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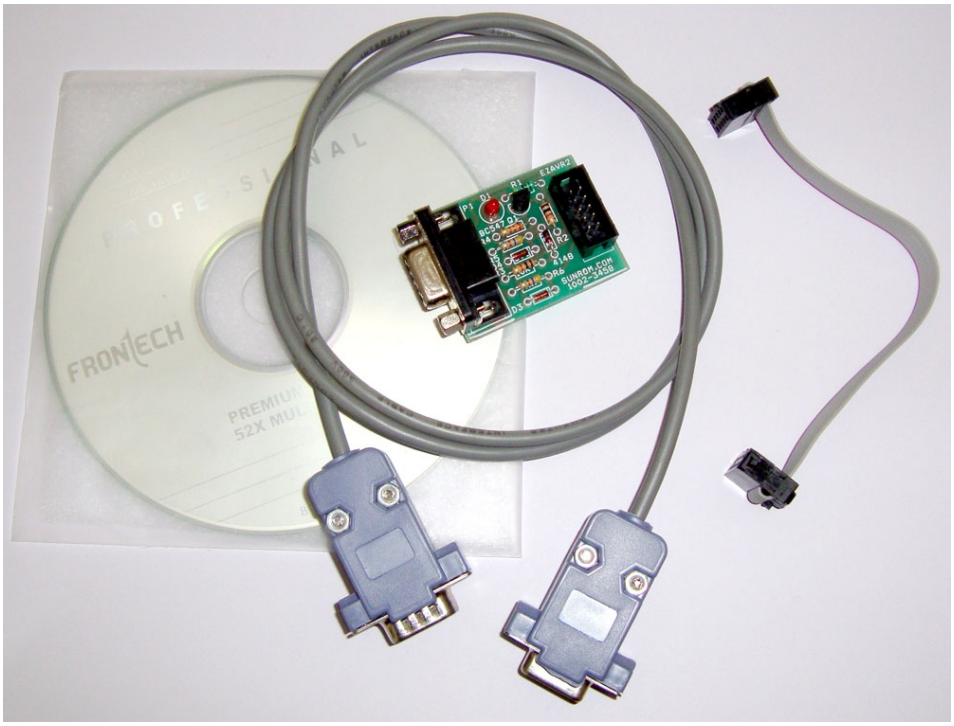
Document: Datasheet | Date: 10-Nov-11 | Model #: 1002-3458 | Product's Page: www.sunrom.com/p-3.html

AVR ISP Serial Programmer

AVR ISP is a low cost way to program most popular AVR microcontrollers through ICSP(In-Circuit Serial Programming). With ICSP the AVR can be programmed any number of times without removing it from target hardware making development and field update work easy.



The programmer connects to a PC through a standard RS232 Serial Port and draws the necessary power from the target board eliminating the need for an additional power supply for programmer.

PonyProg software is used with this programmer hardware to provide all the the necessary read, write, lock, and fuse functions

Features

- Powered from target board voltage
- Programs AVR's Flash, EEPROM, Security and Configuration Bits
- Low cost and easy to use
- Atmel Standard 10 pin ICSP connector
- Busy LED Indicator
- Feature rich PonyProg Software
- ISP Programming of most popular AVR Devices

Our Package Includes

- Assembled and Tested Programmer model 1002-3458 with 1 Year warranty
- Serial Cable for connection to PC's RS232 Serial Port
- CDROM containing Pony Prog software and instruction manual
- 10 pin FRC for connection to target boards

NOTE: This serial programmer needs REAL serial port at back of PC to work. It cannot be used with USB to RS232 adapter due to software limitations.

Supported Devices

Following table shows AVRs which can be programmed using this programmer.

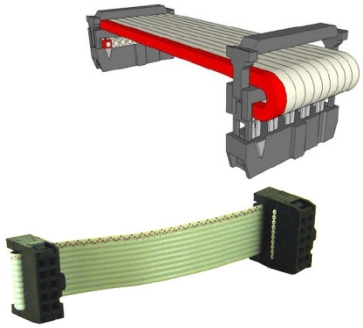
Popular AVR are marked as red in table below

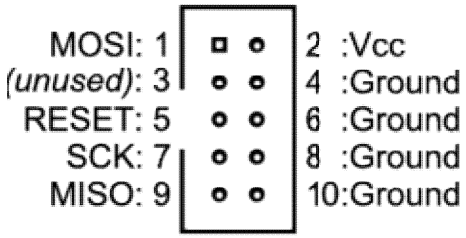
90S AVRs	Tiny AVRs	Mega AVRs
AT90S1200	ATtiny10	ATmega8
AT90S2313	ATtiny11	ATmega88
AT90S2323	ATtiny12	ATmega128
AT90S2333	ATtiny13	ATmega1281
AT90S2343	ATtiny15	ATmega16
AT90S4414	ATtiny22	ATmega161
AT90S4433	ATtiny2313	ATmega162
AT90S4434	ATtiny25	ATmega163
AT90S8515	ATtiny26	ATmega164
AT90S8534	ATtiny261	ATmega168
AT90S8535	ATtiny28	ATmega169
	ATtiny45	ATmega2560
	ATtiny461	ATmega2561
	ATtiny85	ATmega32
	ATtiny861	ATmega323
		ATmega324
		ATmega48
		ATmega603
		ATmega64
		ATmega640
		ATmega644
		ATmega1280
		ATmega8515
		ATmega8535
		ATmega103

Future devices supported on update of PonyProg software from following link.
http://www.lancos.com/prog.html

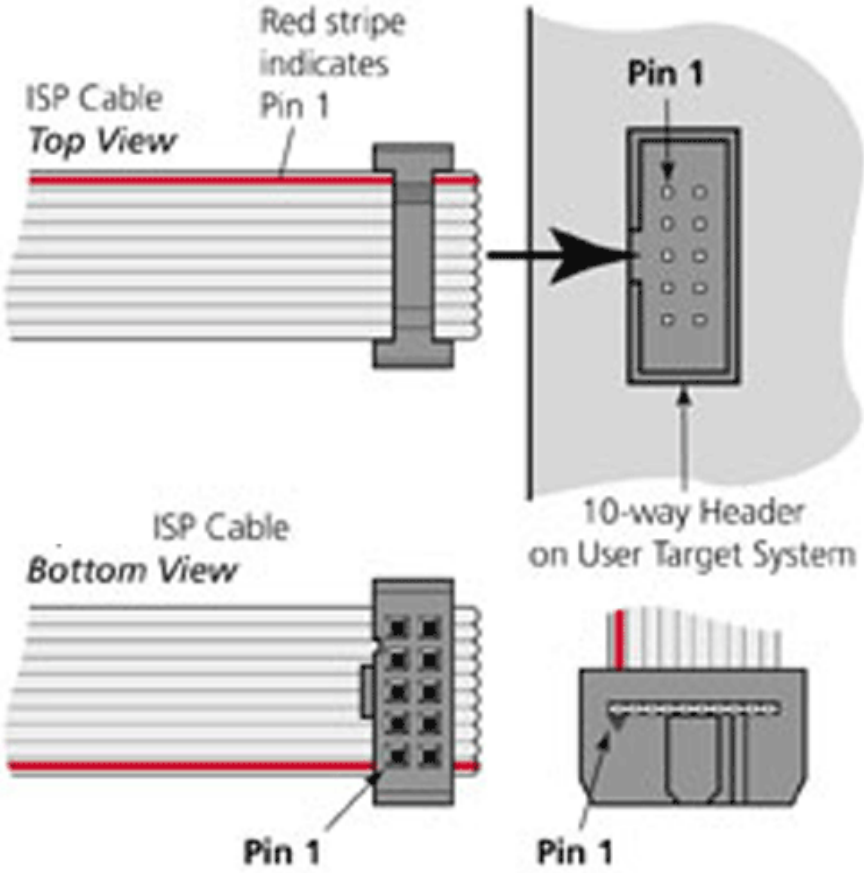
Understanding ICSP Connector

The programming connector is 2x5 type 10 pin Box Header. This connector is in the programmer as well required in target board. The connector has polarity protection slot to prevent accidently reverse connection and damage to programmer or target board.
Target Board connector is same as on programmer which is connected through 10 way FRC cable.





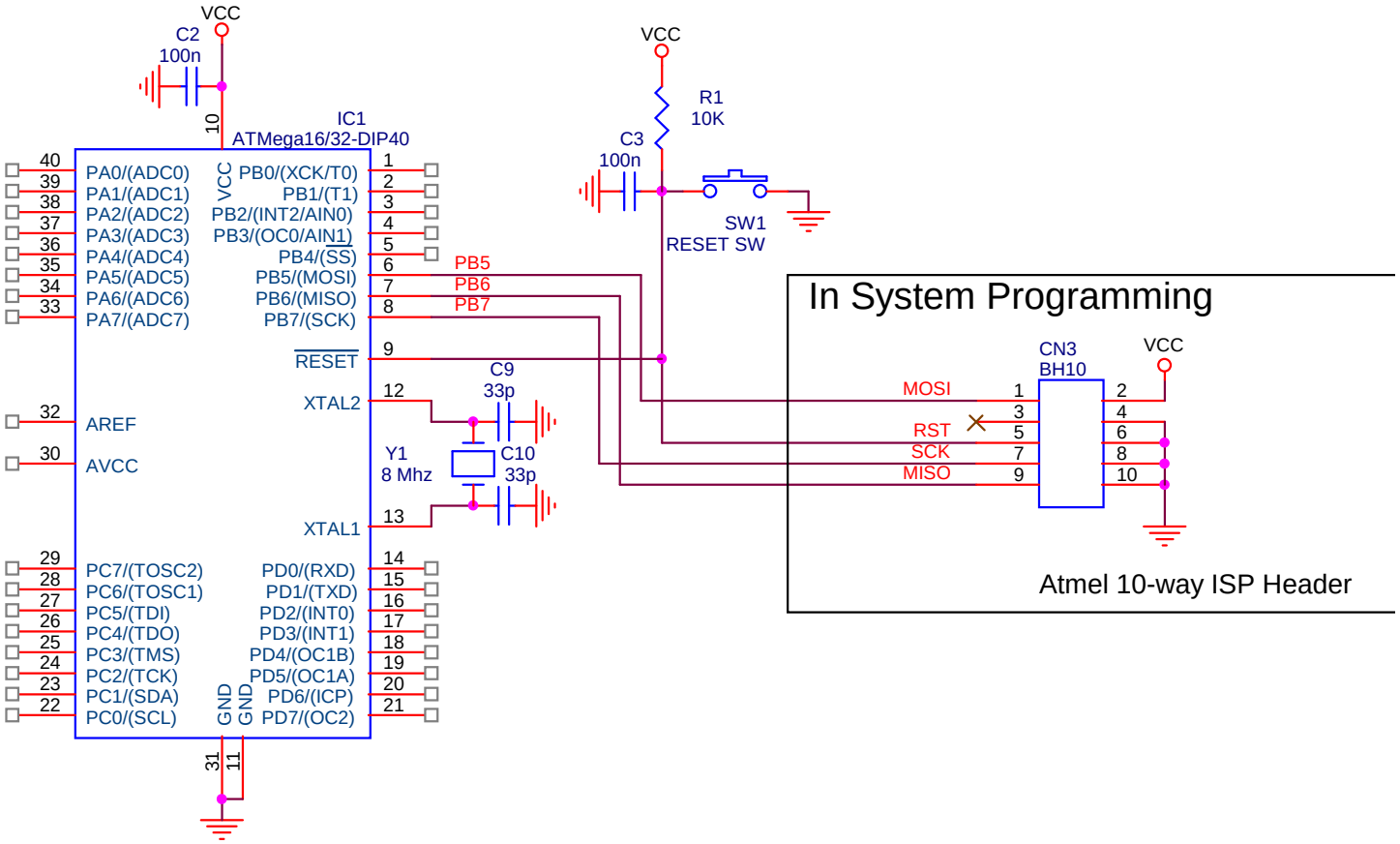
Connector on Programmer ------ FRC10 Cable(Pin#1 arrow) ------ Target board connector



Target Board

The programmer needs a target board with supported chip to load program into. Note the programmer cannot power your target board. The target board should be powered externally by 5V or 3V as per application. The programmer will get power from its VCC pin of target board 10 pin ICSP connector. Crystal can be of any value. Once programming is finished the reset pin is released and target chip is put to run mode.

Minimum required schematic for your target board is described below for 40 pin AVR chip ATMEGA16 or similar IC. Your target board can have a 10 pin connector for ICSP. Make sure that the MOSI, MISO, SCK pins are not connected in your target hardware to other units so that it would not affect the programming signals.



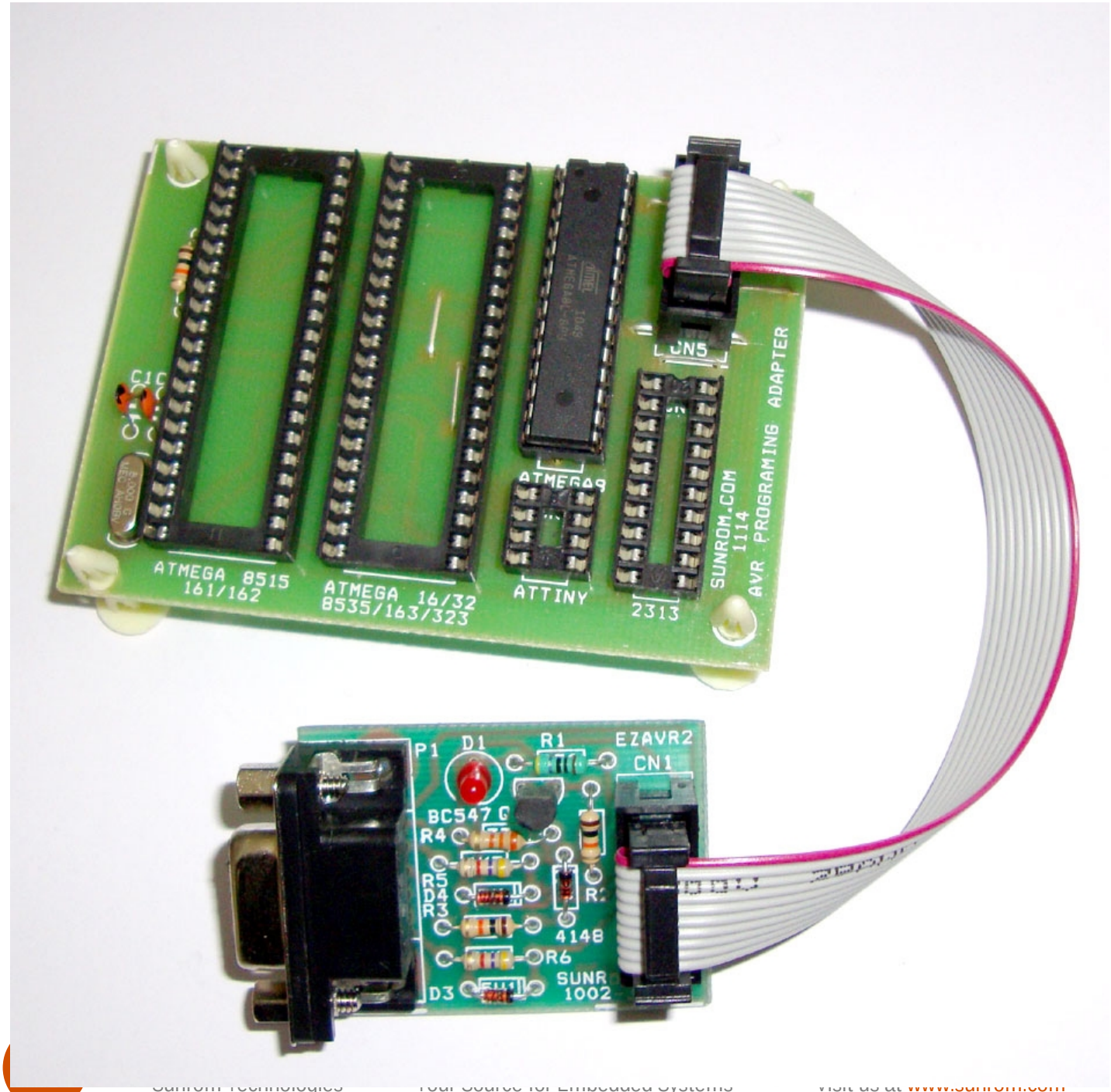
Using Programmer with AVR programming adapter

You can use this serial programmer with our AVR Programming Adapter board which can be purchased seperately.

It can be used instead of your target board for quick programming of many AVR ICs. It has IC sockets which supports many AVR ICs.

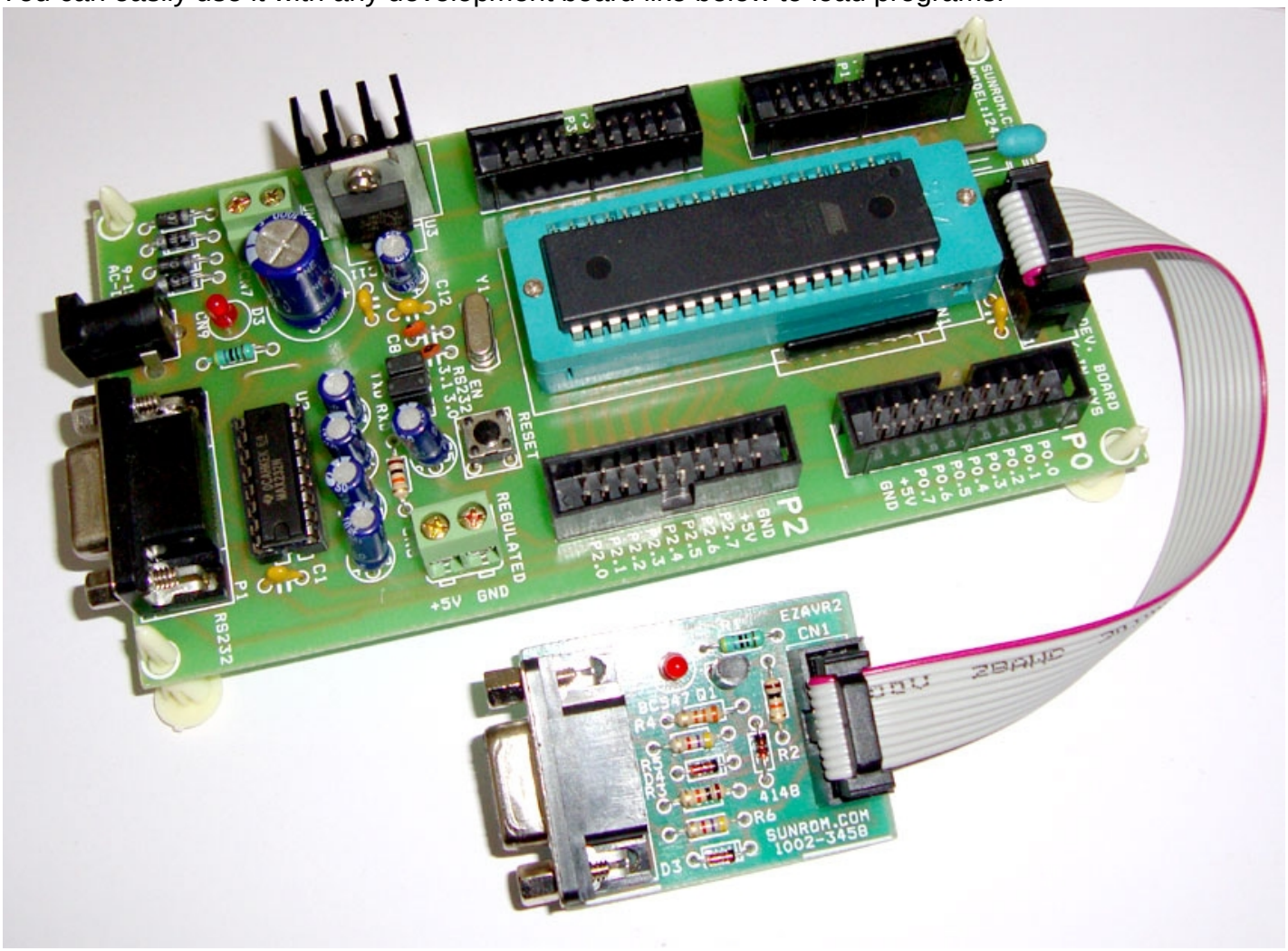
Note that: You need to give power to the hardware externally by soldering wires to its VCC and GND pins since programmer cannot provide power to adapter board.

AVR Programming Adapter
Schematic is given in its datasheet
http://www.sunrom.com/p-529.html



Using Programmer with AVR Development Board

You can easily use it with any development board like below to load programs.

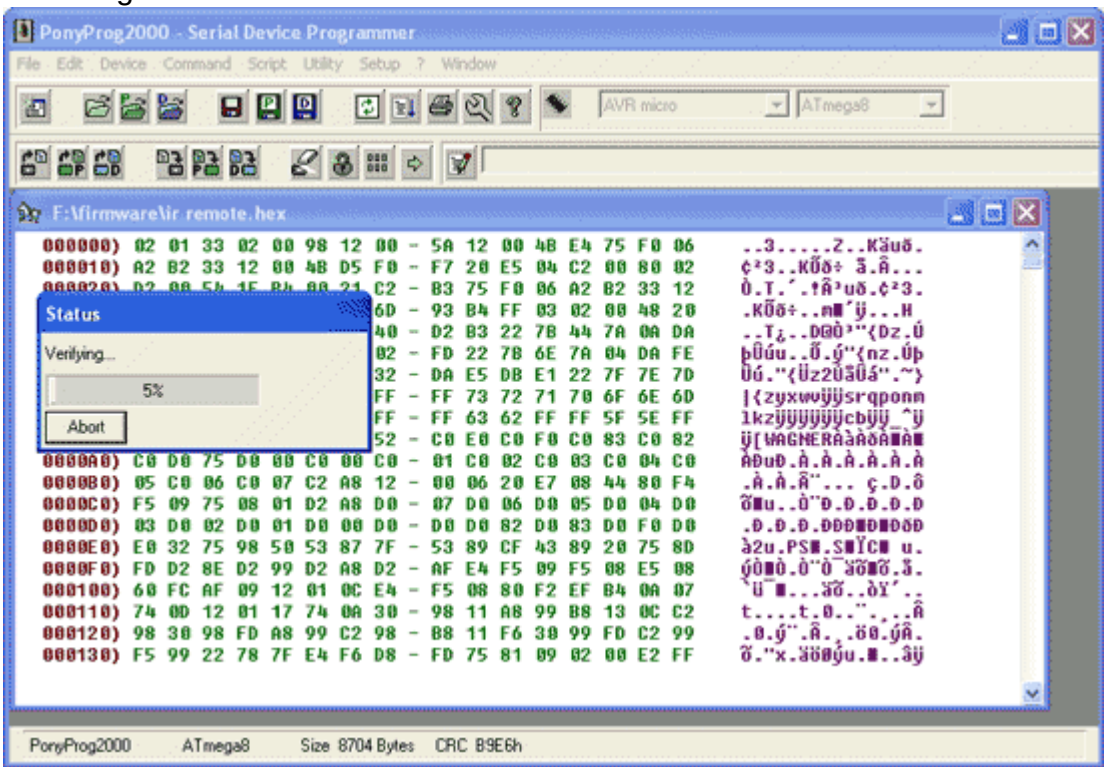


Programming Software

PonyProg is good feature rich software for programming AVR.

Future devices supported on update of PonyProg software from following link.
http://www.lancos.com/prog.html

Following is the screenshot of software



Next Pages we will see how to get started using it.

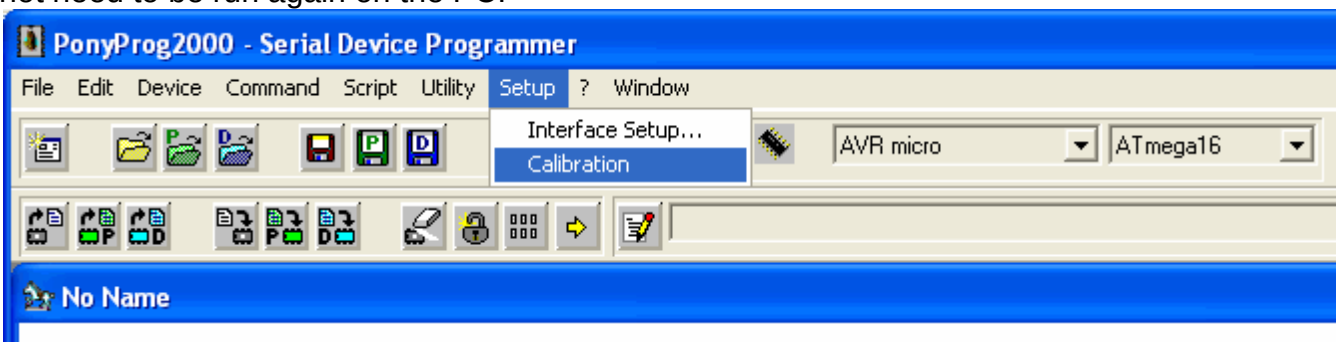
NOTE: This serial programmer needs REAL serial port at back of PC to work. It cannot be used with USB to RS232 adapter due to software limitations.

Setting up PonyProg

Start setup ponyprog.exe and follow on screen instructions to install Pony Prog.
After setup run from Start Menu > All Programs > PonyProg or from Desktop Shotcut

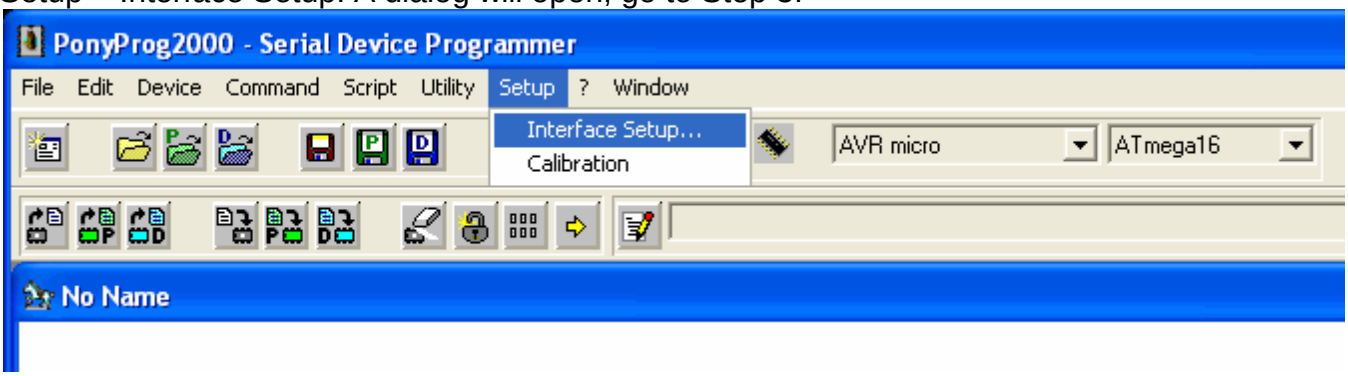
Step #1

Setup > Calibration: Make sure there is no heavy process running in background like CD Burning or Antivirus scanning. It is recommended that all applications be kept closed. This calibration process involves measuring the CPU timing for delay adjustment during programming and once setup, does not need to be run again on the PC.



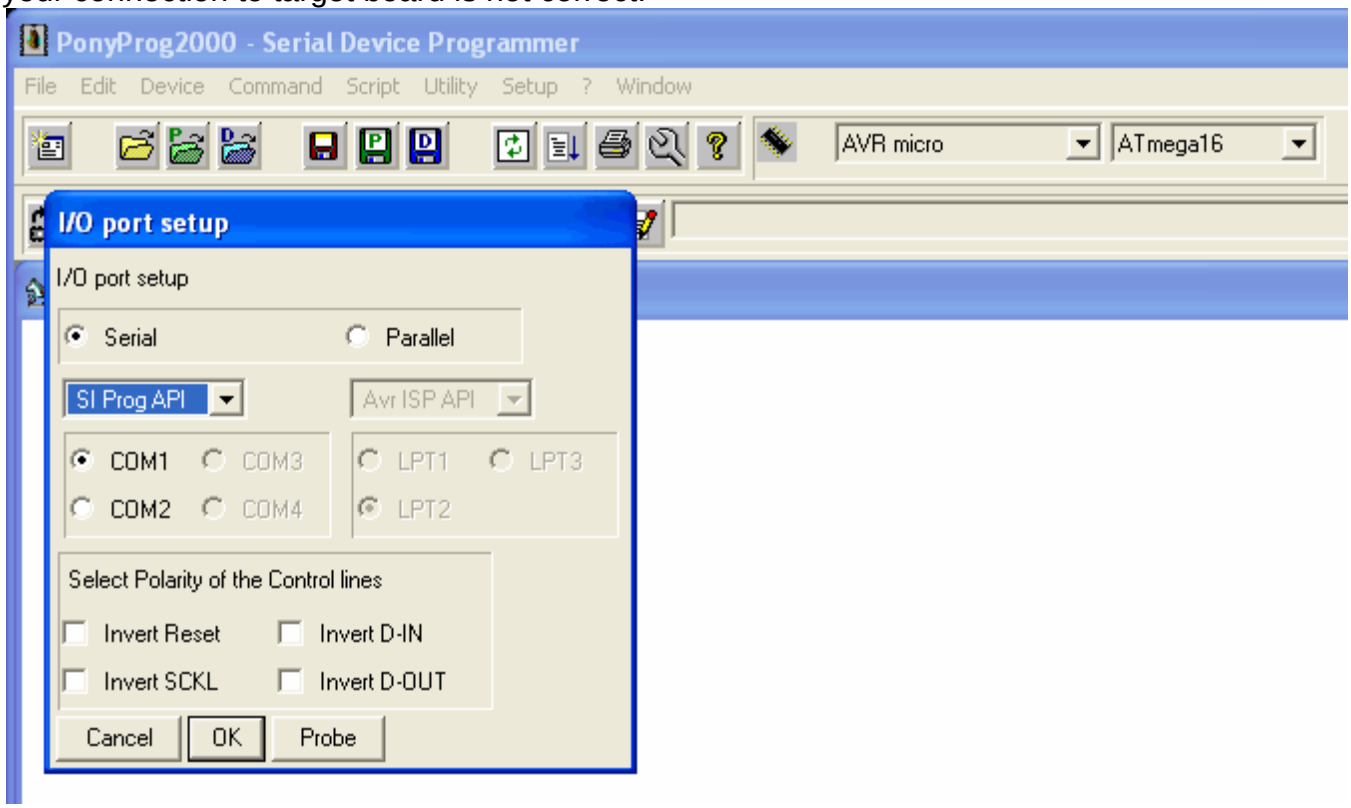
Step #2

Setup > Interface Setup: A dialog will open, go to Step 3.



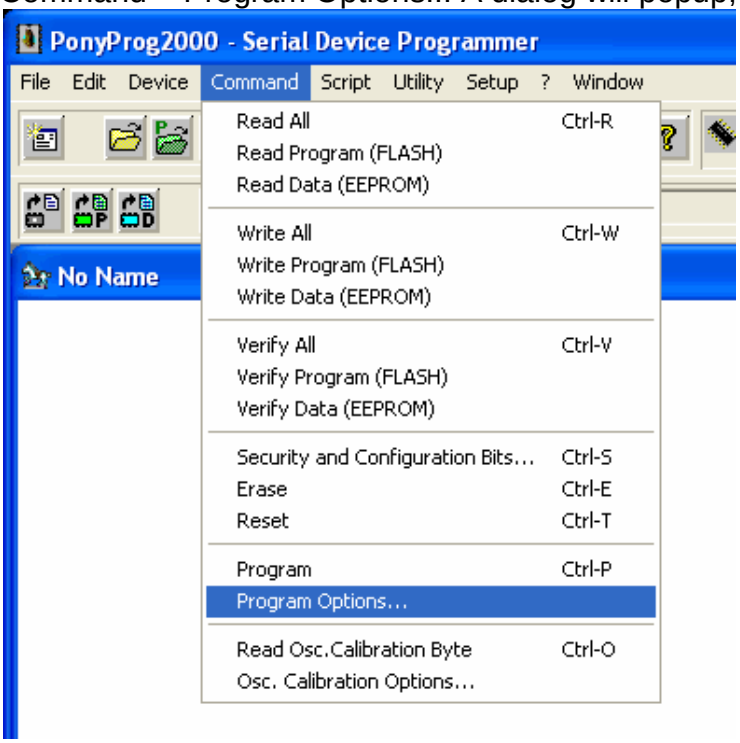
Step #3

Setup the interface, and select your COM Port. If your target board is powered on and connected to proper COM port, clicking on Probe will say “Test OK”. If you get “Test Failed” means an error and your connection to target board is not correct.



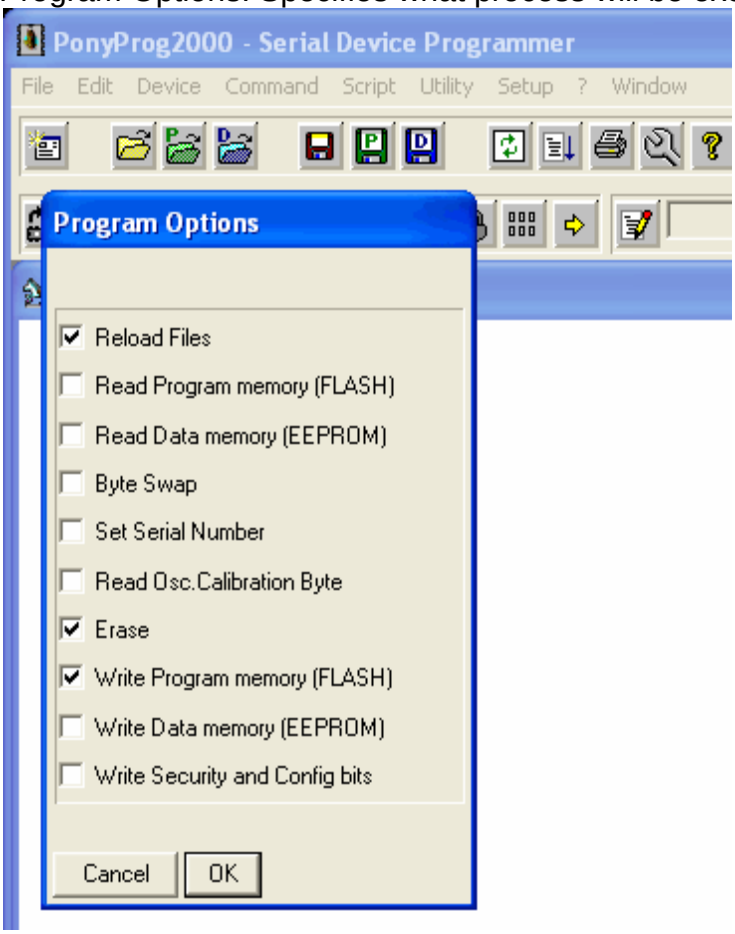
Step #4

Command > Program Options... A dialog will popup, go to next step.



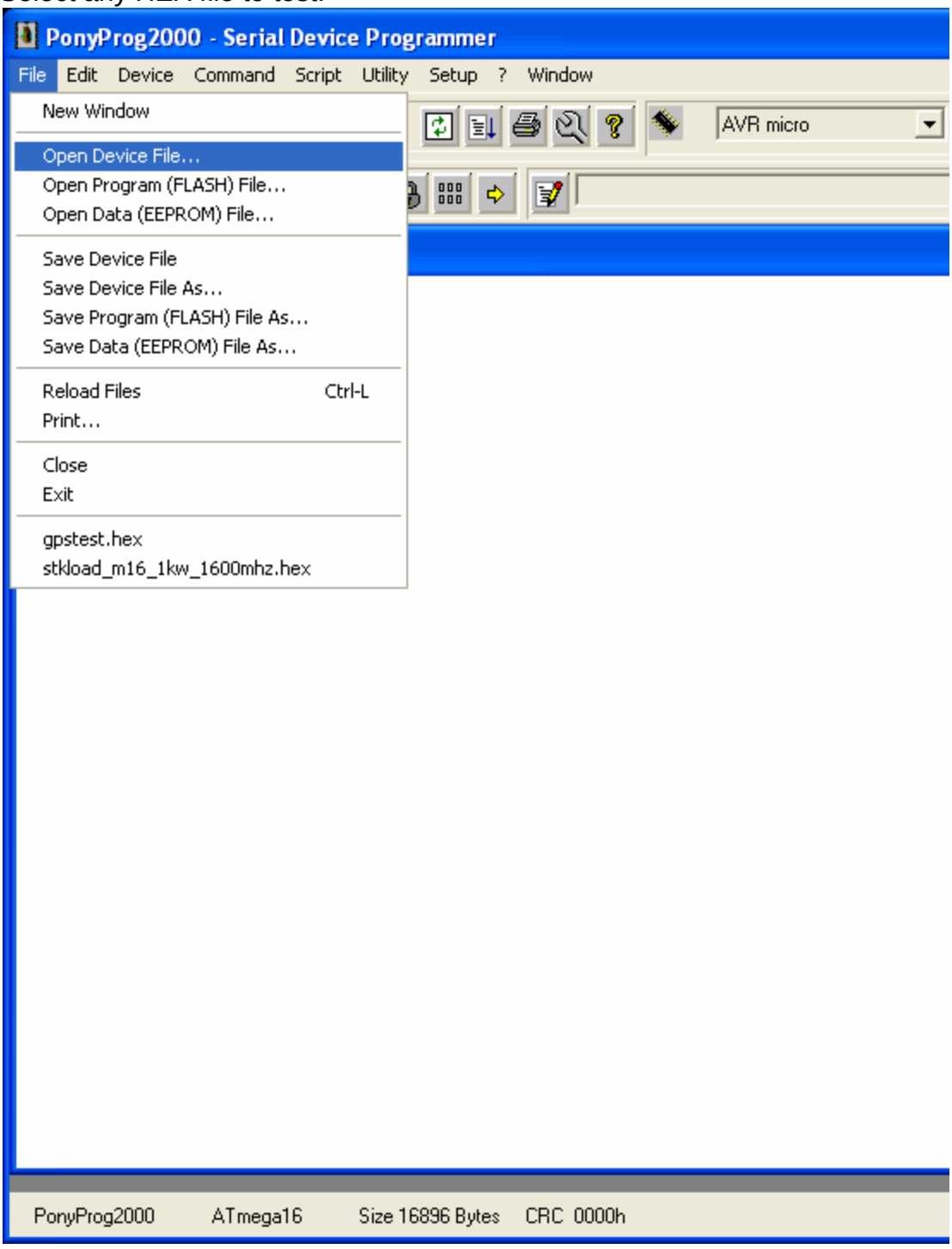
Step #5

Program Options: Specifies what process will be executed when program option is clicked.



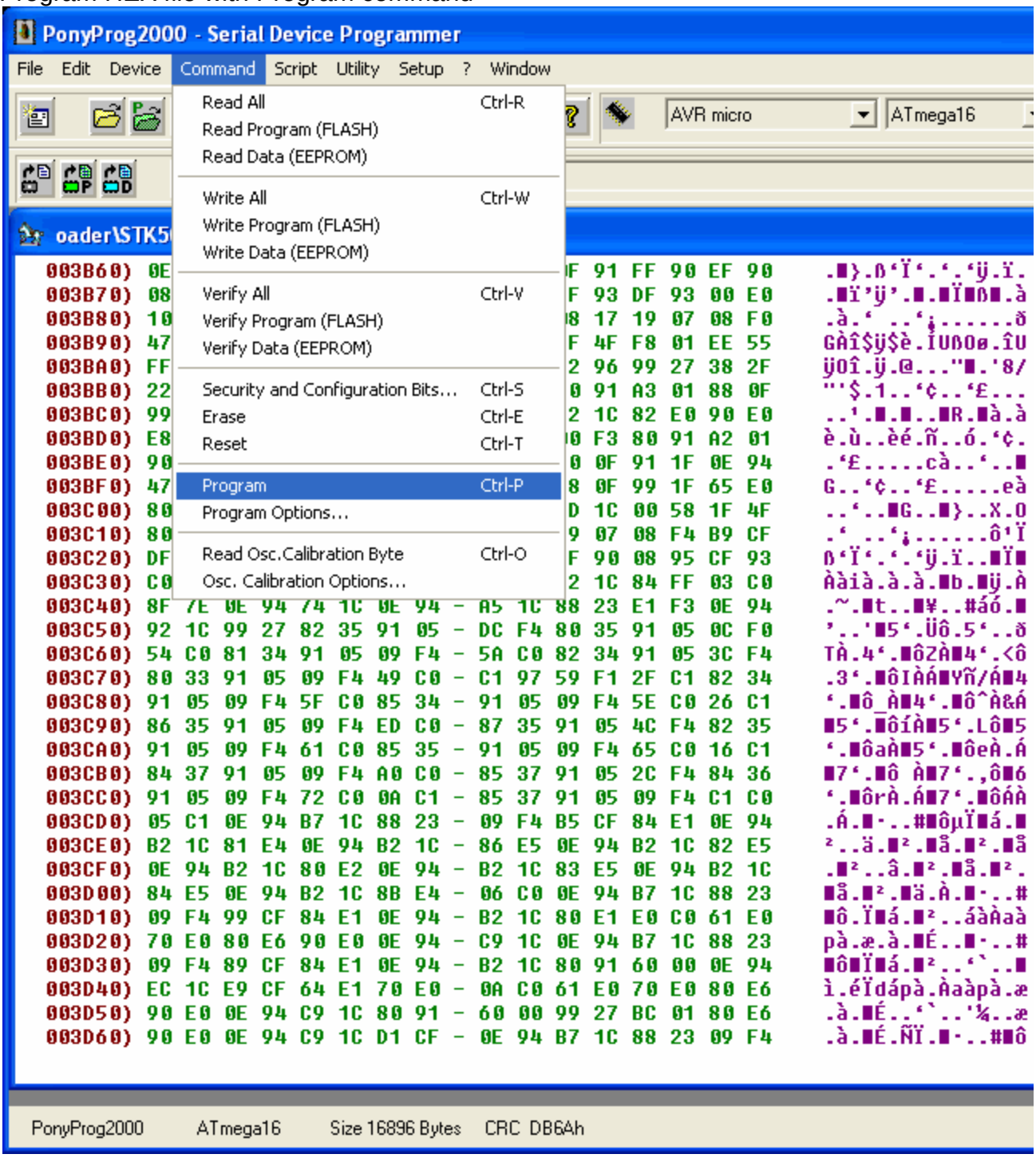
Step #6

Select a Device from drop down menu for Example we selected AVR Micro > ATMEGA16 below, Select any HEX file to test.



Step #7

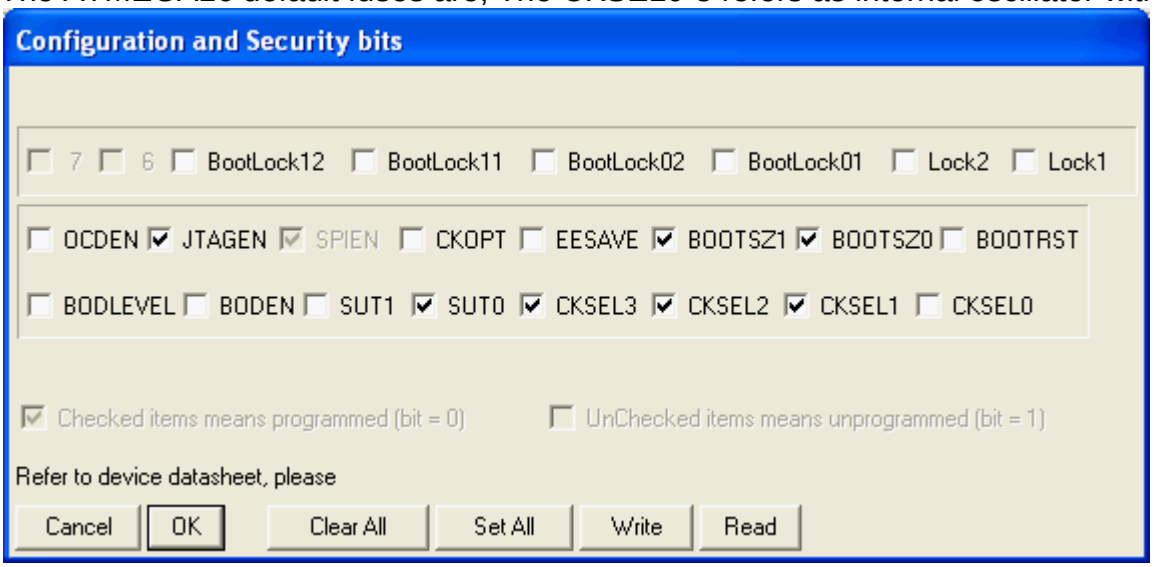
Program HEX file with Program command



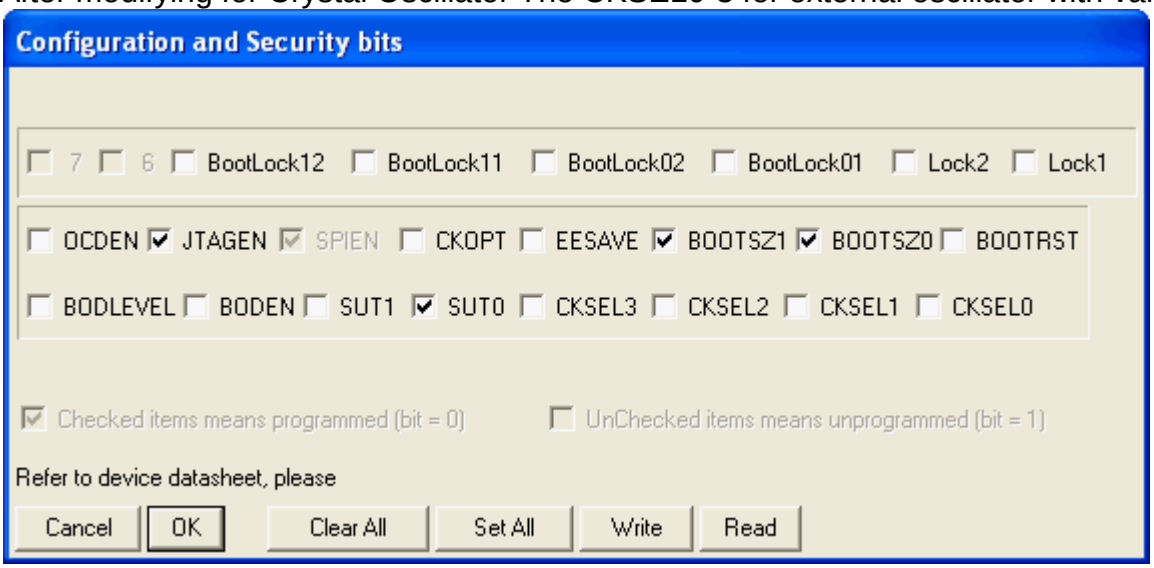
Security and Configuration

Normally all AVR chips have internal oscillator as default. To use a crystal oscillator, you are required to set the fuse bits from Command > Security and Configuration Bits. Lock bits are erased once you Erase the Chip while the Fuse bits of Oscillator and other configuration remains as set. Always refer to the datasheet before attempting any fuse settings.

The ATMEGA16 default fuses are, The CKSEL0-3 refers as internal oscillator with value 0001



After modifying for Crystal Oscillator The CKSEL0-3 for external oscillator with value 1111



Related Links

Atmel AVR Studio Latest Version http://www.atmel.com/dyn/products/tools_card.asp?tool_id=2725
WinAVR C Compiler http://winavr.sourceforge.net/