MacB IT Solutions ESP32-WROVER-IE BuzzBoxx Wi-Fi Module User Guide

Contents

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Specifications

- Product Name: BuzzBoxx
- Version: V1.0
- Release Date: 2024.12

Product Information

The BuzzBoxx is a hardware platform designed for developing applications using Arduino and ESP32 modules.

Product Usage Instructions

Introduction
The BuzzBoxx is a versatile tool for software development. It supports Arduino and ESP32 modules for creating applications.

Get Started
Begin by setting up the basic software development environment as described in the user guide.

Configure
Follow the menu-based configuration wizard to set up your development environment.

Connect
Connect the BuzzBoxx hardware to your computer using the appropriate cables.

Test Demo
Run the test demo to ensure that the hardware is functioning correctly.

Upload Sketch

To upload sketches, follow these steps:

1. Build your sketch.
2. Flash the sketch to the ESP32 module.
3. Monitor the output for any errors.

SSC Command Reference

The BuzzBoxx supports various commands for configuration:

- **op:** Perform operation commandSta**ta:** Configures station mode.Ap**p:** Configure access point mode.
- **Mac:** Set MAC address.
- **dhcp:** Enable DHCP.
- **Ip:** Set IP address.
- **Reboot:** Reboot the system.

BuzzBoxx

- BuzzBoxx is a development board. It can work independently.
- It consists of an ESP32-WROVER-IE Module supporting the Wi-Fi + BT+ BLE communication protocol and motherboard PCB.
- And this product has a 4G function. The LTE Cat-4 Module is SIM7600G-H.
- For applications ranging from low-power sensor networks to the most demanding tasks.
  ESP32 integrates Wi-Fi (2.4 GHz band) and Bluetooth 4.2 solutions on a single chip, along with dual high-performance cores and many other versatile peripherals. Powered by 40 nm technology, ESP32 provides a robust, highly integrated platform to meet the continuous demands for efficient power usage, compact design, and security.
- We provides the basic hardware and software resources that empowers application developers to build their ideas around the ESP32 series hardware. The software development framework provided is intended for rapidly developing Internet-of-Things (IoT) applications, with Wi-Fi, Bluetooth, flexible power management and other advanced system features.

Arduin
A set of cross-platform applications written in Java. The Arduino Software IDE is derived from the Processing programming language and the integrated development environment of the Wiring program. Users can develop applications in Windows/Linux/MacOS based on Arduino. It is recommended to use Windows 10. Windows OS has been used as an example in this document for illustration purposes.

Preparation
To develop applications for ESP32, you need:

- PC loaded with either Windows, Linux,x or Mac operating system
- Toolchain to build the Application for ESP32
- Arduino that essentially contains API for ESP32 and scripts to operate the Toolchain

- The ESP32 board itself and a USB cable to connect it to the PC

Download the Arduino Software

The quickest how to install the Arduino Software (IDE) on Windows machines

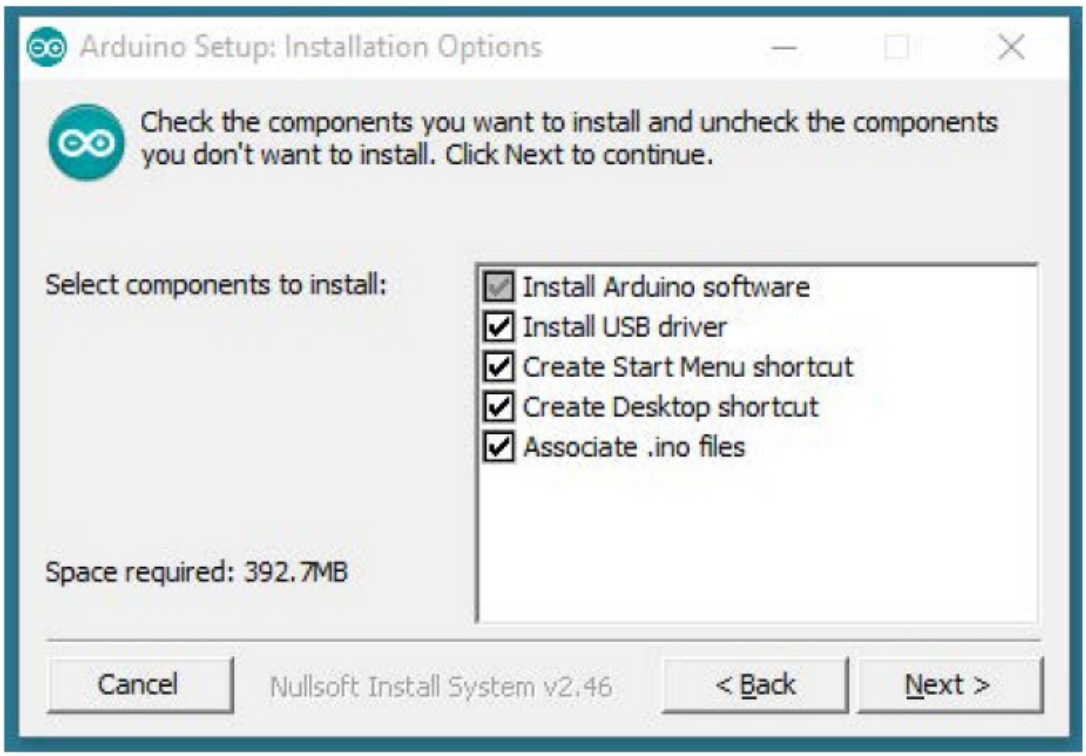
Quick Starid

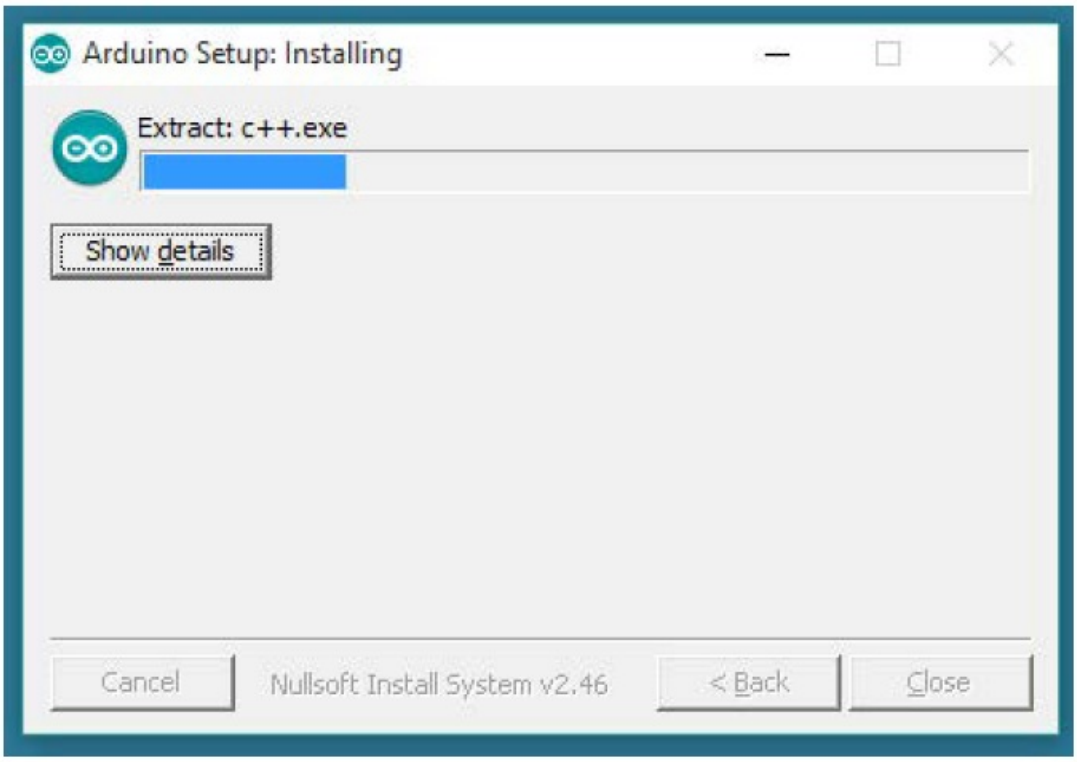
- The website provides a quick start tutorial
- **Windows:**
  - **https://www.arduino.cc/en/Guide/Windows**
- **Linux:**
  - **https://www.arduino.cc/en/Guide/Linux**
- **Mac OS X:**
  - **https://www.arduino.cc/en/Guide/MacOGuideSX**

Installation steps for Windows platform Arduino

Enter the download interface, select Windows installer to install directly

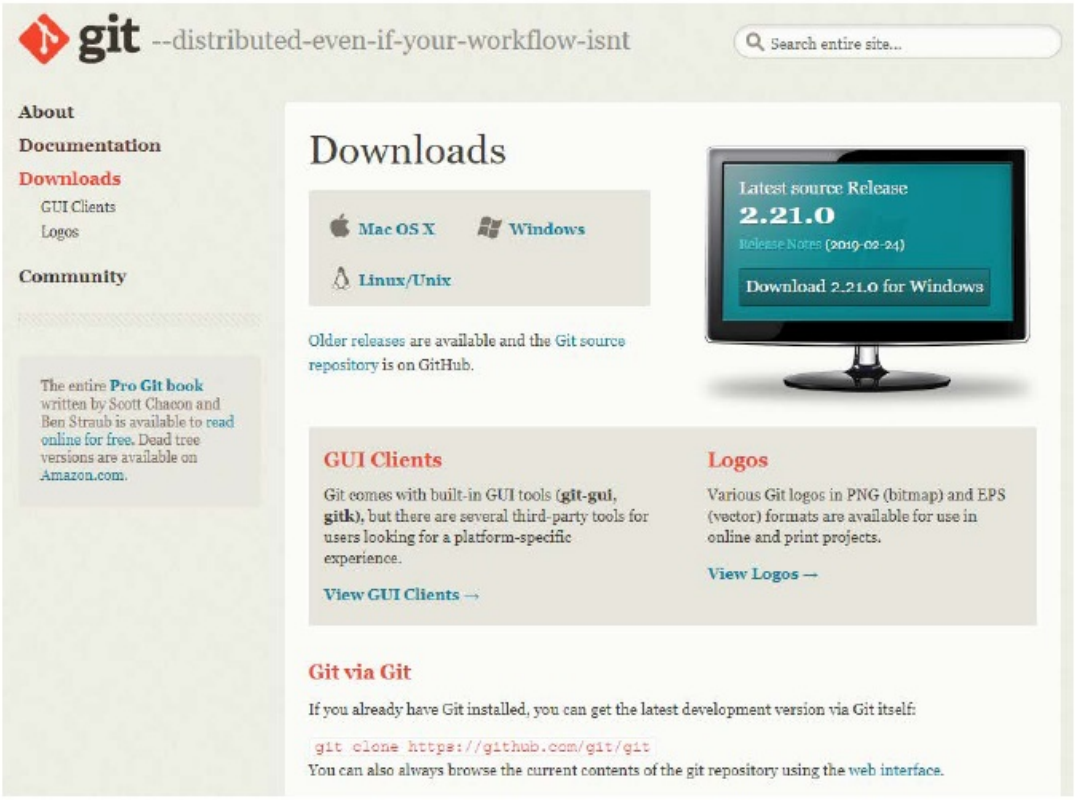
Install the Arduino Software





Download Git

Download the installation package Git.exe.



Pre-build configuration Click the Arduino icon, then right-click and select “Open folder where “ Select hardware ->

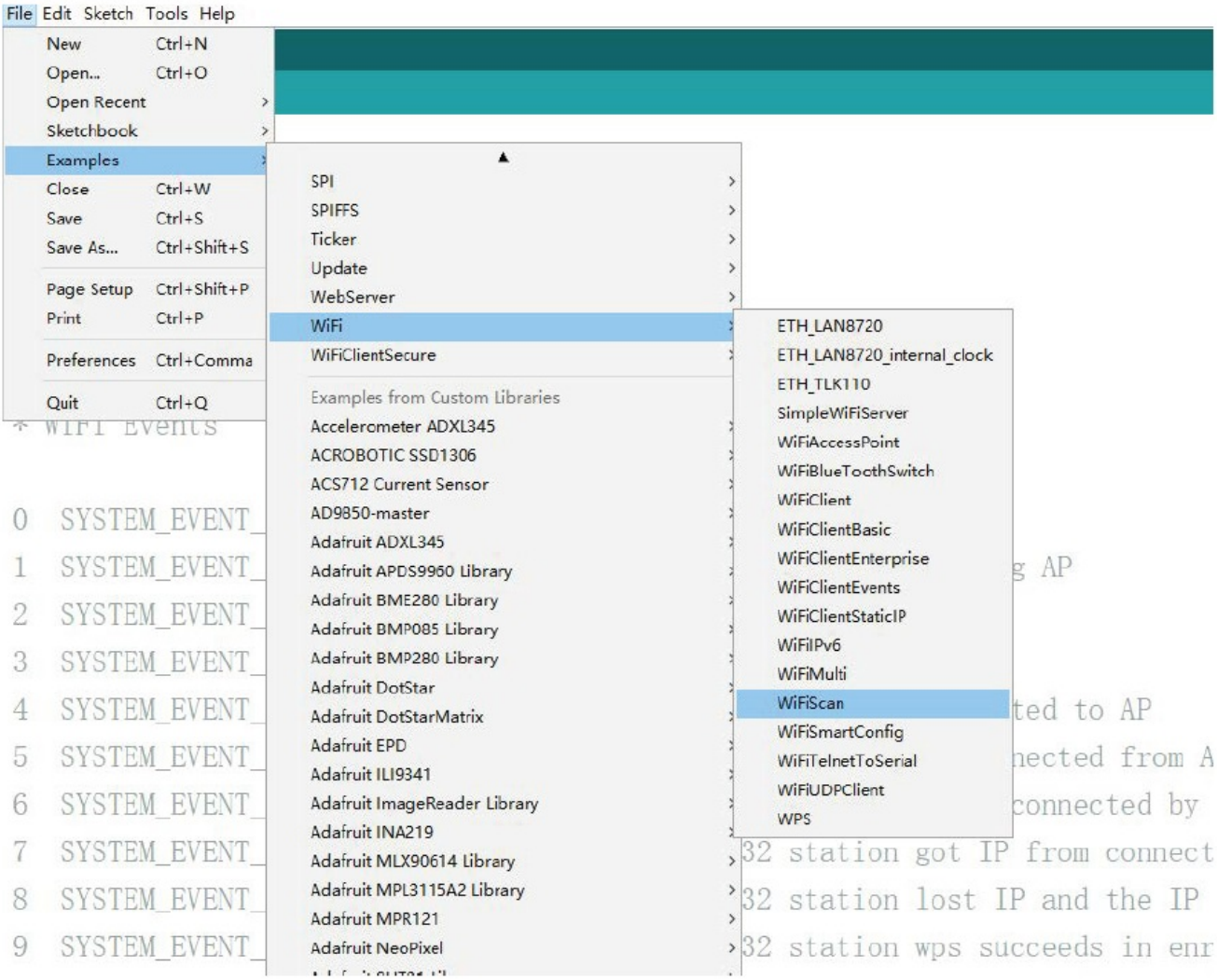
- Mouse ** Right click ** ->
- Click Git Bash Here

Cloning a remote repository

- $ mkdir espressif
- $ cd espressif
- $ git clone –recursive **https://github.com/**espressif/arduino-esp32.git esp32

Connect
You are almost there. To be able to proceed further, connect the ESP32 board to the PC, check under what serial port the board is visible, and verify if serial communication works.

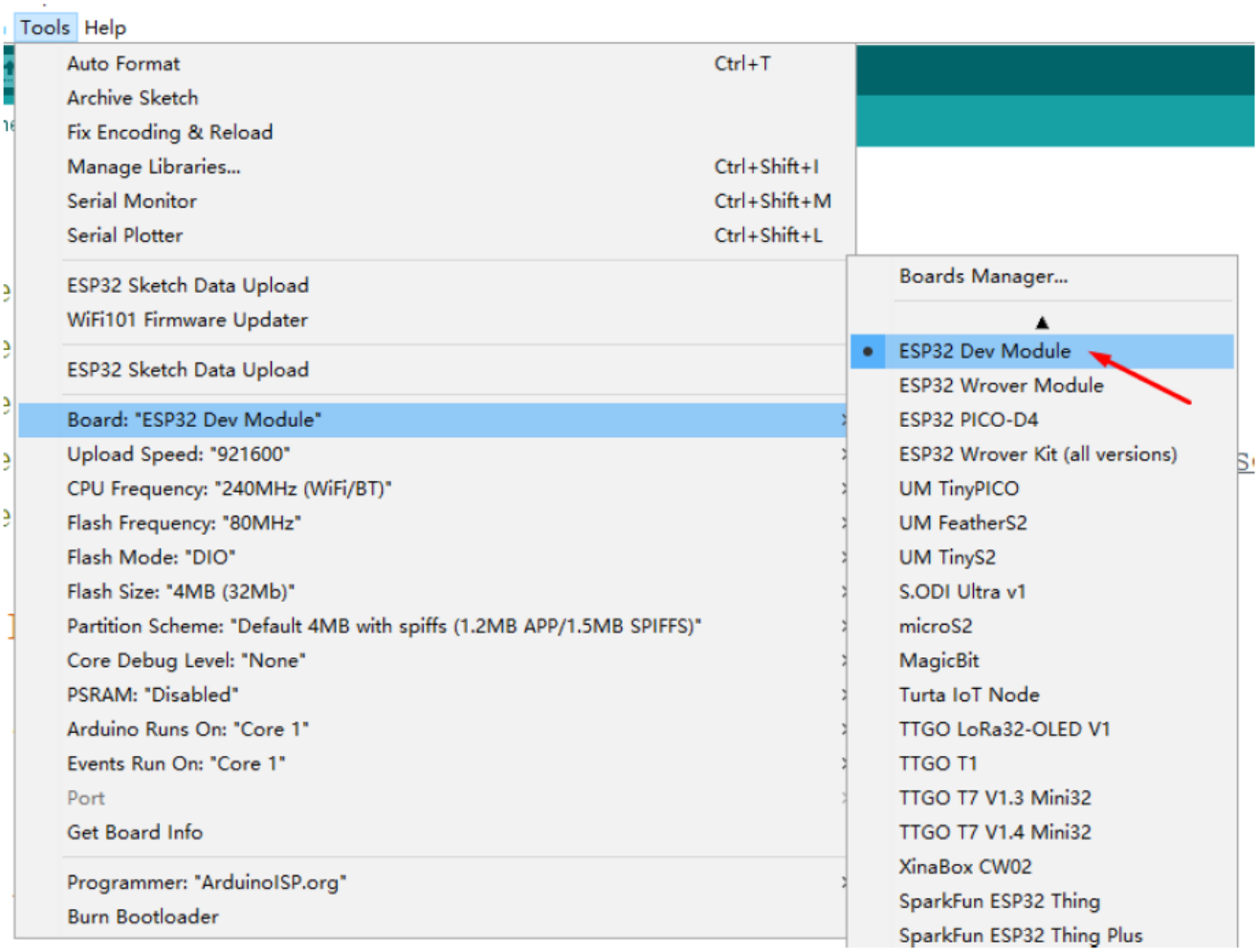
Test Demo
Select File>>Example>>WiFi>>WiFiScan



Upload Sketch

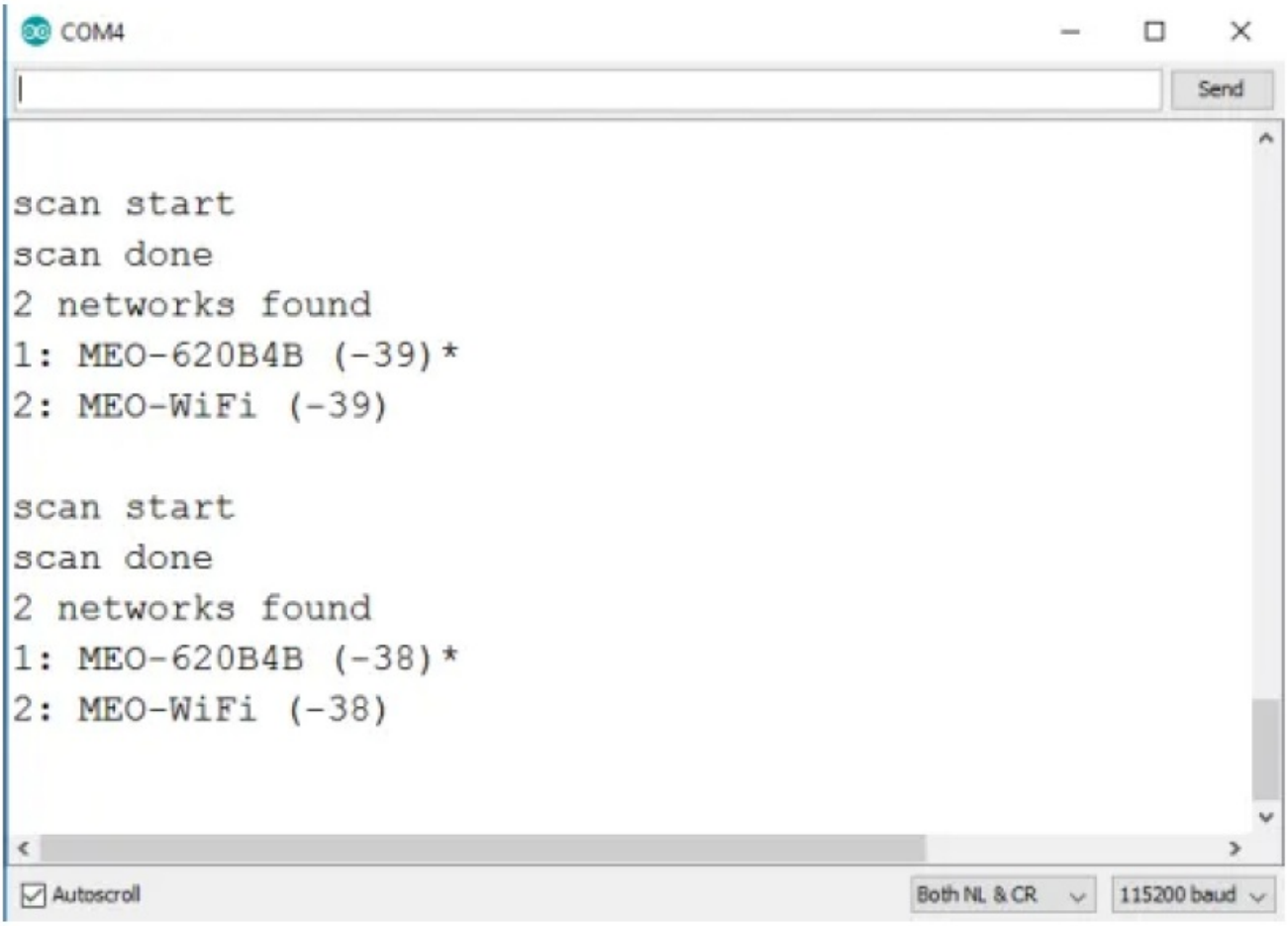
Select Board

Tools<<Board<<ESP32 Dev Module



Upload

Sketch << Upload
Serial Monitor
Tools << Serial Monitor



SSC Command Reference

op
Here are some common Wi-Fi commands for you to test the module.
Description
op commands are used to set and query the Wi-Fi mode of the system.
Example
op -Q
op: S -o wmode

Parameter

-Q	Query Wi-Fi mode.
-S	Set the Wi-Fi mode.
wmode	There are 3 Wi-Fi modes: • mode = 1: STA mode • mode = 2: AP mode • mode = 3: STA+AP mode

sta
Description
sta commands are used to scan the STA network interface, connect or disconnect AP, and query the connecting

status of the STA network interface.

Example

sta -S [-s ssid] [-b bssid] [-n channel] [-h] sta -Q
sta -C [-s ssid] [-p password] sta -D

Parameter	Description
-S scan	Scan Access Points.

Parameter

-s ssid	Scan or connect Access Points with the ssid.
-b bssid	Scan the Access Points with the bssid.
-n channel	Scan the channel.
-h	Show scan results with hidden ssid Access Points.
-Q	Show STA connect stutus.
-D	Disconnected with current Access Points.

ap

Description

ap commands are used to set the parameter of AP network interface.

Example

ap -S [-s ssid] [-p password] [-t encrypt] [-n channel] [-h] [-m max_sta] ap –Q
ap –L

Parameter

-S	Set AP mode.
-s ssid	Set AP ssid.
-p password	Set AP password.
-t encrypt	Set AP encrypt mode.
-h	Hide ssid.
-m max_sta	Set AP max connections.
-Q	Show AP parameters.
-L	Show MAC Address and IP Address of the connected station.

mac

Description

Mac commands are used to query the MAC address of the network interface.

Example

mac -Q [-o mode]

-Q	Show MAC address.
-o mode	• mode = 1: MAC address in STA mode. • mode = 2: MAC address in AP mode.

Parameter

-Q	Show MAC address.
-o mode	• mode = 1: MAC address in STA mode. • mode = 2: MAC address in AP mode.

Description
dhcp commands are used to enable or disable the dhcp server/client.
. Example

dchp -S [-o mode] dhcp -E [-o mode] dhcp -Q [-o mode]

Parameter

	Start DHCP (Client/Server).
-E	End DHCP (Client/Server).
-Q	Show the DHCP status.
-o mode	• mode = 1: DHCP client of STA interface. • mode = 2: DHCP server of AP interface. • mode = 3: both.

ip
Description
ip command is used to set and query the IP address of the network interface.
Example

ip -Q [-o mode] ip -S [-i ip] [-o mode] [-m mask] [-g gateway]

-Q	Show IP address.
-o mode	• mode = 1: IP address of interface STA. • mode = 2: IP address of interface AP. • mode = 3: both
-S	Set IP address.
-i ip	IP address.
-m mask	Subnet address mask.
-g gateway	Default gateway.

reboot
Description
reboot command is used to reboot the board.
Example
rebot

ramThe
ram command is used to query the size of the remaining heap in the system.
Example
ram

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
IMPORTANT NOTE:
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, under part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This

equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

FAQS

Q: Can I use BuzzBoxx for other hardware platforms?
A: The BuzzBoxx is specifically designed for use with Arduino and ESP32 modules. Compatibility with other platforms is not guaranteed.

Q: How can I troubleshoot connectivity issues?
A: Ensure that all connections are secure and that the drivers are properly installed. Restarting both the hardware and software can often resolve connectivity issues.

Documents / Resources

	MacB IT Solutions ESP32-WROVER-IE BuzzBoxx Wi-Fi Module [pdf] User Guide ESP32-WROVER-IE, ESP32-WROVER-IE BuzzBoxx Wi-Fi Module, BuzzBoxx Wi-Fi Module, Wi-Fi Module, Module

References

- arduino.cc/en/Guide/Linux
- arduino.cc/en/Guide/MacOSX
- User Manual