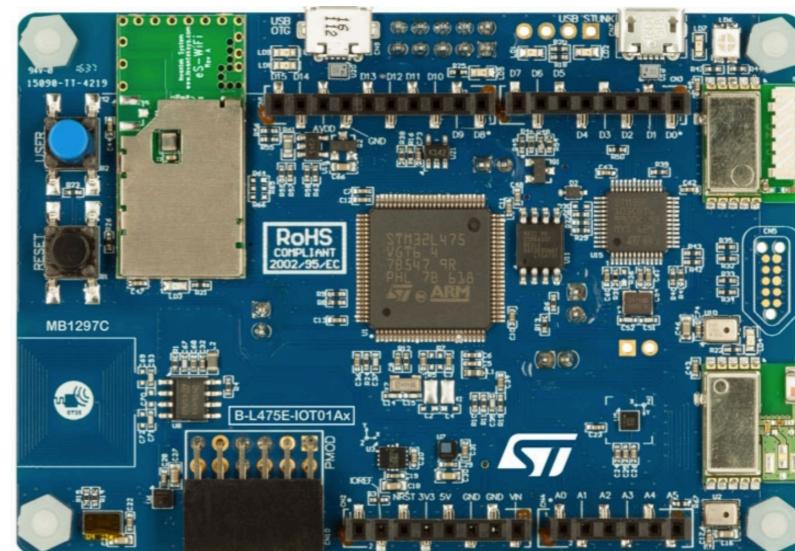
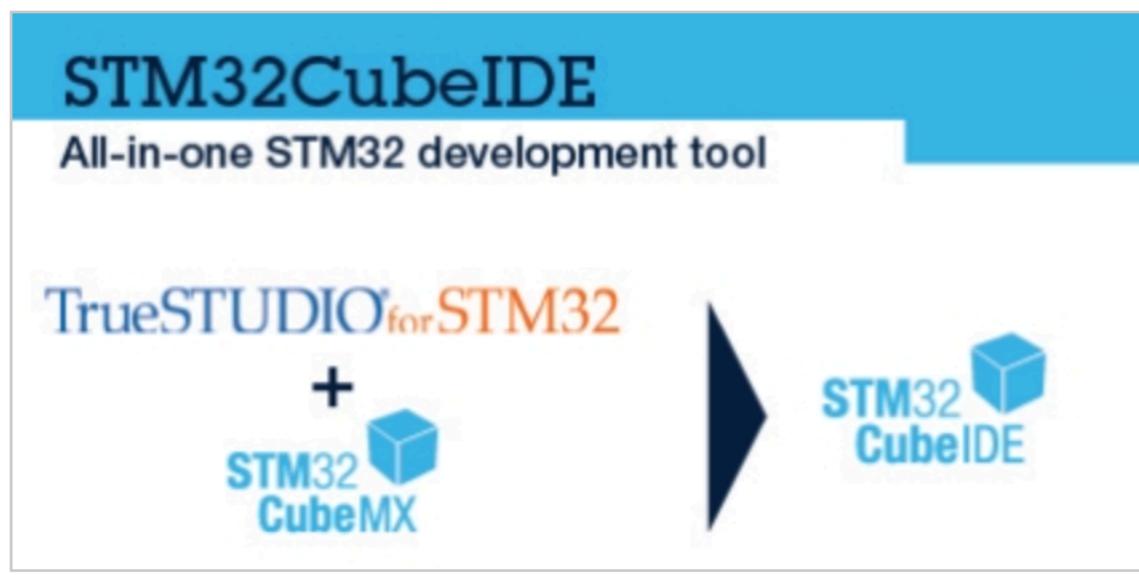


# STM32Cube IDE

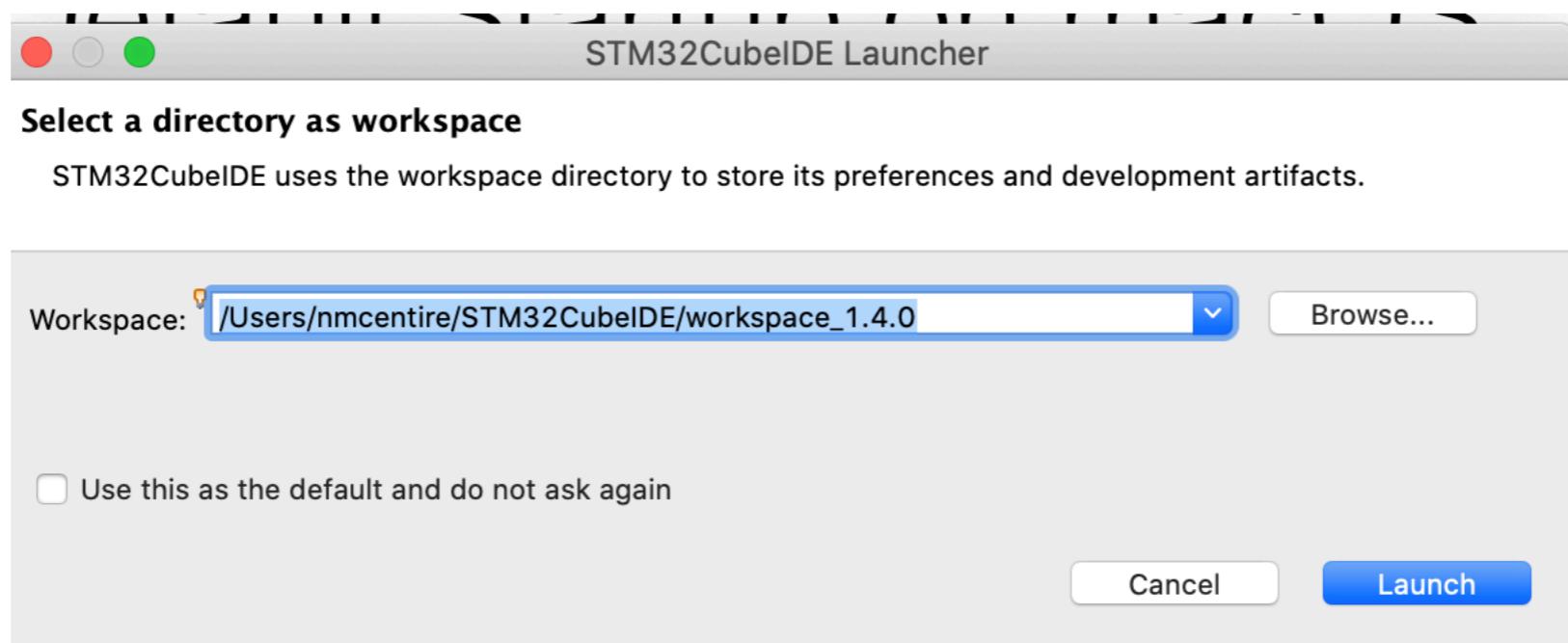
# Hello FreeRTOS

Norman McEntire

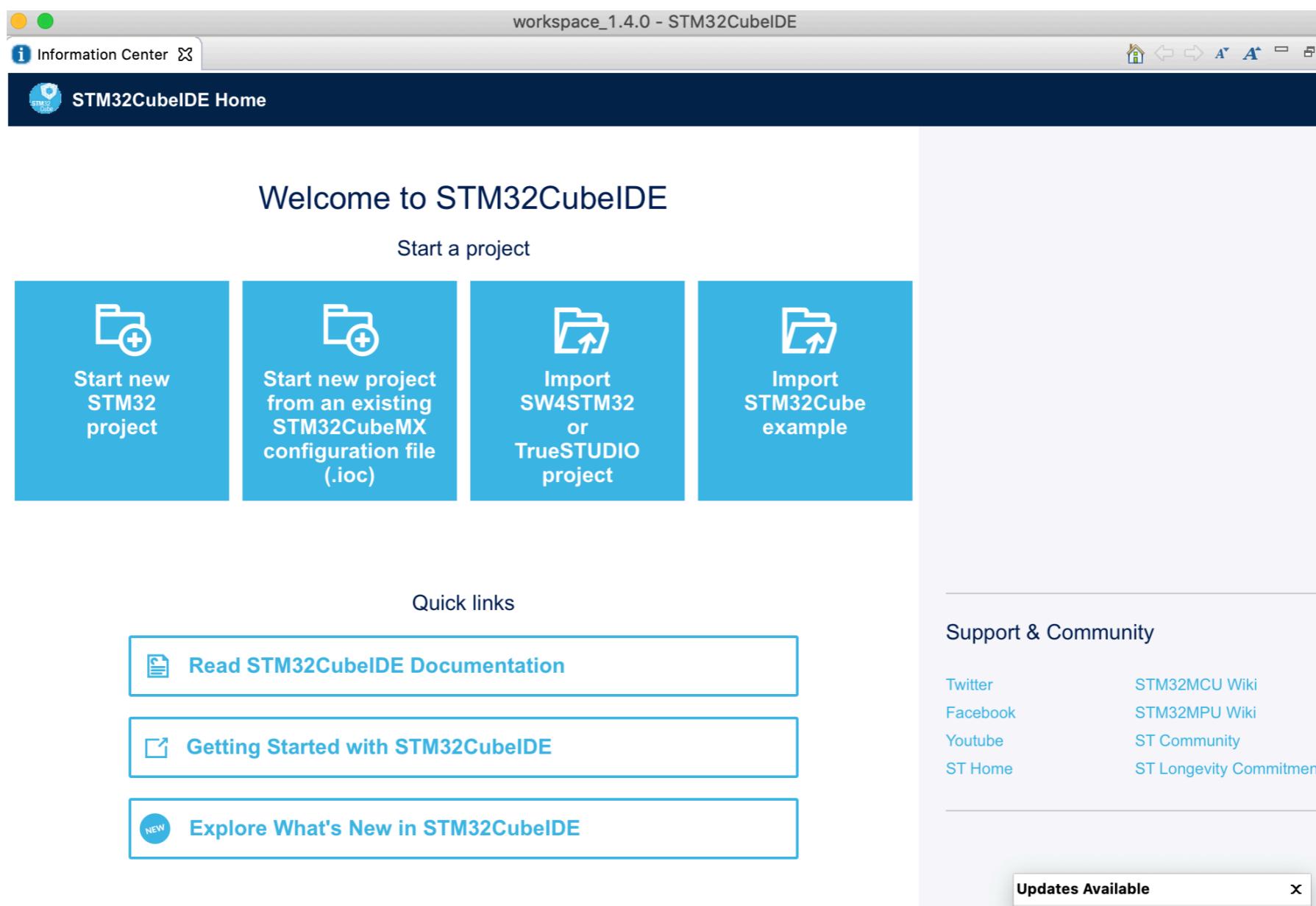


# Startup

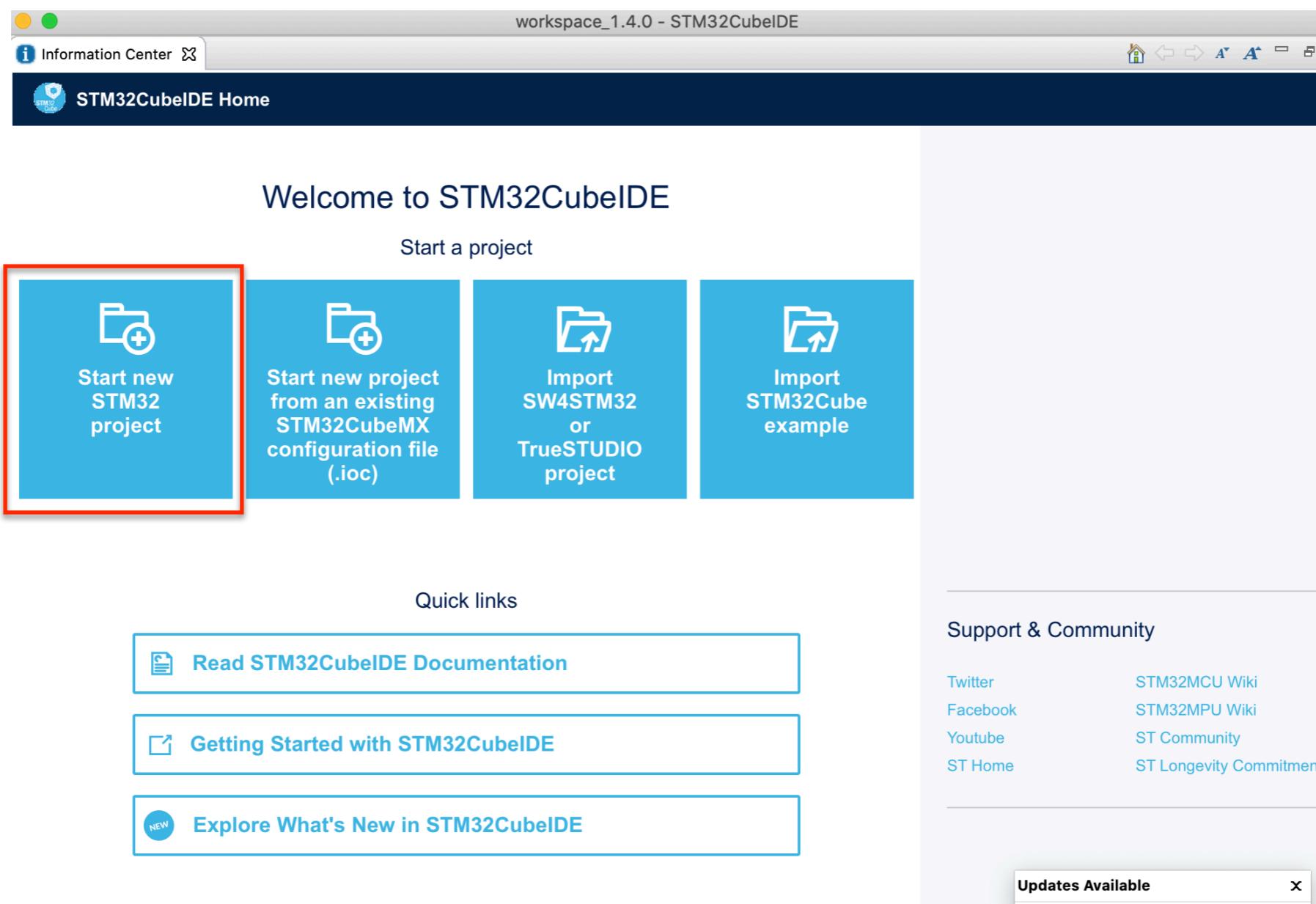
# Default Workspace



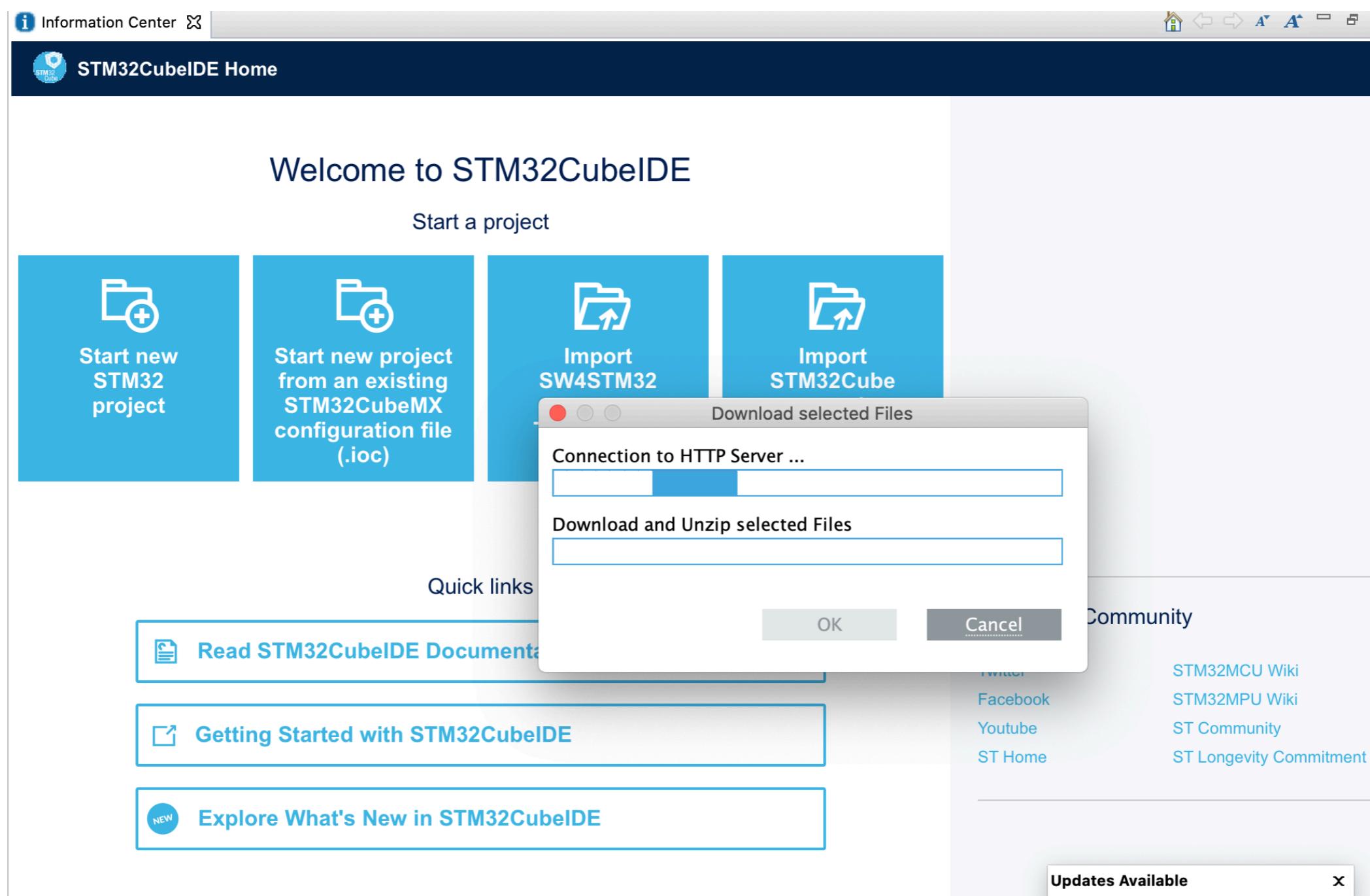
# Welcome Screen



# Start New Project



# Start New Project



# Target Selector

STM32 Project

**Target Selection**

STM32 target or STM32Cube example selection is required

ID

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

MCU/MPU Filters

- Part Number
- Core >
- Series >
- Line >
- Package >
- Other >
- Peripheral >

Features | Block Diagram | Docs & Resources | Datasheet | Buy

SIL Ready | ASIL Ready | ClassB Ready | Partner Program

Build your certified safety system with STM32 and STM8 ST

MCUs/MPUs List: 1728 items

Display similar items | Export

*	Part No	Reference	Marketing Status	Unit Price for 10kU (US\$)	Board	Package	Flash	RAM	IO	Freq.
★	STM32F030C6	STM32F030C6Tx	Active	0.597		LQFP48	32 kBytes	4 kBytes	39	48 MHz
★	STM32F030C8	STM32F030C8Tx	Active	0.722		LQFP48	64 kBytes	8 kBytes	39	48 MHz
★	STM32F030CC	STM32F030CCTx	Active	1.1		LQFP48	256 kBytes	32 kBytes	37	48 MHz
★	STM32F030F4	STM32F030F4Px	Active	0.424		TSSOP20	16 kBytes	4 kBytes	15	48 MHz
★	STM32F030K6	STM32F030K6Tx	Active	0.518		LQFP32	32 kBytes	4 kBytes	25	48 MHz
★	STM32F030R8	STM32F030R8Tx	Active	0.754	NU...ST...	LQFP64	64 kBytes	8 kBytes	55	48 MHz
★	STM32F030RC	STM32F030RCTx	Active	1.21		LQFP64	256 kBytes	32 kBytes	51	48 MHz
★	STM32F031C4	STM32F031C4Tx	Active	0.97		LQFP48	16 kBytes	4 kBytes	39	48 MHz
★	STM32F031C6	STM32F031C6Tx	Active	1.013		LQFP48	32 kBytes	4 kBytes	39	48 MHz
★	STM32F031E6	STM32F031E6Yx	Active	0.776		WLCSP25	32 kBytes	4 kBytes	20	48 MHz

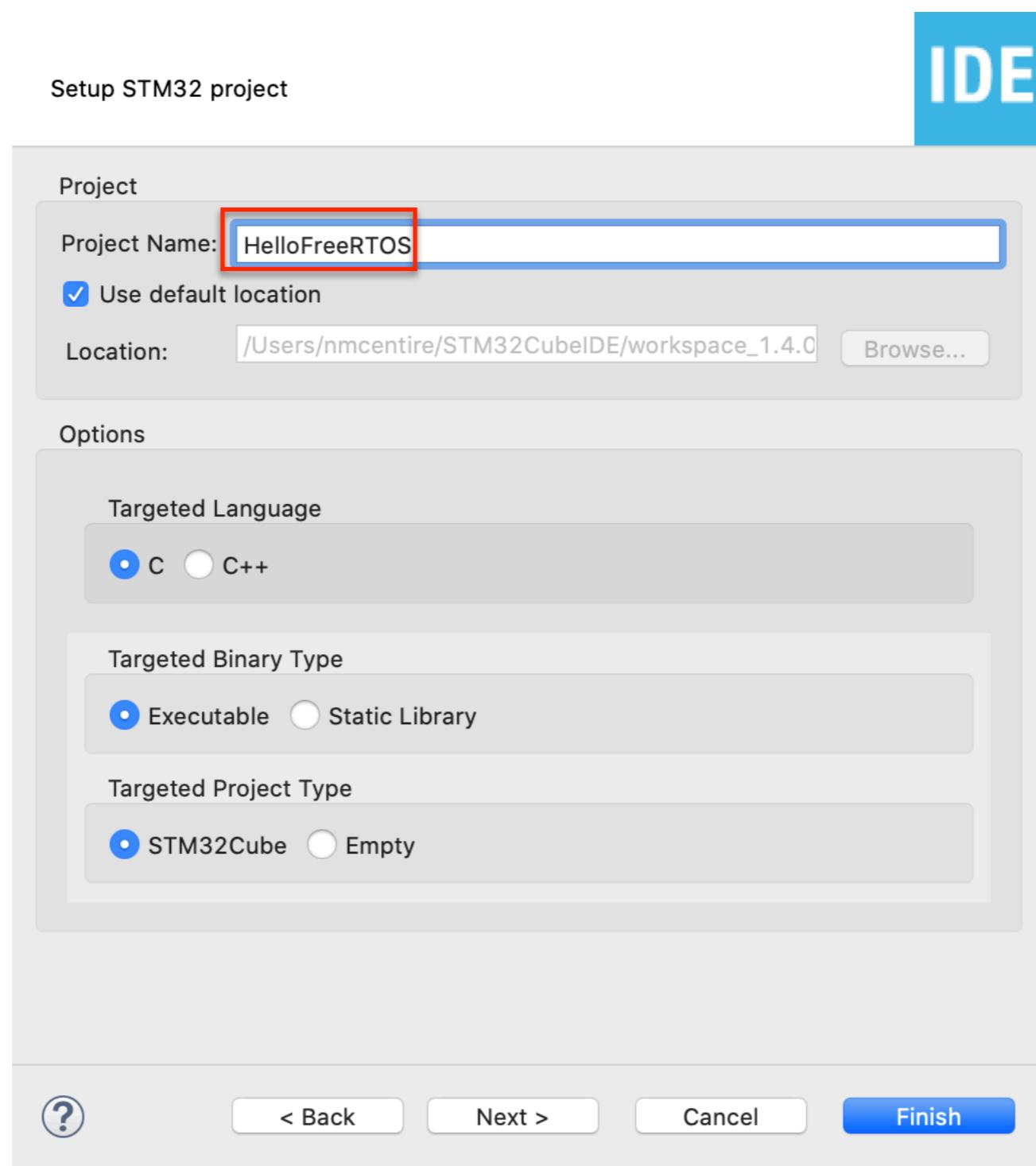
# Board Selector

## B-L475E-IOT01A1

The screenshot shows the STM32 Project interface with the 'Board Selector' tab selected (highlighted by a red box). The main area displays a table of boards under the 'STM32L4 Series' heading. The table includes columns for Overview, Commercial Part No., Type, Marketing Status, Unit Price (US\$), and Mounted Device. The row for the B-L475E-IOT01A1 board is highlighted with a red box.

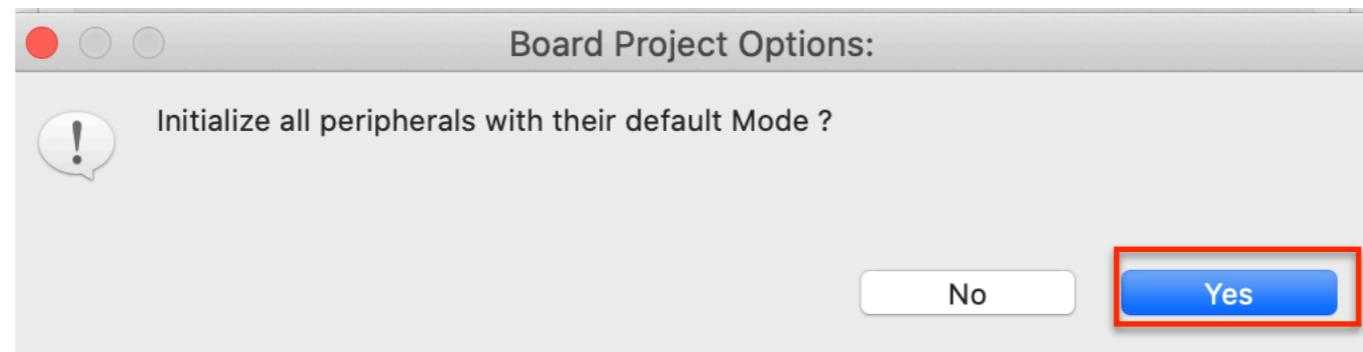
*	Overview	Commercial Part No.	Type	Marketing Status	Unit Price (US\$)	Mounted Device
★		B-G474E-DPOW1	Discovery Kit	Active	59.0	<a href="#">STM32G474RETx</a>
★		B-L072Z-LRWAN1	Discovery Kit	Active	46.5	<a href="#">STM32L072CZYx</a>
★		B-L462E-CELL1	Discovery Kit	NA	NA	<a href="#">STM32L462REYx</a>
★		<b>B-L475E-IOT01A1</b>	Discovery Kit	Active	53.0	<a href="#">STM32L475VGTx</a>
★		B-L475E-IOT01A2	Discovery Kit	NA	NA	<a href="#">STM32L475VGTx</a>

# HelloFreeRTOS



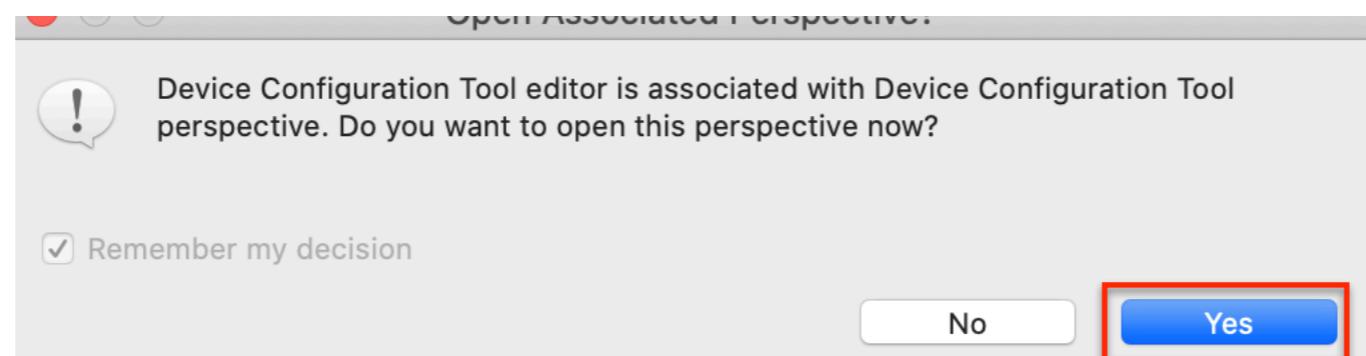
# Setup Project

## Init all peripherals to default mode

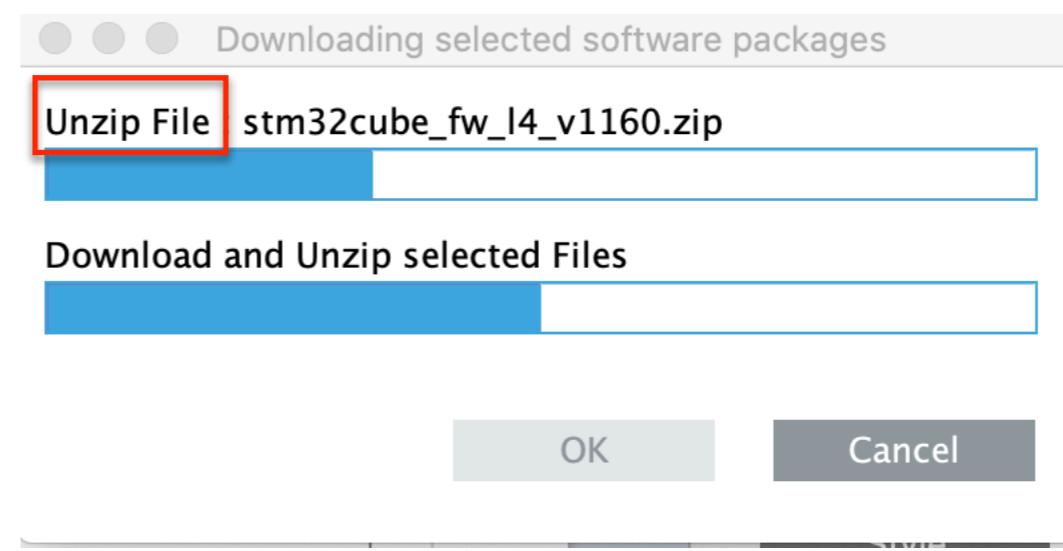
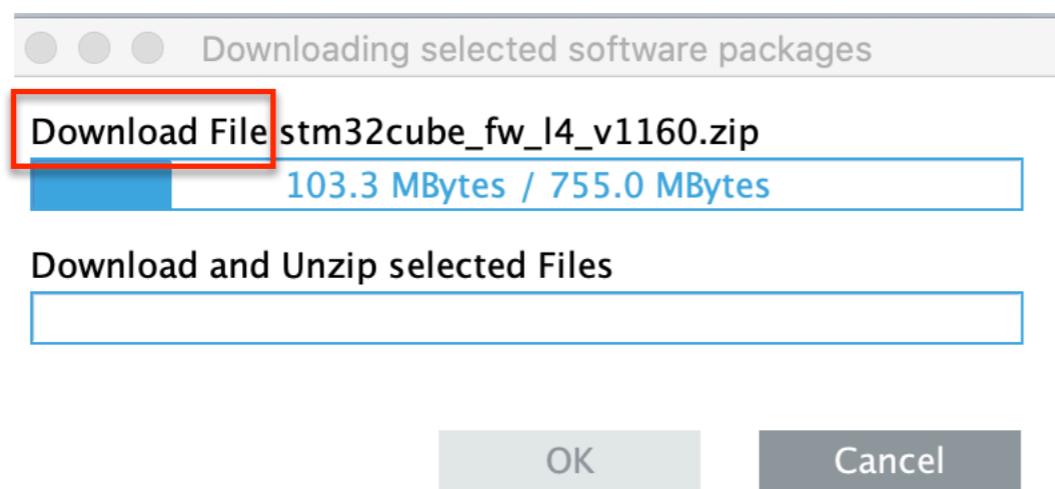


# Setup Project

# Open Device Config Tool Perspective

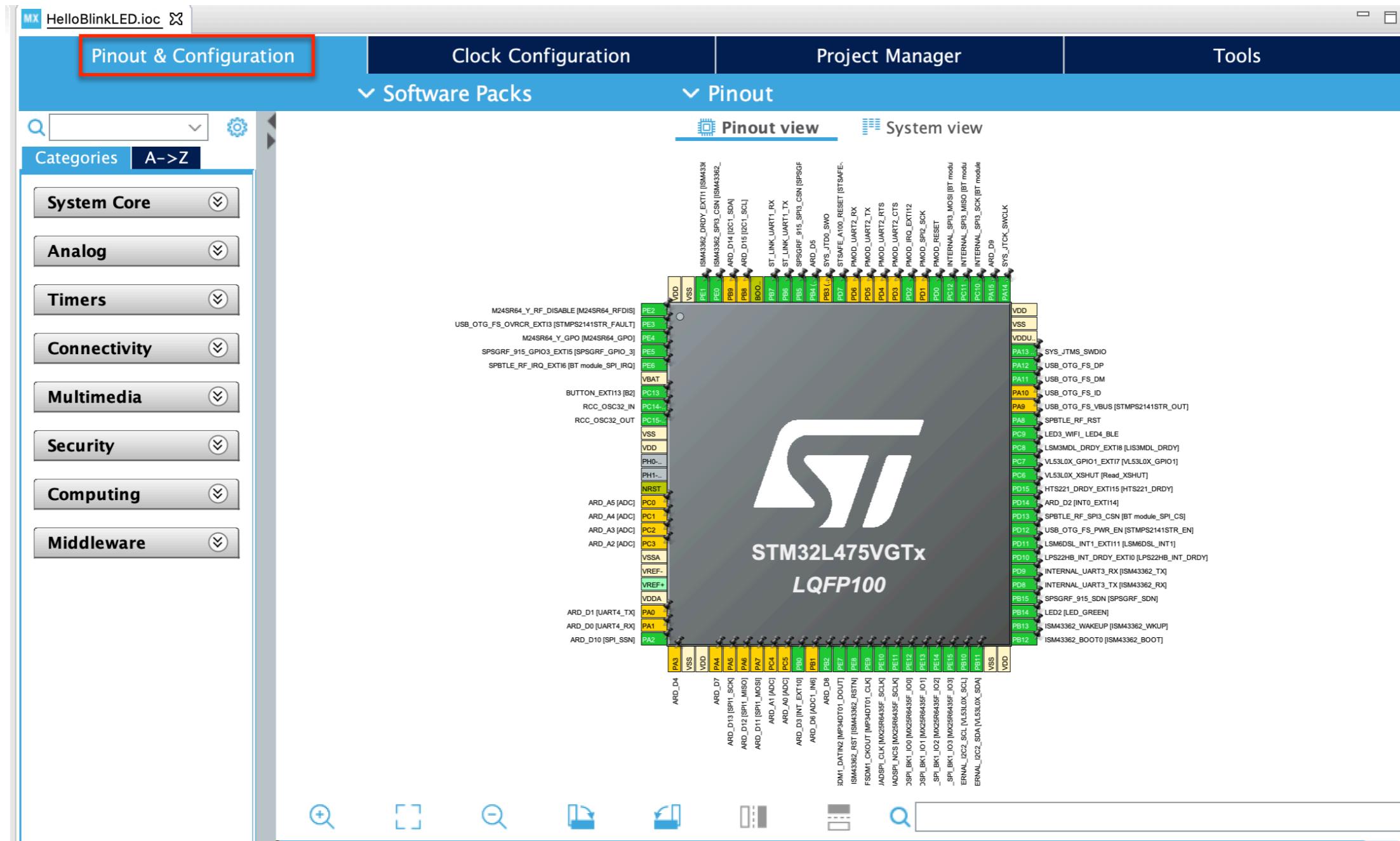


# Downloading Software

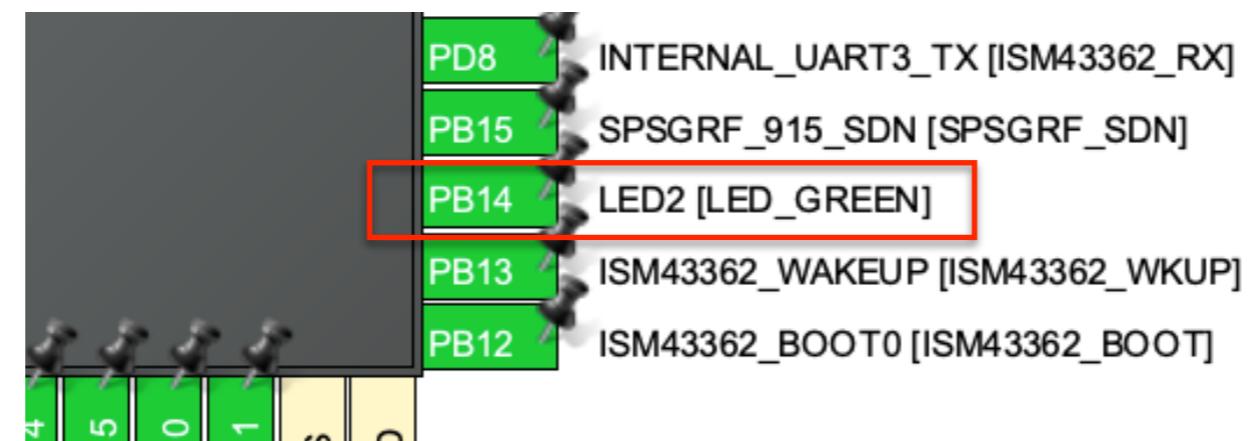


# Device Config Perspective

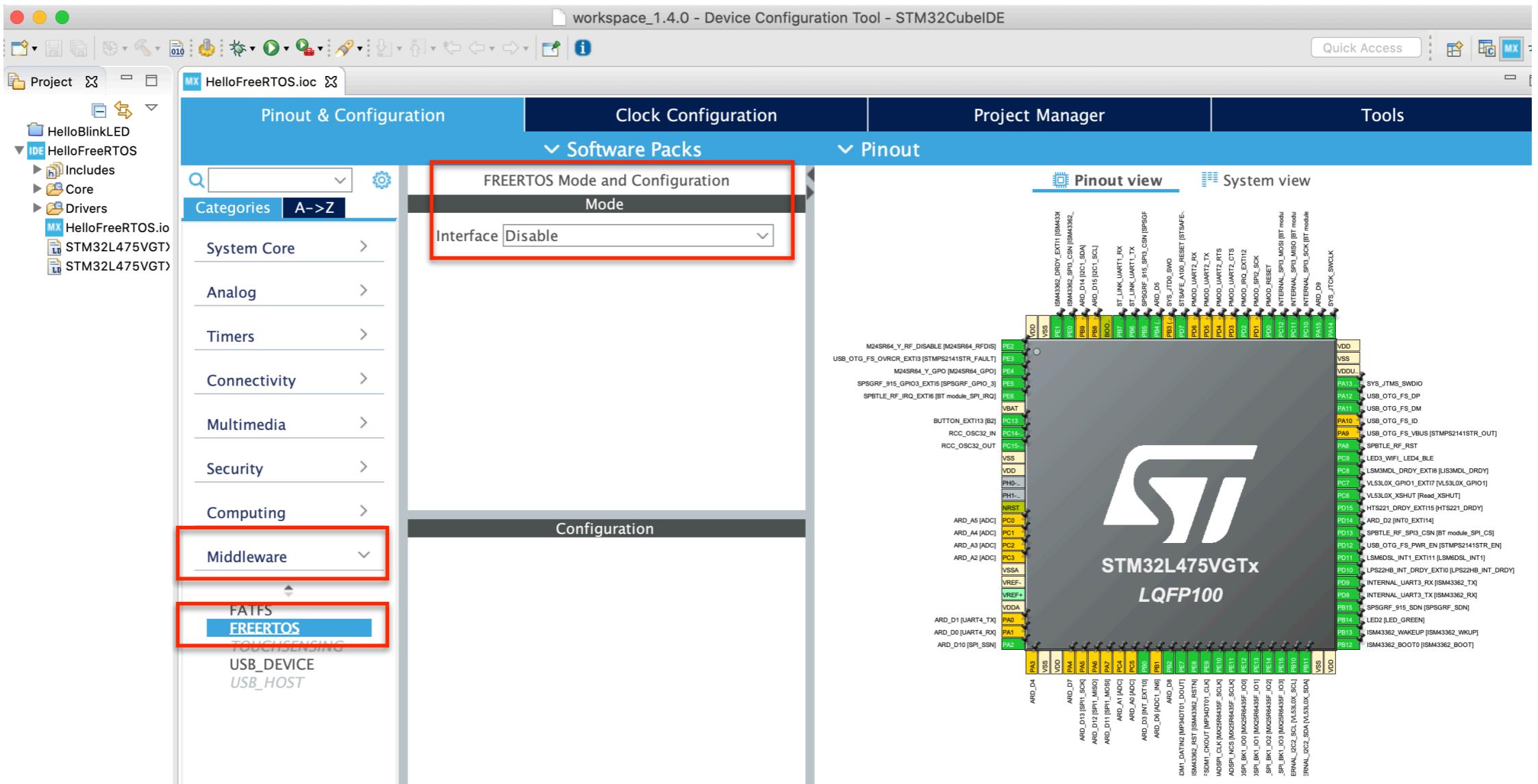
## Pinout & Configuration



# LED2

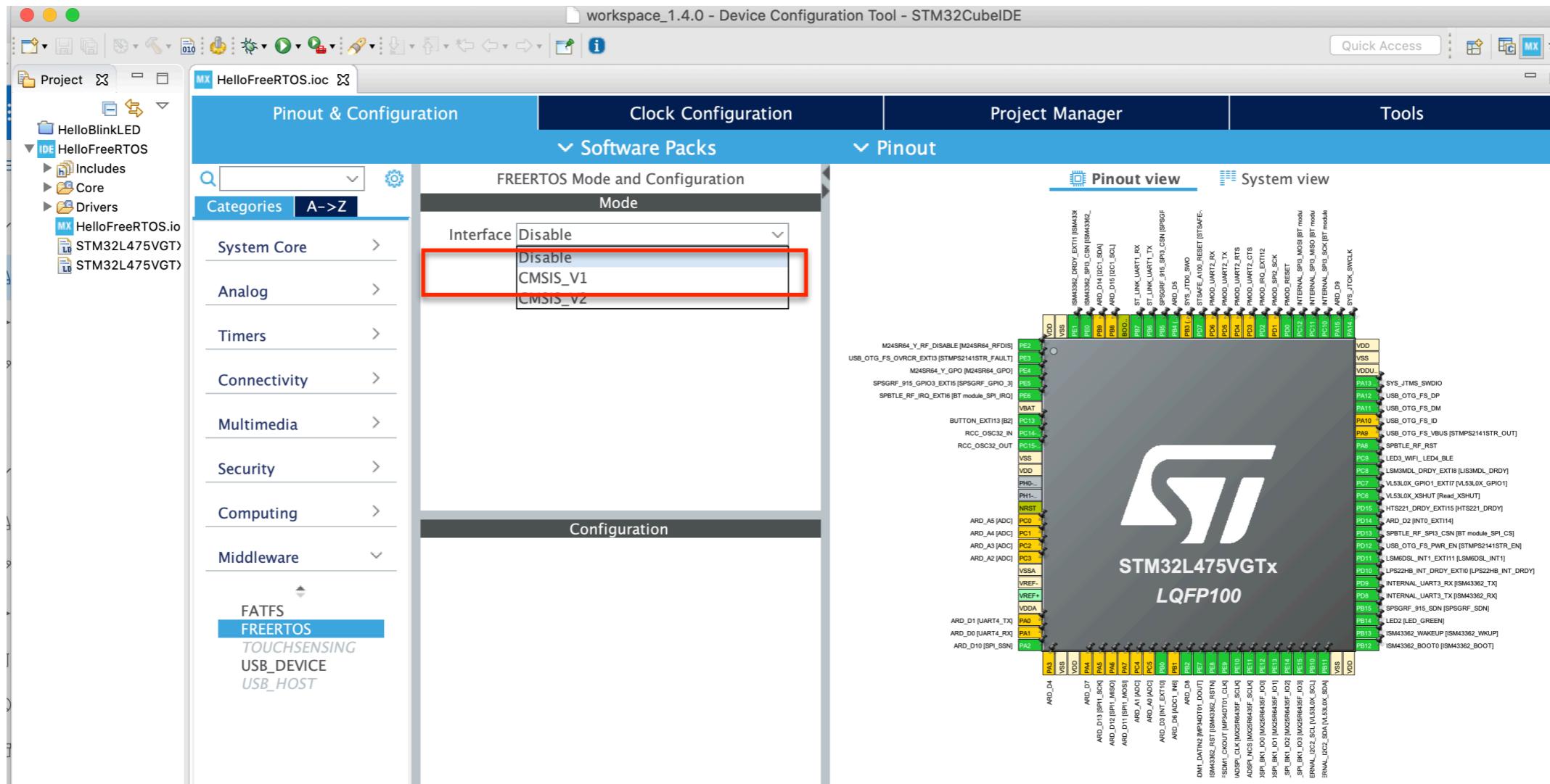


# Middleware / FreeRTOS (Disabled by Default)



# Middleware / FreeRTOS

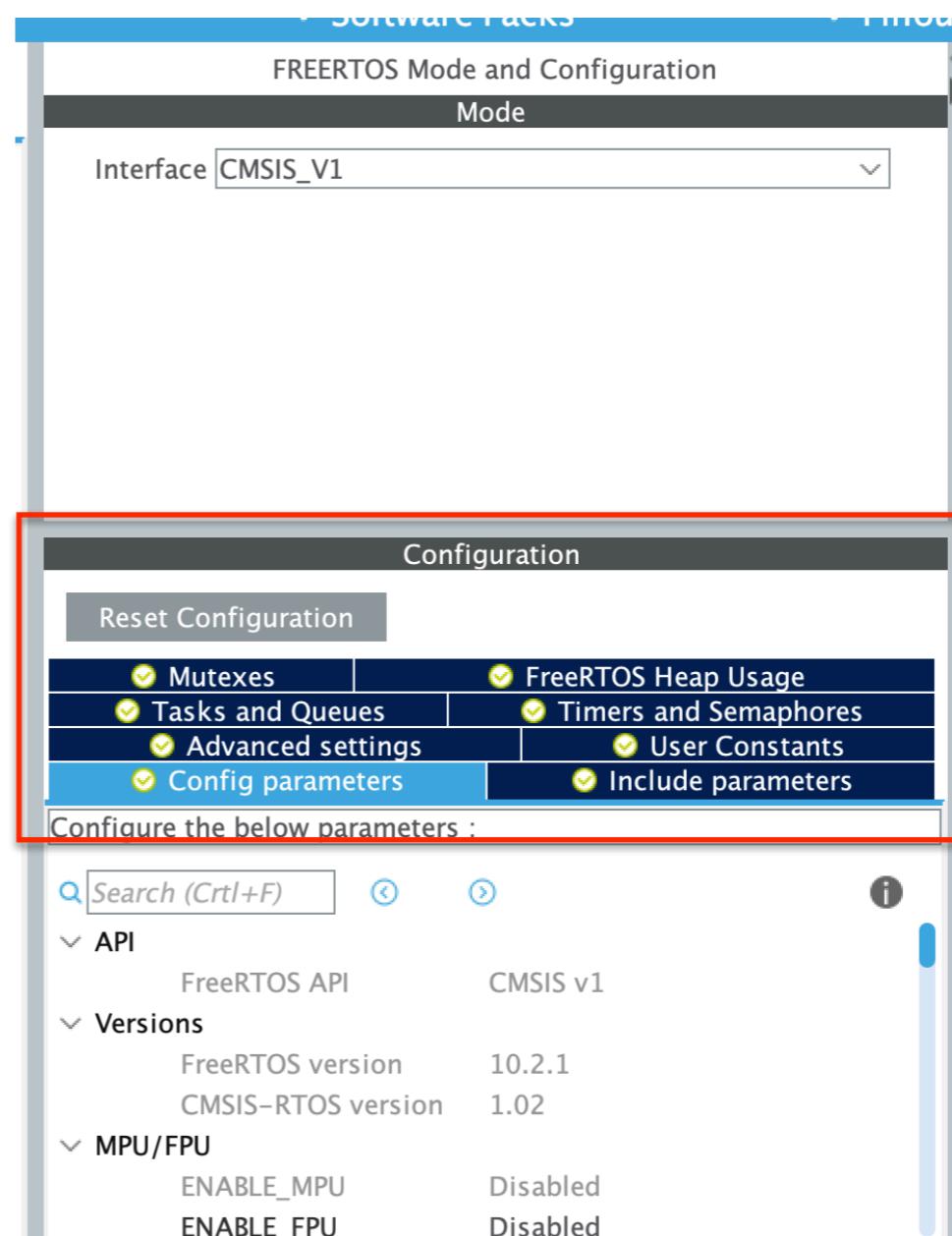
## Enable CMSIS\_V1



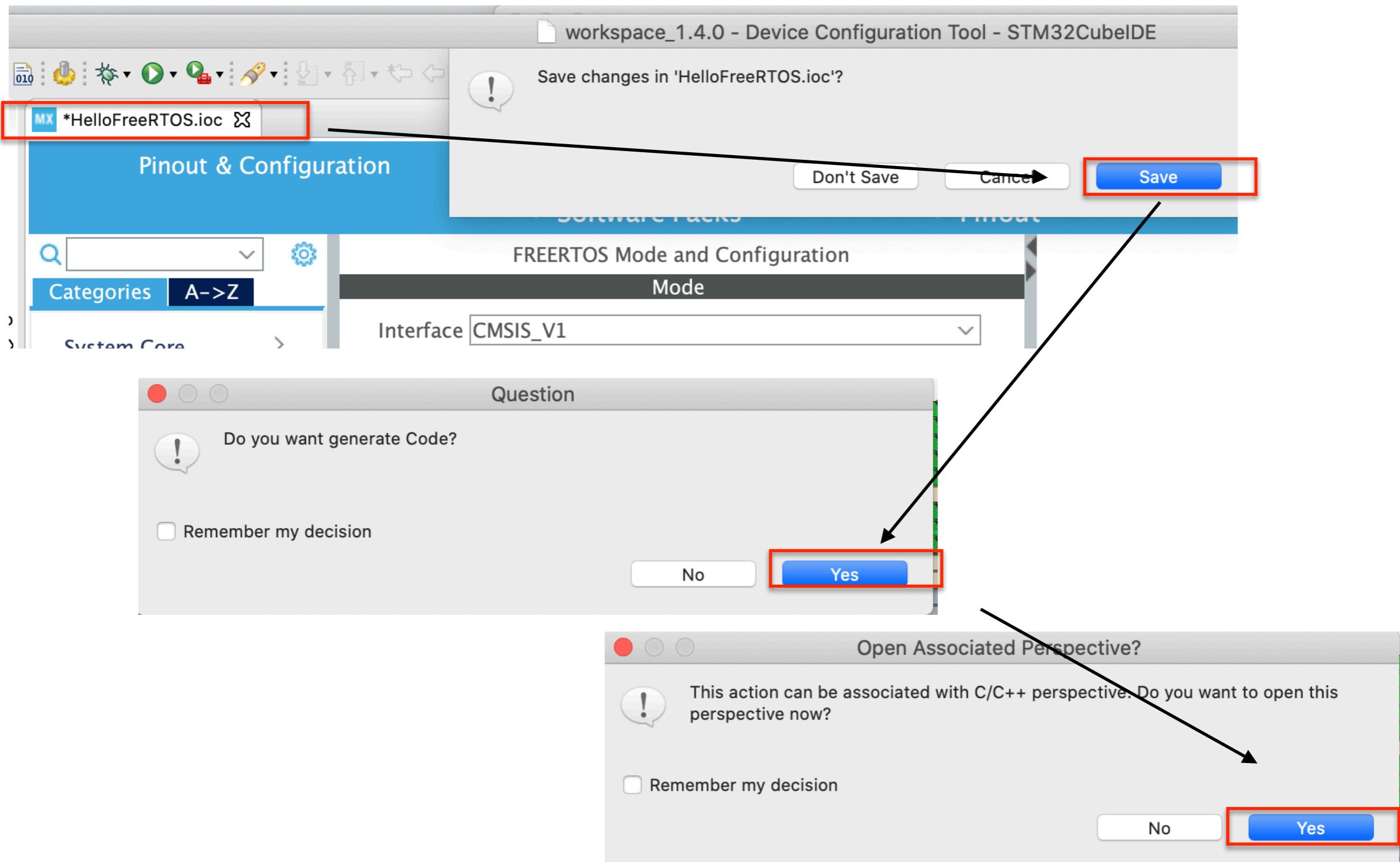
# Middleware / FreeRTOS

## Leave all defaults

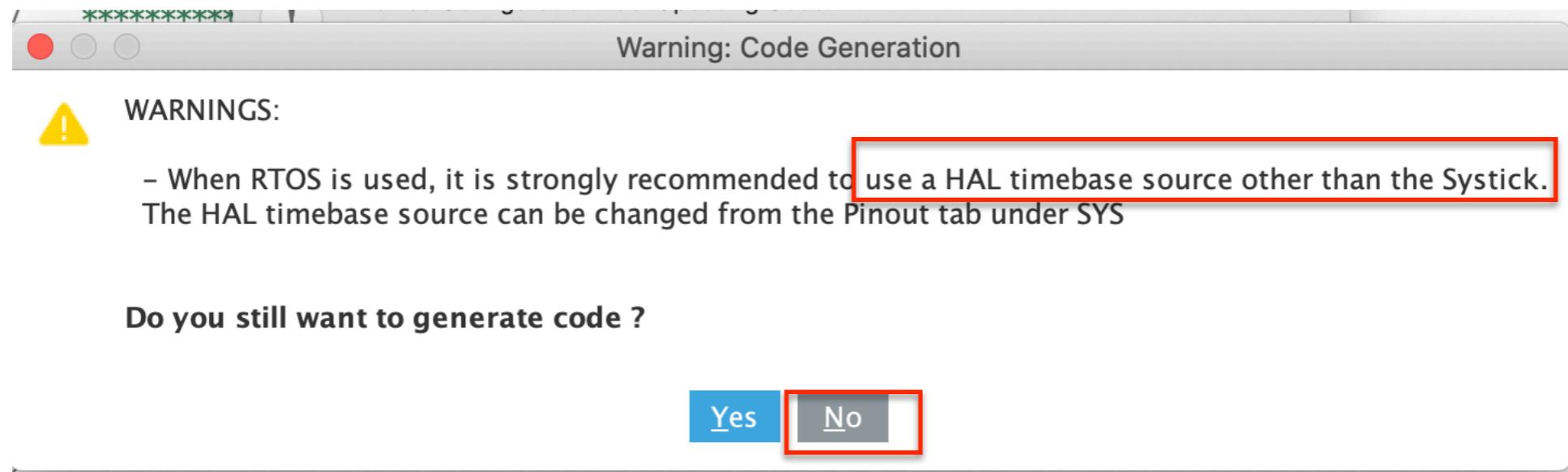
Mutexes  
Heap Usage  
Tasks and Queues  
Timers and Semaphores  
Advanced Settings  
User Constants  
Config Params  
Include Params



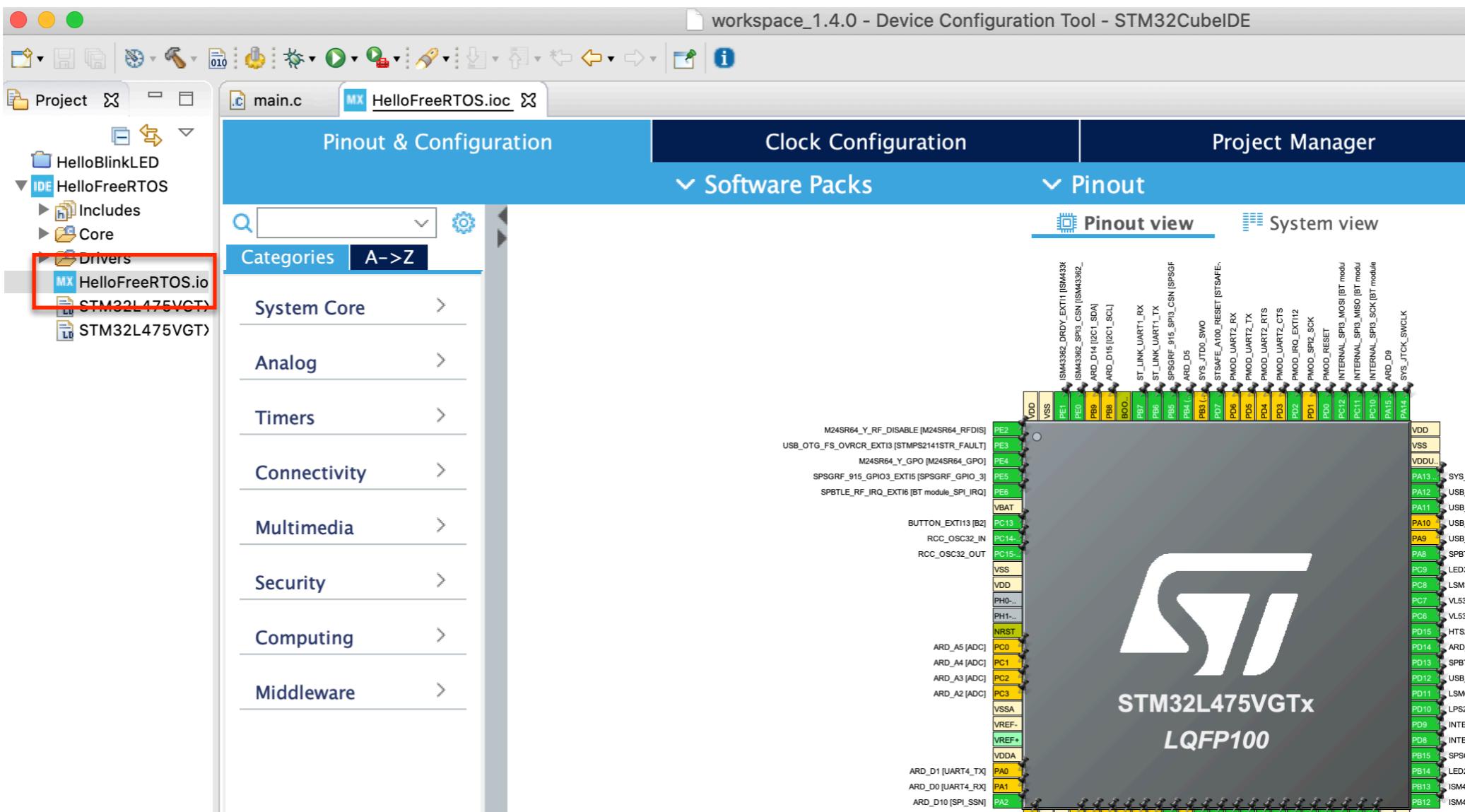
# Click to Close HelloFreeRTOS.ioc - Save Changes and Generate Code



# Need to change timebase from Systick



Double-click on  
HelloFreeRTOS.ioc



# System Core / SYS / Timebase Source / TIM1

Pinout & Configuration      Clock Configuration      Project Manager

Categories A-Z

System Core

DMA  
GPIO  
IWDG  
NVIC  
RCC  
**SYS**  
TSC  
WWDG

Analog

Timers

Connectivity

Multimedia

Software Packs

SYS Mode and Configuration

Mode

Debug Serial Wire

System Wake-Up 1

System Wake-Up 2

System Wake-Up 3

System Wake-Up 4

System Wake-Up 5

Power Voltage Detector In Disable

VREFBUF Mode Disable

Timebase Source SysTick

SysTick

TIM1

TIM2

TIM3

TIM4

TIM5

TIM6

TIM7

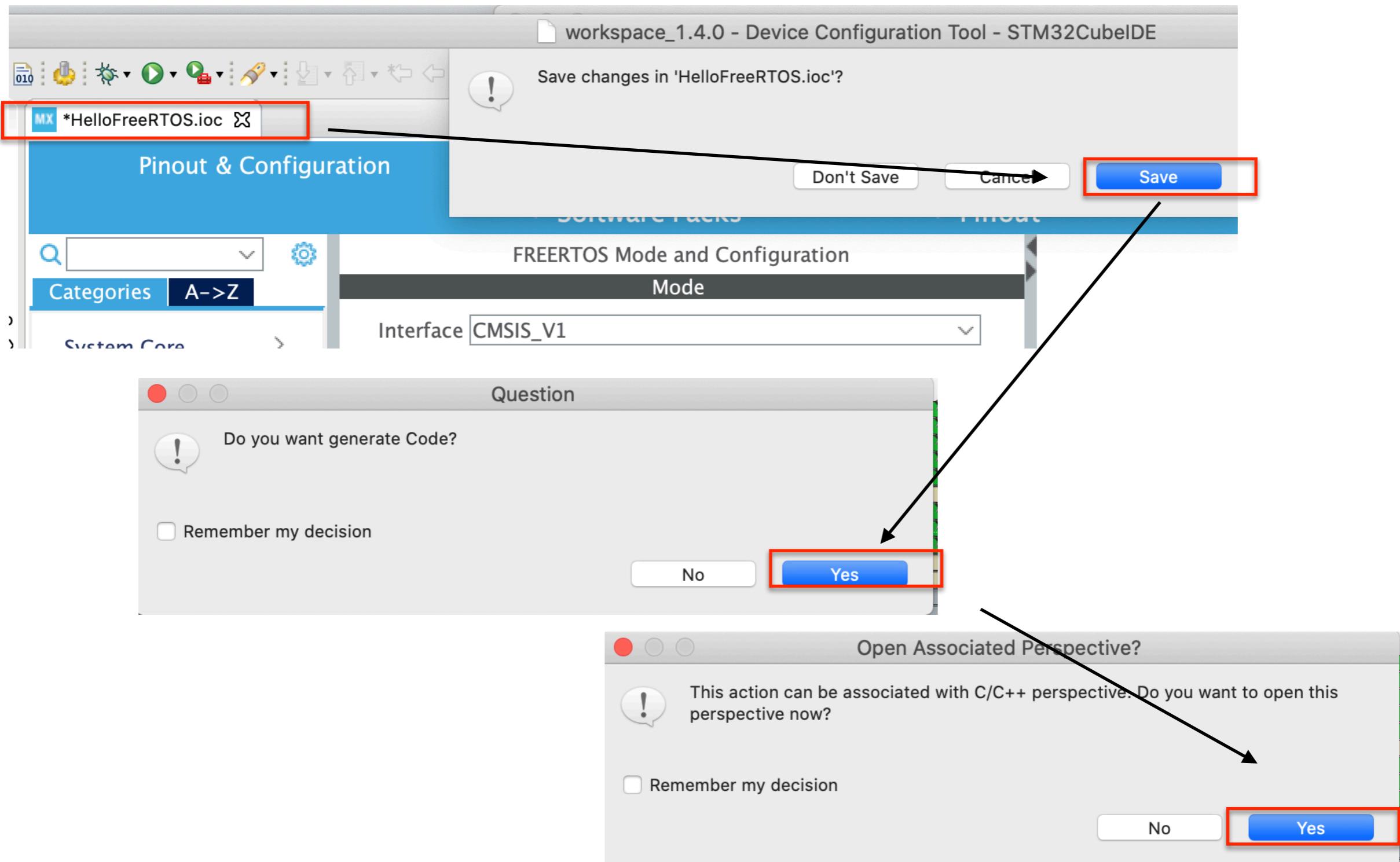
Warning: This IP has been modified.

Pinout

Pinout

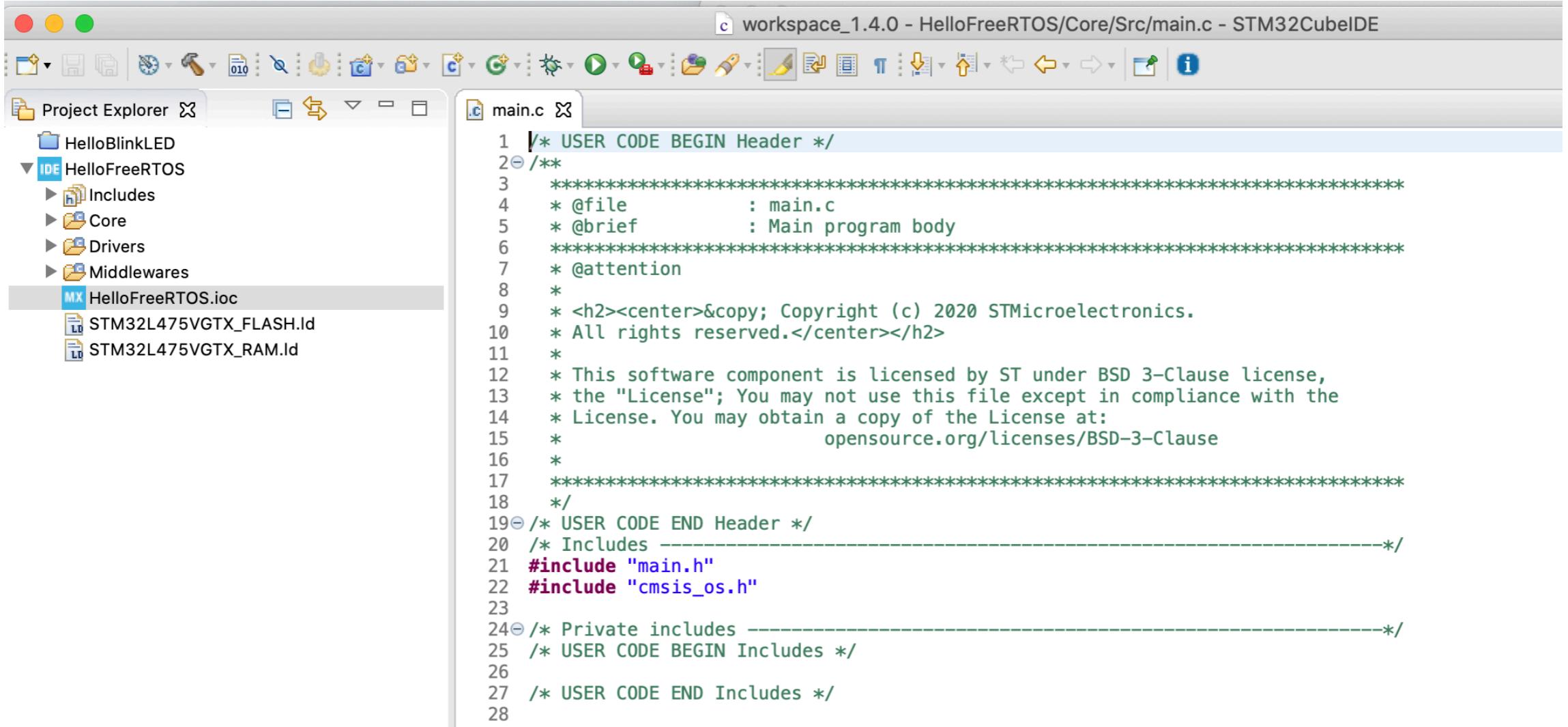
ISM43362\_DRDY\_EXTI11 [ISM43362]  
ISM43362\_SPI3\_CSN [ISM43362]  
ARD\_D14 [2C1\_SDA]  
ARD\_D15 [2C1\_SCL]  
STLINK\_LVDT1\_DV  
PE2  
PE3  
PE4  
PE5  
PE6  
VBAT  
PC13  
RCC\_OSC32\_IN  
RCC\_OSC32\_OUT  
PC15...  
VSS  
VDD  
PH0...  
PH1...  
NRST  
PC0  
PC1  
PC2  
PC3  
VSSA  
VREF-  
VREF+  
VDDA  
ARD\_D1 [UART4\_TX]  
ARD\_D0 [UART4\_RX]  
PA0  
PA1

# Click to Close HelloFreeRTOS.ioc - Save Changes and Generate Code



# Resulting Code

## main.c



The screenshot shows the STM32CubeIDE interface. The title bar reads "workspace\_1.4.0 - HelloFreeRTOS/Core/Src/main.c - STM32CubeIDE". The left side features a "Project Explorer" window with a tree view. Under the "IDE" category, "HelloFreeRTOS" is expanded, showing "Includes", "Core", "Drivers", "Middlewares", and "HelloFreeRTOS.ioc" (which is selected). Other items include "STM32L475VGTX\_FLASH.Id" and "STM32L475VGTX\_RAM.Id". The main workspace contains a code editor for "main.c". The code is as follows:

```
1 /* USER CODE BEGIN Header */
2 /**
3  * @file          : main.c
4  * @brief         : Main program body
5  * @attention
6  *
7  * <h2><center>&copy; Copyright (c) 2020 STMicroelectronics.
8  * All rights reserved.</center></h2>
9  *
10 * This software component is licensed by ST under BSD 3-Clause license,
11 * the "License"; You may not use this file except in compliance with the
12 * License. You may obtain a copy of the License at:
13 *           opensource.org/licenses/BSD-3-Clause
14 *
15 */
16 *
17 */
18 */
19 /* USER CODE END Header */
20 /* Includes -----*/
21 #include "main.h"
22 #include "cmsis_os.h"
23
24 /* Private includes -----*/
25 /* USER CODE BEGIN Includes */
26
27 /* USER CODE END Includes */
28
```

# main.c

# main.c - main()

main.c

```
81 /* USER CODE END 0 */
82
83 /**
84  * @brief The application entry point.
85  * @retval int
86 */
87 int main(void)
88 {
89     /* USER CODE BEGIN 1 */
90
91     /* USER CODE END 1 */
92
93     /* MCU Configuration-----*/
94
95     /* Reset of all peripherals, Initializes the Flash interface and the Systick. */
96     HAL_Init();
97
98     /* USER CODE BEGIN Init */
99
100    /* USER CODE END Init */
101
102    /* Configure the system clock */
103    SystemClock_Config();
104
105    /* USER CODE BEGIN SysInit */
106
107    /* USER CODE END SysInit */
108
```

# main.c - StartDefaultTask()

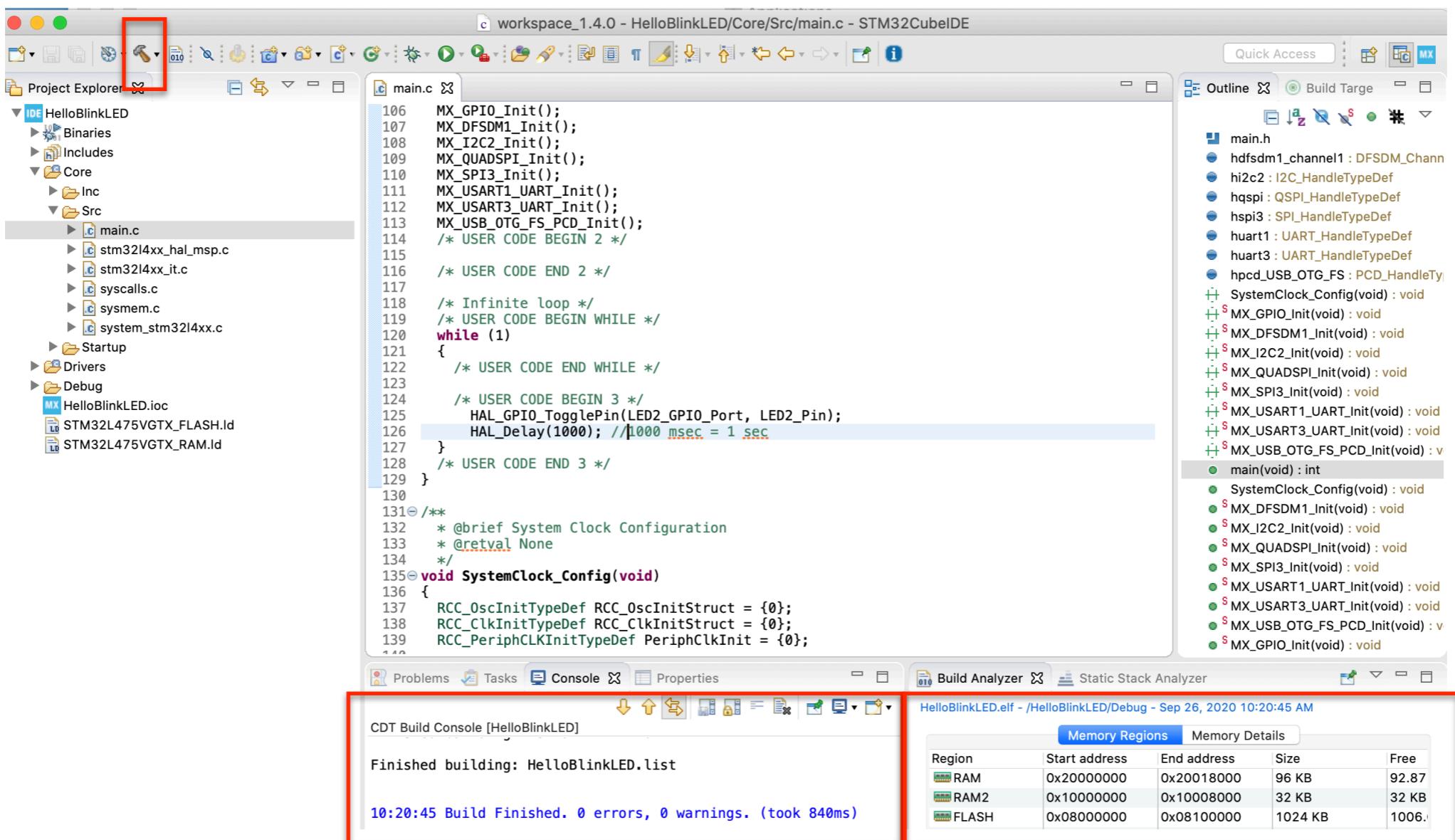
```
690
691 /* USER CODE BEGIN Header_StartDefaultTask */
692 /**
693  * @brief Function implementing the defaultTask thread.
694  * @param argument: Not used
695  * @retval None
696 */
697 /* USER CODE END Header_StartDefaultTask */
698 void StartDefaultTask(void const * argument)
699 {
700     /* USER CODE BEGIN 5 */
701     /* Infinite loop */
702     for(;;)
703     {
704         osDelay(1);
705     }
706     /* USER CODE END 5 */
707 }
```

# main() - StartDefaultTask()     HAL\_GPIO\_TogglePin()         osDelay()

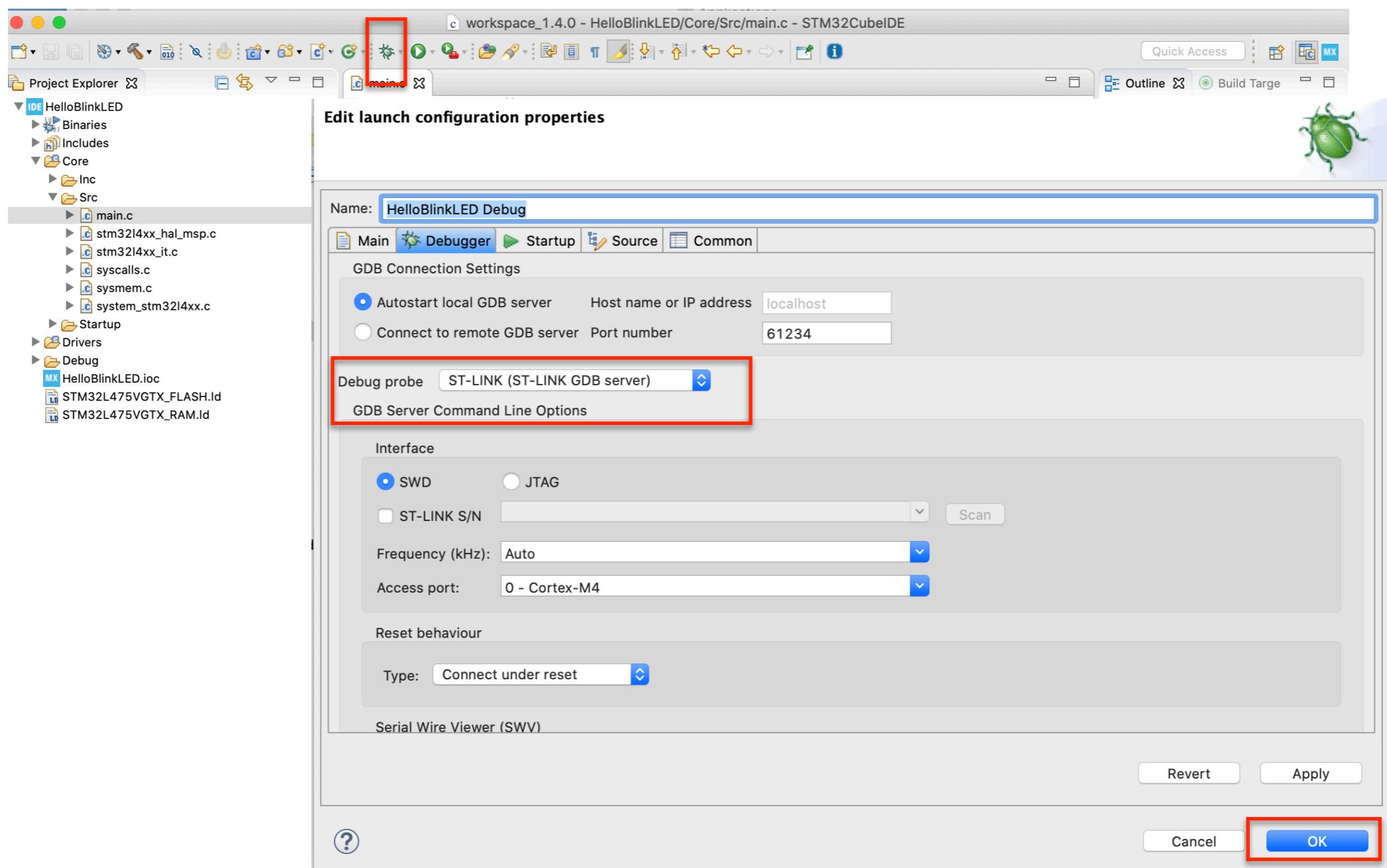
```
693     * @brief  Function implementing the defaultTask thread.  
694     * @param argument: Not used  
695     * @retval None  
696     */  
697 /* USER CODE END Header_StartDefaultTask */  
698 void StartDefaultTask(void const * argument)  
699 {  
700     /* USER CODE BEGIN 5 */  
701     /* Infinite loop */  
702     for(;;)  
703     {  
704         HAL_GPIO_TogglePin(LED2_GPIO_Port, LED2_Pin);  
705         osDelay(1000);  
706     }  
707     /* USER CODE END 5 */  
708 }  
709 }  
710
```

# Build and Run

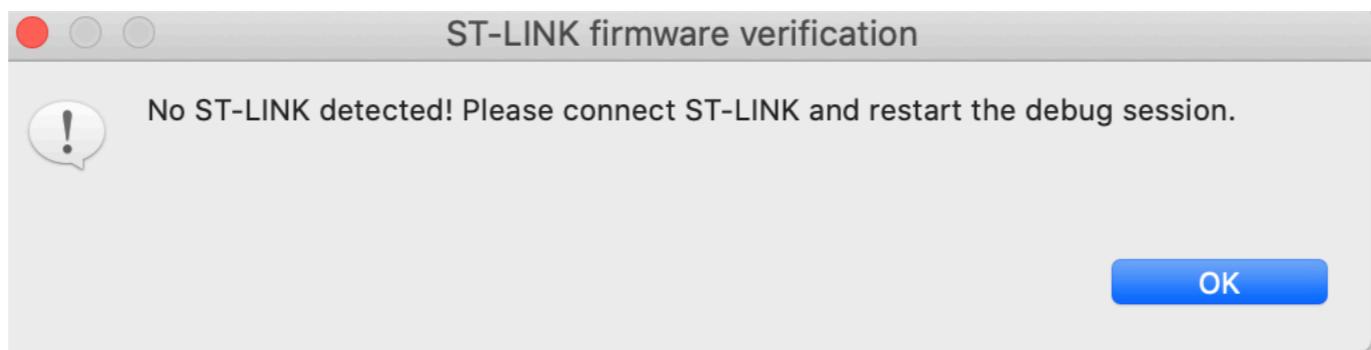
# Building



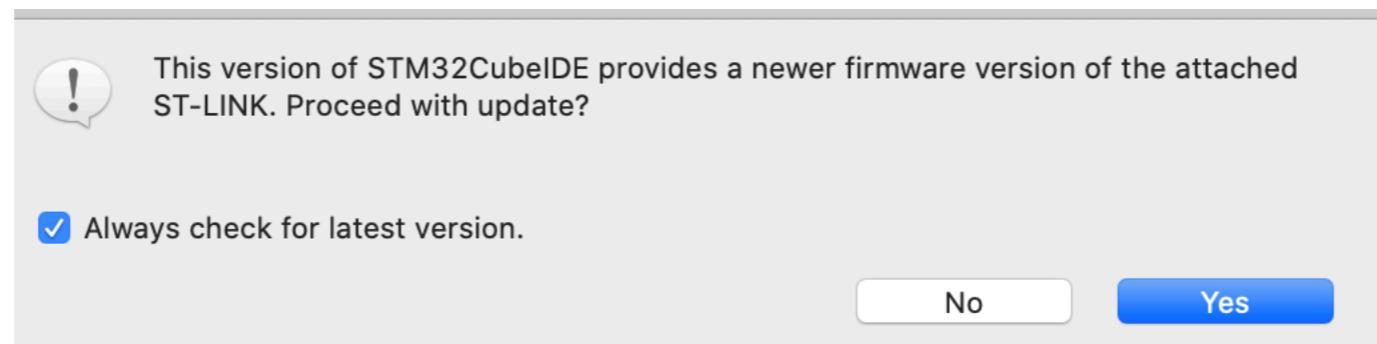
# Debugging



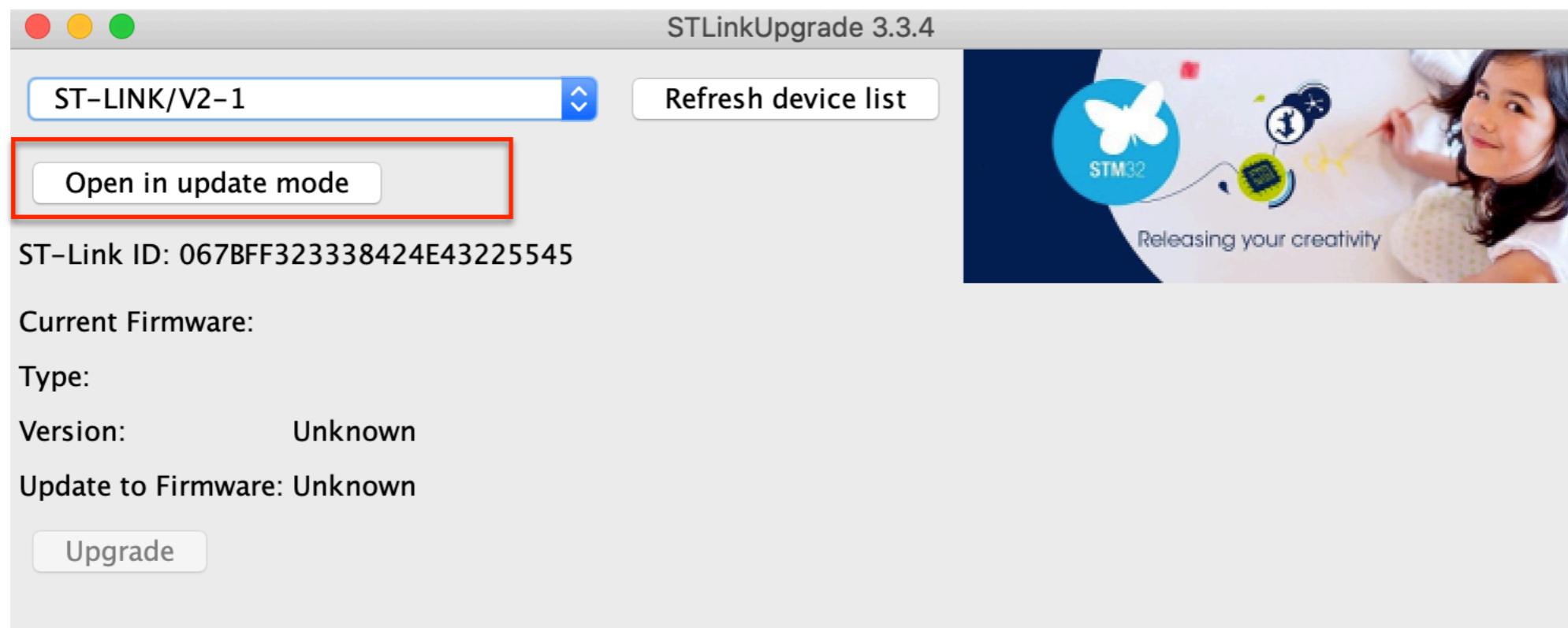
# If ST-LINK Not Detected



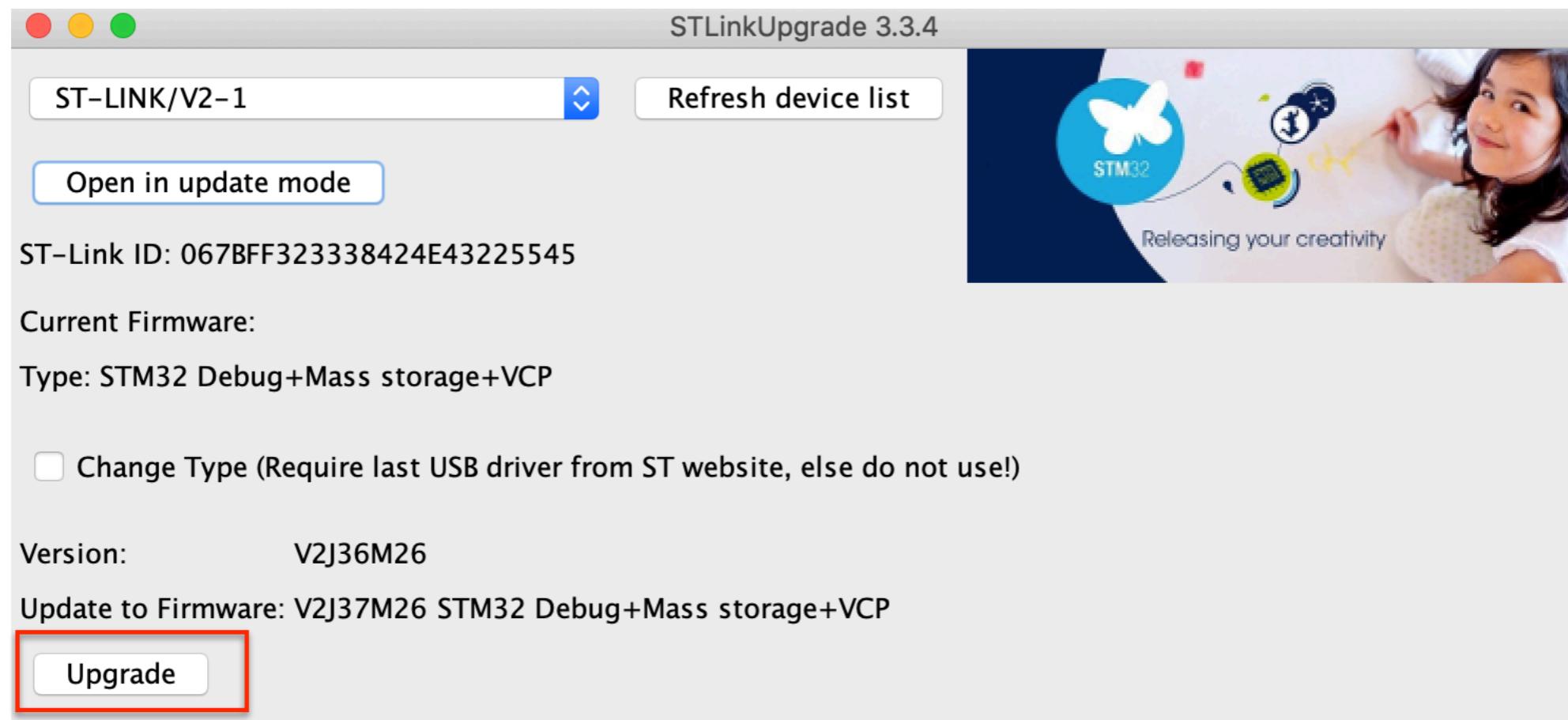
# If ST-LINK Needs Firmware Update



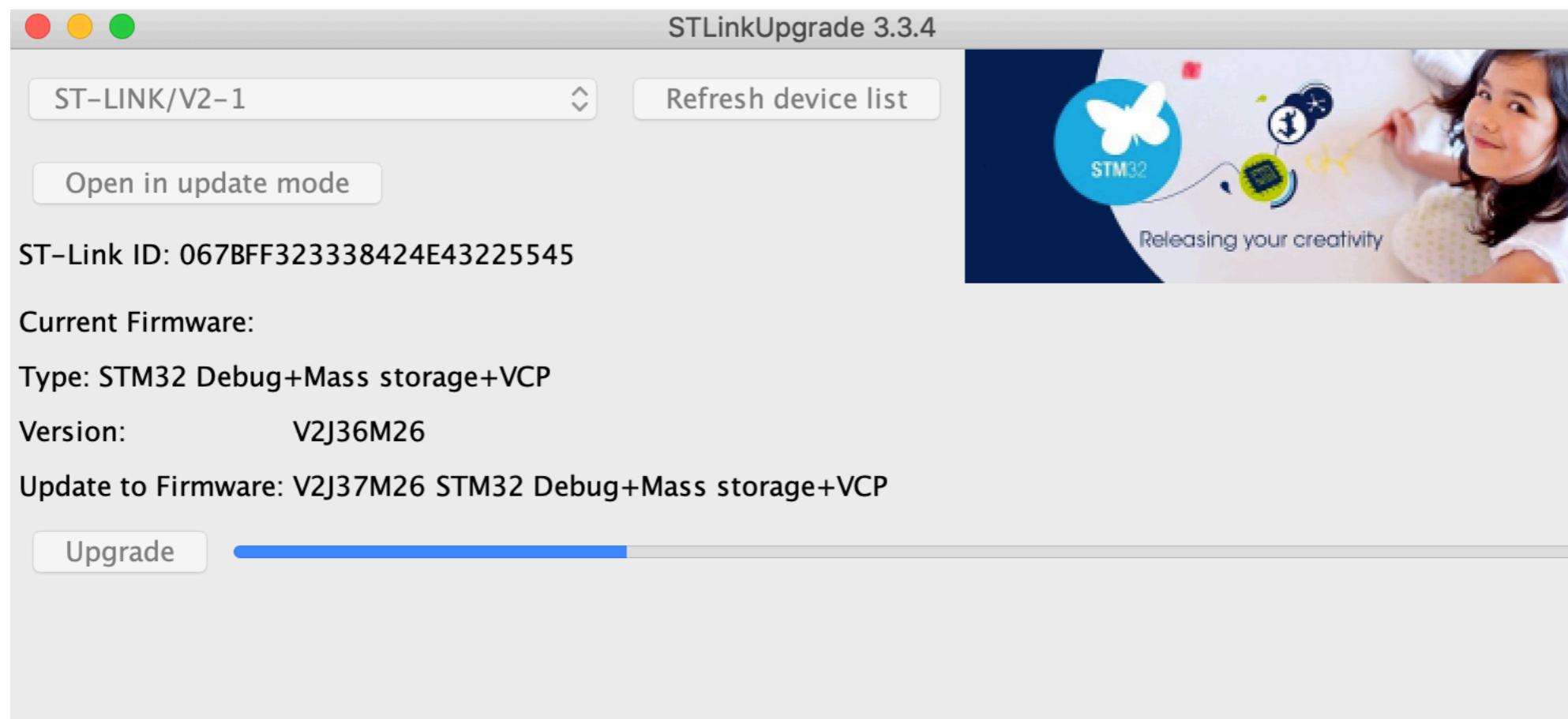
# ST-Link Update - 1



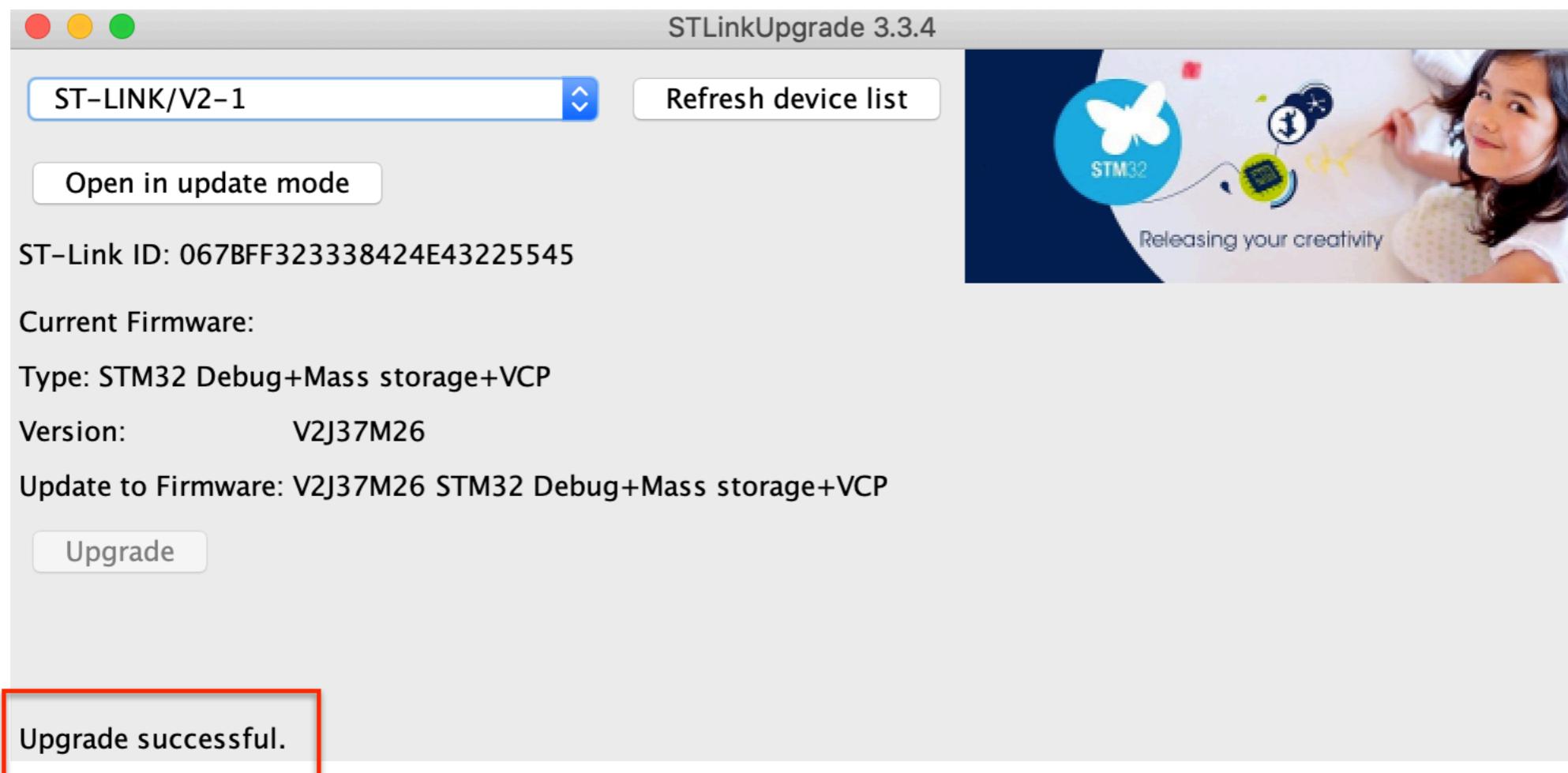
# ST-Link Update - 2



# ST-Link Update - 3

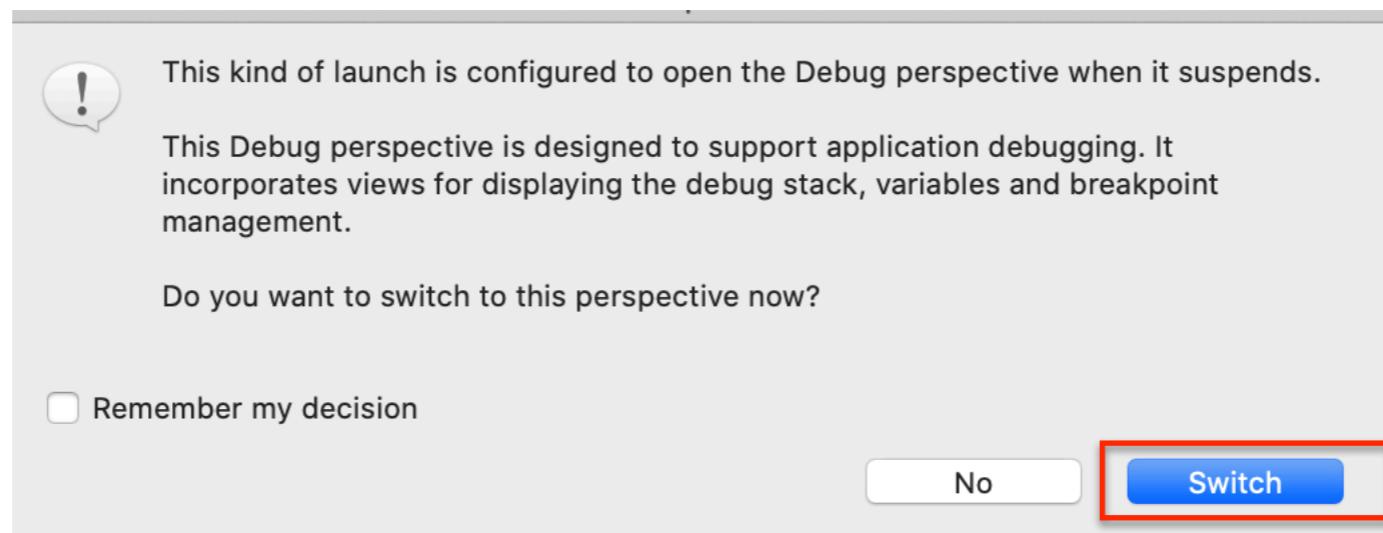


# ST-Link Update - 4



# Back to Startup In Debug

# Change to Debug Perspective

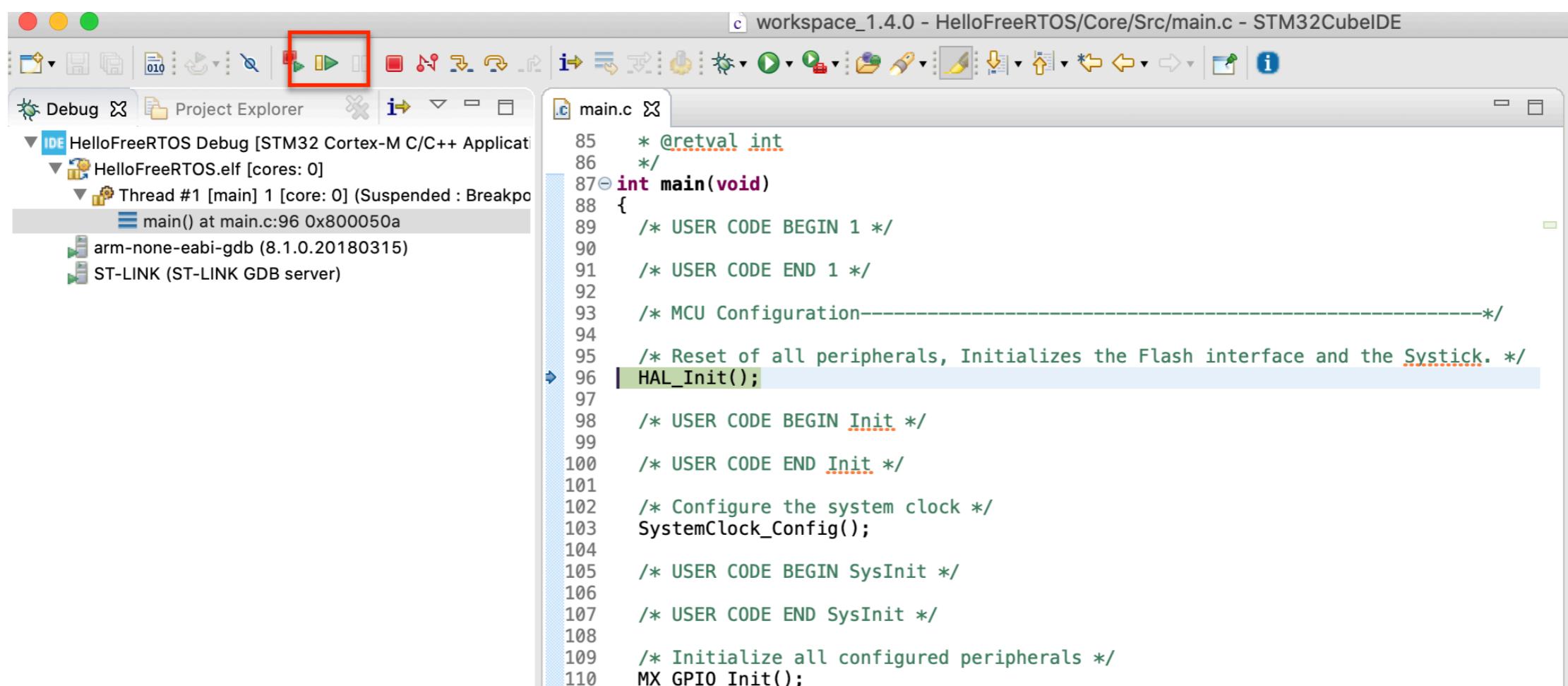


# Hit Breakpoint

The screenshot shows the STM32CubeIDE interface. The Project Explorer panel displays a project named "HelloFreeRTOS Debug [STM32 Cortex-M C/C++ Application]" with a single file "HelloFreeRTOS.elf". The main window shows the code editor for "main.c". A red box highlights the line of code where the breakpoint was hit: "HAL\_Init();". The status bar at the bottom indicates "Thread #1 [main] 1 [core: 0] (Suspended : Breakpoint)".

```
85     * @retval int
86     */
87     int main(void)
88     {
89     /* USER CODE BEGIN 1 */
90
91     /* USER CODE END 1 */
92
93     /* MCU Configuration-----*/
94
95     /* Reset of all peripherals, Initializes the Flash interface and the Systick. */
96     HAL_Init();
97
98     /* USER CODE BEGIN Init */
99
100    /* USER CODE END Init */
101
102    /* Configure the system clock */
103    SystemClock_Config();
104
105    /* USER CODE BEGIN SysInit */
106
107    /* USER CODE END SysInit */
108
109    /* Initialize all configured peripherals */
110    MX_GPIO_Init();
```

# Resume



The screenshot shows the STM32CubeIDE interface. The top bar displays the workspace name "workspace\_1.4.0 - HelloFreeRTOS/Core/Src/main.c - STM32CubeIDE". The toolbar has several icons, with the first four (play, pause, stop, step) highlighted with a red box. The left sidebar shows the "Project Explorer" with a tree view of the project "HelloFreeRTOS Debug [STM32 Cortex-M C/C++ Application]". Under this, there is a "Thread #1 [main] 1 [core: 0] (Suspended : Breakpoint)" entry, which is expanded to show "main() at main.c:96 0x800050a". Below this are entries for "arm-none-eabi-gdb (8.1.0.20180315)" and "ST-LINK (ST-LINK GDB server)". The main editor window shows the "main.c" file with the following code:

```
85 * @retval int
86 */
87 int main(void)
88 {
89 /* USER CODE BEGIN 1 */
90
91 /* USER CODE END 1 */
92
93 /* MCU Configuration-----*/
94
95 /* Reset of all peripherals, Initializes the Flash interface and the Systick. */
96 HAL_Init();
97
98 /* USER CODE BEGIN Init */
99
100 /* USER CODE END Init */
101
102 /* Configure the system clock */
103 SystemClock_Config();
104
105 /* USER CODE BEGIN SysInit */
106
107 /* USER CODE END SysInit */
108
109 /* Initialize all configured peripherals */
110 MX_GPIO_Init();
```

# Results

# LED Blinking!

