ENDORPHIN.ES - SHUTTLE MATE - FIRMWARE UPDATE

We at Endorphin.es always try to improve our products. Now we offer firmware update v.1.2 for Endorphin.es – Shuttle Mate.

Shuttle Mate firmware update history:

v 1.2 (03.01.2017):

- Elektron Digitakt compatibility (as well as all rest new Elektron [mk2] devices)

v 1.1 (21.10.2016):

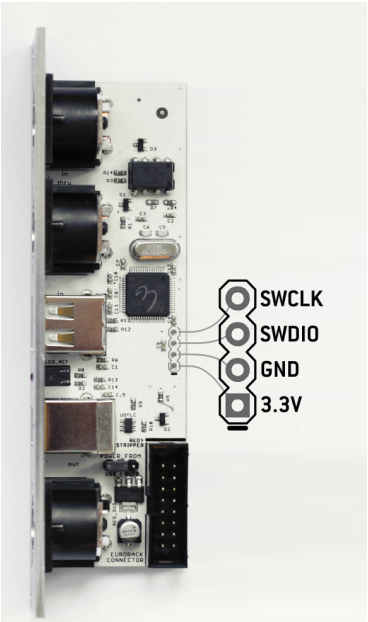
- physical MIDI DIN-5 input (most upper jack) accepts all MIDI channels. Before it accepted MIDI signals only from MIDI channel 1;

- Original PID/VID of Shuttle Mate licensed by USB-IF.

v. 1.0 (01.09.2016):

Initial release

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. as Shuttle Control, Grand Terminal), others require extra hardware - 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. 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.

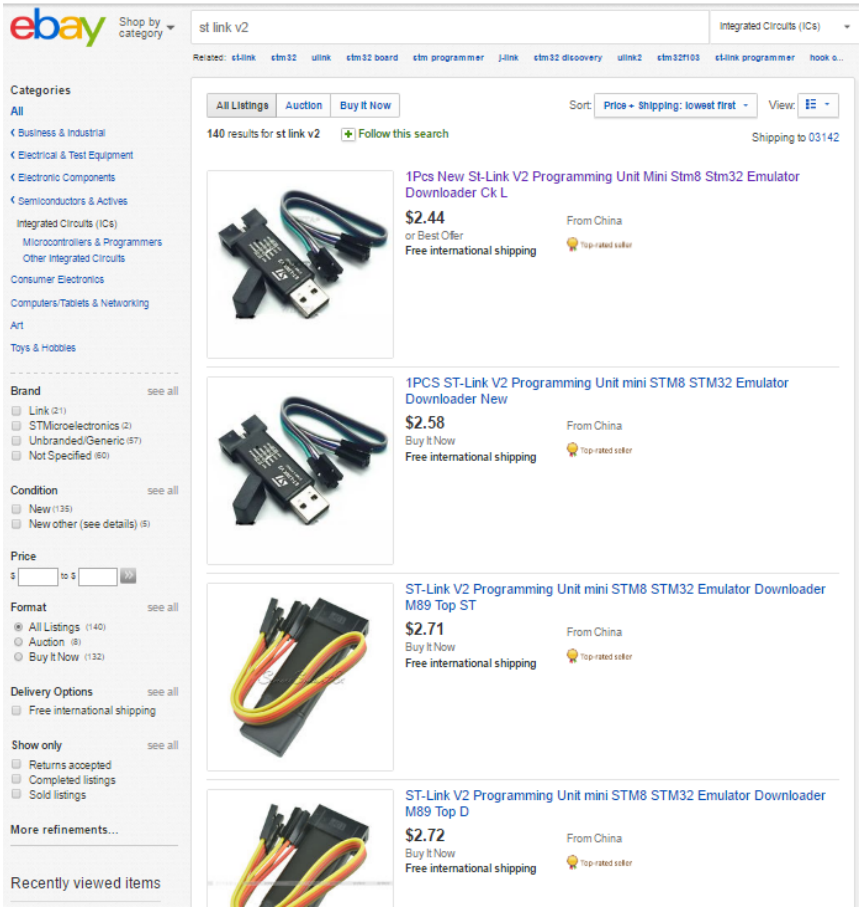
In general the update procedure looks like as follows: you connect the USB programmer into the PC*, connect 4 certain pins from the programmer to 4 certain pins on the backside of the module, launch the programming software, choose proper firmware binary file, click start – 5...10 seconds and you are 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 around 20 EUR over EU (up to 20 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 also 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.



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**. 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/embedded-software/development-tool-software/stsw-link009.html

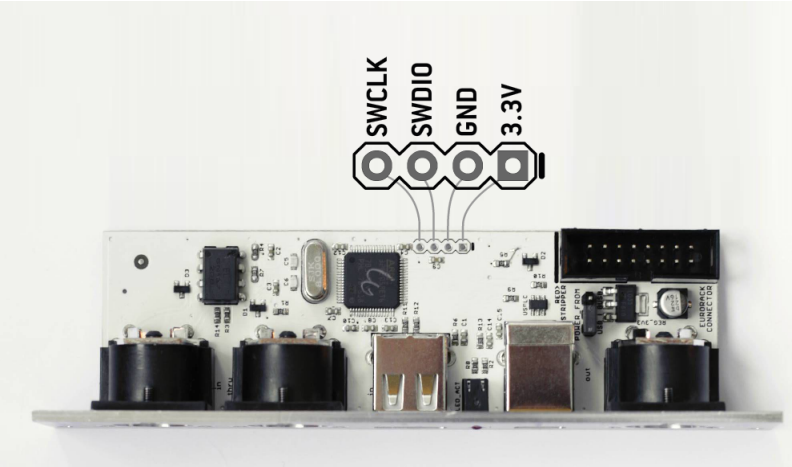
- ST-LINK UTILITY - **STSW-LINK004** – flashing software. Scroll down and press '**GET SOFTWARE**', then scroll down and press '**ACCEPT**', then press '**DOWNLOAD**' (no sms/registration required):

  http://www.st.com/content/st_com/en/products/embedded-software/development-tool-software/stsw-link004.html

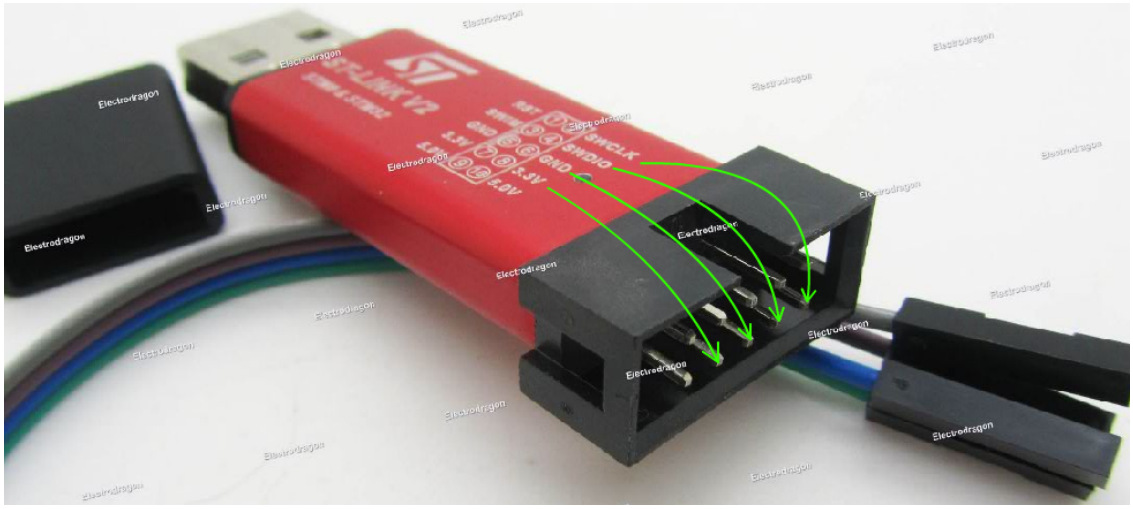
- Latest **Shuttle Mate v1.2 firmware**:

  (link: http://firmware.endorphin.es/Shuttle_mate_fw_v1.1_211016.zip).

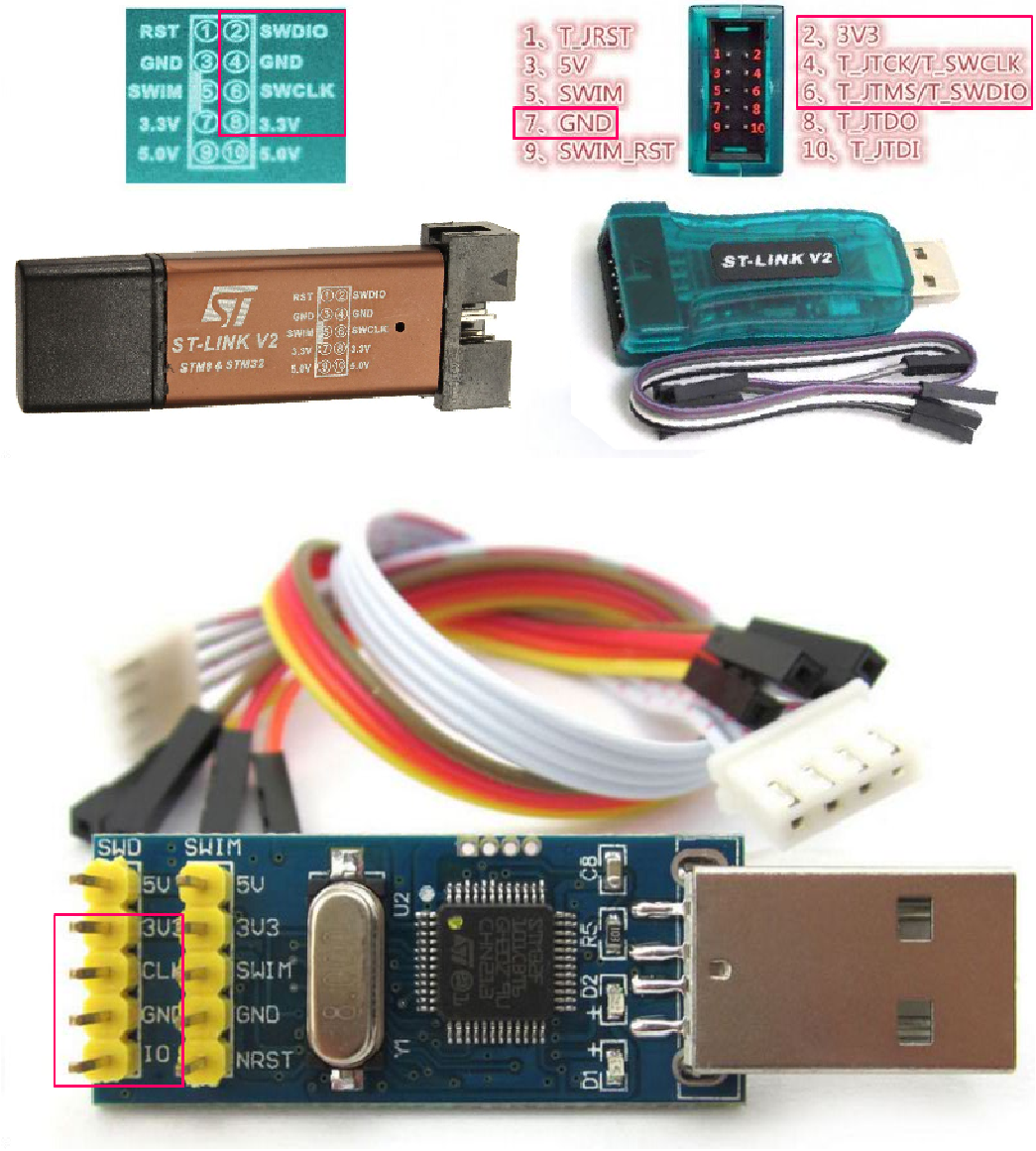
3. Prepare the module for update. Unscrew it from the rack and disconnect its power cable (usually powering of the module during programming procedure is not required). Find 4 programmer pins on the module and keep in mind its pin-out:



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



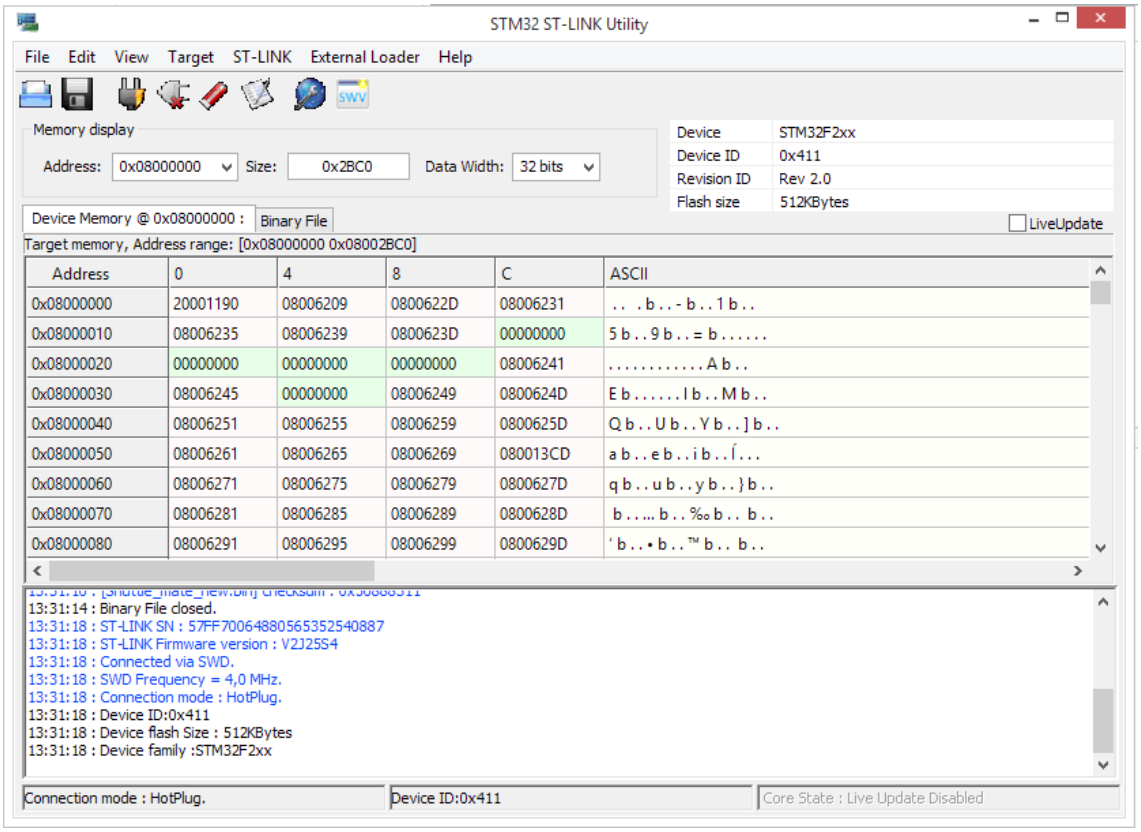
5. You have to find same 4 pins on the programmer and connect to the same pins one-by-one to the module. Some programmers have same pin-out (pins **3.3V GND SWDIO SWCLK** stay in one row in same sequence as on every Endorphin.es module). Some other programmers have a bit different pin-out, however all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



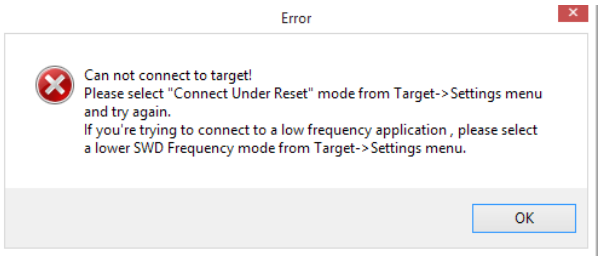
6. Connect all four pins to the module and plug the programmer in the USB. It is possible to connect them without soldering, just inserting the pin-headers into appropriate holes and bend the plastic headers with the finger to the side to make the connection secured.

7. Launch STM32 ST-LINK Utility from your installed  STM32 ST-LINK Utility apps:

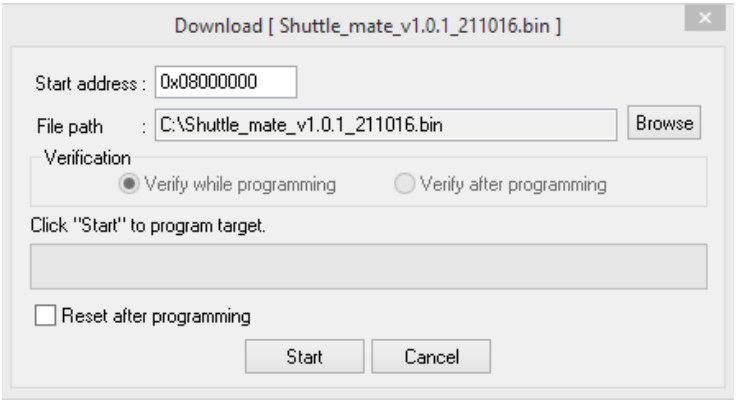
8. In STM32 ST-LINK Utility navigate to **TARGET** > **CONNECT** to ensure the module is connected to programmer correctly. After correct connection you should see the following message:



If you see the error message, that means that some of the pins are connected wrong. It is impossible to harm the module or programmer by mistakengly connecting the pins – no worries, however try to check all connections until you connect to the device properly:.

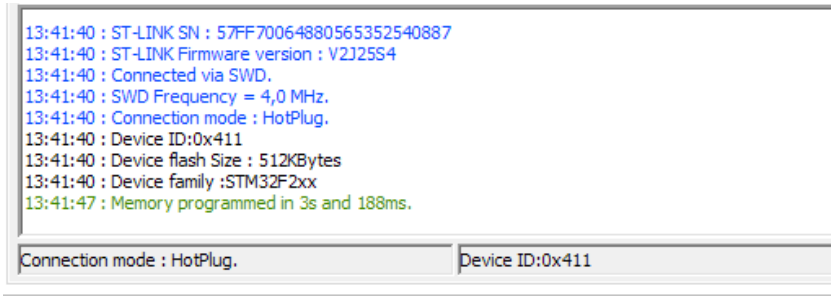


9. If everything is correct, then navigate to **TARGET** > **PROGRAM...** and choose unpacked binary file **Shuttle_mate_v1.0.1_211016.bin** of firmware to be updated:



10. Press 'START' and wait a few seconds. At that moment, don't 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.



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 is 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 firmware on all your devices without pressing '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-%22ST-Link-V2%22-programmer-from-Linux

https://github.com/texane/stlink