DDF Controller Board Programming Guide v1.00

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1. INTRODUCTION

This document describes the process of programming your Dropout Design Disco Dance Floor (DDF) Controller. It applies to hardware revisions 1.*xx* and 2.*xx*. If you purchased your board assembled, it has already been programmed and you need not take any further action.

This document does not describe assembly or usage of the DDF Controller. That information can be found in the DDF Documentation, available at `web.mit.edu/storborg/ddf`.

In order to program your board, you will need an AVR Programmer, such as the STK500 or ISP. Here, we describe the process using an STK500 and Atmel's AVR Studio 4.0 for Windows, available at `www.atmel.com`.

2. PROGRAMMING THE DDF CONTROLLER

2.1. Setup

To begin, connect your programmer to the DDF Controller's ISP port using a 6-pin ribbon cable. Depending on the programmer you are using, you may or may not need to independantly power the DDF Controller. With an STK500, you may set the jumper VTARGET to power the board from the STK500's power supply. With an RS232 interfaced In System Programmer (ISP), you will need to power the DDF Controller logic separately.

With the programmer connected, start AVR Studio and click the AVR icon to open the programming interface. You are now ready to program your DDF Controller.

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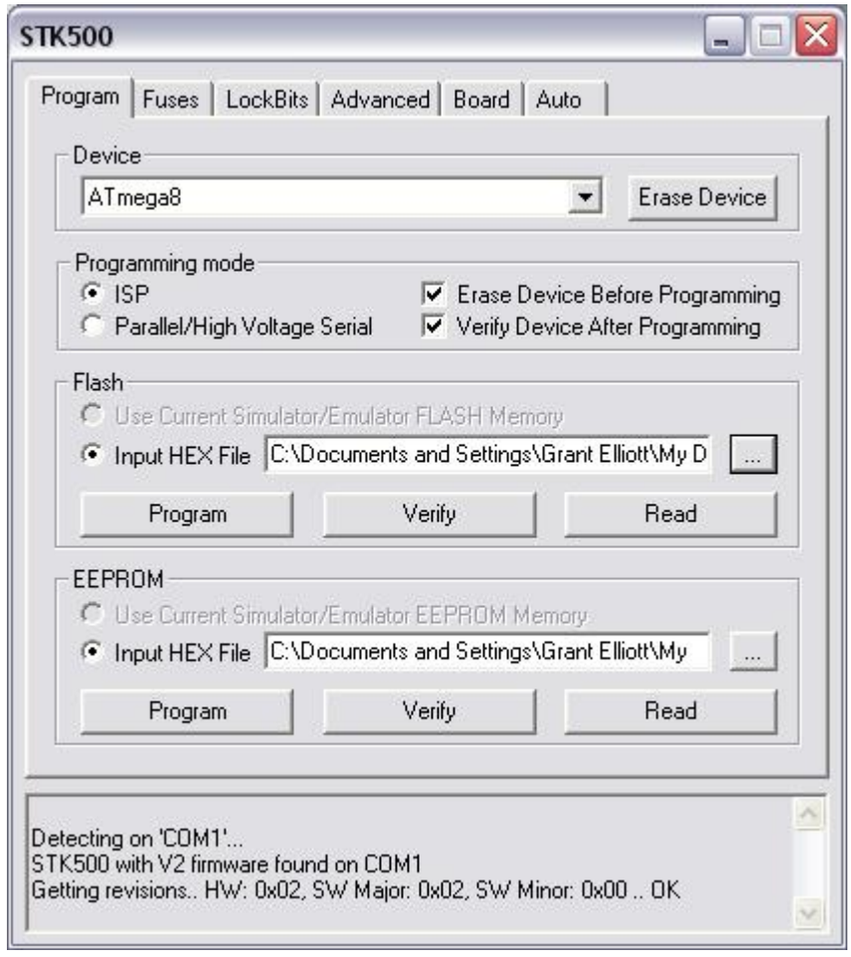
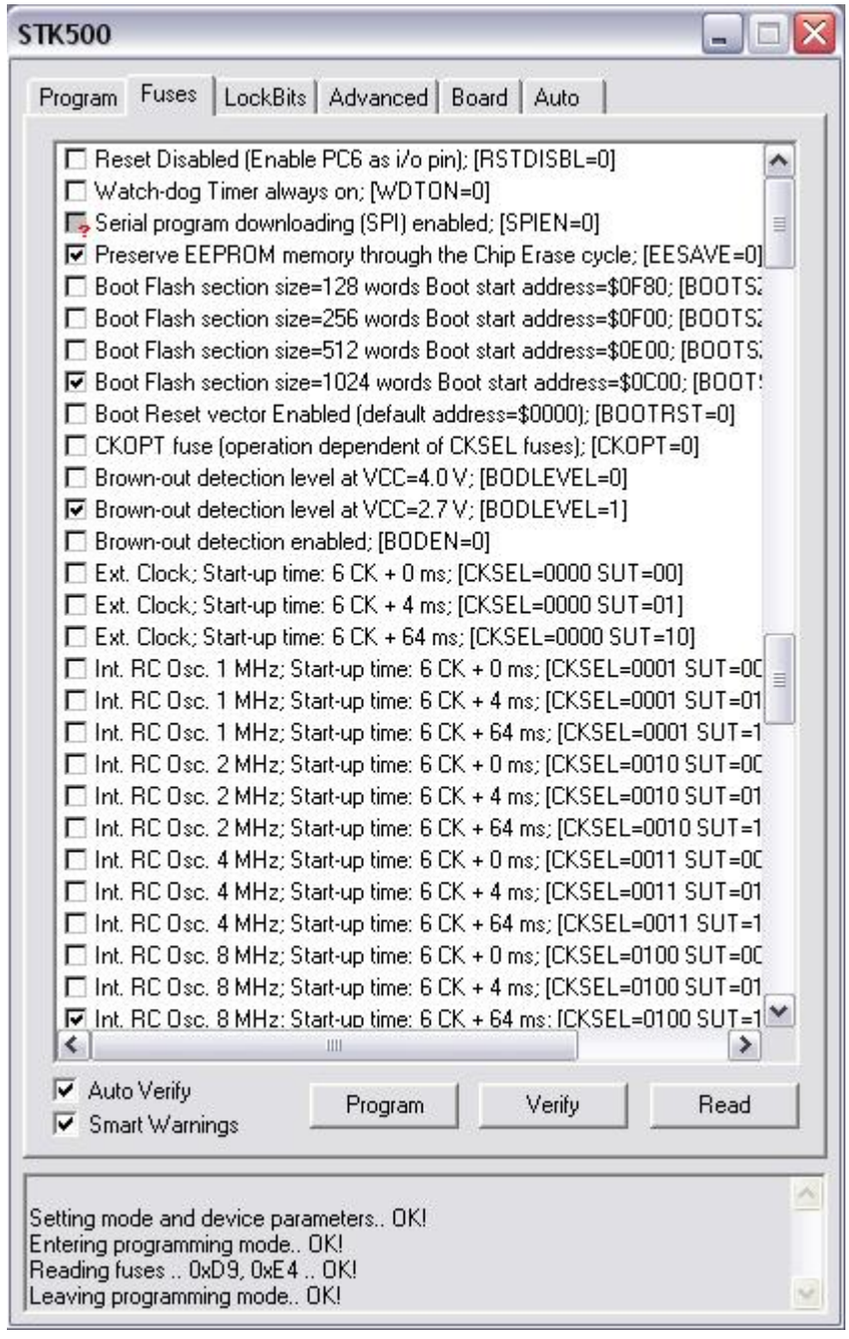
2.2. Selecting the Device

On the **Program** tab, select "Device" to be the Atmega8. It is extremely important that you perform this step first, or the subsequent menus will be different from those shown here.



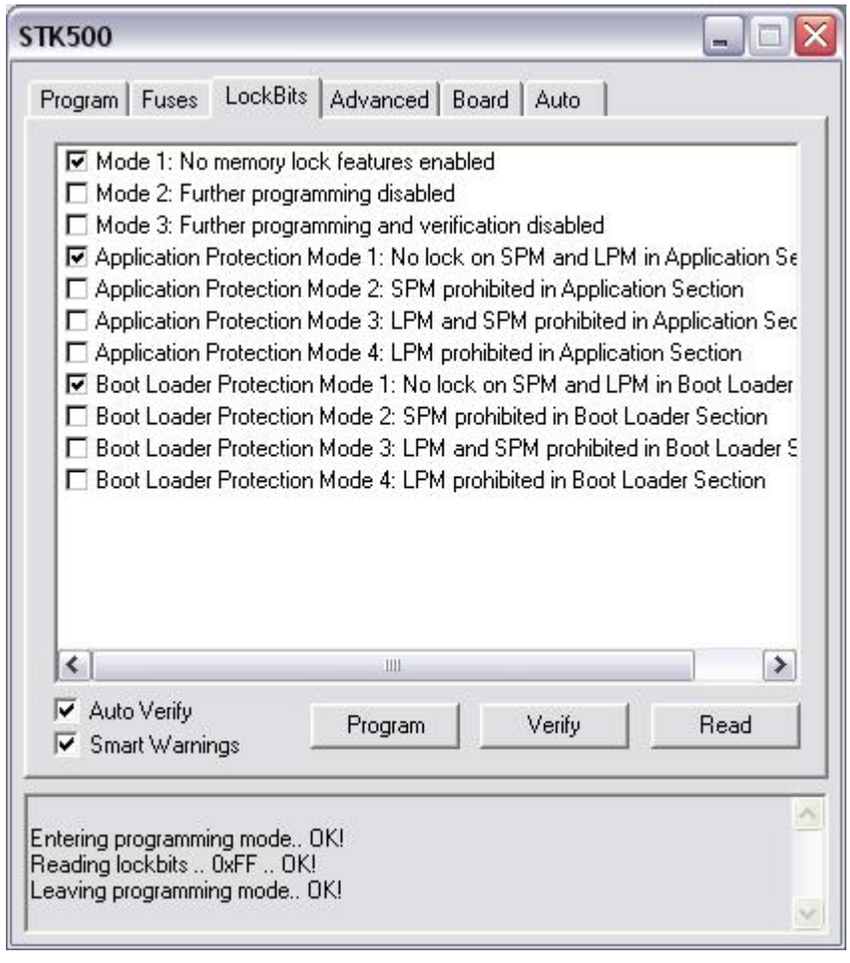
2.3. Setting Fuses

On the **Fuses** tab, set the fuses for "Preserve EEPROM Memory" and "Int. Oscillator 8MHz" as shown. The other defaults should be left as is. Click "Program" when you're done. Note that the following screenshot is a composite.



2.4. Setting LockBits

On the **LockBits** tab, do nothing.

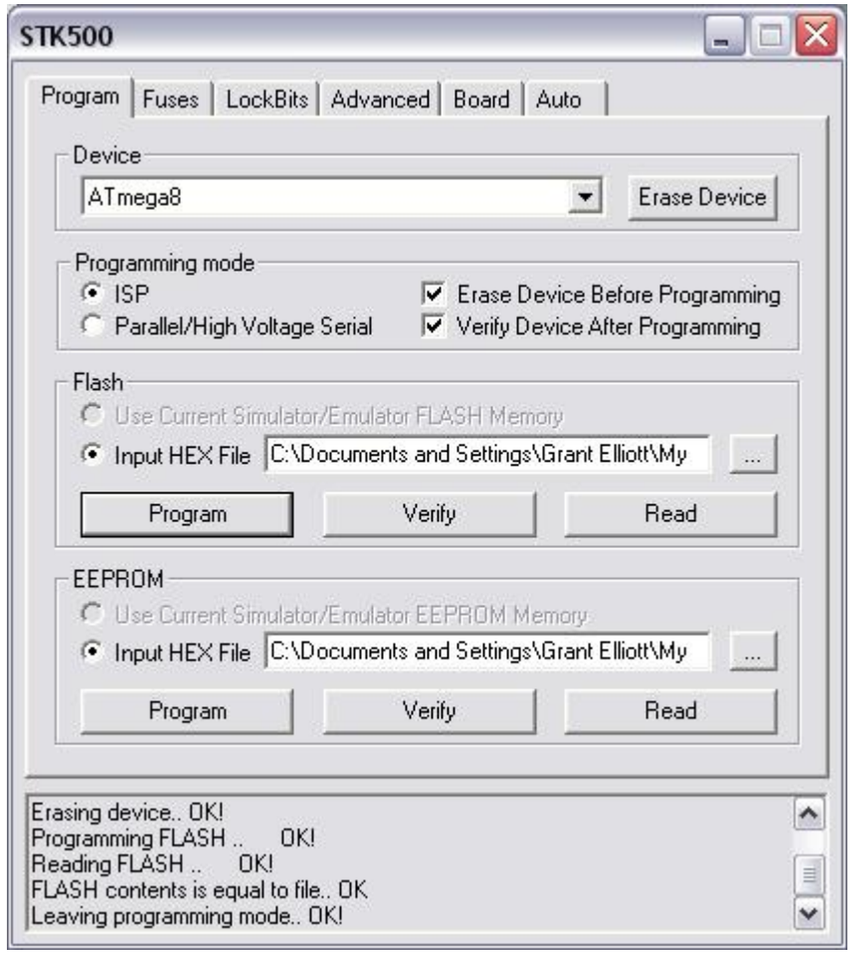


2.5. Calibrating the Internal Oscillator

On the **Advanced** tab, first select the 8MHz oscillator under “Calibrate for Frequency” and click “Read Cal. Byte”. Now set the “Write Address” to 1 and select the radio button “Eeprom”. Finally click “Write to Memory”.

2.6. Flashing the Firmware

Back on the **Program** tab, locate the firmware file (firmware.hex) in the field for "Input HEX File" and click "Program". Ignore the options for writing a file to the EEPROM. You should only write the firmware to FLASH; nothing needs to be written to the EEPROM (except for the single calibration byte written in the previous step).



3. THE END

Congratulations, your DDF Controller is now programmed. You will need to download the VCP drivers from Future Technology Devices Incorporated (`www.ftdichip.com`) to interface over USB. If you wish to program the USB EEPROM (completely optional, but assigns a serial number and allows the host computer to recognize the DDF Controller by name), you'll also need MProg and the D2XX drivers from FTDI.

Complete protocol documentation can be found on our websites (`www.dropoutdesign.com` and `web.mit.edu/storborg/ddf`). You can also find code samples and links to third-party software packages.

Good luck with your new DDF Controller.