

DAFTAR ISI

| | |
|----------------------------------|-------------|
| JUDUL | i |
| LEMBAR PERSETUJUAN | ii |
| LEMBAR PENGESAHAN PENGUJI | iii |
| ABSTRAK | v |
| ABSTRACT | vi |
| KATA PENGANTAR | vii |
| DAFTAR ISI | x |
| DAFTAR GAMBAR | xv |
| DAFTAR TABEL | xvii |

BAB 1 PENDAHULUAN

| | | |
|--------|--------------------|----|
| 1.1 | Latar Belakang | 1 |
| 1.2 | Batasan Masalah | 7 |
| 1.3 | Rumusan Masalah | 8 |
| 1.4 | Tujuan Penelitian | 9 |
| 1.4.1 | Tujuan Umum | 9 |
| 1.4.2 | Tujuan Khusus | 9 |
| 1.5 | Manfaat Penelitian | 10 |
| 1.5.1. | Manfaat Teoritis | 10 |
| 1.5.2. | Manfaat Praktis | 10 |

BAB 2 TINJAUAN PUSTAKA

| | | |
|--------|---|----|
| 2.1 | Studi Literatur | 11 |
| 2.1.1 | Use of Particle Counter System for the Optimization of Sampling, Identification and Decontamination Procedures for Biological Aerosols Dispersion in Confined Environment | 13 |
| 2.1.2 | Laminar air flow reduces particle load in TKA — even outside the LAF panel : a prospective , randomized cohort study | 16 |
| 2.1.3 | Calibration of optical particle counters first comprehensive inter-comparison for particle sizes up to 5 μ m and number concentrations up to 2 cm^{-3} | 18 |
| 2.2 | Dasar Teori | 18 |
| 2.2.1. | Partikel Udara dan Bagian Filturnya | 18 |
| 2.2.2. | Faktor lingkungan yang mempengaruhi pertumbuhan mikroorganisme | 19 |

| | | |
|------------------------------------|--|-----------|
| 2.2.3. | Ukuran partikel dan nilai indeks polidispersitas (PDI) | 21 |
| 2.2.4. | Biological Safety Cabinet | 23 |
| 2.2.5. | Level keselamatan biologi 1 | 25 |
| 2.2.6. | Level keselamatan biologi 2 | 26 |
| 2.2.7. | Level keselamatan biologi 3 | 27 |
| 2.2.8. | Level keselamatan biologi 4 | 28 |
| 2.2.9 | Fluke 985 Particle Counter | 29 |
| 2.2.10 | Trolley-mounted SmartFast | 30 |
| 2.3 | Penggunaan Komponen | 32 |
| 2.3.1 | Sensor PMS7003 | 32 |
| 2.3.2 | Arduino MEGA | 36 |
| 2.3.3 | LCD TFT 3,5” | 38 |
| 2.3.4 | RTC | 41 |
| 2.3.5 | Data Logger | 43 |
| 2.3.6 | Modul MikroSD | 45 |
| BAB 3 METODOLOGI PENELITIAN | | 47 |
| 3.1 | Prosedur Penelitian | 47 |
| 3.1.1 | Diagram Blok Sistem | 47 |
| 3.1.2 | Diagram Alir | 49 |

| | | |
|--------------------------------------|--|----|
| 3.1.3 | Diagram Mekanis | 50 |
| 3.1.4 | Perancangan Peralatan | 51 |
| 3.1.5 | Variabel Penelitian | 52 |
| 3.1.6 | Definisi Operasional Variabel | 52 |
| 3.1.7 | Tempat dan Jadwal | 53 |
| 3.1.8 | Alat dan Bahan | 54 |
| 3.2 | Teknik Analisis Data | 55 |
| 3.3 | Urutan Kegiatan (Prosedur Penelitian) | 55 |
| BAB 4 | | 59 |
| HASIL PENGUKURAN DAN ANALISIS | | 59 |
| 4.1. | Hasil Perancangan Desain Alat | 59 |
| 4.2. | Hasil Pengukuran Jumlah partikel dibandingkan dengan alat Standar | 59 |
| 4.3.1. | Analisa | 63 |
| 4.3. | Pengukuran Kestabilan Waktu dan Kinerja Sensor PMS7003 | 64 |
| 4.3.1 | Kondisi 1 | 65 |
| 4.3.2 | Kondisi 2 | 67 |
| 4.3.3 | Kondisi 3 | 70 |
| 4.3.4 | Kondisi 4 | 73 |
| 4.3.5 | Kondisi 5 | 76 |

| | | |
|-------|---------|----|
| 4.3.6 | Analisa | 79 |
|-------|---------|----|

BAB 5 PEMBAHASAN

| | | |
|----------|----------------------------------|-----|
| 5.1. | Rangkaian | 82 |
| 5.2. | Program | 84 |
| 5.3. | Perbandingan Dengan Alat Standar | 110 |
| 5.3.1. | Prosedure Perbandingan | 111 |
| 5.3.2. | Hasil Perbandingan | 113 |
| 5.3.2.1. | Perbandingan Pada Sensor 1 | 113 |
| 5.3.2.2. | Perbandingan pada sensor 2 | 116 |
| 5.3.2.3. | Perbandingan pada sensor 3 | 119 |
| 5.3.2 | Analisa | 122 |
| 5.4 | SOP | 123 |
| 5.5 | Kinerja Sistem Keseluruhan | 126 |

BAB 6 PENUTUP

| | | |
|-----|------------|-----|
| 6.1 | Kesimpulan | 129 |
| 6.2 | Saran | 130 |

| | |
|-----------------------|------------|
| DAFTAR PUSTAKA | 132 |
|-----------------------|------------|

