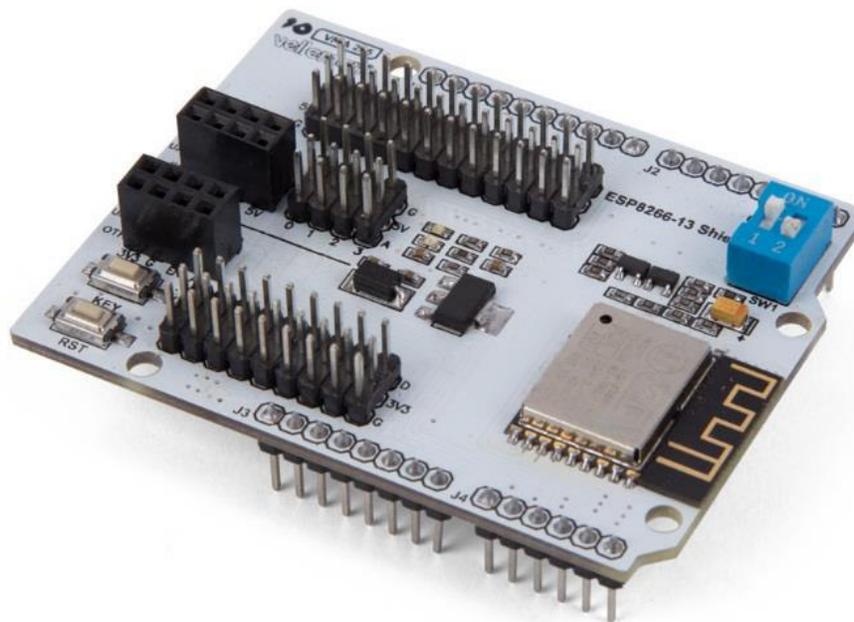


**EN** WLAN ESP-WROOM-02 Shield

WPSH205



## 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](http://www.arduino.cc) for more information.

## RED Declaration of Conformity

Hereby, Velleman Group nv declares that the radio equipment type WPSH205 is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: [www.velleman.eu](http://www.velleman.eu).

## Product Overview

This convenient ESP-WROOM-02 shield for Arduino® includes a pre-soldered ESP8266 module, and power supply – so all the hard work is done and you will receive a plug-and-play ESP8266 solution for your Arduino®.

You can start straight away with the ESP8266 in serial AT command serial mode or – if you're interested in deeper exploration of the ESP8266 – you can upload different firmware such as NodeMCU and others.

All the GPIO pins are brought out to inline header pins, and the shield has a great online user manual, so you'll be up and running in no time at all.

## Specifications

- chipset: ESP8266
- Wi-Fi operation current:
  - continuous transmission operation: 70 mA (200 mA max.)
  - idle mode: < 200 µA
- serial WiFi transmission rate: 110-460800 bps
- operating humidity: 10%-90% non-condensing
- operating temperature: -10 to 70 °C
- weight: ± 20 g (0.7 oz)

## Pin Layout

Part	Pin	Ground	Remark
Arduino®	G	Digital IO	
	D	Analogue IO	
	A	5V	
	5V	Arduino® Uno TX	Connection with ESP8266
	TX	Arduino® Uno TX	Connection with ESP8266
	RX	Arduino® SCL	
	SCL	Arduino® SDA	
	SDA	Ground	
ESP8266	G	Ground	
	D	Digital IO	
	3V3	3.3V	
	RX0	ESP8266 RX0	Connection with Arduino®
	TX0	ESP8266 TX0	Connection with Arduino®
	EN	ESP8266 EN	
	AD	ESP8266 AD	
	RST	ESP8266 reset	
KEY	ESP8266 WiFi configuration		
	SW	ESP8266 and Arduino®	When programming Arduino® with IDE, SW1 and SW2 must be set to OFF

## Example

### Hardware Requirements

- 1x Arduino® Uno board
- 1x WPSH205
- 1x PC with wireless LAN
- 1x USB cable

### Software Requirements

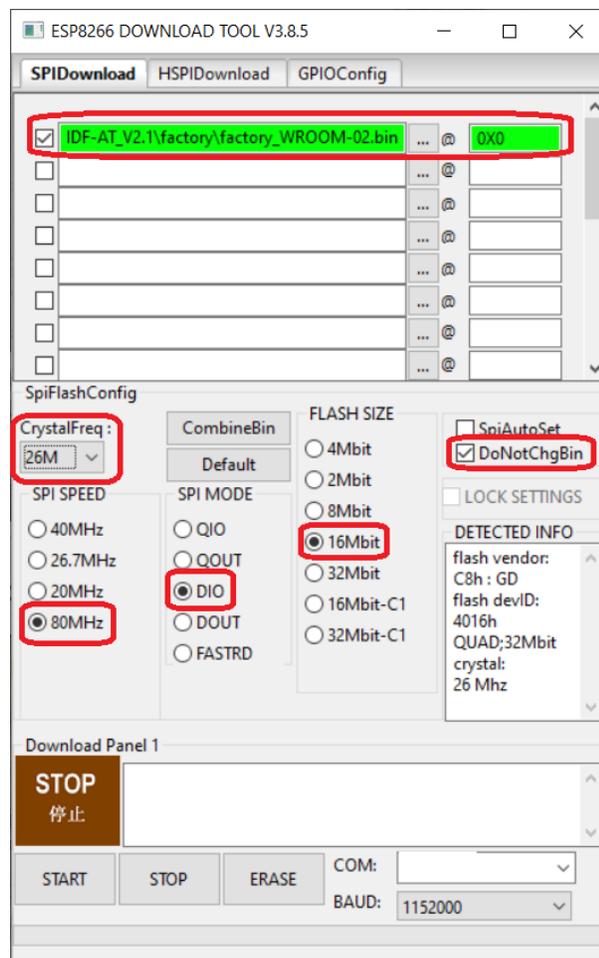
- 1x Arduino® IDE
- TCPUDPDbg download (for sending and receiving Internet communication data)

The standard firmware programmed onto the ESP-WROOM-02 module is designed to work in conjunction with an Arduino® UNO or MEGA compatible board (e.g. [Whadda ATmega328 Development board](#)). The Arduino® compatible board uses the ESP-WROOM-02 as a Wi-Fi modem to connect to a wireless network or even host its own access point. By using a standard set of AT commands the Arduino® compatible board can communicate to the ESP-WROOM-02 how the Wi-Fi modem needs to be set up.

Before the shield can be used in this manner however, some initial configuration steps need to be done to update the firmware on the module and enable it to communicate with the Arduino® compatible board:

1. Connect a USB to Serial adapter to the ESP13 shield UART pins (RX->TX0, TX->RX0)
2. Use the ESP8266 flashing tool to flash the most recent IDF-AT firmware (v2.1 or higher):
  - a. Download the flashing tool here (under Flash Download Tools: [www.espressif.com/en/support/download/other-tools](http://www.espressif.com/en/support/download/other-tools)).
  - b. Download the most recent IDF-AT firmware (v2.1 or higher) here: [docs.espressif.com/projects/espressif-at/en/latest/AT\\_Binary\\_Lists/ESP8266\\_AT\\_binaries.html](http://docs.espressif.com/projects/espressif-at/en/latest/AT_Binary_Lists/ESP8266_AT_binaries.html)
  - c. Open the flashing tool and select developer mode and ESP8266. Use the SPIDownload tab to set the factory\_WROOM-02.bin file (located in the factory folder of the downloaded ZIP file) to be flashed starting at memory location 0x0.

Make sure all settings are configured as in the screenshot below:



- d. Press and hold the RST and KEY buttons on the shield, while pressing START in the ESP8266 Download tool.
  - e. Release the RST button but keep holding down the KEY button until the firmware download has finished.
3. The new firmware enables another UART port on the ESP-WROOM-02 module that listens to AT commands. Connect the USB to serial adapter to this second UART port by connecting RX to Pin 15 on the shield, and TX to Pin 13 on the shield (on the lower ESP-WROOM-02 side).
  4. Open the serial monitor in the Arduino® IDE, set it to a baud rate of 115200 and make sure both NL & CR is configured.
  5. Briefly press the RST button on the shield, if everything is connected properly the word "ready" should appear in the serial monitor. Enter AT+GMR to get an overview of the firmware version installed on the module.
  6. To be able to use the SoftwareSerial library to connect to the ESP-WROOM-02 module, the baud rate of the module needs to be lowered to 9600 baud. This can be done by sending the following AT command: AT+UART\_DEF=9600,8,1,0,0.
  7. Reconfigure the Serial monitor to now use a baud rate of 9600, and briefly hit the RST button. The word "ready" should again appear in the serial monitor.
  8. Remove the connections to the USB to serial adapter and connect the shield to an Arduino® compatible board. Use two female-to-female jumper cables to connect pin 13 of the ESP side to digital pin 7 on the Arduino® board side, and pin 15 of the ESP13 side to digital pin 6 on the Arduino® board side. Make sure both DIP switches are set to the lowest position.
  9. Install the WiFiEspAT library using the Arduino® IDE library manager.
  10. Your shield is now configured to be used with an Arduino® compatible board using the WiFiEspAT library! You can follow the Getting started guide of the WiFiEspAT library (available here: [github.com/jandrassy/WiFiEspAT](https://github.com/jandrassy/WiFiEspAT)) to learn how to use the included examples of the library.



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