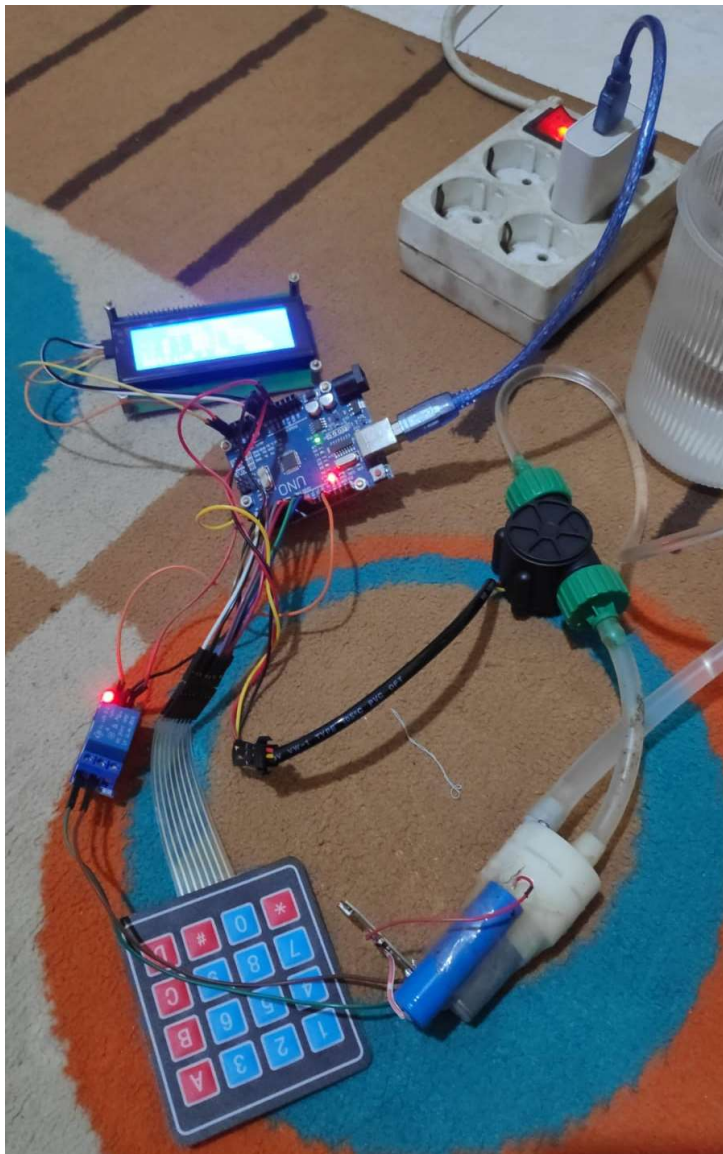


LAMPIRAN

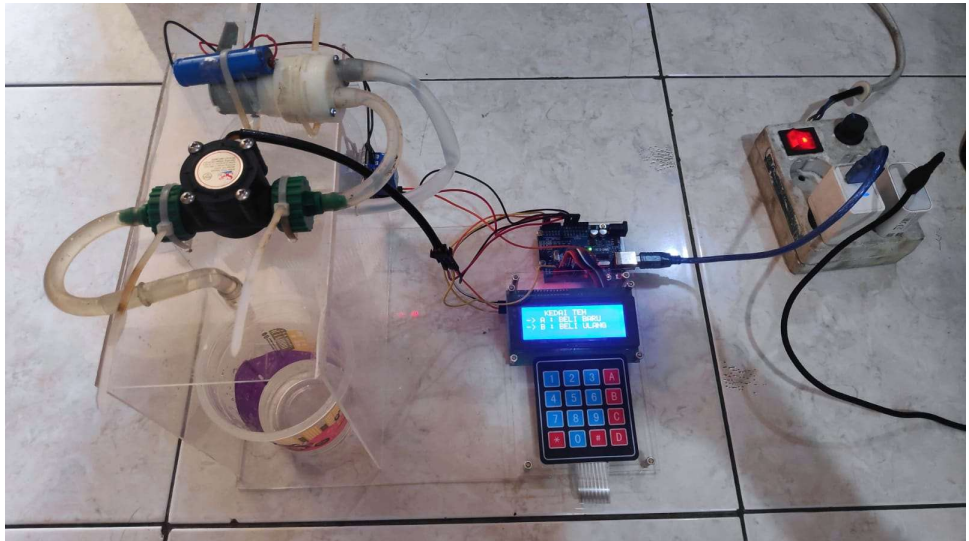
LAMPIRAN

Lampiran A. Dokumentasi Penelitian

Lampiran A.1 Dokumentasi Penelitian



Lampiran A.2 Dokumentasi Penelitian



Lampiran B. Code Arduino

Lampiran B.1 Code Arduino

```
13-5-23 §                               13-5-23 §
#include <Keypad.h>                        Serial.begin(9600);

#include <LiquidCrystal_I2C.h>            delay(1000);
LiquidCrystal_I2C lcd(0x27, 20, 4);      }

int relay = 13;

char customKey;
const byte ROWS = 4;
const byte COLS = 4;
long limit;
int id;
long beli;
long beli1;
char keys[ROWS][COLS] = {
  {'1', '2', '3', 'A'},
  {'4', '5', '6', 'B'},
  {'7', '8', '9', 'C'},
  {'*', '0', '#', 'D'}

void loop()
{
  lcd.setCursor(0,0);
  lcd.print("    KEDAI TEH    ");
  lcd.setCursor(0,1);
  lcd.print("-> A : BELI BARU    ");
  lcd.setCursor(0,2);
  lcd.print("-> B : BELI ULANG  ");

  customKey = customKeypad.getKey();

  if(customKey == 'A'){
    pulseCount      = 0;

13-5-23 §                               13-5-23 §
};
byte rowPins[ROWS] = {3,4,5,6}; //pin row keypad
byte colPins[COLS] = {7,8,9,10}; //pin column keypad

Keypad customKeypad = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS);

byte sensorInterrupt = 0; // 0 = digital pin 2
byte sensorPin      = 2;

float calibrationFactor = 15; // faktor pembagi untuk menyesuaikan kalibrasi
// sensor aliran air

volatile byte pulseCount;

unsigned int frac;
float flowRate;
unsigned int flowMilliLitres;
int totalMilliLitres;

unsigned long oldTime;

void setup()
{
  pinMode(relay, OUTPUT);
  digitalWrite(relay, HIGH);

  pinMode(sensorPin, INPUT);
  digitalWrite(sensorPin, LOW);

  pulseCount      = 0;
  flowRate        = 0.0;
  flowMilliLitres = 0;
  totalMilliLitres = 0;
  oldTime        = 0;

  attachInterrupt(sensorInterrupt, pulseCounter, FALLING);

  lcd.init(); //set inisiasi lcd i2c
  lcd.backlight();
  lcd.noCursor(); //biar gak ada cursor di lcd
  lcd.clear();
```

Lampiran B.2 Code Arduino

```

5-23$
if(customKey == 'A'){
pulseCount      = 0;
flowRate        = 0.0;
flowMilliLitres = 0;
totalMilliLitres = 0;
oldTime         = 0;

lcd.clear();
lcd.setCursor(0,0);
lcd.print("Loading...");
delay(2000);
lcd.clear();

lcd.clear();
beli = 0;
beli1 = 0;
bayar();
digitalWrite(relay, HIGH);
mulaiisi();
}

13-5-23$
if(customKey == 'B'){
pulseCount      = 0;
flowRate        = 0.0;
flowMilliLitres = 0;
totalMilliLitres = 0;
oldTime         = 0;
lcd.clear();
digitalWrite(relay, HIGH);
mulaiisi();
}

void bayar(){
lcd.setCursor(0,0);
lcd.print("Mau Beli Berapa...");
lcd.setCursor(0,3);
lcd.print("lalu tekan 'D' ");
customKey = customKeypad.getKey();
}

i:23$
if(customKey >= '0' && customKey <= '9')
{
beli = beli * 10 + (customKey - '0');
lcd.setCursor(0,1);
lcd.print("Rp. ");
lcd.print(beli);

beli1 = beli * 0.1 ;
lcd.setCursor(0,2);
lcd.print(beli1);
lcd.print(" mL");
}

if(customKey == 'C'){
lcd.clear();
delay(200);
beli = 0;
}

13-5-23$
if(customKey == 'D'){
lcd.clear();
delay(200);
limit = limit - beli;

limit = 50000;

if(limit >= 0){
Serial.println(beli1);
delay(100);
lcd.setCursor(0,0);
lcd.print("BERHASIL");
lcd.setCursor(0,1);
lcd.print("Rp. ");
lcd.print(beli);
lcd.setCursor(0,2);
lcd.print(beli1);
lcd.print(" mL");
lcd.setCursor(0,3);
lcd.print("Loading...");
delay(3000);
}

13-5-23$
lcd.clear();
return;
}

bayar();
}

void mulaiisi(){
lcd.setCursor(0,0);
lcd.print("Setting : ");
lcd.print(beli1);
lcd.print(" mL ");

delay(100);

if((millis() - oldTime) > 1000)
{

```

Lampiran B.3 Code Arduino

5-23 §

```
detachInterrupt(sensorInterrupt);
flowRate = ((1000.0 / (millis() - oldTime)) * pulseCount) / calibrationFactor;
oldTime = millis();
flowMilliLitres = (flowRate / 60) * 1000;
totalMilliLitres += flowMilliLitres;
//dikali 10 untuk memberikan tempat untuk bilangan desimal.
frac = (flowRate - int(flowRate)) * 10;

lcd.setCursor(0,1);
lcd.print("Spd Flow: ");      // kecepatan aliran
lcd.print(flowMilliLitres);
lcd.print(" mL/Sec  ");

lcd.setCursor(0,2);
lcd.print("ISI      : ");      // total air yang akan diisi
lcd.print(totalMilliLitres);
lcd.print(" mL    ");

lcd.setCursor(0,3);
lcd.print("Setting : ");
```

13-5-23 §

```
    lcd.print("Rp. ");
    lcd.print(beli);
//reset pembacaan sensor untuk memulai pengisian baru
    pulseCount = 0;
//menambahkan interupsi ketika pengiriman sudah sesuai untuk mematikan pompa
    attachInterrupt(sensorInterrupt, pulseCounter, FALLING);

    if(totalMilliLitres < beli){
        delay(1000);
        digitalWrite(relay, LOW);
    }

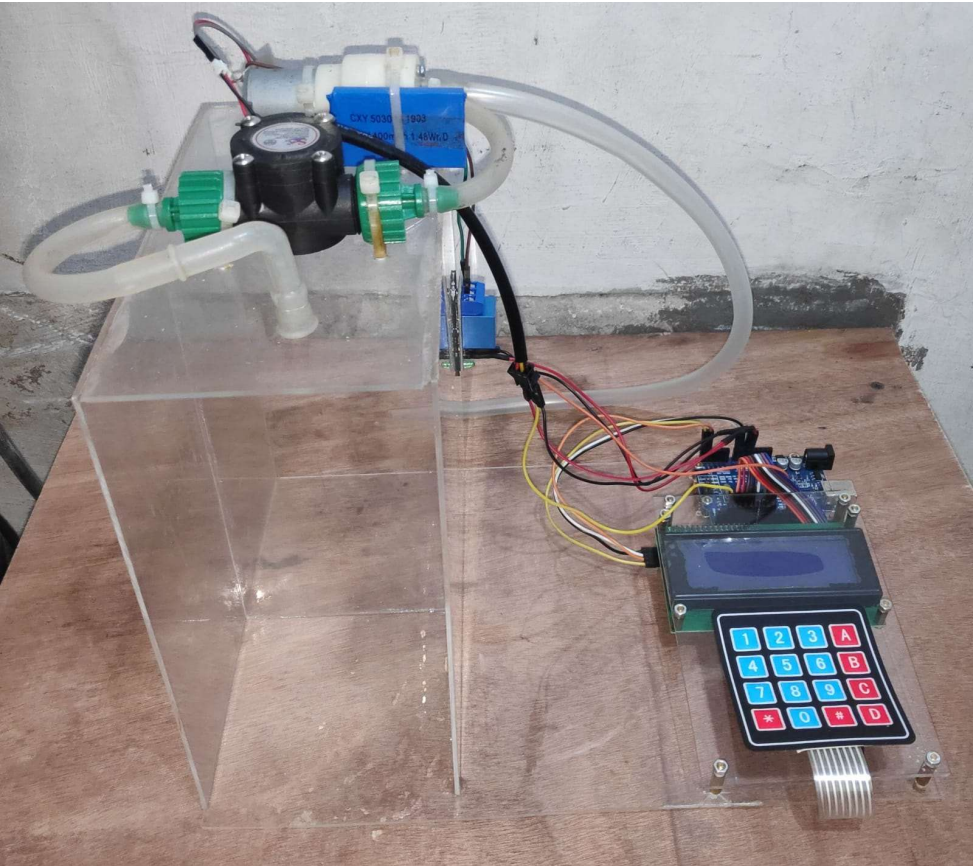
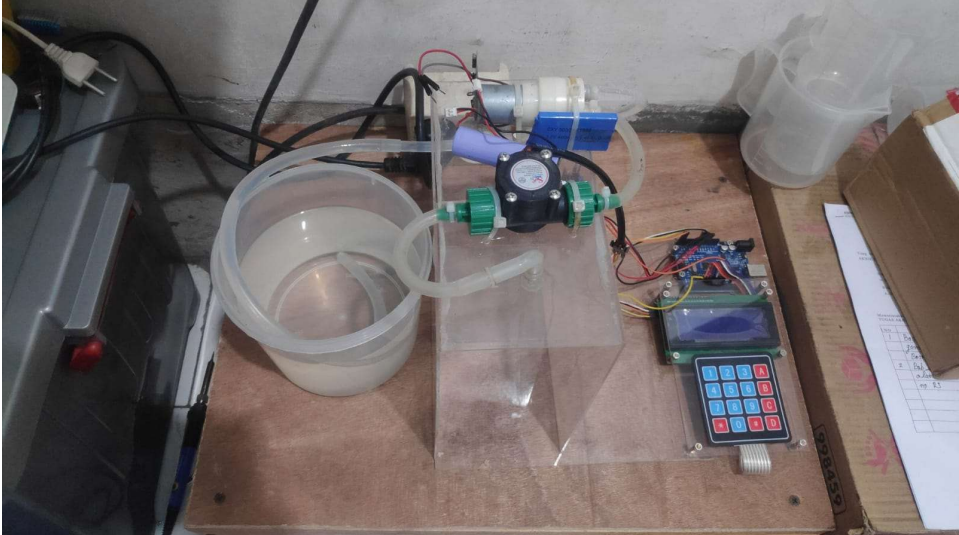
    if(totalMilliLitres >= beli){

        digitalWrite(relay, HIGH);

        delay(1000);

        return;
    }
}
```

Lampiran C. Bentuk Akhir Mesin Pompa Digital



Lampiran D. Surat Rekomendasi TA

FAKULTAS TEKNIK – PRODI TEKNIK ELEKTRO
UNIVERSITAS 17 AGUSTUS 1945 SURABAYA

REKOMENDASI SEMINAR / TUGAS AKHIR

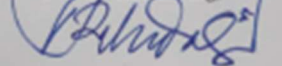
Yang bertanda tangan di bawah ini Dosen Pembimbing dari Mahasiswa :

N a m a : Ronald Milano
N. B. I. : 1451900030
Bidang Studi : Teknik Elektro
Judul TA : RANCANG BANGUN MESIN POMPA CAIRAN DIGITAL UNTUK
UMKM KEDAI THE DENGAN ARDUINO UNO R3 CH340

Menerangkan bahwa Mahasiswa yang bersangkutan mengambil SEMINAR / TUGAS AKHIR dibawah bimbingan saya, untuk itu saya sebagai Dosen Pembimbing / Co. Pembimbing menyetujui mahasiswa tersebut dan dapat diberikan kesempatan menempuh SEMINAR dan UJIAN TUGAS AKHIR Semester GENAP 2022 / 2023 yang akan dilaksanakan pada tanggal :

Surabaya, 23 Mei 2023

Mengetahui / Menyetujui,
Dosen Pembimbing,



Ir. H.M. Balok Hariadi, Msc.
NPP. 20450.89.0184

Nomor HP yang bisa di hubungi : 0895-6200-59591

“Halaman Ini Sengaja Dikosongkan”