

W7200 Startup Guide for IAR EWARM

Version 1.0.0



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1 Setup the Development Environment

1.1 IAR EWARM Installation

Go to the IAR SYSTEMS website (www.iar.com) and select the [downloads] menu in the SERVICE CENTER tab for IAR compiler download.

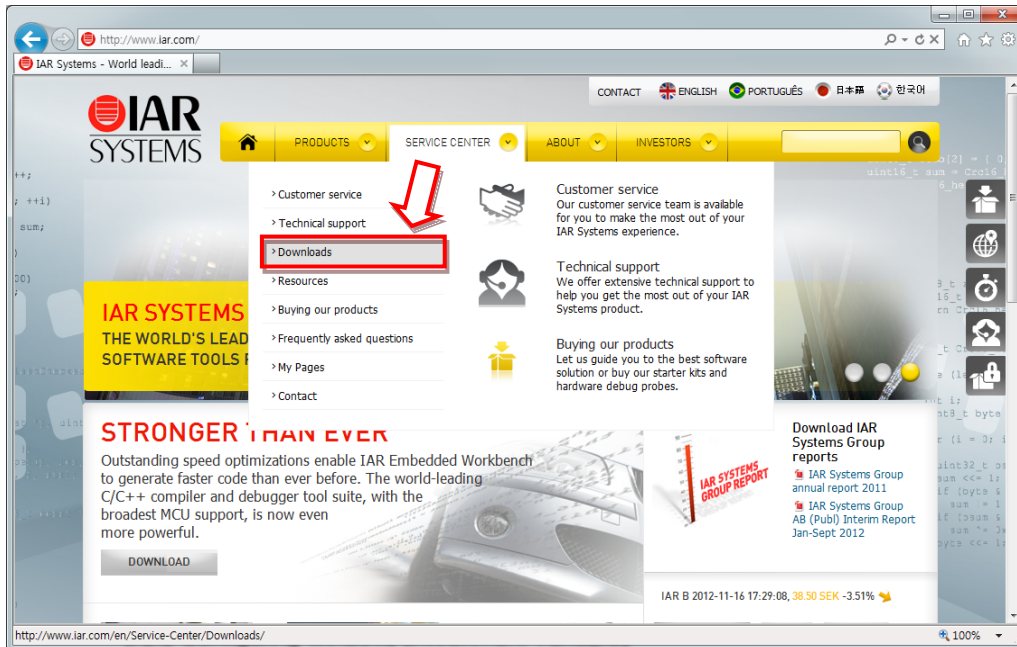


Figure 1. IAR SYSTEMS website

Select the IAR **ARM** version [Process or core] from the download page (IAR EWARM; Embedded Workbench for ARM)

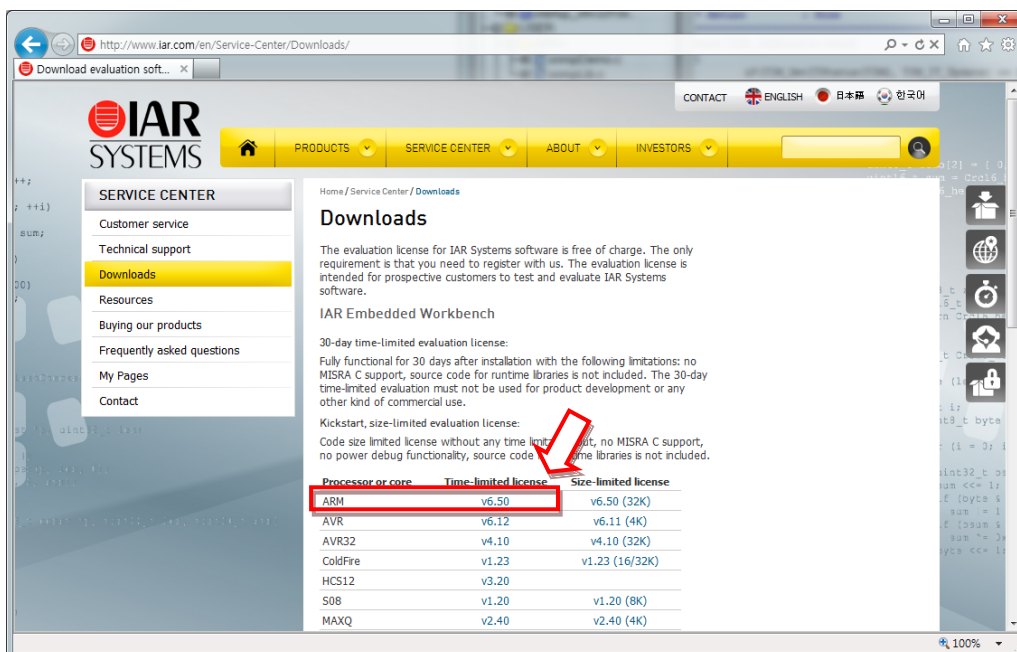


Figure 2. IAR Embedded Workbench Download list

After the IAR EWARM Download is completed, installation will start.

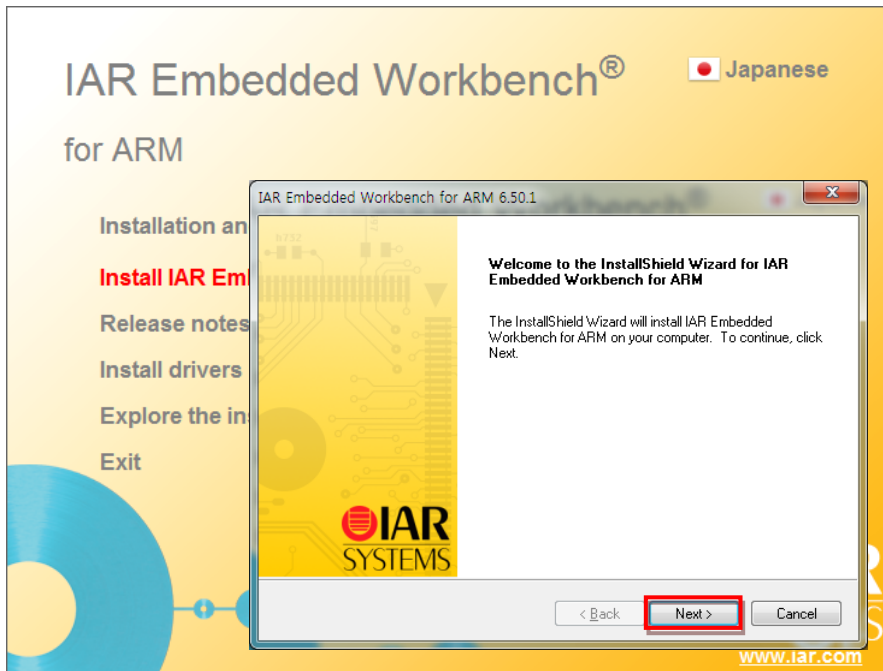


Figure 3. IAR EWARM InstallShield

Click next to run the IAR Embedded Workbench and get the evaluation license.

※ **Note:** In this document, EWARM is using [30-day time-limited evaluation license].

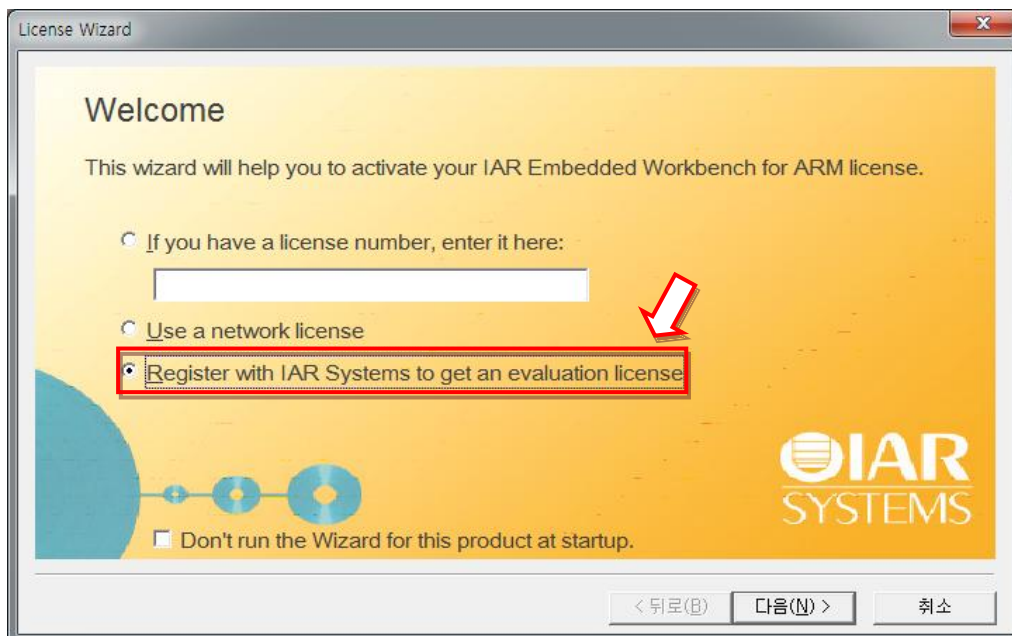


Figure 4. IAR EWARM License Wizard : Start

[Register for Evaluation] step. Click the [Register] button to get the license

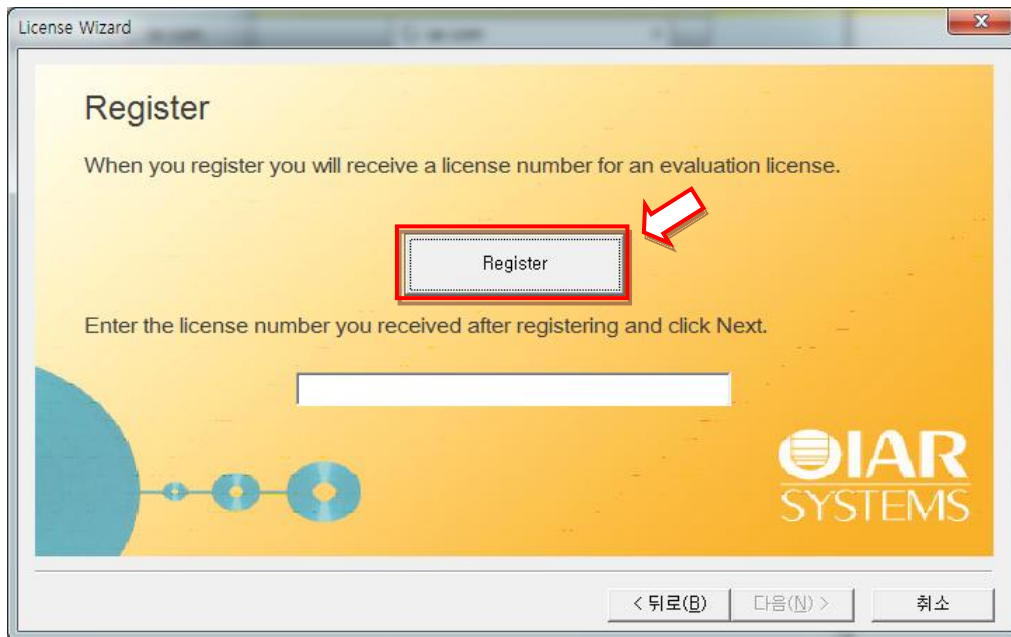


Figure 5. IAR EWARM License Wizard : Register

Select [Time limited] for license type and fill out the [Register for Evaluation form].

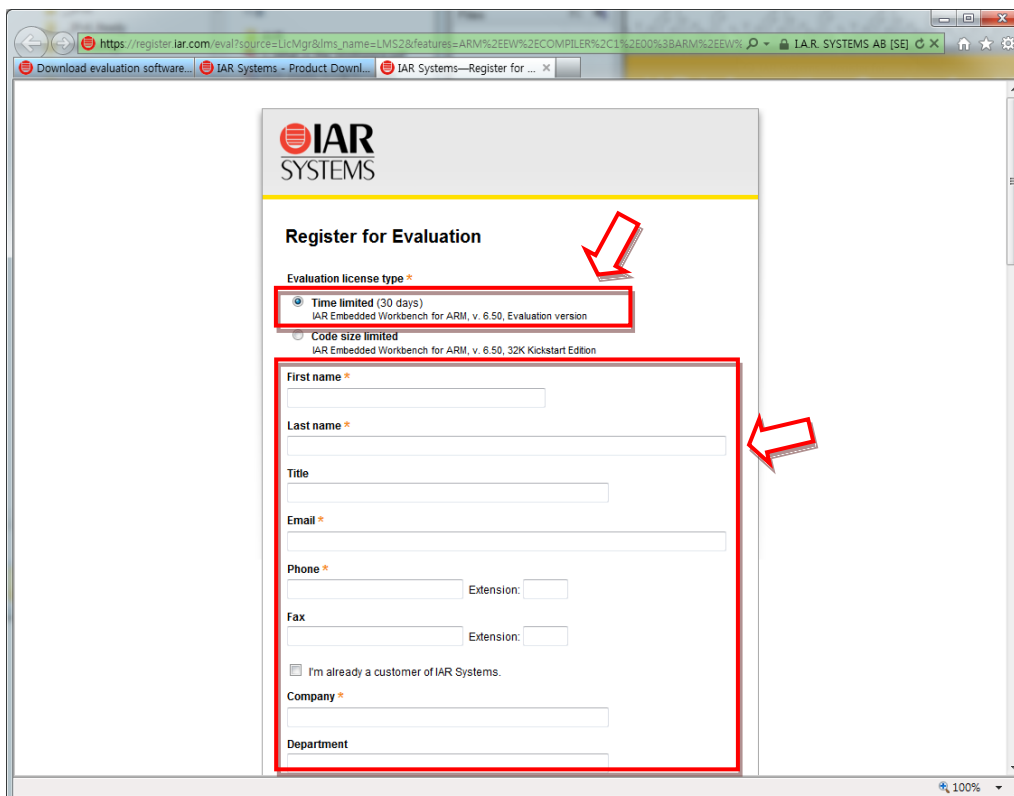


Figure 6. Register for Evaluation

After filling out the all entries in the [Register for Evaluation form], click the [Submit Registration] button. An email to confirm the registration will be sent to the email address entered by the user. Click the link in the email and you can receive the license number.

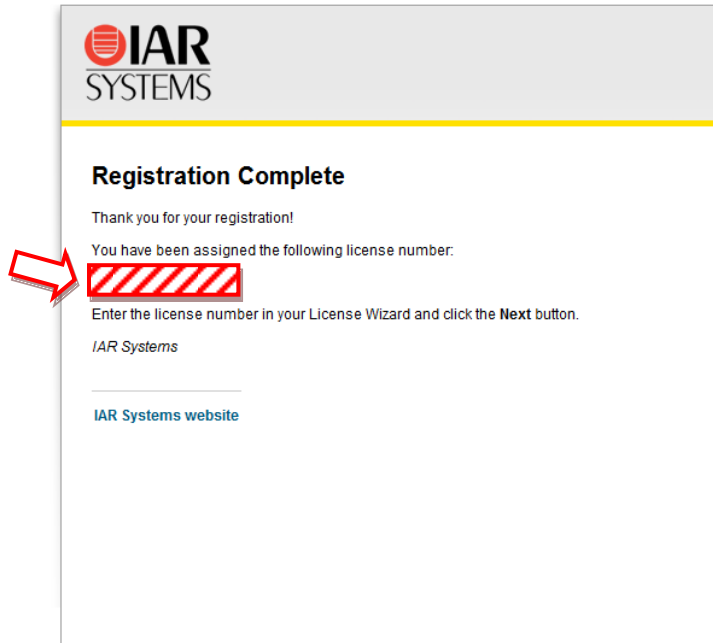


Figure 7. Get the Time-limited License Number

Enter the license number in the input box shown in Figure 5, and all license registration and activation process are complete.



Figure 8. License Activation

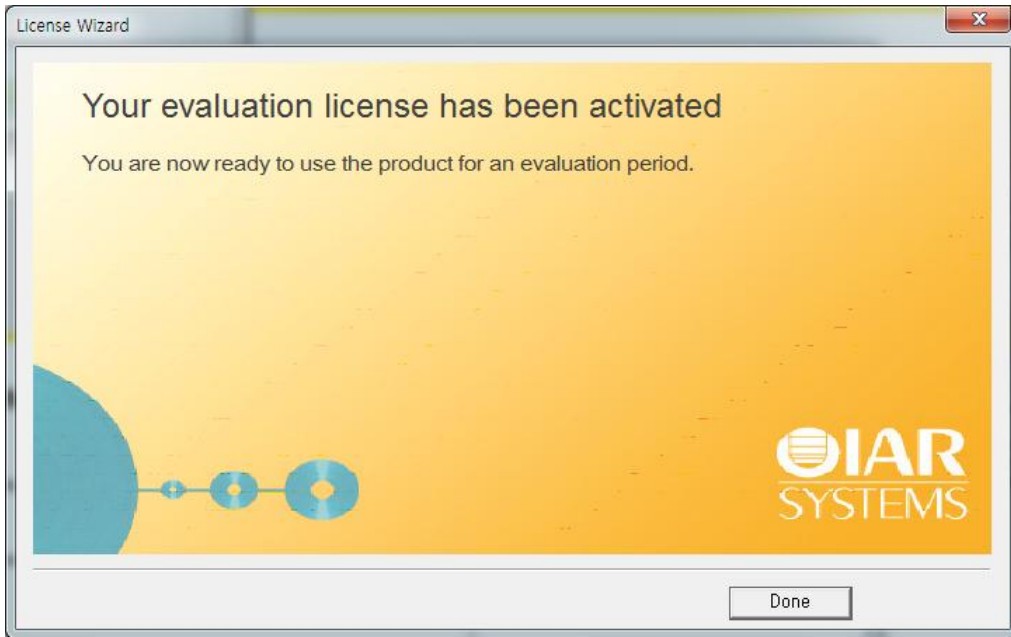


Figure 9. License Registration Complete

1.2 WIZnet W7200 Example Firmware Download

W7200 Example firmware consists the STM32F10x standard peripheral library and drivers/examples for W7200. To download, go to WIZnet's website(www.wiznet.co.kr) and select **Internet MCU** under the **PRODUCT** menu.

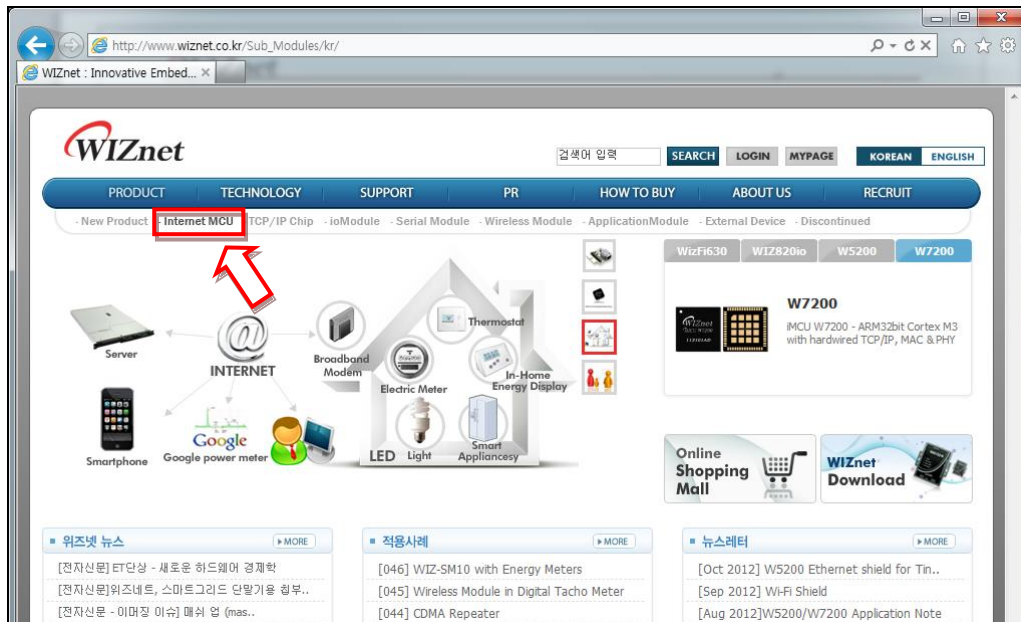


Figure 10. WIZnet website

Click the download tab for W7200 and download the **W7200 application note SMTP with DHCP**.

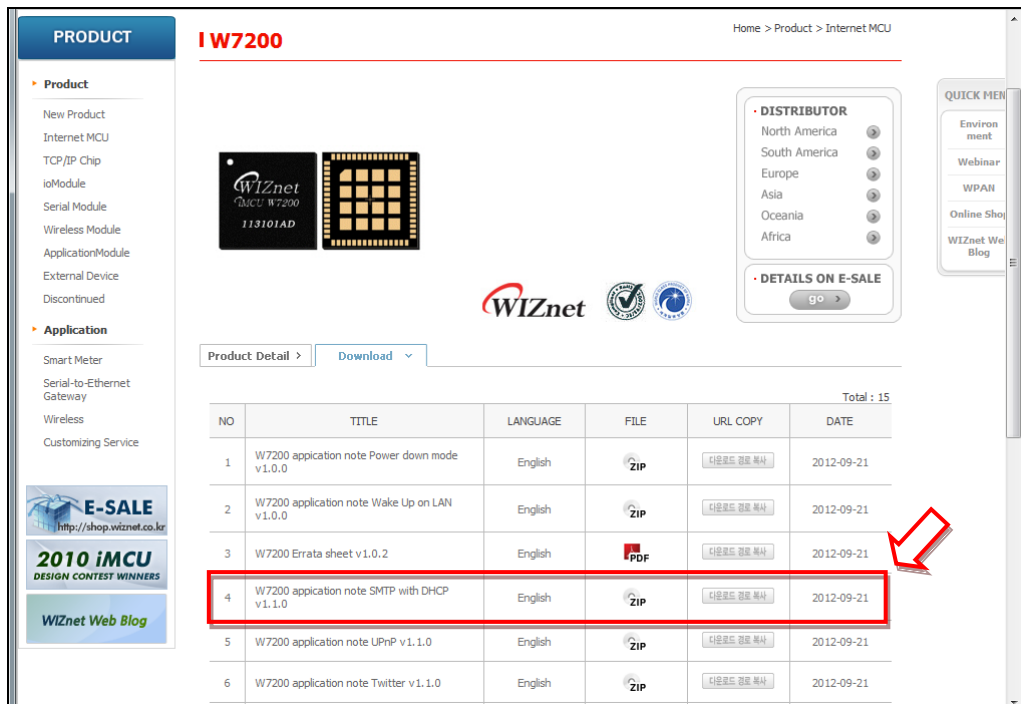
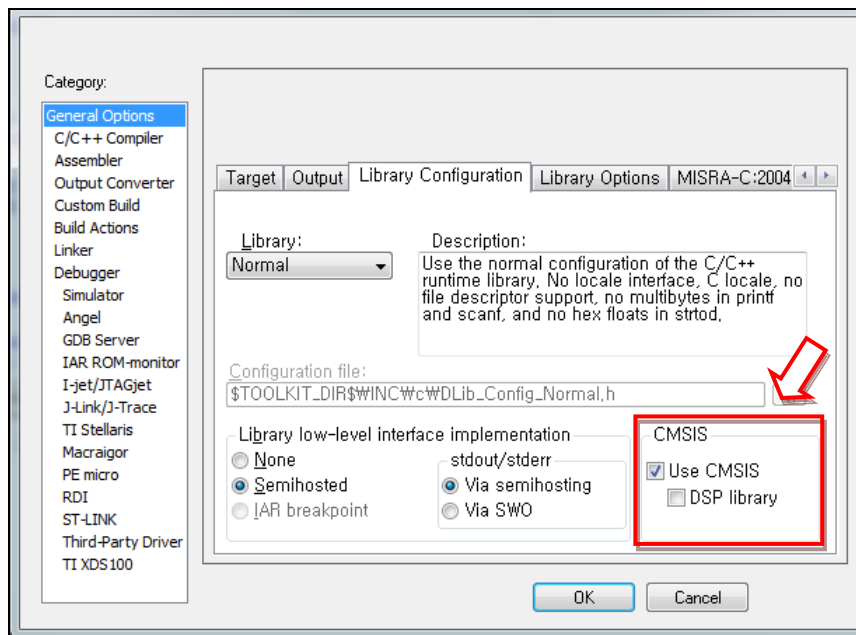


Figure 11. Download for W7200

<Note>

The W7200 Application note firmware is implemented based on IAR EWARM Version 5.4. Subsequent versions of EWARM have different CMSIS configuration settings from version 5.4, therefore, follow the next steps for correct compilation.

1. Open the provided example IAR project, and select **Options** menu in **Project** menu bar. Select **General Options** on left category and select **Library Configuration** tab and then enable the [use CMSIS] option.



2. **Delete** the `core_cm3.h` file from the CMSIS library in the example firmware.

Delete `$PROJ_DIR$\Libraries\CMSIS\CM3\CoreSupport\core_cm3.h`

3. Create a binary image by compiling the W7200 example firmware in IAR EWARM

2 Configuration and Start the Project

2.1 Network Configuration

Modify the network information of the downloaded firmware source code in order for the W7200 board to connect to Ethernet. The network information of the board is included in the main.c file of the source code, and the network information must be modified according to the user's settings.

```

/* main.c */

...

/* Configure network information of W7200 */
uint8 MAC[6] = {0x00, 0x08, 0xDC, 0x11, 0x22, 0x33}; // MAC address
uint8 IP[4] = {192, 168, 11, 4}; // IP address
uint8 GateWay[4] = {192, 168, 11, 1}; // Gateway address
uint8 SubNet[4] = {255, 255, 255, 0}; // Subnet Mask address

...

/* For TCP client */

/* Configure network information of test PC */
uint8 Dest_IP[4] = {192, 168, 11, 3}; // DST_IP address
uint16 Dest_PORT = 4000; // DST_IP port

...

```

Test MAC address and IP address have been used in this document for demonstration purpose. The IP address of the Test PC was set to 192.168.11.3; the IP address of the board and gateway must be set according to the Test PC. Users have to check or change IP address of PC: [Local Area Connection - Properties - Internet Protocol - Properties]

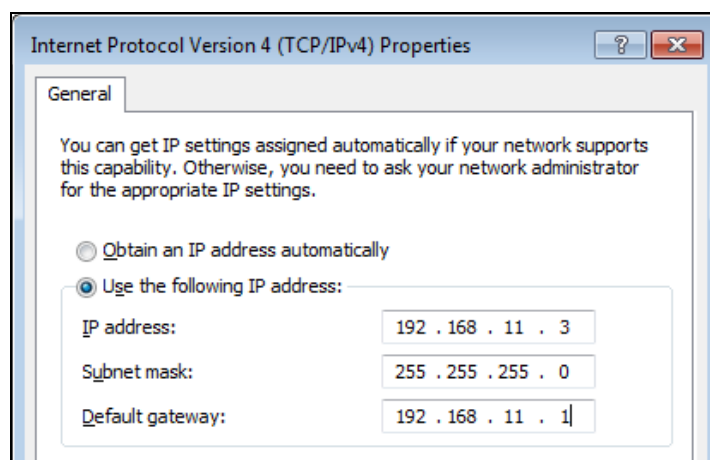


Figure 12. Internet Protocol Properties

The test MAC address is **00:08:DC:11:22:33** and the test IP address is **192.168.11.4** for the W7200 board. When setting the network, enter the identical Gateway as the Test PC's so that the PC and W7200 board can be on the sub-network to exchange data.

If the W7200 board is running in TCP client mode, the W7200 board will try to connect to the TCP server of the user's PC every 3 seconds. User must set the Dest_IP and Dest_PORT according to the test PC's network information in the firmware source code.

After setting the network, use ping test to check the communication between the W7200 board and network. Open the command window and enter [ping 192.168.11.4].

If the W7200 board is connected, the screen will appear as shown in Figure 13.



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\wiznet>ping 192.168.11.4

Pinging 192.168.11.4 with 32 bytes of data:

Reply from 192.168.11.4: bytes=32 time<1ms TTL=128
Reply from 192.168.11.4: bytes=32 time=5ms TTL=128
Reply from 192.168.11.4: bytes=32 time<1ms TTL=128
Reply from 192.168.11.4: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.11.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 1ms

C:\Documents and Settings\wiznet>
```

Figure 13. Ping Test at Command Prompt

If the ping test is successful, network settings are completed.

2.2 Firmware Image Download

Use the IAR EWARM to open the W7200 example firmware project. Click **Project - Make (F7)** to create the binary image of the firmware. The process of downloading the created binary image (.bin) file to the W7200 board is as followed.

(Download binary image to W7200 EVB through **USB mini cable.**)

1. Create binary image in IAR compiler (Make)
2. Set the Boot0 pin of W7200 to high to change into program mode and reset the board. (Select PROG for PROG S/W of W7200 EVB. Reset the board and set to program mode)
3. Run the Flash Loader Demonstrator and set serial port (Download is available at STMicroelectronics website www.st.com / [Demonstration Software for STM32 MCUs](#))
4. Select Target device (STM32_Med-density_128K)
5. Select 'Download to device' and set the image file path
(Image file path : [\Work\App\Debug\Exe] / located in project directory)
6. Once download is completed, set the Boot0 pin to low and reset the board.
(Change the PROG S/W to RUN and reset the W7200 EVB)

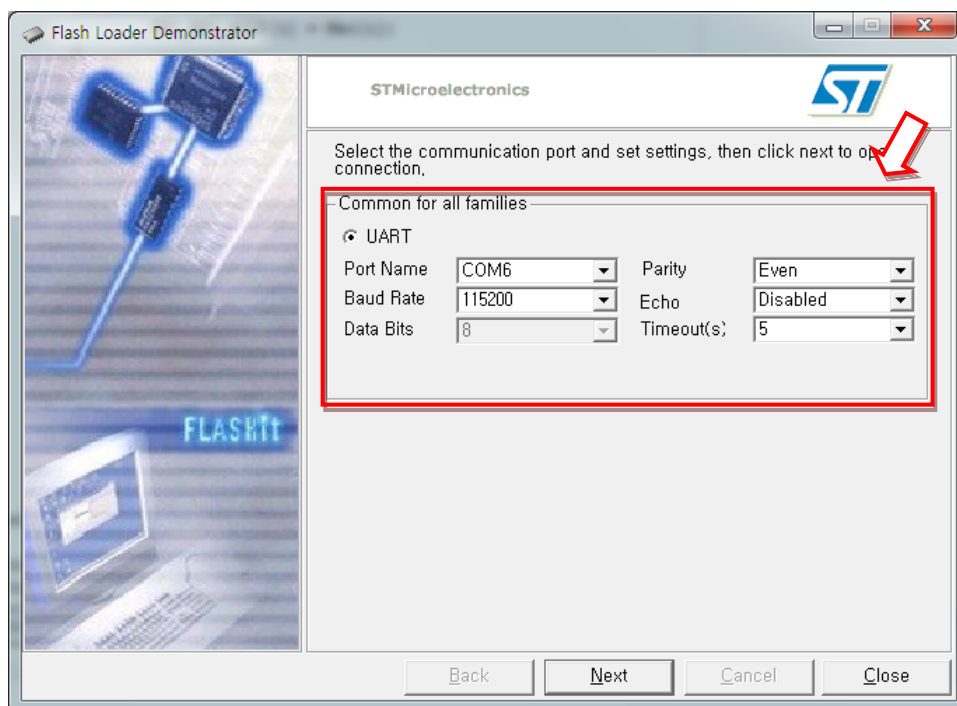


Figure 14. Serial Configuration of Flash Loader Demonstrator

Select the COM port that is connected with the W7200 board for Port Name.

The settings must be done according to user's PC's serial communication settings.

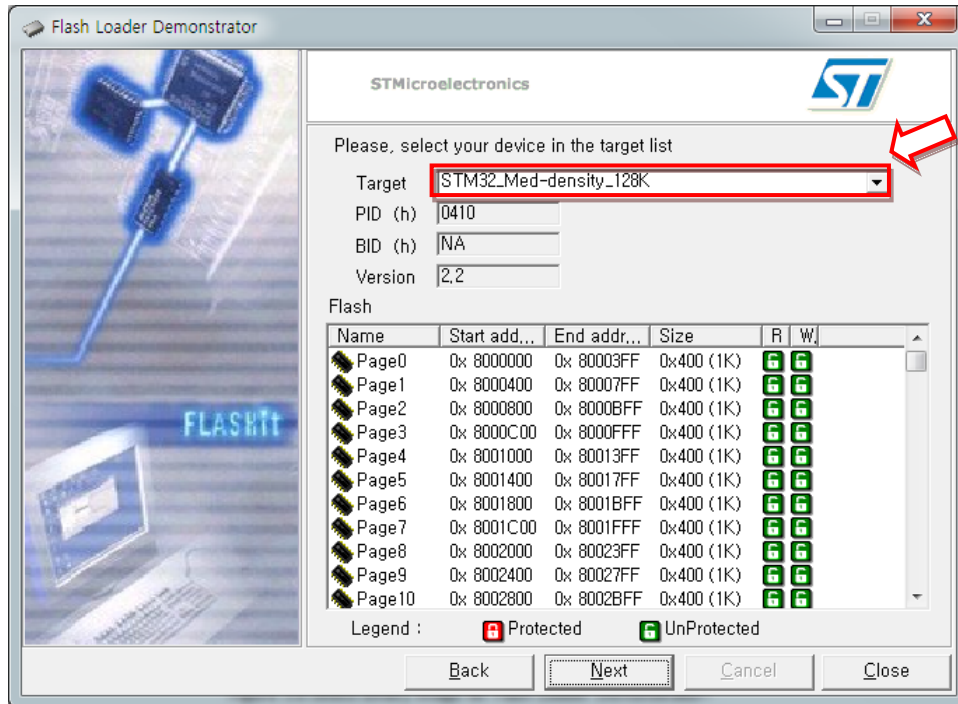


Figure 15. Select Target Device for Flash Loader Demonstrator

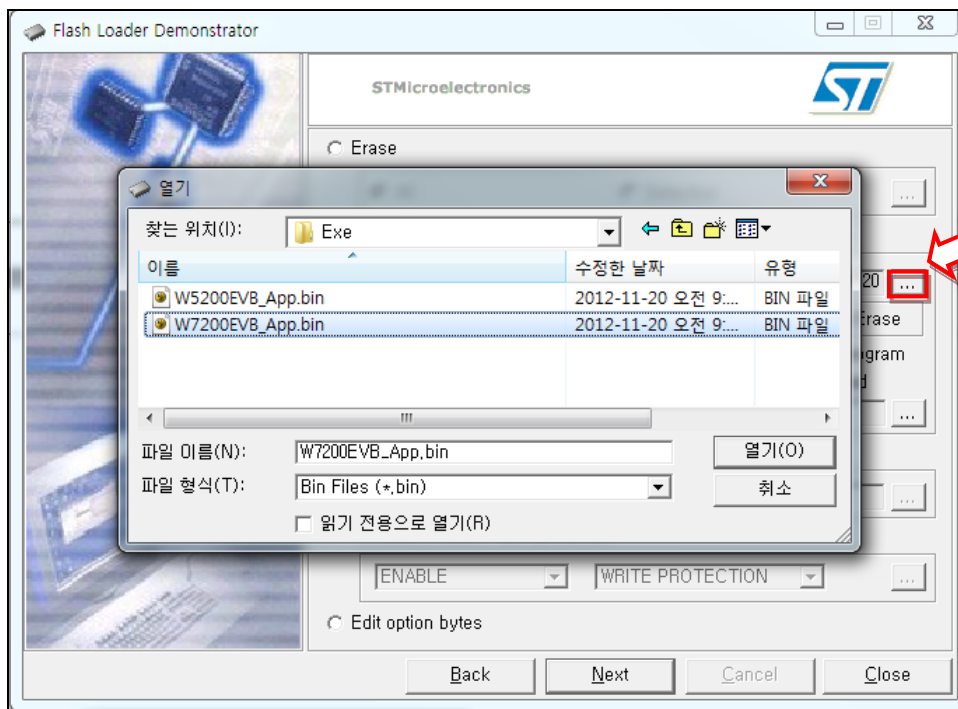


Figure 16. Select Binary Image for Flash Loader Demonstrator

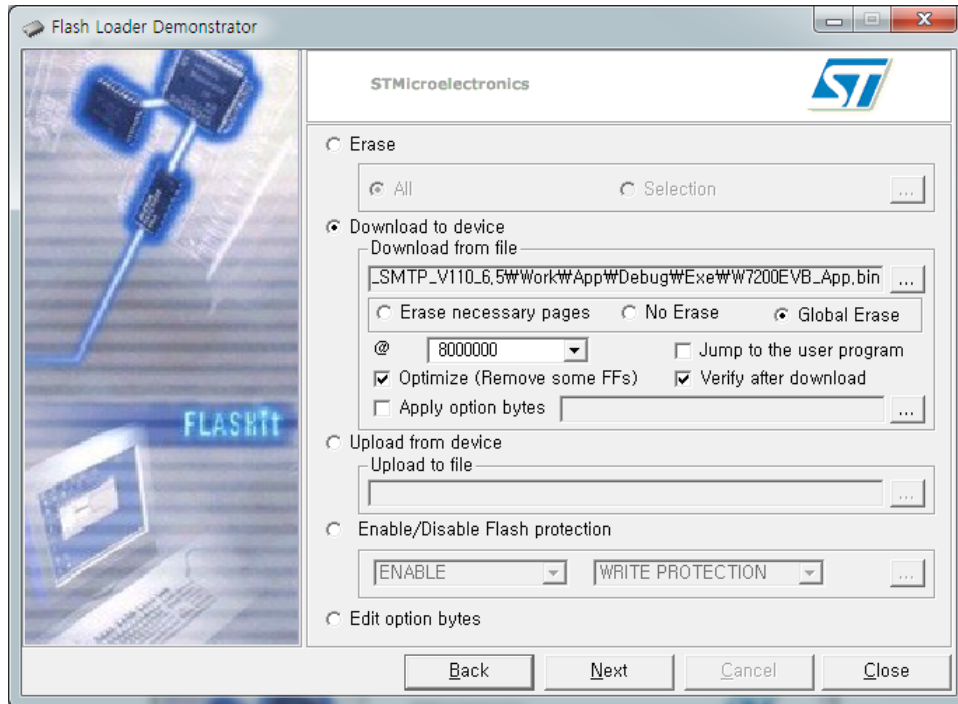


Figure 17. Firmware Image Download to W7200 Device

Start the download from @ 0x08000000 of the memory address.
 User may use a different starting address for download if needed.

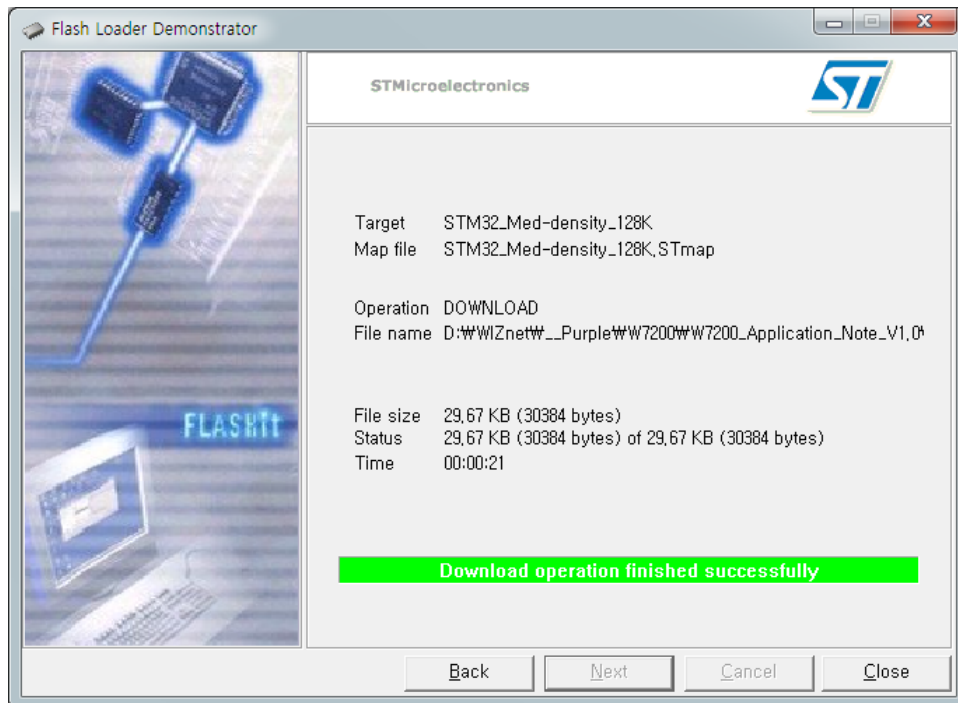


Figure 18. Firmware Image Download Finished

2.3 Setting for Serial Terminal

After the image is successfully loaded to the W7200 board, set the serial terminal to test the board. In this document, Hyper Terminal, which is the most used serial terminal, will be used for serial configuration. Run the Hyper terminal to set the port information for communication with the board. Click the [Properties] from the File menu and select the COM port. Click the [Configure] button and the screen will appear as shown in Figure 19.

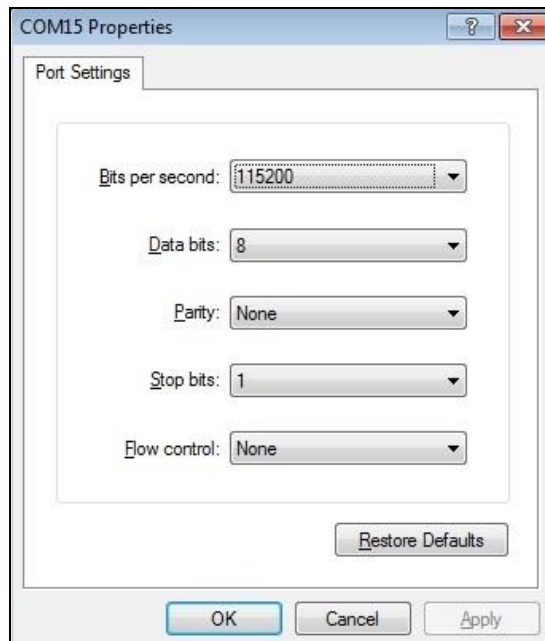


Figure 19. Hyper terminal setting

Table 1. Hyper terminal setting

Port Settings	value
Baud rate	115200
Data bits	8
Parity bits	None
Stop bits	1
Flow control	None

The example firmware for W7200 board will be ready after the terminal setting as shown in Table 1 is done.

<Note>

The 'Hyper terminal' is the default application program In the Windows XP version, but not in Windows 7 and later versions. if you are using Windows 7 or the later versions, please refer to the below links for free serial terminals

- PuTTY : <http://www.chiark.greenend.org.uk/~sgtatham/putty/>
- Tera Term : <http://ttssh2.sourceforge.jp/>

2.4 W7200 Example Firmware Demonstration

W7200 example firmware includes GPIO control (LED), Network configuration for Ethernet connection, TCP/UDP loopback test applications, DNS test application and etc.

User can check debugging messages, network configuration information, and the application menu by using serial terminal using USART.

Figure 20 shows the W7200 EVB application menu demo by PuTTY

```
COM6 - PuTTY
W7200 EVB
Network Configuration Information
-----
MAC : 00:08:DC:11:22:33
IP : 192.168.11.4
SN : 255.255.255.0
GW : 192.168.11.1
DNS server : 8.8.8.8
-----

===== STM32-Discovery =====
This Application is basic example of UART interface with
Windows Hyper Terminal.

===== APPLICATION MENU : =====
-----
1 - Set LD1 on
2 - Set LD1 off
3 - Show network setting
4 - Set network setting
5 - Run TCP Loopback
6 - Run UDP Loopback
7 - DNS test
8 - BASE64 test
9 - Send Mail
Enter your choice : █

Network Info
Apps Menu
```

Figure 20. W7200 Example Firmware Demonstration

In this document, the W7200 board's operation is tested by using the TCP loopback test application in the example firmware.

The test uses the AX1 loopback test program provided from WIZnet's website.

(AX1 program can be download in WIZnet download page www.wiznet.co.kr/download)

The W7200 board operates as TCP server and the AX1 program operates as TCP client during the loopback test.

```
5 - Run TCP Loopback
6 - Run UDP Loopback
7 - DNS test
8 - BASE64 test
9 - Send Mail
Enter your choice : 5

Run TCP loopback
Run TCP loopback, port number [5000] is listened
To Exit, press [0]
7 : Loop-Back TCP Started.
```

Figure 21. Run TCP Loopback Server

Once the TCP loopback server on W7200 board is started, user can try to connect with server through AX1.

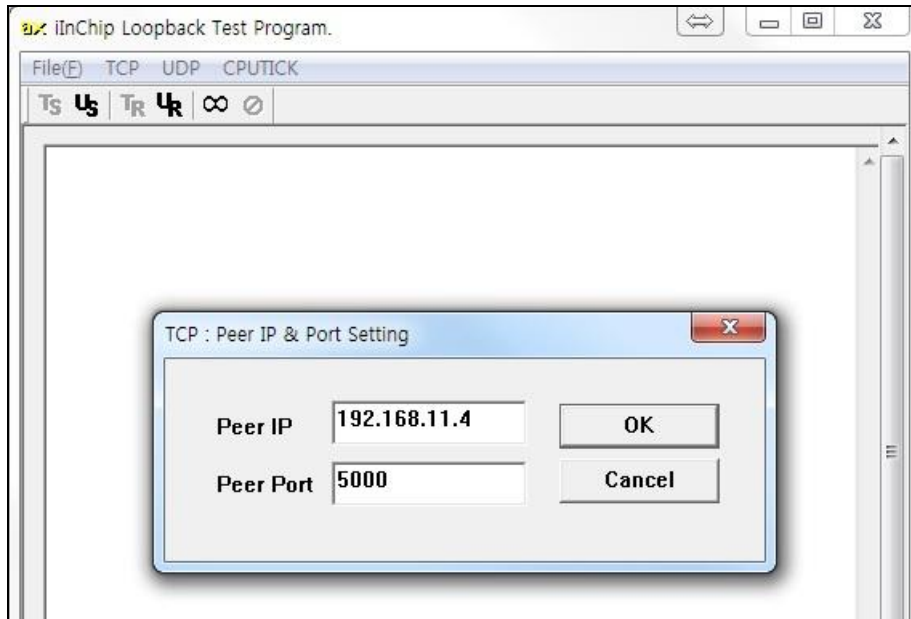


Figure 22. AX1: Peer IP address and port number setting

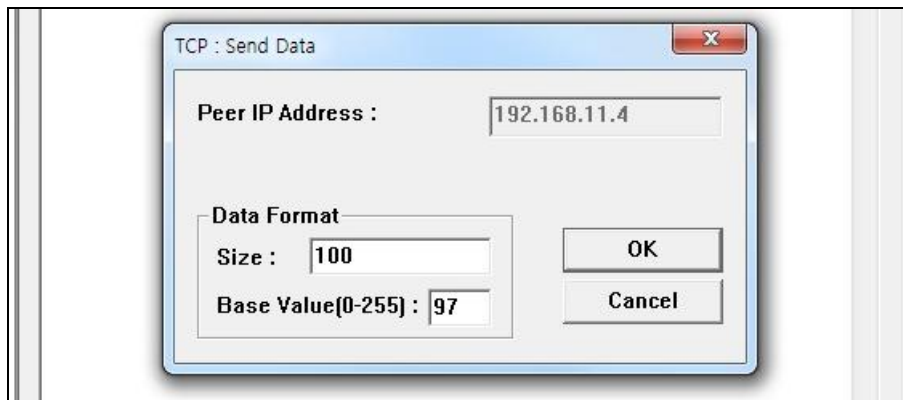


Figure 23. AX1: Send data

After the AX1 program successfully sends data, the TCP loopback server of the W7200 will resend the data to AX1 (loopback) the received data. If the AX1 program successfully receives the same data, the loopback test is complete and the operation of W7200 board is verified.

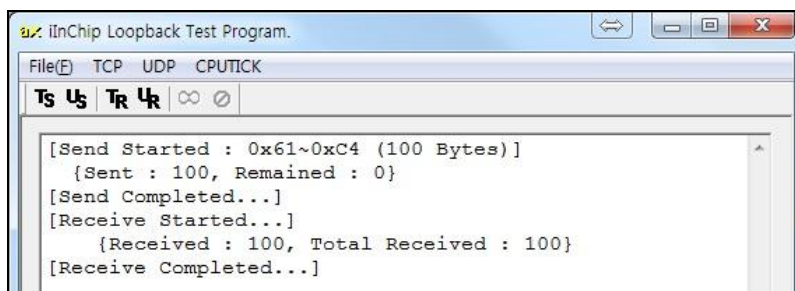


Figure 24. TCP Loopback Test Result

Appendix A: STMicro STMF10x Standard Peripheral Library

The W7200 example firmware provided by WIZnet includes and is based on the STMF10x Standard Peripheral library supported by STMicroelectronics. The STM32F10x library was implemented based on a CMSIS(Cortex Microcontroller Software Interface Standard) library for Cortex-M series MCU provide from ARM. This library includes STM32F10x Drivers, peripheral example codes, and IDE project templates. To Download STM32F10x library, go to STMicroelectronics website (www.st.com) and follow next steps.

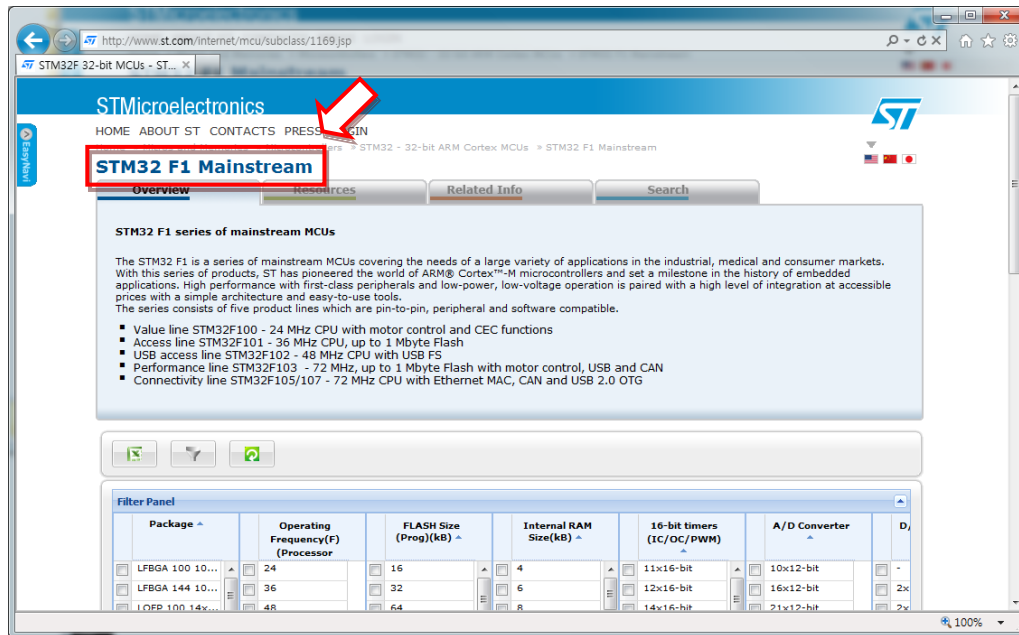


Figure 25. STMicroelectronics website

Select the Resources tab and then choose [Firmware].

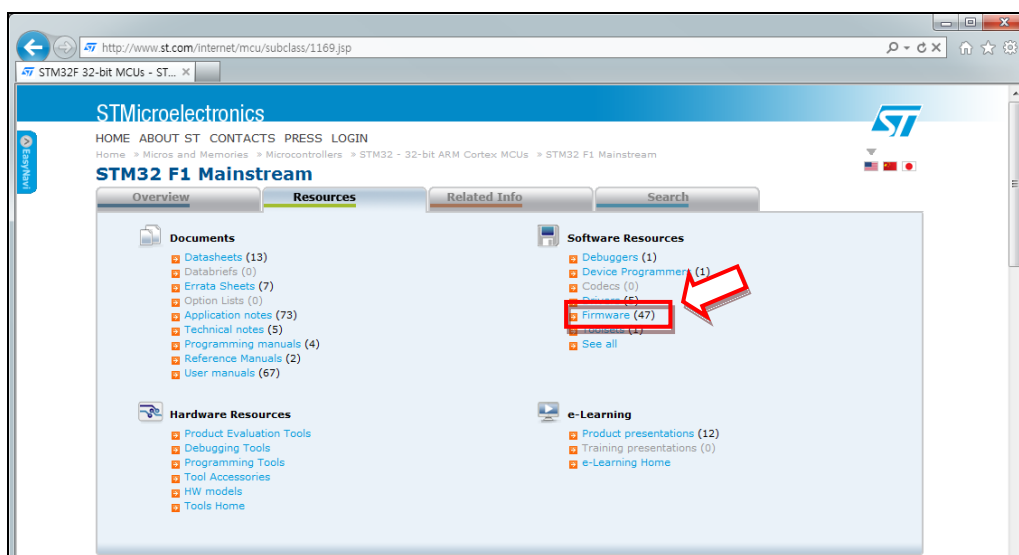


Figure 26. STM32 F1 Resources

Download the **STM32F10x standard peripheral library**.

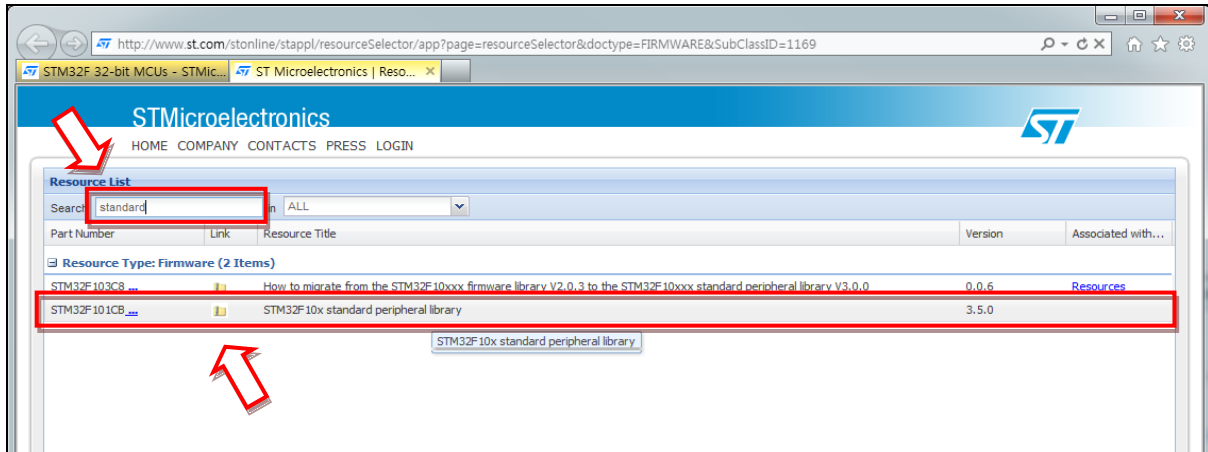


Figure 27. STM32 F10x Standard Peripheral Library Download

The **stm32f10x_stdperiph_lib_um.chm** file (HTML helpfile) in library folder describes about the STM32 F10x library contents and structure in detail.

Users should consider this helpfile when developing a product using STM32 F10x MCU.

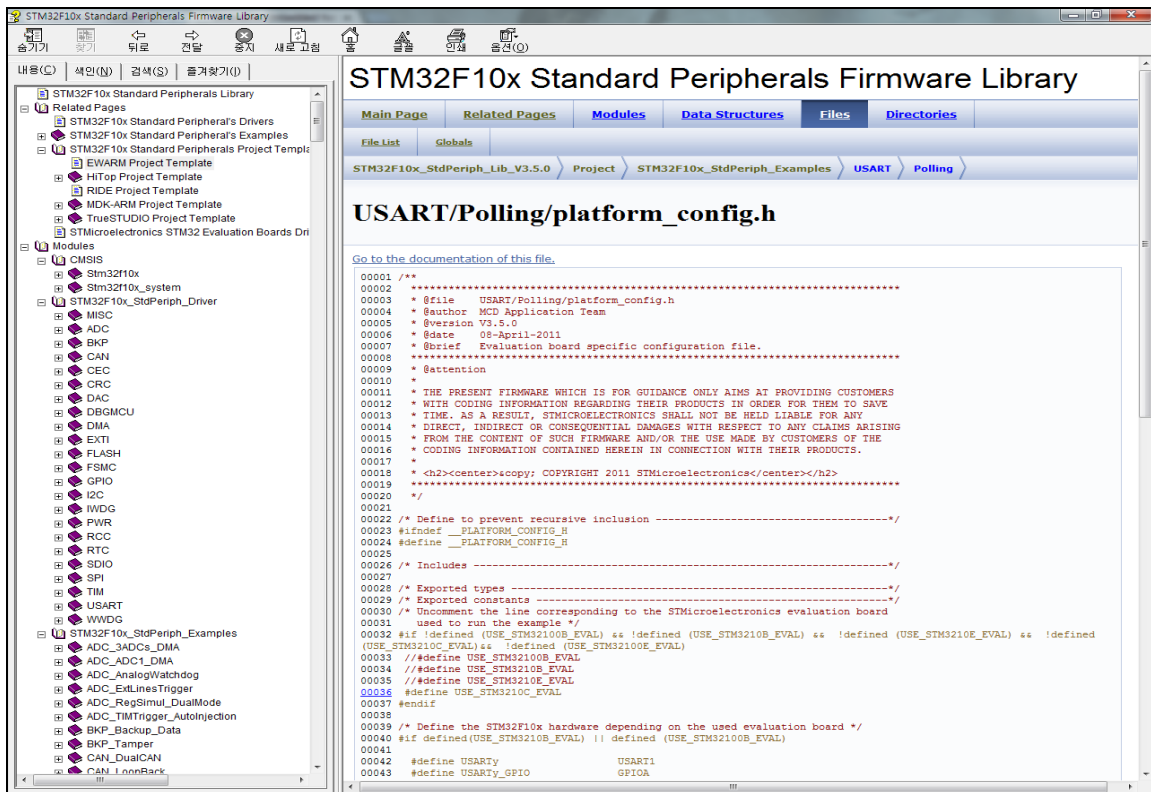


Figure 28. STM32F10x Standard Peripherals Firmware Library HTML help file

Document History Information

Version	Date	Descriptions
Ver. 1.0.0	12Dec2012	Document released

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