

***ATMEGA2560***  
***Boot Loader***  
***for***  
***MINI-MAX/AVR***

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# 1. Introduction.

BiPOM ATMEGA2560 bootloader is a piece of software that runs on the MINI-MAX/AVR to facilitate downloading to the FLASH/EEPROM memory of ATMEGA2560 microcontroller on the MINI-MAX/AVR board.

The boot loader communicates with ATMEL AVR Studio ( [www.atmel.com](http://www.atmel.com)) running on a PC through the serial port.

Through the bootloader, the MINI-MAX/AVR appears AVR Studio as the ATMEL STK500 board. Most of STK500 functions is working:

FLASH/EEPROM programming/reading/verifying, Fuses/locks/signature/parameters reading, etc.

There are some restrictions:

- Fuses and lock bits can not be changed;
- “Erase Device” erases only the 1<sup>st</sup> FLASH page ( 256 bytes).

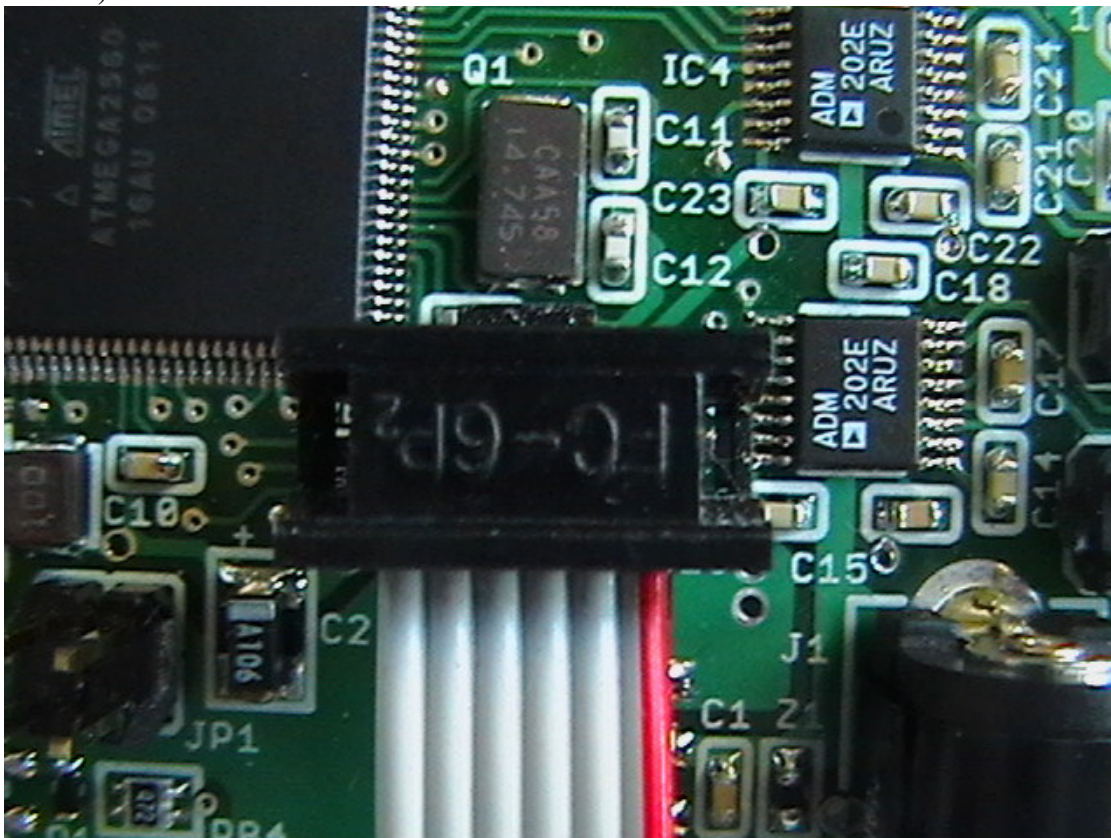
# 2. How to get started ?

To get started with ATMEGA2560 bootloader it is necessary to download the bootloader itself to BOOT section of the FLASH. Any AVR programmer can be used for that purpose.

Please download [http://www.bipom.com/support/mmavr/bootloader\\_atmega2560.zip](http://www.bipom.com/support/mmavr/bootloader_atmega2560.zip) and unzip to c:\bootloader\_atmega2560 folder.

Let's review how to do that using AVRISP (or AVRISP2):

2.1. Connect the 6-pin header of AVRISP to X2 connector of MINI-MAX/AVR board ( AVRISP comes with both 6-pin and 10-pin headers so if yours is set to 10-pin, header, change this to 6-pin header ).

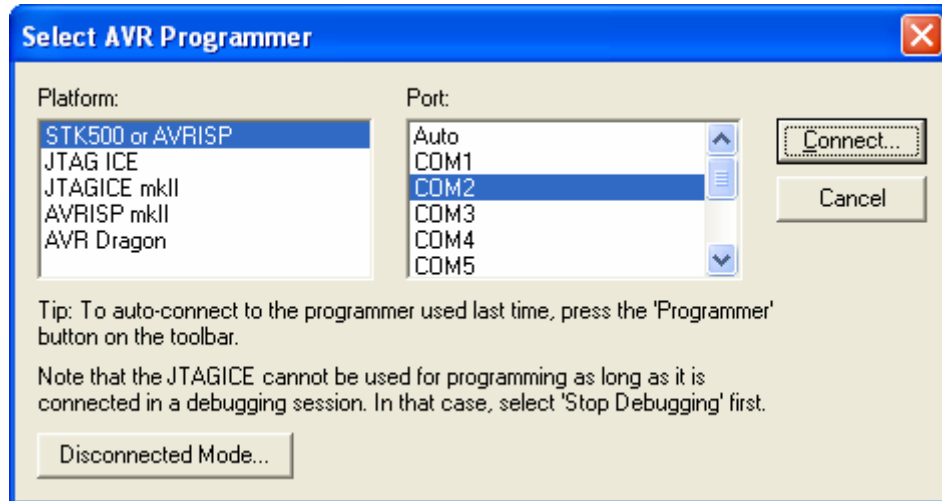


2.2. Connect your AVRISP to your PC's COM port.

2.3. Power the MINI-MAX/AVR board. AVRISP will be powered from the MINI-MAX/AVR board.

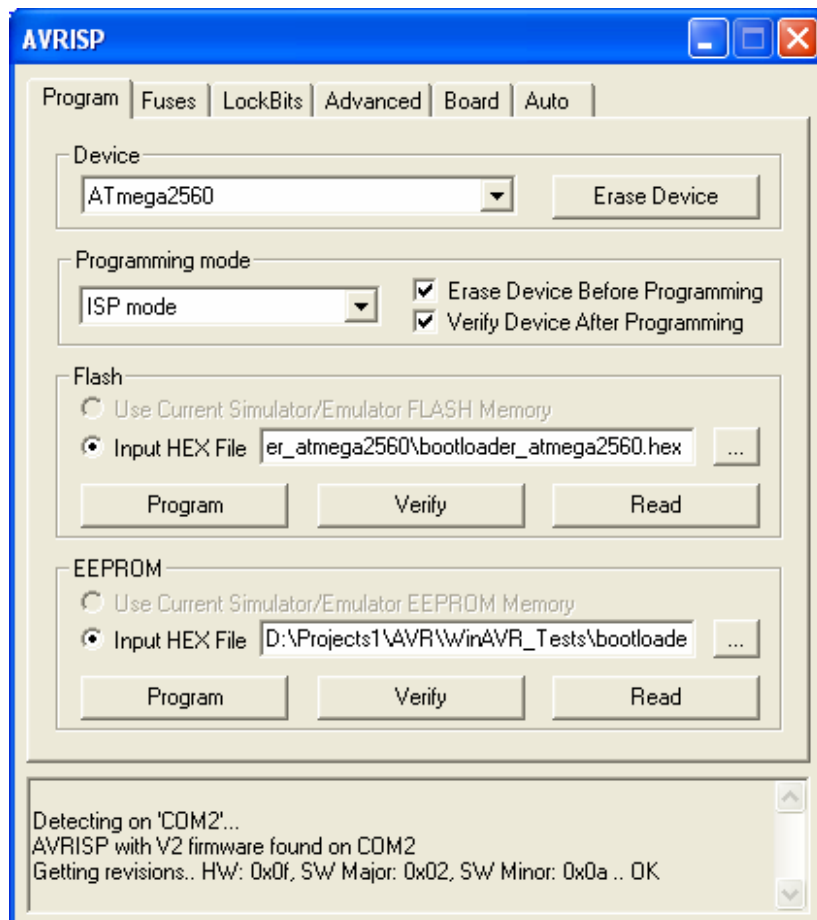
2.4. Run the AVR Studio on your PC.

2.5. Select Tools->Program AVR->Connect menu option.

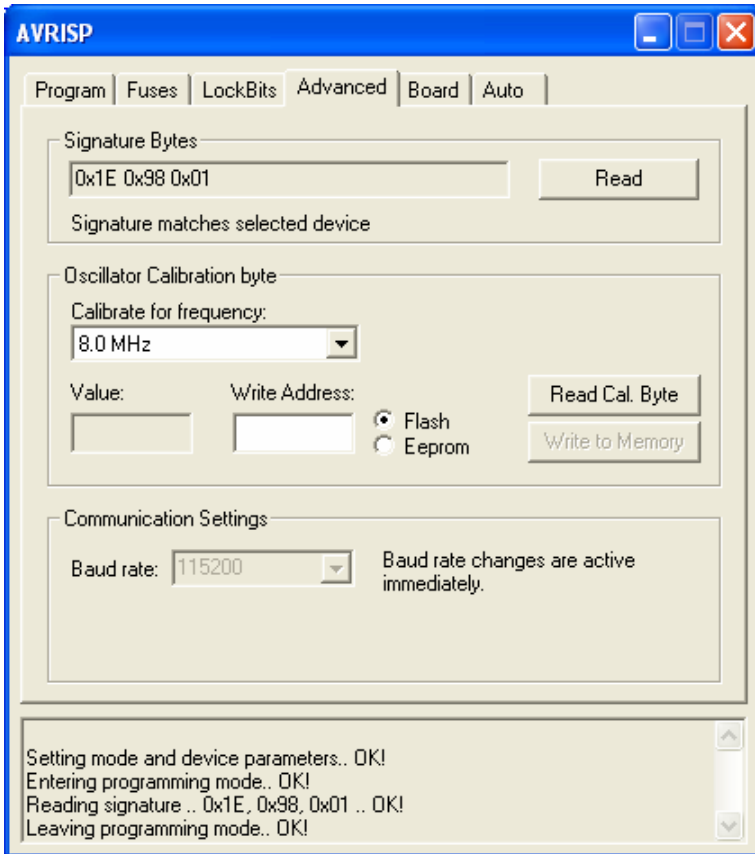


2.6. Select the COM port and press "Connect".

2.7. Select ATmega2560 as the "Device"

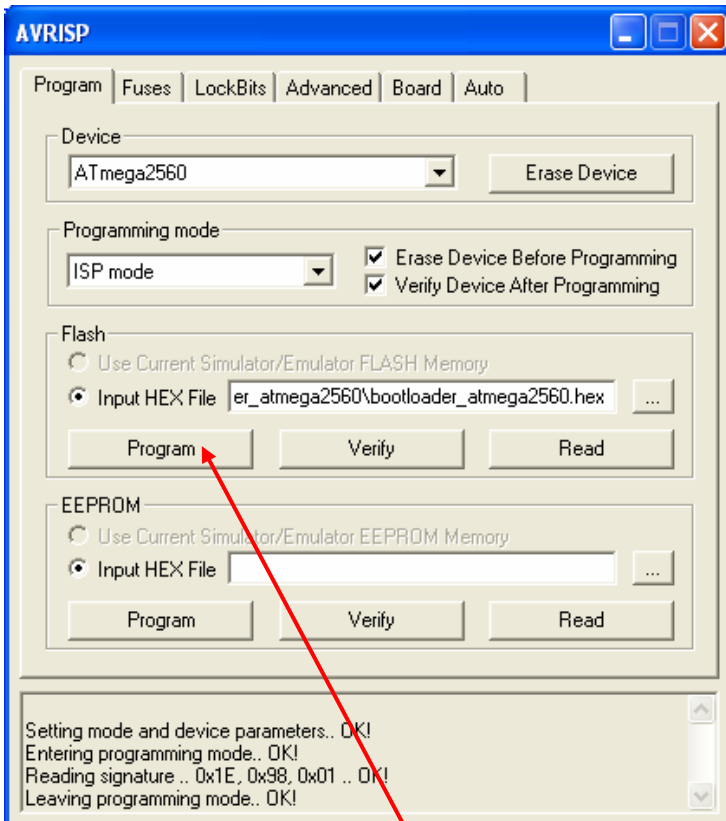


2.8. Go to “Advanced “ TAB and check signature



Signature bytes should be reported as 0x1E 0x98 0x01 and the message should indicate “Signature matches device”.

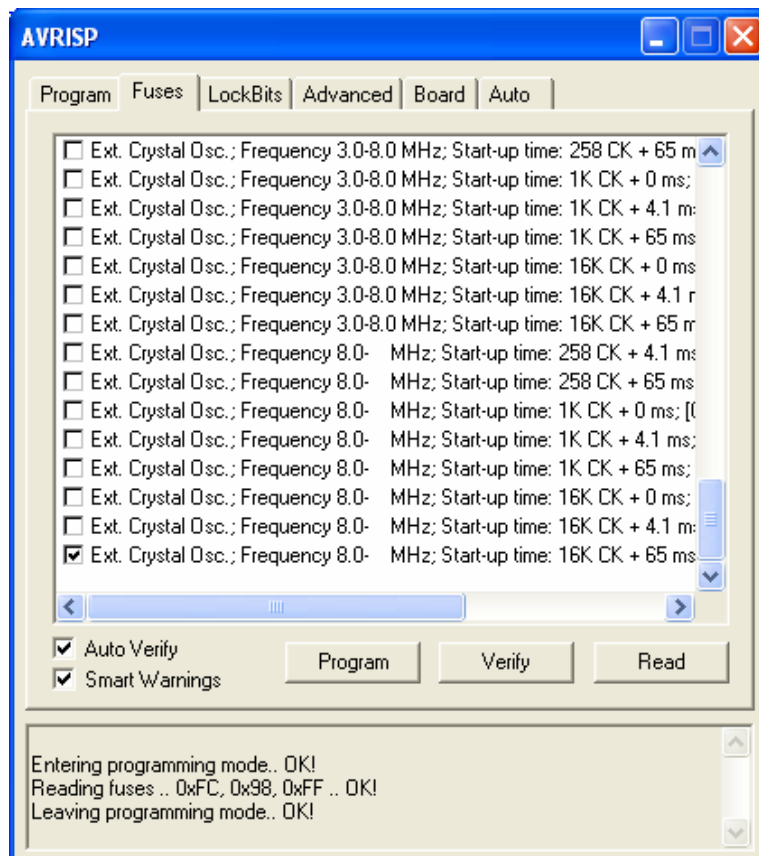
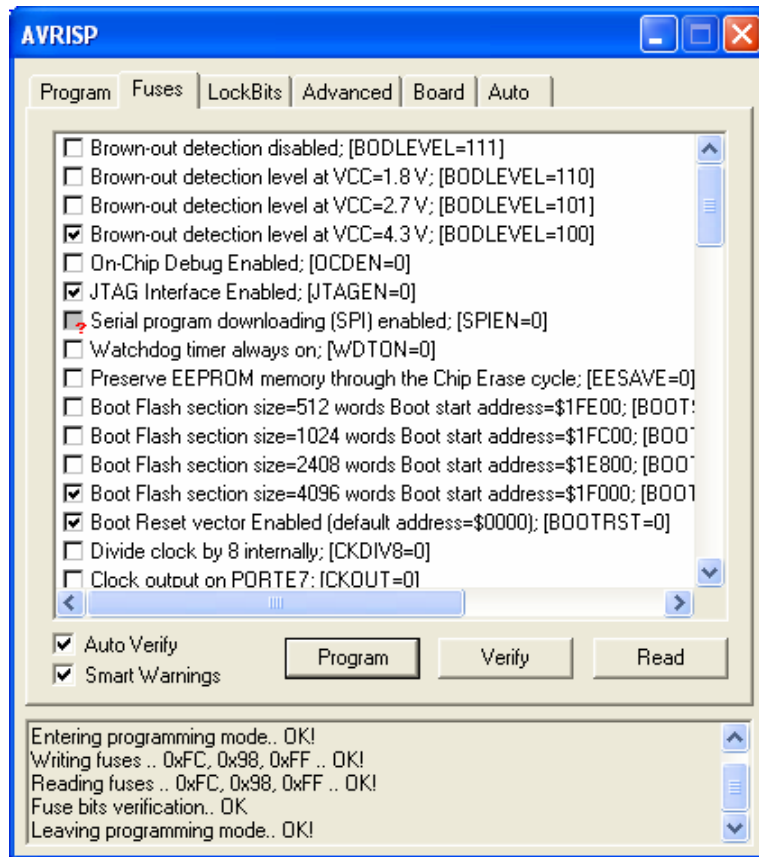
2.9. Click on “Program” Tab and select bootloader\_atmega2560.hex as the Input Hex File in Flash section.



2.10. Press the “Program” button in the Flash section to download the ATMEGA2560 bootloader to BOOT Section of the FLASH.

2.11. Click on “Fuses” Tab and check all the boxes according to two screen shoots below.

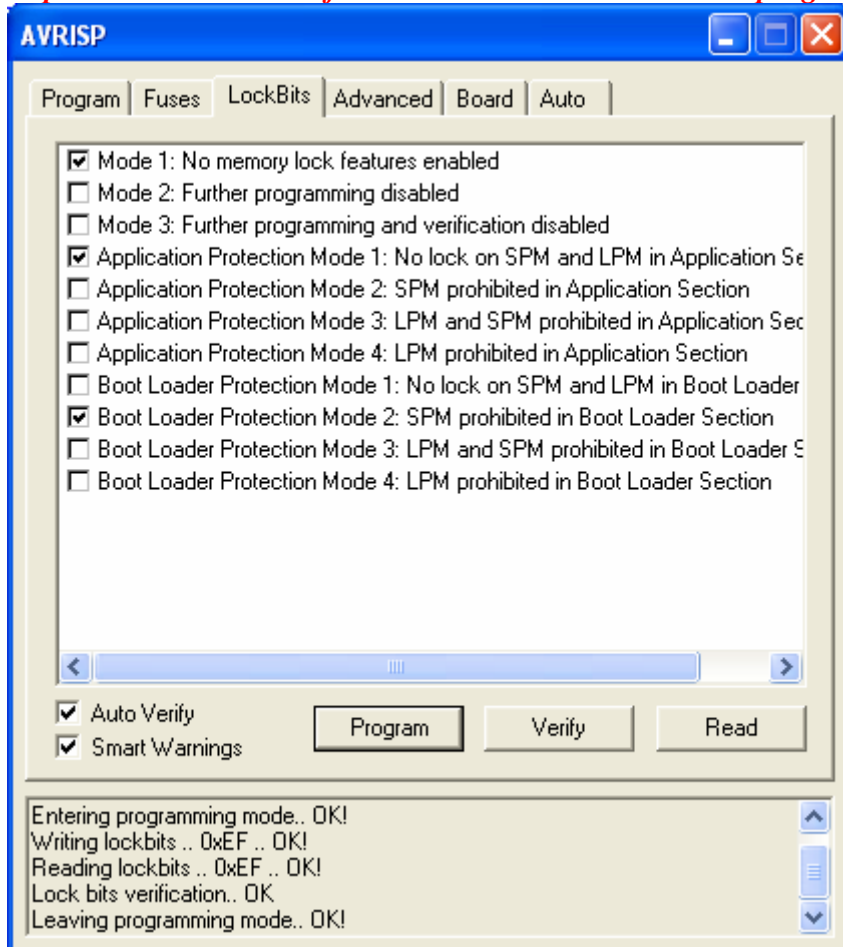
**Important Note. Be careful and don't block the Serial program downloading.**



2.12. Press the “Program” button.

2.13. Click on “LockBits” Tab and check all the boxes according to the picture below.

**Important Note. Be careful and do NOT check “Further programming disabled” options.**



2.14. Press the “Program” Button.

2.15. Remove power from MINI-MAX/AVR and disconnect AVRISP.

### 3. How to use the boot loader ?

3.1. Connect the 10-pin header of serial cable to X8 connector of MINI-MAX/AVR board. ATMEGA2560 uses UART1 as BOOT serial port.

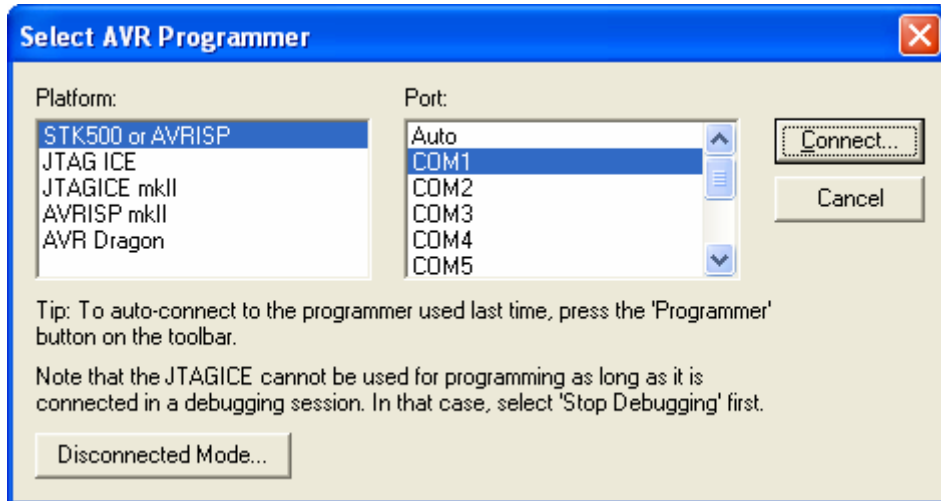
3.2. Connect the other end of the serial cable to your PC’s COM port.

3.3. Install JP1 jumper.

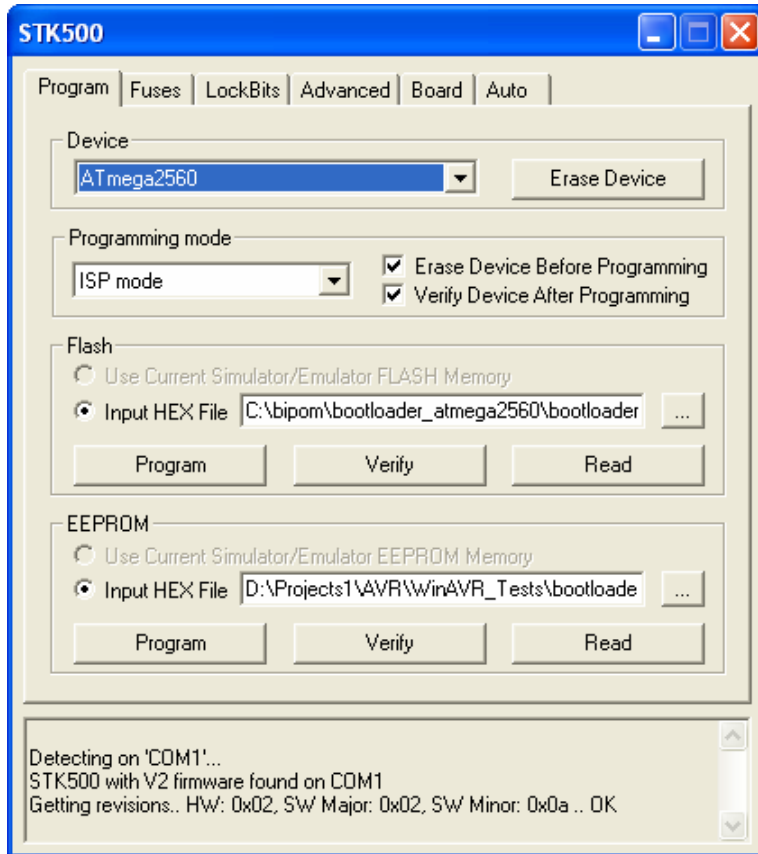
3.4. Power the MINI-MAX/AVR board.

3.5. Start AVR Studio on your PC.

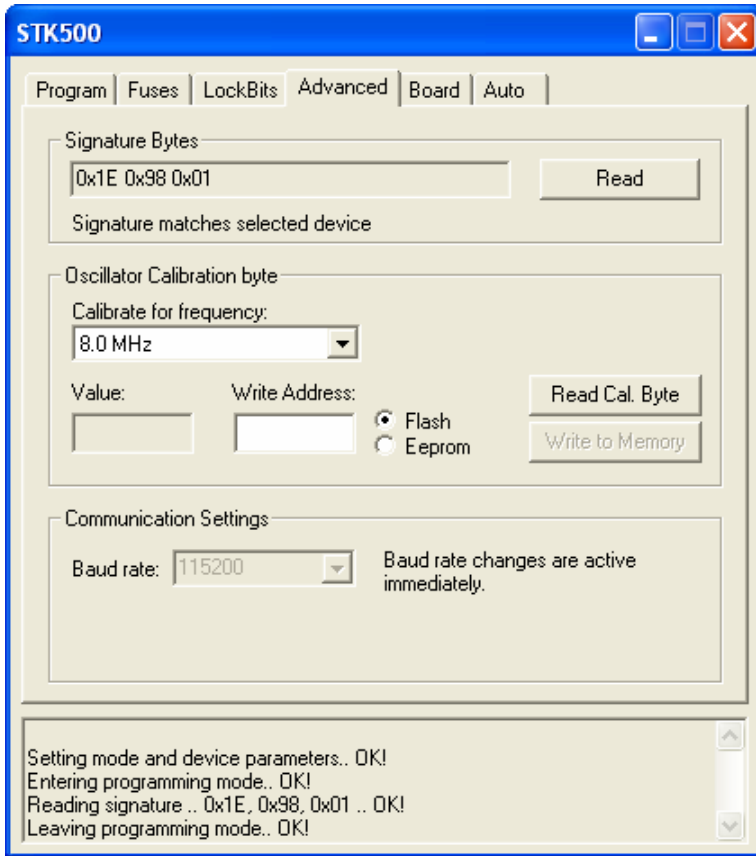
### 3.6. Press Tools->Program AVR->Connect menu option



3.7. Select COM port and press “Connect”. You will see that the MINI-MAX/AVR board is detected as STK500. Select ATmega2560 as “Device”



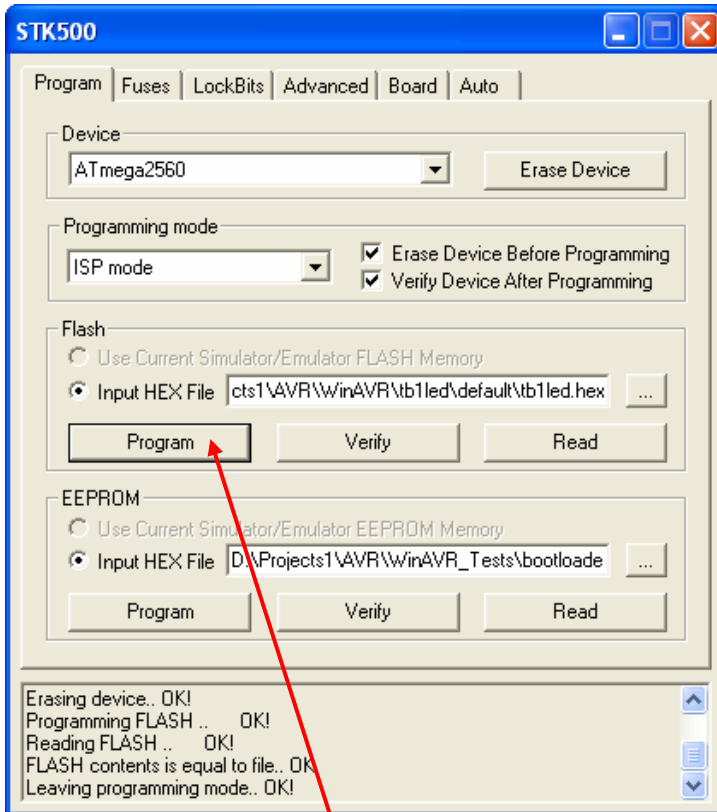
3.8. Click on “Advanced “ Tab and check signature



Signature bytes should be reported as 0x1E 0x98 0x01 and the message should indicate “Signature matches selected device”.

3.9. Click on “Program” Tab and select the hex file that you want to download ( that is, your application code ) as Input Hex File in the Flash section.





3.10. Press the “Program” button to download your program to the FLASH memory of ATMEGA2560.

3.11. Remove power from the MINI-MAX/AVR board.

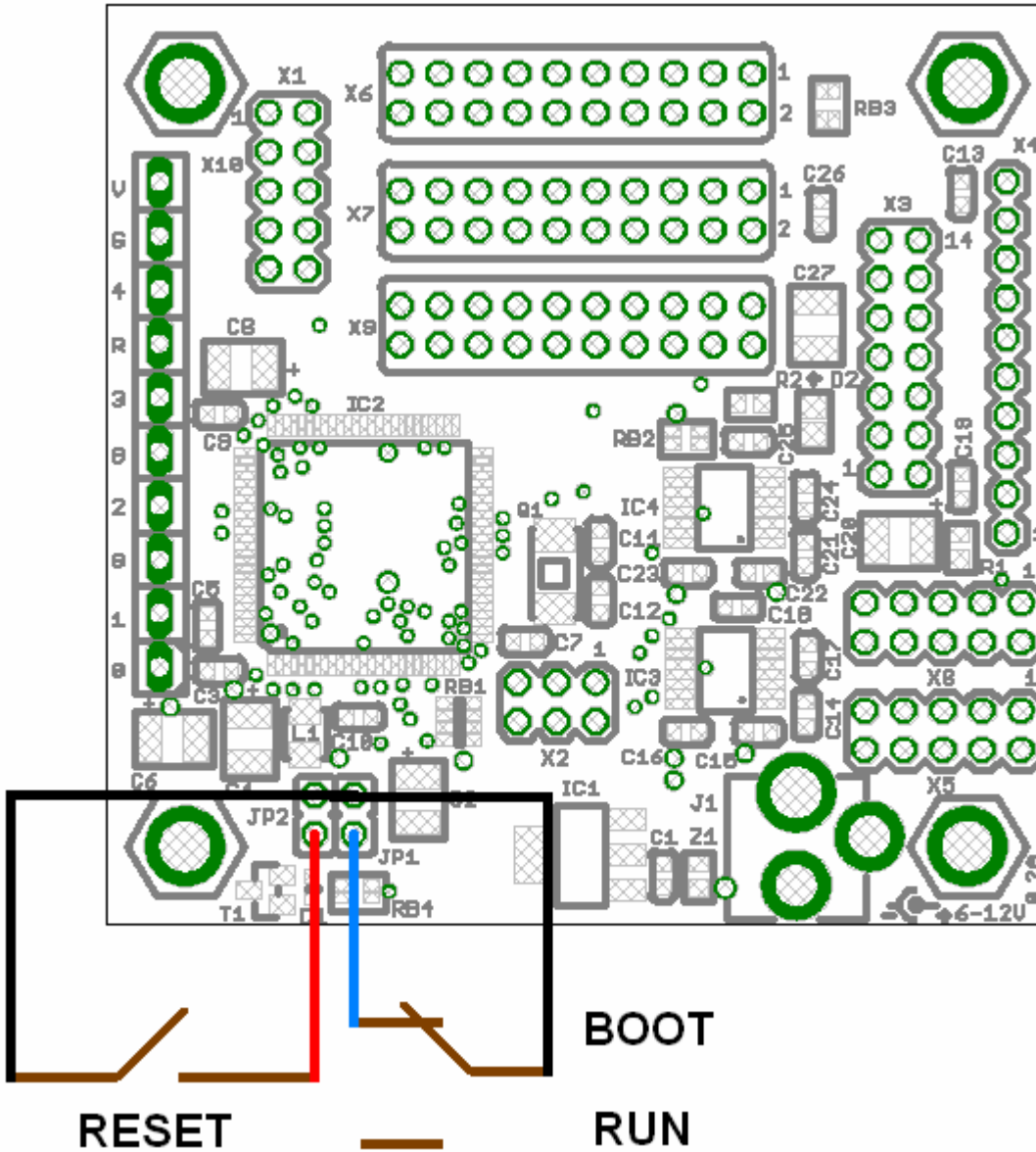
3.12. Remove JP1 jumper.

3.13. Connect power to the MINI-MAX/AVR board. This resets the board and your application will start.

To provide a more efficient download environment and not have to cycle power each time, a switch can be connected to JP1 jumper pins.

To reset the board, a push button can be connected to JP2 jumper pins.

This is shown in the diagram below:



To enter BOOT mode: JP1 (switch) is closed, JP2 (button) is closed momentarily;  
 To enter RUN mode: JP1 (switch) is open, JP2 (button) is closed momentarily.