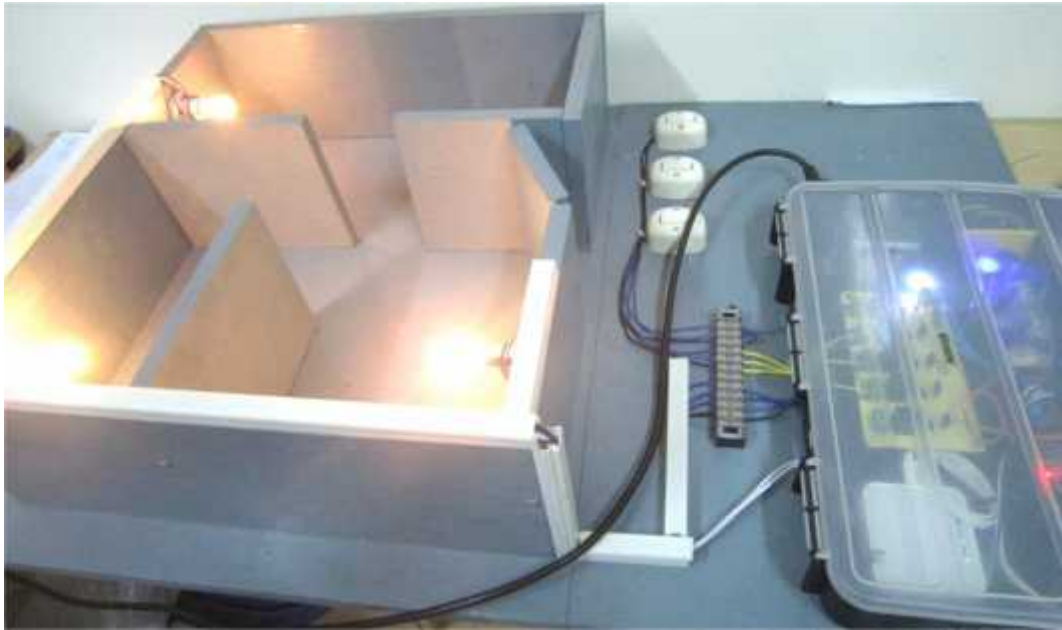


LAMPIRAN

Lampiran 1. Spesifikasi Prototipe Sistem Kontrol Penerangan Rumah Menggunakan Aplikasi Android Berbasis Arduino Mega 2560



Unit Pemroses : Arduino Mega 2560 dan Ethernet Shield

Unit Masukan : Sensor cahaya *Light Dependent Resistor*, perintah dari aplikasi android dan saklar

Unit Keluaran : Router dan rangkaian relay

Interface : Aplikasi *Smartphone* Android



Lampiran 2. Prosedur Penggunaan

1. Tombol Power prototipe dihidupkan
2. Tunggu sampai Router dan Arduino Mega 2560 dalam keadaan *stand-by*
3. Koneksikan fitur WLAN pada smartphone android pada jaringan wi-fi router yang digunakan
4. Buka aplikasi android *interface*
5. Klik Connect untuk memulai koneksi dengan prototipe dan Disconnect untuk menghentikan koneksi.
6. Pilih Mode Aplikasi untuk kontrol dengan Aplikasi dan pilih Mode Saklar untuk kontrol dengan Saklar.



7. Pada Mode Aplikasi, klik tombol Lampu On dan Lampu Off untuk kontrol penerangan, pada Mode Pilihan ini saklar tidak berfungsi
8. Pada Mode Saklar, kontak saklar untuk kontrol penerangan, pada Mode Pilihan ini tombol kontrol aplikasi android tidak berfungsi
9. Monitoring keadaan penerangan pada bagian Status Lampu.

Lampiran 3. List Program Prototipe Sistem Kontrol Penerangan Rumah Menggunakan Aplikasi Android Berbasis Arduino Mega 2560

1. Program Arduino Mega 2560 dengan Software Arduino IDE 1.0.5

```
#include <SPI.h>
#include <Ethernet.h>
byte mac[] = { 0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED };
IPAddress ip(192,168,0,100);
EthernetServer server(80);
String readString;

int sensorldr1=A8;
int sensorldr2=A9;
int sensorldr3=A10;
String status1;
String status2;
String status3;

void setup(){
  pinMode(23, OUTPUT);
  pinMode(25, OUTPUT);
  pinMode(27, OUTPUT);
  pinMode(29, OUTPUT);
  pinMode(31, OUTPUT);

  pinMode(sensorldr1, INPUT);
  pinMode(sensorldr2, INPUT);
  pinMode(sensorldr3, INPUT);

  //start Ethernet
  Ethernet.begin(mac, ip);
  server.begin();
```

```

//serial data print
Serial.begin(9600);
Serial.println("Sistem Kontrol Penerangan Rumah");
}

void loop(){
// Memulai client connection
EthernetClient client = server.available();
if (client) {
    while (client.connected()) {
        if (client.available()) {
            char c = client.read();
//Baca char dari char HTTP request
            if (readString.length() < 100) {
//Masukkan characters to string
                readString += c;
            }
//HTTP request has ended
            if (c == '\n') {

client.println("HTTP/1.1 200 OK"); //buka halaman baru
client.println("Content-Type: text/html");
client.println();
////Jika ingin menampilkan pada browser
/*
client.println("<HTML>");
client.println("<HEAD>");
client.println("<TITLE>Light Control</TITLE>");
client.println("</HEAD>");
client.println("<BODY bgcolor='grey'>");
client.println("<H1>Sistem Kontrol Penerangan Rumah</H1>");
client.println("<H2>Muhammad Hafidz</H2>");

```

```
client.println("<H2>5215102648</H2>");
client.println("<hr />");
client.println("<br />");
client.println("<br />");
client.println("<a href='?light1on'>Turn On Lampu 1</a>");
client.println("<a href='?light1off'>Turn Off Lampu 1</a><br />");
client.println("<br />");
client.println("<br />");
client.println("<a href='?light2on'>Turn On Lampu 2</a>");
client.println("<a href='?light2off'>Turn Off Lampu 2</a><br />");
client.println("<br />");
client.println("<br />");
client.println("<a href='?light3on'>Turn On Lampu 3</a>");
client.println("<a href='?light3off'>Turn Off Lampu 3</a><br />");
client.println("<br />");
client.println("<br />");
client.println("<a href='?light4on'>Turn On Lampu 4</a>");
client.println("<a href='?light4off'>Turn Off Lampu 4</a><br />");
client.println("<br />");
client.println("<br />");
client.println("<a href='?light5on'>Turn On Lampu 5</a>");
client.println("<a href='?light5off'>Turn Off Lampu 5</a><br />");
client.println("</BODY>");
client.println("</HTML>");
*/
client.println("");
client.println(status1);
client.println("");
client.println(status2);
client.println("");
client.println(status3);
delay(1);
```

```
//stopping client
client.stop();

////////// kontrol pin arduino untuk relay
if(readString.indexOf("?light1on") >0)
{
digitalWrite(23, HIGH);
digitalWrite(25, LOW);
digitalWrite(27, LOW);
digitalWrite(29, LOW);
digitalWrite(31, HIGH);
Serial.println("LED 1 On");
}
else{
if(readString.indexOf("?light1off") >0)
{
digitalWrite(23, LOW);
digitalWrite(25, LOW);
digitalWrite(27, LOW);
digitalWrite(29, LOW);
digitalWrite(31, LOW);
Serial.println("LED 1 Off");
}
}

if(readString.indexOf("?light2on") >0)
{
digitalWrite(25, HIGH);
Serial.println("LED 2 On");
}
else{
if(readString.indexOf("?light2off") >0)
```

```
{
  digitalWrite(25, LOW);
  Serial.println("LED 2 Off");
}
}

if(readString.indexOf("?light3on") >0)
{
  digitalWrite(27, HIGH);
  Serial.println("LED 3 On");
}
else{
  if(readString.indexOf("?light3off") >0)
  {
    digitalWrite(27, LOW);
    Serial.println("LED 3 Off");
  }
}

if(readString.indexOf("?light4on") >0)
{
  digitalWrite(29, HIGH);
  Serial.println("LED 4 On");
}
else{
  if(readString.indexOf("?light4off") >0)
  {
    digitalWrite(29, LOW);
    Serial.println("LED 4 Off");
  }
}
```

```
if(readString.indexOf("?light5on") >0)
{
digitalWrite(31, HIGH);
Serial.println("LED 5 On");
}
else{
if(readString.indexOf("?light5off") >0)
{
digitalWrite(31, LOW);
Serial.println("LED 5 Off");
}
}

if(readString.indexOf("?reset") >0)
{
digitalWrite(37, LOW);
delay(300);
digitalWrite(37, HIGH);
Serial.println("RESET");
}

readString=""; //clearing string for next read
}
}
}

////////// Baca Sensor
int lampu1 = analogRead(sensorldr1);
int lampu2 = analogRead(sensorldr2);
int lampu3 = analogRead(sensorldr3);
```



```
if (lampu1<=950){
  status1="Lampu 1 OFF";}
else if (lampu1>950){
  status1="Lampu 1 ON";}

if (lampu2<=950){
  status2="Lampu 2 OFF";}
else if (lampu2>950){
  status2="Lampu 2 ON";}

if (lampu3<=950){
  status3="Lampu 3 OFF";}
else if (lampu3>950){
  status3="Lampu 3 ON";}

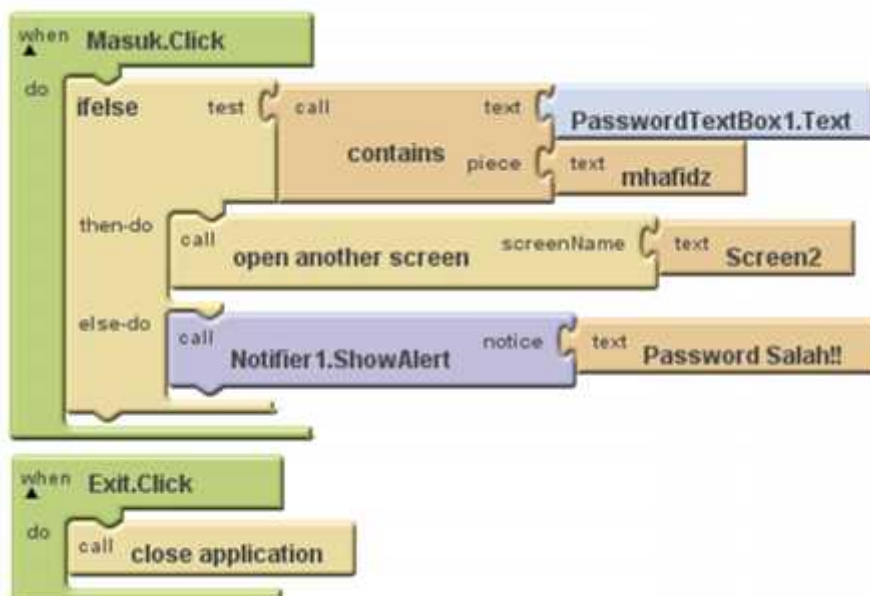
Serial.print("  ");
Serial.print(lampu1,DEC);
Serial.print("  ");
Serial.print(lampu2,DEC);
Serial.print("  ");
Serial.println(lampu3,DEC);
delay(100);      // delay 100 ms for next reading
}
```

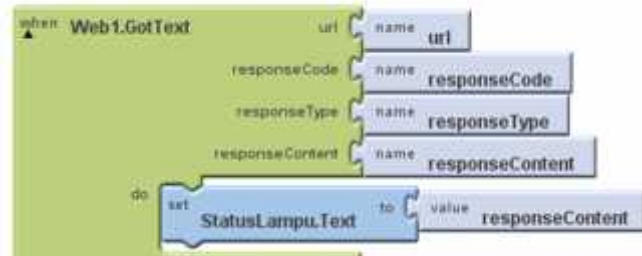
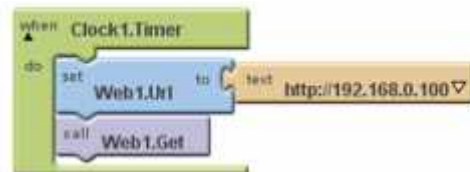
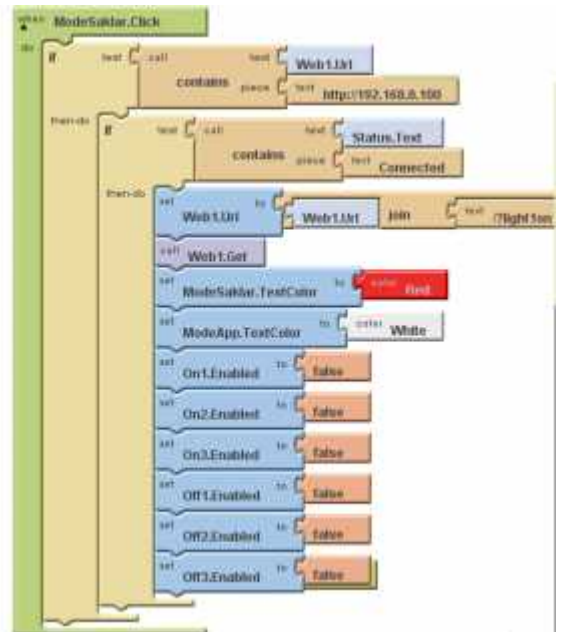
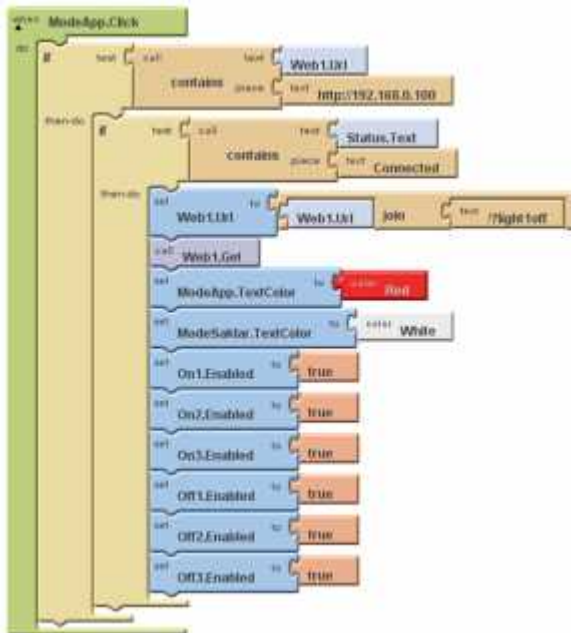
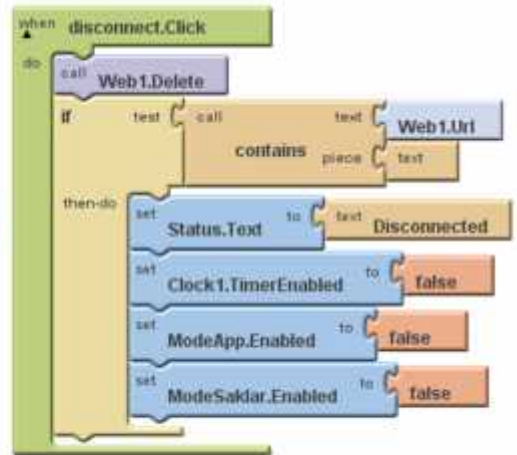
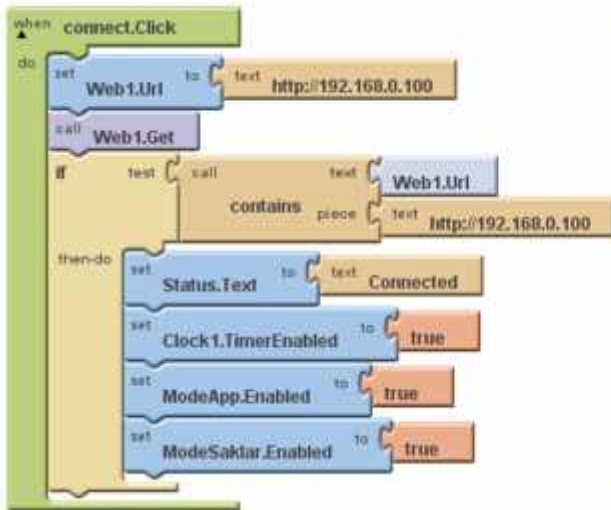
2. Program Aplikasi Android

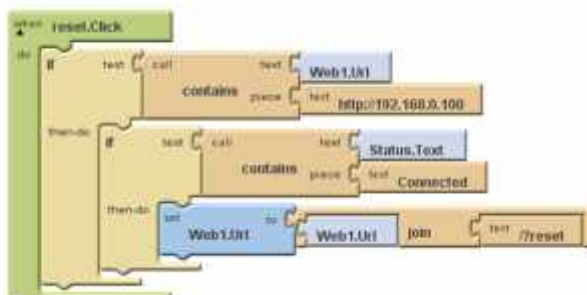
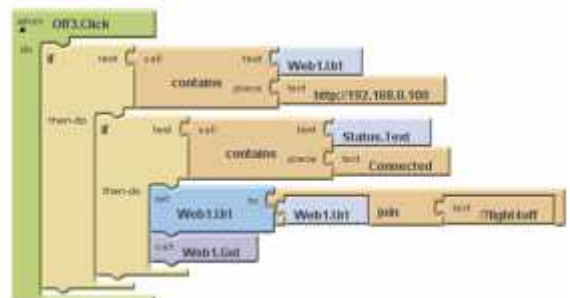
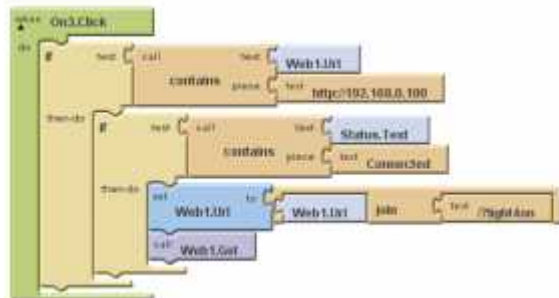
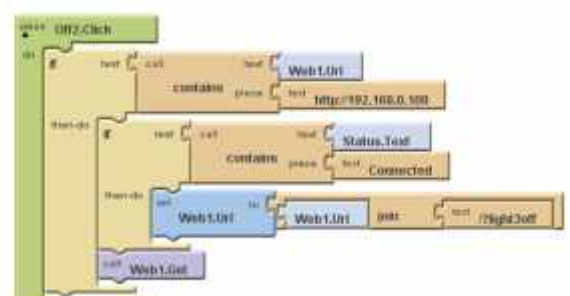
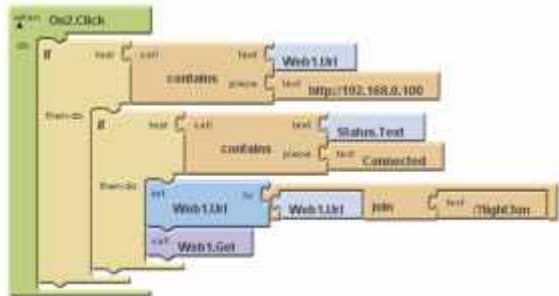
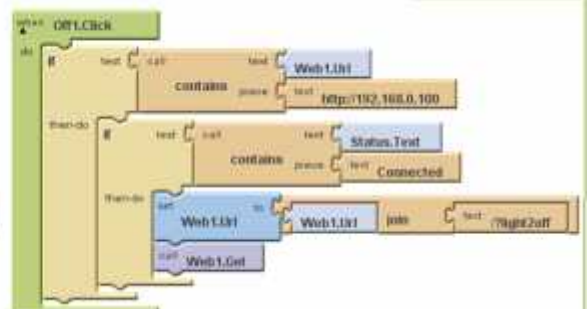
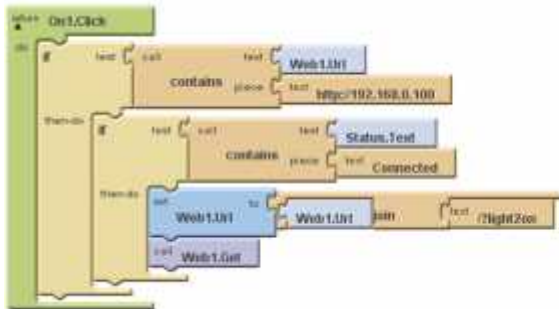
Tampilan Aplikasi



Blok Program Aplikasi Android







Lampiran 4. Datasheet AVR ATmega 2560



Atmel ATmega640/V-1280/V-1281/V-2560/V-2561/V

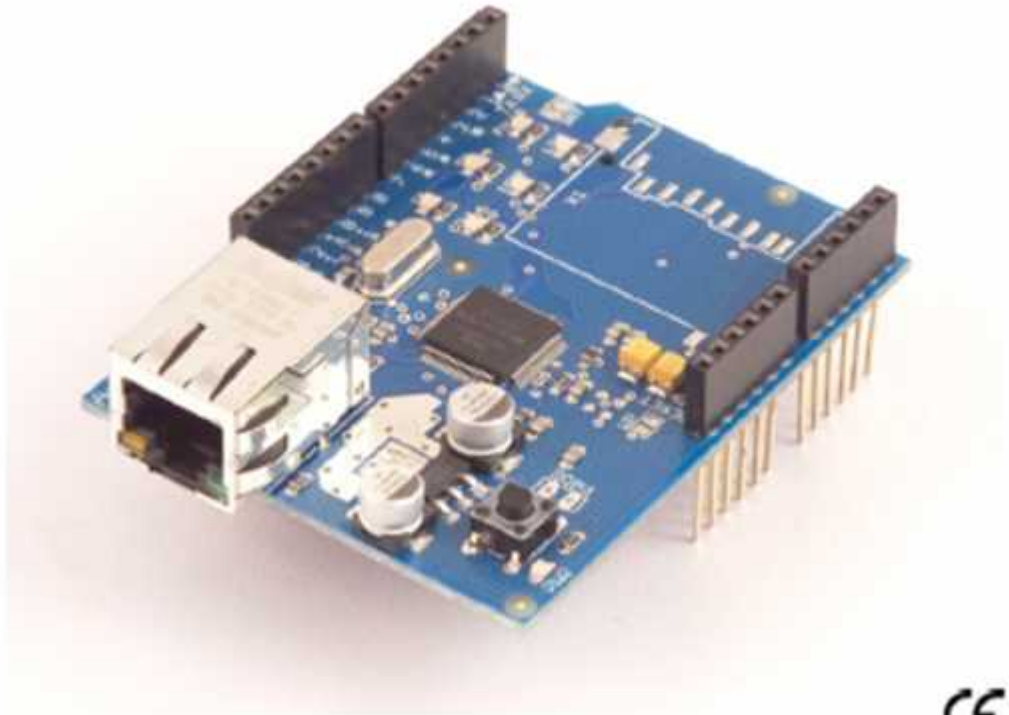
8-bit Atmel Microcontroller with 16/32/64KB In-System Programmable Flash

DATASHEET

Features

- High Performance, Low Power Atmel® AVR® 8-Bit Microcontroller
- Advanced RISC Architecture
 - 136 Powerful Instructions – Most Single Clock Cycle Execution
 - 32 x 8 General Purpose Working Registers
 - Fully Static Operation
 - Up to 16 MIPS Throughput at 16MHz
 - On-Chip 2-cycle Multiplier
- High Endurance Non-volatile Memory Segments
 - 64K/128K/256KBytes of In-System Self-Programmable Flash
 - 4Kbytes EEPROM
 - 8Kbytes Internal SRAM
 - Write/Erase Cycles: 10,000 Flash/100,000 EEPROM
 - Data retention: 20 years at 85°C/ 100 years at 25°C
 - Optional Boot Code Section with Independent Lock Bits
 - In-System Programming by On-chip Boot Program
 - True Read-While-Write Operation
 - Programming Lock for Software Security
 - Endurance: Up to 64Kbytes Optional External Memory Space
- Atmel® QTouch® library support
 - Capacitive touch buttons, sliders and wheels
 - QTouch and QMatrix acquisition
 - Up to 64 sense channels
- JTAG (IEEE® std. 1149.1 compliant) Interface
 - Boundary-scan Capabilities According to the JTAG Standard
 - Extensive On-chip Debug Support
 - Programming of Flash, EEPROM, Fuses, and Lock Bits through the JTAG Interface
- Peripheral Features
 - Two 8-bit Timer/Counters with Separate Prescaler and Compare Mode
 - Four 16-bit Timer/Counter with Separate Prescaler, Compare- and Capture Mode
 - Real Time Counter with Separate Oscillator
 - Four 8-bit PWM Channels
 - Six/Twelve PWM Channels with Programmable Resolution from 2 to 16 Bits (ATmega1281/2561, ATmega640/1280/2560)
 - Output Compare Modulator
 - 8/16-channel, 10-bit ADC (ATmega1281/2561, ATmega640/1280/2560)
 - Two/Four Programmable Serial USART (ATmega1281/2561, ATmega640/1280/2560)
 - Master/Slave SPI Serial Interface
 - Byte Oriented 2-wire Serial Interface
 - Programmable Watchdog Timer with Separate On-chip Oscillator
 - On-chip Analog Comparator
 - Interrupt and Wake-up on Pin Change
- Special Microcontroller Features
 - Power-on Reset and Programmable Brown-out Detection
 - Internal Calibrated Oscillator
 - External and Internal Interrupt Sources
 - Six Sleep Modes: Idle, ADC Noise Reduction, Power-save, Power-down, Standby, and Extended Standby
- I/O and Packages
 - 54/66 Programmable I/O Lines (ATmega1281/2561, ATmega640/1280/2560)
 - 64-pad QFN/MLF, 64-lead TQFP (ATmega1281/2561)
 - 100-lead TQFP, 100-ball BGA (ATmega640/1280/2560)
 - RoHS Fully Green
- Temperature Range:
 - -40°C to 85°C Industrial
- Ultra-Low Power Consumption
 - Active Mode: 1MHz, 1.5V: 500µA
 - Power-down Mode: 0.1µA at 1.8V
- Speed Grade:
 - ATmega640V/ATmega1280V/ATmega1281V:
 - 0 - 8MHz @ 1.8V - 5.5V, 0 - 8MHz @ 2.7V - 5.5V
 - ATmega2560V/ATmega2561V:
 - 0 - 2MHz @ 1.8V - 5.5V, 0 - 8MHz @ 2.7V - 5.5V
 - ATmega640/ATmega1280/ATmega1281:
 - 0 - 8MHz @ 2.7V - 5.5V, 0 - 10MHz @ 4.5V - 5.5V
 - ATmega2560/ATmega2561:
 - 0 - 10MHz @ 4.5V - 5.5V

Lampiran 5. Datasheet Arduino Ethernet Shield



Product Overview

The Arduino Ethernet Shield allows an Arduino board to connect to the internet. It is based on the [Wiznet W5100](#) ethernet chip ([datasheet](#)). The Wiznet W5100 provides a network (IP) stack capable of both TCP and UDP. It supports up to four simultaneous socket connections. Use the [Ethernet library](#) to write sketches which connect to the internet using the shield.

Please note that the current design of the ethernet shield is not compatible with the Arduino Mega.



radiospares

RADIONICS



Lampiran 6. Spesifikasi TP-Link TL MR3020

TP-LINK®

Portable 3G/3.75G Wireless N Router TL-MR3020

⊙ Features:

- Compatible with UMTS/HSPA/EVDO USB modems
- Travel-sized design, light and small enough to take anywhere
- Wireless N speed up to 150Mbps
- Three modes available: 3G Router, WSP Client Router and Travel Router (AP), interchangeable at the flip of a switch
- 3G/WAN failover guarantees an "always-online" Internet connection
- Quick security setup, for faster, safer and more convenient security
- A mini USB port to be connected to your laptop or power adapter for power
- IP-based bandwidth control allows administrators to determine how much bandwidth is allotted to each PC



⊙ Description:

The TL-MR3020 allows users to share a 3G mobile connection. By connecting a UMTS/HSPA/EVDO USB modem to the router, a 3G Wi-Fi hotpot is instantly established. With its portable design, it is small and light enough to take on the road, and can be powered through a USB Cable connected to a laptop or adapter, allowing users to share a 3G mobile connection even when on the train, camping or at a construction site. With the TL-MR3020, you can share the 3G internet connection with your family or friends anywhere 3G coverage is available!

Lampiran 7. Datasheet Light Dependent Resistor



Email: info@sunrom.com or sunrom@gmail.com

Visit us at <http://www.sunrom.com>

Document: Datasheet

Date: 28-Jul-08

Model #: 3190

Product's Page: www.sunrom.com/p-510.htm

Light Dependent Resistor - LDR

Two cadmium sulphide(cds) photoconductive cells with spectral responses similar to that of the human eye. The cell resistance falls with increasing light intensity. Applications include smoke detection, automatic lighting control, batch counting and burglar alarm systems.



Applications

Photoconductive cells are used in many different types of circuits and applications.

Analog Applications

- Camera Exposure Control
- Auto Slide Focus - dual cell
- Photocopy Machines - density of toner
- Colorimetric Test Equipment
- Densitometer
- Electronic Scales - dual cell
- Automatic Gain Control – modulated light source
- Automated Rear View Mirror

Digital Applications

- Automatic Headlight Dimmer
- Night Light Control
- Oil Burner Flame Out
- Street Light Control
- Absence / Presence (beam breaker)
- Position Sensor

Electrical Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Cell resistance	1000 LUX	-	400	-	Ohm
	10 LUX	-	9	-	K Ohm
Dark Resistance	-	-	1	-	M Ohm
Dark Capacitance	-	-	3.5	-	pF
Rise Time	1000 LUX	-	2.8	-	ms
	10 LUX	-	18	-	ms
Fall Time	1000 LUX	-	48	-	ms
	10 LUX	-	120	-	ms
Voltage AC/DC Peak		-	-	320	V max
Current		-	-	75	mA max
Power Dissipation				100	mW max
Operating Temperature		-60	-	+75	Deg. C