

Program Arduino Leonardo board from Microchip/Atmel Studio IDE

This guide is also applicable to the Sparkfun 'Pro Micro' module.

Programming the target device (ATmega32U4) can be achieved without Arduino IDE and without any hardware programming tool. The Leonardo and Pro Micro boards have a flash-resident AVR bootloader. A Windows PC application called "**AVRdude**" communicates with the bootloader via USB to program firmware into the MCU flash memory.

Hence you need to download some files to run "**avrdude**" on Windows. The best place to download the files is GitHub, here: <https://github.com/mariusgreuel/avrdude/releases>. There should be 3 distribution files: "avrdude.exe", "avrdude.conf" and "avrdude.pdb". Copy these files to a new folder named "**AVRdude**" on your PC local drive, in the "root directory" (C:\).

Connect your board to a USB port on your PC. Open Windows "Device Manager" utility and click on "Ports (COM & LPT)". You should see the board's USB-serial device listed. Note the number of the associated "COM" port. Be aware that the COM port number may change from time to time. Always check the allocated COM port after re-connecting the board to your PC.

How to create a (software) "Programming Tool" in Microchip Studio

Click in the menu "**Tools/External tools**".

You should see a dialog box asking for some parameters, as follows...

In **Title**, write: **Program Leonardo** or any other name you prefer.

In **Command**, write: **C:\AVRdude\avrdude.exe**

In **Arguments**, write (all on one line):

```
-C "C:\AVRdude\avrdude.conf" -v -V -p atmega32u4 -cavr109 -P COM# -b 57600 -D -U flash:w:"$(ProjectDir)Debug\$(TargetName).hex":i
```

Replace **COM#** (in the Arguments field) with the actual COM port your board is connected to, as found in Windows Device Manager. (Example: COM4)

Tick the box: "**Use output window**". Click OK.

Done... You should see a new option "**Program Leonardo**" in the **Tools** menu.

After your program code is built, it can be programmed into the Leonardo board simply by clicking the item "Program Leonardo" in the Tools menu, shortly after resetting the MCU.

The MCU bootloader must be running for the programmer tool to work. When the MCU is reset, the bootloader will run and wait for a few seconds until a command is received from AVRdude. If no command is received, the bootloader will time-out and attempt to start the application program. It is recommended to provide a RESET button on the Pro Micro board (wired from RST pin to GND).

If you get an error message from AVRdude, check the COM port number. If you still get errors, try a different baud rate... it should be either 57600 or 115200 baud.