

Ginobot Python Module

The Ginobot Python module is a new interactive way that Ginobot can be controlled with. Python is one of the most popular programming languages in the world with one of the largest communities built around it. Python is simple to understand and easy to use, while also being able to give you full control to your code. Python and its hundreds of millions of modules allow for Ginobot to be used in any kind of way. As a team we built the foundation and you get to explore, experiment, and alter the code in your way.

The library

For connecting to Ginobot we used a module called BleakClient. With Bleak we can build programs that allow for Bluetooth connection. A very key characteristic of Bleak is that it uses Asynchronous connectivity. Which means that no matter what happens there will be an attempt for connection to the device. Beside the technical information a key feature of Asynchronous programs in python is the “await” routine, which is needed to be placed in-front of every function in your program.

```
import GinobotBLE as gb # Imports Ginobot Library
import asyncio # Imports asyncio Library for asynchronous calls

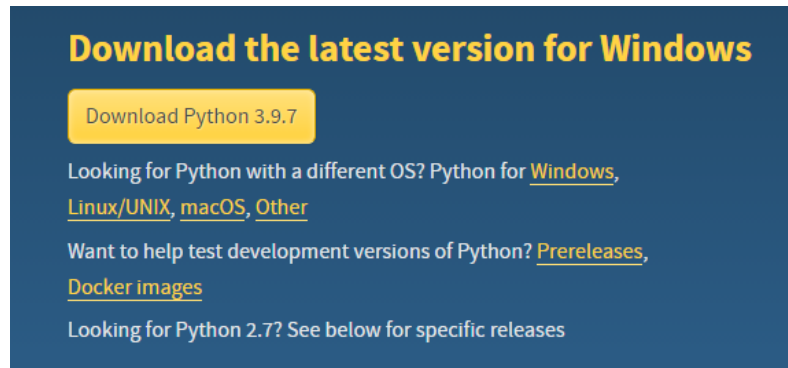
async def run(): # Run Function (Runs what ever program is placed inside)
    # scan function. Important to locate your device and connect to it.
    # With out the scan function you will not be able to controll Ginobot
    await gb.scan()
```

When installing the module, you need to make sure it recognizes all packages. Make sure Bleak was installed in the folder you downloaded. If bleak is missing, then follow the document to the installation section.

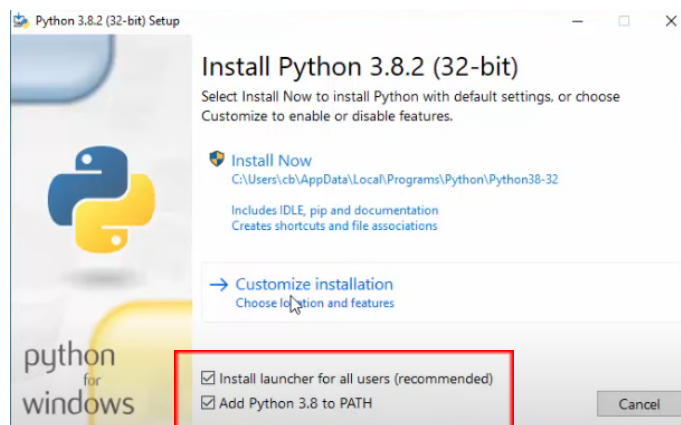
Installation

Step 1: Installing Python.

To install python simply open your web-browser and navigate to python.org/downloads/. From there click the Download Python with the latest version written on it.



The python program file will start to download. Once the program is downloaded click on it to run. A pop-up window will appear and from there you have to install the Latest version by simply clicking on Install Now. Make sure the checkboxes shown in the following picture are checked.



Step 2: Installing Ginobot-Python module.

From your web-browser navigate to www.egino.com and click on the Download Link. A zip folder should be downloaded to your computer. Extract the zip to a location on your computer and open the file. In the zip folder you should find a file with the name GinobotBLEPy. Open the file

Optional Step: Installing Pycharm.

To install Pycharm simply open your web-browser at <https://www.jetbrains.com/pycharm/download/>. Click the download button under the community section.

Download PyCharm

Windows

macOS

Linux

Professional

For both Scientific and Web Python development. With HTML, JS, and SQL support.

Download

Free trial

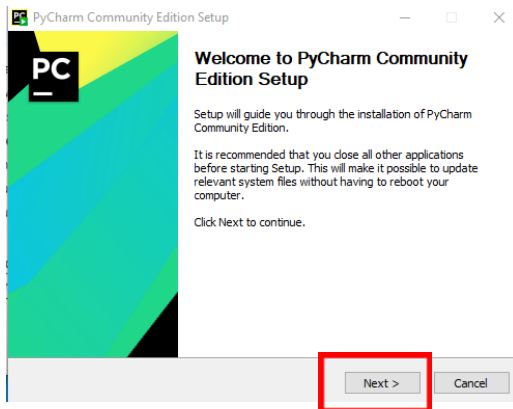
Community

For pure Python development

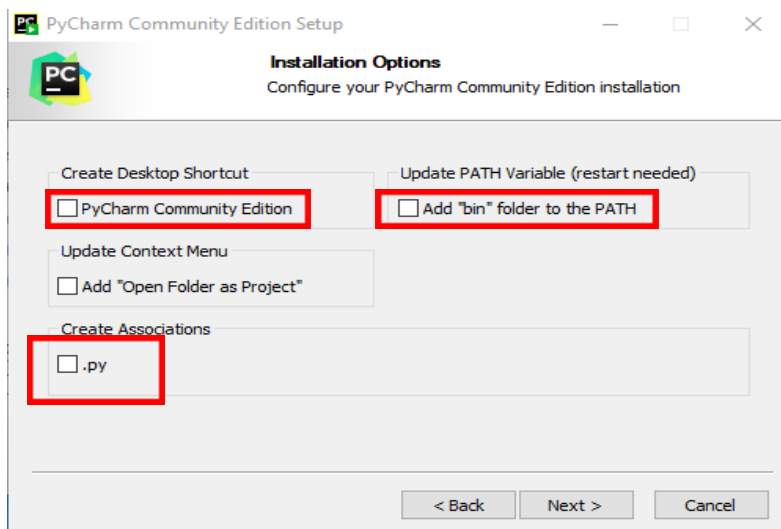
Download

Free, built on open-source

A program will start to download. Once the program is downloaded click on it to run. Then on the Setup window click Next.



Keep Clicking Next until you reach the page. Where you will need to check everything apart from Add "Open Folder as Project".

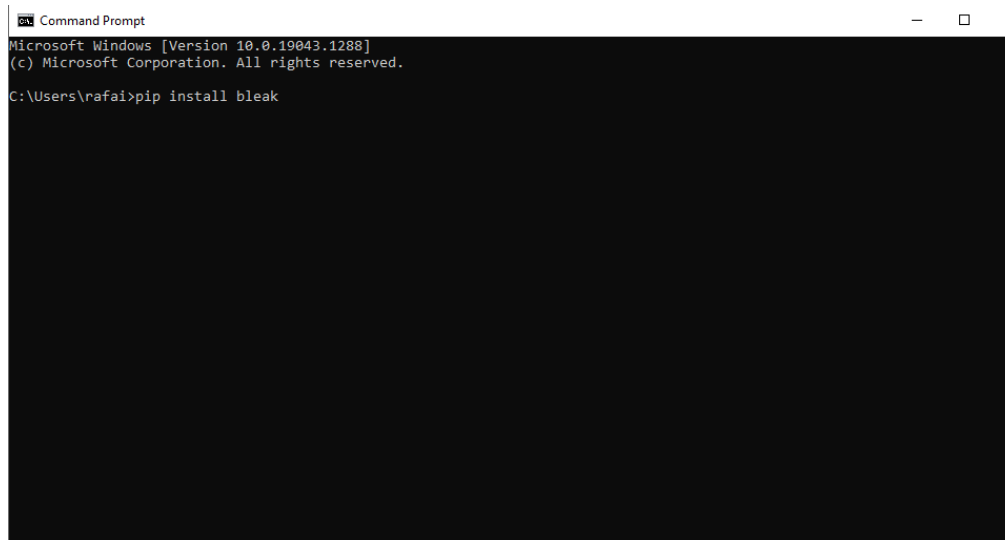


Click Next and Install.

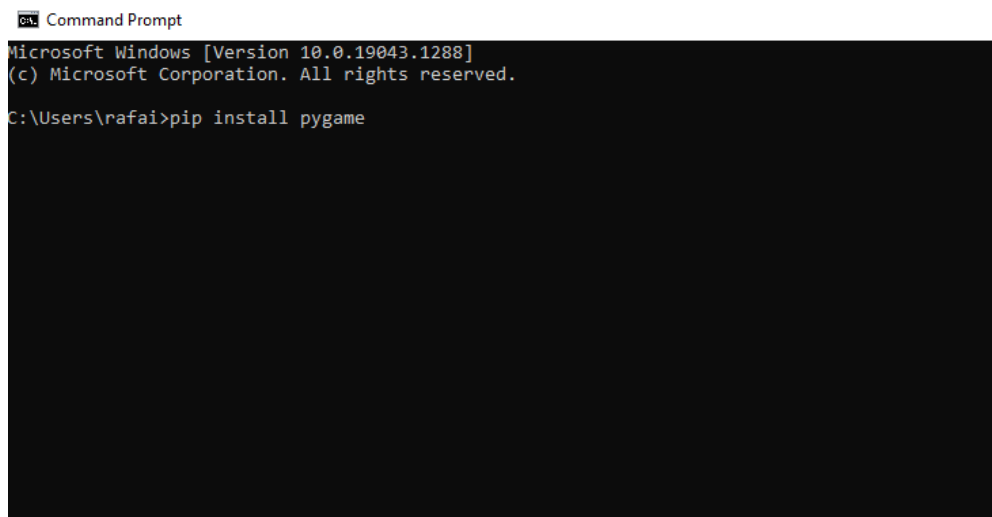
Using Library with Python

Set-up in Python

In order to run Control Ginobot you will have to install some python modules. If you are going to run the module using Python (From CMD) you simply open a new CMD Window by searching for CMD on your machine or by pressing the windows and “R” button and typing CMD there. Then type the following commands “pip install bleak” and hit enter, then type “pip install pygame” and hit enter.

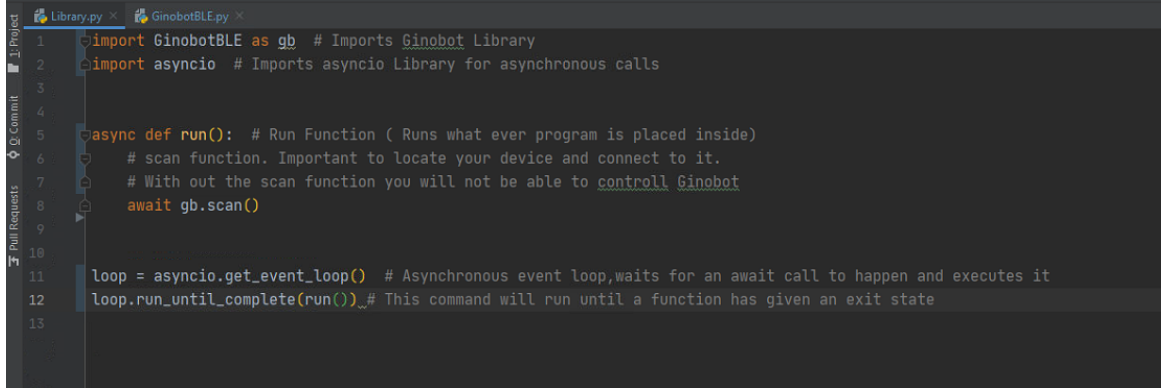


```
Command Prompt
Microsoft Windows [Version 10.0.19043.1288]
(c) Microsoft Corporation. All rights reserved.
C:\Users\rafai>pip install bleak
```



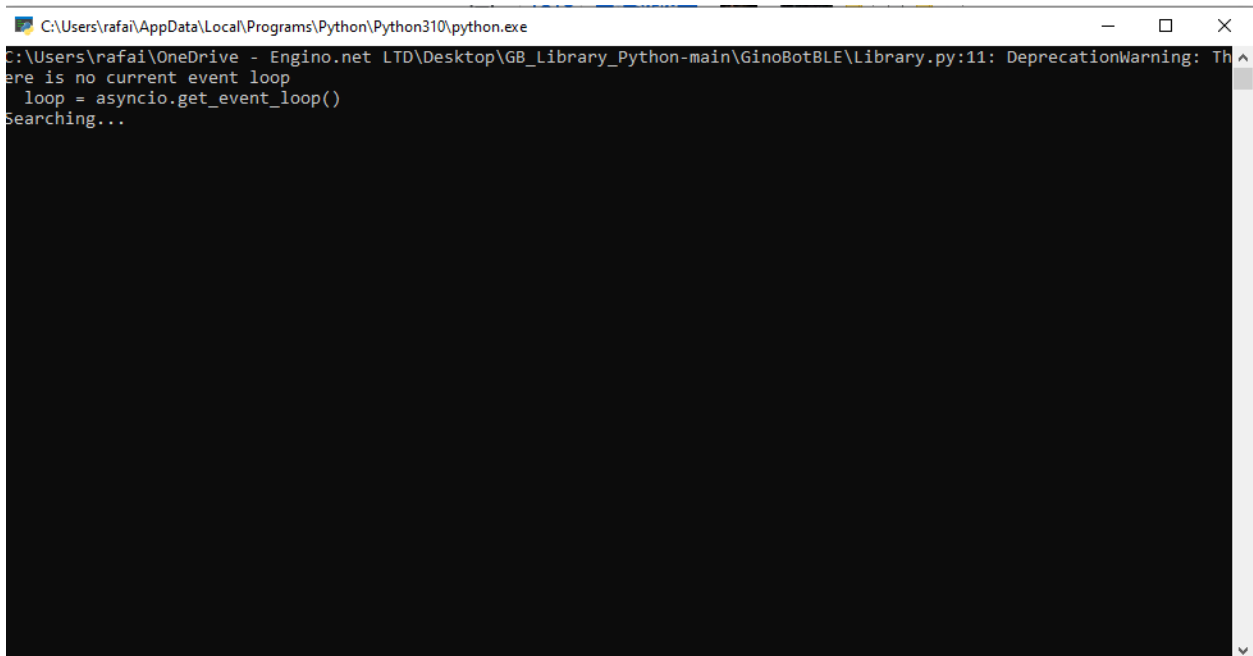
```
Command Prompt
Microsoft Windows [Version 10.0.19043.1288]
(c) Microsoft Corporation. All rights reserved.
C:\Users\rafai>pip install pygame
```

Then just open the folder with the Library “GB_Library_Python” you just downloaded and head over to GinoBotBLE->Library. You can open the library using Notepad or any other text editor (Atom , VSCode). Check that Library code looks like this! You can do that by opening the Library file with notepad.

A screenshot of a text editor window with two tabs: 'Library.py' and 'GinobotBLE.py'. The 'Library.py' tab is active, showing a Python script. The code includes imports for 'GinobotBLE as gb' and 'asyncio'. It defines an 'async def run()' function with comments explaining its purpose and a 'scan' function. The script then creates an 'asyncio.get_event_loop()' and runs 'loop.run_until_complete(run())'.

```
1 import GinobotBLE as gb # Imports Ginobot Library
2 import asyncio # Imports asyncio Library for asynchronous calls
3
4
5 async def run(): # Run Function ( Runs what ever program is placed inside)
6     # scan function. Important to locate your device and connect to it.
7     # With out the scan function you will not be able to controll Ginobot
8     await gb.scan()
9
10
11 loop = asyncio.get_event_loop() # Asynchronous event loop,waits for an await call to happen and executes it
12 loop.run_until_complete(run())_# This command will run until a function has given an exit state
13
```

Close the text editor file and double click it. If the file doesn't start searching then you might need to right click and open the file with “Python”.

A screenshot of a Windows command prompt window. The title bar shows the path 'C:\Users\rafael\AppData\Local\Programs\Python\Python310\python.exe'. The command prompt shows the execution of 'Library.py' from the path 'C:\Users\rafael\OneDrive - Engino.net LTD\Desktop\GB_Library_Python-main\GinoBotBLE\Library.py:11: DeprecationWarning: Th'. The output shows a deprecation warning, the creation of an event loop, and the start of a search process.

```
C:\Users\rafael\AppData\Local\Programs\Python\Python310\python.exe
C:\Users\rafael\OneDrive - Engino.net LTD\Desktop\GB_Library_Python-main\GinoBotBLE\Library.py:11: DeprecationWarning: Th
ere is no current event loop
  loop = asyncio.get_event_loop()
Searching...
```

Turn your GinoBot and check if it appears when the program is searching.

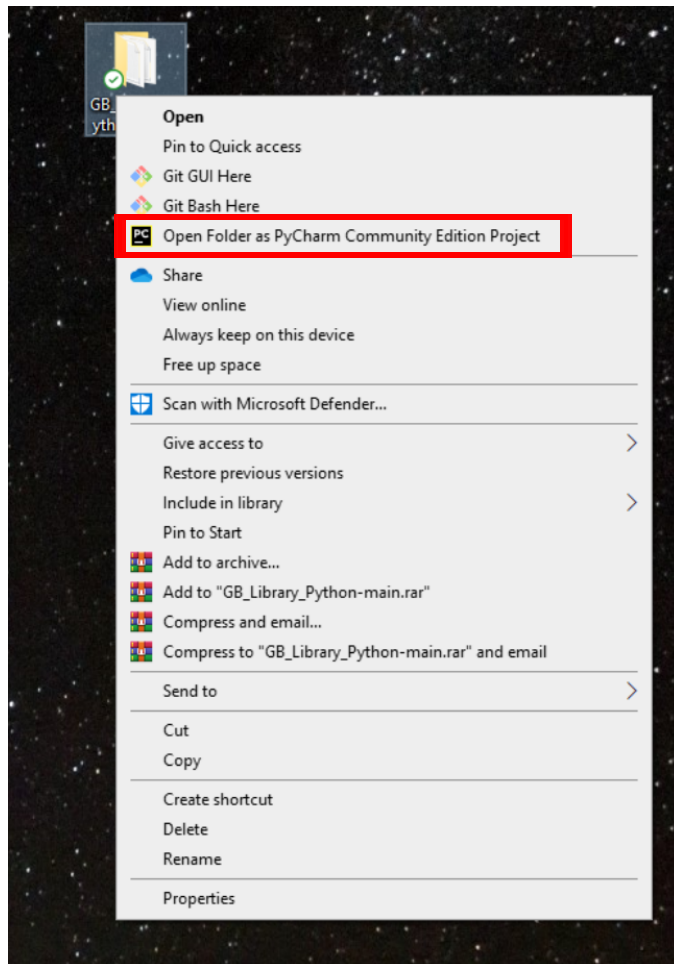
If yes you can refer to the Functions Paragraph below.

MAKE SURE YOUR BLUETOOTH IS TURNED ON!

Using Library with Pycharm

After the installation is complete you can now open the modules using Pycharm.

Right click on the Ginobot Module File and hover to “open Folder as Pycharm Community Edition Project”.

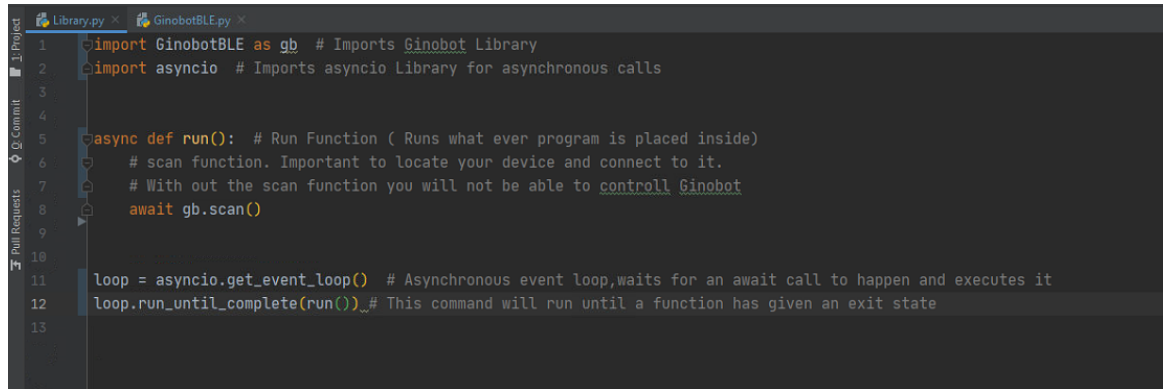


Pycharm will open and we will have to install the modules and configure the interpreter (What makes our code readable for the computer).

On the top of the file you can 2 Bleak and Pygame in red highlighted lines. Right click on Bleak and Pygame and Click “Install Package”. Or you can go to the bottom of your Pycharm window and open the terminal tab. Type “pip install bleak” and hit enter and “pip install pygame” and hit enter.

To configure your interpreter On the left of your Pycharm Window click on the Project Tab. Open GB_Library_Python-main -> GinoBotBLE -> Library. Right click on the Library file and click Run. If a text saying searching appears then the software works, otherwise refer to the readme.md file to manually configure the interpreter.

Default Setup: Your default Library File should look like this.

A screenshot of a PyCharm code editor window. The top bar shows two tabs: 'Library.py' and 'GinobotBLE.py'. The 'Library.py' tab is active. The code is as follows:

```
1 import GinobotBLE as gb # Imports Ginobot Library
2 import asyncio # Imports asyncio Library for asynchronous calls
3
4
5 async def run(): # Run Function (Runs what ever program is placed inside)
6     # scan function. Important to locate your device and connect to it.
7     # With out the scan function you will not be able to controll Ginobot
8     await gb.scan()
9
10
11 loop = asyncio.get_event_loop() # Asynchronous event loop, waits for an await call to happen and executes it
12 loop.run_until_complete(run())_# This command will run until a function has given an exit state
13
```

MAKE SURE YOUR BLUETOOTH IS ON!

Functions:

If you are using Pycharm on your project tab you can edit the contents of the Library with the following commands. If you are running it with Python you can open the file with notepad and edit the contents of the file there.

Important!

Any of the commands that follow and additional command you wish to add to the library has to include the await routine in front of it.

await gb.Scan()

Scans for open Ginobots to connect with bluetooth

await gb.Front_Lights(0 ,0 ,0)

Turns the front Lights on in relation to the color of input, you can use custom numbers as parameters from 0 -255 or the build-in color functions e.x "color.RED" as parameter.

await gb.Back_Lights(0 ,0 ,0)

Turns the back lights on in relation to the color of input, you can use custom numbers as parameters from 0 -255 or the build-in color functions e.x “color.RED” as parameter.

await Buzzer(frequency)

Turns the buzzer on to the frequency of input. Can take values from 0 – 1000

await move_forward(speed)

Move the Ginobot forward indefinitely for an input speed.

await move_backwards(speed)

Move the Ginobot backwards indefinitely for an input speed.

await move_right(speed)

Move the Ginobot to the right indefinitely for an input speed.

await move_left(speed)

Move the Ginobot to the left indefinitely for an input speed.

await stop_movement()

Stops the Ginobot from moving.

await Right_Color_Sense() == COLOR

Checks if the Right color sensor is equal with a specific color. Use it as follows

if await Right_Color_Sence() == color.RED:

await Left_Color_Sense() == Color

Checks if the Left color sensor is equal with a specific color. Use it as follows

await Right_Color_Sence() == color.RED

await Ultrasonic_Sense()

Checks the ultrasonic sensor value. Us it as follows:

if await Ultrasonic_Sence() <= 5:

await Front_Right_IR(Threshold)

Checks the Front Right IR sensor value distance. You can adjust the threshold, so it detects in smaller or longer distances. Use as follows

if await Front_Right_IR(threshold.HIGH)

await Front_Left_IR(Threshold)

Checks the Front Left IR sensor value distance. You can adjust the threshold, so it detects in smaller or longer distances. Use as follows

if await Front_Left_IR(threshold.HIGH)

await Back_IR(Threshold)

Checks the Rear IR sensor value distance. You can adjust the threshold, so it detects in smaller or longer distances. Use as follows

if await Back_IR(threshold.HIGH)

await controller ()

Allows full control of Ginobot's movements. Needs pygame installed!

Control Ginobot Using the arrow keys on your computer

await Ginobot_Listen()

On beta. Makes use of the SpeechRecognition module and pyaudio. Ginobot can listen to commands like move forward , open lights and other!