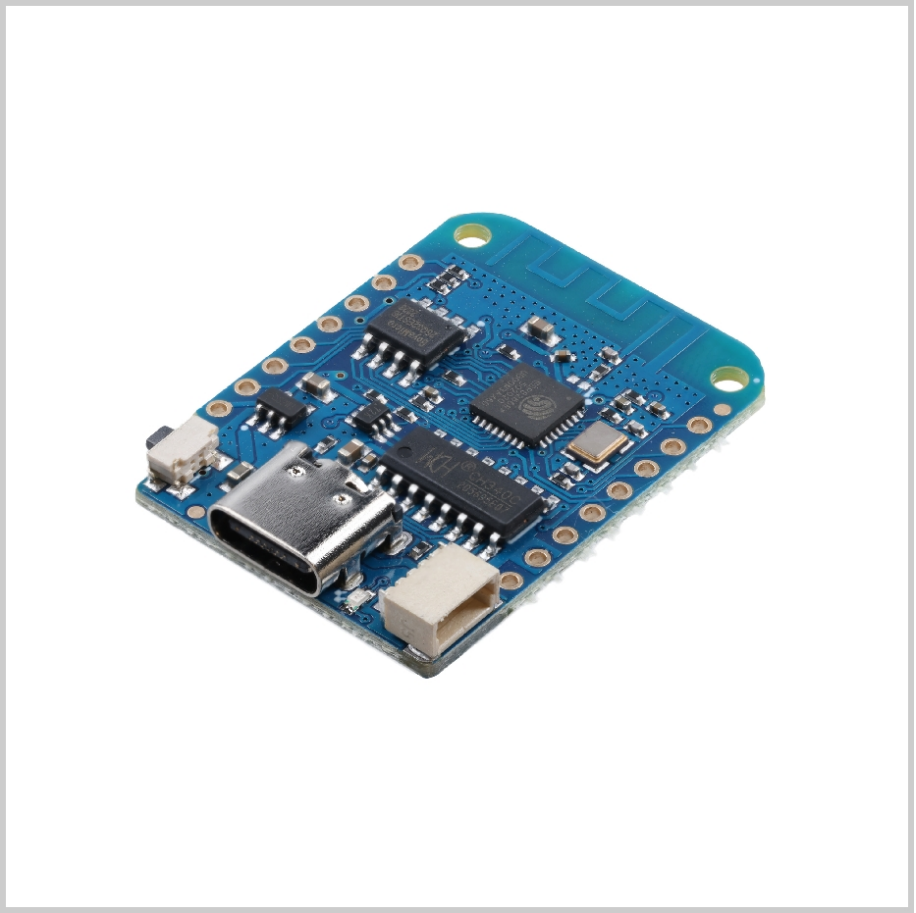
Operating instructions

AZ-Delivery D1 mini V4



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All relevant national, regional and local safety regulations must be observed when installing and using this product. For safety reasons and to ensure compliance with the documented system data, only the manufacturer may carry out repairs to components.

Failure to observe these instructions may result in injury or damage to property.

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General notes: Some product names used in this manual are used for identification purposes only and may be trademarks of their respective companies.

Product changes

Year	Version	Modifications
	V1.0.0	-

Versions of this documentation

date	Version	Changes

Operating instructions D1 mini V4

Table of contents

1. Foreword

1.1. Description of the target group

These instructions are intended for hardware and software developers with expertise in the field of electrical engineering and for original equipment manufacturers (OEMs).

1.2. Conventions used in this manual

The following formatting is used in this document:

Bold print

Names of product elements, commands, options, programs, processes, services and utilities Names of interface elements (e.g. windows, dialogue boxes, buttons, fields and menus)

Interface elements that the user selects, clicks, presses or types

Italics

Publication title referred to in the text Focus (e.g. a new term)
Variables

`Courier`

System output, e.g. error message or script
URLs, complete paths, file names, prompts and syntax

1.3. Explanation of the safety instructions

The following warnings are used in these operating instructions:

Personal injury:

DANGER indicates an imminent danger. If it is not avoided, death or serious injury will result.

WARNING indicates a potentially imminent danger. If it is not avoided, death or serious injury may result.

CAUTION indicates a potentially imminent danger. If it is not avoided, slight or minor injuries may result.

Product/machine/equipment damage (ANSI Z535 only):

NOTICE indicates a potentially harmful situation. If it is not avoided, the system or something in its vicinity may be damaged.

1.4. Storage instructions

Read and observe this manual and the safety instructions it contains before using this product. Failure to do so may result in damage to the product.
Follow all instructions. This will prevent fire, explosions, electric shocks or other hazards that could lead to property damage or personal injury.
The product may only be used by persons who have fully read and understood the contents of these operating instructions.
Ensure that every person using the product has read and followed these warnings and instructions.
Keep all safety information and instructions for future reference and pass them on to subsequent users of the product. The manufacturer is not liable for damage to property or personal injury c a u s e d by improper handling or failure to observe the safety instructions. In such cases, the warranty is void.

1.5. Procurement of documents and information

1.5.1. Internet

The latest version of the documentation is available at the following address: www.az-delivery.de

1.5.2. Other languages

This is the operating manual in German. Manuals in other languages will be provided on request if available.

1.5.3. Feedback on the documentation

Comments on AZ-Delivery documentation can be sent by e-mail to the following address: redaktion@az-delivery.com

We welcome your comments.

1.5.4. Support and customer service

For further questions, information, technical support or to order operating instructions, please contact the manufacturer:

AZ-Delivery Vertriebs GmbH
Bräugasse 9
94469 Deggendorf

info@az-delivery.com

2. Description of the product

2.1. Intended use

The AZ-Delivery D1 mini V4 was developed as a test module or prototyping platform for learning the programming of microcontrollers. Any other use beyond this is not intended. Never use the module for safety-relevant applications.

The AZ-Delivery D1 mini V4 may only be used with the following software, original accessories and components:

- Espressif SDK
- Arduino core
- USB-C cable, USB2.0 certified

2.2. Product description

The AZ-Delivery D1 mini V4 is a so-called "physical computing platform" similar to the modules of the well-known Arduino family. The module essentially consists of two components, a USB-to-serial converter (CH340) and a microcontroller with a highly integrated TCP/IP stack (ESP8266). The module also has a micro USB socket for power supply and as a programming interface, a controllable LED and a fixed voltage regulator.

2.3. Scope of delivery

- 1x AZ-Delivery D1 mini V4 WiFi board
- 2x socket strip 8-pin short
- 2x socket strip 8-pin long
- 2x pin header 8-pin

2.4. Dimensions

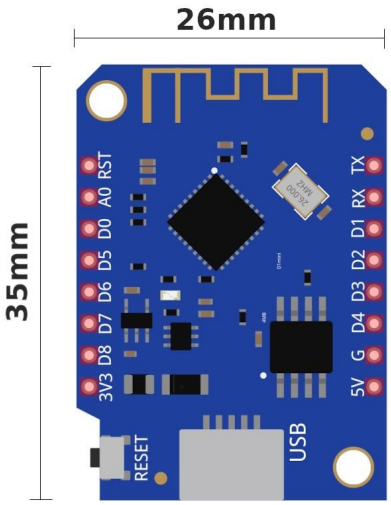


fig. 2.4.1 - AZ-Delivery - D1 mini - Dimensions in mm

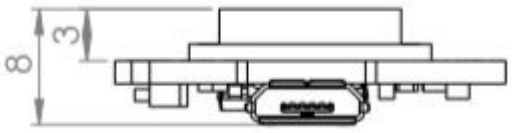


fig. 2.4.2 - AZ-Delivery - D1 mini - Dimensions in mm

2.5. Technical data

Technical data	
Device name	AZ-Delivery D1 mini V4
Model	V4
Processor	ESP8266EX
Logic level	3.3V
Power supply	Supply via USB interface: 5.1V Supply via input pins: 3.0V - 3.6V
Max. Load capacity of the GPIO pins	10mA each, max. 50mA total
Energy consumption	Depending on the operating mode, up to a maximum of 500mA (peak)
Frequency range	ISM band at 2.4Ghz: 2.412-2.472 GHz
Maximum transmission power	Up to 20 dBm (0.1W) (802.11b) @ 11Mbps Up to 19 dBm (0.08W) (802.11g) Up to 19 dBm (0.08W) (802.11n)
Interfaces	UART / GPIO / ADC / PWM / SPI / I2C
Max. Baud rate UART	Up to 4608000 bps
I / O pins	11
USB interface	CH340G, USB-C
Grid dimension	2.54 mm
Requirements for the Operating environment	Exclusively indoor
Dimensions	L = 34 mm, W = 26 mm, H = 8 mm
Weight	3g
I2C connection	JST SH1.0 4 pin

2.6. Requirements for the operating environment

Only operate the product in a clean, dry and dust-free environment. Never expose the product to water or moisture.

Please note that the processor generates heat during operation and ensure adequate ventilation to dissipate this heat.

Protect the module from conductive surfaces during operation to avoid short circuits.

2.7. Requirements for the power supply

A stabilised direct current source with appropriate protective devices is required to supply the module via the input pins.

Each voltage source must comply with the relevant national standards and regulations. Only use a fused, stable DC voltage source with 5V and at least 500mA nominal power.

For supplying the module via the USB interface:
Only use a power supply unit that complies with the USB specifications.

2.8. Product elements

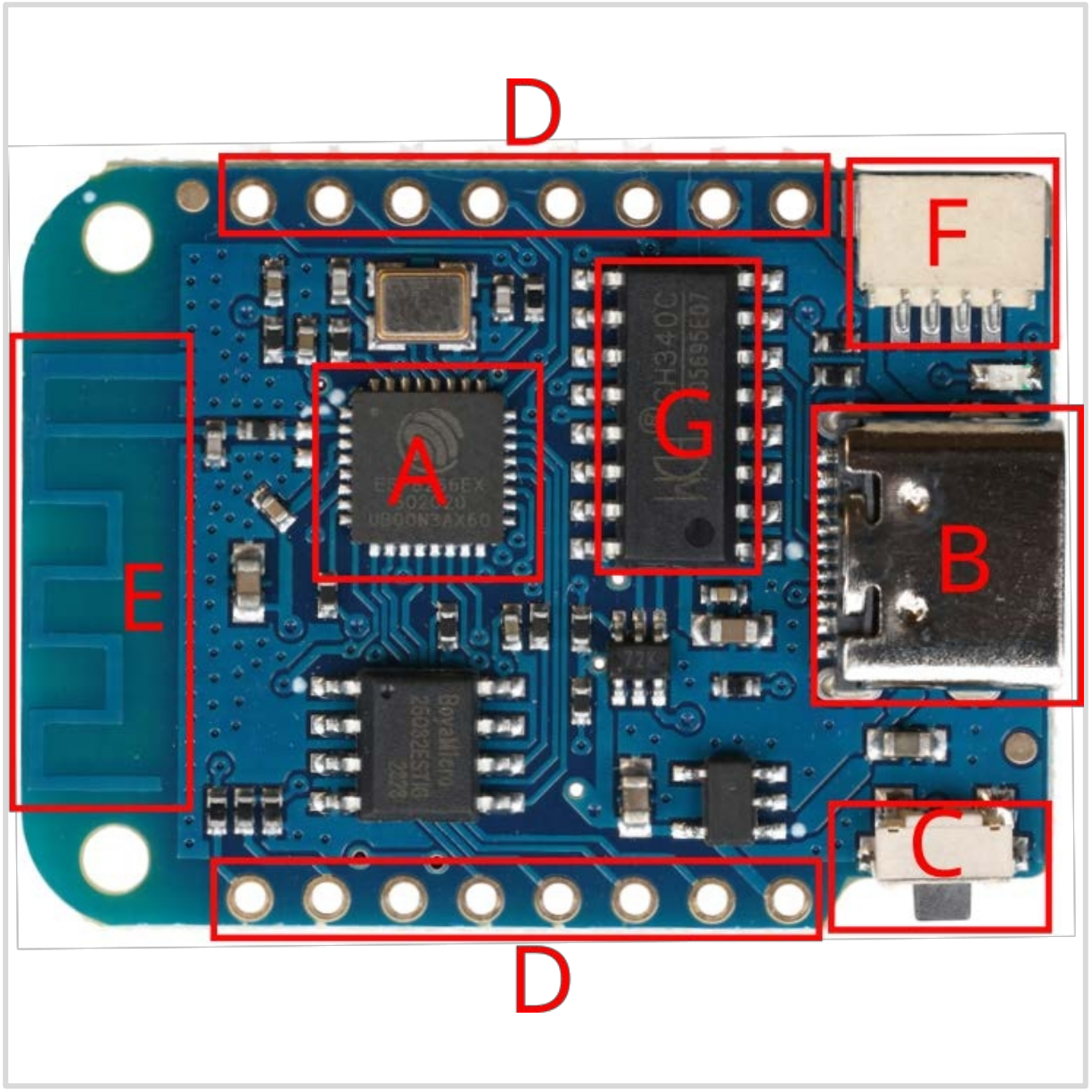


fig. 2.8.2 - AZ-Delivery - Di mini V4 - Top side

A. ESP8266EX
B. USB-C socket
C. Reset button
D. GPIOs
E. Wlan antenna
F. JST SH1.0 4pin I2C connection
G. CH340C

2.9. Pinout Diagram

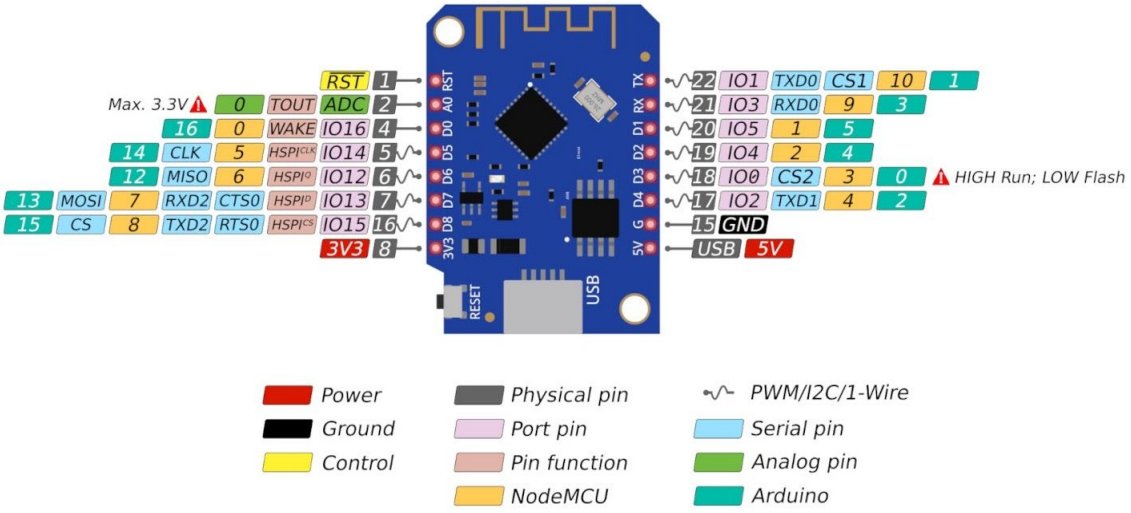


fig. 2.9.1 - AZ-Delivery - Di mini V4- Pinout Diagram

3. Functionality

The AZ-Delivery D1 mini V4 was created from the requirement to make a WiFi development board with the simplest possible circuitry available to specialists on the European market at the lowest possible price. The module essentially consists of the following components:

3.1. ESP8266EX

The ESP processor integrates the Tensilica L106 ultra-low-power 32-bit microprocessor architecture in a small housing and clocks at 80 MHz and 160 MHz. It supports RTOS and integrates Wi-Fi MAC/BB/RF/PA/LNA functions.

The ESP8266EX WiFi module supports the IEEE802.11 b/g/n standard and implements the complete TCP/IP protocol stack. Users can use this module to add network functions to existing devices or create separate network controllers. The ESP8266EX is a powerful wireless SOC (SystemOnaChip) that offers maximum benefit at the lowest cost and almost unlimited possibilities for integrating WiFi functions into other systems. The ESP8266EX is a complete and self-contained WiFi network solution that enables both host and client operation.

The ESP8266MOD is able to boot directly from the SPIFFS integrated in the module (external flash memory with SPI connection). The built-in cache helps to improve system performance and reduce memory requirements.

The ESP takes over the functionality of a WiFi adapter and can be added to any microcontroller-based design. Communication is straightforward via the SPI/SDIO, I2C or UART interfaces.

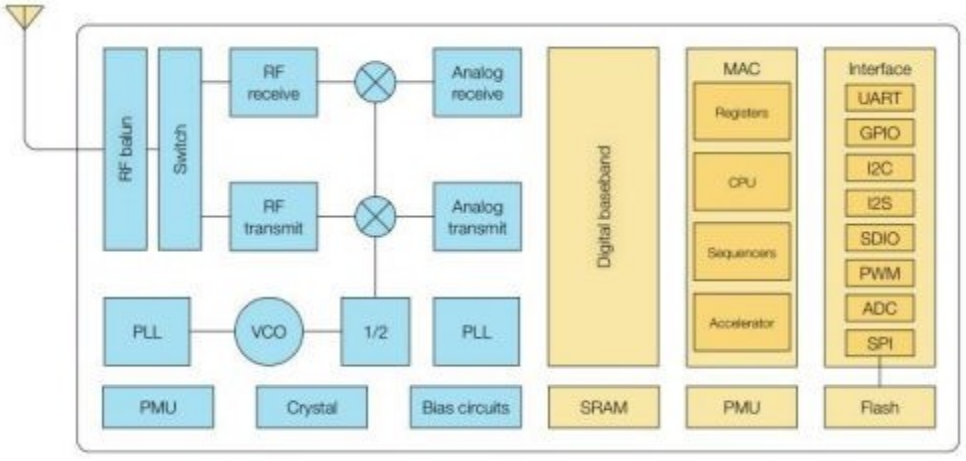


fig. 3.1.1 - ESP8266MOD 12-F - Functionality

3.2. CH340

The CH340 IC is a widely used USB to serial converter with TTL and UART compatibility. It serves as an inexpensive and reliable programming interface and can be found in many IoT devices as well as in everyday hardware such as coffee machines, barcode scanners, children's toys or even vehicles.

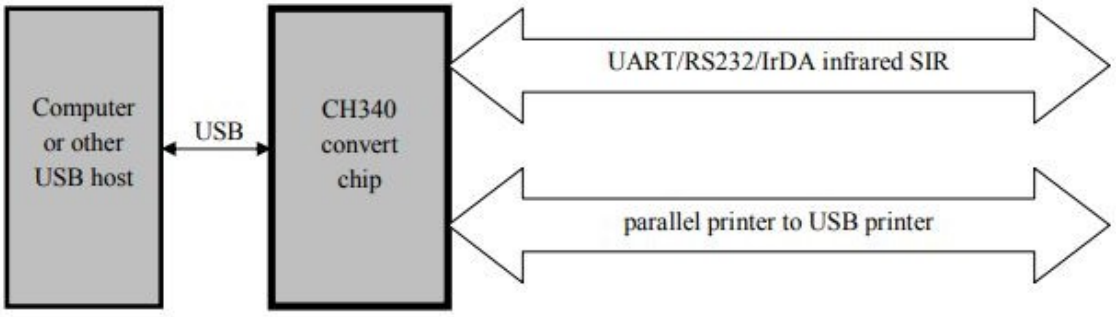


fig 3.2.1 - CH340G - Mode of operation

3.3. Operating interface

The user interface depends on the programming environment used. Use with the Arduino IDE or Eclipse is possible. You can find installation instructions for the Arduino IDE in chapter 6.2.3.

3.4. Control panels

The AZ-Delivery D1 mini only offers a single button for operation. Pressing the button triggers a reset of the ESP8266EX by pulling pin 1 'RST' to 'LOW'.

3.5. Explanation of the visual signals

Visual signals can be output via an LED. This is connected to the GPIO2 pin of the ESP8266EX.

4. Safety instructions

⚠ CAUTION

Read and understand this manual and its safety instructions before using this product. Failure to do so may result in damage to property.

4.1. Safety instructions for handling microcontrollers

When using electronic modules, a number of safety precautions must be observed to prevent injury, damage and interference with other devices. Therefore, please read these operating instructions and the safety instructions carefully before commissioning. Keep them in a safe place so that this information is available to you at all times. If you pass the module on to other persons, please hand over these operating instructions/safety instructions with it. We accept no liability for accidents or damage caused by non-compliance with these instructions and safety instructions.

4.1.1. General safety instructions

- Do not continue to use the module if it is damaged.
- When handling products that come into contact with electrical voltage, the applicable VDE regulations must be observed.
- In schools, training centres, hobby and self-help workshops, operation must be supervised by trained personnel.
- In commercial facilities, the accident prevention regulations of the German Federation of Industrial Employers' Liability Insurance Associations for electrical systems and equipment must be observed.
- Do not operate the product in an environment where flammable gases, vapours or dusts are present or may be present.
- The product must not be dropped or subjected to strong mechanical pressure, as it may be damaged by the impact.

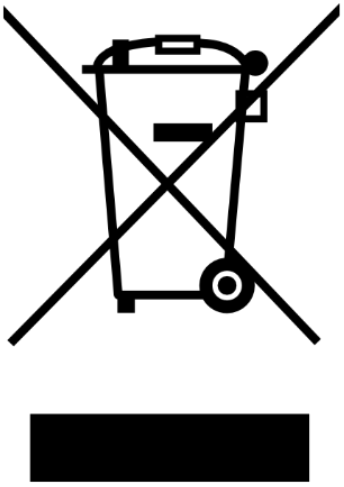
4.1.2. Safety instructions for handling electrostatic-sensitive components and groups

- In principle, microcontrollers are sensitive to electrostatic charges. When handling the module, make sure to dissipate electrostatic charges before touching the product to avoid damaging the module.
- Only remove the product from the anti-static packaging if you want to solder or programme the product.

4.1.3. Safety instructions for soldering the pin strips

- Check soldering equipment for proper condition before starting work, especially in the case of electric soldering equipment and damaged cables and cable entries.
- Use a safe, non-flammable surface. Keep the workplace free of highly flammable materials.
- The temperature of the hot soldering iron is over 300 °C. There is a risk of burns if handled incorrectly!
- Do not inhale soldering vapours! They are hazardous to health.
- Place the soldering iron in the holder immediately after soldering before proceeding with further work steps.
- Work calmly and with concentration!

4.1.4. Explanation of the safety instructions on the packaging and the product

Symbol	Meaning
	The CE marking on the product is the manufacturer's declaration that the product the essential requirements of the relevant European health, safety and environmental protection legislation.
	The symbol on the product, accessories or packaging indicates that this appliance must not be treated as unsorted municipal waste, but must be collected separately. WEEE-Reg.-No.: DE 62624346

5. Instructions for safe operation

- Do not make any changes to the hardware!
- Do not overclock the product!
- Only use the product with the software recommended by us.
- Only operate the module within the specifications stated by us
- Pay attention to the respective local conditions for the use of WiFi (e.g. petrol stations, hospitals).
- Avoid avoid the handling of the product with connected voltage source.
- The module was designed for operation at room temperature, do not expose it to any heat source after soldering.
- Avoid direct sunlight, as this can damage the circuit board in the long term.
- Only load the GPIOs within the specifications defined in the data sheet

6. Commissioning

6.1. Soldering the pin or pin headers

When mounting, you have the option of using the pin headers. Alternatively, you can use the socket connectors with long pins or the socket connectors with short pins.

To prevent the pins from moving during the soldering process, it is recommended to place the pin headers in a breadboard as shown below.

The long side of the pins should sit downwards in the breadboard.

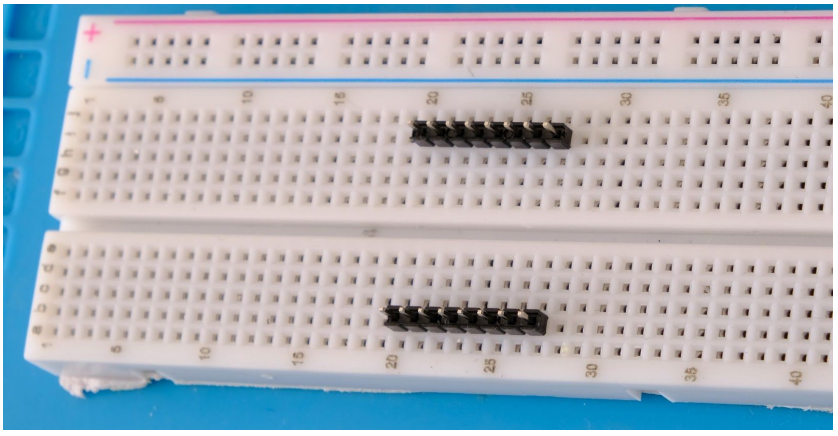


fig. 6.1.1 - Breadboard with pin headers

Place the D1 mini V4 module with the ESP8266EX chip facing upwards over the pin headers so that the short pins protrude through the openings provided.

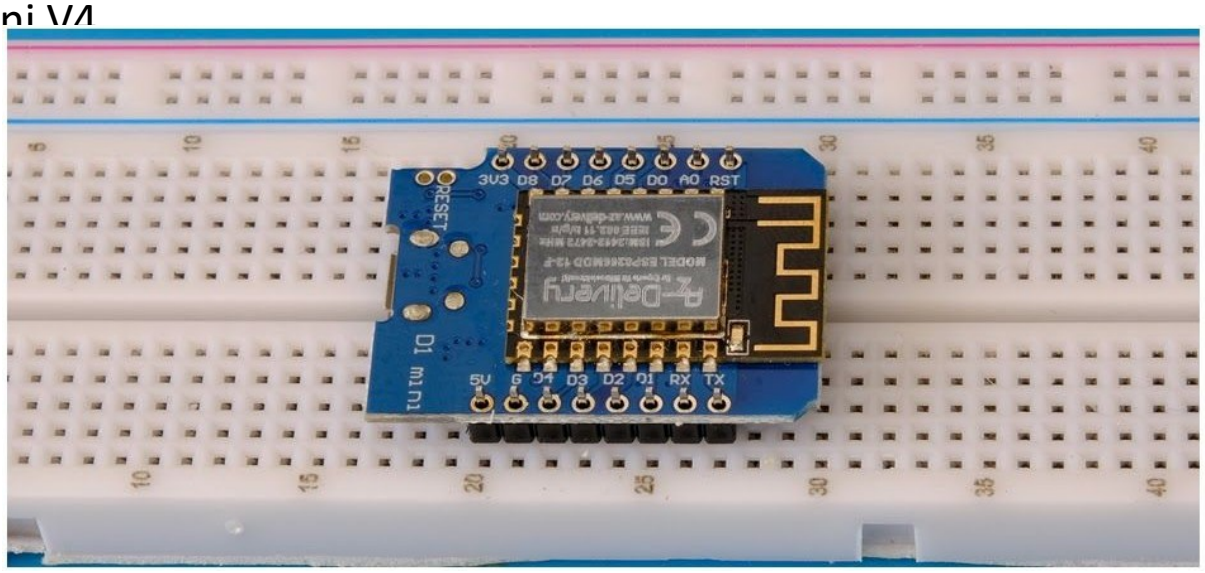


fig. 6.1.2 - Top side of a D1 Mini on pin headers (example)

During the soldering process, make sure that you create both a reliable mechanical and an electrically conductive connection.

fig 6.1.3 - The soldering process

When using the female headers (either with long or short pins), you can place the female header on the male headers in the breadboard to simplify positioning during the soldering process.

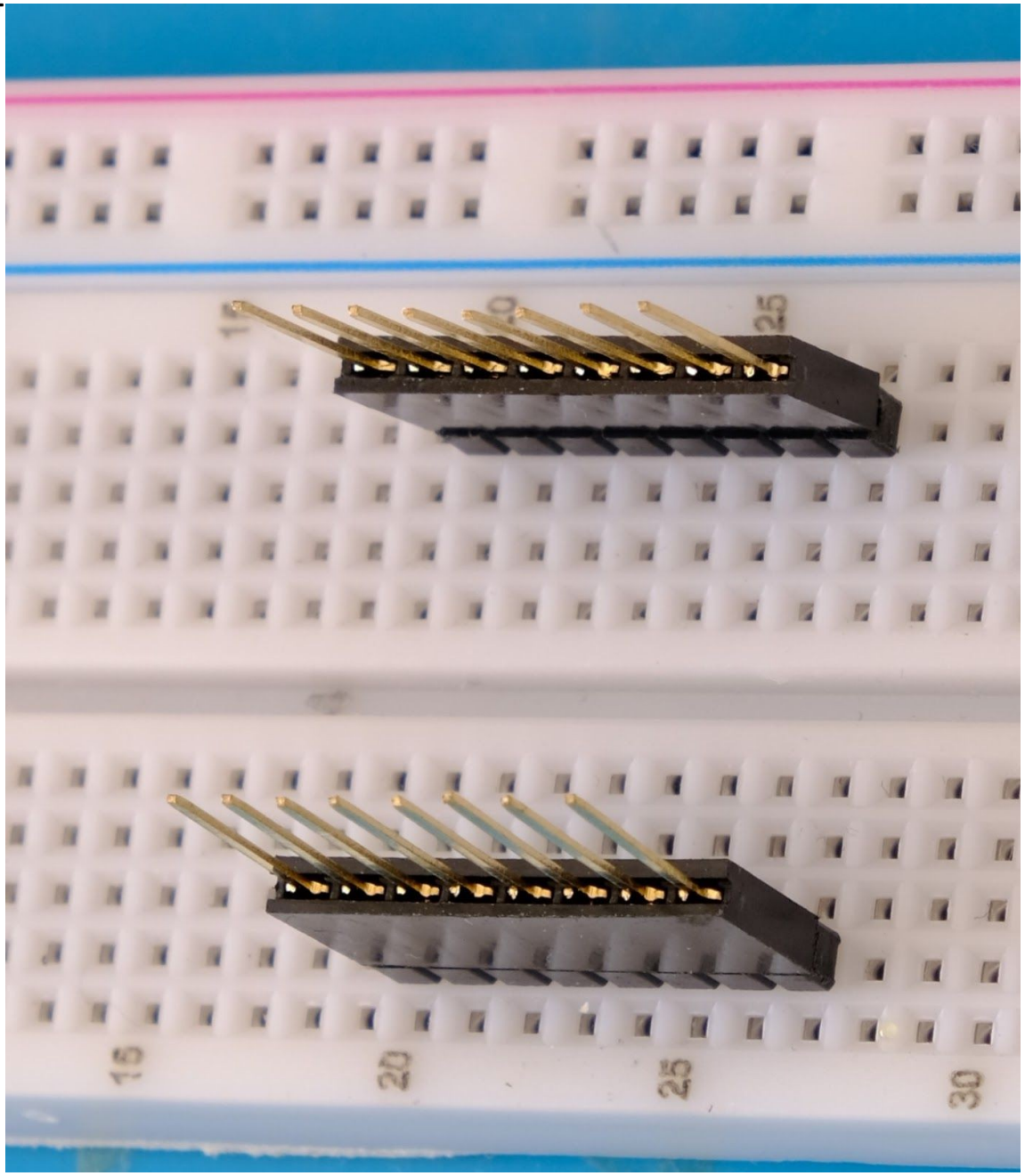


fig 6.1.4 - Breadboard with pin headers on which the socket connectors have been placed

Now place the D1 mini V4 module over the socket strips and press the module completely down until it is flush. The pins should protrude as far as possible.

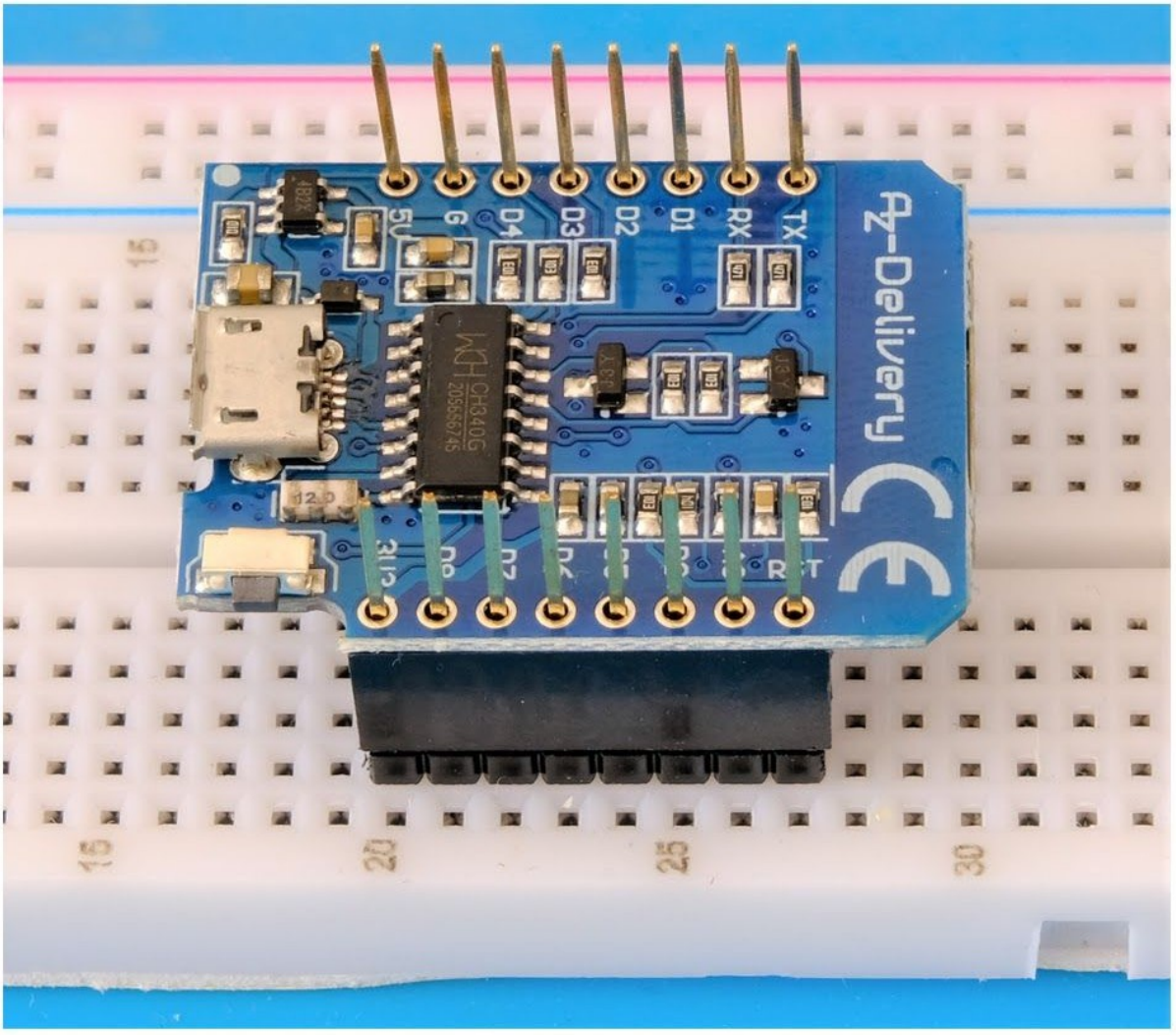


fig 6.1.5 - Breadboard with pin headers, on which the socket connectors with long pins have been placed, with a D1 mini module

Operating instructions D1 mini V4

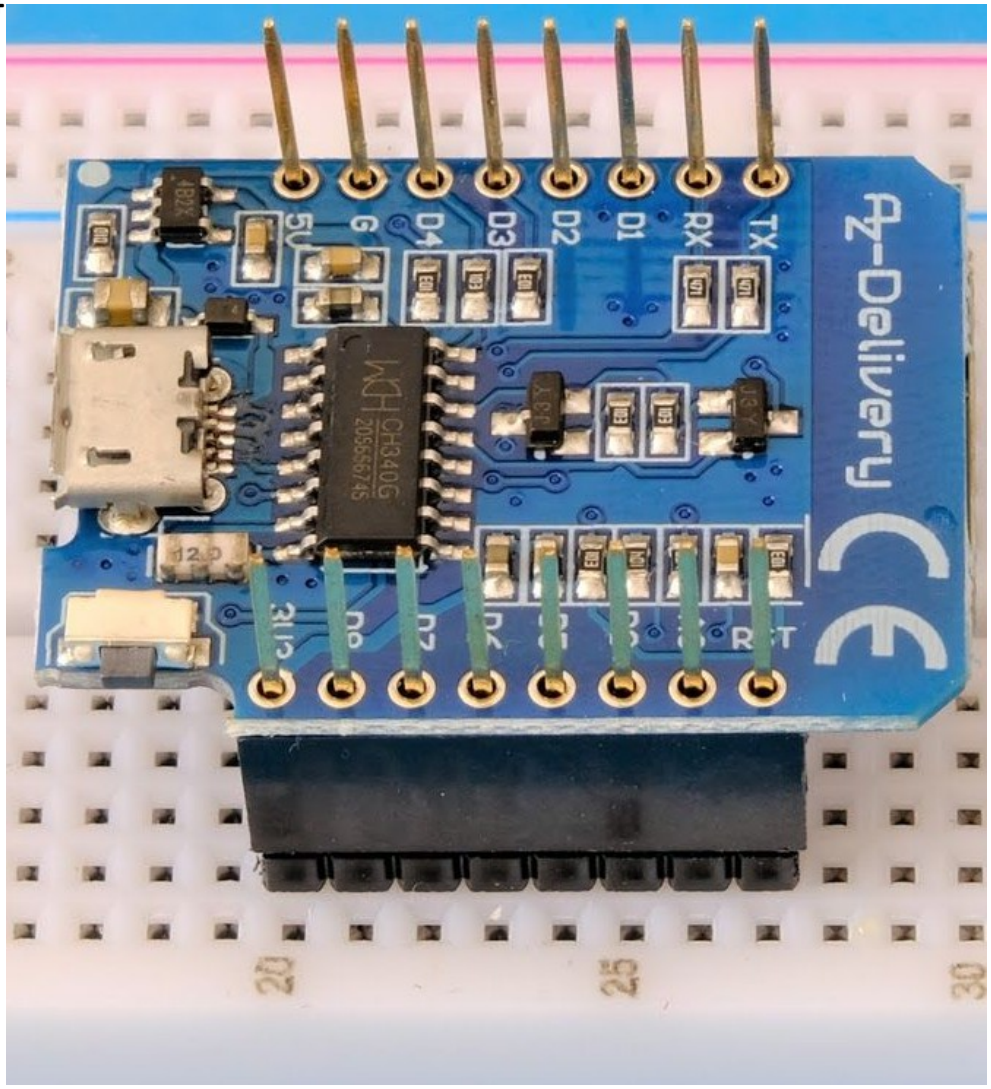


fig. 6.1.6 - Breadboard with pin headers, on which the socket connectors with short pins have been placed, with a D1 mini module

Make sure that the D1 mini is flush before starting the soldering process.

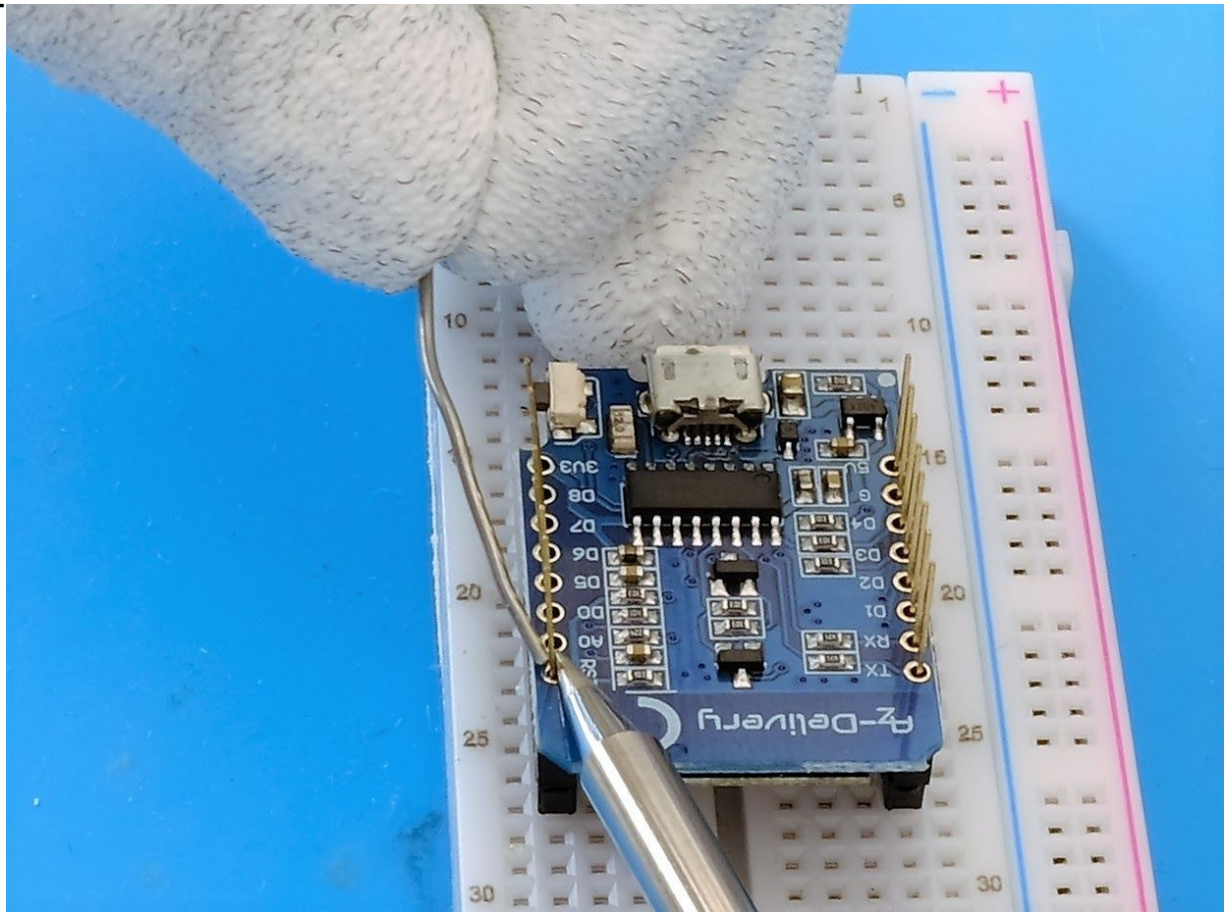


fig. 6.1.7 - The soldering process with socket connectors and long pins

6.2. Download and installation of the development environment

6.2.1. Obtaining the necessary software

Obtain the latest version of the following software packages:

- Driver for the USB interface CH340
  `http://www.wch.cn/download/CH341SER_ZIP.html`

- Development environment and toolchain for Arduino-compatible boards
  `https://www.arduino.cc/en/Main/Software`

6.2.2. Driver installation

The download of the file CH341SER.zip starts after clicking on the button marked blue in the picture.

fig. 6.2.2.1 - Download page for the CH340 driver

Then unzip the *.zip file into a directory of your choice and run the "`Setup.exe`" application. You can then install the drivers automatically by clicking on the button.

6.2.3. Installation of the development environment

Windows users should definitely use one of the first two download options for the Arduino IDE. The "Windows App" version from the Windows Store leads to connection problems, especially when using third-party board definitions.

fig. 6.2.3.1 - Download of the Arduino IDE with hint arrow for Windows users

After starting the Arduino IDE installation file "`arduino-1.X.X-windows.exe`", the licence conditions of the software must be read and accepted.

fig. 6.2.3.2 - Arduino licence conditions

In the next step, various options can be selected for installation. can be selected.

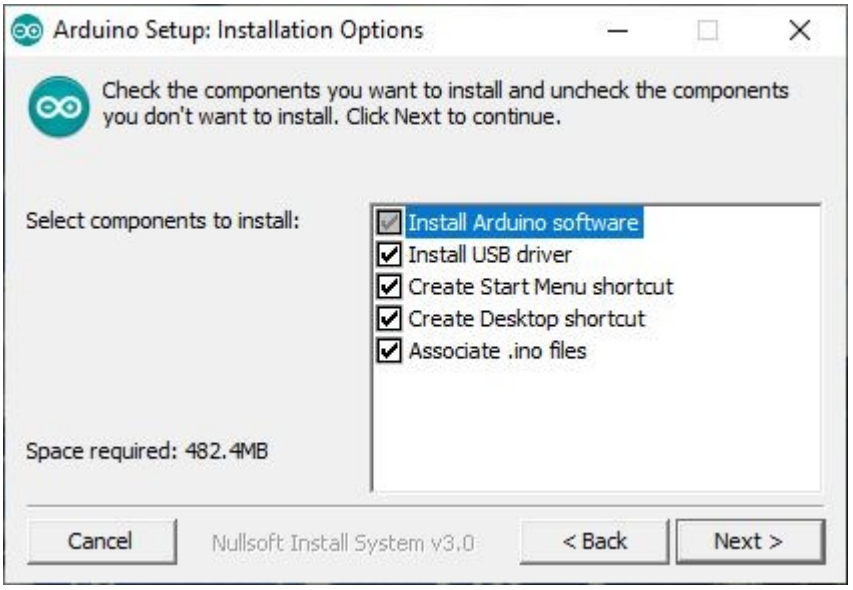


fig. 6.2.3.3 - Arduino options during installation

Option	Explanation
Install Arduino software	Installs the Arduino IDE - This option cannot be deselected
Install USB Driver	Installs USB drivers for various other microcontrollers. These are not required to use the software with the D1 mini V4, but we strongly recommend installing them if you also use other microcontrollers
Create Start Menu shortcut	Creates a shortcut in the Windows Start menu (optional)
Create Desktop shortcut	Creates a shortcut on the workstation (optional)
Associate .ino files	Creates a file name extension for files with the extension .ino and links them to the Arduino IDE

Finally, the destination folder must be specified. The installation requires approx. 500MB of free disc space.

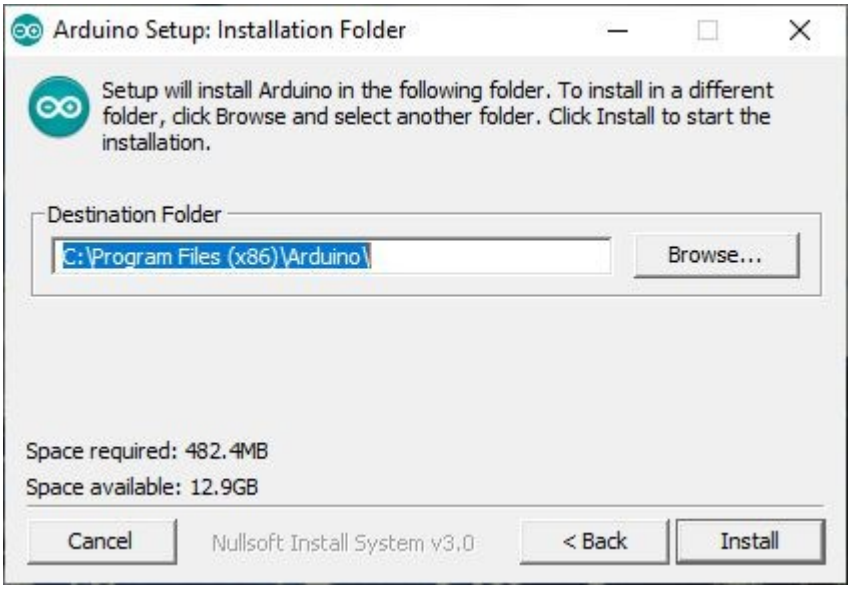


fig. 6.2.3.4 - Arduino installation - destination folder

Click on "Install" to start the installation.

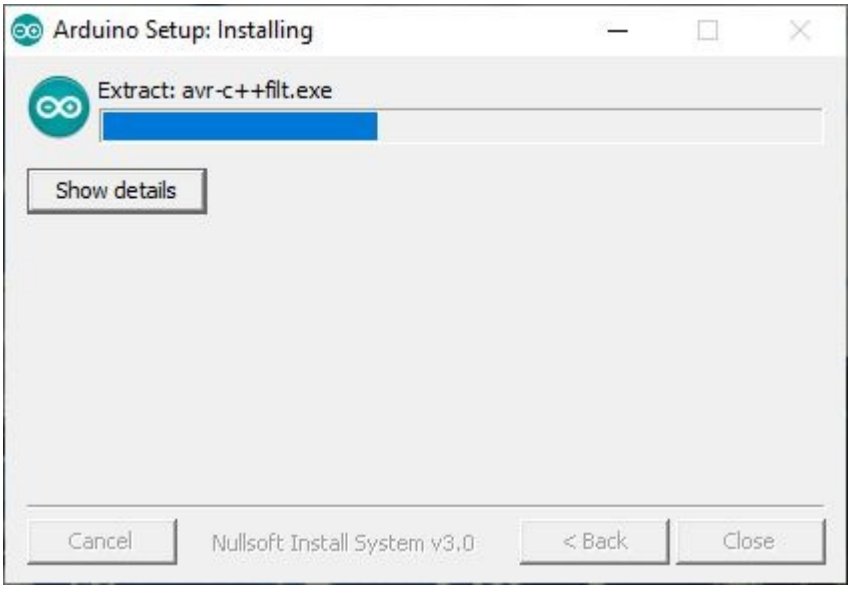


fig. 6.2.3.5 - Arduino installation - Installation procedure

After successful installation, the installation programme can be **closed** using the "**Close**" button.

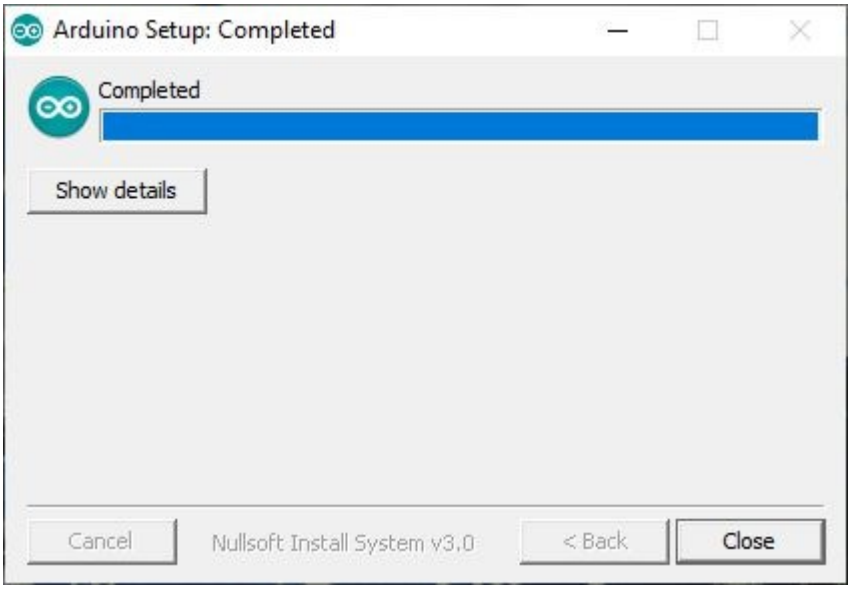


fig. 6.2.3.5 - Arduino installation successfully completed

6.3. Configuration of the Arduino IDE

Once the drivers and the development environment have been installed, the necessary board information and the toolchain for the ESP still need to be entered: To do this, start the development environment that has just been installed.

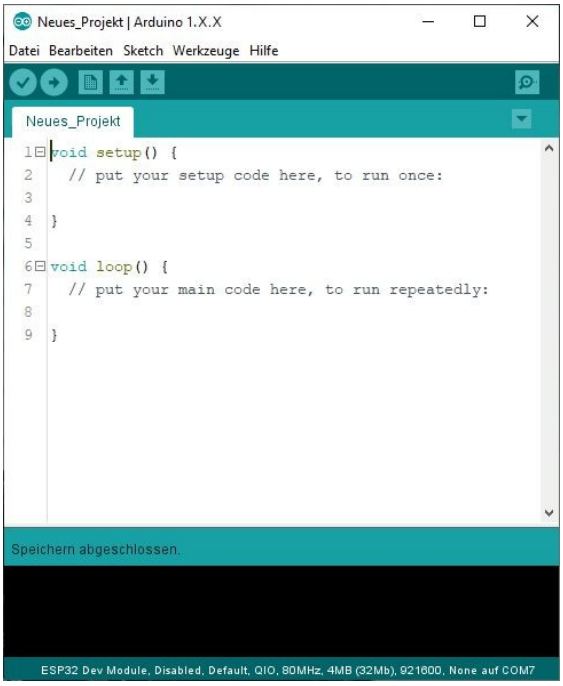


fig. 6.3.1 - Arduino IDE - The first start

The D1 mini is not part of the standard repertoire of the Arduino IDE. Additional board definitions must therefore be installed via the board manager. In order for the board administrator to have access to the definitions, the board administrator URL must first be specified in the Arduino IDE default settings.

This setting can be found in the "**File**" -> "**Preferences**" menu. The following URL must be entered in the "**Additional board administrator URLs**:" input field:

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

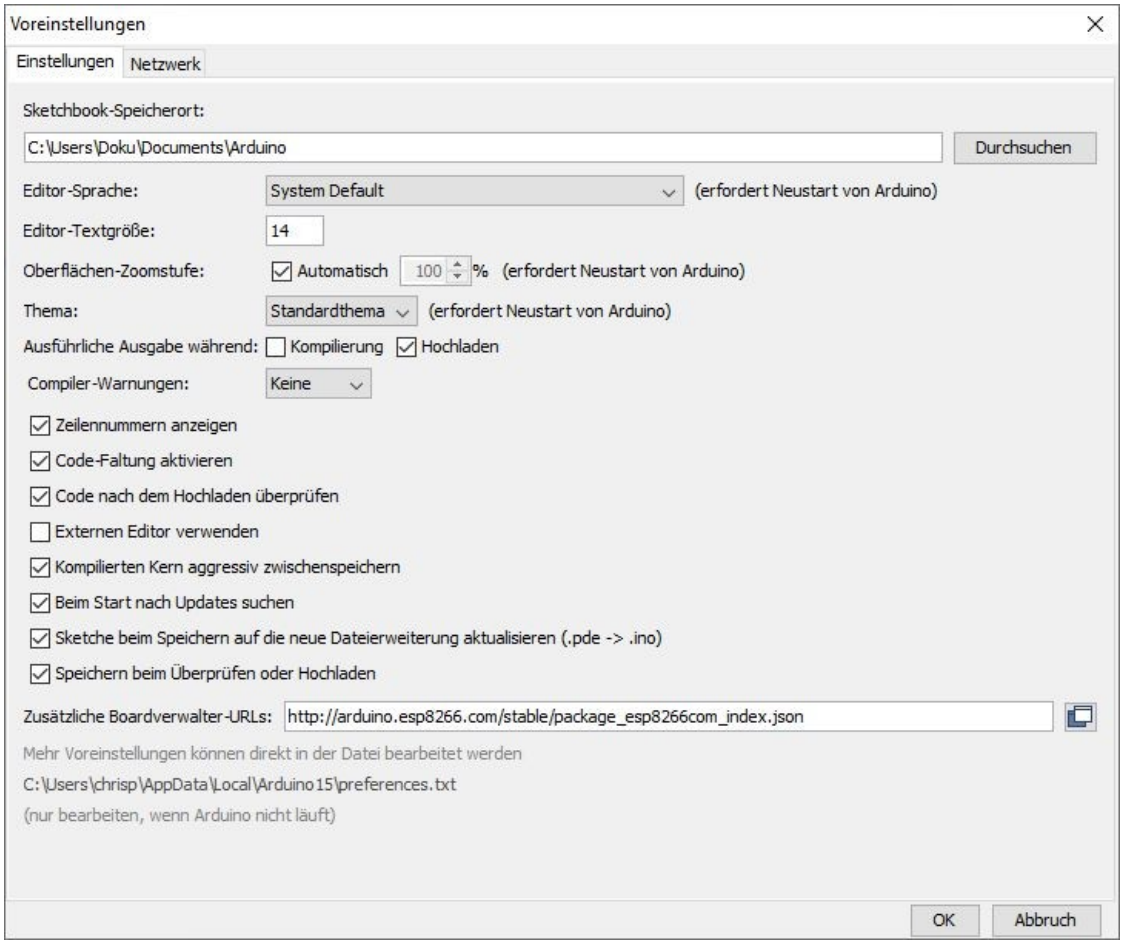


fig. 6.3.2 - Arduino IDE - "File" -> "Preferences" -> "Additional board manager URLs"

Confirm the entry by clicking on the "OK" button.
The corresponding board definitions are downloaded and installed in the board manager of the Arduino IDE. You can access the corresponding dialogue via the "**Tools**" -> "**Board**:" -> "**Board manager...**" menu.
As soon as "8266" is entered in the search field, the package "esp8266 by ESP8266 Community" appears. By clicking on the "**Install**" button, the required components are downloaded and are immediately available within the Arduino IDE.

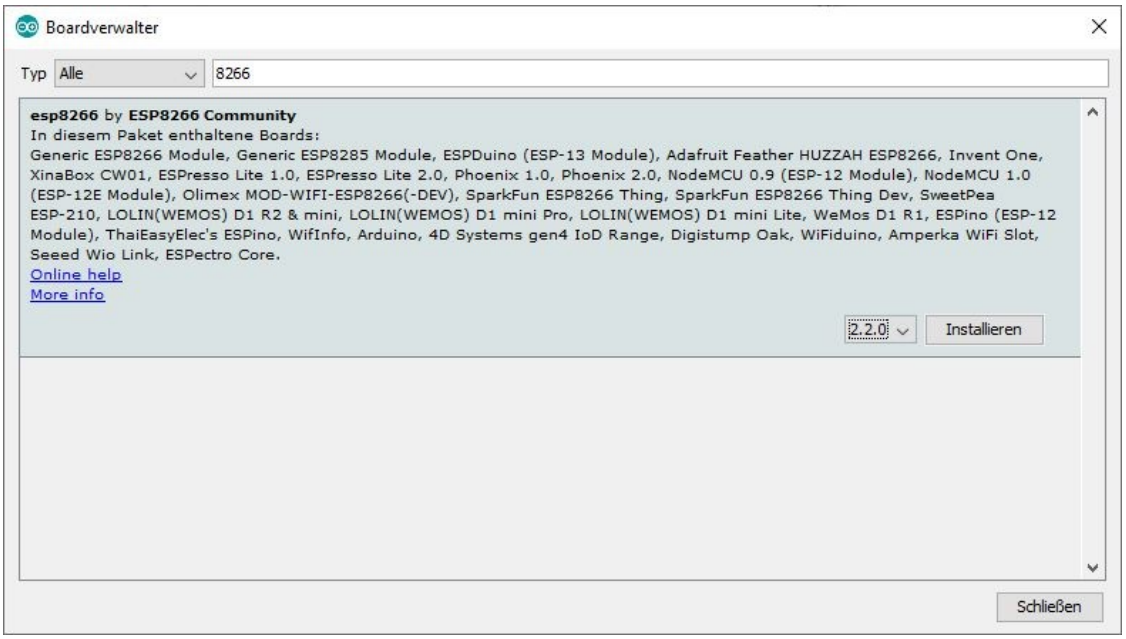


fig. 6.3.3 - Arduino IDE - "Tools" -> "Board:" -> "Board manager..." -> "8266"

6.4. Commissioning the WiFi board

After mounting the module and installing the software, you can connect the module to your PC. If a new USB device is recognised, you will hear the typical signal tone in Windows. To check whether the module is recognised correctly and the driver installation was successful, the interface can be displayed in the device manager.
The easiest way to open the device manager is to use the **WIN+R** key combination to open the command prompt. Then enter "`devmgmt.msc`" and confirm with the Enter key or by clicking the "OK" button.

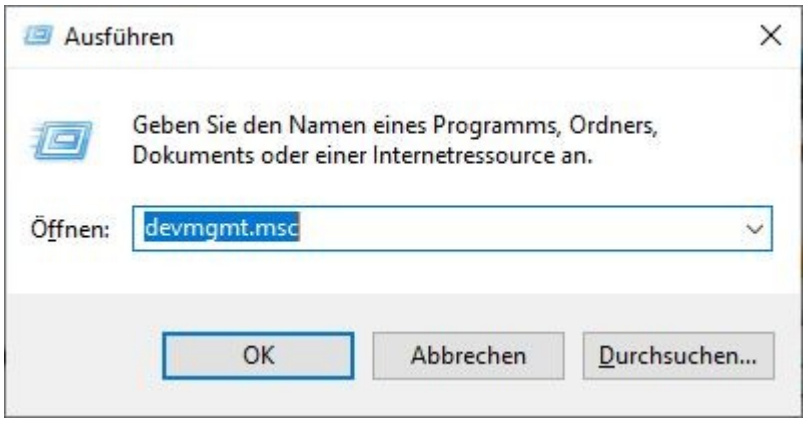


fig. 6.4.1 - "Execute" dialogue box

*The device appears in the Device Manager under the "**Ports (COM & LPT)**" tab as "USB-SERIAL CH340 (COMX)", where X is replaced by the corresponding port number.*

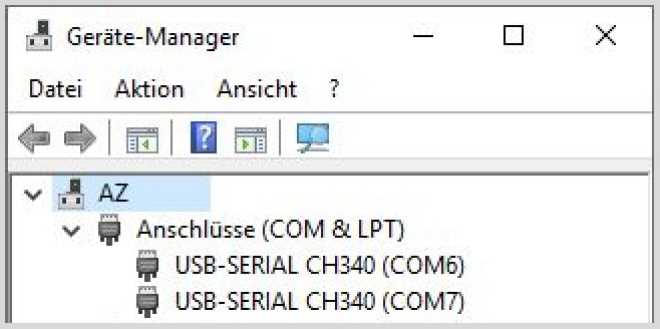


fig. 6.4.2 - View in Windows Device Manager

6.5. The Arduino IDE

6.5.1. Choosing the right board

To be able to load the sample code onto your controller, it is necessary to specify the board in the IDE with the corresponding serial port (COMX). The COM port is only displayed after the board has been connected. Accept all settings as shown in the screenshot:

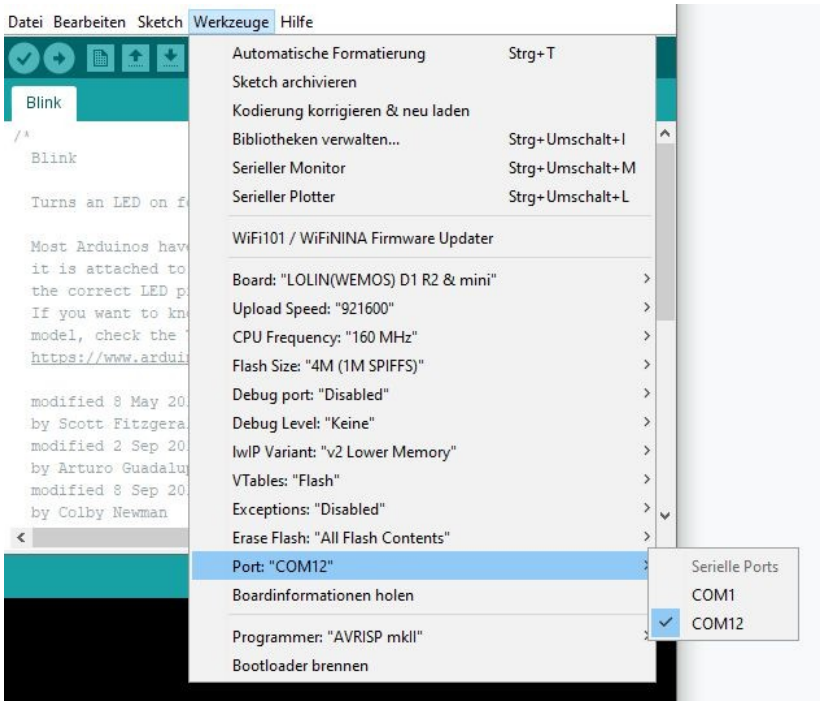


fig. 6.5.1 Selecting the appropriate board with the corresponding port

6.5.2. Programming process and language reference

The "Arduino programming language is closely related to C and C++. A complete overview and explanation in German can be found directly on the Arduino website under the following link:
https://www.arduino.cc/reference/de/

In order to be able to programme the board, there are many examples already included. You can find these directly in the development environment under File -> Examples. There are also examples specifically for boards with an ESP8266 processor.

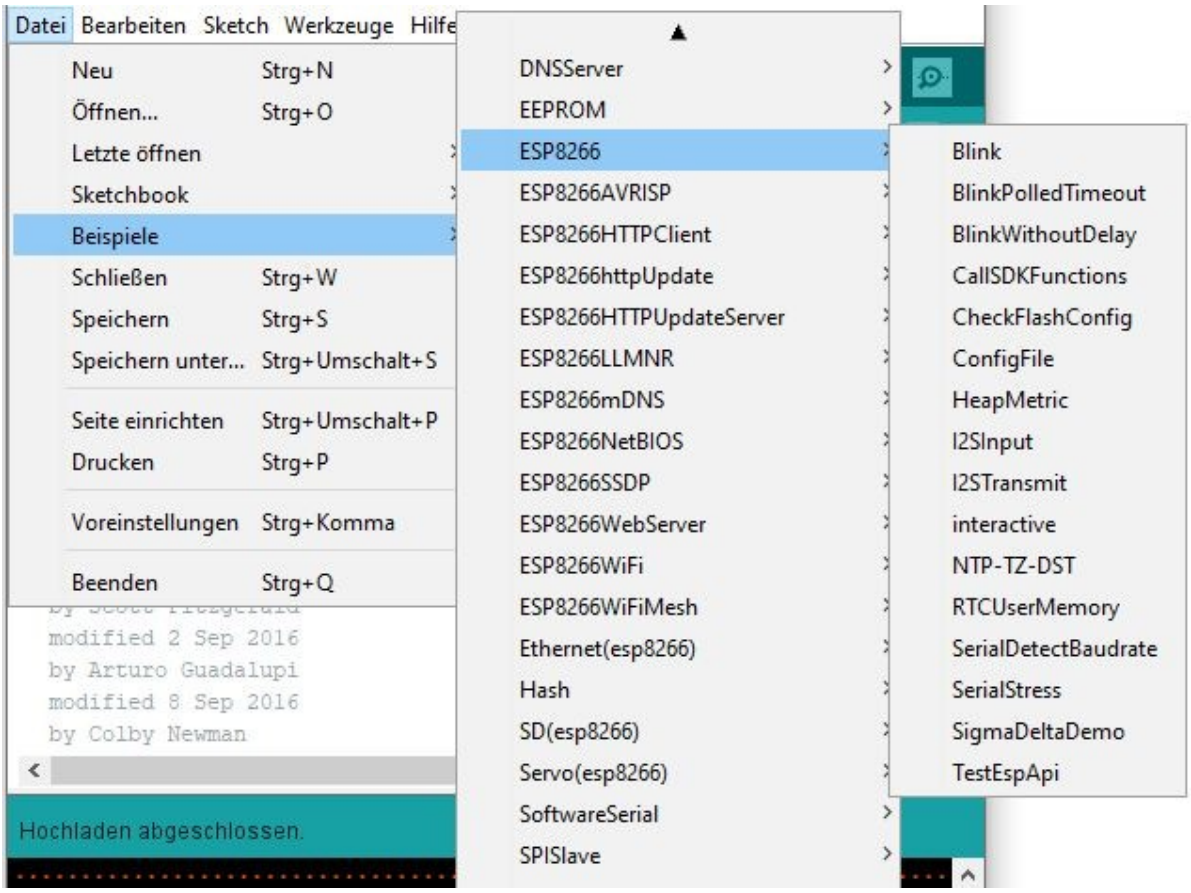


fig. 6.5.2.1 Supplied examples for the board with ESP8266

To start the programming process, connect your controller to the PC, select the correct board definitions and the relevant COM port. Then click on the "Upload" button to compile the programme code with all the necessary libraries and transfer it to the controller via the serial connection (COM port):

fig. 6.5.2.2 Starting the compilation and transfer process of the code to the controller

6.5.3. Arduino core for ESP

The language reference mentioned in chapter 6.5.2 can be used without any significant restrictions. However, a large number of functions have been added for boards with an ESP processor that cannot be found in the Arduino documentation. An up-to-date version of the Arduino Core documentation for boards with an ESP processor can be accessed at any time via the following link:

https://arduino-esp8266.readthedocs.io/en/latest/

7. Handling the pins of the D1 mini V4

7.1 Digital I/O pins

Just like the Arduino, the D1 Mini V4 has digital input/output pins or GPIO - General Purpose Input/Output Pins. As the name suggests, they can be used as digital inputs to read a digital voltage, or as digital outputs to output either 0V (LOW) or 3.3V (HIGH). The D1 Mini V4 has a microcontroller that works with a voltage range of 0V-3.3V.

The maximum voltage that can be drawn from a GPIO pin is 12mA!

Note: The pins are not 5V-tolerant, applying more than 3.6V PER PIN will destroy the chip!

GPIO1 and GPIO3 are used as TX and RX of the serial interface (UART), so in most cases they cannot b e used as normal I/O when sending/receiving serial data. The D1 Mini

V4 module has an integrated LED that is connected to the GPIO2 pin.

7.2 PWM

Unlike most Atmel chips (Arduino), the D1 Mini module does not support hardware PWM, but software PWM is supported on all digital pins. The default PWM range is 10 bits at 1kHz, but this can be changed (up to >14 bits at 1kHz).

7.3 Analogue input

The D1 Mini V4 module has an analogue input with an input range of 0V-3.0V. If more is supplied, this could damage the chip. The ADC (analogue-to-digital converter) has a resolution of 10 bits.

7.4 Serial

The D1 Mini module has two hardware UARTS (serial interfaces): UART0 on pins 1 and 3 (TX0 and RX0 respectively) and UART1 on pins 2 and 8 (TX1 and RX1 respectively), but GPIO8 is used to connect the flash chip. This means that UART1 can only transmit data. In most cases, one UART port is more than sufficient.

UART0 also has a hardware flow control on pins 15 and 13 (RTS0 and CTS0 respectively). These two pins can also be used alternatively as TX0 and RX0 pins.

7.5 I2C

The D1 Mini Module V4 does not have a hardware TWI (Two Wire Interface), but is implemented in software. This means that you can use pretty much any two

digital pins can be used. By default, the I²C library uses pin 4 as SDA and pin 5 as SCL. (The data sheet specifies GPIO2 as SDA and GPIO14 as SCL) The maximum speed is about 450kHz.

7.6 SPI

The D1 Mini Module V4 has an SPI connection that is available to the user and is referred to as HSPI. It can be used in both slave and master mode (in software!).
It uses:
- GPIO14 as clock - CLK,
- GPIO12 as MISO,
- GPIO13 as MOSI and
- GPIO15 as slave select - SS.

8. Using the pins in the Arduino IDE

8.1. Digital IO pins

Just as with a normal Arduino board, the pin function can be set with the following line of code:

```
pinMode(pin, mode)
```

where "pin" is the name of the GPIO pin and the mode can be either INPUT (which is the default) or OUTPUT or INPUT_PULLUP to enable the inbuilt pull-up resistors for pins GPIO0-15. To enable the pull-down resistor for GPIO16, use INPUT_PULLDOWN_16.

To set an output pin to HIGH (3.3V) or LOW (0V), use the following line of code:

```
digitalWrite(pin, value)
```

where pin is the name of the GPIO pin and the value is either 1 or 0 (or HIGH and LOW).

To read an input, use the following line of code:

```
digitalRead(pin)
```

To activate PWM on a specific pin, use the following line of code:

```
analogWrite(pin, value)
```

where pin is the name of the GPIO pin and the value is a number between 0 and 1023.

The range of the PWM output can be changed using the following line of code:

```
analogWriteRange(new_range)
```

The frequency of the PWM can be changed using the following line of code:

```
analogWriteFreq(new_frequency)
```

where new_frequency should be between 100Hz and 1000Hz.

9. Flashing the firmware

9.1. Preparation

The module is supplied with AT firmware already installed. If you have overwritten the firmware with your own sketch or third-party firmware, you can **restore** the module **to its factory settings**. To do this, the firmware must be downloaded from the chip manufacturer and transferred to the module using a PC with special software. The following packages must be downloaded for this:

- the "Espressif NON-OS SDK" from the official GitHub page ("Clone or Download" and then "Download ZIP"): https://github.com/espressif/ESP8266_NONOS_SDK/tree/release/v2.2.x
- the "NodeMCU Flasher" tool from https://github.com/nodemcu/nodemcu-flasher (depending on platform WIN32/Release or Win64/Release)

9.2. The required .bin files

Since version 2.1.0, the firmware is divided into 4 files with the extension .bin. The following files from the .ZIP file are required for the D1 mini:

- bin/boot_v1.7.bin
- bin/at/512+512/user1.1024.new.2.bin (4MB Flash = 32 Mbit, 512+512)
- bin/esp_init_data_default_v08.bin
- bin/blank.bin

9.3. NodeMCU Flasher

After starting the software, the following window appears:

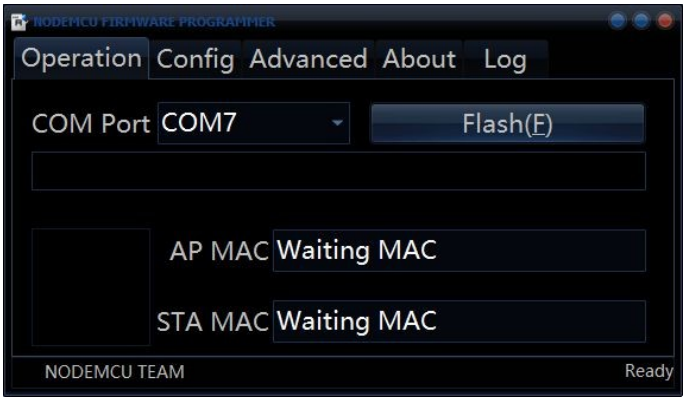


fig. 7.3.1 - Programme interface of the NodeMCU Flasher

As "COM Port" we select the COM port to which the module is connected.

The "Config" tab takes you to the configuration page where you can specify the desired files and the offset in the memory. The following settings must be made here:

File from the firmware SDK	Flash Offset
bin\boot_v1.7.bin	0x00000
bin\at\512+512\user1.1024.new.2.bin	0x01000
bin\esp_init_data_default_v08.bin	0x7C000
bin\blank.bin	0x7E000

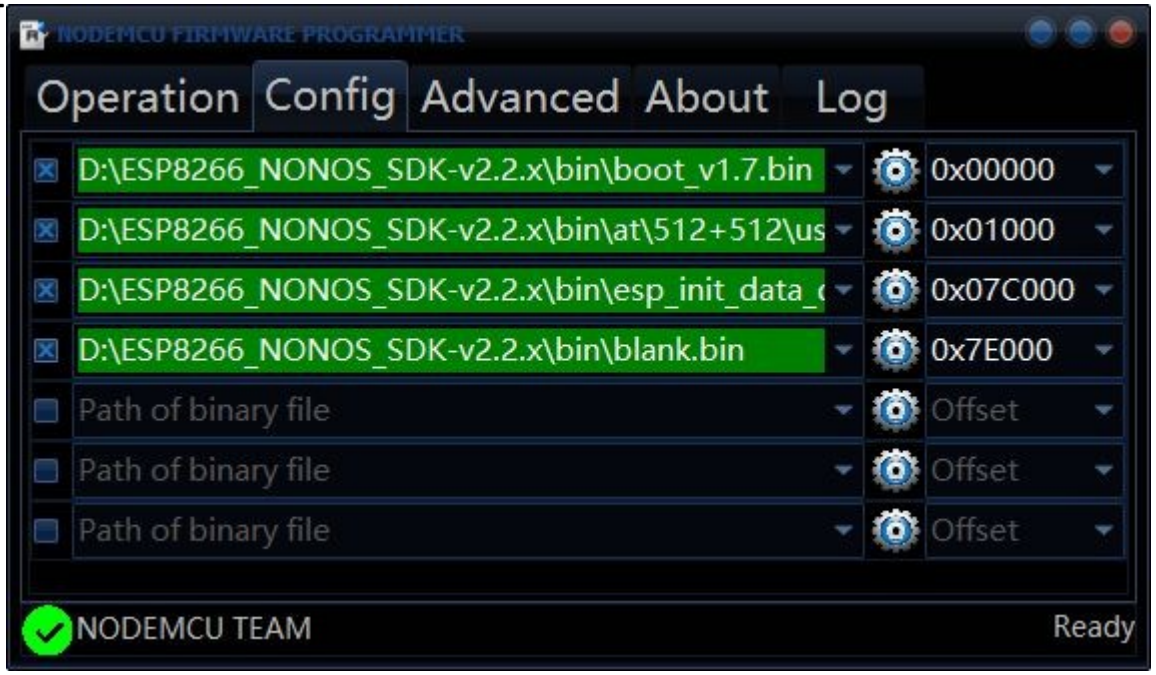


fig. 7.3.2 -Configuration of the NodeMCU Flasher

Make sure that the entries to be transferred are marked with an "X" on the left-hand side.

To start the flash process, switch to the "**Operation**" tab and select the "**Flash**" button. The programme overwrites the module's flash memory with the selected files without prompting you.

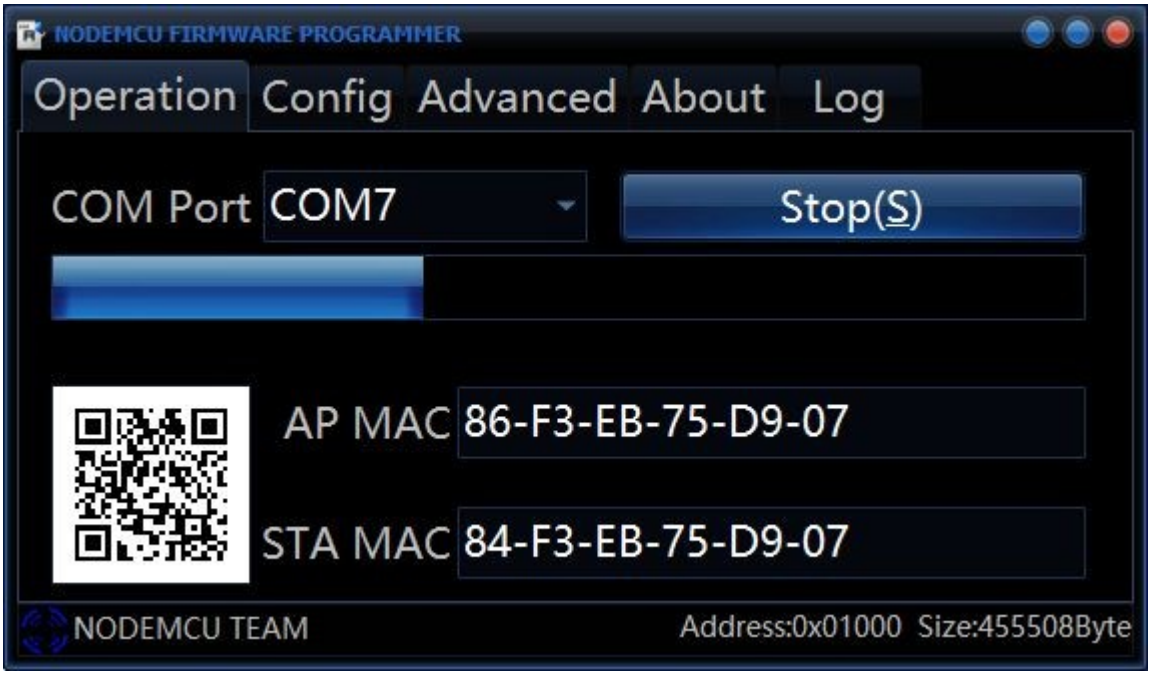


fig. 7.3.3 -Flashing process in the NodeMCU Flasher

Once the flash process is complete, the module can be communicated with via the serial interface using AT commands. To do this, the baud rate must be set to 115200 baud.

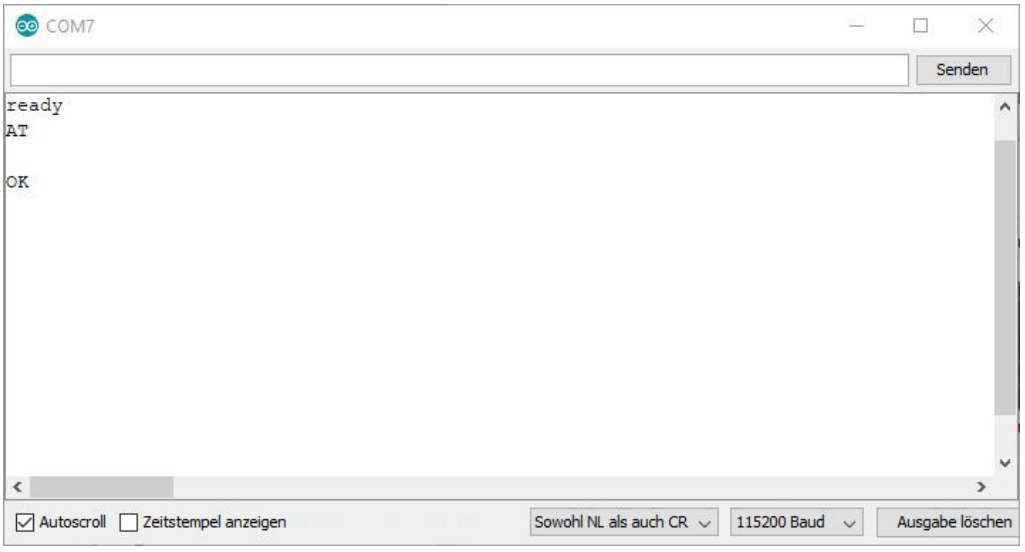


fig. 7.3.4 -Communication using AT command via terminal programme

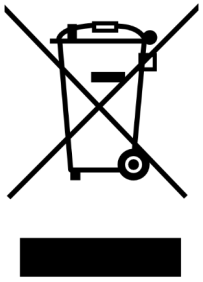
10. Error table

Malfunction	Possible cause	Troubleshooting
No function (the LED does not light up briefly when connected to the power source)	Missing power supply	Check voltage source
		Check USB cable
	Module defect	Contact customer service
COM port is not available	No connection with PC	Connect the module to your PC
	Check driver installation	Reinstall driver
	USB cable	Please only use **certified** USB2.0 cables
	Module defect	Contact customer service
Programming process not possible	Wrong COM port selected	Select the correct COM port as shown in fig. 6.5.1
	Wrong board selection	Check board information as shown in fig. 6.5.1 mapped
	USB cable	Please only use **certified** USB2.0 cables
	Firmware defect	Restoration of the delivery status as described in chapter 7
	Module defect	Contact customer service
Code cannot be compiled	exit status 1 expected ';'	Please check your programme code
	exit status 1 missing termination	

	exit status 1 No such file or dir	Integrate library

11. Waste disposal

Do not dispose of with household waste! Your microcontroller must be disposed of in an environmentally friendly manner in accordance with the European Directive 2012/19/EC on waste electrical and electronic equipment. The valuable raw materials it contains can then be recycled. The application of this directive contributes to environmental and health protection. Use the collection centre set up by your local authority to return and recycle old electrical and electronic equipment. **WEEE reg. no.: DE 62624346**



12. Guarantee and warranty

The statutory warranty regulations apply unless otherwise agreed in our GTC. You can find the GTC on our website at:

http://www.az-delivery.de/pages/agb

as well as in Appendix I of this documentation. The version of the General Terms and Conditions in force at the time of conclusion of the contract between the Buyer and AZ-Delivery Vertriebs GmbH shall apply.

13. Licence information

13.1. Arduino core

Arduino IDE is developed and maintained by the Arduino team. The IDE is licensed under GPL.

ESP8266 core includes an xtensa gcc toolchain, which is also under GPL.

Esptool written by Christian Klippel is licensed under GPLv2, currently maintained by Ivan Grokhotkov: https://github.com/igrr/esptool-ck.

Espressif SDK included in this build is under Espressif MIT Licence.

ESP8266 core files are licensed under LGPL.

SPI Flash File System (SPIFFS) written by Peter Andersson is used in this project. It is distributed under the MIT licence.

umm_malloc memory management library written by Ralph Hempel is used in this project. It is distributed under the MIT licence.

SoftwareSerial library and examples written by Peter Lerup. Distributed under LGPL 2.1.

axTLS library written by Cameron Rich, built from https://github.com/igrr/axtls-8266, is used in this project. It is distributed under BSD licence.

BearSSL library written by Thomas Pornin, built from https://github.com/earlephilhower/bearssl-esp8266, is used in this project. It is distributed under the MIT Licence.

LittleFS library written by ARM Limited and released under the BSD 3-clause licence.

13.2. Espressif firmware

The MIT Licence (MIT)

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13.3. Espressif ESP8266_NONOS_SDK

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Appendix I - General Terms and Conditions

1. Scope of application

The following terms and conditions apply to all orders placed via our online shop by consumers and entrepreneurs.

A consumer is any natural person who enters into a legal transaction for purposes that are predominantly outside their trade, business or profession. An entrepreneur is a natural or legal person or a partnership with legal capacity who, when concluding a legal transaction, is acting in the exercise of their commercial or independent professional activity.

These General Terms and Conditions shall also apply to future business relationships with entrepreneurs without us having to refer to them again. If the entrepreneur uses conflicting or supplementary general terms and conditions, their validity is hereby rejected; they shall only become part of the contract if we have expressly agreed to them.

2. Contractual partner, Conclusion of contract

The purchase contract is concluded with AZ-Delivery Vertriebs GmbH.

The presentation of the products in the online shop does not constitute a legally binding offer, but a non-binding online catalogue. You can initially place our products in the shopping basket without obligation and correct your entries at any time before sending your binding order by using the correction aids provided and explained for this purpose in the order process. By clicking on the order button, you place a binding order for the goods contained in the shopping basket. Confirmation of receipt of your order will be sent by e-mail immediately after the order has been sent.

When the contract with us is concluded depends on the payment method you have chosen:

Invoice

We accept your order by sending a declaration of acceptance in a separate e-mail or by delivering the goods within two days.

Credit card

When you place your order, you also send us your credit card details. After you have been legitimised as the legal cardholder, we will ask your credit card company to initiate the payment transaction and thereby accept your offer.

PayPal Express

During the ordering process, you will be redirected to the website of the online provider PayPal. There you can enter your payment details and confirm the payment instruction to PayPal. After placing the order in the shop, we request PayPal to initiate the payment transaction and thereby accept your offer.

Immediately

After placing the order, you will be redirected to the website of the online provider Sofort GmbH, where you confirm the payment instruction. This concludes the contract with us.

Cash payment on collection

We will accept your order by sending a separate e-mail declaration of acceptance within two days.

Payment by SEPA direct debit

The buyer can issue AZ-Delivery Vertriebs GmbH with a SEPA basic mandate. The period for pre-notification shall be reduced to one day. The Buyer warrants to ensure that the account is covered. Costs incurred due to non-payment or reversal of the direct debit shall be borne by the Buyer, provided that the non-payment or reversal was not caused b y AZ-Delivery Vertriebs GmbH.

3. Contract language, Contract text storage

The languages available for the conclusion of the contract are German and English.

We save the text of the contract and send you the order data and our GTC by e-mail. For security reasons, the text of the contract is no longer accessible via the Internet.

74. Terms of delivery

Shipping costs are added to the indicated product prices. You can find out more about the shipping costs in the offers.

In principle, you have the option of collecting the goods from AZ-Delivery Vertriebs GmbH, Plattlinger Straße 5 , 94469 Deggendorf, Germany during the following business hours: 8:00-18:00 (Mon-Sat).

5. Payment

The following payment methods are available in our shop:

Credit card

When you place your order, you also send us your credit card details.

Once you have been legitimised as the legitimate cardholder, we will ask your credit card company to initiate the payment transaction immediately after you place the order. The payment transaction will be carried out automatically by the credit card company and your card will be debited.

PayPal Express

During the ordering process, you will be redirected to the website of the online provider PayPal. In order to be able to pay the invoice amount via PayPal, you must be registered there or register first, legitimise yourself with your access data and confirm the payment instruction to us. After placing the order in the shop, we request PayPal to initiate the payment transaction.

Immediately

After placing the order, you will be redirected to the website of the online provider Sofort GmbH. In order to be able to pay the invoice amount via Sofort, you must have an online banking account with PIN/TAN procedure activated for participation in Sofort, legitimise yourself accordingly and confirm the payment instruction to us. You will receive further instructions during the order process. The payment transaction will be carried out immediately afterwards by Sofort and your account will be debited.

Invoice

You pay the invoice amount after receipt of the goods and the invoice by bank transfer to our bank account. We reserve the right to offer purchase on account only after a successful credit check.

Cash payment on collection

You pay the invoice amount in cash on collection.

6. Retention of title

The goods remain our property until full payment has been received.

For entrepreneurs, the following also applies: We reserve title to the goods until all claims arising from an ongoing business relationship have been settled in full. You may resell the goods subject to retention of title in the ordinary course of business; you assign to us in advance all claims arising from this resale - irrespective of any combination or mixing of the goods subject to retention of title with a new item - in the amount of the invoice amount, and we accept this assignment. You remain authorised to collect the claims, but we may also collect claims ourselves if you do not meet your payment obligations.

7. Transport damage

The following applies to consumers:

If goods are delivered with obvious transport damage, please complain about such defects to the deliverer as soon as possible and contact us immediately. Failure to make a complaint or contact us has no consequences for your legal claims and their enforcement, in particular your warranty rights. However, you will help us to assert our own claims against the carrier or the transport insurance company.

The following applies to entrepreneurs:

The risk of accidental loss and accidental deterioration shall pass to you as soon as we have delivered the goods to the carrier, freight forwarder or other person or organisation designated to carry out the shipment. The obligation to inspect and give notice of defects regulated in § 377 HGB applies to merchants. If you fail to notify us as stipulated therein, the goods shall be deemed to have been approved unless the defect was not recognisable during the inspection. This shall not apply if we have fraudulently concealed a defect.

8. Warranty rights and Liability

Unless otherwise stated in these GTC including the following provisions, we shall be liable in the event of a breach of contractual and non-contractual obligations in accordance with the statutory provisions.

We shall be liable for damages - irrespective of the legal grounds - within the scope of fault-based liability in the event of wilful intent and gross negligence. In the event of simple negligence, we shall only be liable, subject to statutory limitations of liability (e.g. care in our own affairs; insignificant breach of duty), for

A. for damages resulting from injury to life, limb or health,
B. for damages arising from the breach of an essential contractual obligation (an obligation whose fulfilment is essential for the proper execution of the contract and on whose compliance the contractual partner regularly relies and may rely); in this case, however, our liability is limited to compensation for foreseeable, typically occurring damages.

The limitations of liability set out above shall also apply to breaches of duty by or in favour of persons whose fault we are responsible for in accordance with statutory provisions. They shall not apply if we have fraudulently concealed a defect or have assumed a guarantee for the quality of the goods and for claims under the Product Liability Act.

9. Dispute resolution

The European Commission provides a platform for online dispute resolution (OS), which you can find here https://ec.europa.eu/consumers/odr/.

We are not obliged or willing to participate in dispute resolution proceedings before a consumer arbitration board.

10. Final provisions

If you are an entrepreneur, German law shall apply to the exclusion of the UN Convention on Contracts for the International Sale of Goods.

If you are a merchant within the meaning of the German Commercial Code, a legal entity under public law or a special fund under public law, the exclusive place of jurisdiction for all disputes arising from contractual relationships between us and you is our registered office.

Terms and conditions created with the Trusted Shops legal text editor in co-operation with Wilde Beuger Solmecke Rechtsanwälte.

Please note that we use the following licences, among others, to create our website:
Licencing

Appendix II - Contact details

AZ-Delivery Vertriebs GmbH
Bräugasse 9
94469 Deggendorf
Germany

Phone: +49 991 999 27 8 27
Email: info@az-delivery.com