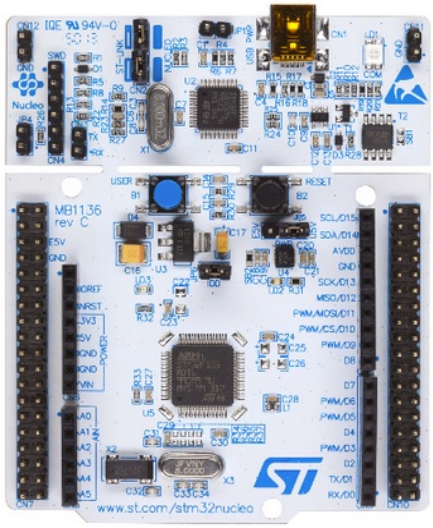
How to use NUCLEO-L152RE and Mbed



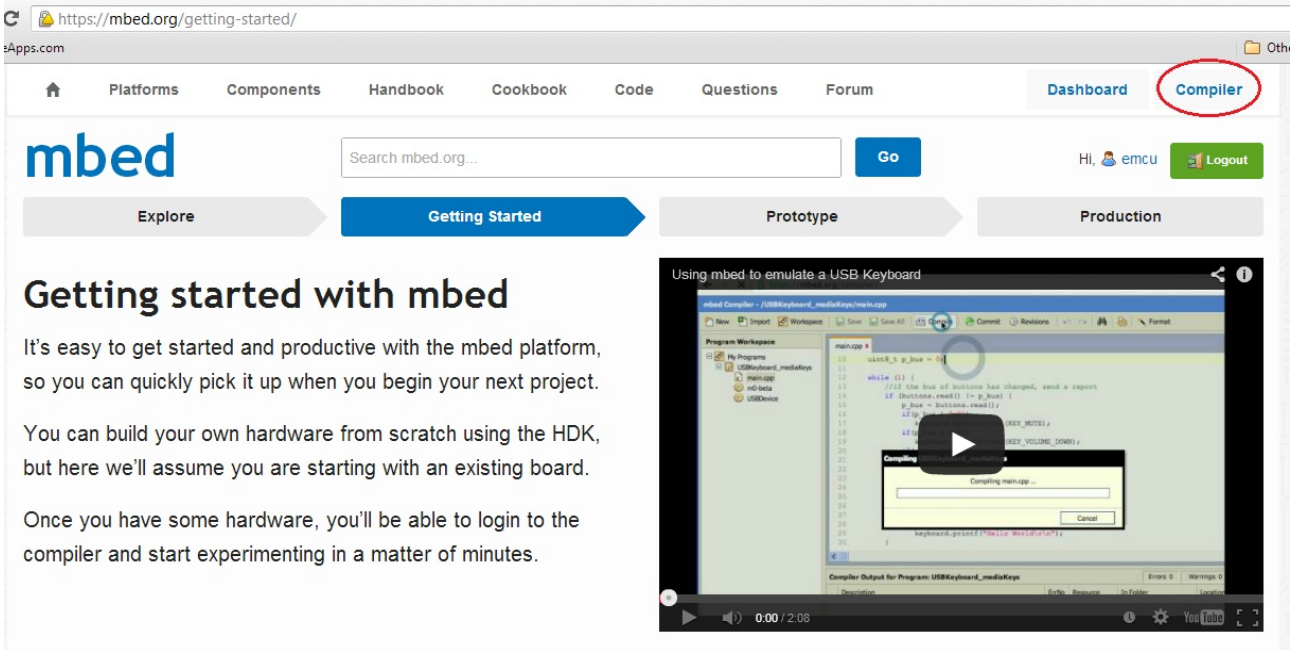
What is Mbed

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.



Update the FW on NUCLEO-L152RE

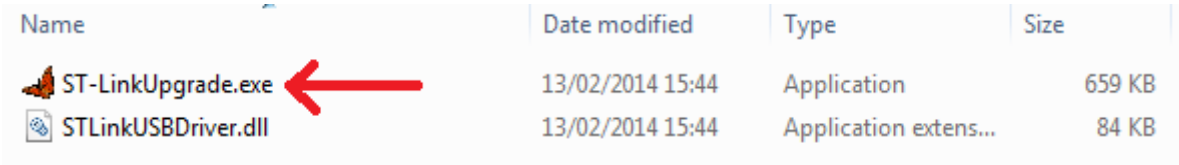
- First install the **ST-Link driver** (**stlinknucleodriversigned.zip**)
- Next go **here** and download the **FW update** (**stlinkv2m4upgrade.zip**).

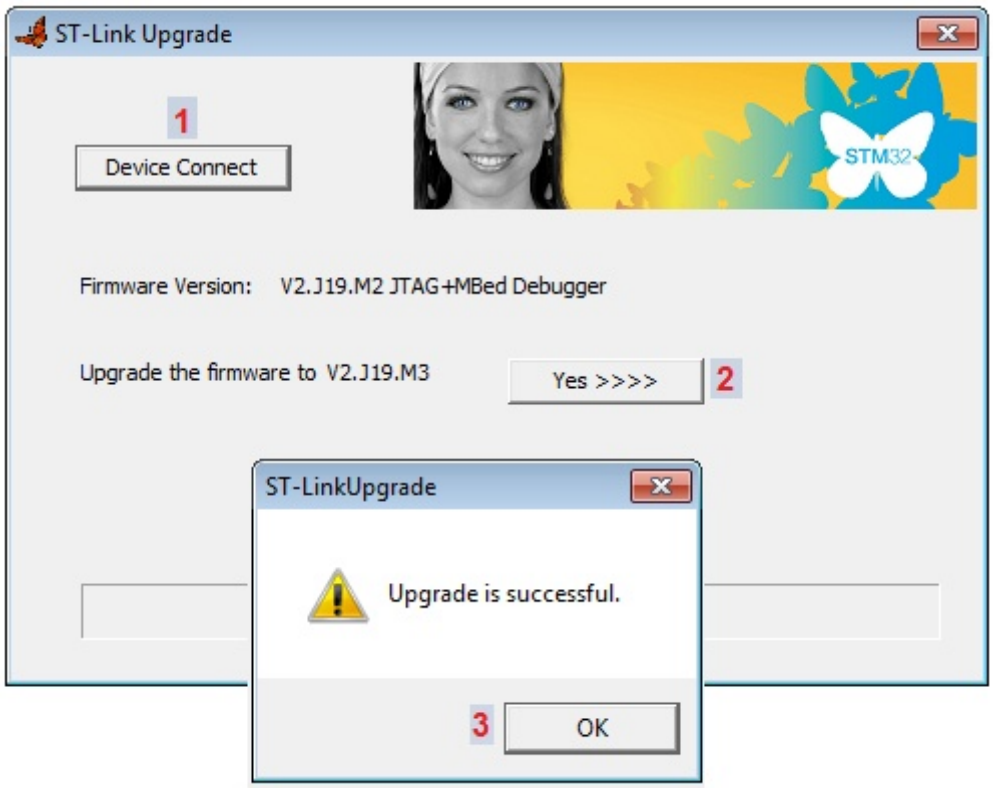
ST-Link driver Installation

1. Extract (**stlinknucleodriversigned.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.

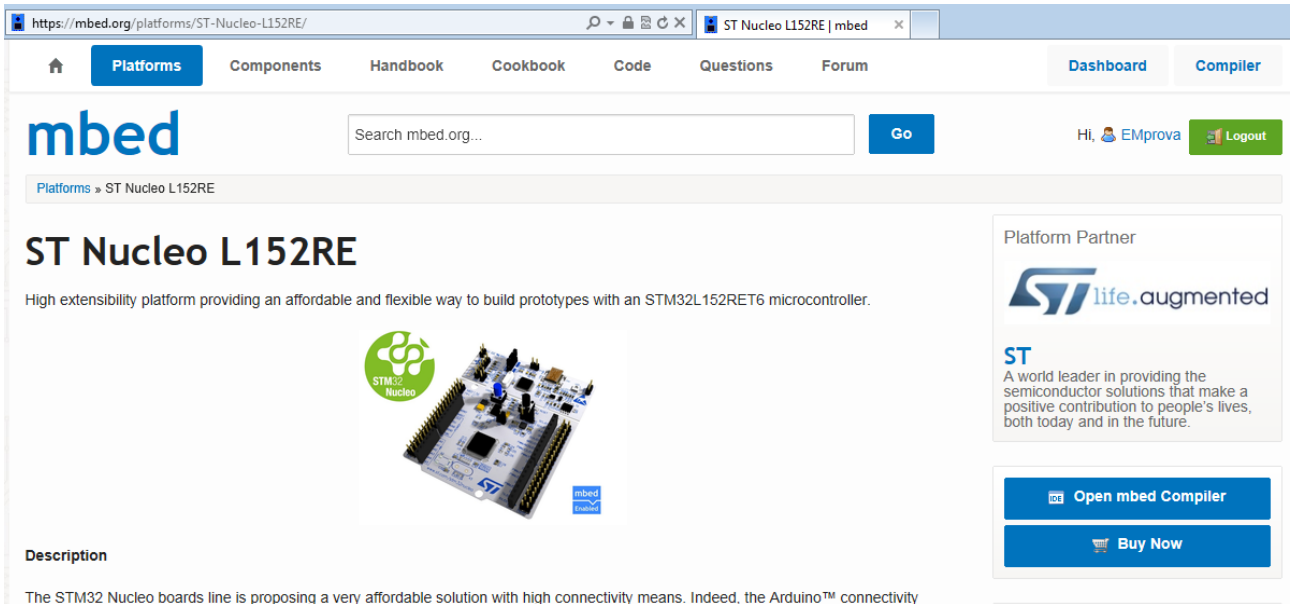




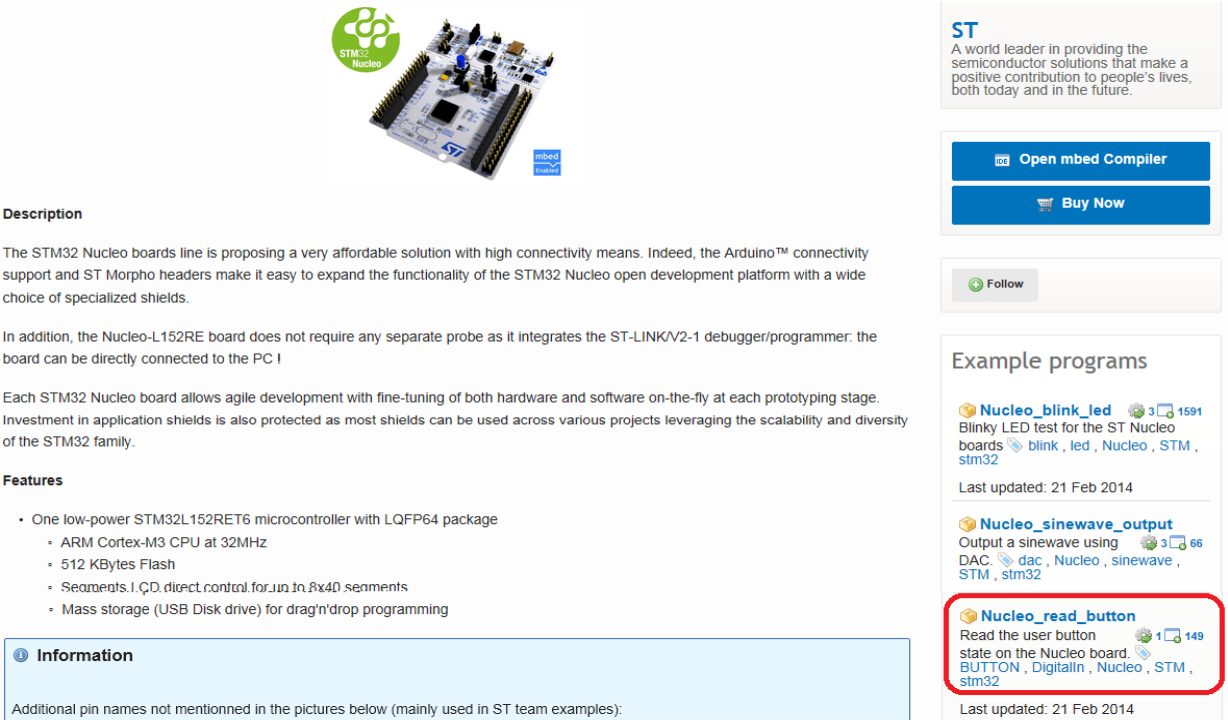
In case of problems do this:
Execute the: **Update the USB driver for ST-LINK-v2**

SW examples

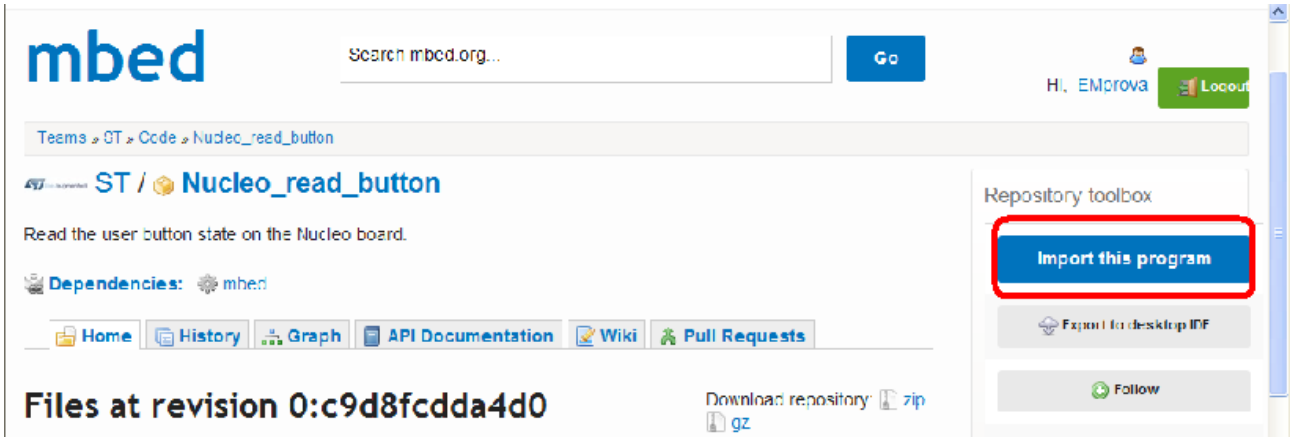
To use the **NUCLEO-L152RE Mbed examples** you must before register on mbed and: **add the platform to your compiler**, chose **ST NUCLEO L152RE**, see below.



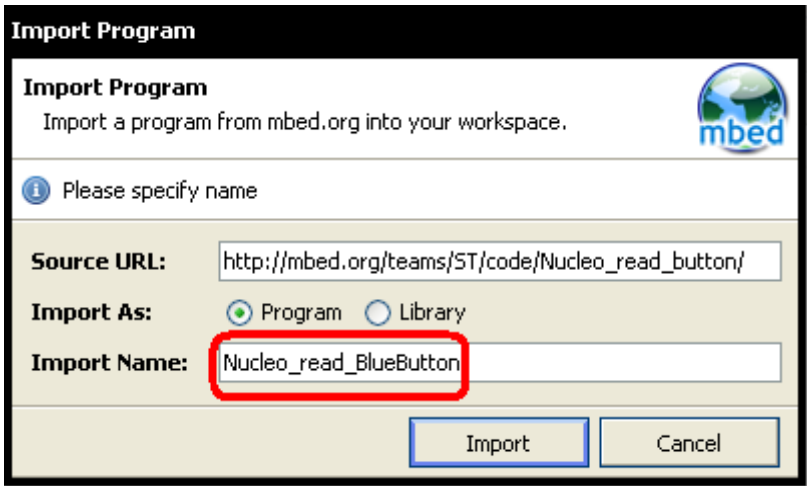
Now we need to use the example: **Nucleo_read_button**
for do this, select it, see below.



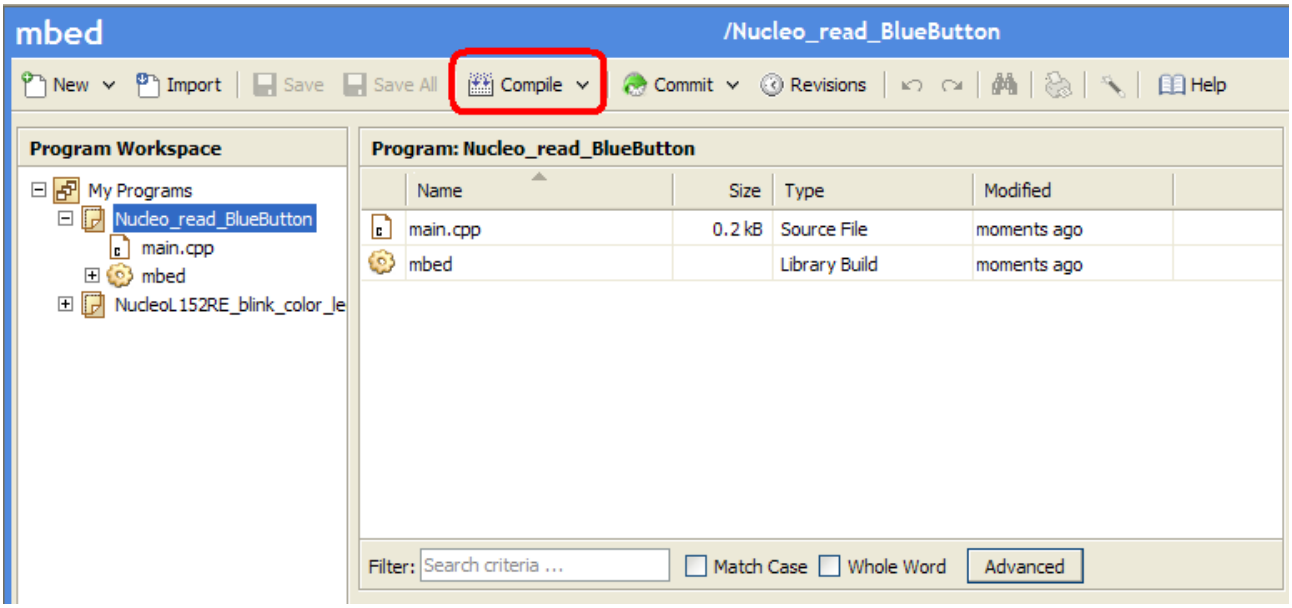
From the new window that appears, select:
Import this program
see below.



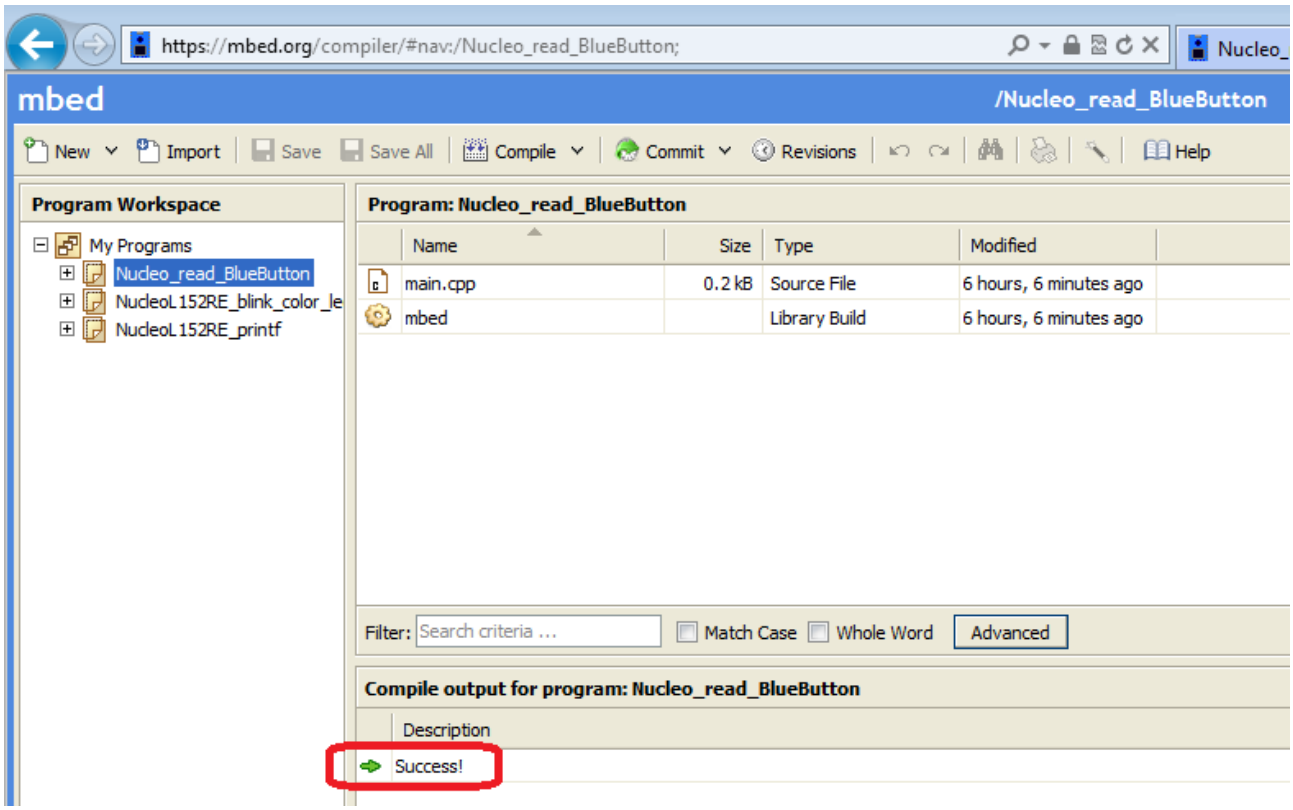
From the new window that appears, set a name for the project and select IMPORT, see below.



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



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

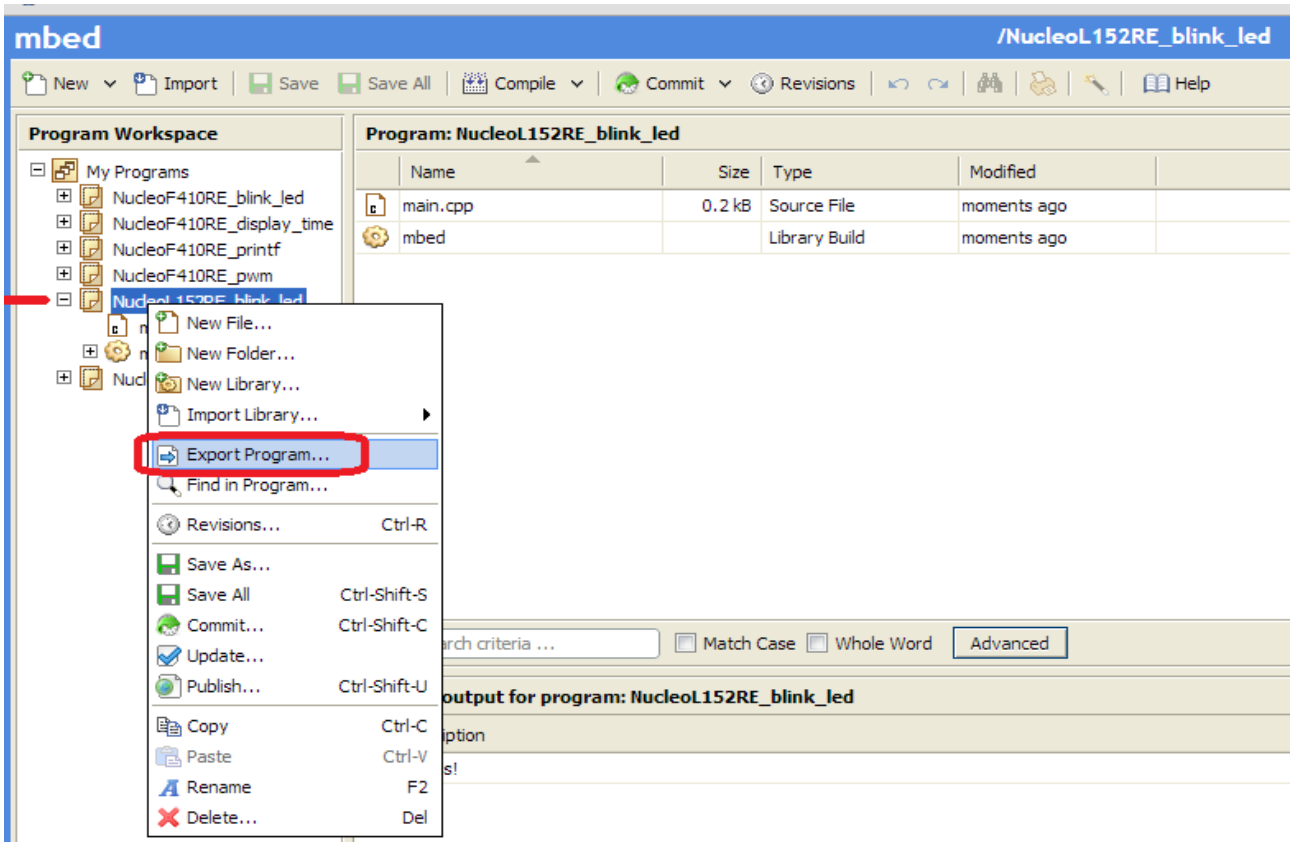


Save the **bin** file in a directory.

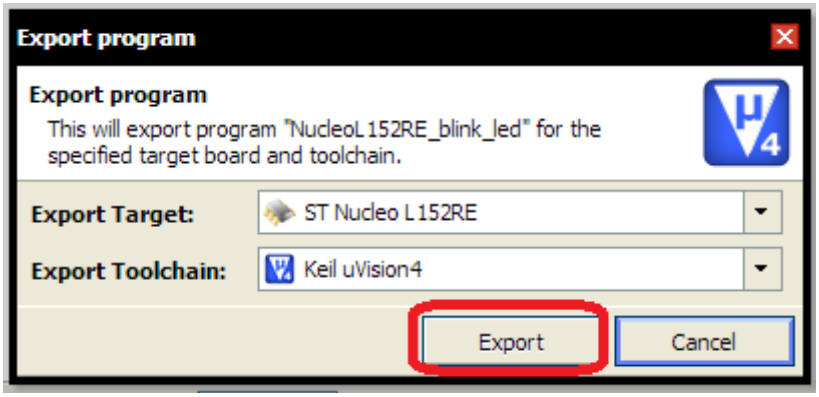
Now for programming NUCLEO-L152RE use **ST-LINK-Utility**.
At the end of the programming you must see the green LED blinking.

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.



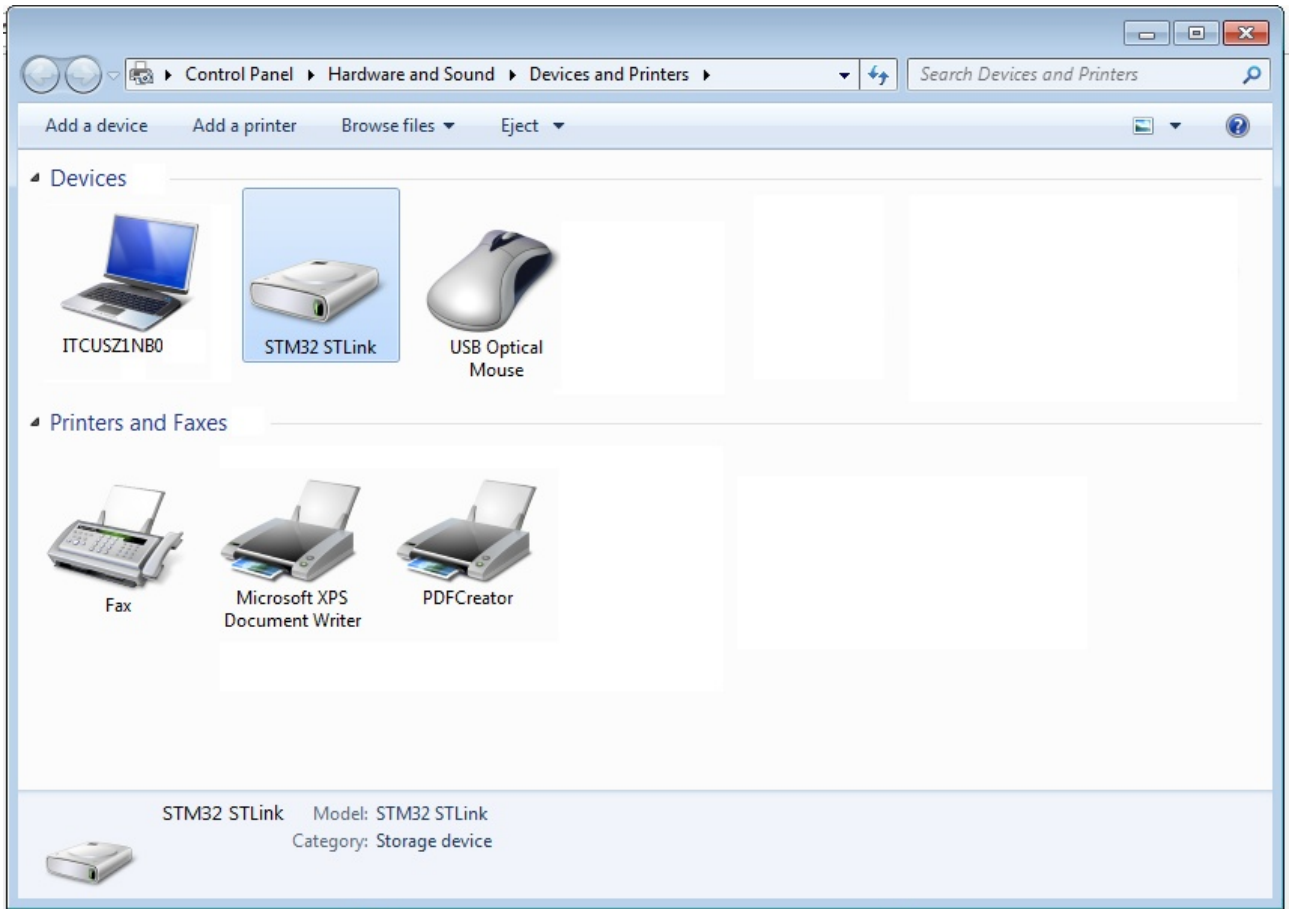
From the new window that appears, select the name of the toolchain and click on EXPORT button.



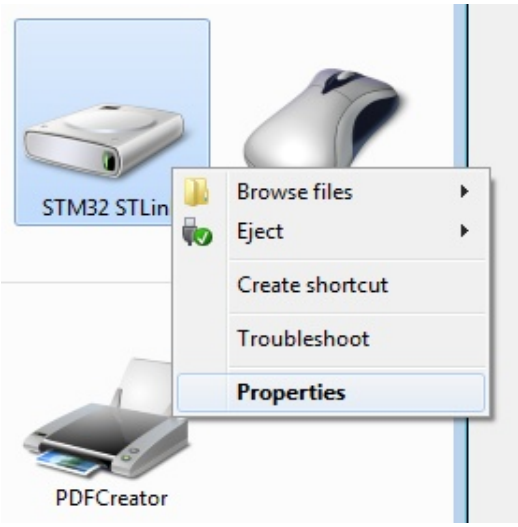
A minimum debug using pc.printf

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**.

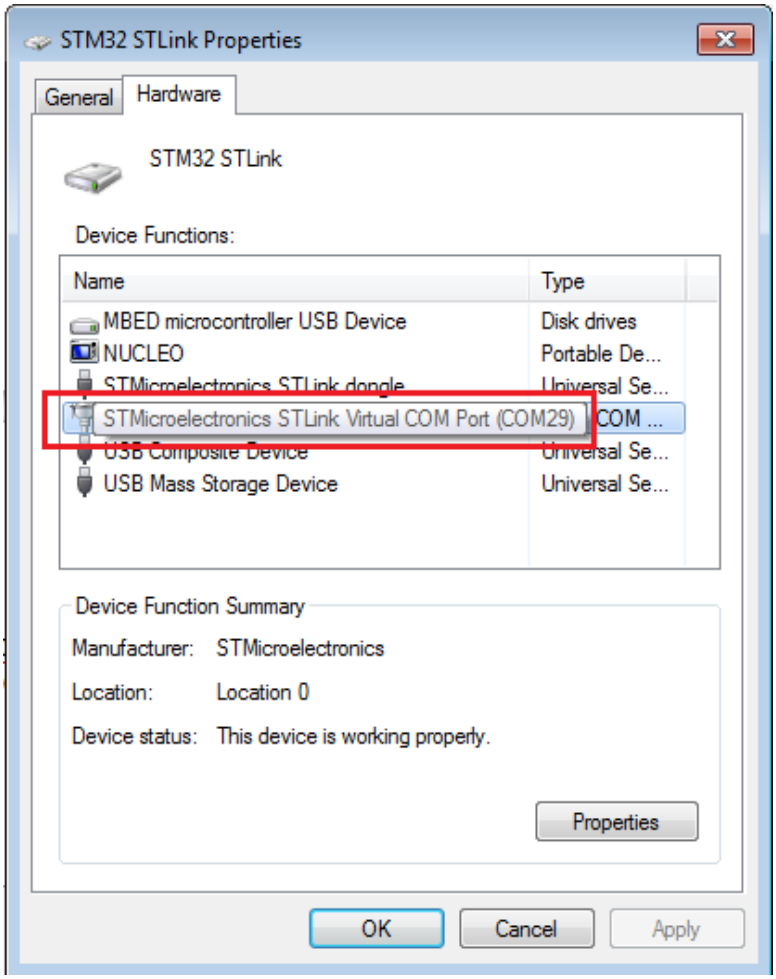
To check if the **Virtual COM Port** is installed correctly on **Windows 7**, follow the instructions below.
Select: **START -> Device and Printer**
You must see something like below.



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.

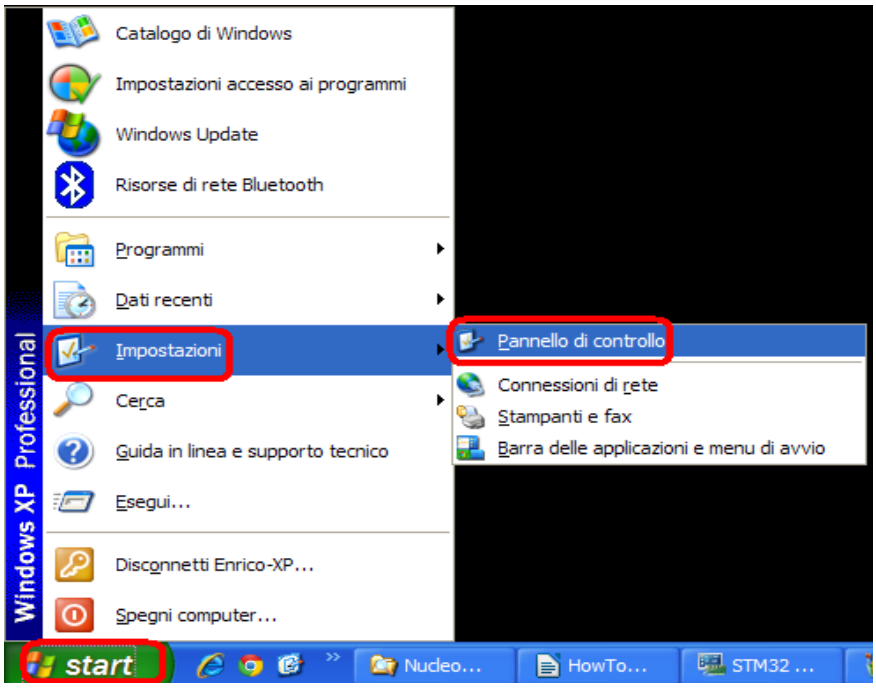


From the window that appears, select **Hardware**.
You must see something like below.
My Virtual COM Port is **COM29**.

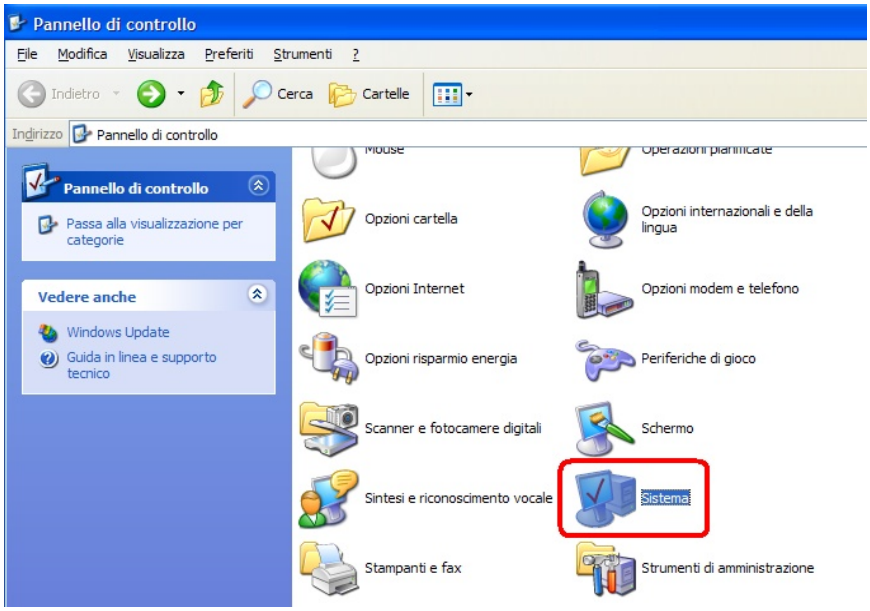


To check if the **Virtual COM Port** is installed correctly on **Windows XP** , follow the instructions below.

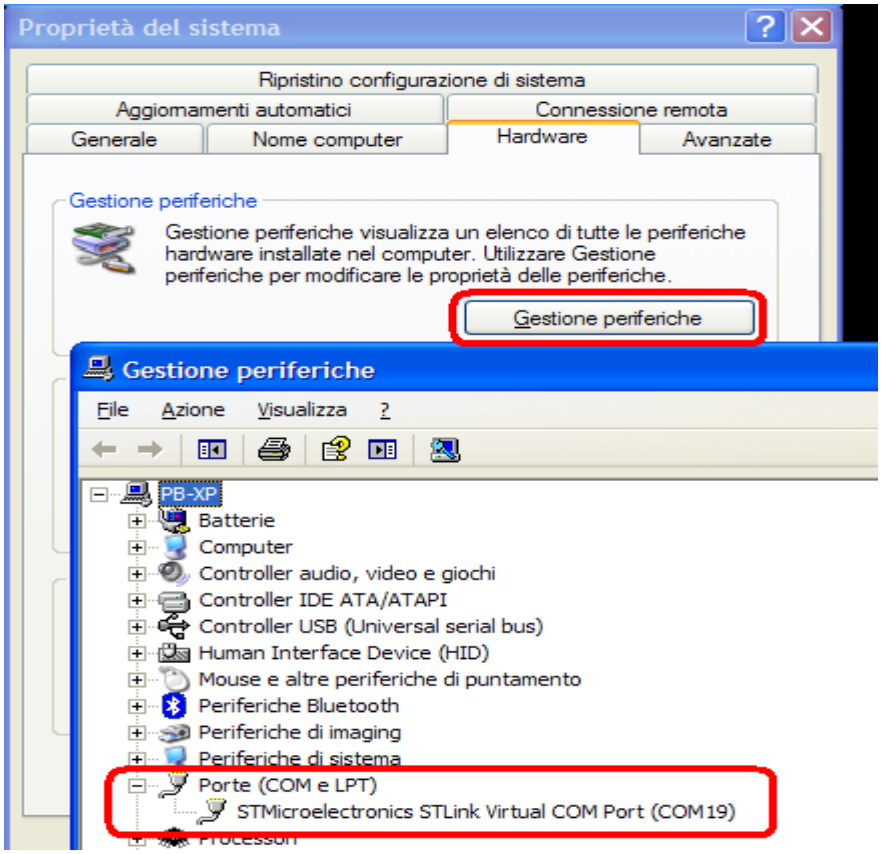
START → Impostazioni → Pannello di Controllo



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.

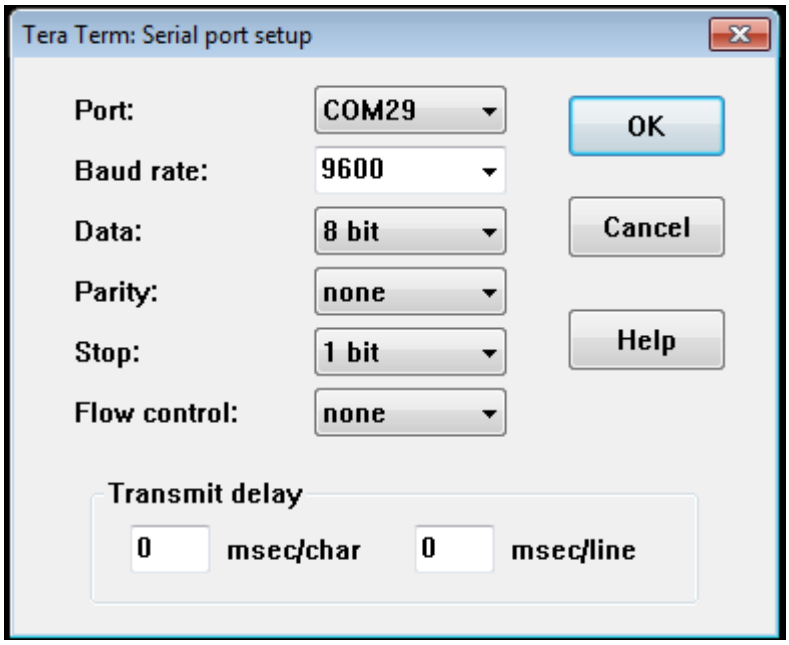


At this point you must see the STLink Virtual Com Port, in my case is COM19.

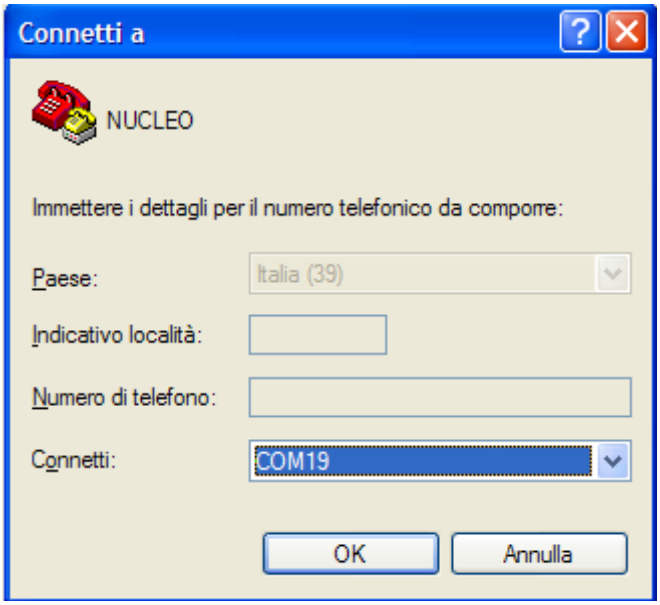
Now use the example **Nucleo_printf** and **programing** your **Nucleo-L152RE.**
Below there is the content of **main.cpp**

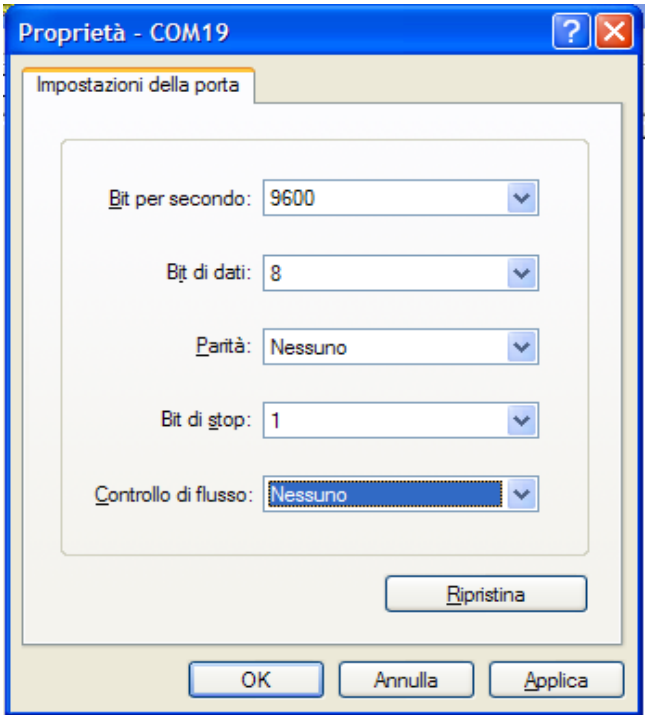
```
#include "mbed.h"
//------------------------------------
// Hyperterminal configuration
// 9600 bauds, 8-bit data, no parity
//------------------------------------
Serial pc(SERIAL_TX, SERIAL_RX);

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:

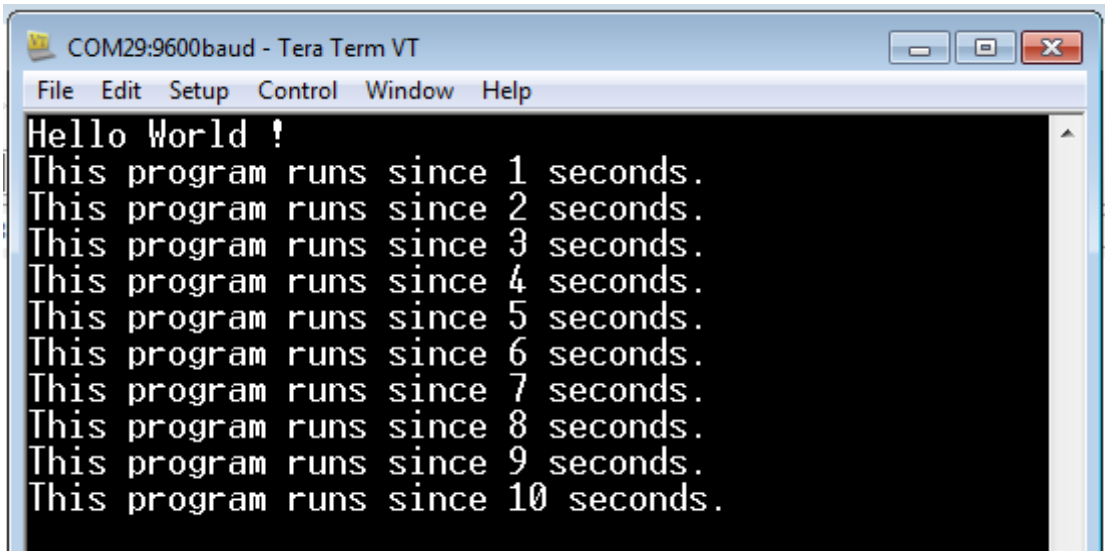


On **Windows XP** use **HyperTerminal** and configure it how to show below.

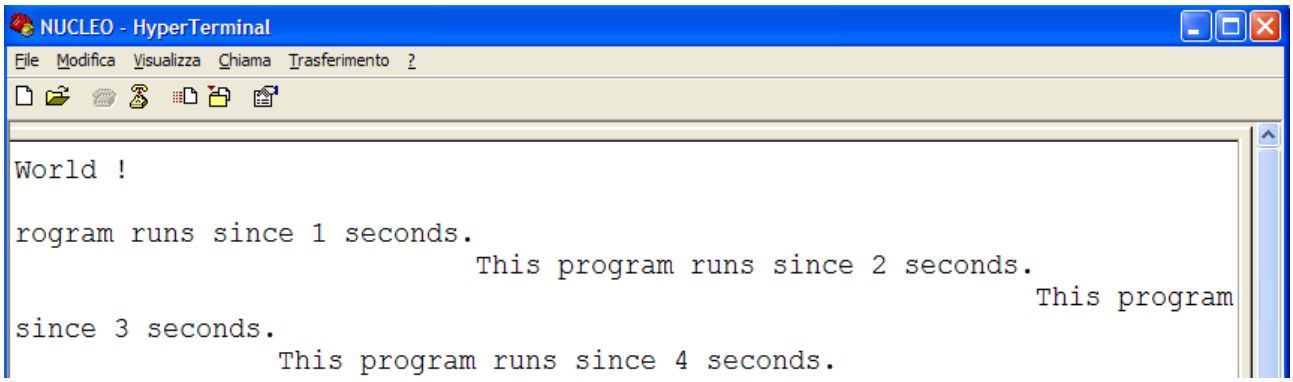




On your PC, you must see something like below, on **Windows 7** (Tera Term).



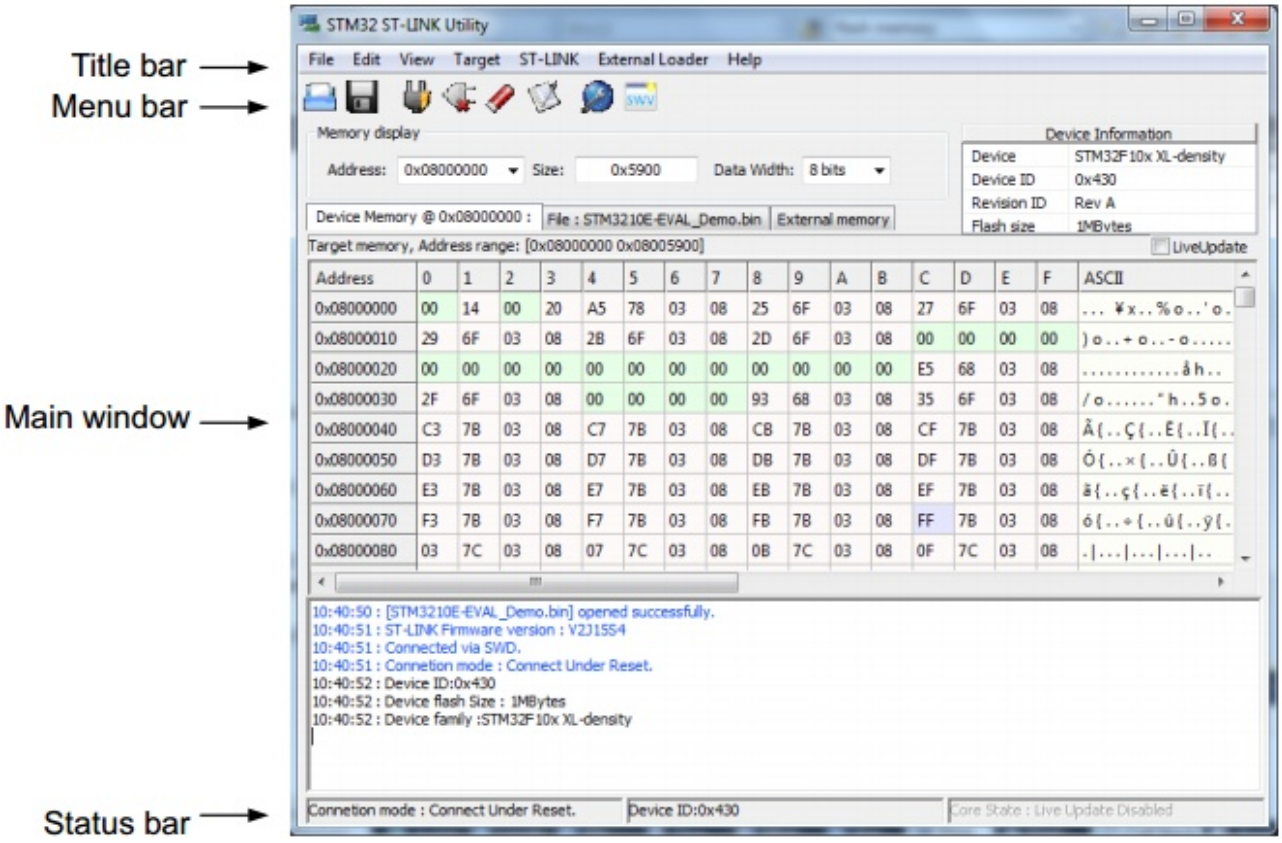
On your PC, you must see something like below, on **Windows XP** (Hyper Terminal).



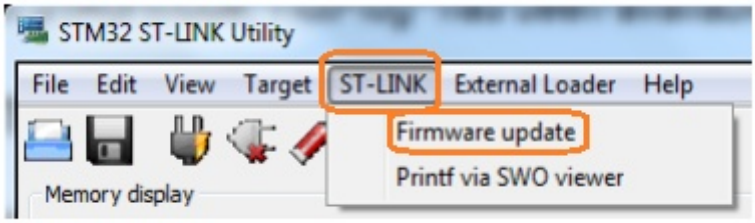
And on the **NUCLEO-L152RE** you must see the **green led** that **flashing**.

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.

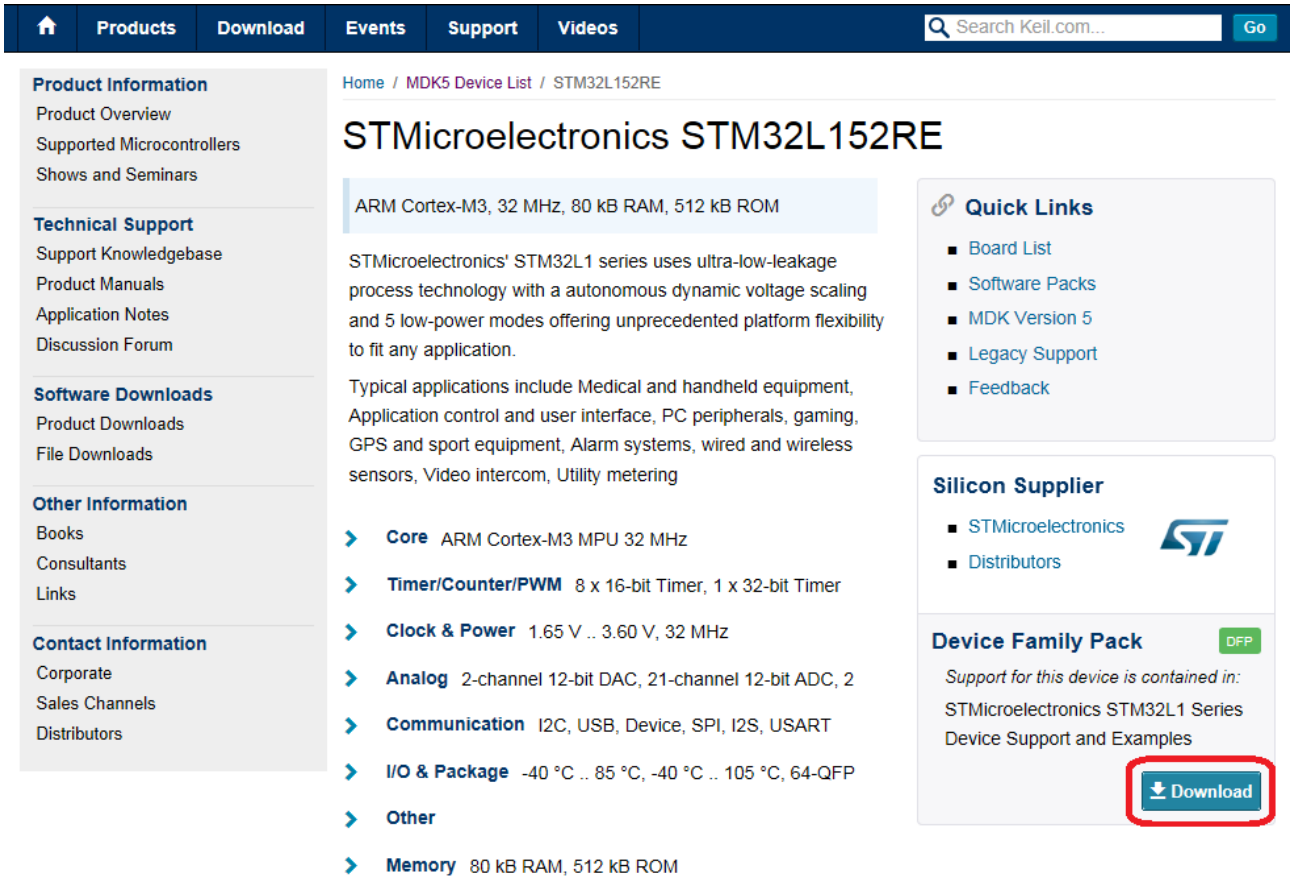


To **update the firmware** on ST-Link select the menù show below.



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.



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

Update the USB driver for ST-LINK-v2

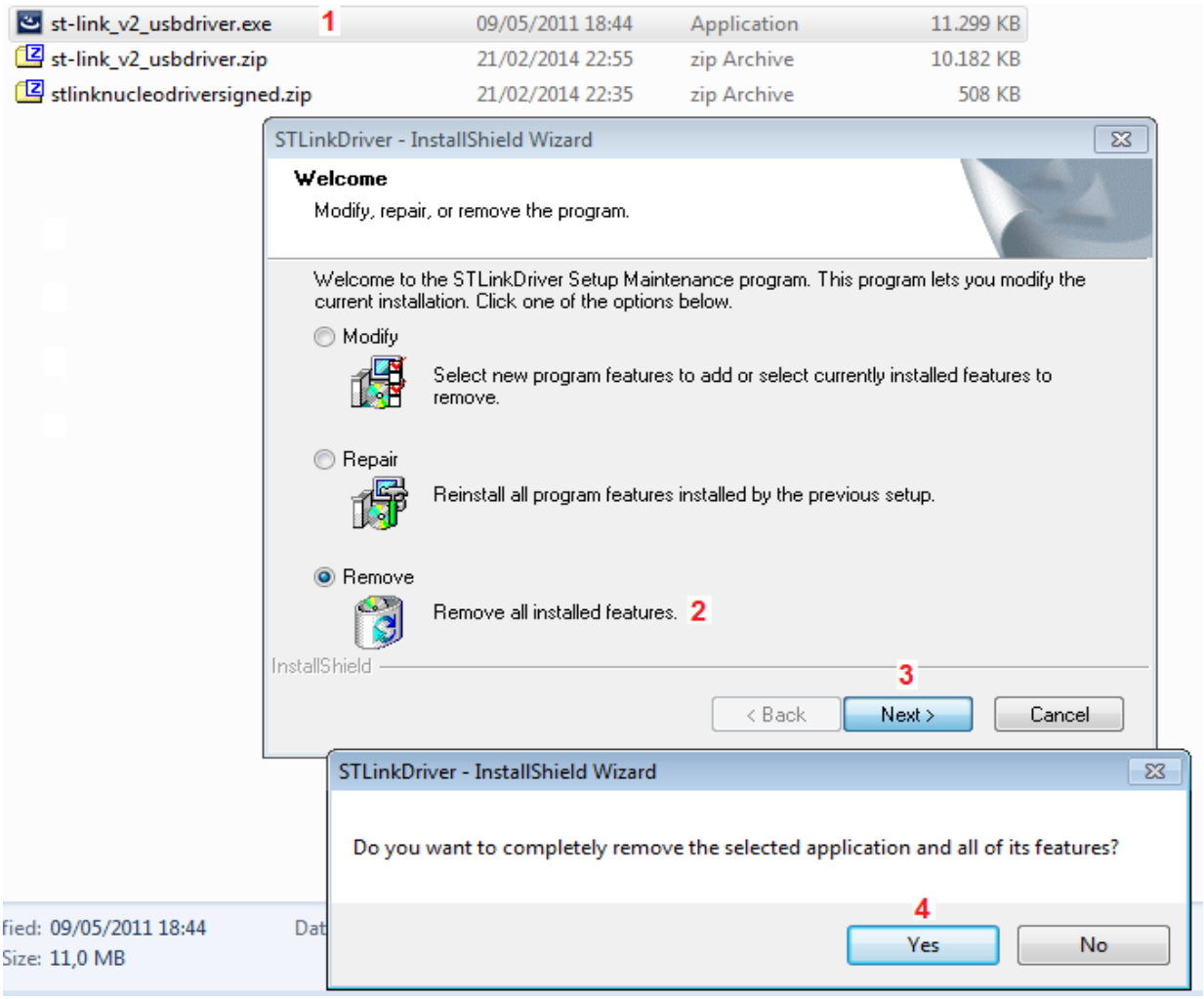
NOTE:
Do this update only if the: **Update the FW on NUCLEO-L152RE** fails.

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

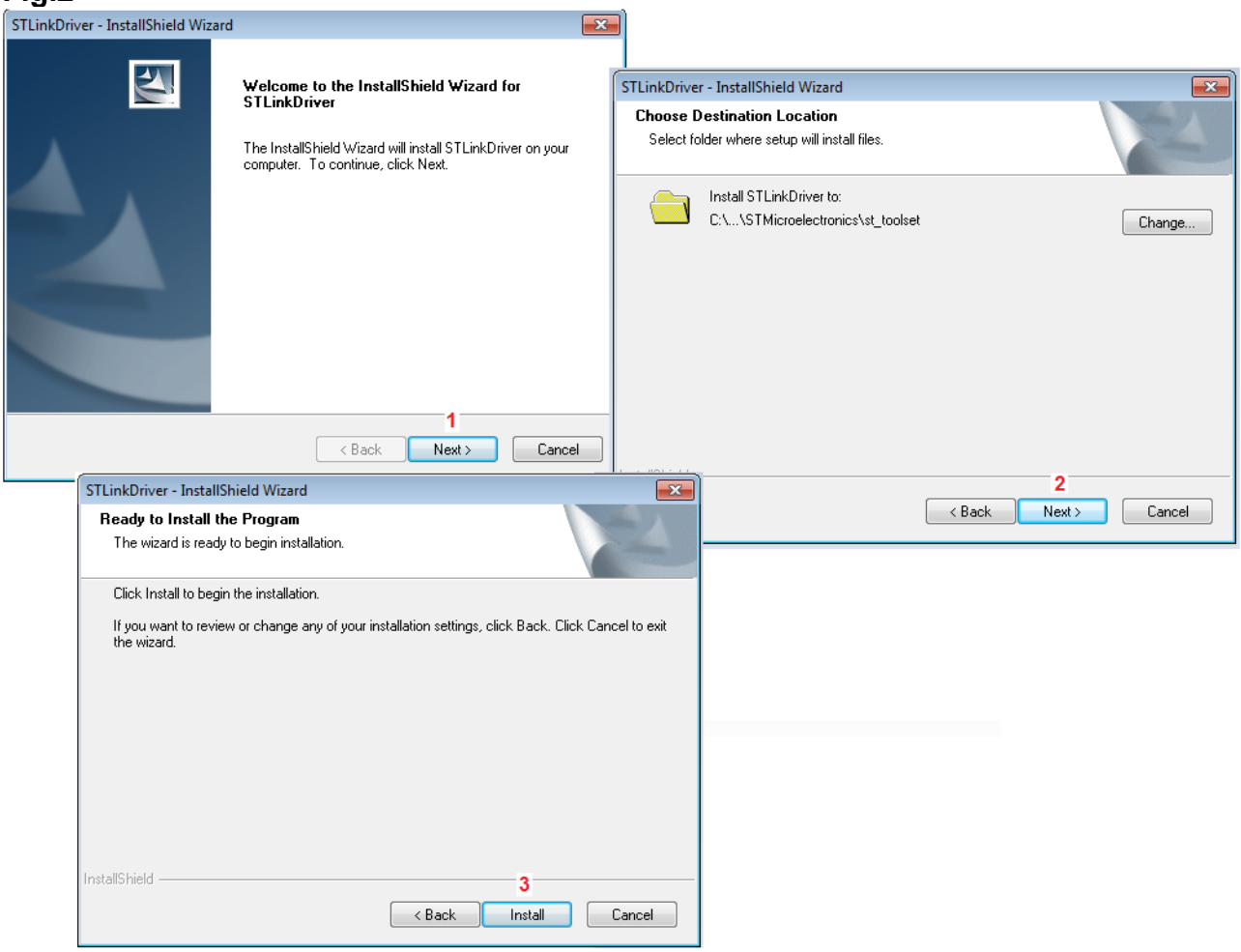
If the USB drive **is already installed** on your PC, first remove it (Fig.1) and next re-install it (Fig.2), see below.

Fig.1 – remove the previous installation

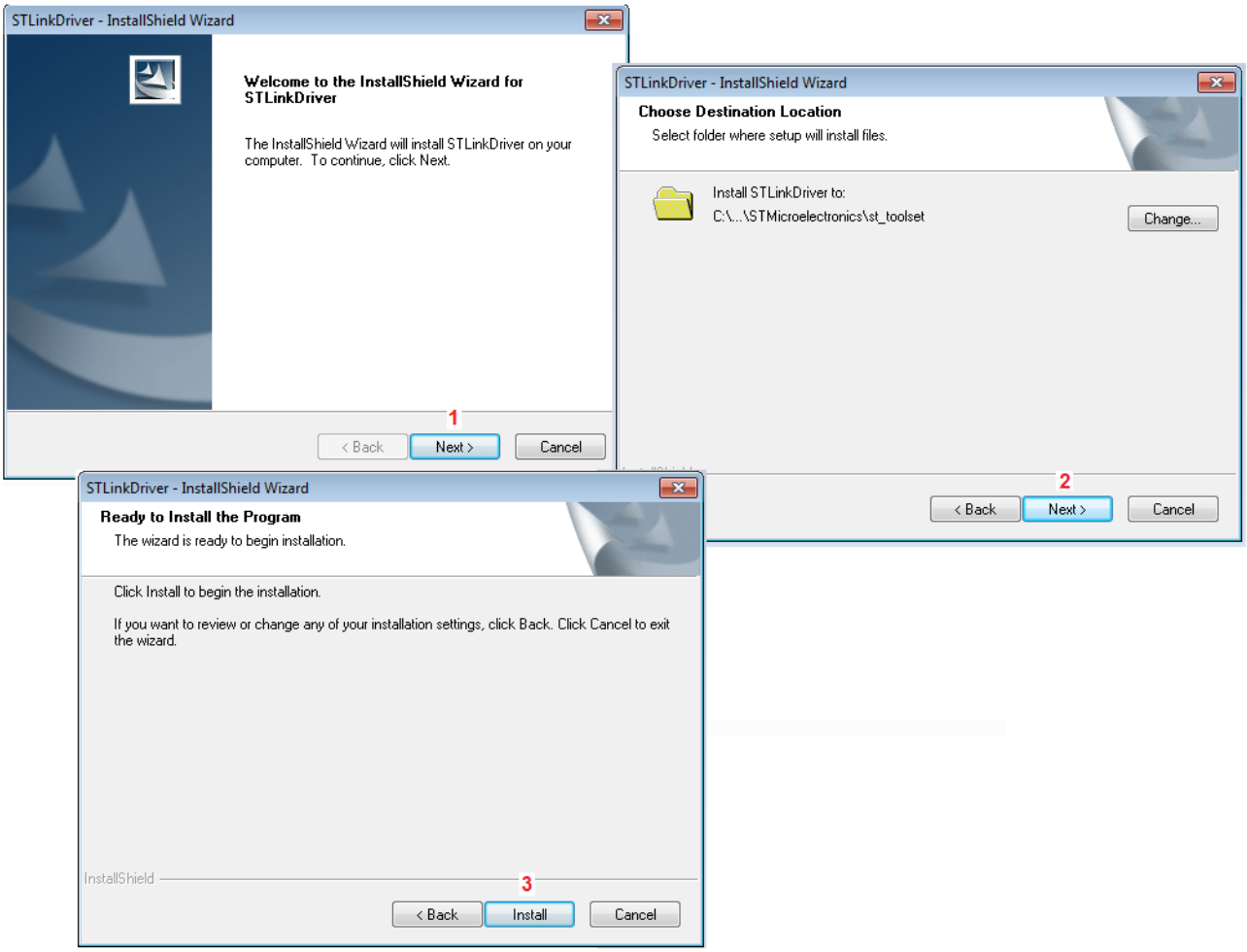


Now re-run the **st-link_v2_usbdriver.exe** and follow the steps below (1...3).

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://ttssh2.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