DAFTAR ISI

ABSTRAK .................................................................................................................. Error! Bookmark not defined.

KATA PENGANTAR ................................................................................................. Error! Bookmark not defined.

DAFTAR ISI .................................................................................................................. iv

DAFTAR TABEL ............................................................................................................. vi

DAFTAR GAMBAR ....................................................................................................... vii

BAB I PENDAHULUAN .............................................................................................. Error! Bookmark not defined.

1.1 Latar Belakang Penelitian ....................................................................................... Error! Bookmark not defined.

1.2 Rumusan Masalah Penelitian ............................................................................... Error! Bookmark not defined.

1.3 Batasan Masalah Penelitian ................................................................................. Error! Bookmark not defined.

1.4 Tujuan Penelitian ................................................................................................. Error! Bookmark not defined.

1.5 Manfaat Penelitian .............................................................................................. Error! Bookmark not defined.

1.6 Struktur Organisasi Skripsi ................................................................................ Error! Bookmark not defined.

BAB II KAJIAN PUSTAKA .......................................................................................... Error! Bookmark not defined.

2.1 Android ................................................................................................................ Error! Bookmark not defined.


2.1.2 Android Software Development Kit (Android SDK) ................................. Error! Bookmark not defined.

2.1.3 Fundamental aplikasi Android ............................................................. Error! Bookmark not defined.

2.1.4 Versi Android ................................................................................................. Error! Bookmark not defined.

2.2 Software Arduino Studio ..................................................................................... Error! Bookmark not defined.

2.3 Hypertext Transfer Protocol (HTTP) ............................................................. Error! Bookmark not defined.

2.3.1 Dasar-dasar HTTP ......................................................................................... Error! Bookmark not defined.

2.3.2 Uniform Resource Locators (URL) .......................................................... Error! Bookmark not defined.

2.3.3 Verbs pada protokol HTTP ........................................................................ Error! Bookmark not defined.

2.4 Software POSTMAN .......................................................................................... Error! Bookmark not defined.

2.5 Platform Cloud Storage ...................................................................................... Error! Bookmark not defined.

2.6 ESP-12E ............................................................................................................... Error! Bookmark not defined.

2.7 Relay 220V ........................................................................................................... Error! Bookmark not defined.

2.7.1 Prinsip kerja relay ......................................................................................... Error! Bookmark not defined.

2.7.2 Arti pole dan throw pada relay ................................................................ Error! Bookmark not defined.

Rauuf Ashshally Wahyudi, 2017
SISTEM PENGENDALI DAN PEMANTAU KONSUMSI ENERGI LISTRIK BERBASIS ESP-12E DENGAN MENGUNGGANKAN INTERNET OF THINGS universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu
BAB III METODE PENELITIAN

3.1 Metode Penelitian

3.2 Perancangan Sistem Pengendali dan Pemantau Konsumsi Energi Listrik Berbasis ESP12E dengan Menggunakan IoT

3.2.1 Perangkat penunjang penelitian

3.2.2 Prinsip kerja

3.2.3 Desain skematik & PCB prototipe smart socket

3.2.4 Algoritma

3.2.5 Perancangan User Interface (UI)

3.2.6 Perancangan sketch program Arduino IDE

3.2.7 Perancangan sketch javascript Android Studio

BAB IV HASIL PENELITIAN

4.1 Hasil Pembuatan Perangkat Keras

4.2 Hasil Pengujian

4.2.1 Hasil pengujian aplikasi Android

4.2.2 Hasil pengujian perangkat smart socket

4.2.3 Data pada ANTARES Cloud Storage

4.3 Analisis Hasil Pengujian

4.3.1 Aplikasi Android

4.3.2 Prototipe smart socket
BAB V KESIMPULAN DAN REKOMENDASI

5.1 Kesimpulan

5.2 Rekomendasi

DAFTAR PUSTAKA

DAFTAR TABEL

Tabel 2.1 Parameter ESP-12E
Tabel 2.2 Fungsi Pin Sensor Arus ACS712
Tabel 4.1 Informasi dan perintah pada prototipe smart socket
Tabel 4.2 Hasil pengukuran arus pada pemanas air 600W
Tabel 4.3 Hasil pengukuran arus pada penghisap debu 350W
Tabel 4.4 Hasil pengukuran arus pada setrika 250W
Tabel 4.5 Hasil pengukuran arus pada susunan beban paralel
Tabel 4.6 Hasil arus rata-rata pada beban yang diukur
Tabel 4.7 Perhitungan energi pada drop tegangan 0% dan 5%
Tabel 4.8 Biaya listrik per bulan
DAFTAR GAMBAR

Gambar 2.1 Tampilan project pada software Android Studio ......................... 9
Gambar 2.2 Struktur sederhana URL .................................................. 10
Gambar 2.3 Fitur-fitur pada software POSTMAN .................................. 12
Gambar 2.4 Modul ESP-12E ............................................................... 13
Gambar 2.5 Diagram blok ESP-12E ...................................................... 14
Gambar 2.6 (a) Bentuk relay (b) Simbol relay ........................................ 16
Gambar 2.7 Struktur sederhana relay .................................................... 17
Gambar 2.8 Jenis relay berdasarkan pole dan throw ................................ 18
Gambar 2.9 Modul sensor arus ACS712 .............................................. 19
Gambar 2.10 Tampilan software Arduino IDE ......................................... 22
Gambar 2.11 Prinsip kerja HTML ......................................................... 23
Gambar 2.12 FTDI USB to TTL ............................................................ 25
Gambar 2.13 Segitiga daya listrik .......................................................... 26
Gambar 3.1 Diagram alur Penelitian ..................................................... 28
Gambar 3.2 Diagram blok prinsip kerja prototipe smart socket ................ 30
Gambar 3.3 Skematik prototipe smart socket ........................................ 32
Gambar 3.4 Desain PCB prototipe smart socket ..................................... 33
Gambar 3.5 Diagram blok algoritma prototipe smart socket .................... 34
Gambar 3.6 Diagram blok algoritma aplikasi Android ............................. 36
Gambar 3.7 Menu utama prototipe smart socket .................................... 37
Gambar 3.8 Menu WiFi Config pada prototipe smart socket .................... 38
Gambar 3.9 Menu Platform Config pada prototipe smart socket ............... 38
Gambar 3.10 Menu Local Power Monitoring prototipe smart socket .......... 39
Gambar 3.11 Layout main activity aplikasi Android ................................. 39
Gambar 3.12 Layout setting activity aplikasi Android .............................. 40
Gambar 4.1 PCB smart socket (a) tampak atas (b) tampak bawah ......................... 41
Gambar 4.2 Tampak atas hasil perancangan hardware smart socket .................. 42
Gambar 4.3 Tampak bawah hasil perancangan hardware smart socket ............... 42
Gambar 4.4 Hasil perancangan hardware smart socket .................................. 43
Gambar 4.5 Tampilan main activity aplikasi Android smart socket ..................... 44
Gambar 4.6 Tampilan setting activity aplikasi Android smart socket ................. 44
Gambar 4.7 Serial monitor pada saat Config Mode ........................................... 45
Gambar 4.8 Access point smart socket (ALTAIR) .............................................. 46
Gambar 4.9 Tampilan Config menu ................................................................. 46
Gambar 4.10 Tampilan WiFi Config menu ......................................................... 47
Gambar 4.11 Tampilan Platform Config menu ................................................. 47
Gambar 4.12 Serial monitor saat submit data .................................................... 48
Gambar 4.13 Tampilan Local Power Monitoring menu ....................................... 48
Gambar 4.14 Serial monitor pembacaan Local Power Monitoring ...................... 49
Gambar 4.15 Serial monitor saat melakukan clear data ..................................... 49
Gambar 4.16 Serial monitor setelah selesai melakukan konfigurasi .................... 50
Gambar 4.17 Serial monitor saat Running Mode ............................................... 50
Gambar 4.18 Serial monitor saat mengambil dan mengirim data ....................... 51
Gambar 4.19 Perangkat saat socket 1&3 menyala serta 2&4 mati ....................... 51
Gambar 4.20 Perangkat saat socket 4 menyala serta 1,2 dan 3 mati ..................... 52
Gambar 4.21 Tampilan project pada ANTARES Cloud Storage ......................... 52
Gambar 4.22 Tampilan device Socket2 pada ANTARES Cloud Storage ............. 53
Gambar 4.23 Tampilan PowerMonitoring2 pada ANTARES Cloud Storage ...... 53
Gambar 4.24 Rangkaian pembagi tegangan ..................................................... 56
Gambar 4.25 Pemanas air dengan daya 600W ............................................... 58
Gambar 4.26 Penghisap debu dengan daya 350W ............................................ 58
Gambar 4.27 Setrika dengan daya 250W ............................................................ 58
Gambar 4.28 Pengukuran arus pemanas air menggunakan tang ampere .......... 59
Gambar 4.29 Pengukuran arus pemanas air menggunakan smart socket .......... 59
Gambar 4.30 Pengukuran arus penghisap debu menggunakan tang ampere ....... 59
Gambar 4.31 Pengukuran arus penghisap debu menggunakan smart socket ...... 60
Gambar 4.32 Pengukuran arus setrika menggunakan tang ampere ................. 60
Gambar 4.33 Pengukuran arus setrika menggunakan *smart socket* .................. 60
Gambar 4.34 Pengukuran arus beban paralel menggunakan tang ampere.......... 61
Gambar 4.35 Pengukuran arus beban paralel menggunakan *smart socket* ........ 61