**Arduino – Webserver with an Arduino + Ethernet Shield**

This project is all about using an Arduino with an Ethernet shield. I’ll be controlling one LED and a servo, but you can apply this method to control any electronic device you want. (such as DC motors, buzzers, relays, stepper motors, etc..)

A picture containing text, electronics

Description automatically generated

## **Introduction**

The code provided when uploaded and connected to the internet it creates a webserver in your LAN and you simply use the IP to access that webserver through your browser. After that it shows a webpage similar to that one below. When you press the button “Turn On LED” your url will change  to: **“http://192.168.1.178/?button1on”** the arduino will read that information and It turns the LED On.

By default the IP is “192.168.1.178”. That also can be found on the arduino code provided.

Graphical user interface, text, application, email

Description automatically generated

## **Parts Required**

A picture containing text

Description automatically generated

* [Arduino UNO](https://makeradvisor.com/tools/compatible-arduino-uno-r3-board/)
* [1x Ethernet Shield](https://makeradvisor.com/tools/ethernet-shield-w5100-arduino-shield/)
* [1x 220 Ohm Resistor](https://makeradvisor.com/tools/resistors-kits/)
* [1x LED](https://makeradvisor.com/tools/3mm-5mm-leds-kit-storage-box/)
* [1x Micro Servo Motor](https://makeradvisor.com/tools/micro-servo-motor-tool/)
* [1x Breadboard](https://makeradvisor.com/tools/mb-102-solderless-breadboard-830-points/)
* [Jumper Cables](https://makeradvisor.com/tools/jumper-wires-kit-120-pieces/)

## **Schematics**

Diagram, schematic

Description automatically generated

**Code**

(raw code - <https://randomnerdtutorials.com/arduino-webserver-with-an-arduino-ethernet-shield/>)

/\*

Created by Rui Santos

Visit: http://randomnerdtutorials.com for more arduino projects

Arduino with Ethernet Shield

\*/

#include <SPI.h>

#include <Ethernet.h>

#include <Servo.h>

int led = 4;

Servo microservo;

int pos = 0;

byte mac[] = { 0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED }; //physical mac address

byte ip[] = { 192, 168, 1, 178 }; // ip in lan (that's what you need to use in your browser. ("192.168.1.178")

byte gateway[] = { 192, 168, 1, 1 }; // internet access via router

byte subnet[] = { 255, 255, 255, 0 }; //subnet mask

EthernetServer server(80); //server port

String readString;

void setup() {

// Open serial communications and wait for port to open:

Serial.begin(9600);

while (!Serial) {

; // wait for serial port to connect. Needed for Leonardo only

}

pinMode(led, OUTPUT);

microservo.attach(7);

// start the Ethernet connection and the server:

Ethernet.begin(mac, ip, gateway, subnet);

server.begin();

Serial.print("server is at ");

Serial.println(Ethernet.localIP());

}

void loop() {

// Create a client connection

EthernetClient client = server.available();

if (client) {

while (client.connected()) {

if (client.available()) {

char c = client.read();

//read char by char HTTP request

if (readString.length() < 100) {

//store characters to string

readString += c;

//Serial.print(c);

}

//if HTTP request has ended

if (c == '\n') {

Serial.println(readString); //print to serial monitor for debuging

client.println("HTTP/1.1 200 OK"); //send new page

client.println("Content-Type: text/html");

client.println();

client.println("<HTML>");

client.println("<HEAD>");

client.println("<meta name='apple-mobile-web-app-capable' content='yes' />");

client.println("<meta name='apple-mobile-web-app-status-bar-style' content='black-translucent' />");

client.println("<link rel='stylesheet' type='text/css' href='http://randomnerdtutorials.com/ethernetcss.css' />");

client.println("<TITLE>Random Nerd Tutorials Project</TITLE>");

client.println("</HEAD>");

client.println("<BODY>");

client.println("<H1>Random Nerd Tutorials Project</H1>");

client.println("<hr />");

client.println("<br />");

client.println("<H2>Arduino with Ethernet Shield</H2>");

client.println("<br />");

client.println("<a href=\"/?button1on\"\">Turn On LED</a>");

client.println("<a href=\"/?button1off\"\">Turn Off LED</a><br />");

client.println("<br />");

client.println("<br />");

client.println("<a href=\"/?button2on\"\">Rotate Left</a>");

client.println("<a href=\"/?button2off\"\">Rotate Right</a><br />");

client.println("<p>Created by Rui Santos. Visit http://randomnerdtutorials.com for more projects!</p>");

client.println("<br />");

client.println("</BODY>");

client.println("</HTML>");

delay(1);

//stopping client

client.stop();

//controls the Arduino if you press the buttons

if (readString.indexOf("?button1on") >0){

digitalWrite(led, HIGH);

}

if (readString.indexOf("?button1off") >0){

digitalWrite(led, LOW);

}

if (readString.indexOf("?button2on") >0){

for(pos = 0; pos < 180; pos += 3) // goes from 0 degrees to 180 degrees

{ // in steps of 1 degree

microservo.write(pos); // tell servo to go to position in variable 'pos'

delay(15); // waits 15ms for the servo to reach the position

}

}

if (readString.indexOf("?button2off") >0){

for(pos = 180; pos>=1; pos-=3) // goes from 180 degrees to 0 degrees

{

microservo.write(pos); // tell servo to go to position in variable 'pos'

delay(15); // waits 15ms for the servo to reach the position

}

}

//clearing string for next read

readString="";

}

}

}

}

}