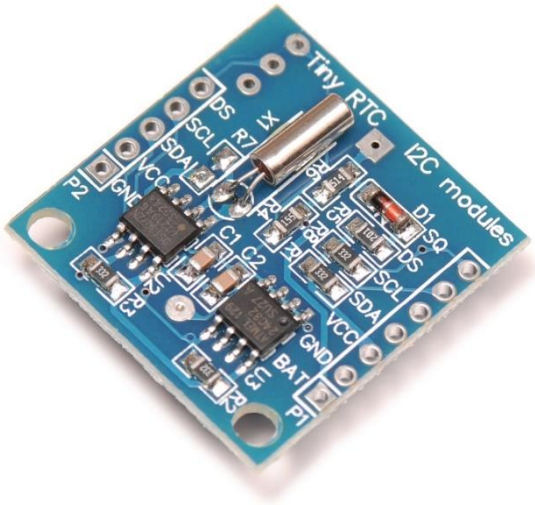
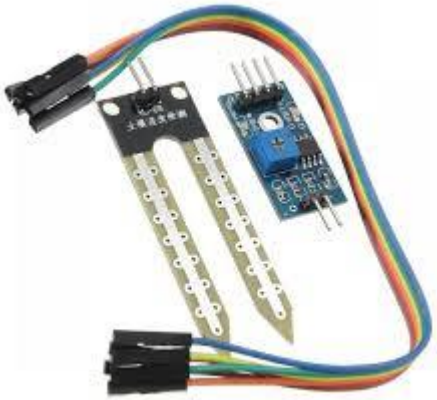
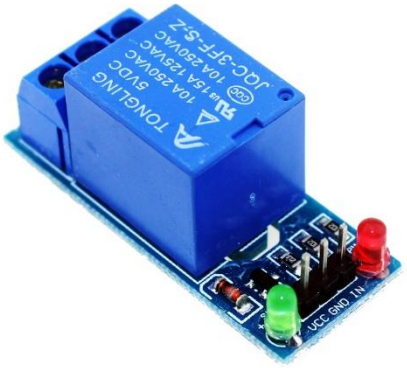
Đề tài: HỆ THỐNG THỦY CANH THÔNG MINH

Thành phần.

Tên linh kiện	Chức năng	Hình ảnh
Node MCU	Bộ vi điều khiển trung tâm để nhận, thu tín hiệu và điều khiển hệ thống	
Module DS1307	Cập nhật thời gian, ngày tháng để hiển thị lên LCD	

LCD 16x2	Hiển thì dữ liệu 16 cột,2 hàng	
Module I2C LCD	Giúp LCd giao tiếp I2C với Arduino	
Cảm biến độ ẩm đất	Đọc dữ liệu độ ẩm đất	

Adapter 12V		
Module ổn áp LM2596	Ổn áp 5V cung cấp cho Servo	
Module relay 1 kênh		

Cảm biến đo độ PH		
DHT11	Đọc giá trị nhiệt độ , độ ẩm gửi về node MCU	

Data:

- Blynk là gì?

- Chuẩn Giao tiếp 1 dây (DHT11) ?

- I2C là gì?

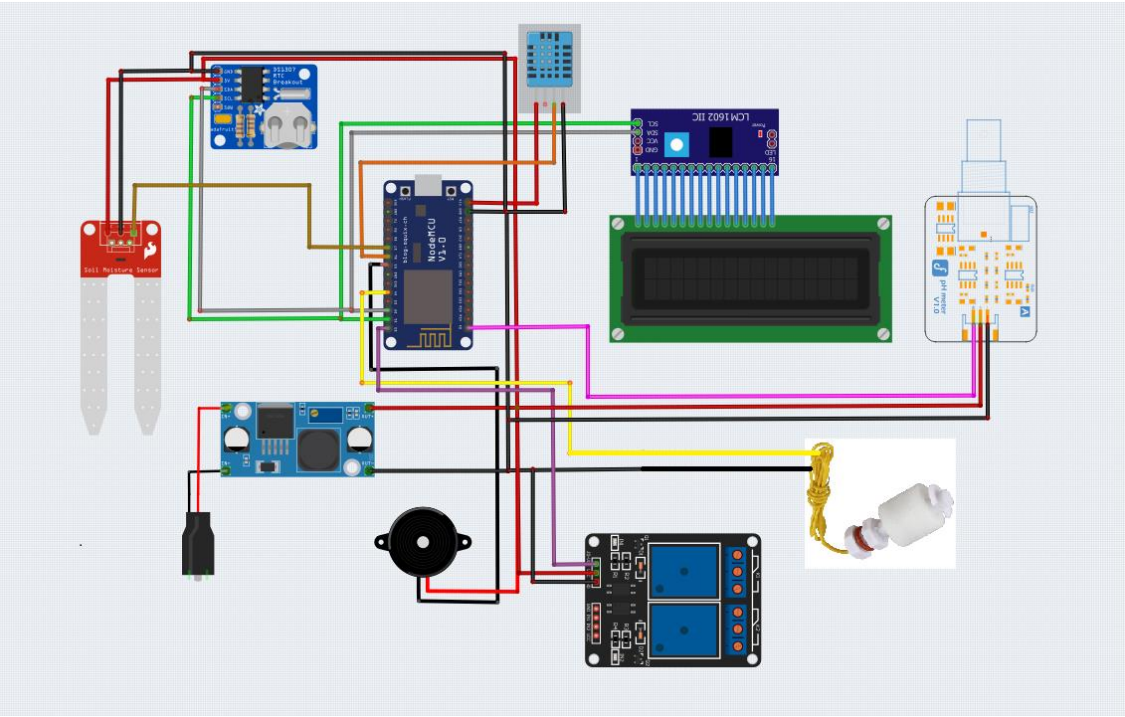
- Giao tiếp UART là gì?

- Webserver là gì?

- HTML là gì? Lập trình giao diện web

1. *Sơ đồ kết nối.*

- Download phần mềm Fritzing



2. *Code*

```
#include <ESP8266WiFi.h>

#include <WiFiClient.h>;

#include <BlynkSimpleEsp8266.h>

#include <DHT.h>

#include <Wire.h>

#include <LiquidCrystal_I2C.h>

#include <DS1307.h>
```

```
#define BLYNK_PRINT Serial
#define phao 2 // D4
#define relay 16 // D0
#define coi 14 // D5
#define DHTPIN 12  // D6
#define PHSensor A0
#define datsensor 13 // D7
LiquidCrystal_I2C lcd(0x3f,16,2);

DS1307 rtc;
int bom,chedo;
float PH;
int doamdat;
int doamdat1;
char auth[] = "dPj40fO07oAE2mXU5En3s0RePhefWYLz";
char ssid[] = "vanhanh";
char pass[] = "vanhanh123";
WiFiClient client;
WiFiServer server(80);
String header;
String State = "tat";
int outbom1 = 0;
int outbom2 = 0;

#define DHTTYPE DHT11
```

```
DHT dht(DHTPIN, DHTTYPE);
int h,t;
int timer1,timer2;
unsigned long time1 = 0;
unsigned long time2 = 0;
BlynkTimer timer;
WidgetLED led (V5);
WidgetLED led1 (V8);
BLYNK_WRITE(V3)
{
  bom = param.asInt();

}
BLYNK_WRITE(V6)
{
  chedo = param.asInt();

}

 BLYNK_WRITE(V10)
{
  timer1 =param.asInt();
  Serial.print("Got a value: ");
  Serial.println(param.asStr());
}
```

```
BLYNK_WRITE(V11)
{
  timer2 = param.asInt();
  Serial.print("Got a value: ");
  Serial.println(param.asStr());
}
unsigned long int avgValue;
float b;
int buf[10],temp;

void hienthi(){
 uint8_t sec, min, hour, day, month;
 uint16_t year;

  rtc.get( &sec, &min, &hour, &day, &month, &year);
  lcd.setCursor(0,0);
  lcd.print(hour/10, DEC);
  lcd.setCursor(1,0);
  lcd.print(hour%10, DEC);

  lcd.setCursor(3,0);
  lcd.print(min/10, DEC);
  lcd.setCursor(4,0);
  lcd.print(min%10, DEC);
```

```
  lcd.setCursor(6,0);
  lcd.print(sec/10, DEC);
  lcd.setCursor(7,0);
  lcd.print(sec%10, DEC);

  lcd.setCursor(1,1);
  lcd.print(day/10, DEC);
  lcd.setCursor(2,1);
  lcd.print(day%10, DEC);

  lcd.setCursor(4,1);
  lcd.print(month/10, DEC);
  lcd.setCursor(5,1);
  lcd.print(month%10, DEC);


 }


void cambienPH(){
  for(int i=0;i<10;i++)       //lấy mẫu của 10 lần
  {
    buf[i]=analogRead(PHSensor);
    delay(10);
```

```
  }
  for(int i=0;i<9;i++)       //sắp xếp giá trị từ nhỏ đến lớn
  {
   for(int j=i+1;j<10;j++)
   {
    if(buf[i]>buf[j])
    {
     temp=buf[i];
     buf[i]=buf[j];
     buf[j]=temp;
    }
   }
  }
  avgValue=0;
  for(int i=2;i<8;i++)                    //Lấy số trung bình của 6 lần đo
   avgValue+=buf[i];
  float phValue=(float)avgValue*5.0/1024/6;          //Chuyển từ Analog sang milivol
  PH=3.5*phValue;                    //Chuyển Milivol sang độ PH
  lcd.setCursor(11,1);
  lcd.print(PH,1);

}
void mucnuoc(){
   if(digitalRead(phao)==1){
   digitalWrite(coi,1);
```

```
  }
 else {
  digitalWrite(coi,0);
  }




 }

void bangtay(){



 if (bom==1 ){
  digitalWrite(relay,1);led.on();
  lcd.setCursor(11,0);
  lcd.print("ON ");
  }
 else if (bom==0 ){
  digitalWrite(relay,0);led.off();
  lcd.setCursor(11,0);
  lcd.print("OFF");}


 }
```

```
void setup()
{
Serial.begin(115200);
lcd.init();
lcd.backlight();
WiFi.begin(ssid, pass);
server.begin();
Serial.println("IP address: ");
Serial.println(WiFi.localIP());
pinMode(coi,OUTPUT);
pinMode(relay,OUTPUT);
pinMode(phao,INPUT_PULLUP);
pinMode(datsensor,INPUT_PULLUP);
digitalWrite(coi,0);
digitalWrite(relay,1);
Blynk.begin(auth, ssid, pass);
dht.begin();
//rtc.set( 0, 41, 22, 22, 3, 2020); //08:00:00 24.12.2014 //sec, min, hour, day, month, year
rtc.start();
lcd.setCursor(0, 0);
lcd.print("De tai: He thong");
lcd.setCursor(0, 1);
lcd.print("   thuy canh    ");
delay(5000);
lcd.setCursor(0, 0);
```

```
lcd.print("Nguyen Van Hanh ");
lcd.setCursor(0, 1);
lcd.print("Mssv: 2202180015");
delay(5000);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("   IP address:  ");
lcd.setCursor(2, 1);
lcd.print(WiFi.localIP());
delay(4000);
lcd.clear();
lcd.setCursor(0,0);
lcd.print("  :  :    Off  ");
lcd.setCursor(0,1);
lcd.print("   /   PH:     ");
timer.setInterval(2000L, sendSensor);
}
void webserver(){
WiFiClient client = server.available();
  if (client) {
    Serial.println("New Client.");
    String currentLine = "";
    while (client.connected()) {
      if (client.available()) {
        char c = client.read();
```

```
        Serial.write(c);
        header += c;
        if (c == '\n') {
          if (currentLine.length() == 0) {
            client.println("HTTP/1.1 200 OK");
            client.println("Content-type:text/html");
            client.println("Connection: close");
            client.println();
            client.println("<!DOCTYPE html><html>");
            client.println("<meta charset=\"utf-8\">");
            client.println("<head>");
            client.println("<title>Hệ thống thủy canh thông minh</title>");
            client.println("<meta name=\"viewport\" content=\"width=device-width, initial-scale=1\">");
            client.println("<meta http-equiv=\"refresh\" content=\"60\" />");
            client.println("<script src=\"https://code.jquery.com/jquery-2.1.3.min.js\"></script>");
            client.println("<link rel=\"stylesheet\"
href=\"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.4/css/bootstrap.min.css\">");
            client.println("<style>body{font-size: 24px;} .voffset {margin-top: 30px;}</style>");
            client.println("<div class=\"container\">");
            client.println("<p><b>Nguyễn Văn Hạnh </b></p>");
            client.println("<p><b>MSSV:2202180015 </b></p>");
            client.println("<p><b>Lớp:08DHLDT_CT </p>");
            client.println("<p><b>Trường đại học Công Nghiệp Thực Phẩm </b></p>");
            client.println("<h1><font color=#dd0000 size= \"15\">Hệ thống thủy canh thông
minh</font></h1>");
            client.println("<div class=\"row voffset\">");
```

```
client.println("<div class=\"col-md-3\"><font color=#00cc33 size=\"5\">Nhiệt độ</font> : </div><div class=\"col-md-3\">" + String(t) + String("&degC") +"</div>");

client.println("<div class=\"col-md-3\"><font color=#00cc33 size=\"5\">Độ ẩm không khí</font>: </div><div class=\"col-md-3\">" + String(h)+ String("%") +"</div>");

client.println("<div class=\"col-md-3\"><font color=#00cc33 size=\"5\">Độ PH </font>: </div><div class=\"col-md-3\">" + String(PH)+ "</div>");

client.println("<div class=\"col-md-3\"><font color=#00cc33 size=\"5\">Độ ẩm đất</font>: </div><div class=\"col-md-3\">" + String(doamdat1) + String("%") +"</div>");

client.println("</div>");

client.println("<meta name=\"viewport\" content=\"width=device-width, initial-scale=1\">");

client.println("<link rel=\"icon\" href=\"data:,\">");

client.println("<style>html { font-family: Helvetica; display: inline-block; margin: 0px auto; text-align: center;}");

client.println(".button { background-color: #195B6A; border: none; color: white; padding: 16px 40px;");

client.println("text-decoration: none; font-size: 30px; margin: 2px; cursor: pointer;}");

client.println(".button2 {background-color: #77878A;}</style>");

client.println("</script>");

client.println("</head>");


// The HTTP response ends with another blank line

client.println();

// Break out of the while loop

break;

} else { // if you got a newline, then clear currentLine

currentLine = "";

}

} else if (c != '\r') {  // if you got anything else but a carriage return character,
```

```
        currentLine += c;      // add it to the end of the currentLine
       }
      }
    }
    header = "";
    client.stop();
  }
  }



void loop()
{


  if(chedo==0){
    mucnuoc();
    hienthi();
    cambienPH();
    webserver();
    Blynk.run();
    timer.run();
    if((digitalRead(datsensor)== 1)){
     digitalWrite(relay,1);led.on();
    lcd.setCursor(11,0);
    lcd.print("ON ");
    Blynk.notify("Do am dat< 30%, ban can cung cap them duong chat !");
```

```
    }
   else if((timer1==1 )|| (timer2== 1)){
    digitalWrite(relay,1);led.on();
   lcd.setCursor(11,0);
   lcd.print("ON ");
    }
   else if(digitalRead(datsensor)== 0 && (timer1==0 ) && (timer2== 0)){
    digitalWrite(relay,0);led.off();
    lcd.setCursor(11,0);
    lcd.print("OFF");
   }}

else {

    mucnuoc();
    hienthi();
    cambienPH();
    webserver();
    Blynk.run();
    timer.run();


  if((bom==1 )||(timer1==1 )|| (timer2== 1)){
   digitalWrite(relay,1);led.on();
   lcd.setCursor(11,0);
```

```
    lcd.print("ON ");
     }
   else if( (bom==0 )||((timer1==0 ) && (timer2== 0))){
     digitalWrite(relay,0);led.off();
     lcd.setCursor(11,0);
     lcd.print("OFF");

     }}

}


void sendSensor(){
  h = dht.readHumidity();
  t = dht.readTemperature();
  doamdat= digitalRead(datsensor);
  if(doamdat==1){
    doamdat1=15;
    }
  if(doamdat==0){
    doamdat1=75;
    }
  Blynk.virtualWrite(V1, h);
  Blynk.virtualWrite(V0, t);
  Blynk.virtualWrite(V2, PH);
```

```
 Blynk.virtualWrite(V9, doamdat1);

}
```