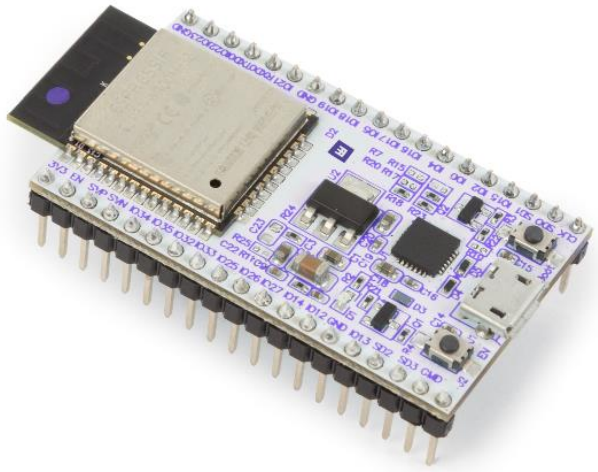
WHADDA
EXCITING ELECTRONICS

USER MANUAL

EN ESP32 development board

WPB109



whadda.com

Introduction

To all residents of the European Union
Important environmental information about this product
This symbol on the device or the package indicates that disposal of the device after its lifecycle could harm the environment. Do not dispose of the unit (or batteries) as unsorted municipal waste; it should be taken to a specialized company for recycling. This device should be returned to your distributor or to a local recycling service. Respect the local environmental rules.
If in doubt, contact your local waste disposal authorities.

Thank you for choosing Whadda! Please read the manual thoroughly before bringing this device into service. If the device was damaged in transit, do not install or use it and contact your dealer.

Safety Instructions

Read and understand this manual and all safety signs before using this appliance.

For indoor use only.

- This device can be used by children aged from 8 years and above, and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning the use of the device in a safe way and understand the hazards involved. Children shall not play with the device. Cleaning and user maintenance shall not be made by children without supervision.

General Guidelines

- Refer to the Velleman® Service and Quality Warranty on the last pages of this manual.
- All modifications of the device are forbidden for safety reasons. Damage caused by user modifications to the device is not covered by the warranty.
- Only use the device for its intended purpose. Using the device in an unauthorized way will void the warranty.
- Damage caused by disregard of certain guidelines in this manual is not covered by the warranty and the dealer will not accept responsibility for any ensuing defects or problems.
- Nor Velleman Group nv nor its dealers can be held responsible for any damage (extraordinary, incidental or indirect) – of any nature (financial, physical…) arising from the possession, use or failure of this product.
- Keep this manual for future reference.

What is Arduino®

Arduino® is an open-source prototyping platform based on easy-to-use hardware and software. Arduino® boards are able to read inputs – light-on sensor, a finger on a button or a Twitter message – and turn it into an output – activating of a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so, you use the Arduino programming language (based on Wiring) and the Arduino® software IDE (based on Processing). Additional shields/modules/components are required for reading a twitter message or publishing online. Surf to www.arduino.cc for more information.

Product Overview

The Whadda WPB109 ESP32 development board is a comprehensive development platform for Espressif's ESP32, the upgraded cousin of the popular ESP8266. Like the ESP8266, the ESP32 is a Wi-Fi-enabled microcontroller, but to that it adds support for Bluetooth low-energy (i.e. BLE, BT4.0, Bluetooth Smart), and 28 I/O pins. The ESP32's power and versatility make it the ideal candidate to serve as the brains of your next IoT project.

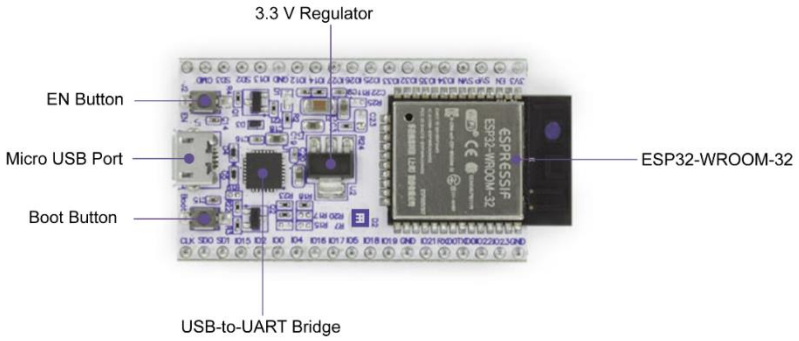
Specifications

- chipset: Espressif ESP-WROOM-32
- general purpose IO: GPIO 28
- processors:
  - CPU: Xtensa dual-core (or single-core) 32-bit LX6 microprocessor, operating at 160 or 240 MHz and performing at up to 600 DMIPS
  - ultra-low power (ULP) co-processor
- memory:
  - 520 KB SRAM
  - 448 KB ROM
- wireless connectivity:
  - Wi-Fi: 802.11 b/g/n
  - Bluetooth®: v4.2 BR/EDR and BLE
- power management:
  - max. current consumption: 300 mA
  - deep sleep power consumption: 10 µA
  - max. battery input voltage: 6 V
  - max. battery charge current: 450 mA
- dimensions: 27.9 x 54.4.9 x 19 mm

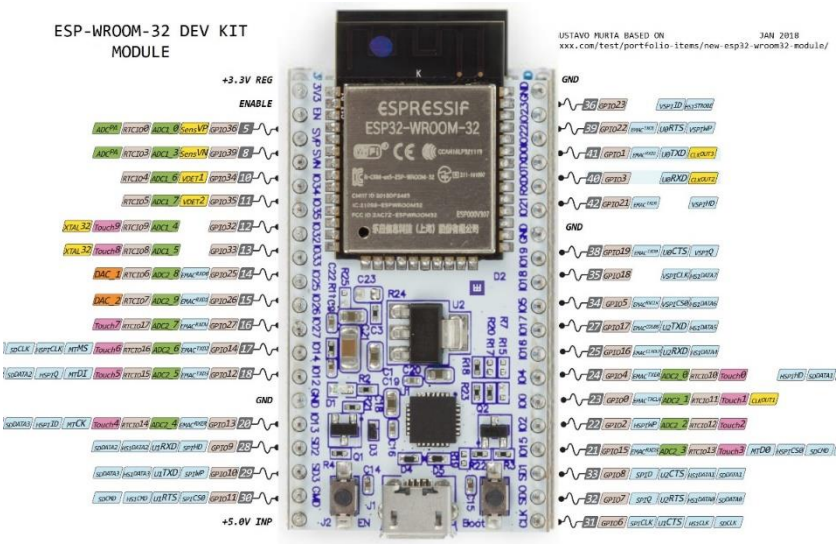
Features

- onboard Wi-Fi and Bluetooth®
- 1 x onboard red LED
- hall effect sensor
- temperature sensor
- ultra-low power analogue pre-amplifier
- dedicated reset button
- 2 × 8-bit DACs
- SPI, I^2S, I^2C and UART interfaces
- the LED PWM, UART, I2C, I2S, and general-purpose SPI functions can be configured to any GPIO
- 12-bit SAR ADC
- LED PWM (up to 16 channels)
- deep sleep mode to lower power consumption when preferable
- onboard boot button

Product Description



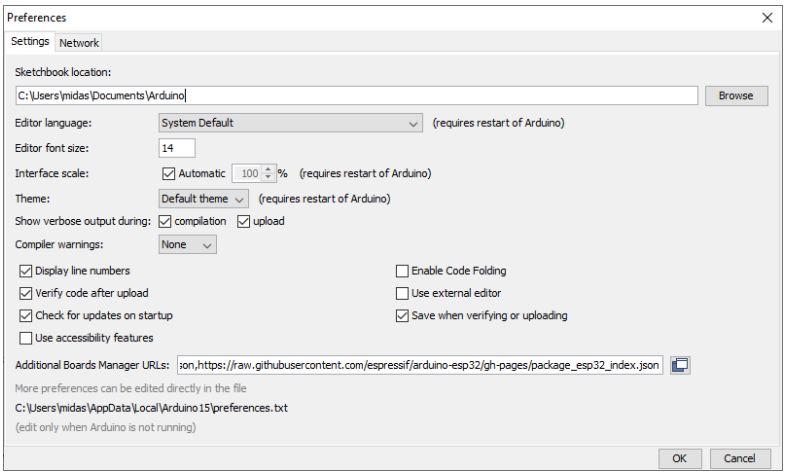
ESP32-WROOM-32	A module with ESP32 at its core.
EN button	Reset button.
USB-to-UART bridge	Download button. Holding down Boot and then pressing EN initiates the firmware-download mode for downloading firmware through the serial port.
microUSB port	Converts USB into UART serial to facilitate the communication between the ESP32 and the PC.
3.3 V regulator	USB interface. Power supply for the board as well as the communication interface between a computer and the ESP32 module.



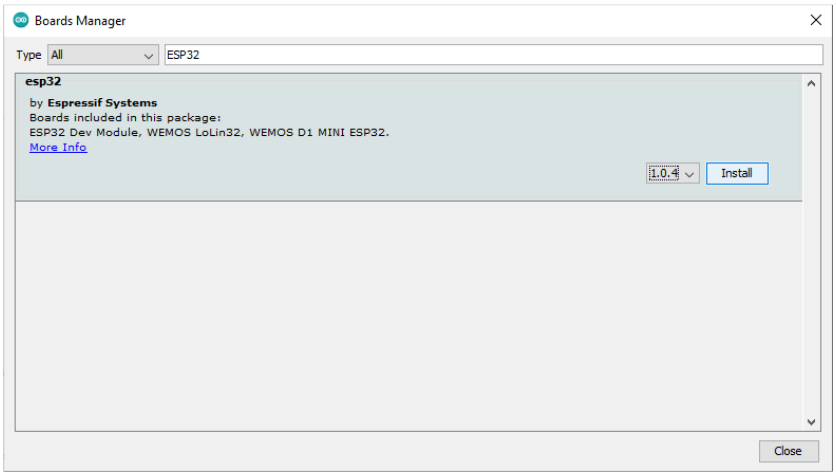
Getting Started

Installing the Required Software

1. First, make sure you have the latest version of the Arduino® IDE installed on your computer. You can download the latest version by going to www.arduino.cc/en/software.
2. Open the Arduino® IDE and open the preferences menu by going to **File > Preferences**. Enter the following URL into the "Additional Boards Manager URLs" field: https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json , and tap OK.

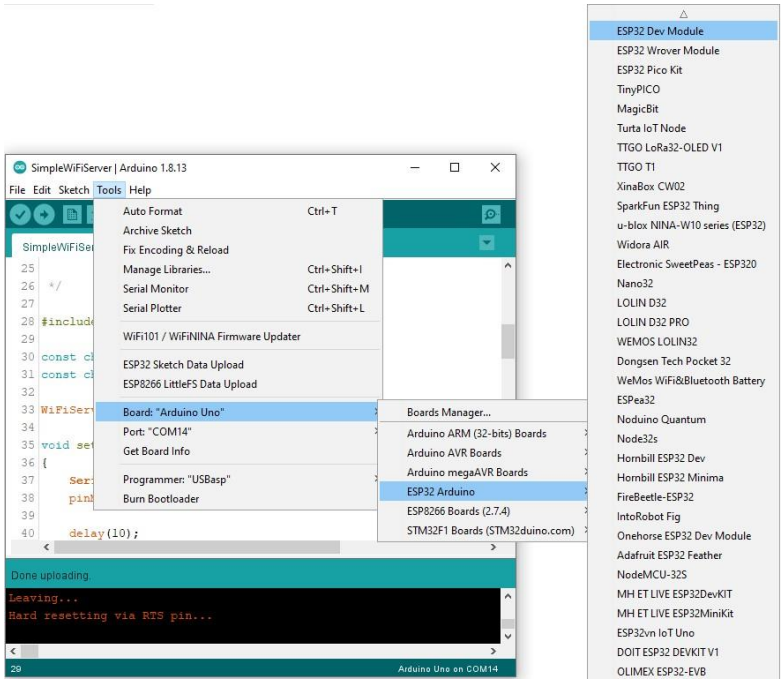


3. Open the Boards Manager from **Tools > Board menu** and install the esp32 platform by putting ESP32 into the search field, selecting the most recent version of the esp32 core (by Espressif Systems), and clicking "Install".



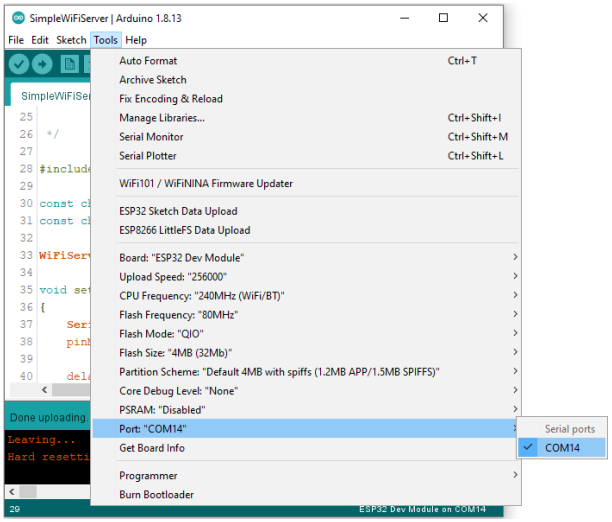
Uploading the First Sketch to the Board

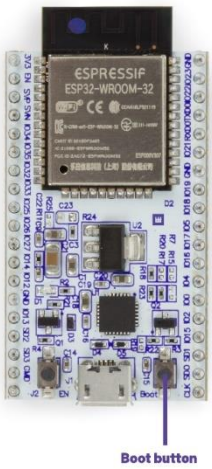
1. Once the ESP32 core has been installed, open the tools menu and select the ESP32 Dev module board by going to: **Tools > Board: "…" > ESP32 Arduino > ESP32 Dev Module**.



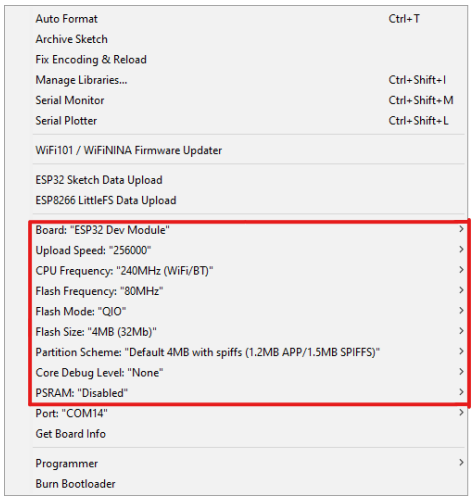
2. Connect the Whadda ESP32 module to your PC using a microUSB cable. Open the tools menu again and check if a new serial port has been added to the port list and select it (**Tools > Port: "COM14" > COM14**). If this is not the case, you may need to install a new driver to enable the ESP32 to properly connect to your computer.

   Go to https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers to download and install the driver. Reconnect the ESP32 and restart the Arduino® IDE once the process is finished.

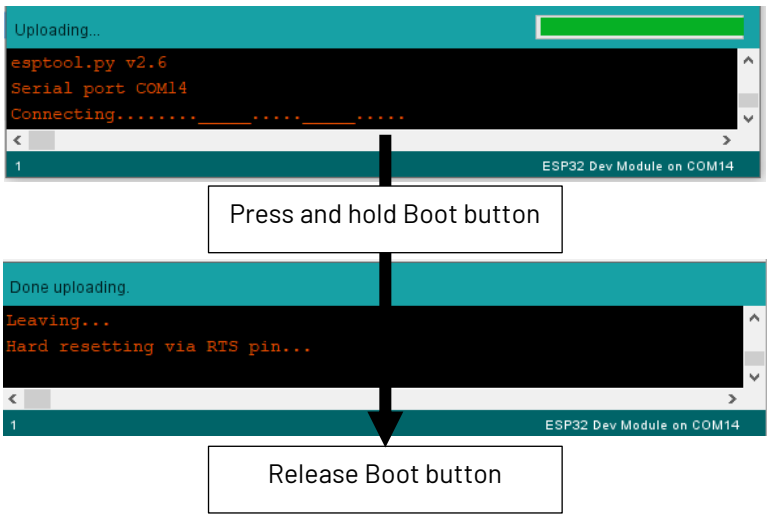




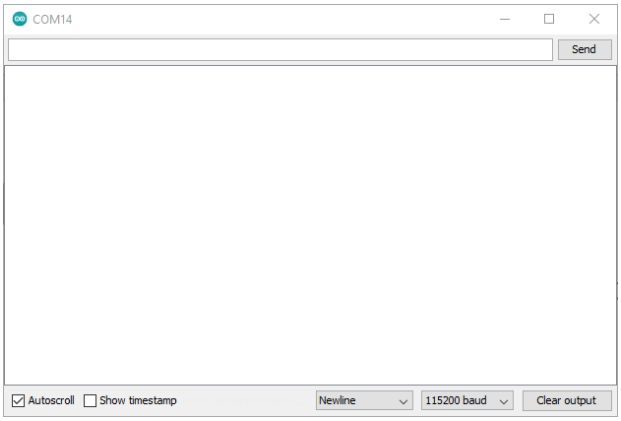
3. Check that the following settings have been selected in the tools board menu:



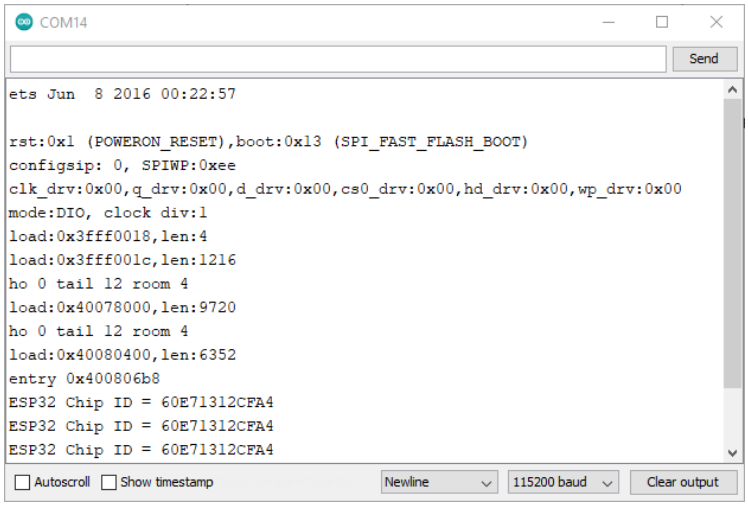
4. Click the Upload button ( ) and monitor the info messages at the bottom.
   Once the message "Connecting..." appears, **press and hold the Boot button** on the ESP32 until the uploading process has finished.



5. Open the serial monitor ( ), and check that the baud rate is set to 115200 baud:



6. Press the Reset/EN button, debug messages should start appearing on the serial monitor, together with the Chip ID (If the GetChipID example was uploaded).



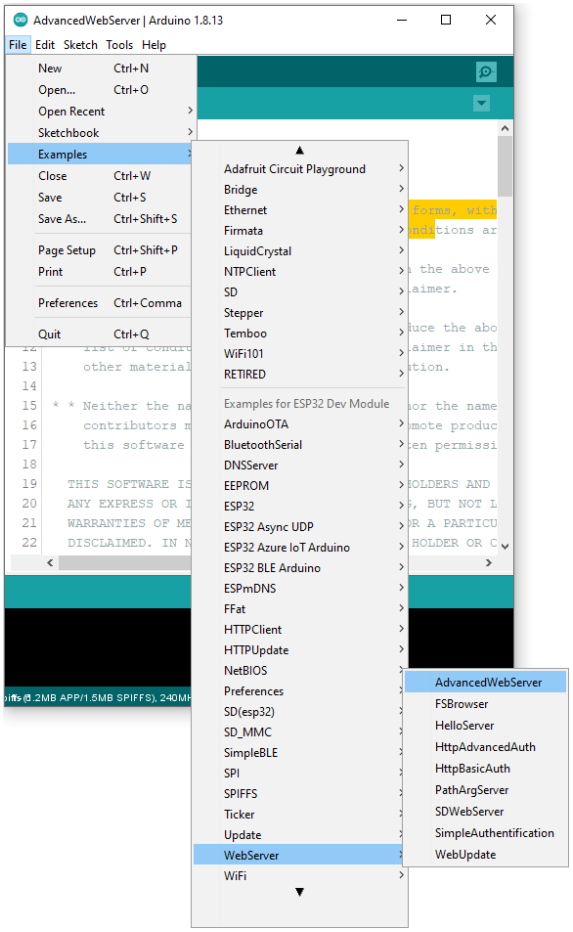
Having Trouble?

Restart the Arduino® IDE and reconnect the ESP32 board. You can check if the driver has been properly installed by checking Device manager on Windows under COM Ports to see if a Silicon Labs CP210x device is recognized. Under Mac OS you can run the command ls /dev/{tty,cu}.* in the terminal to check this.

Wi-Fi Connection Example

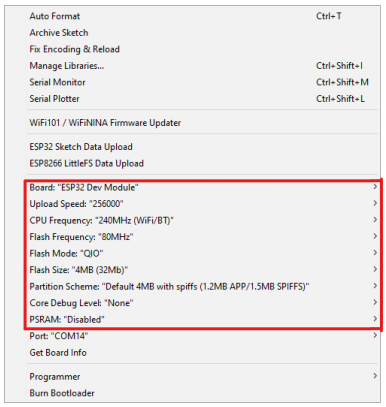
The ESP32 really shines in applications where Wi-Fi connectivity is required. The following example will harness this extra functionality by having the ESP module function as a basic webserver.

1. Open the Arduino® IDE and open the AdvancedWebServer example by going to **File > Examples > WebServer > AdvancedWebServer**.

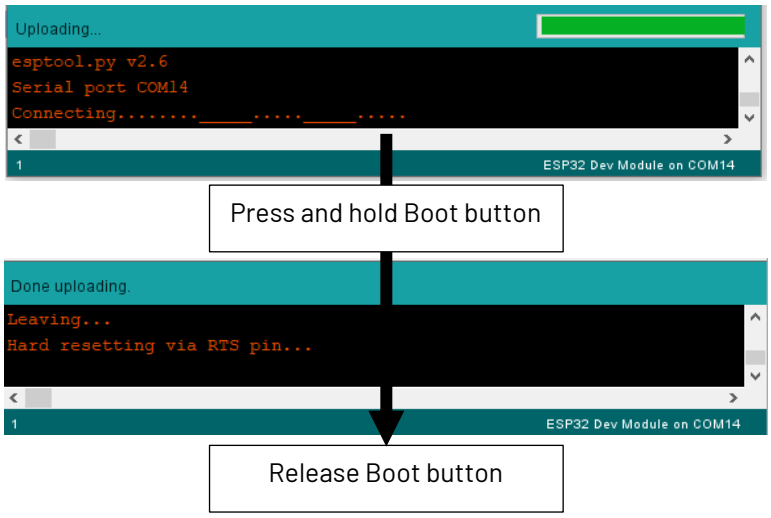


2. Replace YourSSIDHere with your own Wi-Fi network name and replace YourPSKHere with your Wi-Fi network password.

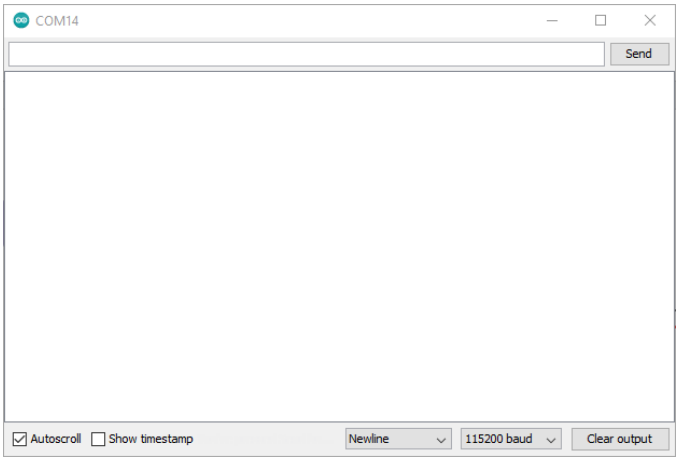
3. Connect your ESP32 to your pc (if you haven't already), and make sure that the correct board settings in the **Tools** menu are set and that the proper serial communication port has been selected.



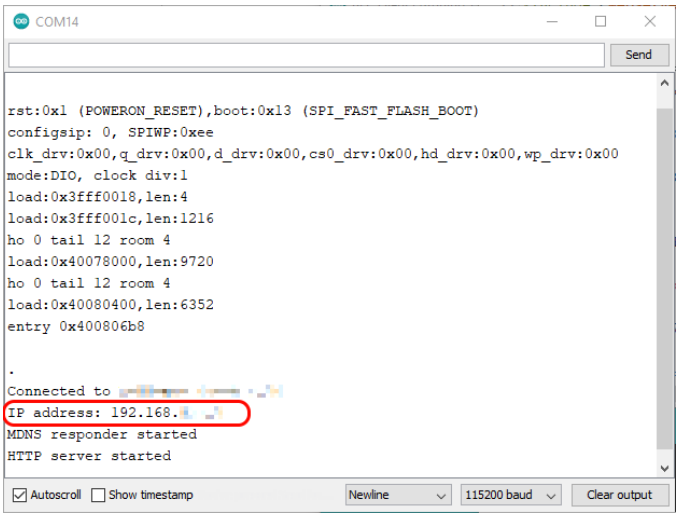
4. Click the Upload button ( ) and monitor the info messages at the bottom. Once the message "Connecting..." appears, **press and hold the Boot button** on the ESP32 until the uploading process has finished.



5. Open the serial monitor ( ) and check that the baud rate is set to 115200 baud:



6. Press the Reset/EN button, debug messages should start appearing on the serial monitor, together with status info about the network connection and the IP-address. Take a note of the IP address:



Is the ESP32 Having Trouble to Connect to your Wi-Fi?

Check that the Wi-Fi network name and password have been set up correctly, and that the ESP32 is in range of your Wi-Fi access point. The ESP32 has a relatively small antenna so it might have more difficulties to pick up the Wi-Fi signal at a certain location than your PC.

7. Open our web browser and try to connect to the ESP32 by entering its IP addresses in the address bar. You should get a webpage that shows a randomly generated graph from the ESP32.

What to do Next with My Whadda ESP32 Board?

Check out some of the other ESP32 examples that come preloaded in the Arduino® IDE. You could try out the Bluetooth® functionality by trying the example sketches in the **ESP32 BLE Arduino** folder, or try out the internal magnetic (hall) sensor test sketch (**ESP32 > HallSensor**). Once you tried out a few different examples you can try to edit the code to your liking and combine the various examples to come up with your own unique projects!

Also, check out these tutorials made by our friends at last minute engineers: lastminuteengineers.com/electronics/esp32-projects/

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