

## LAMPIRAN A

### Program Arduino

```
#include <HX711.h>
#include <Wire.h>
#include <RtcDS3231.h>
#include <movingAvg.h>
#include <Servo.h>

#define DOUT 24
#define CLK 26
#define phPin A0
#define turbiPin A1
#define salinitasPin A2
#define motor 2

char daysOfTheWeek[7][12] = {"minggu", "senin", "selasa", "rabu",
"Kamis", "Jumat", "Sabtu"};

int detik, menit, jam, hari;

//.....ph.....

int dataPH;

double Vph;

float phEquals;
```

```
float ph_stp;
float vph7 = 3.352;
float vph4 = 3.536;
int hasilavg;
//.....turbi.....
int dataTurbi;
int hasilavgTurbi;
double voltTurbi;
double hasilKeruh;

//.....salinitas.....
// int dataSalinitas;
int dataSalinitas = 0;
int hasilavgSalinitas;
double hasilSalinitas;
//.....loadcell.....
float calibration_factor = 1743.30;
float gram;
//.....ultrasonik.....
int trigPin = 27;
int echoPin = 29;
long waktu;
int jarak;
```

```

int persentase;

//.....global.....

int countGram;

byte countPagi;

int buka = 0;

int tutup = 60;

unsigned long prefTime = 0;

String dataSerial;

String je, me, de, ja, ma, da, js, ms, ds, jm, mm, dm; //variable jam
terima dari serial

int jamPagi, menitPagi, detikPagi, jamSiang, menitSiang, detikSiang,
jamSore, menitSore, detikSore, jamMalam, menitMalam, detikMalam;

String pakan;

int pakanIn;

RtcDS3231<TwoWire> Rtc(Wire);

HX711 scale;

movingAvg avg(6);

movingAvg avgTurbi(6);

movingAvg avgSalinitas(6);

Servo openStorage;

Servo openScale;

void setup() {

Serial.begin(9600);

Serial1.begin(9600);

```

```

rtcSet();
pinMode(phPin, INPUT);
pinMode(turbiPin, INPUT);
pinMode(salinitasPin, INPUT);
pinMode(motor, OUTPUT);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
openStorage.attach(25);
openScale.attach(23);
openScale.write(tutup);
openStorage.write(tutup);
avg.begin();
avgTurbi.begin();
avgSalinitas.begin();
scale.begin(DOUT, CLK);
scale.set_scale(calibration_factor);
scale.tare();
// delay(1000);
}

void loop() {
  ReadAllSensor();
  printing();
}

```

```
}
```

```
void printing() {  
    if ((millis() - prefTime) > 1000) {  
        Serial.println("_____");  
        Serial.println("countPagi=" + String(countPagi));  
        Serial.println("countGrm=" + String(countGram));  
        Serial.println("berat=" + String(gram));  
        Serial.println(" ");  
        Serial.println("adcPH=" + String(hasilavg) + " Vph=" + String(Vph)  
+ " PH_out=" + String(phEquals));  
        Serial.println(" ");  
        Serial.println("adcTurbi=" + String(hasilavgTurbi) + " VTurbi=" +  
String(voltTurbi) + " Turbi_out=" + String(hasilKeruh));  
        Serial.println(" ");  
        Serial.println("adcSanilitas=" + String(hasilavgSalinitas) + "  
Sal_out=" + String(hasilSalinitas));  
        Serial.println("JAM=" + String(jam) + ":" + String(menit) + ":" +  
String(detik));  
        Serial.println("Pagi=" + String(jamPagi) + ":" + String(menitPagi) +  
":" + String(detikPagi));  
        Serial.println("siang=" + String(jamSiang) + ":" + String  
(menitSiang) + ":" + String(detikSiang));  
        Serial.println("sore=" + String(jamSore) + ":" + String(menitSore) +  
":" + String(detikSore));  
    }  
}
```

```
Serial.println("Malam=" + String (jamMalam) + ":" + String  
(menitMalam) + ":" + String (detikMalam));
```

```
Serial.println("mam=" + String(pakan));
```

```
Serial.println(" ");
```

```
prefTime = millis();
```

```
}
```

```
Serial1.print("{");
```

```
Serial1.print(String(gram));
```

```
Serial1.print(",");
```

```
Serial1.print(String(phEquals));
```

```
Serial1.print(",");
```

```
Serial1.print(String(hasilKeruh));
```

```
Serial1.print(",");
```

```
Serial1.print(hasilSalinitas, 2);
```

```
Serial1.print(",");
```

```
Serial1.print(String(jam));
```

```
Serial1.print(",");
```

```
Serial1.print(String(menit));
```

```
Serial1.print(",");
```

```
Serial1.print(String(detik));
```

```
Serial1.print(",");
```

```
Serial1.print(String(persentase));
```

```

Serial1.println("{}");
}
void ReadAllSensor() {
    RtcDateTime now = Rtc.GetDateTime();
    printDateTime(now);
    jam = now.Hour();//jam saat ini
    menit = now.Minute();//menit saat ini
    detik = now.Second();//detik saat ini
    gram = (scale.get_units() * -1), 4;

    //.....rumus ph.....

    dataPH = analogRead(phPin);
    hasilavg = avg.reading(dataPH);
    Vph = 5.0 / 1023.0 * hasilavg;
    //rumus ph step ph_stp=(VPH4-VPH7)/(7-4)
    ph_stp = (vph4 - vph7) / (7 - 4);
    phEquals = 7.00 + ((vph7 - Vph) / ph_stp);
    //.....rumus turbi.....
    dataTurbi = analogRead(turbiPin);
    hasilavgTurbi = avgTurbi.reading(dataTurbi);
    voltTurbi = dataTurbi * (5.0 / 1023);
    hasilKeruh = 100.00 - (voltTurbi / 3.86) * 100.00;
}

```

```

//.....rumus salinitas.....
dataSalinitas = analogRead(salinitasPin);
hasilavgSalinitas = avgSalinitas.reading(dataSalinitas);
hasilSalinitas = (0.3417 * hasilavgSalinitas) + 110.1 * 12 * 3;

//-----Rumus sensor ultrasonik-----
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
waktu = pulseIn(echoPin, HIGH);
jarak= waktu*0.034/2;
persentase = map(jarak, 50, 5, 0, 100);
Serial.print("pakan: ");
Serial.println(persentase);
Serial.println(" %");
delay(200);

if (Serial1.available() > 0) {
    dataSerial = Serial1.readStringUntil('\n');
}
int data1 = dataSerial.indexOf('{');

```



```
int data2 = dataSerial.indexOf(',', data1 + 1);
int data3 = dataSerial.indexOf(',', data2 + 1);
int data4 = dataSerial.indexOf(',', data3 + 1);
int data5 = dataSerial.indexOf(',', data4 + 1);
int data6 = dataSerial.indexOf(',', data5 + 1);
int data7 = dataSerial.indexOf(',', data6 + 1);
int data8 = dataSerial.indexOf(',', data7 + 1);
int data9 = dataSerial.indexOf(',', data8 + 1);
int data10 = dataSerial.indexOf(',', data9 + 1);
int data11 = dataSerial.indexOf(',', data10 + 1);
int data12 = dataSerial.indexOf(',', data11 + 1);
int data13 = dataSerial.indexOf(',', data12 + 1);
int data14 = dataSerial.indexOf('}', data13 + 1);
//pemisah data string
je = dataSerial.substring(data1 + 1, data2);
me = dataSerial.substring(data2 + 1, data3);
de = dataSerial.substring(data3 + 1, data4);

ja = dataSerial.substring(data4 + 1, data5);
ma = dataSerial.substring(data5 + 1, data6);
da = dataSerial.substring(data6 + 1, data7);

js = dataSerial.substring(data7 + 1, data8);
```

```
ms = dataSerial.substring(data8 + 1, data9);
ds = dataSerial.substring(data9 + 1, data10);

jm = dataSerial.substring(data10 + 1, data11);
mm = dataSerial.substring(data11 + 1, data12);
dm = dataSerial.substring(data12 + 1, data13);

pakan = dataSerial.substring(data13 + 1, data14);

//data integer hasil jadi
jamPagi = je.toInt();
menitPagi = me.toInt();
detikPagi = de.toInt();

jamSiang = ja.toInt();
menitSiang = ma.toInt();
detikSiang = da.toInt();

jamSore = js.toInt();
menitSore = ms.toInt();
detikSore = ds.toInt();

jamMalam = jm.toInt();
```

```

menitMalam = mm.toInt();
detikMalam = dm.toInt();

pakanIn = pakan.toInt();
logicPagi(jamPagi, menitPagi, detikPagi);
logicPagi(jamSiang, menitSiang, detikSiang);
logicPagi(jamSore, menitSore, detikSore);
logicPagi(jamMalam, menitMalam, detikMalam);
}

void logicPagi(int setJam, int setMenit, int setDetik) {
    if (jam == setJam and menit == setMenit and detik == setDetik) {
        countPagi = 1;
    }
    if (countPagi == 1) {
        //////////////////////////////////////
        if (gram >= pakanIn) {
            countGram = 1;
            openStorage.write(tutup);
        }
        else {
            openStorage.write(buka);//ngisi corong
            openScale.write(tutup);
        }
    }
}

```

```

    delay(10);
}

if (countGram == 1) {
    if (gram <= 5 or gram == 0)
    {
        openScale.write(tutup);
        digitalWrite(motor, LOW);
        delay(10);
        countPagi = 0;
        countGram = 0;
    }
    else
    {
        openStorage.write(tutup);
        openScale.write(buka);
        digitalWrite(motor, HIGH);
        delay(5000);
    }
}

////////////////////////////////////
}

```

```

else {
    openStorage.write(tutup);
}

}

void rtcSet() {
    Rtc.Begin();
    RtcDateTime compiled = RtcDateTime(_DATE, __TIME_);
    printDateTime(compiled);
    Serial.println();
    if (!Rtc.IsDateTimeValid())
    {
        if (Rtc.LastError() != 0)
        {
            Serial.print("RTC communications error = ");
            Serial.println(Rtc.LastError());
        }
        else
        {
            Serial.println("RTC lost confidence in the DateTime!");
            Rtc.SetDateTime(compiled);
        }
    }
}

```

```

    }
}
if (!Rtc.GetIsRunning())
{
    Serial.println("RTC was not actively running, starting now");
    Rtc.SetIsRunning(true);
}

RtcDateTime now = Rtc.GetDateTime();
if (now < compiled)
{
    Serial.println("RTC is older than compile time! (Updating
DateTime)");
    Rtc.SetDateTime(compiled);
}

Rtc.Enable32kHzPin(false);
Rtc.SetSquareWavePin(DS3231SquareWavePin_ModeNone);
}

#define countof(a) (sizeof(a) / sizeof(a[0]))
void printDateTime(const RtcDateTime& dt)
{

```

```
char datestring[20];

sprintf_P(datestring,
          countof(datestring),
          PSTR("%02u/%02u/%04u %02u:%02u:%02u"),
          dt.Month(),
          dt.Day(),
          dt.Year(),
          dt.Hour(),
          dt.Minute(),
          dt.Second() );
Serial.println(datestring);
}
```

## Program ESP

```
#define BLYNK_PRINT Serial

#include <WiFi.h>//library esp32 diseting nggo wifi Akses point
#include <WiFiClient.h>//librari esp32 dijadikan client
#include <BlynkSimpleEsp32.h>//library blink esp32
#include <SoftwareSerial.h>//library komunikasi serial untuk
konukikasi dengan nano

// kode autententi bylnk
unsigned long timeShow ;
byte flagRun ;
const char auth[] = "YddcpEBibqmacX7OMdxj3Rv8J68lDigz";
const char ssid[] = "sedekah";
const char pass[] = "modalnapa";
String dataMasuk = "";

BlynkTimer timer;//deklarasi timer pada blynk
WidgetLCD lcdh(V7);//deklarasi virtual pin lcd pada blynk
WidgetLCD lcd(V9);
//SoftwareSerial Serial2(12, 14); //(RX,TX);
//serial
#define RXD2 16
#define TXD2 17
float loadcel, ph , turbi , tds;
int cnt = 0;
```



```
int tambah , kurang ;  
int jam , menit , detik , persentase;  
int jam_esuk, menit_esuk, detik_esuk;  
int jam_awan, menit_awan, detik_awan;  
int jam_sore, menit_sore, detik_sore;  
int jam_wengi, menit_wengi, detik_wengi;
```

```
//serial Kirim
```

```
String jam_esuk_str, menit_esuk_str, detik_esuk_str;
```

```
String jam_awan_str, menit_awan_str, detik_awan_str;
```

```
String jam_wengi_str, menit_wengi_str, detik_wengi_str;
```

```
String loadcel_str, ph_str , turbi_str , tds_str , jam_str , menit_str ,  
detik_str , ultra_str ;
```

```
BLYNK_WRITE(V0) {
```

```
    TimeInputParam esuk(param);
```

```
    if (esuk.hasStartTime()) {
```

```
        jam_esuk = esuk.getStartHour();
```

```
        menit_esuk = esuk.getStartMinute();
```

```
        detik_esuk = esuk.getStartSecond();
```

```
    }
```

```
}
```

```
BLYNK_WRITE(V1) {
```

```

TimeInputParam awan(param); // read data tombol dari blynk
if (awan.hasStartTime()) {
    jam_awan = awan.getStartHour();
    menit_awan = awan.getStartMinute();
    detik_awan = awan.getStartSecond();
}
}
BLYNK_WRITE(V2) {
    TimeInputParam sore(param); // read data tombol dari blynk
    if (sore.hasStartTime()) {
        jam_sore = sore .getStartHour();
        menit_sore = sore .getStartMinute();
        detik_sore = sore.getStartSecond();
    }
}
BLYNK_WRITE(V5) {
    TimeInputParam wengi(param); // read data tombol dari blynk
    if (wengi.hasStartTime()) {
        jam_wengi = wengi .getStartHour();
        menit_wengi = wengi .getStartMinute();
        detik_wengi = wengi.getStartSecond();
    }
}
}

```

```

//////////set berat//////////
BLYNK_WRITE(V3) {
  int tambah = param.asInt();
  Serial.println(tambah);
  if (tambah == 1 ) {
    cnt += 125;
  }
}

BLYNK_WRITE(V4) {
  int kurang = param.asInt();
  if (kurang == 1) {
    cnt -= 125;
  }
}

void myTimerEvent()
{
  show();//fungsi menampilkan lcd pada blynk
  show1();
}

void setup() {
  // open serial for monitoring

```

```

Serial.begin(9600);
// Serial2.begin(9600);
Blynk.begin(auth, ssid, pass, "blynk.cloud", 80);
Serial2.begin(9600);
timer.setInterval(1000L, myTimerEvent);
}

void loop() {
  serial_terima();
  Serial.println(dataMasuk);
  Serial.print("cnt =");
  Serial.print(cnt);
  kirim();
  Blynk.run();
  timer.run();
  Blynk.virtualWrite(V6 , cnt );
  sendSensor();

}

//////////////////////////////////TERIMA DATA//////////////////////////////////

void serial_terima() {

  if (Serial2.available() > 0) {
    dataMasuk = Serial2.readStringUntil('\n' );

```

```
dataMasuk.trim();  
byte x1 = dataMasuk.indexOf('{');  
byte x2 = dataMasuk.indexOf(',', x1 + 1);  
byte x3 = dataMasuk.indexOf(',', x2 + 1);  
byte x4 = dataMasuk.indexOf(',', x3 + 1);  
byte x5 = dataMasuk.indexOf(',', x4 + 1);  
byte x6 = dataMasuk.indexOf(',', x5 + 1);  
byte x7 = dataMasuk.indexOf(',', x6 + 1);  
byte x8 = dataMasuk.indexOf(',', x7 + 1);  
byte x9 = dataMasuk.indexOf('}', x7 + 1);  
loadcel_str = dataMasuk.substring(x1 + 1, x2);  
ph_str = dataMasuk.substring(x2 + 1, x3);  
turbi_str = dataMasuk.substring(x3 + 1, x4);  
tds_str = dataMasuk.substring(x4 + 1, x5);  
jam_str = dataMasuk.substring(x5 + 1, x6);  
menit_str = dataMasuk.substring(x6 + 1, x7);  
detik_str = dataMasuk.substring(x7 + 1, x8);  
ultra_str = dataMasuk.substring(x8 + 1, x9);  
  
loadcel = loadcel_str.toFloat();  
ph = ph_str.toFloat();  
turbi = turbi_str.toFloat();  
tds = tds_str.toFloat();
```

```

    persentase = ultra_str.toFloat();
    jam = jam_str.toInt();
    menit = menit_str.toInt();
    detik = detik_str.toInt();
}
}
////////////////////////////////////LCD////////////////////////////////////
void show() {
    if (millis() - timeShow > 3000) {
        lcdh.print (0, 0, " MONITORING DATA ");
        flagRun++;
        timeShow = millis();
    }

    switch (flagRun) {

        case 0:

            break;

        case 1:

            lcdh.print (0, 1, " BERAT: kg" );//+ String(char(223)) + "Kg ");
            lcdh.print(7, 1, String (loadcel));
            break;

```

case 2:

```
lcdh.print(0, 1, "PH=      ");
```

```
lcdh.print(6, 1, String(ph));
```

```
break;
```

case 3:

```
lcdh.print(0, 1, "TURBI=   NTU");
```

```
lcdh.print(7, 1, String (turbi));
```

```
break;
```

case 4:

```
lcdh.print(0, 1, " Sal=   PPM ");
```

```
lcdh.print(6, 1, String (tds));
```

```
break;
```

// case 5:

```
//lcdh.print(0, 1, " jam= : :  ");
```

```
//lcdh.print(5, 1, String(jam));
```

```
//lcdh.print(8, 1, String(menit));
```

```
//lcdh.print(11, 1, String(detik));
```

```
//break;
```

case 5:

```
lcdh.print(0, 1, " pakan=   % ");
```

```
lcdh.print(6, 1, String (persentase));
```

```
break;
```

case 6:

```

    flagRun = 1;
    break;
}
}
////////////////////////////////////LCD2////////////////////////////////////
void show1() {

    // lcd.clear();
    // lcd.print(0, 0, "set abot");
    // lcd.print( 0 , 1 , String(cnt));

}

void kirim() {

    Serial2.print("{}");
    Serial2.print(jam_esuk);
    Serial2.print(",");
    Serial2.print(menit_esuk);
    Serial2.print(",");
    Serial2.print(detik_esuk);
    Serial2.print(",");
    Serial2.print(jam_awan);

```



```
Serial2.print(",");
Serial2.print(menit_awan);
Serial2.print(",");
Serial2.print(detik_awan);
Serial2.print(",");
Serial2.print(jam_sore);
Serial2.print(",");
Serial2.print(menit_sore);
Serial2.print(",");
Serial2.print(detik_sore);
Serial2.print(",");
Serial2.print(jam_wengi);
Serial2.print(",");
Serial2.print(menit_wengi);
Serial2.print(",");
Serial2.print(detik_wengi);
Serial2.print(",");
Serial2.print(cnt);
Serial2.println("{}");
//serialmonitor
//Serial.println("{}");

Serial.print("JAM_esuk =" + String(jam_esuk) + ":" +
String(menit_esuk) + ":" + String(detik_esuk));
```

```
    Serial.print("JAM_awan =" + String(jam_awan) + ":" +
String(menit_awan) + ":" + String(detik_awan));

    Serial.print("JAM_sore =" + String(jam_sore) + ":" +
String(menit_sore) + ":" + String(detik_sore));

    Serial.println("JAM_wengi =" + String(jam_wengi) + ":" +
String(menit_wengi) + ":" + String(detik_wengi));

}

void sendSensor(){
    Blynk.virtualWrite(V8, persentase);
}
```





## BIODATA PENULIS



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### **Riwayat Pendidikan**

- SDN Kuripan 1 Tahun 2008-2014
- SMPN 3 Kesugihan Tahun 2014-2017
- MAN 1 Cilacap  
Jurusan IPA Tahun 2017-2020
- Politeknik Negeri Cilacap  
Prodi D3 Teknik Elektronika Tahun 2020-2023

Penulis telah mengikuti seminar proposal pada tanggal 16 Februari 2023 sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A.Md)