# AVRISP-U Quick Start Guide

## Installing Software

1. Run the executable file on the CD. This will install software and pre-install USB drivers using FTDI driver installer.

2. Plugin PC dongle to a USB port. The drivers should install automatically. If they do not, see Troubleshooting section

3. Connect the 10-way ISP lead (or use 6-way adapter supplied for 6-way ISP connectors) to your AVR target. Power target or see Important Power Target section

4. Run AVRISP-U software from desktop icon or its default location, C:\Program Files\Kanda

The main screen will appear as shown on next page. If you get this error, then the target hasn't been found. If you get Voltage not Detected, see Power Target



**IMPORTANT Power Target**

Target power is OFF by default.
If you do want AVRISP-U to supply 5V target voltage, enable Target Power in Setup (top right of screen).  Please see section on **SETUP** Screen for details of switching target power on. The AVRISP-U can operate with external power down to 1.8V but it has a current limit of 100 mA, which is enough for STK200/STK300. If  you get the "Your target device is not responding…" error with Target Power enabled, the current trip  has probably shout down power out.

This new Dongle (with Dongle2 label) must be used with V2.0.0 software or later (Help > About menu).

Once the target AVR is powered, either by the dongle or externally, click Reset button and the software will detect the target AVR and display the screen below.  You may get a message to confirm ISP speed setting.

**Click Reset button at top right of the screen to get programmer to reconnect.**

**Hardware** will say AVRISP-U.

**Device** will be set to last device selected or the device passed from AVR studio. Select a device from the drop-down list to select a new AVR target.

**Programmer** will say AVR unless the dongle is not plugged in or there is a USB driver problem.
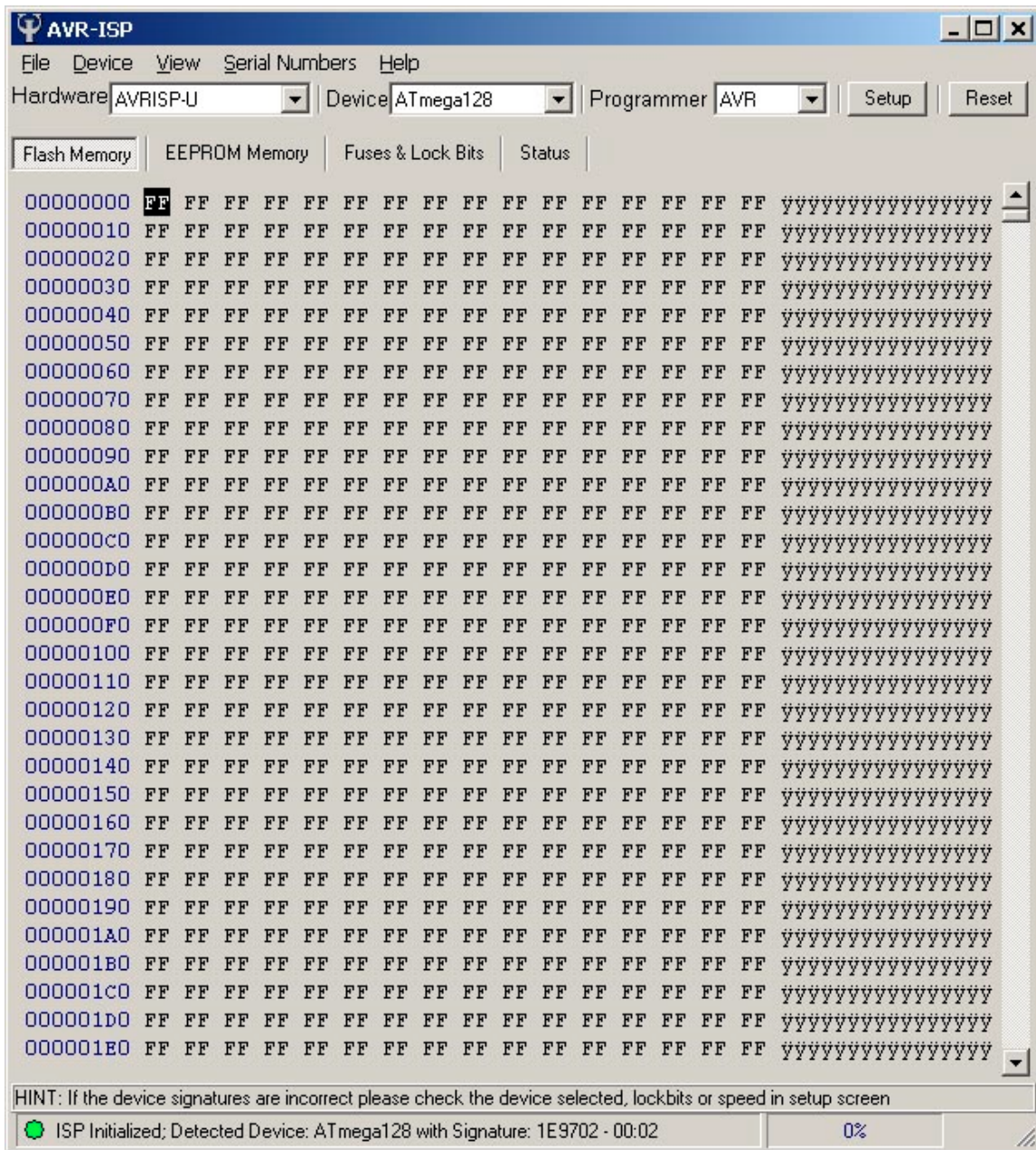
The bottom of this screen shows the status. A green light means that an AVR has been found, and the device type is also displayed.

This screen is the Flash or code memory buffer. You can load a file from File menu, or type Hex or ASCII characters directly in to the buffer. Right click on buffer for options. There are four tabs to display Flash buffer, EEPROM buffer, Fuse & Lockbits and Status of programmer. The tabs are described in other sections.

**Running from AVRStudio**

If you run this software from AVRStudio, it will automatically set the device and load flash and EEPROM buffers plus set Auto-Program Options.

To program target, just press F5 key or select Device Menu > Auto-Program

**File Menu**
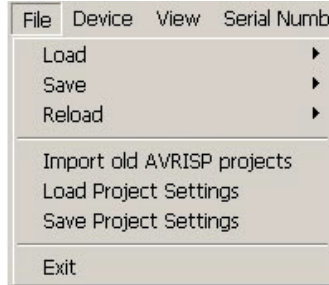


Click **Load > Flash** to load flash (code) buffer. If you have launched the program from AVRStudio, the buffer should already be loaded.

Click **Load > EEPROM** to load EEPROM (data) buffer. If you have launched the program from AVRStudio, the buffer should already be loaded, if an EEPROM file has been generated.

**Reload** will update the file in the flash and EEPROM buffers. This is also an option in Auto-program Settings.

**Project Settings** are used to save all the programmer settings for later use or to send to someone else. Device type, filenames, fuses, serial numbers and Auto-program settings are saved and can then be loaded again later.

**Device Menu**

This is the most important menu, where all the important operations are carried out.

**Erase** device will erase the AVR. *The AVR must be erased before it is programmed.* This operation can be included in Auto-program.

**Copy RC Calibration Byte** is used to save the contents of the AVR's calibration bytes (1-4 depending on device) to a user selected location in flash or EEPROM memory. These values will then be programmed in to the memory so that firmware can access them to load OSCCAL register with correct value to trim the Internal RC Oscillator. This function can be included in Auto-program options.
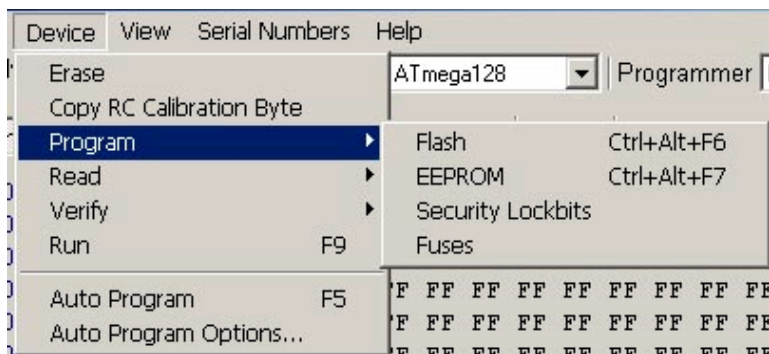
**Program** device has four options for each part of the AVR – Flash, EEPROM, Fuses and Lockbits. You will need 4 Program choices to program the whole device, otherwise use Auto-Program.

**Read** and **Verify** have the same choices as Program, Flash, EEPROM, Fuses and Lockbits. Verify operations can be added to Auto-Program. Verify reads the device and compares it with the buffer and any errors are shown in red. Successful Verify is shown in green. Read updates the buffer with the contents of the AVR and original buffer contents are lost.

**Run** releases the device from ISP so that the AVR can run code with ISP lead still connected. If Target Power is On, it will continue to power the target during Run mode.

**Auto Program** carries out a whole sequence of operations that are set in Auto Program Options. **Shortcut key is F5.**

**Auto Program Options**

The **Auto Program Options** dialog appears and you check operations you want to include in Auto Program sequence.

**Reload Files** updates the Flash buffer (and EEPROM buffer if used) from the file already loaded. This is useful after a read or a recompile has been done in AVRStudio.

**Program Fuses First** is used to change AVR setting before erasing the device. This is usually used to set the EESAVE fuse to preserve the EEPROM (if it isn't already set) or change clock fuses.

**Read EEPROM** will read AVR EEPROM into EEPROM buffer. This is another way of preserving EEPROM on devices without EESAVE fuse.

**Erase Device** and **Copy RC Calibration Byte** have been discussed above. **Program and Verify flash and EEPROM** memories do just that. Check **Program Fuses, Program Lockbits** and **Run** if you want them as part of the device program operation.

**Increment Serial Number** will add 1 to current serial number and program it as part of flash or EEPROM as set in Serial Numbers dialog – see below.
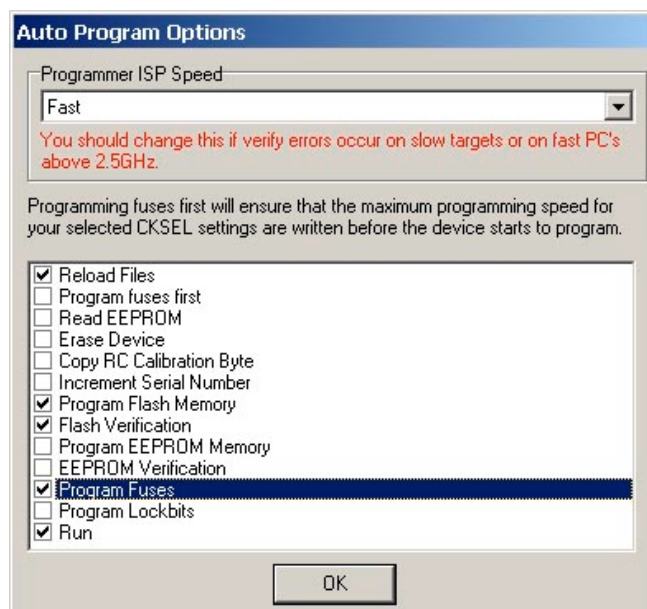
**Setup Dialog**

Click Setup Button at top right of screen to launch Setup dialog box.
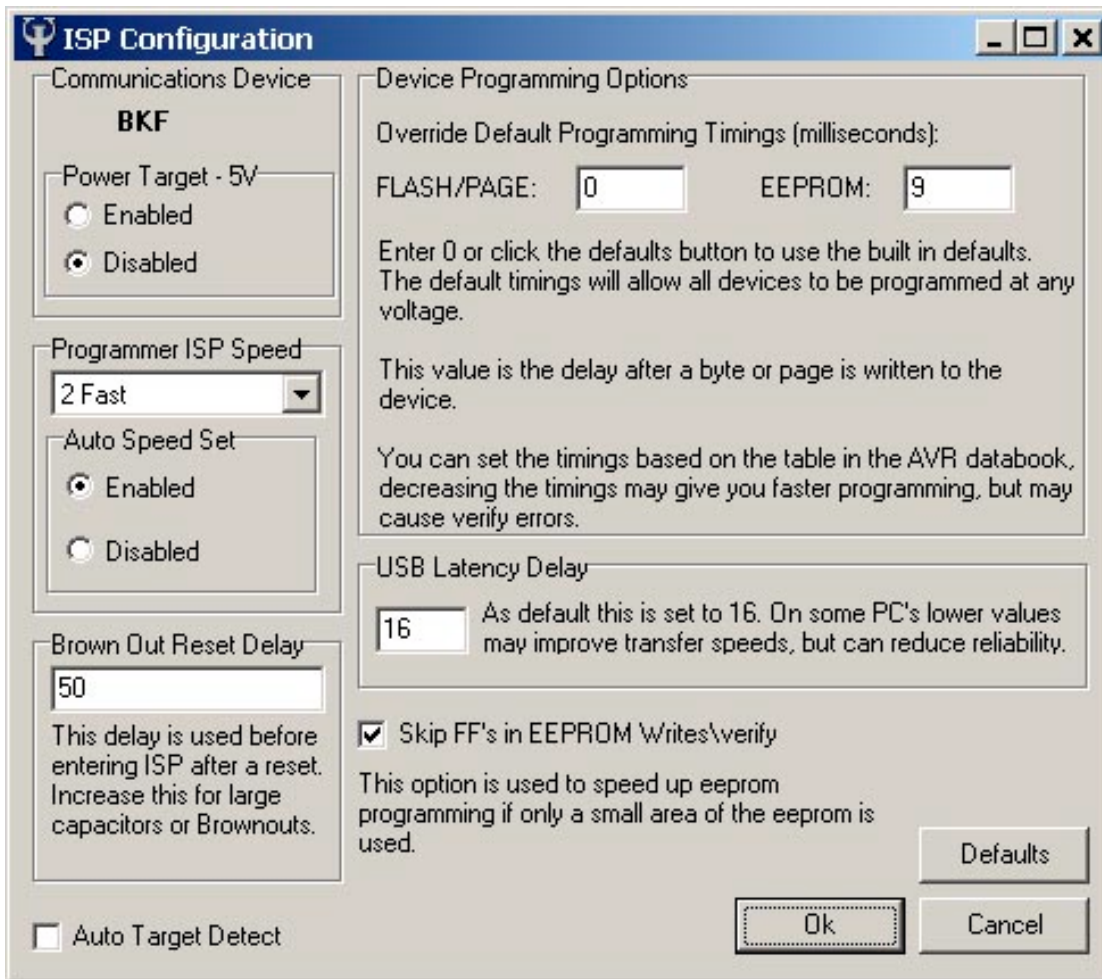


The important settings on this screen are on the left, Power Target, Programmer ISP Speed and Auto Speed Set.

**Power Target** will output 5V to the target if it is Enabled. It is Disabled by default. Maximum current that can be supplied is 120 mA, enough for STK200 or STK300 boards. Do NOT use this option if your target is running at lower voltages unless it is protected (with diodes or resistors) from 5V.

**Auto Speed Set.** If enabled (default is ON), the software will automatically determine the fastest ISP speed possible. This can be reduced from fastest setting by low frequency crystals, lower voltage or CLKSEL fuse settings. You can disable Auto Speed and set **Programmer ISP Speed** manually.

**Brownout Reset Delay** can be increased if programmer will not enter ISP mode (Target Device Not Responding), which can happen with large capacitors or brownout circuits on Reset pin.

**Auto Target Detect** will automatically start Auto Program sequence when the ISP lead is plugged into a new target.

**Default Program Timings** can be over-ridden to speed up programming times. If you get verify errors, put them back to original value or enter 0 to reload default timings.

**USB Latency Delay** is set to 16, which will work on all PC USB ports. Reducing this value (minimum is usually 5) can speed up programming on some PCs. Again, if you get verify errors, restore it to 16.

**Skip FF on EEPROM read and writes** means that only EEPROM locations with data (not FF) are programmed and verified. This can greatly increase EEPROM programming speed with small files.

**View Menu**
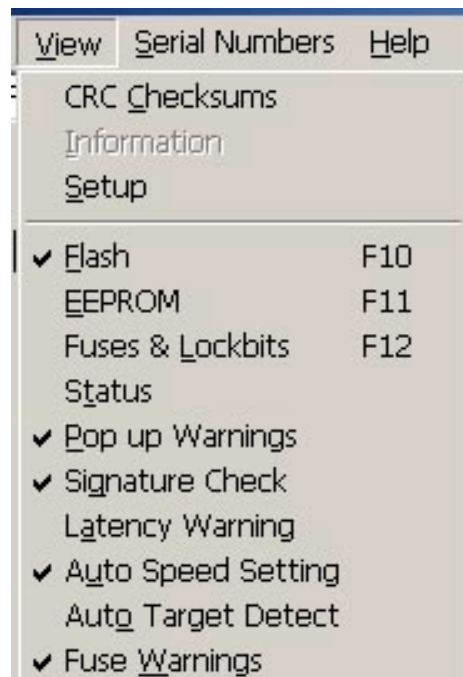


**CRC Checksums** launches a dialog box where calculations of the checksum of the Flash and EPROM buffers can be chosen and displayed.

**Setup** launches the Setup dialog, described before under Setup Button.

**Flash, EEPROM, Fuses & Lockbits** and **Status** select the different tabs. Clicking on the tab does the same thing.

For the rest of this menu, a tick indicates that a feature is ON. Click on it to change its state.

Switching **Pop up Warnings** off  will stop warning dialogs from being displayed.
**Auto Speed Setting** and **Auto Target Detect** are covered in Setup section

**Signature Check** on will bring up a warning dialog if target device signature does not match the device selected in Device drop-down.

**Latency Warning** warns about problems with USB latency.

**Serial Numbers**

Select this menu to bring up Serial Number dialog box.
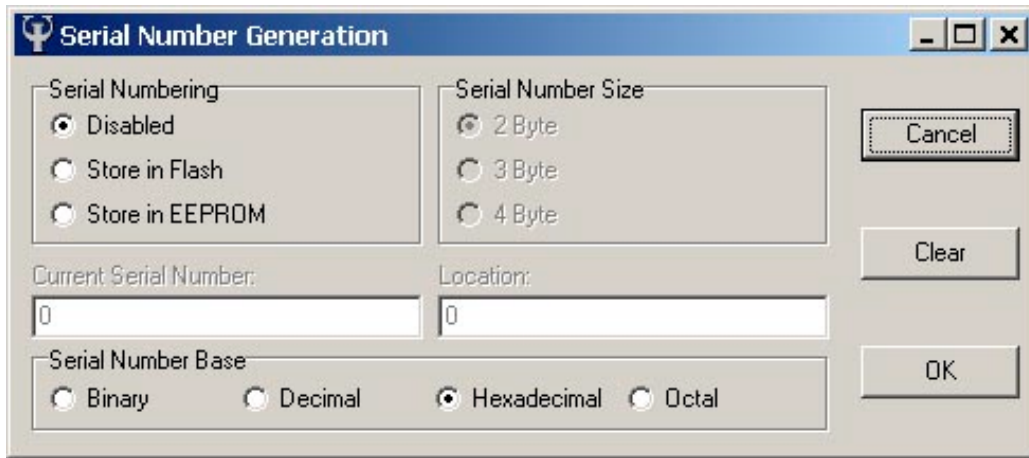


Serial Numbers are disabled by default. Set serial numbering to be stored in Flash or EEPROM memory. Once this is set, the number base and size (2, 3 or 4 bytes) can be selected. The start serial number  can be selected and so can the address in Flash or EEPROM where it will be stored.

Once serial numbering is enabled, **set Increment Serial Number in Auto Program Options** (Device menu) to write the next serial number to chosen location every time a device is Auto Programmed.

**Fuses and Lockbits**

This is the third tab. Either click on tab heading or  select it from **View menu >  Fuses & Lockbits.**  This tab displays all the fuses available on the selected AVR. Please note that some fuses and the lockbits are accessed by secondary tabs on the right of the screen.
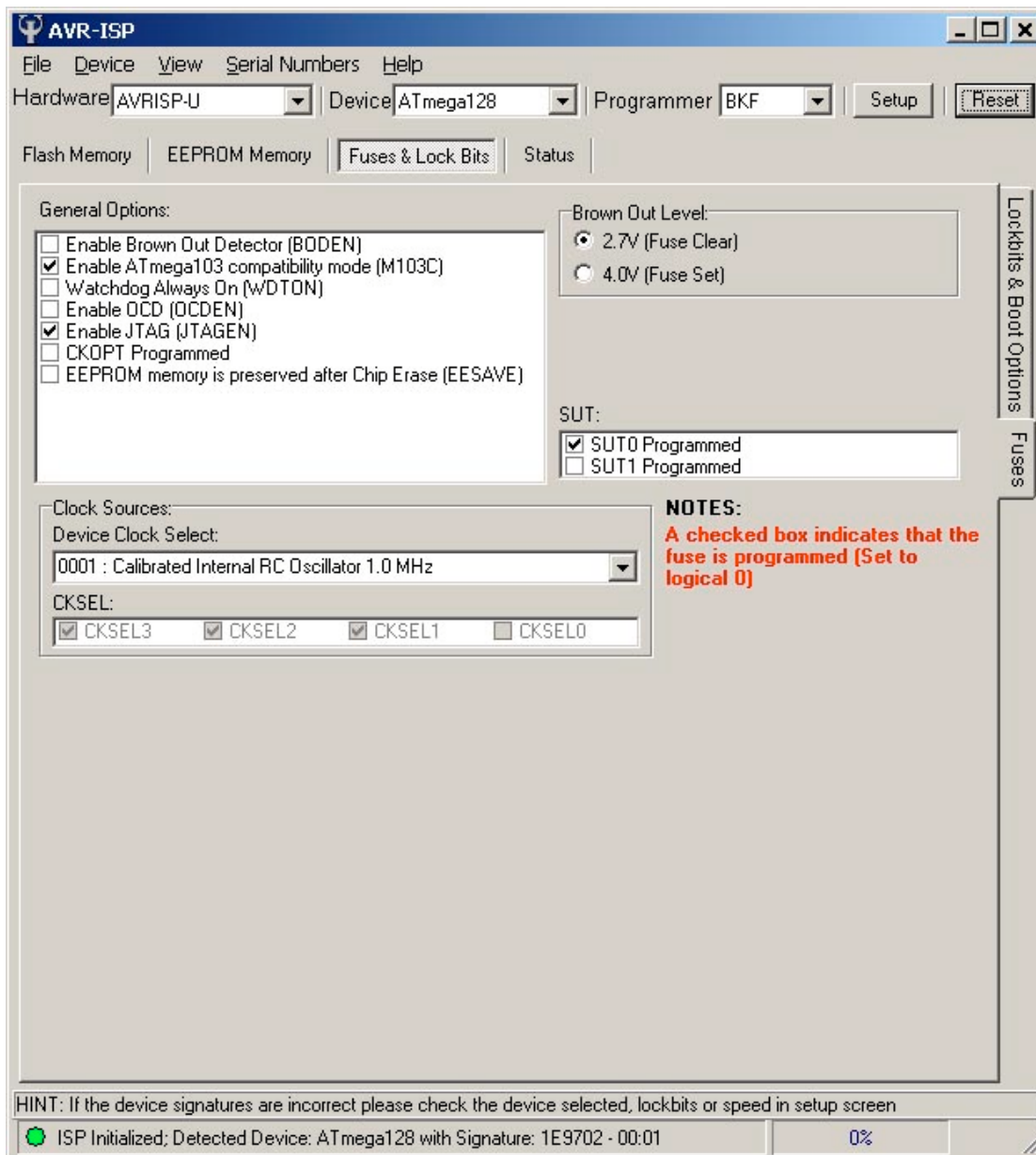
The Fuses and Lockbits are described in the AVR Datasheets in the Memory Programming section.

The important ones are **Clock Select (CLKSEL) fuses**. The default on all AVRs is Internal RC (0001), so change this to another value to use the crystal or resonator on your target. STK boards should have CLKSEL set to Crystal Oscillator, 3-8MHz, 1110 or 1111 on CLKSEL.

SUT fuses set start-up delay, and general options include things like Watchdog, Brownout, EESAVE to preserve EEPROM, JTAGEN for debug operations (DWEN for DebugWire enable on smaller AVRs) and Clock out (CLKOPT) or clock divide by 8 on some devices (CLKDIV8). **All these fuse and lockbits are fully described in the AVR Datasheets in Memory Programming section.**

**Lockbits**

Click the tab at the right of the screen to see Lockbits tab.
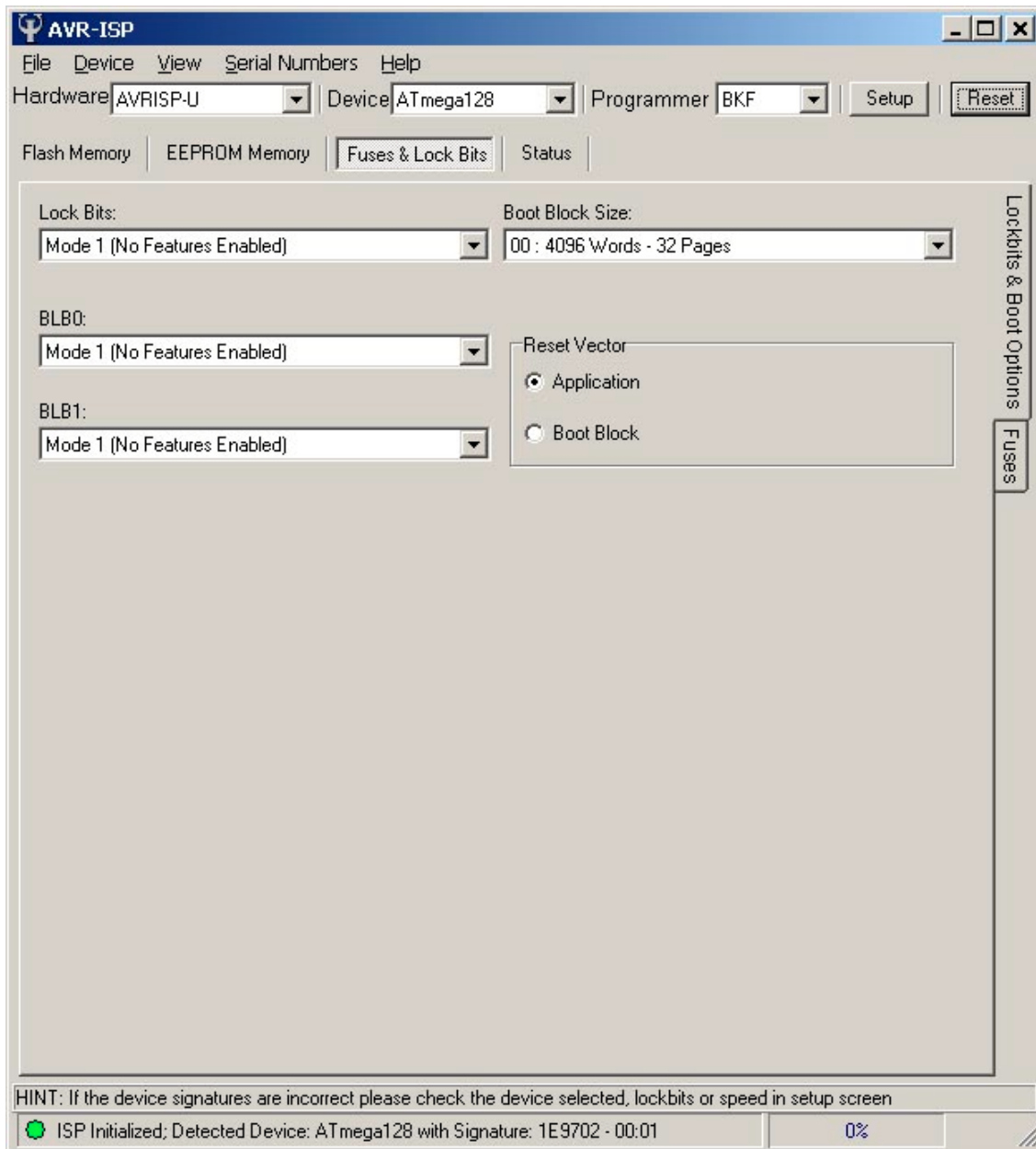


As well as the lockbits for the whole device and Bootblock sections (BLB1:0), this screen contains fuses to set Bootblock size and also the fuse to set whether the device resets to Application (0000) or the start of the Bootblock.

# FURTHER INFORMATION

Please contact support@kanda.com for technical support or go to our website support pages for latest software.

See **www.kanda.com/support**

## Contact details

**Website**: www.kanda.com

**email:** sales@kanda.com

## Phone/Fax: +44 (0)1974 261 273



*Atmel, AVR and associated logos are registered trade marks of Atmel Corp. San Jose, CA, USA*