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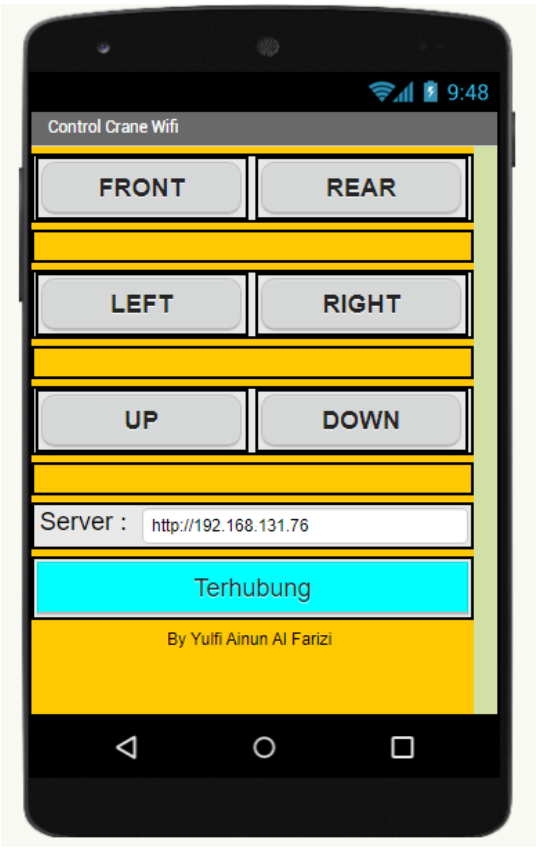
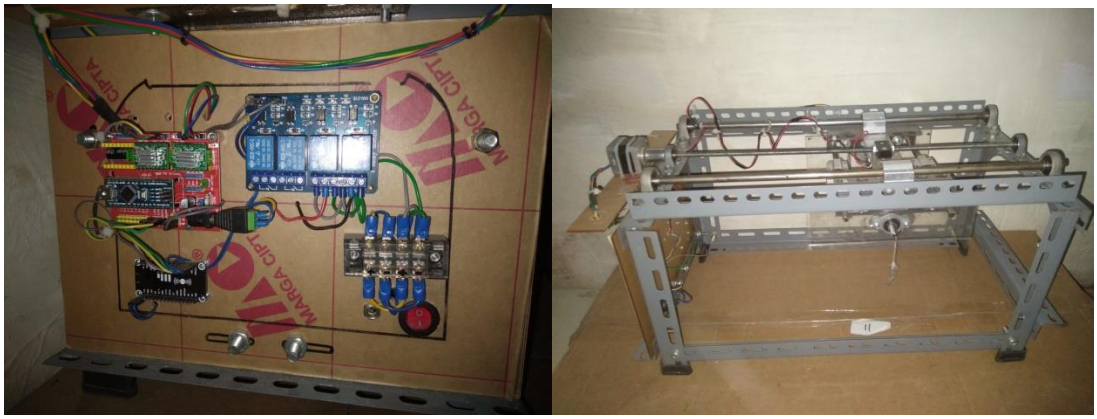
Lampiran 1 . Gambar Alat



Gambar Aplikasi



Gambar Prototipe

Lampiran 2. Koding

KODING WIFI :

```
#include <ESP8266WiFi.h>

#ifndef STASSID
#define STASSID "A02s3795"
#define STAPSK  "Riski844211"
#endif

const char* ssid = STASSID;
const char* password = STAPSK;

WiFiServer server(80);

void setup() {
  Serial.begin(115200);

//Relay
  pinMode(D0, OUTPUT);
  pinMode(D1, OUTPUT);
  pinMode(D2, OUTPUT);
  pinMode(D3, OUTPUT);
  pinMode(D4, OUTPUT);
  pinMode(D5, OUTPUT);
  digitalWrite(D0, LOW);
  digitalWrite(D1, LOW);
  digitalWrite(D2, LOW);
  digitalWrite(D3, LOW);
```

```
 digitalWrite(D4, LOW);
 digitalWrite(D5, LOW);

WiFi.mode(WIFI_STA);
WiFi.begin(ssid, password);

 while (WiFi.status() != WL_CONNECTED) {
   delay(500);
   Serial.print(F("."));
 }
 Serial.println();
 Serial.println(F("WiFi connected"));

 // Start the server
 server.begin();
 Serial.println(F("Server started"));

 // Print the IP address
 Serial.println(WiFi.localIP());
}

void loop() {
 // Check if a client has connected
 WiFiClient client = server.available();
 if (!client) {
   return;
 }


 client.setTimeout(5000); // default is 1000
```

```
 // Read the first line of the request
  String req = client.readStringUntil('\r');
//  Serial.println(F("request: "));
  //Serial.println(req);

  while (client.available()) {
    client.read();
  }


  client.print(F("HTTP/1.1 200 OK\r\nContent-Type: text/html\r\n\r\n"));

  //CRANE MAJU//X
  if (req == "GET /MAJU HTTP/1.1"){
    digitalWrite(D2, HIGH);
    delay(1000);
    digitalWrite(D2, LOW);
  }

  //CRANE MUNDUR//X
  if (req == "GET /MUNDUR HTTP/1.1"){
    digitalWrite(D3, HIGH);
    delay(1000);
    digitalWrite(D3, LOW);
  }

  //CRANE KANAN//Y
  if (req == "GET /KANAN HTTP/1.1"){
    digitalWrite(D4, HIGH);
```

```
  delay(1000);
  digitalWrite(D4, LOW);
 }

 //CRANE KIRI//Y
 if (req == "GET /KIRI HTTP/1.1"){
  digitalWrite(D5, HIGH);
  delay(1000);
  digitalWrite(D5, LOW);
 }

 //CRANE ATAS
 if (req == "GET /ATAS HTTP/1.1"){
  digitalWrite(D0, HIGH);
  delay(200);
  digitalWrite(D0, LOW);
 }

 //CRANE BAWAH
 if (req == "GET /BAWAH HTTP/1.1"){
  digitalWrite(D1, HIGH);
  delay(200);
  digitalWrite(D1, LOW);
 }
}
```

KODING ARDUINO NANO :

```
#define pinEN    8
```

```
#define stepPinX 5
#define stepPinY 6
#define stepPinZ 7

#define dirPinX  2
#define dirPinY  3
#define dirPinZ  4

void MAJU(){
  digitalWrite(dirPinY, LOW);

  for (int x = 0; x < 600; x++)
  {
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(10);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(10);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(10);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(10);
    digitalWrite(stepPinY, LOW);
```

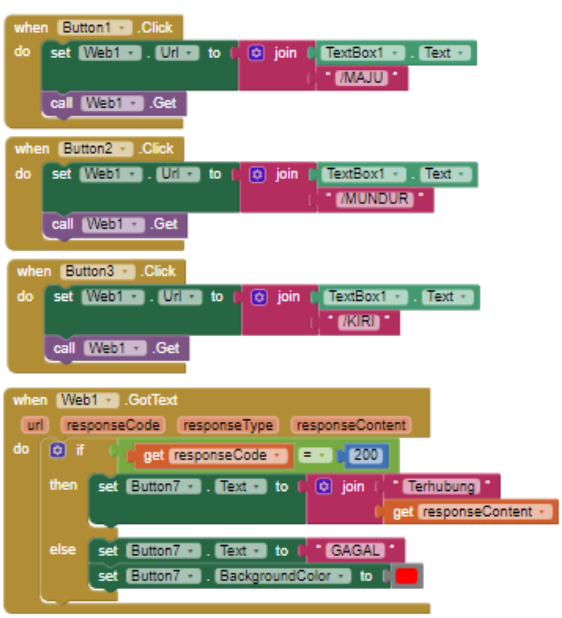
```
    delayMicroseconds(20000);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(10);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(10);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(10);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(10);
  }
  delay(100);
}

void MUNDUR(){
  //Balik Arah
   digitalWrite(dirPinY, HIGH);

  for (int x = 0; x < 600; x++)
  {
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(10);
    digitalWrite(stepPinY, HIGH);
```

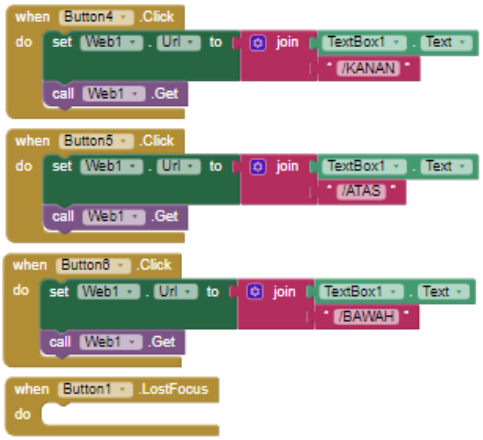
```
    delayMicroseconds(20000);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(10);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(10);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(10);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(10);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(10);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(10);
    digitalWrite(stepPinY, HIGH);
    delayMicroseconds(20000);
    digitalWrite(stepPinY, LOW);
    delayMicroseconds(10);
}
delay(100);
}
```

```
void KANAN(){
  digitalWrite(dirPinX, LOW);

  for (int x = 0; x < 200; x++)
  {
    digitalWrite(stepPinX, LOW);
    delayMicroseconds(20000);
    digitalWrite(stepPinX, HIGH);
    delayMicroseconds(1000);
  }
delay(100);
}

void KIRI(){
  //Balik Arah
  digitalWrite(dirPinX, HIGH);

  for (int x = 0; x < 200; x++)
  {
    digitalWrite(stepPinX, HIGH);
    delayMicroseconds(20000);
    digitalWrite(stepPinX, LOW);
    delayMicroseconds(1000);
}
delay(100);
}
void setup() {
  Serial.begin(115200);
  pinMode(stepPinX , OUTPUT);
```

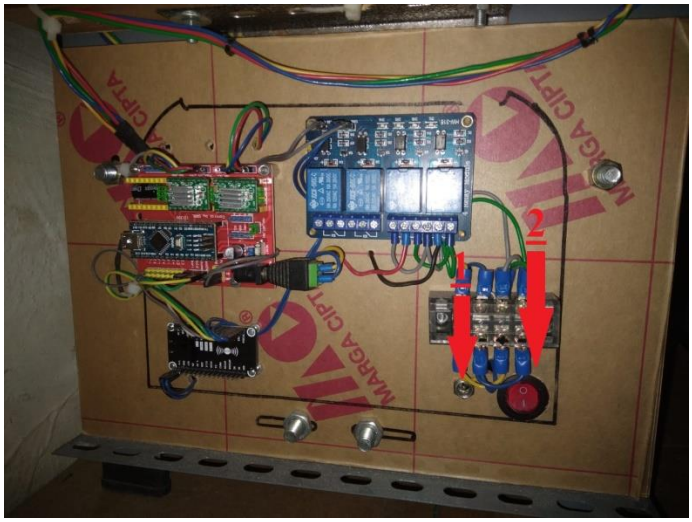
```
  pinMode(stepPinY , OUTPUT);

  pinMode(dirPinX , OUTPUT);
  pinMode(dirPinY , OUTPUT);

  pinMode(pinEN , OUTPUT);
  digitalWrite(pinEN, LOW); // Aktifkan Driver, jika ingin non-aktifkan driver, set to
HIGH
}

void loop() {
  int val1 = digitalRead(A3);
  int val2 = digitalRead(A2);
  int val3 = digitalRead(A1);
  int val4 = digitalRead(A0);

  if (val1 == HIGH){
    MAJU();
  }
  if (val2 == HIGH){
    MUNDUR();
  }
  if (val3 == HIGH){
    KANAN();
  }
  if (val4 == HIGH){
    KIRI();
  }

  }
```

KODING APLIKASI :





Lampiran 3. SOP



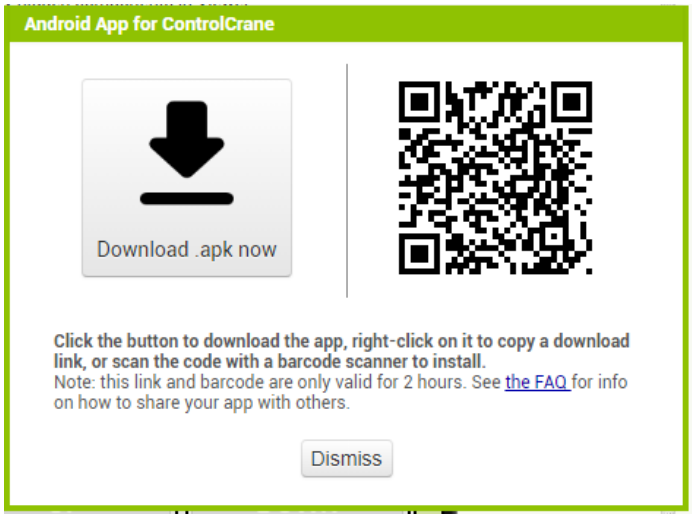
1. Pasang Power Supply / adaptor 12 V di No.1 pada gambar di atas.
2. Tekan saklar power (No.2) untuk menghidupkan alat

3. 

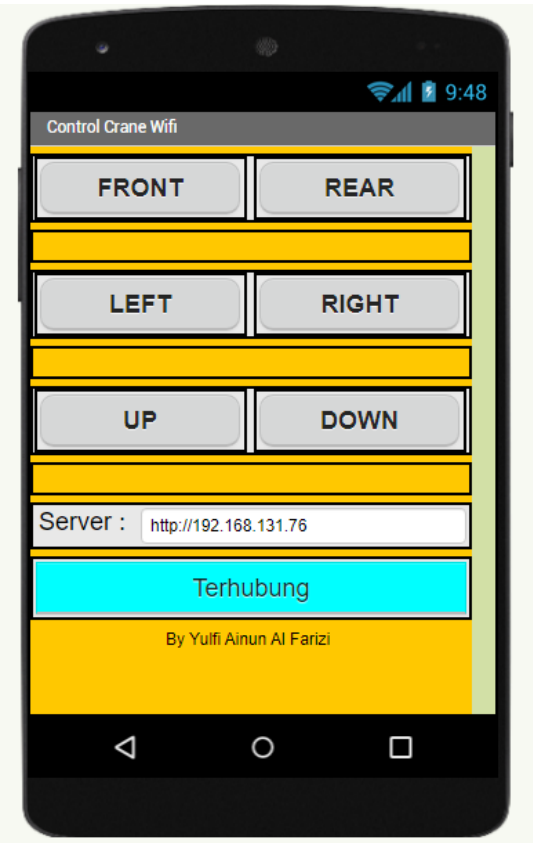
Koneksikan Android dengan wifi

4. Buka Aplikasi Crane Control

   Aplikasi bias di download di :



   Tampilan Aplikasi :



5. Aplikasi Siap untuk di Operasikan