LAMPIRAN

Lampiran 1

Cara Kerja Alat

1. Hubungkan kabel *micro* USB dari alat ke *power bank* .
2. Menunggu koneksi *hotspot* yang telah di konfigurasi pada program arduino IDE
3. Menunggu identifikasi seluruh sensor
4. Membuka *web thinger.io* atau aplikasi *thinger.io* yang telah didownload pada android

Lampiran 2

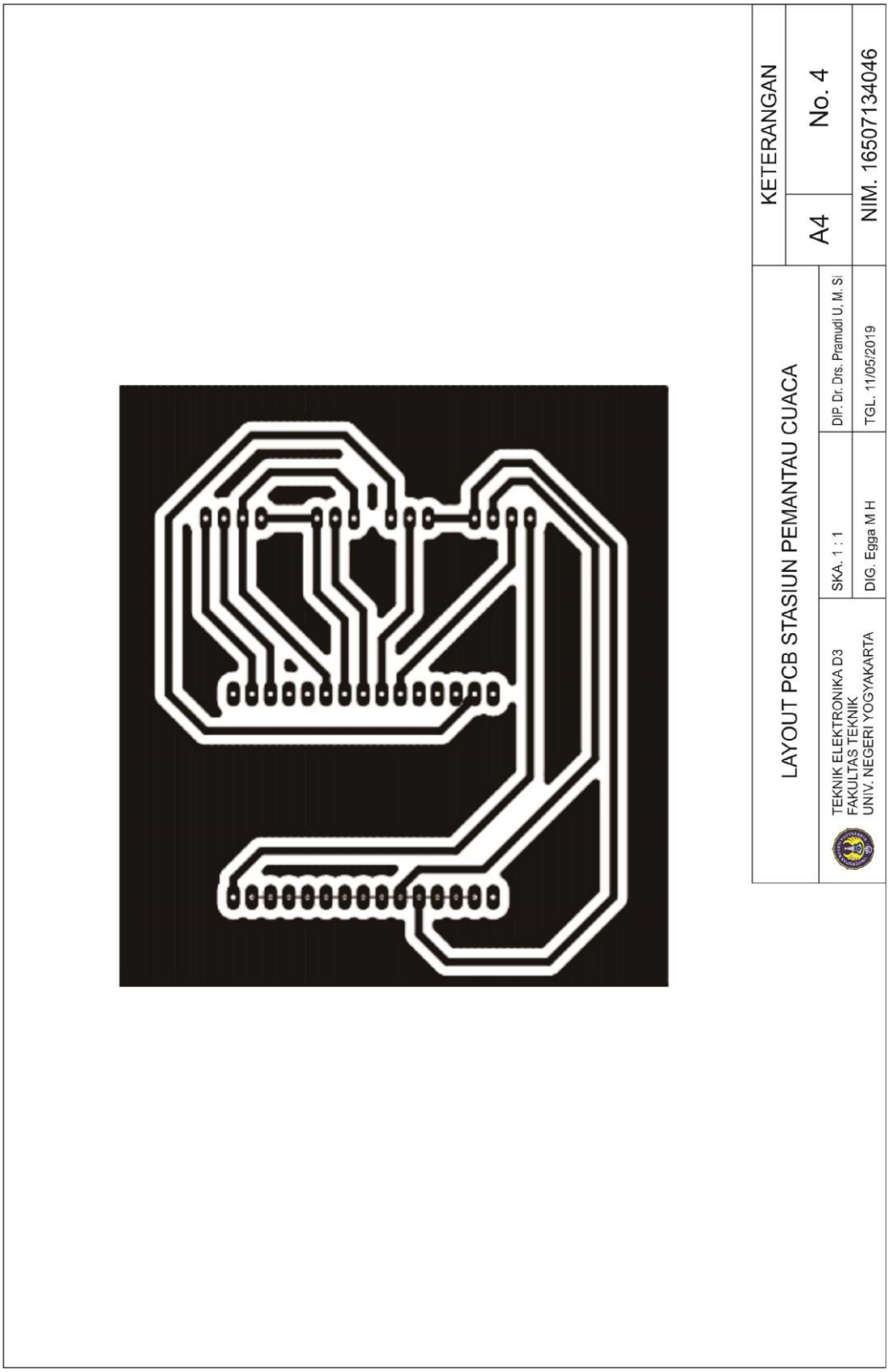
Source Code

```
#include <SPI.h>
#include <ThingerESP8266.h>
#include <DHT.h>
#include <SFE_BMP180.h>
#include <Wire.h>
#include <SFE_BMP180.h>
#define USERNAME "EMiHa"
#define DEVICE_ID "esp8266"
#define DEVICE_CREDENTIAL "HoTT0BU9LmkC"

#define DHTPIN D5 //Pin data dari DHT terhubung ke pin D5 NodeMCU
#define DHTTYPE DHT11

#define windPin D8

#define serialDebug  // commend ini jika ingin mematikan serial print
#ifdef serialDebug
  #define timeRefresh 1000 // waktu refresh serial debug dalam Ms
#endif

DHT dht(DHTPIN, DHTTYPE);

SFE_BMP180 pressure;

#define SSID "ndang lulus"
#define SSID_PASSWORD "kopengsalatiga"

float altitudeRead,PresureRead;
float baseline; // baseline pressure

// Constants definitions
const float pi = 3.14159265; // pi number
int period = 10000; // Measurement period (miliseconds)
int delaytime = 10000; // Time between samples (miliseconds)
int radio = 80; // Distance from center windmill to outer cup (mm)
int jml_celah = 18; // jumlah celah sensor

unsigned int Sample = 0;
float counter = 0;
unsigned int RPM = 0;
float speedwind = 0;
float humadity=0,temperature=0;
String weater = "UNKNOW";

uint32_t timeNow;

ThingerESP8266 thing(USERNAME, DEVICE_ID, DEVICE_CREDENTIAL);
```

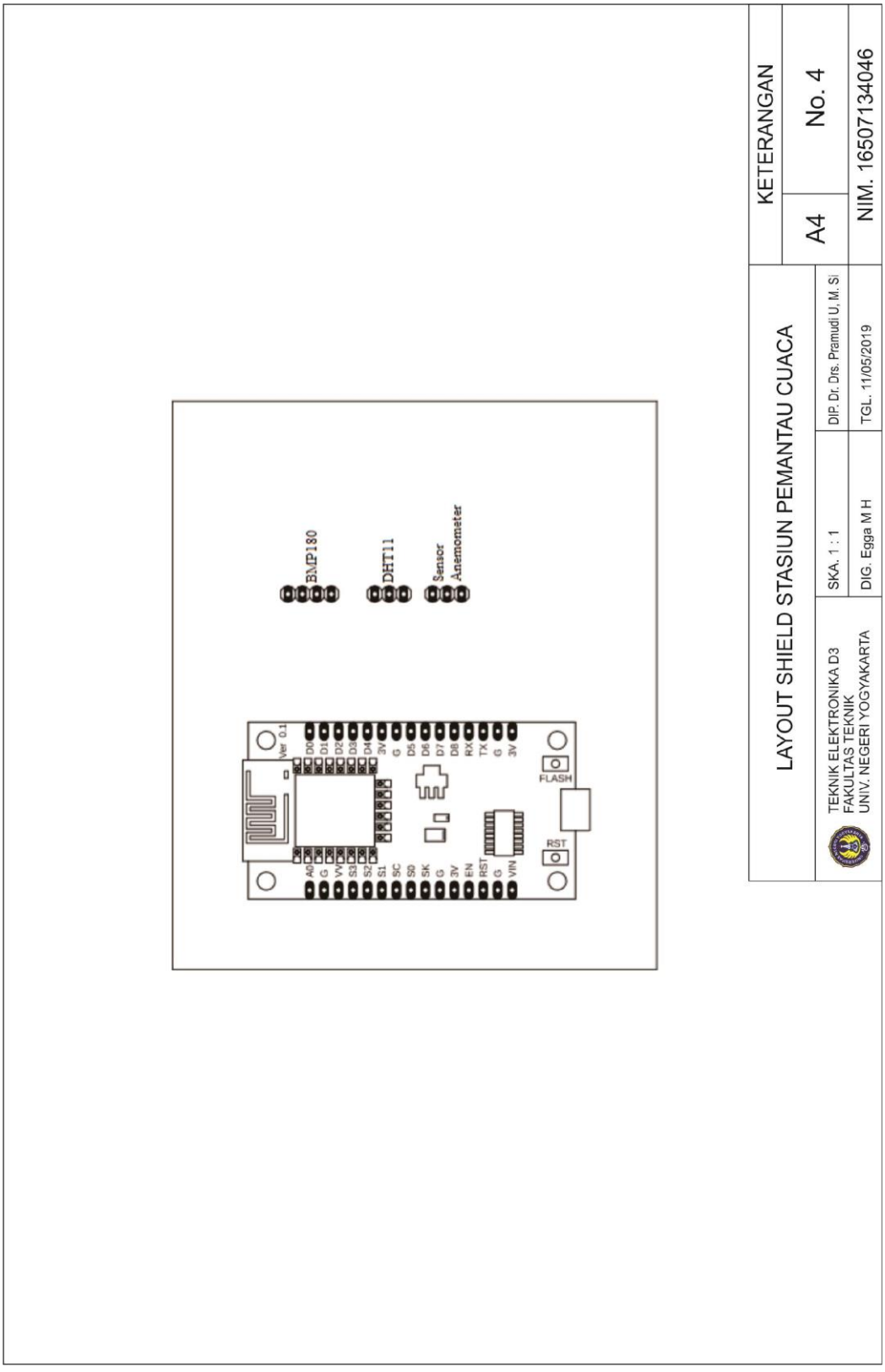
```
void setup()
{
#ifdef serialDebug
  Serial.begin(115200);
#endif
  attachInterrupt(windPin, addcount, RISING);
  pinMode(windPin, INPUT_PULLUP);
  dht.begin();
  thing.add_wifi(SSID, SSID_PASSWORD);
  // Initialize the sensor (it is important to get calibration values stored on the
device).
  thing["SENSOR"] >> [](pson& out){
        // Add the values and the corresponding code
        out["humidity"] = humadity;
        out["celsius"] = temperature;
        out["pressure"] = PresureRead;
        out["altitude"] = altitudeRead;
        out["wind"] = (int)speedwind;
        out["Weater"] = weater;
    };
    if (pressure.begin())
    {
#ifdef serialDebug
      Serial.println("BMP180 init success");
#endif
    }
    else
    {
    Serial.println("BMP180 init fail (disconnected?)\n\n");
    while(1)
      {
        delay(1);
        yield();// Pause forever.
      }
    }
  // Get the baseline pressure:
  baseline = getPressure();
  Serial.printf("baseline pressure: %d mb/n",baseline);
}

void loop()
{
  timeNow = millis();
  // Get a new pressure reading:
  PresureRead = getPressure();
  //Serial.printf("Nilai Preasure: %d\n",getPressure());
```

```
altitudeRead = pressure.altitude(PresureRead,baseline);
  sendDataThinger();
  cekHumadityAndTemperature();
  cekWindSpeed();
  cekWeater();
#ifdef serialDebug
  displayData();
#endif

}
double getPressure()
{
  char status;
  double T,P,p0,a;

  status = pressure.startTemperature();
  if (status != 0)
  {
    delay(status);

 status = pressure.getTemperature(T);

 if (status != 0)
    {
      status = pressure.startPressure(3);
      if (status != 0)
      {
        // Wait for the measurement to complete:
        delay(status);
number of pressure measurements.)
        status = pressure.getPressure(P,T);
        if (status != 0)
        {
          return(P);
        }
        else Serial.println("error retrieving pressure measurement\n");
      }
      else Serial.println("error starting pressure measurement\n");
    }
    else Serial.println("error retrieving temperature measurement\n");
  }
  else Serial.println("error starting temperature measurement\n");
}
```

Lampiran 3


LAYOUT PCB STASIUN PEMANTAU CUACA
KETERANGAN
A4
No. 4
TEKNIK ELEKTRONIKA D3
FAKULTAS TEKNIK
UNIV. NEGERI YOGYAKARTA
SKA. 1 : 1
DIP. Dr. Drs. Pramudi U, M. Si
DIG. Egga M H
TGL. 11/05/2019
NIM. 16507134046

Lampiran 4


BMP180
DHT11
Sensor Anemometer
FLASH
RST
LAYOUT SHIELD STASIUN PEMANTAU CUACA
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Lampiran 5

Datasheet NodeMCU

Handson Technology

User Manual V1.2

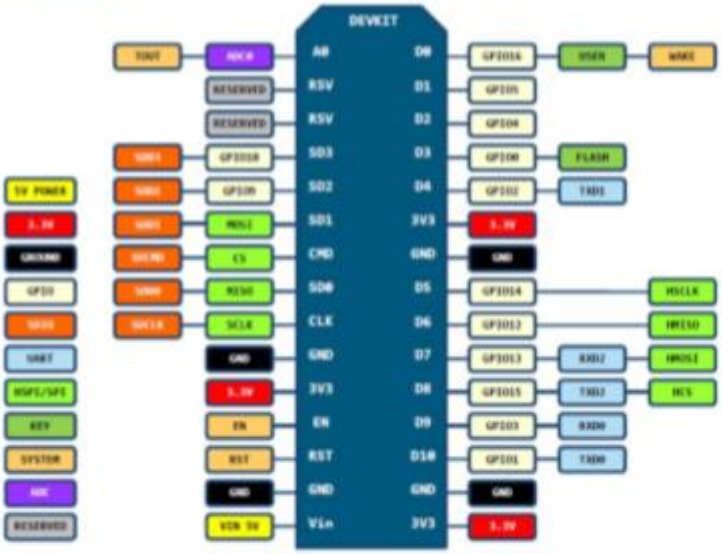
ESP8266 NodeMCU WiFi Devkit

The ESP8266 is the name of a micro controller designed by Espressif Systems. The ESP8266 itself is a self-contained WiFi networking solution offering as a bridge from existing micro controller to WiFi and is also capable of running self-contained applications.

This module comes with a built in USB connector and a rich assortment of pin-outs. With a micro USB cable, you can connect NodeMCU devkit to your laptop and flash it without any trouble, just like Arduino. It is also immediately breadboard friendly.

1. Specification:
   - Voltage:3.3V.
   - Wi-Fi Direct (P2P), soft-AP.
   - Current consumption: 10uA~170mA.
   - Flash memory attachable: 16MB max (512K normal).
   - Integrated TCP/IP protocol stack.
   - Processor: Tensilica L106 32-bit.
   - Processor speed: 80~160MHz.
   - RAM: 32K + 80K.
   - GPIOs: 17 (multiplexed with other functions).
   - Analog to Digital: 1 input with 1024 step resolution.
   - +19.5dBm output power in 802.11b mode
   - 802.11 support: b/g/n.
   - Maximum concurrent TCP connections: 5.

2. Pin Definition:



D0(GPIO16) can only be used as gpio read/write, no interrupt supported, no pwm/I2C/one supported.

3. Using Arduino IDE

Lampiran 6

Datasheet DHT11

SUNROM TECHNOLOGIES

For more products visit our website http://www.sunrom.com

Document: Datasheet | Date: 20-Jun-12 | Model #: 3732 | Product's Page: www.sunrom.com/p-1141.html

DHT11 - Humidity and Temperature Sensor

The DHT11 is a basic, low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed).

Its fairly simple to use, but requires careful timing to grab data. The only real downside of this sensor is you can only get new data from it once every 2 seconds.

Features

- Full range temperature compensated
- Relative humidity and temperature measurement
- Calibrated digital signal
- Outstanding long-term stability
- Extra components not needed
- Long transmission distance
- Low power consumption
- 4 pins packaged and fully interchangeable

Details

This sensor includes a resistive-type humidity measurement component and an NTC temperature measurement component, and connects to a high-performance 8-bit microcontroller, offering excellent quality, fast response, anti-interference ability and cost-effectiveness. Each DHT11 element is strictly calibrated in the laboratory that is extremely accurate on humidity calibration. The calibration coefficients are stored as programmes in the OTP memory, which are used by the sensor's internal signal detecting process.
The single-wire serial interface makes system integration quick and easy. Its small size, low power consumption and up-to-20 meter signal transmission making it the best choice for various applications, including those most demanding ones. The component is 4-pin single row pin package.

Specifications

Item	Measurement Range	Humidity Accuracy	Temperature Accuracy	Resolution	Package
DHT11	20-90%RH 0-50 ℃	±5%RH	±2℃	1	4 Pin Single Row

Parameters	Conditions	Minimum	Typical	Maximum
Humidity				
Resolution		1%RH	1%RH	1%RH
			8 Bit	
Repeatability			±1%RH	
Accuracy	25℃		±4%RH	
	0-50℃			±5%RH
Interchangeability	Fully Interchangeable			
Measurement Range	0℃	30%RH		90%RH
	25℃	20%RH		90%RH
	50℃	20%RH		80%RH
Response Time (Seconds)	1/e(63%)25℃, 1m/s Air	6 S	10 S	15 S
Hysteresis			±1%RH	
Long-Term Stability	Typical		±1%RH/year	
Temperature				
Resolution		1℃	1℃	1℃
		8 Bit	8 Bit	8 Bit
Repeatability			±1℃	
Accuracy		±1℃		±2℃
Measurement Range		0℃		50℃
Response Time (Seconds)	1/e(63%)	6 S		30 S

Item	Condition	Min	Typical	Max	Unit
Power supply	DC	3	5	5.5	V
Current supply	Measuring	0.5		2.5	mA
	Stand-by	100	Null	150	uA
	Average	0.2	Null	1	mA

Lampiran 7

Datasheet BMP180

1. Electrical characteristics

If not stated otherwise, the given values are ±3-Sigma values over temperature/voltage range in the given operation mode. All values represent the new parts specification; additional solder drift is shown separately.

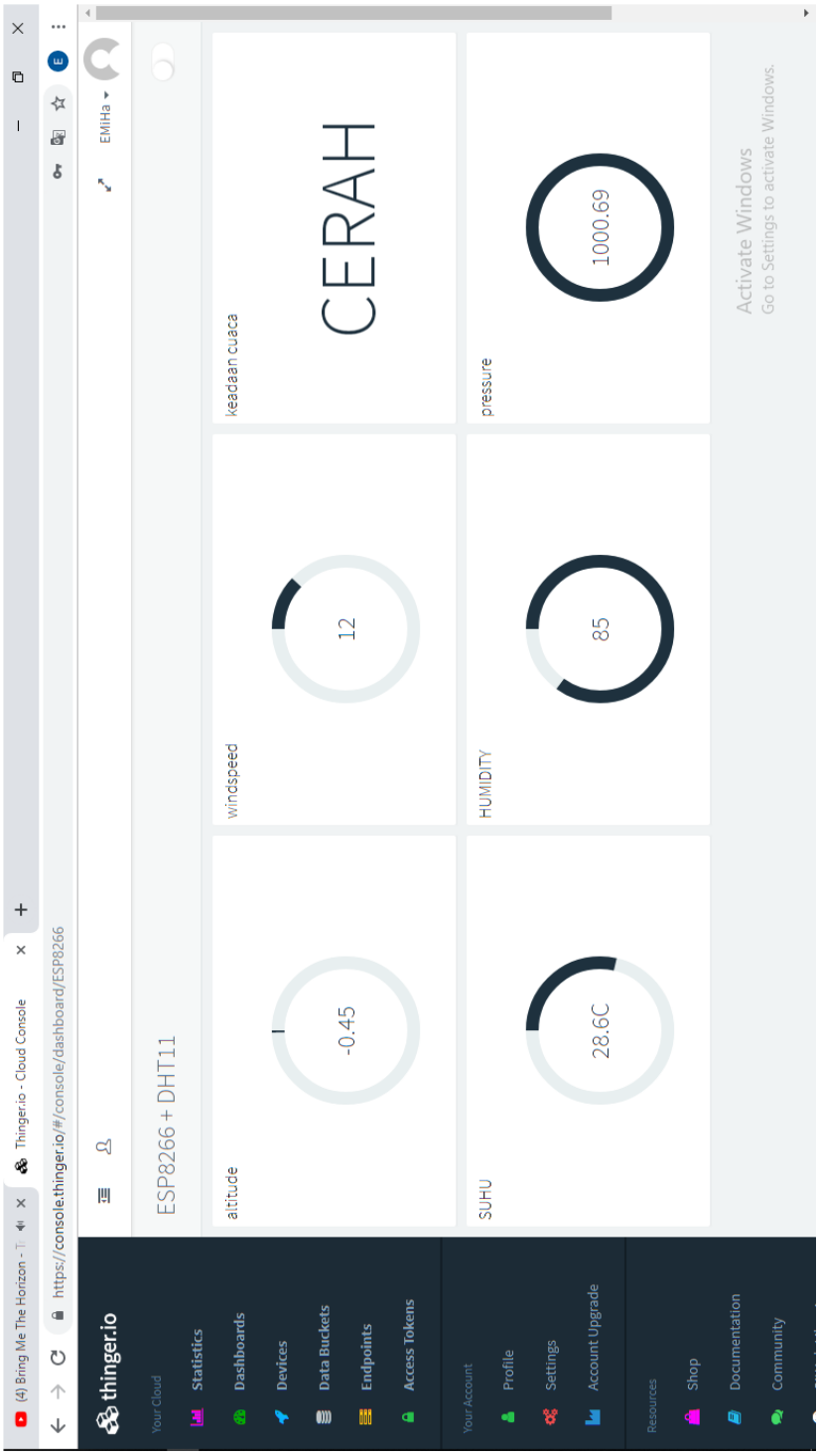
Table 1: Operating conditions, output signal and mechanical characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Units
Operating temperature	T_A	operational	-40		+85	°C
		full accuracy	0		+65	
Supply voltage	V_{DD}	ripple max. 50mVpp	1.8	2.5	3.6	V
			1.62	2.5	3.6	
Supply current @ 1 sample / sec. 25°C	I_{DDLOW}	ultra low power mode		3		µA
	I_{DDSTD}	standard mode		5		µA
	I_{DDHR}	high resolution mode		7		µA
	I_{DDUHR}	Ultra high res. mode		12		µA
	I_{DDAR}	Advanced res. mode		32		µA
Peak current	I_{peak}	during conversion		650		µA
Standby current	I_{DDSBM}	@ 25°C		0.1	4[1]	µA
Relative accuracy pressure V_{DD} = 3.3V		950 . . . 1050 hPa @ 25 °C		±0.12		hPa
				±1.0		m
		700 ... 900hPa 25 . . . 40 °C		±0.12		hPa
				±1.0		m
Absolute accuracy pressure V_{DD} = 3.3V		300 . . . 1100 hPa 0 . . . +65 °C	-4.0	-1.0*	+2.0	hPa
		300 . . . 1100 hPa -20 . . . 0 °C	-6.0	-1.0*	+4.5	hPa
Resolution of output data		pressure		0.01		hPa
		temperature		0.1		°C
Noise in pressure		see table on page 12-13				
Absolute accuracy temperature V_{DD} = 3.3V		@ 25 °C	-1.5	±0.5	+1.5	°C
		0 . . . +65 °C	-2.0	±1.0	+2.0	°C

[1] at 85°C

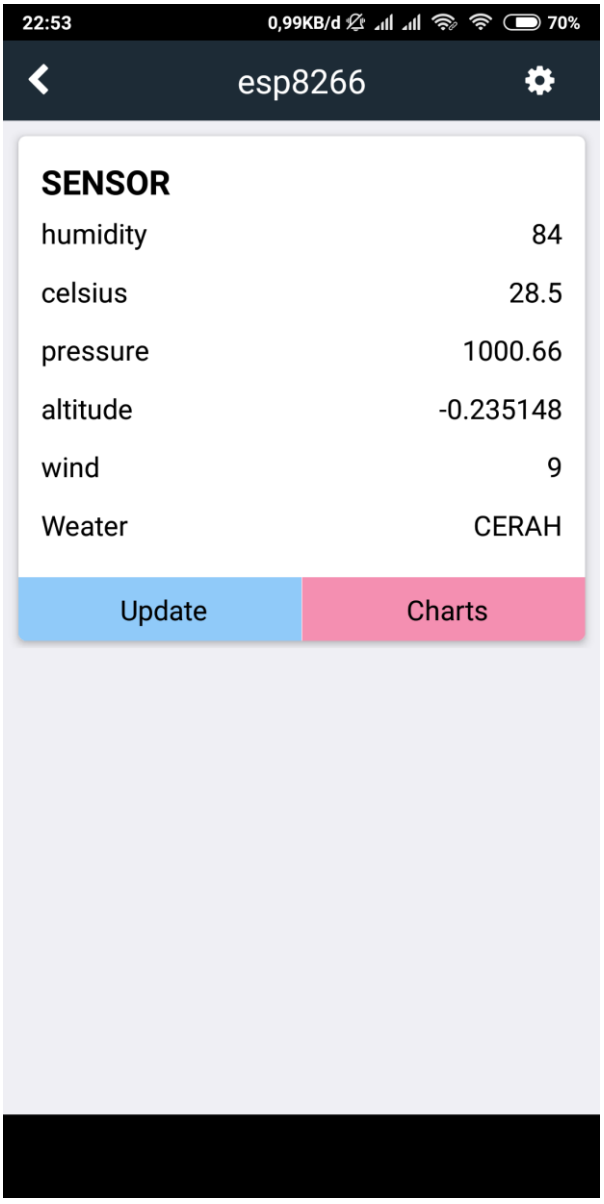
Lampiran 8

Tampilan *web*



Lampiran 9

Tampilan android



Lampiran 10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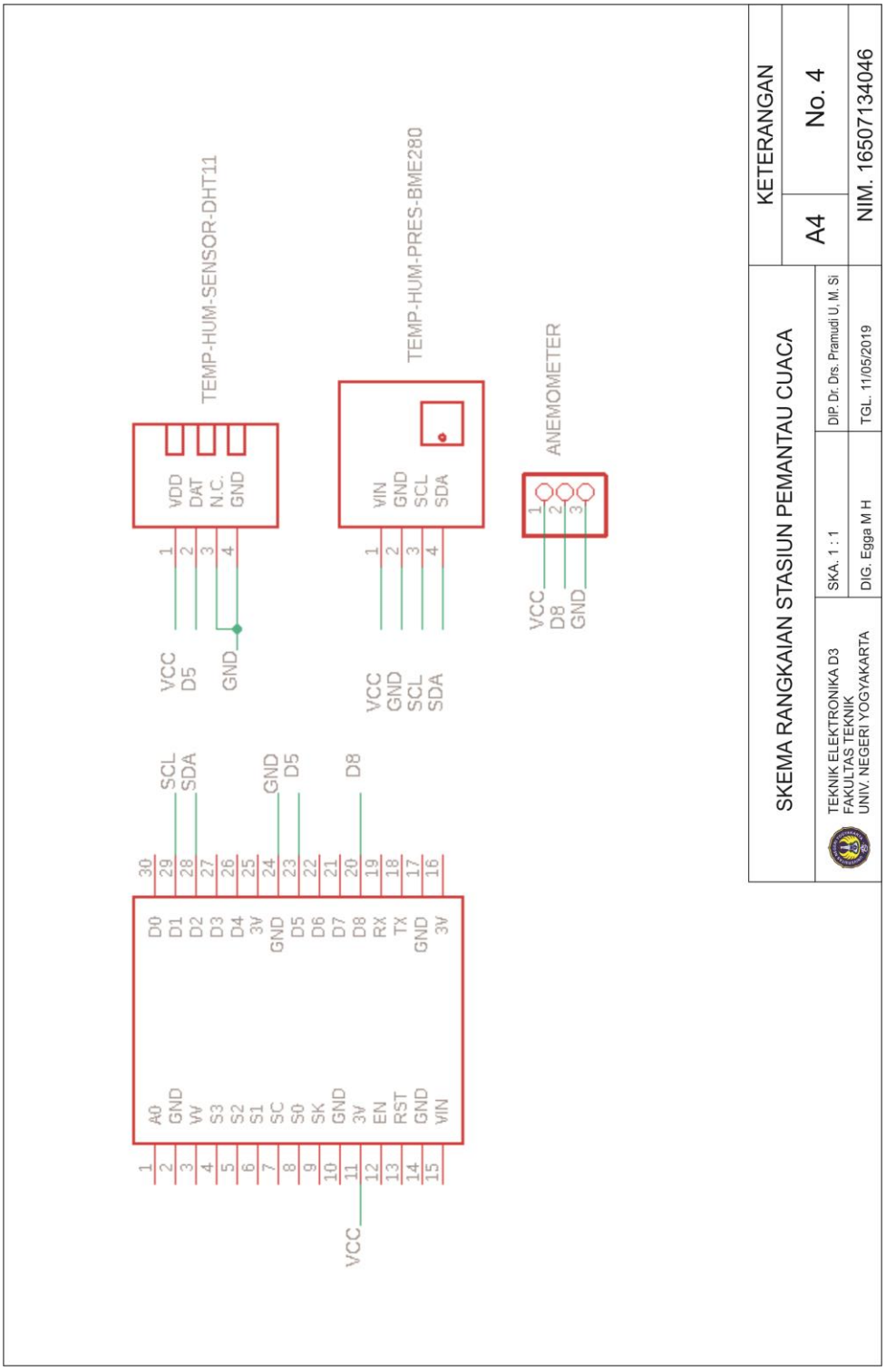
Lampiran 11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TGL. 11/05/2019
NIM. 16507134046
TEMP-HUM-SENSOR-DHT11
VDD
DAT
N.C.
GND
VCC
D5
GND
TEMP-HUM-PRES-BME280
VIN
GND
SCL
SDA
VCC
GND
SCL
SDA
ANEMOMETER
VCC
D8
GND
A0
GND
VV
S3
S2
S1
SC
S0
SK
GND
3V
EN
RST
GND
VIN
D0
D1
D2
D3
D4
3V
GND
D5
D6
D7
D8
RX
TX
GND
3V
SCL
SDA
GND
D5
D8
VCC