

LASER HARP

www.harpelaser.com

GENESIS LASER HARP CONTROLLER FIRMWARE FLASH PROCEDURE

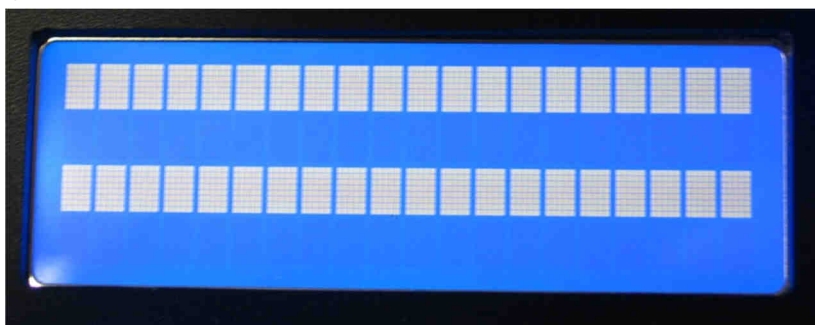
This procedure describes how to program the firmware in your Laser Harp controller.

How to flash the firmware? Easy! But start with the serial one.

You must have a "A" to mini "B" USB cable to connect the harp to your computer.

BEWARE!: NO LASER OR MIDI DEVICE SHOULD BE CONNECTED TO THE CONTROLLER DURING FIRMWARE UPGRADE!

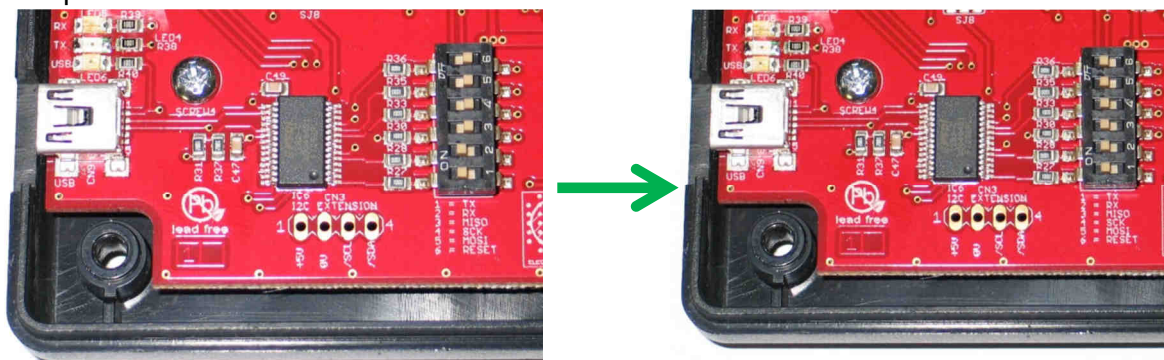
First open your Laser Harp controller (4 screws) connect the power supply and turn it on. You should see two lines of 20 white blocks on the LCD screen like this (if not previously programmed):



If not you can increase the contrast with a screwdriver thanks to the potentiometer on the rear of the display PCB:



Now find the dip switch "DSW1" at the bottom left of the board and set all the switches to the "ON" position.



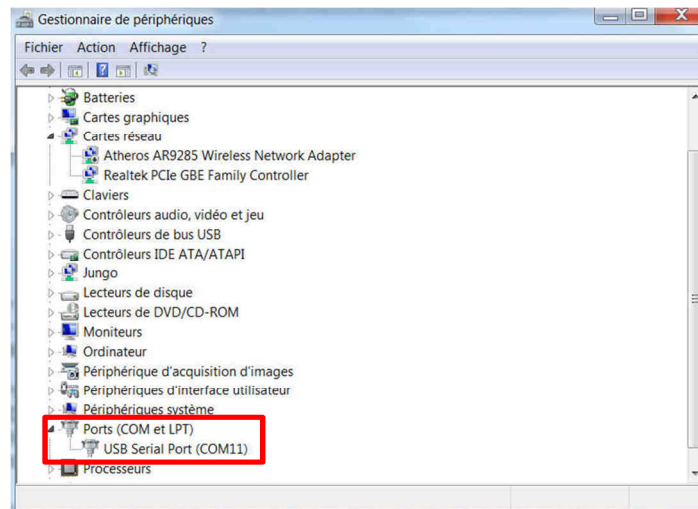
Create a new directory on your hard disk root like **"harp"** and extract the content of the downloaded archive.
Connect the USB cable in your computer and the other end in the Laser Harp mini USB connector. The yellow **"USB"** led must light and the green + red will flash during enumeration.

Your operating system must discover a new peripheral interface and ask for drivers.
Don't choose internet but set the search bar to the **"ftdi_drivers"** directory from the package.
When done the FTDI chip is now installed and acts as a serial interface between your computer and the Laser Harp Controller.

Check if the bridge is recognized and which serial port is used.

Go to **"control panel" > "system" > "peripherals"**

You must see an **"USB TO SERIAL COM PORT"** in the **"LPT and COM PORT"** section like this:



Now close the control panel window and go in the **"firmware"** directory of the pack.

First execute the **"set_fuses.bat"** command file.

This one set the microcontroller fuses to choose the external crystal oscillator instead of the internal RC one.

You must get a command line window like this one:

```
C:\Windows\system32\cmd.exe
avrdude: writing efuse (1 bytes):
Writing : ##### : 100% 0.03s
avrdude: 1 bytes of efuse written
avrdude: verifying efuse memory against 0xFC:
avrdude: load data efuse data from input file 0xFC:
avrdude: input file 0xFC contains 1 bytes
avrdude: reading on-chip efuse data:
Reading : ##### : 100% 0.03s
avrdude: verifying ...
avrdude: 1 bytes of efuse verified
avrdude: reading input file "0xDF":
avrdude: writing hfuse (1 bytes):
Writing : ##### : 100% 0.03s
avrdude: 1 bytes of hfuse written
avrdude: verifying hfuse memory against 0xDF:
avrdude: load data hfuse data from input file 0xDF:
avrdude: input file 0xDF contains 1 bytes
avrdude: reading on-chip hfuse data:
Reading : ##### : 100% 0.03s
avrdude: verifying ...
avrdude: 1 bytes of hfuse verified
avrdude: reading input file "0xF7":
avrdude: writing lfuse (1 bytes):
Writing : ##### : 100% 0.03s
avrdude: 1 bytes of lfuse written
avrdude: verifying lfuse memory against 0xF7:
avrdude: load data lfuse data from input file 0xF7:
avrdude: input file 0xF7 contains 1 bytes
avrdude: reading on-chip lfuse data:
Reading : ##### : 100% 0.03s
avrdude: verifying ...
avrdude: 1 bytes of lfuse verified
avrdude done. Thank you.

C:\harpe\Firmware>pause
Appuyez sur une touche pour continuer...
```

Close the command window when it's done.

You can now execute the “**program_bootloader.bat**” command file to load the boot loader firmware in the microcontroller flash memory.

(Check the « device signature », if you get « FF FF FF » something is wrong)

You should get a window like this:

```
C:\Windows\system32\cmd.exe
D:\laser_harp\boot>avrdude -c laser_harp -P ft0 -p atmega1280 -F -U flash:w:BootLH-0101.hex
avrdude: BitBang OK
avrdude: pin assign miso 3 sck 5 mosi 6 reset 7
avrdude: drain OK

ft245r: hitclk 230400 -> ft baud 115200
avrdude: AVR device initialized and ready to accept instructions

Reading : ##### : 100% 0.00s
avrdude: Device signature = 0x1e9705
avrdude: Expected signature for ATMEGA1280 is 1E 97 03
avrdude: erasing chip
ft245r: hitclk 230400 -> ft baud 115200
avrdude: reading input file "BootLH-0101.hex"
avrdude: input file BootLH-0101.hex auto detected as Intel Hex
avrdude: writing flash (130226 bytes):

Writing : ##### : 35% 25.73s
```

```
C:\Windows\system32\cmd.exe
ft245r: hitclk 230400 -> ft baud 115200
avrdude: AVR device initialized and ready to accept instructions

Reading : ##### : 100% 0.00s
avrdude: Device signature = 0x1e9705
avrdude: Expected signature for ATMEGA1280 is 1E 97 03
avrdude: erasing chip
ft245r: hitclk 230400 -> ft baud 115200
avrdude: reading input file "BootLH-0101.hex"
avrdude: input file BootLH-0101.hex auto detected as Intel Hex
avrdude: writing flash (130226 bytes):

Writing : ##### : 100% 73.32s
avrdude: 130226 bytes of flash written
avrdude: verifying flash memory against BootLH-0101.hex:
avrdude: load data flash data from input file BootLH-0101.hex:
avrdude: input file BootLH-0101.hex auto detected as Intel Hex
avrdude: input file BootLH-0101.hex contains 130226 bytes
avrdude: reading on-chip flash data:

Reading : ##### : 54% 28.50s
```

And :

```
C:\Windows\system32\cmd.exe
Reading : ##### : 100% 0.02s
avrdude: verifying ...
avrdude: 1 bytes of lfuse verified
avrdude: reading input file "0xF7"
avrdude: writing lfuse (1 bytes):

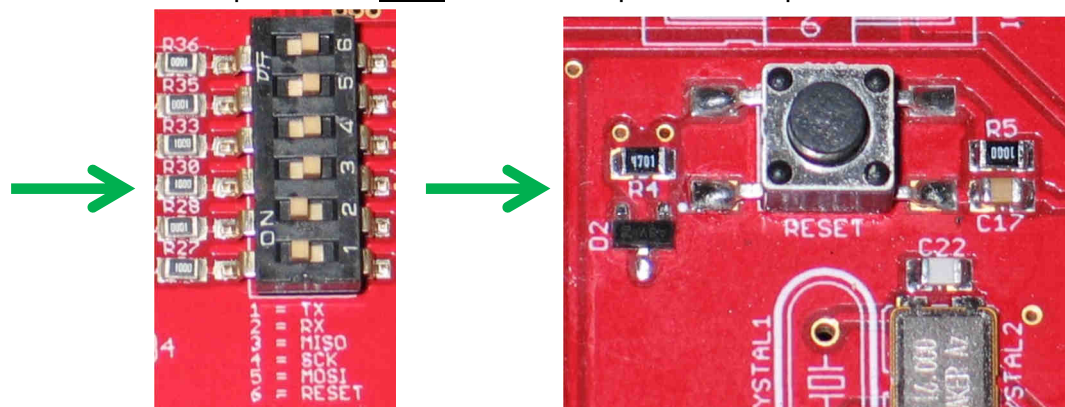
Writing : ##### : 100% 0.03s
avrdude: 1 bytes of lfuse written
avrdude: verifying lfuse memory against 0xF7:
avrdude: load data lfuse data from input file 0xF7:
avrdude: input file 0xF7 contains 1 bytes
avrdude: reading on-chip lfuse data:

Reading : ##### : 100% 0.02s
avrdude: verifying ...
avrdude: 1 bytes of lfuse verified
avrdude done. Thank you.

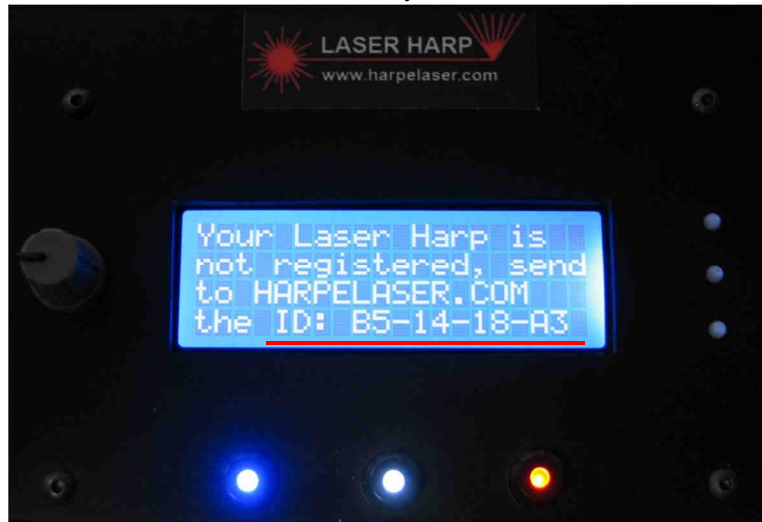
D:\laser_harp\boot>pause
Appuyez sur une touche pour continuer...
```

Close the command window when it's done.

Now set all the dip switches **3 à 6** in the “**OFF**” position and push the “**RESET**” switch:



The LCD must show the welcome screen with your board serial number.



Note this serial and send it to our team to get the fully functional firmware registered to your board.

Don't forget to tell us :

Your first name

Your last name

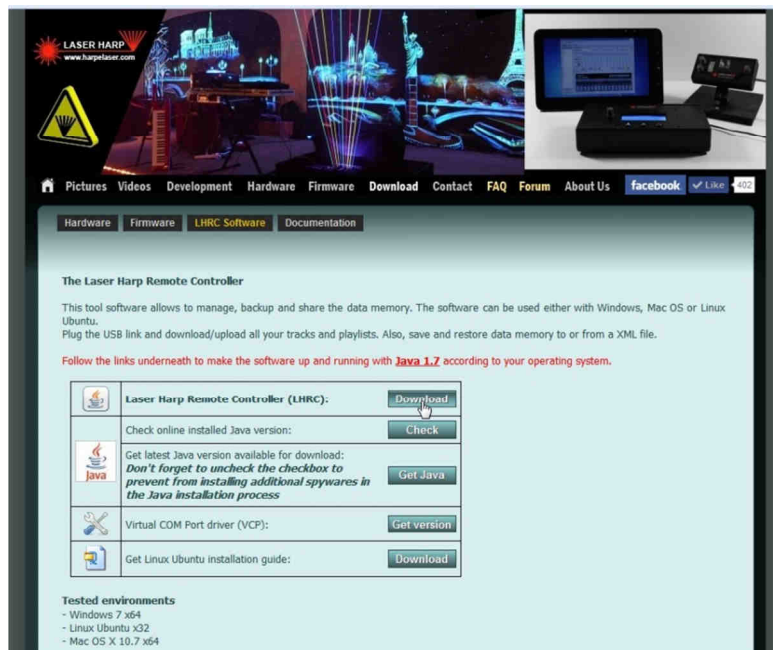
Your company if applicable

Don't forget : this harp is not intended for commercial use without our permission.

Some hours or days after your request you will get a binary file by mail from us.

Simply store this file in your computer where you can find it later.

Download our « Laser Harp Remote Controller software» from our website. Install the java environment if needed.



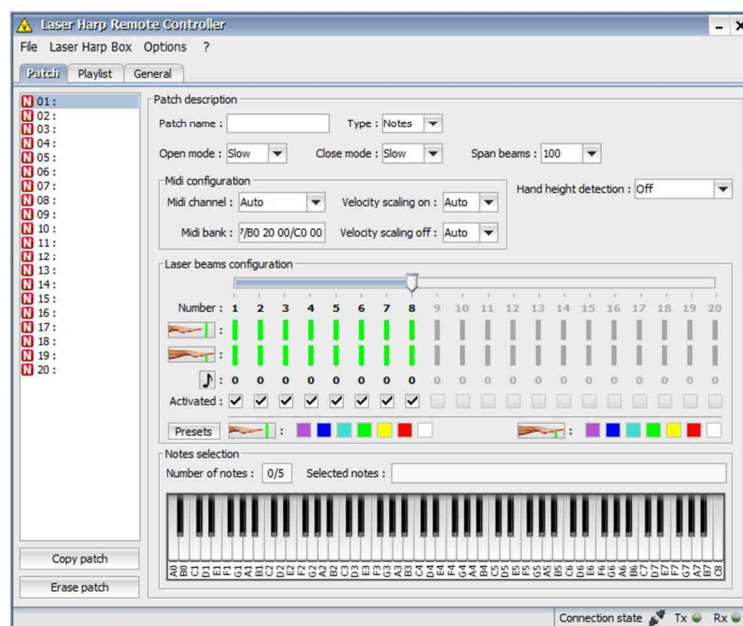
Connect your controller to one of your computer USB port with FTDI drivers installed. Start your controller when holding the middle (white) switch to enter in the boot loader program.



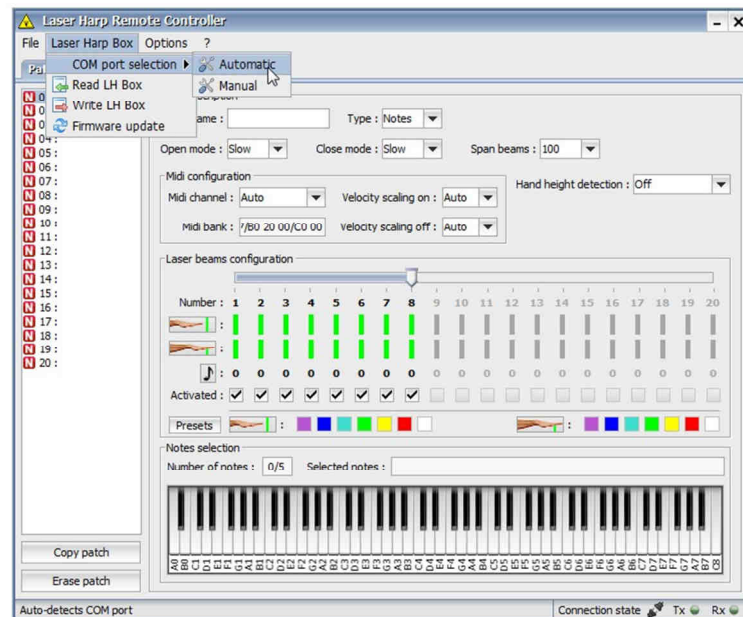
You will get this screen :



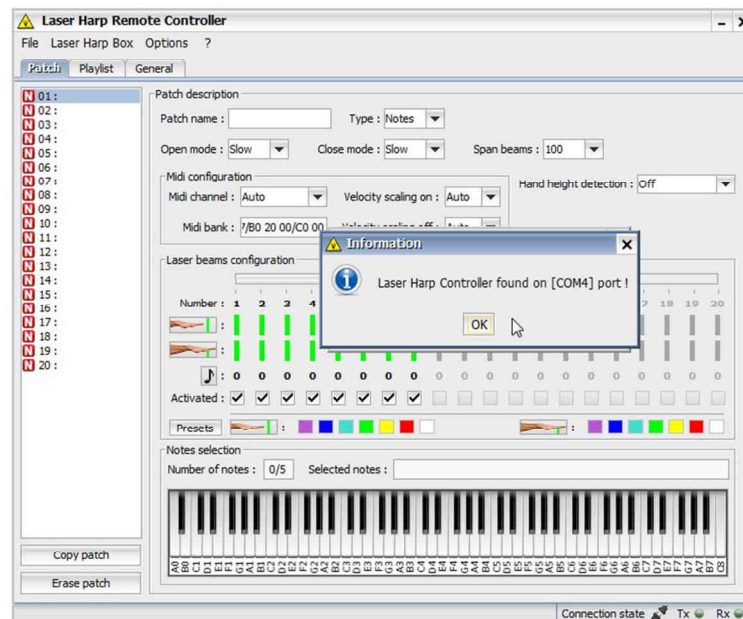
Start the LHRC software



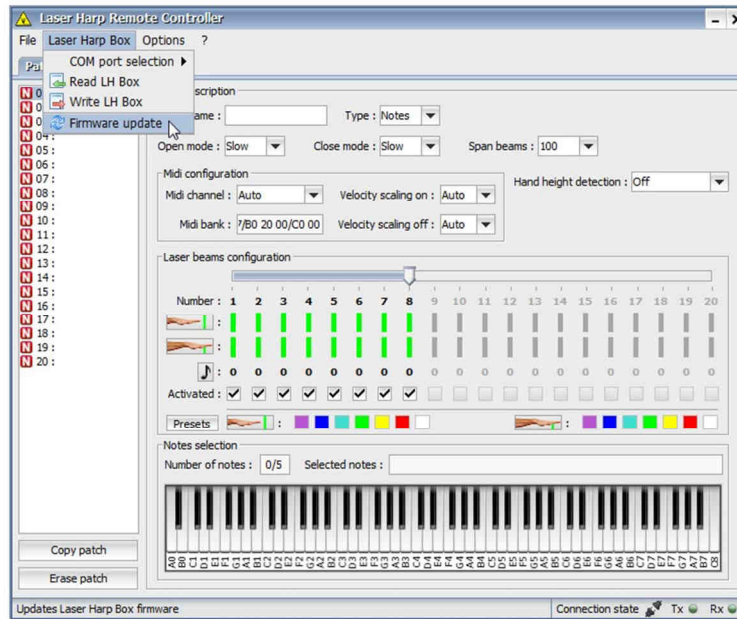
And connect the software with the controller by going into « Laser Harp Box » and « Com Port Selection » and click « Automatic ».



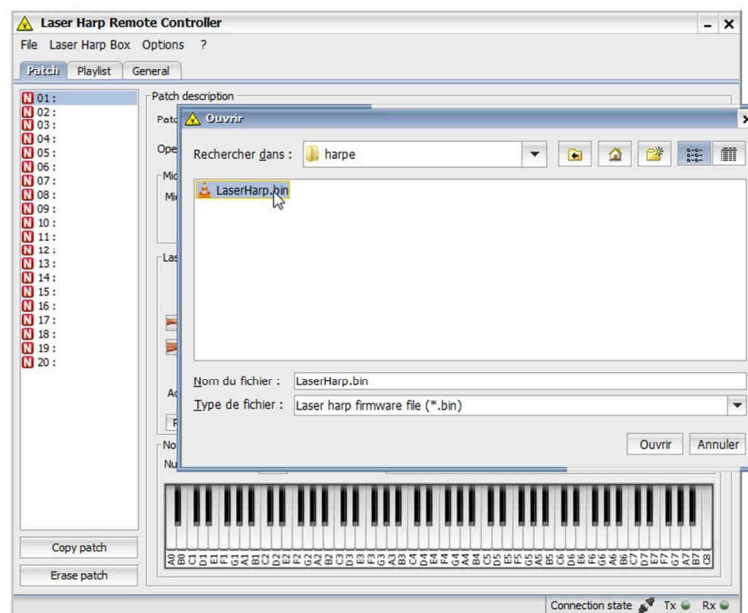
A pop-up indicating that the controller has been found should appear .



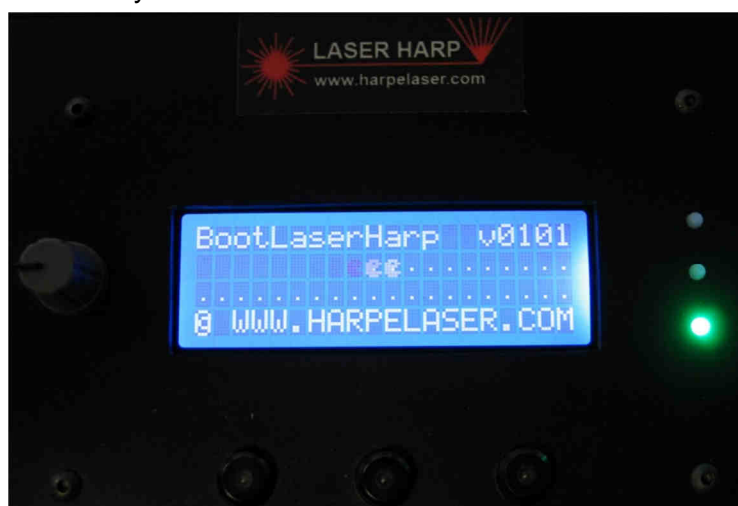
Now go to the « Laser Harp Box » menu and « Firmware Update »

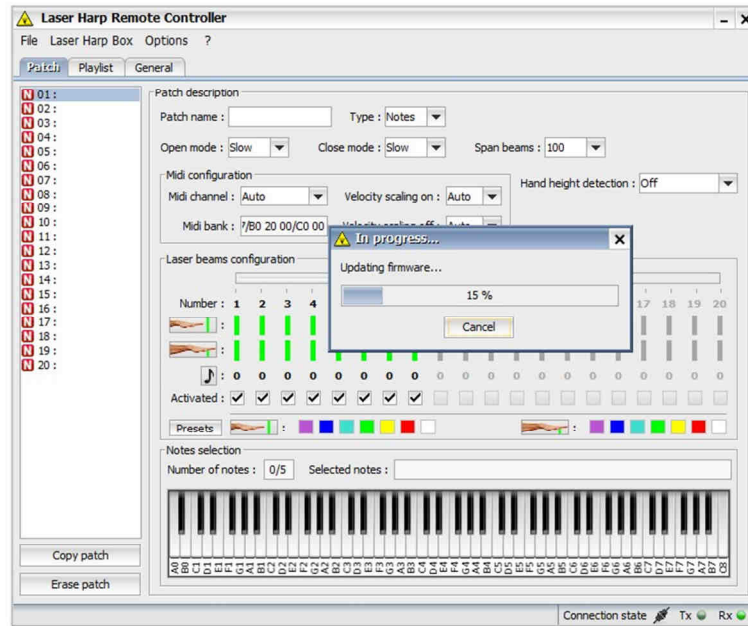


Give the binary file location

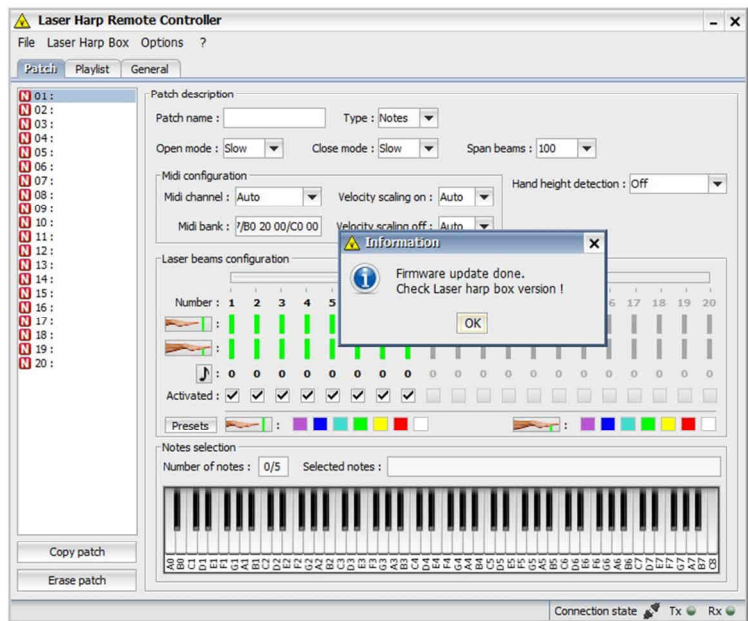


And click « OK ». The binary file is sent to the controller.





When it's done:



The controller automatically restart :



And you should get the welcome screen with your name:



Followed by the main screen :



The update process is finished.

**Opening of the controller will not be necessary for future update.
Start the controller holding the middle switch to go in the boot loader and use our
LHRC software to download the upgrade.**

FM V1.2 du 06/04/2014

