# **Program STM32 Black Pill (STM32F401 / F411) with Arduino IDE (Windows OS)**

**SKU: 835834**



The STM32F401/F411 Black Pill Development Board is an updated version of the popular [F103 based Blue Pill](https://www.sgbotic.com/index.php?dispatch=products.view&product_id=3043). This newer version features a more powerful Core-M4F based ARM CPU. Both F401 and F411 processors supports DFU bootloader.

This tutorial covers the DFU bootloader. For other programming options, refer to this tutorial: [Program STM32 Blue Pill (STM32F103C8T6) with Arduino IDE](https://www.sgbotic.com/index.php?dispatch=pages.view&page_id=48#bootloader)

### **Download and install Arduino IDE**

The first thing you need to do is to download and install the Arduino IDE to your computer. You can get the latest version from the official Arduino website: <https://www.arduino.cc/en/Main/Software>

Follow the link below to install the Arduino IDE:

* Windows: <https://www.arduino.cc/en/Guide/Windows>
* Mac OSX: <https://www.arduino.cc/en/Guide/MacOSX>

### **Install STM32 Add-on to Arduino IDE**

In your Arduino IDE, go to ***File*** > ***Preferences***

Add the URL below to ***Additional Board Manager URLs*** text box:

<https://github.com/stm32duino/BoardManagerFiles/raw/master/STM32/package_stm_index.json>

If the text box is not empty, you can separate the URLs with a comma.



Go to ***Tools*** > ***Board*** > ***Boards Manager***



Search for ***STM32***, select latest version and click ***Install.***



There are a few megabytes of data to download and install, so be patient.

Once the installation is completed, quit and restart the Arduino IDE.

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#### **Install STM32CubeProg**

Download and install STM32CubeProg from ST.com: <https://www.st.com/en/development-tools/stm32cubeprog.html>



Start the STM32CubeProg. It will look like this:



Close the STM32CubeProg.

#### **Setup Arduino IDE**

From the ***Tools*** > ***Board*** > ***STM32 Board***, select ***Generic STM32F4 series***



Select ***Tools*** > ***Board Part Number*** > ***BlackPill F411CE***

***NOTE: This tutorial is based on STM32F411CE. For STM32F401CE, select BlackPill F401CC***



Under ***USB Support***, select ***CDC (generic "Serial" supersede U(S)ART)***



Under ***Upload method***, select ***SMT32CubeProgrammer(DFU)***



These are your Tool configurations:



Connect STM32 Black Pill to your computer USB port.

#### **Enable DFU bootlaoder**



Use the onboard BOOT0 and NRST button to put the board into bootloader mode:

* press and hold the BOOT0 button
* press and release NRST (reset) button to power cycle the processor
* release BOOT0 button

#### **Upload sketch**

Create new sketch and copy / paste the code below:

/\*
 Blink onboard LED at 0.1 second interval
\*/
void setup() {
 // initialize digital pin PB2 as an output.
 pinMode(PC13, OUTPUT); // LED connect to pin PC13
}
void loop() {
 digitalWrite(PC13, HIGH); // turn the LED on (HIGH is the voltage level)
 delay(100); // wait for 100mS
 digitalWrite(PC13, LOW); // turn the LED off by making the voltage LOW
 delay(100); // wait for 100mS
}

Click on the upload button to compile and upload the code to STM32 Black Pill.



You should see the blue LED blink at 0.1 second interval.

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