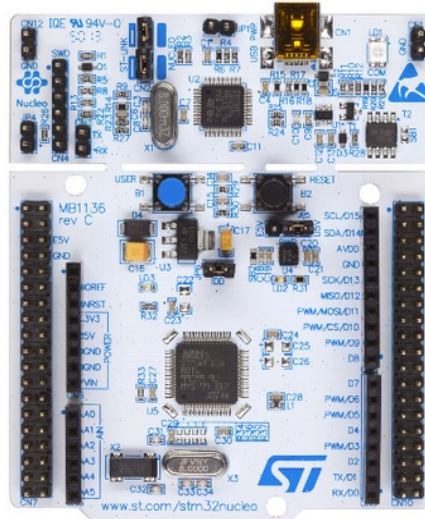


How to use NUCLEO-L152RE and Mbed



- [What is Mbed](#)
- [Update the FW on NUCLEO-L152RE](#)
- [SW examples](#)
- [Export your programs to KEIL, IAR, etc](#)
- [A minimum debug using pc.printf](#)
- [How to use ST Link Utility](#)
- [How to update KEIL v.5.10.0.2 for supporting STM32L152RE using the Device Family Pack](#)
- [Update the USB driver for ST-LINK-v2](#)
- [LINKs](#)

What is Mbed

The **mbed** development platform is the fastest way to create products based on ARM microcontrollers.

The project is being developed by **ARM**, its Partners and the contributions of the global mbed Developer Community.

In practice Mbed is online compiler tool.

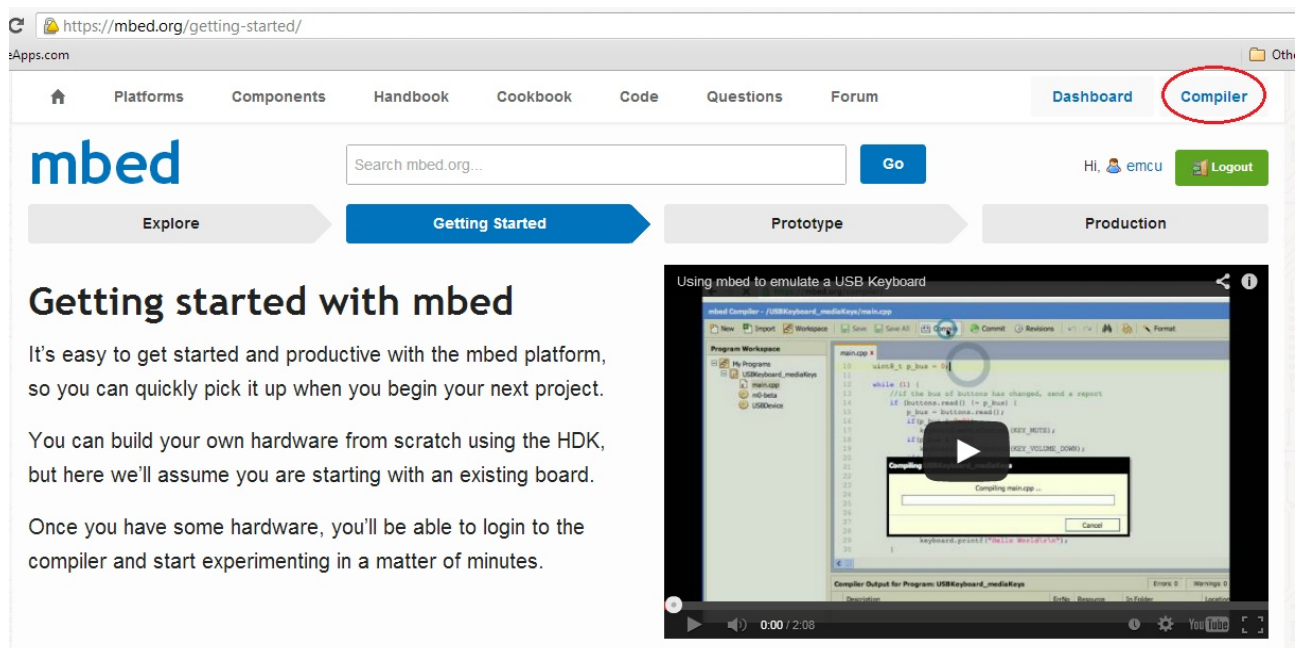
This means that to use it, it is necessary to have a Internet connection.

More info are [here](#).

First you must [register on Mbed](#).

Next follow the [getting started example](#).

The **online compiler** is in the first page after you are login on Mbed, see below.



The screenshot shows the Mbed website interface. At the top, there's a navigation bar with links like Platforms, Components, Handbook, Cookbook, Code, Questions, Forum, Dashboard, and Compiler (highlighted with a red circle). Below the navigation bar, the 'Getting Started' section is active, showing a video player titled 'Using mbed to emulate a USB Keyboard'. The video player shows a code editor with C++ code for emulating a USB keyboard. The code includes a while loop that reads a button and sends a report to the keyboard. The video player has a play button and a progress bar at the bottom.

Update the FW on NUCLEO-L152RE



- First install the **ST-Link driver** ([stlinknucleodiversigned.zip](#))
- Next go [here](#) and download the **FW update** ([stlinkv2m4upgrade.zip](#)).

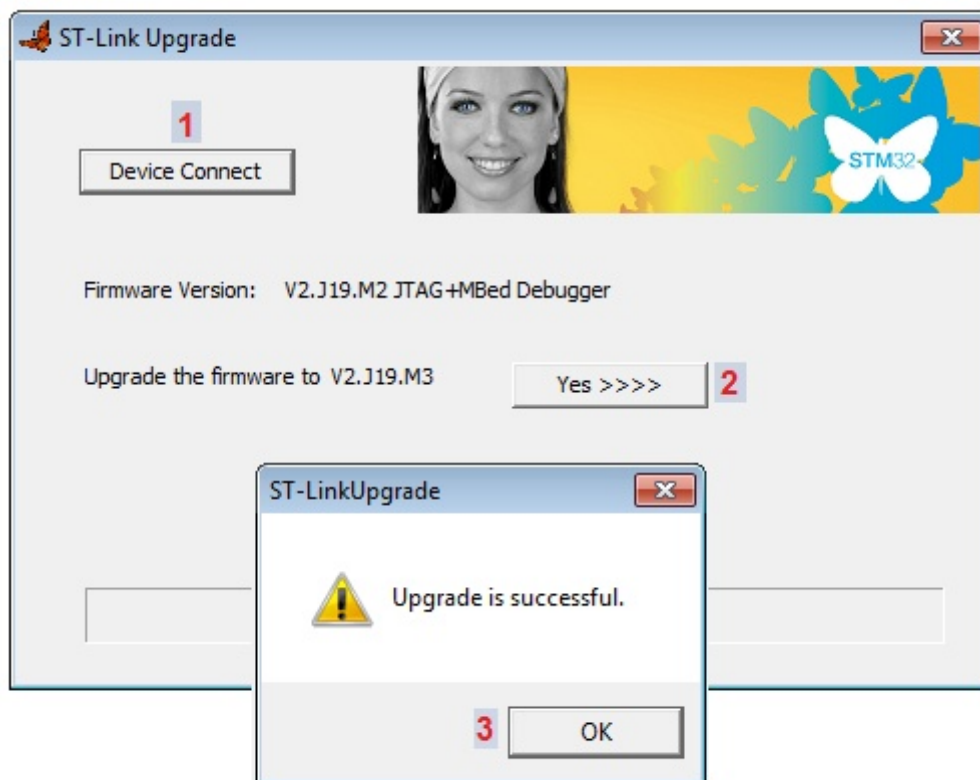
ST-Link driver Installation

1. Extract ([stlinknucleodiversigned.zip](#)) and run either dpinst_amd64.exe (for 64bit PC) or dpinst_x86.exe (for standard 32bit PC) depending on whether you are on a 64bit machine.
2. Follow the prompts

FW update

Connect the NUCLEO-L152 to the PC and extract and run (also with ADMINISTRATOR privilege) **ST-LinkUpgrade.exe** ([stlinkv2m4upgrade.zip](#)) and follow the prompts, see below.

Name	Date modified	Type	Size
 ST-LinkUpgrade.exe	13/02/2014 15:44	Application	659 KB
 STLinkUSBDriver.dll	13/02/2014 15:44	Application extens...	84 KB

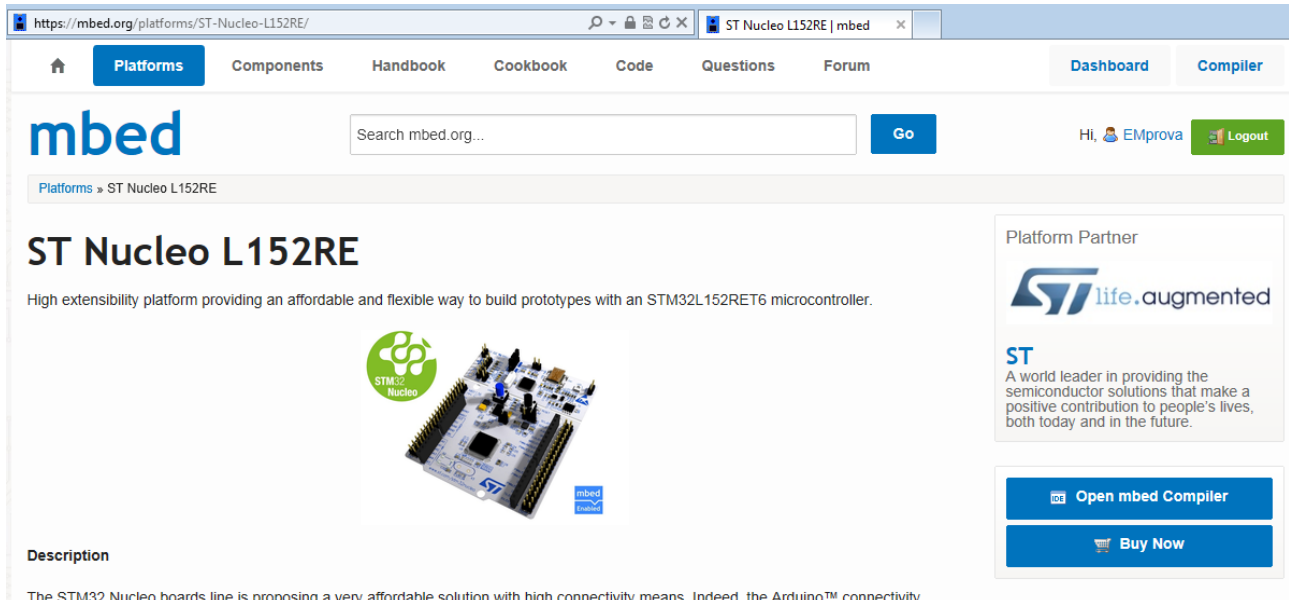


In case of problems do this:

Execute the: [Update the USB driver for ST-LINK-v2](#)

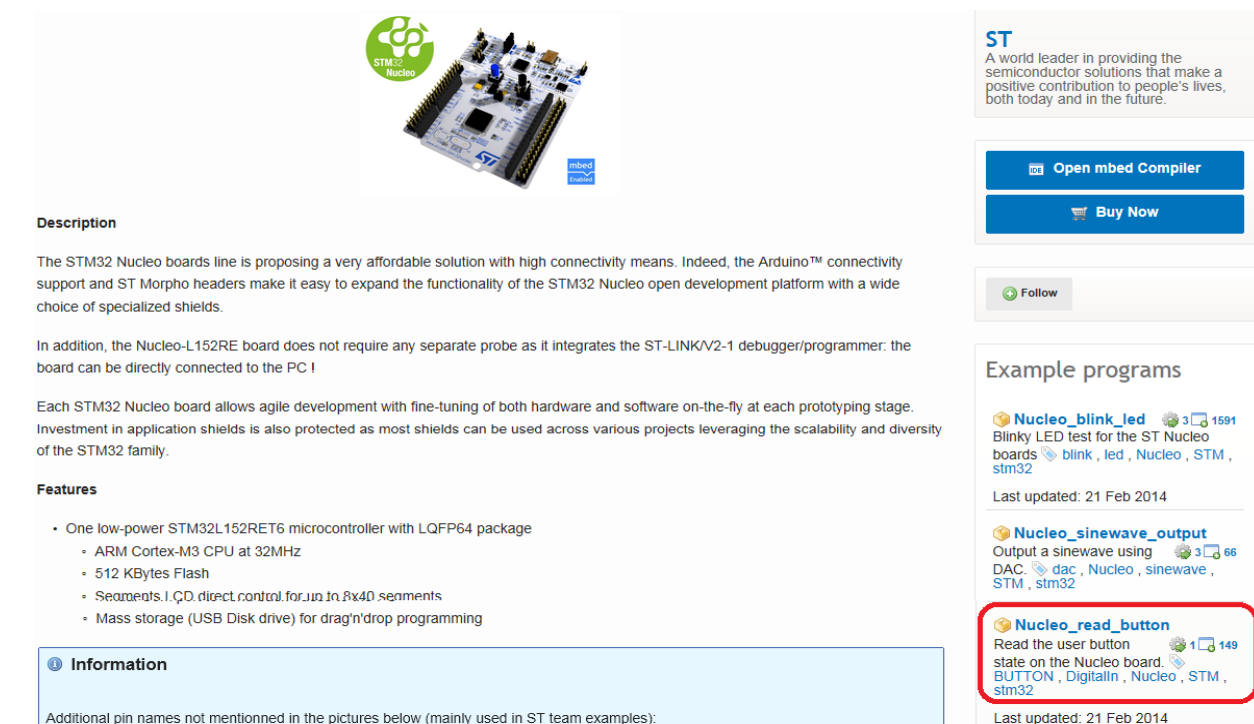
SW examples

To use the **NUCLEO-L152RE Mbed examples** you must before [register on mbed](#) and: [add the platform to your compiler](#), chose **ST NUCLEO L152RE**, see below.



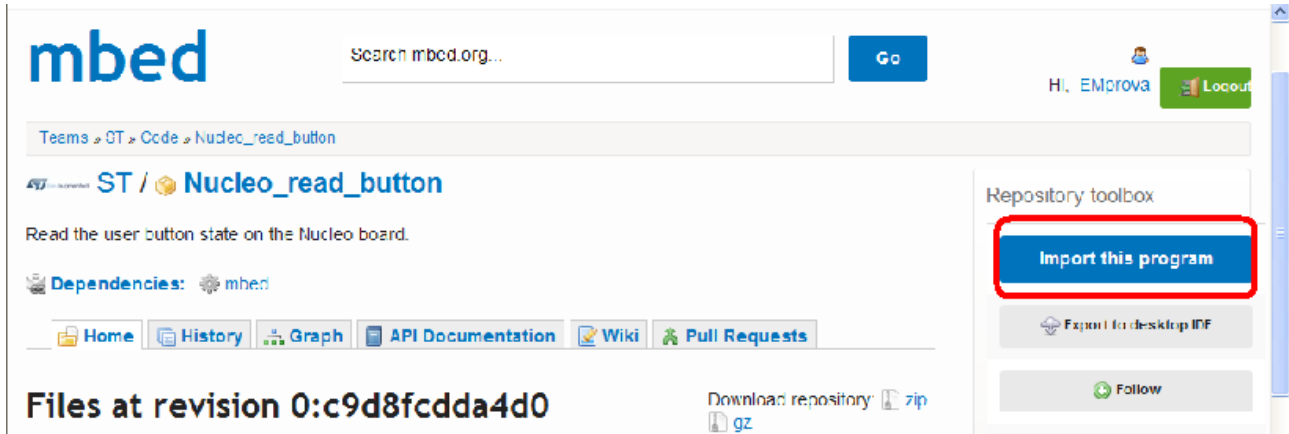
The screenshot shows the mbed.org website interface. The browser address bar displays "https://mbed.org/platforms/ST-Nucleo-L152RE/". The page title is "ST Nucleo L152RE". Below the title, it says "High extensibility platform providing an affordable and flexible way to build prototypes with an STM32L152RET6 microcontroller." There is an image of the STM32 Nucleo board. To the right, there is a "Platform Partner" section for ST, with a description: "A world leader in providing the semiconductor solutions that make a positive contribution to people's lives, both today and in the future." Below this, there are two buttons: "Open mbed Compiler" and "Buy Now".

Now we need to use the example: [Nucleo_read_button](#) for do this, select it, see below.

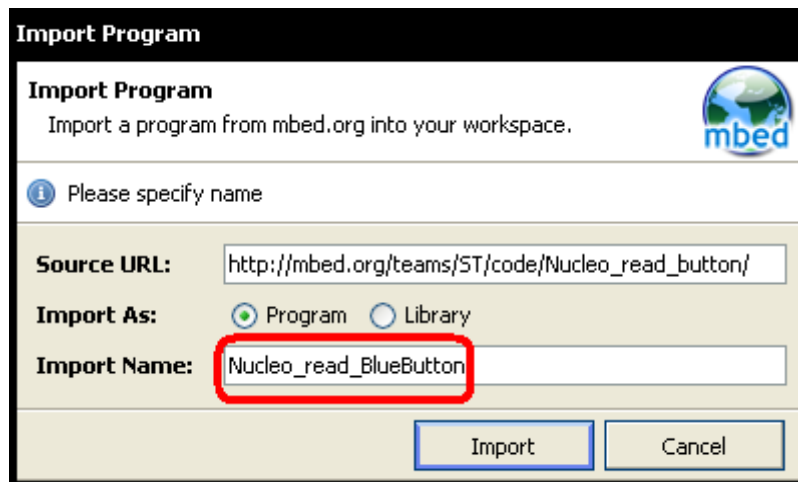


The screenshot shows the mbed.org website interface, specifically the "Example programs" section. The "Nucleo_read_button" example is highlighted with a red box. The example description is: "Read the user button state on the Nucleo board. BUTTON, DigitalIn, Nucleo, STM, stm32". The last updated date is "21 Feb 2014".

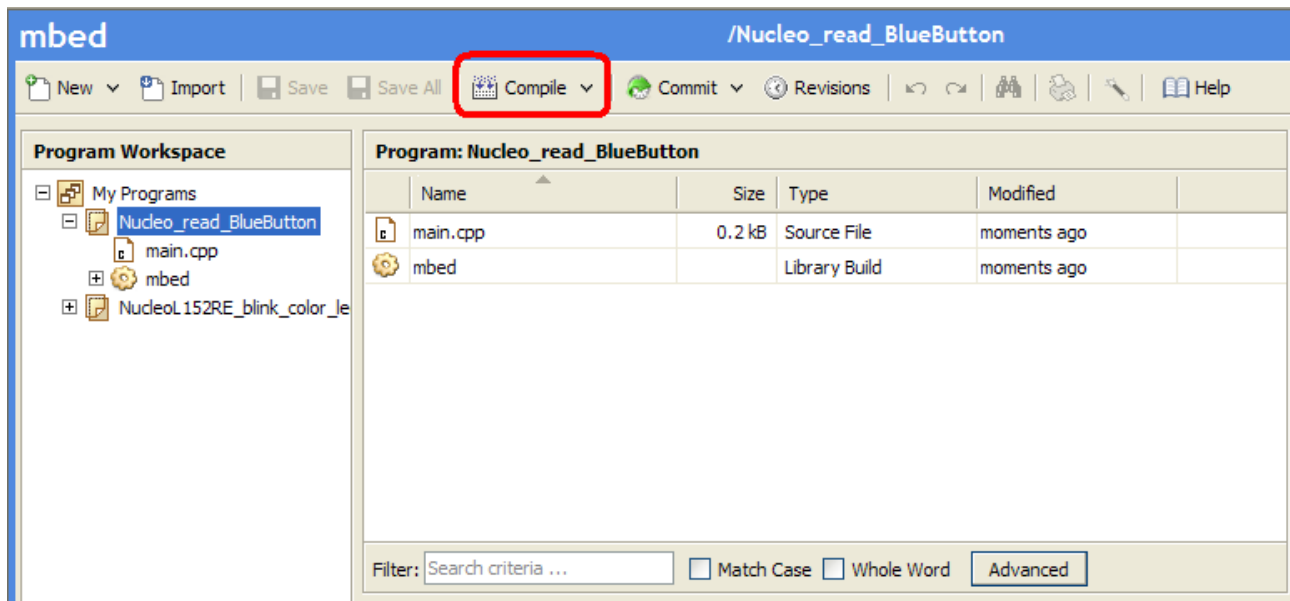
From the new window that appears, select:
Import this program
see below.



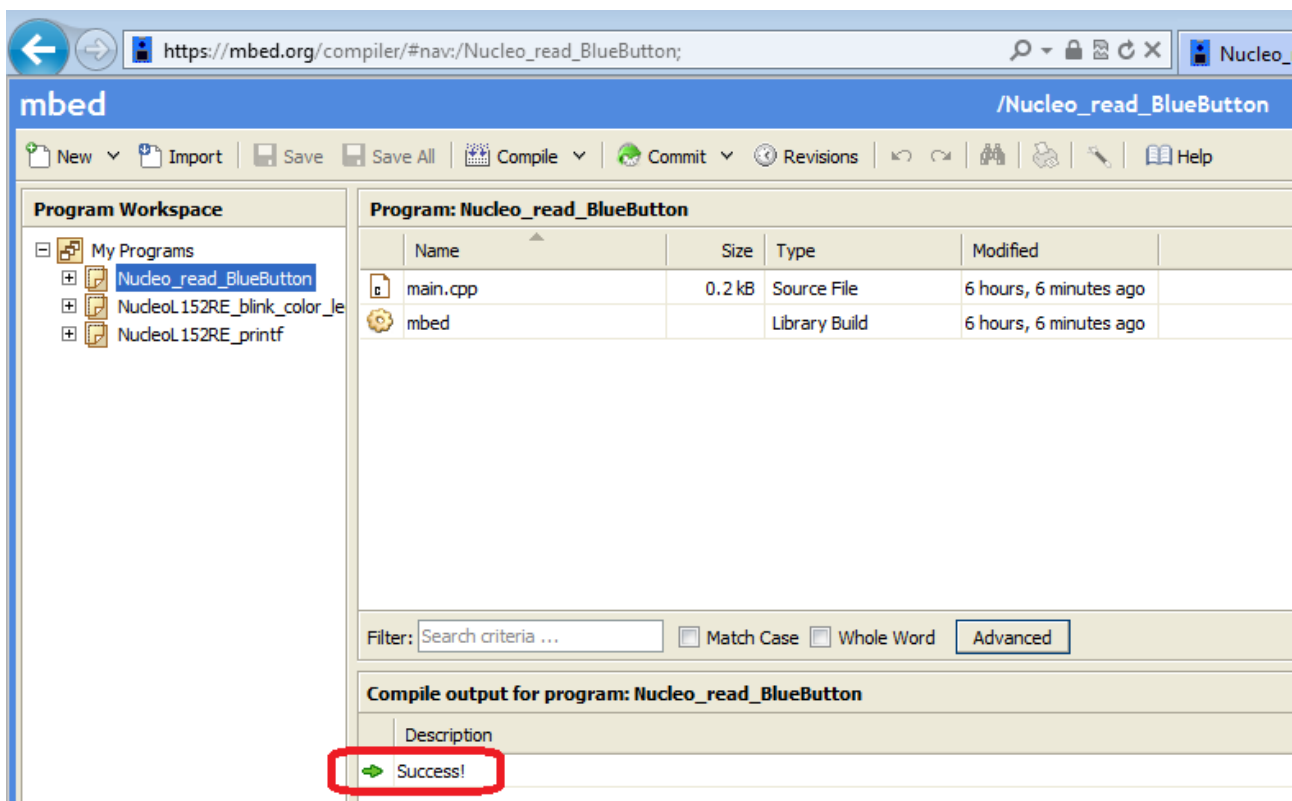
From the new window that appears, set a name for the project and select IMPORT, see below.



After importing the project, **click on the Compile icon**, see below.



You must see: **Success!**
See below.



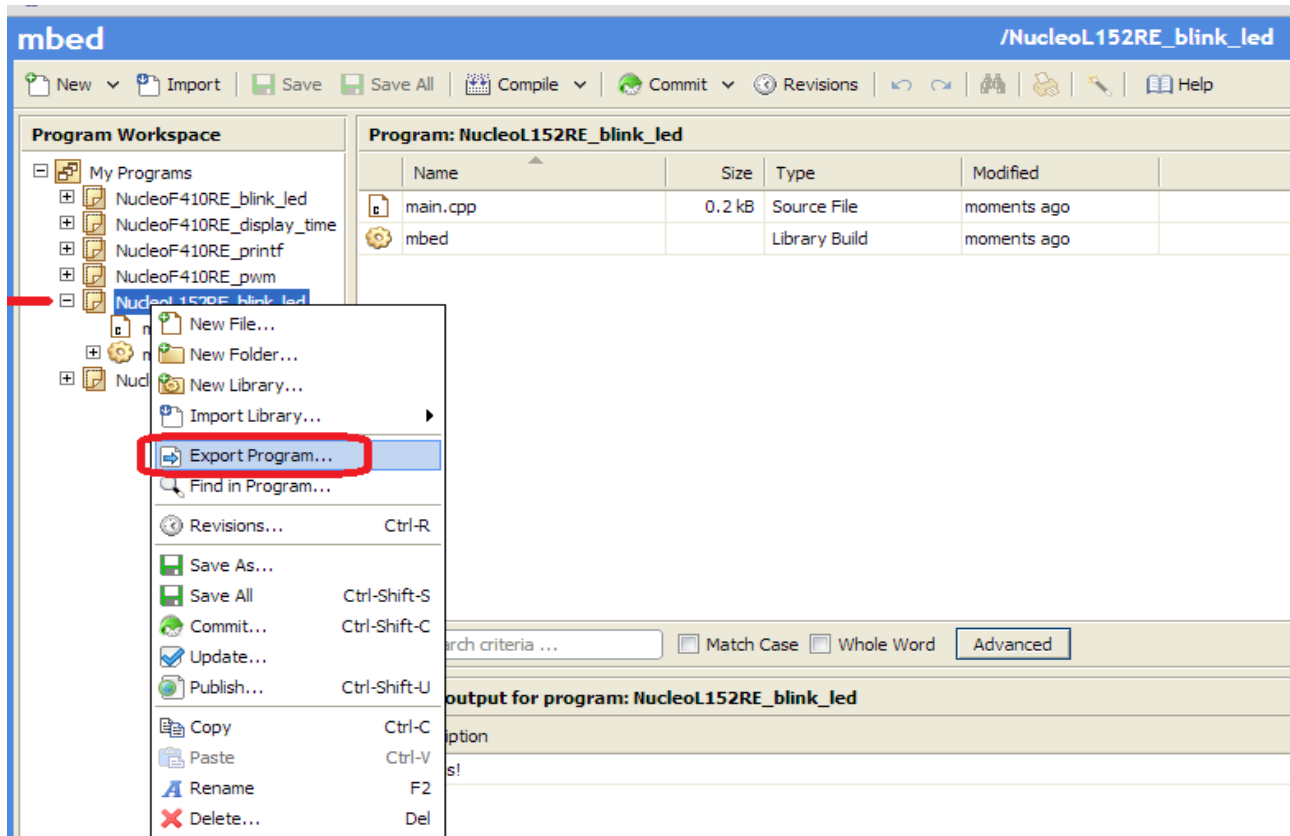
Save the **bin** file in a directory.

Now for programming NUCLEO-L152RE use [ST-LINK-Utility](#).
At the end of the programming you must see the green LED blinking.

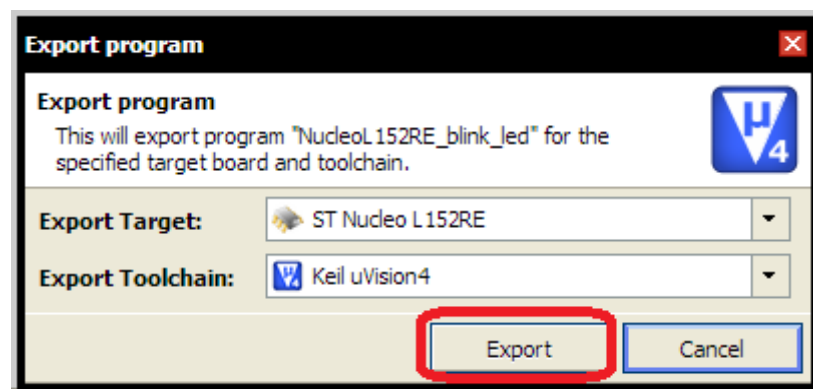
Export your programs to KEIL, IAR, etc

First: select the program that you need to export..

Second: click on it with the right mouse button and from the window that appears select Export Program, see below.



From the new window that appears, select the name of the toolchain and click on EXPORT button.



A minimum debug using pc.printf

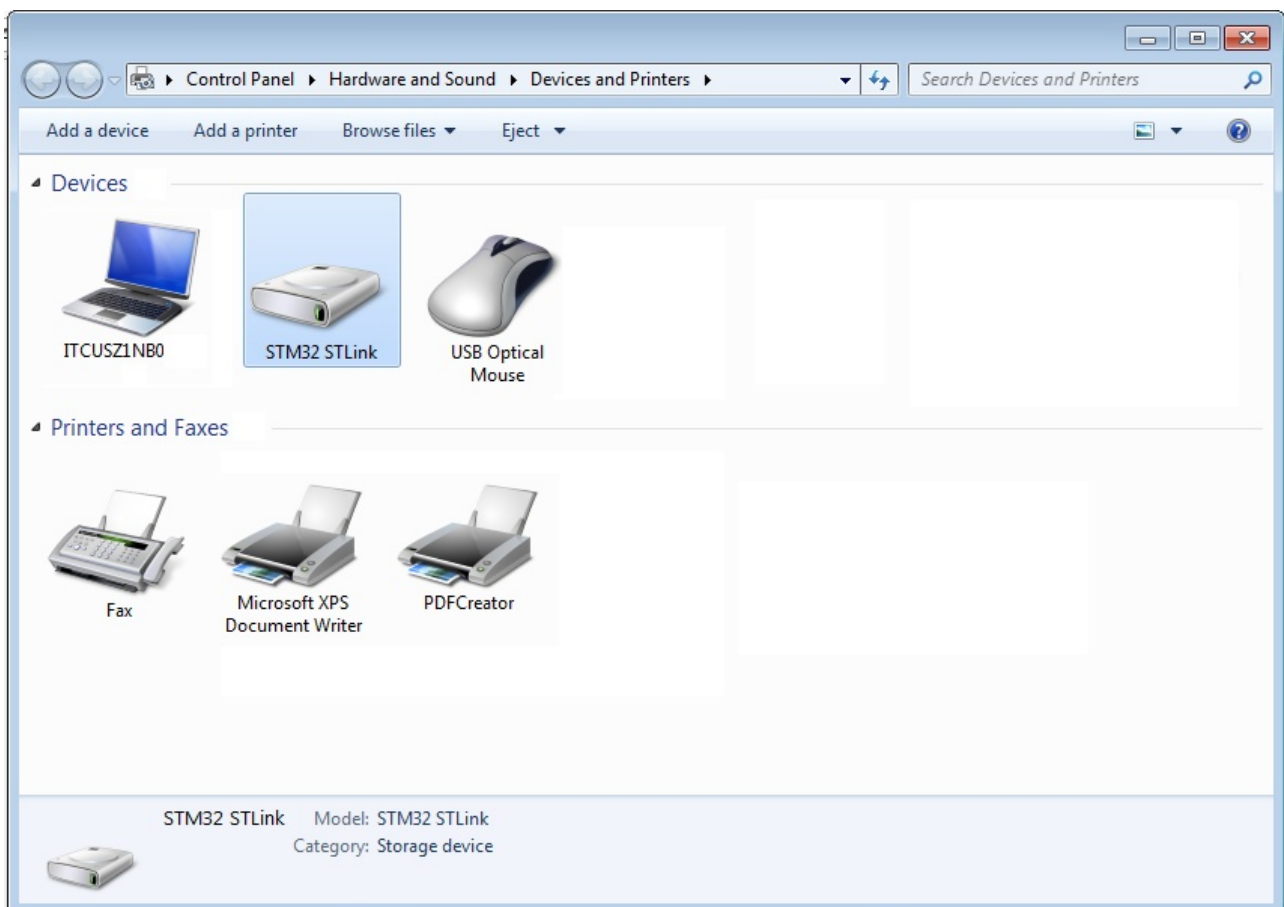
Up to now it is not present a serious debug tool in Mbed, the only possibility that you have is to use the **pc.printf** or **printf** that sends a message (text, variable, etc) via USB port to the PC.

The PC see the NUCLEO-L152RE as a **Virtual COM Port**.

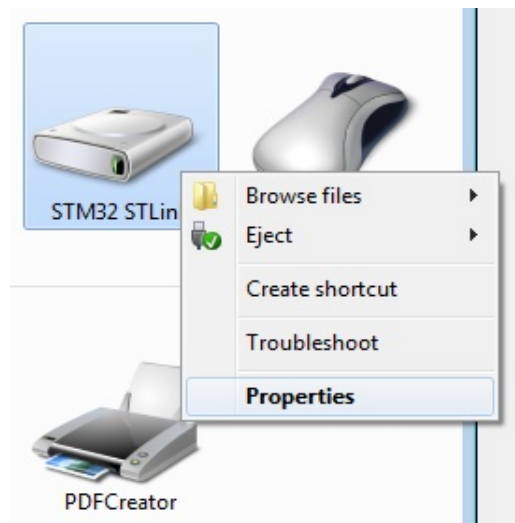
To check if the **Virtual COM Port** is installed correctly on **Windows 7**, follow the instructions below.

Select: **START -> Device and Printer**

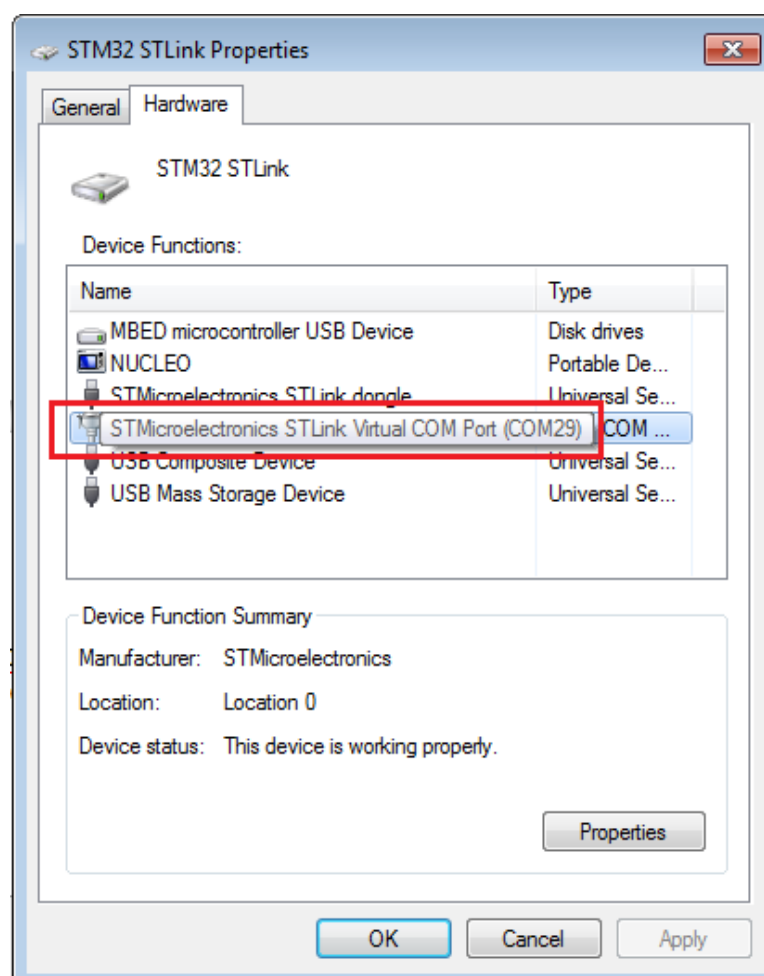
You must see something like below.



Now select the **STM32 STLink** and click on it using the right button of the mouse. From the window that appears, select **Properties**, see below.

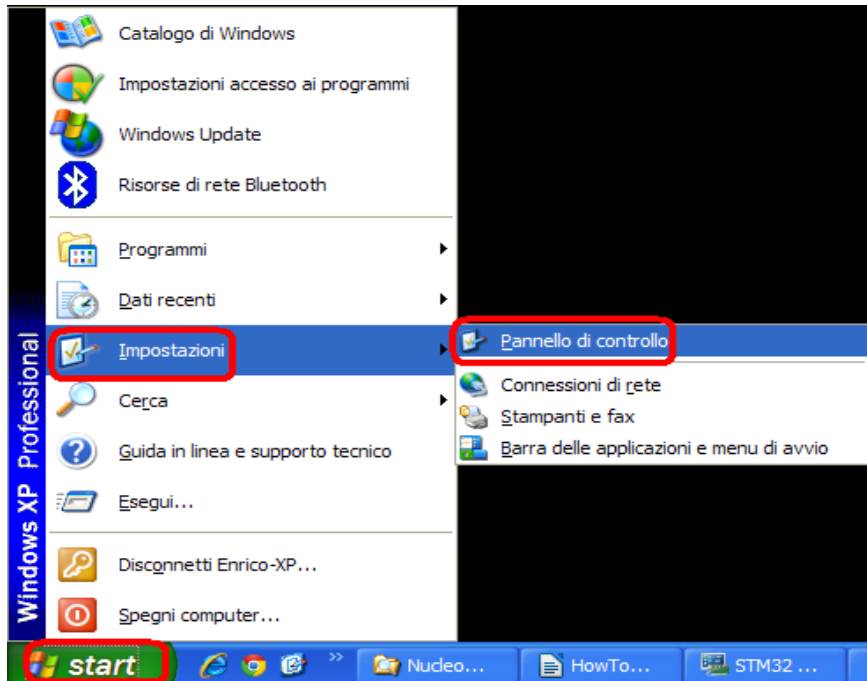


From the window that appears, select **Hardware**.
You must see something like below.
My Virtual COM Port is **COM29**.

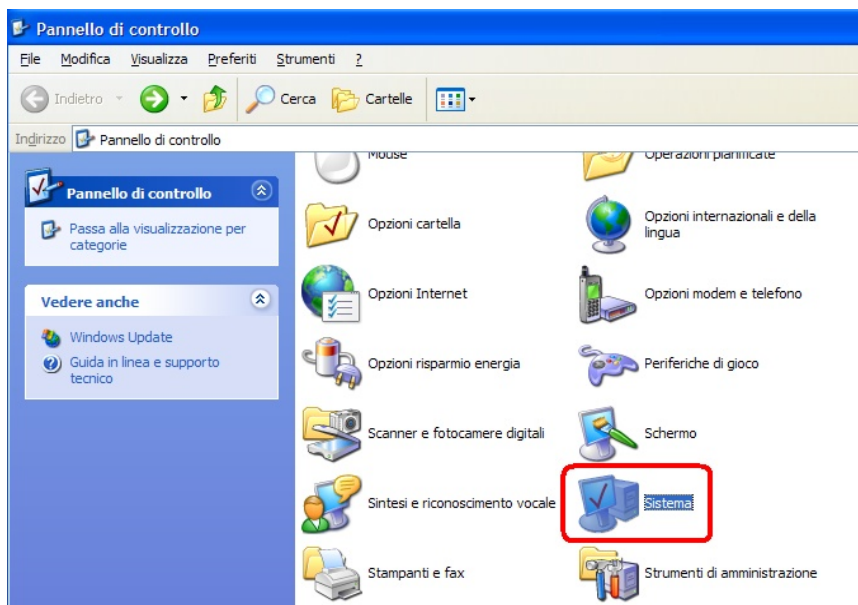


To check if the **Virtual COM Port** is installed correctly on **Windows XP**, follow the instructions below.

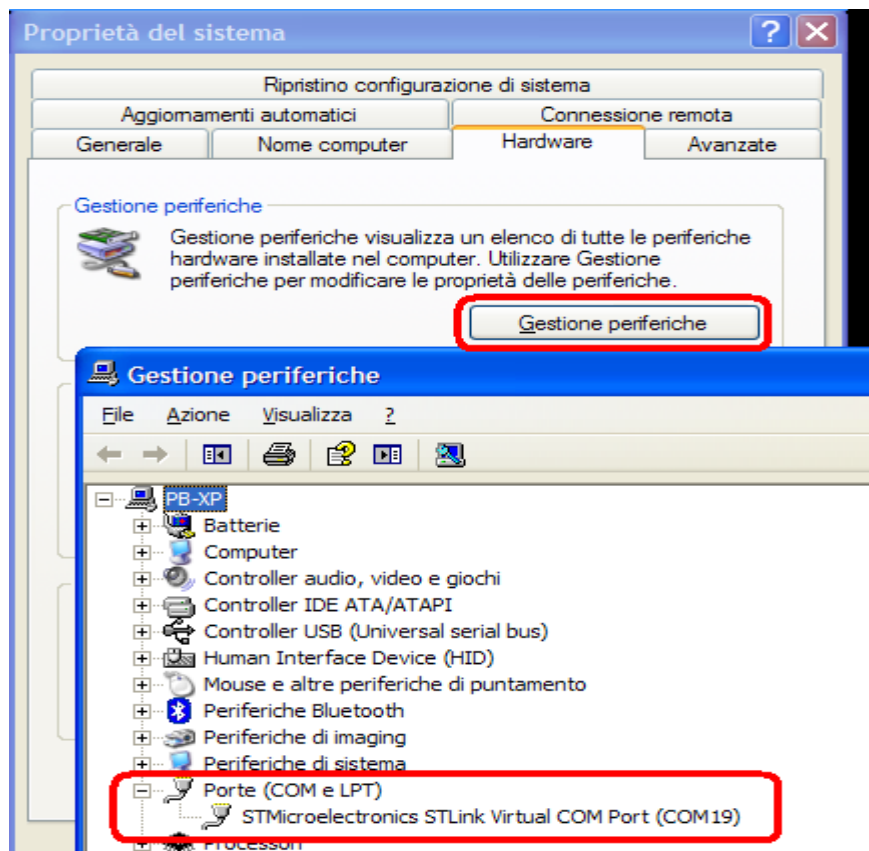
START → Impostazioni → Pannello di Controllo



From **Pannello di Controllo** select **Sistema**, see below.



From the new window that appears, select **Gestione Periferiche** and a new window appear. From this window select **Porte (COM e LPT)**, see below.



At this point you must see the STLink Virtual Com Port, in my case is COM19.

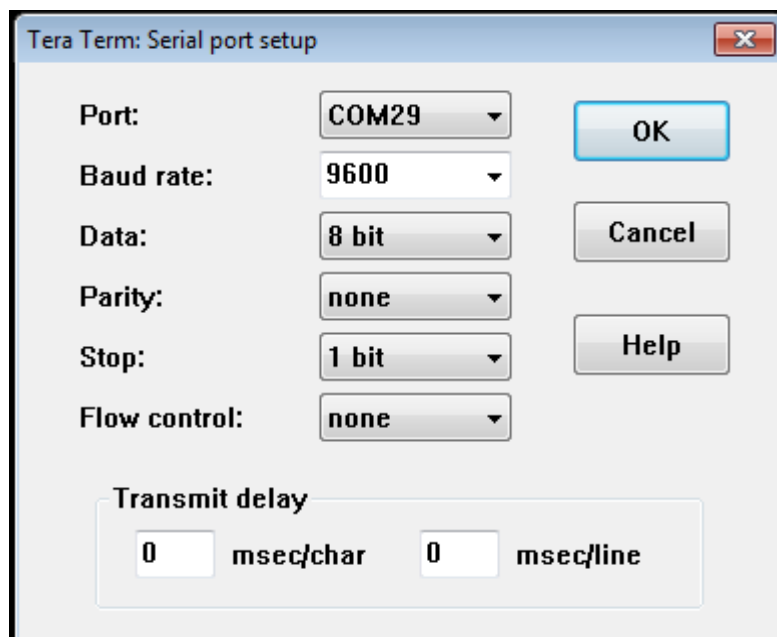
Now use the example [Nucleo_printf](#) and **programming** your **Nucleo-L152RE**.
Below there is the content of **main.cpp**

```
#include "mbed.h"
//-----
// Hyperterminal configuration
// 9600 bauds, 8-bit data, no parity
//-----
Serial pc(SERIAL_TX, SERIAL_RX);

DigitalOut myled(LED1);

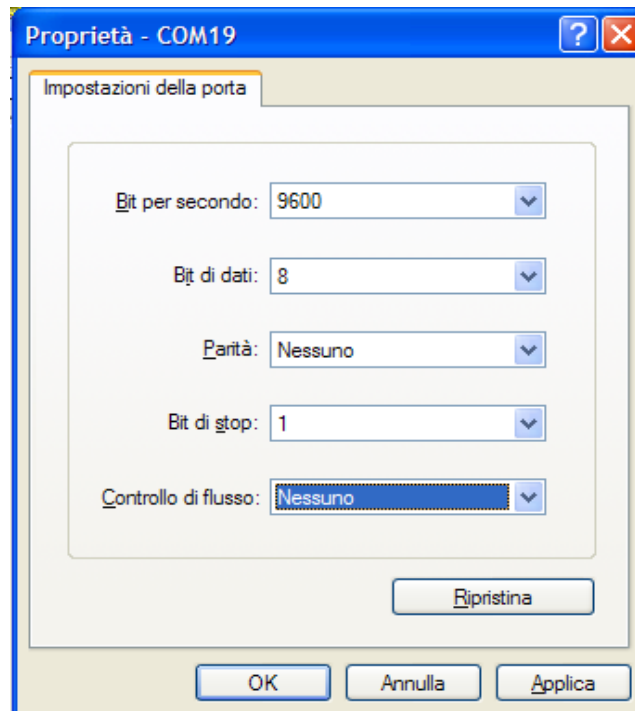
int main() {
    int i = 1;
    pc.printf("Hello World !\n");
    while(1) {
        wait(1);
        pc.printf("This program runs since %d seconds.\n", i++);
        myled = !myled;
    }
}
```

Configure your [TeraTerm](#) (on **Windows 7**) using the following parameters:

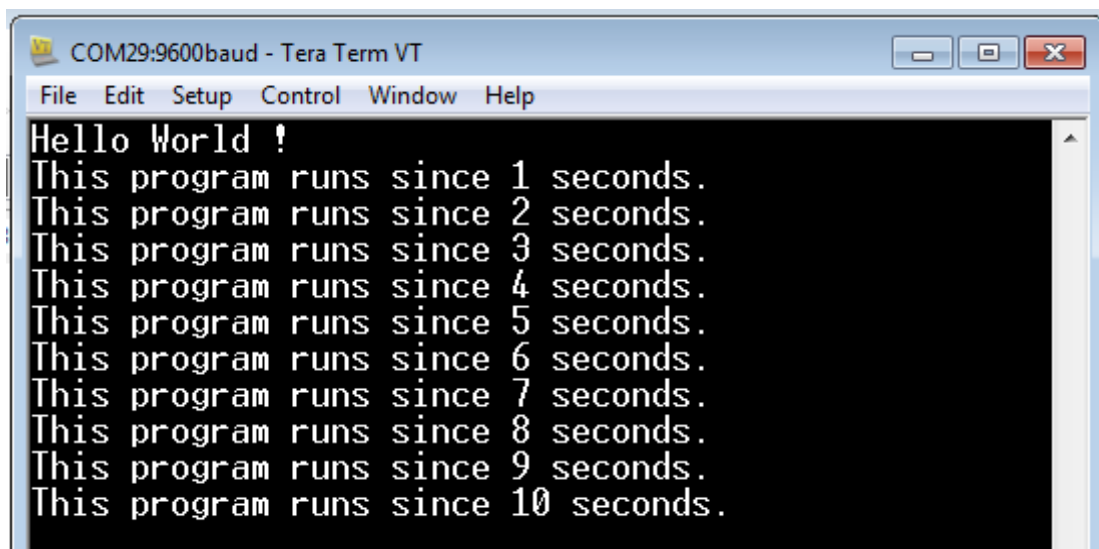


On **Windows XP** use **HyperTerminal** and configure it how to show below.

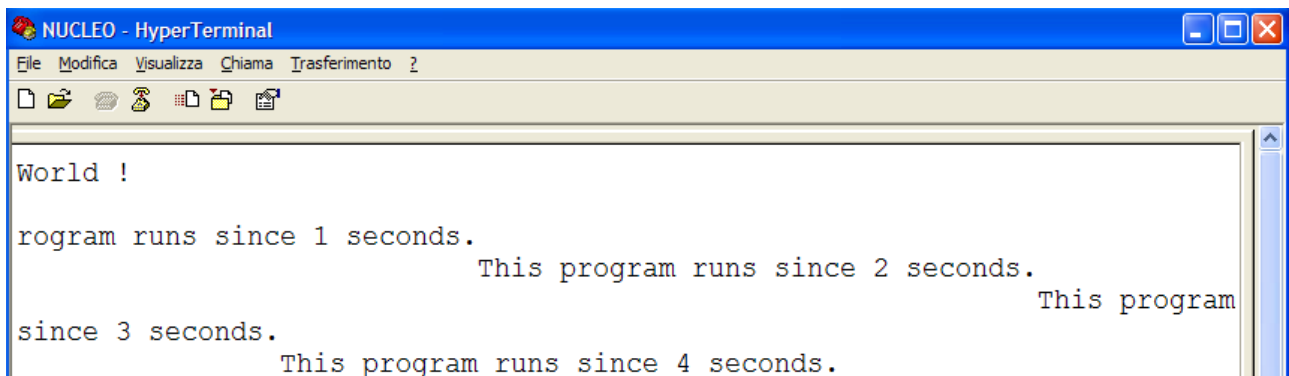




On your PC, you must see something like below, on **Windows 7** (Tera Term).



On your PC, you must see something like below, on **Windows XP** (Hyper Terminal).

A screenshot of a HyperTerminal window titled "NUCLEO - HyperTerminal". The window has a menu bar with "File", "Modifica", "Visualizza", "Chiama", and "Trasferimento". Below the menu bar is a toolbar with icons for file operations. The main text area displays the following output:

```
World !  
rogram runs since 1 seconds.  
                This program runs since 2 seconds.  
                This program  
since 3 seconds.  
                This program runs since 4 seconds.
```

And on the **NUCLEO-L152RE** you must see the **green led** that **flashing**.

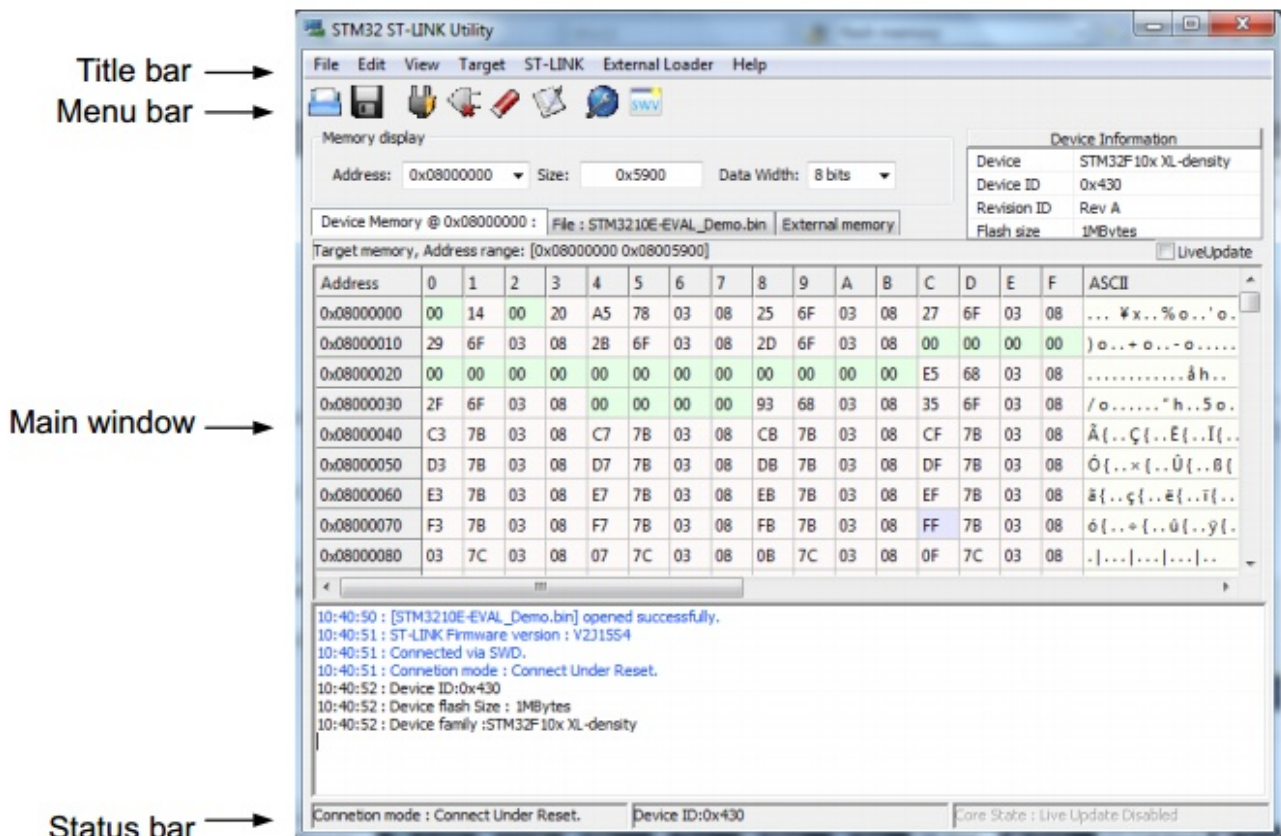
How to use ST-Link-Utility

The STM32 ST-Link Utility software facilitates fast in-system programming of the STM32 microcontroller families in both development and production environments via the ST-Link tool.

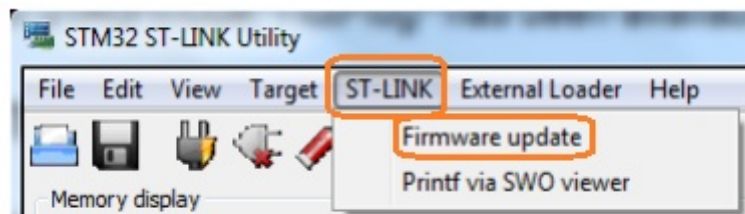
The reference page is:

<http://www.st.com/internet/evalboard/product/251168.jsp>

This tool is compatible with ST-LINK and ST-LINKv2.

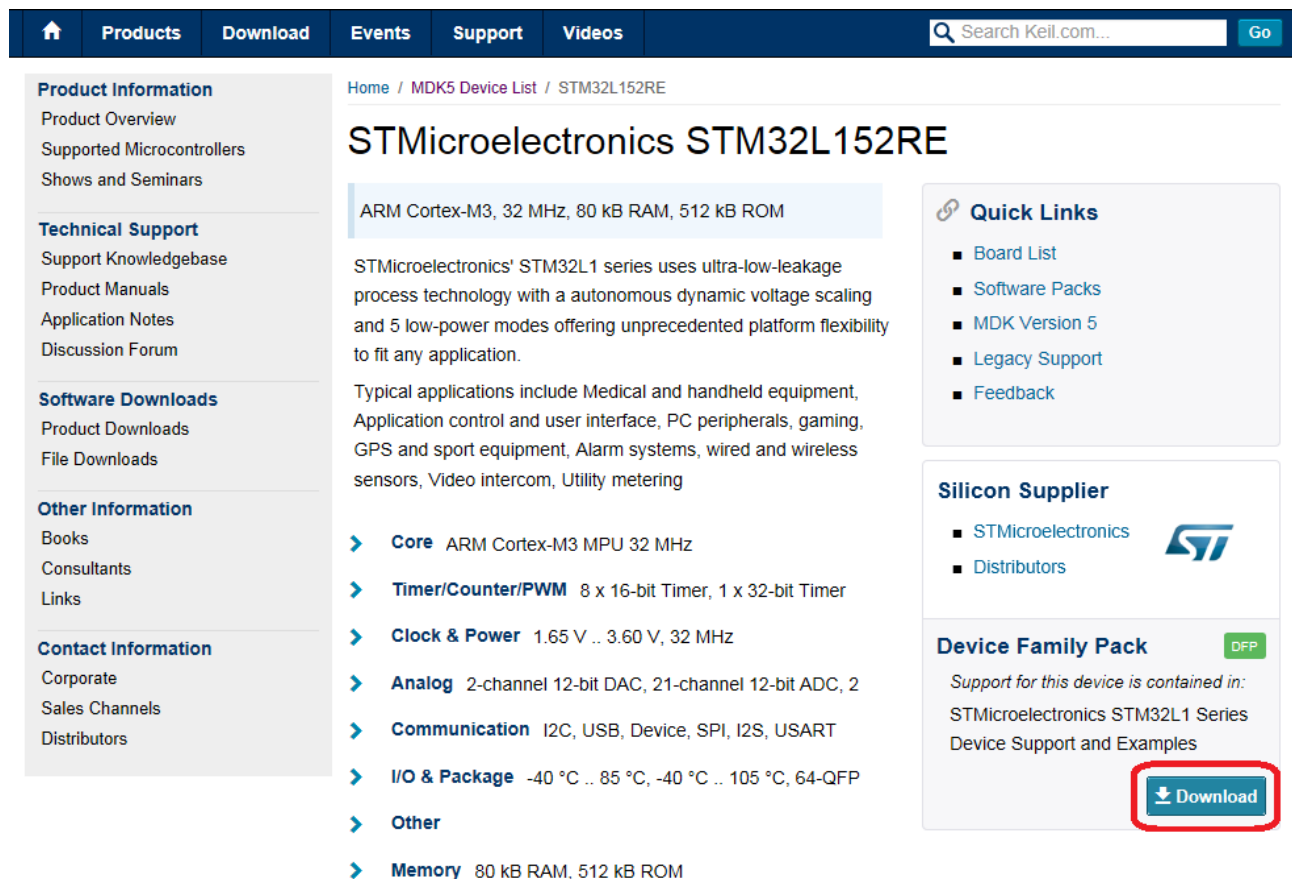


To update the firmware on ST-Link select the menù show below.



How to update KEIL v.5.10.0.2 for support STM32L152RE using the Device Family Pack

On the KEIL v.5.10.0.2 is not present the STM32L152RE.
To add the support to the STM32L152RE it is necessary to download and install the Device Family Pack that is [here](#). See below.



The screenshot shows the STM32L152RE product page on the STMicroelectronics website. The page layout includes a navigation bar at the top with links like Home, Products, Download, Events, Support, and Videos. A search bar is also present. The main content area is divided into several sections:

- Product Information:** Includes links for Product Overview, Supported Microcontrollers, and Shows and Seminars.
- Technical Support:** Includes links for Support Knowledgebase, Product Manuals, Application Notes, and Discussion Forum.
- Software Downloads:** Includes links for Product Downloads and File Downloads.
- Other Information:** Includes links for Books, Consultants, and Links.
- Contact Information:** Includes links for Corporate, Sales Channels, and Distributors.

The main content area for the STM32L152RE includes:

- ARM Cortex-M3, 32 MHz, 80 kB RAM, 512 kB ROM**
- STM32L1 Series:** Describes the ultra-low-leakage process technology and its applications in Medical and handheld equipment, Application control and user interface, PC peripherals, gaming, GPS and sport equipment, Alarm systems, wired and wireless sensors, Video intercom, and Utility metering.
- Quick Links:** Includes links for Board List, Software Packs, MDK Version 5, Legacy Support, and Feedback.
- Silicon Supplier:** Includes links for STMicroelectronics and Distributors.
- Device Family Pack:** A section with a green 'DFP' badge and a 'Download' button (highlighted with a red rectangle). The text states: "Support for this device is contained in: STM32L1 Series Device Support and Examples".

After the download, simply click on the file for start the update.

Update the USB driver for ST-LINK-v2

NOTE:

Do this update only if the: [Update the FW on NUCLEO-L152RE](#) fails.

Update the usb driver for ST-LINK-v2, chose it from the list below.

[STSW-LINK003](#) ST-LINK/V2 USB driver for Windows 7, Vista and XP

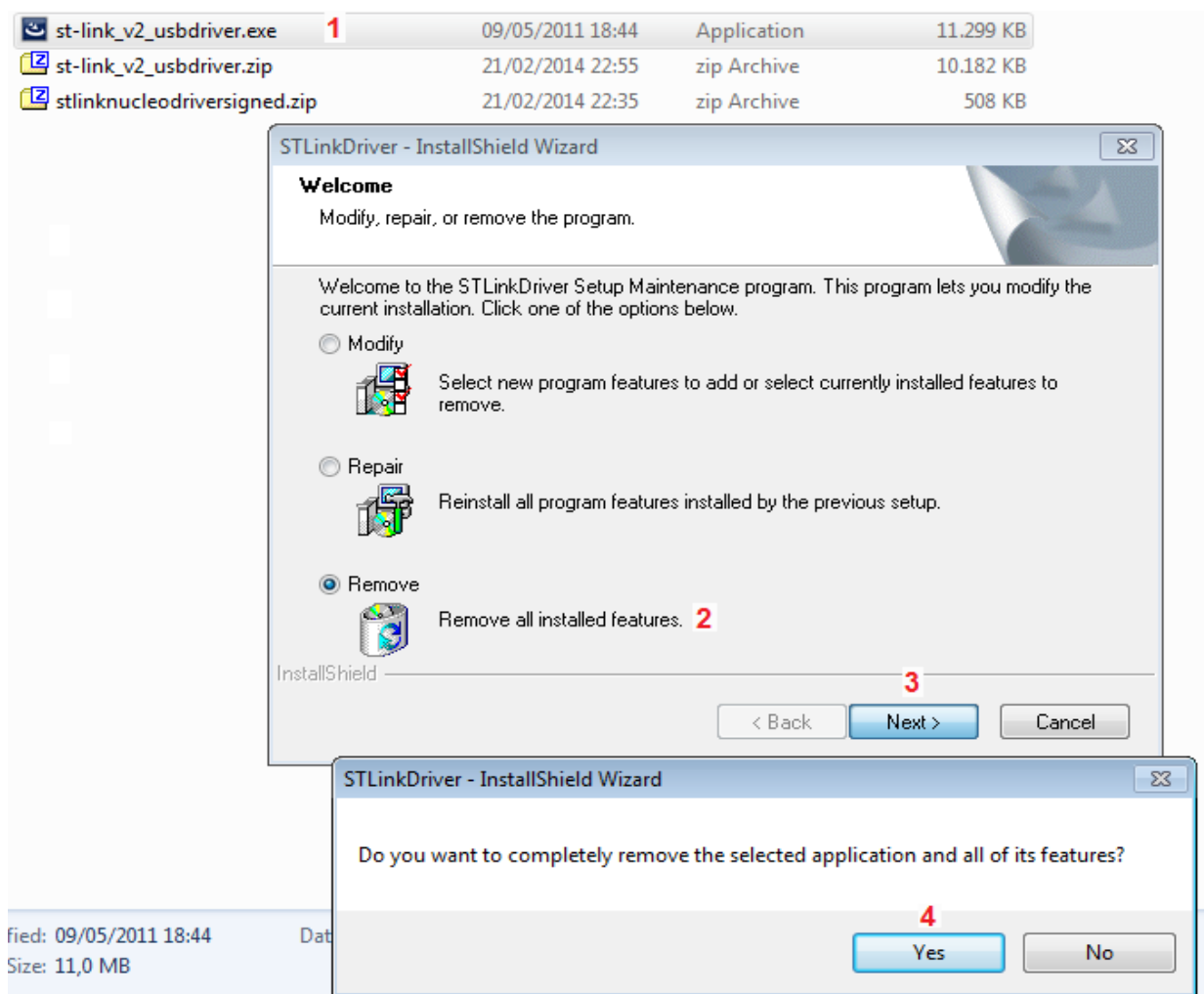
[STSW-LINK006](#) ST-LINK/V2 USB driver for Windows 8

Unzip the file and run it, with the privilege of ADMINISTRATOR, the file is:

st-link_v2_usbdriver.exe

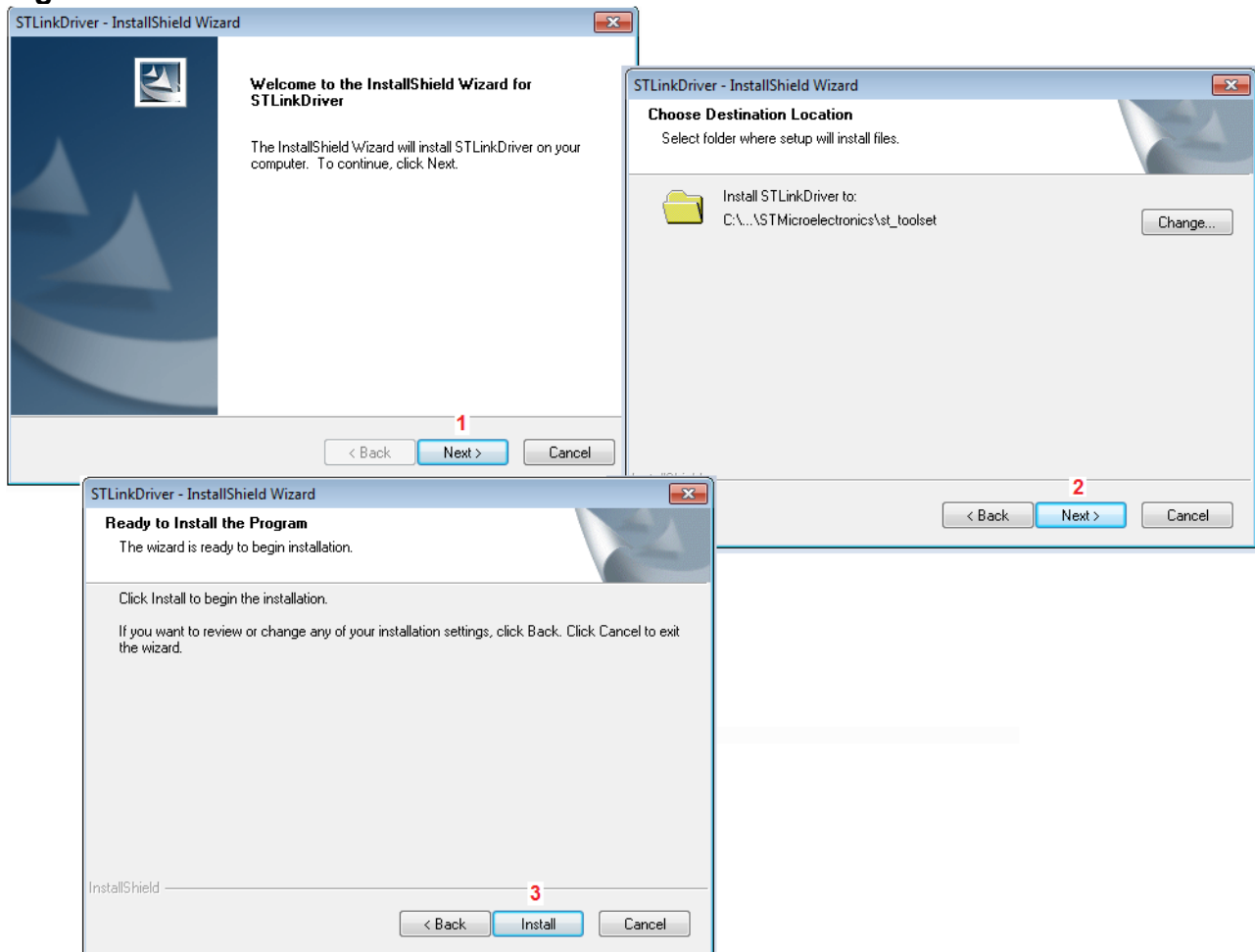
If the USB drive **is already installed** on your PC, first remove it (Fig.1) and next re-install it (Fig.2), see below.

Fig.1 – remove the previous installation

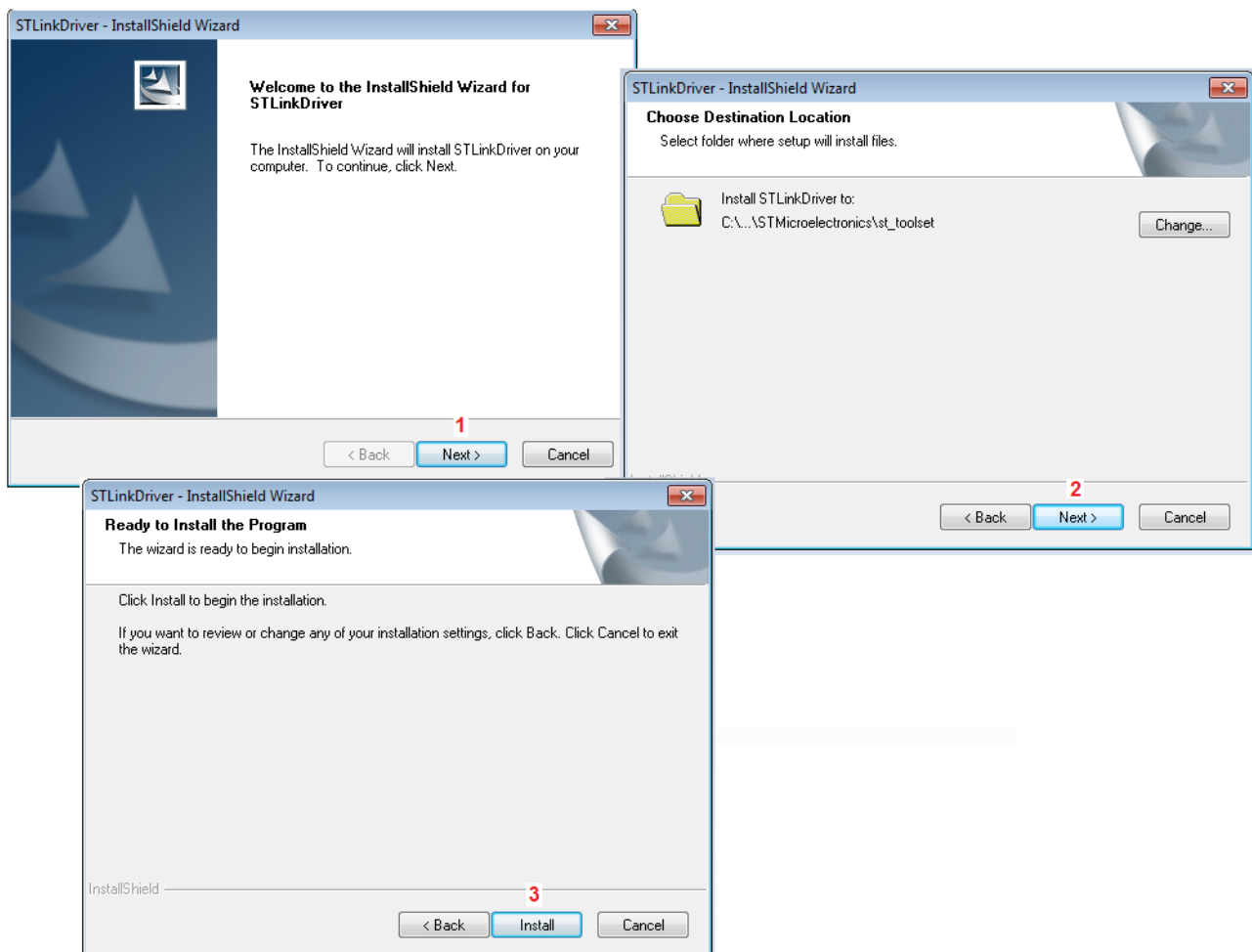


Now re-run the **st-link_v2_usbdriver.exe** and follow the steps below (1...3).

Fig.2



If the USB drive **is not already installed** on your PC, follow the steps below (1...3).



LINKs

- [NUCLEO eva board](#)
- For who has Windows 7/8 we suggest **TeraTerm**
http://en.wikipedia.org/wiki/Tera_Term
download it from this link: <http://tssh2.sourceforge.jp/index.html.en>
- From this [link](#) you find my doc, examples, etc, regarding **NUCLEO boards**.
From this [link](#) you find the **Mbed NUCLEO-L152RE** doc, example, etc.
- **Mbed** [home page](#)
 - [General sw](#)
 - [Library](#), provides the C/C++ software platform and libraries to build your applications