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L A M P I R A N

Lampiran 1 Source Code Program Arduino IDE Akuator

Kode inisialisasi *library*

```
#include <FirebaseESP8266.h>

#include <ESP8266WiFi.h>

#include <SimpleDHT.h>

#include <Servo.h>
```

Kode koneksi ke firebase

```
#define FIREBASE_HOST "https://serbukapps-default-rtdb.firebaseio.com/"

#define FIREBASE_AUTH
"fboRKOYsiXCo6yKfylwsDWnRpW3saWtgtjgvHfLX"

#define WIFI_SSID "vivo"

#define WIFI_PASSWORD "fitrihasari"
```

Kode Pin menghubungkan pin *relay*, motor gearbox, dan DHT-11

```
#define relayBlender D7

#define relayHeater D8

#define relayGearbox D6

#define pinDHT11 D0
```

Kode Untuk mengetahui on/off blender firebase

```
int statusBlender=0;

int statusAyakan=0;
```

Kode *Libraray* objek untuk mengontrol servo dan objek DHT11

```
FirebaseData firebaseData;  
  
Servo servo1;  
  
Servo servo2;  
  
Servo servo3;  
  
Servo servo4;  
  
SimpleDHT11 dht11(pinDHT11);
```

Kode Mengatur pin blender, penghangat dan gearbox

```
void setup() {  
  Serial.begin (9600);  
  
  pinMode(relayBlender, OUTPUT);  
  
  pinMode(relayHeater, OUTPUT);  
  
  pinMode(relayGearbox, OUTPUT);  
  
  Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);  
  
  WiFi.begin (WIFI_SSID, WIFI_PASSWORD);  
  
  while (WiFi.status() != WL_CONNECTED) {Serial.print (".");delay (500);};
```

Kode Mengirim status blender ke firebase

```
Firebase.setInt(firebaseData,"StatusBlender",statusBlender);  
  
Firebase.setInt(firebaseData,"StatusAyakan",statusAyakan);  
  
digitalWrite (relayGearbox,LOW);
```

kode Mengatur derajat setvo 1,2,3 dan 4

```
servo1.attach(D1); servo1.write(5); delay (1000);  
  
servo2.attach(D2); servo2.write(180);delay (1000);  
  
servo3.attach(D3); servo3.write(90);delay (1000);  
  
servo4.attach(D4); servo4.write(70);delay (1000);  
  
}
```

kode Mengirim data suhu ke firebase dan pengaturan on/off penghangat

```
void loop() {  
  
  byte temperature = 0;  
  
  int err = SimpleDHTErrSuccess;  
  
  byte humidity = 0;  
  
  if ((err = dht11.read(&temperature,&humidity, NULL)) !=  
  SimpleDHTErrSuccess) {  
  
    Serial.print("Read DHT11 failed, err="); Serial.println(err);delay(1000);return;}  
  
    Firebase.pushInt (firebaseData,"/Suhu",temperature);  
  
    Firebase.pushInt (firebaseData,"/Kelembaban",humidity);  
  
    Serial.println(temperature);  
  
    if (temperature<30) {heaterON();}  
  
    if (temperature>35) {heaterOFF();}
```

Kode Perintah mengambil dan menyimpan data Swich

```
int Data1,Data2;  
  
Firebase.getInt(firebaseData,"Switch1/Value",Data1);  
  
Firebase.getInt(firebaseData,"Switch2/Value",Data2);
```

Kode Menampilkan data Swich

```
Serial.print("Data1");Serial.print(Data1);Serial.println();  
  
Serial.print("Data2");Serial.print(Data2);Serial.println();
```

Kode On/off swich

```
if (Data1==1) {  
    while(1){statusBlender=1;  
    Firebase.setInt(firebaseData,"StatusBlender",statusBlender);mesinON();statusBlender=0;Firebase.setInt(firebaseData,"StatusBlender",statusBlender);break;}}  
  
if (Data2==1) {  
    while(1){statusAyakan=1;  
    Firebase.setInt(firebaseData,"StatusAyakan",statusAyakan);filter();statusAyakan=0;Firebase.setInt(firebaseData,"StatusAyakan",statusAyakan);break;}}  
}
```

Kode Mengarahkan servo dan gearbox

```
void mesinON() {  
for (int x=90;x>25;x--) {servo3.write(x); delay(10);}; delay(1000);  
  
for (int x=5;x<40;x++) {servo1.write(x);delay (5);}; delay(1000);  
  
digitalWrite (relayGearbox,HIGH); delay (3000);digitalWrite (relayGearbox,LOW); delay (1000);  
  
for (int x=40;x>5;x--) {servo1.write(x); delay (5);}; delay(1000);  
for (int x=25;x<90;x++) {servo3.write(x); delay (10);}delay(1000);
```

Kode Menyalakan dengan waktu blender

```
blenderON();delay (5000) ; blenderOFF();delay (3000);  
  
blenderON();delay (5000); blenderOFF();delay (3000);  
  
blenderON();delay (5000); blenderOFF();delay (3000);
```

Kode Mengarahkan servo untuk kembali ke posisi awal

```
servo2.write(0); delay(1000);  
  
for (int x=90;x<165;x++) {servo3.write(x); delay(10);} delay(1000);  
  
for (int x=165;x>90;x--) {servo3.write(x);delay(10);} delay(1000);  
  
servo2.write(180);delay (1000);  
  
delay(1000);  
  
}
```

Kode Perintah on/off blender

```
void filter() {for (int x=0;x<5;x++) {servo4.write(20);  
delay(1000);servo4.write(70); delay(1000);}}  
  
void blenderON() {digitalWrite (relayBlender, HIGH  
  
void blenderOFF() {digitalWrite (relayBlender, LOW);}  
  
void heaterON() {digitalWrite (relayHeater, HIGH);}  
  
void heaterOFF() {digitalWrite (relayHeater, LOW);}
```

Lampiran 2 Source Code Program Arduino IDE Sensor

Kode inialisasi *library*

```
#include <NTPClient.h>

#include <WiFiUdp.h>

#include <ESP8266HTTPClient.h>

#include <FirebaseESP8266.h>

#include <ESP8266WiFi.h>

#include <HX711_ADC.h>

#include <EEPROM.h>
```

Kode koneksi ke firebase

```
#define FIREBASE_HOST "https://serbukapps-default-rtdb.firebaseio.com/"

#define FIREBASE_AUTH
"fboRkKoYsiXC06yKfylwsDWnRpW3saWtgtjgvHfLX"

#define WIFI_SSID "vivo"

#define WIFI_PASSWORD "fitrihasari"
```

Kode Pin menghubungkan pin *LoadCell* 1kg

```
#define HX711_dout1 D2

#define HX711_sck1 D1

#define HX711_dout2 D3

#define HX711_sck2 D0

#define HX711_dout3 D5

#define HX711_sck3 D4
```


Kode Pin menghubungkan pin sensor ultrasonik

```
#define trigPin D7  
  
#define echoPin D6
```

Kode tipe data untuk menyimpan waktu

```
String current_time, current_date, allTime;  
  
WiFiUDP ntpUDP;  
  
NTPClient timeClient(ntpUDP);  
  
String months[12]={"Januari", "Februari", "Maret", "April", "Mei", "Juni", "Juli",  
"Augustus", "September", "Oktober", "November", "Desember"};
```

Kode dari *library*

```
HX711_ADC LoadCell1(HX711_dout1, HX711_sck1);  
  
HX711_ADC LoadCell2(HX711_dout2, HX711_sck2);  
  
HX711_ADC LoadCell3(HX711_dout3, HX711_sck3);
```

Kode data kalibrasi

```
const int calVal_eepromAdress = 0;  
  
unsigned long t = 0;  
  
int statusKelor;  
  
FirebaseData firebaseData;
```

Kode pencarian WiFi

```
void setup() {  
  
  Serial.begin(9600); delay(10);  
  
  Serial.println("Starting...");  
  
  WiFi.begin (WIFI_SSID, WIFI_PASSWORD);  
  
  while (WiFi.status() != WL_CONNECTED) {Serial.print (".");delay (500);};  
  
}
```

Kode mengatur pin dan perintah *LoadCell*

```
Firestore.begin(FIREBASE_HOST, FIREBASE_AUTH);

timeClient.begin();

timeClient.setTimeOffset(28800);

pinMode(trigPin, OUTPUT);

pinMode(echoPin, INPUT);

LoadCell1.begin();

LoadCell2.begin();

LoadCell3.begin();

float calibrationValue;

EEPROM.begin(512);

EEPROM.get(calVal_eeepromAdress, calibrationValue);
```

Kode dari *library*

```
unsigned long stabilizingtime = 2000;

boolean _tare = true;

LoadCell1.start(stabilizingtime, _tare);

LoadCell2.start(stabilizingtime, _tare);

LoadCell3.start(stabilizingtime, _tare);
```

Kode mengatur kalibrasi

```
if (LoadCell1.getTareTimeoutFlag() || LoadCell2.getTareTimeoutFlag() ||
LoadCell3.getTareTimeoutFlag()) {

    Serial.println("Timeout, check MCU>HX711 wiring and pin designations");

    while (1);}

}
```

Kode mengatur kalibrasi

```
else {  
  
  LoadCell1.setCalFactor(calibrationValue);  
  
  LoadCell2.setCalFactor(calibrationValue);  
  
  LoadCell3.setCalFactor(calibrationValue);  
  
  Serial.println("Startup is complete");}  
}
```

Kode menyimpan data durasi dan frekuensi

```
void loop() {  
  
  int duration;  
  
  float distance;  
  
  digitalWrite(trigPin, HIGH);  
  
  delayMicroseconds(20);  
  
  digitalWrite(trigPin, LOW);  
  
  duration = pulseIn(echoPin, HIGH);  
  
  distance = (duration/2) *0.034;  
  
  float volumeWadah1 = (21.73-distance);
```

Kode konversi volume

```
float PersenVolumeWadah1 = (volumeWadah1/21.73)*100;  
  
  if (PersenVolumeWadah1<0.00) {PersenVolumeWadah1=0.00;}  
  
  if (PersenVolumeWadah1<=10.00) {statusKelor=0;  
  Firebase.setInt(firebaseData,"/Status_Kelor", statusKelor);}  
  
  if (PersenVolumeWadah1>10.00) {statusKelor=1;  
  Firebase.setInt(firebaseData,"/Status_Kelor", statusKelor);}
```

Kode perintah mengambil data dan menyimpan data *LoadCell*

```
const int serialPrintInterval = 1000;

if (millis() > t + serialPrintInterval) {

    LoadCell1.update();

    LoadCell2.update();

    LoadCell3.update();

    float a = LoadCell1.getData();

    float b = LoadCell2.getData();

    float c = LoadCell3.getData();

    if (a<0.00) a=0.00;

    if (b<0.00) b=0.00;

    if (c<0.00) c=0.00;

    ntp();
```

Kode perintah tampilkan dan mengirim data ke firebase

```
Serial.print("Berat Utama= ");Serial.print(a);Serial.print("gram");Serial.println();

    Serial.print("Berat Kasar="
");Serial.print(b);Serial.print("gram");Serial.println();

    Serial.print("Berat Halus="
");Serial.print(c);Serial.print("gram");Serial.println();

    Serial.print("Volume Wadah =
");Serial.print(PersenVolumeWadah1);Serial.print("%");Serial.println();

    Firebase.pushFloat (firebaseData,"/BeratUtama", a);

    Firebase.pushFloat (firebaseData,"/BeratKasar", b);

    Firebase.pushFloat (firebaseData,"/BeratHalus", c);
```

```
    Firebase.pushFloat (firebaseData, "/Volume", PersenVolumeWadah1);  
  
    t = millis();  
  
}
```

Merereset data serial monitor

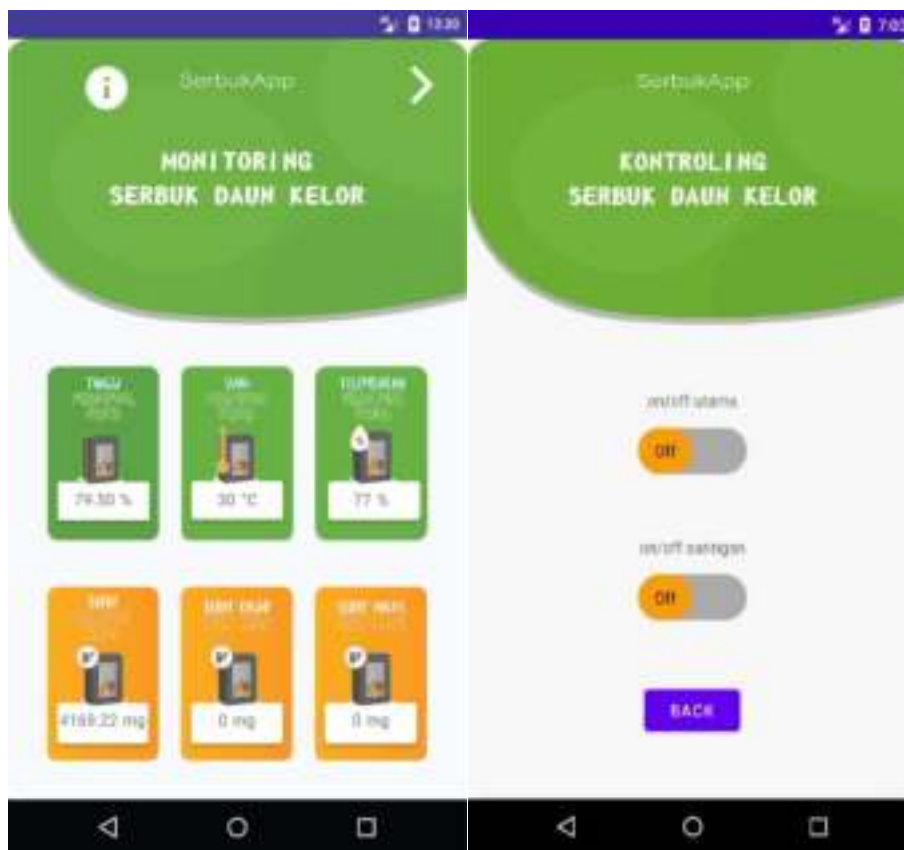
```
if (Serial.available() > 0) {  
  
    char inByte = Serial.read();  
  
    if (inByte == 'a') {LoadCell1.tareNoDelay();}  
  
    if (inByte == 'b') {LoadCell2.tareNoDelay();}  
  
    if (inByte == 'c') {LoadCell3.tareNoDelay();}  
  
    if (LoadCell1.getTareStatus() == true) {Serial.println("Tare1 complete");}  
  
    if (LoadCell2.getTareStatus() == true) {Serial.println("Tare2 complete");}  
  
    if (LoadCell3.getTareStatus() == true) {Serial.println("Tare3 complete");}  
  
}
```

Kode perintah dari *Library*

```
void ntp(){  
  
    timeClient.update();  
  
    unsigned long epochTime = timeClient.getEpochTime();  
  
    struct tm *ptm = gmtime ((time_t *)&epochTime);  
  
    current_time = timeClient.getFormattedTime();  
  
    int monthDay = ptm->tm_mday;  
  
    int currentMonth = ptm->tm_mon+1;  
  
    String currentMonthName = months[currentMonth-1];  
  
    int currentYear = ptm->tm_year+1900
```

```
current_date = String(monthDay) + " " + String(currentMonthName) + " " +  
String(currentYear);  
  
allTime = String(current_time) + " " + String(current_date);  
  
Serial.print("waktu= ");Serial.print(allTime);Serial.println();  
  
Firebase.pushString (firebaseData,"/Waktu",allTime);  
  
}
```

Lampiran 3 Tampilan Aplikasi Android



Lampiran 4 Gambar Sistem



Lampiran 5 Gambar Sistem Saat Sedang Proses Pembuatan Serbuk



Lampiran 6 Gambar Sistem Hasil Serbuk

