

Apeiros Robot Setup & Installation Guide

1 Install USB Drivers

Before connecting Apeiros Robot via USB you must install the USB drivers. Unzip the Apeiros USB driver files, "[Apeiros_Signed_USB_Driver_2018-07-14.zip](#)". Right-click "[apeiros.inf](#)" file and select "**Install**" from the popup menu as shown in **Figure 1**.

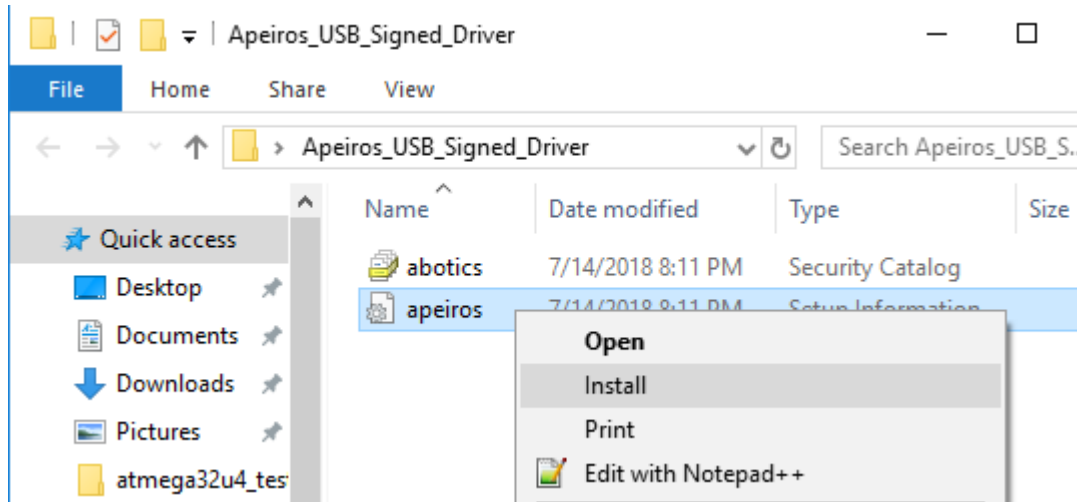


FIGURE 1. Install "apeiros.inf" USB driver file.

If you are unable to use the right-click install method, then run a command line session as administrator. Type the following command: "[RUNDLL32.EXE SETUPAPI.DLL,InstallHinfSection DefaultInstall 132 C:\Apeiros_Signed_Driver_Test\apeiros.inf](#)" as shown in **Figure 2**. Be sure to replace "[C:\Apeiros_Signed_Driver_Test\apeiros.inf](#)" with the directory location of the "[apeiros.inf](#)" file on your machine.

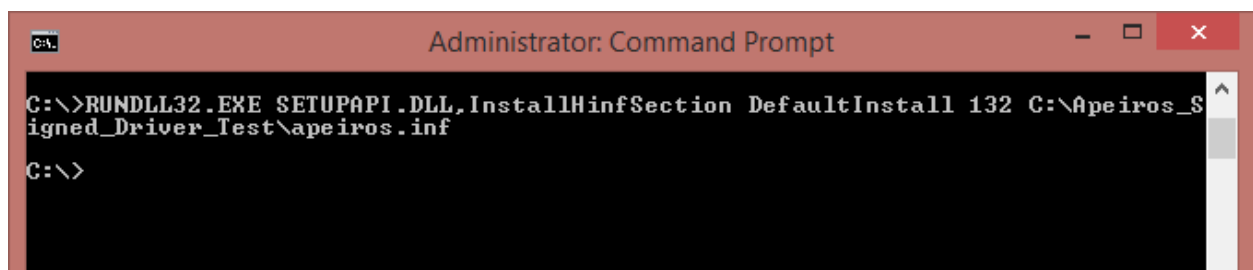


FIGURE 2. Command line install of "apeiros.inf" USB driver file.

You will be presented with a message box asking if you would like to install the device software. Be sure to click the "**Install**" button as shown in **Figure 3**.

Apeiros Robot Setup & Installation Guide

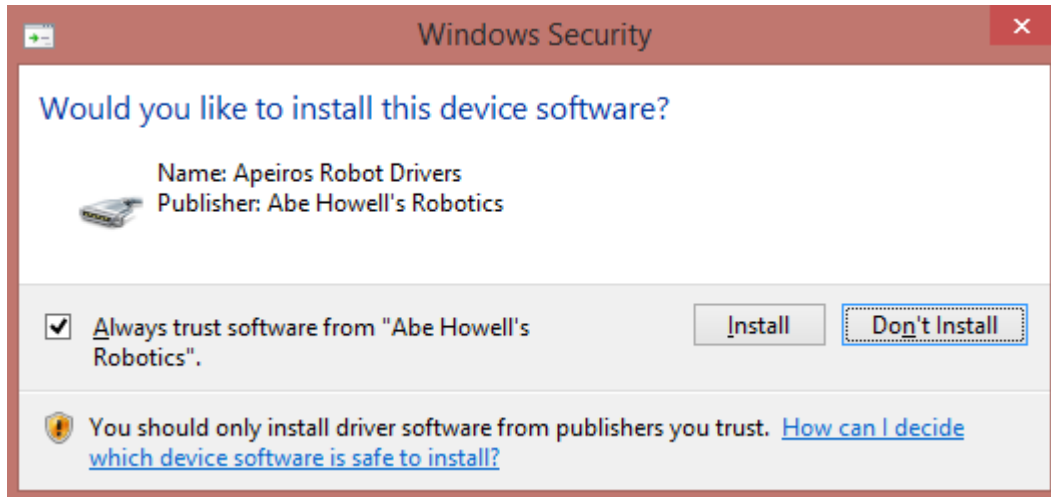


FIGURE 3. Install message box.

Now go ahead and connect a USB cable to your Apeiros Robot and confirm that a USB driver has been installed for "**Apeiros Robot**" as shown in **Figure 4**. Take note of the assigned communication port. In this case, Apeiros Robot has been assigned "**COM5**".

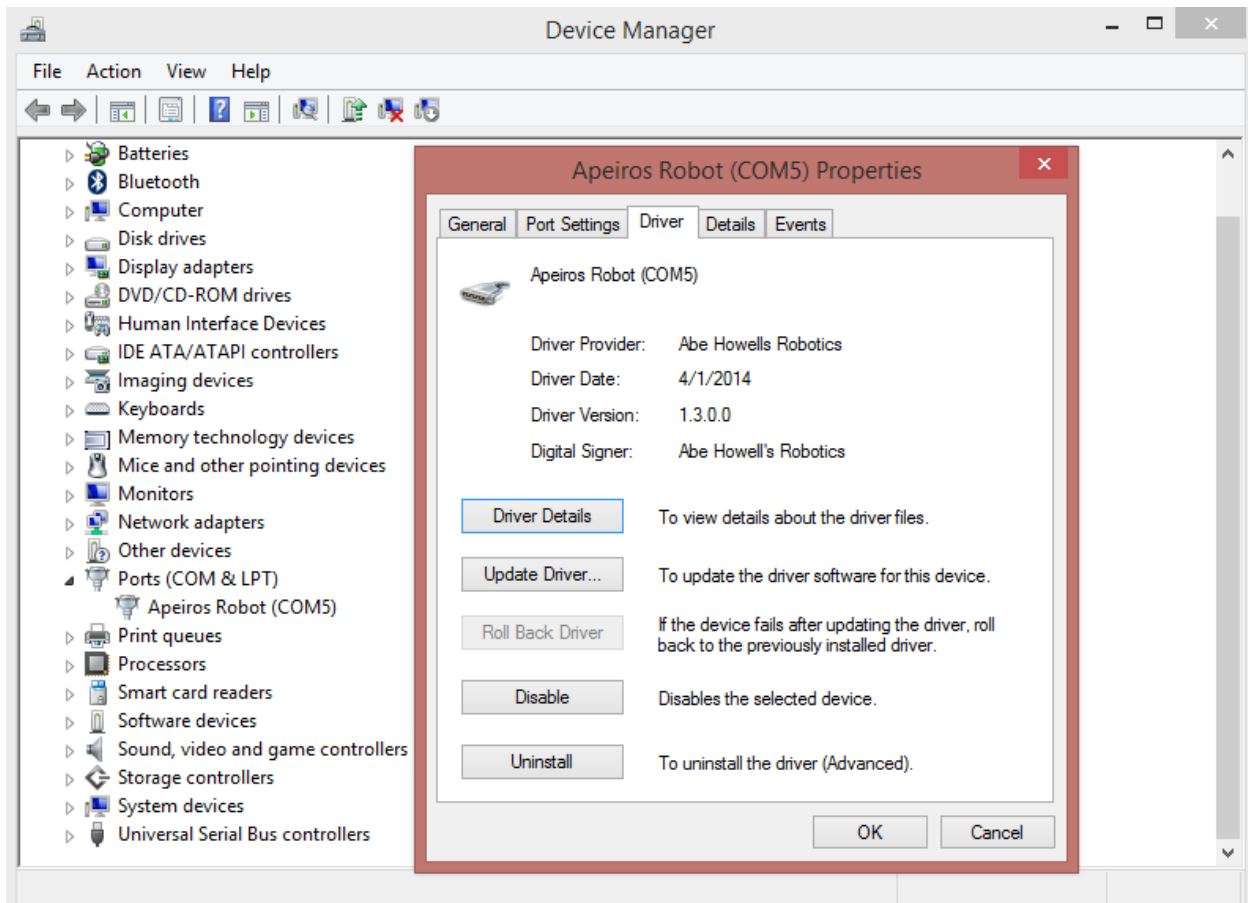


FIGURE 4. Apeiros Robot USB driver assigned communication port.

Apeiros Robot Setup & Installation Guide

Additionally, a USB driver will be installed for the "**Apeiros Bootloader**" as shown in **Figure 5**. You can only observe this after pressing the "**Reset**" button on your Apeiros Robot.

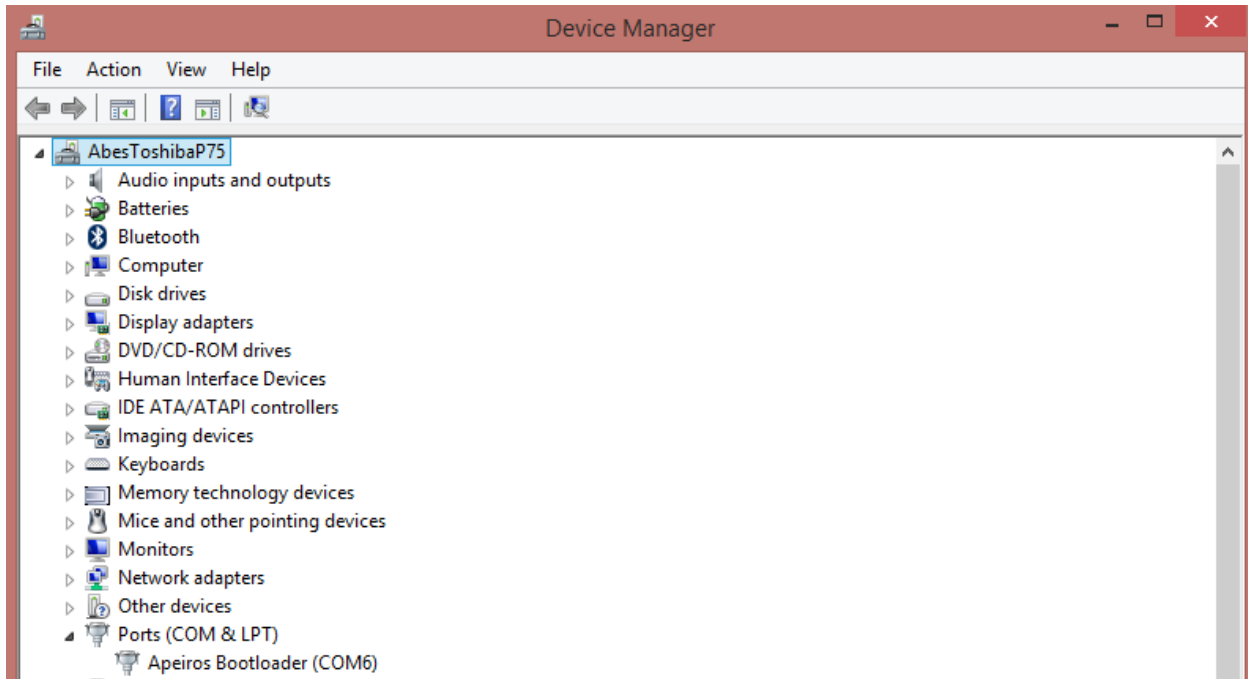


FIGURE 5. Apeiros Bootloader USB driver assigned communication port.

2 Install & Setup Arduino IDE

Download Arduino IDE 1.8.5: <https://www.arduino.cc/en/Main/Software>. All of the Apeiros Robot libraries have been tested on Arduino IDE 1.8.5. Before using the Arduino IDE with Apeiros you must update the "**boards.txt**" file to include specific information about Apeiros Robot. In this example we will be updating the "**boards.txt**" file for an Arduino IDE 1.8.5 installation. The "**boards.txt**" file is located in the following folder for this example: "**C:\arduino-1.8.5\hardware\arduino\avr**" as shown in **Figure 6**. Please be sure to look in the correct folder based upon your specific Arduino IDE installation.

Apeiros Robot Setup & Installation Guide

(C:) > arduino-1.8.5 > hardware > arduino > avr >

Name	Date modified	Type
bootloaders	7/15/2018 1:36 PM	File folder
cores	7/15/2018 1:36 PM	File folder
firmwares	7/15/2018 1:36 PM	File folder
libraries	7/15/2018 1:36 PM	File folder
variants	7/15/2018 1:36 PM	File folder
boards	7/15/2018 1:40 PM	Text Document

FIGURE 6. Arduino IDE "boards.txt" file location.

Now go ahead and copy and paste the new "[boards.txt](#)" file that was supplied within the "[Apeiros_Boards_Bootloader.zip](#)" file download. If you want to open the new file and scroll down to the bottom, you will find the added Apeiros Robot information as shown in **Figure 7**.

```
#####  
  
apeiros.name=Apeiros Robot  
apeiros.vid.0=0x04D8  
apeiros.pid.0=0xEECE  
apeiros.vid.1=0x04D8  
apeiros.pid.1=0xEEC1  
  
apeiros.vid.0x2A03.warning=Uncertified  
  
apeiros.upload.tool=avrdude  
apeiros.upload.protocol=avr109  
apeiros.upload.maximum_size=28672  
apeiros.upload.maximum_data_size=2560  
apeiros.upload.speed=57600  
apeiros.upload.disable_flushing=true  
apeiros.upload.use_1200bps_touch=true  
apeiros.upload.wait_for_upload_port=true  
  
apeiros.bootloader.tool=avrdude  
apeiros.bootloader.low_fuses=0xff  
apeiros.bootloader.high_fuses=0xd8  
apeiros.bootloader.extended_fuses=0xcb  
apeiros.bootloader.file=caterina/Caterina-Apeiros.hex  
apeiros.bootloader.unlock_bits=0x3F  
apeiros.bootloader.lock_bits=0x2F  
  
apeiros.build.mcu=atmega32u4  
apeiros.build.f_cpu=16000000L  
apeiros.build.vid=0x04D8  
apeiros.build.pid=0xEEC1  
apeiros.build.usb_product="Apeiros Robot"  
apeiros.build.board=AVR_LEONARDO  
apeiros.build.core=arduino  
apeiros.build.variant=leonardo  
apeiros.build.extra_flags={build.usb_flags}  
  
#####
```

FIGURE 7. Apeiros Robot information in "boards.txt" file.

Apeiros Robot Setup & Installation Guide

You can go ahead and launch the Arduino IDE. You will notice that "Apeiros Robot" has been added to the list when "Board" is selected from the "Tools" menu as shown in **Figure 8**.

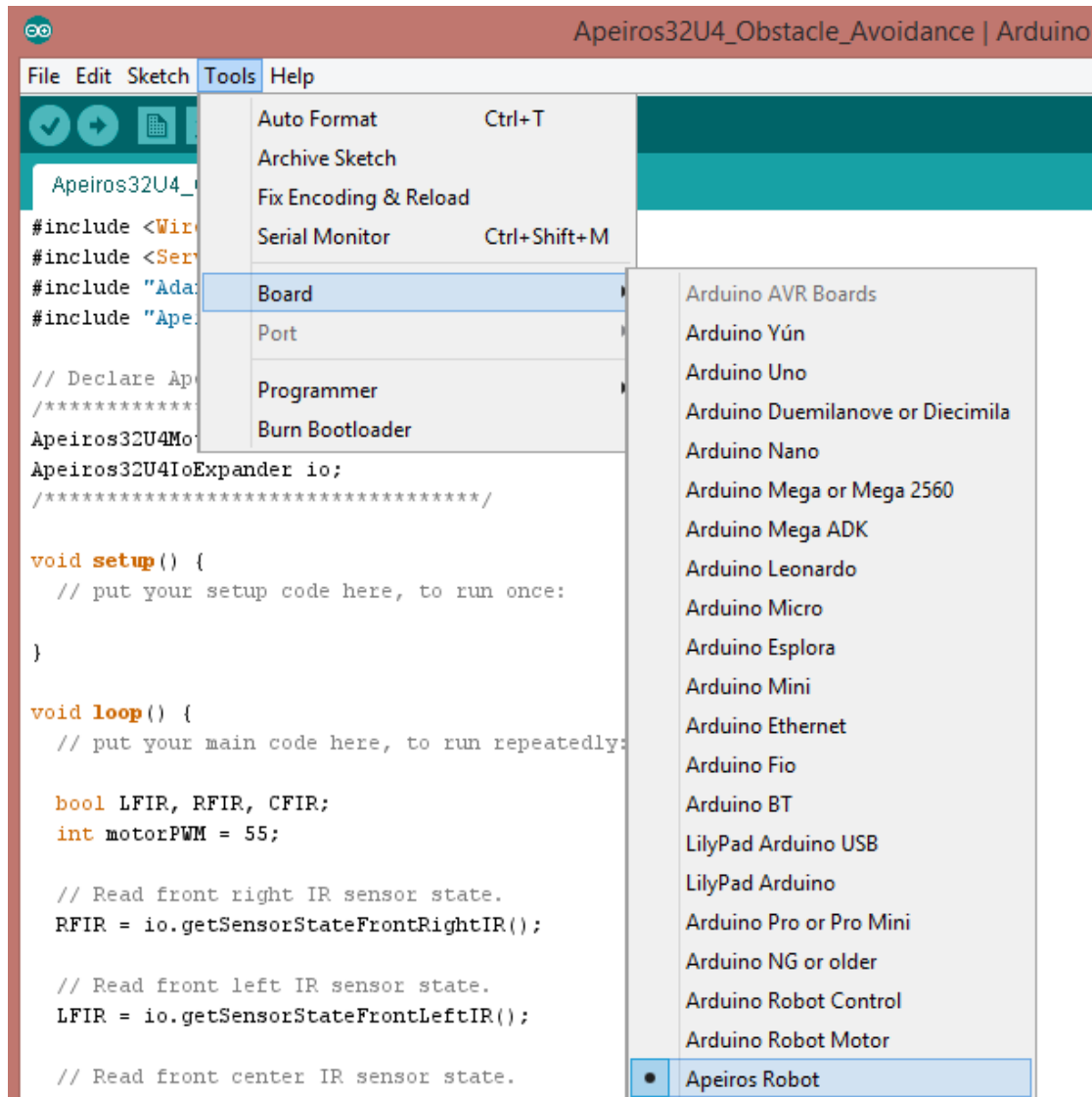


FIGURE 8. Arduino IDE "Boards" menu.

3 Install Apeiros Robot Arduino Class Libraries

You can follow the library installation instructions on the Arduino website:

<https://www.arduino.cc/en/Guide/Libraries>

First try to install using the Library Manager from within the Arduino IDE. If that doesn't work, then follow the "Manual installation" process. To perform a manual install, simply unzip the

Apeiros Robot Setup & Installation Guide

"Apeiros-Robot-arduino-library-master.zip" file, locate the "Apeiros-Arduino" folder and copy it to the Arduino "libraries" folder as shown in **Figure 9**.

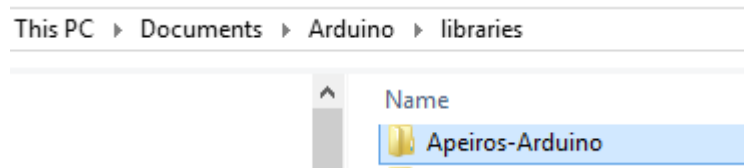


FIGURE 9. Add "Apeiros-Arduino" library to Arduino "libraries" folder.

Some of the Apeiros libraries utilize Pololu's **FastGPIO** library and it must be installed. The Arduino IDE's built-in library manager can be used. From the "**Sketch**" menu, select "**Include Library**" and finally "**Manage Libraries...**" as shown below in **Figure 10**.

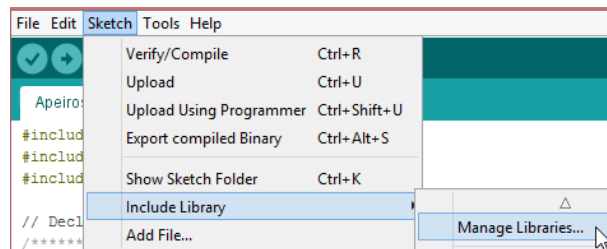


FIGURE 10. Select Manage Libraries from Arduino IDE.

Search for FastGPIO as shown in **Figure 11** below.

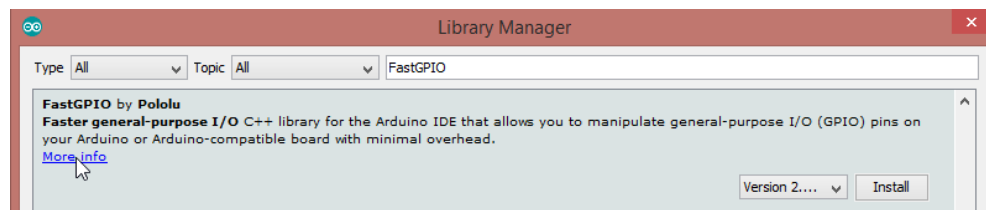


FIGURE 11. Search for FastGPIO.

Be sure to select Version 2.1.0 or the latest version available.

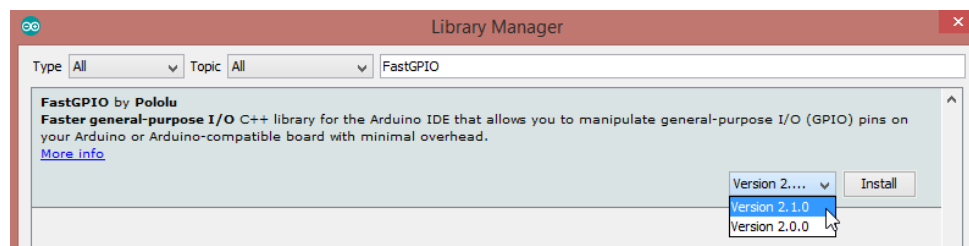


FIGURE 12. Select Version 2.1.0 or latest version available.

Apeiros Robot Setup & Installation Guide

Finally, click the Install button to install the FastGPIO library.

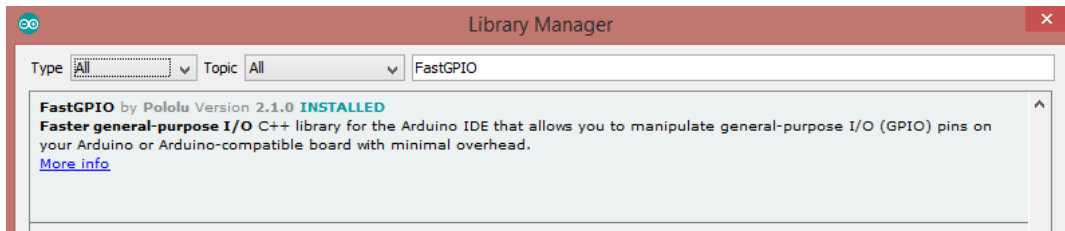


FIGURE 13. FastGPIO library is installed.

4 Run Example Programs

You can run example Apeiros Robot programs by simply selecting "File" -> "Examples" -> "Apeiros" from within the Arduino IDE as shown in Figure 14.

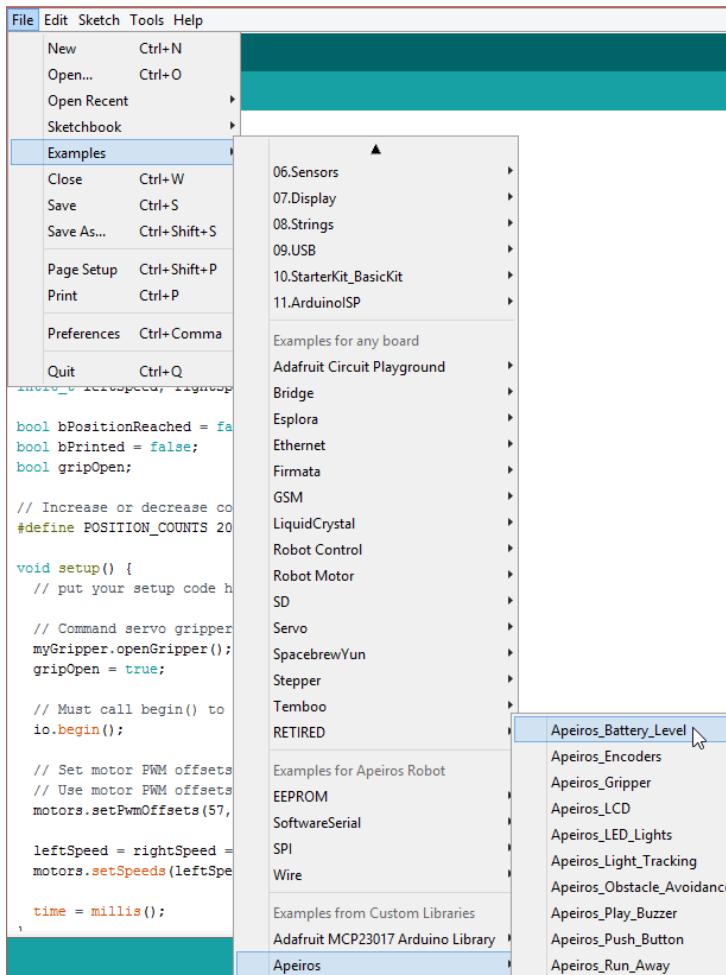


FIGURE 14. Run example Apeiros Robot programs.

Apeiros Robot Setup & Installation Guide

Be sure to connect a USB cable and switch on Apeiros Robot. Then select the communication port before uploading a program as shown in **Figure 15**.

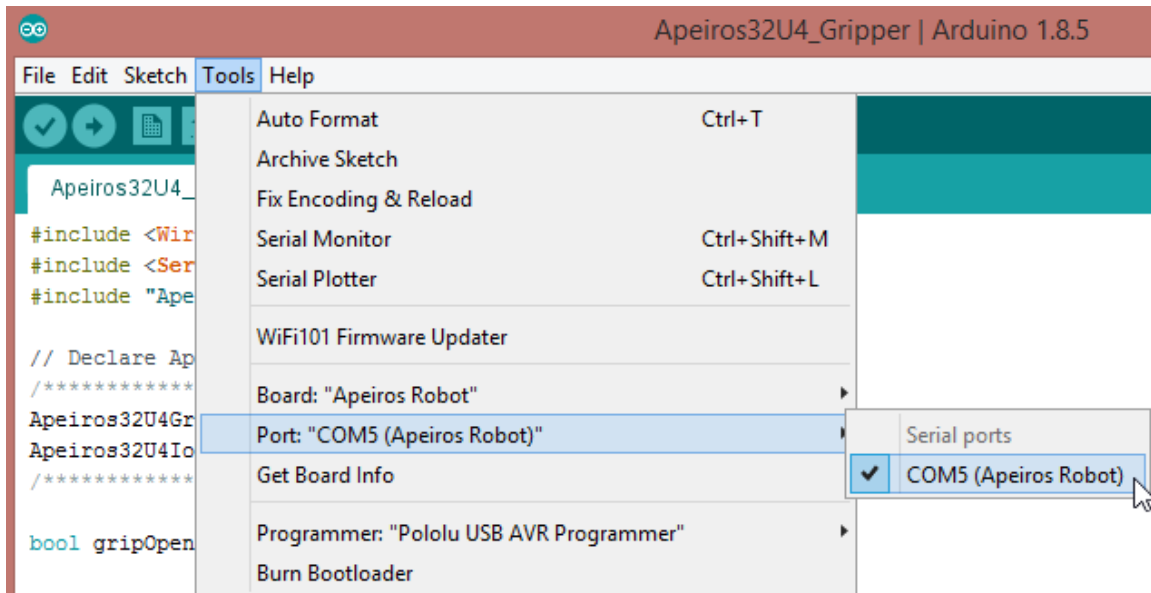


FIGURE 15. Select Apeiros Robot communication port.

Finally, click the "Upload" button as shown in **Figure 16**. Your program will be compiled and then uploaded to the connected Apeiros Robot.

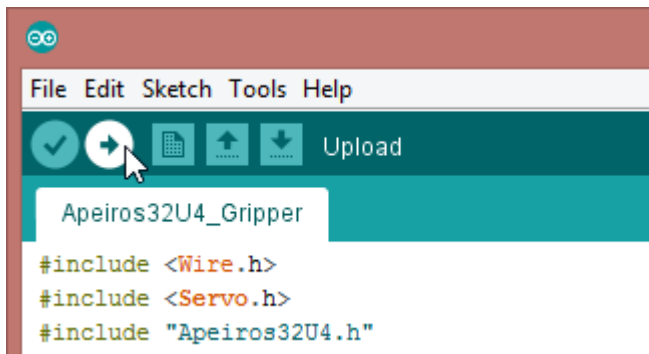


FIGURE 16. Upload program.

While your program is being compiled you will notice "**Compiling sketch**" in lower left-hand corner of Arduino IDE as shown in **Figure 17**.

Apeiros Robot Setup & Installation Guide

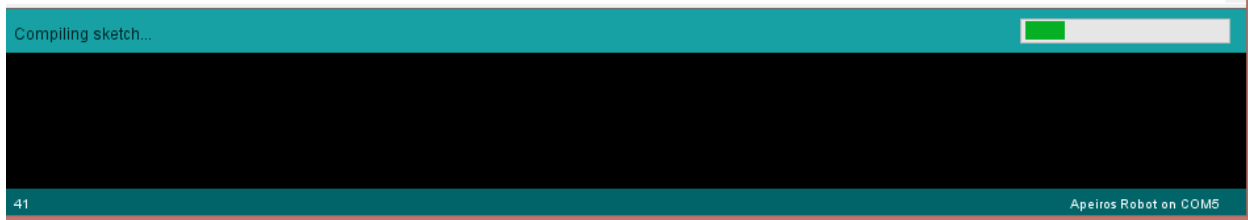


FIGURE 17. Compiling sketch.

You will observe "**Uploading**" when your program is being uploaded to the connected Apeiros Robot as shown in **Figure 18**.

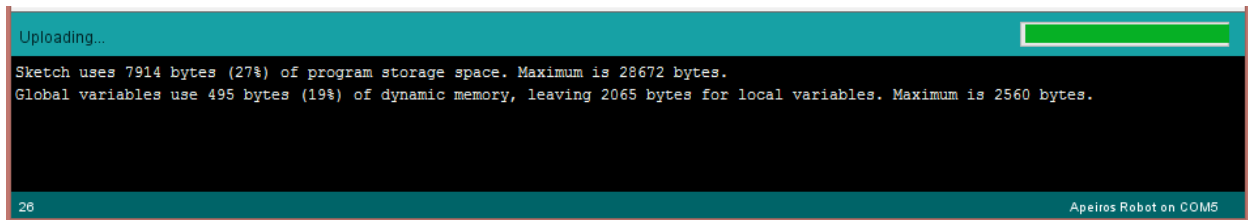


FIGURE 18. Uploading program.

Once the uploading is complete, your Apeiros Robot will begin to execute the uploaded program. Be sure to disconnect the USB cable if your program activates one or both motors!

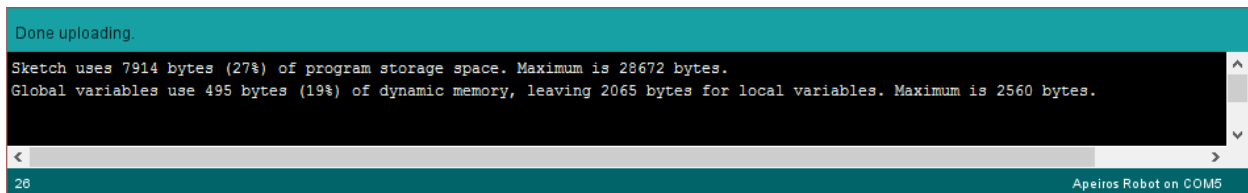


FIGURE 19. Upload complete.

5 Copy Apeiros Robot Bootloader Hex File (Optional)

This step is not necessary unless you need to "**burn**" the Apeiros Robot bootloader. The Apeiros Robot bootloader comes factory installed. However, advanced users may need to reload the Apeiros bootloader at some point. Reloading the bootloader requires using a suitable USB AVR Programmer or a suitable Arduino board. This topic will not be covered in this setup guide. You may have noticed the bootloader file when you installed the "**boards.txt**" file from the "**Apeiros_Boards_Bootloader.zip**" file download back in **Section 2** above. Copy the "**Caterina-Apeiros.hex**" file to the "**caterina**" folder as shown in **Figure 20**. Please note that your Arduino

Apeiros Robot Setup & Installation Guide

installation may have a slightly different path and it depends upon the Arduino IDE version that is currently installed.

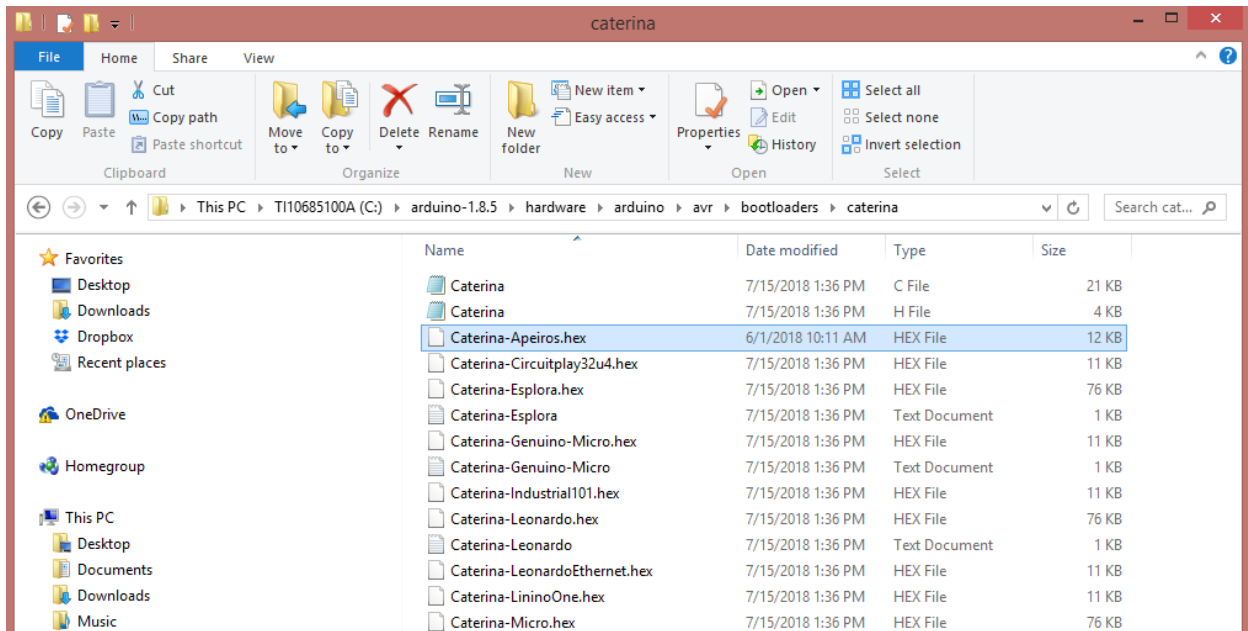


FIGURE 20. Copy "Caterina-Apeiros.hex" bootloader file to Arduino "bootloaders" folder.