

# How to implement HTTP server using W7100A

version 1.1



© 2011 WIZnet Co., Inc. All Rights Reserved.

For more information, visit our website at <http://www.wiznet.co.kr>

## Table of Contents

1	Instruction.....	3
2	HTTP Server.....	3
3	HTTP Server implementation.....	4
3.1	Network settings .....	4
3.2	Default homepage setting .....	5
3.3	Making Romfile .....	5
3.4	Program binary making.....	6
3.5	Combine Bin and Rom files .....	7
4	HTTP Server Demonstration .....	7

# 1 Instruction

This document will explain on how to implement HTTP server by using iMCU7100EVB. The document will also explain about codes and show a simple demo test. All example codes are based on W7100, Keil compiler.

**Note:** This document is based on W7100A 100pin package but W7100A 64pin package has limited number of GPIO pins than 100pin package. So the LED and LCD control example by using GPIO may cannot work properly.

## 2 HTTP Server

HTTP is an abbreviation of Hyper Text Transfer Protocol. Please refer to the following link for more details about this protocol. ([http://en.wikipedia.org/wiki/Hypertext\\_Transfer\\_Protocol](http://en.wikipedia.org/wiki/Hypertext_Transfer_Protocol)) HTTP server can be easily implemented if H/W stack of W7100 is used. Fig. 1 below shows the communication between the HTTP server and client.

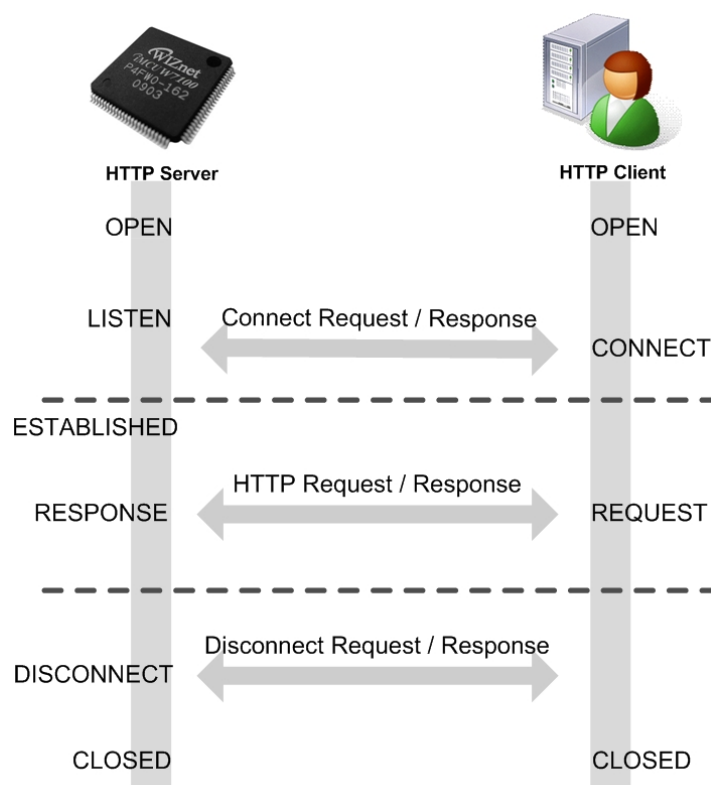


Fig. 1 HTTP communication

The communication process of the HTTP server can be roughly divided into three steps.

1. Connection: The process of W7100 assigning the socket to HTTP server, opening the socket and listening.
2. Communication: The connection established. And the W7100 sending HTTP response after the HTTP request is received from the client.

3. Closing: The process of finishing connection after all HTTP request/response is done.

## 3 HTTP Server implementation

### 3.1 Network settings

Network setting and MAC address from the W7100 HTTP server code is saved in W7100's 258byte User data memory. If user wants to change the Network setting or MAC address; run the WizISP program, set "Flash Operation Mode" as "Data," and then click the Erase button to erase User data memory. By doing this, the MAC address and the network settings are changed to the default settings in the default\_network() function of W7100's task\_config.c. The initialized MAC address and network setting will be written in the User data memory again.

Another way to change the network setting is to connect to the HTTP server webpage of W7100 and use the network configuration page.

```
void default_network(void)
{
    NetworkParam.mac[0] = 0x00;           // MAC address setting
    NetworkParam.mac[1] = 0x08;
    NetworkParam.mac[2] = 0xDC;
    NetworkParam.mac[3] = 0x11;
    NetworkParam.mac[4] = 0x99;
    NetworkParam.mac[5] = 0x77;
    NetworkParam.ip[0] = 0xC0;           // IP address setting
    NetworkParam.ip[1] = 0xA8;
    NetworkParam.ip[2] = 0x00;
    NetworkParam.ip[3] = 0x5C;
    NetworkParam.subnet[0] = 0xFF;       // subnet mask setting
    NetworkParam.subnet[1] = 0xFF;
    NetworkParam.subnet[2] = 0xFF;
    NetworkParam.subnet[3] = 0x00;
    NetworkParam.gw[0] = 0xC0;          // gateway address setting
    NetworkParam.gw[1] = 0xA8;
    NetworkParam.gw[2] = 0x00;
    NetworkParam.gw[3] = 0x5E;
    NetworkParam.dhcp = 0x01;           // DHCP setting 0: disable, 1: enable
    ...
}
```

### 3.2 Default homepage setting

W7100 HTTP server code basically connects to the 'index.html' when HTTP client is connected as W7100's IP address (ex: <http://192.168.1.2>). If user wants to change the basic page to a different one, change the below code from the main.c file.

```
char homepage_default[ROM_FNAMELEN] = "index.html";
```

### 3.3 Making Romfile

Example web pages must be combined together as one Romfile, and be written in the W7100's flash memory with the HTTP server implementation code. The provided program, ROMFILEMaker.exe, is for combining example web pages into one Romfile. This program can be downloaded from WIZnet's homepage -> download center (<http://www.wiznet.co.kr/en/>). The picture shown below is a captured screen of ROMFILEMaker.exe running.

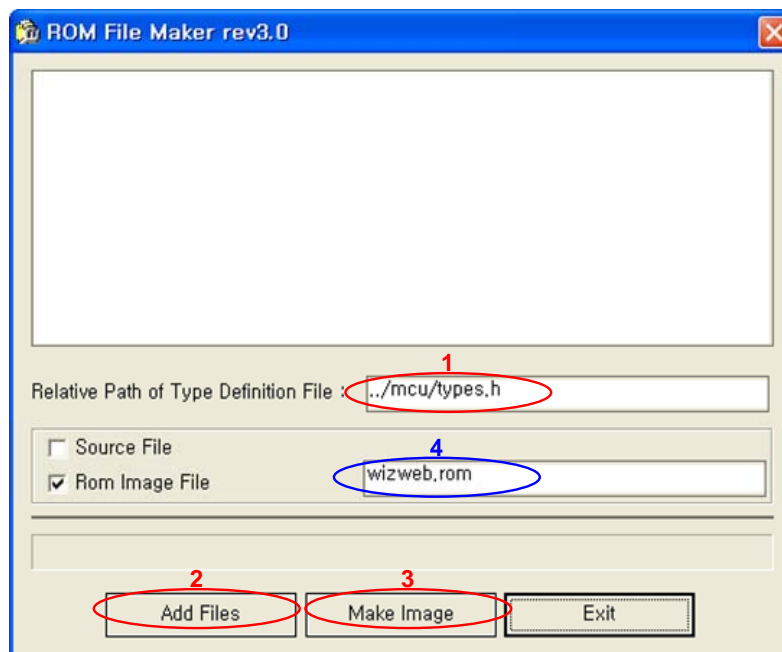


Fig. 2 ROMFILEMaker program

Assign the relative path of types.h file from the W7100 code in area #1. Click the Add Files button, highlighted #2, to add web pages that should be combined. If too many web pages are all added at the same time, an error will occur; therefore, if user plans to combine numerous web pages, repeat the adding step couple of times. Currently, the web pages exist in the same folder. If user clicks the Make Image button, highlighted #3, the combined files are created as the file name in area #4. Do not change the Rom Image file name, highlighted #4, since a change in that will cause the user to change the batch file command, that is used for combining the program binary and a web page.

### 3.4 Program binary making

Use the Keil uVision3 program to build the Keil project files that is attached in the HTTP server application note. If successful, the message like shown below will appear in the Output Window.

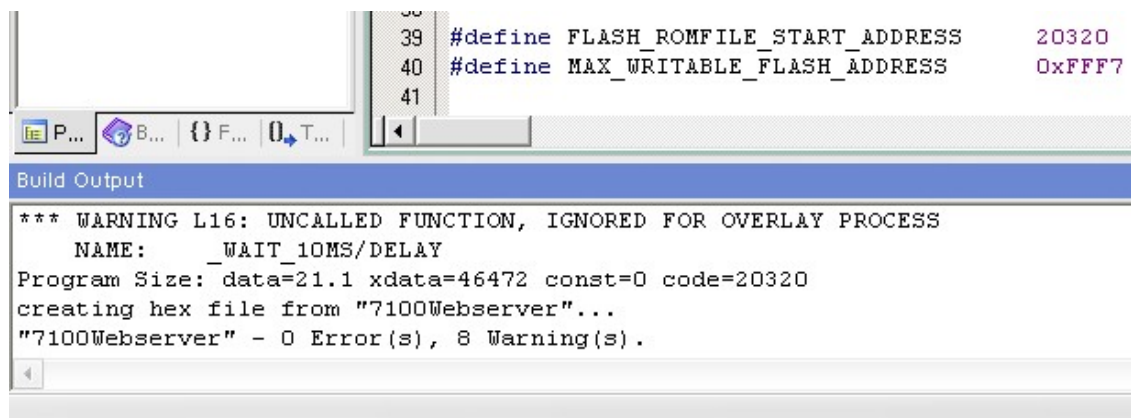


Fig. 3 Successful compile messages

"code=28800" from the message above means the binary size of the output file. This value must be set as the start address of webpage's binary, since the user will add the webpage binary. This setting exists in the Keil project file, romfile.h. Since the decimal number 28800 is 0x7080 in hex character, set as shown below.

```
#define FLASH_ROMFILE_START_ADDRESS 20320
```

If the source code is modified, the size of the output file is modified too, therefore, the size of this definition "FLASH\_ROMFILE\_START\_ADDRESS" must be modified every time after the compilation. After this definition is changed, compile again and create a 7100Webserver.hex file. Change this file to binary file. Use the WiziSP program to change the Hex file into binary file. This step is shown below. For more detail information about WiziSP please refer to the WiziSP userguide.

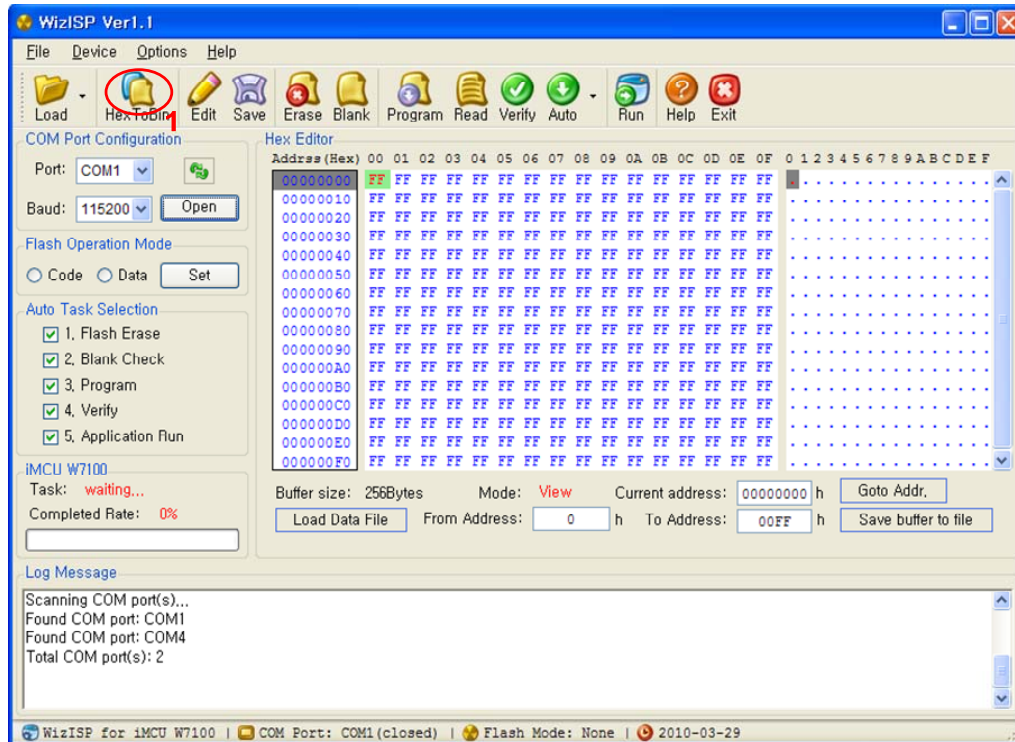


Fig. 4 WizISP program

### 3.5 Combine Bin and Rom files

In order to combine the wizweb.rom file and 7100Webserver.bin file into one, move those two files to the folder which allbin.bat file and allbin.exe file exists. Then run the allbin.bat file. Allbin.bat file and allbin.exe file are included in HTTP server application note's attachment file. Allbin.bat file is used for creating a bin file by adding wizweb.rom at the end of 7100Webserver.bin. The merged file is created in All\_XXXXXX.bin form. The current date will be shown in the part XXXXXX. Load this file in the WizISP program, and write the merged file in W7100's code area. The merged file of program and webpage will be programming in W7100.

## 4 HTTP Server Demonstration

If the bin file for HTTP server is successfully created as mentioned in section 3.5, use WizISP to write the bin file in iMCU7100 board. After writing the bin file in iMCU board, change the bootsel pin of the iMCU7100EVB to "off" and reset the board. In this document, Hyper terminal, which is the basic serial terminal program provided by Windows XP, is used. After resetting, a Hyper terminal message will appear as shown below.

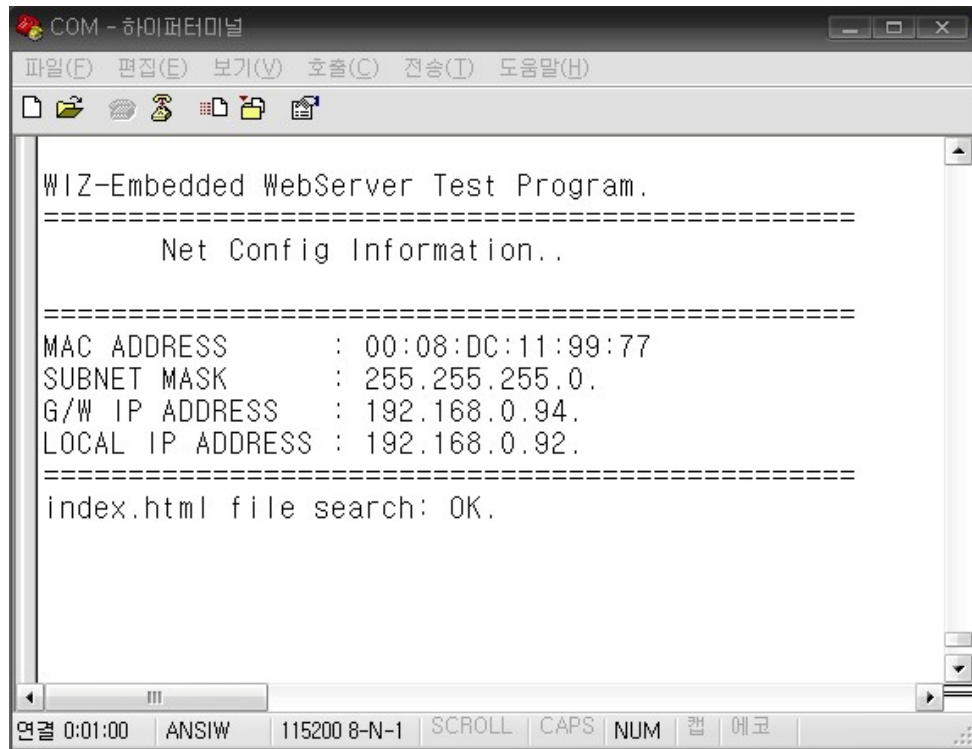


Fig. 5 Hyper terminal message

The IP address of iMCU7100EVB can be checked from the message above. Run the HTTP client program and connect with the board's IP. In this document, Internet explorer, which is the basic HTTP client program provided by Windows XP, is used. After entering the IP, the web page as shown below will appear.



Fig. 6 W7100 HTTP server main page

"Go main" menu on the left top of the W7100 HTTP server main page is for the main page. "Digital



Output" menu is for controlling the LED and LCD of iMCU7100EVB. "Net Config" menu is for modifying the network setting of iMCU7100EVB.

## Document History Information

Version	Date	Descriptions
Ver. 0.9beta	Jun, 2010	Release
Ver. 1.0	Jan, 2011	Modify code and document about flash_read() function
Ver. 1.1	Mar, 2011	Modified for W7100A QFN 64pin package

## Copyright Notice

Copyright 2011 WIZnet, Inc. All Rights Reserved.

Technical Support: [support@wiznet.co.kr](mailto:support@wiznet.co.kr)

Sales & Distribution: [sales@wiznet.co.kr](mailto:sales@wiznet.co.kr)

For more information, visit our website at <http://www.wiznet.co.kr>