AVR USB Programmer

Users Manual

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Thank you for purchasing the Robokits AVR USB Programmer. This unit has been carefully engineered and tested to provide superior performance. This document covers the features and operation of the AVR USB Programmer.

This device is specially designed to work with Laptops/Notebooks which doesn't have Parallel or serial port. At full clock speed of 16 MHz of the microcontroller it can program the flash at very high speeds in STK500 mode. This programmer is supported in STK500 as well as Human Interface Device (HID) mode. It is supported on all versions of Windows, including Windows Vista and Longhorn, as well as on Linux.

Features

- **Compatible to Atmel's STK500V2 with implemented USB to Serial converter.**
- **Compatible with AVR Studio, AVRDUDE and compilers having support for STK500V2 protocol.**
- **Supports 2 modes, STK500 and USB-HID for compatibility.**
- **Adjustable ISP clock allows flashing of devices clocked at very low rate, e.g. 32 kHz.**
- **High Speed Programming : Programs 32 KB flash in just 15 seconds at full speed of microcontroller.**
- **ISP clock can be lowered with a jumper (if the programmer software does not support setting the ISP clock)**
- **Second USB to Serial converter for processing debug output from the target.**
- **Uses USB power supply, no external supply required.**
- **Supported on Windows 98, XP, Vista and Linux.***

***On some PCs, the programmer can show clock errors while flashing the device, use HID mode in this case. For Windows Vista and Linux, this device must be used in HID mode.**

Supported Atmel AVR microcontroller devices

CAN, USB & PWM AVR	90S AVR	Mega AVR	Tiny AVR
AT90CAN128	AT90S1200	ATmega103	ATtiny11
AT90CAN32	AT90S2313	ATmega128	ATtiny12
AT90CAN64	AT90S2313	ATmega1280	ATtiny15
AT90PWM2	AT90S2313	ATmega1281	ATtiny2313
AT90PWM2B	AT90S2343	ATmega16	ATtiny24
AT90PWM3	AT90S4414	ATmega161	ATtiny25
AT90PWM3B	AT90S4434	ATmega162	ATtiny26
AT90USB1286	AT90S8515	ATmega163	ATtiny261
AT90USB1287	AT90S8535	ATmega164	ATtiny44
AT90USB646	AT90S2323	ATmega168	ATtiny45
AT90USB647	AT90S2343	ATmega169	ATtiny461
	AT90S2333	ATmega2560	ATtiny84
	AT90S4433	ATmega2561	ATtiny85
	AT90S4434	ATmega32	ATtiny861
	AT90S8534	ATmega324	
		ATmega325	
		ATmega3250	
		ATmega329	
		ATmega3290	
		ATmega48	
		ATmega64	
		ATmega640	
		ATmega644	
		ATmega645	
		ATmega6450	
		ATmega649	
		ATmega6490	
		ATmega8	
		ATmega8515	
		ATmega8535	
		ATmega88	

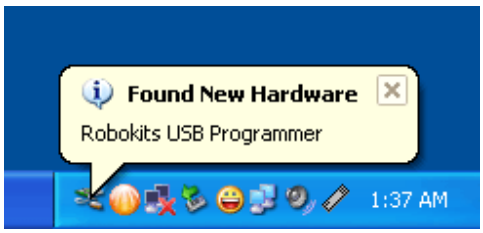
Jumper Settings

- **USB-HID – To connect the programmer in HID (Human Interface Device) mode. If this jumper is not shorted, the programmer will work in STK500 mode. In STK500 mode programmer will not work under Windows Vista.**
- **ISP Supply – To power up microcontroller board from USB 5V you can place this jumper.**
- **Slow SCK – In STK500 mode, if target microcontroller speed is less than 1MHz place this jumper.**

Mode 1: AVR Studio (STK500) Supported mode

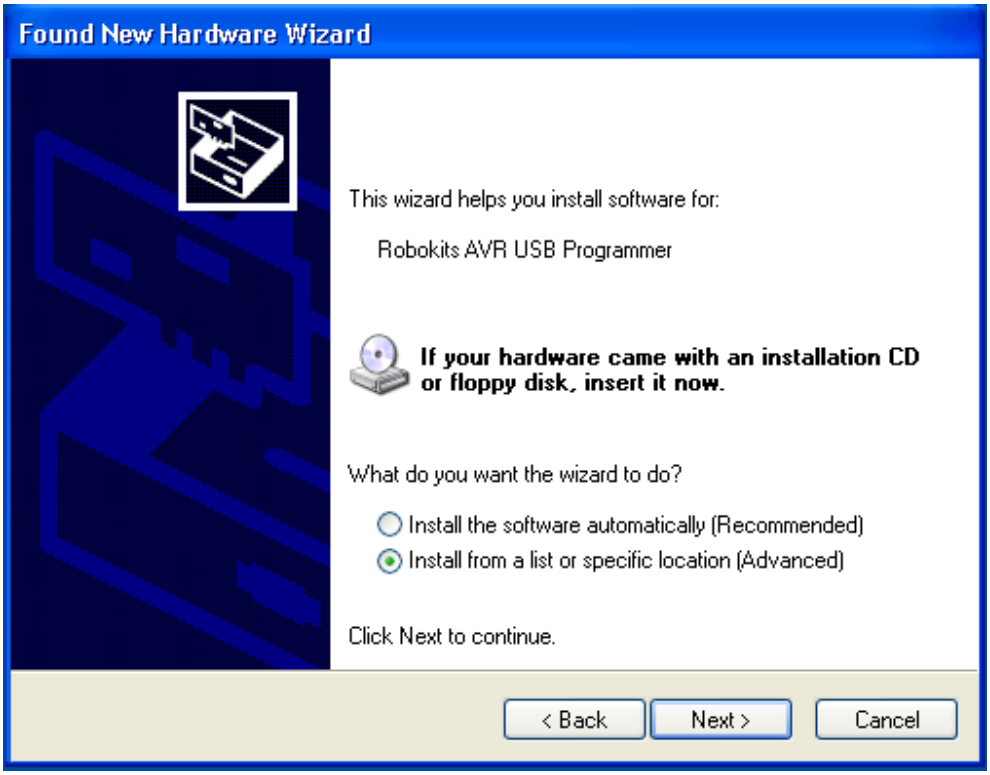
Installation STK500 Mode (Windows 98, ME, XP, Linux)

1. Remove USB-HID jumper. Insert the programmer in the USB port. After inserting the programmer in the USB port you will get following message.

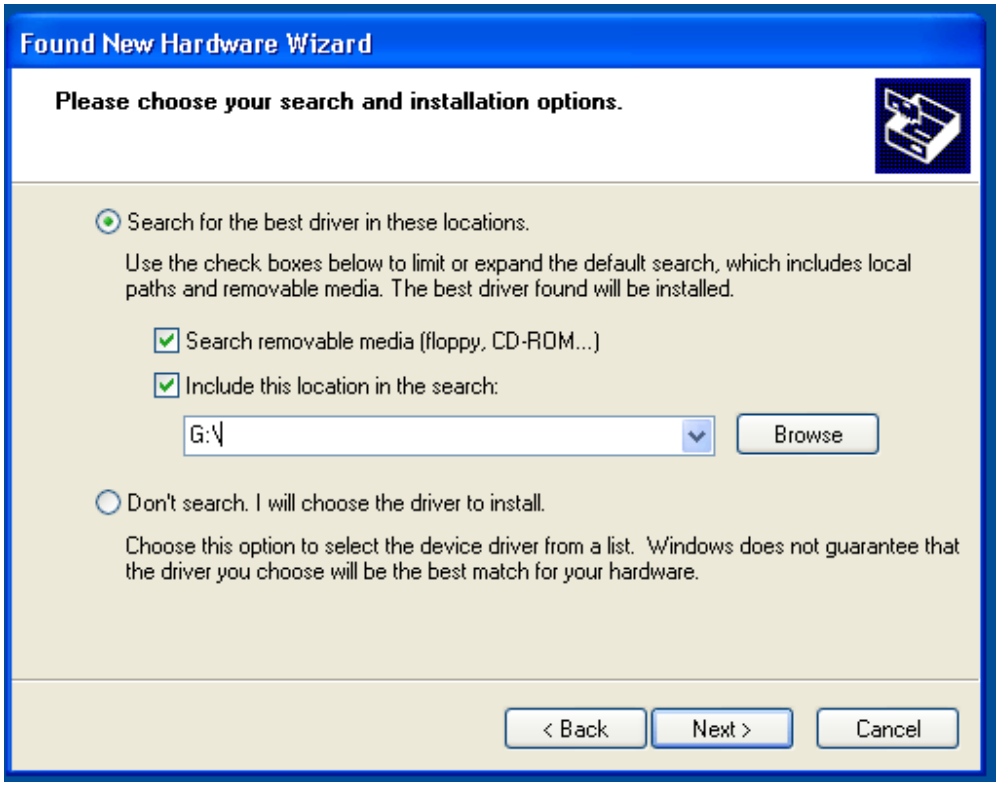


2. You will get this window asking for appropriate driver. Choose option "No, not this time" and click next if it asks for searching through Windows Update.

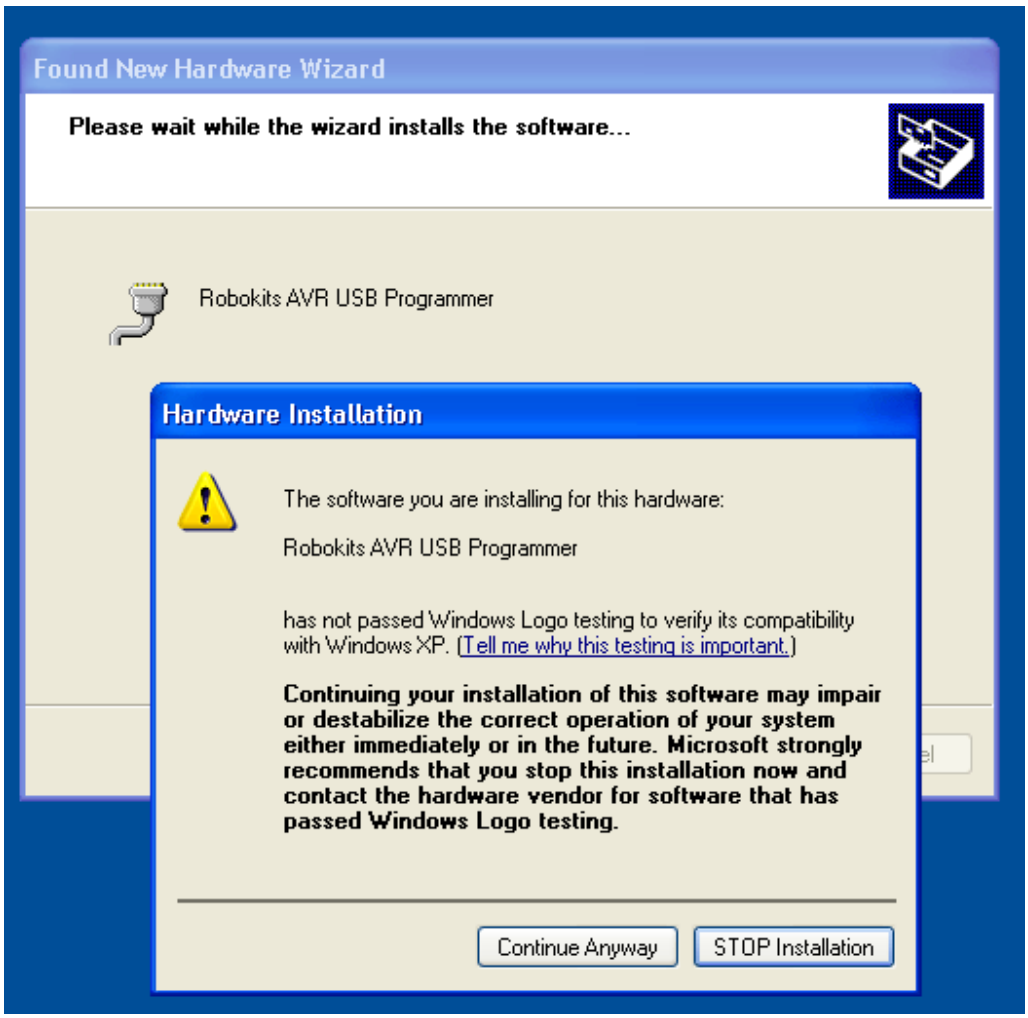
3. Now Choose "Install from a list or specific location (Advanced)", and click next.



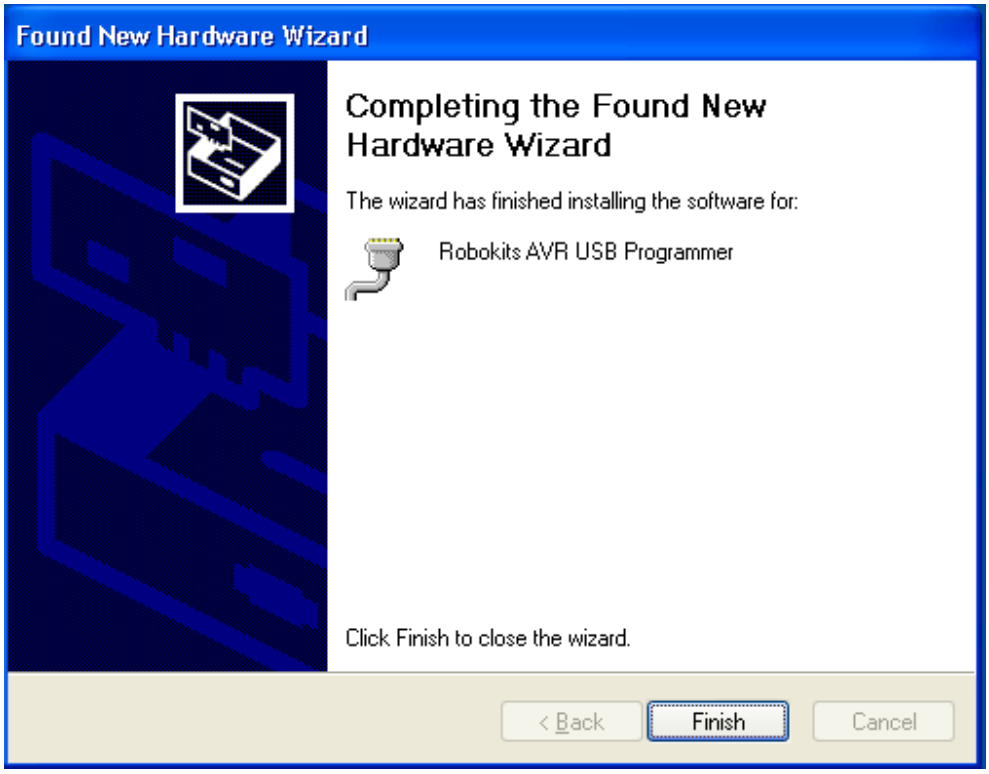
4. Choose the path of Robokits CD which contains "Robokits USB Programmer.inf" file. i.e. "E:", click next.

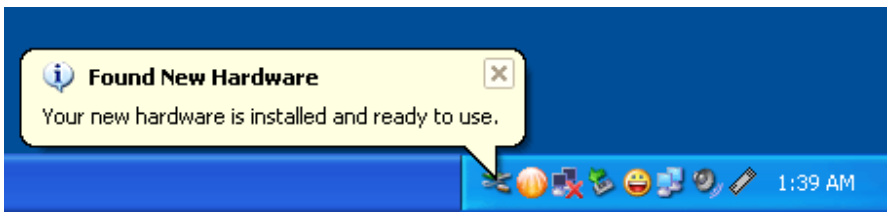


5. Click "Continue Anyway" option. This driver is not Digitally Signed by Microsoft.

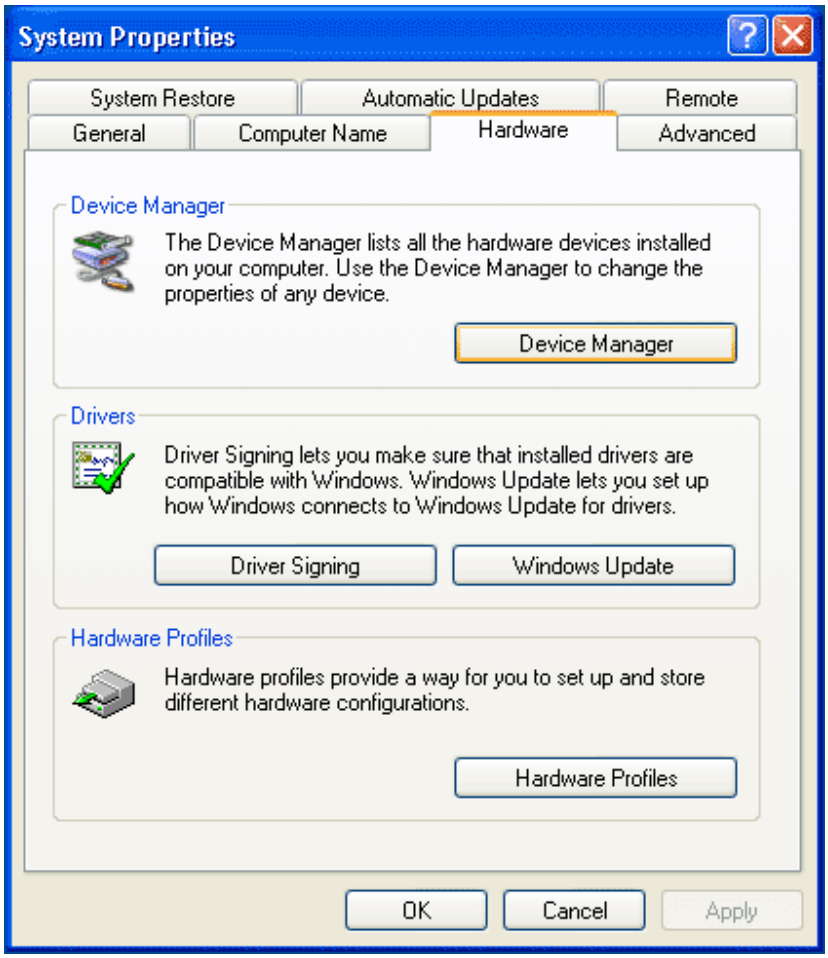


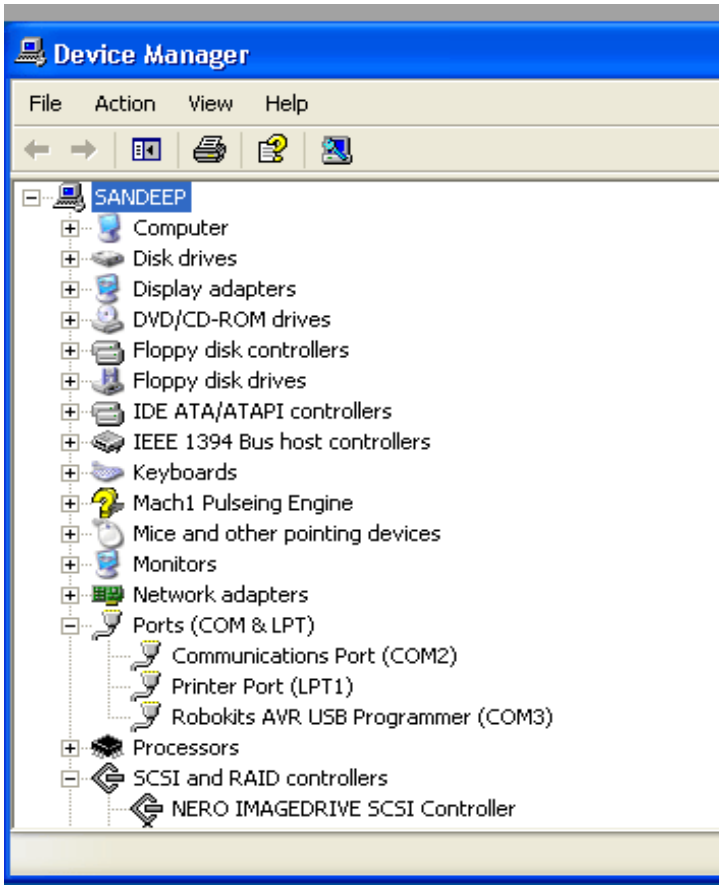
6. Click Finish to complete the wizard. Now your hardware is ready to work.





7. For further customization go to Control Panel -> System -> Hardware -> Device Manager.

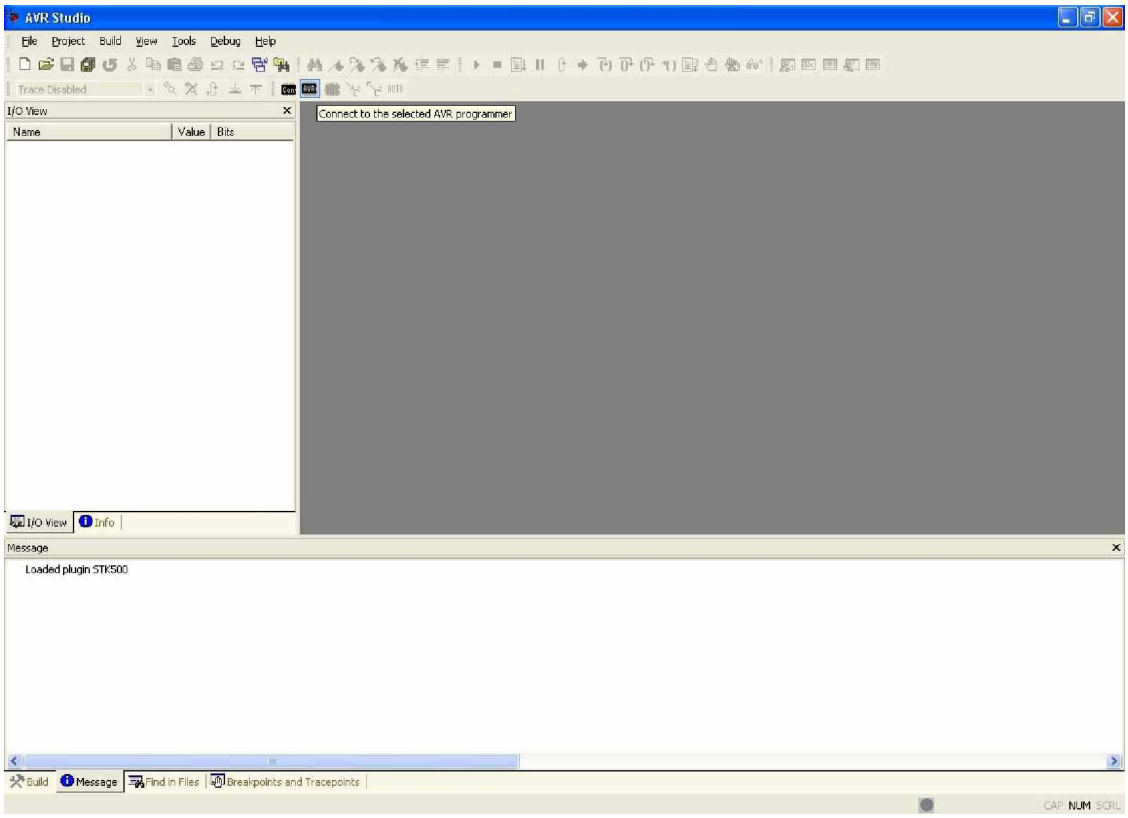




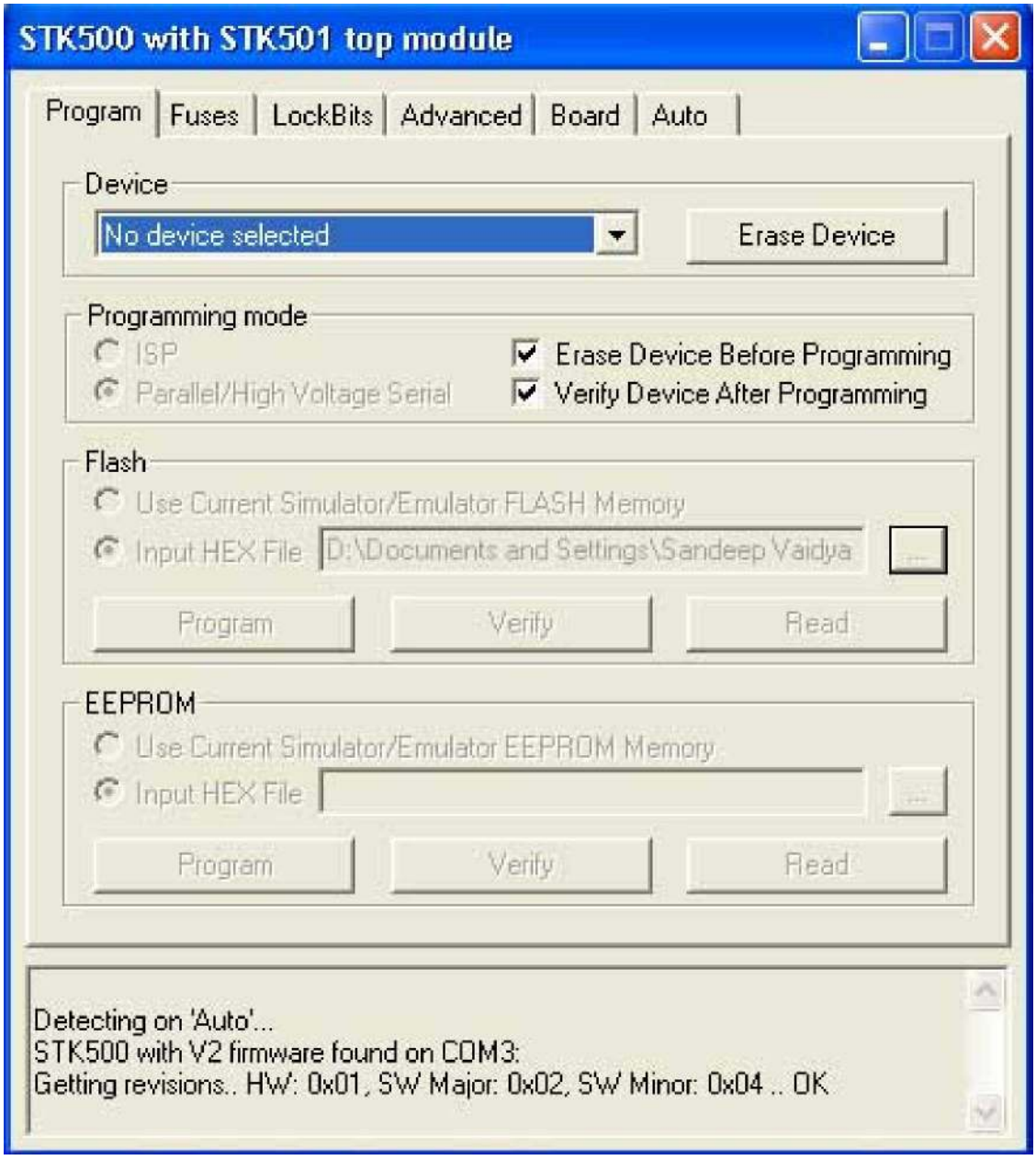
8. Double click "Robokits AVR USB Programmer" to select appropriate COM port and changing setting. By Default it will take any port available. To select other com port go to Port Settings -> Advance -> COM Port Number.

Instructions

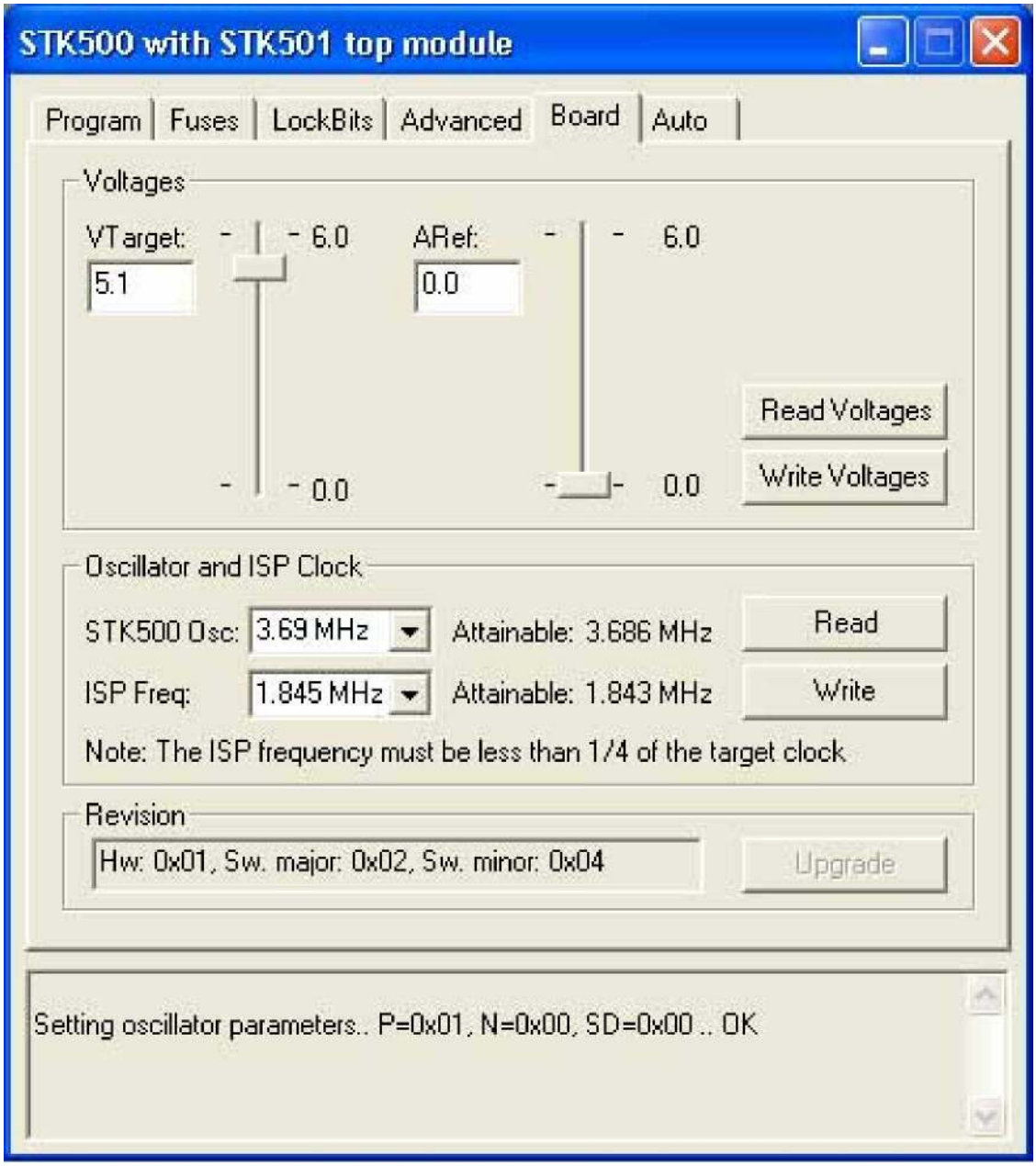
- **STK500 is one of the kits made by ATMEL for learning AVR. It uses STK500V2 for programming the device.**
- **For more details about STK500V2 protocol visit www.atmel.com.**
- **AVRStudio is a free source Assembler, C compiler, Simulator and Debugger.**
- **It supports the STK500V2 protocol. For high speed programming you need to use this software.**
- **When you run AVRStudio it will show the following screen.**



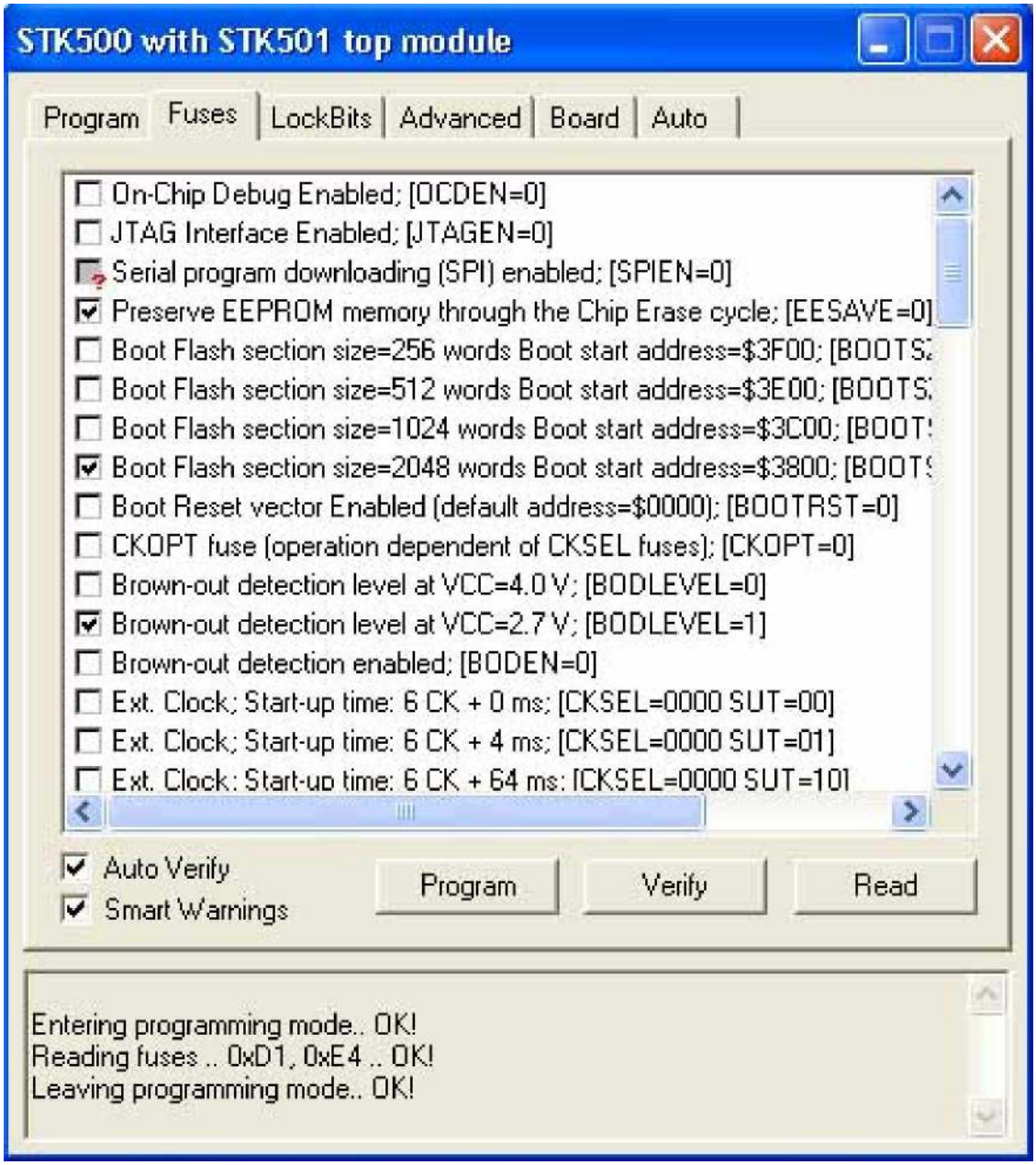
- **Robokits AVR USB programmer assigns a serial port which has to be taken care of. In AVRStudio auto detect function does not need the previous task to be done. It automatically connects to the programmer.**
- **Click on the icon where the cursor is pointing. It will Auto connect the programmer without specifying any COM port settings if the programmer is present at USB port.**

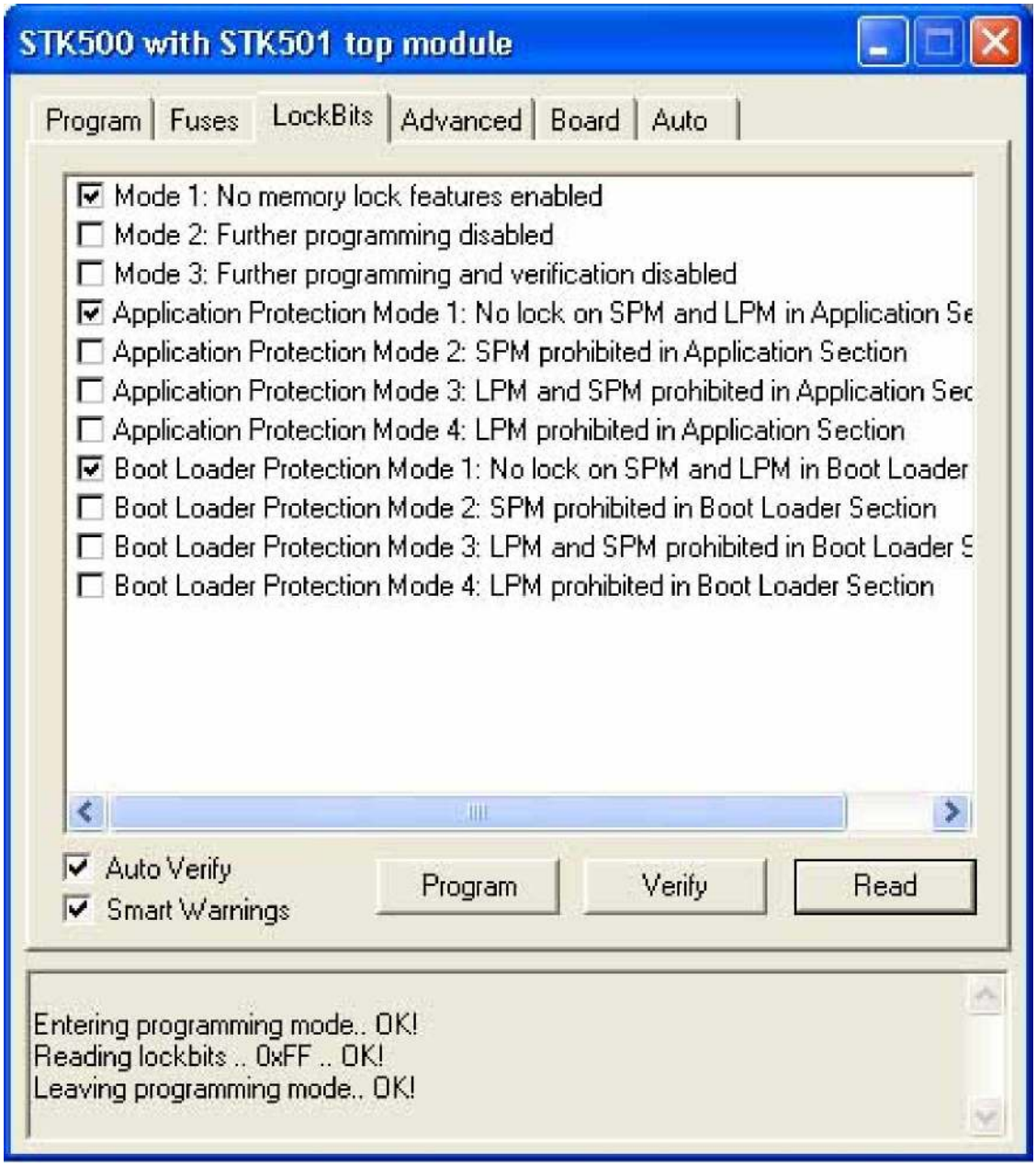


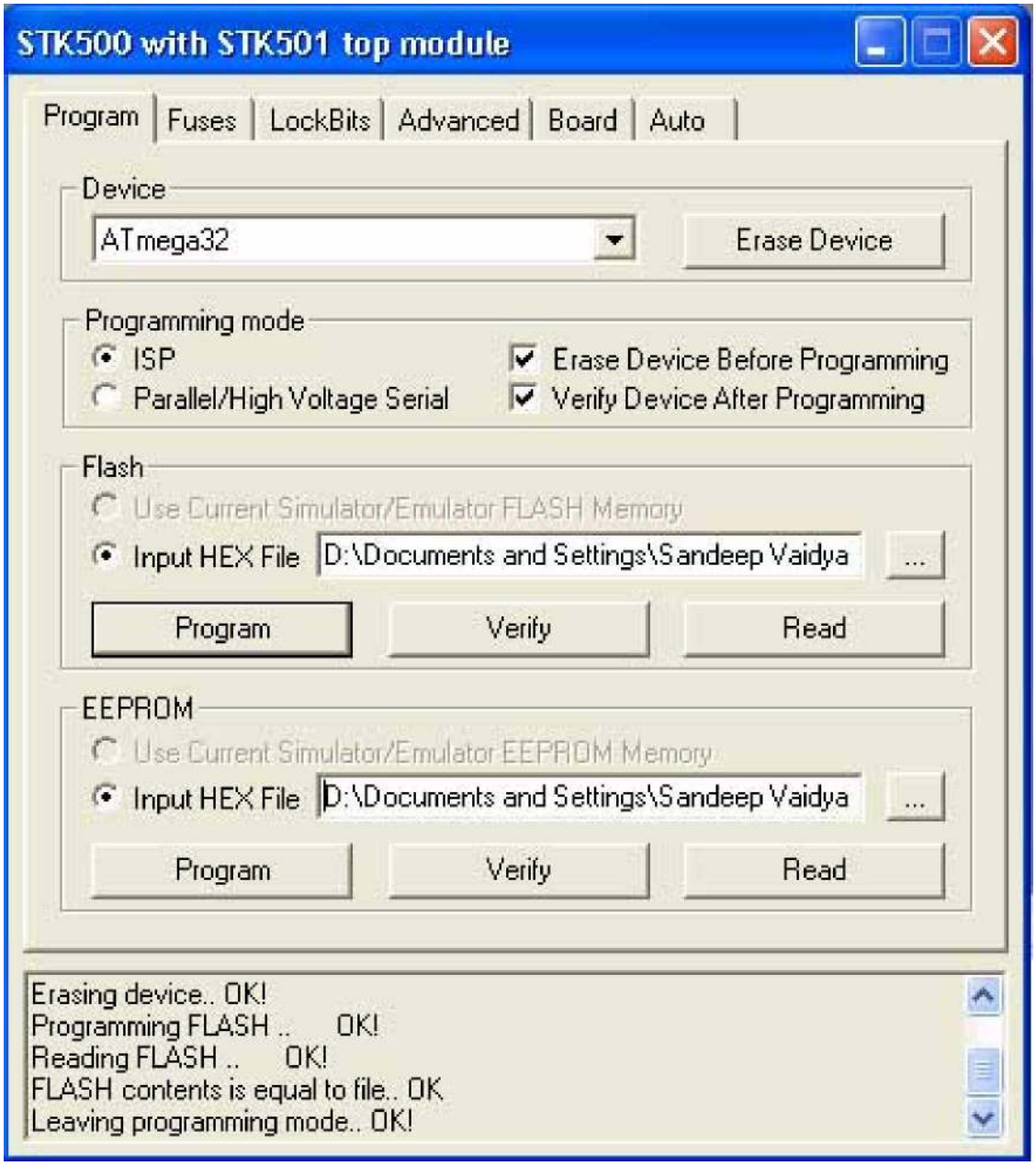
- **Once you get the window shown above the programmer is ready to use.**
- **Select the device and the programming mode ISP / High voltage serial.**
- **Economy Edition of this product does not support high voltage serial programming.**
- **For high speed programming, go to Board tab.**



- **Normally the setting here is for a STK500 protocol and not for STK500V2 so you have to change the clock settings.**
- **Set the STK500 Osc: to 3.69 MHz and ISP Freq: 1.845MHz and click on the write tab. You will get the message shown in the last box.**
- **This procedure is not required if you don't want very high speed programming.**
- **Now you can go to program tab and browse the hex file you want to write in flash and EEPROM and click program.**
- **You can set the Fuses and LockBits from the relevant tab.**


STK500 with STK501 top module
Program
Fuses
LockBits
Advanced
Board
Auto
On-Chip Debug Enabled; [OCDEN=0]
JTAG Interface Enabled; [JTAGEN=0]
Serial program downloading (SPI) enabled; [SPIEN=0]
Preserve EEPROM memory through the Chip Erase cycle; [EESAVE=0]
Boot Flash section size=256 words Boot start address=$3F00; [BOOTS
Boot Flash section size=512 words Boot start address=$3E00; [BOOTS
Boot Flash section size=1024 words Boot start address=$3C00; [BOOT
Boot Flash section size=2048 words Boot start address=$3800; [BOOT
Boot Reset vector Enabled (default address=$0000); [BOOTRST=0]
CKOPT fuse (operation dependent of CKSEL fuses); [CKOPT=0]
Brown-out detection level at VCC=4.0 V; [BODLEVEL=0]
Brown-out detection level at VCC=2.7 V; [BODLEVEL=1]
Brown-out detection enabled; [BODEN=0]
Ext. Clock; Start-up time: 6 CK + 0 ms; [CKSEL=0000 SUT=00]
Ext. Clock; Start-up time: 6 CK + 4 ms; [CKSEL=0000 SUT=01]
Ext. Clock; Start-up time: 6 CK + 64 ms; [CKSEL=0000 SUT=10]
Auto Verify
Smart Warnings
Program
Verify
Read
Entering programming mode.. OK!
Reading fuses .. 0xD1, 0xE4 .. OK!
Leaving programming mode.. OK!


STK500 with STK501 top module
Program
Fuses
LockBits
Advanced
Board
Auto
Mode 1: No memory lock features enabled
Mode 2: Further programming disabled
Mode 3: Further programming and verification disabled
Application Protection Mode 1: No lock on SPM and LPM in Application Se
Application Protection Mode 2: SPM prohibited in Application Section
Application Protection Mode 3: LPM and SPM prohibited in Application Sec
Application Protection Mode 4: LPM prohibited in Application Section
Boot Loader Protection Mode 1: No lock on SPM and LPM in Boot Loader
Boot Loader Protection Mode 2: SPM prohibited in Boot Loader Section
Boot Loader Protection Mode 3: LPM and SPM prohibited in Boot Loader S
Boot Loader Protection Mode 4: LPM prohibited in Boot Loader Section
Auto Verify
Smart Warnings
Program
Verify
Read
Entering programming mode.. OK!
Reading lockbits .. 0xFF .. OK!
Leaving programming mode.. OK!



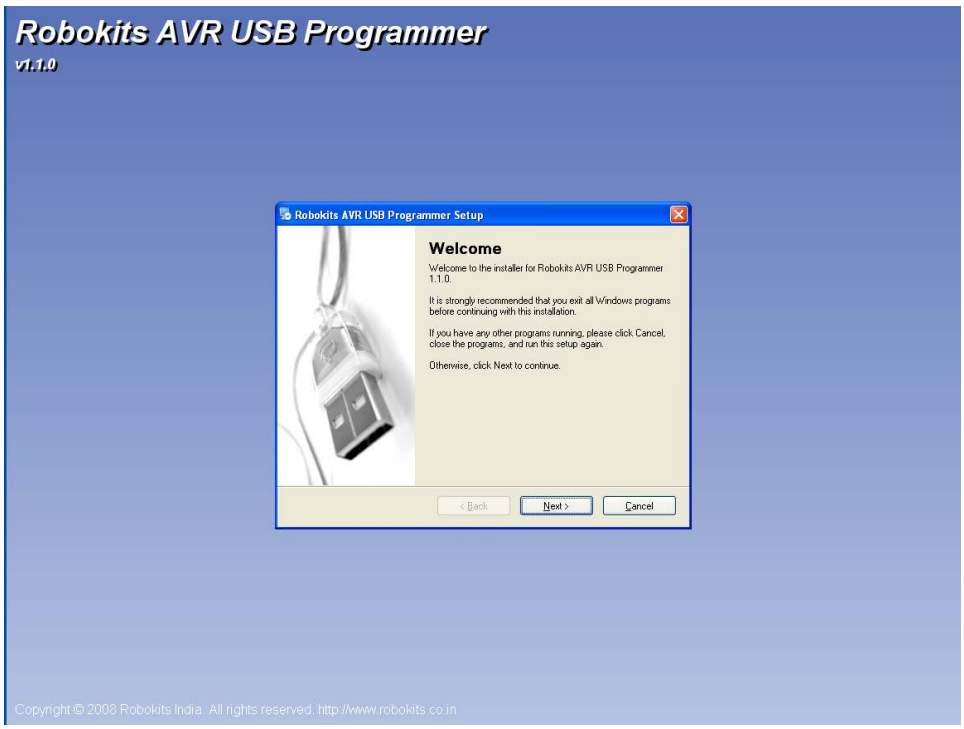
- **After programming the flash you will get the message shown in the last box.**

Mode 2: USB-HID Mode (Any Windows version & Linux)

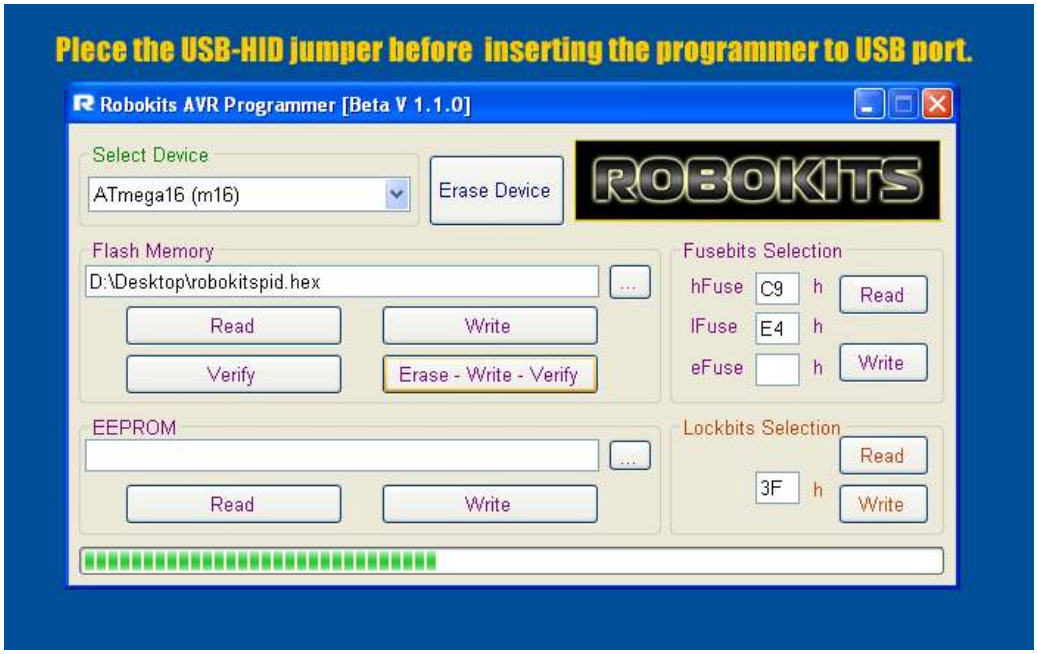
- **Before inserting the programmer place the USB-HID jumper. This mode doesent require any drivers in any operating system.**

- **Run RobokitsUSBProg.exe to install the programmer software. Latest version of this software can be downloaded from http://www.robokits.co.in/downloads/RobokitsUSBProg.exe**
- **To run this software you need to have .net framework 2.0. You can download this from http://download.microsoft.com/download/5/6/7/567758a3-759e-473e-bf8f-52154438565a/dotnetfx.exe**
- **.net framework 2.0 is also included on the CD included with programmer.**

- **After executing the exe file, you should see the following screen.**



- **After clicking next, software will be installed and shortcut will be created on the desktop as well as in start menu. You can click Robokits USB Programmer icon to start the software. You should see the following dialog when you start the software.**



Service and Support

Service and support for this product are available from Robokits India. The Robokits Web site (http://www.robokits.co.in) maintains current contact information for all Robokits products.

Limitations and Warrantees

The Robokits AVR USB Programmer is intended for personal experimental and amusement use and in no case should be used where the health or safety of persons may depend on its proper operation. Robokits provides no warrantee of suitability or performance for any purpose for the product. Use of the product software and or hardware is with the understanding that any outcome whatsoever is at the users own risk. Robokits sole guarantee is that the software and hardware perform in compliance with this document at the time it was shipped to the best of our ability given reasonable care in manufacture and testing. All products are tested for their best performance before shipping, and no warranty or guarantee is provided on any of them. Of course the support is available on all of them for no cost.

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