REPUBLIK INDONESIA
KEMENTERIAN HUKUM DAN HAK ASASI MANUSIA

SURAT PENCATATAN CIPTAAN

Dalam rangka pelindungan ciptaan di bidang ilmu pengetahuan, seni dan sastra berdasarkan Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta, dengan ini menerangkan:

Nomor dan tanggal permohonan	:	EC00201858743, 12 Desember 2018
Pencipta		
Nama	:	**Yohandri**
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Alamat	:	Kampus UNP Air Tawar, Jl. Prof. Dr. Hamka, Padang, Sumatera Barat, 25131
Kewarganegaraan	:	Indonesia
Jenis Ciptaan	:	**Program Komputer**
Judul Ciptaan	:	**Kode Program Alat Dip Coating Berbasis Arduino**
Tanggal dan tempat diumumkan untuk pertama kali di wilayah Indonesia atau di luar wilayah Indonesia	:	15 September 2018, di Padang
Jangka waktu pelindungan	:	Berlaku selama 50 (lima puluh) tahun sejak Ciptaan tersebut pertama kali dilakukan Pengumuman.
Nomor pencatatan	:	000128273

adalah benar berdasarkan keterangan yang diberikan oleh Pemohon.
Surat Pencatatan Hak Cipta atau produk Hak terkait ini sesuai dengan Pasal 72 Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta.

a.n. MENTERI HUKUM DAN HAK ASASI MANUSIA
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PROGRAM KOMPUTER

Kode Program Alat Dip Coating Berbasis Arduino

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JURUSAN FISIKA FMIPA UNP

UNIVERSITAS NEGERI PADANG

Desember 2018

PROGRAM KOMPUTER DIP COATING
By YOHANDRI Universitas Negeri Padang

```
//DipCoating Program V1.0
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27,20,4);  // set the LCD address to 0x27 for a 16 chars and 2 line display
#include <Keypad.h>//header for keypad commands enabling
const byte ROWS = 4; // Four rows
const byte COLS = 4; // Four columns
int laju=128;
int j=14;
int i=0;
int turun,aaa = 0;
int muka=0;
int Timer=0;
int naik,bbb=0;
int PUL=10; //define Pulse pin
int DIR=11; //define Direction pin

// Define the Keymap for Keypad
char keys[ROWS][COLS] = {
  {'1', '2', '3', 'A'},
  {'4', '5', '6', 'B'},
  {'7', '8', '9', 'C'},
  {'*', '0', '#', 'D'}
};

// Connect keypad ROW0, ROW1, ROW2 and ROW3 to these Arduino pins.
byte rowPins[ROWS] = {2, 3, 4, 5};
// Connect keypad COL0, COL1 and COL2 to these Arduino pins.
byte colPins[COLS] = {6, 7, 8, 9};
//  Create the Keypad
Keypad angka = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS );

void setup()
{
    // put your setup code here, to run once:
//lcd.begin(20,4);
//lcd.backlight();
//lcd.clear();
  // Set the outputs for Stepper motor
 pinMode (PUL, OUTPUT);
 pinMode (DIR, OUTPUT);
 digitalWrite(PUL,LOW);
 digitalWrite(DIR,LOW);

  lcd.init();                    // initialize the lcd
  // Print a message to the LCD.
  lcd.backlight();
  lcd.setCursor(5,0);
  lcd.print("DIP COATING");
  lcd.setCursor(2,1);
```

```
  lcd.print("dalko scientific");
   lcd.setCursor(7,2);
  lcd.print("DS-DC01");
   lcd.setCursor(1,3);
  lcd.print("******************");
  delay(3000);
  rumah();
}


void loop ()
{
  lcd.clear();
  masukan();
  kec_turun();

}
void selesai(){
    lcd.clear();
    lcd.setCursor(4,1);
    lcd.print("COATING DONE");
    delay(1000);
}

//=====================================
void masukan() // Masukan nilai parameter
{

  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("   *** INPUT ***   ");

  lcd.setCursor(0,1);
  lcd.print("Speed Down  :");
  lcd.setCursor(16,1);
  lcd.print("mm/s");
  lcd.setCursor(13,1);
  turun = GetNumber();

  lcd.setCursor(0,2);
  lcd.print("Dyeing Time :");
  lcd.setCursor(16,2);
  lcd.print("s");
  lcd.setCursor(13,2);
  Timer = GetNumber();

  lcd.setCursor(0,3);
  lcd.print("Speed Up    :");
  lcd.setCursor(16,3);
  lcd.print("mm/s");
  lcd.setCursor(13,3);
  naik = GetNumber();
```

```
}

int GetNumber()
{
  int num = 0;
  char key = angka.getKey();
  while(key != '#')
  {
    switch (key)
    {
      case NO_KEY:
        break;
      case '0': case '1': case '2': case '3': case '4':
      case '5': case '6': case '7': case '8': case '9':
        lcd.print(key);
        num = num * 10 + (key - '0');
        break;

      case '*':
        //lcd.setCursor(13,1);
       //  lcd.print("   ");
        // lcd.print(num);
        break;
    }
    key = angka.getKey();
  }

  return num;

}
//=======================Panah turun

byte pturun0Char[8] = {
 B11111,
 B11111,
 B11111,
 B11111,
 B11111,
 B11111,
 B11111,
 B11111
};

byte pturun1Char[8] = {
 B11111,
 B01111,
 B00111,
 B00011,
 B00001,
 B00000,
 B00000,
 B00000
};
```

```
byte pturun2Char[8] = {
  B11111,
  B11111,
  B11111,
  B11111,
  B11111,
  B11111,
  B01110,
  B00100
};

byte pturun3Char[8] = {
  B11111,
  B11110,
  B11100,
  B11000,
  B10000,
  B00000,
  B00000,
  B00000
};

byte pnaik0Char[8] = {
  B11111,
  B11111,
  B11111,
  B11111,
  B11111,
  B11111,
  B11111,
  B11111
};

byte pnaik1Char[8] = {
  B00000,
  B00000,
  B00000,
  B00001,
  B00011,
  B00111,
  B01111,
  B11111
};
byte pnaik2Char[8] = {
  B00100,
  B01110,
  B11111,
  B11111,
  B11111,
  B11111,
  B11111,
  B11111
};
```

```
byte pnaik3Char[8] = {
  B00000,
  B00000,
  B00000,
  B10000,
  B11000,
  B11100,
  B11110,
  B11111
};
//=============================================
// Function for right rotation of the motor
void kec_turun()
{
  lcd.clear();
  lcd.setCursor(5,1);
  lcd.print("MOVING DOWN");
  lcd.createChar(3, pturun0Char);
  lcd.setCursor(10, 2);
  lcd.write(byte(3));
  lcd.createChar(0, pturun1Char);
  lcd.setCursor(9, 3);
  lcd.write(byte(0));
  lcd.createChar(1, pturun2Char);
  lcd.setCursor(10, 3);
  lcd.write(byte(1));
  lcd.createChar(2, pturun3Char);
  lcd.setCursor(11, 3);
  lcd.write(byte(2));

  digitalWrite(DIR,HIGH);
  laju=128;
  while (1)
  {
   int homebutton=digitalRead(13);
  if (homebutton== LOW)
  {
    j=14;
    laju=0;
    turun=0;
    waktu_rendam();
  }

    if (turun == 2){
      aaa=60;
    }
    else if(turun == 10){
      aaa=8;
    }
    else if (turun == 6){
      aaa=18;
    }
```

```
    else if (turun == 4){
      aaa=30;
    }
    else if (turun == 8){
      aaa=13;
    }
    for (int i=0;i<laju;i++)
{
  digitalWrite(PUL,HIGH);
    delayMicroseconds(aaa);
    digitalWrite(PUL,LOW);
    delayMicroseconds(aaa);
  }

  }
}


//=============================================
void waktu_rendam()
{

  lcd.clear();
  lcd.setCursor(4,1);
  lcd.print("DYEING    S");
  while (Timer>0)
  {
    Timer--;
    delay(1000);
    lcd.clear();
    lcd.setCursor(4,1);
    lcd.print("DYEING    S");
    lcd.setCursor(12,1);
    lcd.print(Timer);
  //  Serial.println(Timer);
  }
  if (Timer==0)
  {
    lcd.clear();
    lcd.setCursor(4,1);
    lcd.print("DYEING  DONE");
    delay(1000);

    kec_naik();
  }
}

//=============================================
void kec_naik()
{
   lcd.clear();
  lcd.setCursor(6,2);
  lcd.print("MOVING UP");
```

```
  lcd.createChar(3, pnaik0Char);
  lcd.setCursor(10, 1);
  lcd.write(byte(3));
  lcd.createChar(0, pnaik1Char);
  lcd.setCursor(9, 0);
  lcd.write(byte(0));
  lcd.createChar(1, pnaik2Char);
  lcd.setCursor(10, 0);
  lcd.write(byte(1));
  lcd.createChar(2, pnaik3Char);
  lcd.setCursor(11, 0);
  lcd.write(byte(2));

  digitalWrite(DIR,LOW);
  laju=128;
  while (1)
  {

  int homebutton=digitalRead(12);
  if (homebutton== LOW)
  {
    j=14;
    laju=0;
    naik=0;
    selesai();
  }

      if (naik == 2){
      bbb=60;
    }
    else if(naik == 10){
      bbb=8;
    }
    else if (naik == 6){
      bbb=18;
    }
    else if (naik == 8){
      bbb=13;
    }
    else if (naik == 4) {
      bbb=30;
    }
    for (int i=0;i<laju;i++)

{
  digitalWrite(PUL,HIGH);
    delayMicroseconds(bbb);
    digitalWrite(PUL,LOW);
    delayMicroseconds(bbb);
  }

  }
}
```

```
void rumah()
{
  lcd.clear();
  lcd.setCursor(5,2);
  lcd.print("MOVING HOME");
  lcd.createChar(3, pnaik0Char);
  lcd.setCursor(10, 1);
  lcd.write(byte(3));
  lcd.createChar(0, pnaik1Char);
  lcd.setCursor(9, 0);
  lcd.write(byte(0));
  lcd.createChar(1, pnaik2Char);
  lcd.setCursor(10, 0);
  lcd.write(byte(1));
  lcd.createChar(2, pnaik3Char);
  lcd.setCursor(11, 0);
  lcd.write(byte(2));

  digitalWrite(DIR,LOW);
  laju=128;
  while (1)
  {
  int homebutton=digitalRead(12);
  if (homebutton== LOW)
  {
    j=14;
    laju=0;
    naik=0;
    loop();
    }
  else
{
  bbb=18;
  digitalWrite(PUL,HIGH);
    delayMicroseconds(bbb);
    digitalWrite(PUL,LOW);
    delayMicroseconds(bbb);
  }
  }

}
```