

TI DSP, MCU, Xilinx Zynq FPGA

프로그래밍 전문가 과정

Getting Started stm32 with True STUDIO & CubeMx

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1. Install True STUDIO

- www.atollic.com 접속

atollic이라는 소프트웨어 개발 툴 전문 기업은 2018년 초에
ST사에 인수 합병되면서 True STUDIO 컴파일러를 무료로 배포함!



Atollic is now part of ST

All TrueSTUDIO Pro features have been incorporated into TrueSTUDIO for STM32 which is now FREE!

TrueSTUDIO[®] for STM32

Atollic TrueSTUDIO for STM32 is a commercially enhanced C/C++ IDE based on open source components with powerful professional extensions, features and utilities.

Now available free for STM32 developers!

- Free to download and use for STM32 development
- Single installer for all components
- Out of the box support for STM32 boards and devices
- Full-featured IDE with advanced debugging and code analysis
- Project wizards and importers
- Getting started tutorials plus tips and techniques
- User forum

Select your operating system



Atollic provides a single installer for all TrueSTUDIO editions, one for each operating system.



Only a few simple questions and you are on your way to using the new TrueSTUDIO for STM32.

Enter a valid business e-mail address

We use your registration to notify you about new versions, bug fixes, new features and target support updates. We also share tips and tricks and invite you to attend free training webinars.

We do not sell your information to any third parties. You can opt out of these communications at any time.

I am looking for a:*

- ☐ Professional development tool and will evaluate TrueSTUDIO against other commercial tools
- ☒ Basic free tool
- ☐ Not looking. I am already a customer

First Name*

ahn

Last Name*

sangjae

Email*

sangjae2015@naver.com

Country*

Korea South

What best describes you?*

- ☒ Non-commercial
- ☐ Contractor
- ☐ Small business
- ☐ Large business

Device family of interest

STMicroelectronics STM32

☒ I want information about beta versions

Consent to communication

STMicroelectronics would like to keep you up-to-date on STM32 tool development such as TrueSTUDIO. We hope that you will give us consent to communicate about product news and share industry best-practice content:

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Download installer - Windows versions

클릭!

TrueSTUDIO

Installation process is easy. The [installation guide](#) will answer questions related to installation. We recommend users with on-going projects upgrading to a later version to read the [upgrade guide](#).

We recommend using the *latest version* below, but *all versions* are publicly accessible.

Latest version

가장 최신 버전 다운로드

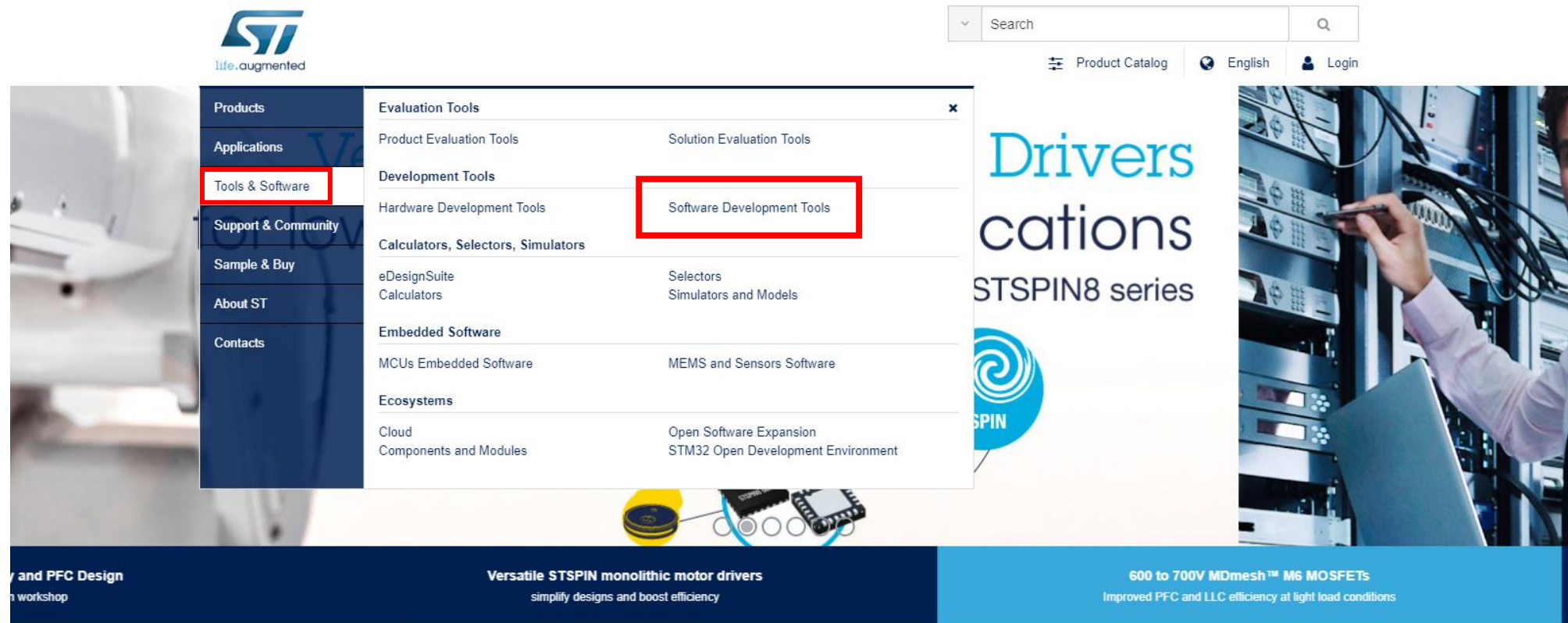
Filename	Version	Size	Revision history
Atollic TrueSTUDIO for STM32 windows x86 v9.0.1 20180420-1214.exe	9.0.1	701 MB	readme.txt

Previous versions

Filename	Version	Size	Revision history
Atollic_TrueSTUDIO_for_STM32_windows_x86_v9.0.0_20180117-1023.exe	9.0.0	704 MB	readme.txt
Atollic_TrueSTUDIO_for_ARM_windows_x86_v8.1.0_20171023-2304.exe	8.1.0	880 MB	readme.txt
Atollic_TrueSTUDIO_for_ARM_windows_x86_v8.0.0_20170621-1519.exe	8.0.0	876 MB	readme.txt
Atollic_TrueSTUDIO_for_ARM_windows_x86_v7.1.2_20170322-1909.exe	7.1.2	792 MB	readme.txt
Atollic_TrueSTUDIO_for_ARM_windows_x86_v7.1.1_20170310-1837.exe	7.1.1	784 MB	readme.txt

2. Install CubeMX

- www.st.com 접속



The screenshot displays the STMicroelectronics website interface. The top navigation bar includes the ST logo, a search bar, and links for 'Product Catalog', 'English', and 'Login'. A left sidebar menu lists 'Products', 'Applications', 'Tools & Software' (highlighted with a red box), 'Support & Community', 'Sample & Buy', 'About ST', and 'Contacts'. A central modal window titled 'Evaluation Tools' is open, showing a grid of tool categories. The 'Software Development Tools' category is highlighted with a red box. The background features a large banner for 'Drivers cations STSPIN8 series' and a photograph of a person working on a server rack.

Evaluation Tools	
Product Evaluation Tools	Solution Evaluation Tools
Development Tools	
Hardware Development Tools	Software Development Tools
Calculators, Selectors, Simulators	
eDesignSuite	Selectors
Calculators	Simulators and Models
Embedded Software	
MCUs Embedded Software	MEMS and Sensors Software
Ecosystems	
Cloud	Open Software Expansion
Components and Modules	STM32 Open Development Environment

Drivers cations
STSPIN8 series

Versatile STSPIN monolithic motor drivers
simplify designs and boost efficiency

600 to 700V MDmesh™ M6 MOSFETs
Improved PFC and LLC efficiency at light load conditions

Software Development Tools

Complex programmable silicon components require a full complementary Ecosystem.

ST and its partners provide an extensive range of Software Development Tools that are increasingly becoming a selection of semiconductor devices.

Microcontrollers and microprocessors have always required assemblers, compilers, linkers, debugging and programming tools. They are available both from ST and from a wide selection of 3rd parties. Tools are offered as free downloads or some are sold online through the ST distribution sales network.



MCUs Software Development Tools

For STM32 MCUs



- ▶ **STM32CubeMX**
- ▶ IDEs
- ▶ Performance and Debuggers
- ▶ Programmers
- ▶ Utilities

For STM8 MCUs



- ▶ STM8CubeMX
- ▶ IDEs
- ▶ Performance and Debuggers
- ▶ Programmers

For SPC5 MCUs



- ▶ SPC5 Studio
- ▶ Development Kits
- ▶ Debuggers
- ▶ Utilities

▶ More software tools? Browse the "ProductTree" section



Menu

▼

Search

🔍



Product Catalog



English



Login

Home > Development Tools > Software Development Tools > STM32 Software Development Tools > STM32 Configurators and Code Generators > STM32CubeMX

STM32CubeMX

ACTIVE



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STM32Cube initialization code generator



Download Databrief

QUICK VIEW

RESOURCES

TOOLS AND SOFTWARE

GET SOFTWARE

Support & Community



STM32CubeMX is part of STMicroelectronics STMCube™ original initiative to make developers' lives easier by reducing development effort, time and cost. STM32Cube covers the whole STM32 portfolio.

STM32Cube includes STM32CubeMX, a graphical software configuration tool that allows the generation of C initialization code using graphical wizards.

It also embeds comprehensive STM32Cube MCU Packages, delivered per STM32 microcontroller Series (such as STM32CubeF4 for STM32F4 Series). These packages include the STM32Cube HAL (an STM32 abstraction layer embedded software ensuring maximized portability across the STM32 portfolio), the STM32Cube LL (low layer API, a fast, light weight, expert oriented layer), plus a consistent set

FEATURED PRODUCTS



X-CUBE-VS4A

ST framework for connecting to Alexa Voice Service, software expansion for STM32Cube

X-CUBE-ORPHEUS

QUICK VIEW	RESOURCES	TOOLS AND SOFTWARE	GET SOFTWARE
STM32CubeL1	ST	examples running on ST boards: STM32 Nucleo, Discovery kits and Evaluation boards)	
STM32CubeL1	ST	STM32Cube MCU Package for STM32 L1 series (HAL, Low-Layer APIs and CMSIS (CORE, DSP, RTOS), USB, File system, RTOS, Touch Sensing, Graphic - coming with examples running on ST boards: STM32 Nucleo, Discovery kits and Evaluation boards)	
STM32CubeL4	ST	STM32Cube MCU Package for STM32L4 series and STM32L4 Plus series (HAL, Low-Layer APIs and CMSIS (CORE, DSP, RTOS), USB, TouchSensing, File system, RTOS, Graphic - coming with examples running on ST boards: STM32 Nucleo, Discovery kits and Evaluation boards)	

GET SOFTWARE

Part Number	Software Version	Marketing Status	Supplier	Download
STM32CubeMX	4.27.0	Active	ST	Get Software

RESOURCESTOOLS AND SOFTWAREGET SOFTWAREX

Get Software

If you have an account on my.st.com, login and download the software without any further validation steps.

Login/Register

If you don't want to login now, you can download the software by simply providing your name and e-mail address in the form below and validating it.

This allows us to stay in contact and inform you about updates of this software.

For subsequent downloads this step will not be required for most of our software.

First Name:

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Your registration has been successfully submitted!

To validate your e-mail and start the download, please click on the link inside the e-mail that has been sent to you. This link will be valid for 24 hours. Please check your spam filters in case you did not receive the e-mail.

입력한 E-mail 주소로 들어감!

Start your software download

Ahn,

Please follow this link to validate your email address and start the download of the requested software:

<http://www.st.com/content/st.com/en/products/development-tools/software-development-tools/stm32-software-development-tools/stm32-configurators-and-code-generators/stm32cubeMX.html?dl=fdMkwC9Ib%2FJtGrSricGQ%3D%3D%2CnnGXRPUCZ%2BZ%2FpZp5f1%2B4H80%2BR1Ki2GrKsEV2a8fXrwmacAO1iAF6a9T4N2I0jH7J2dXQwLQlcXCpteAHTQ%3D%3D>

If you have any further issues please send your request to our [online support](#) using the subject line: Software download issues.

Thank you,

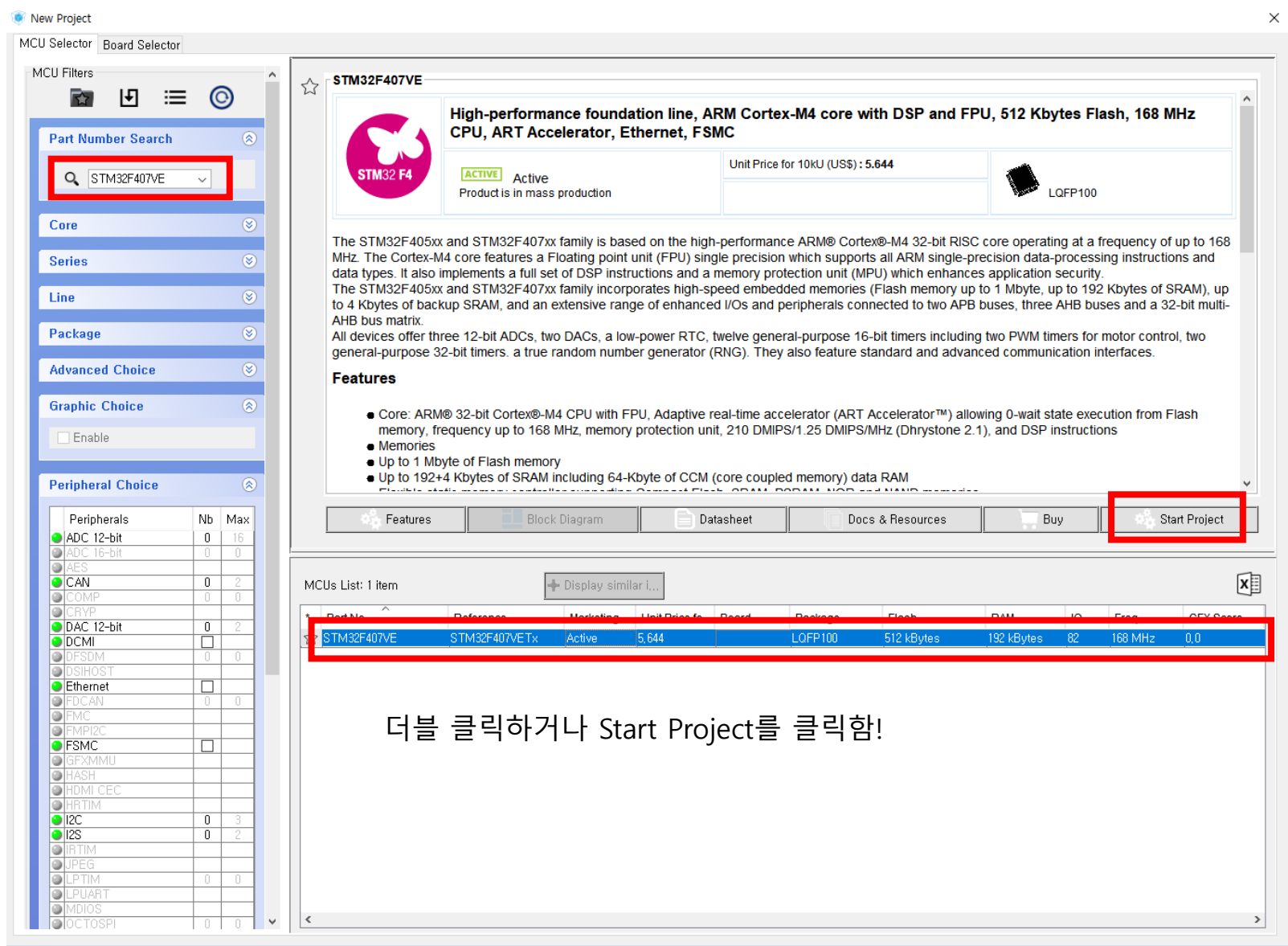
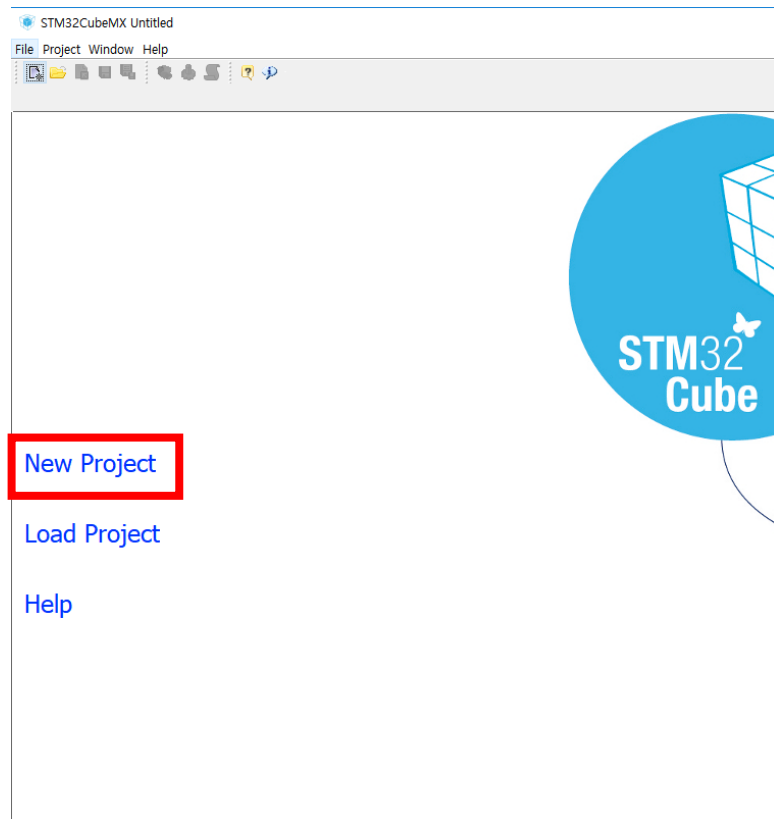
STMicroelectronics

<http://www.st.com>

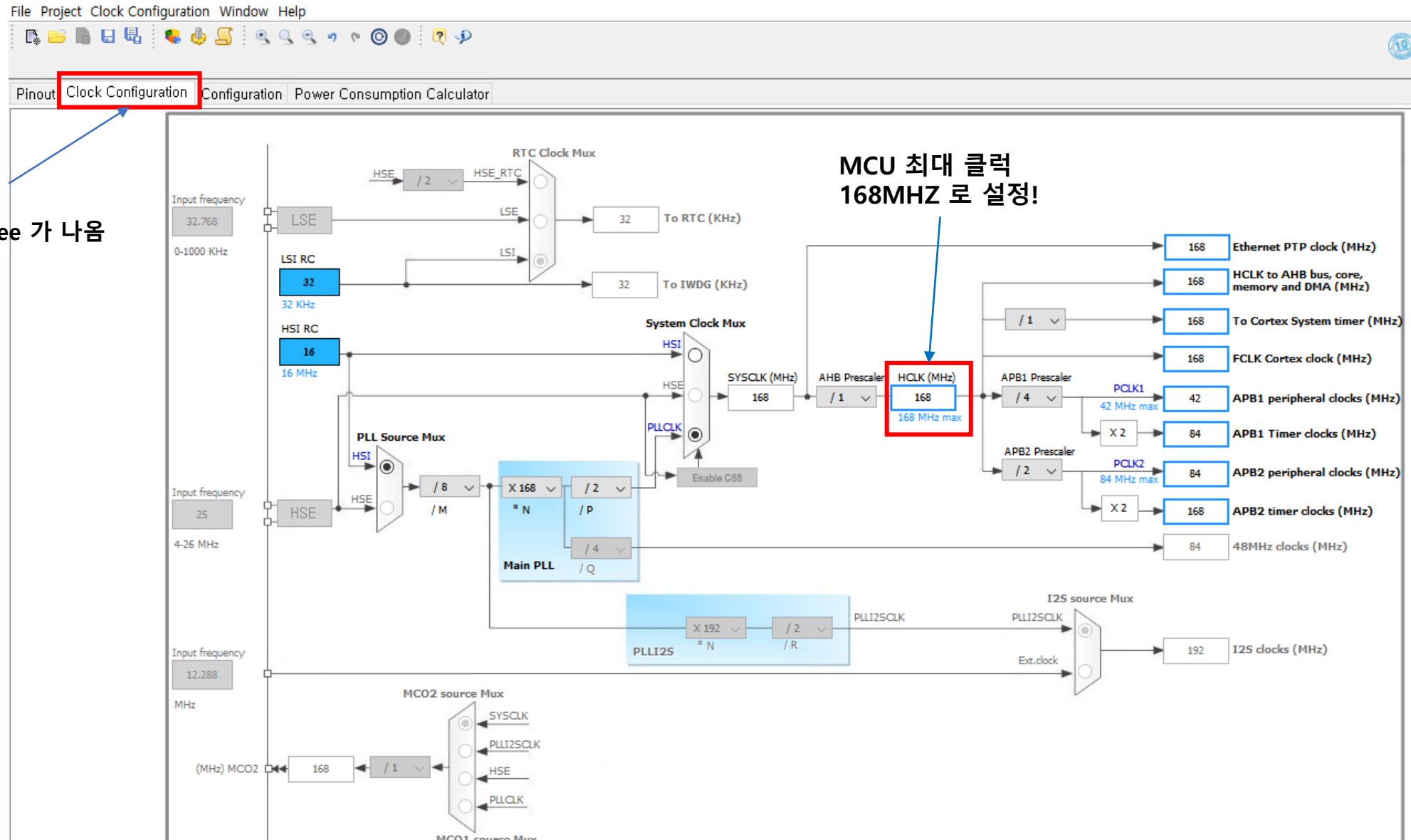
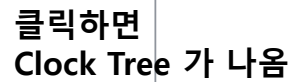
Please do not respond to this auto-generated email.

링크로 들어가면 바로 CubeMX가 다운로드됨!

3. Setting CubeMX



- 클릭 설정



STM32CubeMX Untitled*: STM32F407VETx

FileProjectPinoutWindowHelp

Pinout

Clock Configuration

Configuration

Power Consumption Calculator

ADC1

ADC2

ADC3

CAN1

CAN2

CRC

DAC

DCMI

ETH

FSMC

I2C1

I2C2

I2C3

I2S2

I2S3

IWDG

RCC

High Speed Clock (HSE)Crystal/Ceramic Resonator

Low Speed Clock (LSE)Disable

Master Clock Output 1

Master Clock Output 2

Audio Clock Input (I2S_CKIN)

RNG

RTC

SDIO

SPI1

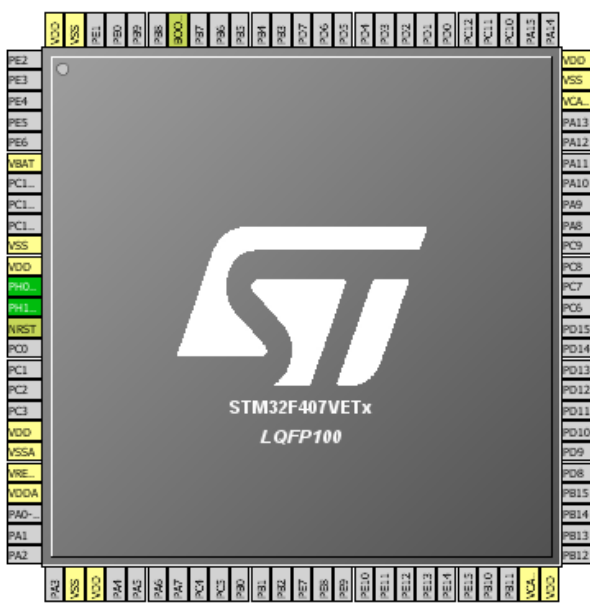
SPI2

SPI3

HSE(High Speed External) 외부 클럭 사용

ROC_OSC_IN

ROC_OSC_OUT

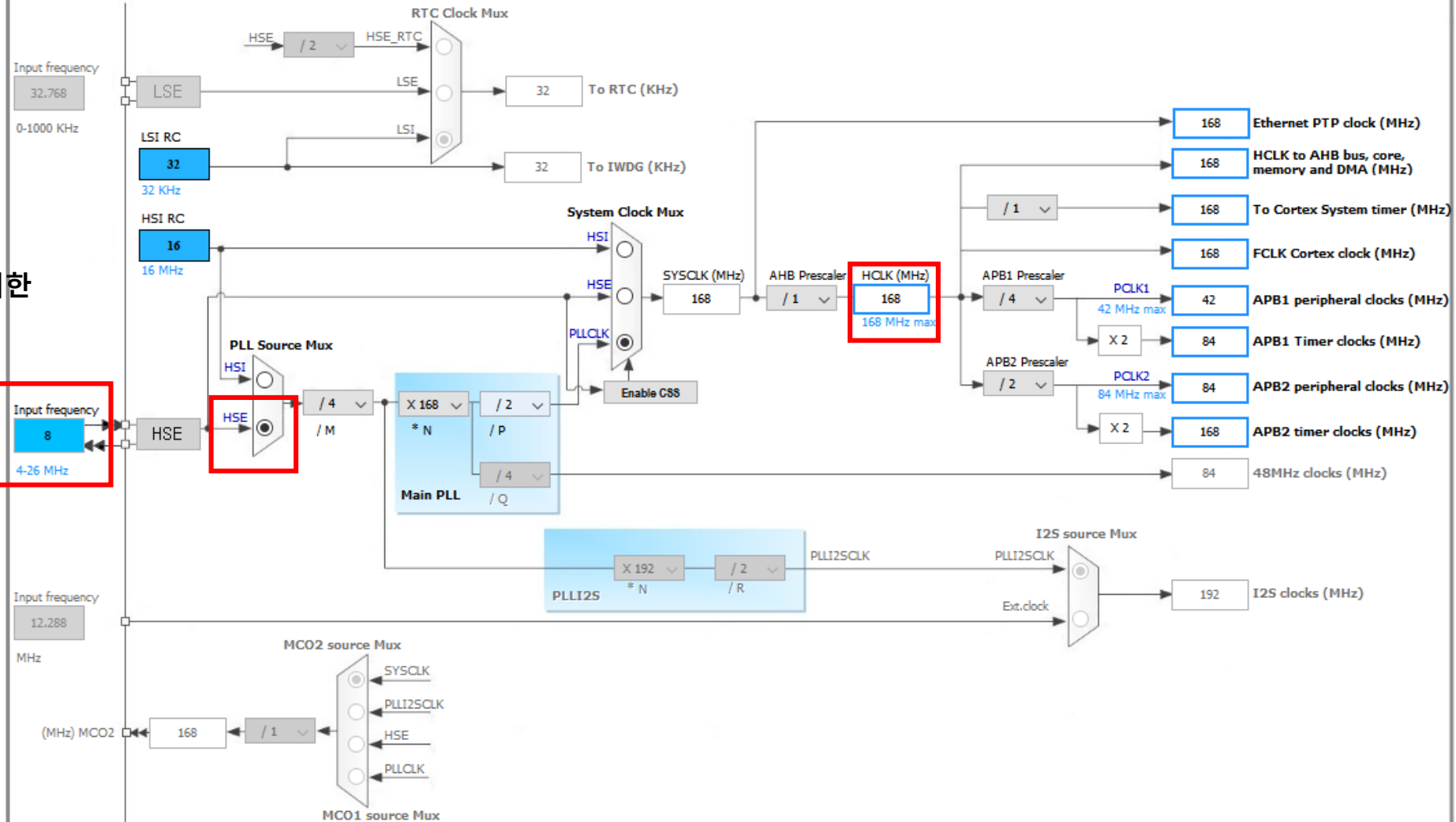


MCUs Selection

Output

Series	Lines	Mcu	Package	Required Peripherals
STM32F4	STM32F407/417	STM32F407VETx	LQFP100	None

외부 크리스탈에 의한
주파수



- GPIO 설정

Pinout Clock Configuration Configuration Power Consumption Calculator

ADC1
ADC2
ADC3
CAN1
CAN2
CRC
DAC
DCMI
ETH
FSMC
I2C1
I2C2
I2C3
I2S2
I2S3
IWDG
RCC
High Speed Clock (HSE) Crystal/Ceramic Resonator
Low Speed Clock (LSE) Disable
Master Clock Output 1
Master Clock Output 2
Audio Clock Input (I2S_CKIN)
RNG
RTC
SDIO
SPI1
SPI2
SPI3
SYS
TIM1
TIM2
TIM3
TIM4
TIM5
TIM6
TIM7
TIM8
TIM9
TIM10

GPIO_Input
GPIO_Input
RCC_OSC_IN
RCC_OSC_OUT
GPIO_Output
GPIO_Output
GPIO_Output
GPIO_Output
GPIO_Input
GPIO_Output
GPIO_Analog
EVENTOUT
GPIO_EXTI10

STM32F407VETx
LQFP100

GPIO Output 설정
GPIO Input 설정

- GPIO 설정

Pinout Clock Configuration **Configuration** Power Consumption Calculator

Configuration

- Additional Software
 - MiddleWares
 - FATFS
 - ☐ User-defined
 - FREERTOS
 - ☐ Enabled
 - LIBJPEG
 - ☐ Enabled
 - MBEDTLS
 - ☐ Enabled
 - Peripherals
 - CRC
 - ☐ Activated
 - IWDG
 - ☐ Activated
 - RCC**
 - High Speed Clock (H
 - ☐ Activated
 - RNG**
 - ☐ Activated
 - SYS**
 - Timebase Source: Sy
 - ☐ Activated
 - ☐ One Pulse Mode
 - TIM6**
 - ☐ Activated
 - ☐ One Pulse Mode
 - TIM7**
 - ☐ Activated
 - ☐ One Pulse Mode
 - WWDG
 - ☐ Activated

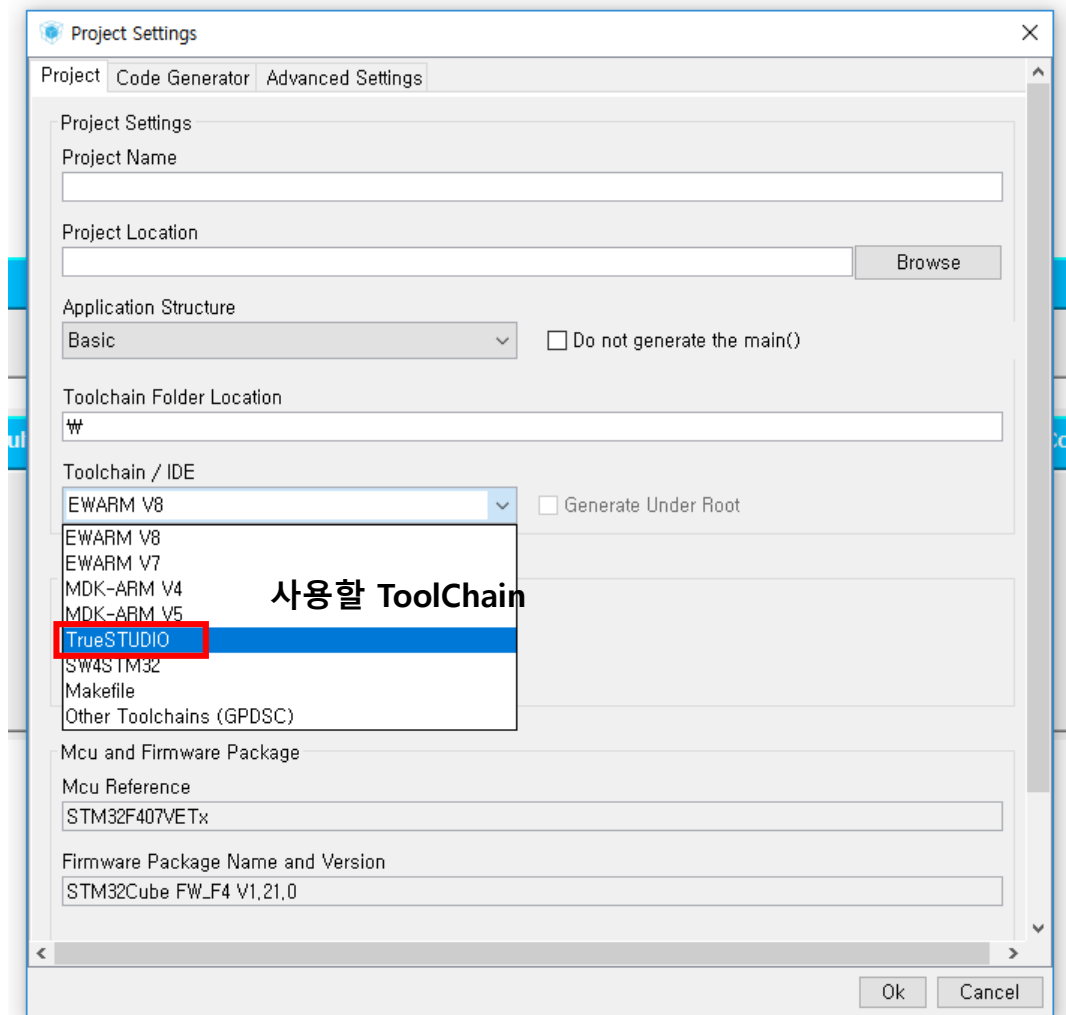
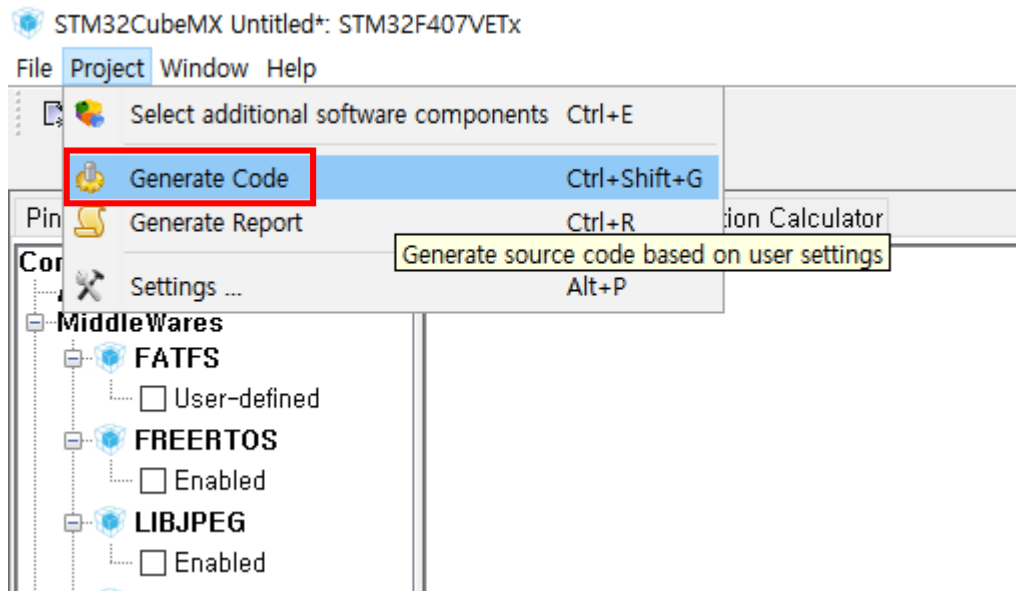
Middlewares

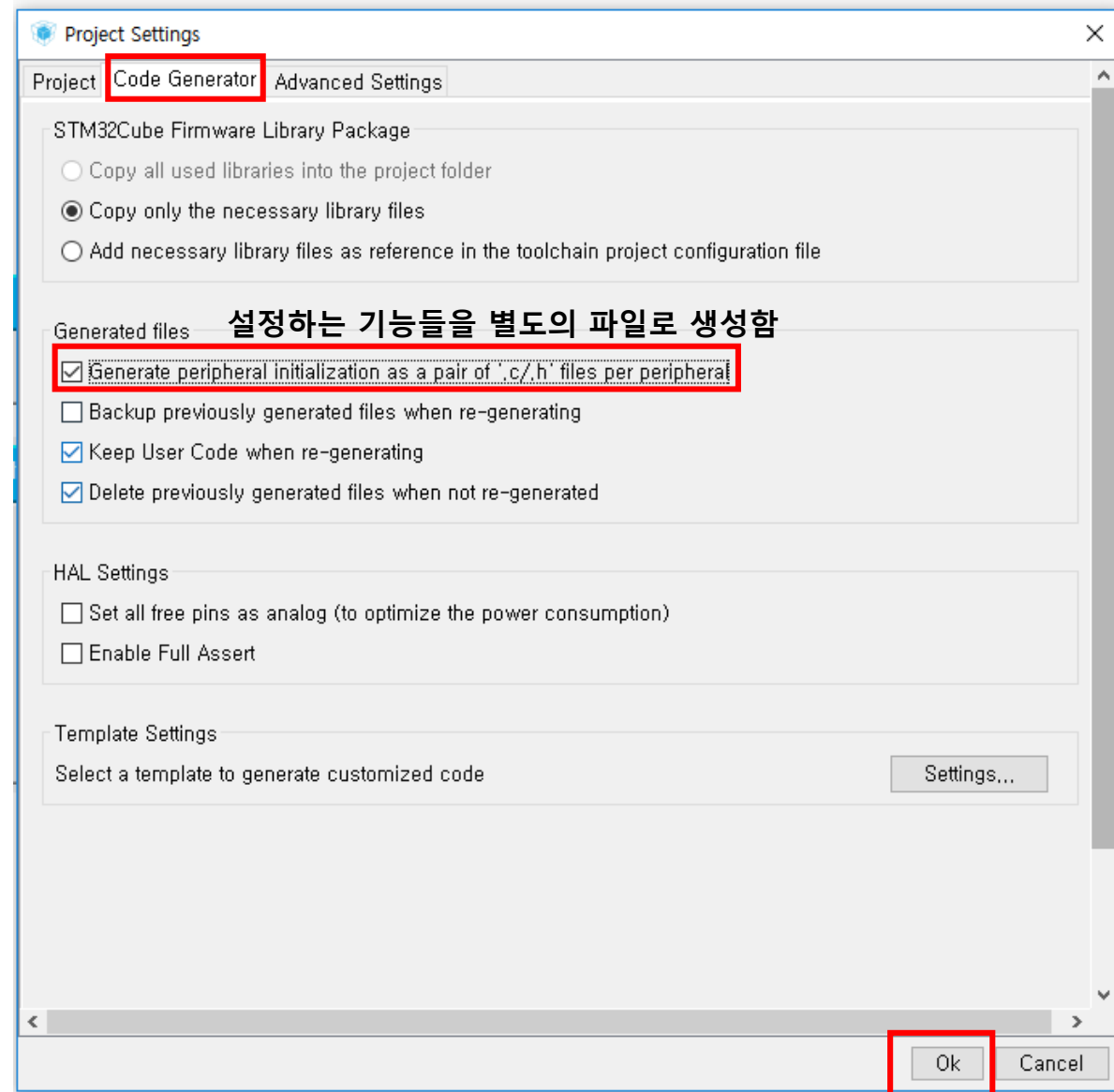
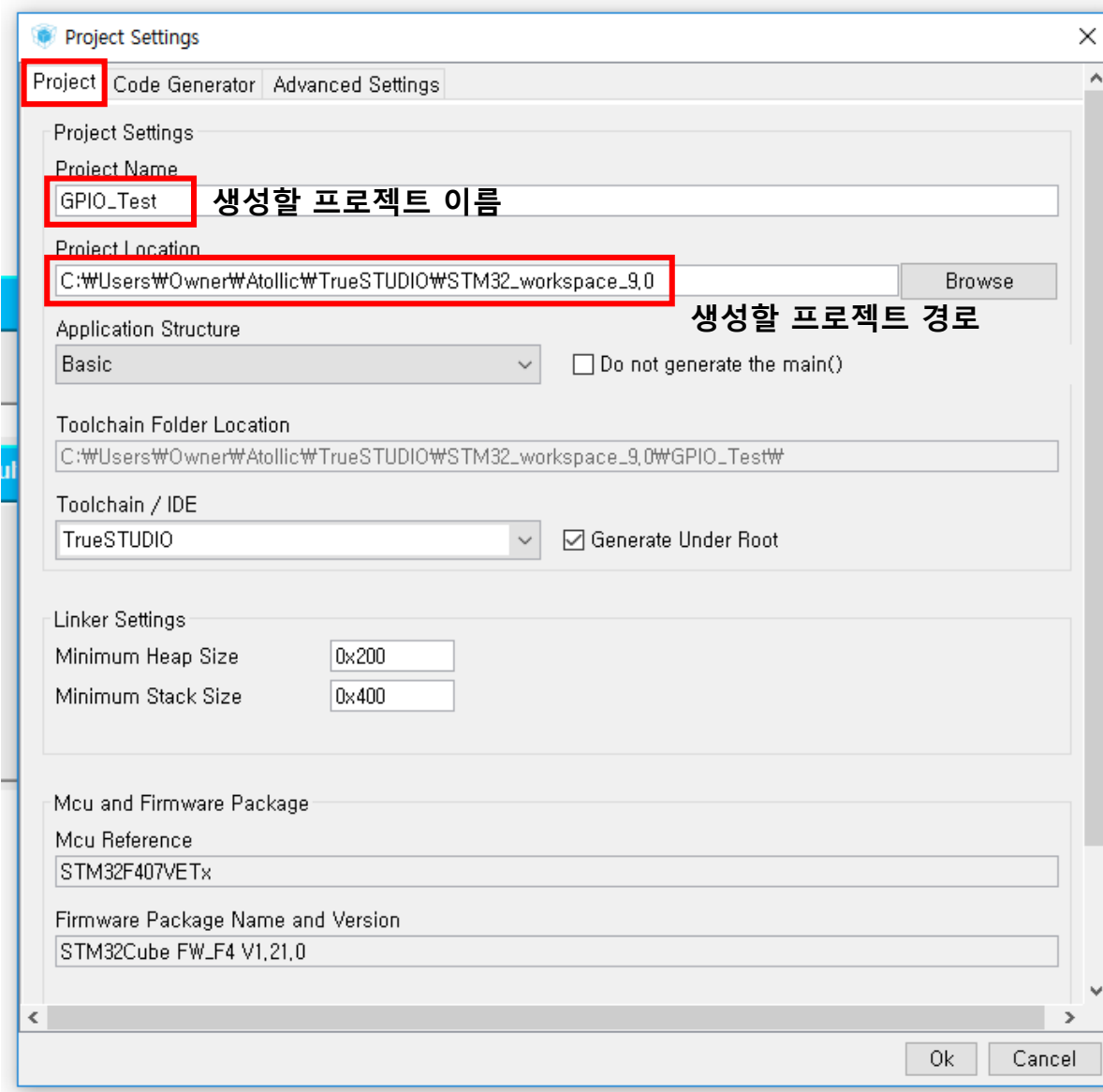
Multimedia	Connectivity	Analog	System	Control	Security
			<div>DMA</div> <div>GPIO</div> <div>NVIC</div> <div>RCC</div>		

Pinout 탭에서 설정한 사항 확인

- Generate Code & 프로젝트 생성

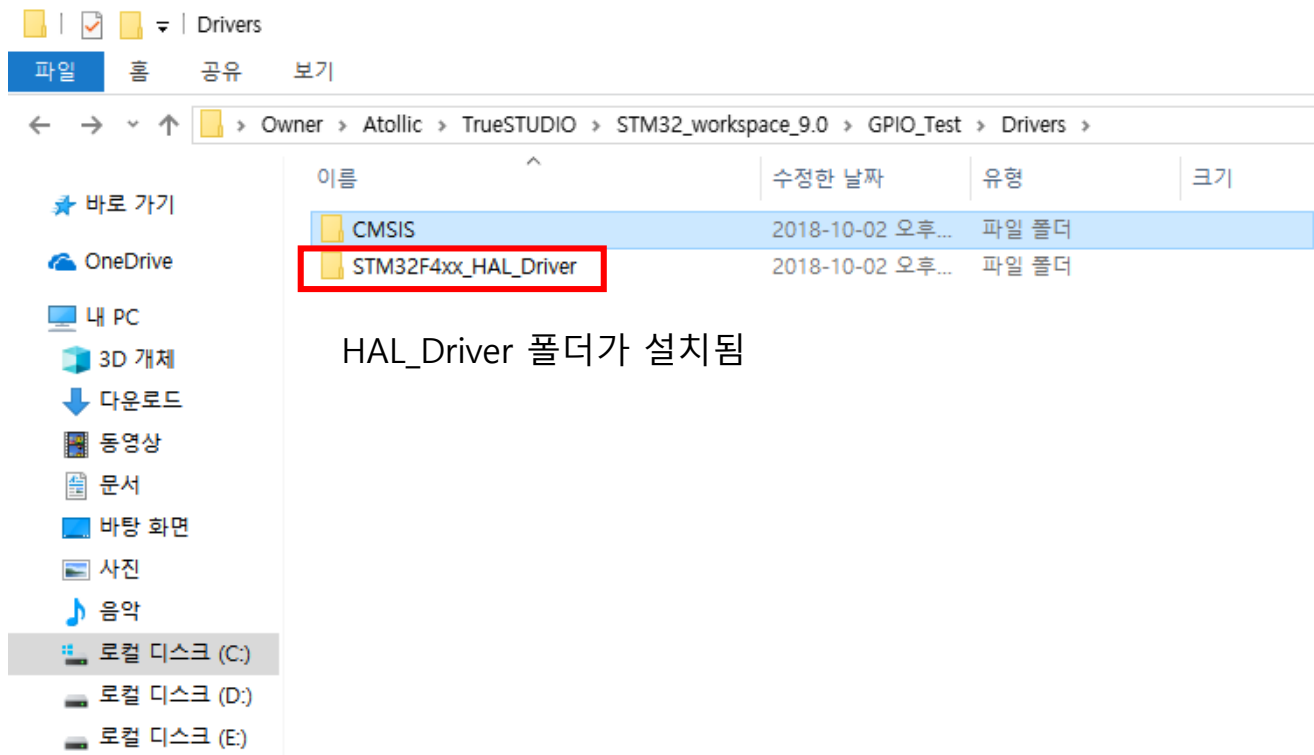
Generate Code 를 클릭하면 처음에만 Project Settings 창이 뜨고,
두번째부터는 바로 프로젝트에 코드가 변경됨!





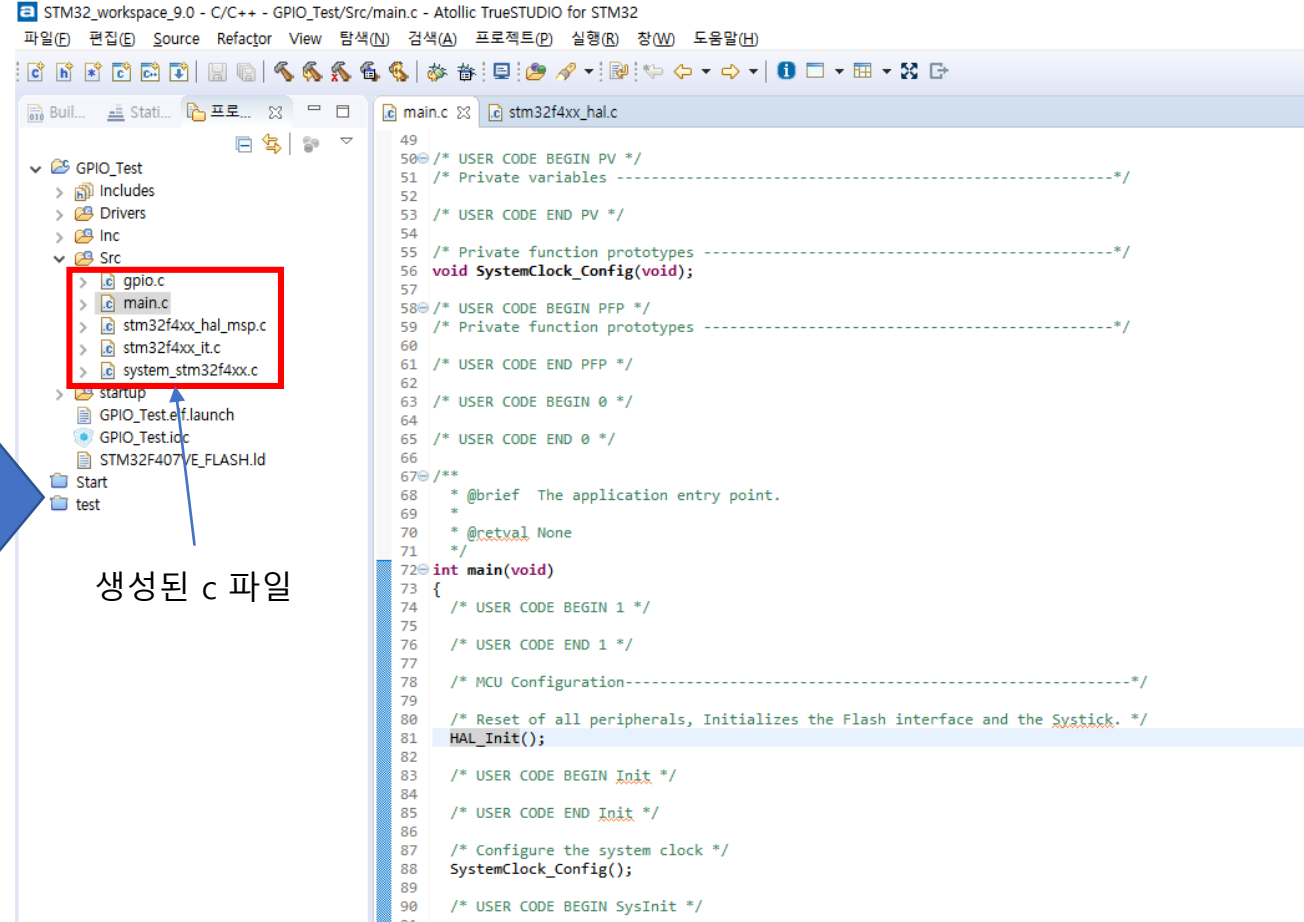
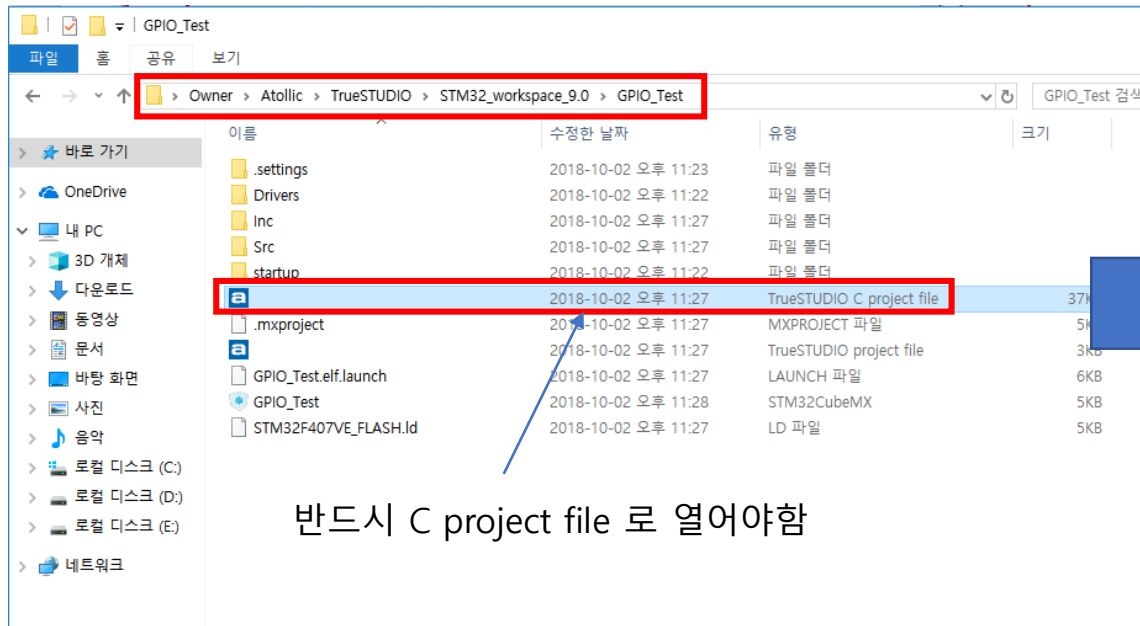
HAL_Driver 가 설치되지 않았다면 설치라는 창이 나옴!

마지막에 Ok 버튼 클릭



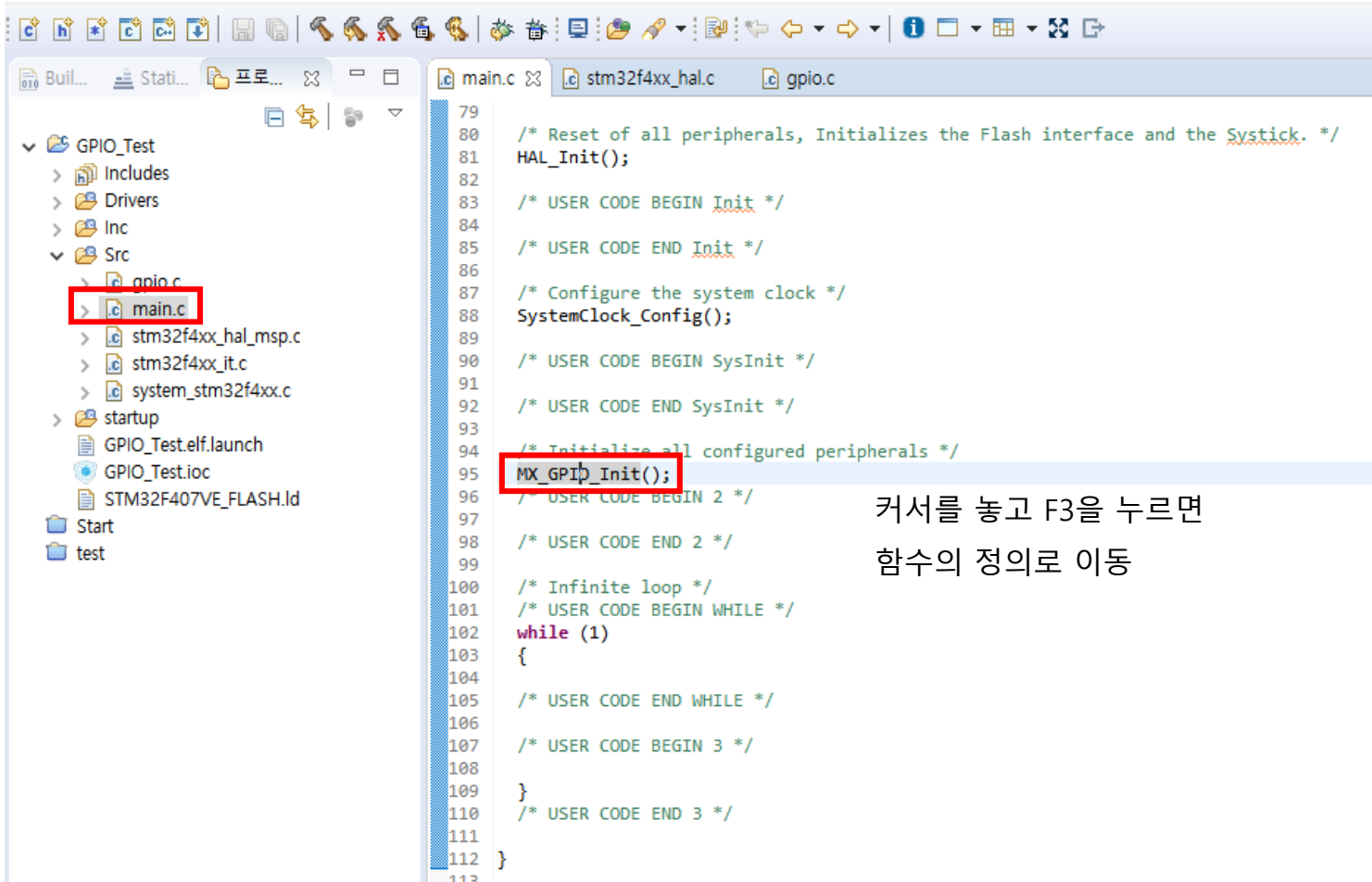
4. Project File

생성한 프로젝트 폴더 경로로 들어감



STM32_workspace_9.0 - C/C++ - GPIO_Test/Src/main.c - Atollic TrueSTUDIO for STM32

파일(F) 편집(E) Source Refactor View 탐색(N) 검색(A) 프로젝트(P) 실행(R) 창(W) 도움말(H)



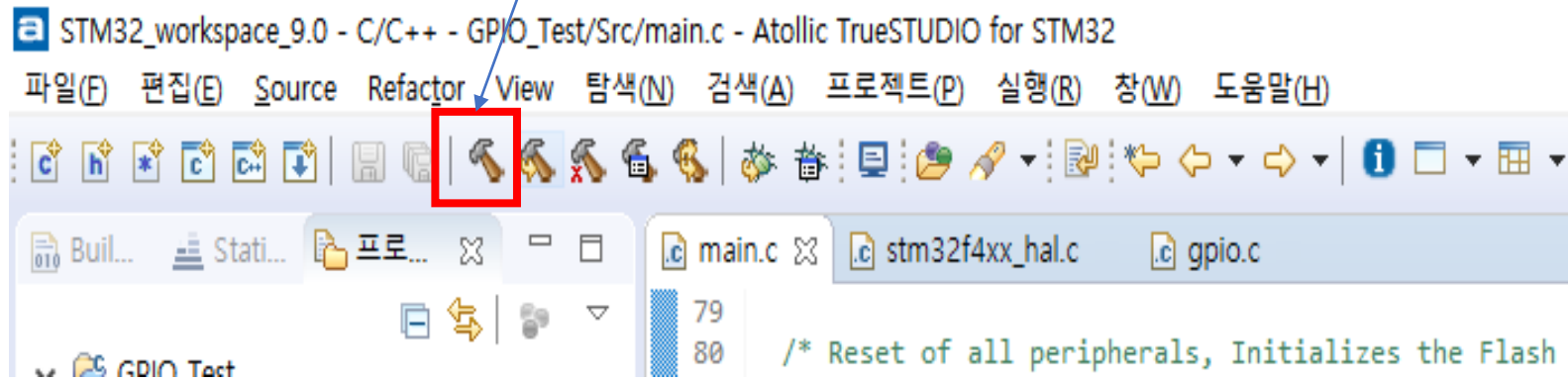
커서를 놓고 F3을 누르면
함수의 정의로 이동

```
59 */
60 void MX_GPIO_Init(void)
61 {
62
63     GPIO_InitTypeDef GPIO_InitStruct;
64
65     /* GPIO Ports Clock Enable */
66     __HAL_RCC_GPIOE_CLK_ENABLE();
67     __HAL_RCC_GPIOC_CLK_ENABLE();
68     __HAL_RCC_GPIOH_CLK_ENABLE();
69     __HAL_RCC_GPIOB_CLK_ENABLE();
70     __HAL_RCC_GPIOD_CLK_ENABLE();
71
72     /*Configure GPIO pin Output Level */
73     HAL_GPIO_WritePin(GPIOB, GPIO_PIN_0|GPIO_PIN_5, GPIO_PIN_RESET);
74
75     /*Configure GPIO pin Output Level */
76     HAL_GPIO_WritePin(GPIOD, GPIO_PIN_12|GPIO_PIN_13|GPIO_PIN_14, GPIO_PIN_RESET);
77
78     /*Configure GPIO pin Output Level */
79     HAL_GPIO_WritePin(GPIOC, GPIO_PIN_6, GPIO_PIN_RESET);
80
81     /*Configure GPIO pin : PE3 */
82     GPIO_InitStruct.Pin = GPIO_PIN_3;
83     GPIO_InitStruct.Mode = GPIO_MODE_INPUT;
84     GPIO_InitStruct.Pull = GPIO_NOPULL;
85     HAL_GPIO_Init(GPIOE, &GPIO_InitStruct);
86
87     /*Configure GPIO pin : PC15 */
88     GPIO_InitStruct.Pin = GPIO_PIN_15;
89     GPIO_InitStruct.Mode = GPIO_MODE_INPUT;
90     GPIO_InitStruct.Pull = GPIO_NOPULL;
91     HAL_GPIO_Init(GPIOC, &GPIO_InitStruct);
92
93     /*Configure GPIO pins : PB0 PB5 */
94     GPIO_InitStruct.Pin = GPIO_PIN_0|GPIO_PIN_5;
95     GPIO_InitStruct.Mode = GPIO_MODE_OUTPUT_PP;
96     GPIO_InitStruct.Pull = GPIO_NOPULL;
97     HAL_GPIO_Init(GPIOB, &GPIO_InitStruct);
```

ALT + <- : 이전으로 돌아가기

ALT + -> : 앞으로 이동

Build

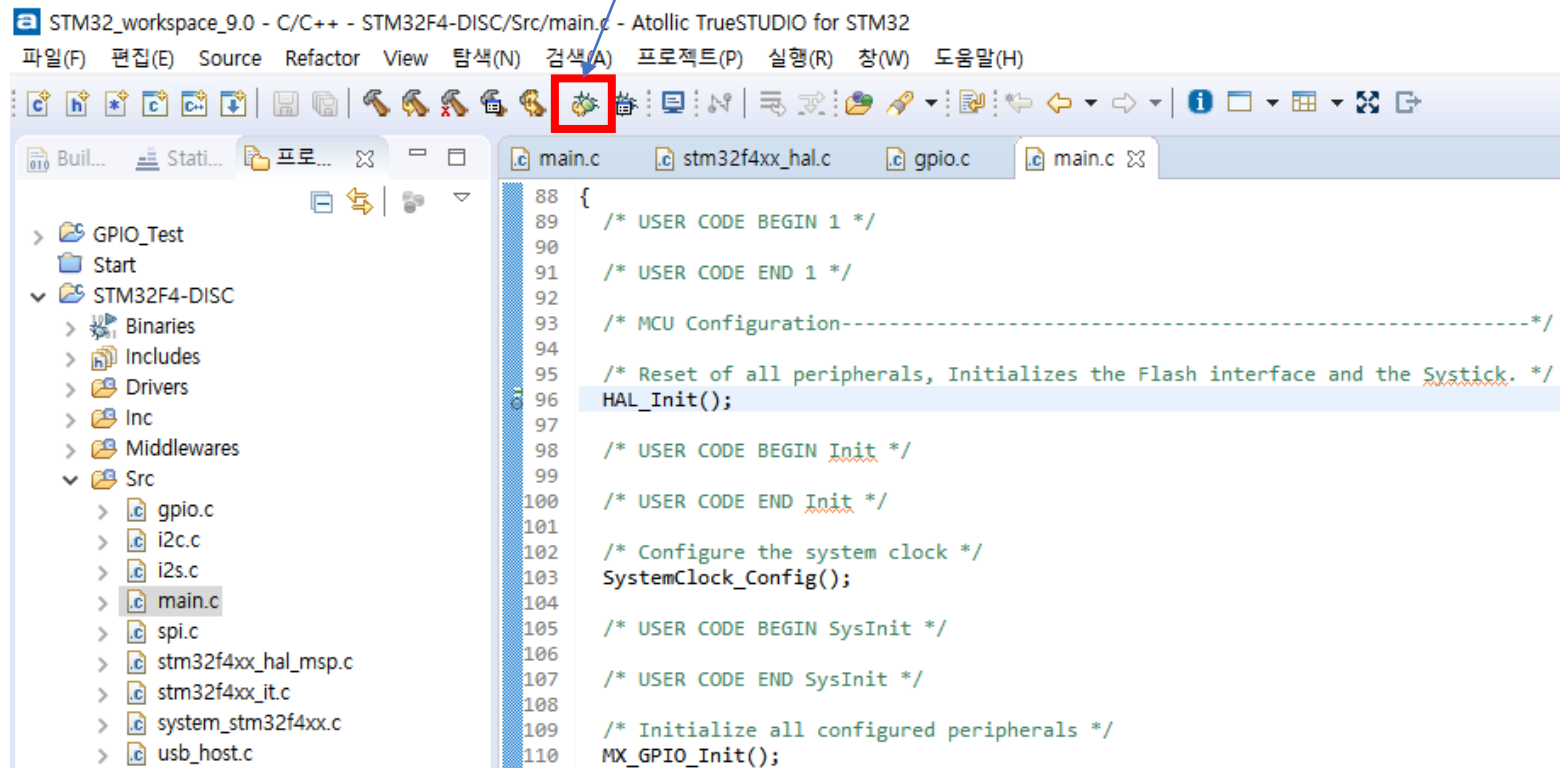


- 소스 코드 다운로드 하기

PC - STM 평가 보드 연결



디버깅 클릭!



시작 버튼 클릭

종료

