



## Daftar Isi

|  |           |
|--|-----------|
| HALAMAN JUDUL.....                                       | i         |
| LEMBAR NOMOR PERSOALAN.....                              | ii        |
| LEMBAR PENGESAHAN.....                                   | iii       |
| LEMBAR PERSEMBAHAN.....                                  | iv        |
| KATA PENGANTAR.....                                      | v         |
| Lembar Pernyataan.....                                   | vii       |
| Intisari.....  | viii      |
| <i>Abstract</i> .....                                    | ix        |
| Daftar Isi.....  | x         |
| Daftar Gambar.....                                       | xii       |
| Daftar Tabel.....  | iv        |
| <b>BAB I PENDAHULUAN.....</b>                            | <b>1</b>  |
| 1.1 Latar Belakang.....                                  | 1         |
| 1.2 Tujuan Pembuatan Tugas Akhir.....                    | 2         |
| 1.3 Batasan Masalah.....                                 | 2         |
| 1.4 Metode Pengumpulan Data.....                         | 2         |
| 1.5 Sistematika Penulisan.....                           | 2         |
| <b>BAB II TINJAUAN PUSTAKA &amp; LANDASAN TEORI.....</b> | <b>4</b>  |
| 2.1 Tinjauan Pustaka.....                                | 4         |
| 2.2 Landasan Teori.....                                  | 4         |
| 2.2.1 PLC.....   | 4         |
| 2.2.2 Komponen Elektronika <i>Pneumatic</i> .....        | 7         |
| <b>BAB III METODE PEMBAHASAN.....</b>                    | <b>13</b> |
| 3.1 <i>Hardware</i> .....                                | 14        |
| 3.1.1 PLC CP1E.....                                      | 14        |
| 3.1.2 <i>Trainer Conveyor</i> .....                      | 15        |
| 3.1.3 <i>Solenoid Valve</i> .....                        | 15        |



|   |    |
|---|----|
| 3.1.4 <i>Pneumatic Cylinder</i> .....       | 16 |
| 3.1.5 <i>Relay</i> .....                    | 16 |
| 3.2 <i>Software</i> .....                   | 17 |
| 3.2.1 Instruksi.....                        | 17 |
| <b>BAB IV PEMBAHASAN</b> .....              | 25 |
| 4.1 Pendahuluan Pembahasan.....             | 25 |
| 4.1.1 Penjelasan Proses Kerja Simulasi..... | 25 |
| 4.2 Pembahasan Program.....                 | 26 |
| 4.2.1 <i>Data Input &amp; Output</i> .....  | 26 |
| 4.2.2 Pembahasan Program Simulasi.....      | 26 |
| <b>BAB V KESIMPULAN &amp; SARAN</b> .....   | 33 |
| 5.1 Kesimpulan.....                         | 33 |
| 5.2 Saran.....                              | 33 |
| <b>DAFTAR PUSTAKA &amp; LAMPIRAN</b> .....  | 34 |



## DAFTAR GAMBAR

|  |    |
|--|----|
| <b>Gambar 2.1</b> Contoh PLC.....  | 5  |
| <b>Gambar 2.2</b> Skema Proses Kerja PLC.....  | 6  |
| <b>Gambar 2.3</b> <i>Pushbutton</i> .....  | 8  |
| <b>Gambar 2.4</b> <i>Limit Switch</i> .....  | 8  |
| <b>Gambar 2.5</b> Sensor <i>Proximity</i> .....  | 9  |
| <b>Gambar 2.6</b> <i>Relay</i> .....   | 9  |
| <b>Gambar 2.7</b> <i>Single Solenoid valve 3/2</i> .....   | 11 |
| <b>Gambar 2.8</b> <i>Double Solenoid valve 5/2</i> .....   | 11 |
| <b>Gambar 2.9</b> <i>Compressor</i> .....  | 12 |
| <b>Gambar 2.10</b> Silinder.....   | 12 |
| <b>Gambar 3.1</b> <i>Flow Chart</i> .....  | 13 |
| <b>Gambar 3.2</b> CP1E.....  | 15 |
| <b>Gambar 3.3</b> <i>Trainer Conveyor</i> .....  | 15 |
| <b>Gambar 3.4</b> <i>Double Solenoid Valve &amp; Single Solenoid 3/2</i> .....                     | 16 |
| <b>Gambar 3.5</b> <i>Pneumatic Cylinder</i> .....  | 16 |
| <b>Gambar 3.6</b> <i>Auxelary Relay</i> .....  | 17 |
| <b>Gambar 3.7</b> Kontak <i>Normaly Open</i> PLC Omron.....  | 18 |
| <b>Gambar 3.8</b> Kontak <i>Normaly Close</i> PLC Omron.....                                       | 18 |
| <b>Gambar 3.9</b> <i>Ladder Output</i> PLC Omron.....  | 18 |
| <b>Gambar 3.10</b> <i>Timer</i> PLC Omron.....   | 18 |
| <b>Gambar 3.11</b> Penulisan Alamat <i>Timer</i> PLC Omron.....                                    | 19 |
| <b>Gambar 3.12</b> <i>Counter</i> PLC Omron.....   | 19 |
| <b>Gambar 3.13</b> Penulisan Alamat dan <i>Comment Counter</i> PLC Omron.....                      | 20 |
| <b>Gambar 3.14</b> Fungsi <i>Differentiate UP</i> dan <i>Differentiate DOWN</i><br>PLC Omron ..... | 20 |
| <b>Gambar 3.15</b> Fungsi Jadi <i>Dif Up</i> PLC Omron.....  | 21 |
| <b>Gambar 3.16</b> Fungsi Jadi <i>Dif Down</i> PLC Omron.....                                      | 21 |
| <b>Gambar 3.17</b> Fungsi <i>Increment</i> PLC Omron.....  | 21 |
| <b>Gambar 3.18</b> Fungsi <i>Decrement</i> PLC Omron.....  | 21 |



|  |    |
|--|----|
| <b>Gambar 3.19</b> Penulisan <i>Comment</i> Fungsi <i>Increment</i> PLC Omron..... | 22 |
| <b>Gambar 3.20</b> Penulisan <i>Comment</i> Fungsi <i>Decrement</i> PLC Omron..... | 22 |
| <b>Gambar 3.21</b> Fungsi <i>Move</i> PLC Omron.....                               | 22 |
| <b>Gambar 3.22</b> Penulisan Alamat Fungsi <i>Move</i> PLC Omron.....              | 23 |
| <b>Gambar 3.23</b> Penulisan Alamat Fungsi <i>Comparison</i> PLC Omron.....        | 23 |
| <b>Gambar 4.1</b> <i>Container</i> .....   | 25 |
| <b>Gambar 4.2</b> <i>Ladder Program no.0</i> kondisi <i>set ON</i> .....           | 27 |
| <b>Gambar 4.3</b> <i>Ladder Program no.0</i> kondisi <i>set ON</i> .....           | 27 |
| <b>Gambar 4.4</b> <i>Ladder Program no.1</i> .....                                 | 27 |
| <b>Gambar 4.5</b> <i>Ladder Program no.2</i> .....                                 | 28 |
| <b>Gambar 4.6</b> <i>Ladder Program no.3</i> dan <i>no.4</i> .....                 | 28 |
| <b>Gambar 4.7</b> <i>Ladder Program no.5 Counter</i> aktif.....                    | 28 |
| <b>Gambar 4.8</b> <i>Ladder Program 5-7</i> .....                                  | 29 |
| <b>Gambar 4.9</b> W000 dan W001 Mematikan Silinder dan <i>Conveyor</i> Dua .....   | 29 |
| <b>Gambar 4.10</b> <i>Ladder Program no.8</i> dan <i>no.9</i> .....                | 30 |
| <b>Gambar 4.11</b> <i>Ladder Program no.10</i> .....                               | 30 |
| <b>Gambar 4.12</b> <i>Stop</i> .....   | 31 |
| <b>Gambar 4.13</b> <i>Emergency</i> .....  | 32 |



## DAFTAR TABEL

|   |    |
|---|----|
| <b>Tabel 2.1</b> Jenis PLC Omron.....           | 5  |
| <b>Tabel 3.2</b> Logika <i>Comparison</i> ..... | 24 |
| <b>Tabel 4.1</b> Tombol <i>Input</i> .....      | 26 |
| <b>Tabel 4.2</b> <i>Output Mode</i> .....       | 26 |