

[SOLVED] Failed to connect to ESP32: Timed out waiting for packet header

Learn how to fix the Fatal Error Occurred: "**Failed to connect to ESP32: Timed out waiting for packet header**" error when trying to upload new code to your ESP32 board once for all.



Why are you getting this error?

Some [ESP32 development boards](#) (read [Best ESP32 boards](#)) don't go into flashing/uploading mode automatically when uploading a new code.

This means that when you try to upload a new sketch to your ESP32, the Arduino IDE fails to connect to your board, and you get the following error message:

An error occurred while uploading the sketch

C:\Users\Sara\AppData\Local\Arduino15\packages\esp32\hardware\esp32\1.0.1/tools/gen_esp32part.exe" -q "C:\Users\Sara\Documents\Arduino\Blink.ino" -t esp32 -o C:\Users\Sara\Documents\Arduino\Blink.ino.elf
"C:\Users\Sara\AppData\Local\Arduino15\packages\esp32\tools\esptool_py\2.6.0/esptool.py" --chip esp32 --port COM7 --baud 921600 --before default --after reset
esptool.py v2.6-beta

"C:\Users\Sara\AppData\Local\Arduino15\packages\esp32\tools\xtensa-esp32-elf-gcc\1.22.0-80-g6c4433a-5.2.0/bin/xtensa-esp32-elf-gcc" -c -S -f elf32el -T link -o C:\Users\Sara\Documents\Arduino\Blink.ino.elf C:\Users\Sara\Documents\Arduino\Blink.ino.elf.o
Sketch uses 190944 bytes (14%) of program storage space. Maximum is 1310720 bytes.
Global variables use 12632 bytes (3%) of dynamic memory, leaving 315048 bytes for local variables. Maximum is 327680 bytes.
C:\Users\Sara\AppData\Local\Arduino15\packages\esp32\tools\esptool_py\2.6.0/esptool.py --chip esp32 --port COM7 --baud 921600 --before default --after reset
esptool.py v2.6-beta
Serial port COM7
Connecting..... An error occurred while uploading the sketch
-

A fatal error occurred: Failed to connect to ESP32: Timed out waiting for packet header

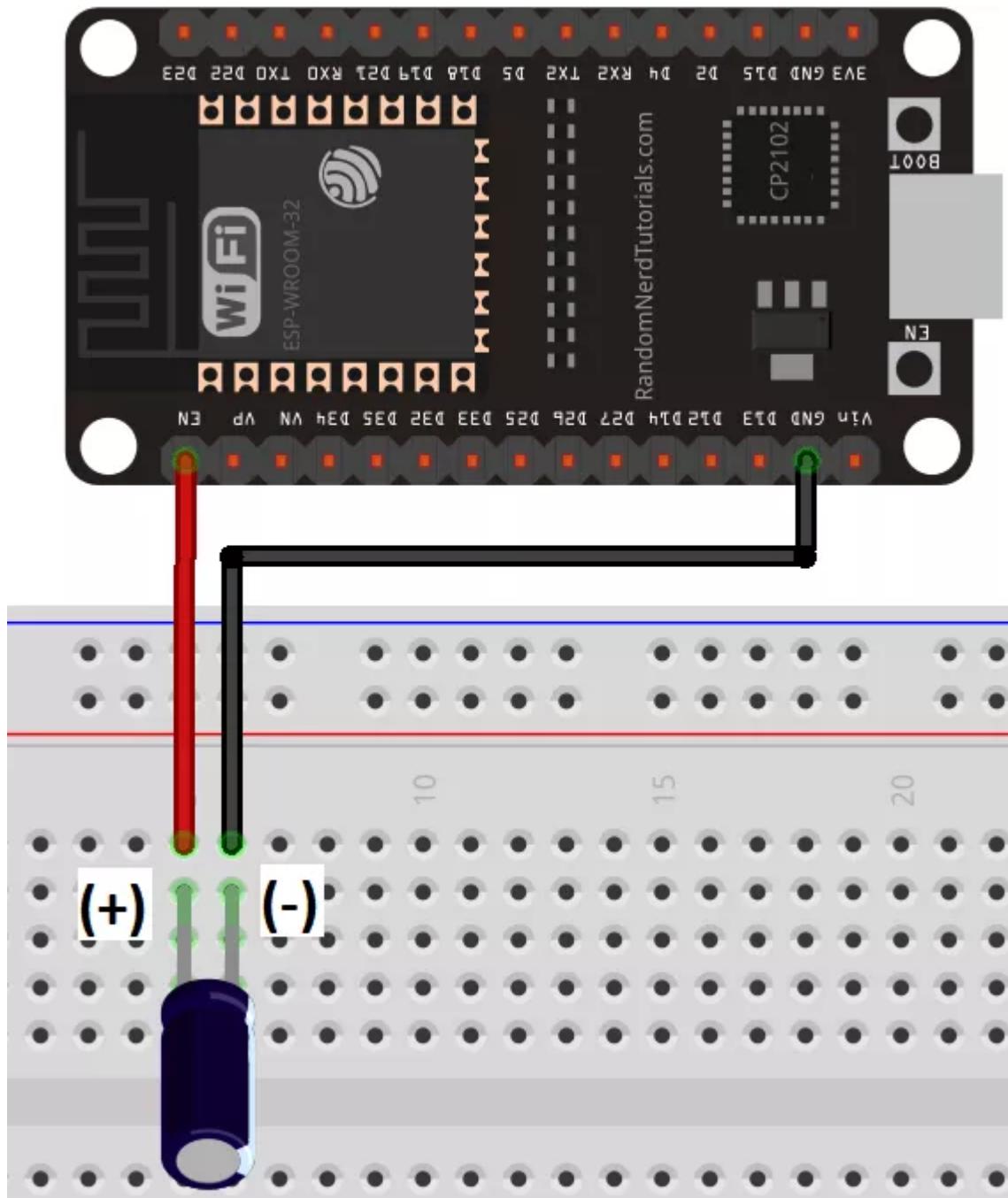
Holding the BOOT/FLASH button

One of the ways to solve this is holding-down the “**BOOT/FLASH**” button in your ESP32 board while uploading a new sketch at the same time. But having to worry about this every time you want to upload new code can be tedious, specially when you’re testing and debugging your code. There is a way to fix this once for all – no need to hold down the “**BOOT/FLASH**” button anymore.

How to fix the Error?

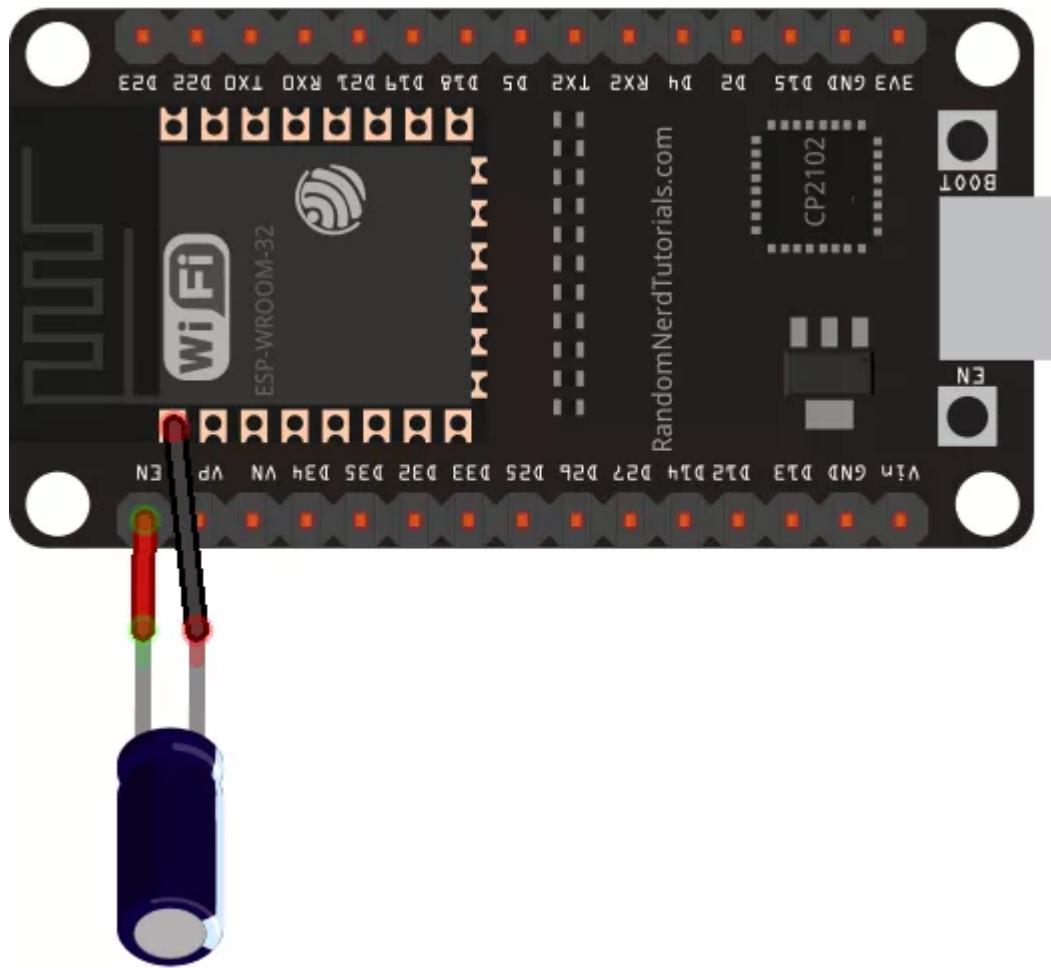
To make your ESP32 board go into flashing/uploading mode automatically, you can **connect a 10 uF electrolytic capacitor between the EN pin and GND**.

You may want to test this setup first on a breadboard to make sure it works for your ESP32 development board.



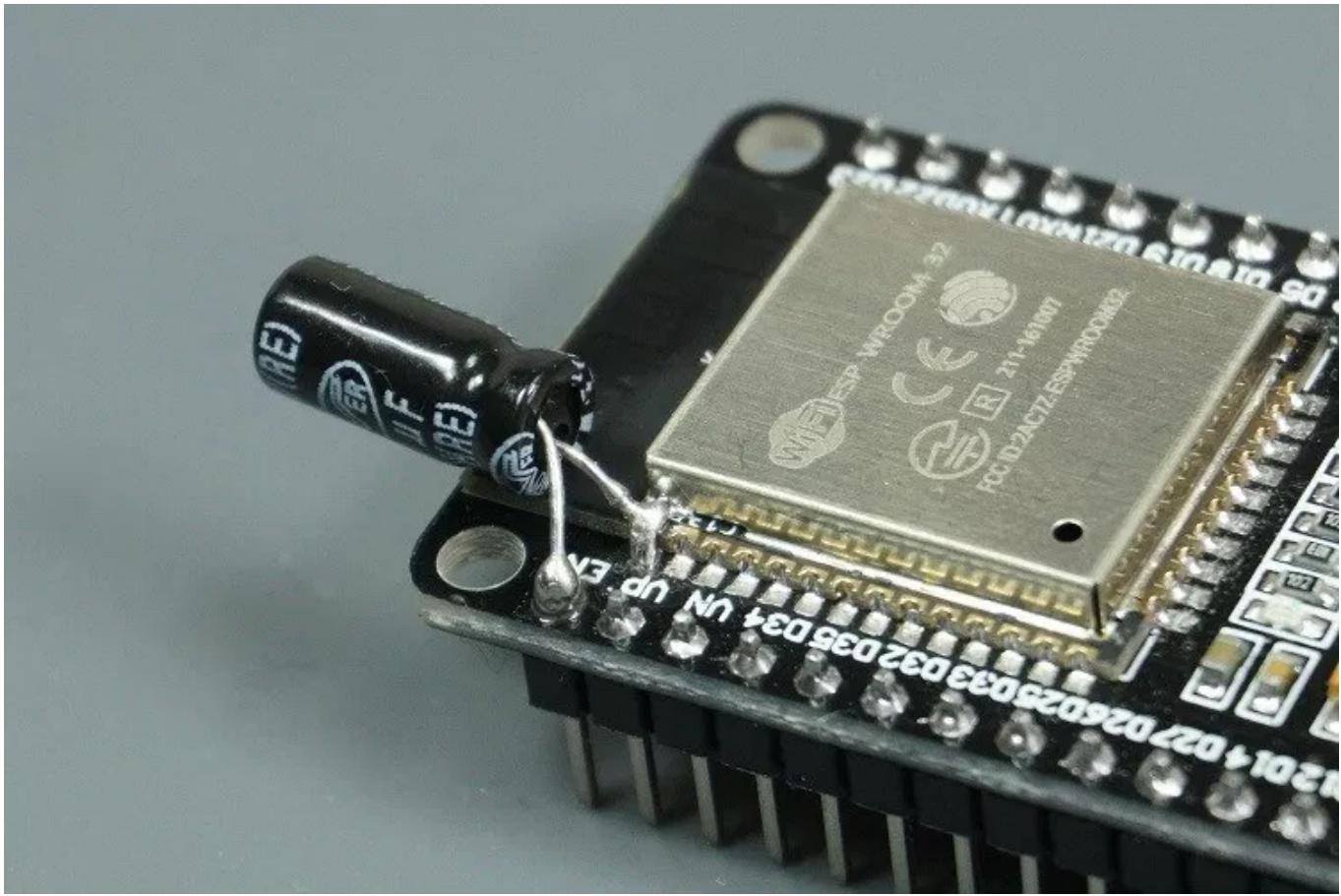
Note: electrolytic capacitors have polarity. The white/grey stripe indicates the negative lead.

If it works, then you can solder the **10 uF electrolytic capacitor** to the board. Since the EN and GND pins are far apart from each other, you can simply connect the capacitor between the EN and the GND of the ESP32 chip as shown in the schematic diagram below:

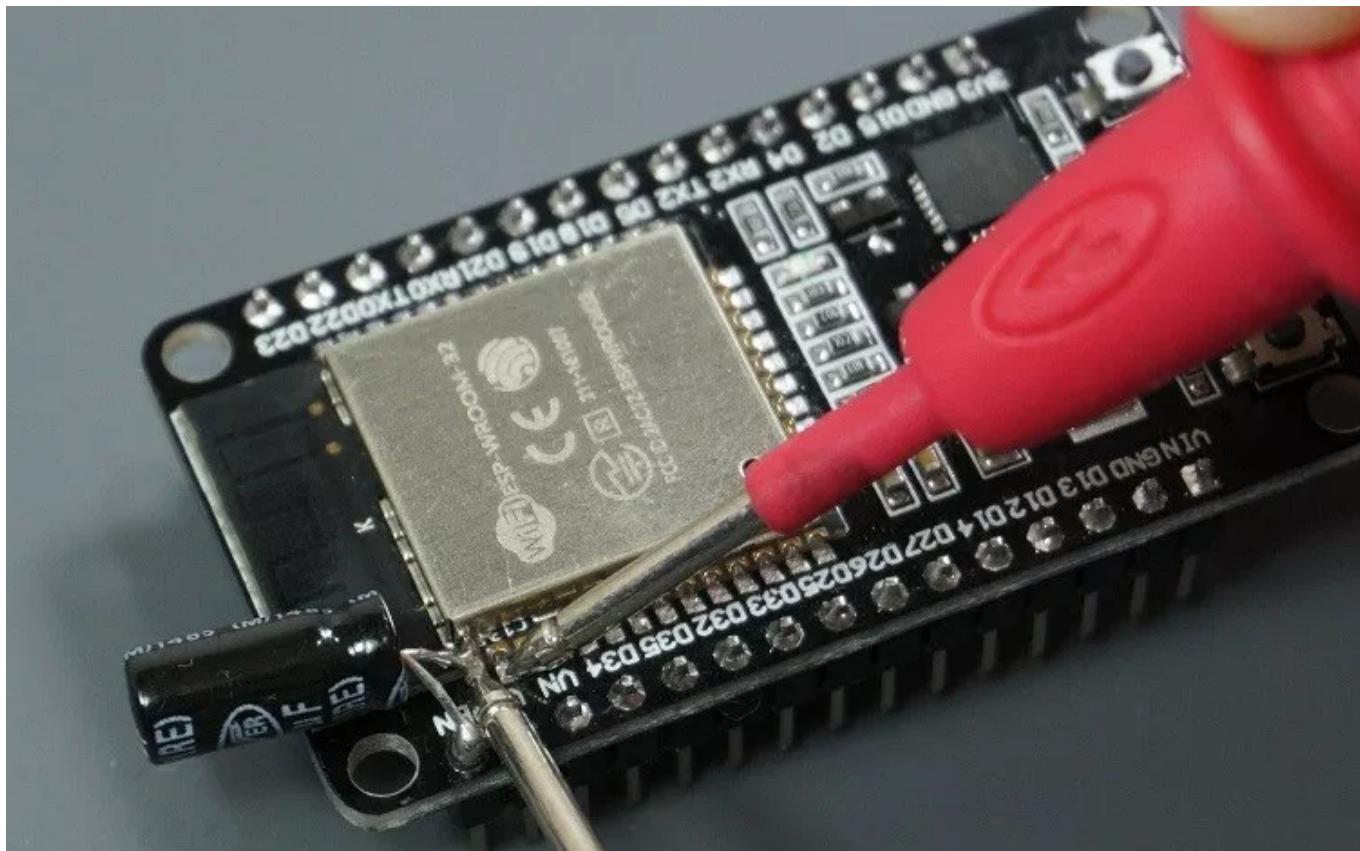


Recommended: [ESP32 Pinout Reference: Which GPIO pins should you use?](#)

The following figure shows how my ESP32 looks like after soldering the capacitor. It doesn't occupy much space, and fortunately you won't get more trouble connecting to the ESP32 when uploading new code.



Before trying to upload a new code, you should check the connections with a multimeter in continuity mode – check that you haven't inadvertently solder anything to the next pin.



If everything is soldered properly, you won't need to press the BOOT button when uploading new code. You also won't get the Fatal Error Occurred: "Failed to connect to ESP32: Timed out waiting for packet header".

```
Done uploading.

Writing at 0x00010000... (14 %)
Writing at 0x00014000... (28 %)
Writing at 0x00018000... (42 %)
Writing at 0x0001c000... (57 %)
Writing at 0x00020000... (71 %)
Writing at 0x00024000... (85 %)
Writing at 0x00028000... (100 %)
Wrote 191104 bytes (99404 compressed) at 0x00010000 in 1.5 seconds (effective 1013.8 kbit/s)...
Hash of data verified.
Compressed 3072 bytes to 144...

Writing at 0x00008000... (100 %)
Wrote 3072 bytes (144 compressed) at 0x00008000 in 0.0 seconds (effective 1755.4 kbit/s)...
Hash of data verified.

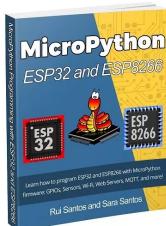
Leaving...
Hard resetting via RTS pin...

9 DOIT ESP32 DEVKIT V1, 80MHz, 921600, None on COM7
```

Wrapping Up

We hope you've found this trick useful and it solved your problem. Thanks to Ben Hall for the suggestion.

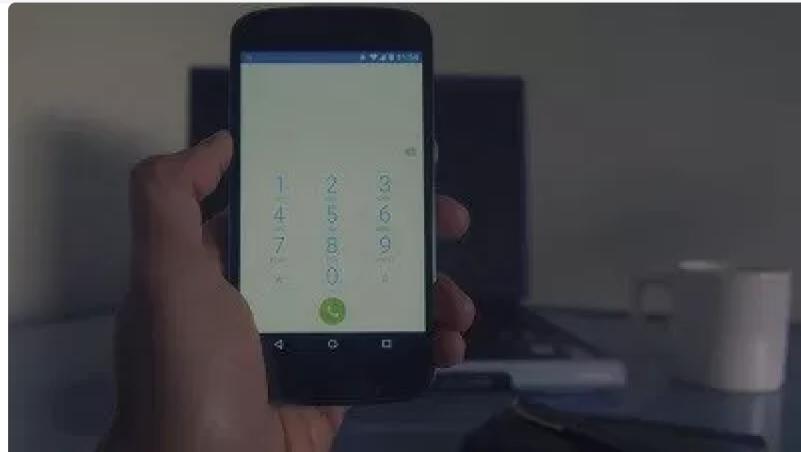
- For more ESP32 troubleshooting tips, consult the [ESP32 troubleshooting guide](#).
- To learn more about ESP32 enroll in the [Learn ESP32 with Arduino IDE](#) course.
- More projects about ESP32: [20+ ESP32 Projects and Tutorials](#)



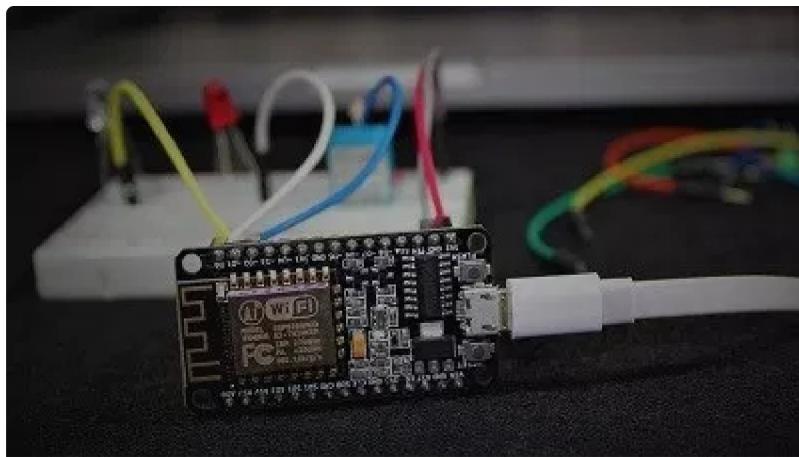
[eBook] MicroPython Programming with ESP32 and ESP8266

Learn how to program and build projects with the ESP32 and ESP8266 using MicroPython firmware [DOWNLOAD »](#)

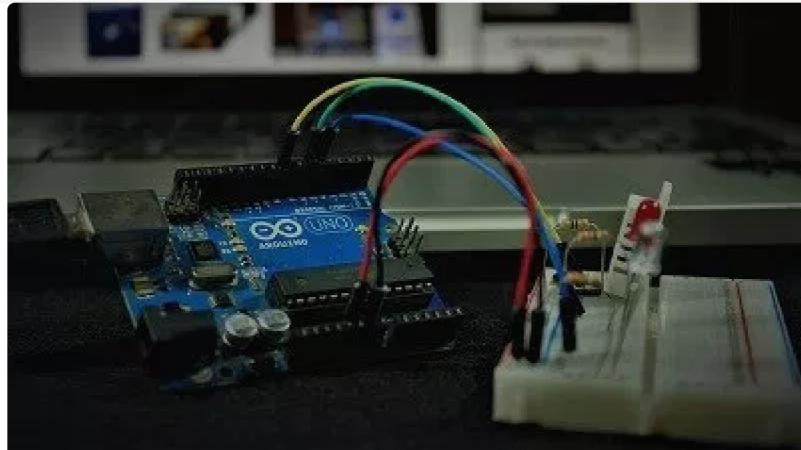
Recommended Resources



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What to Read Next...

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[Build an ESP8266 Web Server – Code and Schematics \(NodeMCU\)](#)

[Power ESP8266 with Mains Voltage using Hi-Link HLK-PM03 Converter](#)

[ESP32 Pinout Reference: Which GPIO pins should you use?](#)

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ESP8266 Voltage Regulator (LiPo and Li-ion Batteries)

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28 thoughts on “[SOLVED] Failed to connect to ESP32: Timed out waiting for packet header”

**Michael Newham**

February 13, 2019 at 5:17 pm | Reply

I wonder what would occur if I used a 100uf Capacitor instead of the 10uf one as recommended in the post above? Would it hurt the ESP board?

**Ezio Somà**

February 16, 2019 at 9:35 pm | Reply

I have an ESP32 with this problem. I have added the capacitor as described in the article. Now the upload start automatically, but the software does not start. If I press the reset I obtain the following message
rst:0x1 (POWERON_RESET),boot:0x0
(DOWNLOAD_BOOT(UART0/UART1/SDIO_FEI_FEO_V2))
waiting for download

the only way to start the program is to switch off and the switch on again the esp32.

Any Idea?

**Ezio Somà**

February 16, 2019 at 9:43 pm | Reply

I have resolved the problem in my previous post by adding a resistor of one 1kohm between the pin EN and the 3v.

Now the upload runs automatically and the reset maintain its function.

**Sara Santos**

February 17, 2019 at 10:52 am | Reply

Thank you for sharing that solution.

Regards,

Sara

**Ezio Somà**

February 17, 2019 at 8:25 pm | Reply

I would like to add that in some cases, with some esp32 I must add a 47 uF capacitor + resistance of 1Kohm for resolving the problem.

**Diogo Alves da Silva**

March 8, 2019 at 5:25 pm | Reply

Muito Obrigado pelo excelente post, me ajudou e muito e tenho certeza que vai ajudar muitas outras pessoas. "Compartilhar conhecimento só enriqueci o nosso saber"

**Sara Santos**

March 9, 2019 at 12:00 pm | Reply

Obrigada 😊

**Luis Alberto Sanchez Garcia**

March 28, 2019 at 6:43 pm | Reply

¡gracias!
por la informacion que deberia venir con la placa

**Sara Santos**

March 30, 2019 at 10:27 am | Reply

Thanks 😊

**Budi**

April 3, 2019 at 4:03 pm | Reply

Hello, thanks for the info.

I have the same problem, but the device I'm using is ESP-32 CAM, so the pinouts are different from the original ESP-32. Do you have a solution for this? Thanks again in advance.

**Sara Santos**

April 16, 2019 at 3:05 pm | Reply

Hi Budi.

To upload code to the ESP32-CAM you need an FTDI programmer.

Please make sure that you have RX and TX pins wired correctly.

Also, very important: GPIO0 needs to be connected to GND, otherwise the ESP32 will not be in flashing mode:

<https://i2.wp.com/randomnerdtutorials.com/wp-content/uploads/2019/03/ESP32-CAM-wiring-FTDI1.png>

I hope this helps.

Regards,

Sara

**Karanbir Soin**

April 12, 2019 at 5:58 pm | Reply

I have a Lolin D32 board which was giving this error. It has only one button(Reset). I put the capacitor like suggested above but the error was persistent. As a last ditch effort I used a jumper on GPIO0 to GND during compile and upload(I use Arduino IDE). Now the code is uploaded without a problem. I remove this jumper and the board functions as programmed.

**Sara Santos**

April 18, 2019 at 2:31 pm | Reply

Hi.

Thank you for sharing your solution. It will certainly be useful for other readers that use the Lolin D32 board.

Regards,

SAra

**yoh-there**

April 29, 2019 at 6:51 pm | Reply

Thank you for the article. I have exactly the same board as in your pictures. It was enough to use 2.5 uF and no resistor was needed. However I didn't like the metal can of the capacitor so close to the antenna. An alternative location is negative to the pin of the AMS1117 that is closest to the USB connector, positive to the middle pin of the transistor closest to D2. And of course if project allows, the capacitor can be applied on the underlying project PCB.

**Daniel Fernandes**

May 10, 2019 at 6:27 pm | Reply

Many thanks, it worked!

Is this for esp8266 or is it just in case of this error in esp32? Well, I noticed that the sketch loads faster.

**John**

May 18, 2019 at 12:49 am | Reply

Another thank you, this solved my problem as well. Great stuff Rui and Sara, keep it coming 😊

**vitali**

June 17, 2019 at 3:00 pm | Reply

Hi! How remove error (A fatal error occurred: Timed out waiting for packet header) to ESP32-CAM Esp32s module ?

**Sara Santos**

June 18, 2019 at 6:30 pm | Reply

Hi Vitali.

That means that your ESP32-CAM is not in flashing mode.

See our troubleshooting guide and follow all the exact steps to put the ESP32 in flashing mode: <https://randomnerdtutorials.com/esp32-cam-troubleshooting-guide/> its in bullet 1.

I hope this helps.

Regards,

Sara



Gary Robinson

July 2, 2019 at 2:51 am | Reply

Hi,

I'm getting error

"Connecting..... An
error occurred while uploading the sketch"
its a Webcam ESP32s.

I've been able to connect to "factory setting AP" and test the camera and wifi ok but doesn't matter what I try I can get it to upload a new sketch. I have two and one works as expected but the other is a no go.

Would try to add a 10 uF electrolytic capacitor but the pinout on the Webcam ESP32 is different from the image shown above. Do you have the EN pin placement for Webcam ESP 32?

Any ideas?



Sara Santos

July 2, 2019 at 5:06 pm | Reply

Hi Gary.

That error means that your ESP32-CAM is not in flashing mode when uploading code.

Make sure you follow the exact same steps we describe in our

troubleshooting guide, bullet 1:

<https://randomnerdtutorials.com/esp32-cam-troubleshooting-guide/>

I hope this helps.

Regards,

Sara



Gary Robinson

July 2, 2019 at 10:32 pm | Reply

Hi Sarah thanks for the reply but I had followed all the troubleshooting elements of the guidelines. I have one esp32 webcam that works so i know my setup is correct.

My real question was: were is EN pin on the esp32 webcam so I could try the capacitor fix. The esp32 in that example was not a webcam version.



Felipe

July 18, 2019 at 3:37 am | Reply

Thanks! Works for me!!



Steve Dickinson

July 24, 2019 at 4:04 pm | Reply

Thanks for posting the solution. I had been using the ESP32 on my Windows 10 desktop with no issues uploading. Wanted to move over to my MAC Laptop. First issue was the lack of USB driver on the MAC. Found

info on that, but then it kept failing to connect – timing out. I assumed it was still an issue with the USB Port / Driver, till I saw your comment about holding down the Boot button throughout the upload process. Worked perfectly. Thank you.

**Sara Santos**

July 25, 2019 at 9:58 am | Reply

Hi Steve.

I'm glad this solved your problem.

Have fun programming your ESP32 board 😊

Regards,

Sara

**ajay rajan**

August 14, 2019 at 12:50 pm | Reply

Hey Sara Santos!

I pulled up EN to 3v3 with a 10K ohm resistor and a switch to ground it while uploading.

I Pulled up IO0 to 3.3V using a 10K ohm resistor and A button switch to pull it down to GND while uploading the code.

The Tx and Rx are also correctly connected to the FTDI programmer(PS). I'm using the same 3.3V- 5V programmer that I use for Esp8266).

And still I am receiving this error. I have even tried attaching capacitor between the EN pin and the gnd. Still the code is just not flashing.

It flashed once and I was able to blink a LED, but after that the device is just not flashing the code.!

Please suggest a solution 😊

""Connecting....._____....._____....._____....._____....._____....._____....._____An
error occurred while uploading the sketch

A fatal error occurred: Failed to connect to ESP32: Timed out waiting for packet header””



Sara Santos

August 24, 2019 at 11:02 am | Reply

Hi.

Are you using an ESP32-CAM?

In that case, you should follow our ESP32-CAM troubleshooting guide, bullet 1: <https://randomnerdtutorials.com/esp32-cam-troubleshooting-guide/>

I hope this helps.

Regards,

Sara



Digitali

August 20, 2019 at 7:44 pm | Reply

Vielen Dank für die Info – nun funktioniert es!



Sara Santos

August 24, 2019 at 8:47 am | Reply

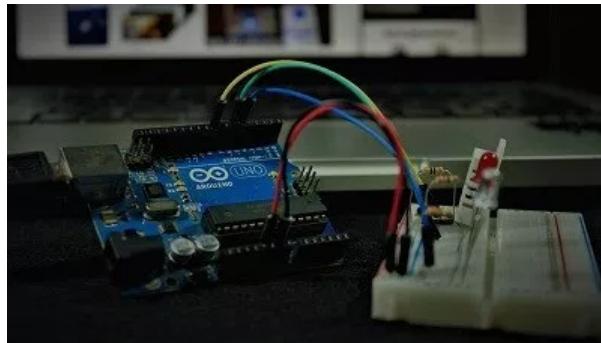
Great!
Regards.
Sara

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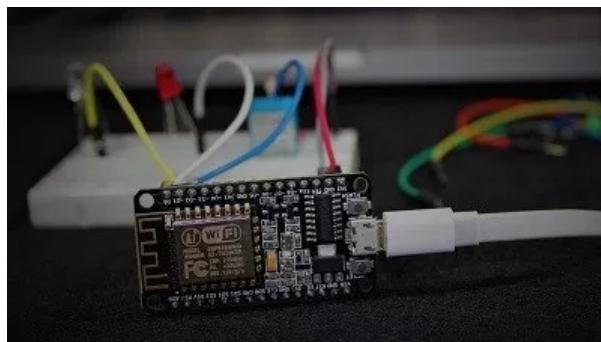


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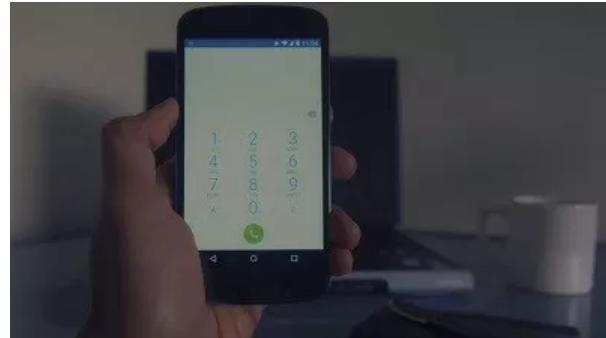
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