

AVR Standalone ISP Programmer V2 Instructions

The AVR Standalone ISP Programmer is designed to accept a hex file from any terminal program*** and store it in external eeprom for later use. Once the file has been loaded into the programmers buffer, configuration is required. Configuration consists of fuse bytes, Lock/BLLB byte, and programming options. Configuration settings must be done before programming and will be held in the programmers memory until changed. When configuration is complete, you are now ready to use the programmer as a Stand Alone Programmer simply by setting the jumpers J4 and J1. (see Fig 2 & Fig 3 below)

***We recommend [teraterm](#) as other terminal programs may not display the menu text correctly.

Step 1 Setting up Tera-Term

Download TeraTerm from here:

<http://sourceforge.jp/projects/ttssh2/downloads/47683/teraterm-4.66.exe>

TeraTerm works with Windows XP, and Windows Vista. (We have not tested it on other systems). Once installed, the program must be configured correctly.

Set the correct com port,

baud rate should be 9600,

Data Bits = 8,

Parity = none,

Stop Bits = 1,

Flow Control = none,

Transmit Delay = 0 msec/char

*****The next line is very important, or the file will not upload correctly.*****

Transmit Delay = 100msec/line.

(See the Fig.1 below).

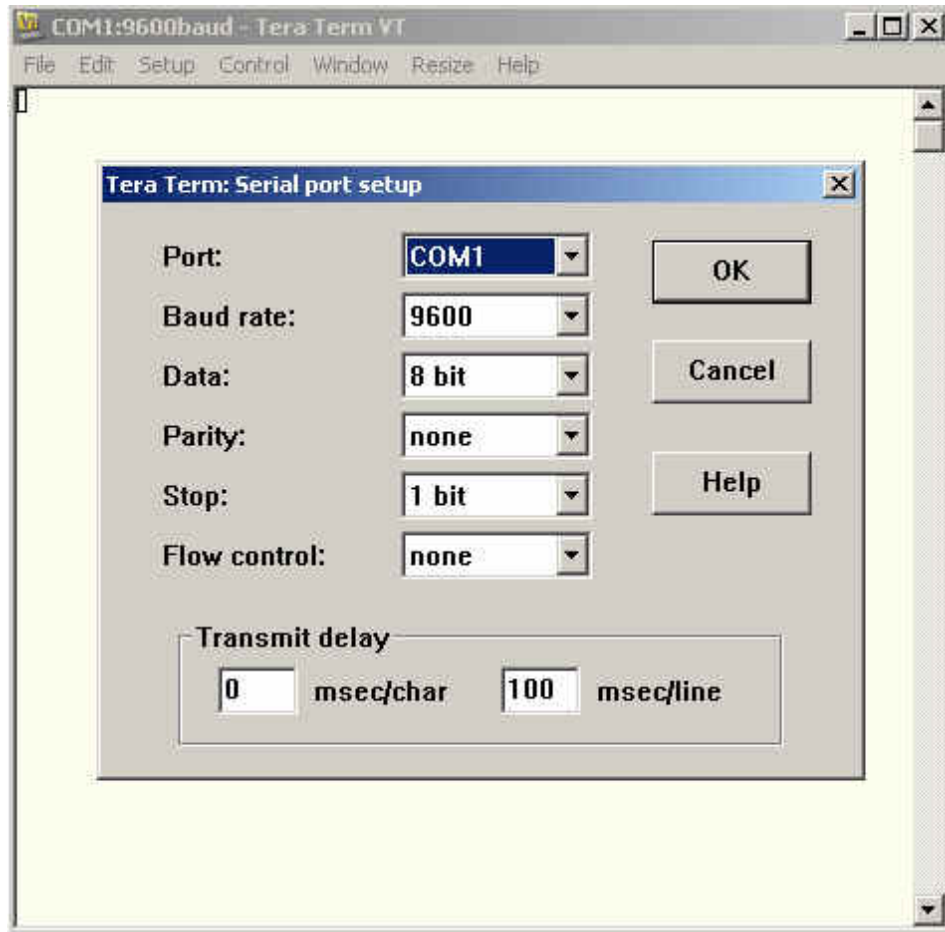


Fig.1

Step 2. Setting up Hardware.

Once your terminal program has been configured, you can now connect the programmer to the com port you have selected in the terminal configuration. The programmers power can be taken from the target, or from the USB/RS232 interface connected to the PC.



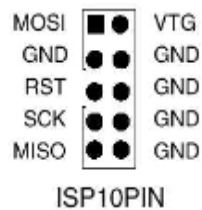
Fig 2. Take 5V power from USB/RS232 Interface.



Fig 3. Take power from target 3 - 5 V.

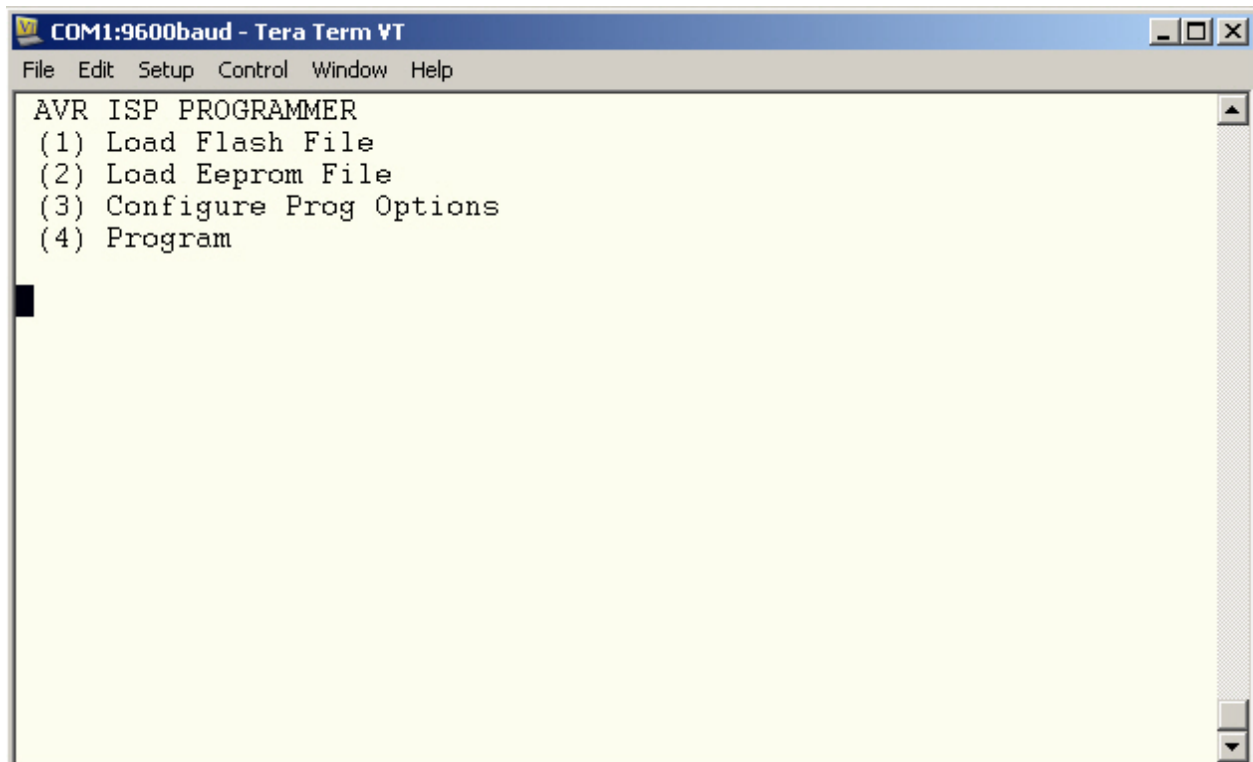
*****Please remember that there is no protection if you are using power from the target! Please be sure that the target voltage does not exceed 5VDC.*****

The programmer uses the ATMEL standard 10 pin ISP connector.

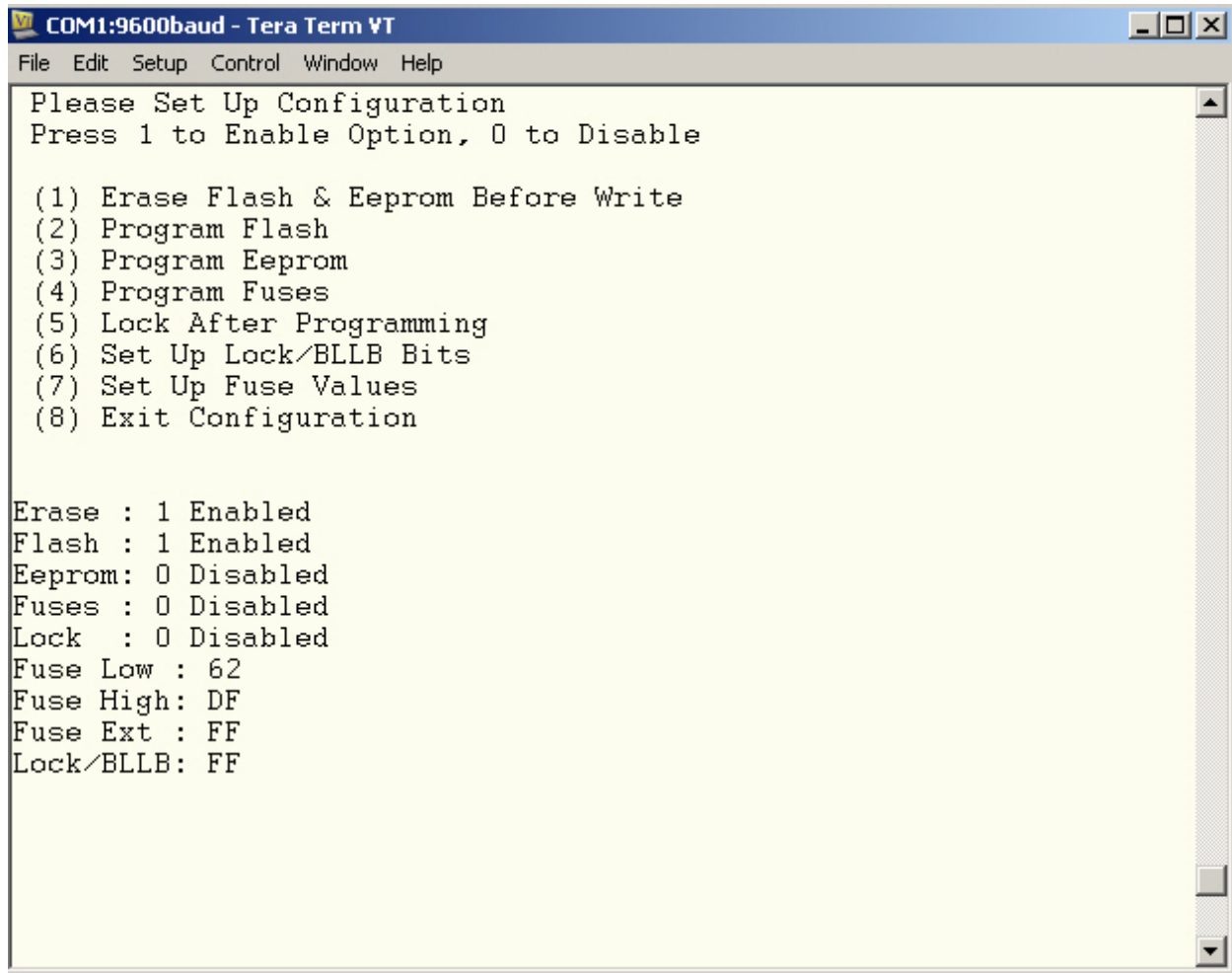


Step 3. Programmer Configuration.

Ensure that jumper J1 has been removed. Connect the programmer to a com port on your PC and connect the ISP cable from the programmer to the target. If jumper J3 is set to take power from the target, you do not need to connect power to the programmer. If everything is configured correctly you will see the main menu.



Pressing "3" will bring you to the configuration menu:



```
COM1:9600baud - Tera Term VT
File Edit Setup Control Window Help

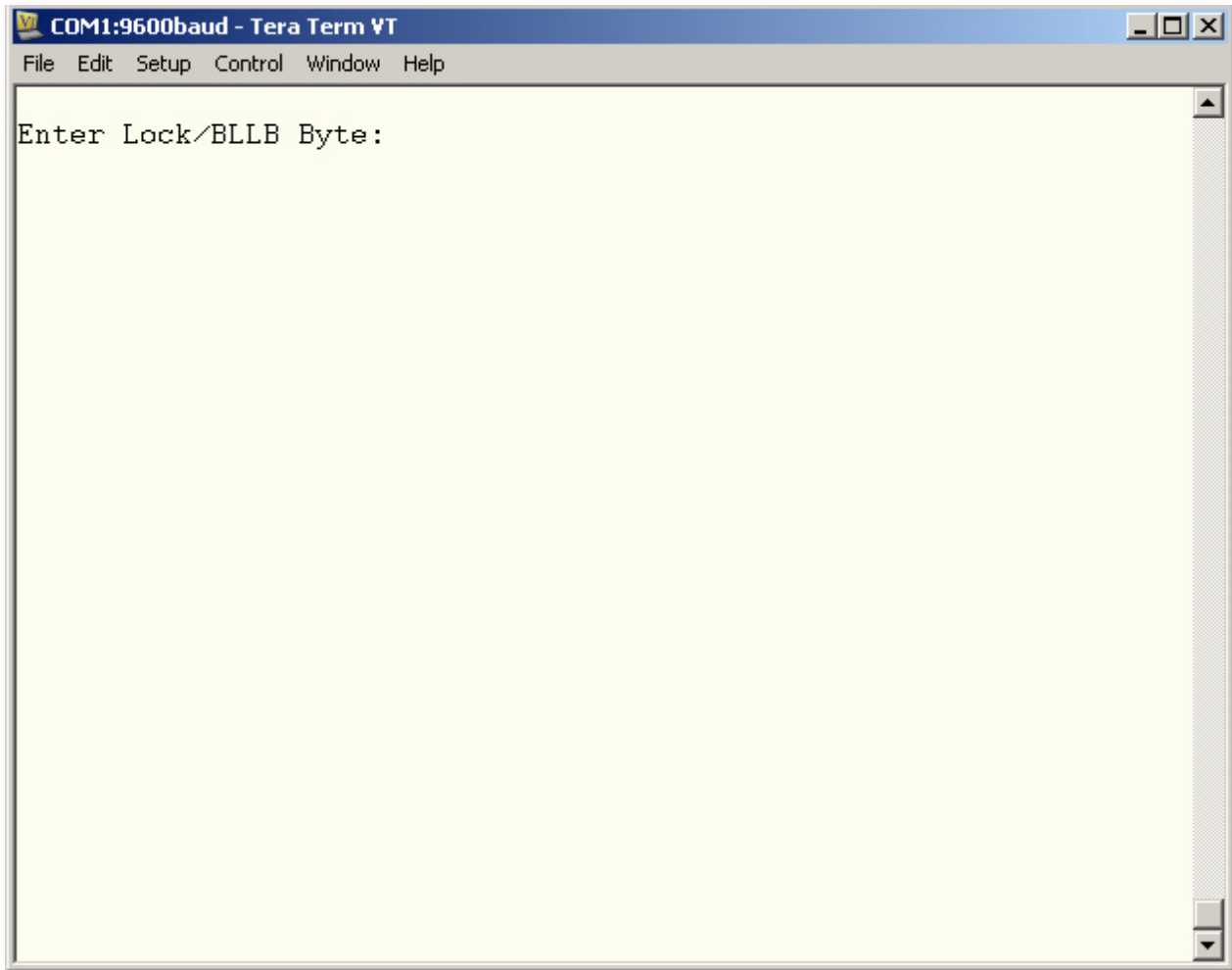
Please Set Up Configuration
Press 1 to Enable Option, 0 to Disable

(1) Erase Flash & Eeprom Before Write
(2) Program Flash
(3) Program Eeprom
(4) Program Fuses
(5) Lock After Programming
(6) Set Up Lock/BLLB Bits
(7) Set Up Fuse Values
(8) Exit Configuration

Erase : 1 Enabled
Flash : 1 Enabled
Eeprom: 0 Disabled
Fuses : 0 Disabled
Lock : 0 Disabled
Fuse Low : 62
Fuse High: DF
Fuse Ext : FF
Lock/BLLB: FF
```

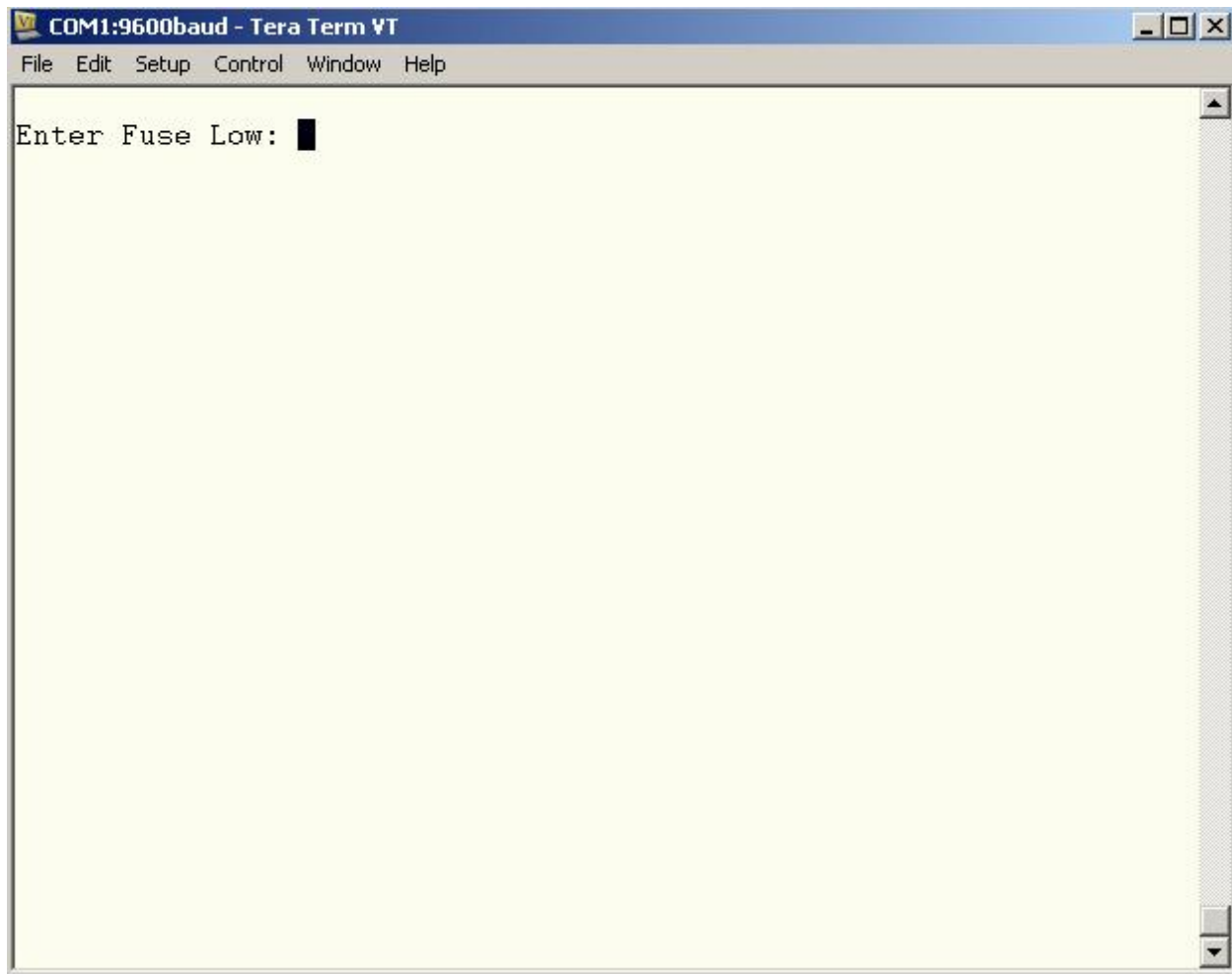
Now you have 8 options. At any time you can exit to the main menu by pressing 8. Options 1 through 5 will establish what steps will be taken when the programmer is working. To enable or disable any of the functions, a "1" or "0" must be pressed after the option is selected. For example, to skip erasing the device before programming, you will press 1, then 0 on your keyboard. The menu will immediately update the option you have selected and return to the configuration menu. To enable the erase option before programming, you will press 1, then 1.

Option 6 will bring up a screen like this:



Here you must enter an 8 bit hex value (2 digits). The screen will then revert back to the configuration menu with the updated lock byte.

Option 7 will bring up a screen like this:



Again, you must enter an 8 bit hex value (2 digits). You will then be asked for the Fuse High Byte and the Fuse Extended Byte. If the device you are programming does not contain a Fuse High Byte or a Fuse Extended Byte, just enter the value FF in its place. When programming, only the fuse bytes that exist on the device will be programmed. Be careful here! If you enter incorrect values, you can disable ISP programming, and lock yourself out of the device!

The screen will then revert back to the configuration menu with the updated values. ****Be sure to enable fuse writing if required!** The fuses only need to be programmed the first time the device is programmed. The erase command does not change the fuse values, therefore with any future software updates to your target, the fuse writing option can be disabled to speed up the programming process.

To exit and return back to the main menu, press 8.

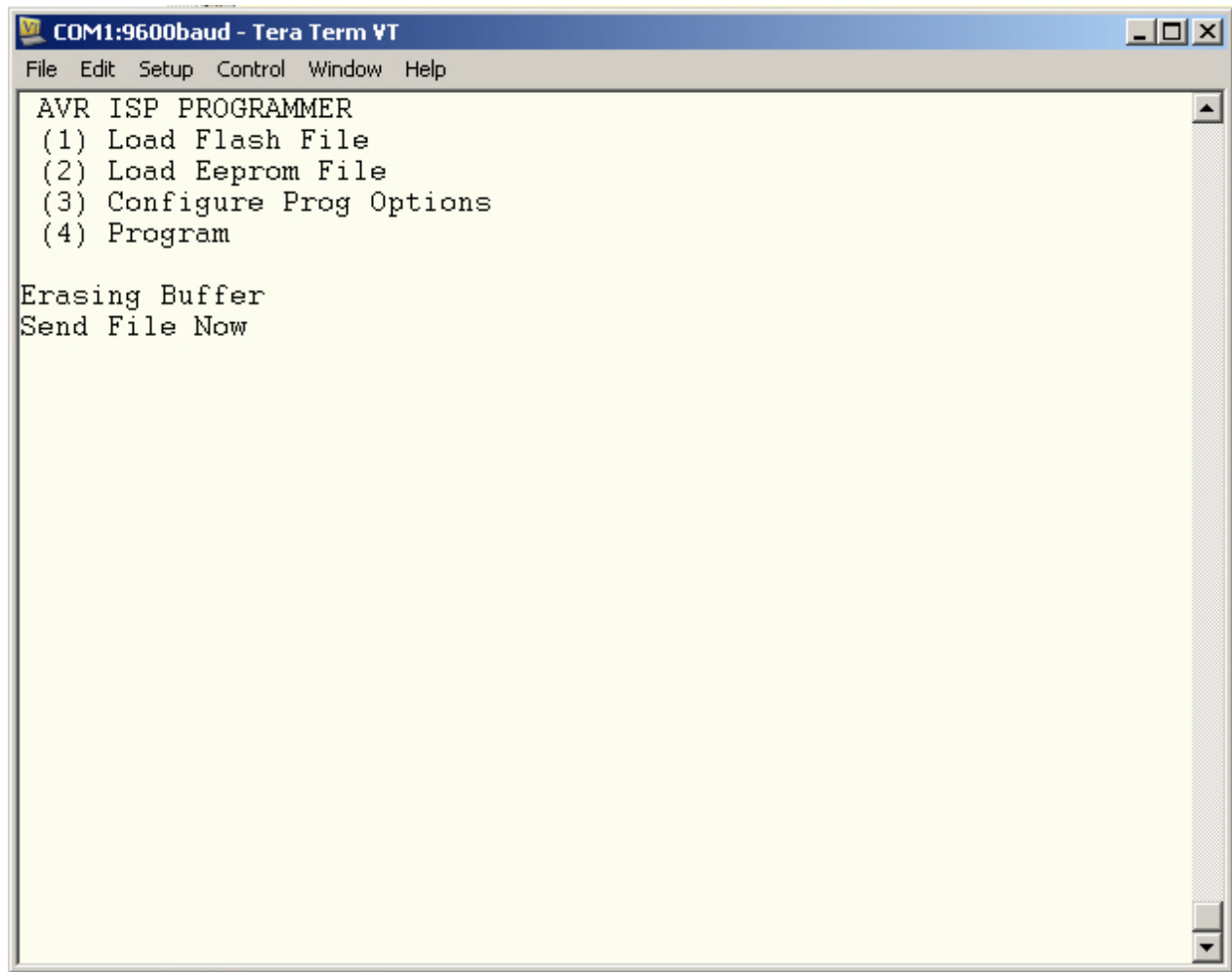
Step 4. Loading Files

A file must be loaded from the PC which will be stored in the programmer until it is changed or updated. Pressing 1 or 2 will show a screen like this:

```
COM1:9600baud - Tera Term VT
File Edit Setup Control Window Help
AVR ISP PROGRAMMER
(1) Load Flash File
(2) Load Eeprom File
(3) Configure Prog Options
(4) Program

Erasing Buffer
02 E0 █
```

The programmer will begin to clear the memory before a hex file can be stored. The buffer memory address will be displayed while it is being erased. This may take a few minutes. When complete, you will see a screen like this:



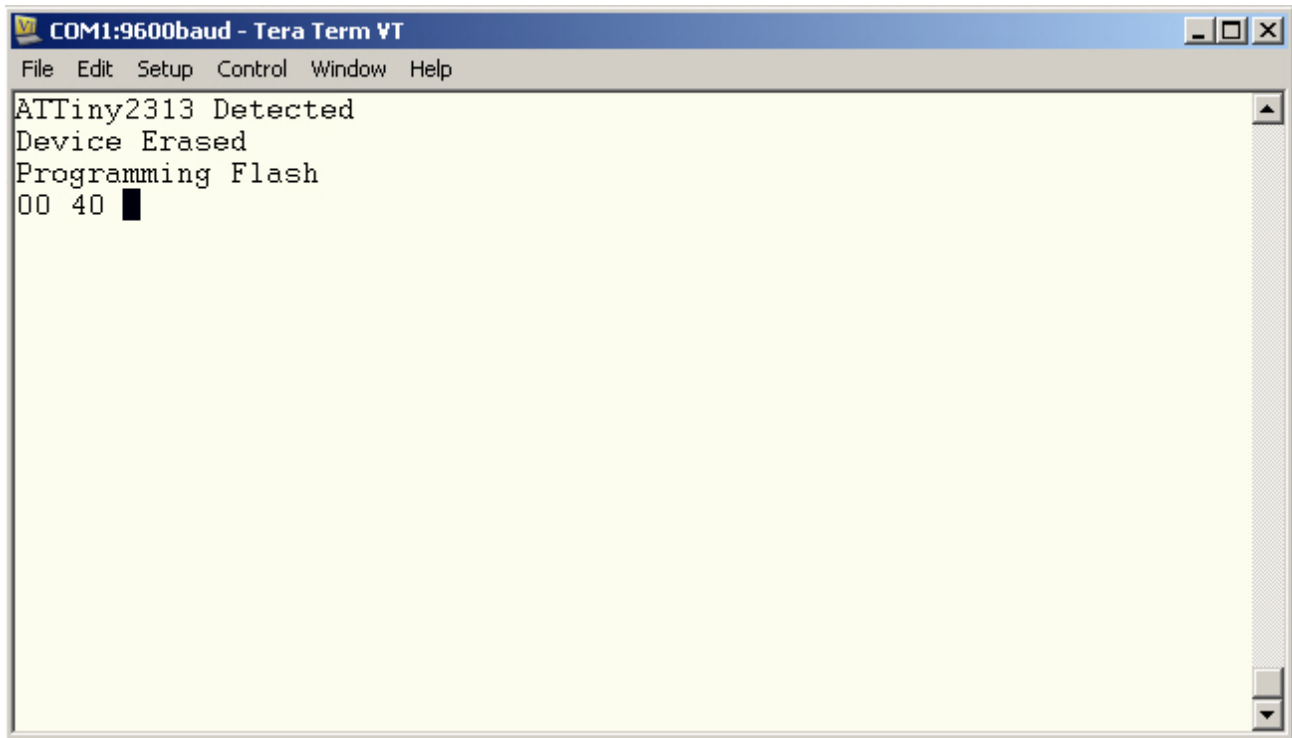
In Tera Term, select File, Send File. Files must be in intel hex format, and no larger than 31K (eeprom and flash combined). If a bad checksum is detected, the programmer will display an error message. The operation is the same for loading target flash files OR target eeprom files. If a larger file is loaded than what the target will hold, the programming will stop at flashend or eepromend. After the file is loaded, a screen will appear like this:


```
COM1:9600baud - Tera Term VT
File Edit Setup Control Window Help
AVR ISP PROGRAMMER
(1) Load Flash File
(2) Load Eeprom File
(3) Configure Prog Options
(4) Program

Erasing Buffer
Loading Success!
Don't Forget to Set Configuration!
Press ESC Key█
```

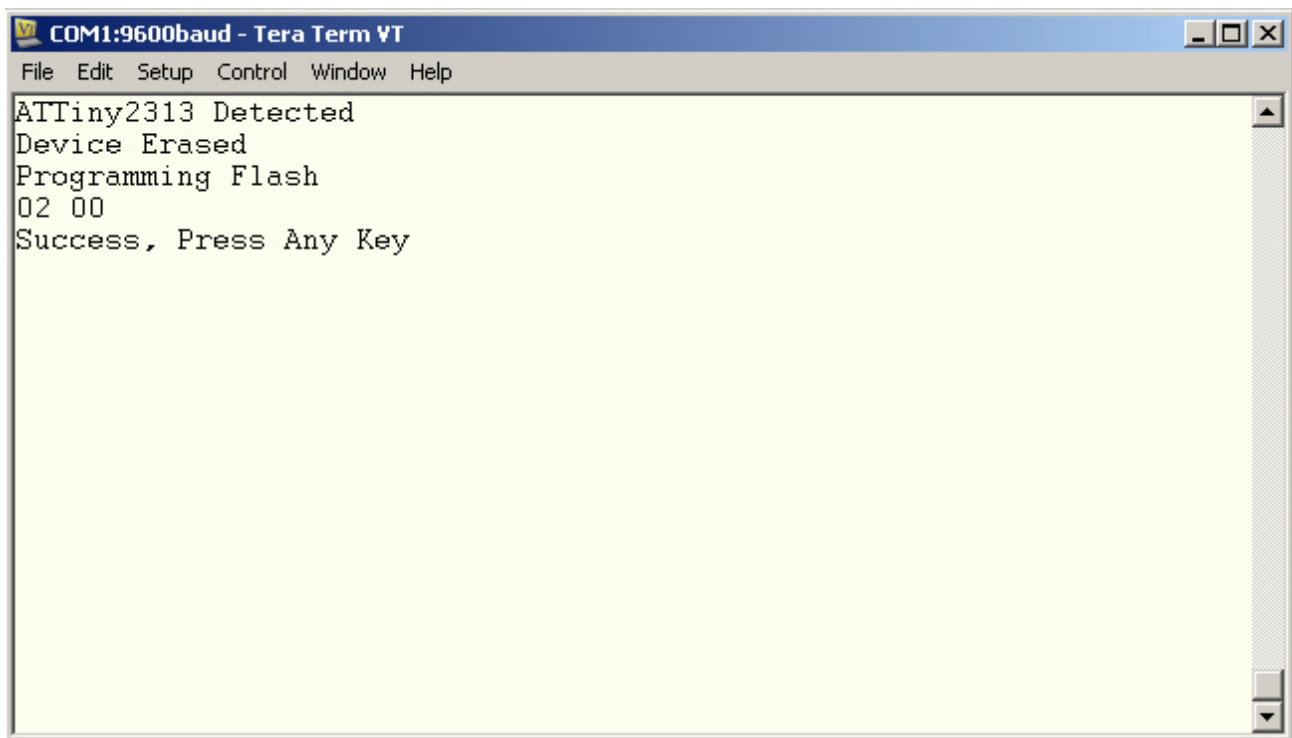
Step 5. Programming the target device.

The target can be programmed in terminal mode from the main menu (while the programmer is connected to the PC) or in standalone mode (if jumper J1 is installed before the device is powered up). When programming, the programmer will execute the options you have configured previously. Here is a screen shot of the programming operation while connected to the PC (either by pressing "4" from the main menu or by powering up the device with jumper J1 installed):



```
COM1:9600baud - Tera Term VT
File Edit Setup Control Window Help
ATTiny2313 Detected
Device Erased
Programming Flash
00 40 █
```

While programming (in standalone mode or terminal mode) the yellow LED will illuminate indicating the programmer is busy programming. The programming address will be displayed on the screen. The programmer will automatically verify every byte as it is written. When complete, the green led will illuminate if there are no verify errors (in the case of errors, the red led will illuminate). You will then see this:



```
COM1:9600baud - Tera Term VT
File Edit Setup Control Window Help
ATTiny2313 Detected
Device Erased
Programming Flash
02 00
Success, Press Any Key
```

You will need to depend on the LEDs to view programming status in standalone mode since there will be no terminal connected. At this point you can press any key to return to the main menu (if in terminal mode) or disconnect the power to the programmer if in standalone mode.

Device List for AVR Standalone ISP Programmer

The following devices are supported by this programmer:

Attiny Devices:

ATTiny13
ATTiny2313
ATTiny24
ATTiny25
ATTiny26
ATTiny261
ATTiny44
ATTiny45
ATTiny461
ATTiny84
ATTiny85
ATTiny861

Atmega Devices:

ATmega8
ATmega16
ATmega32
ATmega48
ATmega88
ATmega162
ATmega164
ATmega165
ATmega168
ATmega324
ATmega325
ATmega3250
ATmega325B
ATmega8515
ATmega8535

For support or any questions, please email: microcontrollerprog@yahoo.com