

## DAFTAR ISI

|                                     |       |
|-------------------------------------|-------|
| SKRIPSI.....                        | i     |
| LEMBAR PERSYARATAN GELAR.....       | ii    |
| LEMBAR PERSETUJUAN .....            | ii    |
| LEMBAR PENGESAHAN.....              | iii   |
| LEMBAR PERNYATAAN ORISINALITAS..... | vi    |
| <i>ABSTRAK</i> .....                | vii   |
| <i>ABSTRACT</i> .....               | viii  |
| KATA PENGANTAR.....                 | ix    |
| DAFTAR ISI .....                    | xii   |
| DAFTAR GAMBAR .....                 | xvii  |
| DAFTAR TABEL .....                  | xviii |
| BAB I.....                          | 1     |
| PENDAHULUAN .....                   | 1     |
| 1.1 Latar Belakang.....             | 1     |
| 1.2 Batasan Masalah.....            | 7     |
| 1.3 Rumusan Masalah .....           | 7     |
| 1.4 Tujuan Penelitian .....         | 7     |
| 1.5 Manfaat Penelitian .....        | 8     |
| BAB II.....                         | 9     |
| TINJAUAN PUSATAKA .....             | 9     |
| 2.1 Studi Literatur .....           | 9     |

|   |    |
|---|----|
| 2.2 Paru-Paru Manusia .....             | 12 |
| 2.3 Peak Flow Meter .....               | 13 |
| 2.4 <i>Peak Expiratory Flow</i> .....   | 18 |
| 2.5 Water flow sensor .....             | 21 |
| 2.6 <i>Nextion</i> .....                | 25 |
| 2.7 Mikrokontroler .....                | 28 |
| 2.8 <i>Modul charger</i> .....          | 29 |
| 2.9 <i>Google Sheet</i> .....           | 30 |
| 2.10 Perokok aktif dan Non perokok..... | 31 |
| BAB III.....                            | 1  |
| METODE PENELITIAN .....                 | 35 |
| 3.1 Diagram Blok Sistem .....           | 35 |
| 3.2 Diagram alir.....                   | 36 |
| 3.3 Diagram alir Google Sheet .....     | 38 |
| 3.4 Diagram Mekanis .....               | 39 |
| 3.5 Alat bahan.....                     | 40 |
| 3.6 Desain Penelitian.....              | 41 |
| 3.7 Variabel Penelitian.....            | 41 |
| 3.8 Metode Penelitian.....              | 43 |
| 3.9 Definisi Operational Variabel ..... | 43 |
| 3.10 Teknik Analisa data .....          | 43 |
| 3.11 Urutan Kegiatan Penelitian.....    | 46 |

|   |    |
|---|----|
| 3.12 Tempat dan Jadwal Penelitian.....                            | 48 |
| BAB IV .....  | 35 |
| HASIL PENGUKURAN DAN ANALISIS .....                               | 51 |
| 4.1 Hasil Pengukuran Alat .....                                   | 51 |
| 4.2 Hasil Pengukuran Nilai Flow Pada Modul Dan<br>Pembanding..... | 54 |
| 4.3 Hasil Pengukuran Nilai Flow Pada Modul .....                  | 55 |
| BAB V.....  | 51 |
| PEMBAHASAN .....  | 65 |
| 5.2.1 Inisialisasi Program .....                                  | 66 |
| 5.2.2 Inisialisasi Google Sheet .....                             | 67 |
| 5.2.3 Inisialisasi Konfigurasi awal .....                         | 67 |
| 5.2.4 Program Perhitungan PEF PFR .....                           | 67 |
| 5.2.5 Program Tampil Sinyal ke nextion.....                       | 68 |
| 5.2.6 Program <i>Button</i> Kirim Data ke <i>Web</i> .....        | 68 |
| 5.2.7 Program <i>Connect</i> WiFi pada ESP8266 .....              | 69 |
| 5.2.8 Program <i>Connect</i> ke <i>Web</i> .....                  | 69 |
| 5.2.9 Program Kirim Data ke <i>Web</i> .....                      | 70 |
| 5.2.1 Program Tampil Nilai Pada <i>Web</i> .....                  | 71 |
| 5.3 Tampilan Hasil TFT Nextion.....                               | 75 |
| 5.4 Tampilan Data Pada Web.....                                   | 76 |
| 5.5 Kinerja Sistem Keseluruhan.....                               | 77 |
| PENUTUP.....  | 79 |

|                      |    |
|----------------------|----|
| 6.1 Kesimpulan.....  | 79 |
| 6.2 Saran.....       | 80 |
| DAFTAR PUSTAKA ..... | 81 |
| LAMPIRAN .....       | 87 |