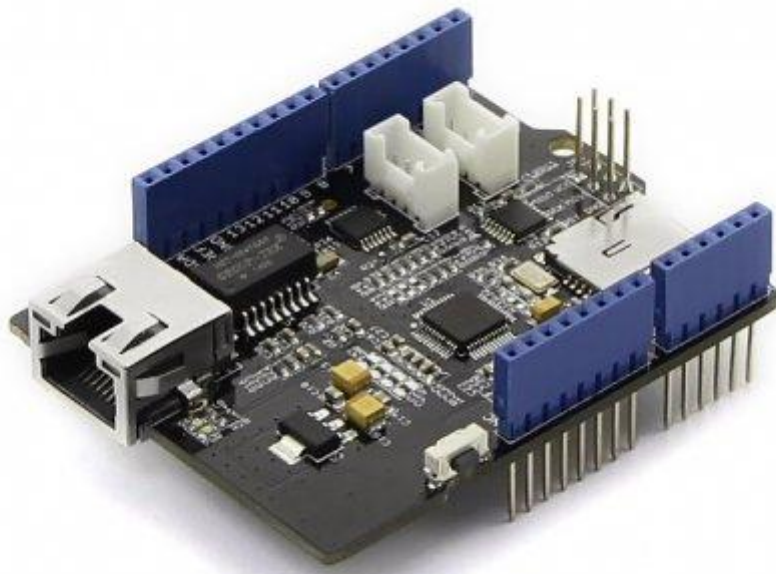# W5500 Ethernet Shield v1.0

The W5500 Ethernet Shield v1.0 can provide your projects with internet connectivity. W5500 enables users to have the Internet connectivity in their applications by using the single chip, in which TCP/IP stack, 10 / 100 Ethernet MAC and PHY embedded. The shield also has two Grove connectors and a microSD card socket to support projects which require storing large amounts of data from Grove sensor. The RJ45 port (where the Ethernet cable is connected to) is low enough to allow you to stack more shields on top of this one if needed.

Get One Now 🛒

[https://www.seeedstudio.com/W5500-Ethernet-Shield-p-2433.html]

Features

- Supports Hardwired TCP/IP Protocols : TCP, UDP, ICMP, IPv4, ARP, IGMP, PPPoE

- Supports 8 independent sockets simultaneously

- Supports Power down mode

- Supports Wake on LAN over UDP

- Supports High Speed Serial Peripheral Interface(SPI MODE 0, 3)

- Internal 32Kbytes Memory for TX/RX Buffers

- 10BaseT/100BaseTX Ethernet PHY embedded

- Supports Auto Negotiation (Full and half duplex, 10 and 100* based)

- Not supports IP Fragmentation

- 3.3V operation with 5V I/O signal tolerance

- LED outputs (Full/Half duplex, Link, Speed, Active)

- Micro-SD card socket

- Grove connectors for I2C and UART

Compatibility

We have produced a lot of extension boards that can make your platform board more powerful, however not every extension board is compatible with all the platform boards, here we use a table to illustrate the compatibilities between extension boards and platform boards.
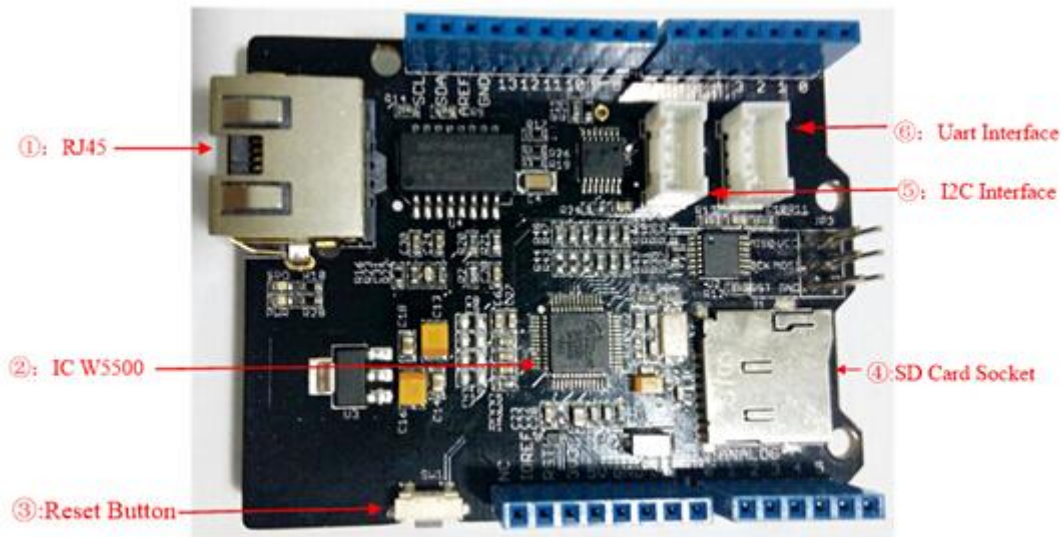
> ✏️ **Note**

> Please note that "Not recommended" means that it might have chance to work with the platform board however requires extra work such as jump wires or rewriting the code. If you are interested in digging more, welcome to contact with techsupport@seeed.cc [mailto:techsupport@seeed.cc].

Click to see full picture

	Arduino Uno Seeeduino v4.2	Arduino Mega Seeeduino Mega	Zero(m0) LoraWan	Arduino Leonardo Seeeduino Lite	Arduino 101	Arduino Due 3.3v	Intel Edison 5v	Linkit One
2.8'' TFT Touch Shield V2.0	bmp nonsupport	bmp nonsupport	Not recommended	bmp nonsupport	Not recommended	Not recommended	Not recommended	Not recommended
Base Shield V2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Camera Shield	Only Pin234567	Hardware Serial OK	Not recommended	Not recommended	Yes	Hardware Serial OK	No	No
EL Shield	Yes	Yes	No	Yes	No	No	No	No
Energy Shield	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
GPRS Shield	Not recommended	Not recommended	Yes	Yes	Yes	Not recommended	Yes	No need
Motor Shield V2.0	Yes	Stepper motor only	No	Yes	Stepper motor only	Stepper motor only	No	No
Music Shield V2.0	Yes	Yes	Not recommended	Yes	Yes	Yes	Yes	Yes
NFC Shield V2.0	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Protoshield Kit for Arduino	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RS232 Shield	Yes	Yes	No	Yes	No	No	No	No
Relay Shield V3.0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SD Card Shield V4.0	Yes	Yes	Not recommended	Yes	Yes	Yes	No	No
Seeed BLE Shield V1	Yes	Not recommended	Not recommended	Yes	No need	Not recommended	Not recommended	No need
W5500 Ethernet Shield	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wifi Shield(Fi250) V1.1	Not recommended	Not recommended	Not recommended	Yes	Yes	Not recommended	No need	No need
Wifi Shield V2	Yes	Not recommended	Not recommended	Yes	Yes	Not recommended	No need	No need
XBee Shield V2	Yes	Not recommended	Not recommended	Yes	Yes	Not recommended	Not recommended	Not recommended

[https://raw.githubusercontent.com/SeeedDocument/Seeed-WiKi/master/docs/images/Shield%20Compatibility.png]

Hardware Overview

Hardware Configuration

1. RJ45: Ethernet Port;

2. IC W5500: a hardwired TCP/IP Ethernet Controller;

3. Reset Button: Reset Ethernet shield ;

4. SD Card Socket: support Micro SD card in FAT16 or FAT32; maximum storage is 2GB.

5. I2C Interface

6. UART Interface

Pins usage on Arduino

1. D4： SD card chip Selection

2. D10： W5200 Chip Selection

3. D11： SPI MOSI

4. D12： SPI MISO

5. D13： SPI SCK

> ✏️ **Note**
> Both W5500 and SD card communicate with Arduino via SPI bus. Pin 10 and pin 4 are chip Selection pins for W5500 and SD slot. They cannot be used as general I/O.

Usage

We will show you an example.This example can upload data to webpage and store your sensor data to SD Card.

Hardware

Part List:

Name	Function	Qty
W5500 Ethernet Shield [https://www.seeedstudio.com/W5500-Ethernet-Shield-p-2433.html]	Provide Ethernet connectivity	1
Seeeduino V4.2 [http://www.seeedstudio.com/item_detail.html?p_id=2517]	Controller	1
Grove-Temp&Humi Sensor [https://www.seeedstudio.com/Grove-Temp%26Humi-Sensor-p-745.html]	Sensor	1
Base Shield V2 [https://www.seeedstudio.com/Base-Shield-V2-p-1378.html]	Base Shield	1
Micro SD Card	Store data	1

Procedure:

1. Mount W5500 Ethernet Shield v1.0 on your Arduino, mount Base Shield V2 on Ethernet Shield, and connect Grove-Temp&Humi sensor to Base Shield D5 Grove port, attach the SD card.

2. Connect the Ethernet shield to network with a standard Ethernet cable;

3. Connect Arduino to PC via USB cable;
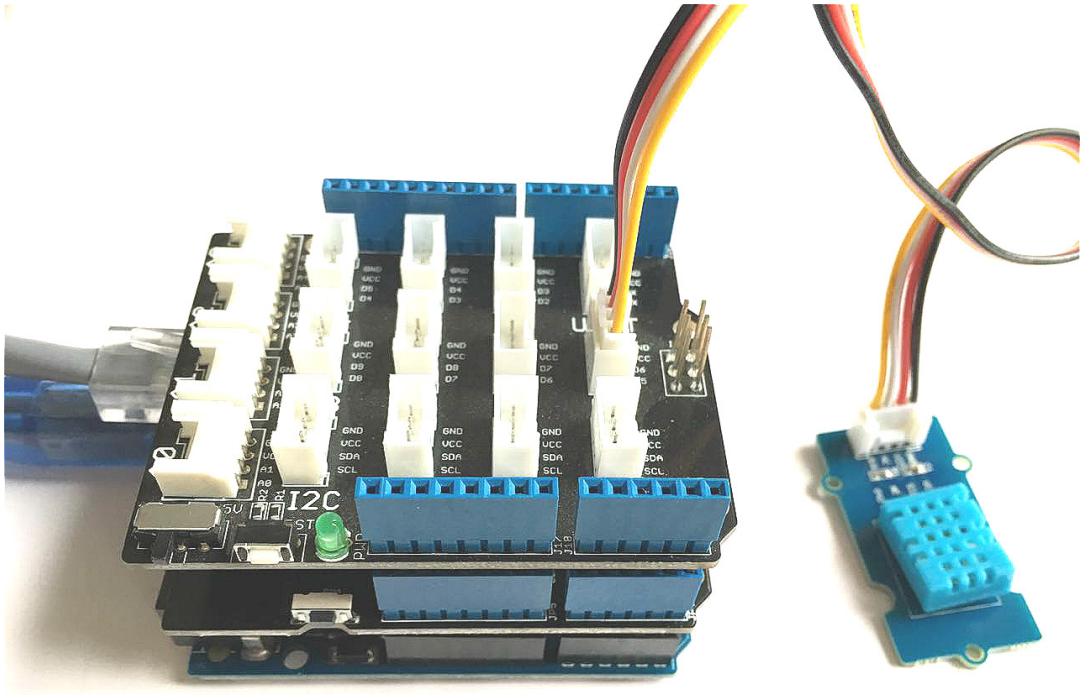
Software

- Please follow how to install an arduino library
  [http://wiki.seeed.cc/How_to_install_Arduino_Library/] procedures to install
  library.

- Click on below button to download W5500 Ethernet Shield libraries.

  [https://github.com/SeeedDocument/W5500_Ethernet_Shield_v1.0/raw/ma
  ster/res/WIZ_Ethernet_Library-IDE1.6.x-master.zip]

- Install the library to your Arduino IDE when it is downloaded.

- Copy below code into sketch and then upload:

```
1   //This sketch uses W5500 Ethernet Shield,Seeeduino V4.2,Grove
2   //Base Shield V2 Sensor and Micro SD Card to design a tempera
3   //attach the temperature and humidity sensor to base shield D
4   //It publishes the temperature and humidity data to webpage
5   //and refresh every 5 seconds, store the data into SD card da
```

```
6
7    #include <SD.h>
8    #include <SPI.h>
9    #include <Ethernet.h>
10   #include <dht11.h>
11   dht11 DHT;
12   #define DHT11_PIN 5
13   const int chipSelect = 4;
14
15   // Please update IP address according to your local network
16   #if defined(WIZ550io_WITH_MACADDRESS) // Use assigned MAC add
17   ;
18   #else
19   byte mac[] = {0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED};
20   #endif
21   IPAddress ip(192,168,0,177);
22
23   // Initialize the Ethernet server library
24   // with the IP address and port you want to use
25   // (port 80 is default for HTTP):
26   EthernetServer server(80);
27
28   void setup() {
29    // Open serial communications and wait for port to open:
30     Serial.begin(9600);
31      while (!Serial) {
32       ; // wait for serial port to connect. Needed for Leonardo
33     }
34
35     // start the Ethernet connection and the server:
36   #if defined(WIZ550io_WITH_MACADDRESS)
37     Ethernet.begin(ip);
38   #else
39     Ethernet.begin(mac, ip);
40   #endif
41     server.begin();
42     Serial.print("server is at ");
43     Serial.println(Ethernet.localIP());
44
45     //initializing the SD card
46     Serial.print("Initializing SD card...");
47
48     // see if the card is present and can be initialized:
49     if (!SD.begin(chipSelect)) {
50       Serial.println("Card failed, or not present");
51       // don't do anything more:
52       return;
53     }
54     Serial.println("card initialized.");
```

```
55    }
56
57
58    void loop() {
59      // listen for incoming clients
60      EthernetClient client = server.available();
61      if (client) {
62        Serial.println("new client");
63        // an http request ends with a blank line
64        boolean currentLineIsBlank = true;
65        while (client.connected()) {
66          if (client.available()) {
67            char c = client.read();
68            Serial.write(c);
69            // if you've gotten to the end of the line (received
70            // character) and the line is blank, the http request
71            // so you can send a reply
72            if (c == '\n' && currentLineIsBlank) {
73              // send a standard http response header
74              client.println("HTTP/1.1 200 OK");
75              client.println("Content-Type: text/html");
76              client.println("Connection: close");  // the connec
77          client.println("Refresh: 5");  // refresh the page auto
78              client.println();
79              client.println("<!DOCTYPE HTML>");
80              client.println("<html>");
81
82              // output the value of input pin on web
83              int chk;
84              chk = DHT.read(DHT11_PIN);    // READ DATA
85              client.print("Humidity: ");
86              client.print(DHT.humidity);
87              client.println("<br />");
88              client.print("Temperature: ");
89              client.print(DHT.temperature);
90
91              //write value of input pin into SD card
92              // make a string for assembling the data to log:
93              String dataString = "";
94              // read the humidity and temperature and append to
95              dataString = String(DHT.humidity) + String(DHT.temp
96              // open the file. note that only one file can be op
97              // so you have to close this one before opening ano
98              File dataFile = SD.open("datalog.txt", FILE_WRITE);
99              // if the file is available, write to it:
100             if (dataFile) {
101             dataFile.println(dataString);
102             dataFile.close();
103               // print to the serial port too:
```

```
104              Serial.println(dataString);
105              }
106              // if the file isn't open, pop up an error:
107              else {
108              Serial.println("error opening datalog.txt");
109              }
110              break;
111            }
112          if (c == '\n') {
113            // you're starting a new line
114            currentLineIsBlank = true;
115          }
116          else if (c != '\r') {
117            // you've gotten a character on the current line
118            currentLineIsBlank = false;
119          }
120        }
121      }
122      // give the web browser time to receive the data
123      delay(1);
124      // close the connection:
125      client.stop();
126      Serial.println("client disconnected");
127    }
128  }
```

Results

Now, we will show result.

1. Put your SD card into the computer,you will see some temperature and humidity information.

2. What's more, we can see information from web.
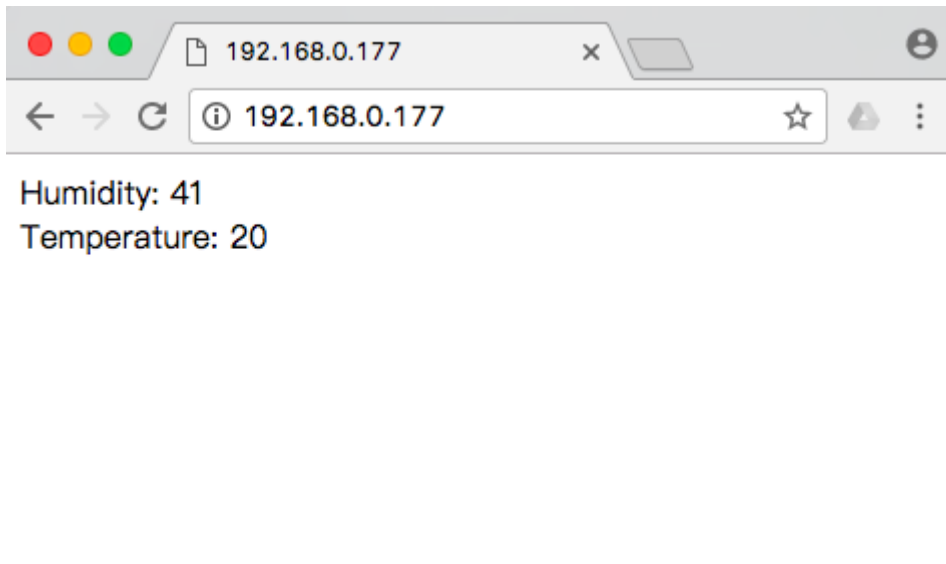
Isn't it very easy? You can begin your project.

Resources

- **W5500 Ethernet Shield in Eagle format**
  [https://raw.githubusercontent.com/SeeedDocument/W5500_Ethernet_Shield_v1.0/master/res/W5500_Ethernet_Shield_v1.0.zip]

- **W5500 Ethernet Shield Schematic in PDF format**
  [https://raw.githubusercontent.com/SeeedDocument/W5500_Ethernet_Shield_v1.0/master/res/W5500_Ethernet_Shield_v1.0.pdf]

- **W5500 Ethernet Shield PCB in PDF format**
  [https://github.com/SeeedDocument/W5500_Ethernet_Shield_v1.0/raw/master/res/W5500%20Ethernet%20Shield%20v1.0%20PCB.pdf]

- **W5500 Ethernet Shield Library**
  [https://github.com/embeddist/WIZ_Ethernet_Library-IDE1.6.x]

- **W5500 Ethernet Shield Datasheet.pdf**
  [https://raw.githubusercontent.com/SeeedDocument/W5500_Ethernet_Shield_v1.0/master/res/W5500_datasheet_v1.0.2.pdf]

Tech Support

Please submit any technical issue into our forum
[http://forum.seeedstudio.com/].