

## Pre-built MavToPassthrough for the Dragonlink V3 with internal WiFi

**Current pre-built binary available here:**

[https://drive.google.com/drive/folders/1XTW\\_HuzADtUIEaqc\\_UVhCL-nzZbtWvdI?usp=sharing](https://drive.google.com/drive/folders/1XTW_HuzADtUIEaqc_UVhCL-nzZbtWvdI?usp=sharing)

**Documentation and source code for MavToPassthrough are here:**

<https://github.com/zs6buj/MavlinkToPassthru/wiki>

**This build is intended to be used with a Dragonlink V3 with internal WiFi.**

**Version for use with the Heltec WiFi Kit 32 board:**

<https://docs.google.com/document/d/1ePGAmYa-GSwJ9TrpRcMSZ5HjKpIELJfxtvpISxID2Xs/edit?usp=sharing>

### Setup and installation

**Step 1: Download the ESP32 download tool, extract and run it.**

First, you'll need to download and install the Espressif ESP32 download tool

It can be found here: <https://www.espressif.com/en/support/download/other-tools>

Extract the .zip contents to your computer. (Desktop is fine if you have no other preference).

Navigate into the folder and launch the "flash\_download\_tool\_x.x.x.exe" program.

Choose "Developer Mode"

Choose "ESP32 DownloadTool"

**Step 2: Flashing with "Menu 6"**

Power on your transmitter while holding down the menu button.

Keep holding the button until you hear menu 6, which shows a teal color on the LED.

Connect the USB port of the transmitter to your PC.

At the bottom of the screen, for "COM:" select the COM port for the connected Dragonlink transmitter.

For the "BAUD:" rate, select "115200"

**Step3: The actual flashing process**

In the ESP32 download tool, click on the three dots near the first green box shown below.

Browse to the location you've extracted this package and select the file

"DL\_V3\_Internal\_X.XX.X.bin". That row should go green.

Click the check box to the left of this row.

To the right, past the "@" symbol, type 0x0 as shown below and hit enter.

Select "SpiAutoSet"

Select "DoNotChgBin".

Hit the "ERASE" button and wait until the "Finish" box appears.

If using "Menu 6" mode, briefly press the "menu" button on the DragonLink transmitter to reset the on-board ESP32.

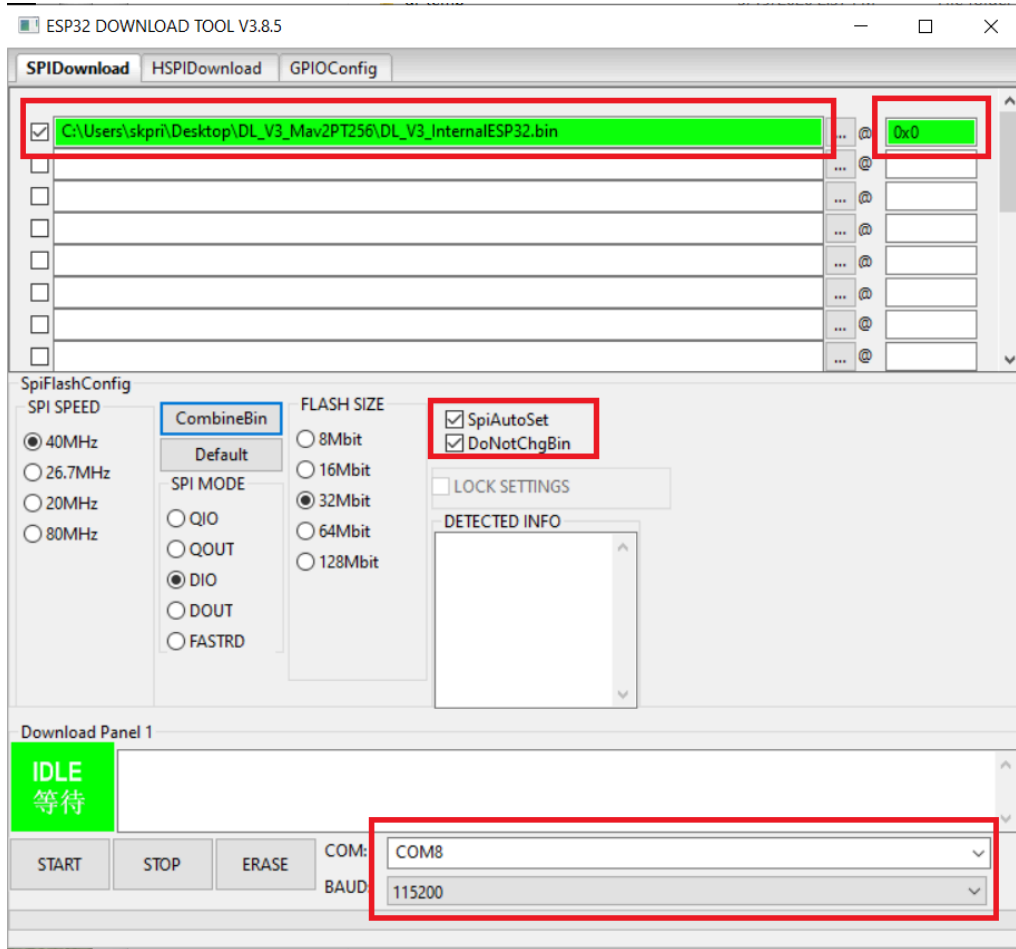
Hit the "START" button. The green bar should slowly fill up, then "Finish" should appear again.

Disconnect your USB connections, then connect the Dragonlink transmitter back to your RC transmitter if necessary and power it up.

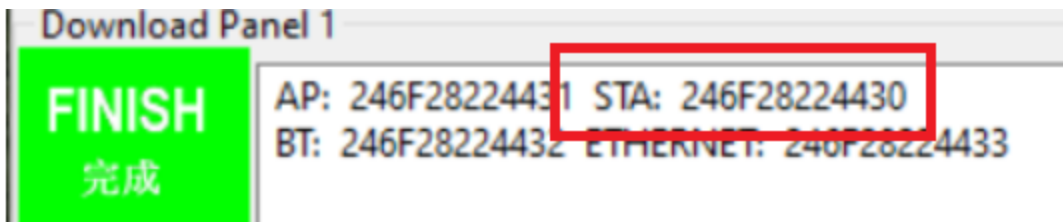
Wait around 20 seconds.

If the flashing went right, the blue LED near the ESP32 should be blinking once per second.

If you get errors while flashing, press the menu button on the transmitter module and try the step again. If you get repeated failures, see the appendix for a complicated work-around.



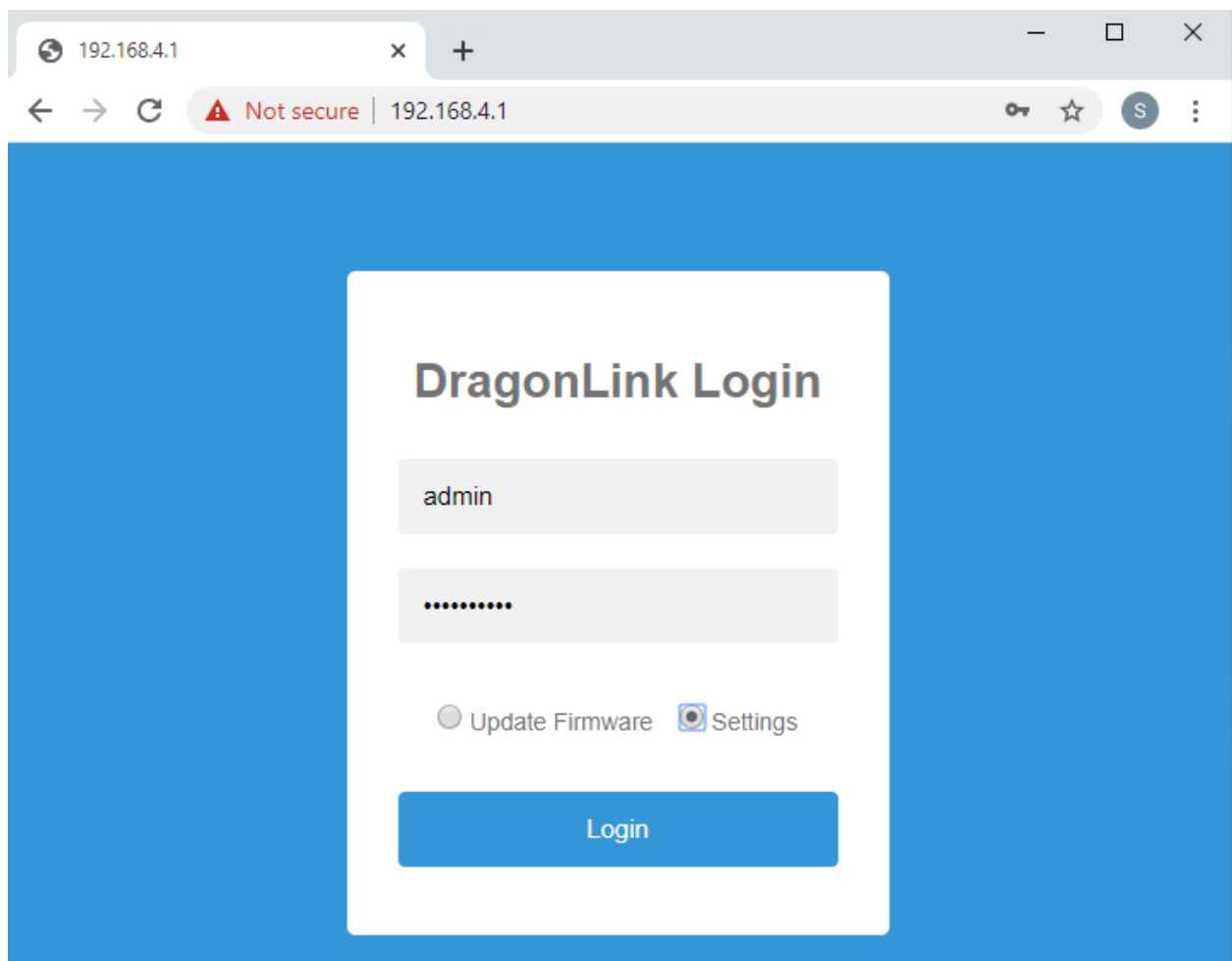
Once flashing is complete, record the “STA” value shown in the Download panel. It will be needed later. It’s the unique network ID (MAC address) of your device.



#### Step 4: Connecting to MavToPassthrough

When the system powers up the first time, it will start a Wifi access point named "DragonLink". Connect to that access point. The WiFi password is "DragonLink". Using a web browser, put in the address 192.168.4.1. You should see the login screen shown below.

Enter "admin" for the login.  
Enter "DragonLink" for the password.  
Select the "Settings" radio button.  
Hit the "Login" button.



### Step 5: Configuring MavToPassthrough

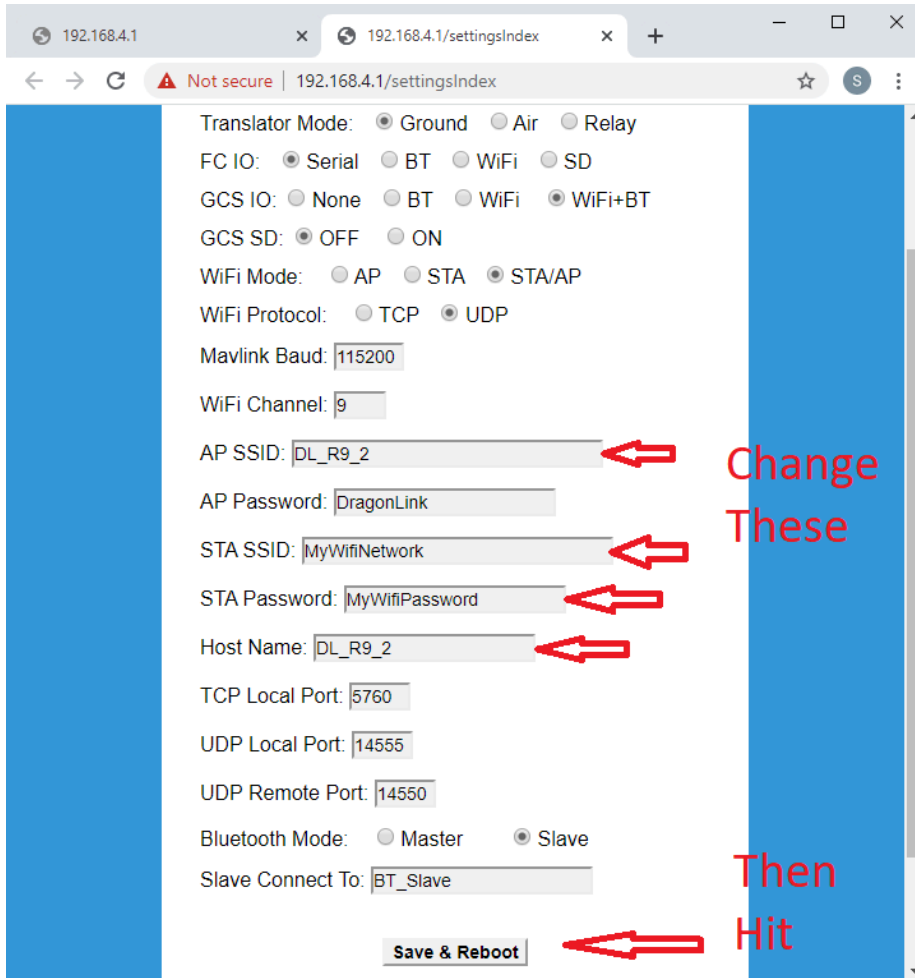
You need to make a few changes to the default settings for full functionality.

First, you need to set the network SSID and Password the device will use when not connected to your home network. You can leave that at “DragonLink:DragonLink” if you want, but I recommend you make it something unique, especially if you fly with other Dragonlink users. I always set the “AP SSID” value the same as the “Host Name” (used by bluetooth and web interface), but I normally make those unique for each of my transmitters so they can be used at the same time.

The most important things to set are the “STA SSID” and “STA Password” values. Those should be set to match your home WiFi settings. If you properly configure this. It will operate in station mode and connect to your home WiFi when you’re there, or start up an access point when you’re in the field. This build of MavToPassthrough supports at most 13 character passwords.

Keep the other settings as shown. Baud is always 115200.


Make sure to hit the “Save & Reboot” button.



**Step 6: Logging in while connected to your home network**

After you've changed the settings as shown above, Mav2PT will connect to your home network when it's available.

If you want to log into it and change settings, you'll need to check your wifi router's list of attached devices and find the device with the MAC address matching what you saw when flashing the device, as shown below. Use that address (in my example case it would be 192.168.1.94) to connect using a web browser.

	192.168.1.94	192.168.1.94	24:6F:28:22:44:30
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**Step 7: Dragonlink Transmitter settings**

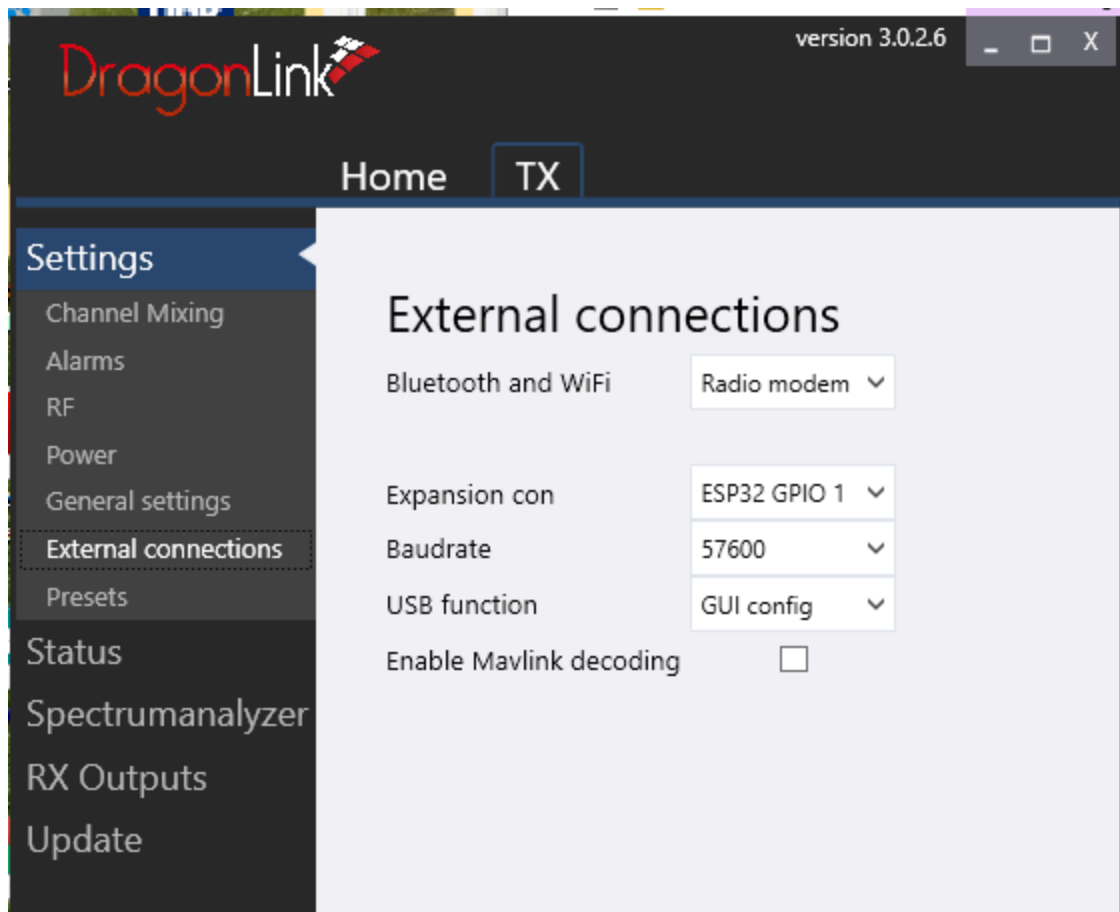
Configure your “External connections” exactly as shown below.

“Radio Modem” sends the radio modem data to Mav2PT for processing.

The “Expansion Con” setting routes the output S.Port telemetry data to the blue wire of the UEXP connector for connection to the bottom pin in the module bay of an OpenTX-based RC transmitter.

Baudrate of 57600 is required for S.Port.

Mavlink decoding is not used with Mav2PT, it does a much more complete job of that.



See the full instructions on radio modem telemetry on the Dragonlink website for other settings.

<http://www.dragonlinkrc.com/instructions/v3equipment/radiomodem/>

## **Working with ground-station software**

If you're using ground-station software which supports WiFi connection, that's generally preferred. (Mission Planner and QGroundControl both do)

Make sure the Dragonlink and your ground-station device are on the same network.

If at home, just use your home network.

If in the field, configure your laptop, tablet etc. to connect to the access point provided by Mav2PT.

With the transmitter and aircraft powered up and running, you should be getting S.Port telemetry on your RC transmitter for use by Yaapu ( <https://github.com/yaapu/FrskyTelemetryScript> )

On the ground-station, just select UDP as the communication type and hit "connect" (if needed). The groundstation should see your aircraft and immediately download parameters.

At this point, you can do full configuration, flight plan management etc. over the telemetry link.

If you're using an Android device and want to connect via Bluetooth, just configure your phone/tablet to connect to the Mav2PT bluetooth device. The behavior is the same after that.

## **Upgrading to newer versions**

Once you've installed a version of Mav2PT on your device, you can upgrade to newer versions simply by connecting to its web interface and selecting "Update Firmware". Then load the "App\_Only\_xxx" version of the firmware.

## **If you forget your password**

Just erase and re-download the firmware. Everything will be reset to defaults.



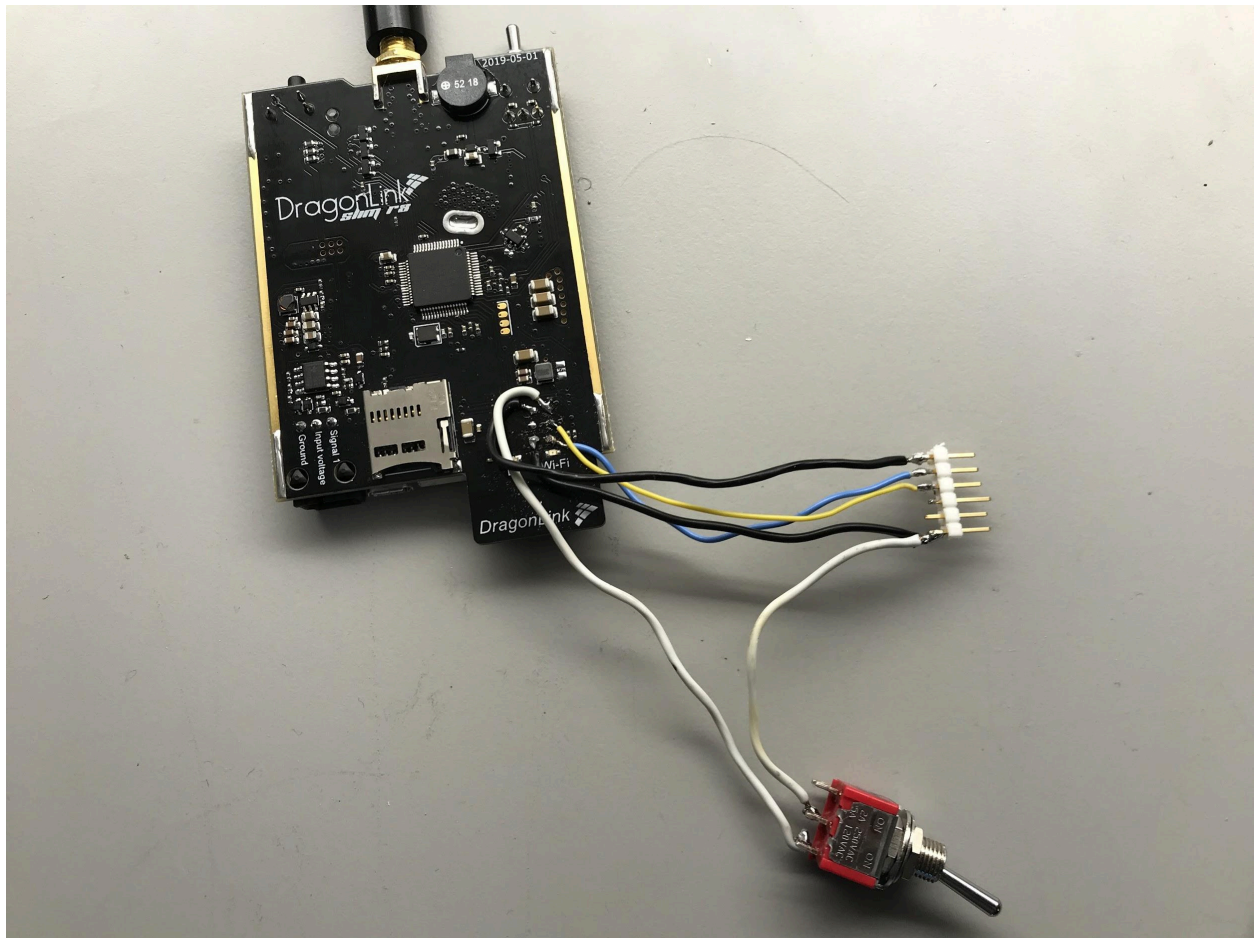
**Appendix: If “Menu 6” flashing doesn’t work for you:**

It’s still possible to flash the ESP32 if Menu 6 flashing fails. This requires some soldering and an FTDI adapter, so I recommend you try menu 6 a few times first. Many people have had success by repeatedly trying it.

If that fails, you will need to solder wires onto the small contact points on the DL transmitter board near the ESP32 chip.

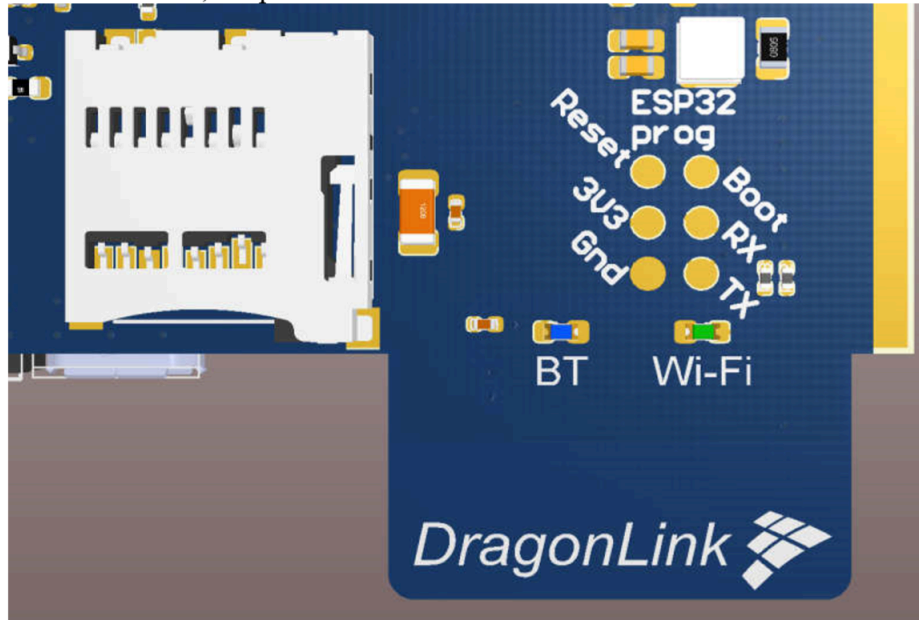
Two versions of boards have been built with ESP32.

Revision 8 was the first, and looks like this:

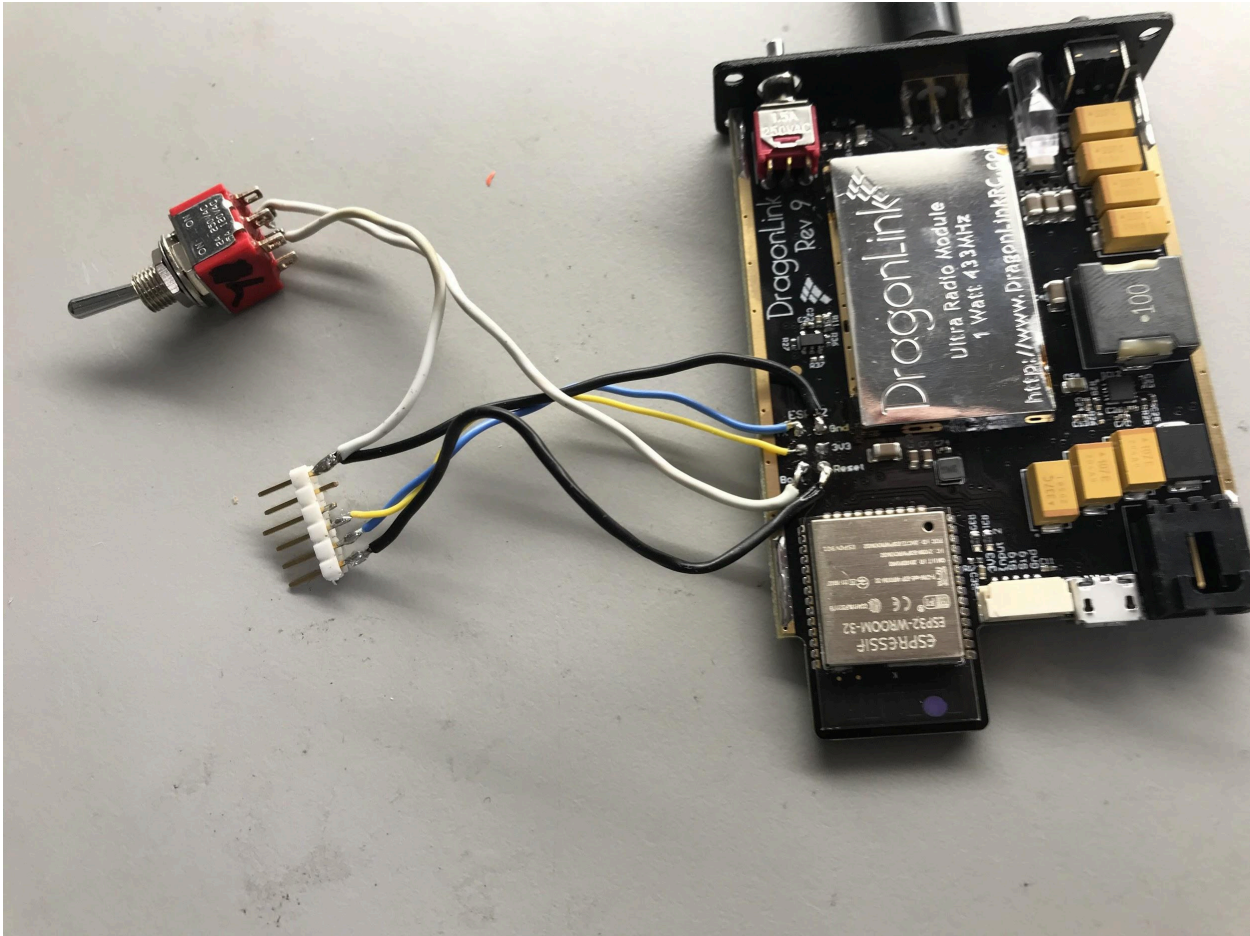


This document from Dennis of Dragonlink shows the pad labels and describes the process:

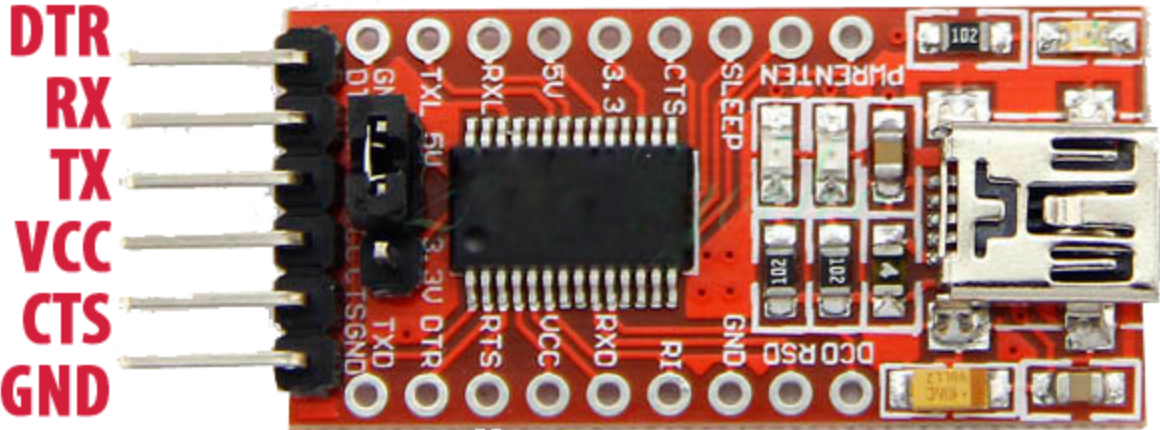
It's also possible to program the ESP32 directly through the test-pads with the pin-out as shown below. It should however be noted that the pins are controlled directly by the MCU and it's necessary to put the transmitter in "firmware update mode" to tri-state the pins. Also, the reset-pin is not actively pulled high on all revisions, so it might be needed with something like 1K pull-up (1K resistor between the reset-pin and 3V3). Using the USBP-port for programming is highly recommended, as a less invasive and easier solution. However, the pins are available.



The revision 9 board looks like this, and the pads are labeled on the silk-screen:



You will need to connect these wires to an FTDI adapter to do the actual programming.



## Wiring connections

**Dragonlink**                      **FTDI adapter**

**RX**                      ->      **TX**

**TX**                      ->      **RX**

**Ground**                      ->      **GND**

**Reset**                      ->      **DTR**

**Boot**    **Via a switch to Ground**

**3V3**                              **No connection**

(Thanks to Carrera0To60 for image/diagram)

Set the jumper on the FTDI adapter to 3.3V mode.

Plug in the FTDI adapter and notice which COM port it shows up as on your computer.

Make sure the “Boot” pin on the DL transmitter is connected to ground, then connect the USB port of the DL transmitter to another USB port of your computer.

Run the Dragonlink GUI and select “Update”, then “Reboot Hardware in firmware update mode”

Now, you can go back and launch the ESP32 download tool as listed in step 2, and:

At the bottom of the screen, for “COM:” select the COM port for the connected FTDI adapter. For the “BAUD:” rate, select “921600” (115200 will also work this way but is much slower)

Now you can flash exactly as in **step 3** above.

After flashing is complete, you can disconnect the FTDI adapter and make sure to remove the connection between boot and ground.

The code will not run, and the blue LED will not blink if you have “Boot” grounded while powering up.