

LAMPIRAN

Lampiran 1. Hasil Perancangan Alat

Perangkat Sender

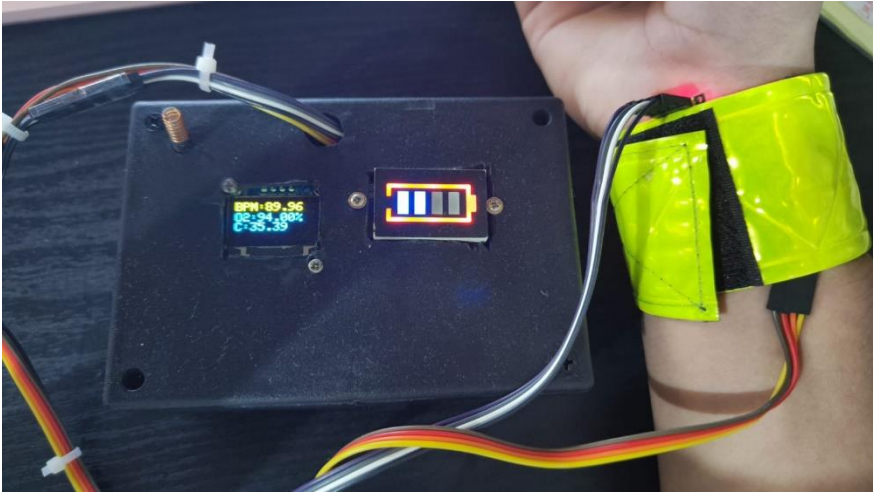


Perangkat Receiver



Lampiran 2. Dokumentasi Percobaan

Dokumentasi Percobaan Sensor



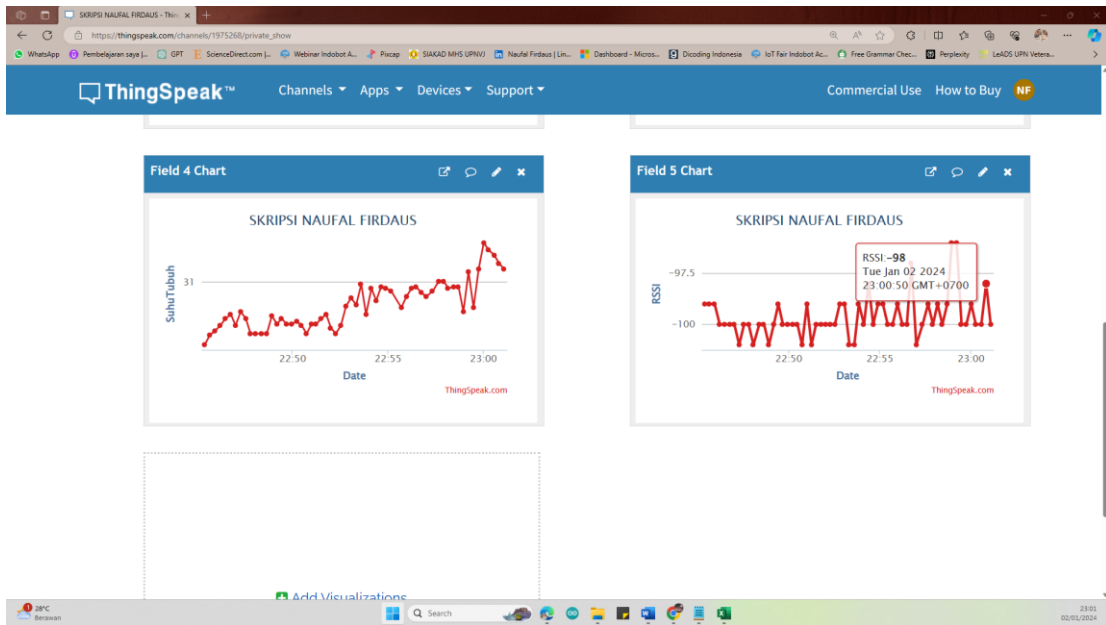
Dokumentasi Percobaan Alat Ukur Oximeter dan Termometer Inframerah



Dokumentasi Percobaan LoRa



Tampilan Data Pada Thingspeak Untuk Mengambil Variabel RSSI LoRa



Tampilan Data Pada Website



Lampiran 3. Data Hasil Percobaan Sensor MAX30100 dan GY906

Variabel Detak Jantung

DETAK JANTUNG (BPM)					
Percobaan	Sensor MAX30100 (BPM)	Alat Ukur Oximeter (BPM)	Selisih	Error (%)	Ketelitian (%)
1	90,44	93	2,56	2,75%	97,25%
2	90,65	93	2,35	2,53%	97,47%
3	90,88	93	2,12	2,28%	97,72%
4	89,28	93	3,72	4,00%	96,00%
5	88,12	94	5,88	6,26%	93,74%
6	89,32	94	4,68	4,98%	95,02%
7	89,67	93	3,33	3,58%	96,42%
8	89,15	93	3,85	4,14%	95,86%
9	90,67	93	2,33	2,51%	97,49%
10	92,78	94	1,22	1,30%	98,70%
11	92,43	94	1,57	1,67%	98,33%
12	92,88	95	2,12	2,23%	97,77%
13	92,46	95	2,54	2,67%	97,33%
14	90,66	94	3,34	3,55%	96,45%
15	90,87	94	3,13	3,33%	96,67%
16	91,66	96	4,34	4,52%	95,48%
17	91,87	96	4,13	4,30%	95,70%
18	93,78	96	2,22	2,31%	97,69%
19	96,67	102	5,33	5,23%	94,77%
20	95,88	100	4,12	4,12%	95,88%
21	95,66	100	4,34	4,34%	95,66%
22	95,87	97	1,13	1,16%	98,84%
23	90,46	95	4,54	4,78%	95,22%
24	90,67	95	4,33	4,56%	95,44%
25	88,78	93	4,22	4,54%	95,46%
26	88,95	92	3,05	3,32%	96,68%
27	87,68	90	2,32	2,58%	97,42%
28	86,73	90	3,27	3,63%	96,37%
29	86,89	90	3,11	3,46%	96,54%
30	87,34	91	3,66	4,02%	95,98%
31	87,67	90	2,33	2,59%	97,41%
32	84,78	88	3,22	3,66%	96,34%
33	87,84	93	5,16	5,55%	94,45%

34	97,76	96	1,76	1,83%	98,17%
35	92,45	95	2,55	2,68%	97,32%
36	92,34	95	2,66	2,80%	97,20%
37	92,78	95	2,22	2,34%	97,66%
38	90,78	94	3,22	3,43%	96,57%
39	90,63	94	3,37	3,59%	96,41%
40	90,44	92	1,56	1,70%	98,30%
41	88,78	92	3,22	3,50%	96,50%
42	88,65	90	1,35	1,50%	98,50%
43	87,54	90	2,46	2,73%	97,27%
44	89,67	93	3,33	3,58%	96,42%
45	90,15	93	2,85	3,06%	96,94%
46	90,88	93	2,12	2,28%	97,72%
47	91,68	94	2,32	2,47%	97,53%
48	92,63	96	3,37	3,51%	96,49%
49	92,89	97	4,11	4,24%	95,76%
50	90,67	94	3,33	3,54%	96,46%
51	91,45	94	2,55	2,71%	97,29%
52	91,89	94	2,11	2,24%	97,76%
53	91,67	95	3,33	3,51%	96,49%
54	92,45	95	2,55	2,68%	97,32%
55	87,14	90	2,86	3,18%	96,82%
56	87,46	90	2,54	2,82%	97,18%
57	88,88	90	1,12	1,24%	98,76%
58	89,45	92	2,55	2,77%	97,23%
59	87,66	92	4,34	4,72%	95,28%
60	87,93	92	4,07	4,42%	95,58%
61	88,46	92	3,54	3,85%	96,15%
62	88,78	93	4,22	4,54%	95,46%
63	90,67	93	2,33	2,51%	97,49%
64	90,89	93	2,11	2,27%	97,73%
65	87,56	90	2,44	2,71%	97,29%
66	87,98	90	2,02	2,24%	97,76%
67	85,88	90	4,12	4,58%	95,42%
68	86,64	91	4,36	4,79%	95,21%
69	86,36	91	4,64	5,10%	94,90%
70	88,75	91	2,25	2,47%	97,53%
71	88,32	91	2,68	2,95%	97,05%
72	93,25	95	1,75	1,84%	98,16%
73	92,89	95	2,11	2,22%	97,78%
74	92,87	95	2,13	2,24%	97,76%

75	93,88	96	2,12	2,21%	97,79%
76	93,24	96	2,76	2,88%	97,13%
77	93,66	96	2,34	2,44%	97,56%
78	96,78	99	2,22	2,24%	97,76%
79	96,45	99	2,55	2,58%	97,42%
80	96,33	99	2,67	2,70%	97,30%
81	97,78	100	2,22	2,22%	97,78%
82	98,67	102	3,33	3,26%	96,74%
83	98,45	100	1,55	1,55%	98,45%
84	96,77	100	3,23	3,23%	96,77%
85	95,68	98	2,32	2,37%	97,63%
86	95,83	98	2,17	2,21%	97,79%
87	95,14	98	2,86	2,92%	97,08%
88	94,76	97	2,24	2,31%	97,69%
89	94,63	97	2,37	2,44%	97,56%
90	96,34	100	3,66	3,66%	96,34%
91	99,78	105	5,22	4,97%	95,03%
92	102,67	105	2,33	2,22%	97,78%
93	100,43	104	3,57	3,43%	96,57%
94	102,44	100	2,44	2,44%	97,56%
95	96,37	98	1,63	1,66%	98,34%
96	92,87	96	3,13	3,26%	96,74%
97	91,94	96	4,06	4,23%	95,77%
98	91,77	96	4,23	4,41%	95,59%
99	91,88	94	2,12	2,26%	97,74%
100	92,65	94	1,35	1,44%	98,56%
Rata-rata <i>error</i> dan akurasi (%)				3,11%	96,89%

Variabel Kadar Oksigen Dalam Darah

Kadar Oksigen Dalam Darah (SpO2)					
Percobaan	Sensor MAX30100 (SpO2)	Alat Ukur Oximeter (SpO2)	Selisih	Error (%)	Ketelitian (%)
1	97	95	2	2,11%	97,89%
2	96	95	1	1,05%	98,95%
3	96	94	2	2,13%	97,87%
4	98	94	4	4,26%	95,74%
5	95	96	1	1,04%	98,96%
6	96	95	1	1,05%	98,95%
7	96	95	1	1,05%	98,95%
8	97	95	2	2,11%	97,89%
9	97	96	1	1,04%	98,96%
10	97	95	2	2,11%	97,89%
11	98	96	2	2,08%	97,92%
12	98	96	2	2,08%	97,92%
13	97	96	1	1,04%	98,96%
14	97	94	3	3,19%	96,81%
15	97	95	2	2,11%	97,89%
16	95	94	1	1,06%	98,94%
17	95	94	1	1,06%	98,94%
18	96	94	2	2,13%	97,87%
19	96	94	2	2,13%	97,87%
20	96	95	1	1,05%	98,95%
21	96	95	1	1,05%	98,95%
22	97	95	2	2,11%	97,89%
23	97	96	1	1,04%	98,96%
24	97	96	1	1,04%	98,96%
25	98	96	2	2,08%	97,92%
26	98	96	2	2,08%	97,92%
27	98	95	3	3,16%	96,84%
28	98	95	3	3,16%	96,84%
29	96	94	2	2,13%	97,87%
30	96	94	2	2,13%	97,87%
31	97	94	3	3,19%	96,81%
32	97	95	2	2,11%	97,89%
33	97	95	2	2,11%	97,89%
34	97	96	1	1,04%	98,96%
35	95	96	1	1,04%	98,96%

36	95	97	2	2,06%	97,94%
37	95	97	2	2,06%	97,94%
38	95	97	2	2,06%	97,94%
39	97	95	2	2,11%	97,89%
40	97	95	2	2,11%	97,89%
41	96	95	1	1,05%	98,95%
42	96	95	1	1,05%	98,95%
43	96	95	1	1,05%	98,95%
44	96	94	2	2,13%	97,87%
45	96	94	2	2,13%	97,87%
46	95	94	1	1,06%	98,94%
47	96	94	2	2,13%	97,87%
48	95	96	1	1,04%	98,96%
49	95	96	1	1,04%	98,96%
50	94	96	2	2,08%	97,92%
51	94	96	2	2,08%	97,92%
52	94	96	2	2,08%	97,92%
53	95	98	3	3,06%	96,94%
54	97	98	1	1,02%	98,98%
55	97	98	1	1,02%	98,98%
56	95	97	2	2,06%	97,94%
57	95	97	2	2,06%	97,94%
58	96	97	1	1,03%	98,97%
59	98	96	2	2,08%	97,92%
60	98	96	2	2,08%	97,92%
61	98	96	2	2,08%	97,92%
62	98	95	3	3,16%	96,84%
63	96	95	1	1,05%	98,95%
64	96	95	1	1,05%	98,95%
65	96	94	2	2,13%	97,87%
66	96	94	2	2,13%	97,87%
67	95	94	1	1,06%	98,94%
68	95	94	1	1,06%	98,94%
69	96	95	1	1,05%	98,95%
70	96	94	2	2,13%	97,87%
71	96	94	2	2,13%	97,87%
72	97	96	1	1,04%	98,96%
73	97	96	1	1,04%	98,96%
74	99	97	2	2,06%	97,94%
75	99	97	2	2,06%	97,94%
76	98	97	1	1,03%	98,97%

77	97	96	1	1,04%	98,96%
78	97	96	1	1,04%	98,96%
79	99	96	3	3,13%	96,88%
80	99	97	2	2,06%	97,94%
81	99	97	2	2,06%	97,94%
82	97	98	1	1,02%	98,98%
83	96	98	2	2,04%	97,96%
84	96	98	2	2,04%	97,96%
85	97	98	1	1,02%	98,98%
86	97	96	1	1,04%	98,96%
87	98	96	2	2,08%	97,92%
88	98	96	2	2,08%	97,92%
89	95	97	2	2,06%	97,94%
90	95	97	2	2,06%	97,94%
91	94	95	1	1,05%	98,95%
92	97	94	3	3,19%	96,81%
93	97	96	1	1,04%	98,96%
94	97	96	1	1,04%	98,96%
95	95	96	1	1,04%	98,96%
96	96	94	2	2,13%	97,87%
97	96	94	2	2,13%	97,87%
98	97	94	3	3,19%	96,81%
99	97	96	1	1,04%	98,96%
100	97	96	1	1,04%	98,96%
Rata-rata <i>error</i> dan akurasi (%)				1,77%	98,23%

Variabel Suhu Tubuh

Suhu Tubuh (°C)					
Percobaan	Sensor GY906 (°C)	Alat Ukur Termometer (°C)	Selisih	Error (%)	Ketelitian (%)
1	34,2	36,6	2,4	6,56%	93,44%
2	35,7	36,4	0,7	1,92%	98,08%
3	34,2	36,5	2,3	6,30%	93,70%
4	35,9	36,6	0,7	1,91%	98,09%
5	35,1	37,2	2,1	5,65%	94,35%
6	35,8	37,2	1,4	3,76%	96,24%
7	34,4	37,6	3,2	8,51%	91,49%
8	34,6	37,7	3,1	8,22%	91,78%
9	34,7	36,6	1,9	5,19%	94,81%
10	35,3	37,5	2,2	5,87%	94,13%
11	35,8	37,5	1,7	4,53%	95,47%
12	35,4	36,6	1,2	3,28%	96,72%
13	34,7	36,4	1,7	4,67%	95,33%
14	34,6	36,4	1,8	4,95%	95,05%
15	34,2	36,7	2,5	6,81%	93,19%
16	35,6	37,8	2,2	5,82%	94,18%
17	35,7	37,5	1,8	4,80%	95,20%
18	35,8	37,2	1,4	3,76%	96,24%
19	36,2	37,7	1,5	3,98%	96,02%
20	34,4	36,5	2,1	5,75%	94,25%
21	34,7	36,8	2,1	5,71%	94,29%
22	34,2	36,4	2,2	6,04%	93,96%
23	34,7	36,4	1,7	4,67%	95,33%
24	34,8	36,6	1,8	4,92%	95,08%
25	35,7	37,5	1,8	4,80%	95,20%
26	36,2	37,6	1,4	3,72%	96,28%
27	35,8	37,6	1,8	4,79%	95,21%
28	35,4	37,5	2,1	5,60%	94,40%
29	34,7	36,8	2,1	5,71%	94,29%
30	35,8	36,6	0,8	2,19%	97,81%
31	34,7	36,6	1,9	5,19%	94,81%
32	34,7	36,3	1,6	4,41%	95,59%
33	34,6	36,4	1,8	4,95%	95,05%
34	35,1	36,3	1,2	3,31%	96,69%
35	35,6	36,3	0,7	1,93%	98,07%

36	35,7	37,8	2,1	5,56%	94,44%
37	35,8	37,4	1,6	4,28%	95,72%
38	36,2	36,7	0,5	1,36%	98,64%
39	35,7	37,2	1,5	4,03%	95,97%
40	35,2	37,4	2,2	5,88%	94,12%
41	34,8	36,7	1,9	5,18%	94,82%
42	35,7	36,6	0,9	2,46%	97,54%
43	35,4	36,8	1,4	3,80%	96,20%
44	35,8	37,4	1,6	4,28%	95,72%
45	36,2	36,8	0,6	1,63%	98,37%
46	34,7	36,6	1,9	5,19%	94,81%
47	34,5	36,4	1,9	5,22%	94,78%
48	35,6	37,3	1,7	4,56%	95,44%
49	35,9	37,8	1,9	5,03%	94,97%
50	35,8	37,7	1,9	5,04%	94,96%
51	35,8	37,6	1,8	4,79%	95,21%
52	34,4	36,5	2,1	5,75%	94,25%
53	34,6	36,8	2,2	5,98%	94,02%
54	35,7	36,3	0,6	1,65%	98,35%
55	35,8	37,5	1,7	4,53%	95,47%
56	36,2	37,4	1,2	3,21%	96,79%
57	34,8	36,7	1,9	5,18%	94,82%
58	35,4	37,6	2,2	5,85%	94,15%
59	35,8	37,9	2,1	5,54%	94,46%
60	34,4	36,6	2,2	6,01%	93,99%
61	34,8	36,6	1,8	4,92%	95,08%
62	35,8	36,3	0,5	1,38%	98,62%
63	34,2	36,4	2,2	6,04%	93,96%
64	35,6	36,3	0,7	1,93%	98,07%
65	35,7	36,3	0,6	1,65%	98,35%
66	35,7	37,8	2,1	5,56%	94,44%
67	36,2	37,4	1,2	3,21%	96,79%
68	35,6	37,7	2,1	5,57%	94,43%
69	34,7	36,6	1,9	5,19%	94,81%
70	35,7	37,5	1,8	4,80%	95,20%
71	35,4	37,5	2,1	5,60%	94,40%
72	35,8	36,6	0,8	2,19%	97,81%
73	36,2	36,4	0,2	0,55%	99,45%
74	34,7	36,7	2	5,45%	94,55%
75	35,7	37,2	1,5	4,03%	95,97%
76	35,9	37,4	1,5	4,01%	95,99%

77	35,9	36,7	0,8	2,18%	97,82%
78	34,4	36,6	2,2	6,01%	93,99%
79	34,6	36,8	2,2	5,98%	94,02%
80	35,7	36,4	0,7	1,92%	98,08%
81	35,8	36,4	0,6	1,65%	98,35%
82	36,3	36,7	0,4	1,09%	98,91%
83	36,1	37,8	1,7	4,50%	95,50%
84	35,4	37,5	2,1	5,60%	94,40%
85	34,8	37,2	2,4	6,45%	93,55%
86	35,7	36,4	0,7	1,92%	98,08%
87	34,6	36,4	1,8	4,95%	95,05%
88	34,8	36,7	1,9	5,18%	94,82%
89	35,7	37,8	2,1	5,56%	94,44%
90	35,4	37,5	2,1	5,60%	94,40%
91	35,8	37,2	1,4	3,76%	96,24%
92	34,2	37,4	3,2	8,56%	91,44%
93	35,6	36,7	1,1	3,00%	97,00%
94	35,2	36,6	1,4	3,83%	96,17%
95	35,7	36,8	1,1	2,99%	97,01%
96	35,8	37,4	1,6	4,28%	95,72%
97	36,2	36,8	0,6	1,63%	98,37%
98	34,4	36,6	2,2	6,01%	93,99%
99	34,7	36,4	1,7	4,67%	95,33%
100	35,3	36,7	1,4	3,81%	96,19%
Rata-rata <i>error</i> dan akurasi (%)				4,45%	95,55%

**LEMBAR KONSULTASI PEMBIMBING TUGAS AKHIR
MAHASISWA FAKULTAS TEKNIK**

Nama : Naufal Firdaus

NIM : 2010314006

PROGRAM STUDI : Teknik Elektro

JUDUL TUGAS AKHIR : RANCANG BANGUN GELANG MONITORING
KESEHATAN DENGAN LORA GATEWAY BERBASIS IOT TERINTEGRASI WEBSITE

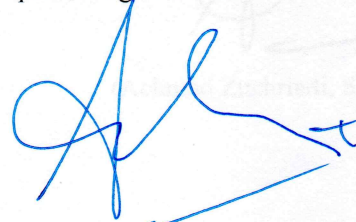
PEMBIMBING : Achmad Zuchriadi S.T., M.T.

No	HARI	TANGGAL	MATERI KONSULTASI	PARAF PEMBIMBING
1	Senin	13 Maret 2023	Judul, Tema, Alat	
2	Senin	20 Maret 2023	Bab 1, Bab 2	
3	Kamis	6 April 2023	Finalisasi Bab 1 & Bab 2	
4	Kamis	27 April 2023	Finalisasi Bab 3.	
5	Selasa	12 September 2023	Pengolahan data & analisis	
6	Selasa	20 September 2023	Pengujian alat	
7	Selasa	24 Oktober 2023	Hasil dan analisis data	
8	Senin	13 November 2023	Perhitungan data	
9	Jumat	24 November 2023	Finalisasi Bab 4	
10	Rabu	3 Januari 2024	Kesimpulan & Lampiran	

Keterangan :

1. Setiap konsultasi harus diparaf Dosen Pembimbing
2. Minimal jumlah konsultasi sebanyak 8 kali pertemuan
3. Penyelesaian TA./Skripsi paling cepat 3 (tiga) bulan dan paling lambat 6(enam) bulan sejak surat pengantar dikeluarkan oleh skretariat Fakultas











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Achmad Zuchriadi S.T., M.T

**LEMBAR KONSULTASI PEMBIMBING TUGAS AKHIR
MAHASISWA FAKULTAS TEKNIK**

Nama : Naufal Firdaus
NIM : 2010314006
PROGRAM STUDI : Teknik Elektro
JUDUL TUGAS AKHIR : RANCANG BANGUN GELANG MONITORING KESEHATAN
DENGAN LORA GATEWAY BERBASIS IOT DAN WEBSITE
PEMBIMBING : Fajar Rahayu, S.T., M.T

No	HARI	TANGGAL	MATERI KONSULTASI	PARAF PEMBIMBING
1	Senin	13 Maret 2023	Judul, Tema, Konsep	
2	Senin	20 Maret 2023	Bab 1	
3	Kamis	27 April 2023	Bab 2	
4	Jumat	28 April 2023	Bab 3	
5	Selasa	12 September 2023	Revisi bab 3	
6	Selasa	20 September 2023	Pengujian alat	
7	Selasa	24 Oktober 2024	teknik pengambilan data	
8	Senin	13 November 2023	Bab 4, perhitungan & analisis	
9	Jumat	24 November 2023	Bab 5	
10	Jumat	5 Januari 2024	Finalisasi Bab 1 - 5	

Keterangan :

1. Setiap konsultasi harus diparaf Dosen Pembimbing
2. Minimal jumlah konsultasi sebanyak 8 kali pertemuan
3. Penyelesaian TA./Skripsi paling cepat 3 (tiga) bulan dan paling lambat 6(enam) bulan sejak surat pengantar dikeluarkan oleh skretariat Fakultas

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(Achmad Zuchriadi, S.T., M.T.)