# W5100S Ethernet Shield User Guide

How to use the WIZnet Ethernet Library

https://github.com/Wiznet/Ethernet.git

Version 0.0.2





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### 1. Overview

Arduino Ethernet Shield의 사용자를 위해 Arduino<sup>1</sup>는 배포하는 IDE에 Ethernet Library<sup>2</sup>를 포함하고 있다. 현재 배포되는 Arduino IDE는 ARDUINO 1.8.7<sup>3</sup>이며 포함된 Ethernet Library 는 V2.0.0이다.

Ethernet Library V2.0.0은 기존 Arduino Ethernet Shield, Arduino Ethernet Shield 2를 함께 지원하며, 이를 위해 W5100/W5200/W5500을 모두 지원할 수 있도록 하였다. Arduino Ethernet Shield 2를 위한 Arduino Ethernet Library 2는 기존과 같이 W5500만을 지원하는 형태로 남았지만 Ethernet Library V2.0.0으로 사용 가능하다.

Ethernet Library V2.0.0은 Github<sup>4</sup>에서 개발되고 Release되며, W5100S를 지원할 수 있도록 WIZnet Github<sup>5</sup>에서 추가 개발하여 현재 Pull Request를 통한 Release를 준비 중 이다.

이 문서는 W5100S를 지원하는 Ethernet Library가 Arduino IDE에 포함되기 전, W5100S Ethernet Shield를 사용하는 사용자를 위해 WIZnet Github에서 Ethernet Library를 다운 받아 설치한 Arduino IDE에 적용하는 방법을 기술한다.

<sup>&</sup>lt;sup>1</sup> <u>https://www.arduino.cc/</u>

<sup>&</sup>lt;sup>2</sup> <u>https://www.arduino.cc/en/Reference/Ethernet</u>

<sup>&</sup>lt;sup>3</sup> <u>https://www.arduino.cc/en/Main/Software</u>

<sup>&</sup>lt;sup>4</sup> <u>https://github.com/arduino-libraries/Ethernet</u>

<sup>&</sup>lt;sup>5</sup> <u>https://github.com/Wiznet/Ethernet</u>

# 2. Download

WIZnet Github에는 Arduino Ethernet Library V2.0.0에서 Fork하여 W5100S를 지원할 수 있 도록 개발한 Library가 있다. 아래와 같이 Download한다.

#### 2.1 WIZnet Github

Internet Browser로 아래 주소에 접속한다. TortoiseGit과 Client를 통해 Download하여도 관계 없다.

#### 주소 : <u>https://github.com/Wiznet/Ethernet</u>

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Firgure 2-1 WIZnet Github



#### 2.2 Clone or download

Clone or download를 선택 한다.

🖒 🏠 🔒 GitHub, Inc.	[US] https://github.com/Wiznet/Ethernet		□☆☆
Features Business	Explore Marketplace Pricing	Search	Sign in or Sign u
Wiznet / Ethernet forked from arduino-libraries/Etherne	e i	🕲 Watch	23 🛊 Star 1 💱 Fork 35
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Firgure 2-2 Clone or download

#### 2.2 Download ZIP

Download ZIP을 선택하여 ZIP으로 압축된 Source Code를 저장한다.

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Firgure 2-3 Download ZIP



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Firgure 2-4 Save



Firgure 2-5 Downloading



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•4 Homegroup					
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1					
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Firgure 2-6 Download Complete



# 3. Location

Download한 Ethernet Library Source는 압축을 풀어 사용자의 Arduino Library directory에 복사한다.

경로는 일반적인 경우 다음과 같다.

"C:\Users\YOURID\Documents\Arduino\libraries"

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> 🝊 OneDrive			
> 💻 This PC			
> 🥩 Network			
• <b>4</b> Homegroup			
1 item			

Firgure 3-1 Default user Libraries

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> 🝊 OneDrive	readme.txt	11/16/2018 5:33 PM TXT File	1 KB		
> 💻 This PC					
> 🥩 Network					
> 🔩 Homegroup					
2 items 1 item selected					

Firgure 3-2 Copy to default user Libraries



# 4. Example

복사한 Ethernet Library는 Arduino IDE에서 Example을 실행하여 정상 동작을 확인할 수 있다. 아래는 Ethernet Library의 Example 중 ChatServer를 Arduino UNO Board에 W5100S Ethernet Shield로 실행한 예이다. 다른 Example은 Arduino Site<sup>6</sup>(RESOURCES > TUTORIAL > EXAMPLE FROM LIBRARYIES > Ethernet Library)를 참조하라.

#### 4.1 ChatServer

Arduino IDE를 실행하여 File -> Examples -> Ethernet -> ChatServer를 선택 한다.



Firgure 4-1 Arduino IDE

<sup>&</sup>lt;sup>6</sup> <u>https://www.arduino.cc/en/Tutorial/LibraryExamples</u>





Firgure 4-2 Ethernet ChatServer



4.2 Set Network

Chatserver Example을 실행하기 위해 사용자의 환경에 맞춰 W5100S Ethernet Shield의 Network(IP, DNS, GATEWAY, SUBNET, PORT)를 설정한다.



Firgure 4-3 ChatServer



Firgure 4-4 Set Network



#### 4.3 Uploading

Network를 설정하고 Arduino Board에 Uploading한다. 사용자는 Uploading하기에 앞서 반 드시 Board가 Arduino IDE에서 사용 가능한 상태인지 확인한다.

3 ChatServer   Arduino 1.8.7	_	×
File Edit Sketch Tools Help		
		ø
ChatServer		
1 /*		
2 Chat Server		
3		
4 A simple server that distributes any incoming messages to all		
5 connected clients. To use, teinet to your device s ir address and type.		
<ul> <li>tou can see the client's input in the serial monitor as well.</li> <li>Uning an Anduing Winnet Ethernet shield.</li> </ul>		
o osnaj di Aldunio Viziel clienel sinero.		
9 Circuit:		
10 + Ethernet shield attached to pins 10, 11, 12, 13		
11		
12 created 18 Dec 2009		
13 by David A. Mellis		
14 modified 9 Apr 2012		
15 by Tom Igoe		
16		
17 */		
18		
19 #include <spi.h></spi.h>		
20 Einstude - Ethernet Is		_
Uploading		
our period - ovordo		1
such de: AMD device initialized and ready to accent instructions		
avrouue, Avn devrice finitianized and ready to accept instructions		
Reading   ###################################		
avrdude: Device signature = 0x1e950f (probably m328p)		
Ariting   ###################################		
<		>

Firgure 4-5 Uploading



Firgure 4-6 Done Uploading



4.4 Run

Example ChatServer는 Arduino Board가 EthernetShield를 사용하여 TCP Client에서 수신한 String을 Serial Monitor에 출력하고, TCP Client에 전송한다. Serial Monitor를 통해 TCP Client 접속과 수신한 String를 확인할 수 있다.

사용자는 TCP Client를 실행하여 설정한 Network 정보로 Arduino Board의 EthernetShield 에 접속하고, String을 전송한다. 아래는 Hercules를 실행하여 TCP Client로 접속하고, String 'Hi'를 전송한 예이다.

'Figure 4-4 Set Network'에 따라 TCP Client가 접속할 Sever IP는 192.168.0.3이며, Port는 23 이다.



Firgure 4-7 Run Serial Monitor



COM9	- 0	>
	S	Send
erial Initialize Complete		
hat server address:192.168.0.3		

Firgure 4-8 Serial Monitor

<b>A</b>			-	
Hercules SETUP utility by HW-group.com		_		×
UDP Setup Serial TCP Client TCP Server UDP Test Mode About				
Received/Sent data	TCP			
Connecting to 192.168.0.3	Modula IP		Part	
Connected to 192.168.0.3	192 169 0	2	23	_
HiHello, client!	1.02.100.0		100	
n1	Ping		🗙 Discon	nect
	TEA autho	rization		
	TEA key			_
	1: 0102	0304 3	3: [090A0B0	C
	2: 0506	0708 4	1: 0D0E0F1	0
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Г НЕ	X Send	- 1	Version 3.	2.8

Firgure 4-9 TCP Client mode Hercules





Firgure 4-10 String from Client