LAMPIRAN

Lampiran -1 Listing Program Topup

```
//--------------------------------------------------------------------------
#include <WiFi.h>
#include <HTTPClient.h>
const char* ssid = "Ali Baba";
const char* password = "bet54321";

const char* url = "http://192.168.93.230/eParkir/topup.php";
WiFiClient client;
HTTPClient http;
//--------------------------------------------------------------------------
#include <SPI.h>
#include <MFRC522.h>
#define SS_PIN 5
 #define RST_PIN 17
MFRC522 rfid(SS_PIN, RST_PIN);
String id;
String staBaca;
//--------------------------------------------------------------------------
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>
#define SCREEN_WIDTH 128 // OLED display width, in pixels
#define SCREEN_HEIGHT 32 // OLED display height, in pixels
#define OLED_RESET     -1 // Reset pin # (or -1 if sharing Arduino reset pin)
```

```
#define SCREEN_ADDRESS 0x3C ///< See datasheet for Address; 0x3D for 128x64, 0x3C for 128x32

Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, OLED_RESET);

//------------------------------------------------------------------------

#define LBz 2

#define HBz 4

int i=0;

String pilNom[] = {"20.000","30.000","50.000","100.000"};

String saldo="";


void setup() {
  Serial.begin(9600);
  pinMode(16, OUTPUT);  digitalWrite(16, HIGH);  // Vcc rfid
  pinMode(15, OUTPUT);  digitalWrite(15, LOW);   // GND rfid


  pinMode(13, INPUT_PULLUP); // tombol nominal
  pinMode(12, INPUT_PULLUP); // tombol kirim
  pinMode(14, INPUT_PULLUP); // tombol batal


  pinMode(LBz, OUTPUT);
  pinMode(HBz, OUTPUT);
  digitalWrite(LBz, LOW);


  //------------------------------------------------------------------------
  SPI.begin();
  rfid.PCD_Init();
  //------------------------------------------------------------------------
```

```
 if(!display.begin(SSD1306_SWITCHCAPVCC, SCREEN_ADDRESS))
   {
    Serial.println(F("SSD1306 allocation failed"));
    for(;;);
   }
 display.clearDisplay();
 display.setTextSize(2);
 display.setTextColor(SSD1306_WHITE);
 //-------------------------------------------------------------------------
 WiFi.mode(WIFI_OFF);
 delay(1000);
 WiFi.mode(WIFI_STA);

 WiFi.begin(ssid, password);
 while (WiFi.status() != WL_CONNECTED)
   {
    delay(500);
    display.clearDisplay();
    display.println("KONEK WIFI");
    display.println("  ......  ");
    display.display();
   }
 standby();
}

void standby(void)
{
```

```
 i=0; id="";
 staBaca="standby";
 display.clearDisplay();
 display.setCursor(45, 0);  display.print("SCAN");
 display.setCursor(20, 18);  display.print("SIM ANDA");
 display.display();
}

void bacaRFID()
{
 if(rfid.PICC_IsNewCardPresent() && rfid.PICC_ReadCardSerial())
   {
    id="";
    for (byte i = 0; i < rfid.uid.size; i++)
      {
        id=id+String(rfid.uid.uidByte[i],HEX);
      }
    id.toUpperCase();
    rfid.PICC_HaltA();
    rfid.PCD_StopCrypto1();
    //buzzer-----------------------------------------------
    tone(HBz, 1500, 100);
    //-----------------------------------------------------
    display.clearDisplay();
    display.setCursor(35, 0);  display.print("PILIH");
    display.setCursor(25, 18);  display.print("NOMINAL");
    display.display();
```

```
    }
}

void kirim_data(String dt)
{
  String postData = (String)"nilai=" + dt;
  HTTPClient http;
  http.begin(url);
  http.addHeader("Content-Type", "application/x-www-form-urlencoded");
  auto httpCode = http.POST(postData);
  //String payload = http.getString();
  saldo = http.getString();
  display.clearDisplay();
  display.setCursor(0, 0);  display.print("SALDO ANDA");
  display.setCursor(0, 18);  display.println(saldo);
  display.display();
  delay(3000);
  standby();
  //Serial.println(postData);
  //Serial.println(saldo);
  http.end();
}

void loop()
{
  if (staBaca=="standby") {
    bacaRFID();
```

```
   }
  if (id != "") {
    pilihNominal();
   }
}

void pilihNominal(void)
{
  if (digitalRead(13)==LOW)
   {
     display.clearDisplay();
     display.setCursor(0, 0);  display.print("TOP-UP SIM");
     display.setCursor(0, 18);  display.print(pilNom[i]);
     display.display();
     i=i+1;
     if (i>4) {
       i=0;
     }
     tone(HBz, 500, 100);
   } else
  if (digitalRead(12)==LOW)
   {
     tone(HBz, 1000, 100);
     display.clearDisplay();
     display.setCursor(0, 0);  display.print("KIRIM DATA");
     display.setCursor(0, 18); display.print("  .....   ");
     display.display();
```

```
      String dtKirim=id+"#"+pilNom[i-1];
      kirim_data(dtKirim);

   } else
  if (digitalRead(14)==LOW)
   {
      standby();
      tone(HBz, 1500, 100);
   }
   delay(250);
}
```

Lampiran -2 Listing Program E-Parkir

```
#include <SPI.h>
#include <Wire.h>
#include <MFRC522.h>
#include <ESP32Servo.h>
#include <WiFi.h>
#include <HTTPClient.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>

// ==================== Konfigurasi WiFi & Server ====================
const char* ssid = "Ali Baba";
const char* password = "bet54321";
const char* urlGetSaldo = "http://192.168.93.230/eParkir/cek_saldo.php";
const char* urlUpdateSaldo = "http://192.168.93.230/eParkir/update_saldo.php";
```

```
// ==================== OLED ====================
#define SCREEN_WIDTH 128
#define SCREEN_HEIGHT 32
#define OLED_RESET -1
Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, OLED_RESET);

// ==================== RFID ====================
#define RFID_SS_PIN 21
#define RFID_RST_PIN 22
MFRC522 rfid(RFID_SS_PIN, RFID_RST_PIN);

// ==================== Servo ====================
#define SERVO_PIN 16
Servo palangServo;

// ==================== Variabel Global ====================
unsigned long waktuTerakhirScan = 0;
const unsigned long jedaScan = 3000;
bool statusMasuk = false;
String lastUID = "";

// ==================== Deklarasi Fungsi ====================
void tampilkanStatus(String baris1, String baris2);
String bacaUID();
int getSaldo(String uid);
```

```
bool updateSaldo(String uid, int newSaldo);

// ==================== SETUP ====================
void setup() {
  Serial.begin(115200);
  Wire.begin(4, 5); // SDA, SCL khusus OLED

  SPI.begin();
  rfid.PCD_Init();

  // OLED
  if (!display.begin(SSD1306_SWITCHCAPVCC, 0x3C)) {
    Serial.println("OLED gagal");
    while (1);
  }

  // Servo
  palangServo.setPeriodHertz(50);
  palangServo.attach(SERVO_PIN, 500, 2500);
  palangServo.write(90); // Palang terbuka awal

  tampilkanStatus("Sistem Aktif", "Palang Terbuka");

  // WiFi
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    tampilkanStatus("Menyambung WiFi", "");
```

```
    delay(500);
  }
  tampilkanStatus("WiFi Terhubung", "Dekatkan kartu");
}

// ==================== LOOP ====================
void loop() {
  if (rfid.PICC_IsNewCardPresent() && rfid.PICC_ReadCardSerial()) {
    String uid = bacaUID();
    Serial.println("UID: " + uid);
    rfid.PICC_HaltA();

    if (!statusMasuk) {
      // Proses Masuk
      statusMasuk = true;
      lastUID = uid;
      tampilkanStatus("Palang Tertutup", "Selamat Berbelanja");
      palangServo.write(20); // Palang tertutup
    }
    else {
      // Proses Keluar
      if (uid == lastUID) {
        int saldo = getSaldo(uid);
        if (saldo >= 2000) {
          int saldoBaru = saldo - 2000;
          if (updateSaldo(uid, saldoBaru)) {
            tampilkanStatus("Saldo: Rp" + String(saldoBaru), "Palang Terbuka");
```

```
          palangServo.write(90); // Palang terbuka
          statusMasuk = false;   // Reset status
        } else {
          tampilkanStatus("Update Gagal", "Coba Lagi");
        }
      }
      else if (saldo >= 0) {
        tampilkanStatus("Saldo Tidak Cukup", "Top Up Dulu");
      }
      else {
        tampilkanStatus("Koneksi Gagal", "Coba Lagi");
      }
    }
    else {
      tampilkanStatus("Bukan Kartu Sama", "Gunakan Kartu Masuk");
    }
  }

  waktuTerakhirScan = millis();
 }

 if (millis() - waktuTerakhirScan > jedaScan && !statusMasuk) {
  tampilkanStatus("Dekatkan kartu", "Palang Terbuka");
 }
}
```

```
// ==================== FUNGSI ====================

String bacaUID() {
  String uid = "";
  for (byte i = 0; i < rfid.uid.size; i++) {
    if (rfid.uid.uidByte[i] < 0x10) uid += "0";
    uid += String(rfid.uid.uidByte[i], HEX);
  }
  uid.toUpperCase();
  return uid;
}

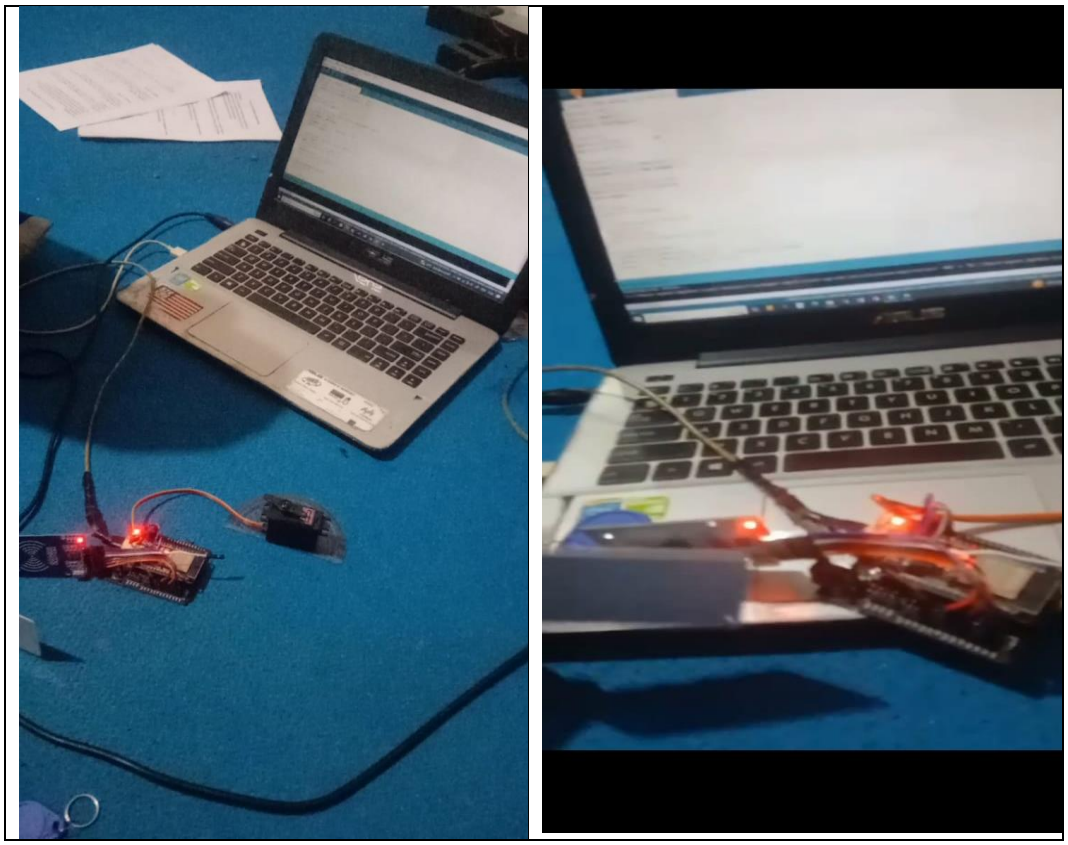
void tampilkanStatus(String baris1, String baris2) {
  display.clearDisplay();
  display.setTextSize(1);
  display.setTextColor(SSD1306_WHITE);
  display.setCursor(0, 0); display.println(baris1);
  display.setCursor(0, 16); display.println(baris2);
  display.display();
}

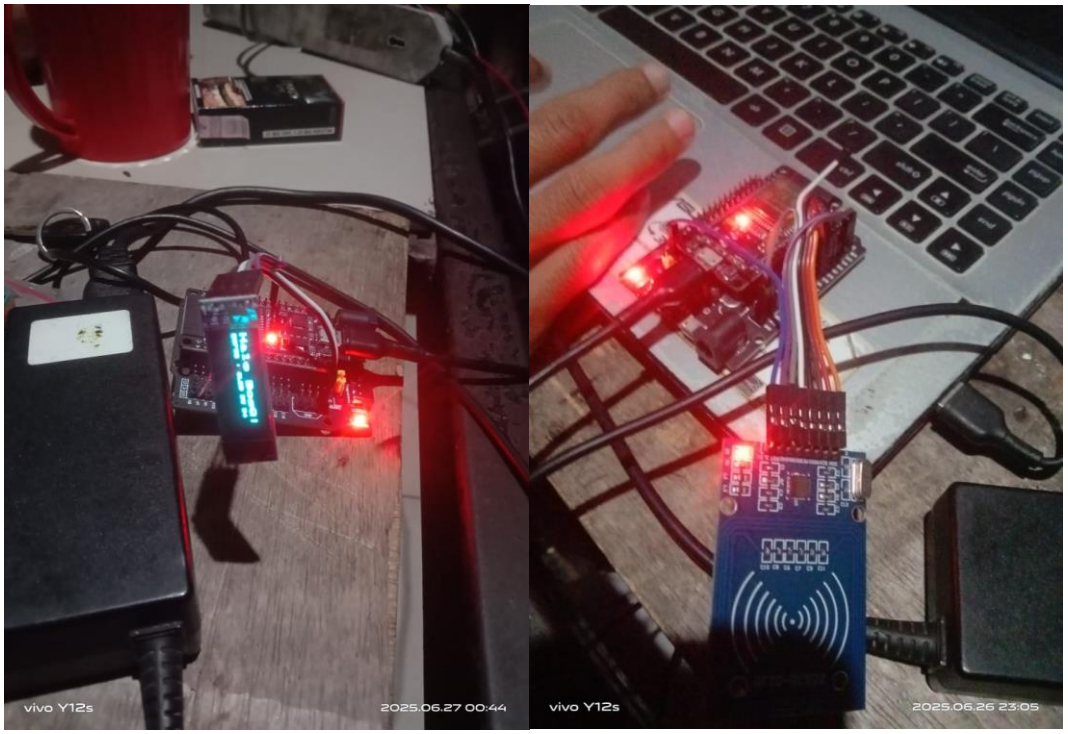
int getSaldo(String uid) {
  if (WiFi.status() != WL_CONNECTED) return -1;
  HTTPClient http;
  String fullURL = String(urlGetSaldo) + "?id=" + uid;
  Serial.println("GET URL: " + fullURL);
  http.begin(fullURL);
```

```
  int httpCode = http.GET();
  String response = http.getString();
  http.end();
  Serial.println("HTTP Code: " + String(httpCode));
  Serial.println("Response: '" + response + "'");
  if (httpCode == 200) {
    response.trim(); // hilangkan spasi/enter
    return response.toInt();
  } else {
    return -1;
  }
}

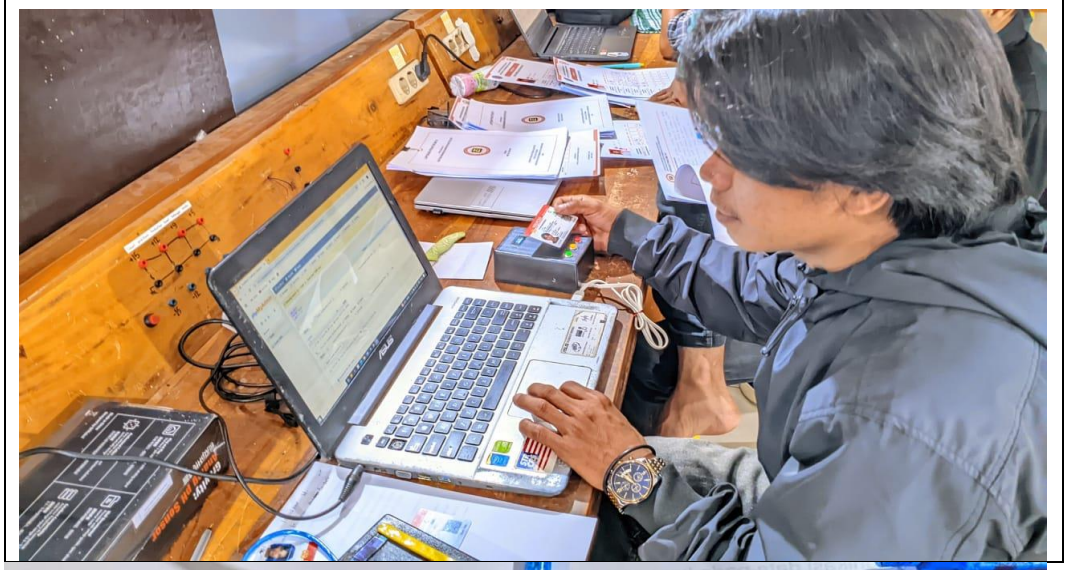
bool updateSaldo(String uid, int newSaldo) {
  if (WiFi.status() != WL_CONNECTED) return false;
  HTTPClient http;
  http.begin(urlUpdateSaldo);
  http.addHeader("Content-Type", "application/x-www-form-urlencoded");
  String data = "id=" + uid + "&saldo=" + String(newSaldo);
  Serial.println("POST Data: " + data);
  int httpCode = http.POST(data);
  String res = http.getString();
  http.end();
  Serial.println("HTTP Code: " + String(httpCode));
  Serial.println("Response: " + res);
  return (httpCode == 200);
}
```

Lampiran -3 Dokumentasi Pekerjaan Alat



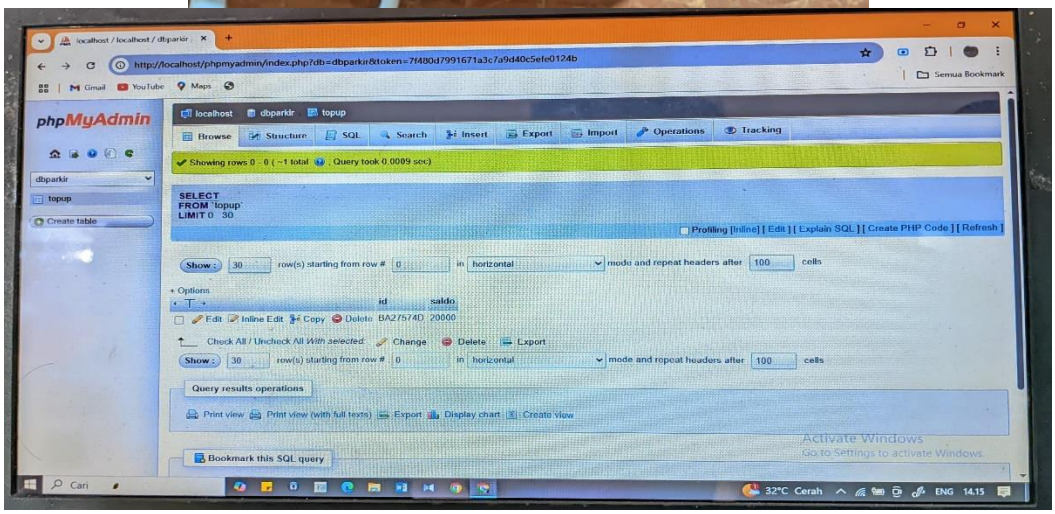


Lampiran -4 Dokumentasi Pengambilan Data






SCAN
SIM ANDA


phpMyAdmin
localhost
dbparkir
topup
Browse
Structure
SQL
Search
Insert
Export
Import
Operations
Tracking
SELECT
FROM `topup`
LIMIT 0 , 30
Query results operations
Bookmark this SQL query
Activate Windows
Go to Settings to activate Windows.