

LAMPIRAN

1. Program Mikrokontroler pada Arduino IDE

```
#include <SPI.h>
#include <Ethernet.h>
#include "Mudbus.h"
#include <LiquidCrystal_I2C.h>
#include <OneWire.h>
#include <DallasTemperature.h>
#define ONE_WIRE_BUS A1
  OneWire oneWire(ONE_WIRE_BUS);
  DallasTemperature sensors(&oneWire);
  Mudbus Mb;
  LiquidCrystal_I2C lcd(0x27,20,4);
int sensorLDR; //membuat variabel "sensorLDR" A0
const int lembabPin=A2;
int sensorValue = 0;
int humidity = 0;
int cahaya = 0;
const int tombol1 = 2;
const int tombol2 = 3;
const int tombol3 = 5;
int tombolState1 =1;
int tombolState2 =0;
int tombolState3 =0;

void setup()
{
  uint8_t mac[]   = { 0x90, 0xA2, 0xDA, 0x00, 0x51, 0x06 };
  uint8_t ip[]    = { 192, 168, 8, 8 }; // ip laptop/pc 192.168.8.1
  uint8_t gateway[] = { 192, 168, 8, 1 };
  uint8_t subnet[] = { 255, 255, 255, 0 };
  Ethernet.begin(mac, ip, gateway, subnet);
```

```

//Avoid pins 4,10,11,12,13 when using ethernet shield
delay(5000);
Serial.begin(9600);
lcd.init();

pinMode(22, OUTPUT); // RELAY 1 PADA TOMBOL HMI
pinMode(24, OUTPUT); // RELAY 2 PADA TOMBOL HMI
pinMode(26, OUTPUT); // RELAY 3 PADA TOMBOL HMI
pinMode(28, OUTPUT); // RELAY 1 PADA TOMBOL
PANEL
pinMode(30, OUTPUT); // RELAY 2 PADA TOMBOL
PANEL
pinMode(32, OUTPUT); // RELAY 3 PADA TOMBOL
PANEL
pinMode(lembabPin,INPUT); // SENSOR KELEMBABAN
pinMode (A1,INPUT); //SENSOR DS18B20
pinMode (2,INPUT_PULLUP); // TOMBOL LUARAN 1
(TOMBOL PANEL )
pinMode (3,INPUT_PULLUP); // TOMBOL LUARAN 2
(TOMBOL PANEL )
pinMode (5,INPUT_PULLUP); // TOMBOL LUARAN 3
(TOMBOL PANEL )
pinMode (7,OUTPUT); // BUZZER
pinMode(14,OUTPUT); // RELAY LED MERAH 1
pinMode(15,OUTPUT); // RELAY LED MERAH 2
pinMode(16,OUTPUT); // RELAY LED MERAH 3
pinMode(17,OUTPUT); // RELAY LED HIJAU 1
pinMode(18,OUTPUT); // RELAY LED HIJAU 2
pinMode(19,OUTPUT); // RELAY LED HIJAU 3
digitalWrite (28,1);
digitalWrite (30,0);
digitalWrite (32,1);
digitalWrite (7,1);

```

```
digitalWrite (14,1);
digitalWrite (15,1);
digitalWrite (16,1);
digitalWrite (17,1);
digitalWrite (18,1);
digitalWrite (19,1);
}

void loop()
{
  Mb.Run();
  tombolFisik();
  lcd.backlight();
  lcd.setCursor(0,0);
  lcd.print("INDOOR GARDEN SYSTEM");

  sensorLDR=analogRead(A0);
  int cahaya = convertToPercent2(sensorLDR);
  lcd.setCursor(1,1);
  lcd.print("Pencahayaannya: ");
  lcd.print(cahaya);
  // Serial.print("cahaya:");
  // Serial.println(sensorLDR);
  // Serial.print("persen cahaya:");
  // Serial.print(cahaya);
  //Serial.println(" ");

  sensorValue = analogRead(lembabPin);
  int humidity = convertToPercent1(sensorValue);
  lcd.setCursor(1,2);
  lcd.print("Kelembaban: ");
  lcd.print(humidity);
  //Serial.print("kelembaban: ");
  //Serial.println(sensorValue);
  //Serial.print("persen lembab : ");
```

```
//Serial.print(humidity);
//Serial.println("  ");

sensors.requestTemperatures();
float suhu = sensors.getTempCByIndex(0);
lcd.setCursor(1,3);
lcd.print("Suhu: ");
lcd.print(suhu);
//Serial.print("Suhu : ");
//Serial.println(suhu);
//Serial.println("  ");

Mb.R[1] = analogRead(A0);
Mb.R[3] = analogRead(A2);
Mb.R[2] = suhu; // NILAI SUHU DS18B20 KE REGISTER 6
Mb.R[4] = cahaya; // NILAI % KELEMBABAN TANAH KE
REGISTER 5
Mb.R[5] = humidity; // NILAI % KELEMBABAN TANAH KE
REGISTER 5

digitalWrite(24, Mb.C[1]);
digitalWrite(26, Mb.C[2]);
digitalWrite(22, Mb.C[3]);

Mb.R[6] = digitalRead(2); //pin 7 to Mb.C[7]
Mb.R[7] = digitalRead(3); //pin 7 to Mb.C[7]
Mb.R[8] = digitalRead(5); //pin 7 to Mb.C[7]

if(cahaya<60)
{
digitalWrite(14,0); // JIKA NILAI SENSOR MELEBIHI 350
MAKA LED ON
```

```
digitalWrite(17,1);
}
else {
digitalWrite(14,1);
digitalWrite(17,0);}

if(suhu>35)
{
digitalWrite(15,0); // JIKA NILAI SENSOR MELEBIHI 350
MAKA LED ON
digitalWrite(18,1);
}
else {
digitalWrite(15,1);
digitalWrite(18,0);}

if(humidity<60)
{
digitalWrite(16,0); // JIKA NILAI SENSOR MELEBIHI 350
MAKA LED ON
digitalWrite(19,1);
}
else {
digitalWrite(16,1);
digitalWrite(19,0);}
}

int convertToPercent1(int value) // PERSEN KELEMBABAN
TANAH
{
int percentValue = 0;
percentValue = map(value, 1023, 100, 0, 100);
return percentValue;
}
```

```
int convertToPercent2(int value) // PERSEN CAHAYA
{
    int percentValue = 0;
    percentValue = map(value, 1023, 0, 100, 0);
    return percentValue;
}

void tombolFisik()
{
    tombolState1=digitalRead(tombol1);
    tombolState2=digitalRead(tombol2);
    tombolState3=digitalRead(tombol3);
    {
        if (tombolState1==0){
            digitalWrite(30,0); }// TOMBOL 1 PADA RELAY PANEL
        else {
            digitalWrite(30,1); }
    }
    {
        if (tombolState2==1){
            digitalWrite(32,1); }// TOMBOL 1 PADA RELAY PANEL
        else {
            digitalWrite(32,0); }
    }
    {
        if (tombolState3==1){
            digitalWrite(28,1); }// TOMBOL 1 PADA RELAY PANEL
        else {
            digitalWrite(28,0); }
    }
}
```