

LAMPIRAN

LAMPIRAN A HASIL PENGUJIAN

Tabel Lampiran A 1 Hasil Pengujian Sensor

WAKTU (ms)	Inframerah	Merah
18780	11736	42811
18820	11761	42784
18860	11749	42847
18900	11772	42873
18940	11759	42891
18980	11766	42847
19020	11767	42892
19060	11748	42880
19100	11711	42723
19140	11723	42592
19180	11732	42605
19220	11745	42698
19260	11755	42704
19300	11769	42746
19340	11769	42782
19380	11762	42821
19420	11760	42752
19460	11781	42773
19500	11758	42787
19540	11738	42811
19580	11751	42786
19620	11754	42817
19660	11757	42810
19700	11760	42896
19740	11754	42798
19780	11747	42845
19820	11723	42821
19860	11703	42639
19900	11696	19940
42581	11676	19980
42638	11684	20020
42691	11671	20060
42672	11675	20100
42697	11702	

Tabel Lampiran A 2 Hasil Pengujian Alat

No	<i>Oximeter S0811</i>		Alat		<i>Error %</i> (BPM)	<i>Error %</i> (Sp02)
	BPM	Sp02	BPM	Sp02		
1	78	98	78	99	0	0,01
2	75	99	75	99	0	0
3	76	99	76	99	0	0
4	75	98	75	99	0	0,01
5	75	98	76	99	0	0,01
6	78	98	79	99	0,01	0,01
7	74	98	74	98	0	0
8	75	98	75	98	0	0
9	71	98	71	98	0	0
10	78	98	77	98	0,1	0

LAMPIRAN B HASIL PENGUKURAN SpO2 dan BPM

Tabel Lampiran B 1 Hasil Pengukuran Usia 7 Sampai 15

No	Nama	Umur	Alat		Pulse Oximetri		Keterangan
			BPM	SpO2	BPM	SpO2	
1	Ahmad Sahal	7	83	96	83	97	Normal
2	Razka Adha M.	7	89	97	89	97	Normal
3	Aqila	7	78	100	78	99	Normal
4	A Zein Al-Fatih	8	100	98	100	98	Normal
5	M. Aqil Musyafa	8	80	99	80	99	Normal
6	Fatimatusahra	8	93	98	93	96	Normal
7	Bilal	9	88	97	88	99	Normal
8	Nabil	13	88	99	88	99	Normal
9	Soraya	15	75	95	75	95	Normal
10	Fada	15	90	96	90	95	Normal

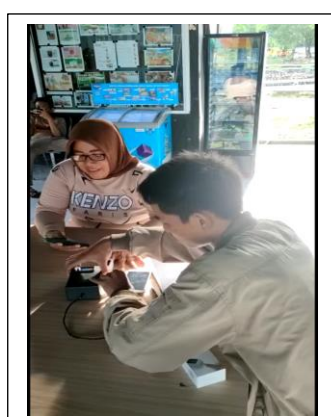
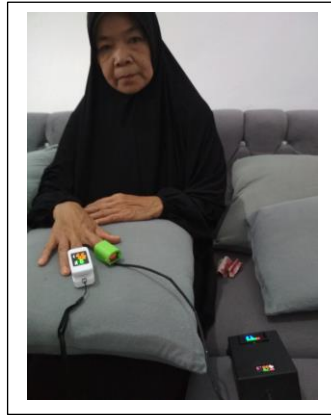
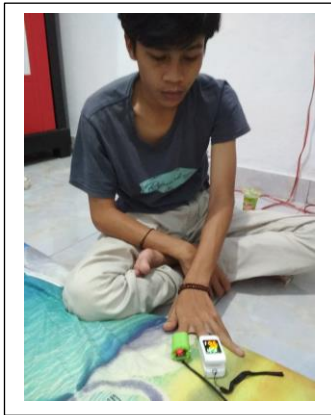
Tabel Lampiran B 2 Hasil Pengukuran Usia 20 Sampai 60

No	Nama	Umur	Alat		Pulse Oximetri		Keterangan
			BPM	SpO2	BPM	SpO2	
1	Rizki	20	100	98	100	98	Normal
2	Aqbal	23	78	100	78	100	Normal
3	Shela	22	100	98	100	99	Normal
4	Dik dik	24	100	98	100	98	Normal
5	Yayat	27	85	100	85	99	Normal
6	Uci	34	91	98	91	98	Normal
7	Desi	35	78	98	78	98	Normal
8	Meli	50	75	98	75	98	Normal
9	Yumaroh	55	65	98	65	98	Normal
10	Enah Hermawati	60	78	96	78	97	Normal

Tabel Lampiran B 3 Spesifikasi SO811

MODEL	SO811
Measurement method	Finger Clif Type
Measurement Range	70% - 99%
SpO2 Accuracy	$\pm 2\% \pm 3\%$ (70%-100%)
SpO2 Alarm range	70% - 99%
Pulse rate range	30 bpm-250 bpm
Pulse Rate Accuracy	30 bpm-250 bpm
Data update cycle	0,25s-2s
SpO2 pr AVERAGE	8s
Peak Wavelenght range	500 nm-100 nm
Display specification	LCD
Power Supply dc	3V (AAA*2)
Size	57,8*31,3*35,9mm
weight	29g

Dokumentasi



LAMPIRANC LISTING PROGRAM

```
#include <Arduino_GFX_Library.h>
Arduino_DataBus *bus = new Arduino_ESP8266SPI(0 /* DC */, 15 /* CS */);
Arduino_ST7789 *gfx = new Arduino_ST7789(bus, 2 /* RST */, 5 /* rotation */, true
    /* IPS */, 135 /* width */, 240 /* height */, 53 /* col offset 1 */, 40 /*
    row offset 1 */, 52 /* col offset 2 */, 40 /* row offset 2 */);

#include <Arduino.h>
#include <Wire.h>
#include "algorithm_by_RF.h"
#include "max30102.h"
// uncomment below line if cannot calculate readings
#define REVERSE_LED

//XZIcon
#include "heartrate.h"
#include "oxygen.h"

// Interrupt pin
const byte oxiInt = 10; // pin connected to MAX30102 INT
uint32_t elapsedTime, timeStart;
uint32_t aun_ir, aun_red;
uint32_t aun_ir_buffer[BUFFER_SIZE]; //infrared LED sensor data
uint32_t aun_red_buffer[BUFFER_SIZE]; //red LED sensor data
float old_n_spo2; // Previous SPO2 value
uint8_t uch_dummy;

void setup()
{
    pinMode(10, INPUT); //pin D10 connects to the interrupt output pin of the
        MAX30102

    Wire.begin();
    Serial.begin(115200);
```

```

gfx->begin();
gfx->fillScreen(BLACK);
    gfx>draw16bitRGBBitmap(0,7,(uint16_t*)heartrate.pixel_data,heartrate.W
    idth,heartrate.height);
gfx>draw16bitRGBBitmap(0,71,(uint16_t*)oxygen.pixel_data,oxygen.width,
    oxygen.height);

Serial.println("Initializing");
gfx->setTextColor(WHITE, BLACK);
gfx->setTextSize(2 /* x scale */, 2 /* y scale */);
gfx->setCursor(72, 0);
gfx->print("Initializing");

maxim_max30102_reset(); //resets the MAX30102
delay(0);

maxim_max30102_read_reg(REG_INTR_STATUS_1, &uch_dummy); //Reads/clears
    the interrupt status register
maxim_max30102_init();//initialize the MAX30102
old_n_spo2 = 0.0;

Serial.println(F("Time[s]\tSpO2\tHR\tRatio\tCorr"));

timeStart = millis();
}
void loop()
{
float n_spo2, ratio, correl; //SPO2 value
int8_t ch_spo2_valid;//indicator to show if the SPO2 calculation is valid
int32_t n_heartrate; //heart rate value
int8_t ch_hr_valid;//indicator to show if the heart rate calculation is
    valid
int32_t i;

//buffer length of BUFFER_SIZE stores ST seconds of samples running at FS
    sps

```



```

//read BUFFER_SIZE samples, and determine the signal range
for (i = 0; i < BUFFER_SIZE; i++)
{
while (digitalRead(10) == HIGH);
yield();//wait until the interrupt pin asserts
#ifdef REVERSE_LED
maxim_max30102_read_fifo(&aun_ir, &aun_red); //read from MAX30102 FIFO
#else
maxim_max30102_read_fifo(&aun_red, &aun_ir); //read from MAX30102 FIFO
#endif
if (aun_ir < 5000)
{
break;
}
if (i == 0)
{
gfx->setTextColor(WHITE, BLACK);
gfx->setTextSize(2 /* x scale */, 2 /* y scale */);
gfx->setCursor(72, 0);
gfx->print("Measuring... ");
}
*(aun_ir_buffer + i) = aun_ir;
*(aun_red_buffer + i) = aun_red;
}

if (aun_ir < 5000)
{
gfx->setTextColor(WHITE, BLACK);
gfx->setTextSize(2 /* x scale */, 2 /* y scale */);
gfx->setCursor(72, 0);
gfx->print("Put On Finger");
}
else
{
//calculate heart rate and SpO2 after BUFFER_SIZE samples (ST seconds of
samples) using Robert's method

```

```

rf_heart_rate_and_oxygen_saturation(aun_ir_buffer,          BUFFER_SIZE,
    aun_red_buffer, &n_spo2, &ch_spo2_valid, &n_heartrate, &ch_hr_valid,
    &ratio, &correl);
elapsedTime = millis() - timeStart;
elapsedTime /= 1000; // Time in seconds

if (ch_hr_valid && ch_spo2_valid) {
Serial.print(elapsedTime);
Serial.print("\t");
Serial.print(n_spo2);
Serial.print("\t");
Serial.print(n_heartrate, DEC);
Serial.print("\t");
Serial.print(ratio);
Serial.print("\t");
Serial.print(correl);
Serial.println("");
gfx->setTextSize(7 /* x scale */, 7 /* y scale */, 2 /* pixel_margin */);
gfx->setTextColor(GREEN, BLACK);
gfx->setCursor(72, 20);
gfx->printf("%d ", n_heartrate);
gfx->setTextColor(ORANGE, BLACK);
gfx->setCursor(72, 84);
gfx->printf("%.1f", n_spo2);

old_n_spo2 = n_spo2;
}

}

```