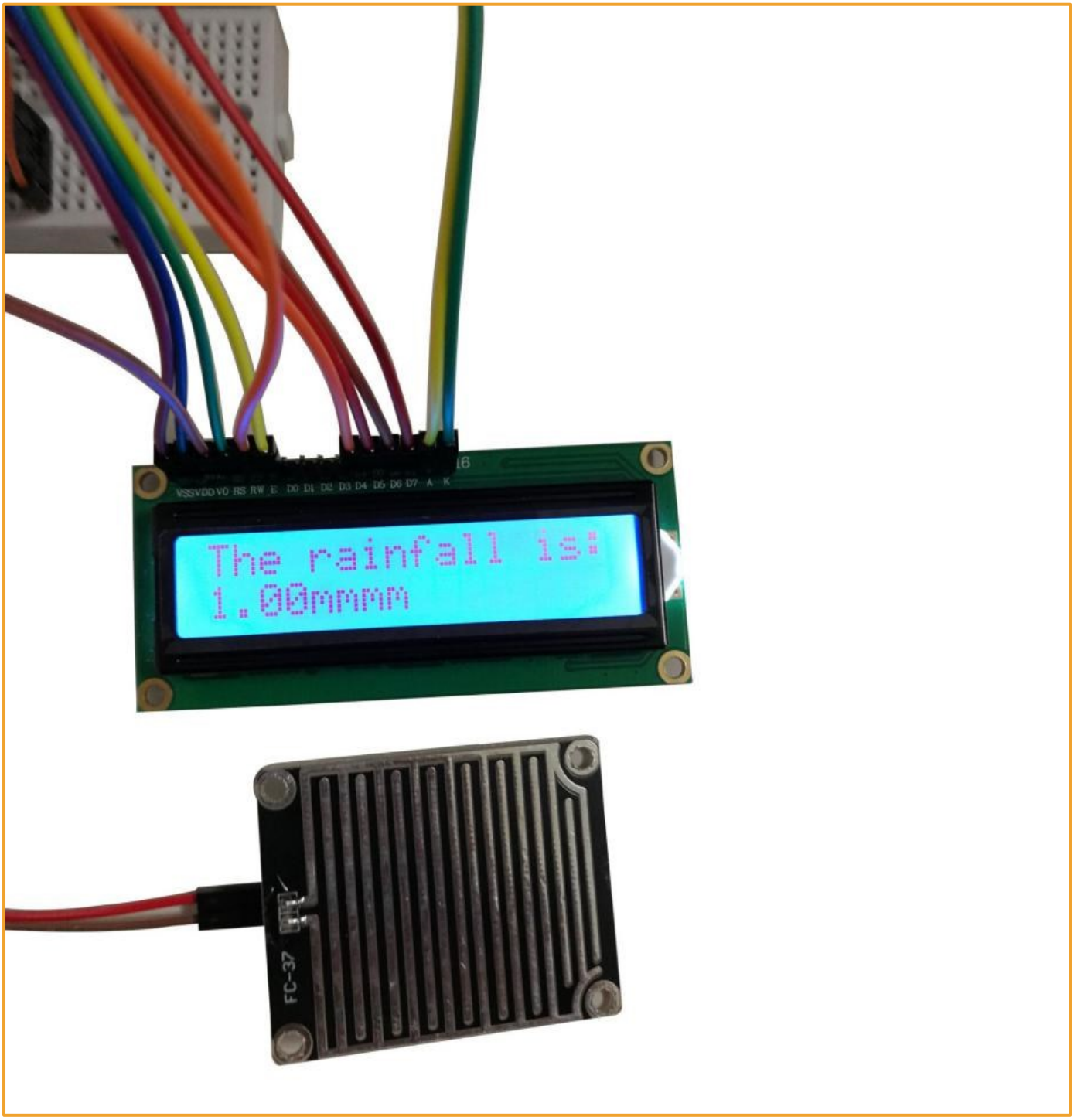
```
#define    DB4    5    // lcd1602 DB4
#define    DB5    4    // lcd1602 DB5
#define    DB6    3    // lcd1602 DB6
#define    DB7    2    // lcd1602 DB7

#define    LCD1602_RS    12
#define    LCD1602_E     11
#define    SOIL_SENSOR_AO 0

#include <LiquidCrystal.h>
// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(LCD1602_RS, LCD1602_E, DB4, DB5, DB6, DB7);
int analogPin=0;
int j=0;
void setup() {
    pinMode(analogPin,OUTPUT);
    // set up the LCD's number of columns and rows:
    lcd.begin(16, 2);
}
void loop() {
    int data= analogRead(analogPin);
    j=1023-data;
    lcd.setCursor(0, 0);
    lcd.print("The rainfall is: ");
    // 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((float)j, 2);
    lcd.print("mm");
    delay(200);
}
```

Experiment Result

When there is no raindrop, it is close to “0”:



When there are raindrops: