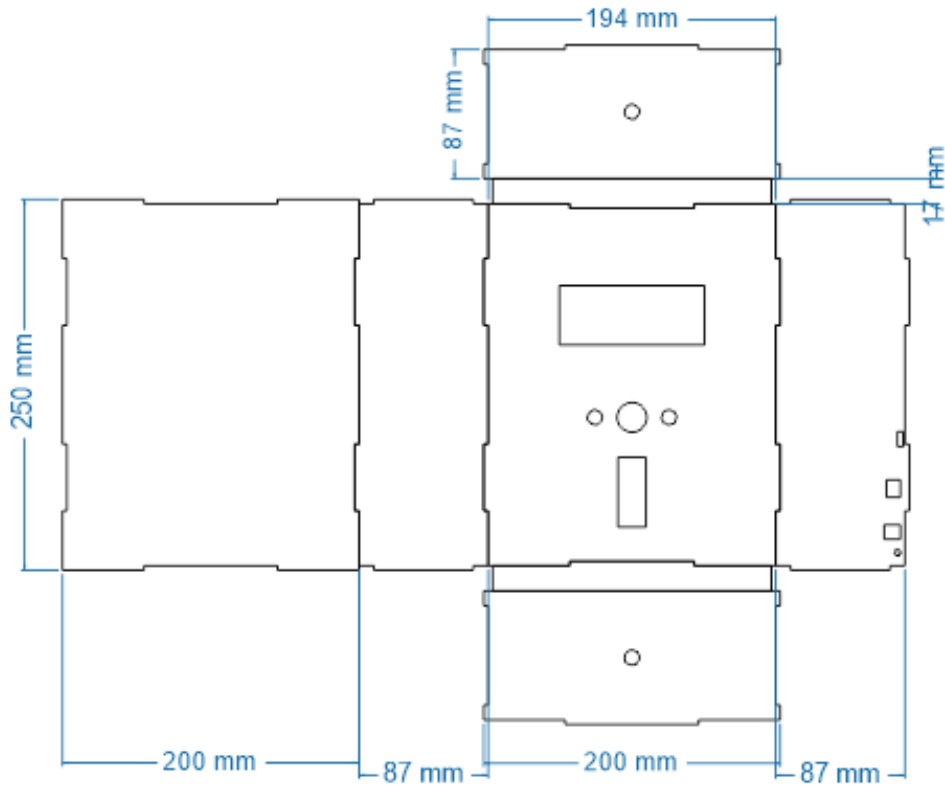


## LAMPIRAN

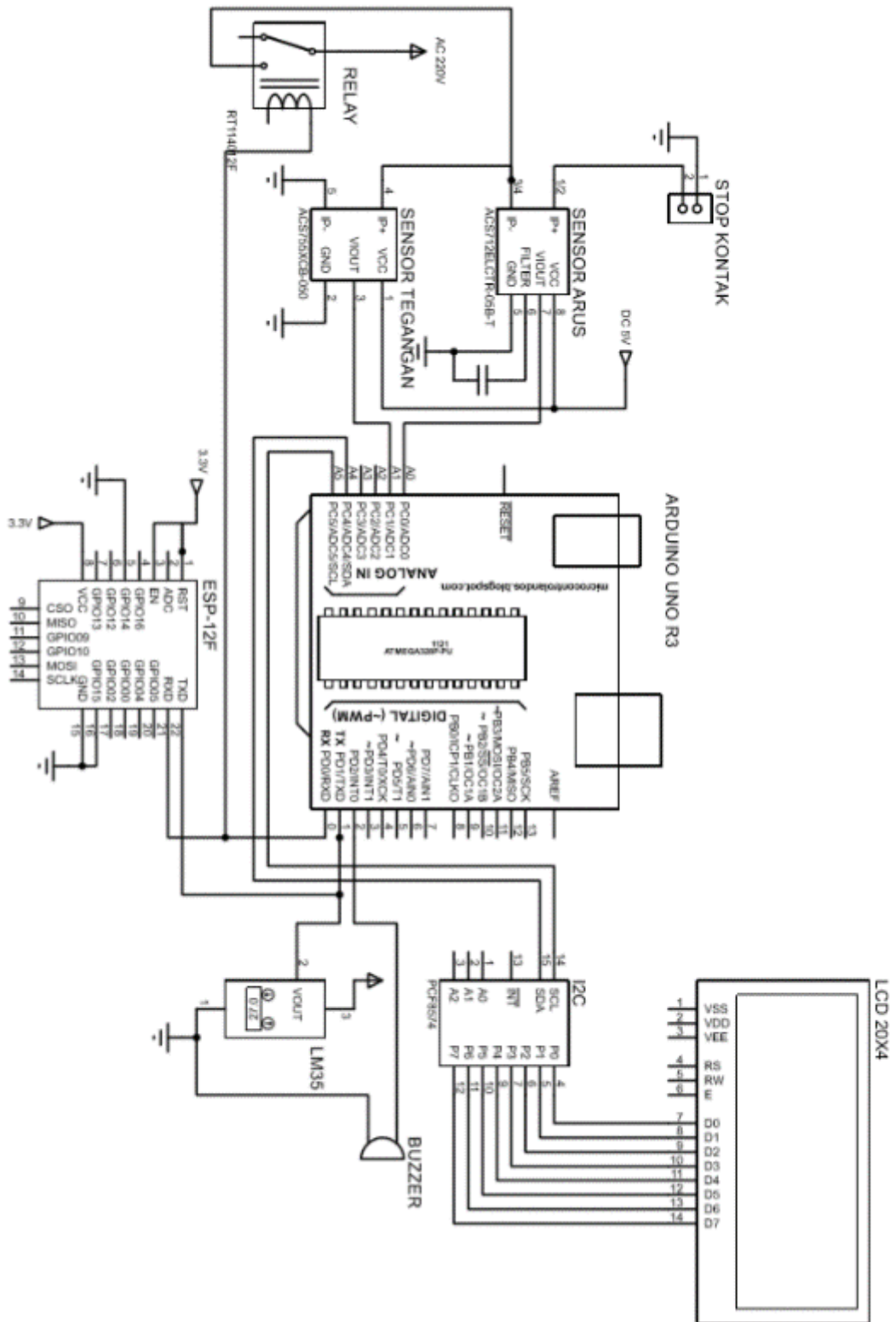
### Lampiran 1. Desain 2D Alat



### Lampiran 2. Desain 3D Alat



### Lampiran 3. Skematik Rangkaian di Proteus



#### Lampiran 4. Dokumentasi Pengerjaan Alat

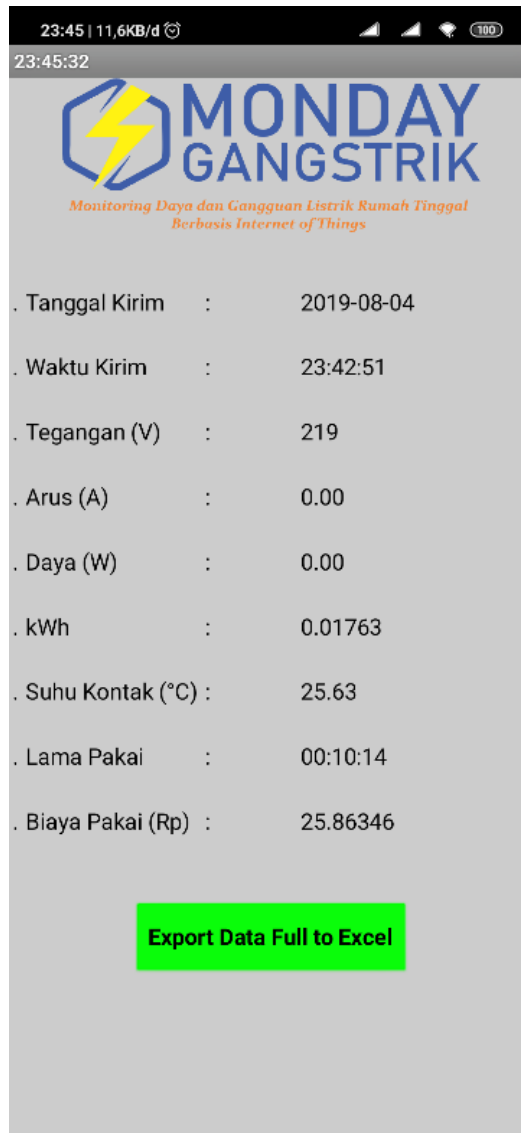


#### Lampiran 5. Wujud Fisik Alat



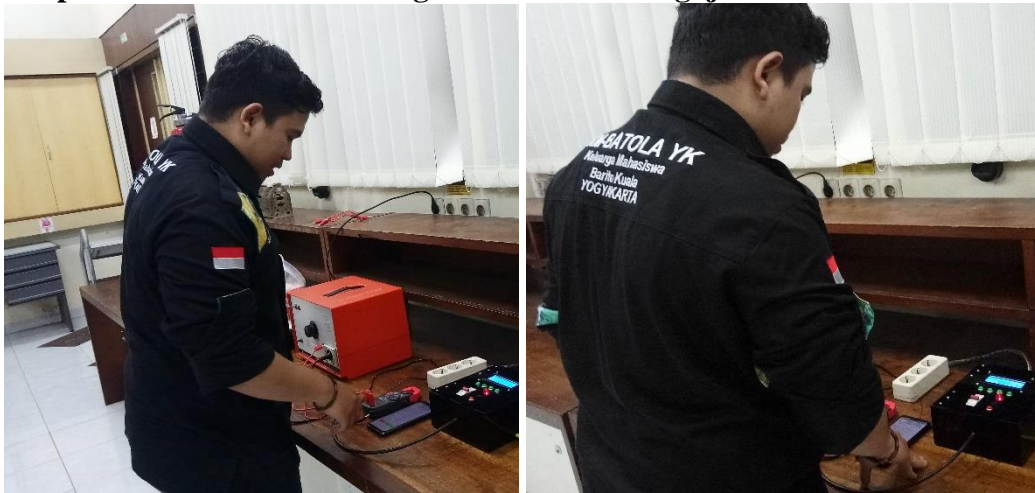


## Lampiran 6. Aplikasi MONDAY GANGSTRIK





### Lampiran 7. Dokumentasi Pengambilan Data Pengujian



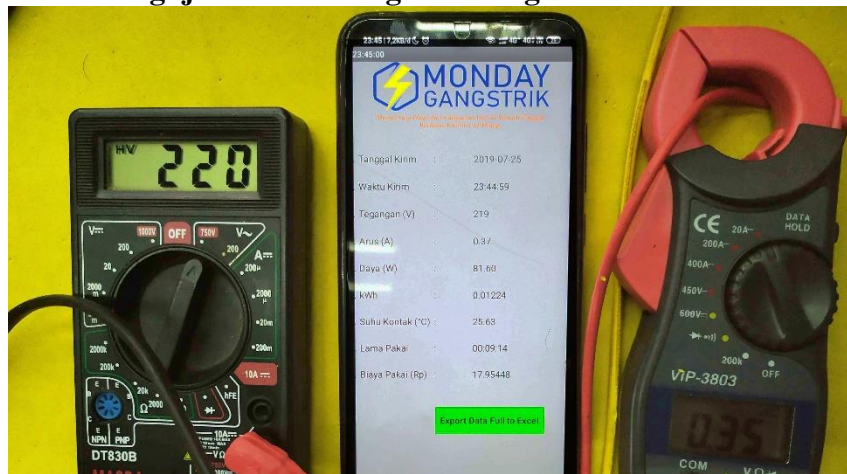
### Lampiran 8. Pengujian Monitoring Kipas angin



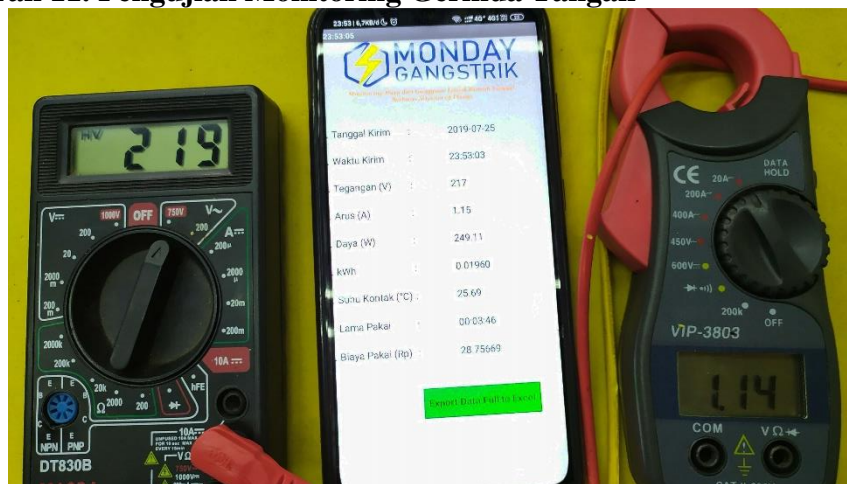
### Lampiran 9. Pengujian Monitoring Solder



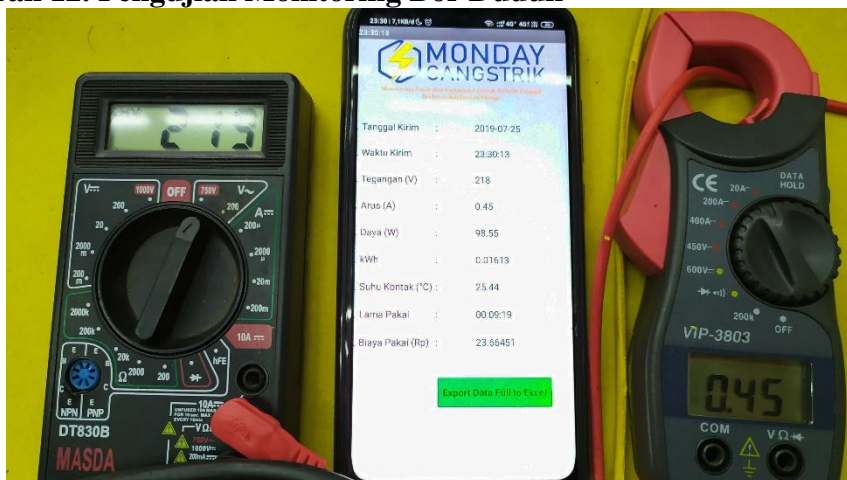
### Lampiran 10. Pengujian Monitoring Bor Tangan



### Lampiran 11. Pengujian Monitoring Gerinda Tangan

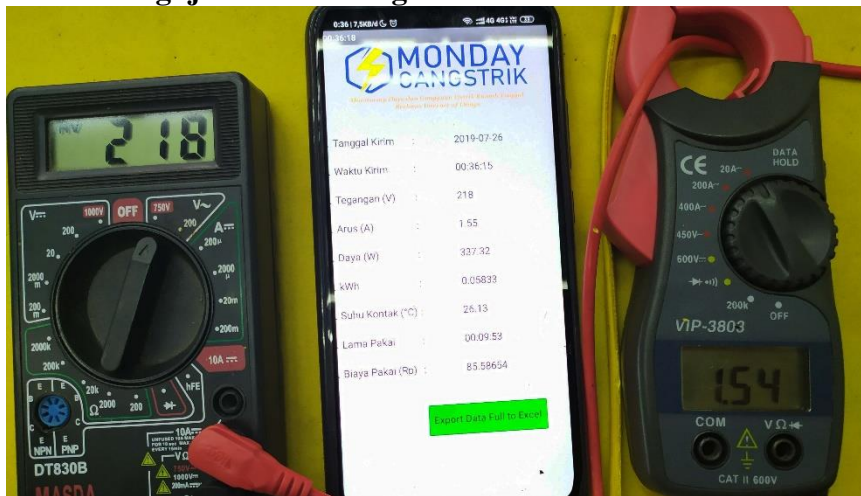


### Lampiran 12. Pengujian Monitoring Bor Duduk

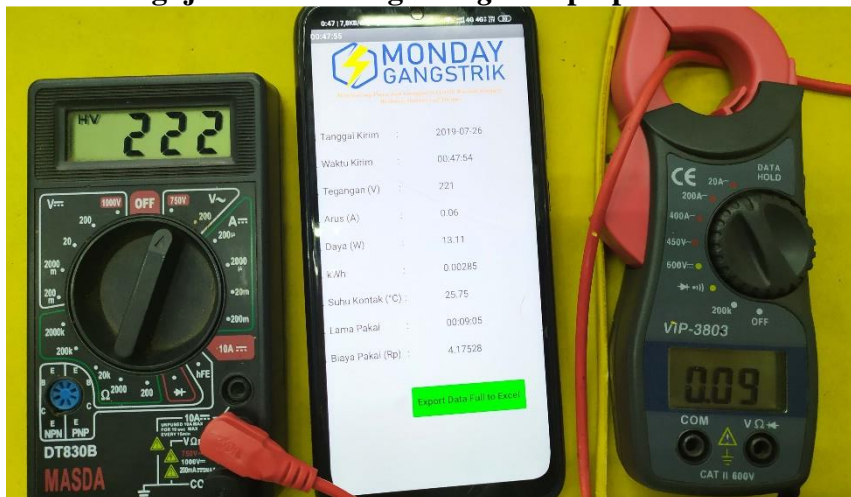




### Lampiran 13. Pengujian Monitoring Setrika

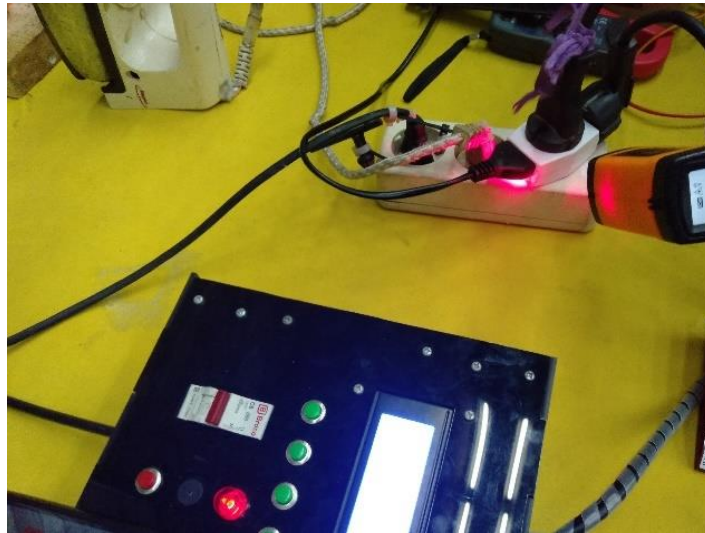


### Lampiran 14. Pengujian Monitoring Charger Laptop

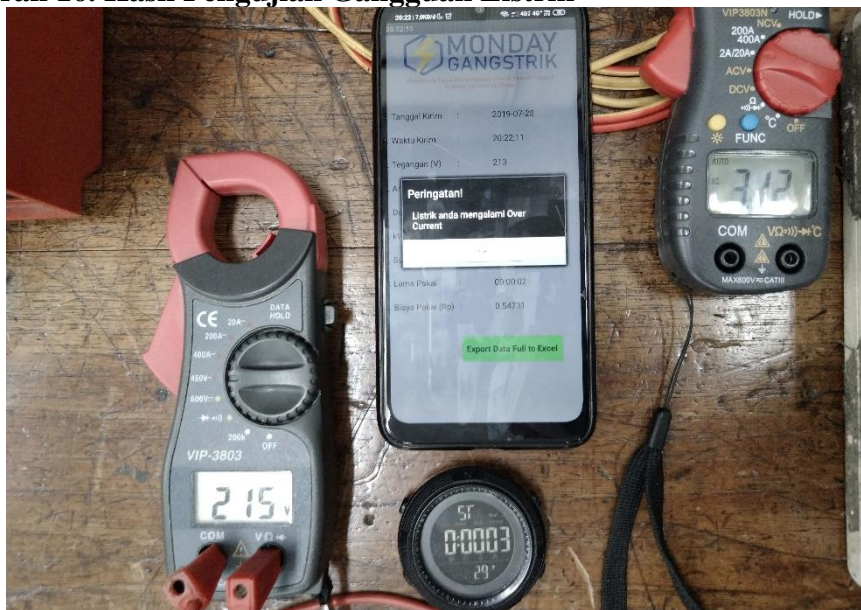


### Lampiran 15. Pengujian Gangguan Listrik





Lampiran 16. Hasil Pengujian Gangguan Listrik







**Lampiran 17. Data Pengujian Monitoring Kipas Angin selama 1 menit**

Tanggal	Waktu	Tegangan (V)	Arus (A)	Suhu (°C)	Daya (Watt)	Waktu pakai	kWh	Biaya (Rp)
7/25/2019	23:07:39	217	0.44	24.81	94.68	0:00:00	0.00009	0.13506
7/25/2019	23:07:40	219	0.42	24.81	91.72	0:00:01	0.00013	0.19159
7/25/2019	23:07:42	219	0.41	24.81	90.6	0:00:02	0.00016	0.22863
7/25/2019	23:07:43	220	0.4	24.75	86.96	0:00:03	0.00018	0.26443
7/25/2019	23:07:44	219	0.38	24.81	82.36	0:00:05	0.00019	0.28121
7/25/2019	23:07:48	219	0.34	24.81	75.35	0:00:07	0.00021	0.31397
7/25/2019	23:07:46	220	0.36	24.81	79.6	0:00:06	0.00021	0.31397
7/25/2019	23:07:50	220	0.32	24.81	69.47	0:00:11	0.00024	0.35795
7/25/2019	23:07:49	219	0.32	24.81	70.57	0:00:10	0.00024	0.35795
7/25/2019	23:07:54	220	0.31	24.81	67.28	0:00:13	0.00025	0.37175
7/25/2019	23:07:52	220	0.31	24.88	68.02	0:00:12	0.00025	0.37175
7/25/2019	23:07:55	220	0.31	24.81	68.02	0:00:16	0.00029	0.42677
7/25/2019	23:07:57	220	0.3	24.81	66.54	0:00:17	0.0003	0.44027
7/25/2019	23:07:58	220	0.3	24.81	66.54	0:00:19	0.00033	0.48104
7/25/2019	23:07:59	220	0.31	24.81	67.28	0:00:20	0.00035	0.50861
7/25/2019	23:08:01	220	0.3	24.94	66.54	0:00:21	0.00037	0.53588
7/25/2019	23:08:02	220	0.3	24.81	65.79	0:00:22	0.00037	0.54923
7/25/2019	23:08:03	219	0.3	24.81	65.49	0:00:24	0.00038	0.56279
7/25/2019	23:08:10	219	0.3	24.75	66.24	0:00:30	0.00072	106,332
7/25/2019	23:08:11	220	0.3	24.81	66.54	0:00:32	0.00074	109,059
7/25/2019	23:08:12	220	0.3	24.81	65.79	0:00:33	0.00076	111,734
7/25/2019	23:08:14	220	0.3	24.81	65.79	0:00:34	0.00077	113,105
7/25/2019	23:08:16	220	0.3	24.81	66.54	0:00:35	0.00079	115,817
7/25/2019	23:08:17	220	0.3	24.81	65.79	0:00:38	0.00083	121,220
7/25/2019	23:08:20	219	0.3	24.81	66.24	0:00:40	0.00084	123,901
7/25/2019	23:08:21	220	0.3	24.88	66.54	0:00:42	0.00087	127,984
7/25/2019	23:08:23	220	0.3	24.69	66.54	0:00:43	0.00089	130,696
7/25/2019	23:08:25	220	0.3	24.81	66.54	0:00:44	0.00091	133,399
7/25/2019	23:08:26	220	0.3	24.81	66.54	0:00:47	0.00096	140,188
7/25/2019	23:08:28	220	0.3	24.81	66.54	0:00:48	0.00096	141,543
7/25/2019	23:08:30	220	0.3	24.81	65.79	0:00:49	0.00098	144,249
7/25/2019	23:08:31	220	0.3	24.81	66.54	0:00:52	0.00102	149,762
7/25/2019	23:08:32	220	0.31	24.81	67.28	0:00:53	0.00104	152,483
7/25/2019	23:08:34	220	0.31	24.69	67.28	0:00:54	0.00106	155,240
7/25/2019	23:08:37	220	0.3	24.63	66.54	0:00:56	0.00108	157,946
7/25/2019	23:08:38	220	0.3	24.75	66.54	0:00:59	0.00111	162,014
7/25/2019	23:08:39	219	0.3	24.81	66.24	0:01:00	0.00111	163,370
<b>Rata-rata</b>		<b>219,68</b>	<b>0,32</b>	<b>24,80</b>	<b>70,30</b>			

**Lampiran 18. Data Pengujian Monitoring Solder selama 1 menit**

Tanggal	Waktu	Tegangan (V)	Arus (A)	Suhu (°C)	Daya (Watt)	Waktu pakai	kWh	Biaya (Rp)
7/26/2019	0:53:16	211	0.11	25.63	23.07	0:00:03	0.00005	0.07808
7/26/2019	0:53:18	220	0.11	25.63	24.05	0:00:04	0.00006	0.09363
7/26/2019	0:53:19	221	0.11	25.63	24.16	0:00:06	0.00007	0.10346
7/26/2019	0:53:21	221	0.12	25.63	26.13	0:00:07	0.00008	0.11368
7/26/2019	0:53:25	220	0.11	25.69	24.05	0:00:10	0.00009	0.13378
7/26/2019	0:53:27	221	0.11	25.63	24.16	0:00:11	0.0001	0.14362
7/26/2019	0:53:29	221	0.12	25.63	26.13	0:00:15	0.00012	0.17515
7/26/2019	0:53:31	221	0.11	25.69	24.16	0:00:17	0.00014	0.20012
7/26/2019	0:53:33	220	0.11	25.69	24.05	0:00:20	0.00015	0.22469
7/26/2019	0:53:34	220	0.12	25.69	26.01	0:00:21	0.00016	0.22962
7/26/2019	0:53:37	220	0.11	25.63	24.05	0:00:22	0.00016	0.23452
7/26/2019	0:53:48	221	0.11	25.63	24.16	0:00:27	0.00019	0.27916
7/26/2019	0:53:51	221	0.11	25.69	24.16	0:00:34	0.00023	0.33448
7/26/2019	0:53:52	221	0.11	25.63	24.16	0:00:39	0.00025	0.36522
7/26/2019	0:53:53	221	0.12	25.63	26.13	0:00:40	0.00025	0.37055
7/26/2019	0:53:59	220	0.11	25.63	24.05	0:00:41	0.00026	0.38527
7/26/2019	0:54:01	221	0.12	25.63	26.13	0:00:44	0.00028	0.41027
7/26/2019	0:54:05	221	0.11	25.63	24.16	0:00:49	0.0003	0.4356
7/26/2019	0:54:06	221	0.11	25.63	24.16	0:00:52	0.00031	0.46019
7/26/2019	0:54:13	221	0.12	25.56	26.13	0:00:57	0.00036	0.53444
7/26/2019	0:54:11	220	0.1	25.56	21.94	0:00:56	0.00036	0.53444
7/26/2019	0:54:15	221	0.11	25.63	24.16	0:01:01	0.00037	0.54428
<b>Rata-rata</b>		<b>220,22</b>	<b>0,11</b>	<b>25,64</b>	<b>24,51</b>			



**Lampiran 19. Data Pengujian Monitoring Bor Tangan selama 1 menit**

Tanggal	Waktu	Tegangan (V)	Arus (A)	Suhu (C)	Daya (Watt)	Waktu pakai	kWh	Biaya (Rp)
7/25/2019	23:35:48	218	0.33	25.5	71.95	0:00:02	0.00004	0.06346
7/25/2019	23:35:50	218	0.33	25.5	72.6	0:00:05	0.00009	0.1386
7/25/2019	23:35:51	217	0.34	25.44	73.55	0:00:06	0.0001	0.1534
7/25/2019	23:35:53	219	0.34	25.44	74.86	0:00:07	0.00013	0.18384
7/25/2019	23:35:55	218	0.34	25.44	74.52	0:00:10	0.00017	0.24446
7/25/2019	23:35:56	219	0.34	25.38	74.22	0:00:11	0.00019	0.27485
7/25/2019	23:35:58	218	0.34	25.44	75.15	0:00:12	0.00021	0.30567
7/25/2019	23:36:01	219	0.35	25.5	76.12	0:00:15	0.00027	0.39772
7/25/2019	23:36:03	219	0.35	25.5	77.37	0:00:18	0.00031	0.45989
7/25/2019	23:36:08	217	0.33	25.44	72.27	0:00:23	0.00057	0.83602
7/25/2019	23:36:09	218	0.35	25.5	77.01	0:00:24	0.00058	0.85172
7/25/2019	23:36:10	219	0.35	25.5	77.37	0:00:26	0.0006	0.88338
7/25/2019	23:36:12	219	0.36	25.44	77.98	0:00:27	0.00062	0.91509
7/25/2019	23:36:14	218	0.35	25.38	77.01	0:00:28	0.00066	0.96239
7/25/2019	23:36:15	219	0.35	25.5	77.37	0:00:31	0.00072	105,702
7/25/2019	23:36:18	218	0.36	25.44	77.63	0:00:32	0.00075	110,442
7/25/2019	23:36:19	218	0.36	25.44	78.84	0:00:34	0.00079	115,208
7/25/2019	23:36:20	219	0.37	25.5	80.41	0:00:36	0.00081	118,461
7/25/2019	23:36:22	219	0.36	25.44	78.6	0:00:37	0.00083	121,676
7/25/2019	23:36:23	219	0.36	25.5	77.98	0:00:38	0.00086	126,494
7/25/2019	23:36:24	219	0.36	25.44	79.2	0:00:39	0.00088	129,727
7/25/2019	23:36:27	219	0.36	25.38	79.81	0:00:41	0.00091	132,967
7/25/2019	23:36:29	219	0.37	25.44	80.41	0:00:43	0.00093	136,244
7/25/2019	23:36:30	219	0.38	25.44	82.19	0:00:46	0.00096	141,174
7/25/2019	23:36:33	218	0.37	25.44	80.04	0:00:47	0.001	146,099
7/25/2019	23:36:34	219	0.38	25.5	82.19	0:00:50	0.00104	152,675
7/25/2019	23:36:36	218	0.37	25.5	80.04	0:00:51	0.00105	154,306
7/25/2019	23:36:37	219	0.36	25.44	79.81	0:00:52	0.00107	157,583
7/25/2019	23:36:38	219	0.37	25.44	81	0:00:53	0.00111	162,491
7/25/2019	23:36:41	219	0.37	25.44	80.41	0:00:55	0.00113	165,793
7/25/2019	23:36:42	218	0.37	25.44	81.22	0:00:57	0.00117	172,376
7/25/2019	23:36:43	218	0.37	25.5	80.63	0:00:58	0.0012	175,694
7/25/2019	23:36:45	219	0.37	25.5	81	0:01:00	0.00122	179,020
<b>Rata-rata</b>		<b>218,51</b>	<b>0,36</b>	<b>25,46</b>	<b>77,90</b>			

**Lampiran 20. Data Pengujian Monitoring Gerinda Tangan selama 1 menit**

Tanggal	Waktu	Tegangan (V)	Arus (A)	Suhu (°C)	Daya (Watt)	Waktu pakai	kWh	Biaya (Rp)
7/25/2019	23:49:17	217	1.21	25.69	261.6	0:00:01	0.0001	0.1397
7/25/2019	23:49:19	217	1.16	25.69	252.3	0:00:02	0.00017	0.24267
7/25/2019	23:49:20	217	1.15	25.69	250	0:00:04	0.00024	0.34588
7/25/2019	23:49:21	217	1.15	25.63	250.2	0:00:05	0.00031	0.44873
7/25/2019	23:49:22	218	1.15	25.69	251.1	0:00:06	0.00034	0.49963
7/25/2019	23:49:24	217	1.15	25.69	249.3	0:00:07	0.00038	0.55044
7/25/2019	23:49:26	217	1.18	25.69	255.8	0:00:09	0.00045	0.65328
7/25/2019	23:49:27	217	1.15	25.69	250	0:00:11	0.00062	0.90834
7/25/2019	23:49:33	215	1.19	25.56	256.1	0:00:17	0.00171	251,373
7/25/2019	23:49:35	217	1.15	25.69	250	0:00:19	0.00175	256,505
7/25/2019	23:49:37	215	1.17	25.5	251.6	0:00:21	0.0022	323,184
7/25/2019	23:49:39	217	1.17	25.69	253.5	0:00:22	0.00234	343,893
7/25/2019	23:49:40	218	1.16	25.63	252	0:00:24	0.00241	354,201
7/25/2019	23:49:41	217	1.16	25.69	252.5	0:00:25	0.00252	369,578
7/25/2019	23:49:43	217	1.16	25.69	251.7	0:00:26	0.00255	374,721
7/25/2019	23:49:47	216	1.19	25.63	257.3	0:00:30	0.00341	500,027
7/25/2019	23:49:48	217	1.16	25.69	252.3	0:00:32	0.00348	510,340
7/25/2019	23:49:49	218	1.16	25.63	253.5	0:00:33	0.00358	525,909
7/25/2019	23:49:51	217	1.17	25.63	254.2	0:00:34	0.00362	531,016
7/25/2019	23:49:52	217	1.17	25.69	254.4	0:00:35	0.00369	541,290
7/25/2019	23:49:53	218	1.16	25.69	253.7	0:00:37	0.00376	551,661
7/25/2019	23:49:54	217	1.16	25.69	252.3	0:00:38	0.00386	567,089
7/25/2019	23:49:56	218	1.16	25.69	252.4	0:00:39	0.0039	572,172
7/25/2019	23:49:58	217	1.14	25.69	247.6	0:00:41	0.00397	582,396
7/25/2019	23:49:59	217	1.17	25.63	253.8	0:00:43	0.00407	597,870
7/25/2019	23:50:01	217	1.16	25.69	250.8	0:00:44	0.00411	602,981
7/25/2019	23:50:11	215	1.19	25.56	254.9	0:00:54	0.00603	885,243
7/25/2019	23:50:13	218	1.18	25.69	258.1	0:00:56	0.00611	895,782
7/25/2019	23:50:14	217	1.18	25.69	256.5	0:00:58	0.00625	916,595
7/25/2019	23:50:15	217	1.18	25.63	257.1	0:00:59	0.00632	926,914
7/25/2019	23:50:17	218	1.14	25.69	249	0:01:00	0.00639	937,097
<b>Rata-rata</b>		<b>217</b>	<b>1,16</b>	<b>25,66</b>	<b>253,08</b>			

**Lampiran 21. Data Pengujian Monitoring Bor Duduk selama 1 menit**

Tanggal	Waktu	Tegangan (V)	Arus (A)	Suhu (C)	Daya (Watt)	Waktu pakai	kWh	Biaya (Rp)
7/25/2019	23:20:49	218	0.45	24.88	98.1	0:00:02	0.00011	0.16271
7/25/2019	23:20:50	218	0.45	24.88	97.64	0:00:03	0.00014	0.2026
7/25/2019	23:20:52	219	0.45	24.88	98.55	0:00:04	0.00017	0.24258
7/25/2019	23:20:54	219	0.45	24.88	97.63	0:00:07	0.00022	0.32264
7/25/2019	23:20:55	218	0.45	25.38	97.64	0:00:08	0.00025	0.36243
7/25/2019	23:20:56	218	0.45	24.94	97.18	0:00:09	0.00026	0.38242
7/25/2019	23:20:59	219	0.45	24.88	98.55	0:00:10	0.00029	0.42268
7/25/2019	23:21:00	218	0.45	24.88	97.18	0:00:13	0.00037	0.54261
7/25/2019	23:21:03	218	0.45	24.88	98.1	0:00:14	0.0004	0.5826
7/25/2019	23:21:04	219	0.45	24.94	99	0:00:17	0.00048	0.70309
7/25/2019	23:21:05	218	0.45	24.94	97.18	0:00:18	0.00051	0.74335
7/25/2019	23:21:11	218	0.45	25.38	97.18	0:00:24	0.00081	118,828
7/25/2019	23:21:10	215	0.47	24.88	102	0:00:22	0.00081	118,828
7/25/2019	23:21:13	219	0.45	25.38	97.63	0:00:25	0.00085	124,816
7/25/2019	23:21:15	218	0.46	24.94	99.46	0:00:27	0.00088	128,795
7/25/2019	23:21:16	219	0.45	24.88	98.09	0:00:29	0.00095	138,809
7/25/2019	23:21:18	218	0.45	25.38	97.64	0:00:30	0.00097	142,798
7/25/2019	23:21:19	219	0.45	24.94	99	0:00:32	0.001	146,824
7/25/2019	23:21:20	218	0.45	24.94	99.01	0:00:33	0.00104	152,830
7/25/2019	23:21:23	219	0.46	24.94	99.92	0:00:34	0.00108	158,882
7/25/2019	23:21:25	219	0.45	24.81	99	0:00:38	0.00112	164,898
7/25/2019	23:21:24	219	0.45	24.94	98.55	0:00:37	0.00112	164,898
7/25/2019	23:21:28	218	0.45	24.88	99.01	0:00:39	0.00116	170,904
7/25/2019	23:21:29	218	0.45	24.94	98.55	0:00:42	0.00122	178,919
7/25/2019	23:21:30	219	0.45	25.38	98.55	0:00:43	0.00126	184,934
7/25/2019	23:21:32	218	0.45	24.88	98.1	0:00:44	0.0013	190,903
7/25/2019	23:21:34	218	0.45	24.88	97.64	0:00:47	0.00131	192,902
7/25/2019	23:21:33	219	0.45	24.94	99	0:00:46	0.00131	192,902
7/25/2019	23:21:37	217	0.46	24.94	100.4	0:00:49	0.00151	221,366
7/25/2019	23:21:38	218	0.45	24.94	99.01	0:00:51	0.00156	229,399
7/25/2019	23:21:39	219	0.46	25.38	100.4	0:00:52	0.0016	235,452
7/25/2019	23:21:42	219	0.46	25.38	99.92	0:00:53	0.00163	239,515
7/25/2019	23:21:43	219	0.45	24.94	99	0:00:56	0.0017	249,622
7/25/2019	23:21:44	219	0.45	24.94	98.55	0:00:57	0.00173	253,657
7/25/2019	23:21:47	219	0.45	25.38	98.55	0:00:58	0.00177	259,719
7/25/2019	23:21:48	219	0.45	24.94	99	0:01:01	0.00185	271,862
<b>Rata-rata</b>		<b>218,39</b>	<b>0,45</b>	<b>24,88</b>	<b>98,60</b>			



**Lampiran 22. Data Pengujian Monitoring Sertika selama 1 menit**

Tanggal	Waktu	Tegangan (V)	Arus (A)	Suhu (C)	Daya (Watt)	Waktu pakai	kWh	Biaya (Rp)
7/26/2019	0:01:14	217	1.55	25.81	335.5	0:00:02	0.00019	0.27434
7/26/2019	0:01:16	218	1.55	25.81	337.2	0:00:04	0.00023	0.3428
7/26/2019	0:01:17	217	1.55	25.75	335.3	0:00:05	0.00033	0.4812
7/26/2019	0:01:19	218	1.55	25.81	337.5	0:00:06	0.00042	0.61866
7/26/2019	0:01:21	218	1.55	25.81	338.1	0:00:09	0.00047	0.68744
7/26/2019	0:01:22	218	1.55	25.81	338.6	0:00:10	0.00056	0.82487
7/26/2019	0:01:23	217	1.55	25.88	335.9	0:00:11	0.0007	103,146
7/26/2019	0:01:25	218	1.55	25.88	338.1	0:00:12	0.00084	123,741
7/26/2019	0:01:27	218	1.54	25.81	336.4	0:00:14	0.00089	130,596
7/26/2019	0:01:28	218	1.55	25.88	337.6	0:00:16	0.00103	151,203
7/26/2019	0:01:30	218	1.55	25.81	337.5	0:00:18	0.00108	158,068
7/26/2019	0:01:31	218	1.55	25.81	338.5	0:00:19	0.00122	178,746
7/26/2019	0:01:33	218	1.54	25.81	336.5	0:00:20	0.00136	199,375
7/26/2019	0:01:36	215	1.58	25.88	339.8	0:00:24	0.00197	289,239
7/26/2019	0:01:38	214	1.53	25.75	328.1	0:00:26	0.00257	376,770
7/26/2019	0:01:42	215	1.58	25.81	339.4	0:00:30	0.0036	528,542
7/26/2019	0:01:44	218	1.55	25.88	337.8	0:00:31	0.0037	542,281
7/26/2019	0:01:45	218	1.55	25.81	337	0:00:33	0.00384	562,889
7/26/2019	0:01:46	218	1.55	25.88	337.2	0:00:34	0.00393	576,643
7/26/2019	0:01:49	218	1.55	25.75	337.3	0:00:35	0.00407	597,243
7/26/2019	0:01:50	218	1.55	25.88	337	0:00:38	0.00435	638,409
7/26/2019	0:01:51	218	1.55	25.81	337	0:00:39	0.0044	645,257
7/26/2019	0:01:53	218	1.55	25.81	337.6	0:00:40	0.00444	652,097
7/26/2019	0:01:55	219	1.55	25.81	339.5	0:00:42	0.00459	672,795
7/26/2019	0:01:56	217	1.55	25.81	336.6	0:00:44	0.00477	700,366
7/26/2019	0:01:58	218	1.55	25.81	337.6	0:00:45	0.00482	707,288
7/26/2019	0:02:00	218	1.55	25.81	337.3	0:00:47	0.00491	721,018
7/26/2019	0:02:01	218	1.55	25.81	337.3	0:00:49	0.00515	755,262
7/26/2019	0:02:02	218	1.55	25.75	338	0:00:50	0.00524	769,022
7/26/2019	0:02:04	217	1.55	25.88	336.6	0:00:52	0.00529	775,874
7/26/2019	0:02:06	215	1.56	25.88	334.7	0:00:54	0.00585	857,789
7/26/2019	0:02:08	215	1.57	25.75	337.9	0:00:56	0.00646	947,246
7/26/2019	0:02:10	218	1.54	25.88	336.7	0:00:57	0.00655	961,014
7/26/2019	0:02:12	218	1.55	25.88	337.5	0:01:00	0.00674	988,474
<b>Rata-rata</b>		<b>217,41</b>	<b>1,55</b>	<b>25,82</b>	<b>337,07</b>			

**Lampiran 23. Data Pengujian Monitoring Charger Laptop selama 1 menit**

Tanggal	Waktu	Tegangan (V)	Arus (A)	Suhu (C)	Daya (Watt)	Waktu pakai	kWh	Biaya (Rp)
7/26/2019	0:37:29	220	0.13	26.13	28.93	0:00:01	0.00001	0.01889
7/26/2019	0:37:31	221	0.12	26.13	26.36	0:00:07	0.00005	0.07297
7/26/2019	0:37:32	220	0.09	26.06	20.26	0:00:10	0.00006	0.09158
7/26/2019	0:37:35	220	0.08	26.06	18.6	0:00:11	0.00007	0.10363
7/26/2019	0:37:37	220	0.08	26.13	18.6	0:00:13	0.00008	0.11737
7/26/2019	0:37:39	221	0.08	26.13	18.69	0:00:16	0.0001	0.15069
7/26/2019	0:37:42	220	0.24	26.13	53.45	0:00:19	0.00011	0.16158
7/26/2019	0:37:43	220	0.19	26.13	41.5	0:00:20	0.00011	0.16571
7/26/2019	0:37:46	222	0.08	26.06	17.01	0:00:23	0.00012	0.17928
7/26/2019	0:37:50	220	0.08	26.13	18.6	0:00:25	0.00015	0.21389
7/26/2019	0:37:51	220	0.08	26.19	18.6	0:00:29	0.00017	0.25383
7/26/2019	0:37:54	221	0.08	26.13	16.93	0:00:30	0.00018	0.2645
7/26/2019	0:37:56	220	0.08	26.06	16.86	0:00:32	0.00019	0.27619
7/26/2019	0:37:59	220	0.08	26.06	18.6	0:00:35	0.00021	0.30107
7/26/2019	0:38:00	220	0.08	26.13	18.6	0:00:37	0.00022	0.32004
7/26/2019	0:38:08	220	0.09	26.06	20.26	0:00:40	0.00023	0.33797
7/26/2019	0:38:03	220	0.08	26.13	16.86	0:00:39	0.00023	0.33797
7/26/2019	0:38:09	221	0.08	26.19	16.93	0:00:46	0.00027	0.39449
7/26/2019	0:38:13	220	0.14	25.94	30.22	0:00:47	0.00028	0.4041
7/26/2019	0:38:21	222	0.08	25.94	17.01	0:00:49	0.00028	0.41136
7/26/2019	0:38:23	218	0.08	25.94	18.43	0:01:01	0.00036	0.52273
<b>Rata-rata</b>		<b>220,28</b>	<b>0,10</b>	<b>26,08</b>	<b>22,44</b>			

## Lampiran 24. Halaman web Monday Gangstrik

mondaygangstrik.karyainovatif.com

**MONDAY GANGSTRIK**

Data monitoring listrik EXPORT SEMUA DATA KE EXCEL

NOMOR	TANGGAL	JAM	TEGANGAN	ARUS	SUHU	DAYA	WAKTU	kWh	BIAYA	UNDER
1	2019-07-29	23:25:13	222	0.00	25.63	0.00	00:10:14	0.01763	25.86346	0
2	2019-07-29	23:25:12	223	0.00	25.63	0.00	00:10:14	0.01763	25.86346	0
3	2019-07-29	23:25:10	221	0.00	25.50	0.00	00:10:14	0.01763	25.86346	0
4	2019-07-29	23:25:03	225	0.00	25.63	0.00	00:10:14	0.01763	25.86346	0
5	2019-07-29	23:25:02	220	0.15	25.75	34.00	00:10:13	0.01762	25.85644	0
6	2019-07-29	23:24:55	220	0.17	25.75	37.25	00:10:06	0.01746	25.62120	0
7	2019-07-29	23:24:52	222	0.15	25.69	34.31	00:10:02	0.01740	25.53199	0
8	2019-07-29	23:24:49	219	0.15	25.69	33.85	00:10:01	0.01739	25.51101	0
9	2019-07-29	23:24:45	222	0.15	25.63	34.31	00:09:56	0.01727	25.34414	0
10	2019-07-29	23:24:43	222	0.15	25.69	32.55	00:09:54	0.01726	25.32316	0
11	2019-07-29	23:24:41	220	0.15	25.69	32.26	00:09:53	0.01725	25.31617	0
12	2019-07-29	23:24:35	222	0.15	25.69	32.55	00:09:47	0.01709	25.07696	0
13	2019-07-29	23:24:34	222	0.15	25.63	34.31	00:09:46	0.01708	25.06298	0
14	2019-07-29	23:24:33	221	0.15	25.63	34.16	00:09:44	0.01707	25.04899	0
15	2019-07-29	23:24:29	222	0.15	25.69	34.31	00:09:41	0.01698	24.90946	0
16	2019-07-29	23:24:27	222	0.15	25.69	34.31	00:09:39	0.01696	24.88848	0
17	2019-07-29	23:24:26	223	0.15	25.69	32.70	00:09:38	0.01691	24.81193	0
18	2019-07-29	23:24:24	222	0.15	25.63	34.31	00:09:37	0.01690	24.79193	0
19	2019-07-29	23:24:23	222	0.15	25.69	34.31	00:09:35	0.01689	24.78494	0
20	2019-07-29	23:24:22	223	0.15	25.69	34.47	00:09:34	0.01689	24.77795	0
21	2019-07-29	23:24:21	223	0.15	25.69	34.47	00:09:32	0.01688	24.76429	0
22	2019-07-29	23:24:19	223	0.15	25.63	32.70	00:09:31	0.01682	24.67304	0



## Lampiran 25. Program Blok MIT APP Inventor

```
when Screen1 .Initialize  
do open another screen screenName " Screen2 "
```

```
when Clock1 .Timer  
do  
  set Web1 . Uri to "http://mondaygangstrik.karyainovatif.com/teganga..."  
  set Web2 . Uri to "http://mondaygangstrik.karyainovatif.com/arus.php"  
  set Web3 . Uri to "http://mondaygangstrik.karyainovatif.com/daya.php"  
  set Web4 . Uri to "http://mondaygangstrik.karyainovatif.com/suhu.php"  
  set Web5 . Uri to "http://mondaygangstrik.karyainovatif.com/waktu.php"  
  set Web6 . Uri to "http://mondaygangstrik.karyainovatif.com/biaya.php"  
  set Web7 . Uri to "http://mondaygangstrik.karyainovatif.com/tanggal..."  
  set Web8 . Uri to "http://mondaygangstrik.karyainovatif.com/jam.php"  
  set Web9 . Uri to "http://mondaygangstrik.karyainovatif.com/kwh.php"  
  set Web10 . Uri to "http://mondaygangstrik.karyainovatif.com/under.php"  
  set Web11 . Uri to "http://mondaygangstrik.karyainovatif.com/upper.php"  
  set Web12 . Uri to "http://mondaygangstrik.karyainovatif.com/heat.php"  
  set Web13 . Uri to "http://mondaygangstrik.karyainovatif.com/over.php"  
  
  call Web1 .Get  
  call Web2 .Get  
  call Web3 .Get  
  call Web4 .Get  
  call Web5 .Get  
  call Web6 .Get  
  call Web7 .Get  
  call Web8 .Get  
  call Web9 .Get  
  call Web10 .Get  
  call Web11 .Get  
  call Web12 .Get  
  call Web13 .Get
```

```
initialize global hour to 0  
initialize global minute to 0  
initialize global second to 0  
  
when Clock2 .Timer  
do  
  set global hour to call Clock2 .Hour  
  instant call Clock2 .Now  
  set global minute to call Clock2 .Minute  
  instant call Clock2 .Now  
  set global second to call Clock2 .Second  
  instant call Clock2 .Now  
  
  if get global hour <= 10  
  then set global hour to join "0" get global hour  
  
  if get global minute <= 10  
  then set global minute to join "0" get global minute  
  
  if get global second <= 10  
  then set global second to join "0" get global second  
  
  set Screen2 . Title to join get global hour  
  " " get global minute  
  " " get global second
```

```

when Screen2 - BackPressed
do call Notifier1 - ShowChooseDialog
    message "Keluar aplikasi"
    title "Anda yakin ingin keluar aplikasi?"
    button1Text "Keluar"
    button2Text "Batal"
    cancelable false

when Notifier1 - AfterChoosing
choice
do if get choice == "Keluar"
then close application

when Web1 - GotText
url responseCode responseType responseContent
do set Label4 - Text to join get responseContent

when Web2 - GotText
url responseCode responseType responseContent
do set Label7 - Text to join get responseContent

when Web3 - GotText
url responseCode responseType responseContent
do set Label10 - Text to join get responseContent

when Web4 - GotText
url responseCode responseType responseContent
do set Label13 - Text to join get responseContent

when Web5 - GotText
url responseCode responseType responseContent
do set Label16 - Text to join get responseContent

when Web6 - GotText
url responseCode responseType responseContent
do set Label19 - Text to join get responseContent

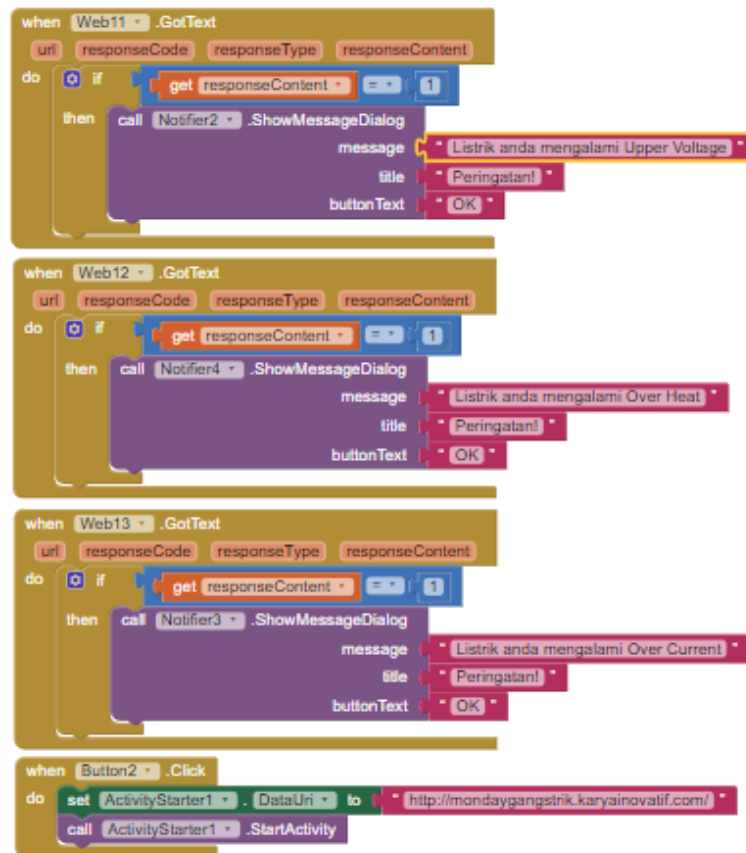
when Web7 - GotText
url responseCode responseType responseContent
do set Label32 - Text to join get responseContent

when Web8 - GotText
url responseCode responseType responseContent
do set Label33 - Text to join get responseContent

when Web9 - GotText
url responseCode responseType responseContent
do set Label37 - Text to join get responseContent

when Web10 - GotText
url responseCode responseType responseContent
do if get responseContent == 1
then call Notifier2 - ShowAlertDialog
    message "Listrik anda mengalami Under Voltage"
    title "Peringatan!"
    buttonText "OK"

```



## Lampiran 26. Program memasukkan data ke Database

```

<?php
header("Access-Control-Allow-Origin: *");
header("Content-Type: application/json; charset=UTF-8");

//Creating Array for JSON response
$response = array();

// Check if we got the field from the user
if (isset($_GET['voltage']) && isset($_GET[' arus']) &&
isset($_GET[' daya']) && isset($_GET[' kwh']) &&
isset($_GET[' suhu']) && isset($_GET[' waktu']) &&
isset($_GET[' biaya']) && isset($_GET[' under']) &&
isset($_GET[' upper']) && isset($_GET[' heat']) &&
isset($_GET[' over']))
{
    $tegangan = $_GET['voltage'];
    $arus = $_GET[' arus'];
    $daya = $_GET[' daya'];
    $suhu = $_GET[' suhu'];
    $waktu = $_GET[' waktu'];
    $biaya = $_GET[' biaya'];
    $kwh = $_GET[' kwh'];
    $under = $_GET[' under'];
}

```



```

$upper = $_GET['upper'];
$heat = $_GET['heat'];
$over = $_GET['over'];

// Include data base connect class
$filepath = realpath (dirname(__FILE__));
    require_once($filepath."/testingconnect.php");

// Connecting to database
$db = new DB_CONNECT();

    date_default_timezone_set('Asia/Bangkok');
    $dateS = date('Y-m-d', time());
    $timeS = date('H:i:s', time());
    //echo $dateS;
    //echo $timeS;

// Fire SQL query to insert data in weather
//INSERT INTO `testingDB` (`No`, `Sensor1`, `Sensor2`)
VALUES ('1', '1', '1');
    $result = mysql_query("INSERT INTO testing
(nomor,tanggal,jam,voltage,arus,daya,kwh,suhu,waktu,biaya,under,
upper,heat,over)
VALUES (Null, '$dateS', '$timeS', '$tegangan', '$arus', '$daya', '$kwh'
, '$suhu', '$waktu', '$biaya', '$under', '$upper', '$heat', '$over')");

// Check for succesfull execution of query
if ($result)
{
    // successfully inserted
    $response["success"] = 1;
    $response["message"] = "Data successfully inserted.";
    // Show JSON response
    echo json_encode($response);
}
else
{
    // Failed to insert data in database
    $response["success"] = 0;
    $response["message"] = "Something has been wrong";
    // Show JSON response
    echo json_encode($response);
}
}
else
{
    // If required parameter is missing
    $response["success"] = 0;
    $response["message"] = "Parameter(s) are missing. Please
check the request";
    // Show JSON response
    echo json_encode($response);
}
?>

```

## Lampiran 27. Program koneksi Database dengan php

```
//Connect.php
<?php
class DB_CONNECT {

    // Constructor
    function __construct() {
        // Trying to connect to the database
        $this->connect();
    }

    // Destructor
    function __destruct() {
        // Closing the connection to database
        $this->close();
    }

    // Function to connect to the database
    function connect() {

        //importing dbconfig.php file which contains database
        credentials
        $filepath = realpath (dirname(__FILE__));

        require_once($filepath."/testingconfig.php");

        // Connecting to mysql (phpmyadmin) database
        $con = mysql_connect(DB_SERVER, DB_USER, DB_PASSWORD) or
        die(mysql_error());

        // Selecing database
        $db = mysql_select_db(DB_DATABASE) or die(mysql_error())
        or die(mysql_error());

        // returing connection cursor
        return $con;
    }

    // Function to close the database
    function close() {
        // Closing data base connection
        mysql_close();
    }
}

?>
```

## Lampiran 28. Arduino IDE

```
#include <ACS712.h>
#include <OneWire.h>
#include <DallasTemperature.h>
#include <LiquidCrystal_I2C.h>
#include <EmonLib.h>
#include <SoftwareSerial.h>
#define ONE_WIRE_BUS A2
LiquidCrystal_I2C lcd(0x27, 20, 4);
OneWire oneWire(ONE_WIRE_BUS);
DallasTemperature sensors(&oneWire);
SoftwareSerial mySerial(2, 3);
const int relay = 4;
const int pbtim = 5;
const int pbup = 6;
const int pbdown = 7;
const int pbok = 8;
const int pbres = 9;
const int buzzer = 10;
int var, var1, set, sketch, gito;
int menu = 0;
int up = 0;
int down = 0;
int ress = 0;
int ok = 0;
int bypas;
int sensorv = 0;
int warning = 0;
float Celcius = 0;
double V, I, P, PP;
double total, biaya;
unsigned long printPeriod = 1000;
unsigned long previousMillis = 0;
ACS712 sensor(ACS712_20A, A1);
EnergyMonitor emon1;
unsigned long waktuterakhir, detik = 0, menit, jam;
long startOver, startHeat, startVoltageun, startVoltageup;
float t, o, s, y, h;
int g, k;
char c = ' ';
long ampereStart, ampereStop;
bool calcI = false, overCurrent = false, over heat = false,
upperVoltage = false, underVoltage = false;
long runI = 0;
long a;
int i = 1;
int un = 0;
int uv = 0;
int ht = 0;
int ov = 0;

void setup()
{
  pinMode(relay, OUTPUT);
  pinMode(buzzer, OUTPUT);
```

```

pinMode(pbtim, INPUT);
pinMode(pbup, INPUT);
pinMode(pbdown, INPUT);
pinMode(pbok, INPUT);
pinMode(pbres, INPUT);
emon1.voltage(A0, 640, 225);
sensor.calibrate();
mySerial.begin(9600);
Serial.begin(57600);
lcd.begin();
lcd.backlight();
}

void loop()
{
  menu = digitalRead(pbtim);
  up = digitalRead(pbup);
  down = digitalRead(pbdown);
  ok = digitalRead(pbok);
  ress = digitalRead(pbres);

  //Tegangan
  emon1.calcVI(20, 2000);
  float V = emon1.Vrms;
  g = V;

  //Arus
  float I = sensor.getCurrentAC();
  t = I;

  //Daya & Biaya
  float P = (g * t);
  o = P;

  //Suhu
  sensors.requestTemperatures();
  float Celcius = sensors.getTempCByIndex(0);
  y = Celcius;

  //Waktu
  tikde();
  a = runI;
  if (calcI == true)
  {
    PP = (P / 1000) * (millis() - ampereStart) / 3600 * 0.5;
    s += PP;
  }
  else
  {
    PP = 0;
  }
  biaya = PP * 1467.28;
  total += biaya;
  h = total;

  if (V > 230) // Upper Voltage

```



```

{
  if (upperVoltage == true)
  {
    if (millis () - startVoltageup >= 3000)
    {
      uv = 1;
      digitalWrite(relay, HIGH);
      digitalWrite(buzzer, HIGH);
      warning = 1;
      lcd.clear();
      delay(5);
      lcd.setCursor(2, 0);
      lcd.print("MONDAY GANGSTRIK");
      lcd.setCursor(0, 1);
      lcd.print("UPPER VOLTAGE");
    }
  }
  else
  {
    startVoltageup = millis();
    upperVoltage = true;
  }
}

if (V < 210 && V > 100 && I < 2) // Under Voltage
{
  if (underVoltage == true)
  {
    if (millis () - startVoltageun >= 3000)
    {
      un = 1;
      digitalWrite(relay, HIGH);
      digitalWrite(buzzer, HIGH);
      warning = 1;
      lcd.clear();
      delay(5);
      lcd.setCursor(2, 0);
      lcd.print("MONDAY GANGSTRIK");
      lcd.setCursor(0, 1);
      lcd.print("UNDER VOLTAGE");
    }
  }
  else
  {
    startVoltageun = millis();
    underVoltage = true;
  }
}

if (Celcius > 35) // Over Heat
{
  if (over heat == true)
  {
    if (millis () - startHeat >= 3000)
    {
      ht = 1;

```

```

        digitalWrite(relay, HIGH);
        digitalWrite(buzzer, HIGH);
        warning = 1;
        lcd.clear();
        delay(5);
        lcd.setCursor(2, 0);
        lcd.print("MONDAY GANGSTRIK");
        lcd.setCursor(0, 1);
        lcd.print("OVER HEAT");
    }
}
else
{
    startHeat = millis();
    over heat = true;
}
}
if (I > i) // Over Current
{
    if (overCurrent == true)
    {
        if (millis() - startOver >= 3000)
        {
            ov = 1;
            digitalWrite(relay, HIGH);
            digitalWrite(buzzer, HIGH);
            warning = 1;
            lcd.clear();
            lcd.setCursor(2, 0);
            lcd.print("MONDAY GANGSTRIK");
            lcd.setCursor(0, 1);
            lcd.print("OVER CURRENT");
        }
    }
    else
    {
        startOver = millis();
        overCurrent = true;
    }
}
}
resetin();

Serial.println(String("V = ") + g + "Volt");
Serial.println(String("I = ") + t + "Ampere");
Serial.println(String("P = ") + o + "W");
Serial.print("kWh = "); Serial.println(s, 10);
Serial.println(String("T = ") + y + "C");
Serial.println(String("t = ") + a + "");
Serial.print("Biaya = Rp "); Serial.println(h, 10);
Serial.println(String("under = ") + un + "");
Serial.println(String("upper = ") + uv + "");
Serial.println(String("heat = ") + ht + "");
Serial.println(String("over = ") + ov + "");

if (mySerial.available() > 0) // Pengiriman Serial ke NodeMCU
{

```

```

c = mySerial.read();
if (c == 'a')
{
  String data = String (g);
  data += ";";
  data += String (t);
  data += ":";
  data += String (o);
  data += "#";
  data += String (s, 10);
  data += "@";
  data += String(y);
  data += "$";
  data += String (a);
  data += "%";
  data += String (h, 10);
  data += "!";
  data += String (un);
  data += "?";
  data += String (uv);
  data += "^";
  data += String (ht);
  data += "*";
  data += String (ov);
  mySerial.println(data);
  Serial.println(data);
}
}

lcd.setCursor(2, 0);
lcd.print("MONDAY GANGSTRIK");

if (menu == LOW) // Tombol Menu ditekan timer
{
  if (gito == 0)
  {
    sketch++;
    gito = 1;
    lcd.clear();
    delay(5);
  }

  else if (gito == 1)
  {
    sketch++;
    gito = 2;
    lcd.clear();
    delay(5);
  }
  else
  {
    gito = 0;
  }
}

if (sketch > 2) {

```

```

    sketch = 0;
}
if (sketch == 1)
{
    lcd.setCursor(0, 1);
    lcd.print("SETTING TIMER : ");
    lcd.setCursor(0, 2);
    lcd.print(set);

    if (up == LOW) // Tombol Up ditekan timer
    {
        if (var == 0)
        {
            set += 10;
            var = 1;
            lcd.clear();
            delay(5);
        }
    }
    else {
        var = 0;
    }

    if (down == LOW) // Tombol Down ditekan timer
    {
        if (var1 == 0)
        {
            set--;
            var1 = 1;
            lcd.clear();
            delay(5);
        }
    }
    else {
        var1 = 0;
    }
    if (ok == LOW) // Tombol Ok ditekan timer
    {
        while (set > 0) {
            set--; delay(1000);
            lcd.clear();
            delay(5);
            if (set < 0) {
                set = 0;
            }
            lcd.setCursor(2, 0);
            lcd.print("MONDAY GANGSTRIK");
            lcd.setCursor(0, 1);
            lcd.print("OTW Padam : ");
            lcd.setCursor(0, 2);
            lcd.print(set);
        }
        if (set == 0) {
            digitalWrite(buzzer, HIGH);
            digitalWrite(relay, HIGH);
            lcd.setCursor(2, 0);

```

```

        lcd.print("MONDAY GANGSTRIK");
        lcd.setCursor(0, 1);
        lcd.print("LISTRIK PADAM");
        lcd.setCursor(0, 2);
    }
}

if (ress == LOW) {
    digitalWrite(buzzer, LOW);
    digitalWrite(relay, LOW);
    lcd.clear();
    delay(5);
}
if (set < 0) {
    set = 0;
}
resetin();
}

else if (sketch == 2) // Tombol menu ditekan 2x
{
    lcd.setCursor(0, 1);
    lcd.print("SETTING BATAS ARUS : ");
    lcd.setCursor(0, 2);
    lcd.print(i);

    if (up == LOW) // Tombol up ditekan batas arus
    {
        if (var == 0)
        {
            i ++;
            var = 1;
            lcd.clear();
            delay(5);

            if (i > 6)
            {
                lcd.clear();
                delay(5);
                lcd.setCursor(2, 2);
                lcd.print("Maaf Range I=1-6A");
                lcd.setCursor(1, 3);
                lcd.print("Mohon diatur < 6A!");
            }
        }
    }
    else {
        var = 0;
    }
    if (down == LOW) // Tombol Down ditekan batas arus
    {
        if (var1 == 0)
        {
            i--;
            var1 = 1;
            lcd.clear();

```



```

        delay(5);
    }
}
else {
    var1 = 0;
}
if (ok == LOW) // Tombol Ok ditekan batas arus
{
    lcd.clear();
    delay(5);
    lcd.setCursor(0, 1);
    lcd.print("SETTING ARUS =");
    lcd.setCursor(0, 2);
    lcd.print(i);
    lcd.clear();
    delay(10);
    sketch = 0;
}
}
else
{
    if (warning == 0)
    {
        lcd.setCursor(0, 1);
        lcd.print("V=");
        lcd.setCursor(2, 1);
        lcd.print(V);
        lcd.setCursor(8, 1);
        lcd.print("VAC");
        lcd.setCursor(13, 1);
        lcd.print("I=");
        lcd.setCursor(15, 1);
        lcd.print(I);
        lcd.setCursor(19, 1);
        lcd.print("A");
        lcd.setCursor(0, 2);
        lcd.print("P=");
        lcd.setCursor(13, 2);
        lcd.print("T=");
        lcd.setCursor(0, 3);
        if (detik >= 59) {
            menit++;
            detik = 0;
        }
        if (menit >= 59) {
            jam++;
            menit = 0;
        }
        lcd.print(jam);
        lcd.print(":");
        lcd.print(menit);
        lcd.print(":");
        lcd.println(detik);
        if (I >= 0.1) runI;
        lcd.setCursor(2, 2);
        lcd.print(P);
    }
}

```

```

        lcd.setCursor(8, 2);
        lcd.print("W");
        lcd.setCursor(11, 3);
        lcd.print("Rp=");
        lcd.setCursor(13, 3);
        lcd.print(total);
        lcd.setCursor(15, 2);
        lcd.print(Celcius);
        lcd.setCursor(19, 2);
        lcd.print("C");
    }
    else if (warning == 1)
    }
}

void resetin() // Reset relay dan buzzer
{
    if (ress == LOW)
    {
        digitalWrite(buzzer, LOW);
        digitalWrite(relay, LOW);
        lcd.clear();
        delay(5);
        warning = 0;
        un = 0;
        uv = 0;
        ht = 0;
        ov = 0;
        overCurrent = false, over heat = false, upperVoltage = false,
        underVoltage = false;
    }
}

void tikde() // Counter waktu pemakaian
{
    if (t > 0.05 && calcI == false)
    {
        if (calcI == false)
        {
            ampereStart = millis();
            calcI = true;
        }
    }
    else if (calcI == true && t <= 0.05)
    {
        ampereStart = 0;
        calcI = false;
    }
    else if (calcI == true)
    {
        runI += millis() - ampereStart;
        ampereStart = millis();
        long allSecs = runI / 1000;
        detik = allSecs % 60;
        menit = (allSecs / 60) % 60;
        jam = (allSecs / 3600) % 24;
    }
}

```

```

}
Serial.print ("Waktu Pemakaian Berbeban = ");
Serial.print(jam);
Serial.print(":");
Serial.print(menit);
Serial.print(":");
Serial.println(detik);
}

```

## Lampiran 29. Program NodeMCU

```

#include <ESP8266WiFi.h>
#include <ESP8266HTTPClient.h>
const char* ssid = "Redmi";
const char* password = "embuhopo";
char c = ' ';
WiFiClient client;
float g, t, o, s, y, a, h, un, uv, ht, ov;

void setup()
{
  Serial.begin(9600);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED)
  {
    delay(100);
  }
}

void loop()
{
  Serial.println('a');
  String data;
  if (Serial.available() > 0)
  {
    data = Serial.readString();
    int idx1 = data.indexOf(';');
    int idx2 = data.indexOf(':');
    int idx3 = data.indexOf('#');
    int idx4 = data.indexOf('@');
    int idx5 = data.indexOf('$');
    int idx6 = data.indexOf('%');
    int idx7 = data.indexOf('!');
    int idx8 = data.indexOf('?');
    int idx9 = data.indexOf('^');
    int idx10 = data.indexOf('*');
    String gS = data.substring(0, idx1); //tegangan
    String tS = data.substring(idx1 + 1, idx2); //arus
    String oS = data.substring(idx2 + 1, idx3); //daya
    String sS = data.substring(idx3 + 1, idx4); //kWh
    String yS = data.substring(idx4 + 1, idx5); //suhu
    String aS = data.substring(idx5 + 1, idx6); //waktu
    String hS = data.substring(idx6 + 1, idx7); //biaya
    String unS = data.substring(idx7 + 1, idx8); //under
    String uvS = data.substring(idx8 + 1, idx9); //upper

```

```

String htS = data.substring(idx9 + 1, idx10); //heat
String ovS = data.substring(idx10 + 1, data.length() - 1);
//over

g = gS.toFloat();
t = tS.toFloat();
o = oS.toFloat();
s = sS.toFloat();
y = yS.toFloat();
a = aS.toFloat();
h = hS.toFloat();
un = unS.toFloat();
uv = uvS.toFloat();
ht = htS.toFloat();
ov = ovS.toFloat();

int jam, menit, detik;
long allSecs = a / 1000;
jam = allSecs / 3600;
int secsRe = allSecs % 3600;
menit = secsRe / 60;
detik = secsRe % 60;

HTTPClient http;

String waktu = String(jam);
waktu += ":";
waktu += String(menit);
waktu += ":";
waktu += String(detik);

String k = "voltage=" + String((int)g) + "&arus=" + String(t)
+ "&daya=" + String(o) + "&kwh=" + String(s, 5) + "&suhu=" +
String(y) + "&waktu=" + waktu + "&biaya=" + String(h, 5) +
"&under=" + String((int)un) + "&upper=" + String((int)uv) +
"&heat=" + String((int)ht) + "&over=" + String((int)ov);

http.begin("http://www.mondaygangstrik.karyainovatif.com/testing
insert.php?" + k);
int httpCode = http.GET();
http.end();
}
}

```