

<https://www.blogger.com/u/1/null>

GENERAL INPUT DAN OUTPUT

<https://almajrikusmaidi212003.blogspot.com/p/kembali-ke-menu-sebelumnya-daftar-isi-2.html> [KEMBALI KE MENU SEBELUMNYA]

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<div style="text-align: left;">

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<div style="text-align: left;">

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1. Tujuan [Kembali]</div><div>Merangkai dan menguji aplikasi output pada mikrokontroller ArduinoMerangkai dan menguji input pada mikrokontroller ArduinoMerangkai dan menguji I/O pada mikrokontroller Arduino

href="https://almajrikusmaidi212003.blogspot.com/p/kembali-ke-menu-sebelumnya-daftar-isi-2.html#kembali">[Kembali]</div><div> Alat <div style="background-color: white; color: #666666; font-family: "Trebuchet MS"; Trebuchet, Verdana, sans-serif; font-size: 15.84px;"><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; margin: 0px; padding: 0px;"> a). Power supply</div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; margin: 0px; padding: 0px; text-align: center;"></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; margin: 0px; padding: 0px; text-align: center;">Power Supply</div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; margin: 0px; padding: 0px;">2. Bahan</div></div><div style="background-color: white; color: #222222; font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 14.52px;"><div> Module Arduino </div><div class="separator" style="clear: both; text-align: center;">font-size: 12pt;">Digital I/O Pins<o:p></o:p></div></td><td style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">54 (of which 15 provide PWM output)<o:p></o:p></div></td></tr><tr><td style="border: 1pt solid windowtext; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">Analog Input Pins<o:p></o:p></div></td><td style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">16<o:p></o:p></div></td></tr><tr><td style="border: 1pt solid windowtext; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">DC Current per I/O Pin<o:p></o:p></div></td><td style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">20 mA<o:p></o:p></div></td></tr><tr><td style="border: 1pt solid windowtext; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">DC Current for 3.3V Pin<o:p></o:p></div></td><td style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">50 mA<o:p></o:p></div></td></tr><tr><td style="border: 1pt solid windowtext; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">Flash Memory<o:p></o:p></div></td><td style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">256 KB of which 8 KB used by bootloader<o:p></o:p></div></td></tr><tr><td style="border: 1pt solid windowtext; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">SRAM<o:p></o:p></div></td><td style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;"></div></td></tr></table> </p>

style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">8 KB</div></td></tr><tr><td style="border: 1pt solid windowtext; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">EEPROM</div></td><td style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">4 KB</div></td></tr><tr><td style="border: 1pt solid windowtext; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">Clock Speed</div></td><td style="border-bottom: 1pt solid windowtext; border-left: none; border-right: 1pt solid windowtext; border-top: none; padding: 0cm 5.4pt; width: 233.75pt;" valign="top" width="312"><div class="MsoNormal" style="line-height: normal; margin-bottom: 0cm; text-align: justify;">16 MHz</div></td></tr></tbody></table>
<ul style="line-height: 1.2; margin: 0px; padding: 0px 0px 0px 1.25em;"><li style="margin: 0px; padding: 0.25em 0px;">LED
<p style="font-family: times; font-size: 13.2px; text-align: justify;">
</p><div style="font-family: times;"><div style="text-align: justify;">Keanekaragaman Warna pada LED tersebut tergantung pada wavelength (panjang gelombang) dan senyawa semikonduktor yang dipergunakannya. Berikut ini adalah Tabel Senyawa Semikonduktor yang digunakan untuk menghasilkan variasi warna pada LED :</div></div><div class="separator" style="clear: both; font-family: times; font-size: 13.2px; text-align: center;"><table style="border-bottom-color: initial; border-bottom-style: initial; border-collapse: collapse; border-image: initial; border-left-color: rgb(235,

235, 235); border-left-style: solid; border-right-color: initial; border-right-style: initial; border-spacing: 0px; border-top-color: rgb(235, 235, 235); border-top-style: solid; border-width: 1px 0px 0px 1px; color: black; font-stretch: inherit; font-variant-east-asian: inherit; font-variant-numeric: inherit; line-height: inherit; margin: 0px 0px 1.25rem; padding: 0px; vertical-align: baseline; width: 678px;"><tbody style="border: 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit; line-height: inherit; margin: 0px; padding: 0px; vertical-align: baseline;"><tr style="border: 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit; line-height: inherit; margin: 0px; padding: 0px; vertical-align: baseline;"><td style="border-bottom-color: rgb(235, 235, 235); border-bottom-style: solid; border-image: initial; border-left-color: initial; border-left-style: initial; border-right-color: rgb(235, 235, 235); border-right-style: solid; border-top-color: initial; border-top-style: initial; border-width: 0px 1px 1px 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit; line-height: inherit; margin: 0px; padding: 5px 10px; vertical-align: baseline;" width="301"><strong style="border: 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; line-height: inherit; margin: 0px; padding: 0px; vertical-align: baseline;">Bahan Semikonduktor</td><td style="border-bottom-color: rgb(235, 235, 235); border-bottom-style: solid; border-image: initial; border-left-color: initial; border-left-style: initial; border-right-color: rgb(235, 235, 235); border-right-style: solid; border-top-color: initial; border-top-style: initial; border-width: 0px 1px 1px 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit; line-height: inherit; margin: 0px; padding: 5px 10px; vertical-align: baseline;" width="96"><strong style="border: 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; line-height: inherit; margin: 0px; padding: 0px; vertical-align: baseline;">Wavelength</td><td style="border-bottom-color: rgb(235, 235, 235); border-bottom-style: solid; border-image: initial; border-left-color: initial; border-left-style: initial; border-right-color: rgb(235, 235, 235); border-right-style: solid; border-top-color: initial; border-top-style: initial; border-width: 0px 1px 1px 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit; line-height: inherit; margin: 0px; padding: 5px 10px; vertical-align: baseline;" width="102"><strong style="border: 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; line-height: inherit; margin: 0px; padding: 0px; vertical-align: baseline;">Warna</td></tr><tr style="border: 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit; line-height: inherit; margin: 0px; padding: 0px; vertical-align: baseline;"><td style="border-bottom-color: rgb(235, 235, 235); border-bottom-style: solid; border-image: initial; border-left-color: initial; border-left-style: initial; border-right-color: rgb(235, 235, 235); border-right-style: solid; border-top-color: initial; border-top-style: initial; border-width: 0px 1px 1px 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit; line-height: inherit; margin: 0px; padding: 5px 10px; vertical-align: baseline;" width="301">Gallium Arsenide (GaAs)</td><td style="border-bottom-color: rgb(235, 235, 235); border-bottom-style: solid; border-image: initial; border-left-color: initial; border-left-style: initial; border-right-color: rgb(235, 235, 235); border-right-style: solid; border-top-color: initial; border-top-style: initial; border-width: 0px 1px 1px 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit; line-height: inherit; margin: 0px; padding: 5px 10px; vertical-align: baseline;" width="96">850-940nm</td><td style="border-bottom-color: rgb(235, 235, 235); border-bottom-style: solid; border-image: initial; border-left-color: initial; border-left-style: initial; border-right-color: rgb(235, 235, 235);

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vertical-align: baseline;" width="102">Biru</td></tr><tr style="border: 0px; font-stretch: inherit;
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0px; vertical-align: baseline;"><td style="border-bottom-color: rgb(235, 235, 235); border-bottom-style:
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1px 1px 0px; font-stretch: inherit; font-style: inherit; font-variant: inherit; font-weight: inherit;
line-height: inherit; margin: 0px; padding: 5px 10px; vertical-align: baseline;" width="301">Gallium
Indium Nitride (GaN)
</td></tr></tbody></table></div><li style="font-size: 12px; margin:
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lang="EN-US" style="font-family: "times new roman"; "serif"; font-size: 12pt;
line-height: 17.12px;"><o:p></o:p></div><div align="center" class="MsoNormal"
style="text-align: center;"><span lang="EN-US" style="font-family: "times new roman";
"serif"; line-height: 12.84px;">Kaki-kaki yang terdapat pada
LCD</div></div><div style="color: black; font-family: "Trebuchet MS";
Trebuchet, Verdana, sans-serif; font-size: 17.6px;"><b style="color: #222222; cursor:
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</div><div style="cursor: url("https://ani.cursors-4u.net/games/gam-16/gam1571.ani"), url("https://ani.cursors-4u.net/games/gam-16/gam1571.png"), auto;"><ul style="line-height: 1.4; margin: 0.5em 0px; padding: 0px 2.5em;"><li style="margin: 0px 0px 0.25em; padding: 0px;"> Seven Segmen</div></div></h3></div></div></div><div class="separator" style="clear: both; display: inline; font-family: times; font-size: small; text-align: center;"><a

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baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans", arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: start;"><div class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify;">A. Resistor</div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify;">Resistor merupakan komponen penting dan sering dijumpai dalam sirkuit Elektronik. Boleh dikatakan hampir setiap sirkuit Elektronik pasti ada Resistor. Tetapi banyak diantara kita yang bekerja di perusahaan perakitan Elektronik maupun yang menggunakan peralatan Elektronik tersebut tidak mengetahui cara membaca kode warna ataupun kode angka yang ada di tubuh Resistor itu sendiri.<br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" />Seperti yang dikatakan sebelumnya, nilai Resistor yang berbentuk Axial adalah diwakili oleh Warna-warna yang terdapat di tubuh (body) Resistor itu sendiri dalam bentuk Gelang. Umumnya terdapat 4 Gelang di tubuh Resistor, tetapi ada juga yang 5 Gelang.<br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" />Gelang warna Emas dan Perak biasanya terletak agak jauh dari gelang warna lainnya sebagai tanda gelang terakhir. Gelang Terakhirnya ini juga merupakan nilai toleransi pada nilai Resistor yang bersangkutan.<br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" />Tabel dibawah ini adalah warna-warna yang terdapat di Tubuh Resistor :</div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify;"><div style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: center;"></div><br style="box-sizing: border-box;" />Tabel

Kode Warna Resistor

Perhitungan untuk Resistor dengan 4 Gelang warna :

Cara menghitung nilai resistor 4 gelang

Masukkan angka langsung dari kode warna Gelang ke-1 (pertama)

Masukkan angka langsung dari kode warna Gelang ke-2

Masukkan Jumlah nol dari kode warna Gelang ke-3 atau pangkatkan angka tersebut dengan 10 (10n)

Merupakan Toleransi dari nilai Resistor tersebut

Contoh :

Gelang ke 1 : Coklat = 1

Gelang ke 2 : Hitam = 0

Gelang ke 3 : Hijau = 5 nol dibelakang angka gelang ke-2; atau kalikan 105

Gelang ke 4 : Perak = Toleransi 10%

Maka nilai Resistor tersebut adalah $10 \times 105 = 1.000.000 \text{ Ohm}$ atau 1 MOhm dengan toleransi 10%.

Perhitungan untuk Resistor dengan 5 Gelang warna :

Cara Menghitung Nilai Resistor 5 Gelang Warna

Masukkan angka langsung dari kode warna Gelang ke-1 (pertama)

Masukkan angka langsung dari kode warna Gelang ke-2

border-box;" />Masukkan angka langsung dari kode warna Gelang ke-3<br style="box-sizing: border-box;" />Masukkan Jumlah nol dari kode warna Gelang ke-4 atau pangkatkan angka tersebut dengan 10 (10n)<br style="box-sizing: border-box;" />Merupakan Toleransi dari nilai Resistor tersebut<br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" />Contoh :<br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" />Gelang ke 1 : Coklat = 1<br style="box-sizing: border-box;" />Gelang ke 2 : Hitam = 0<br style="box-sizing: border-box;" />Gelang ke 3 : Hijau = 5<br style="box-sizing: border-box;" />Gelang ke 4 : Hijau = 5 nol dibelakang angka gelang ke-2; atau kalikan 105<br style="box-sizing: border-box;" />Gelang ke 5 : Perak = Toleransi 10%<br style="box-sizing: border-box;" />Maka nilai Resistor tersebut adalah $105 \times 105 = 10.500.000 \text{ Ohm}$ atau 10,5 MOhm dengan toleransi 10%.<br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" />Contoh-contoh perhitungan lainnya :<br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" />Merah, Merah, Merah, Emas $\rightarrow 22 \times 10^2 = 2.200 \text{ Ohm}$ atau 2,2 Kilo Ohm dengan 5% toleransi<br style="box-sizing: border-box;" />Kuning, Ungu, Orange, Perak $\rightarrow 47 \times 10^3 = 47.000 \text{ Ohm}$ atau 47 Kilo Ohm dengan 10% toleransi<br style="box-sizing: border-box;" /><br style="box-sizing: border-box;" />Cara menghitung Toleransi :<br style="box-sizing: border-box;" />2.200 Ohm dengan Toleransi 5% =<br style="box-sizing: border-box;" /> $2200 - 5\% = 2.090$ <br style="box-sizing: border-box;" /> $2200 + 5\% = 2.310$ <br style="box-sizing: border-box;" />ini artinya nilai Resistor tersebut akan berkisar antara 2.090 Ohm ~ 2.310 Oh</div></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans";, arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans";, arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: start;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">B. Komponen Input</div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans";, arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: start;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">Keypad</div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans";, arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: start;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans";, arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: center;"><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: left;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">C. Komponen Output</div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: left;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: left;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">LED (Light Emiting Diode)</div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: left;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></div><div style="border: 0px; box-sizing: border-box; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: left;"><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; margin: 0px; padding: 0px; text-align: center;">a href="https://1.bp.blogspot.com/-ubSlkJetTV4/WZ6Cpe9DsJI/AAAAAAAAACWU/x84o3i1qQ4Ib_x8CfUbTzU5nghjySM20QCLcBGAs/s1600/symbol%2Bled.jpg" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px 1em; padding: 0px; text-decoration-line: none; transition: all 0.3s ease 0s;"></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;">LED adalah suaatu semikonduktor yang memancarkan cahaya, <span style="border: 0px; box-sizing:
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border-box; color: black; margin: 0px; padding: 0px;">polarisasi<span face="sans-serif" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">. LED mempunyai kutub positif<span face="sans-serif" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">&nbsp;dan<span>negatif</span><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;">&nbsp;(p-n) dan hanya akan menyala bila diberikan arus maju. Ini dikarenakan LED terbuat dari bahan semikonduktor yang hanya akan mengizinkan arus listrik mengalir ke satu arah dan tidak ke arah sebaliknya. Bila LED diberikan arus terbalik, hanya akan ada sedikit arus yang melewati &nbsp;LED. Ini menyebabkan LED tidak akan mengeluarkan emisi cahaya.</span></span></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span style="border: 0px; box-sizing: border-box; font-family: times; margin: 0px; padding: 0px;"><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></span></span></div><div style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: "times new roman", "serif"; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">-Liquid Crystal Display (LCD)<o:p style="box-sizing: border-box;"></o:p></span></b></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: "times new roman", "serif"; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></span></b></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify; text-indent: 36pt;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: "times new roman", "serif"; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">Liquid Crystal Display (LCD) adalah sebuah peralatan elektronik yang berfungsi untuk<span><span style="border: 0px; box-sizing: border-box; font-family: "times new roman", "serif"; font-size: 12pt; margin: 0px; padding: 0px;">menampilkan output sebuah sistem dengan cara membentuk suatu citra atau gambaran pada sebuah layar. Secara garis besar komponen penyusun LCD terdiri dari kristal cair (liquid crystal) yang diapit oleh 2 buah elektroda transparan dan 2 buah filter polarisasi (polarizing filter).</span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: "times new roman", "serif"; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: center;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: "times new roman", "serif"; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;"><a href="https://2.bp.blogspot.com/-ZcScGQfVfDE/W3mc2trbFjI/AAAAAAAAACcM/OVSkGqa3MzgodEEXMkHfYYM8nkAxllroQCEwYBhgL/s1600/2.jpg" style="border: 0px; box-sizing: border-box; clear: left; color: #597e00; font-family: "Times New Roman"; font-size: medium; margin: 0px 1em 1em 0px;

padding: 0px; text-align: justify; text-decoration-line: none; transition: all 0.3s ease 0s;"></a></span></div><br style="box-sizing: border-box;" /><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; margin: 0px; padding: 0px; text-align: center;"><a href="https://1.bp.blogspot.com/-t9WVP\_Ogp6M/W3mc3KiESwI/AAAAAAAAACcU/PM3lyvPRBz8M2E5uVucSJ-kFtmZrM2uJwCEwYBhgL/s1600/3.png" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px 1em; padding: 0px; text-decoration-line: none; transition: all 0.3s ease 0s;"></a></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></span></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; margin: 0px; padding: 0px; text-align: center;"></div><div align="center" class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: center;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;"><o:p style="box-sizing: border-box;"></o:p></span></div><div align="center" class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: center;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; margin: 0px; padding: 0px;">Gambar Penampang komponen penyusun LCD<o:p style="box-sizing: border-box;"></o:p></span></b></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">Keterangan:<o:p style="box-sizing: border-box;"></o:p></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">1. Film dengan polarizing filter vertical untuk memolarisasi cahaya yang masuk.<o:p style="box-sizing: border-box;"></o:p></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box;

color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;, &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">2. Glass substrate yang berisi kolom-kolom elektroda Indium tin oxide (ITO).<o:p style="box-sizing: border-box;"></o:p></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;, &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">3. Twisted nematic liquid crystal (kristal cair dengan susunan terpilin).<o:p style="box-sizing: border-box;"></o:p></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;, &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">4. Glass substrate yang berisi baris-baris elektroda Indium tin oxide (ITO).<o:p style="box-sizing: border-box;"></o:p></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;, &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">5. Film dengan polarizing filter horizontal untuk memolarisasi cahaya yang masuk.<o:p style="box-sizing: border-box;"></o:p></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;, &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">6. Reflektor cahaya untuk memantulkan cahaya yang masuk LCD kembali ke mata pengamat.<o:p style="box-sizing: border-box;"></o:p></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: justify; text-indent: 36pt;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;, &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;">Sebuah citra dibentuk dengan mengombinasikan kondisi nyala dan mati dari pixel-pixel yang menyusun layar sebuah LCD. Pada umumnya LCD yang dijual di pasaran sudah memiliki integrated circuit tersendiri sehingga para pemakai dapat mengontrol tampilan LCD dengan mudah dengan menggunakan mikrokontroler untuk mengirimkan data melalui pin-pin input yang sudah tersedia.<o:p style="box-sizing: border-box;"></o:p></span></div><div align="center" class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: center;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;, &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;"><o:p style="box-sizing: border-box;"></o:p></span></div><div align="center" class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: center;"><br style="box-sizing: border-box;" /></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; margin: 0px; padding: 0px; text-align: center;"><a href="https://2.bp.blogspot.com/-hPofeJkvpQ0/W3mc3Q1IzYI/AAAAAAAAACcQ/MFvle34LW84mWTKkJS1BYHK5mvPjFJv1QCEwYBhGL/s1600/4.jpg" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px 1em; padding: 0px; text-decoration-line: none; transition: all 0.3s ease 0s;"></a></div><br style="box-sizing: border-box;" /></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; color: #444444; margin: 0px; padding: 0px; text-align: center;"><a href="https://4.bp.blogspot.com/-IzOxbu0QuOU/W3mc3sU4zMI/AAAAAAAAACcY/oW28lil-uWAjyldvRbpz6w50M37\_Qxg0ACEwYBhgL/s1600/5.jpg" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px 1em; padding: 0px; text-decoration-line: none; transition: all 0.3s ease 0s;"></a></div><div align="center" class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: center;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; font-size: 12pt; line-height: 17.12px; margin: 0px; padding: 0px;"><o:p style="box-sizing: border-box;"></o:p></span></div><div align="center" class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: center;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; line-height: 17.12px; margin: 0px; padding: 0px;">Kaki-kaki yang terdapat pada LCD<o:p style="box-sizing: border-box;"></o:p></span></div><div align="center" class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px; text-align: center;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; line-height: 17.12px; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; line-height: 17.12px; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; line-height: 17.12px; margin: 0px; padding: 0px;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">-Seven Segment</b></span></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; font-family: &quot;times new roman&quot;; &quot;serif&quot;; line-height: 17.12px; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></span></div><div style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><span lang="EN-US" style="border: 0px; box-sizing: border-box; line-height: 17.12px; margin: 0px; padding: 0px;"><div class="separator" style="border: 0px; box-sizing:

border-box; clear: both; color: #444444; font-family: &quot;Times New Roman&quot;; margin: 0px; padding: 0px; text-align: center;"><a href="https://2.bp.blogspot.com/-YsEeJS5I4a0/WZ6CorhP1ul/AAAAAAAAACWg/gXShithV3KA9mErMtTNZmoQA9D9RKv6OwCEwYBhgL/s1600/seven%2Bsegment%2Brangkaian.jpg" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px 1em; padding: 0px; text-decoration-line: none; transition: all 0.3s ease 0s;"></a></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span style="border: 0px; box-sizing: border-box; font-family: times; margin: 0px; padding: 0px;"><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;">Layar tujuh segmen ini seringkali digunakan pada&nbsp;</span>jam digital<span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;">, meteran elektronik, dan perangkat elektronik lainnya yang menampilkan informasi numerik.&nbsp;</span><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;">Layar tujuh segmen ini terdiri dari 7 buah</span><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;">&nbsp;</span>LED<span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;">&nbsp;</span><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;">yang membentuk angka 8 dan 1 LED untuk titik/DP. Angka yang ditampilkan di seven segmen ini dari 0-9. Cara kerja dari seven segmen disesuaikan dengan LED. LED merupakan komponen diode yang dapat memancarkan cahaya. kondisi dalam keadaan ON jika sisi anode mendapatkan sumber positif dari Vcc dan katode mendapatkan sumber negatif dari ground.</span></span></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span style="border: 0px; box-sizing: border-box; font-family: times; margin: 0px; padding: 0px;"><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;"><br /></span></span></div><div style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><span style="border: 0px; box-sizing: border-box; font-family: times; margin: 0px; padding: 0px;"><span face="sans-serif" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><ul style="font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 13.2px; line-height: 1.4; margin: 0.5em 0px; padding: 0px 2.5em;"><li style="margin: 0px 0px 0.25em; padding: 0px;"><b><span style="font-size: large;"><span style="color: black;">Sensor Magnetic Reed Switch</span></span></b></li></ul><p class="MsoNormal" style="color: #444444; font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 13.2px; line-height: 1.98px; margin-left: 35.45pt; text-align: justify;"><span style="background-attachment: scroll; background-clip: initial; background-image: none; background-origin: initial; background-position: 0% 0%; background-repeat: repeat; background-size: initial; font-family: &quot;Times New Roman&quot;; serif; font-size: 12pt; line-height: 24px;">Sensor magnet adalah sensor yang mudah terpengaruh dan peka terhadap medan



magnet kemudian memberikan perubahan kondisi output. Prinsip kerja Sensor magnet yaitu akan aktif ketika konduktor mempengaruhi medan magnet, sehingga magnet tersebut tertolak atau tertarik sesuai dengan pengaruh konduktor yang diberikan.

Prinsip Sensor Magnet

Sensor Magnet adalah berdasarkan Hukum Faraday dimana apabila sebuah penghantar memotong suatu medan magnet maka pada kedua ujung penghantar tersebut akan menimbulkan Gaya Gerak Listrik (GGL) atau Electromagnetic Force (Emf). Besaran Emf tersebut adalah tergantung kepada kuat medan magnet dan kecepatan pemotongan. Apabila Sensor tersebut menerima getaran maka batang magnet tersebut akan ikut bergetar dan medan magnet tersebut akan terpotong-potong oleh gulungan kawat sehingga kedua ujung gulungan kawat tersebut akan menimbulkan tegangan.

Sensor Magnet adalah Alat yang akan terpengaruh Medan Magnet dan akan memberikan perubahan kondisi pada keluaran, seperti layaknya saklar dua kondisi (on/off) yang digerakkan oleh adanya medan magnet disekitarnya.

Reed switch adalah saklar listrik dioperasikan oleh medan magnet

switch terdiri

dari

dua kawat

feromagnetik

nikel

besi dan

pisau

kontak

berbentuk khusus

buluh

diposisikan dalam

kapsul kaca

tertutup rapat

dengan

celah dan

dalam

pelindung.

sans-serif; font-size: 13.2px; text-align: center;"><span style="font-family: &quot;Times New Roman&quot;, serif; font-size: 12pt;"><a href="https://1.bp.blogspot.com/-cQ7ibuXdZCs/X7oUxMHxF3I/AAAAAAAAAB8w/gua8ueJcBDsUjCTGALwE WpBT6tu7NiCIAClCBGAsYHQ/s224/reedswitch.jpg" style="color: #2288bb; margin-left: 1em; margin-right: 1em; text-decoration-line: none;"></a></span></div><span style="color: #444444;"><span style="font-family: &quot;Times New Roman&quot;, serif; font-size: 12pt;"></span></span><p style="color: #444444; font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 13.2px;"></p><br style="font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 13.2px;" /><div class="separator" style="clear: both; color: #444444; font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 13.2px; text-align: center;"><a href="https://1.bp.blogspot.com/-Du1hykIPbXA/X7oVtiu4Vql/AAAAAAAAAB88/3b7g8oplDiwZXz7kVuthbyb7C3J3snZaACLcBGAsYHQ/s320/Reed%2BSwitch%2Bimage\_0.jpg" style="color: #2288bb; margin-left: 1em; margin-right: 1em; text-decoration-line: none;"></a></div><span face="Arial, Tahoma, Helvetica, FreeSans, sans-serif" style="color: #444444; font-size: 13.2px;">&nbsp;</span><span face="Arial, Tahoma, Helvetica, FreeSans, sans-serif" style="color: red; font-size: 13.2px;"><b><span style="font-size: large;"><br /></span></b></span><div class="separator" style="clear: both; color: #444444; font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 13.2px; text-align: center;"><a href="https://1.bp.blogspot.com/-U9uXU1mng7A/X7oVtvRT6il/AAAAAAAAAB9A/kIH\_LBZ5NecgLmubhM\_x2tI7zDZIMoRwQCLcBGAsYHQ/s237/Reed%2BSwitch%2BOperation.JPG" style="color: #2288bb; margin-left: 1em; margin-right: 1em; text-decoration-line: none;">&nbsp;</a></div><div class="separator" style="clear: both; color: #444444; font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 13.2px; text-align: center;"><div class="separator" style="clear: both;"><a

href="https://1.bp.blogspot.com/-DGQT\_DTjq5Y/X9JD\_9lhy2I/AAAAAAAAACU4/IP3p6LbrRI0Uo\_ombGKxjBCISH463aGoACLCBGAsYHQ/s342/magnet.png" style="color: #2288bb; margin-left: 1em; margin-right: 1em; text-decoration-line: none;"></a></div><br /><div class="separator" style="clear: both; color: #444444; font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 13.2px;"><p class="MsoNormal" style="line-height: normal; margin: 0cm 0cm 0cm 1cm;"><span class="hps"><span style="font-family: &quot;Times New Roman&quot;, serif; font-size: 12pt;">Reed switch dapat dioperasikan</span></span><span style="font-family: &quot;Times New Roman&quot;, serif; font-size: 12pt;">&nbsp;</span><span class="hps">dengan menggunakan</span>&nbsp;<span class="hps">medan magnet yang dihasilkan&nbsp;</span>&nbsp;<span class="hps">magnet</span>&nbsp;<span class="hps">permanen&nbsp;</span>&nbsp;<span class="hps">arus</span>&nbsp;<span class="hps">pembawa</span>&nbsp;<span class="hps">coil</span></span></p><p class="MsoNormal" style="line-height: normal; margin: 0cm 0cm 0cm 1cm;"><span style="font-family: &quot;Times New Roman&quot;, serif; font-size: 12pt;"></span></p><div class="separator" style="clear: both; text-align: center;"><span style="font-family: &quot;Times New Roman&quot;, serif; font-size: 12pt;"><a href="https://1.bp.blogspot.com/-m58Vhpk3-G4/X9JEHnGx1PI/AAAAAAAAACU8/VeBZD\_oi\_kc5CgyxPDzanSKQO6rSOTfRwCLcBGAsYHQ/s355/2.png" style="color: #33aaff; margin-left: 1em; margin-right: 1em; text-decoration-line: none;"></a></span></div></div></span></span></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span style="border: 0px; box-sizing: border-box; font-family: times; margin: 0px; padding: 0px;"><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></span></span></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span style="border: 0px; box-sizing: border-box; font-family: times; margin: 0px; padding: 0px;"><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">D. Komponen Lainnya</b></span></span></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span style="border: 0px; box-sizing: border-box; font-family: times; margin: 0px; padding: 0px;"><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;"><b style="border: 0px; box-sizing: border-box;

margin: 0px; padding: 0px;"><br style="box-sizing: border-box;" /></b></span></span></div><div style="border: 0px; box-sizing: border-box; color: #444444; margin: 0px; padding: 0px;"><span style="border: 0px; box-sizing: border-box; font-family: times; margin: 0px; padding: 0px;"><span face="sans-serif" style="border: 0px; box-sizing: border-box; color: #222222; margin: 0px; padding: 0px;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><span></span></span></div></span></div></div></div><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: &quot;open sans&quot;, arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: start;"><div class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify; text-indent: 36pt;"><p align="justify" class="MsoBodyText" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px;">Arduino&nbsp;adalah&nbsp;kit&nbsp;elektronik&nbsp;atau&nbsp;papan&nbsp;rangkaian&nbsp;elektronik&nbsp;open&nbsp;source&nbsp;yang&nbsp;di&nbsp;dalamnya terdapat komponen utama yaitu sebuah chip mikrokontroler dengan jenis AVR dari&nbsp;perusahaan Atmel. Arduino yang kita gunakan dalam praktikum ini adalah Arduino Uno yang&nbsp;menggunakan&nbsp;chip&nbsp;AVR&nbsp;ATmega&nbsp;328P.&nbsp;Dalam&nbsp;mempogram&nbsp;Arduino,&nbsp;kita&nbsp;bisa&nbsp;menggunakan komunikasi serial agar Arduino dapat berhubungan dengan komputer ataupun&nbsp;perangkat&nbsp;lain.<o:p style="box-sizing: border-box;"></o:p></p><p align="justify" class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px;">Adapun&nbsp;spesifikasi dari&nbsp;Arduino Uno&nbsp;ini&nbsp;adalah&nbsp;sebagai&nbsp;berikut&nbsp;:<o:p style="box-sizing: border-box;"></o:p></p><p align="center" class="MsoBodyText" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px; text-align: center;"><o:p style="box-sizing: border-box;"></o:p></p><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: center;"><a href="https://1.bp.blogspot.com/-PHBnz6eSdes/YYuDt4Xgu7I/AAAAAAAC\_o/xWLcXhsN-UMVIOZ98OYOnZ1O--01p3YNwCLcBGAsYHQ/s609/Picture1.png" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px 1em; padding: 0px; text-decoration-line: none; transition: all 0.3s ease 0s;"></a></div>&nbsp;<p style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px;"></p><p align="center" class="MsoCaption" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px; text-align: center;"><a name="\_bookmark11" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px; padding: 0px; transition: all 0.3s ease 0s;"></a><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">Arduino Uno</b></p><p class="MsoCaption" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px; text-align: left;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">Bagian-bagian arduino

**Power USB**

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Digunakan untuk menghubungkan Papan Arduino dengan komputer lewat koneksi USB.

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div></h4><h5 style="background-color: white; border: 0px; box-sizing: border-box; color: #757575;
font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 17px; letter-spacing: 0px;
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padding-top: 4px !important; padding: 4px 0px 0px; text-indent: -1px;"><span style="border: 0px;
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class="separator" style="background-attachment: initial; background-clip: initial; background-image:
initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial;
background-size: initial; border: 0px; clear: both; cursor:
url("https://ani.cursors-4u.net/games/gam-16/gam1571.ani")),
url("https://ani.cursors-4u.net/games/gam-16/gam1571.png")), auto; margin: 0px; outline:
0px; padding: 0px; text-align: center; transition: all 0.3s ease 0s; vertical-align: baseline;"><div
class="separator" style="clear: both; cursor:
url("https://ani.cursors-4u.net/games/gam-16/gam1571.ani")),
url("https://ani.cursors-4u.net/games/gam-16/gam1571.png")), auto; text-align:
justify;"><div class="separator" style="background-attachment: initial; background-clip: initial;
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baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial;
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baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial;
background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat:
initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align:
baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial;
background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat:
initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align:
baseline;"><div style="border: 0px; box-sizing: border-box; color:
#444444; font-family: "open sans"; arial, helvetica, sans-serif; font-size: 15px; font-weight:
400; margin: 0px; padding: 0px; text-align: start;"><div class="MsoNormal" style="border: 0px;
box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify; text-indent: 36pt;"><p
class="MsoBodyText" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px;
text-align: left;">Supply atau sumber listrik untuk
Arduino dengan tipe Jack. Input DC 5 - 12 V.<
o:p style="box-sizing:

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[illegible]

[illegible]



[illegible]

baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><b><span style="font-family: courier;"><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: &quot;open sans&quot;; arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: start;"><div class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify; text-indent: 36pt;"><p class="MsoBodyText" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px;">Papan Arduino UNO memiliki 6 pin analog A0 sampai A5. Digunakan untuk membaca sinyal&nbsp;atau&nbsp;sensor analog&nbsp;seperti sensor&nbsp;jarak, suhu dsb,&nbsp;dan mengubahnya&nbsp;menjadi nilai&nbsp;digital.<o:p style="box-sizing: border-box;"></o:p></p></div></div></span></b></div></div></div></div></div></div></div></div></h4><h5 style="background-color: white; border: 0px; box-sizing: border-box; color: #757575; font-family: Arial, Tahoma, Helvetica, FreeSans, sans-serif; font-size: 17px; letter-spacing: 0px; line-height: 26px; margin: 0px 0px 4px; padding-bottom: 0px; padding-left: 0px; padding-right: 0px; padding-top: 4px !important; padding: 4px 0px 0px; text-indent: -1px;"><span style="border: 0px; box-sizing: border-box; font-size: small; margin: 0px; padding: 0px;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">-LED</b><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">&nbsp;</b><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">Power</b><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">&nbsp;</b><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">Indicator</b><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;"><o:p style="box-sizing: border-box;"></o:p></b></span></h5><h4 style="background-color: white; color: #666666; font-family: &quot;Trebuchet MS&quot;; Trebuchet, Verdana, sans-serif; font-size: 15.84px; margin: 0px; position: relative;"><div class="separator" style="clear: both; text-align: justify;"><div style="cursor: url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.ani&quot;), url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.png&quot;), auto; text-align: left;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; cursor: url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.ani&quot;), url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.png&quot;), auto; margin: 0px; outline: 0px; padding: 0px; text-align: center; transition: all 0.3s ease 0s; vertical-align: baseline;"><div

**Lampu ini akan menyala**

dengan  
menandakan Papan Arduino mendapatkan supply listrik dan baik.

Bagian - bagian pendukung:

RAM

o:p

RAM

o:p

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"Trebuchet MS", Trebuchet, Verdana, sans-serif; font-size: 15.84px; margin: 0px; position: relative;"><div class="separator" style="clear: both; text-align: justify;"><div style="cursor: url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.ani&quot;), url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.png&quot;), auto; text-align: left;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; cursor: url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.ani&quot;), url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.png&quot;), auto; margin: 0px; outline: 0px; padding: 0px; text-align: center; transition: all 0.3s ease 0s; vertical-align: baseline;"><div class="separator" style="clear: both; cursor: url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.ani&quot;), url(&quot;https://ani.cursors-4u.net/games/gam-16/gam1571.png&quot;), auto; text-align: justify;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><div class="separator" style="background-attachment: initial; background-clip: initial; background-image: initial; background-origin: initial; background-position: 0px 0px; background-repeat: initial; background-size: initial; border: 0px; clear: both; outline: 0px; padding: 0px; vertical-align: baseline;"><b><span style="font-family: courier;"><div style="border: 0px; box-sizing: border-box; color: #444444; font-family: &quot;open sans&quot;, arial, helvetica, sans-serif; font-size: 15px; font-weight: 400; margin: 0px; padding: 0px; text-align: start;"><div class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify; text-indent: 36pt;"><p class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px;">ROM (<i style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">Read-only Memory</i>) adalah perangkat keras pada computer yang dapat menyimpan&nbsp;data secara permanen tanpa harus memperhatikan adanya sumber listrik. ROM terdiri dari&nbsp;Mask&nbsp;ROM, PROM, EPROM, EEPROM.</p><p class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px;"><b style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">Block Diagram Mikrokontroler ATMega 328P pada Arduino UNO</b></p><p class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px 0px 15px; padding: 0px;">Adapun block diagram mikrokontroler ATMega 328P dapat dilihat pada gambar berikut:</p><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: center;"><a

href="https://1.bp.blogspot.com/-Ypz\_gHIMOXo/YYuLmq7J3yl/AAAAAAAC\_4/QbCpfrwk5BwPqKhVMasYys8FTn7oPi\_pAClCBGAsYHQ/s760/WhatsApp%2BImage%2B2021-11-10%2Bat%2B16.02.56.jpeg" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px 1em; padding: 0px; text-decoration-line: none; transition: all 0.3s ease 0s;"></a></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: center;"><br style="box-sizing: border-box;" /></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: center;"><br style="box-sizing: border-box;" /></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: left;">Block diagram dapat digunakan untuk memudahkan / memahami bagaimana kinerja dari mikrokontroler ATmega 328P.</div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: left;"><br style="box-sizing: border-box;" /></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: left;">Pin-pin ATmega 328P:</div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: left;"><br style="box-sizing: border-box;" /></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: center;"><a href="https://1.bp.blogspot.com/-1CW079JP8BI/YYuNJ\_D6UjI/AAAAAAADAA/m9ylsan2FkQ1H3OjhO0gN-4rIBPBWIKLAClCBGAsYHQ/s524/WhatsApp%2BImage%2B2021-11-10%2Bat%2B16.12.31.jpeg" style="border: 0px; box-sizing: border-box; color: #597e00; margin: 0px 1em; padding: 0px; text-decoration-line: none; transition: all 0.3s ease 0s;"></a></div><span style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;</span><span style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;</span><span style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;</span><span style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;</span></div><div class="MsoNormal" style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px; text-align: justify; text-indent: 36pt;"><br style="box-sizing: border-box;" /></div><div class="separator" style="border: 0px; box-sizing: border-box; clear: both; margin: 0px; padding: 0px; text-align: center;"><a href="https://1.bp.blogspot.com/-MFwDTC\_nF4M/YYuN2vlrcI/AAAAAAADAI/hdLooh8SBSsg54L4N\_3U

8. Rangkaian simulasi dan Prinsip kerja <a name="8"></a><a href="https://almajrikusmaidi212003.blogspot.com/p/kembali-ke-menu-sebelumnya-daftar-isi-2.html#kembali"></a></div><div><br /></div><div><div class="separator" style="clear: both; text-align: center;"></div><br /><br /></div><div><br />

9. Flowchart dan lisning program <a name="9"></a><a href="https://almajrikusmaidi212003.blogspot.com/p/kembali-ke-menu-sebelumnya-daftar-isi-2.html#kembali">[Kembali]</a></div><div><br />

10. Video simulasi <a name="10"></a><a href="https://almajrikusmaidi212003.blogspot.com/p/kembali-ke-menu-sebelumnya-daftar-isi-2.html#kembali">[Kembali]</a></div><div><br />

11. Link Download <a name="G"></a><a href="https://annisaaurelerman181036.blogspot.com/p/modul-1-laporan-akhir-1.html#kembali">[Kembali]</a><br /></div><div>File rangkaian <a href="https://drive.google.com/file/d/1-xiVx3vD2Fq5xNpxWgiSfuP9hDo-yH40/view?usp=sharing" target="\_blank">download</a></div><div>Video simulasi <a href="https://drive.google.com/file/d/1rEqd\_WYoZg3V5qAkjGc2e7k1A1GWzDCZ/view?usp=sharing" target="\_blank">download</a></div><div>File HTML download<a href="https://drive.google.com/file/d/1-xiVx3vD2Fq5xNpxWgiSfuP9hDo-yH40/view?usp=sharing" target="\_blank">download</a></div>

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