DAFTAR PUSTAKA

Anita Dwi Septiani (2015), Perancangan Alat Pemantau Kondisi Kesehatan Manusia, Jurusan Teknik Elektro, Fakultas Teknik, Universitas Negeri Semarang.

Ashifa Shan Stevania (2019), Alat Pengukur dan Pencatat Suhu Tubuh Manusia Berbasis Arduino Mega 2560 dengan SMS *Gateway*, Teknik Elektro, Universitas Negeri Semarang, p 67.

Gusti Arya Dinata (2017), Rancang Bangun Alat Pengukur Suhu Tubuh Manusia dengan Non-Contact Thermometer, D3 Teknik Elektromedik, Fakultas Vokasi, Universitas Muhammadiyah Yogyakarta, p10.

Huang, et al. (2020). *Clinical features of patients infected with 2019 novel coronavirus in Wuhan*, China. The Lancet, 6736(20), pp. 1-10.

Indra A Eko Prasetyo, Rikie Kartadie (2019), Sistem Keamanan Area Parkir Berbasis *Radio Frequency Identification* (RFID), Program Studi Pendidikan Teknologi Informasi, STKIP PGRI Tulungagung. 66-75.

J. Steven, D. Zebua, M. S. Suraatmadja, and A. Qurthobi (2016), "PERANCANGAN TERMOMETER DIGITAL TANPA SENTUHAN MLX90164 Infrared Temperature Sensor Arduino Uno R3," p.

Melexis Microelectronic Integrated System (2013), Data Sheet MLX90615 ISO/TS 16949 and ISO14001 Certified, www.melexis.com. (diakses tanggal 19 Agustus 2020)

N. P. Y. N, J. Pebralia, and Y. Citra (2015), "Studi Penerapan Sensor MLX90614 Sebagai Pengukur Suhu Tinggi secara Non-kontak Berbasis Arduino dan Labview," vol. 2015, no. Snips, p. 90.

Nusi, D. T., Danes, V. R., Moningka, M. E. W., Skripsi, K., Kedokteran, F., Sam, U.,Manado, R. (2012). Pengukuran Menggunakan Termometer Air Raksa Dan Termometer Digital Pada Penderita Demam, *1*, 190–196.

Reza Ervani (2019), Catatan Pembelajaran Mekatronika. Modul RTC DS3231. arduino.rezaervani.com/2019/03/02/modul-rtc-ds3231/ (diakses tanggal 25 Agustus 2020)

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Pembimbing	: ATMIASRI, ST., MT.
Periode Bimbingan	: Gasal/~~Genap~~*) Tahun 2020 / 2021
Judul Skripsi	SISTEM PEMINDAI SUHU TUBUH OTOMATIS TERINTEGRASI PRESENSI KARYAWAN SEBAGAI ANTISIPASI PENCEGAHAN PENYEBARAN COVID-19

KEGIATAN KONSULTASI / BIMBINGAN

No	Tanggal	Materi pembimbingan	Keterangan	Paraf
1	January 4, 2021	Mengubah format proposal ke laporan tugas akhir	ACC	
2	January 5, 2021	Rancangan alat yang efisien	ACC	
3	January 5, 2021	Metode analisis data pada bab 3	ACC	
4	January 11, 2021	Besaran fisis yang diukur dalam percobaan	ACC	
5	January 11, 2021	Rumus error, presisi dan akurasi alat	ACC	
6	January 16, 2021	Pengecekan penulisan laporan sesuai SOP	REVISI	
7	January 16, 2021	Daftar isi, tabel dan gambar dalam halaman yang berbeda	ACC	
8	January 17, 2021	Melengkapi isi lampiran	ACC	
9	January 18, 2021	Siap diujikan	ACC	

Dinyatakan selesai tanggal 18 January 2021

Surabaya, January 18, 2021

Mengetahui,	Pembimbing,	Mahasiswa,
Ketua Program Studi,		
AKBAR SUJIWA, S.Si., M.Si.	ATMIASRI, ST., MT.	A. RIZKY WAHYU S.

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Judul Skripsi : SISTEM PEMINDAI SUHU OTOMATIS TERINTEGRASI PRESENSI KARYAWAN SEBAGAI ANTISIPASI PENCEGAHAN PENYEBARAN COVID-19

Ujian Tanggal :

No Bab.	Tanggal	Materi Konsultasi	Keterangan Catatan	Tanda Tangan Penguji
I	9 FEB 2021	FLOWCHART	Acc	
II	9 FEB 2021	DATA ANALISIS	Acc	
III	9 FEB 2021	PENULIS AKURASI/PRESISI	Acc	
IV	9 FEB 2021	DOKPROT PUSTAKA MIN 10	Acc	
V	9 FEB 2021	FOTO LAMPIRAN	Acc	

Disetujui Dosen Penguji
Pada Tanggal, 09-02-2021

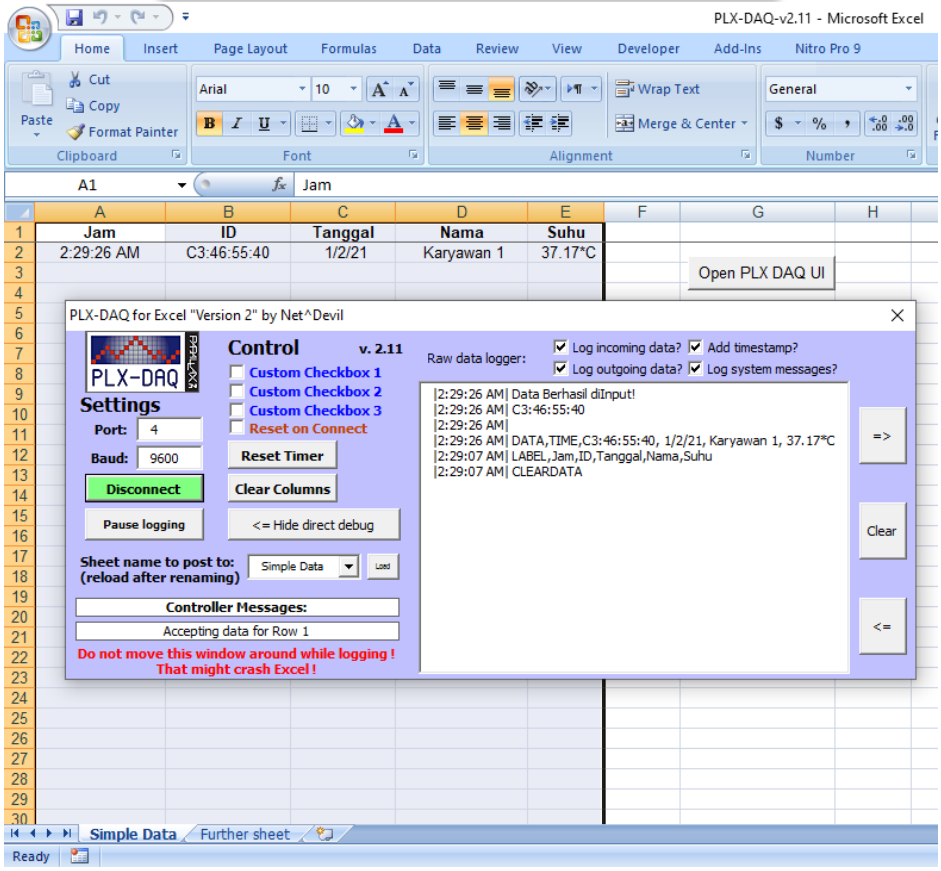
Penguji I, (_____)

Penguji II, (_____)

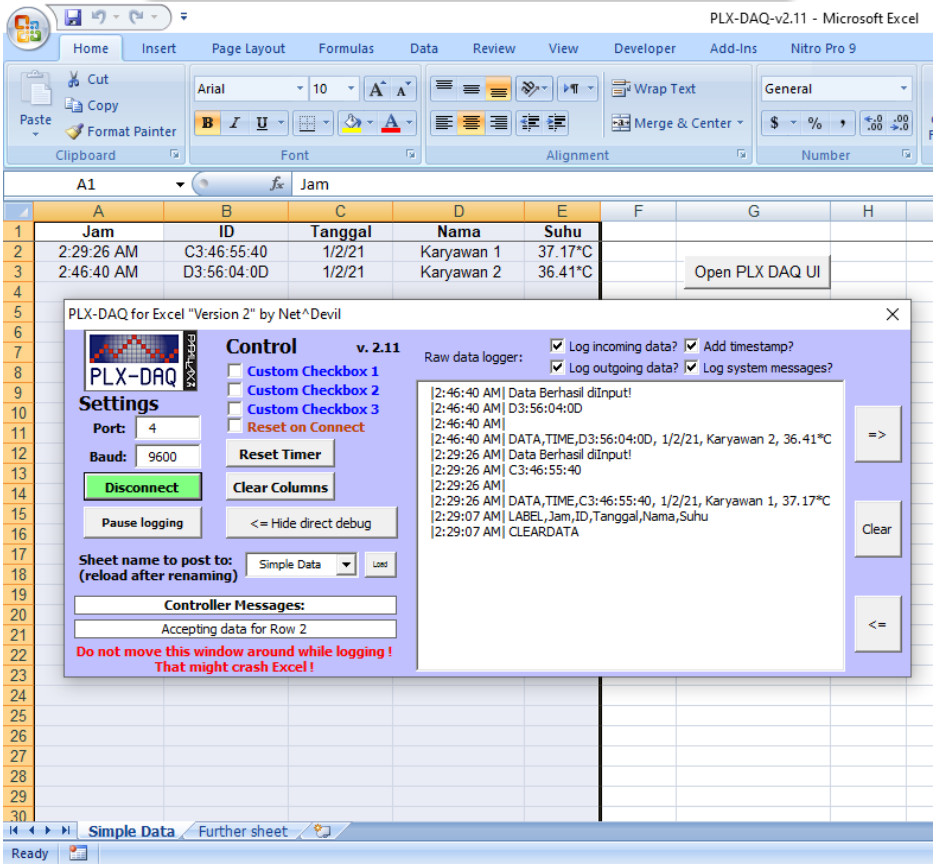
1. a. Penyelesaian Revisi paling lambat 2 minggu dari pelaksanaan Ujian Skripsi.
   b. Pengetikan, penjilidan, penandatangani Skripsi dan mengumpulkan Skrispi paling lambat 2 minggu dari revisi.
2. Apabila sampai batas waktu tersebut (point 1,a dan b) mahasiswa belum menyelesaikan revisi dan tanda tangan, maka **Ujian dinyatakan Gugur**.
3. a. Foto copy Form Revisi diserahkan ke Program Studi.
   b. Skripsi yang sudah direvisi diserahkan ke Fakultas tiga eksemplar untuk dijilid.

LAMPIRAN


Karyawan 1
Suhu : 37.17 C
Selamat Datang!
Silahkan Masuk
1


PLX-DAQ-v2.11 - Microsoft Excel
Home
Insert
Page Layout
Formulas
Data
Review
View
Developer
Add-Ins
Nitro Pro 9
Cut
Copy
Format Painter
Paste
Clipboard
Arial
10
Font
Wrap Text
Merge & Center
Alignment
General
Number
A1
Jam
Jam
ID
Tanggal
Nama
Suhu
2:29:26 AM
C3:46:55:40
1/2/21
Karyawan 1
37.17*C
Open PLX DAQ UI
PLX-DAQ for Excel "Version 2" by Net^Devil
PLX-DAQ
Control
v. 2.11
Custom Checkbox 1
Custom Checkbox 2
Custom Checkbox 3
Reset on Connect
Raw data logger:
Log incoming data?
Add timestamp?
Log outgoing data?
Log system messages?
Settings
Port:
4
Baud:
9600
Disconnect
Reset Timer
Clear Columns
Pause logging
<= Hide direct debug
Sheet name to post to:
(reload after renaming)
Simple Data
Load
Controller Messages:
Accepting data for Row 1
Do not move this window around while logging !
That might crash Excel !
|2:29:26 AM| Data Berhasil diInput!
|2:29:26 AM| C3:46:55:40
|2:29:26 AM|
|2:29:26 AM| DATA,TIME,C3:46:55:40, 1/2/21, Karyawan 1, 37.17*C
|2:29:07 AM| LABEL,Jam,ID,Tanggal,Nama,Suhu
|2:29:07 AM| CLEARDATA
=>
Clear
<=
Simple Data
Further sheet
Ready


Karyawan 2
Suhu : 36.41 C
Selamat Datang!
Silahkan Masuk
2


PLX-DAQ-v2.11 - Microsoft Excel
Home
Insert
Page Layout
Formulas
Data
Review
View
Developer
Add-Ins
Nitro Pro 9
Cut
Copy
Format Painter
Paste
Clipboard
Arial
10
Font
Wrap Text
Merge & Center
Alignment
General
Number
A1
Jam
Jam
ID
Tanggal
Nama
Suhu
2:29:26 AM
C3:46:55:40
1/2/21
Karyawan 1
37.17°C
2:46:40 AM
D3:56:04:0D
1/2/21
Karyawan 2
36.41°C
Open PLX DAQ UI
PLX-DAQ for Excel "Version 2" by Net^Devil
PLX-DAQ
Control
v. 2.11
Settings
Port:
4
Baud:
9600
Disconnect
Pause logging
Custom Checkbox 1
Custom Checkbox 2
Custom Checkbox 3
Reset on Connect
Reset Timer
Clear Columns
<= Hide direct debug
Sheet name to post to:
(reload after renaming)
Simple Data
Load
Controller Messages:
Accepting data for Row 2
Do not move this window around while logging !
That might crash Excel !
Raw data logger:
Log incoming data?
Add timestamp?
Log outgoing data?
Log system messages?
|2:46:40 AM| Data Berhasil diInput!
|2:46:40 AM| D3:56:04:0D
|2:46:40 AM|
|2:46:40 AM| DATA,TIME,D3:56:04:0D, 1/2/21, Karyawan 2, 36.41°C
|2:29:26 AM| Data Berhasil diInput!
|2:29:26 AM| C3:46:55:40
|2:29:26 AM|
|2:29:26 AM| DATA,TIME,C3:46:55:40, 1/2/21, Karyawan 1, 37.17°C
|2:29:07 AM| LABEL,Jam,ID,Tanggal,Nama,Suhu
|2:29:07 AM| CLEARDATA
=>
Clear
<=
Simple Data
Further sheet
Ready

PROGRAM SOFTWARE ARDUINO

```
#include <SPI.h>
#include <SD.h>
#include <MFRC522.h>
#include <Wire.h>
#include <DS3231.h>
#include <LiquidCrystal_I2C.h>
#include <Adafruit_MLX90614.h>
#include <Servo.h>

LiquidCrystal_I2C lcd (0x27, 20, 4);    //INISIALISASI LCD

Adafruit_MLX90614 mlx = Adafruit_MLX90614();    //INISIALISASI MLX

//INSIALISASI RFID
#define RST_PIN 5
#define SS_PIN 10
MFRC522 rfid(SS_PIN, RST_PIN);
String id;

//INISIALISASI RTC
DS3231 Clock;
bool Century=false;
bool h12;
bool PM;
byte ADay, AHour, AMinute, ASecond, ABits;
bool ADy, A12h, Apm;
byte year, month, date, DoW, hour, minute, second;

//INISIALISASI SD CARD
const int cs = 53;
File file;

float kalibrasi = 4.50;   //Nilai Kalibrasi Sensor

#define trigger 11    //Inisialisasi Relay
#define buzzer 22     //Inisialisasi Buzzer
#define freq1 850     //Frekuensi Buzzer 1
#define freq2 1000    //Frekuensi Buzzer 2
#define servo_pin 7   //Inisialisasi Pin Servo
Servo servo;

void setup() {
  // put your setup code here, to run once:
```

```
  pinMode(trigger,OUTPUT);
servo.attach(servo_pin);
  Serial.begin(9600);
    Serial.println("CLEARDATA");                    //Serial to Excel
    Serial.println("LABEL,Jam,ID,Tanggal,Nama,Suhu");   //Serial to Excel Table
(Label)
  mlx.begin();
lcd.begin(20,4);
lcd.init();
lcd.backlight();
  SPI.begin();
  rfid.PCD_Init();
  digitalWrite(trigger,LOW);
lcd.clear();
servo.write(0);


  //SETUP WAKTU
  /*
  Clock.setSecond(00);
  Clock.setMinute(9);
  Clock.setHour(13);
  Clock.setDoW(6);
  Clock.setDate(11);
  Clock.setMonth(12);
  Clock.setYear(20);
  */
}

void loop() {
  // put your main code here, to run repeatedly:
  //Mengambil data dari library RTC
  second=Clock.getSecond();
  minute=Clock.getMinute();
  hour=Clock.getHour(h12,PM);
  date=Clock.getDate();
  month=Clock.getMonth(Century);
  year=Clock.getYear();

  //Program Penampil LCD
lcd.setCursor(4,0);
  lcd.print(hour);
lcd.setCursor(7,0);
  lcd.print(":");
lcd.setCursor(9,0);
  lcd.print(minute);
```

```
lcd.setCursor(12,0);
  lcd.print(":");
lcd.setCursor(14,0);
  lcd.print(second);
lcd.setCursor(6,1);
  lcd.print(date);
lcd.setCursor(8,1);
  lcd.print("/");
lcd.setCursor(9,1);
  lcd.print(month);
lcd.setCursor(11,1);
  lcd.print("/");
lcd.setCursor(12,1);
  lcd.print(year);

lcd.setCursor(2,2);
  lcd.print("Tempelkan Kartu!");
lcd.setCursor(3,3);

tampilRfid(); //Memanggil fungsi tapilRfid
}

void tampilRfid(){
  //Program penampil ID dari kartu RFID
  if(rfid.PICC_IsNewCardPresent() && rfid.PICC_ReadCardSerial()){
    //Serial.println("ID: ");
for(int i=0; i<=3; i++){
     id=id+(rfid.uid.uidByte[i]<0x10 ? "0" : "") + String(rfid.uid.uidByte[i],HEX)
+ (i==3 ? "" : ":");
    }
id.toUpperCase();
rfid.PICC_HaltA();
   rfid.PCD_StopCrypto1();
simpanData(); //Memanggil fungsi simpanData

   //Program pembanding suhu tubuh
   if(mlx.readObjectTempC()+kalibrasi <= 37.00){   //Jika nilai suhu+kalibrasi
diatas 37.0 maka program dibawah akan dieksekusi
lcd.clear();
delay(5);
lcd.setCursor(3,0);
     lcd.print("Suhu : ");
lcd.setCursor(10,0);
     lcd.print(mlx.readObjectTempC()+kalibrasi);
lcd.setCursor(16,0);
     lcd.print("C");
```

```
lcd.setCursor(3,1);
     lcd.print("Selamat Datang!");
lcd.setCursor(3,2);
     lcd.print("Silahkan Masuk");
     tone(buzzer,freq1);          //"tone" mengatifkan suara buzzer sesuai nilai
frekuensi
delay(50);
     noTone(buzzer);
delay(50);
     tone(buzzer,freq1);
delay(50);
     noTone(buzzer);              //"noTone" mematikan suara buzzer
servo.write(90);
   }

else{   //Jika nilai suhu+kalibrasi tidak sesuai perbandingan diatas maka program
dibawah akan dieksekusi
lcd.clear();
delay(5);
lcd.setCursor(3,1);
     lcd.print("Suhu : ");
lcd.setCursor(10,1);
     lcd.print(mlx.readObjectTempC()+kalibrasi);
lcd.setCursor(16,1);
     lcd.print("C");
lcd.setCursor(4,2);
     lcd.print("Suhu Tinggi!");
     tone(buzzer,freq2);
delay(1000);
     noTone(buzzer);
   }
delay(2000);
   noTone(buzzer);
servo.write(0);
lcd.clear();
  }
}

//C3:46:55:40 Kartu 1
//D3:56:04:0D Kartu 2
//93:68:02:0D Kartu 3
//B3:23:57:0B Kartu 4
//23:C9:0F:0D Kartu 5
//73:73:06:0D Kartu 6
//09:DC:84:D5 Pin
```

```
void simpanData(){
  //PROGRAM UNTUK MENYIMPAN DATADI SD CARD DAN
MENAMPILKAN DATA DI EXCEL
  //"file.print" menyimpan data pada micro SD sesuai veriabel di dalam kurung

  digitalWrite(trigger,HIGH);     //Relay Aktif
SD.begin(cs);
  file=SD.open("absen.txt", FILE_WRITE);    //Membuat File di Micro SD
  if(file){
    file.print("ID = ");
    file.print(id);

    Serial.print("DATA,TIME,");              //Memulai Teks di Excel
    Serial.print(id); Serial.print(", ");     //Menuliskan variabel id ke excel
    Serial.print(date); Serial.print("/");    //Menuliskan variabel tanggal ke excel
    Serial.print(month); Serial.print("/");   //Menuliskan variabel bulan ke excel
    Serial.print(year); Serial.print(", ");   //Menuliskan variabel tahun ke excel
    //DATA BASE ID dan NAMA
if(id == "C3:46:55:40"){          //Program inisialisasi id menjadi nama
      file.print(", ");
      file.print("Karyawan 1");
      Serial.print("Karyawan 1");
      Serial.print(", ");
    }
if(id == "D3:56:04:0D"){          //Program inisialisasi id menjadi nama
      file.print(", ");
      file.print("Karyawan 2");
      Serial.print("Karyawan 2");
      Serial.print(", ");
    }
if(id == "93:68:02:0D"){          //Program inisialisasi id menjadi nama
      file.print(", ");
      file.print("Karyawan 3");
      Serial.print("Karyawan 3");
      Serial.print(", ");
    }
if(id == "B3:23:57:0B"){          //Program inisialisasi id menjadi nama
      file.print(", ");
      file.print("Karyawan 4");
      Serial.print("Karyawan 4");
      Serial.print(", ");
    }
if(id == "23:C9:0F:0D"){          //Program inisialisasi id menjadi nama
      file.print(", ");
      file.print("Karyawan 5");
      Serial.print("Karyawan 5");
```

```
      Serial.print(", ");
    }
if(id == "73:73:06:0D"){          //Program inisialisasi id menjadi nama
      file.print(", ");
      file.print("Karyawan 6");
      Serial.print("Karyawan 6");
      Serial.print(", ");
    }
    Serial.print(mlx.readObjectTempC()+kalibrasi); Serial.println("*C");
//Menuliskan nilai suhu ke excel
    Serial.println();             //Mengakhiri Teks di Excel

    file.print(", ");
    file.print(date); file.print("/");
    file.print(month); file.print("/");
    file.print(year); file.print(", ");
    file.print(hour); file.print(":");
    file.print(minute); file.print(":");
    file.print(second); file.print(", ");

    file.print("Suhu Tubuh = ");
    file.print(mlx.readObjectTempC()+kalibrasi);
file.println("*C");
file.println("");
    Serial.println(id);
    Serial.println("Data Berhasil diInput!");
file.close();
  }
  id="";
  digitalWrite(trigger,LOW);
  }
```

Spesifikasi Sensor IR MLX90615

7 Electrical Specification

All parameters are valid for T_A = 25 °C, V_{DD} =3V (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Supplies						
External supply	V_{DD}		2.6	3	3.4	V
Supply current	I_{DD}	No load		1.3	1.5	mA
Supply current (programming)	I_{DDpr}	No load, erase / write EEPROM operations		1.5		mA
Power-down supply current	Isleep	No load, SCL and SDA high		1.1	3	µA
Power On Reset						
POR level	V_{POR}	Power-up, power-down and brown-out	0.8	1.5	1.9	V
V_{DD} rise time	T_{POR}	Ensure POR signal			20	ms
Output valid	Tvalid	After POR		0.5		s
EEPROM						
Data retention		T_A = +85°C	10			years
Erase/write cycles		T_A = +25°C	100,000			Times
Erase/write cycles		T_A = +85°C	40,000			Times
Erase cell time	Terase			5		ms
Write cell time	Twrite			5		ms
Pulse width modulation						
PWM resolution	PWMres	Data band		10		bit
PWM output period	$PWM_{T,H,def}$	Factory default high frequency PWM, HFO factory calibrated		1.024		ms
PWM output period	$PWM_{T,L}$	Low frequency PWM, HFO factory calibrated		102.4		ms
PWM period stability	$dPWM_T$	Internal oscillator factory calibrated, over the entire operation range and supply voltage	-15		+15	%
Output low Level	PWM_{LO}	I_{sink} = 2 mA			VSS+0.2	V
Output sink current	$Isink_{PWM}$	Vout,L = 0.5V		10		mA

Table 4 Electrical specification parameters of the MLX90615

4 Glossary of Terms

PTAT	**P**roportional **T**o **A**bsolute **T**emperature sensor (package temperature)
POR	**P**ower **O**n **R**eset
HFO	**H**igh **F**requency **O**scillator (RC)
DSP	**D**igital **S**ignal **P**rocessing
FIR	**F**inite **I**mpulse **R**esponse. Digital filter
IIR	**I**nfinite **I**mpulse **R**esponse. Digital filter
IR	**I**nfra-**R**ed
DC	**D**irect **C**urrent (for settled conditions specifications)
LPF	**L**ow **P**ass **F**ilter
FOV	**F**ield **O**f **V**iew
SDA, SCL	**S**erial **DA**ta, **S**erial **CL**ock – SMBus compatible communication pins
T_A	**A**mbient **T**emperature measured from the chip – (the package temperature)
T_O	**O**bject **T**emperature, 'seen' from IR sensor
ESD	**E**lectro-**S**tatic **D**ischarge
EMC	**E**lectro-**M**agnetic **C**ompatibility
TBD	**T**o **B**e **D**efined

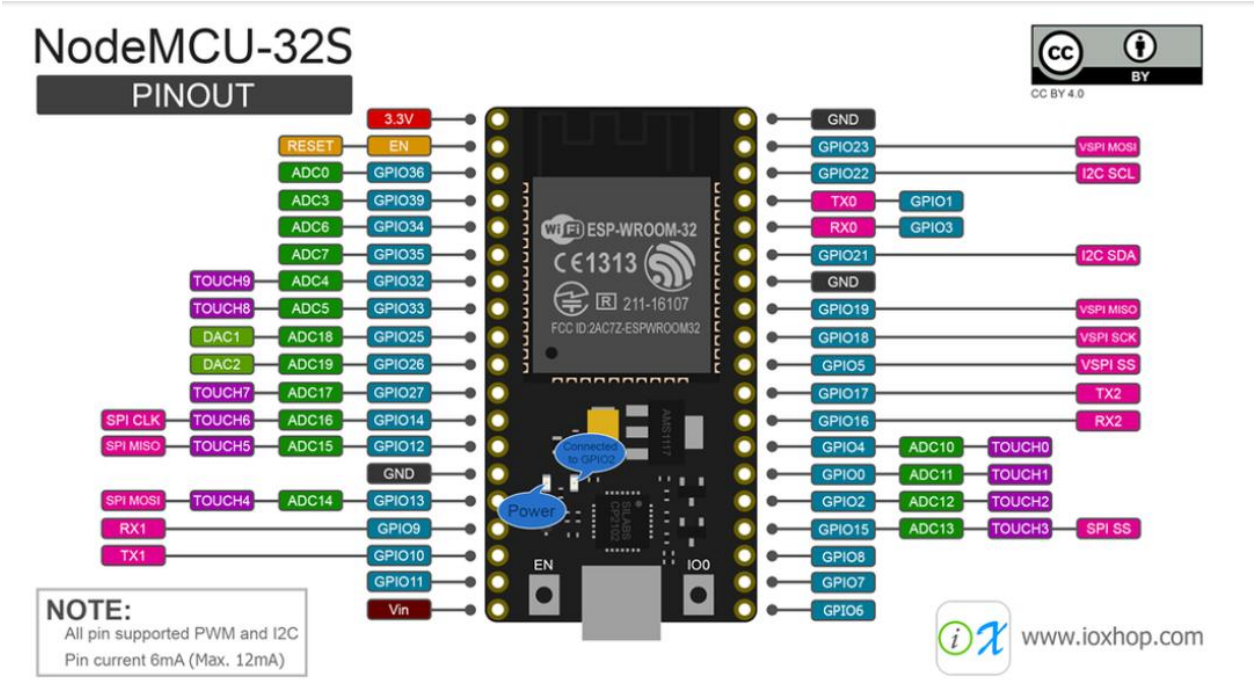
Table 1: Glossary of Terms

5 Maximum ratings

Parameter	MLX90615
Supply Voltage, V_{DD} (over voltage)	5V
Supply Voltage, V_{DD} (operating)	3.6V
Reverse Voltage	0.5 V
Operating Temperature Range, T_A	-20…+85°C
Storage Temperature Range, T_S	-20…+125°C
ESD Sensitivity (AEC Q100 002)	2kV
DC sink current, SDA pin	25 mA
DC clamp current, SDA pin	10 mA
DC clamp current, SCL pin	10 mA

Table 2: Absolute maximum ratings for MLX90615

NODEMCU ESP32S PIN DIGRAM



Source :https://www.instructables.com/ESP32-Internal-Details-and-Pinout/