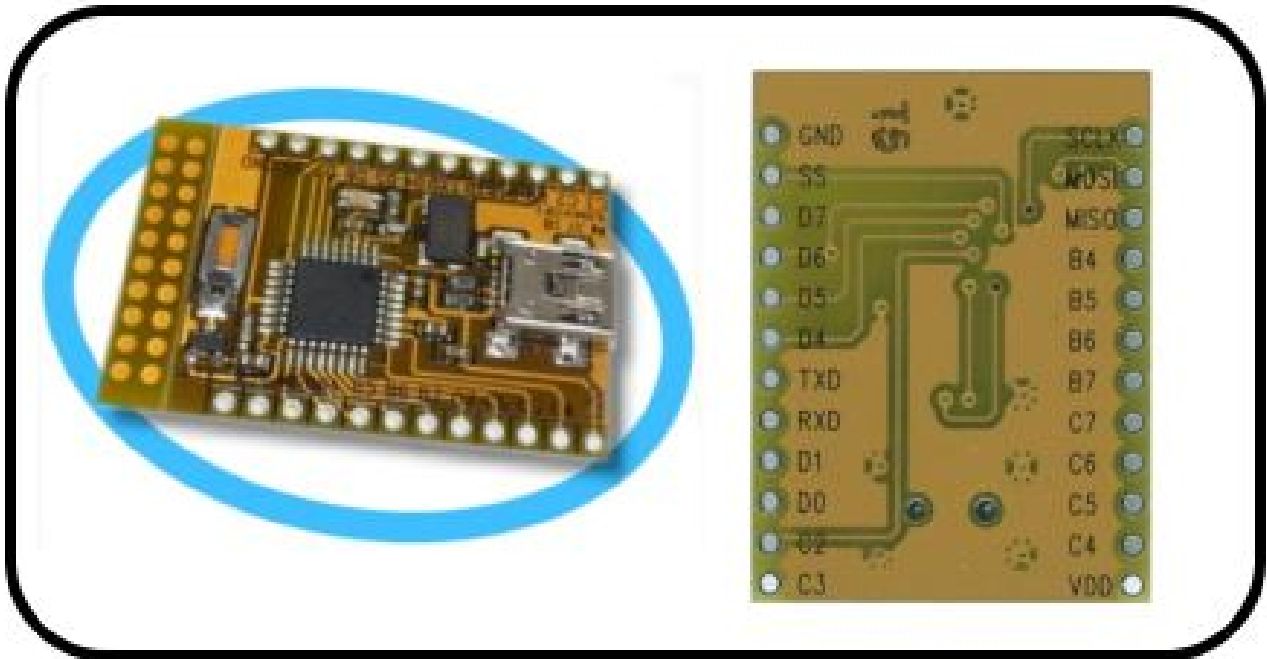


# GOLDUINO



# BITORINO



# Introduction

---

The GOLDUINO and BITORINO AVR Training Boards are a low-cost demonstration boards based on the AT90USB162 16kb microcontroller. It allows the quick evaluation of AVR microcontrollers and the AT90USB family.

Goldduino board is more useful for on-board developments and tests attaching to I/O ports buttons, lcds, sensors, leds... This board includes a Led and a Reset button button to enter the board in programming mode.

Bitorino board is better for programming HID devices emulators like keyboard and Mouse. You can program the Bitorino board as a USB key and see how the board acts as a keyboard writing on screen the programmed keystrokes or moving your mouse pointer as soon is connected to your computer USB port. This boards includes a Bi-color led (Red/Blue) and a Reset button to enter the board in programming mode.

In all cases, both boards can be used to attach buttons, leds, and other peripherals to their I/O ports. The bootloader, is the standard ATMEL bootloader.

In this tutorial, I will explain how to use these boards with the Arduino environment. We will use the Arduino IDE software for design / program code and the ATMEL FLIP software to upload the code to the microcontroller.

Most programs written for Arduino work on Goldduino and Bitorino. All of the standard Arduino functions (digitalWrite, pinMode, analogRead, etc) all work on our boards.

## 1. Installing Teensyduino

---

Teensyduino is a software add-on for the Arduino, to help us to run sketches on our boards. Teensyduino is designed for Teensy boards, our boards are not Teensy boards, but in hardware are nearest to their v1.0 boards. Then, we can use this add-on for the bitorino and goldduino boards. Teensyduino is also compatible with many Arduino libraries.

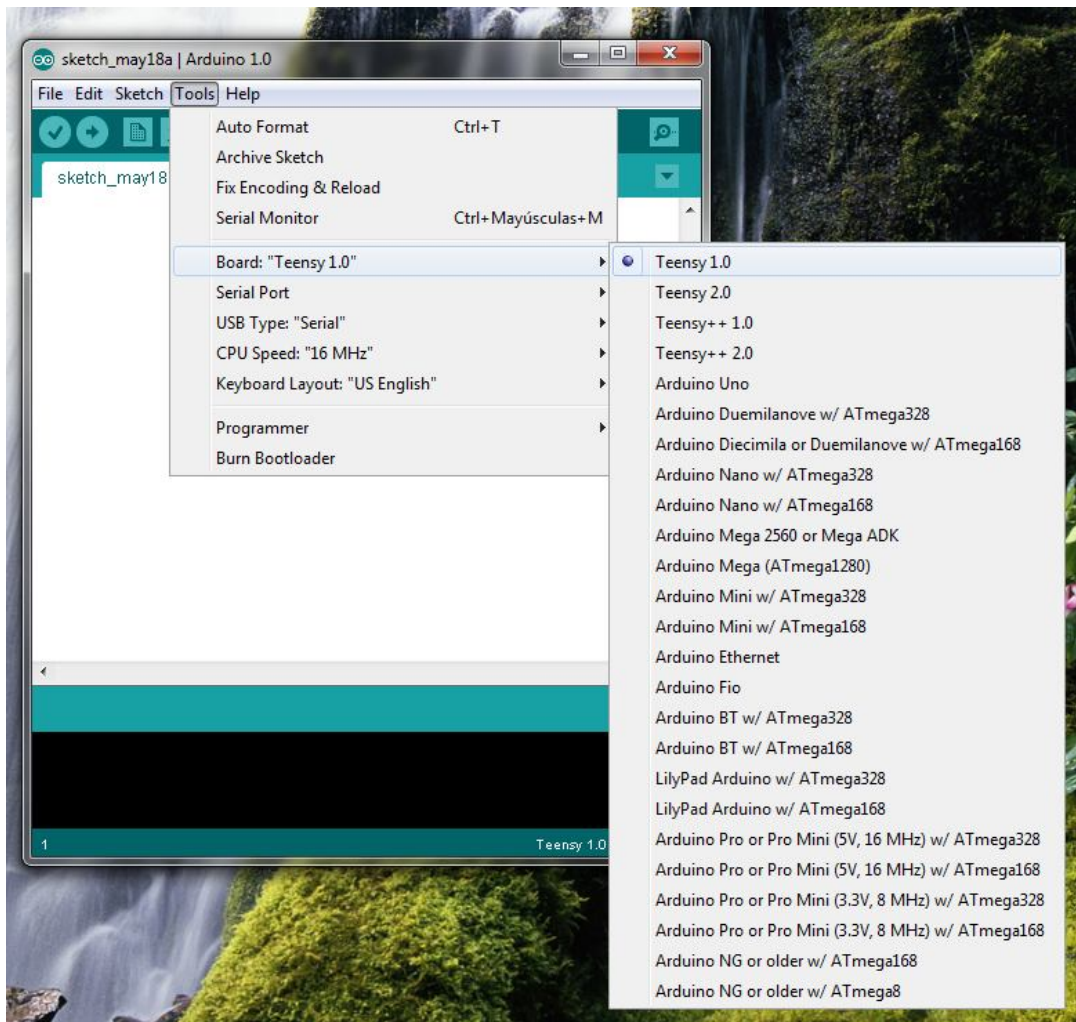
For download and installing Teensyduino, follow all the instructions in their official page [http://pjrc.com/teensy/td\\_download.html](http://pjrc.com/teensy/td_download.html)

**Note** : USB serial driver needed, if not installed in your system, Teensyduino installer will install it for you.

## 2. Teensyduino Configuration

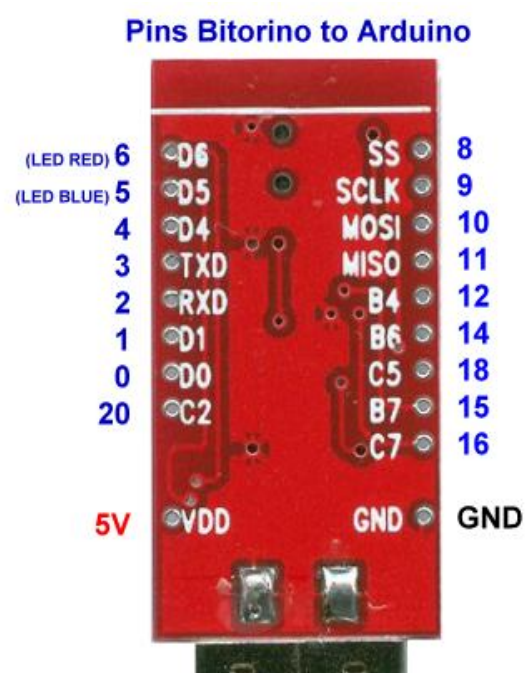
---

Start the Arduino IDE software and select the **Teensy 1.0** from the Tools -> Board menu. See picture :



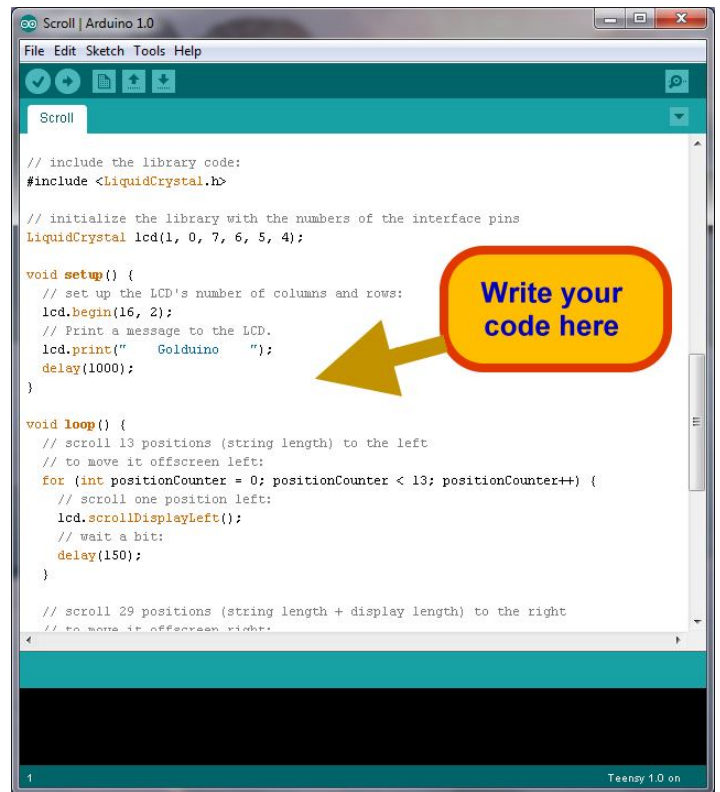
### 3. Programming code

To program code for our boards Bitorino and Golduino, you need to know the PIN assignments, our boards have no the same pin configuration as Arduino boards. Here are the PIN maps for our boards :



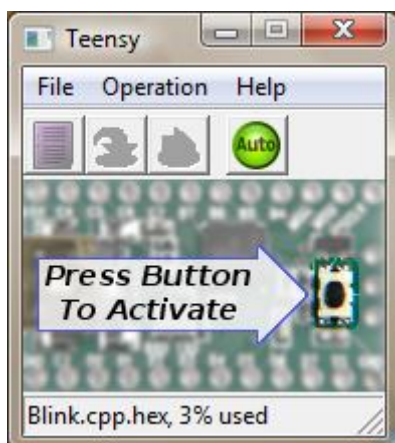
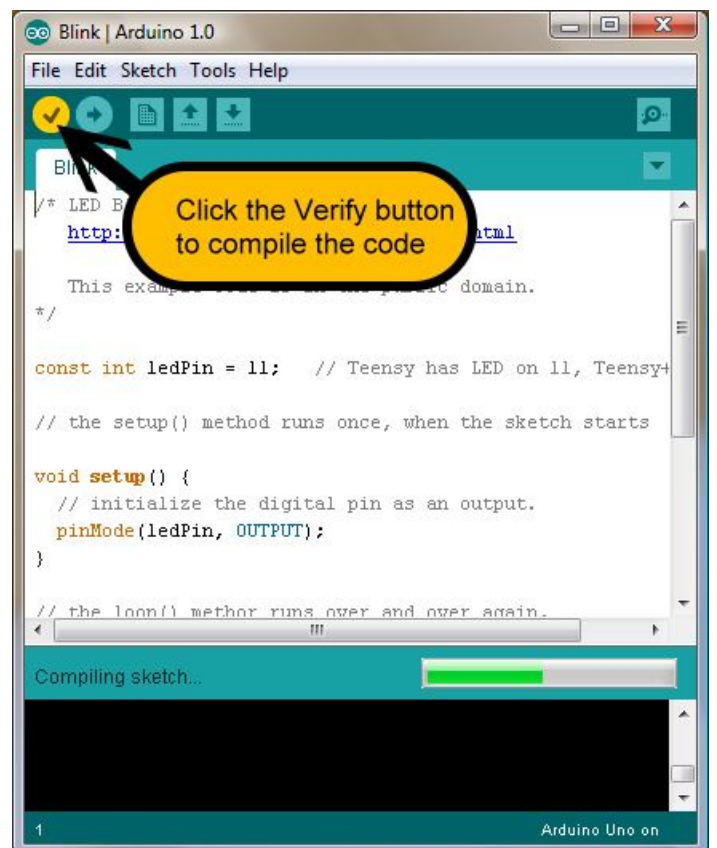
## Step 1. Make Code

- 1.- Start Arduino IDE software.
- 2.- Start NEW project : **File -> New.**
- 3.- Write your code, ( also you can paste or select sample code from File -> Examples ).



## Step 2. Compile the Code

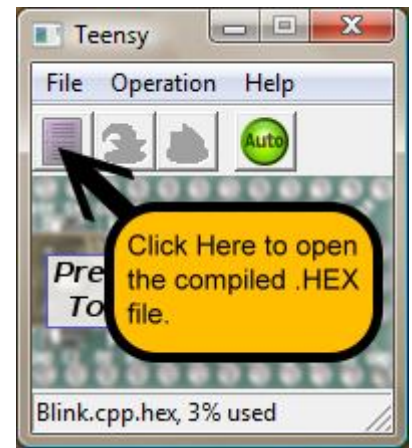
- 1.- Click the Verify button to compile the code, if no errors and all is ok, in the status windows you will see "Done compiling"
- 2.- As soon as Compilation is finished, a popup window will appear :





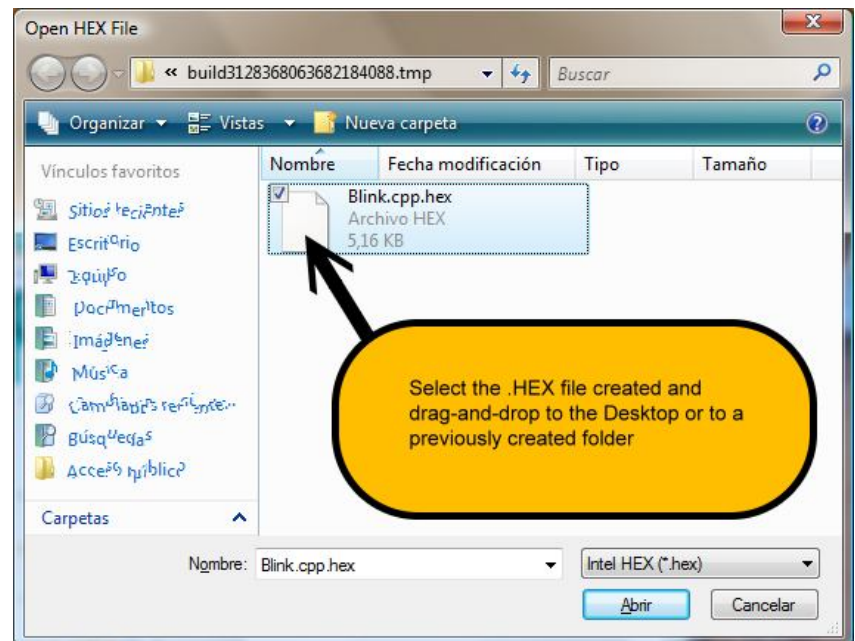
3.- **Dont press** the button as indicated in the popup window, our boards have not the Teensy bootloader. We will save now the code compiled .HEX file. You can **create a folder to hold the compiled .Hex** or store in your Desktop.

Click the open HEX file button as described in image :



A dialog box will appear with the .HEX file created, select it and drag-and-drop to the folder created or to the desktop. Remember the location where the .HEX file is stored, we will need it to upload in our boards.

At this stage, we have completed the process of programming, next step : Upload our code to the boards.



## 4. UPLOAD code to the boards with FLIP

### 1 – Software Installation :

- Start by installing the Atmel Flip software including the Java Runtime Environment if you do not already have this installed. FLIP (FLexible In-system Programmer) is a software that runs Windows 9x/Me/NT/2000/XP/Vista/Windows7 and Linux x86. FLIP supports in-system programming of Flash devices through RS232, USB or CAN. FLIP 3.4.5 can be downloaded from here :

[http://www.atmel.com/dyn/products/tools\\_card.asp?tool\\_id=3886](http://www.atmel.com/dyn/products/tools_card.asp?tool_id=3886)

## ***II – Hardware Preparation :***

- The next step is to plug the GOLDUINO or BITORINO board into your PC USB port.
- Now you'll need to put the BOARD into Programming mode :
  1. Hold the RST button
  2. Release the RST button.

At this point windows should start prompting you for drivers so direct it to the USB directory in your Atmel Flip folder for example (C:\Program Files\Atmel\Fliip 3.4.5\usb) and you're done.

**Note :** The boards have two states : Programming mode and Working mode. Normally board is always in working mode, each time you upload new code to the board previously you have to push and release the RESET button in boards to enter in programming mode.

## ***III - .HEX Uploading to the board :***

You're now going to flash the .hex to your BOARD (\*Must be done in this order).

1. Launch Atmel Flip and select 'Device', Select the microcontroller that matches your board (In this case AT90USB162) and select OK.
2. Select 'File' - 'Load Hex File' - Select the .hex file you drag-and-drop previously to a folder or desktop.
3. Select 'Settings' - 'Communication' - 'USB' - 'Open'
4. Click the 'Erase Target Device Memory button'.
5. Click the 'Program Target Device Memory button'.

***That's all folks!***

**Tutorial by Juan Andres**

Thanks to my friend Tino for give me the Golduino and Bitorino Boards as gift.