



Agrumino Lemon Dev Guide rev 1.2 _ENG

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1 INTRODUCTION

This document provides a guide to install Agrumino Board and its libraries. Moreover it describes some example sketches, part of the Agrumino libraries.

2 INSTALLATION

2.1 INSTALL THE USB DRIVER

Modern Windows installations seem to automatically install the USB driver. If you're on another platform, like Mac OS/Linux/Android or Windows, which doesn't recognize the Serial Port automatically, you can download the official driver from here: [CP2102 Driver](#).

2.2 INSTALL THE AGRUMINO BOARD ON ARDUINO IDE

The Agrumino board is based on an ESP8266 WiFi chip. The official programming environment is Arduino, this is possible thanks to the Open Source project [ESP8266 Core for Arduino](#). We have forked this project and created a custom Agrumino core that includes all the libraries needed by the example sketches to ease the installation procedure.

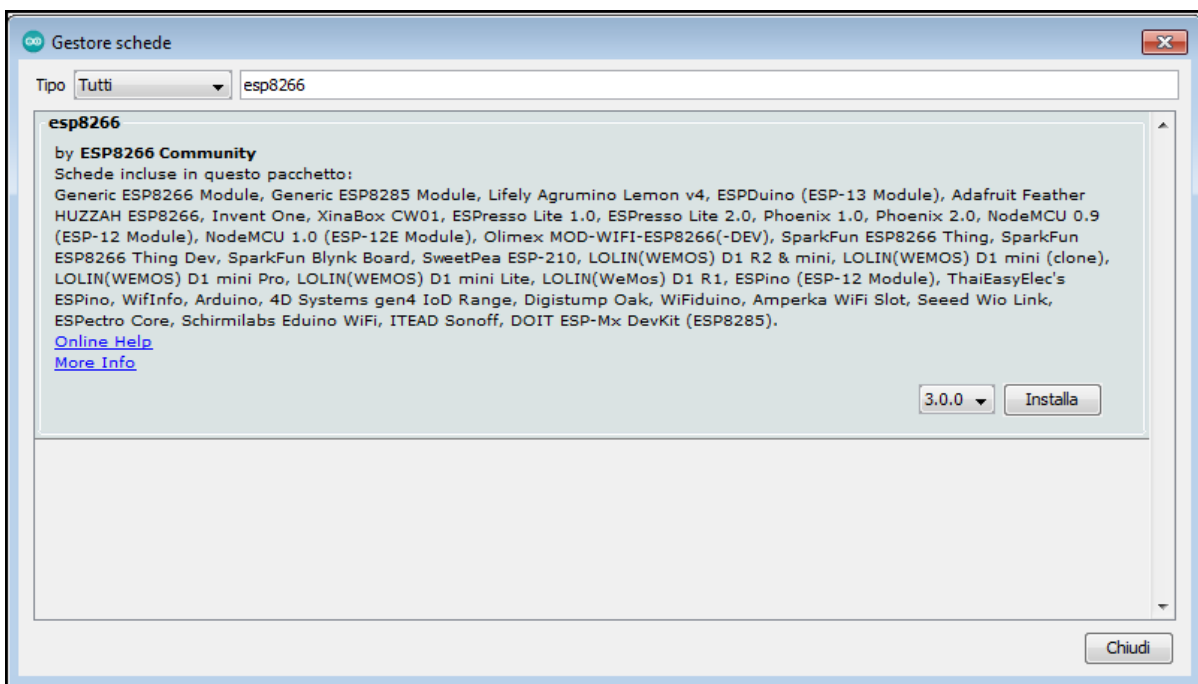
Arduino allows installation of packages using Boards Manager. The package is available for Windows, Mac OS, and Linux (32 and 64 bit).

1. Install the latest version of the Arduino IDE available from the official Arduino website at the following link: <https://www.arduino.cc/en/software>.
2. Then open Arduino Ide and click on File->Preferences and in the URLs text box enter the following url:

http://arduino.esp8266.com/stable/package_esp8266com_index.json

into Additional Board Manager URLs field. You can add multiple URLs, separating them with commas.

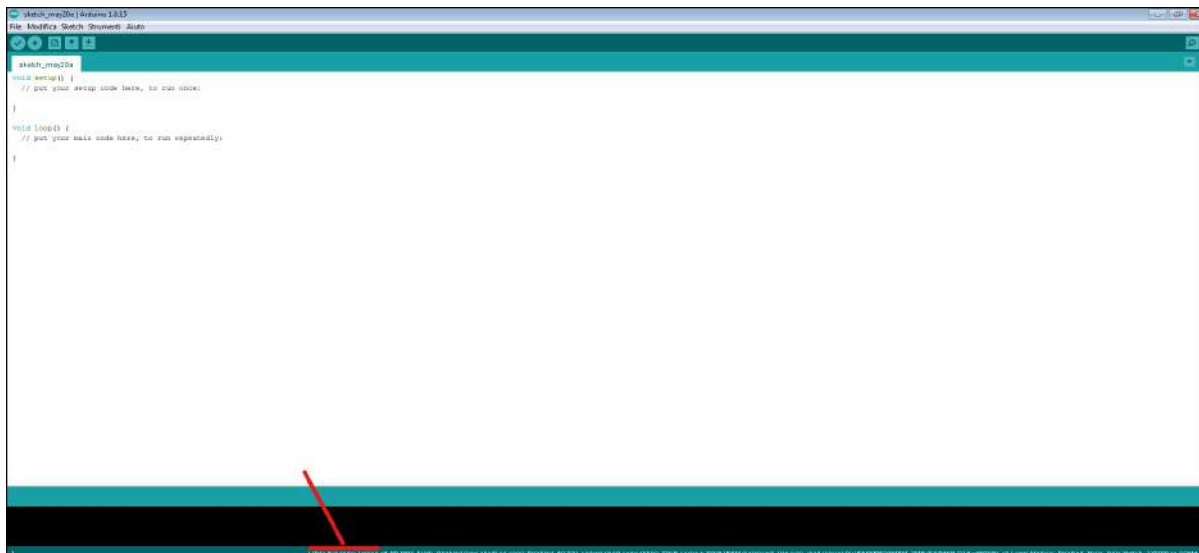
3. Open Boards Manager (Tools → Board→ Boards Manager and enter Esp8266), at which point the screen below will be visible.



At this point we install version 3.0.0 or later.

4. Now you must select Agrumino via the menu Tools→ Board→ ESP8266 Boards and select Lifely Agrumino Lemon v4.

If everything has been done correctly, you should see Lifely Agrumino Lemon at the bottom of the Arduino IDE as in the spot highlighted in the image below.

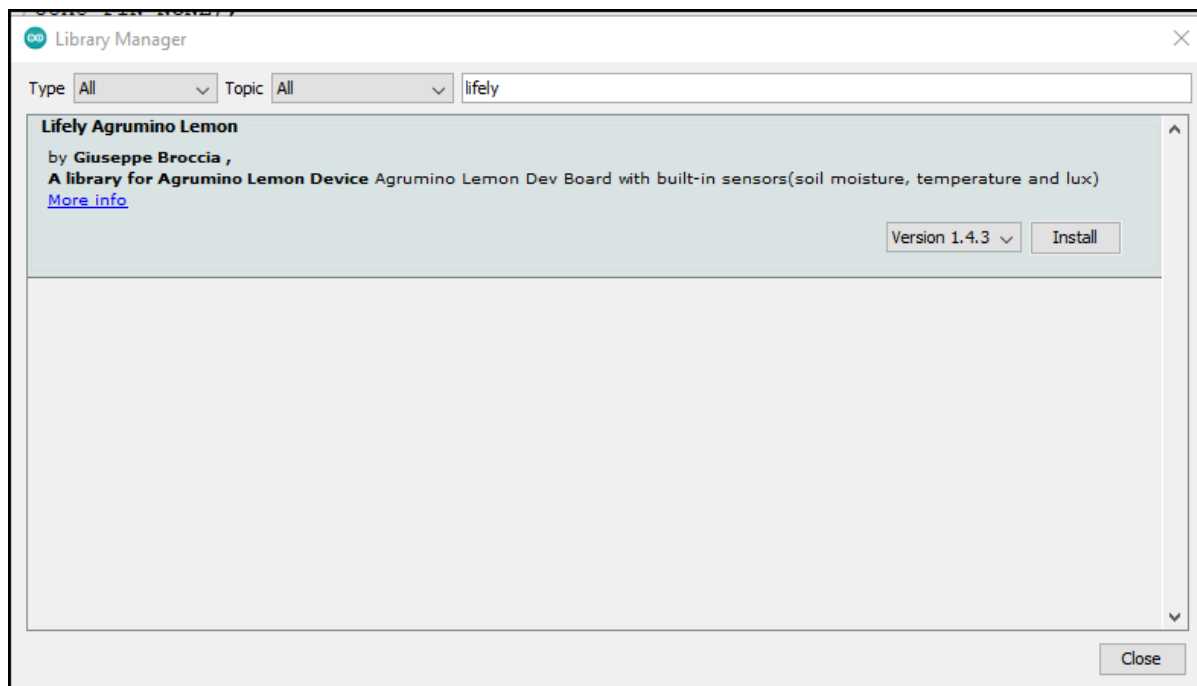


2.2.1 IF YOU HAVE PROBLEM WITH SETUP IN STEP 2.2

In order to use Agrumino Lemon, it is very simple to install the Official Lifely Agrumino Lemon library. This can be done directly from the library manager in the Arduino IDE.

To do this go to Tools → Library Manager and then type in citrus lemon or simply Lifely.

Here is the screen, now you need to install the latest release of the library, in this case 1.4.3 by simply pressing the install button **(always install the latest release anyway)**.



Installing the library will only take a few seconds.

In addition, installing the library will install some example sketches, which are useful for starting to use Agrumino Lemon without having to write a line of code. Start Arduino and open File->Preferences.

3 PROGRAMMING AGRUMINO LEMON

The Agrumino board can be easily programmed by selecting an example sketch (alternatively, sketches can be created completely independently) from the Examples folder and then uploading it by pressing the Upload button on the Arduino IDE.

Check that you have selected the correct board "Lifely Agrumino Lemon v4 " from the menu (Tools → Board).

The official *Agrumino* library comes together with the core installation. We provide a list of the libraries below only as a reference. **You don't need** to install any library.

- [WiFiManager](#) (2.0.3-alpha)
- [ArduinoJson](#) (6.15.2)

Thing Speak Json Post

- [NTPClient](#) (master 9beb84ba50ce37d4c60b08574e1c37b6f598cb6c)

OTA web:

- [ESPAsyncWiFiManager](#) (master bf342327f2fd0f0518bf4932b50c04732063b8d1)
- [ESPAsyncTCP](#) (master 15476867dcbab906c0f1d47a7f63cdde223abeab)
- [ESPAsyncWebServer](#) (master f13685ee97675be2ac9502d177d3024ebc49c1e0)
- [AsyncElegantOTA](#) (2.2.2)

4 Programming the board

The Agrumino Board can be easily programmed by pressing the “Upload” button on the Arduino IDE.

Be sure to select “Agrumino Lemon v4 (WT8266-S1 Module)” as a Board in the (Tools → Board) menu.

5 Arduino library usage

5.1 Examples using USB

On this paragraph, example sketches of the Agrumino library are briefly presented. Notice that they are divided into three folders: QuickStart, Cloud, OTA and Advanced (File → Examples →Agrumino).

Accessing Wifi network

For Cloud and OTA sketches, it is necessary to connect Agrumino Board to the WiFi network (2.4 Ghz networks only). Then, after uploading the sketch to the Arduino IDE, proceed as follows:

1. Using any available device with WiFi, log in via a browser to connect to the newly created access point (look for SSIDs such as Agrumino-XXXX, where XXXXX is the unique Id of the Lifely Agrumino Lemon card)
2. Enter the DNS server IP in your browser (192.168.4.1) and click on 'Configure Wifi'. Choose one of the scanned access points, enter the password and click Save. From now on Citrus Lemon will save the connection data and activate the 'Station' mode by trying to connect to the previously configured network(s).

- If step 1 is unsuccessful (or if there is no previous configuration), the card is moved to "Access Point" mode and reactivates the Web Server (default ip 192.168.4.1) and the WiFi network configuration procedure must be repeated.

If the procedure was successful, the configuration page is interrupted. Otherwise, reconnect to the AP and reconfigure, taking care to correctly enter the access passwords for the selected network (respect upper and lower case).

Further informations at official library page: [WifiManager](#).

5.1.1 QuickStart examples

These sketches display the basic data of Agrumino, such as reading sensor data, saving data to flash memory and controlling the wifi connection.

- AgruminoSample**
 Simple sketch to read all the values from the Agrumino Board and print them in the serial console every 30 sec.
- AgruminoBringUp**
 Simple sketch to test Agrumino board and FLASH Memory of ESP8266 Module. In particular it is possible to read all the values of sensors and print them in the serial console. Moreover it is possible to clean, read, write and commit on memory to verify its integrity.
- WifiClient (ESP8266 example)**
 Sketch to check wifi connection. It is necessary to fill STASSID and STAPSK with personal wifi SSID and password.

5.1.2 Cloud examples

Sketches to send sensor data of Agrumino board to various cloud backends. All the sketches use deep sleep to save energy and keep a queue of samples in EEPROM (flash).

- AgruminoDweet**
 Sketch that reads every 1h all values from the Arduino board and update them to the Dweet.io service every 4h. It integrates FLASH management to collect all data before transmitting them. More details [here](#).
- AgruminoThingSpeakHttpPost**
 Same as the AgruminoDweet sketch but data are sent to the [Thing Speak website](#) with 4 different Http Post.
- AgruminoThingSpeakJsonPost**
 Like the [AgruminoThingSpeakHttpPost](#) sketch, but in this case all data is sent in a single Json file.
- AgruminoThingSpeakVeryEasy**
 Similar to the [AgruminoThingSpeakHttpPost](#) sketch but much simpler. The data is sent to the server with a direct connection.
- AgruminoThingCloudWithPump**
 Sketch that is able to send all data to the Thinger.io platform and at the same time it will be possible to activate or deactivate the integrated connector for the 3.7v pump, thus activating irrigation remotely.

5.1.3 Advanced examples



Example sketch with Citrus Lemon, using other sensors, actuators, third-party cards such as OLED display, water pump etc. For the time being there is only one sketch for using and displaying data via an I2C oled display

- **AgruminoOledSample**

5.1.4 OTA flashing to update firmware examples

Sketches that send sensor data to the cloud and at the same time demonstrate the usage of Over The Air updates.

- **AgruminoDweetWebOTA**
This sketch is the same as the AgruminoDweet sketch moreover integrates the update of the firmware via OTA using a web page. Users can choose an executable from pc and upload it on the board using the address of the board.
- **AgruminoDweetHttpOTA**
This sketch is the same as the AgruminoDweet sketch moreover integrates the update of the firmware via OTA using a remote HTTP server. Each time the executable (.bin) loaded on the server is updated, the board downloads it automatically.

5.1.5 Diagnostics

Example sketches to check the correct functioning of the device

- **AgruminoLemonTesting**

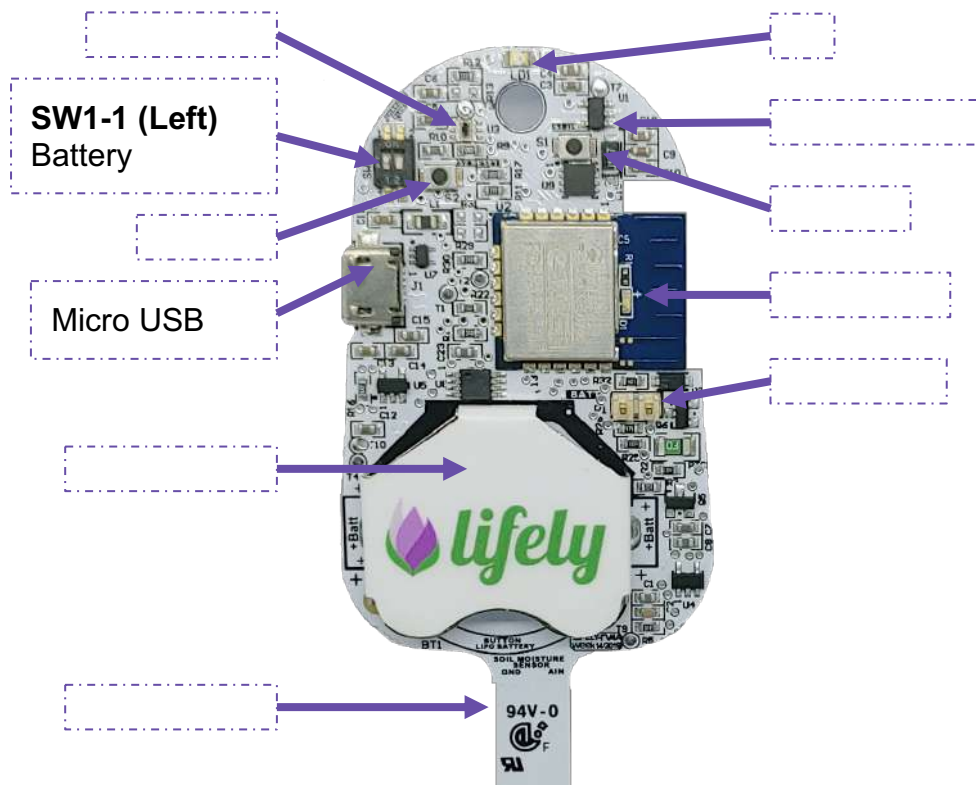
This sketch can be used to test the operation of all connectors and integrated sensors. Inside the sketch folder itself is a picture illustrating its use. The connection diagram is illustrated on a screen fritzing

6 Hardware components

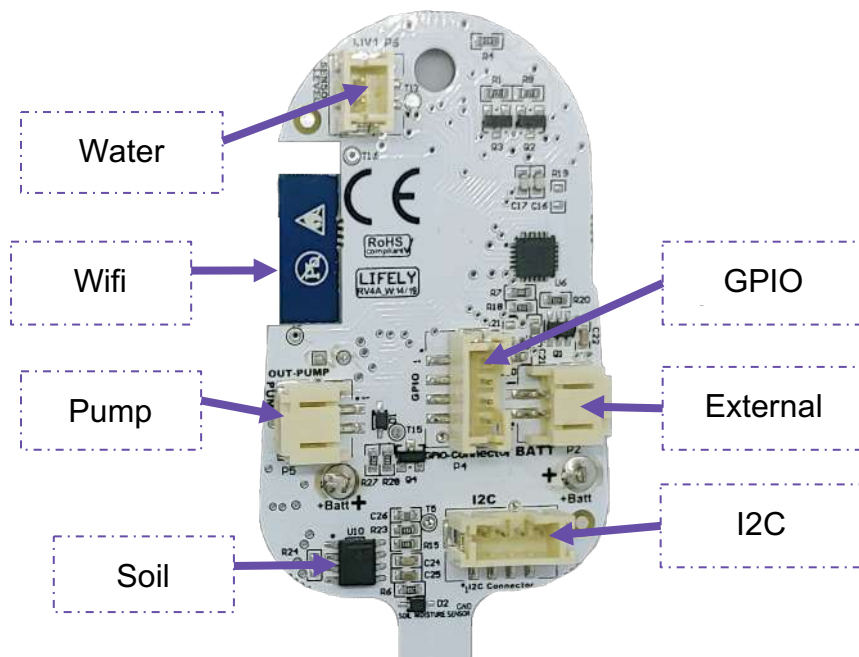
In the following paragraph are underlined the principal components of Agrumino Board, front and back sides.

6.1 Agrumino board front





6.2 Agrumino board back



I2C Connector and GPIO Connector are compatible with the [Grove System](#). Grove I2C and Grove Digital are supported out-of-the-box while Grove Analog can be used with an external [Grove-I2C-ADC](#).

7 FAQ & Common Errors

1. error: cannot access ...

Check from the (Tools → Port) menu that the selected board is the correct one and that it's connected. If other USB devices are connected, check the one corresponding to Agrumino Lemon.

2. espncom sync error

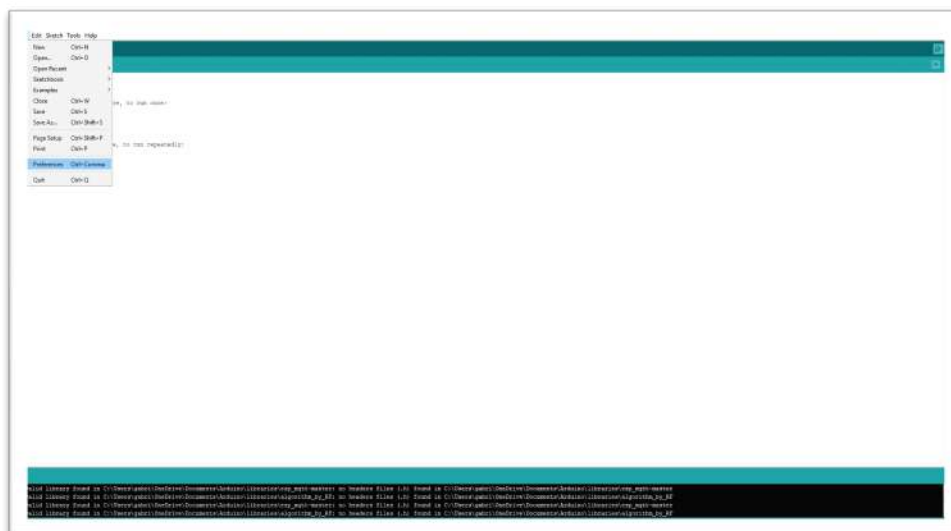
Press the reset button on the Agrumino (S2 on the Top-Left) and try again. If the error happens again disconnect the Agrumino from the USB, remove and reconnect the jumper P1 and try again.

Visual Guide

In the first place install Arduino IDE from this link on your Pc, Notebook or Mac <https://www.arduino.cc/en/software>

After installing the Arduino Ide, connect Agrumino to your PC/MAC with micro usb cable and go to the next step.

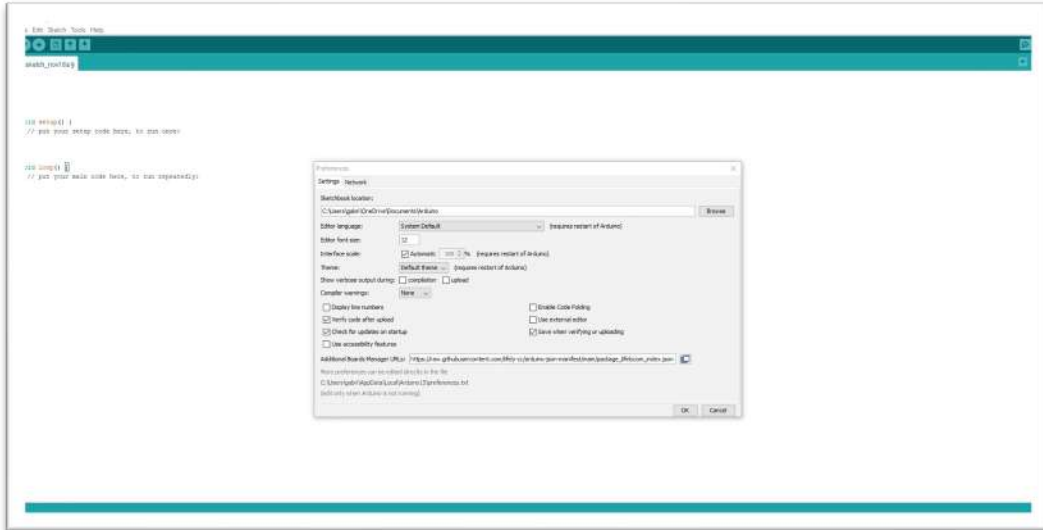
Open Arduino IDE and go to **File** → **Preferences**, and click 



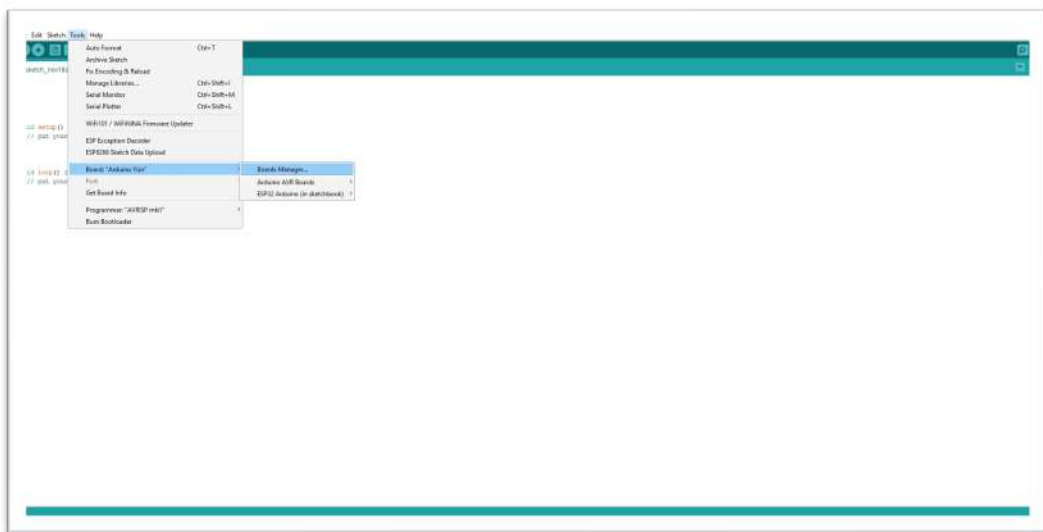
Now in text box “Additional Boards Manager URLs” copy and paste this link:

http://arduino.esp8266.com/stable/package_esp8266com_index.json

and click  Ok



Now go to: **Tools**  **Board**  **Boards Manager** and click 



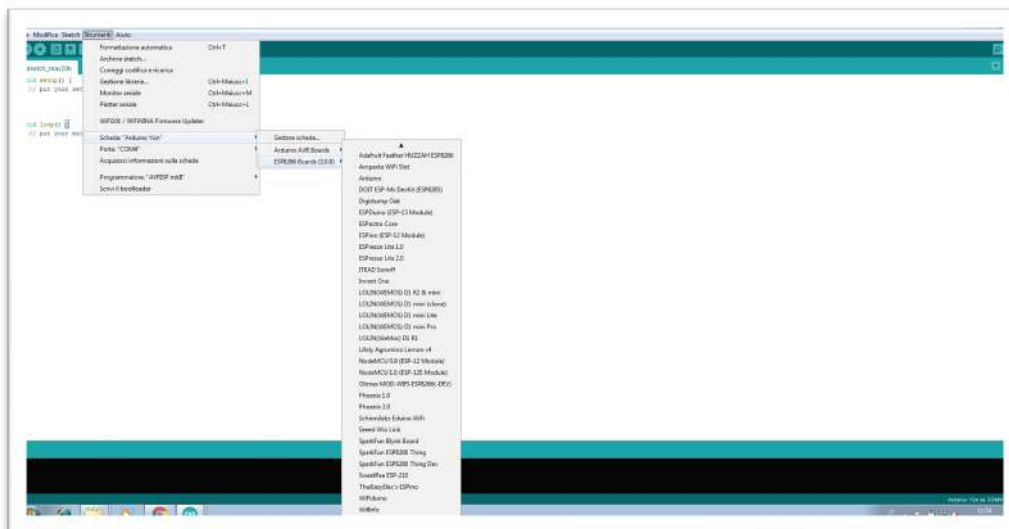
In the text box, type **ESP8266** and click on **Install**.
Important, only install version 3.0.0 or later.

After completing the installation click on Close.

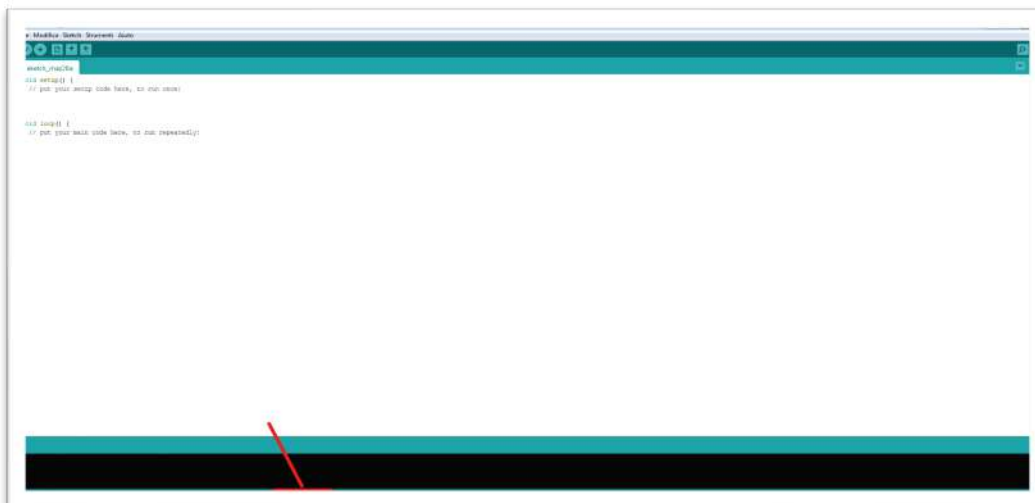


Go to **Tools** → **Board** → **Esp8266 Boards (3.0.0)** → **Agrumino Lemon v4**

and click

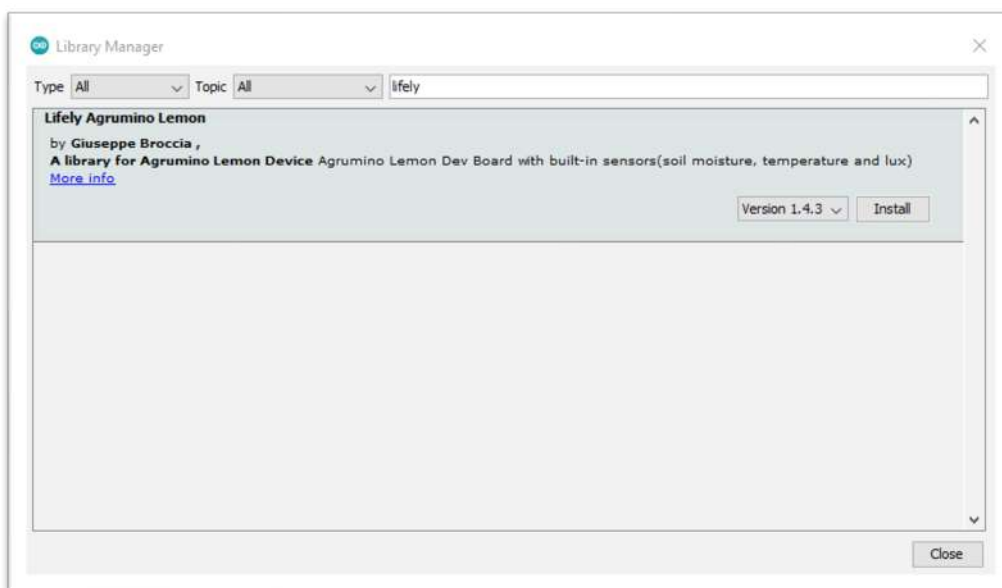


If the choice was successful, you should see “Lifely Agrumino Lemon v4” at the bottom right on Arduino IDE



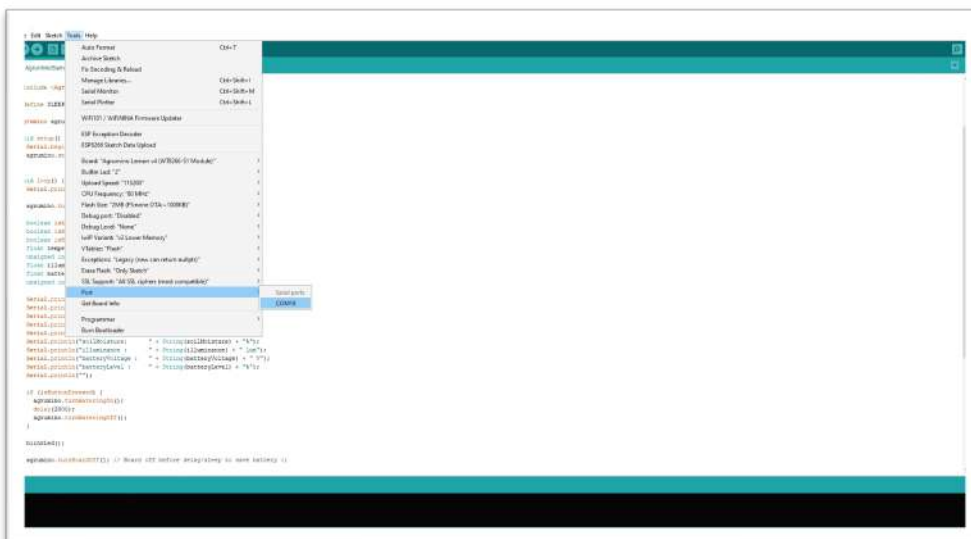
Now you have to install the official library, so go to:

Tools → **Library Manager** and type “Agrumino Lemon” or simply “Lifely” (see image below).

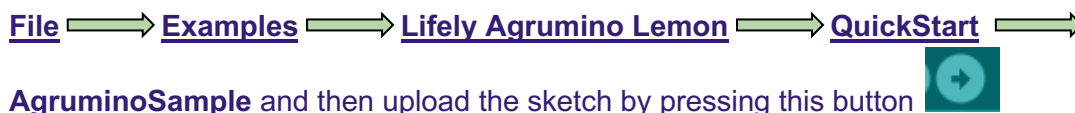


Having done this, you must now click on Install (**always install the latest release**). With the installation of the library, all example sketches will also be installed.

Now connect Agrumino to the PC and go to **Tools** → **Port**, select your port for your Agrumino

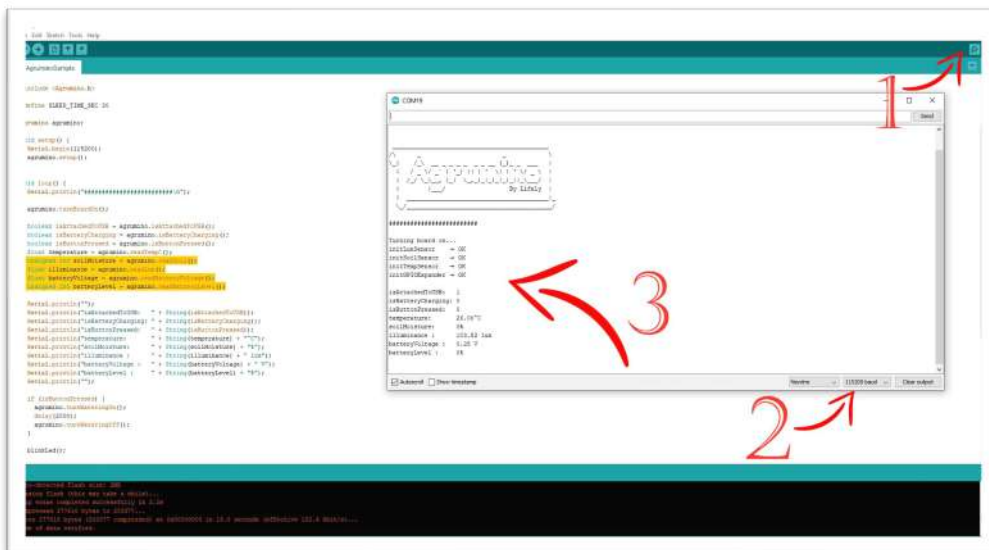


Now select the base sketch, to find it go to:



Now that you have uploaded the sketch to Agrumino, to view the data acquired by the sensors click on this button to open the serial monitor (**see arrow no. 1**) next, change the "baud rate" to 115200 (**see arrow no. 2**) and now you can finally view the data acquired by your Agrumino Lemon (**see arrow no. 3**)





From now on, you can manage your device.
Also try the other sketches in the examples folder of
Lifely Agrumino Lemon.

For support visit
www.lifely.cc