# Start new project on NUCLEO-L476RG for AC6 (SW4STM32)

…

- Run **CubeMX**
- Click “**New Project**”
- Select “**Board Selector**”
- Choose **Nucleo64**
- Select “**NUCLEO-L476RG**”

STM32CubeMX Untitled

File Project Window Help

New Project

Load Project

Help

New Project

MCU Selector | Board Selector

MCU Filters

Part Number Search

Core

Serie

ST MCU Finder
All STM32 & STM8
MCUs in one place

Features | Block Diagram | Datasheet | Docs & Ressources | Buy | Start Project

| Part No | Refere... | Mark... | Unit Price f... | Package | Flash | RAM | IO | Freq. | CRYP | ... | ... | ... | ... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STM32... | STM32... | Active | 0.59 | LQFP48 | 32 kB... | 4 kBytes | 39 | 48 MHz | 0 | 0 | 0 | 0 | 0 |
| STM32... | STM32... | Active | 0.72 | LQFP48 | 64 kB... | 8 kBytes | 39 | 48 MHz | 0 | 0 | 0 | 0 | 0 |
| STM32... | STM32... | Active | 1.1 | LQFP48 | 256 k... | 32 kB... | 37 | 48 MHz | 0 | 0 | 0 | 0 | 0 |
| STM32... | STM32... | Active | 0.42 | TSSOP20 | 16 kB... | 4 kBytes | 15 | 48 MHz | 0 | 0 | 0 | 0 | 0 |
| STM32... | STM32... | Active | 0.51 | LQFP32 | 32 kB... | 4 kBytes | 25 | 48 MHz | 0 | 0 | 0 | 0 | 0 |

New Project

MCU Selector | Board Selector

Board Filter

Vendor : STMicroelectronics

Type of Board : Nucleo64

MCU Series : STM32L4

Initialize all peripherals with their default Mode

>>

Peripheral Selection

| Peripherals | Nb | Max |
|---|---|---|
| Accelerometer | | |
| Analog I/O | 0 | 0 |
| Arduino Form Factor | 0 | 0 |
| Audio Line In | 0 | 0 |
| Audio Line Out | 0 | 0 |
| Button | 0 | 1 |
| CAN | 0 | 0 |
| Camera | | |
| Compass | | |
| Custom Form Factor | 0 | 0 |
| Digital I/O | 0 | 76 |
| Eeprom | | |
| Ethernet | | |

Boards List: 4 Items

| Type | Reference | MCU |
|---|---|---|
| Nucleo64 | NUCLEO-L476RG | STM32L476RGTx |
| Nucleo64 | NUCLEO-L452RE | STM32L452RETx |
| Nucleo64 | NUCLEO-L433RC-P | STM32L433RCTxP |
| Nucleo64 | NUCLEO-L452RE-P | STM32L452RETxP |

…

STM32CubeMX Untitled*: STM32L476RGTx NUCLEO-L476RG

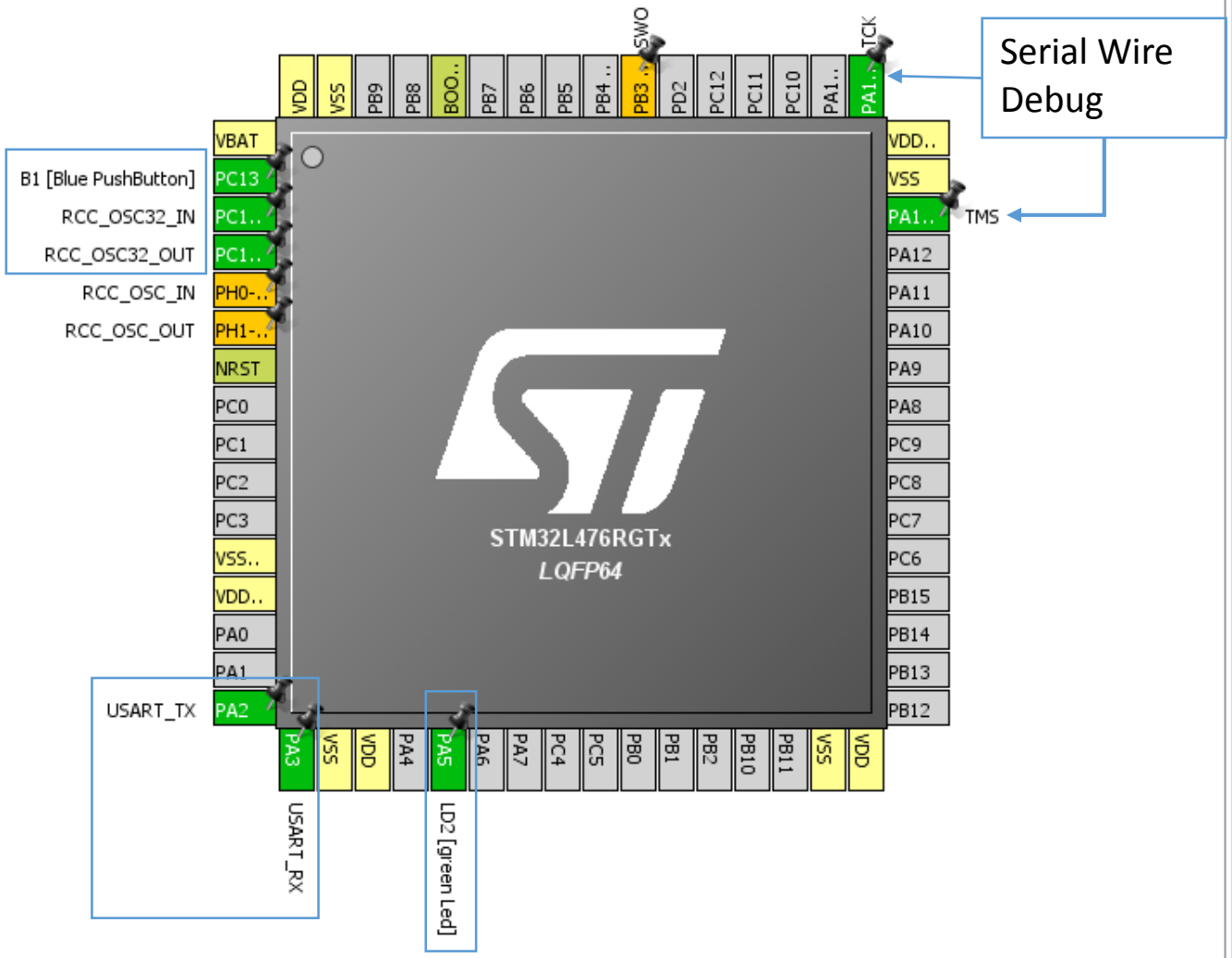
File Project Pinout Window Help

Keep Current Signals Placement | Find | Show user Label

Pinout | Clock Configuration | Configuration | Power Consumption Calculator

**Configuration**

- **MiddleWares**
  - FATFS
  - FREERTOS
  - USB_DEVICE
  - USB_HOST
- **Peripherals**
  - ADC1
  - ADC2
  - ADC3
  - CAN1
  - COMP1
  - COMP2
  - CRC
  - DAC1
  - DFSDM1
  - I2C1
  - I2C2
  - I2C3
  - IRTIM
  - IWDG
  - LCD
  - LPTIM1
  - LPTIM2
  - LPUART1
  - OPAMP1
  - OPAMP2
  - QUADSPI
  - RCC



STM32CubeMX Untitled*: STM32L476RGTx NUCLEO-L476RG

File Project Clock Configuration Window Help

**Write 80 in the box**

Pinout | Clock Configuration | Configuration | Power Consumption Calculator

RTC/LCD Source Mux

Input frequency 32.768 KHz — LSE

LSI RC 32 — 32 KHz

HSE / 32 → HSE_RTC

LSE → 32 To LCD (KHz)

LSE → 32 To RTC (KHz)

LSI → Enable CSS → 32 To IWDG (KHz)

System Clock Mux

MSI RC 4000 KHz — MSI

HSI — HSE — PLLCLK

Enable CSS

SYSCLK (MHz) 80 → AHB Prescaler / 1 → HCLK (MHz) 80 (80 MHz max)

80 To Power (MHz)

80 HCLK to AHB bus, core, memory and DMA (MHz)

/ 1 → 80 To Cortex System timer (MHz)

80 FCLK Cortex clock (MHz)

APB1 Prescaler / 1 → PCLK1 (80 MHz max) → 80 APB1 peripheral clocks (MHz)

X 1 → 80 APB1 Timer clocks (MHz)

APB2 Prescaler / 1 → PCLK2 (80 MHz max) → 80 APB2 peripheral clocks (MHz)

X 1 → 80 APB2 timer clocks (MHz)

PLL Source Mux

HSI RC 16 — 16 MHz — MSI, HSI

Input frequency 8 — 4-48 MHz — HSE

PLLM / 1

PLL: X 10 *N; / 2 /R → PLLQ 80; / 2 /Q; / 7 /P → PLLP 22.857143

PLLSAI1: X 8 *N; / 2 /R → PLLSAI1R 64; / 2 /Q → PLLSAI1Q 64; / 7 /P → PLLSAI1P 18.285714

CLK48 Clock Mux: PLLSAI1Q, PLLQ, MSI → 64 To SDMMC1 (MHz); 64 To USB (MHz); 64 To RNG (MHz)

I2C1 Clock Mux: PCLK1, SYSCLK, HSI → 80 To I2C1 (MHz)

ADC Clock Mux: PLLSAI1R, PLLSAI2R → 64 To ADC (MHz)

USART2 Clock Mux: PCLK1, SYSCLK, HSI, LSE → 80 To USART2 (MHz)

UART4 Clock Mux: PCLK1, SYSCLK, HSI → 80 To UART4 (MHz)

USART1 Clock Mux: PCLK2, SYSCLK, HSI, LSE → 80 To USART1 (MHz)

USART3 Clock Mux: PCLK1, SYSCLK, HSI, LSE → 80 To USART3 (MHz)

# Configure CUBE for generate REPORT and a project for a GUI

STM32CubeMX P1.ioc: STM32L476RGTx NUCLEO-L476RG

File Project Window Help

Generate Code Ctrl+Shift+G

Generate Report Ctrl+R

Settings ... Alt+P

Project Settings

Project | Code Generator | Advanced Settings

Project Settings

Project Name

P1 2

Project Location 1

C:\mNucleoL476RG

Toolchain Folder Location

C:\mNucleoL476RG\P1\

Toolchain / IDE

SW4STM32 3

Generate Under Root

Linker Settings

Minimum Heap Size 0x200

Minimum Stack Size 0x400

Mcu and Firmware Package

Mcu Reference

STM32L476RGTx

Firmware Package Name and Version

STM32Cube FW_L4 V1.8.0

Use Default Firmware Location

C:/Users/marinonie/STM32Cube/Repository/STM32Cube_FW_L4_V1.8.0

Ok Cancel

Project Settings

Project | Code Generator | Advanced Settings

STM32Cube Firmware Library Package

Copy all used libraries into the project folder

Copy only the necessary library files

Add necessary library files as reference in the toolchain project co

Generated files

Generate peripheral initialization as a pair of '.c/.h' files per periph

Backup previously generated files when re-generating

Keep User Code when re-generating

Delete previously generated files when not re-generated

HAL Settings

Set all free pins as analog (to optimize the power consumption)

Enable Full Assert

Template Settings

Select a template to generate customized code

Project Settings

Project | Code Generator | Advanced Settings

Driver Selector

Search : Search (Crtl+F)

| | |
|---|---|
| USART | HAL |
| RCC | HAL |
| GPIO | HAL |

HAL

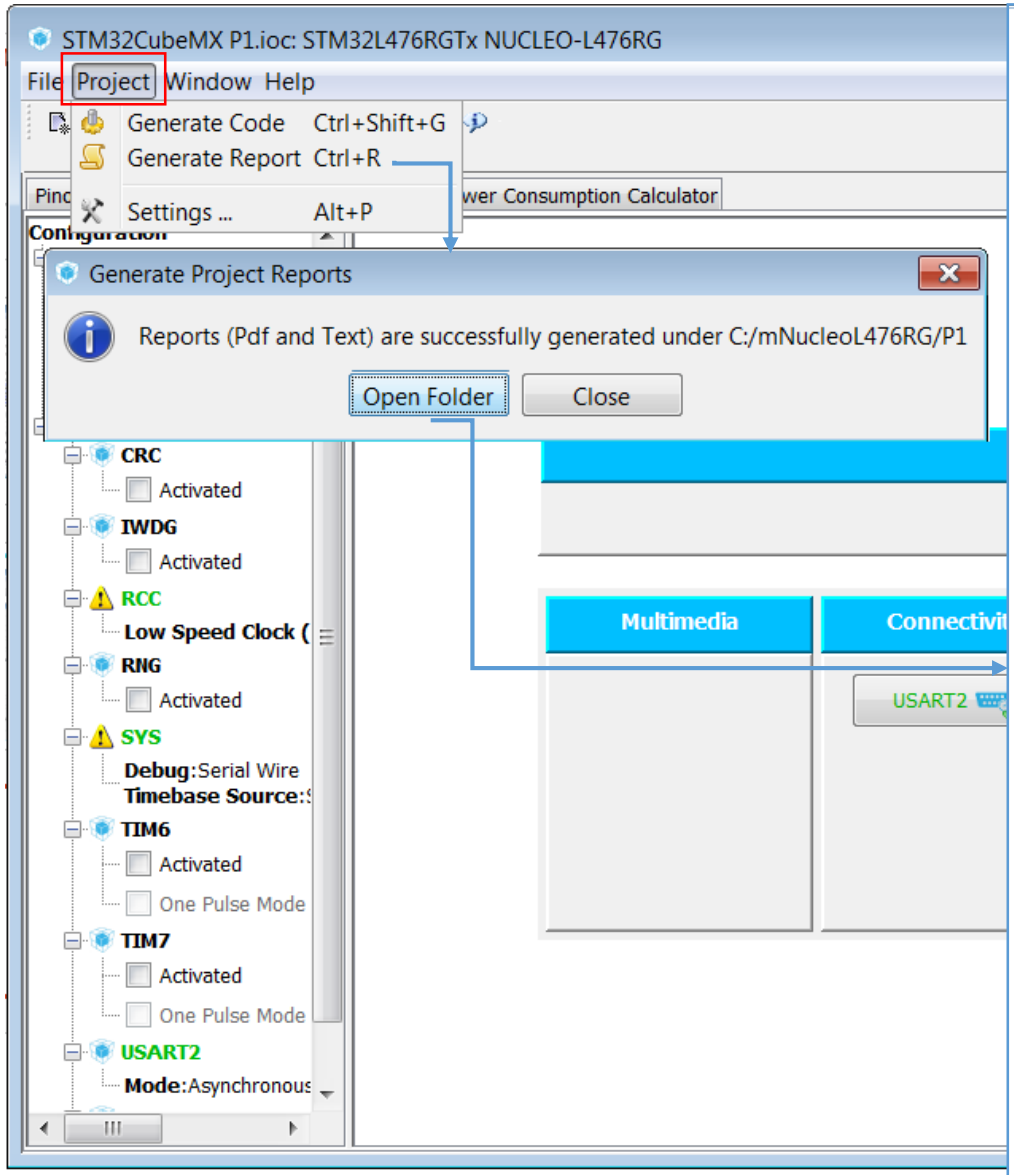
LL

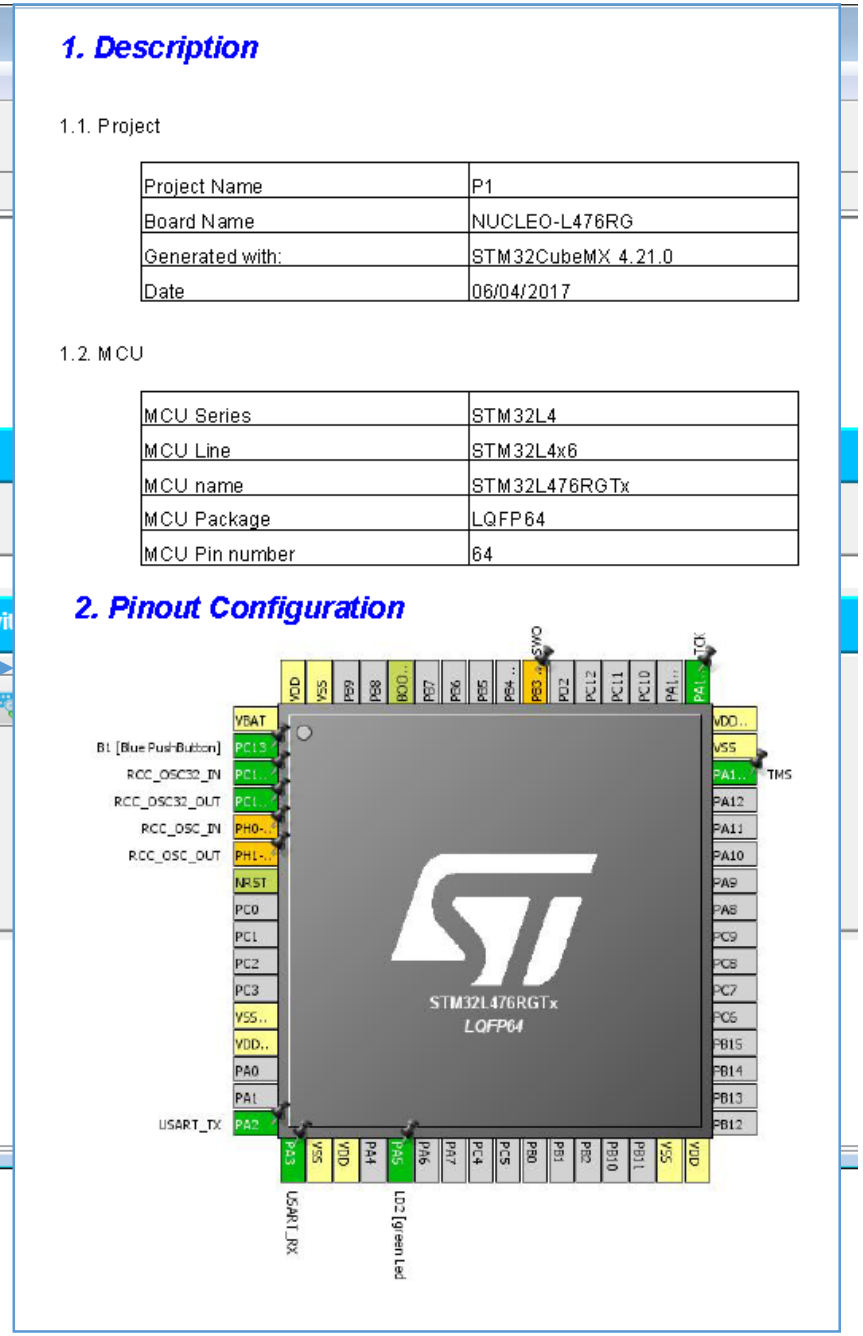
Generated Function Calls

| Rank | Function Name | IP Instance Name | Not Generate Function Call |
|---|---|---|---|
| 1 | MX_GPIO_Init | GPIO | |
| 2 | SystemClock_Config | RCC | |
| 3 | MX_USART2_UART_Init | USART2 | |

Ok Cancel

…



## 1. Description

1.1. Project

| | |
|---|---|
| Project Name | P1 |
| Board Name | NUCLEO-L476RG |
| Generated with: | STM32CubeMX 4.21.0 |
| Date | 06/04/2017 |

1.2. MCU

| | |
|---|---|
| MCU Series | STM32L4 |
| MCU Line | STM32L4x6 |
| MCU name | STM32L476RGTx |
| MCU Package | LQFP64 |
| MCU Pin number | 64 |

## 2. Pinout Configuration

…

STM32CubeMX P1.ioc*: STM32L476RGTx NUCLEO-L476RG

File Project Window Help

Generate Code Ctrl+Shift+G

Generate Report Ctrl+R

Settings ... Alt+P

Pinc … wer Consumption Calculator

Configuration

Code Generation

The Code is successfully generated under C:/mNucleoL476RG/P1

Open Folder | Open Project | Close

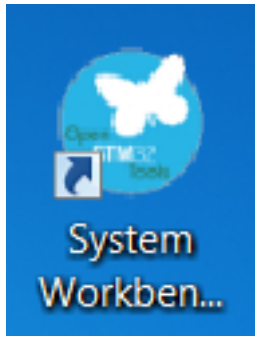
CRC
Activated
IWDG
Activated
RCC
Low Speed Clock (
RNG
Activated
SYS
Debug:Serial Wire
Timebase Source:
TIM6
Activated
One Pulse Mode
TIM7
Activated
One Pulse Mode
USART2
Mode:Asynchronous

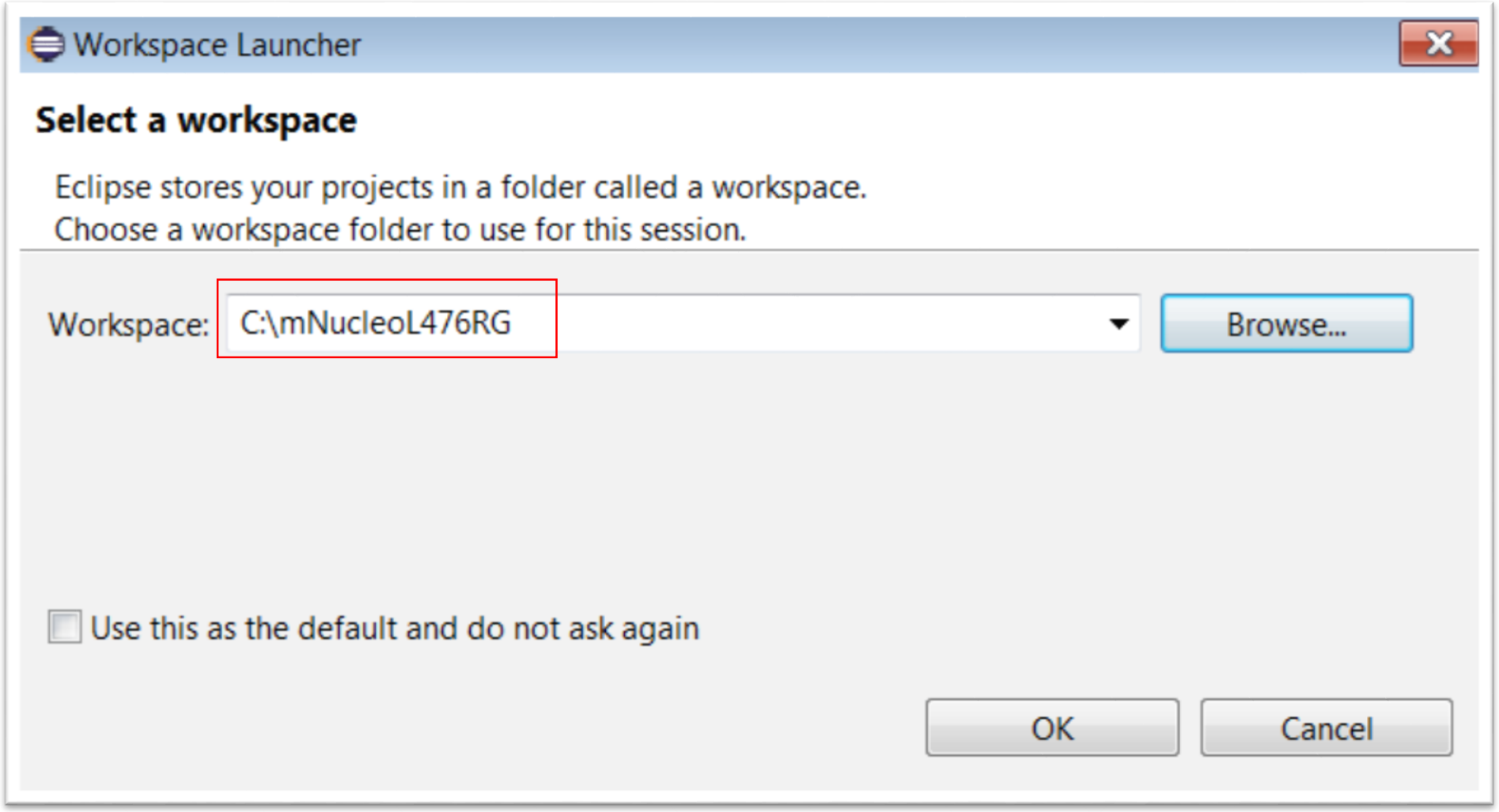
Computer ▸ OS (C:) ▸ mNucleoL476RG ▸ P1 ▸

Include in library | Share with | Burn | New folder

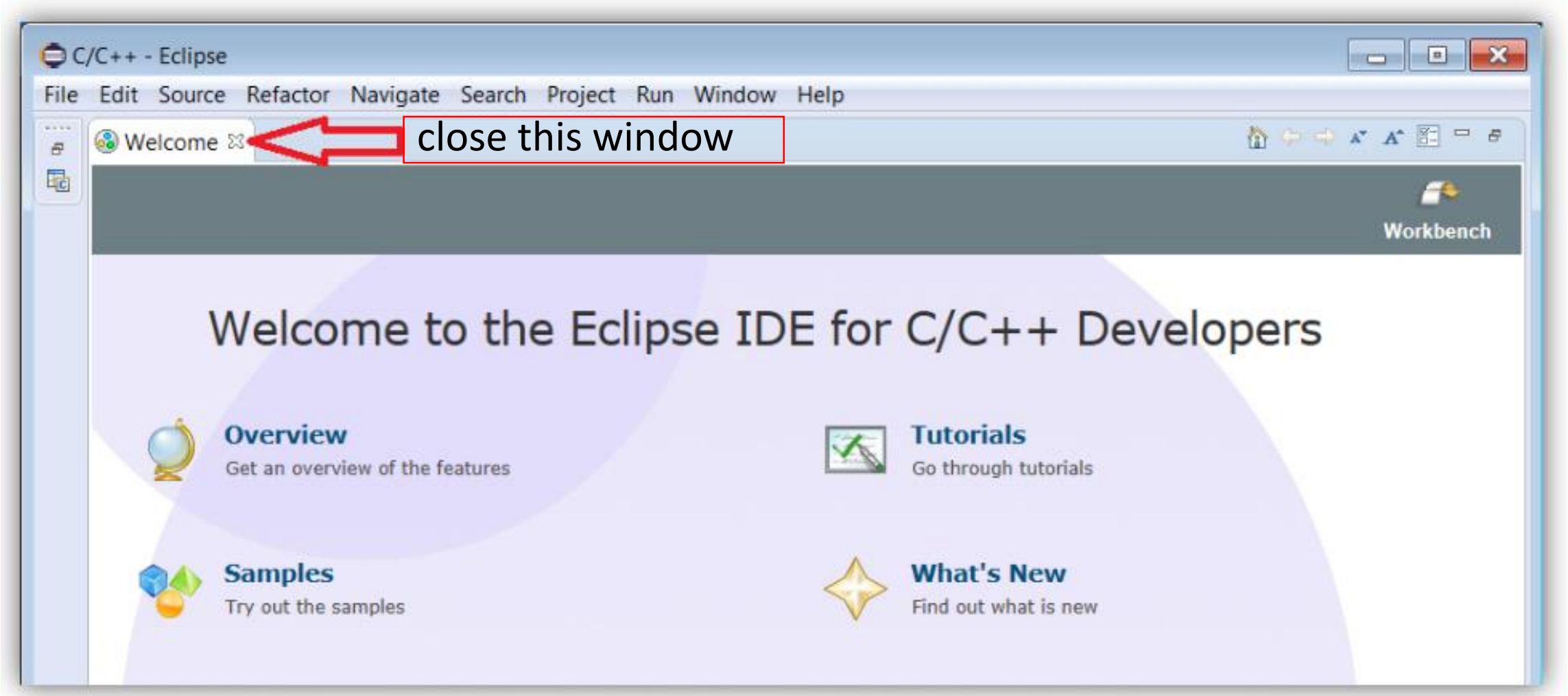
| Name | Date modified |
|---|---|
| Drivers | 04/06/2017 22:19 |
| Inc | 04/06/2017 22:19 |
| Src | 04/06/2017 22:19 |
| startup | 04/06/2017 22:19 |
| .cproject | 04/06/2017 22:19 |
| .mxproject | 04/06/2017 22:19 |
| .project | 04/06/2017 22:19 |
| P1.ioc | 04/06/2017 22:19 |
| P1.pdf | 04/06/2017 22:11 |
| P1.txt | 04/06/2017 22:11 |
| STM32L476RGTx_FLASH.ld | 04/06/2017 22:19 |

# Run AC6 - (SW4STM32 - System Workbench)



…


C/C++ - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Welcome
close this window
Workbench
Welcome to the Eclipse IDE for C/C++ Developers
Overview
Get an overview of the features
Tutorials
Go through tutorials
Samples
Try out the samples
What's New
Find out what is new

# Import project

C/C++ - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

1 New Alt+Shift+N
Open File...
Close Ctrl+W
Close All Ctrl+Shift+W
Save Ctrl+S
Save As...
Save All
Revert
Move...
Rename...
Refresh
Convert Line Delimiters To
Print...
Switch Workspace
Restart
Import... 2
Export...
Properties
Exit

0 items selected

Import

**Select**

Create new projects from an archive file or directory.

Select an import source:

type filter text

General 3
Archive File
Existing Projects into Workspace 4
File System
Preferences
C/C++
Git
Install
Oomph

5

< Back Next >

Import

**Import Projects**

Select a directory to search for existing Eclipse projects.

6

Select root directory: C:\mNucleoL476RG\P1 7 Browse...

Select archive file: Browse...

Projects:

P1 (C:\mNucleoL476RG\P1)

Select All
Deselect All
Refresh

Options

Search for nested projects
Copy projects into workspace
Hide projects that already exist in the workspace

Working sets

Add project to working sets

Working sets: Select...

8

< Back Next > Finish Cancel

# Compile project

C/C++ - P1/Src/main.c - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access | C/C++

compile

Project Explorer

- P1
  - Binaries
  - Includes
  - Drivers
  - Inc
  - Src
    - Backup
    - main.c
    - stm32l4xx_hal_msp.c
    - stm32l4xx_it.c
    - system_stm32l4xx.c
  - startup
  - Debug
  - P1.ioc
  - P1.pdf
  - P1.txt
  - STM32L476RGTx_FLASH.ld

main.c

```c
  * File Name          : main.c
/* Includes ------------------------------------------
#include "main.h"
#include "stm32l4xx_hal.h"

/* USER CODE BEGIN Includes */

/* USER CODE END Includes */

/* Private variables ---------------------------------
UART_HandleTypeDef huart2;

/* USER CODE BEGIN PV */
/* Private variables ---------------------------------

/* USER CODE END PV */

/* Private function prototypes -----------------------
void SystemClock_Config(void);
```

Outline | Make ... | Task ...

- main.h
- stm32l4xx_hal.h
- huart2 : UART_HandleTypeDef
- SystemClock_Config(void) : void
- MX_GPIO_Init(void) : void
- MX_USART2_UART_Init(void) : void
- main(void) : int
- SystemClock_Config(void) : void
- MX_USART2_UART_Init(void) : void
- MX_GPIO_Init(void) : void
- _Error_Handler(char*, int) : void
- assert_failed(uint8_t*, uint32_t) : void

Problems | Tasks | Console | Properties

CDT Build Console [P1]

```
make --no-print-directory post-build
'Generating binary and Printing size information:'
arm-none-eabi-objcopy -O binary "P1.elf" "P1.bin"
arm-none-eabi-size "P1.elf"
   text    data     bss     dec     hex filename
  12376      24    1680   14080    3700 P1.elf
' '

22:43:49 Build Finished (took 21s.88ms)
```

results

C/C++ - P1/Src/main.c - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access | C/C++

Project Explorer 2 3

- P1
  - Binaries
  - Includes
  - Drivers
  - Inc
  - Src
    - Backup
    - main.c
    - stm32l4xx_hal_msp.c
    - stm32l4xx_it.c
    - system_stm32l4xx.c
  - startup
  - Debug
  - P1.ioc
  - P1.pdf
  - P1.txt
  - STM32L476RGTx_FLASH.ld

main.c

```
94
95    /* USER CODE BEGIN 2 */
96
97    /* USER CODE END 2 */
98
99    /* Infinite loop */
100   /* USER CODE BEGIN WHILE */
101   while (1)
102   {
103   /* USER CODE END WHILE */
104
105   /* USER CODE BEGIN 3 */
106       HAL_GPIO_TogglePin(GPIOA, GPIO_PIN_5);
107       HAL_Delay(200);
108   }
109   /* USER CODE END 3 */
110
111 }
112
```

Insert this lines

1

Outline | Make ... | Task ...

- main.h
- stm32l4xx_hal.h
- huart2 : UART_HandleTypeDef
- SystemClock_Config(void) : void
- MX_GPIO_Init(void) : void
- MX_USART2_UART_Init(void) : void
- main(void) : int
- SystemClock_Config(void) : void
- MX_USART2_UART_Init(void) : void
- MX_GPIO_Init(void) : void
- _Error_Handler(char*, int) : void
- assert_failed(uint8_t*, uint32_t) : void

Problems | Tasks | Console | Properties

CDT Build Console [P1]

```
'Generating binary and Printing size information:'
arm-none-eabi-objcopy -O binary "P1.elf" "P1.bin"
arm-none-eabi-size "P1.elf"
   text    data     bss     dec     hex filename
  12456      24    1680   14160    3750 P1.elf
' '

22:53:02 Build Finished (took 2s.288ms)
```

Writable | Smart Insert | 107 : 22

# Debug - Connect to PC the NUCLEO-L476RG

C/C++ - P1/Src/main.c - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access | C/C++

1

Project Explorer

- P1
  - Binaries
  - Includes
  - Drivers
  - Inc
  - Src
    - Backup
    - main.c
    - stm32l4xx_hal_msp.c
    - stm32l4xx_it.c
    - system_stm32l4xx.c
  - startup
  - Debug
  - P1.ioc
  - P1.pdf
  - P1.txt
  - STM32L476RGTx_FLASH.ld

main.c

```
94
95    /* USE
96
97    /* USE
98
99    /* Inf
100   /* USE
101   while
102   {
103   /* USE
104
105   /* USE
106       HA
107       HA
108   }
109   /* USE
110
111 }
112
```

Problems

Debug As

Select a way to debug 'P1':

- Ac6 STM32 C/C++ Application
- Local C/C++ Application

2

Description

Debug with the Ac6 STM32 Debugging

3

OK | Cancel

Outline | Make ... | Task ...

main.h

Confirm Perspective Switch

This kind of launch is configured to open the Debug perspective when it suspends.

This Debug perspective is designed to support application debugging. It incorporates views for displaying the debug stack, variables and breakpoint management.

Do you want to open this perspective now?

Remember my decision

4

6

Yes | No

…

Debug - P1/Drivers/STM32L4xx_HAL_Driver/Src/stm32l4xx_hal.c - Eclipse

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access | C/C++ | Debug

Debug

P1.elf [Ac6 STM32 Debugging]
- P1.elf
  - Thread #1
    - HAL_D
    - main()
- openocd
- C:/Ac6/Syste … s.arm-none.win32_1.7.0

Click here and you must see the LED flashing

Variables | Breakpoints | Registers | I/O Registers | Modules

| Name | Type | Value |
|---|---|---|
| Delay | uint32_t | 200 |
| Delay@entry | uint32_t | 200 |
| tickstart | uint32_t | 269943 |
| wait | uint32_t | 201 |

main.c | stm32l4xx_hal.c

```
339     wait++;
340   }
341
342   while((HAL_GetTick() - tickstart) < wait)
343   {
344   }
345 }
346
347 /**
348   * @brief Suspend Tick increment.
349   * @note In the default implementation , SysTick timer is the source of time base. It is
350   *       used to generate interrupts at regular time intervals. Once HAL SuspendTick()
```

Outline
- stm32l4xx_hal.h
- # __STM32L4xx_HAL_VERSION_MAI
- # __STM32L4xx_HAL_VERSION_SUB
- # __STM32L4xx_HAL_VERSION_SUB
- # __STM32L4xx_HAL_VERSION_RC
- # __STM32L4xx_HAL_VERSION
- # VREFBUF_TIMEOUT_VALUE
- # SYSCFG_OFFSET
- # MEMRMP_OFFSET

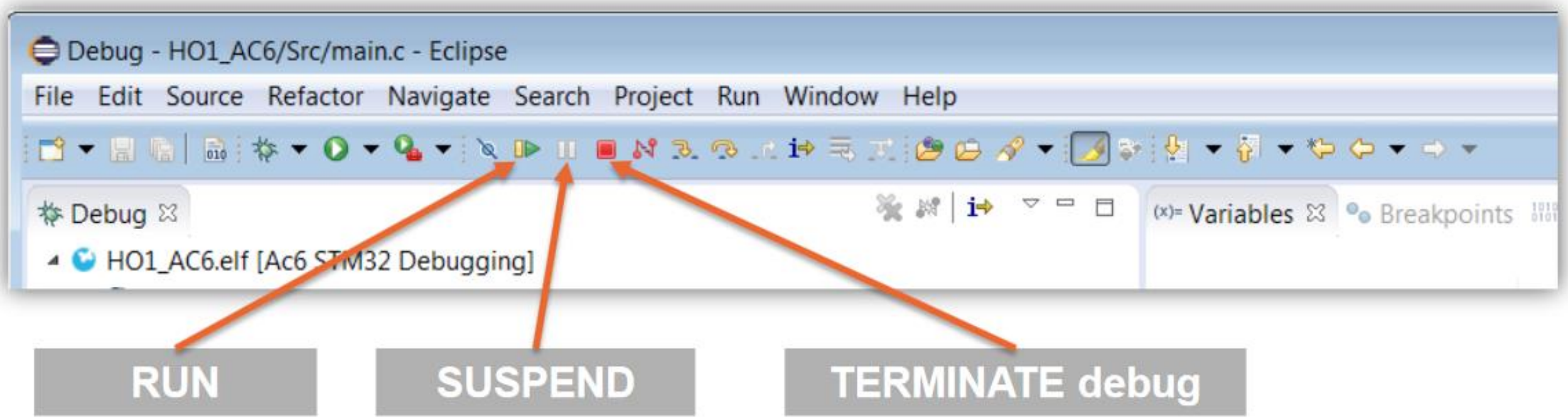
Console | Tasks | Problems | Executables | Memory

P1.elf [Ac6 STM32 Debugging] C:/Ac6/SystemWorkbench/plugins/fr.ac6.mcu.externaltools.arm-none.win32_1.7.0.201602121829/tools/compiler/bin/arm-none-eabi-gdb (7.10.1.20151

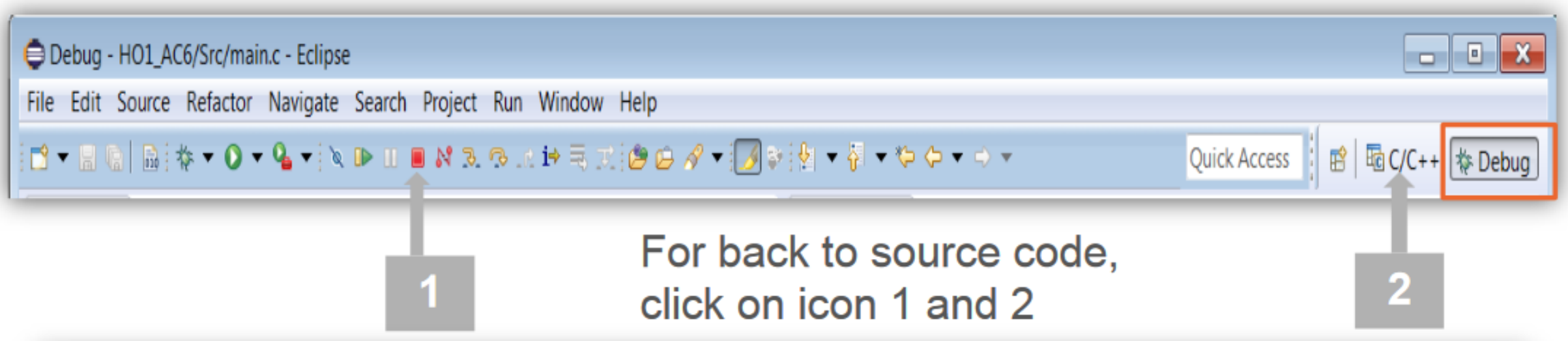
```
Program received signal SIGINT, Interrupt.
0x080005c6 in HAL_Delay (Delay=Delay@entry=200) at ../Drivers/STM32L4xx_HAL_Driver/Src/stm32l4xx_hal.c:342
342       while((HAL_GetTick() - tickstart) < wait)
```

Writable | Smart Insert | 342 : 1

…


Debug - HO1_AC6/Src/main.c - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Debug
HO1_AC6.elf [Ac6 STM32 Debugging]
Variables
Breakpoints
RUN
SUSPEND
TERMINATE debug

…




More info concerning **AC6** are **here**

# Thank you!