Installation Procedure (v1.3)

Virtual Workshop: **STM32C0: Your next generation 8-bit MCU is a 32-bit**

Welcome to the STM32C0 Workshop!
Please follow all installation steps below before the day of the Workshop.

Workshop – Requirements

Important:

You need to have administration rights to be able to install drivers and software and to do the workshop.

System requirements:

Windows® 10 and later or MacBook running Windows using Parallels, VM Fusion

Minimum Recommended Hardware Requirements:

- Micro USB Cable
- 2+ GHz processor
- 4 GB of system memory (RAM)
- 7 GB of available disk space

Note: For machines with USB Type C, please bring a Type A to Type C adapter.

Makes sure the USB port you will use for the workshop is enabled.

STM32C0 Workshop - Installation Procedure – Introduction:

In the following installation procedure, you are going to install the following Software/Tools/Libraries that are needed for the Workshop:

1. STM32CubeIDE: version 1.10.1 minimum required, if you have a previous version you will need to install a new version as explained in this installation procedure.
    - Page 4
2. STM32CubeC0: version 1.0.0 minimum required, if you have a previous version you will need to install a new one as explained in this installation procedure.
    - Page 12
3. STM32CubeProgrammer: version 2.10.0 minimum required, if you have a previous version you will need to install a new version as explained in this installation procedure.
    - Page 15
4. *Workshop Information & WebEx Installation: WebEx will be used for live support during the day of the session you are registered. It will be used only when you have specific questions.*
    - *Page 25*

Code changes to use during the workshop:

5. Code to use during the workshop
    - Page 29

Notes:

1- Some of the versions of the software and libraries on our website might have newer version than the version seen in the document, please use the latest version from the links provided in the installation procedure below.

2- The look of our website is changing but the links provided in this document remain the same.

The entire installation procedure can take several hours (downloading and installing).

Questions and support ahead of the workshop

1. If you have issues during the software download and install, please contact ST by entering an Online Support Request at:
   https://community.st.com/s/onlinesupport?o=ws&tabset-08cae=2
   to help resolve the issue.

2. When entering the support request, in the Subject field please fill with:
   "**STM32C0: Your next generation 8-bit MCU is a 32-bit**"

3. To ensure your request is quickly routed to the correct support team, please indicate the Workshop Request Type, Technical or Non-Technical, that best describes your question.

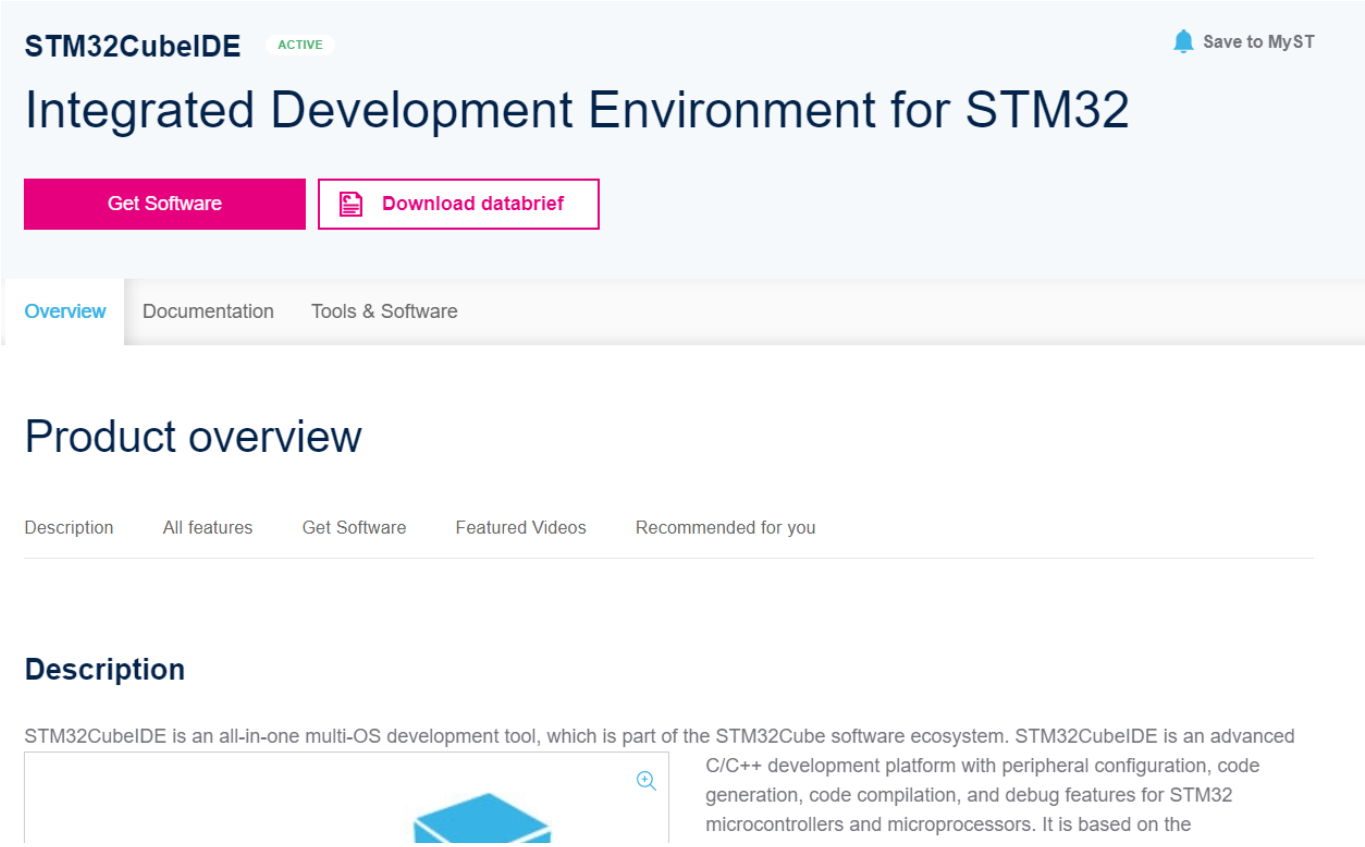
STM32C0 Workshop - Installation Procedure

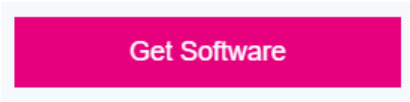
For the Workshop installation please follow the steps below:

1- STM32CubeIDE: STM32Cube initialization code generator

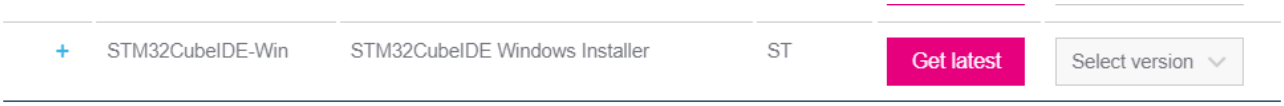
Click Link: STM32CubeIDE
Minimum version to be installed: 1.10.1
Or use Direct Install Link:
STM32CubeIDE - Integrated Development Environment for STM32 - STMicroelectronics

In the web browser, a similar page will come up:

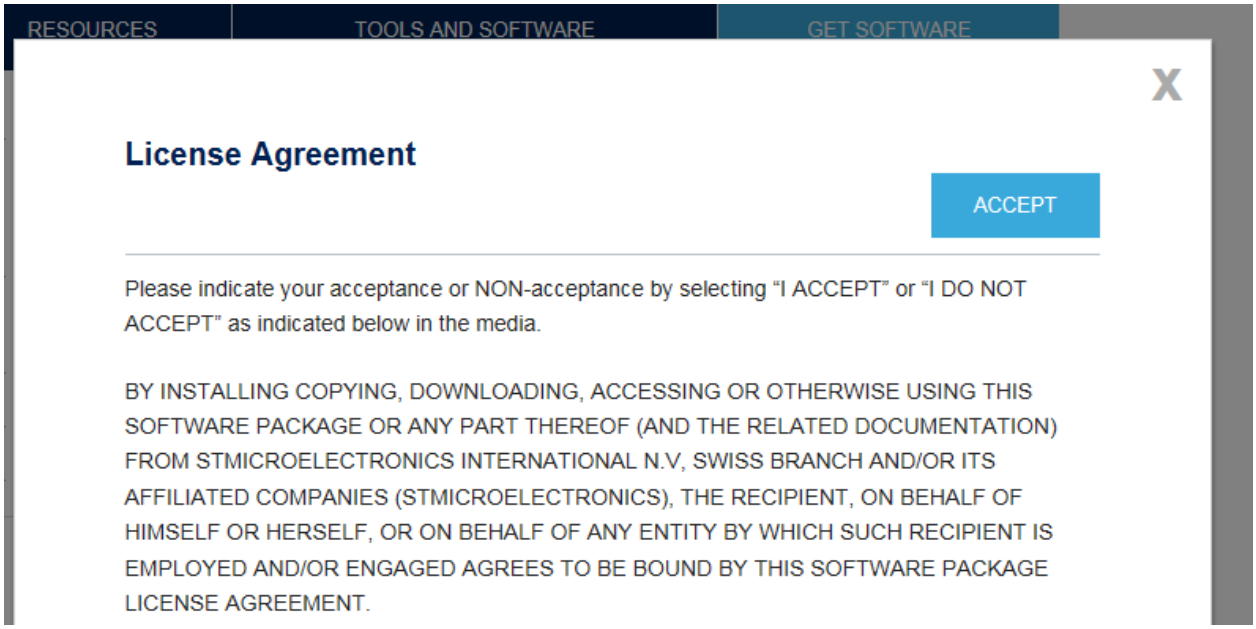


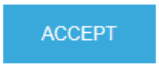
Click on “Get Software” button: 

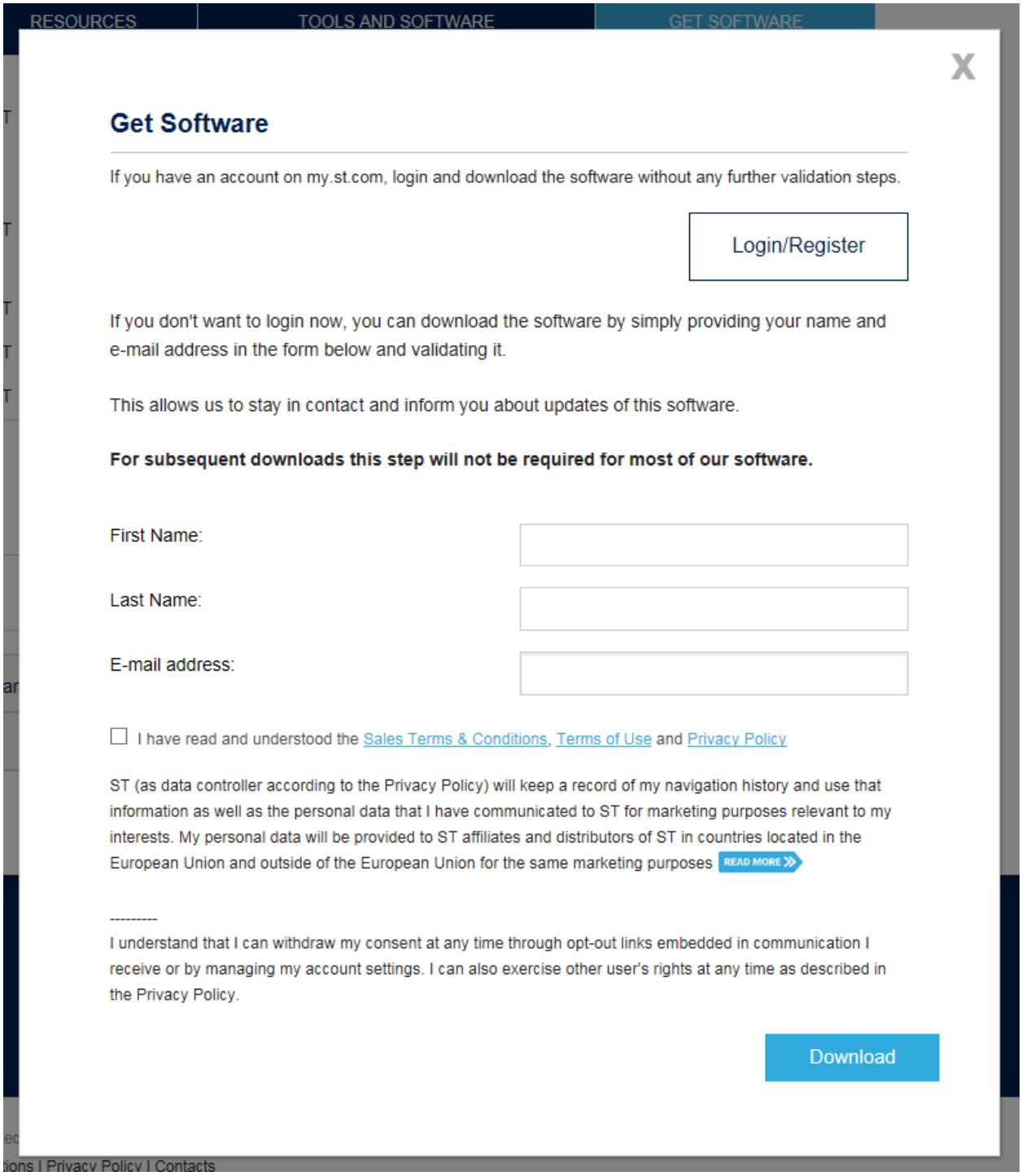
Assuming you have a Windows-based machine click on “Get Latest” below:



When the following page appears:



Click on: 



There are 3 ways of getting the software:

If you have an ST account, click on: Login/Register

If you don’t have one, create one by clicking on: Login/Register

If you don’t have an account and don’t want to create one, fill in the information below:

First Name:

Last Name:

E-mail address:

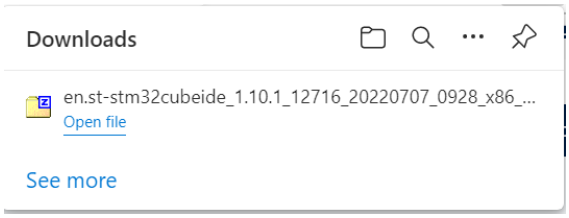
Click on the check box:

I have read and understood the Sales Terms & Conditions, Terms of Use and Privacy Policy

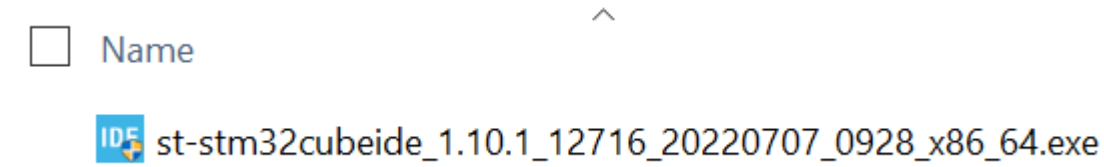
ST (as data controller according to the Privacy Policy) will keep a record of my navigation history and use that information as well as the personal data that I have communicated to ST for marketing purposes relevant to my interests. My personal data will be provided to ST affiliates and distributors of ST in countries located in the European Union and outside of the European Union for the same marketing purposes READ MORE

The software will automatically download in your browser.

If not click “Get Software” Get Software

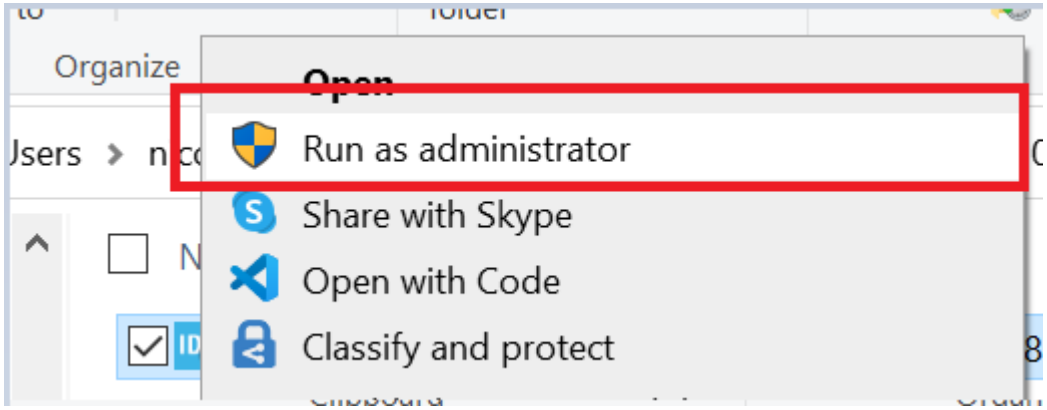


Unzip the file (en.st-stm32cubeide_x.x.x_xxxx.zip) and you will see this:

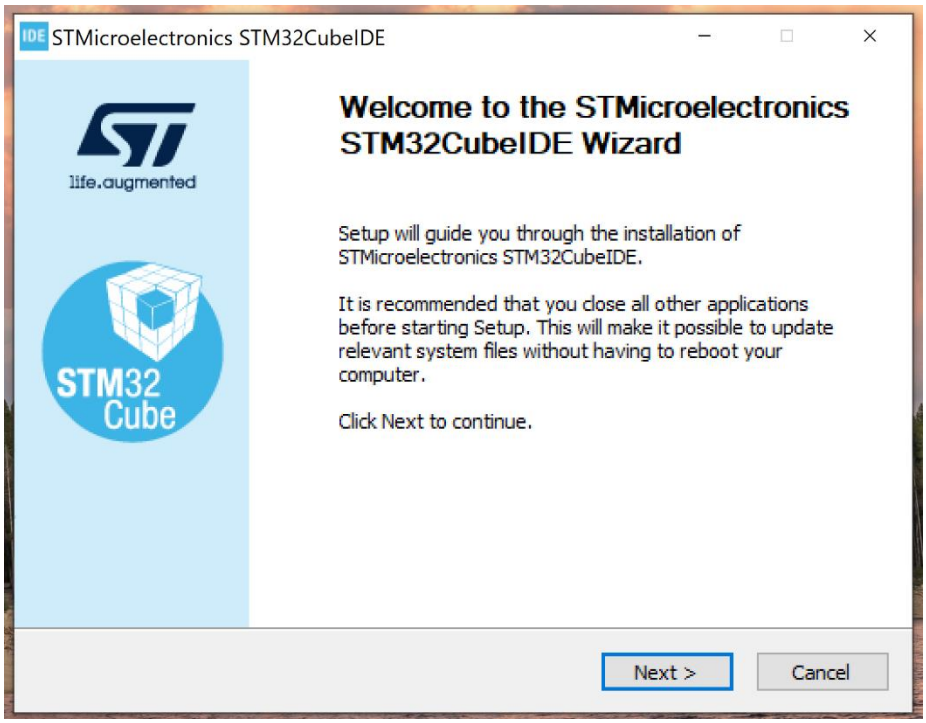


Note: you may see a newer version in your case than the screenshot above.

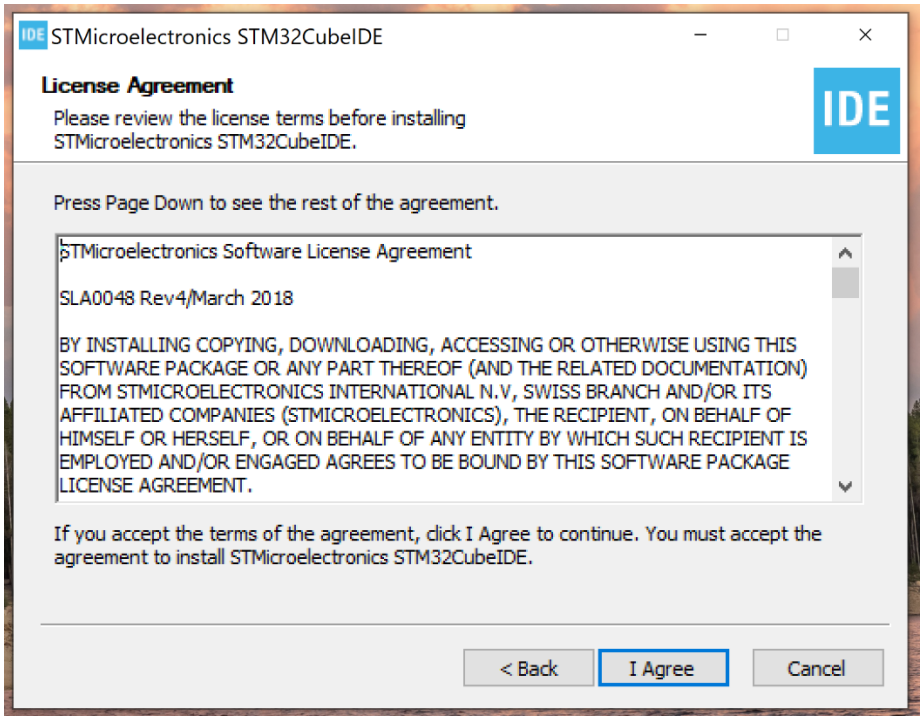
Right Click on ‘st-stm32cubeide_x.x.x_yyy_x86_64.exe’ (x.x.x is the version number) and Run as administrator:



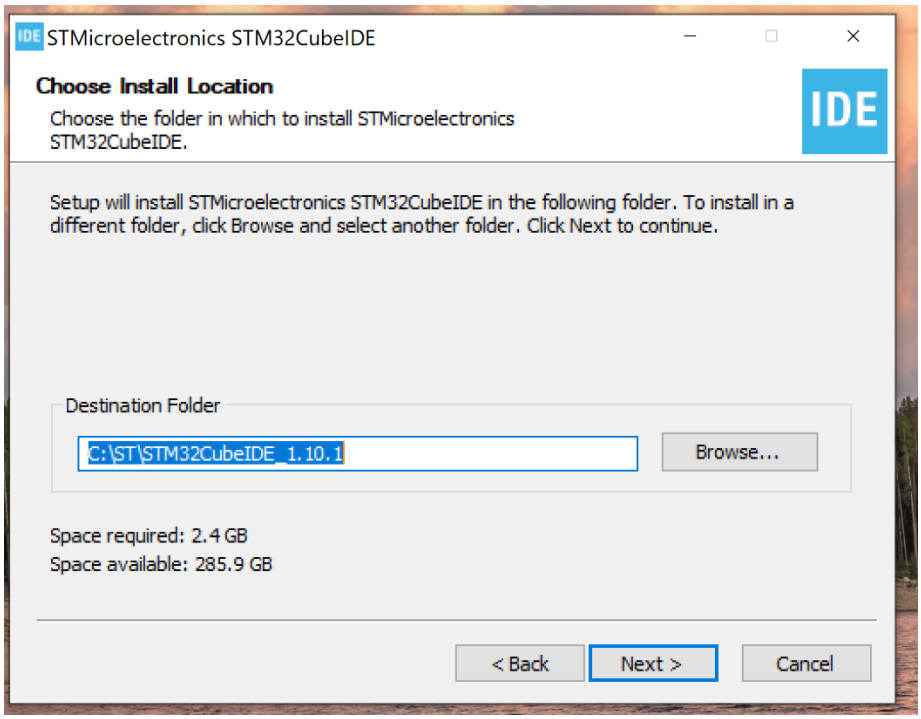
Press “Next”:



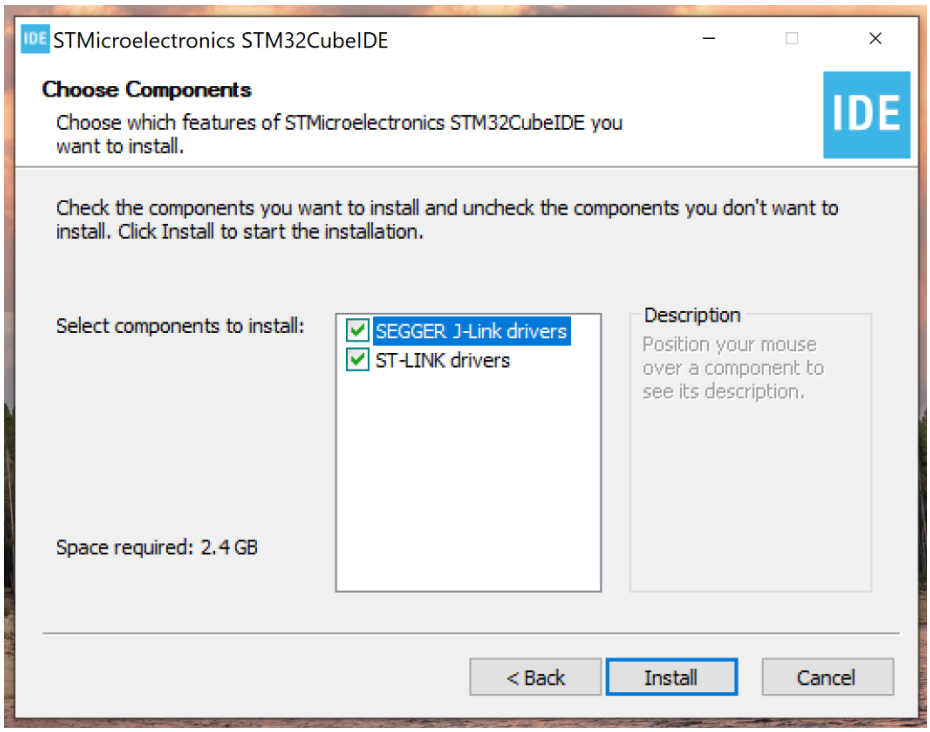
Press “I agree”:



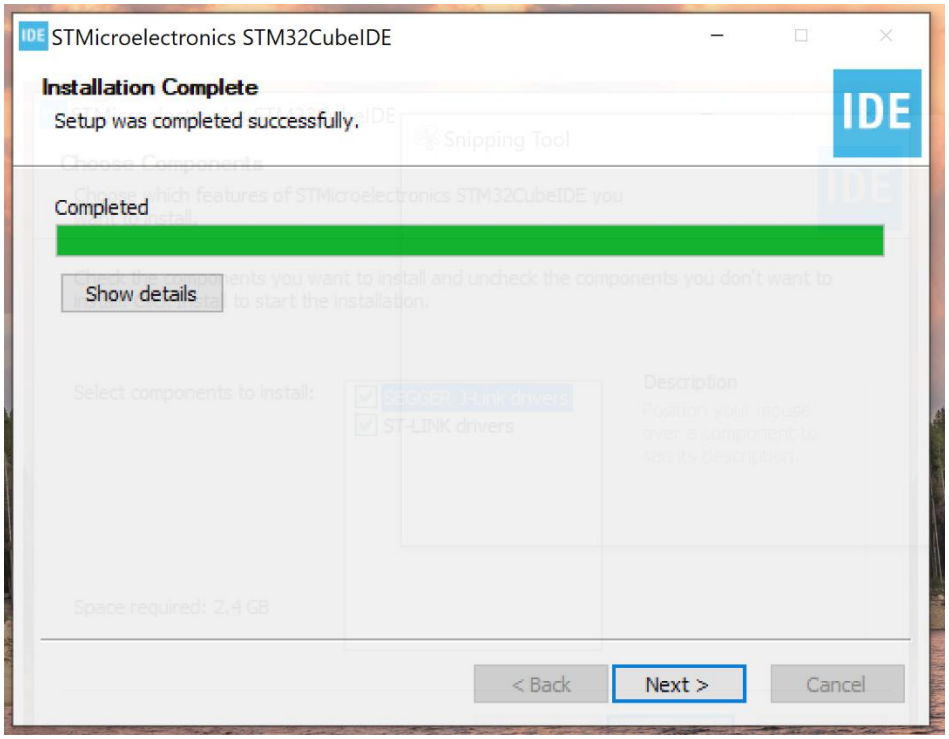
Press “Next”:



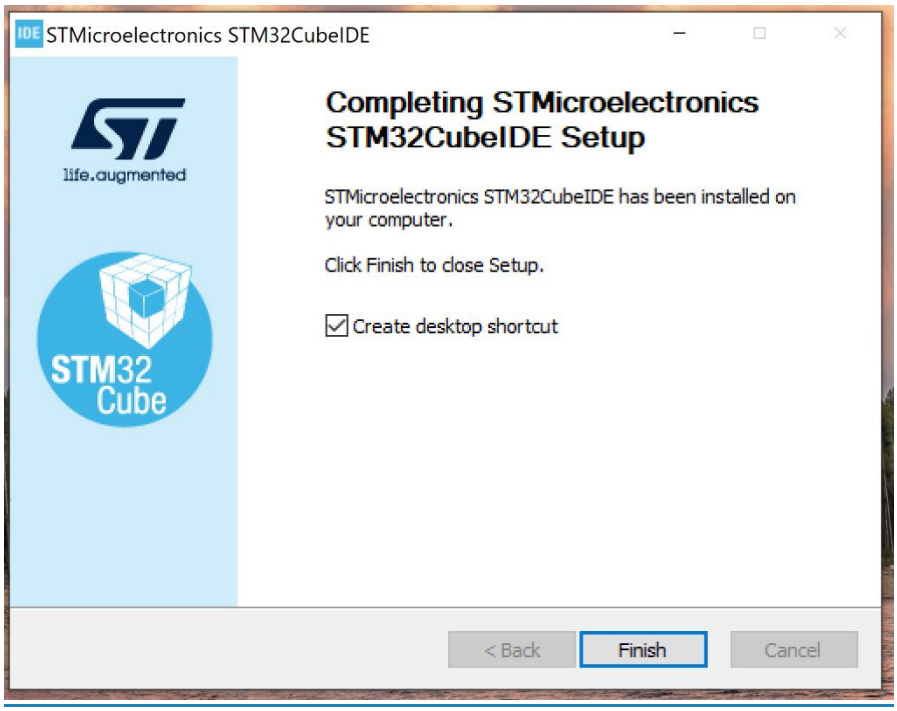
Press: “Install”



Wait for the install to complete and then press “Next”



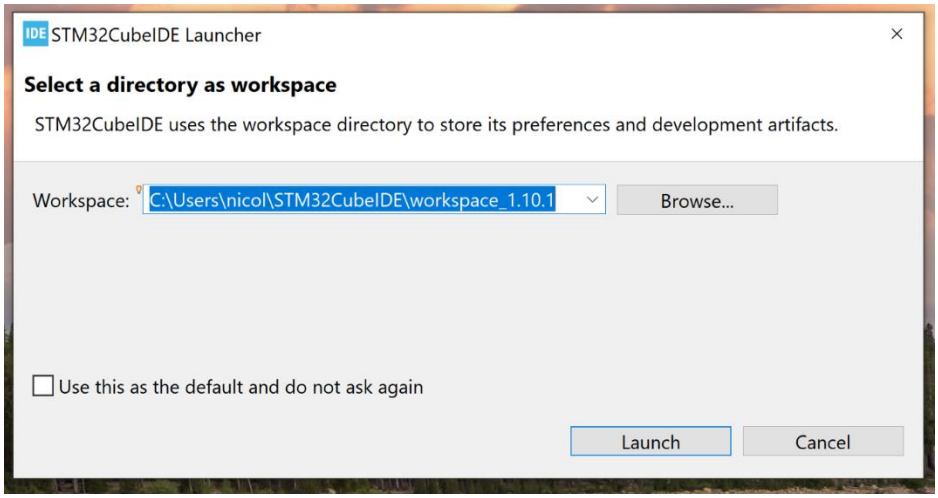
Press “Finish”



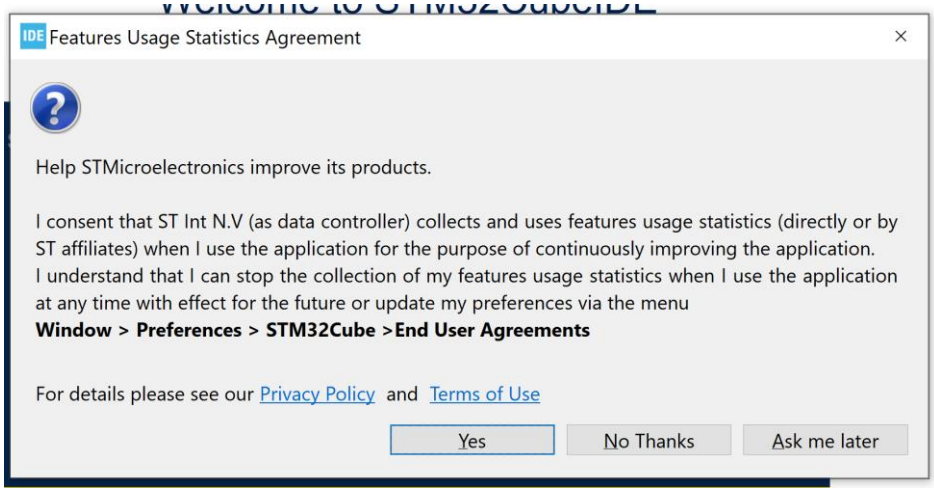
2 - STM32CubeC0: Install STM32Cube MCU Package for STM32C0 series

Double click on STM32CubeIDE icon or look for it in your Start Menu:

Click Launch:



Make your choice for the Usage Statistics Agreement:

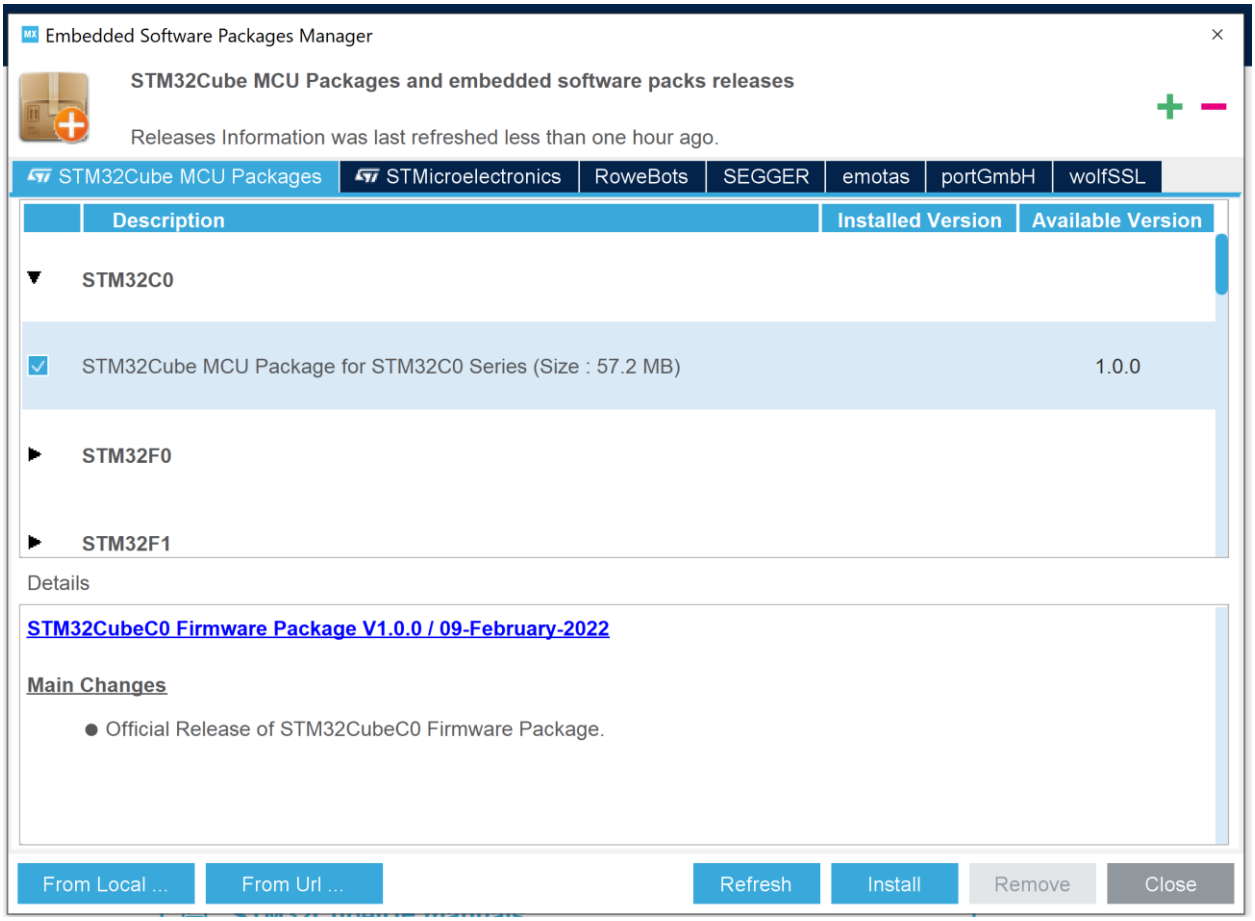


Note: For those behind a corporate firewall or having issue with installing the Cube Library from the internet, you can use “From local” to do an offline install of the STM32CubeC0 Library.

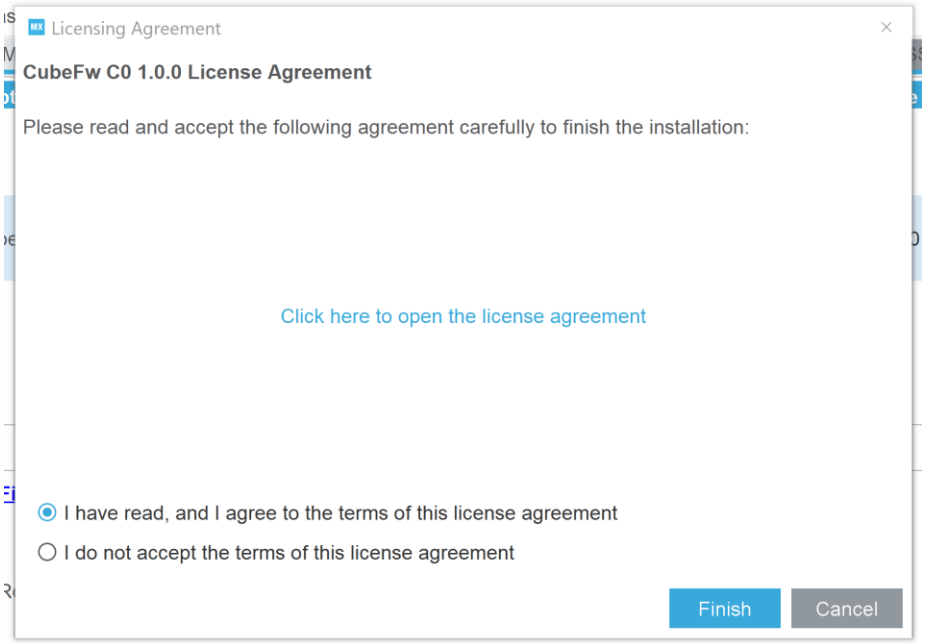
From STM32CubeIDE: Help -> Manage embedded software packages

Click on Refresh:

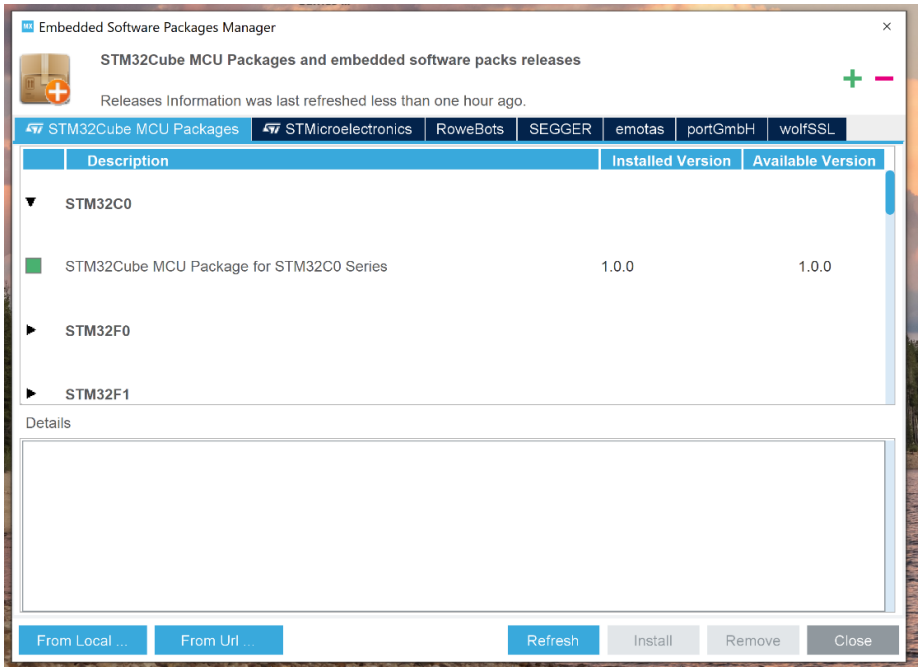
Under STM32C0, expand then check the **latest** STM32 MCU Package for STM32C0 and click “Install”:



Agree on the terms of this license agreement, by selecting “I have read, and I agree to the the terms of this license agreement” and then press Finish.



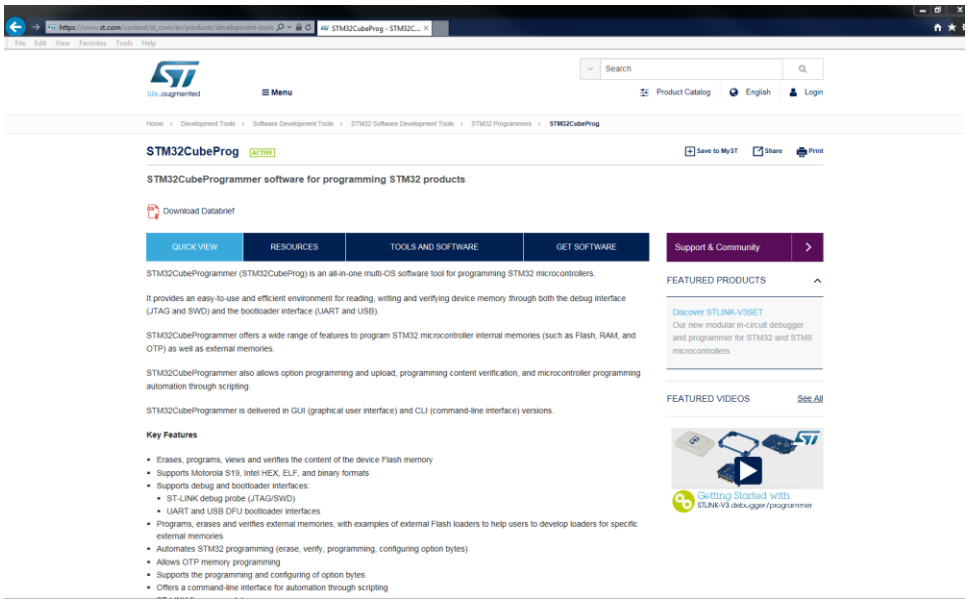
Once installed it should look like this and you can press “Close”



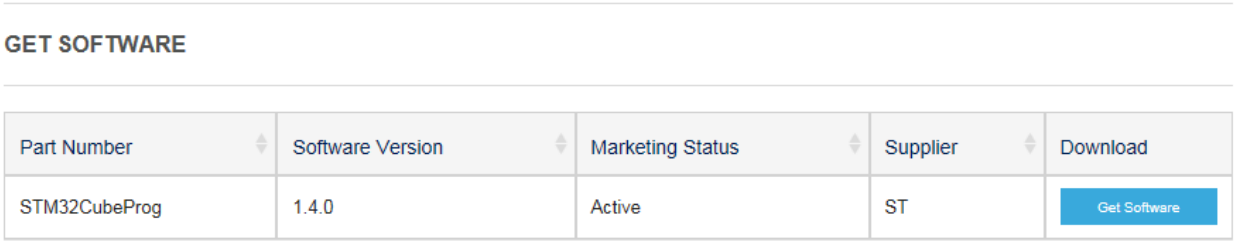
Note: In your system it might show a newer version depending on what latest version is available

3 - STM32CubeProg: STM32CubeProgrammer software for programming STM32 products

Click Link: STM32CubeProg
Minimum version required: 2.10.0
Direct Install Link:
https://www.st.com/content/st_com/en/products/development-tools/software-development-tools/stm32-software-development-tools/stm32-programmers/stm32cubeprog.html

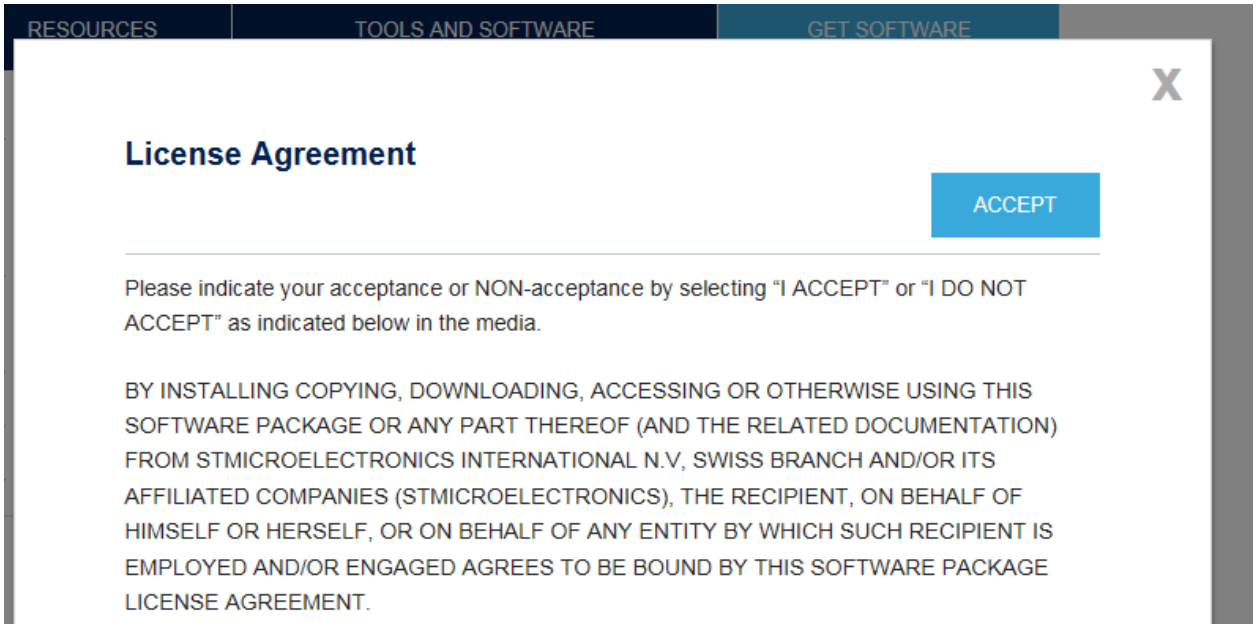


Click on: GET SOFTWARE

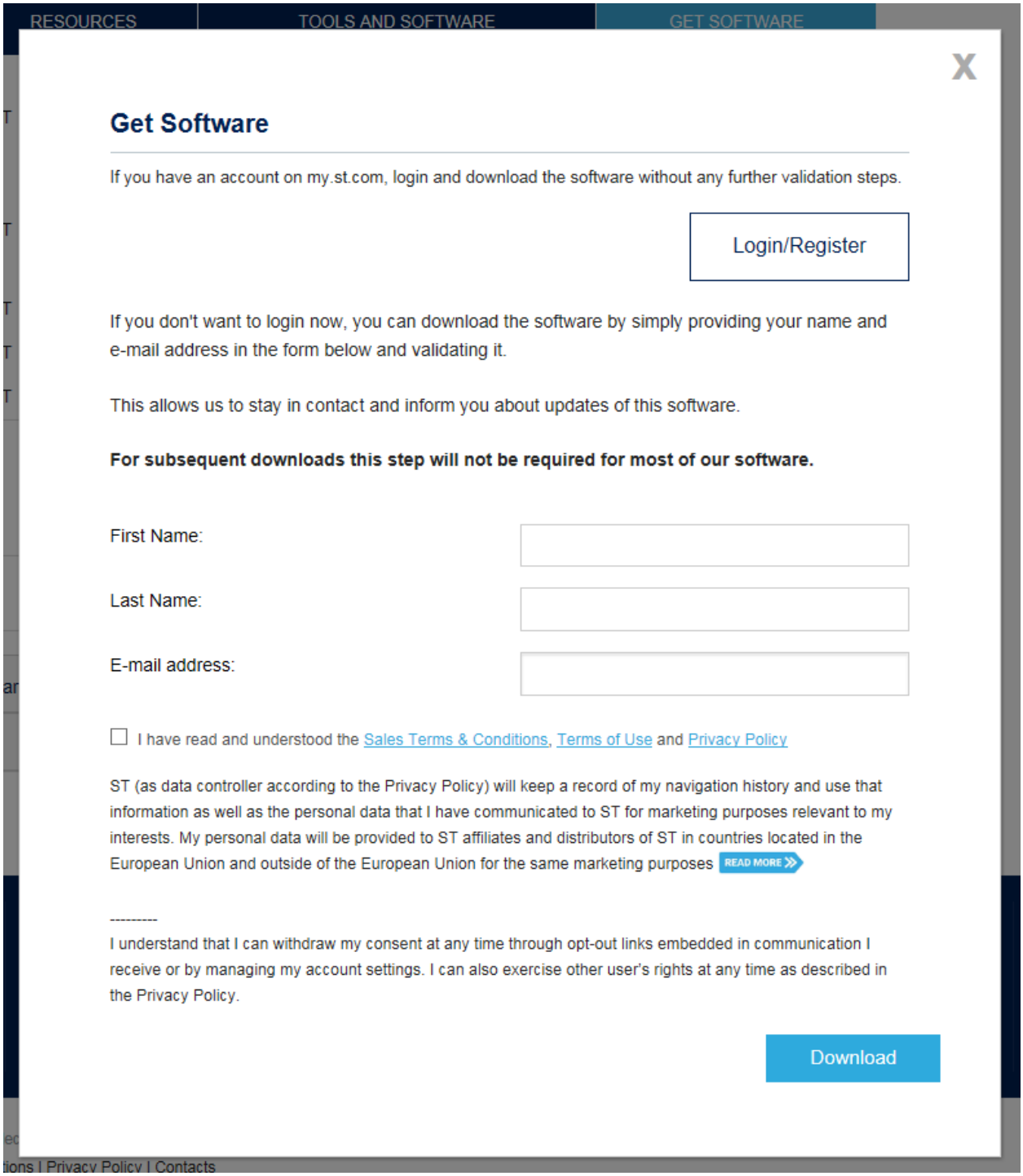


Please get the latest software version available that will be accessible by clicking on:

Get Software



Click on: ACCEPT


RESOURCES
TOOLS AND SOFTWARE
GET SOFTWARE
X
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:
Last Name:
E-mail address:
I have read and understood the Sales Terms & Conditions, Terms of Use and Privacy Policy
ST (as data controller according to the Privacy Policy) will keep a record of my navigation history and use that information as well as the personal data that I have communicated to ST for marketing purposes relevant to my interests. My personal data will be provided to ST affiliates and distributors of ST in countries located in the European Union and outside of the European Union for the same marketing purposes READ MORE

I understand that I can withdraw my consent at any time through opt-out links embedded in communication I receive or by managing my account settings. I can also exercise other user's rights at any time as described in the Privacy Policy.
Download
ions | Privacy Policy | Contacts

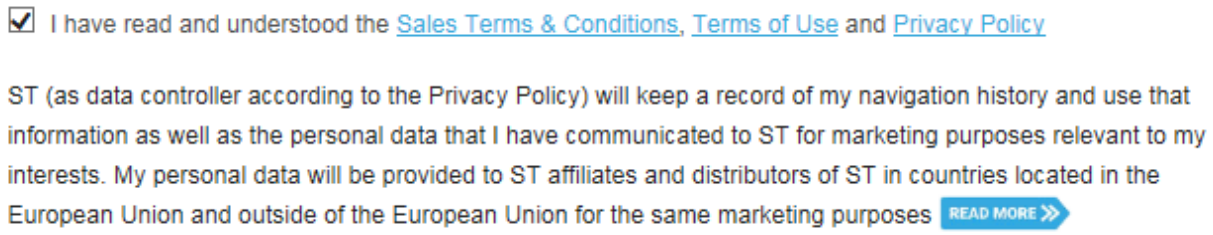
There are 3 ways of getting the software:

If you have an ST account click on: 

If you don’t have one, create one by clicking on: 

If you don’t have an account and don’t want to create one, fill in the information below:

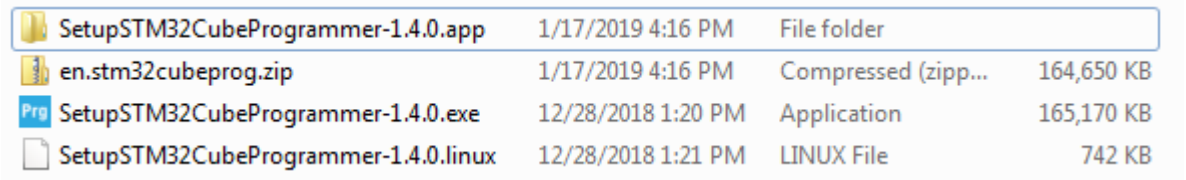
Click on the check box:



Then click: 

Save the file at a location of your choice:

Unzip the file (en.stm32cubeprog.zip)

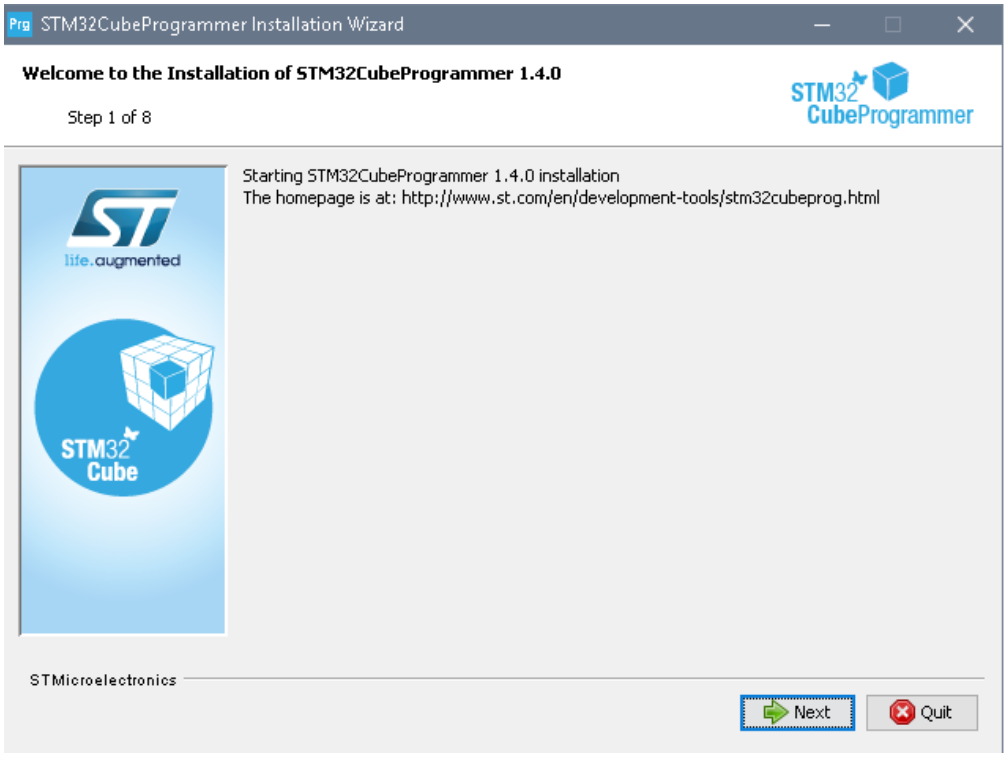


Note: you may see a newer version in your case than the screenshot above.

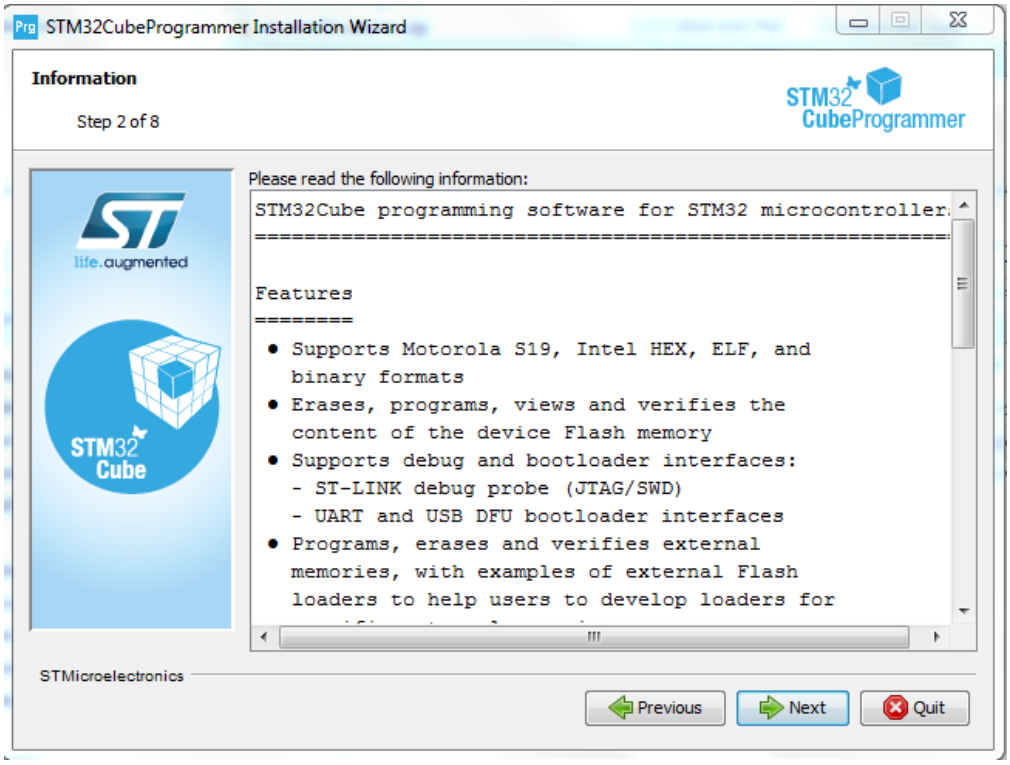
Right Click on SetupSTM32CubeProgrammer-x.x.x.exe and Run as administrator

Add screen shot

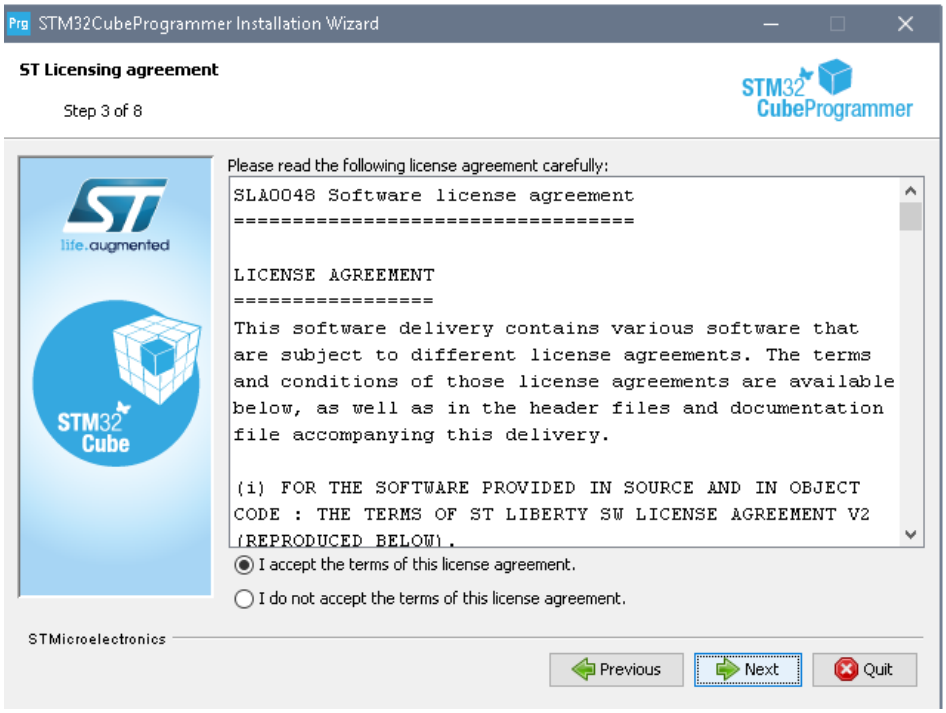
Press Next:



Press Next:

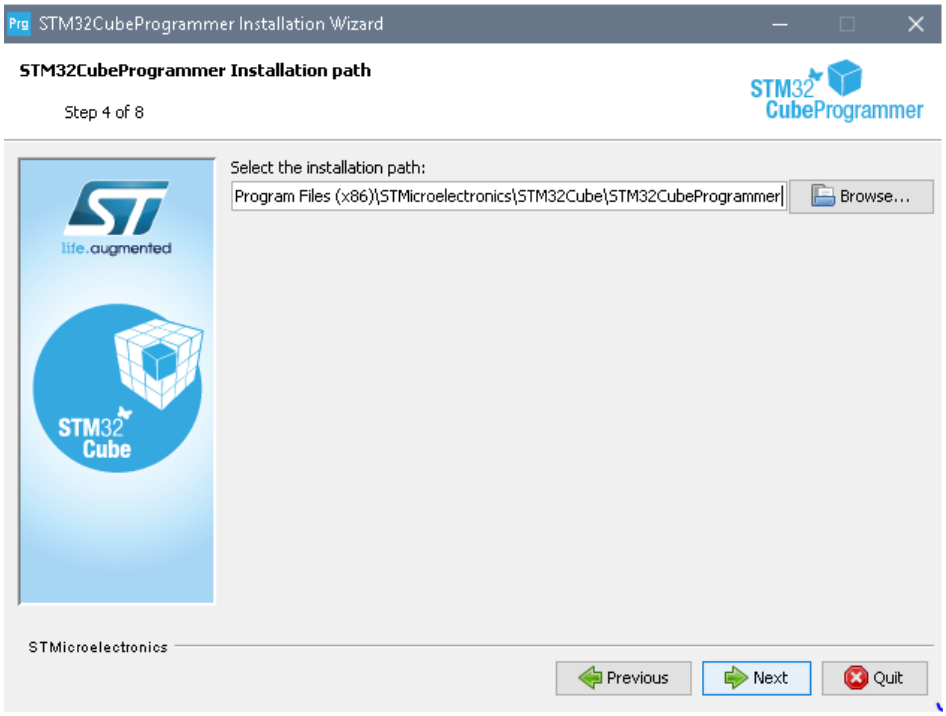


Accept the Terms and then click on Next:

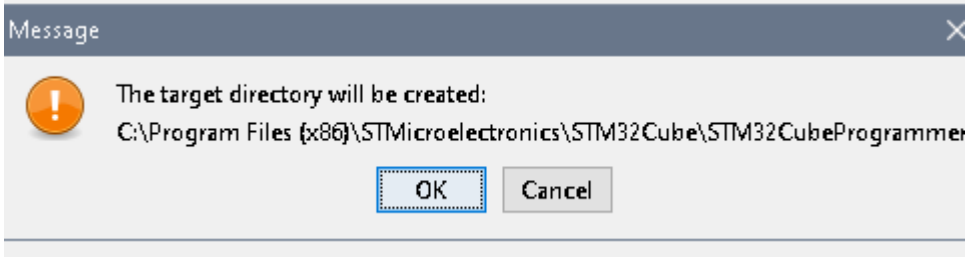


Important note: If you have a previous version, it will be overwritten if you keep the default path. So, if you want to keep your previous version you will need to install the new version at a different directory. But for the workshop make sure to use the correct version (version that we are installing here).

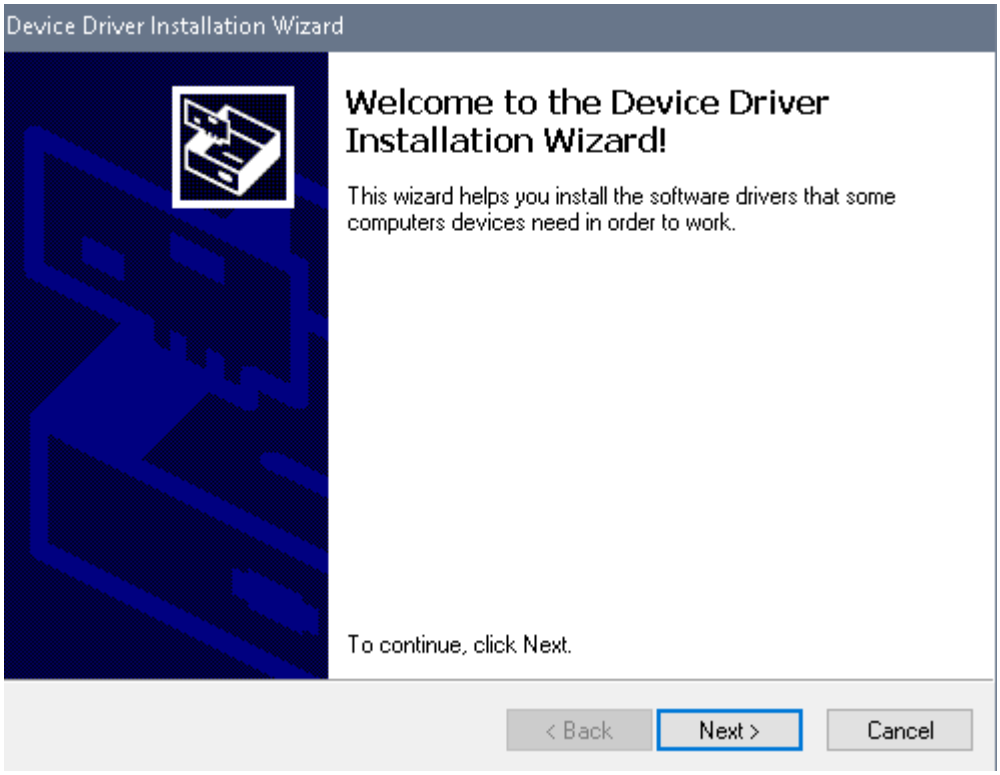
Once you have decided on the path then press Next:



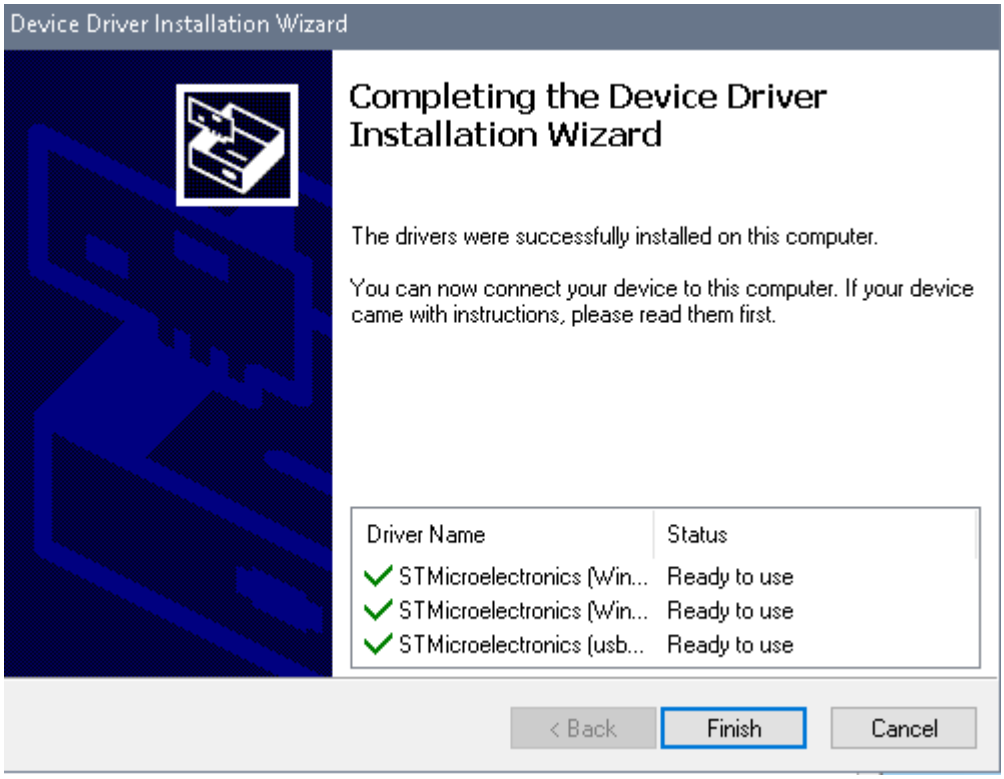
Press OK to create the Directory if the directory does not exist:



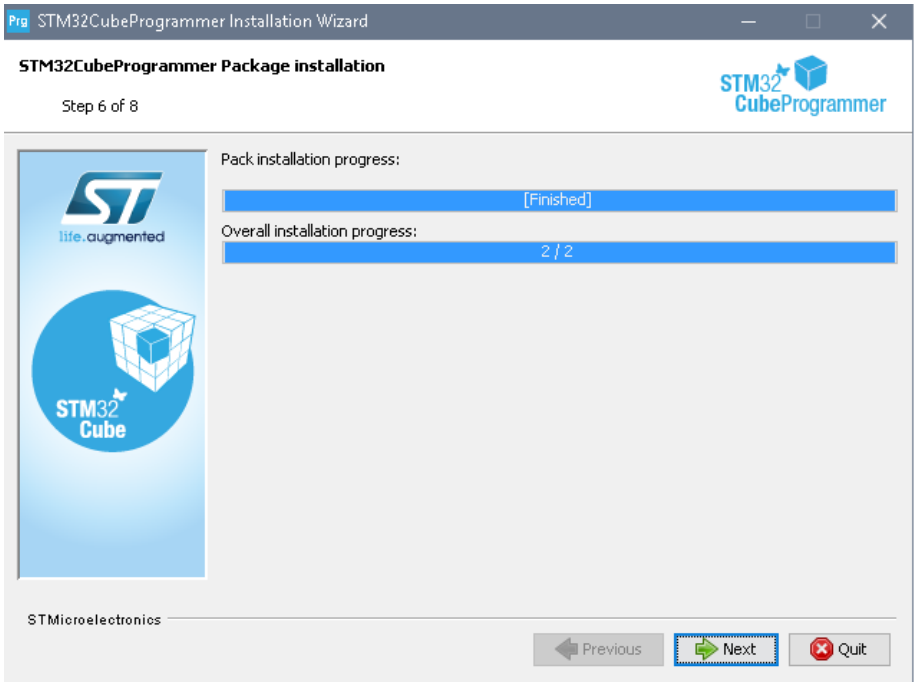
Follow those steps to install the ST-LINK Driver:
Press Next:



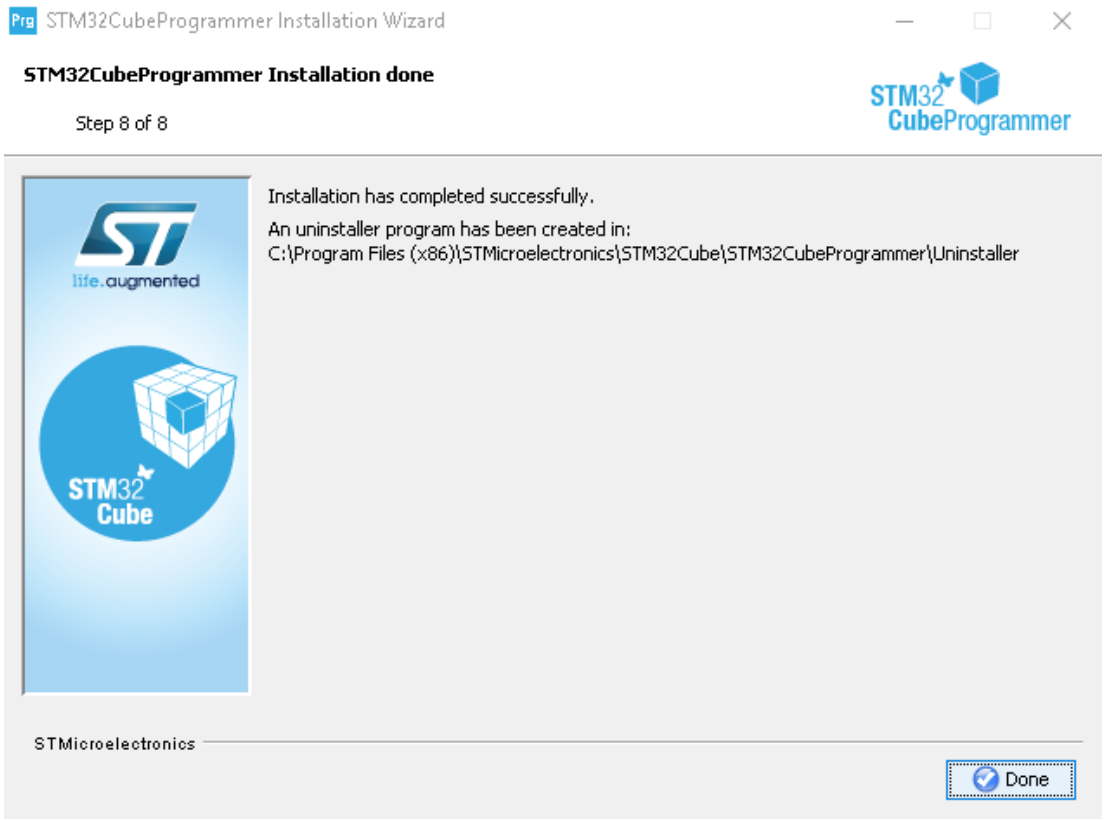
Press Finish:



Wait for the install to complete and then press Next:



Press Done:



Now try to open STM32CubeProgrammer to make sure it was installed properly.

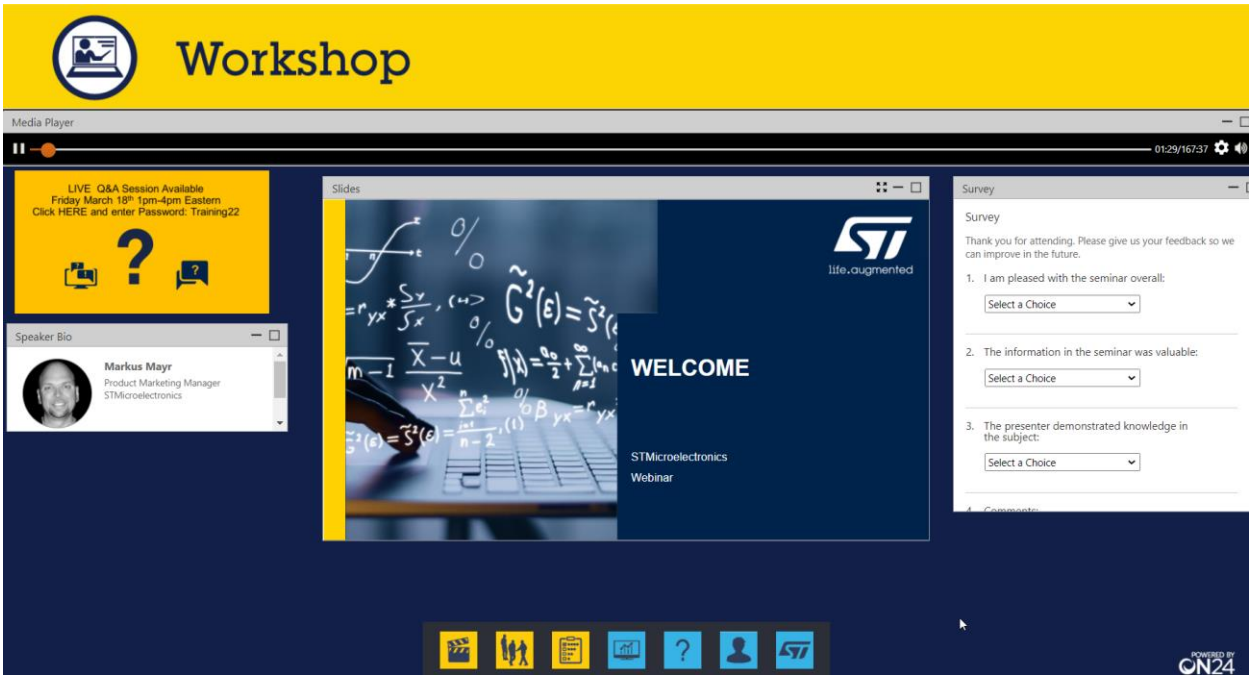
4 - Workshop Information & WebEx Installation

Workshop platform Information:

This workshop is self-paced.

The day of the event, when logging in to the platform, you will have access to many tiles and capabilities to play the content, explore resources, get live support and more.

Here is a look and feel example:



The day of the event, please make sure you locate the “media player” that will allow you to play & pause the workshop move forward / backward as you feel the need.

Please, note that this content will be available to you even after the event without limitation. However, the live support will not be available after the workshop.

When you pause the Workshop platform for more than 10 minutes without interaction, you will get the following message:

This webinar has concluded. Thank you for engaging with us.

Do not worry you can come back to the exact state you left. Here is what to do:

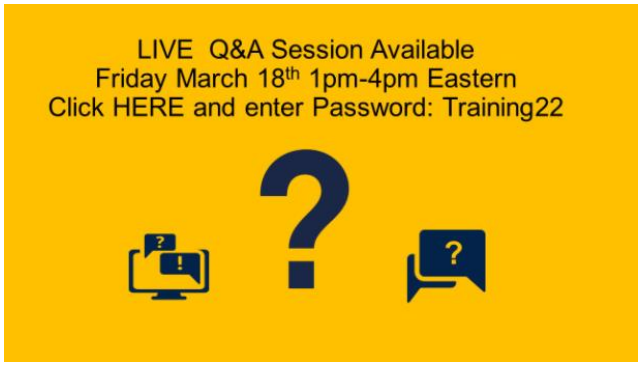
- Use the “Back Arrow” in your browser
- If this doesn’t work, reconnect using the link as you did the very first time

Any way it will bring you back where you left off.

Workshop live support information:

During the workshop day from 1-4pm US ET if you have any question (technical or non-technical) our team will be able to help you live through the WebEx video conference system.

- First, pause the workshop platform media player.
- Then, press to the following tile (should have the date of your session)



You will have the choice to connect to WebEx either by Application or Web Interface.
Please choose “by Application”.
Please note of the Password: “**Training23** that will be asked during the connection process.

Once connected, you will access the main lobby. At your turn the moderator will ask you to state in just few words the nature of your problem. We will then redirect you to a dedicated WebEx space (a Room) with our technical support expert, isolated from other attendees, where you will be able to share the details of your concern and get a solution. Please understand that we will have limited support capabilities and thanks in advance for your patience if all our support people are already assisting other customers.

IMPORTANT NOTE 1: To save bandwidth and ease the ST support we request that you connect to the live support resources **ONLY IF** you have a specific question or problem

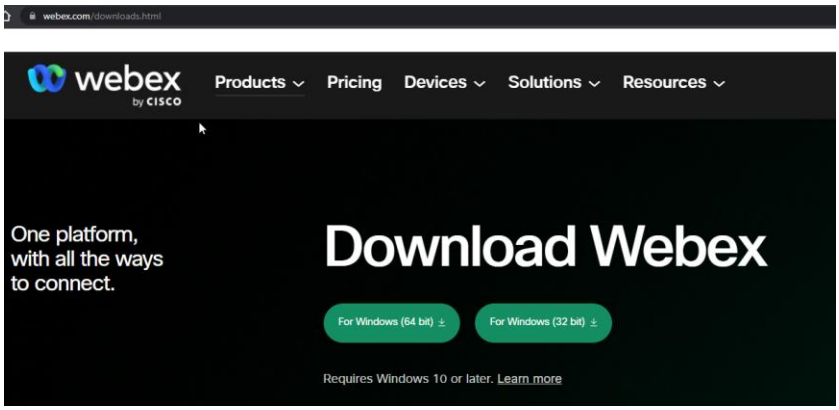
that needs to be solved. Then at the end of the call quit WebEx. You will be able to come back any time you need.
IMPORTANT NOTE 2: To ease the interaction during live session, please make sure that you have a functional microphone working. We also recommend having your video camera on, but this is not mandatory… also monitor the chat section since we use it when we can't hear you and face technical problems interacting.

WebEx Installation:

To save some time during the workshop, we recommend that you download and install the WebEx application before on the computer you are using for running the workshop. We recall that we requested to run the workshop on a Windows 64 bits machine.

We request that you install WebEx application on your computer to be able to share your screen with our experts so they can better assist you. If you use the Web interface only, you will be able to see and talk to the team but won't be able to the share your screen and this will limit our support capabilities.

Here is the process to install on your Windows 64 bits computer:
https://www.webex.com/downloads.html

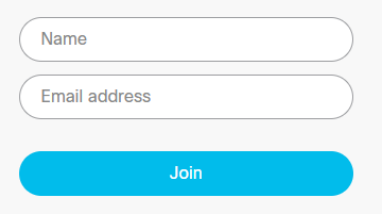


Select the left green button labeled "For Windows (64 bit)", then save locally & install the file "Webex.msi". test launching and agree on the agreement.

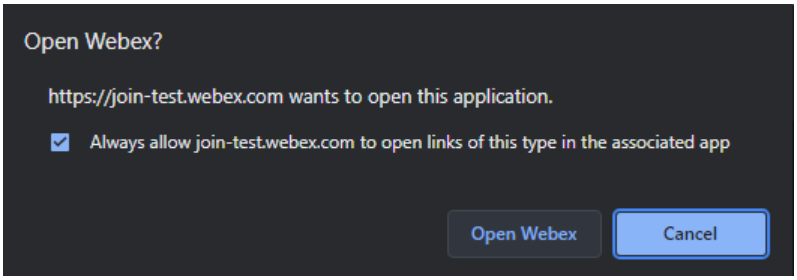
Test WebEx meeting: Test application installation and Audio/Video Settings:

We highly suggest that you look at this URL https://www.techsolutions.support.com/how-to/how-to-test-out-webex-audio-and-video-settings-13305
Follow the process to test your connection of your Microphone and Camera.
This will help greatly during the day of the workshop.

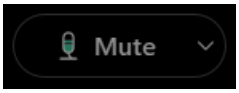
You will be asked to connect to a test meeting:
http://webex.com/test-meeting
Enter your name and email address and press “Join”.



A Pop-up will ask you to confirm to launch the WebEx application. We suggest that you check



You will then be able to test your microphone and camera.

For the Microphone, please explore audio options, by opening the menu: 

And exploring the **Audio Settings**: 

For further help on WebEx, please contact WebEx support line

5 – Code to be added during the workshop:

The code below are the changes we are going to do during the course of the workshop and you will be guided in step by step. This will help you so you do not have to retype everything since you will be able simply to copy-paste.

STM32C0 Workshop Lab 1: Blinky

in main.c:

```
HAL_GPIO_TogglePin(LED_GPIO_Port, LED_Pin);
HAL_Delay(100);
```

STM32C0 Workshop Lab 2: PWM

in main.c:

```
HAL_TIM_PWM_Start(&htim1, TIM_CHANNEL_1);
```

STM32C0 Workshop Lab 3: EXTI

in main.c

```
uint8_t PC13_flag = 0;

//////////////////////

void HAL_GPIO_EXTI_Rising_Callback(uint16_t GPIO_Pin)
{
 PC13_flag++;
 if ( ( PC13_flag & 0x01 ) == 0x01 )
 {
   HAL_GPIO_WritePin(GPIOA, GPIO_PIN_5, GPIO_PIN_SET);
 }
 else
 {
   HAL_GPIO_WritePin(GPIOA, GPIO_PIN_5, GPIO_PIN_RESET);
 }
}
```

STM32C0 Workshop Lab 4: Printf debugging using UART

in main.c:

```
/* USER CODE BEGIN PFP */
#define PUTCHAR_PROTOTYPE int __io_putchar(int ch)
/* USER CODE END PFP */

////////////////////////////

 while (1)
 {
    printf("** Hello World ** \n\r");
    HAL_Delay(1000);
 /* USER CODE END WHILE */

////////////////////////////

 /* USER CODE BEGIN 4 */
 PUTCHAR_PROTOTYPE
 {
  HAL_UART_Transmit(&huart2, (uint8_t *)&ch, 1, 0xFFFF);
  return ch;
 }
 /* USER CODE END 4 */
```

STM32C0 Workshop Lab 5: LL Drivers

in main.c:

```
LL_GPIO_TogglePin(GPIOA, LL_GPIO_PIN_5);
// Delay 100 ms
LL_mDelay(100);
```

STM32C0 Workshop Lab 6: ADC + DMA + TIM

in main.c:

```
/* USER CODE BEGIN PV */
uint8_t buffer[8];

...

 /* USER CODE BEGIN 2 */
  HAL_ADCEx_Calibration_Start(&hadc1);
  HAL_ADC_Start_DMA(&hadc1, (uint32_t *)buffer, 8);
  HAL_TIM_Base_Start(&htim3);
```

STM32C0 Workshop Lab 7: RAM

in main.c:

```
/* USER CODE BEGIN 2 */
  LL_USART_EnableIT_RXNE(USART2);
  LL_USART_EnableIT_ERROR(USART2);

...

/* USER CODE BEGIN 4 */
void USART_CharReception_Callback(void)
{
  uint8_t received_char;
  received_char = LL_USART_ReceiveData8(USART2);
  if ((received_char == 'E') || (received_char == 'e')) {
     LL_GPIO_TogglePin(LED_GPIO_Port, LED_Pin);
  }
  LL_USART_TransmitData8(USART2, received_char);
}
```

in main.h:

```
/* USER CODE BEGIN EFP */
void USART_CharReception_Callback(void);
/* USER CODE END EFP */
```

in stm32c0xx_it.c:

```
/* USER CODE BEGIN USART2_IRQn 0 */
USART_CharReception_Callback();
/* USER CODE END USART2_IRQn 0 */
```

in STM32C031C6TX_FLASH.ld:

```
*/Drivers/*(.text*)
*main.o(.text.MX_GPIO_Init)
*main.o(.text.MX_USART2_UART_Init)
*main.o(.text.USART_CharReception_Callback)
```