

ENDORPHIN.ES – TERMINAL – FIRMWARE UPDATE

We at Endorphin.es always try to improve our products. Now we offer firmware update v.2.0 for Endorphin.es – Terminal.

The update includes the following addition/fix:

- After this update, Cabin pressure becomes a powerful reverb with almost up to infinite decay tail. Dry/wet is controlled by the same O₂ knob (along with CV control). TAP IN acts as a clock input in the range of approx. 1 Hz...400 Hz adjusting the decay of the reverb's tail (shorter clock for shorter decay and vice-versa). By default at power-up, the decay is moderate.
- After this update both airplanes /envelopes in Transient (AD) or Looping modes catch every trigger input from CHECK-IN jack (envelope start/restart). Before the trigger sometimes but very rare was being lost in AD/cycling modes.

All Endorphin.es products use same family of digital chips – SMT32F1/2/3/4. Some of the products may be updated via USB from the module directly in DFU mode (e.g. Shuttle Control, Grand Terminal), other require extra hardware – small USB stick / programmer that runs under Windows XP/7/8/8.1/10 and is called – **ST-LINK V2 Programmer (Debugger/Emulator/Downloader)** for SMT32:



Every Endorphin.es product (except Furthrrrr Generators before S/N°571) incorporates one or a few SMT32 chips. Every chip on PCB has a programming interface slot – so called Serial Wire Debug (SWD), which requires only 4 (four) pins to be connected from the programmer to the pins on the rear side PCB of the module and upload the firmware in a moment.

All Endorphin.es products incorporate **same** pin-out for those four pins. There is a small line from one side of the programmer pins, located on the PCB. The nearest pin to that line is a power pin **+3.3 VOLTS** (3V3, V_{CC}). Next to it, one by one are the following: **GROUND** (GND), **SWDIO** (I/O) and **SWCLK** (CLOCK).

Every programmer comes with 4 wires of DuPont line (female-female jumper cable):

Pin-headers usually are not soldered on the modules, so connection is done cutting 4 pins from **PLS-40** pin strip, inserted in the wires and then inserted with shorter side into the programmer slots and bended a bit to the side:



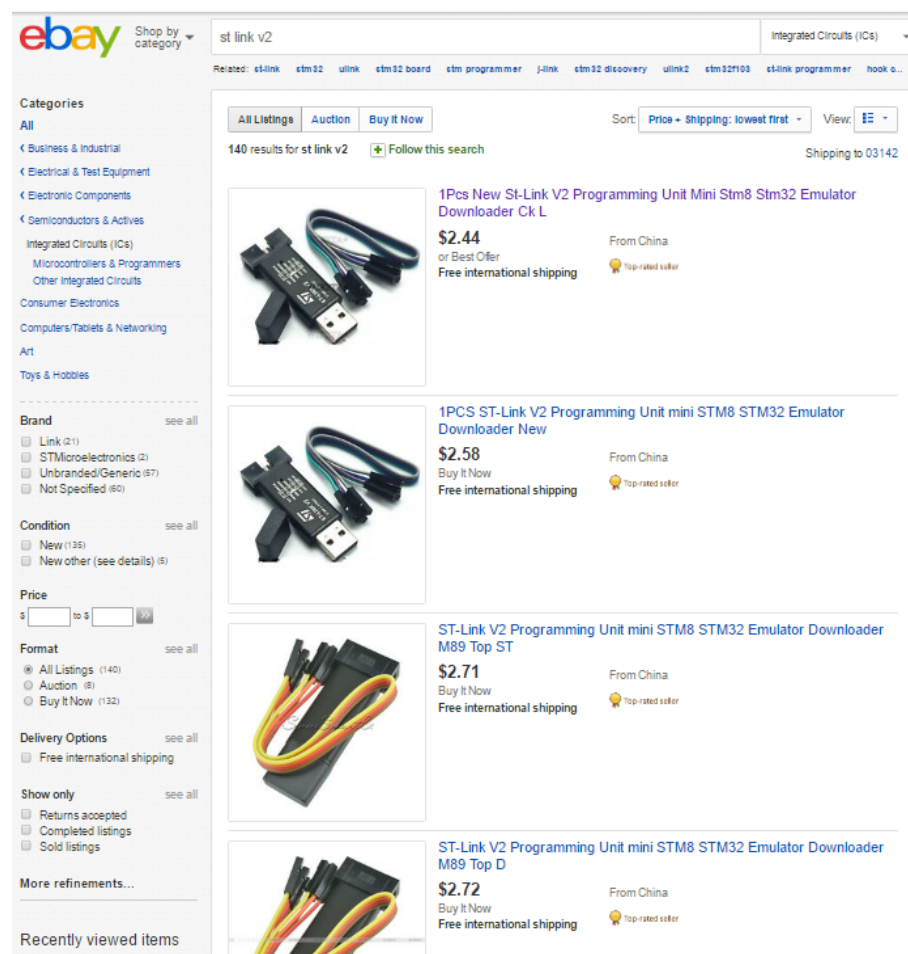
In general the update procedure looks like as follows: you connect the USB programmer into the PC*, connect 4 certain pins from the programmer to 4 certain pins on the backside of the module, launch the programming software, choose proper firmware binary file, click start – 5...10 seconds and you are ready with the update. In reality, some steps may require more attention, however no worries – you do not need to ‘hack’ any software or use the command line. Everything is done click-by-click and requires medium level of PC skills.

There are a few options how to update:

- Purchase additional hardware - USB stick and flash the firmware on your own
- Send your module to us and we will flash it for you free. The only thing we would ask is to pay return shipping which is usually up to 25 EUR over EU (or up to 25 USD to US/worldwide) with International Post.

UPDATE INSTRUCTIONS.

1. Obtain the programmer. The easiest way is to get it from Ebay/Amazon/DealeXtreme/ AliExpress. Search for ‘**ST Link v2**’ keywords at your favourite web-site (e.g. Ebay). Sort the items by ‘**Price + Shipping: lowest first**’. You may buy original [ST-LINK/V2](#) in-circuit debugger/programmer for STM8 and STM32 from STMicroelectronics. You don’t need the most expensive option, any cheaper solution will work. Usually you will find the first results on Ebay at a price around 2.5...3 USD including free international shipping. Also some local offers may be faster in delivery to your place.

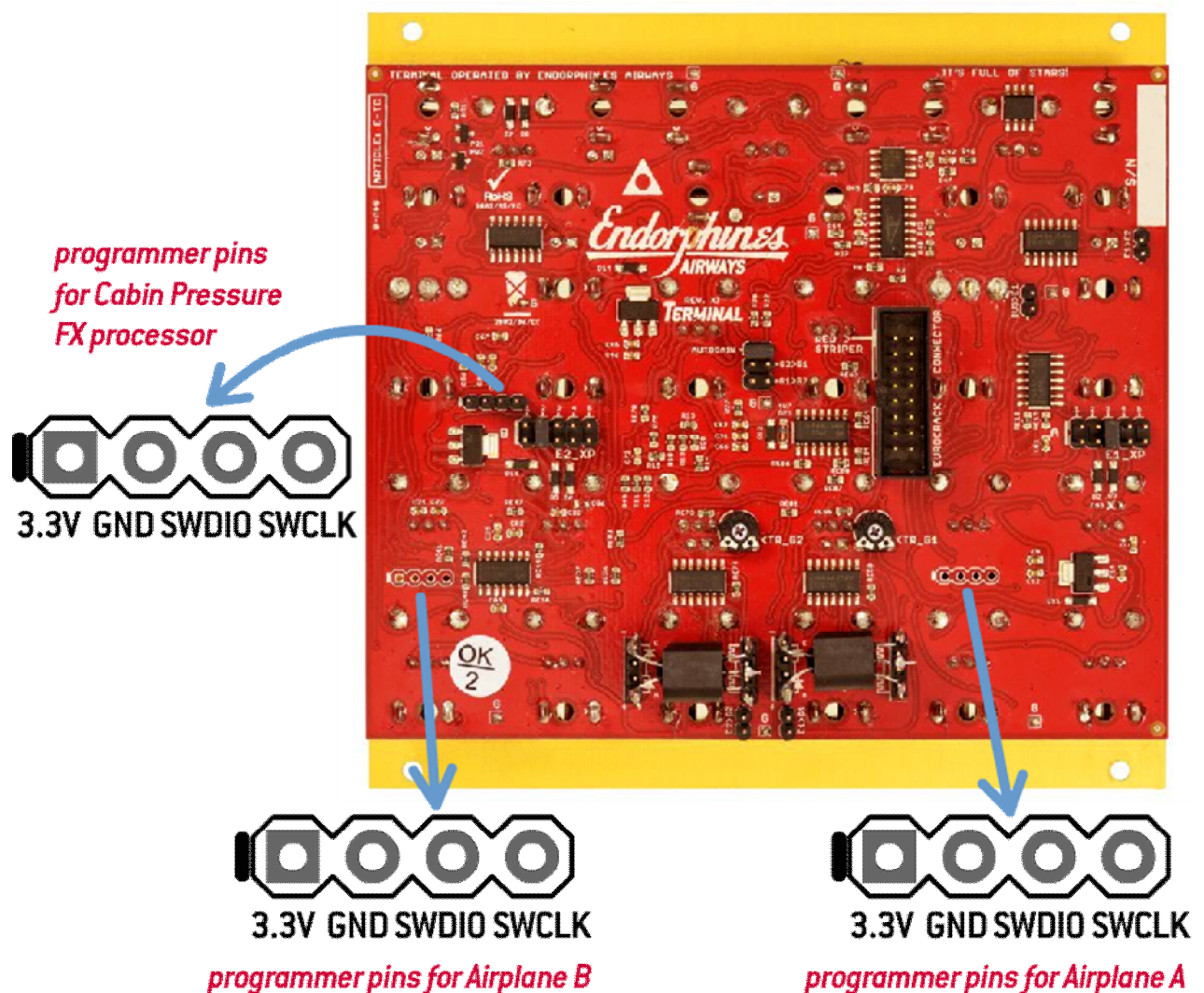


The screenshot shows an eBay search results page for 'st link v2'. The search results are sorted by 'Price + Shipping: lowest first'. There are 140 results for 'st link v2'. The first four listings are:

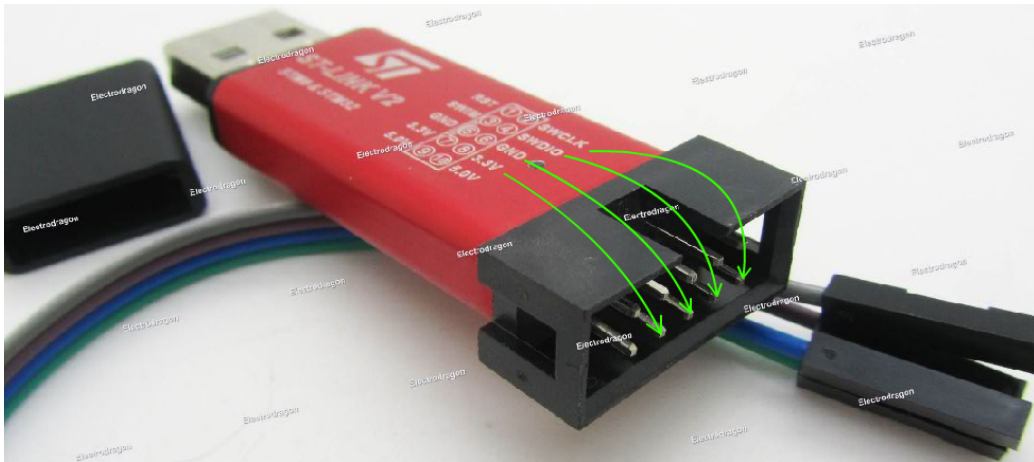
- 1Pcs New St-Link V2 Programming Unit Mini Stm8 Stm32 Emulator Downloader Ck L**
\$2.44 or Best Offer
Free international shipping
From China
Top-rated seller
- 1PCS ST-Link V2 Programming Unit mini STM8 STM32 Emulator Downloader New**
\$2.58
Buy It Now
Free international shipping
From China
Top-rated seller
- ST-Link V2 Programming Unit mini STM8 STM32 Emulator Downloader M89 Top ST**
\$2.71
Buy It Now
Free international shipping
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Top-rated seller
- ST-Link V2 Programming Unit mini STM8 STM32 Emulator Downloader M89 Top D**
\$2.72
Buy It Now
Free international shipping
From China
Top-rated seller

The left sidebar shows filters for Categories, Brand, Condition, Price, Format, Delivery Options, and Show only. The right sidebar shows 'Recently viewed items'.

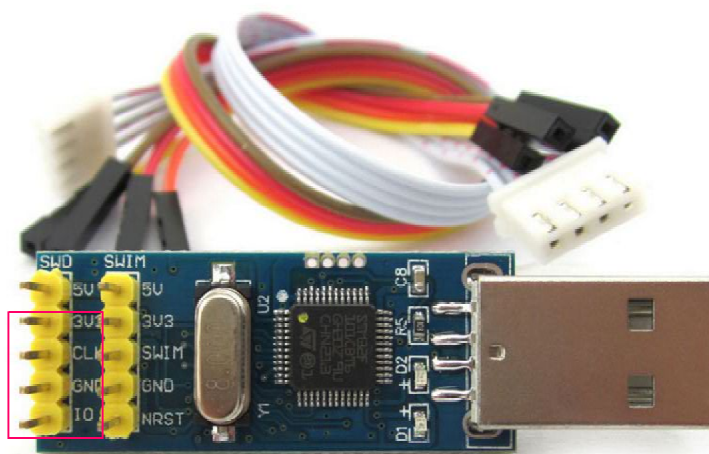
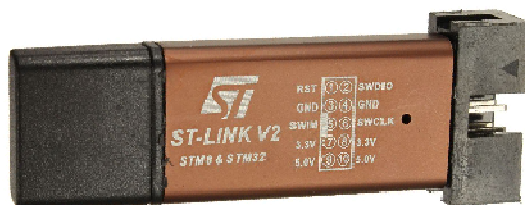
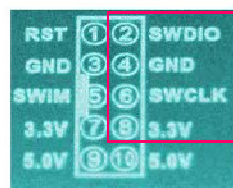
2. While waiting for the ordered ST-Link v2 programmer, you may prepare and download/install all necessary software and prepare firmware:
 - ST-LINK V2 driver [STSW-LINK009](http://www.st.com/content/st_com/en/products/development-tool-software/stsw-link009.html). Scroll down and press 'GET SOFTWARE', then scroll down and press 'ACCEPT', then press 'DOWNLOAD' (no sms/registration required):
http://www.st.com/content/st_com/en/products/development-tool-software/stsw-link009.html
 - ST-LINK UTILITY [STSW-LINK004](http://www.st.com/content/st_com/en/products/development-tool-software/stsw-link004.html) – flashing software. Scroll down and press 'GET SOFTWARE', then scroll down and press 'ACCEPT', then press 'DOWNLOAD' (no sms/registration required):
http://www.st.com/content/st_com/en/products/development-tool-software/stsw-link004.html
 - Latest [Terminal v2.0 firmware](http://firmware.endorphin.es/terminal_fw_v2.0_281016.zip) (for both fx-processor/reverb and envelopes in one archive):
 (link: http://firmware.endorphin.es/terminal_fw_v2.0_281016.zip)
3. Prepare the module for update. Unscrew it from the rack and disconnect its power cable (usually powering of the module during programming procedure is not required). Find all both three 4-pin programmer pins on the module and keep in mind its pin-out. You have to program each of the parts separately with a certain firmware.



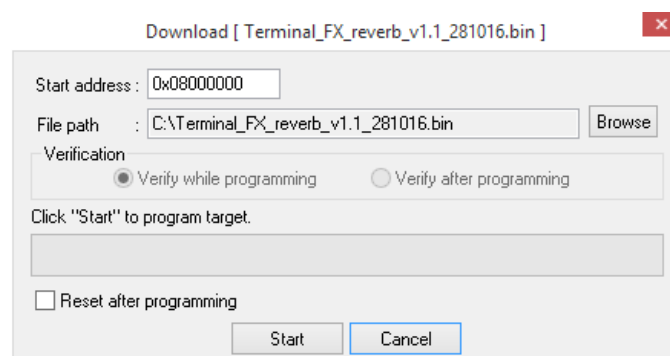
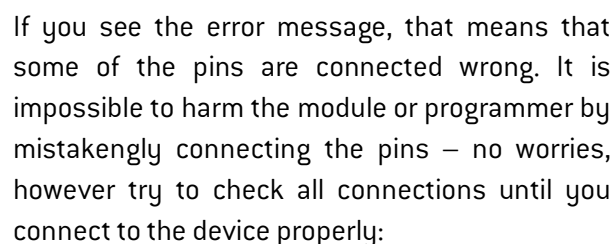
4. Take the programmer and have a look at its pin-out:



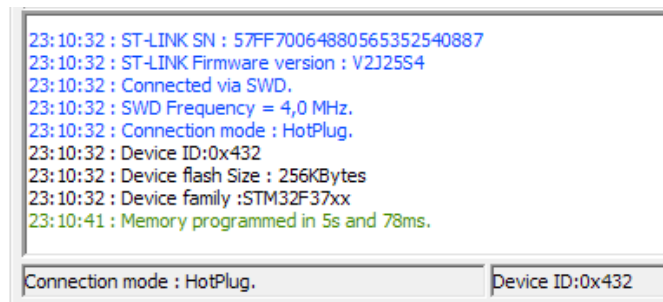
5. You have to find same 4 pins on the programmer and connect to the same pins one-by-one to the module. Some programmers have same pin-out (pins 3.3V GND SWDIO SWCLK stay in one row in same sequence as on every Endorphin.es module). Some other programmers have a bit different pin-out, however all you need is to navigate to four 3.3V, GND, SWDIO, and SWCLK pins and connect them with the supplied DuPont cable to the module:



-
- STM32 ST-LINK Utility



10. Press 'START' and wait a few seconds. At that moment, do not disconnect or make weaker connection from module to programmer. It is barely impossible to brick the module with that programming procedure (basically, that procedure can UNBRICK any badly programmed modules) and flashing of the firmware may be done any amount of times.



```
23:10:32 : ST-LINK SN : 57FF70064880565352540887
23:10:32 : ST-LINK Firmware version : V2J25S4
23:10:32 : Connected via SWD.
23:10:32 : SWD Frequency = 4,0 MHz.
23:10:32 : Connection mode : HotPlug.
23:10:32 : Device ID:0x432
23:10:32 : Device flash Size : 256KBytes
23:10:32 : Device family :STM32F37xx
23:10:41 : Memory programmed in 5s and 78ms.
```

Connection mode : HotPlug. Device ID:0x432

11. Afterwards you will see green message in the bottom of ST-LINK Utility window:

Memory programmed in Xs and XXXms.

That means you did it - congratulations!

12. You may now disconnect the module from the programmer pins, close ST-LINK Utility app and disconnect the programmer from your PC. You may now install module back to your rack and enjoy new functions.
13. If you have a few modules (or a few chips to reprogram – e.g. both envelopes in Terminal) – you may use batch mode in ST-LINK Utility (TARGET > Automatic mode...), then choose your firmware and press start. All you need is to connect one module to its pins. Once it connected properly, its firmware flash will start automatically. After the flashing, the app will ask to disconnect that module and connect another one. One by one, you can easily update same the firmware on all your devices without clicking 'START' button every time.

* - there are no straightforward solutions for updating the firmware under Linux or MAC OSX with ST-LINK v2 programmer; however, you may check a few following articles and links. Sorry, no support for that topic.

[Programming an STM32F103XXX with a generic "ST Link V2" programmer from Linux:](https://github.com/rogerclarkmelbourne/Arduino_STM32/wiki/Programming-an-STM32F103XXX-with-a-generic-ST-Link-V2-programmer-from-Linux)

https://github.com/rogerclarkmelbourne/Arduino_STM32/wiki/Programming-an-STM32F103XXX-with-a-generic-ST-Link-V2-programmer-from-Linux

<https://github.com/texane/stlink>