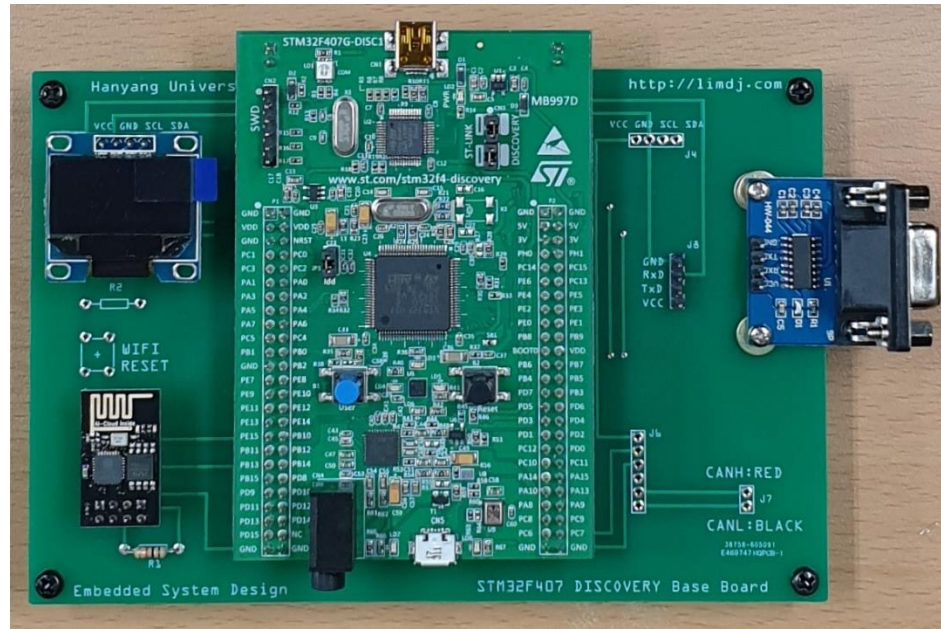


Lab Cortex-M4: Serial WIFI

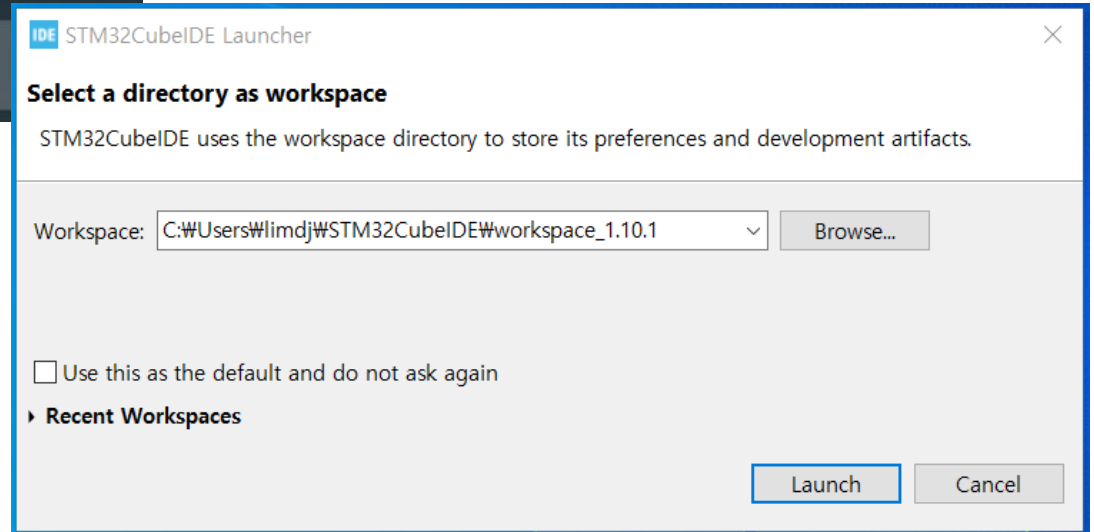
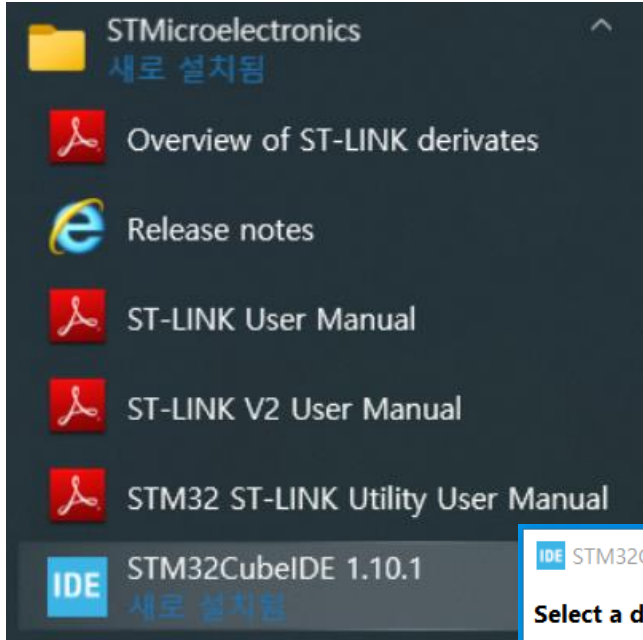


Cortex-M4 Board

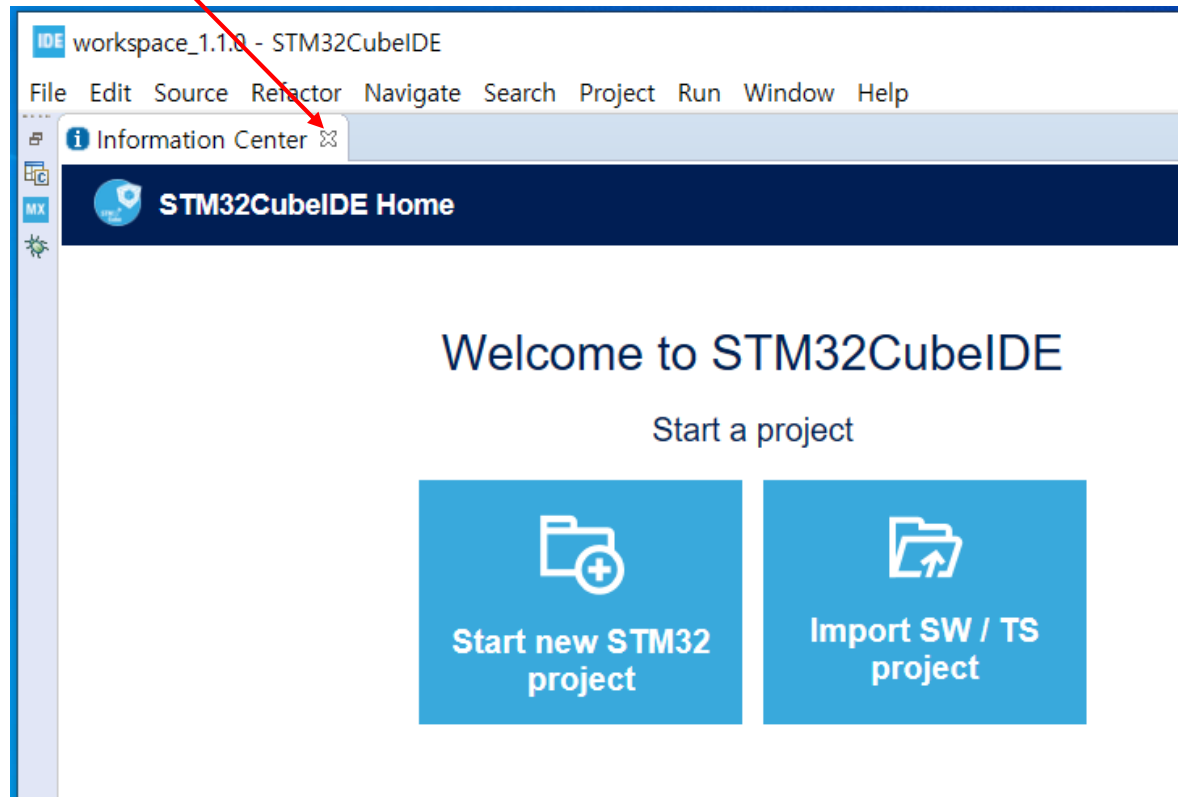
- STM32F407 Discovery Board
 - RS232C
 - Serial WIFI
 - 0.96 inch OLED graphic display
- On board ST-LINK JTAG debugging interface



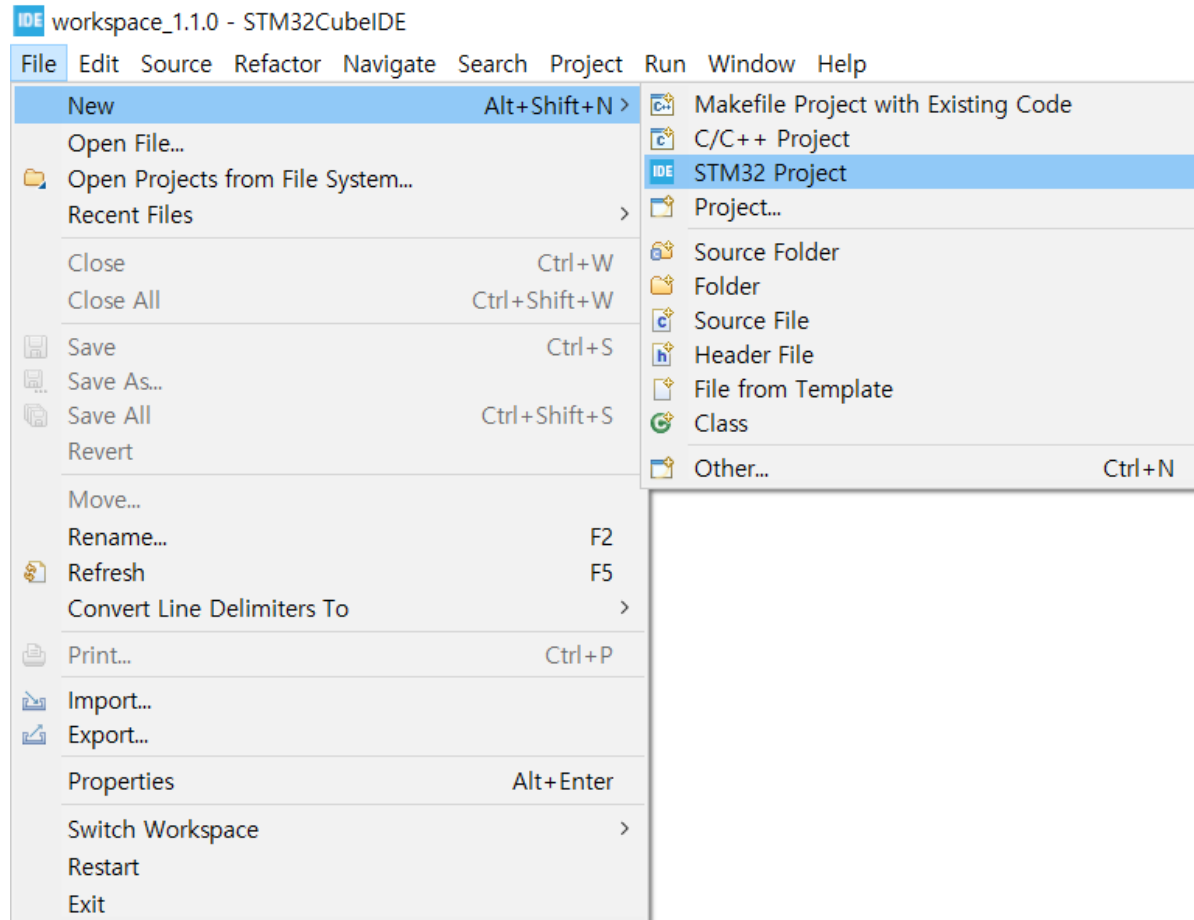
Start STM32CubeIDE



- Click X to close



New STM32 Project



Select Board (Not MCU)

■ Select Board Selector

The screenshot shows the STM32 Project IDE interface. The 'Board Selector' tab is highlighted with a red box. The interface includes filters for Board Filters and MCU/MPU Series, a search bar, and a list of boards with columns for Overview, Part No, Type, Marketing Status, Unit Price (US\$), and Mounted Device.




Board Filters

- Part Number Search
- Vendor
- Type
- Check/Uncheck All
- Discovery kit
- Evaluation Board
- Nucleo USB Dongle
- Nucleo-RF Kit
- Nucleo144
- Nucleo32
- Nucleo64

MCU/MPU Series

- Check/Uncheck All
- STM32F0
- STM32F1
- STM32F2
- STM32F3
- STM32F4
- STM32F7

Boards List: 7 items

| * | Overview | Part No | Type | Marketing Status | Unit Price (US\$) | Mounted Device |
|---|---|------------------|---------------|------------------|-------------------|-------------------------------|
| ☆ |  | 32F469IDISCOVERY | Discovery kit | Active | 59.0 | STM32F469NHx |
| ☆ |  | STM32F401C-DISCO | Discovery kit | | 0.0 | STM32F401VCTx |
| ☆ |  | STM32F4DISCOVERY | Discovery kit | Active | 19.89 | STM32F407VGTx |

■ Select STM32F4DISCOVERY and click Next

The screenshot shows the 'Target Selection' window in the IDE. The 'Board Selector' tab is selected, displaying a list of boards on the left and a detailed view of the selected board on the right. The 'Next >' button is highlighted in the bottom navigation bar.

Target Selection
Select STM32 target or STM32Cube example

MCU/MPU Selector | **Board Selector** | Example Selector | Cross Selector

Type

- Discovery Kit
- Evaluation Board
- Evaluation Kit
- Nucleo USB Dongle
- Nucleo-144
- Nucleo-32
- Nucleo-64
- Nucleo-RF Kit

MCU/MPU Series

- STM32F0
- STM32F1
- STM32F2
- STM32F3
- STM32F4

STM32F4 Series

STM32F407G-DISC1 **STMicroelectronics STM32F407G Discovery Kit Board Support and Examples**

ACTIVE Active
Product is in mass production

Part Number : STM32F4DISCOVERY
Commercial Part Number : STM32F407G-DISC1

Unit Price (US\$) : **19.89**
Mounted Device : [STM32F407VGTx](#)

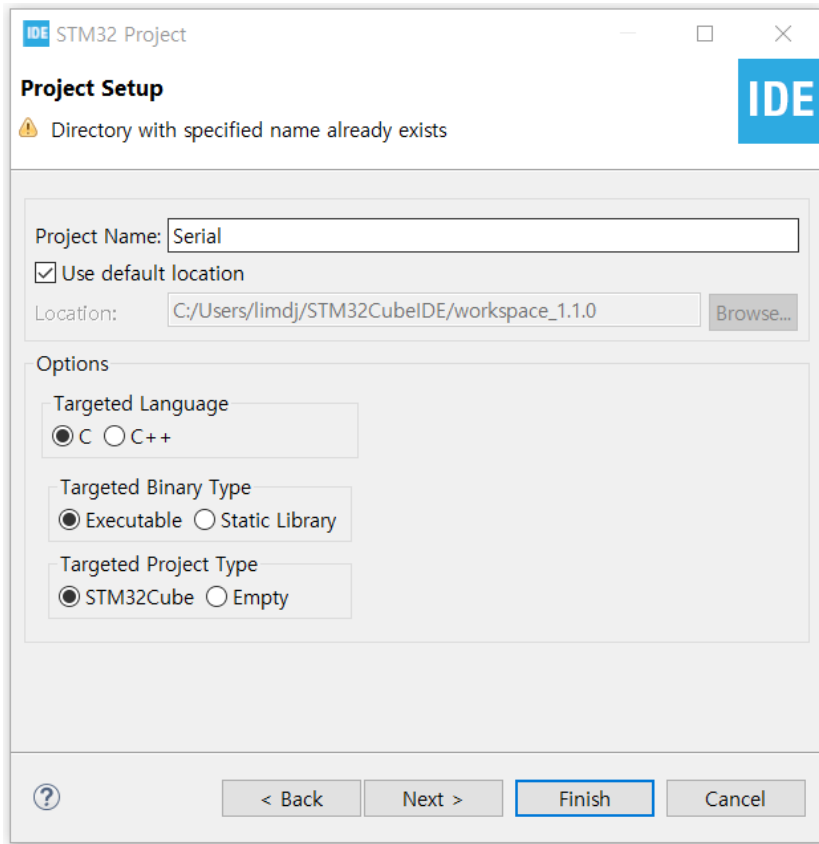
The STM32F4DISCOVERY Discovery kit leverages the capabilities of the STM32F407 high-performance microcontrollers, to allow users to develop audio applications easily. It includes an ST-LINK/V2-A embedded debug tool, one ST-MEMS digital

Boards List: 7 items

| | Overview | Commercial Part No | Type | Marketing Sta... | Unit Price (US... | Mounted Dev... |
|---|----------|--------------------|-----------|------------------|-------------------|----------------|
| ☆ | | STM32F407G-DISC1 | Discov... | Active | 19.89 | STM32F407VGTx |
| | | STM32F407G-DISC1 | Discov... | Active | 19.89 | STM32F407VGTx |

< Back | **Next >** | Finish | Cancel

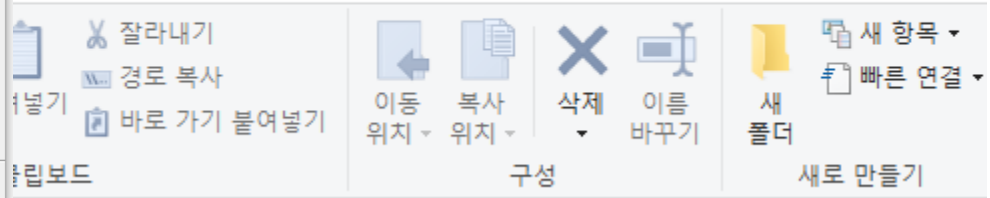
Project Name



- 이 화면에서 Next를 누르면 다음 화면이 나오고, Finish를 누르면 설정이 끝남

space_1.6.0

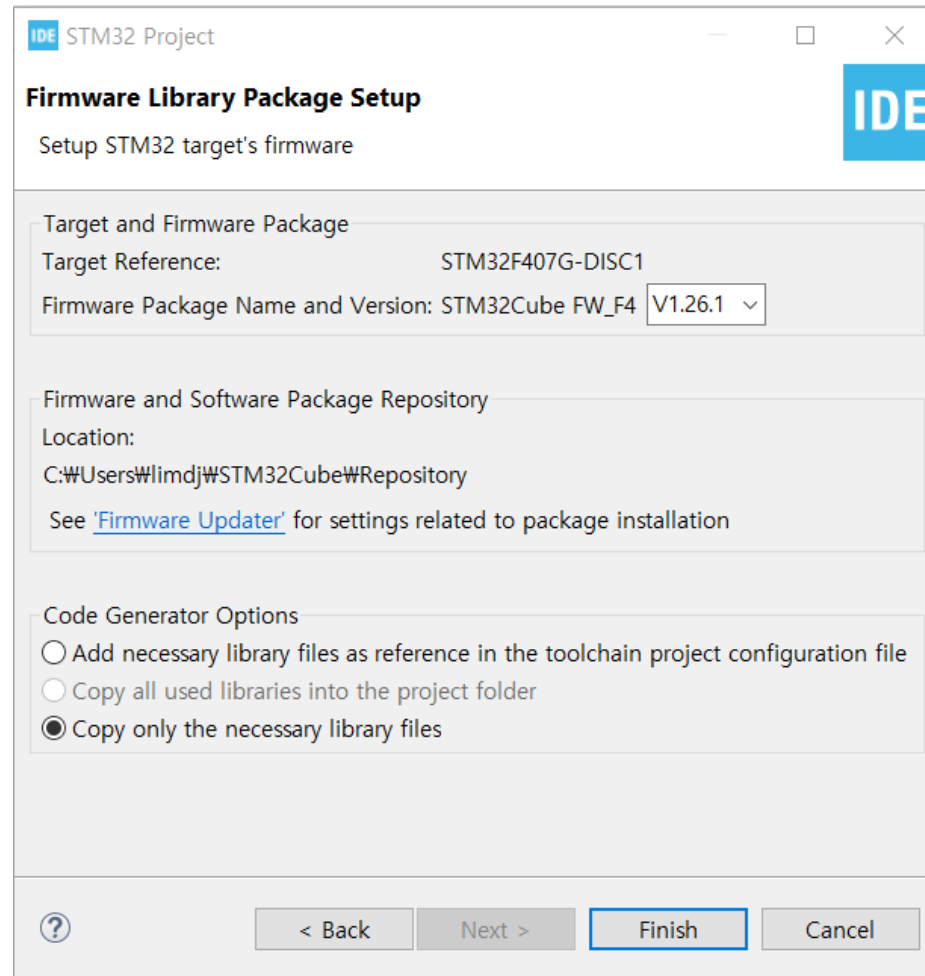
보기



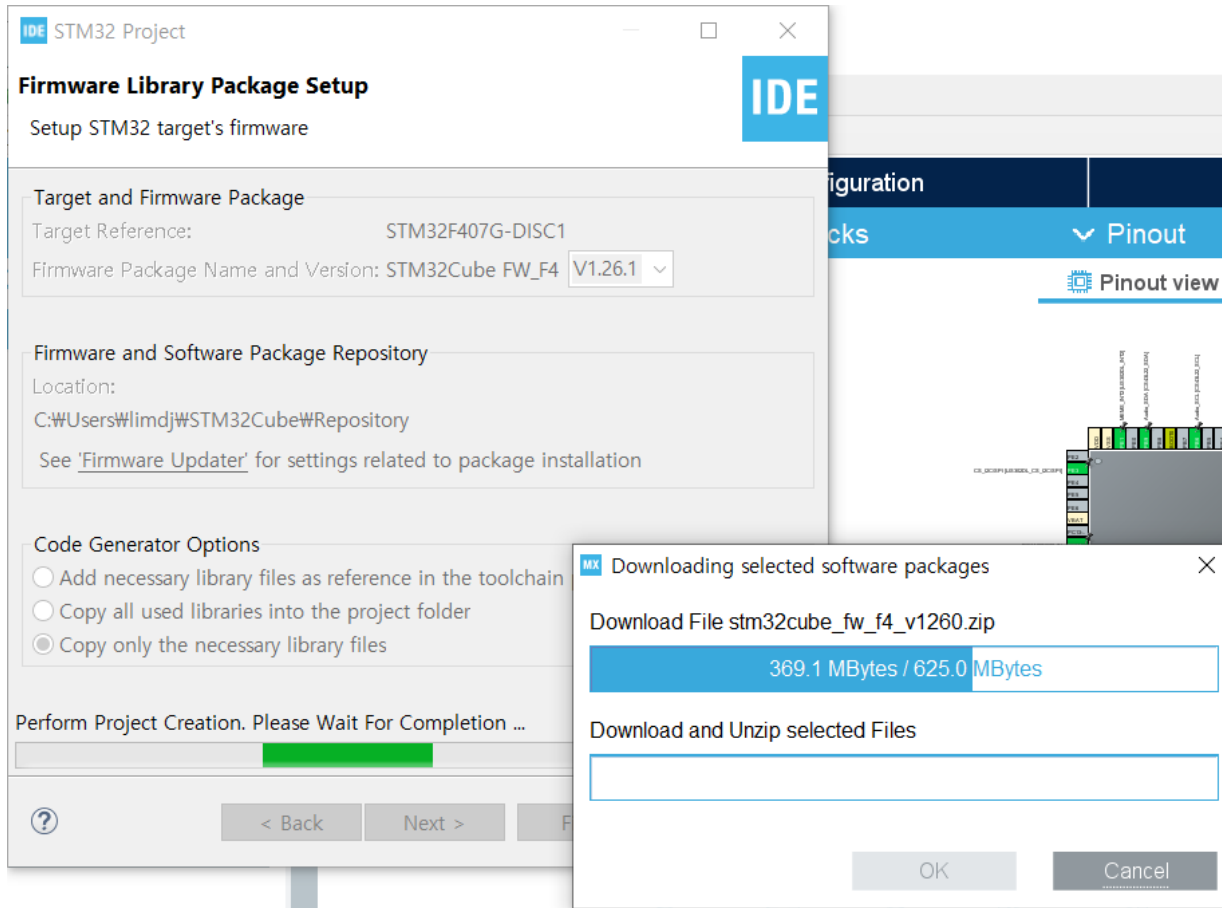
내 PC > 로컬 디스크 (C:) > 사용자 > limdj > STM32CubeIDE > workspace_1.6.0

| 이름 | 수정한 날짜 | 유형 |
|------------|---------------------|-------|
| Serial | 2021-05-01 오후 6:17 | 파일 폴더 |
| nucleo | 2021-03-28 오후 7:30 | 파일 폴더 |
| 407Can500K | 2021-03-14 오후 3:15 | 파일 폴더 |
| 407oled | 2021-03-11 오전 8:24 | 파일 폴더 |
| .metadata | 2021-03-05 오전 10:58 | 파일 폴더 |

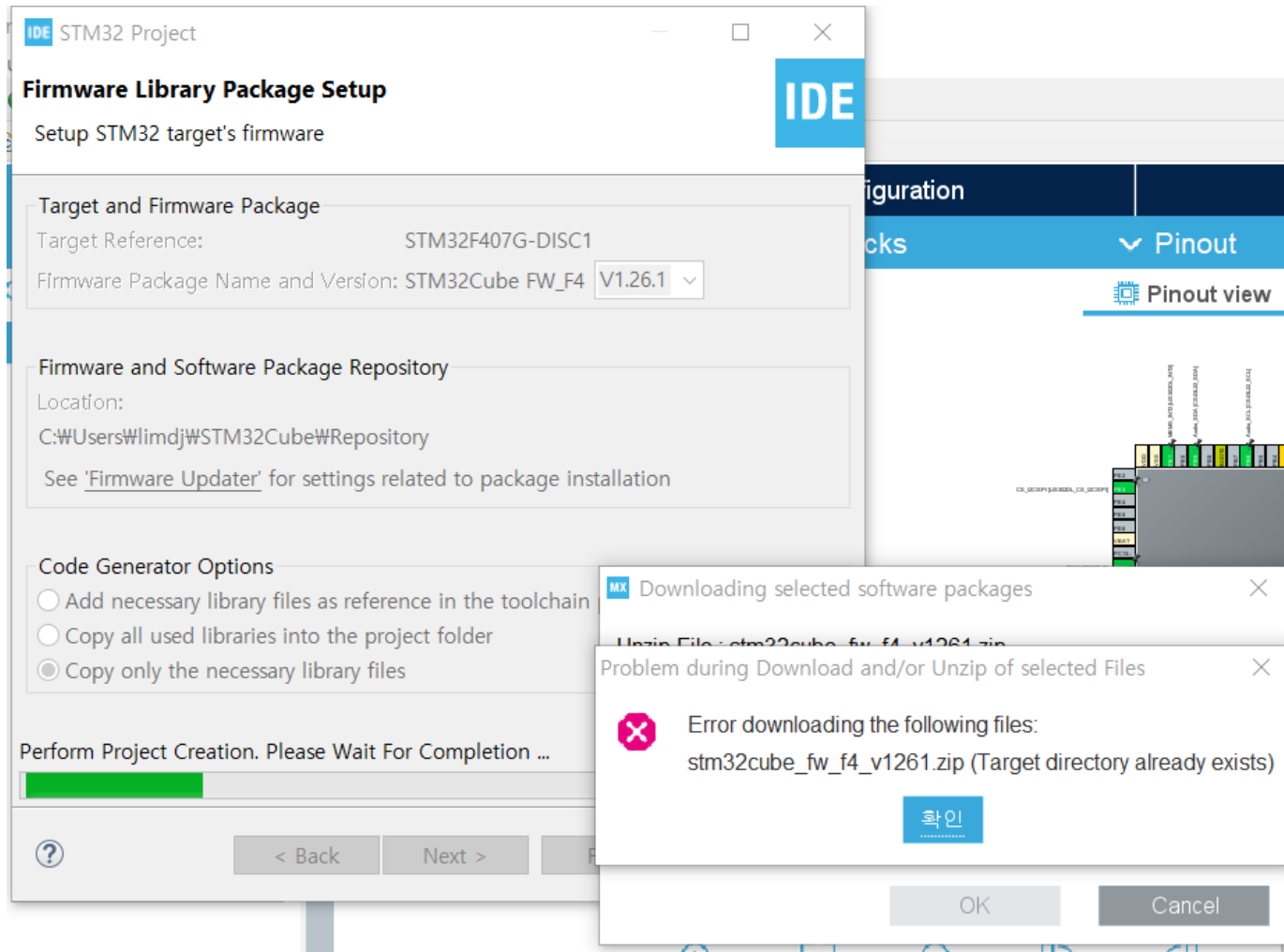
- 이전 화면에서 Next를 누르면 이 화면이 나옴
- Firmware Package Version check를 위해서 필요함



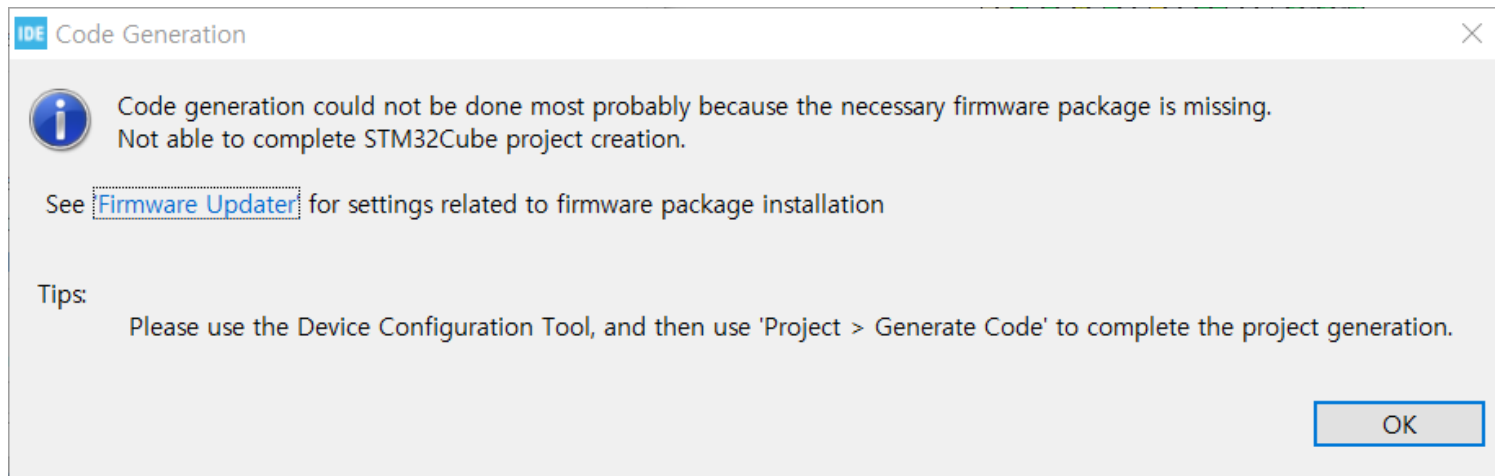
- **필수** **Firmware Package**가 없으면 다운 로드가 진행



■ 종종 아래와 같은 에러가 발생할 수 있음



- 앞의 화면과 같이 다운 로드에서 에러가 발생할 경우 OK를 누르고 수동으로 설치를 진행해야 함



- 아래의 디렉토리에서 필요한 Firmware Package 디렉토리가 존재하는지 확인하고 없으면 압축을 풀어야 함

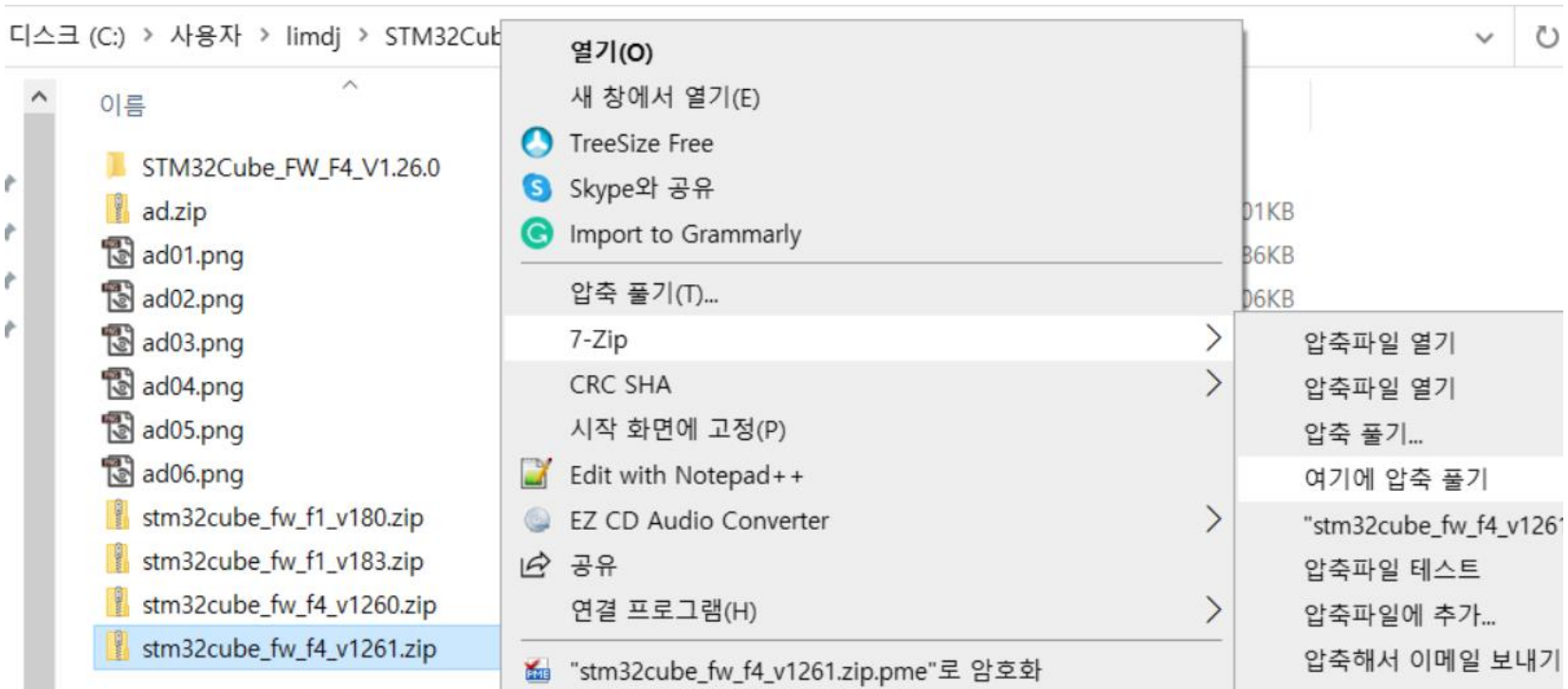
로컬 디스크 (C:) > 사용자 > limdj > STM32Cube > Repository

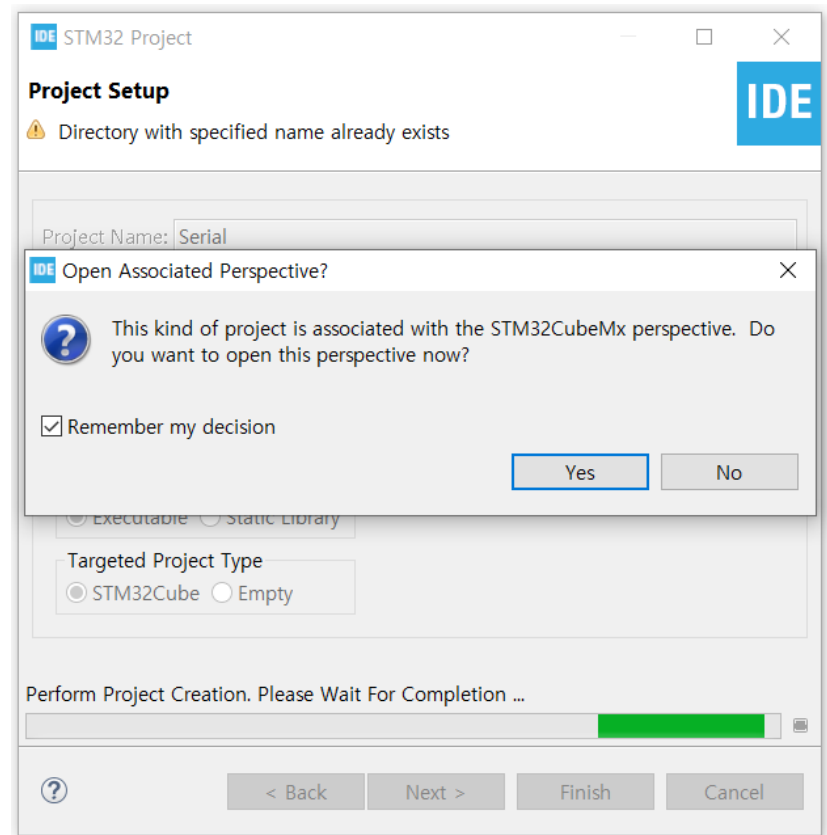
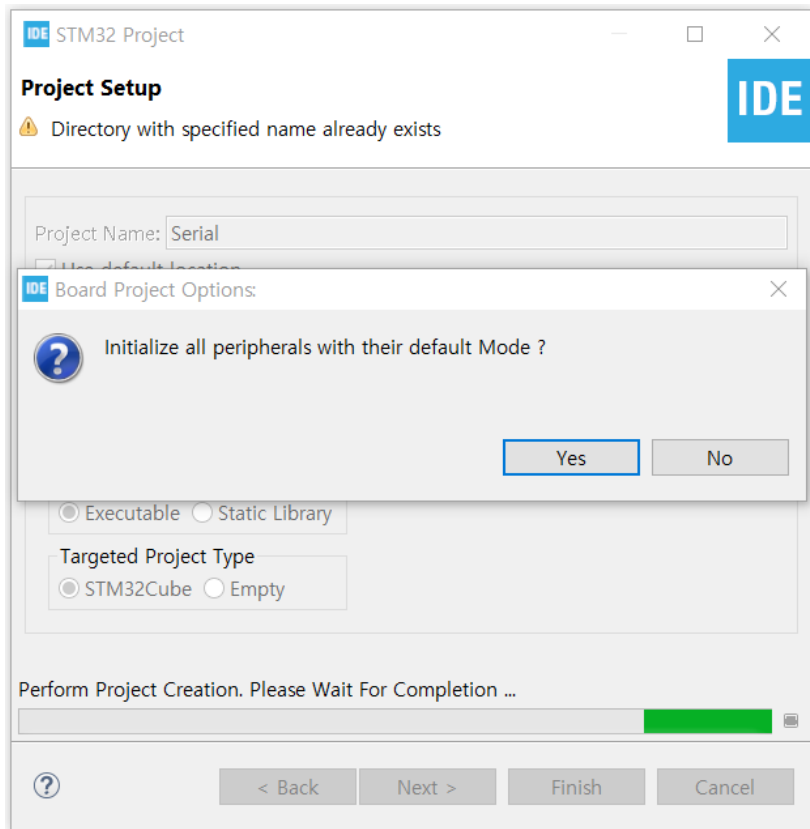
| 이름 | 수정한 날짜 | 유형 | 크기 |
|---------------------------|--------------------|--------------------|-----------|
| STM32Cube_FW_F4_V1.26.0 | 2021-03-26 오전 2:31 | 파일 폴더 | |
| ad.zip | 2021-05-01 오후 6:13 | 압축(ZIP) 폴더 | 701KB |
| ad01.png | 2021-05-01 오후 6:13 | ACDSee 20 PNG I... | 86KB |
| ad02.png | 2021-05-01 오후 6:13 | ACDSee 20 PNG I... | 106KB |
| ad03.png | 2021-05-01 오후 6:13 | ACDSee 20 PNG I... | 109KB |
| ad04.png | 2021-05-01 오후 6:13 | ACDSee 20 PNG I... | 88KB |
| ad05.png | 2021-05-01 오후 6:13 | ACDSee 20 PNG I... | 107KB |
| ad06.png | 2021-05-01 오후 6:13 | ACDSee 20 PNG I... | 230KB |
| stm32cube_fw_f1_v180.zip | 2021-03-28 오후 7:30 | 압축(ZIP) 폴더 | 112,452KB |
| stm32cube_fw_f1_v183.zip | 2021-03-28 오후 7:30 | 압축(ZIP) 폴더 | 38,972KB |
| stm32cube_fw_f4_v1260.zip | 2021-05-01 오후 7:07 | 압축(ZIP) 폴더 | 639,331KB |
| stm32cube_fw_f4_v1261.zip | 2021-05-01 오후 7:09 | 압축(ZIP) 폴더 | 2,086KB |

■ 여기에 압축 풀기



- 만약 마이너 버전 업데이트가 있으면 아래와 같이 업데이트 파일의 압축을 풀며, 이때 이전 설치 디렉토리에 덮어쓰게 되므로 **모두 덮어쓰기**를 선택해서 업데이트를 함





■ Enable USART2, USART3 (Mode: Asynchronous)

The screenshot displays the STM32CubeMX configuration interface for USART2. The 'Mode' is set to 'Asynchronous' and 'Hardware Flow Control (RS232)' is set to 'Disable'. The configuration parameters are as follows:

| Category | Parameter | Value |
|---------------------|----------------|---------------------------|
| Basic Parameters | Baud Rate | 115200 Bits/s |
| | Word Length | 8 Bits (including Parity) |
| | Parity | None |
| | Stop Bits | 1 |
| Advanced Parameters | Data Direction | Receive and Transmit |

The Pinout view shows the USART2_TX pin connected to PA2 and USART2_RX to PA1. The device is identified as STM32F407VGTx LQFP100.

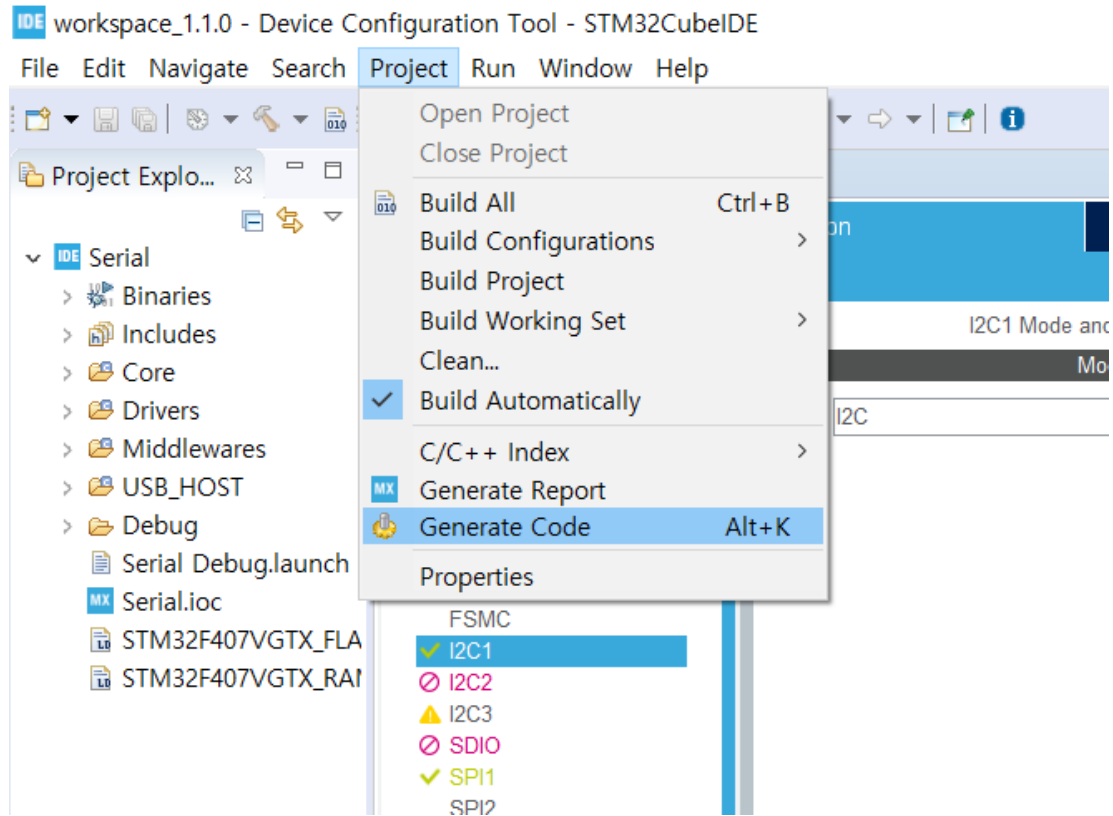
■ Check if I2C1 is enabled

The screenshot displays the STM32CubeMX software interface, specifically the 'Pinout & Configuration' tab. The 'I2C1 Mode and Configuration' window is open, showing the 'Mode' set to 'I2C'. The 'Configuration' section is active, with 'Parameter Settings' selected. The 'Configure the below parameters' section shows the following settings:

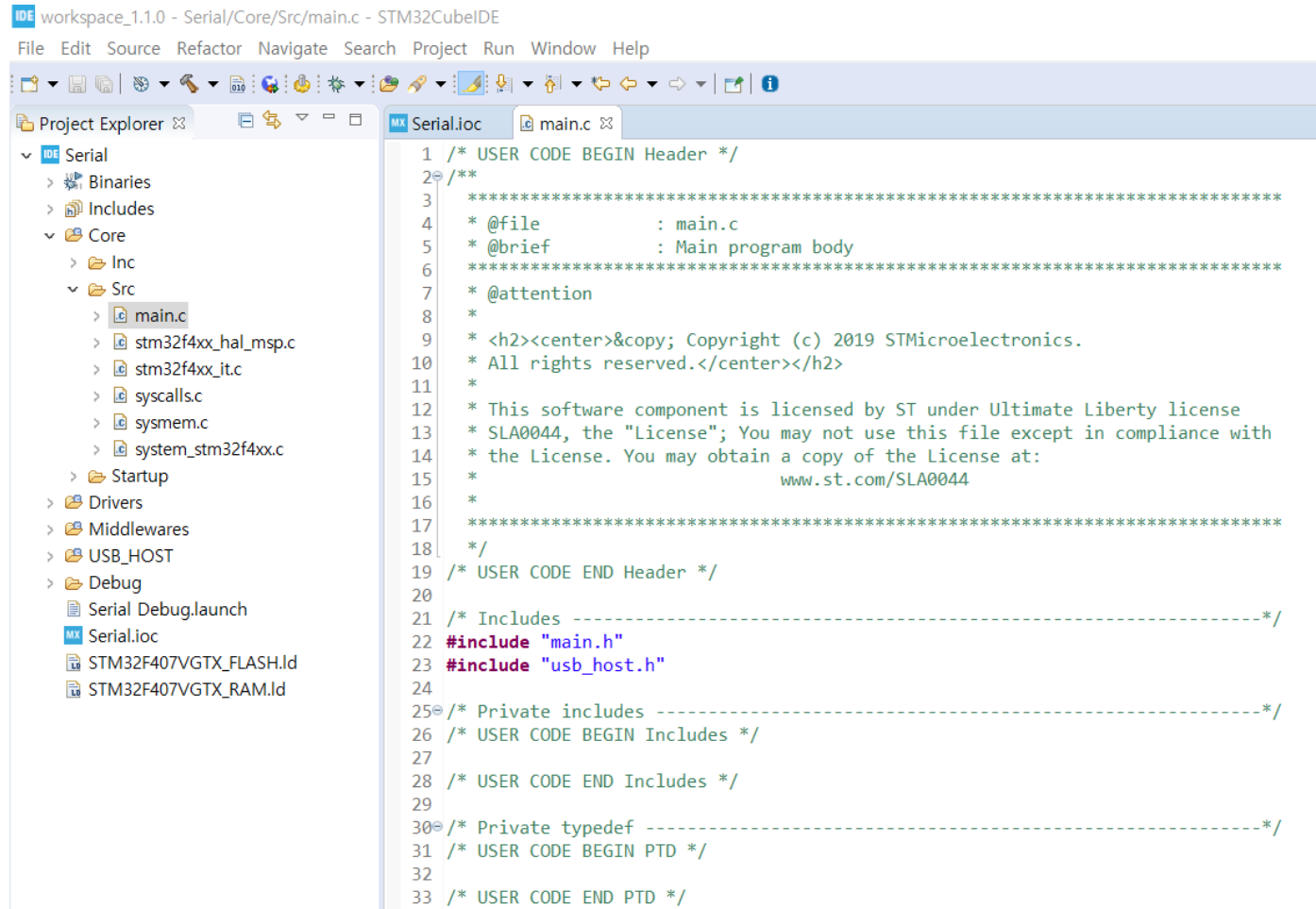
- Master Features:**
 - I2C Speed Mode: Standard Mode
 - I2C Clock Speed (Hz): 100000
- Slave Features:**
 - Clock No Stretch Mode: Disabled
 - Primary Address Length: 7-bit
 - Dual Address Acknowledged: Disabled

The left sidebar shows the 'Connectivity' tree with 'I2C1' selected. The right side of the image shows a pinout diagram for the STM32F407VGTx LQFP100 package, with various pins labeled and color-coded.

Generate Code

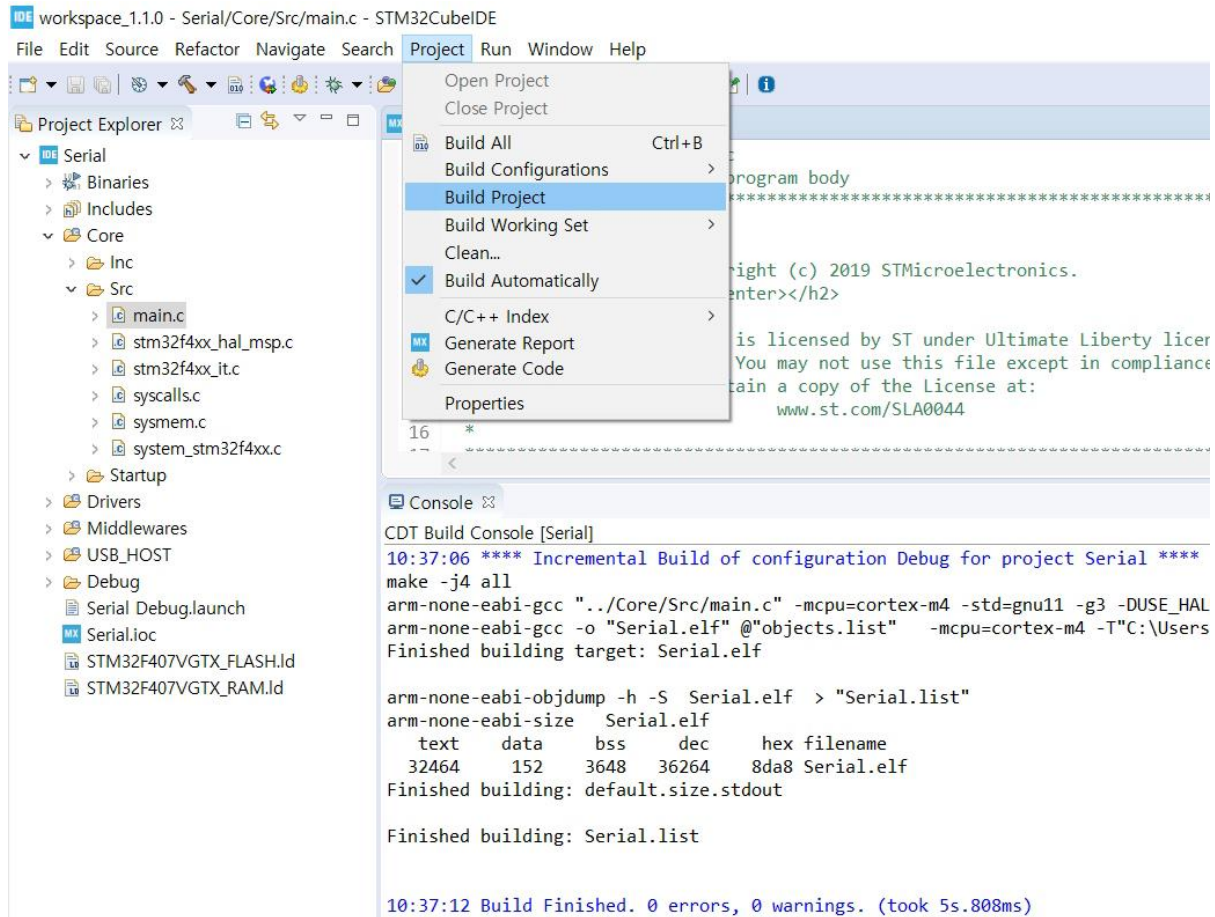


■ Open main.c



```
workspace_1.1.0 - Serial/Core/Src/main.c - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
Serial
  Binaries
  Includes
  Core
    Inc
    Src
      main.c
      stm32f4xx_hal_msp.c
      stm32f4xx_it.c
      syscalls.c
      systemem.c
      system_stm32f4xx.c
    Startup
  Drivers
  Middlewares
  USB_HOST
  Debug
    Serial Debug.launch
    Serial.ioc
    STM32F407VGTX_FLASH.Id
    STM32F407VGTX_RAM.Id
Serial.ioc
main.c
1 /* USER CODE BEGIN Header */
2 /**
3  * *****
4  * @file      : main.c
5  * @brief     : Main program body
6  * *****
7  * @attention
8  *
9  * <h2><center>&copy; Copyright (c) 2019 STMicroelectronics.
10 * All rights reserved.</center></h2>
11 *
12 * This software component is licensed by ST under Ultimate Liberty license
13 * SLA0044, the "License"; You may not use this file except in compliance with
14 * the License. You may obtain a copy of the License at:
15 *
16 *          www.st.com/SLA0044
17 * *****
18 */
19 /* USER CODE END Header */
20
21 /* Includes -----*/
22 #include "main.h"
23 #include "usb_host.h"
24
25 /* Private includes -----*/
26 /* USER CODE BEGIN Includes */
27
28 /* USER CODE END Includes */
29
30 /* Private typedef -----*/
31 /* USER CODE BEGIN PTD */
32
33 /* USER CODE END PTD */
```

Build Project



workspace_1.1.0 - Serial/Core/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigate Search Project Run Window Help

Project Explorer

- Serial
 - Binaries
 - Includes
 - Core
 - Inc
 - Src
 - main.c
 - stm32f4xx_hal_msp.c
 - stm32f4xx_it.c
 - syscalls.c
 - systemem.c
 - system_stm32f4xx.c
 - Startup
 - Drivers
 - Middlewares
 - USB_HOST
 - Debug
 - Serial Debug.launch
 - Serial.ioc
 - STM32F407VGTX_FLASH.ld
 - STM32F407VGTX_RAM.ld

Console

```
CDT Build Console [Serial]
10:37:06 **** Incremental Build of configuration Debug for project Serial ****
make -j4 all
arm-none-eabi-gcc "../Core/Src/main.c" -mcpu=cortex-m4 -std=gnu11 -g3 -DUSE_HAL
arm-none-eabi-gcc -o "Serial.elf" @"objects.list" -mcpu=cortex-m4 -T"C:\Users
Finished building target: Serial.elf

arm-none-eabi-objdump -h -S Serial.elf > "Serial.list"
arm-none-eabi-size Serial.elf
text data bss dec hex filename
32464 152 3648 36264 8da8 Serial.elf
Finished building: default.size.stdout

Finished building: Serial.list

10:37:12 Build Finished. 0 errors, 0 warnings. (took 5s.808ms)
```

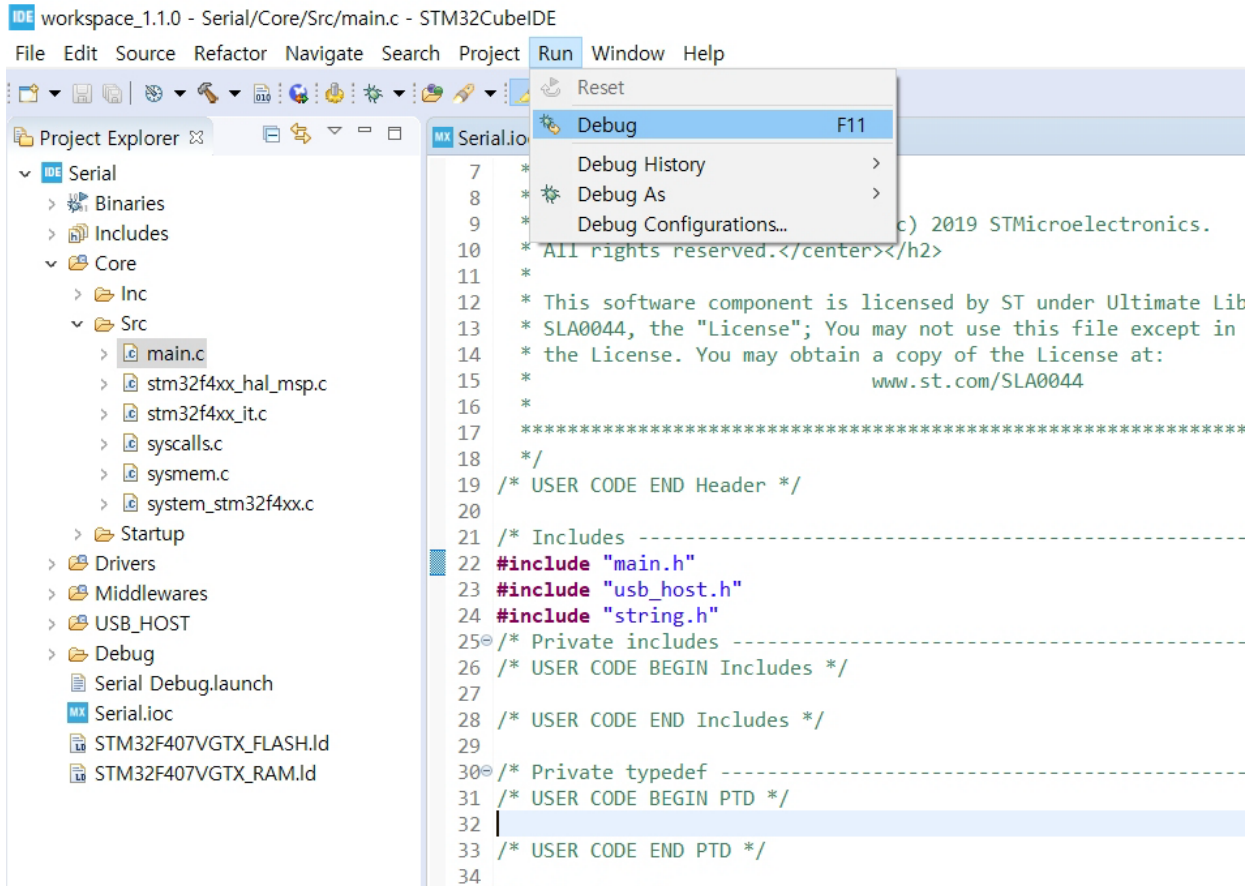
```
/* Private includes ----- */
/* USER CODE BEGIN Includes */
#include "string.h"
/* USER CODE END Includes */
```

```
/* Private user code ----- */
/* USER CODE BEGIN 0 */
void PrintString(uint8_t * string)
{
    HAL_UART_Transmit(&huart2, (uint8_t *)string, strlen((char *)string), 0xffff);
}
/* USER CODE END 0 */
```

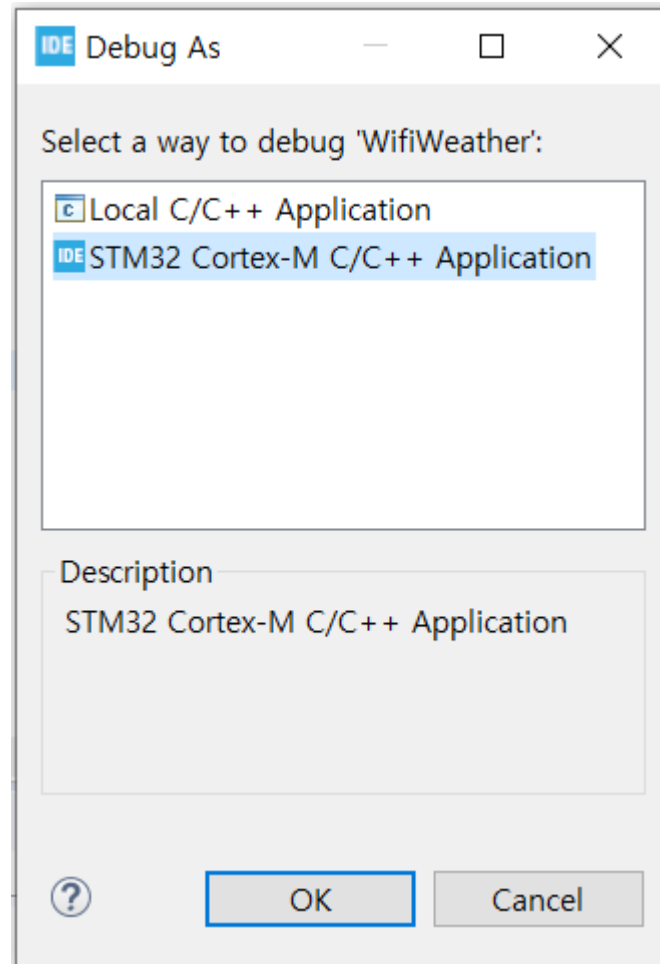
```
/* USER CODE BEGIN 2 */
    PrintString((uint8_t *)"Hello Cortex-M\n\r");
/* USER CODE END 2 */
```

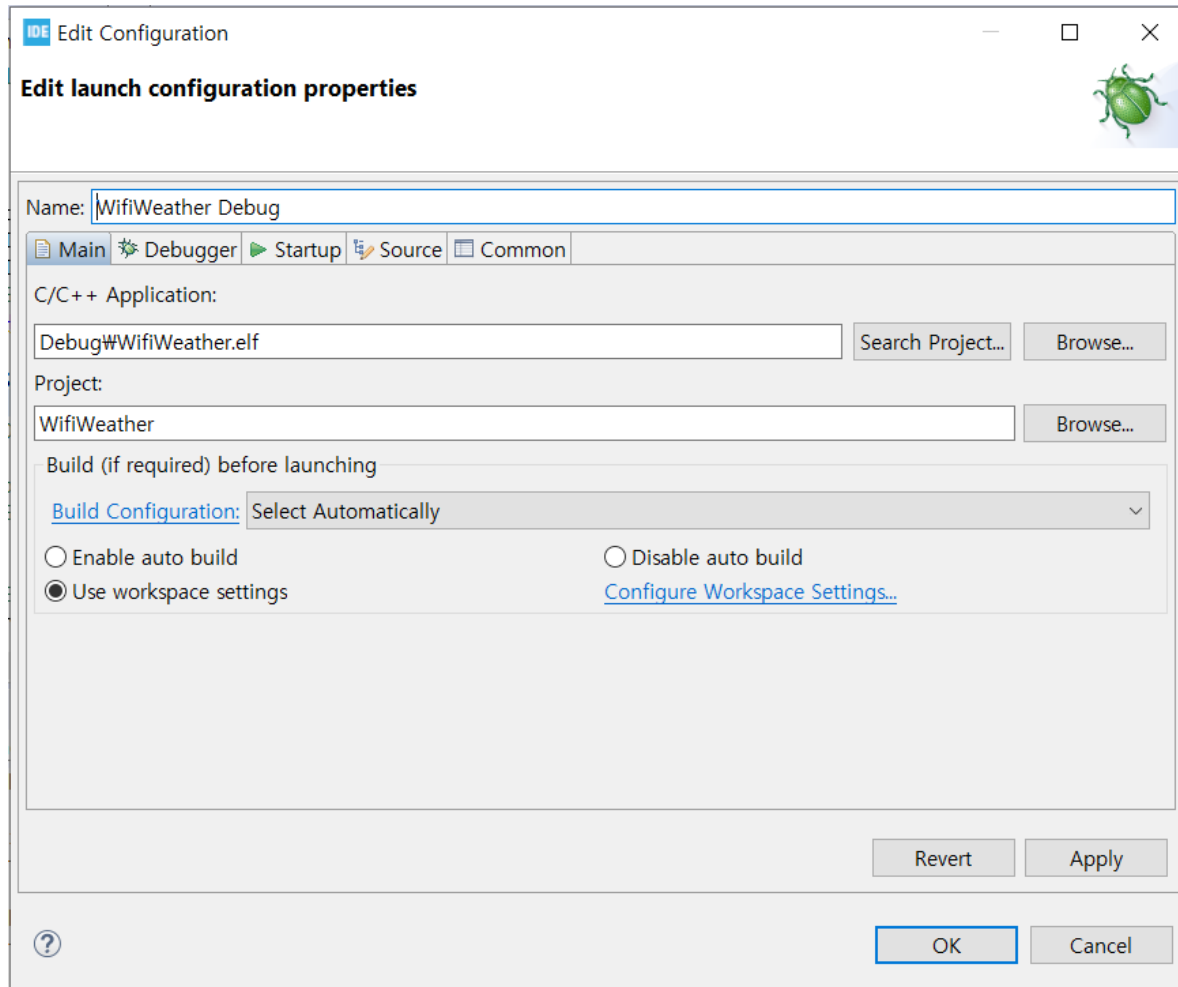
```
Serial.ioc  main.c  usbh_core.c
84 int main(void)
85 {
86     /* USER CODE BEGIN 1 */
87
88     /* USER CODE END 1 */
89
90
91     /* MCU Configuration-----*/
92
93     /* Reset of all peripherals, Initializes the Flash interface and the Systick. */
94     HAL_Init();
95
96     /* USER CODE BEGIN Init */
97
98     /* USER CODE END Init */
99
100    /* Configure the system clock */
101    SystemClock_Config();
102
103    /* USER CODE BEGIN SysInit */
104
105    /* USER CODE END SysInit */
106
107    /* Initialize all configured peripherals */
108    MX_GPIO_Init();
109    MX_I2C1_Init();
110    MX_I2S3_Init();
111    MX_SPI1_Init();
112    MX_USB_HOST_Init();
113    MX_USART2_UART_Init();
114    MX_USART3_UART_Init();
115    /* USER CODE BEGIN 2 */
116    PrintString((uint8_t *) "Hello Cortex-M\n\r");
117    /* USER CODE END 2 */
118
```

Run Debug

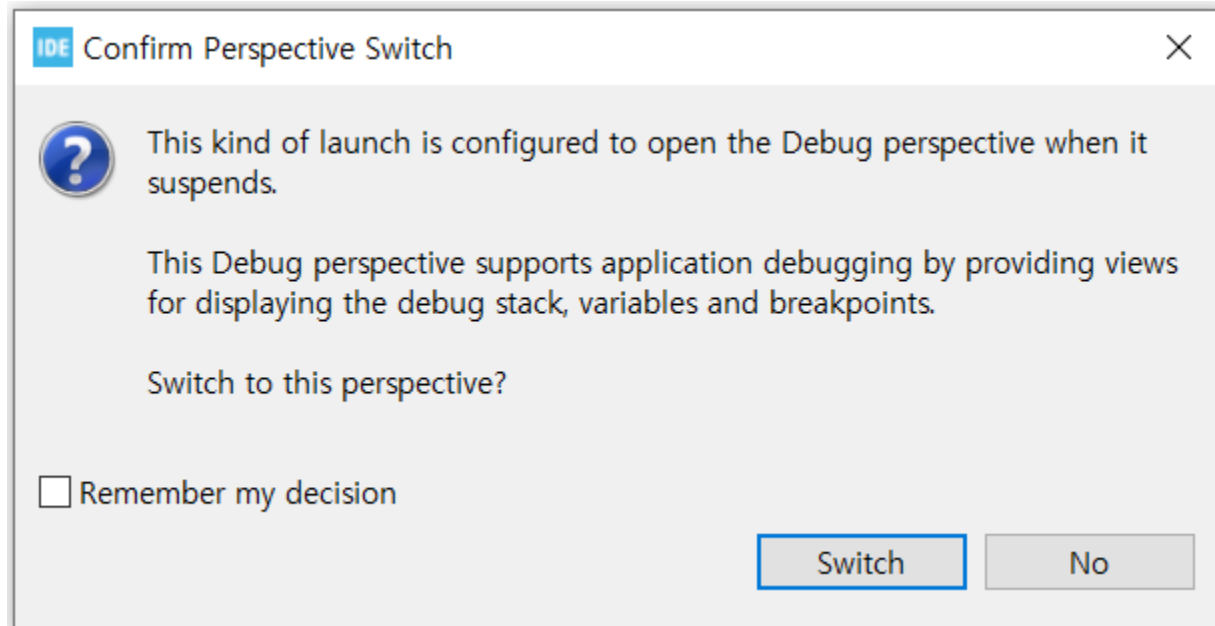


- 이 화면은 안 나와도 상관 없음





- Remember my decision check
- Switch



workspace_1.1.0 - Serial/Core/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigate Search Project Run Window Help

Debug Project Explorer

Serial Debug [STM32 Cortex-M C/C++ Appli
Serial.elf [cores: 0]
Thread #1 [main] 1 [core: 0] (Suspende
main() at main.c:94 0x8000508
Reset_Handler() at startup_stm32f407
C:/ST/STM32CubeIDE_1.1.0/STM32CubeID
ST-LINK (ST-LINK GDB server)

```
84 int main(void)
85 {
86     /* USER CODE BEGIN 1 */
87
88     /* USER CODE END 1 */
89
90
91     /* MCU Configuration-----*/
92
93     /* Reset of all peripherals, Initializes the Flash interface and the Systick. */
94     HAL_Init();
95
96     /* USER CODE BEGIN Init */
97
98     /* USER CODE END Init */
99
100    /* Configure the system clock */
101    SystemClock_Config();
```

Console Problems Executables Debugger Console Memory

Serial Debug [STM32 Cortex-M C/C++ Application] ST-LINK (ST-LINK GDB server)

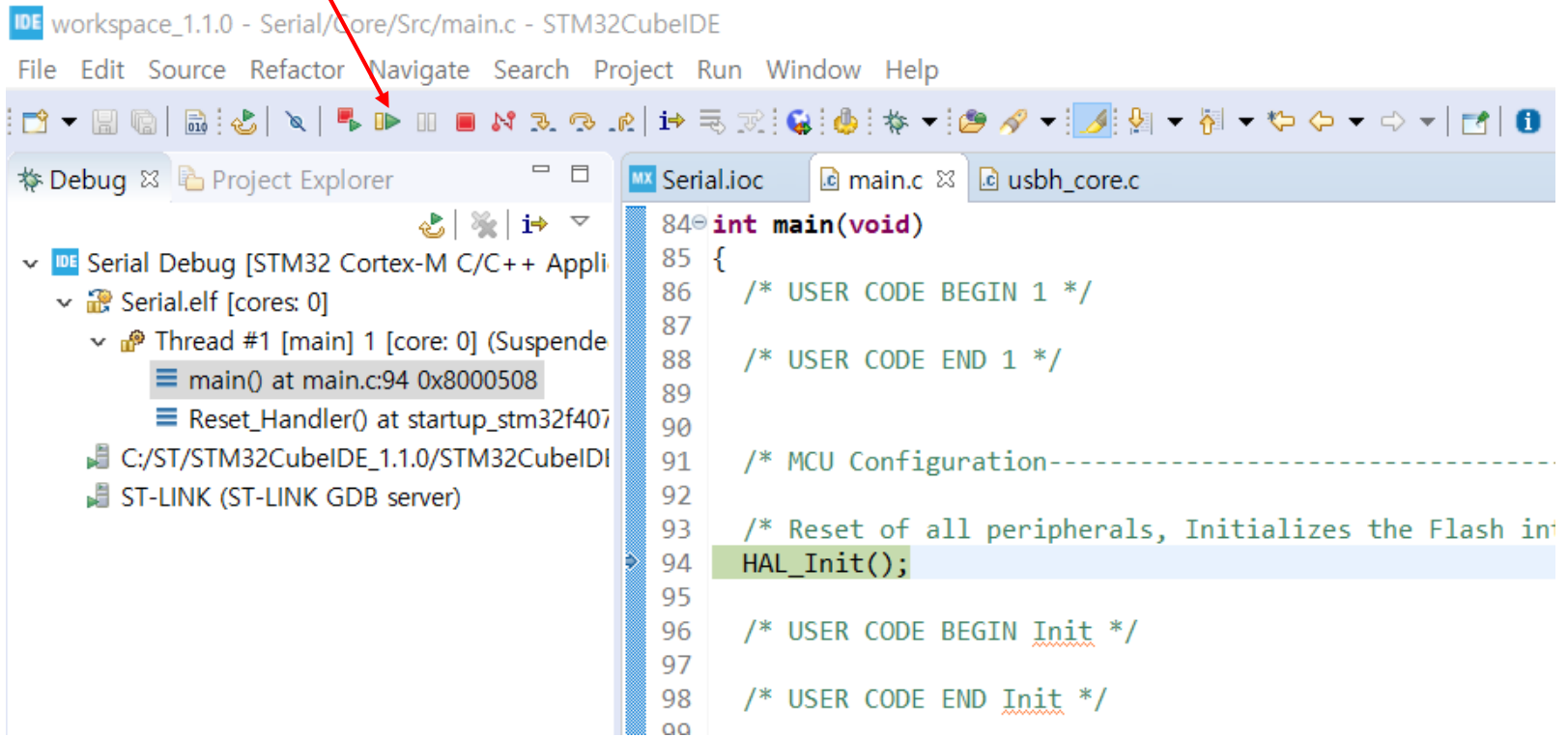
Erasing memory corresponding to segment 0:
Erasing internal memory sectors [0 1]
Download in Progress:

File download complete
Time elapsed during download operation: 00:00:01.301

Verifying ...

Download verified successfully

■ Resume



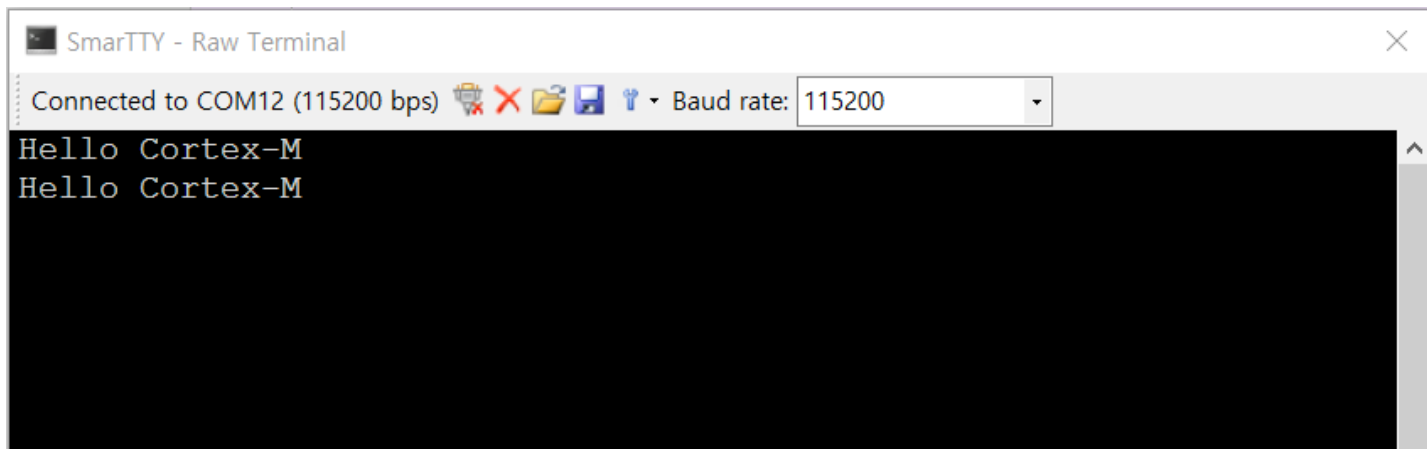
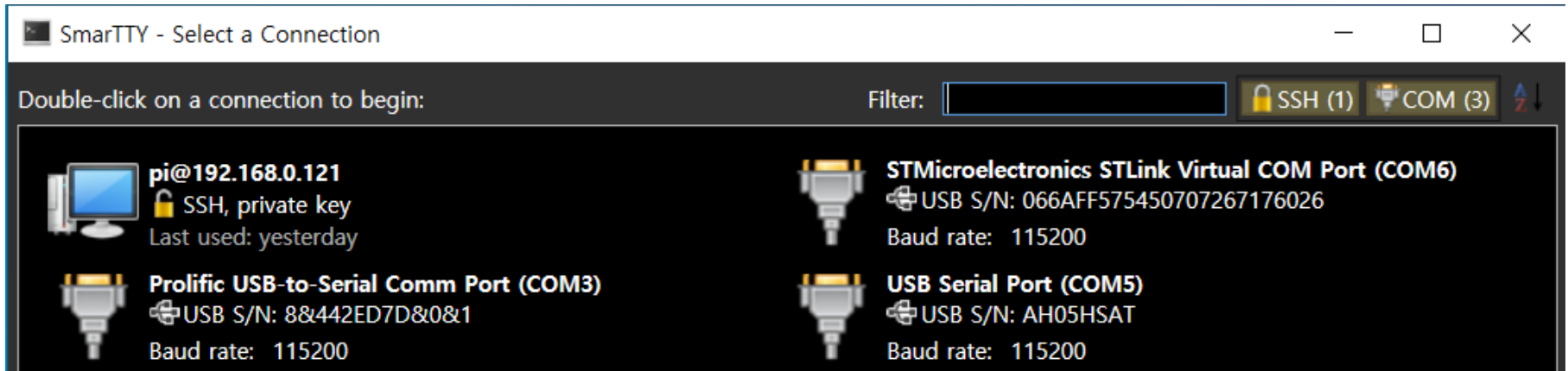
workspace_1.1.0 - Serial/Core/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigate Search Project Run Window Help

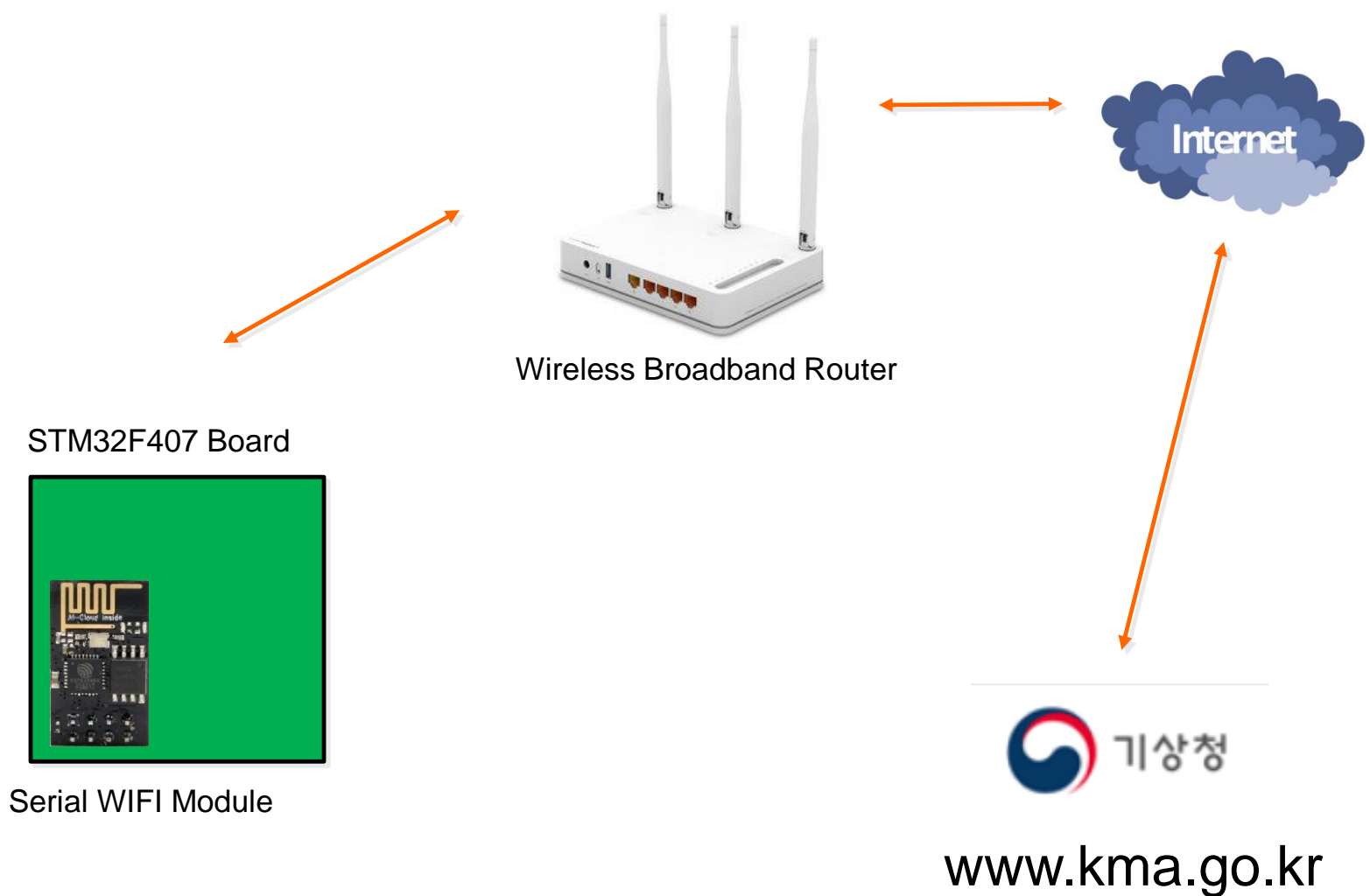
Debug Project Explorer

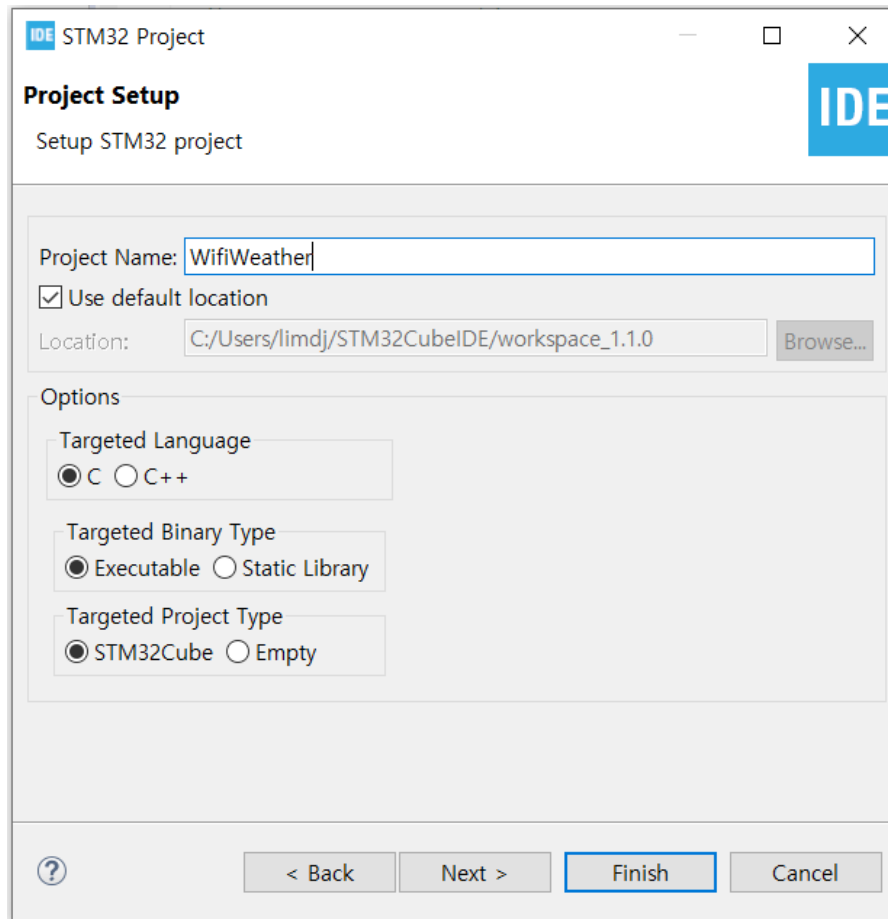
Serial Debug [STM32 Cortex-M C/C++ Appli
Serial.elf [cores: 0]
Thread #1 [main] 1 [core: 0] (Suspende
main() at main.c:94 0x8000508
Reset_Handler() at startup_stm32f407
C:/ST/STM32CubeIDE_1.1.0/STM32CubeIDI
ST-LINK (ST-LINK GDB server)

```
84 int main(void)
85 {
86     /* USER CODE BEGIN 1 */
87
88     /* USER CODE END 1 */
89
90
91     /* MCU Configuration-----
92
93     /* Reset of all peripherals, Initializes the Flash in
94     HAL_Init();
95
96     /* USER CODE BEGIN Init */
97
98     /* USER CODE END Init */
99
100
```



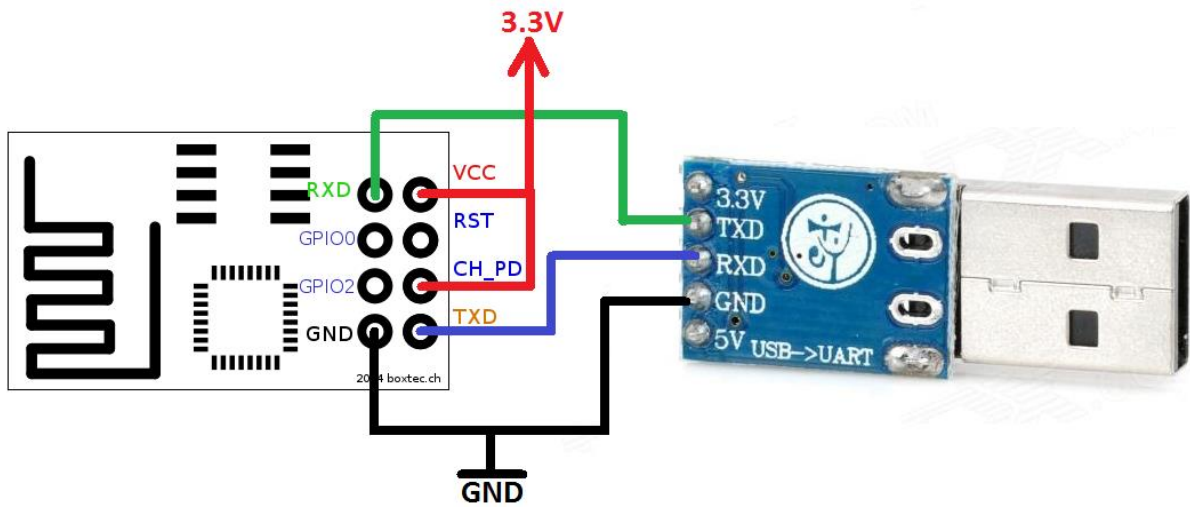
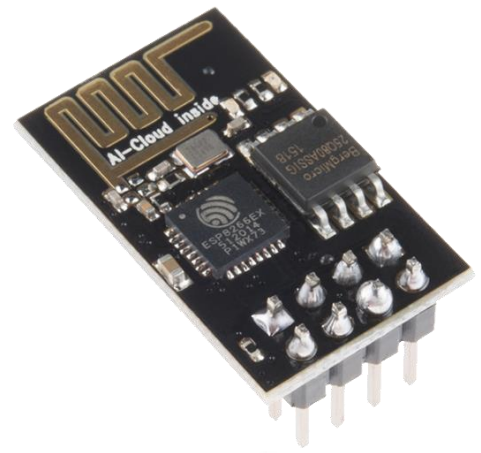
Exercise 1: Weather Forecast using WIFI Module





Serial WIFI Module

- ESP8266 ESP-01



ESP8266 AT Command Set

ESP8266 AT Command Set

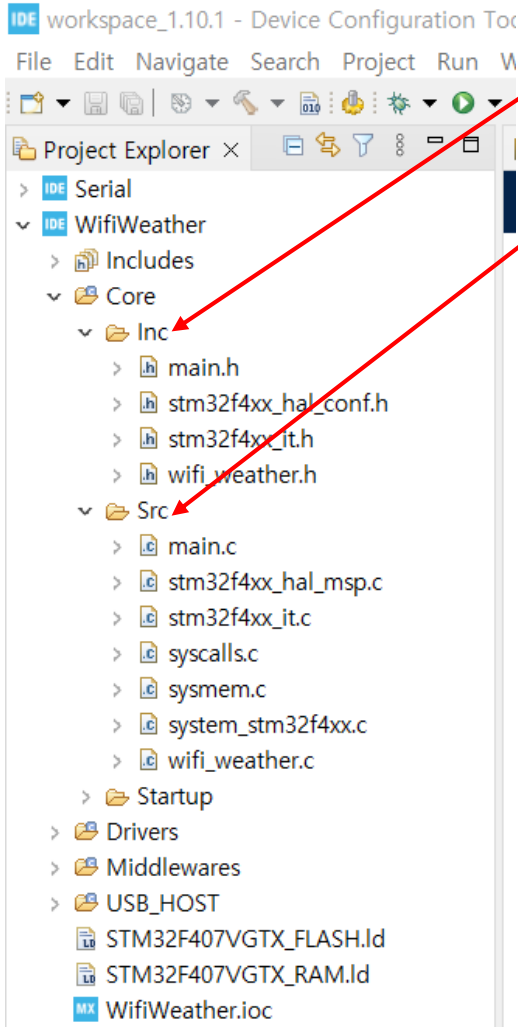
| <i>Function</i> | <i>AT Command</i> | <i>Response</i> |
|--------------------|---|--|
| Working | AT | OK |
| Restart | AT+RST | OK [System Ready, Vendor:www.ai-thinker.com] |
| Firmware version | AT+GMR | AT+GMR 0018000902 OK |
| List Access Points | AT+CWLAP | AT+CWLAP +CWLAP:(4,"RochefortSurLac",-38,"70:62:b8:6f:6d:58",1) +CWLAP:(4,"LiliPad2.4",-83,"f8:7b:8c:1e:7c:6d",1) OK |
| Join Access Point | AT+CWJAP? AT+CWJAP="SSID","Password" | Query AT+CWJAP? +CWJAP:"RochefortSurLac" OK |
| Quit Access Point | AT+CWQAP=? AT+CWQAP | Query OK |
| Get IP Address | AT+CIFSR | AT+CIFSR 192.168.0.105 OK |

ESP8266 AT Command Set

| | | |
|------------------------------|---|--|
| WiFi Mode | AT+CWMODE? AT+CWMODE=1 AT+CWMODE=2 AT+CWMODE=3 | Query STA AP BOTH |
| Set up TCP or UDP connection | AT+CIPSTART=? (CIPMUX=0) AT+CIPSTART = <type>,<addr>,<port> (CIPMUX=1) AT+CIPSTART= <id><type>,<addr>, <port> | Query id = 0-4, type = TCP/UDP, addr = IP address, port= port |
| TCP/UDP Connections | AT+ CIPMUX? AT+ CIPMUX=0 AT+ CIPMUX=1 | Query Single Multiple |
| Check join devices' IP | AT+CWLIF | |
| TCP/IP Connection Status | AT+CIPSTATUS | AT+CIPSTATUS? no this fun |
| Send TCP/IP data | (CIPMUX=0) AT+CIPSEND=<length>; (CIPMUX=1) AT+CIPSEND= <id>,<length> | |
| Close TCP / UDP connection | AT+CIPCLOSE=<id> or AT+CIPCLOSE | |

Copy Files

- Copy wifi_weather.h file to Inc folder
- Copy wifi_weather.c file to Src folder



Location of folders

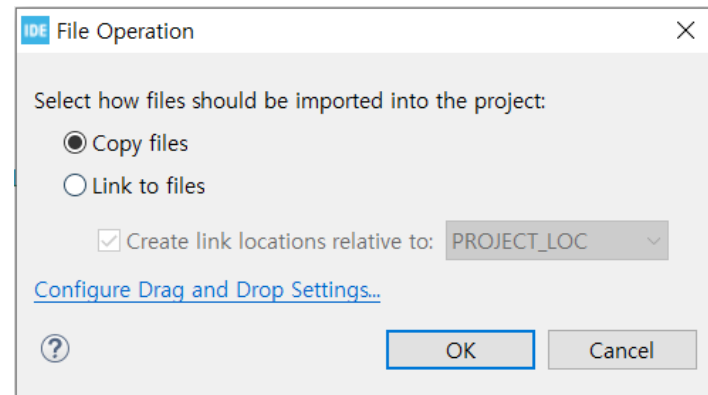
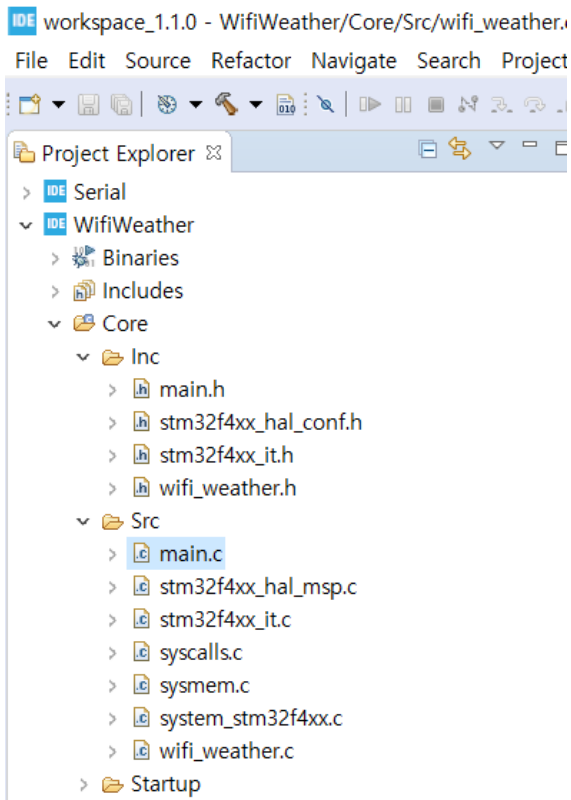
C:\Users\limdj\STM32CubeIDE\workspace_1.10.1\WifiWeather\Core\Inc

C:\Users\limdj\STM32CubeIDE\workspace_1.10.1\WifiWeather\Core Src

> 내 PC > 로컬 디스크 (C:) > 사용자 > limdj > STM32CubeIDE > workspace_1.10.1 > WifiWeather > Core

| 이름 | 수정한 날짜 | 유형 | 크기 |
|---------|---------------------|-------|----|
| Inc | 2022-10-28 오후 1:00 | 파일 폴더 | |
| Src | 2022-10-28 오후 1:00 | 파일 폴더 | |
| Startup | 2022-10-28 오후 12:43 | 파일 폴더 | |

- 소스 파일을 프로젝트 폴더에 복사하는 것은 마우스로 소스 파일을 클릭해서 STM32CubeIDE의 Project Explorer의 디렉토리에 끌어다 놓는 것 (drag and drop)으로도 가능합니다.



- wifi_weather.c에서 무선 공유기 이름(SSID), 비밀번호 변경

```
WifiWeather.ioc  main.c  wifi_weather.c
19 void WifiSetup(void)
20 {
21     uint8_t string[200];
22     uint8_t buffer[200];
23     int length;
24
25     for (int i = 0; i < 200; i++)buffer[i] = ' ';
26     strcpy((char *)string, "AT+CWMODE=3");
27     length = strlen((char *)string);
28     string[length] = 0x0D;
29     string[length + 1] = 0x0A;
30     string[length + 2] = 0;
31     HAL_UART_Transmit(&huart3, (uint8_t *)string, length + 2, 0xFFFF);
32     HAL_UART_Receive(&huart3, (uint8_t *)buffer, 100, 1000);
33     HAL_UART_Transmit(&huart2, (uint8_t *)buffer, 100, 0xFFFF);
34     string[0] = 0x0D;
35     string[1] = 0x0A;
36     HAL_UART_Transmit(&huart2, (uint8_t *)string, 2, 0xFFFF);
37
38     strcpy((char *)string, (char *)"AT+CWJAP=\"iptime_limdj\", \"password\"");
39     length = strlen((char *)string);
40     string[length] = 0x0D;
41     string[length + 1] = 0x0A;
42     string[length + 2] = 0;
```

ESP8266 AT Instructions

AT+CWJAP – Connects to an AP

[@deprecated] This command is deprecated. Please use AT+CWJAP_CUR or AT+CWJAP_DEF instead.

| | | |
|-----------------|---|--|
| Commands | Query Command: AT+CWJAP? Function: to query the AP to which the ESP8266 Station is already connected. | Set Command: AT+CWJAP=<ssid>,<pwd>[,<bssid>] Function: to set the AP to which the ESP8266 Station needs to be connected. |
|-----------------|---|--|

main.c 수정

```
/* USER CODE BEGIN Includes */
#include "string.h"
#include "wifi_weather.h"
/* USER CODE END Includes */

/* USER CODE BEGIN 0 */
void PrintString(uint8_t * string)
{
    HAL_UART_Transmit(&huart2, (uint8_t *)string, strlen((char *)string), 0xffff);
}
/* USER CODE END 0 */

/* USER CODE BEGIN 2 */
    PrintString((uint8_t *)"Hello Cortex-M\n\r");
    WifiSetup();
    WifiWeather();
/* USER CODE END 2 */
```


프로그램 실행 결과

```
SmarTTY - Raw Terminal
Connected to COM11 (115200 bps) [Icons] Baud rate: 115200
AT+CWJAP="iptime_limdj", ""
CLOSED
WIFI DISCONNECT
WIFI CONNECTED
WIFI GOT IP

AT+CIPSTART="TCP", "www.kma.go.kr", 80
busy p...

OK

AT+CIPSTART="TCP", "www.kma.go.kr", 80
CONNECT

OK

08:16:03 GMT<hour>21<temp>13.0<wfEn>Clear
08:16:05 GMT<hour>21<temp>13.0<wfEn>Clear
08:16:08 GMT<hour>21<temp>13.0<wfEn>Clear
```

네이버에서 기상청 동네예보 검색

주소: http://www.weather.go.kr/weather/lifenindustry/sevice_rss.jsp

사이트명: ENGLISH JAPANESE CHINESE 글자크기 + - 검색

날씨누리 기상청 국가기상종합정보 특보 발효중 기상청 홈페이지 바로가기

특보·예보 날씨영상 바다날씨 태풍 황사 지진·화산 관측자료 기후자료 생활과산업

홈 > 생활과 산업 > 서비스 > 인터넷 > RSS

서비스 | 인터넷

RSS 서비스에서 제공하는 기상 자료는 기상청의 기상자료 제공 정책에 따라 자료 형식 변경 혹은 중단될 수 있으며 이 경우 기상청 홈페이지를 통하여 사전 공지됩니다. (이용조건: 출처표시)
또한, 기존 XML 형식의 자료 제공 서비스는 국가 정보화 정책 기조에 따라 앞으로도 계속 제공될 예정입니다. (문의: webmasterkma@korea.kr)

웹 RSS 날씨위젯

RSS란?

RSS(Really Simple Syndication, Rich Site Summary)란 블로그처럼 콘텐츠 업데이트가 자주 일어나는 웹사이트에서, 업데이트된 정보를 쉽게 구독자들에게 제공하기 위해 XML을 기초로 만들어진 데이터 형식입니다. RSS서비스를 이용하면 업데이트된 정보를 찾기 위해 홈페이지에 일일이 방문하지 않아도 업데이트 될 때마다 빠르고 편리하게 확인할 수 있습니다.

RSS 서비스 이용하기

RSS리더기 설치 → 구독을 원하는 정보의 RSS주소 복사 → 복사된 RSS주소를 RSS리더기에 추가 → RSS리더기를 통해 실시간으로 정보를 확인

한RSS 다운받기 구글RSS 다운받기

동네예보 > 시간별예보

동네예보 서울특별시 검색 동작구 검색 신대방제2동 검색 RSS

바로그가서비스: 현재날씨, 지난날씨, 생활과산업, 바다날씨, 산악날씨, 지진/해일, 주말날씨, 세계날씨, 공항날씨, 날씨ON

국기태풍센터, 기후정보포털, 기상자료개방포털, 국가기상위성센터, 기상레이더센터

기상청 날씨누리

■ RSS 서비스

The screenshot shows the homepage of the Korea Meteorological Administration's weather website. The browser address bar displays 'https://www.weather.go.kr/w/in'. The page features a navigation menu on the left with options like '날씨' (Weather), '바다' (Sea), and '영상·일기도' (Video/Chart). The main content area includes a search bar, a location dropdown set to '서울특별시 동작구 신대방제2동', and a weather forecast section. An orange arrow points from the 'RSS 서비스' header to the 'RSS' link in the footer.

A horizontal row of nine service icons with labels: '밀물·썰물 정보', '해와 달이 뜨고지는 시간', '기후정보포털', '기상자료 개방포털', '날씨알리미앱', '대기질 예·경보', '날씨해설 (유튜브)', '기상청 행정홈페이지', and '산불상'.

개인정보 처리방침 | 이용약관 | 저작권보호 및 정책 | 웹접근성정책 | 홈페이지유류·건의 | 전화번호안내 | 부서·직원찾기 | 뷰어다운로드 | RSS

(07062) 서울시 동작구 여의대방로16길 61 | T. (02)2181-0900 (평일 9:00~18:00, 야간휴일은 당직실 연결)

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RSS 서비스 페이지

RSS 서비스 안내 - Internet Explorer

https://www.weather.go.kr/w/pop/rss-guide.do

RSS 서비스 안내

▪ RSS 서비스 이용하기

RSS(Really Simple Syndication, Rich Site Summary)란 블로그처럼 콘텐츠 업데이트가 자주 일어나는 웹사이트에서, 업데이트된 정보를 쉽게 구독자들에게 제공하기 위해 XML을 기초로 만들어진 데이터 형식입니다. RSS서비스를 이용하면 업데이트된 정보를 찾기 위해 홈페이지에 일일이 방문하지 않아도 업데이트 될 때마다 빠르고 편리하게 확인할 수 있습니다.

RSS리더기 설치



구독을 원하는 정보의
RSS주소 복사



복사된 RSS주소를
RSS리더기에 추가



RSS리더기를 통해
실시간으로 정보를 확인

▪ 동네예보 > 시간별 예보

시도

강원도



선

구군

강릉시



선

읍면동

강남동




선

RSS

기상청 동네예보 웹서비스 - 경기도 안산시상록구 사동 도표예보

자주 업데이트되는 콘텐츠를 가진 피드를 보고 있습니다. 피드에 가입하면 일반 피드 목록에 추가됩니다. 피드의 업데이트된 정보는 자동으로 사용자의 컴퓨터로 다운로드되며 Internet Explorer 또는 다른 프로그램에서 볼 수 있습니다. [피드에 대해 자세히 알아봅니다.](#)

 [이 피드에 가입](#)

동네예보(도표) : 경기도 안산시상록구 사동 [X=58,Y=121]

기상청 

201805052000 6 58 121 24 0 16.0 -999.0 -999.0 4 0 흐림 Cloudy 30 0.0 0.0 2.0 4 남 S 75 0.0 0.0 3 1 15.0 18.0 14.0 4 1 비 Rain 60 0.0 0.0 1.8 4 남 S 85 5.0 0.0 6 1 14.0 18.0 14.0 4 1 비 Rain 60 0.0 0.0 2.0 4 남 S 90 5.0 0.0 9 1 15.0 18.0 14.0 4 1 비 Rain 70 0.0 0.0 2.1 2 동 E 85 8.0 0.0 12 1 16.0 18.0 14.0 4 1 비 Rain 80 0.0 0.0 2.8000000000000003 2 동 E 80 8.0 0.0 15 1 17.0 18.0 14.0 4 0 흐림 Cloudy 30 0.0 0.0 3.0 2 동 E 80 0.0 0.0 18 1 18.0 18.0 14.0 4 0 흐림 Cloudy 30 0.0 0.0 2.5 2 동 E 75 0.0 0.0 21 1 16.0 18.0 14.0 4 0 흐림 Cloudy 30 0.0 0.0 1.8 1 북동 NE 80 0.0 0.0 24 1 15.0 18.0 14.0 4 0 흐림 Cloudy 30 0.0 0.0 1.1 0 북 N 85 0.0 0.0 3 2 14.0 25.0 13.0 4 0 흐림 Cloudy 30 0.0 0.0 1.6 0 북 N 85 0.0 0.0 6 2 13.0 25.0 13.0 4 0 흐림 Cloudy 30 0.0 0.0 1.4000000000000001 0 북 N 85 0.0 0.0 9 2 18.0 25.0 13.0 3 0 구름 많음 Mostly Cloudy 20 0.0 0.0 1.0 0 북 N 55 0.0 0.0 12 2 23.0 25.0 13.0 3 0 구름 많음 Mostly Cloudy 20 0.0 0.0 2.1 0 북 N 35 0.0 0.0 15 2 25.0 25.0 13.0 3 0 구름 많음 Mostly Cloudy 20 0.0 0.0 3.5 7 북서 NW 30 0.0 0.0 18 2 21.0 25.0 13.0 2 0 구름 조금 Partly Cloudy 10 0.0 0.0 2.8000000000000003 7 북서 NW 45 0.0 0.0 21 2 17.0 25.0 13.0 1 0 맑음 Clear 0 0.0 0.0 2.6 7 북서 NW 65 0.0 0.0 24 2 14.0 25.0 13.0 1 0 맑음 Clear 0 0.0 0.0 1.8 7 북서 NW 75 0.0 0.0

Temperature, Weather Forecast, Humidity

■ <temp><wfEn><reh>

```
<?xml version="1.0" encoding="UTF-8" ?>
<rss version="2.0">
<channel>
<title>기상청 동네예보 웹서비스 - 경기도 안산시상록구 사동 도표예보</title>
<link>http://www.kma.go.kr/weather/main.jsp</link>
<description>동네예보 웹서비스</description>
<language>ko</language>
<generator>동네예보</generator>
<pubDate>2018년 01월 05일 (금)요일 11:00</pubDate>
<item>
<author>기상청</author>
<category>경기도 안산시상록구 사동</category>
<title>동네예보 (도표) : 경기도 안산시상록구 사동 [X=58,Y=121]</title><link>http://www.kma.go.kr/weather/forecast/timeser
<guid>http://www.kma.go.kr/weather/forecast/timeseries.jsp?searchType=INTEREST&dongCode=4127152500</guid>
<description>
<header>
<tm>201801051100</tm>
<ts>3</ts>
<x>58</x>
<y>121</y>
</header>
<body>
<data seq="0">
<hour>15</hour>
<day>0</day>
<temp>1.0</temp>
<tmx>1.0</tmx>
<tmn>-999.0</tmn>
<sky>2</sky>
<pty>0</pty>
<wfKor>구름 조금</wfKor>
<wfEn>Partly Cloudy</wfEn>
<pop>10</pop>
<r12>0.0</r12>
<s12>0.0</s12>
<ws>3.1</ws>
<wd>6</wd>
<wdKor>서</wdKor>
<wdEn>W</wdEn>
<reh>40</reh>
<r06>0.0</r06>
<s06>0.0</s06>
</data>
```

TCP Connection

```
strcpy((char *)string, (char *)"AT+CIPSTART=\"TCP\", \"www.kma.go.kr\", 80");
length = strlen((char *)string);
string[length] = 0x0D;
string[length + 1] = 0x0A;
string[length + 2] = 0;
HAL_UART_Transmit(&huart3, (uint8_t *)string, length + 2, 0xFFFF);
HAL_UART_Receive(&huart3, (uint8_t *)buffer, 100, 4000);
HAL_UART_Transmit(&huart2, (uint8_t *)buffer, 100, 0xFFFF);
string[0] = 0x0D;
string[1] = 0x0A;
HAL_UART_Transmit(&huart2, (uint8_t *)string, 2, 0xFFFF);
```

AT+CIPSTART – Establishes TCP Connection, UDP Transmission or SSL Connection

Establish TCP Connection

| Set Command | Single TCP connection (AT+CIPMUX=0): | Multiple TCP Connections (AT+CIPMUX=1): |
|-------------|---|---|
| | AT+CIPSTART=<type>,<remote IP>,<remote port>[,<TCP keep alive>] | AT+CIPSTART=<link ID>,<type>,<remote IP>,<remote port>[,<TCP keep alive>] |

```
sprintf((char *)query, "GET /wid/queryDFSRSS.jsp?zone=4127152500 HTTP/1.1\r\nHost: www.kma.go.kr\n");
queryLength = strlen((char *)query);
```

```
for (int i = 0; i < 50; i++)buffer[i] = ' ';
my_itoa(queryLength, queryLengthString, 3);
sprintf((char *)string, "AT+CIPSEND=%s", queryLengthString);
length = strlen((char *)string);
string[length] = 0x0D;
string[length + 1] = 0x0A;
string[length + 2] = 0;
HAL_UART_Transmit(&huart3, (uint8_t *)string, length + 2, 0xFFFF);
HAL_UART_Receive(&huart3, (uint8_t *)buffer, 23, 4000);
```

```
for (int i = 0; i < 2000; i++)buffer[i] = ' ';
HAL_Delay(1);
HAL_UART_Transmit(&huart3, (uint8_t *)query, queryLength, 0xFFFF);
HAL_UART_Receive(&huart3, (uint8_t *)buffer, 2000, 4000);
//HAL_UART_Transmit(&huart2, (uint8_t *)buffer, 2000, 0xFFFF);
string[0] = 0x0D;
string[1] = 0x0A;
HAL_UART_Transmit(&huart2, (uint8_t *)string, 2, 0xFFFF);
```

AT+CIPSEND—Sends Data

Commands

Set Command:

1. Single connection: (+CIPMUX=0)
AT+CIPSEND=<length>
2. Multiple connections: (+CIPMUX=1)
AT+CIPSEND=<link ID>,<length>
3. Remote IP and ports can be set in UDP transmission:
AT+CIPSEND=[<link ID>,<length> [<remote IP>,<remote port>]

Function: to configure the data length in normal transmission mode.


```
ret1 = (int)strstr((char *)buffer, (char *)"GMT");
HAL_UART_Transmit(&huart2, (uint8_t *) (ret1 - 9), 12, 0xFFFF);

ret1 = (int)strstr((char *)buffer, (char *)<hour>");
ret2 = (int)strstr((char *)buffer, (char *)</hour>");
HAL_UART_Transmit(&huart2, (uint8_t *) (ret1), ret2 - ret1, 0xFFFF);

ret1 = (int)strstr((char *)buffer, (char *)<temp>");
ret2 = (int)strstr((char *)buffer, (char *)</temp>");
HAL_UART_Transmit(&huart2, (uint8_t *) (ret1), ret2 - ret1, 0xFFFF);

ret1 = (int)strstr((char *)buffer, (char *)<wfEn>");
ret2 = (int)strstr((char *)buffer, (char *)</wfEn>");
HAL_UART_Transmit(&huart2, (uint8_t *) (ret1), ret2 - ret1, 0xFFFF);

string[0] = 0x0D;
string[1] = 0x0A;
HAL_UART_Transmit(&huart2, (uint8_t *)string, 2, 0xFFFF);
/* wait for a while to slow down */
HAL_Delay(2000);
```

```

sprintf((char *)string, "AT+CIPSEND=%s", queryLengthString);
length = strlen((char *)string);
string[length] = 0x0D;
string[length + 1] = 0x0A;
string[length + 2] = 0;
HAL_UART_Transmit(&huart3, (uint8_t *)string, length + 2, 0xFFFF);
HAL_UART_Receive(&huart3, (uint8_t *)buffer, 23, 4000);

for (int i = 0; i < 2000; i++)buffer[i] = ' ';
HAL_Delay(1);
HAL_UART_Transmit(&huart3, (uint8_t *)query, queryLength, 0xFFFF);
HAL_UART_Receive(&huart3, (uint8_t *)buffer, 2000, 4000);
//HAL_UART_Transmit(&huart2, (uint8_t *)buffer, 2000, 0xFFFF);
string[0] = 0x0D;
string[1] = 0x0A;
HAL_UART_Transmit(&huart2, (uint8_t *)string,

```

COM4 - Tera Term VT

File Edit Setup Control Window Help

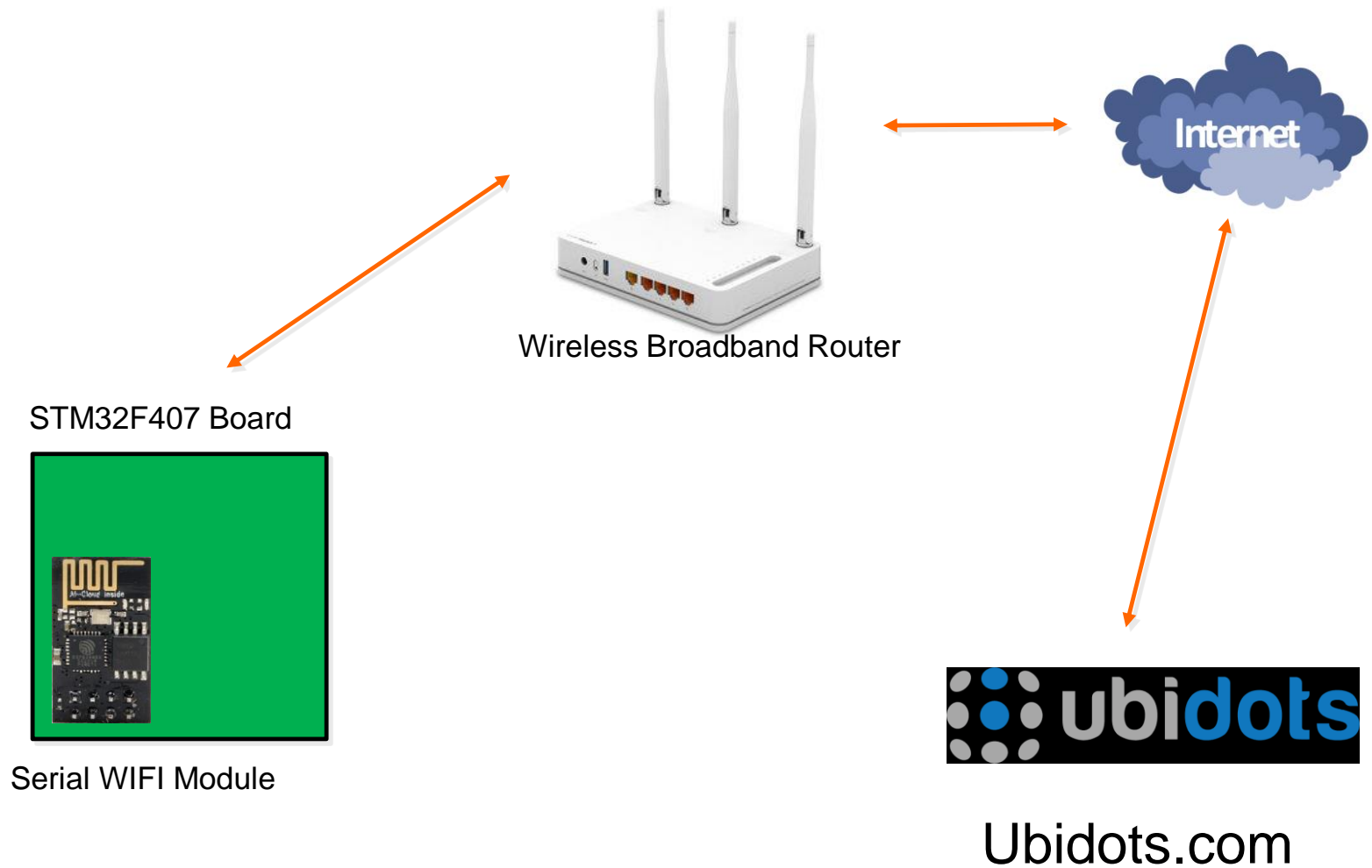
```

+IPD,1460:HTTP/1.1 200 OK
Transfer-Encoding: chunked
Date: Mon, 07 May 2018 00:46:49 GMT
Accept-Ranges: bytes
Content-Type: text/xml; charset=UTF-8
Connection: Keep-Alive
Keep-Alive: timeout=10

1000
<?xml version="1.0" encoding="UTF-8" ?>
                                     <rss version="2.0">
                                                                 <channel>
                                                                 <
동네예보 웹서비스 - 경기도 안산시상록구 사동 도표예보 </title>
                                                                 <link>
ma.go.kr/weather/main.jsp</link>
                                                                 <description>동네예보 웹서비스 </desc

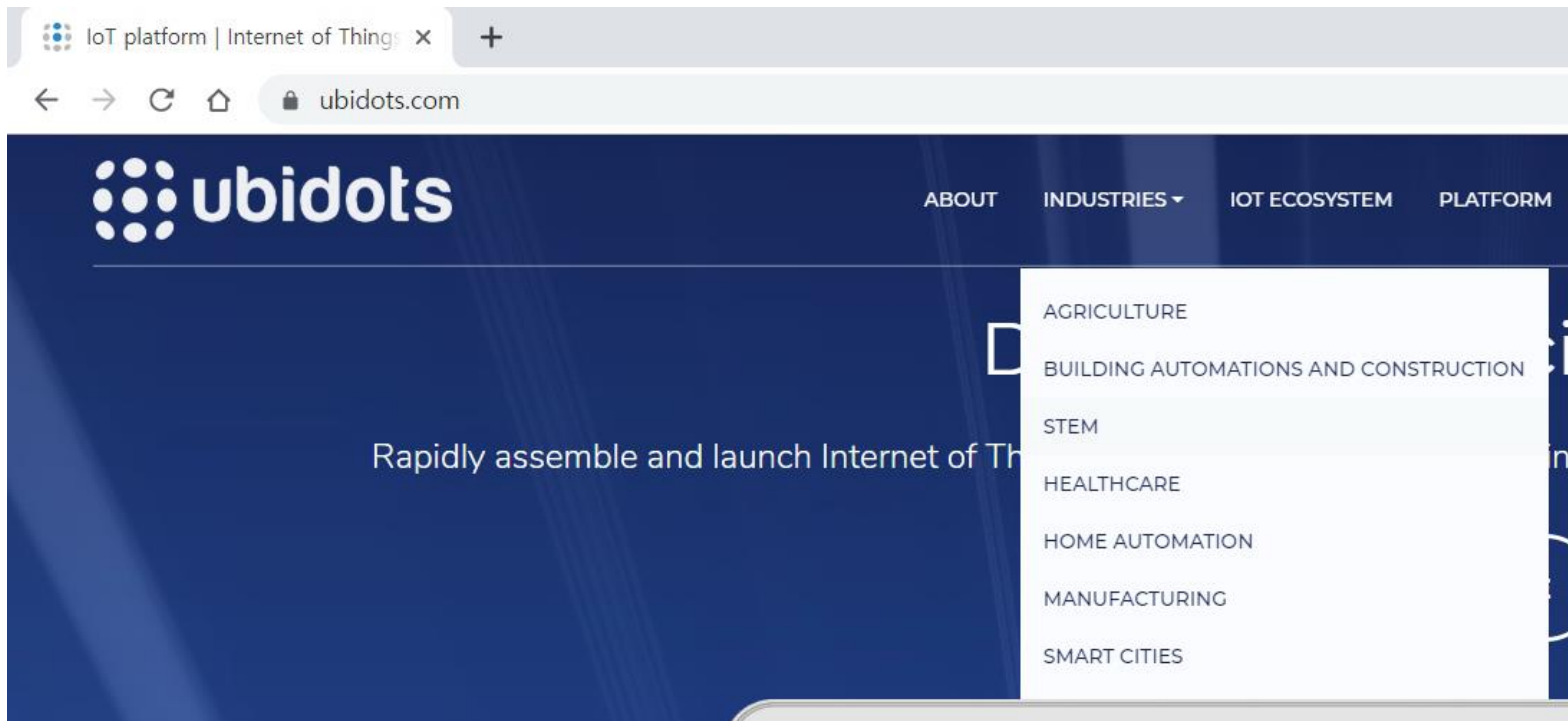
```

Exercise 2: IoT Exercise using WIFI Module

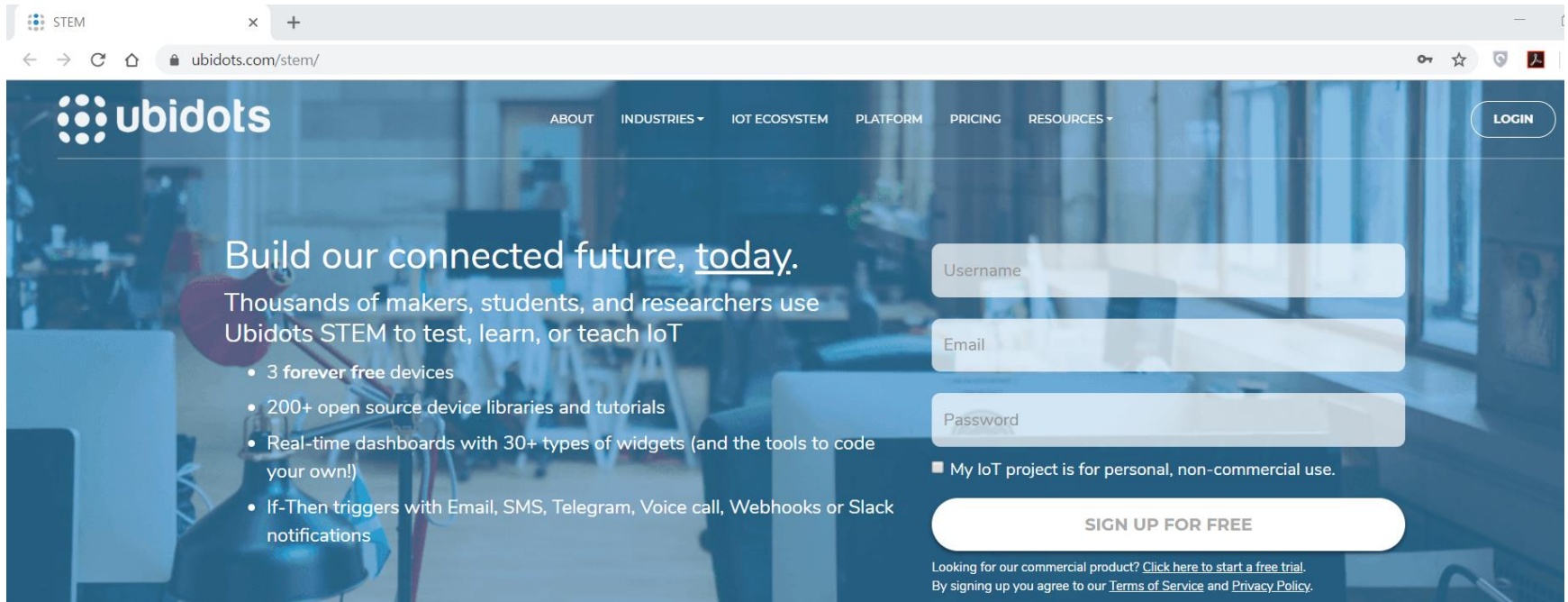


IoT Website

- Ubidots.com
- Select STEM from INDUSTRIES menu



■ Sign Up or Login



The screenshot shows a web browser window with the URL `ubidots.com/stem/`. The page features the Ubidots logo and a navigation menu with links for ABOUT, INDUSTRIES, IOT ECOSYSTEM, PLATFORM, PRICING, and RESOURCES. A LOGIN button is located in the top right corner. The main content area has a blue background with the text "Build our connected future, today." and "Thousands of makers, students, and researchers use Ubidots STEM to test, learn, or teach IoT". Below this is a list of features: 3 forever free devices, 200+ open source device libraries and tutorials, Real-time dashboards with 30+ types of widgets (and the tools to code your own!), and If-Then triggers with Email, SMS, Telegram, Voice call, Webhooks or Slack notifications. To the right of the text is a sign-up form with fields for Username, Email, and Password, a checkbox for "My IoT project is for personal, non-commercial use.", and a "SIGN UP FOR FREE" button. At the bottom of the form, there is a note: "Looking for our commercial product? [Click here to start a free trial.](#) By signing up you agree to our [Terms of Service](#) and [Privacy Policy](#)."

STEM

ubidots.com/stem/

ubidots

ABOUT INDUSTRIES IOT ECOSYSTEM PLATFORM PRICING RESOURCES

LOGIN

Build our connected future, today.

Thousands of makers, students, and researchers use Ubidots STEM to test, learn, or teach IoT

- 3 forever free devices
- 200+ open source device libraries and tutorials
- Real-time dashboards with 30+ types of widgets (and the tools to code your own!)
- If-Then triggers with Email, SMS, Telegram, Voice call, Webhooks or Slack notifications

Username

Email

Password

My IoT project is for personal, non-commercial use.

SIGN UP FOR FREE

Looking for our commercial product? [Click here to start a free trial.](#)
By signing up you agree to our [Terms of Service](#) and [Privacy Policy](#).



SIGN IN

 limdj



Sign in to existing workspace

[Forgot password?](#)

SIGN IN

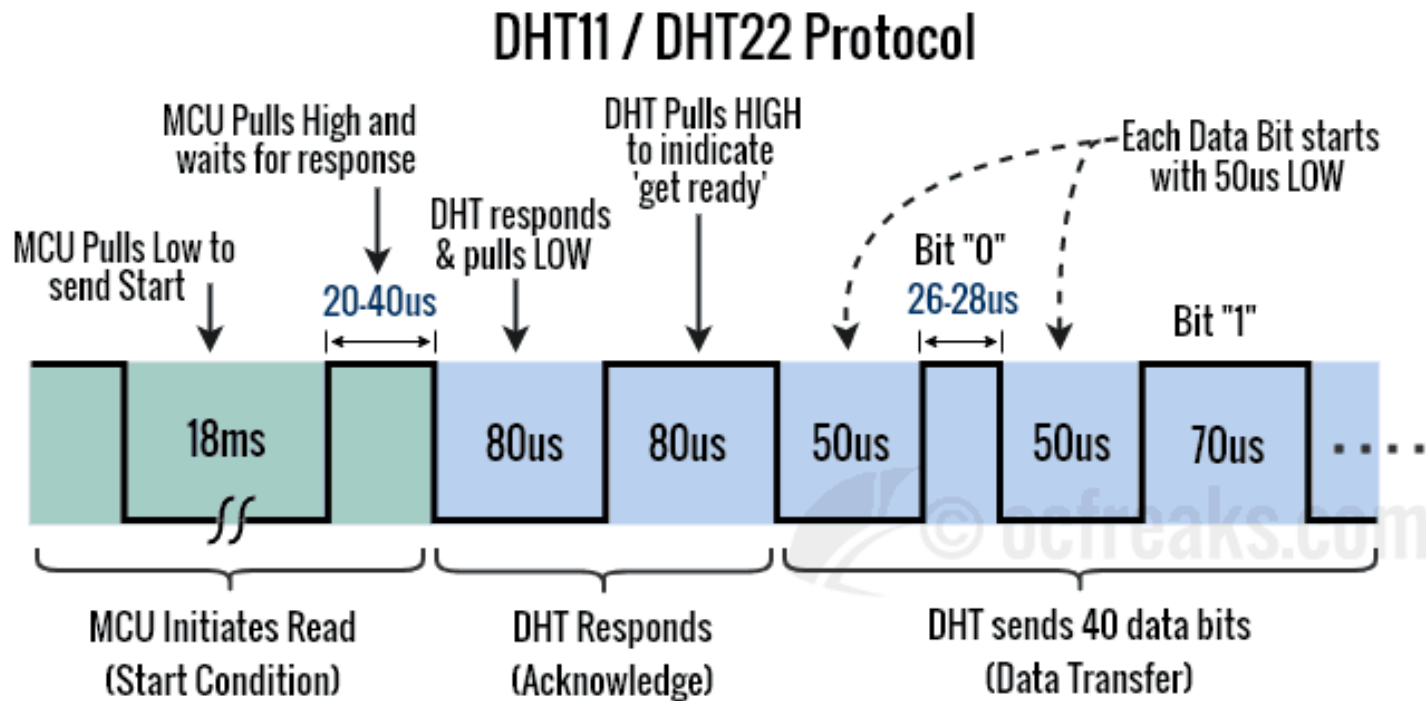
[New to Ubidots? Create an account](#)

DHT22 온/습도 센서 연결

- VCC→3V, GND→GND, DAT→PE0

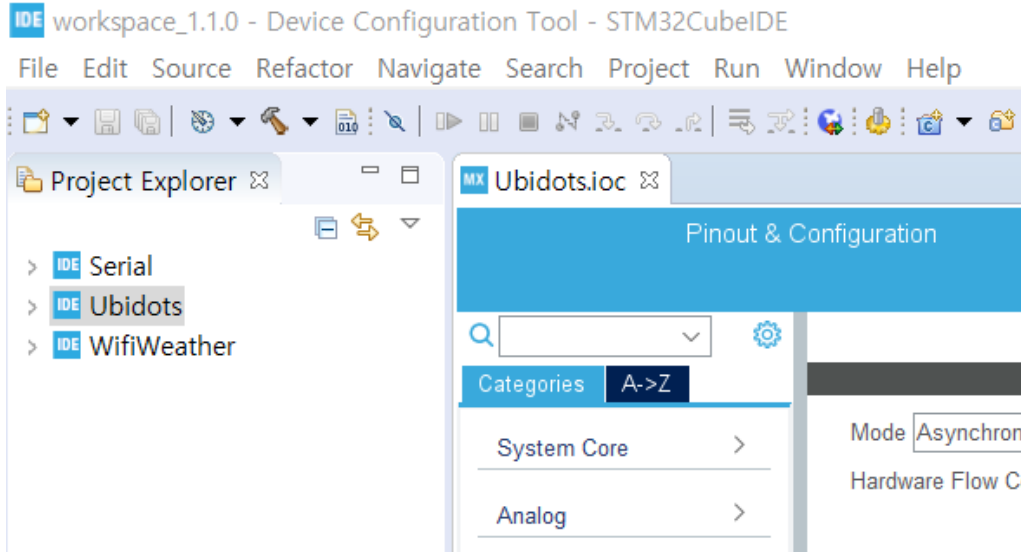


DHT22 Protocol



New STM32 Project

■ Project Name: Ubidots



내 PC > 로컬 디스크 (C:) > 사용자 > limdj > STM32CubeIDE > workspace_1.10.1

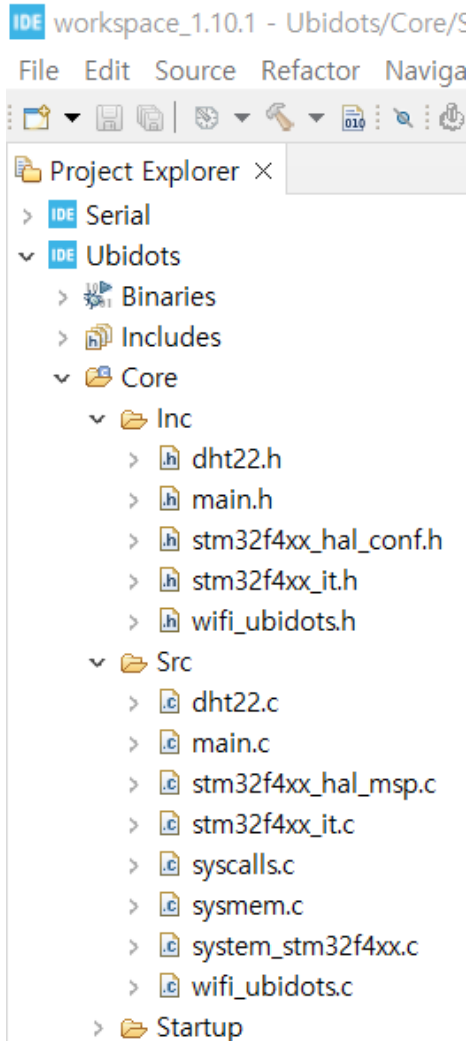
| 이름 | 수정한 날짜 | 유형 |
|-------------|---------------------|-------|
| .metadata | 2022-10-28 오전 10:19 | 파일 폴더 |
| Serial | 2022-10-28 오후 12:40 | 파일 폴더 |
| Ubidots | 2022-10-28 오후 1:27 | 파일 폴더 |
| WifiWeather | 2022-10-28 오후 1:02 | 파일 폴더 |

STM32CubeMX: Pinout & Configuration

- USART2: Asynchronous
- USART3: Asynchronous
- TIM9: Internal Clock,
Prescaler: 84
Counter Period: 0xFFFF

The screenshot displays the STM32CubeMX software interface. The main window is titled 'Ubidots.ioc' and shows the 'Pinout & Configuration' tab. The left sidebar lists various categories: System Core, Analog, Timers, RTC, TIM1, TIM2, TIM3, TIM4, TIM5, TIM6, TIM7, TIM8, TIM9 (selected), TIM10, TIM11, TIM12, TIM13, TIM14, Connectivity, and Multimedia. The right pane shows the 'TIM9 Mode and Configuration' settings. The 'Mode' section includes: Slave Mode (Disable), Trigger Source (Disable), Internal Clock (checked), Channel1 (Disable), Channel2 (Disable), Combined Channels (Disable), and One Pulse Mode (unchecked). The 'Configuration' section includes a 'Reset Configuration' button and three tabs: 'Parameter Settings' (selected), 'User Constants', and 'NVIC Settings'. Below the tabs, a search bar is present, and the 'Counter Settings' section is expanded, showing: Prescaler (PSC - 16 bits value) set to 84, Counter Mode set to Up, Counter Period (AutoReload Register - ...) set to 0xFFFF, Internal Clock Division (CKD) set to No Division, and auto-reload preload set to Disable.

- Copy wifi_ubidots.c, dht22.c, main.c file to Src folder
- Copy wifi_ubidots.h, dht22.h file Inc folder



■ wifi_ubidots.c에서 무선 공유기 이름(SSID), 비밀번호 변경

```
Ubidots.ioc  wifi_ubidots.c
61 }
62
63 void WifiSetup(void)
64 {
65     uint8_t string[200];
66     uint8_t buffer[200];
67     int length;
68
69     for (int i = 0; i < 200; i++)buffer[i] = ' ';
70     strcpy((uint8_t *)string, "AT+CWMODE=3");
71     length = strlen((uint8_t *)string);
72     string[length] = 0x0D;
73     string[length + 1] = 0x0A;
74     string[length + 2] = 0;
75     HAL_UART_Transmit(&huart3, (uint8_t *)string, length + 2, 0xFFFF);
76     HAL_UART_Receive(&huart3, (uint8_t *)buffer, 100, 1000);
77     HAL_UART_Transmit(&huart2, (uint8_t *)buffer, 100, 0xFFFF);
78     string[0] = 0x0D;
79     string[1] = 0x0A;
80     HAL_UART_Transmit(&huart2, (uint8_t *)string, 2, 0xFFFF);
81
82     strcpy((uint8_t *)string, (uint8_t *)"AT+CWJAP=\"iptime_limdj\", \"xxxxx\"");
83     length = strlen((uint8_t *)string);
84     string[length] = 0x0D;
85     string[length + 1] = 0x0A;
86     string[length + 2] = 0;
87     HAL_UART_Transmit(&huart3, (uint8_t *)string, length + 2, 0xFFFF);
```

```
DHT22_start();
check_response();
Rh_byte1 = read_data();
Rh_byte2 = read_data();
Temp_byte1 = read_data();
Temp_byte2 = read_data();
//sum = read_data();
//if (sum == (Rh_byte1+Rh_byte2+Temp_byte1+Temp_byte2))
{
    TEMP = ((Temp_byte1 << 8) | Temp_byte2);
    RH = ((Rh_byte1 << 8) | Rh_byte2);
}
temp = (float)TEMP / 10.0;
humid = (float)RH / 10.0;
FloatToString(temp_string, temp, 4, 1);
FloatToString(humid_string, humid, 4, 1);
```

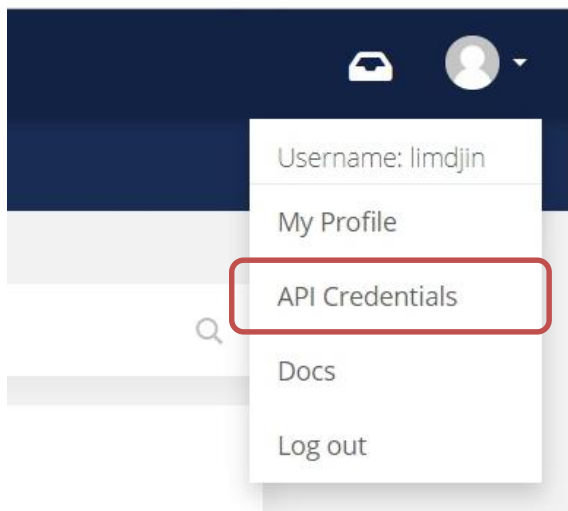
```

sprintf(message, "{\"temperature\": %s, \"humidity\": %s}", temp_string, humid_string);
HAL_UART_Transmit(&huart2, (uint8_t *)message, strlen(message), 0xFFFF);
sprintf(sendBuffer, "POST /api/v1.6/devices/%s/?token=%s HTTP/1.1\r\nHost: things.ubidots.com\r\n");
sendBufferLength = strlen((char *)sendBuffer);
for (int i = 0; i < 50; i++)buffer[i] = ' ';
my_itoa(sendBufferLength, sendBufferLengthString, 3);
sprintf((char *)string, "AT+CIPSEND=%s", sendBufferLengthString);
length = strlen((char *)string);
string[length] = 0x0D;
string[length + 1] = 0x0A;
string[length + 2] = 0;
HAL_UART_Transmit(&huart3, (uint8_t *)string, length + 2, 0xFFFF);
HAL_UART_Receive(&huart3, (uint8_t *)buffer, 24, 4000);

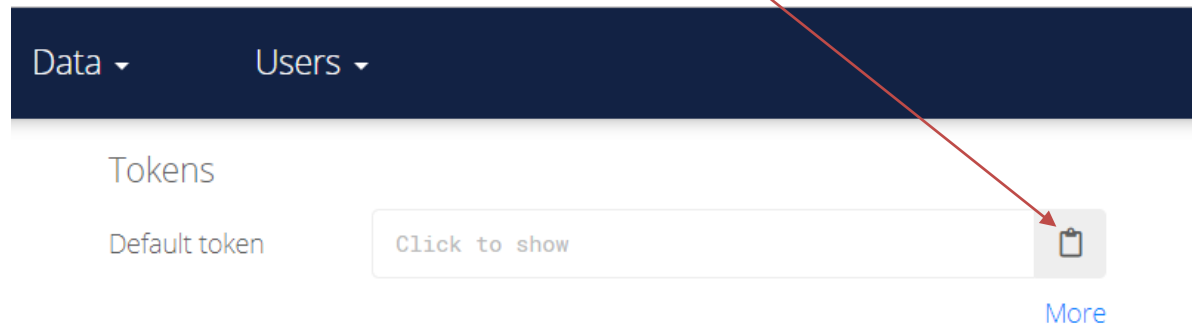
for (int i = 0; i < 2000; i++)buffer[i] = ' ';
HAL_Delay(1);
HAL_UART_Transmit(&huart3, (uint8_t *)sendBuffer, sendBufferLength, 0xFFFF);
HAL_UART_Receive(&huart3, (uint8_t *)buffer, 500, 4000);
HAL_UART_Transmit(&huart2, (uint8_t *)buffer, 500, 0xFFFF);
string[0] = 0x0D;
string[1] = 0x0A;
HAL_UART_Transmit(&huart2, (uint8_t *)string, 2, 0xFFFF);
ret = (int)strstr((char *)buffer, (char *)"ERROR");
/* wait for a while to slow down */

```

- Copy your Ubidots Token and paste in your source.

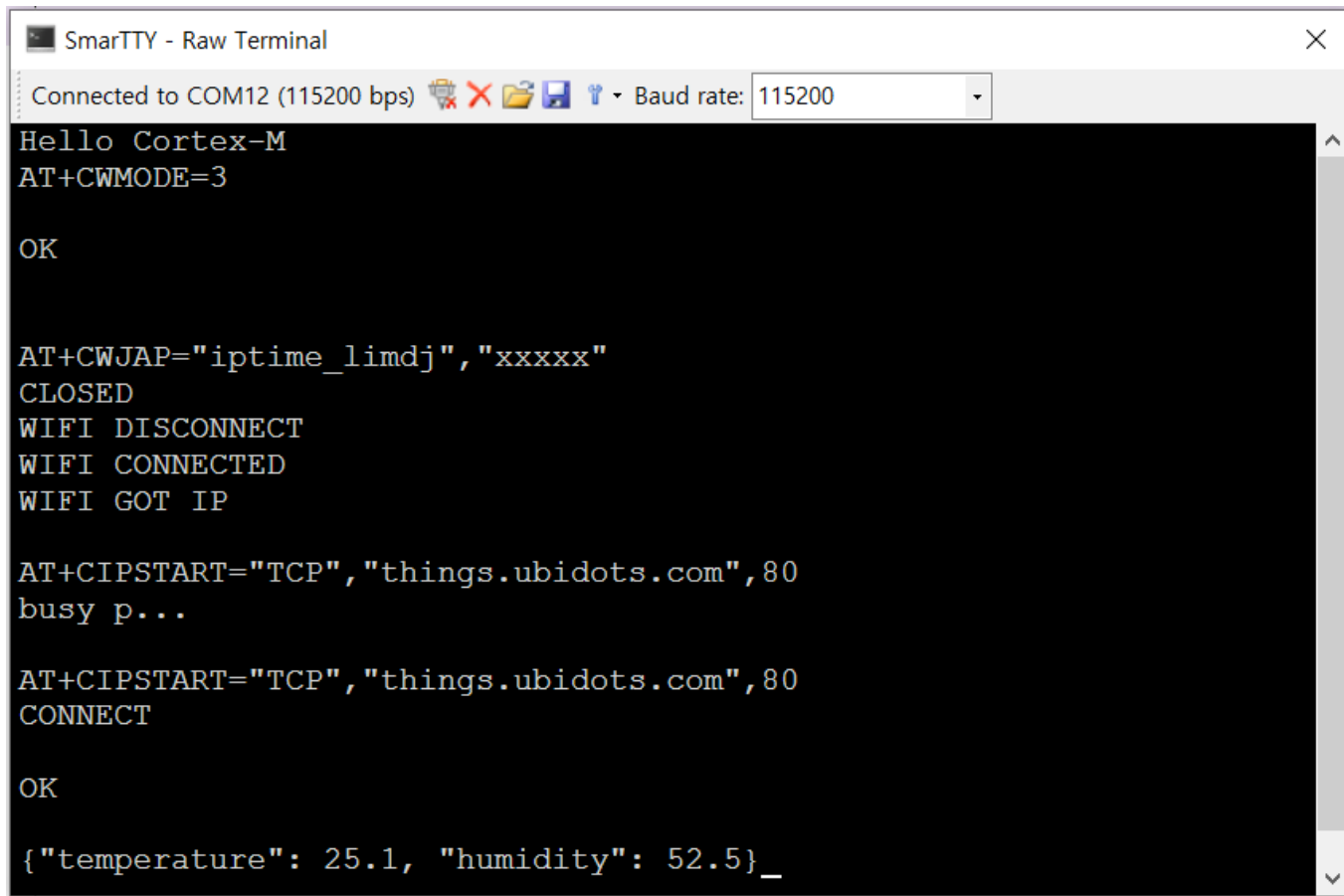


Click to copy



- Paste the token in wifi_ubidots.c

```
Ubidots.ioc  main.c  *wifi_ubidots.c  ⌵
1 #include "stm32f4xx_hal.h"
2 #include "string.h"
3 #include "math.h"
4 #include "dht22.h"
5 extern UART_HandleTypeDef huart2;
6 extern UART_HandleTypeDef huart3;
7 #define UBIDOTS_TOKEN "BBFF-FNbbvAjk3TN96Bv2xxxxxxxxxxx"
8 #define UBIDOTS_DEVICE "STM32F407"
```

The image shows a terminal window titled "SmarTTY - Raw Terminal". The window's status bar indicates it is connected to COM12 at 115200 bps with a baud rate of 115200. The terminal output shows the following sequence of commands and responses:

```
Hello Cortex-M
AT+CWMODE=3

OK

AT+CWJAP="iptime_limdj","xxxxx"
CLOSED
WIFI DISCONNECT
WIFI CONNECTED
WIFI GOT IP

AT+CIPSTART="TCP","things.ubidots.com",80
busy p...

AT+CIPSTART="TCP","things.ubidots.com",80
CONNECT

OK

{"temperature": 25.1, "humidity": 52.5}_
```

```
SmarTTY - Raw Terminal
Connected to COM11 (115200 bps) [Icons] Baud rate: 115200
Recv 204 bytes

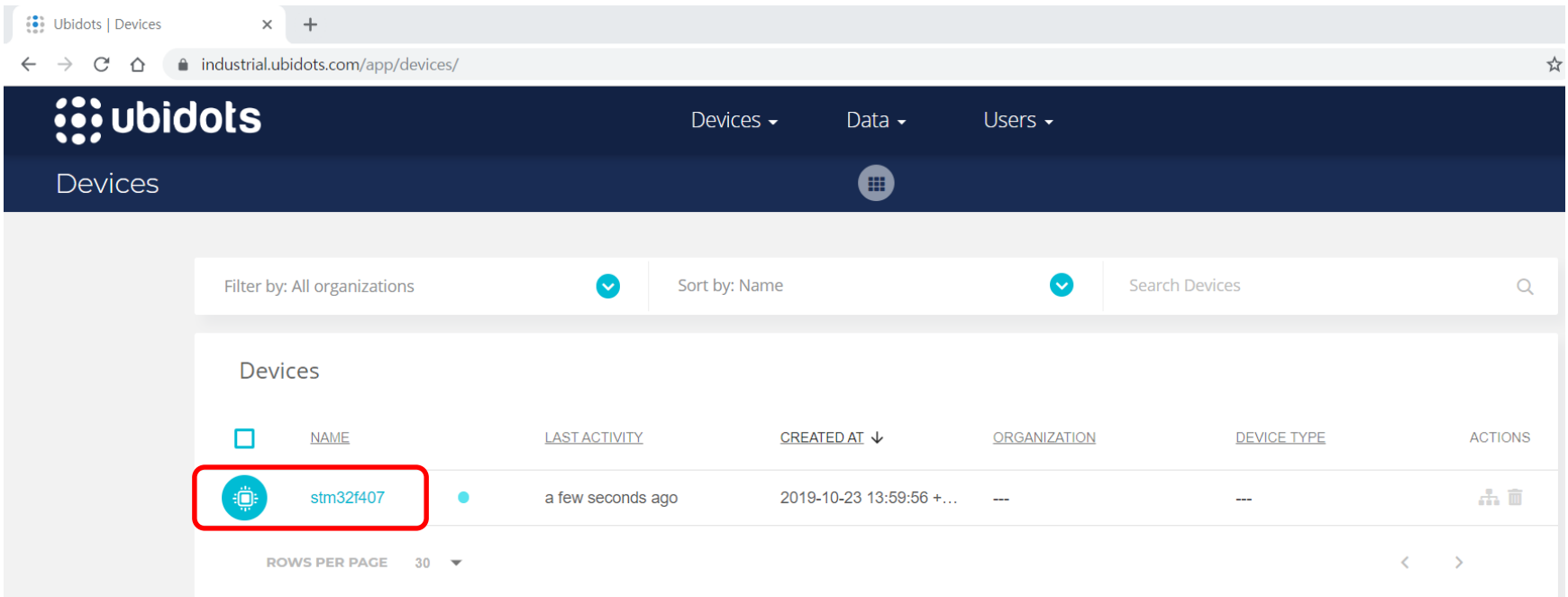
SEND OK

+IPD,311:HTTP/1.1 200 OK
Server: nginx
Date: Thu, 02 May 2019 01:34:10 GMT
Content-Type: application/json
Transfer-Encoding: chunked
Connection: keep-alive
Vary: Accept-Encoding
Vary: Cookie
Allow: GET, POST, HEAD, OPTIONS



4b
{"temperature": [{"status_code": 201}], "humidity": [{"status_code": 201}]}
0
```

Devices

- Select Devices and wait for the device to appear



The screenshot shows the Ubidots web interface. The browser address bar displays 'industrial.ubidots.com/app/devices/'. The page header includes the Ubidots logo and navigation menus for 'Devices', 'Data', and 'Users'. Below the header, there are filters for 'All organizations' and 'Sort by: Name', along with a search bar labeled 'Search Devices'. The main content area is titled 'Devices' and contains a table with the following columns: NAME, LAST ACTIVITY, CREATED AT, ORGANIZATION, DEVICE TYPE, and ACTIONS. A single device is listed in the table, with its name 'stm32f407' highlighted by a red rectangular box. The device's last activity is 'a few seconds ago' and it was created on '2019-10-23 13:59:56 +...'. The table also shows a 'ROWS PER PAGE' dropdown set to 30 and navigation arrows.

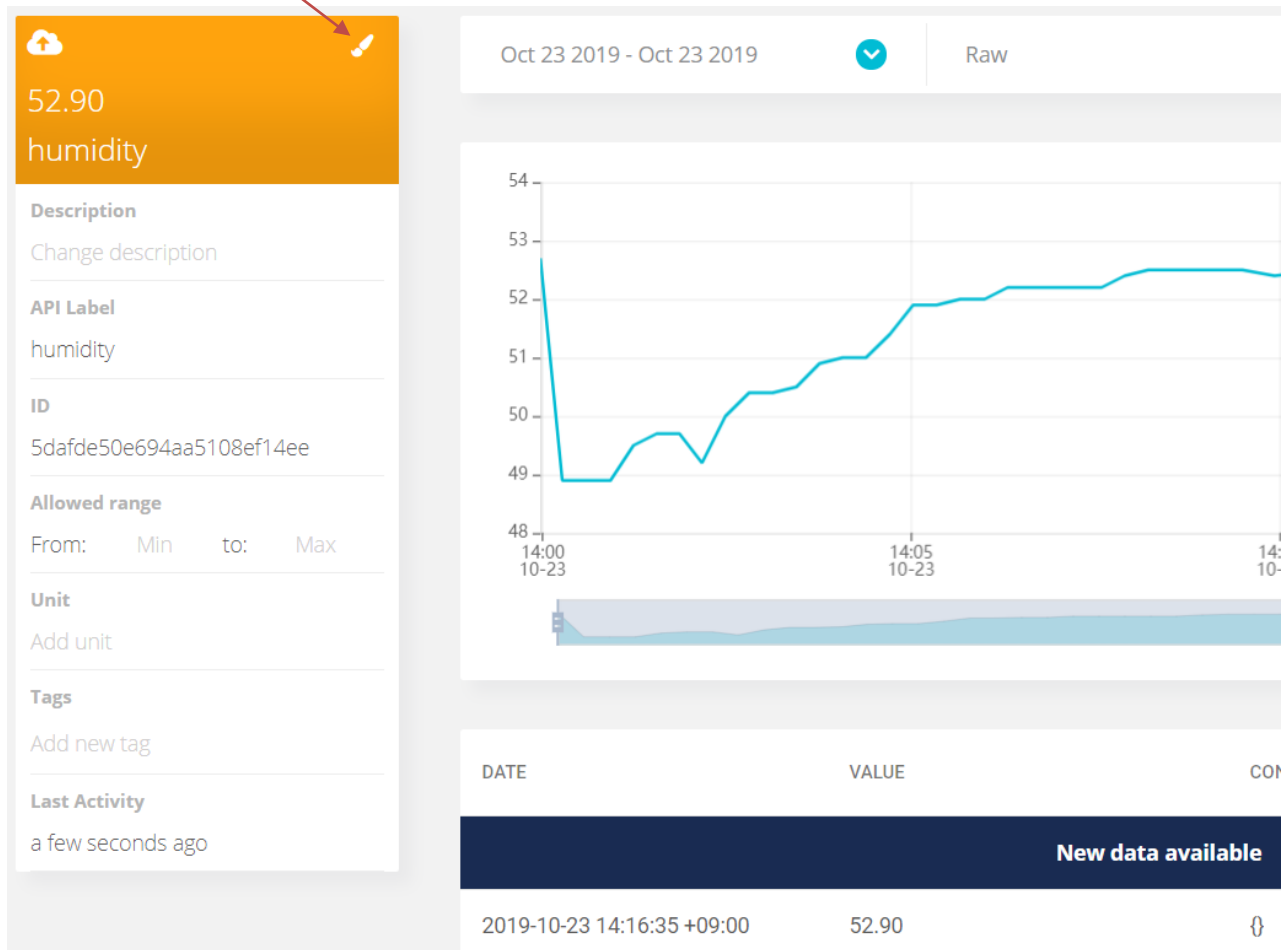
| NAME | LAST ACTIVITY | CREATED AT | ORGANIZATION | DEVICE TYPE | ACTIONS |
|-----------|-------------------|--------------------------|--------------|-------------|---|
| stm32f407 | a few seconds ago | 2019-10-23 13:59:56 +... | --- | --- |   |

- Click humidity to change the color

The screenshot shows a dashboard for a device named 'stm32f407'. On the left is a sidebar with a teal header containing a microchip icon and a pencil icon. Below the header, the device name 'stm32f407' is displayed. The sidebar contains sections for 'Description' (with a 'Change description' link), 'API Label' (with an info icon and the value 'stm32f407'), 'ID' (with an info icon and the value '5dafde4ce694aa5108ef14e4'), and 'Tags' (with an 'Add new tag' link). The main content area has a light blue header and a light gray background. It features two orange data cards. The left card shows a humidity value of '53.00' and the right card shows a temperature value of '25.20'. Both cards include a cloud icon, the unit name, and a 'Last activity: a few seconds ago' message with eye, info, and trash icons.

| Property | Value |
|-------------|--------------------------|
| Device Name | stm32f407 |
| API Label | stm32f407 |
| ID | 5dafde4ce694aa5108ef14e4 |
| Humidity | 53.00 |
| Temperature | 25.20 |

■ Click brush



The screenshot displays a data dashboard for humidity. On the left, a sidebar shows the current value of 52.90 and the label 'humidity'. The main area features a line graph showing humidity fluctuations over time, with a red arrow pointing to a brush icon in the top left corner. Below the graph is a table with columns for DATE, VALUE, and CON. A dark blue banner at the bottom of the table reads 'New data available'.

Oct 23 2019 - Oct 23 2019 Raw

52.90
humidity

Description
Change description

API Label
humidity

ID
5dafde50e694aa5108ef14ee

Allowed range
From: Min to: Max

Unit
Add unit

Tags
Add new tag

Last Activity
a few seconds ago

14:00 10-23 14:05 10-23 14:10 10-23

| DATE | VALUE | CON |
|----------------------------|-------|-----|
| New data available | | |
| 2019-10-23 14:16:35 +09:00 | 52.90 | {} |

- Click desired color and click ←

Oct 23 2019 - Oct 23 2019

52.90
humidity

Description
Change description

API Label
humidity

ID
5dafde50e694aa5108ef14ee

Allowed range

Color picker overlay showing Hex: FFA30D, R: 255, G: 163, B: 13.

Oct 23 2019 - Oct 23 2019

52.70
humidity



Description
Change description

API Label
humidity

ID
5dafde50e694aa5108ef14ee

Allowed range

Color picker overlay showing Hex: 2CCCE4, R: 44, G: 204, B: 228.


stm32f407

Description
Change description

API Label ⓘ
stm32f407


ID ⓘ
5dafde4ce694aa5108ef14e4

Tags
Add new tag



52.50
humidity

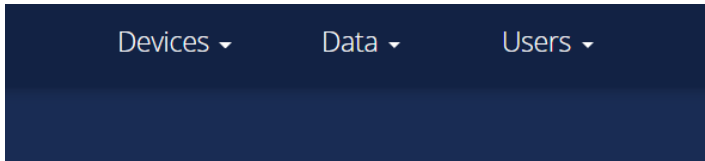
Last activity:
a few seconds ago



25.10
temperature

Last activity:
a few seconds ago

- Select Dashboards from Data menu and click “Add new Dashboard”. Then **SAVE**.



No Dashboards created yet

Create Dashboards to visualize your data in realtime

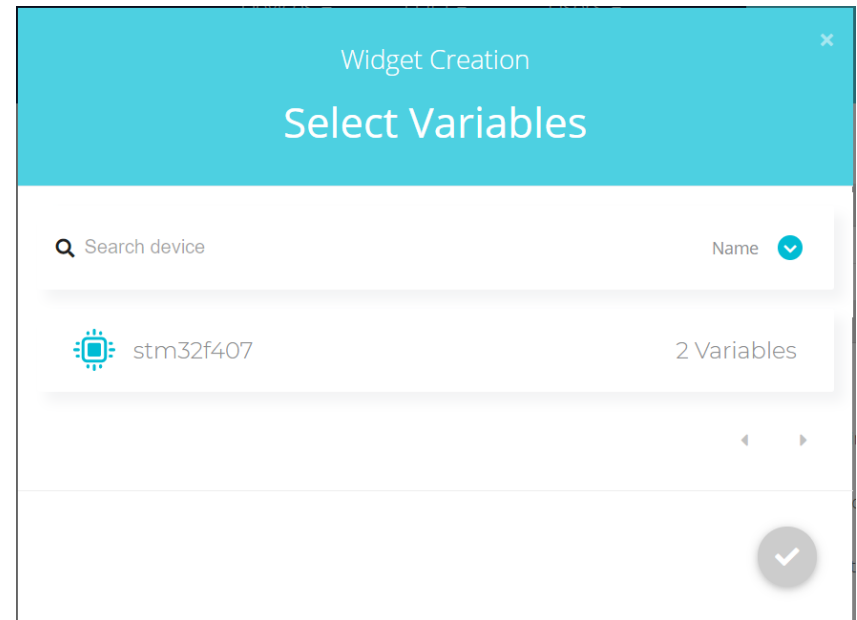
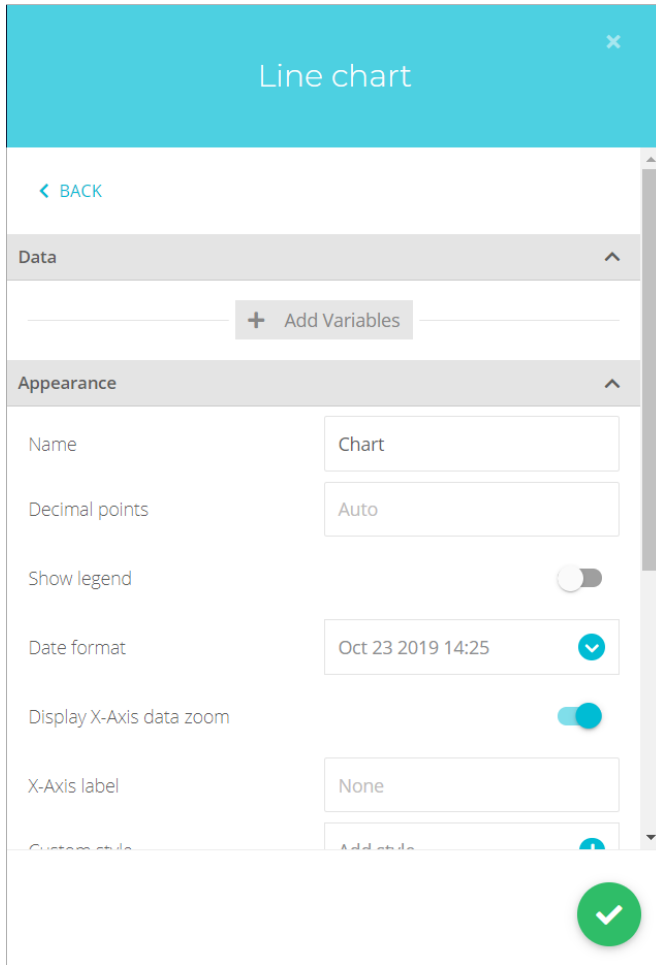
Add new Dashboard

A modal window titled "Add new Dashboard" with a close button (X) in the top right corner. The modal is divided into two tabs: "SETTINGS" (active) and "APPEARANCE". Under "SETTINGS", there are five rows of form fields: "Name" (text input with "New Dashboard"), "Default time range" (text input with "Last 24 hours" and a calendar icon), "Dynamic Dashboard" (text input with "Static" and a dropdown arrow, with a subtext "Update widgets based on selected Device"), "Width" (text input with "Auto" and a dropdown arrow), and "Date format" (text input with "10/28/2022 13:48" and a dropdown arrow). At the bottom right, there are two buttons: "CANCEL" and "SAVE". A red arrow points from the "Add new Dashboard" button in the previous slide to the "SAVE" button in this modal.

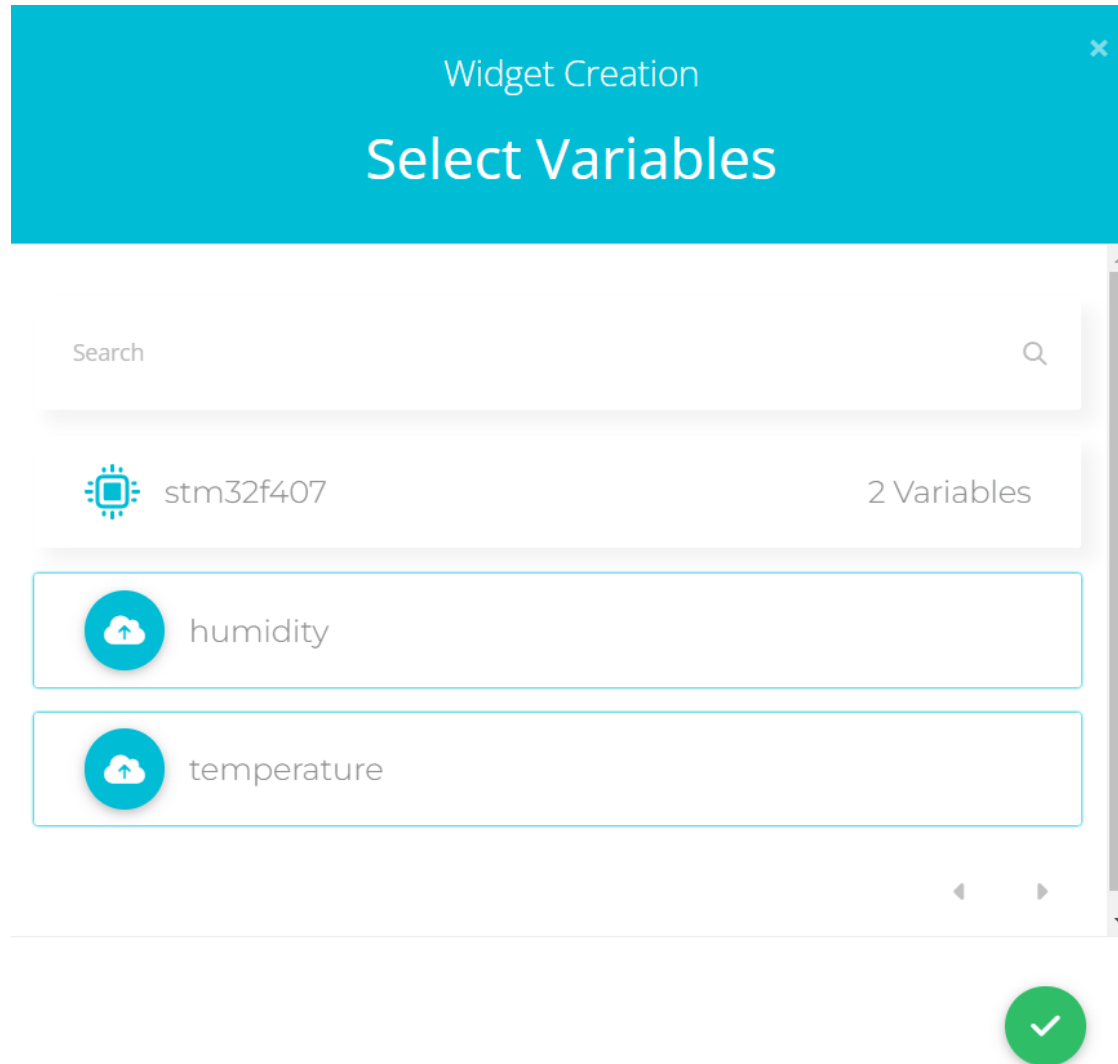
- Add new Widget and select Line chart

The screenshot displays the Ubidots dashboard configuration interface. On the left, a dark blue sidebar features the 'ubidots' logo and a 'New Dashboard' menu item. Below the menu is a large dashed box with a plus sign and the text 'Add new Widget'. On the right, a light blue header reads 'New Dashboard' and 'Add new widget'. Below the header is a search bar. The main content area is divided into two sections: 'Metrics' and 'Charts'. The 'Metrics' section contains six icons: Metric, Thermometer, Gauge, Indicator, Tank, and Battery. The 'Charts' section contains seven icons: Line chart, Double Axis, Bar chart, Rose chart, Histogram, Pie chart, and Scatter.

■ Click Add Variables



- Select Variables and click check mark.



- Click check mark.

Line chart

< BACK

Data

- humidity (stm32f407)
- temperature (stm32f407)

+ Add Variables

Appearance

Name: Chart

Decimal points: Auto

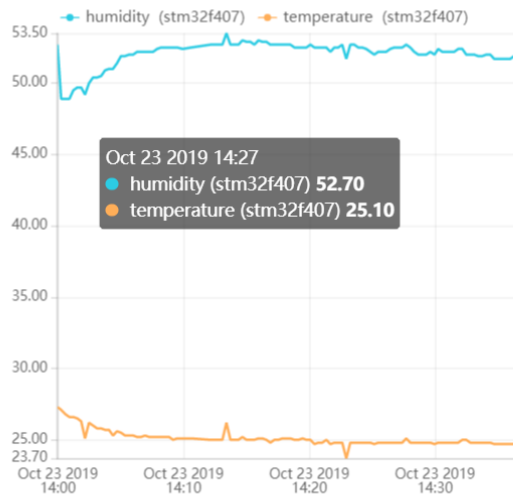
Show legend:

Date format: Oct 28 2022 13:51

Display X-Axis data zoom:

✓

Chart

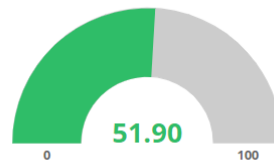


Thermometer widget


24.70

Last Updated: 10/23/2019 14:36

Gauge widget



Values Table

| DATE | HUMIDITY LAST VALUE | TEMPERATURE LAST VALUE |
|------------------|---------------------|------------------------|
| 10/23/2019 14:36 | 51.90 | 24.70 |
| 10/23/2019 14:35 | 51.70 | 24.70 |
| 10/23/2019 14:35 | 51.70 | 24.70 |
| 10/23/2019 14:35 | 51.70 | 24.70 |
| 10/23/2019 14:35 | 51.70 | 24.70 |
| 10/23/2019 14:34 | 51.70 | 24.70 |
| 10/23/2019 14:34 | 52.00 | 24.80 |
| 10/23/2019 14:34 | 52.00 | 24.80 |
| 10/23/2019 14:33 | 51.90 | 24.80 |
| 10/23/2019 14:33 | 51.90 | 24.80 |

Smartphone App

