CUSTOM FIRMWARE INFO

The firmware of Madexp HV board is provided as Open Source software. You can modify it using Arduino IDE 1.8.3
To program the board with a USBisp/USBasp or other ATmega compatible programmer you'll must follow this connection diagram:

JTAG connector on the board
    1: GND
    2: /Reset
    3: SCK
    4: MISO
    5: MOSI

You can create the binary file to be flashed directly on Arduino IDE.

Board setup for the IDE:

Tools➔Board➔Arduino Nano
Tools➔Processor➔ATmega328

Then you can create the firmware with:

Sketch➔Export compiled binary

You'll find your *.hex file into your Arduino project folder.
The "without bootloader" is that to be flashed on the IC with a software like "eXtreme Burner AVR" that is free.

You can also directly program the board from Arduino IDE too.
Select your programming JTAG adapter from:

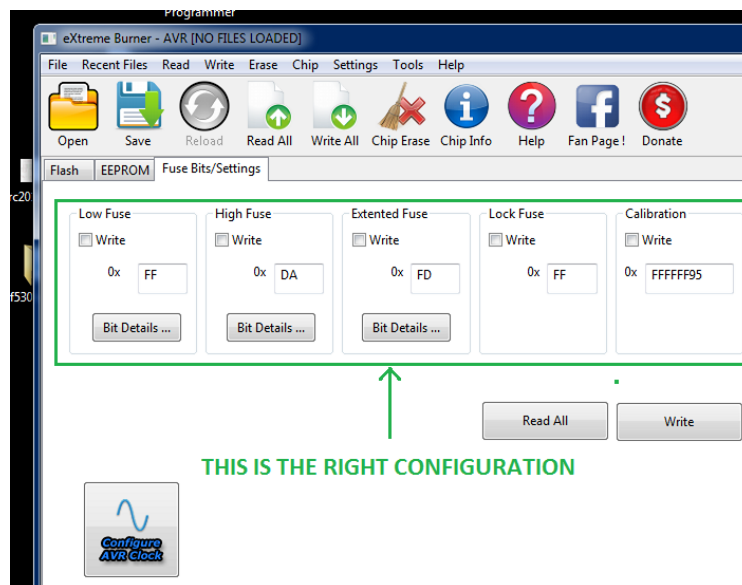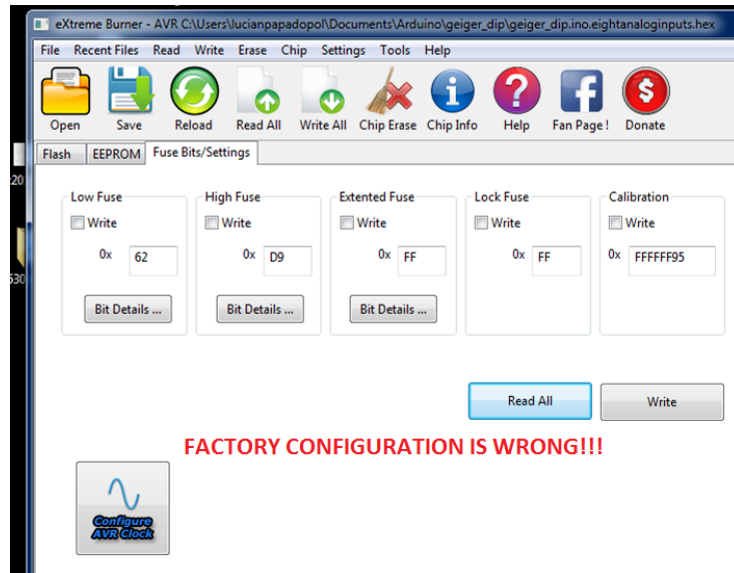Tools➔Programmer: and select yours (mine is USPasp)

To burn it just press:

Sketch➔Uploading using programmer

That's all. Enjoy!

NOTE: FUSE BITS

I've found that you must change ATmega328 fuse bits because, it exits from factory, configured with the option "low speed internal oscillator" active. This is wrong! MadExp HV uses external high speed crystal resonator.

A simple but less correct way than change fuse bits manually is, from Arduino software select Tools→Burn Bootloader This will correct the fuse bits but you'll put also a useless bootloader into the chip.