

Updated 29 March 1999.

This file contains the latest information about the AVR Development Tools.

Currently, the following tools are covered by this document:

- AVR Assembler (current version 1.30) (Available from www.atmel.com)
- AVR Studio (current version 1.51) (Available from www.atmel.com)
- AVR Prog (current version 1.25) (Available from www.atmel.com)
- ICEPRO (current version 1.31) (Available from www.atmel.com)
(NOTE: If you don't have tracebuffer support
in your current version, you need to get an upgrade
from your local sales office.)
- megaICE (current version 1.11) (Available from www.atmel.com)
- IAR Assembler (current version 1.30) (Available from www.atmel.com)

For information about the STK200 and STK300 starter kits, see AVR_ISP_REL.TXT.

NEWS:

AVR STUDIO v1.51 RELEASED

AVR STUDIO v1.51 is now released. AVR STUDIO version 1.50 and 1.51 include the following new features:

- Enhanced detection of synchronization problems with ICEPRO (1.51).
- ICEPRO Diagnostic software included, and can be launched from AVR STUDIO (1.51).
- Multistep. Specify number of single step instructions to go in debug options menu.
- Autostep. Automatically single step through code with a specified delay.
- Memory view little/big endian mode switch.
- X,Y,Z pointer in processor view.
- Register view names. The user can add and remove comments for any register.
- Cycle counter display time elapsed

AVR STUDIO includes the new AVR Emulator Configuration System. This program automatically upgrades the ICEPRO to latest version (1.31).

When no files are open in AVR STUDIO, select 'Tools->AVR Emulator Configuration System'. Select the desired devices and click "download" to configure the emulator.

AVR STUDIO V1.51 includes the new ICEPRO selftest software. This program will guide the user through the required settings of the POD needed to perform the test, and then perform the test of the devices available in the ICEPRO. When no files are open in Studio, select 'Tools->Selftest'.

SUPPORT FOR NEW DEVICES

The combination of AVR STUDIO version 1.50 or newer and ICEPRO version 1.30 or newer offers emulator support for 7 new devices, including the first tinyAVR devices.

AVR ASSEMBLER VERSION 1.30.

1. WINDOWS 95(R) CAUSING ASSEMBLER CRASH:

On some installations of Windows 95(r), the assembler generates a General Protection Fault when opening.

PROBLEM FIX/WORKAROUND:

Delete the 'wavrasm.ini' file before opening the assembler. Then select the option 'close all windows on exit'. Note 1: This is only necessary on installations that fail.

2. RJMP WITH OFFSET 0x800:

When 'Wrap Relative Jumps' is enabled, and the jump is exactly 2K Words, the assembler fails with an error message 'Relative jump out of reach'.

PROBLEM FIX/WORKAROUND:

Insert one extra nop in front of the label where the rjmp is jumping to.

AVR STUDIO VERSION 1.51:

1. FEATURES NOT SUPPORTED IN THE SIMULATOR:

- Analog comparator.
- ADC.
- Watchdog timer.
- Sleep modes.
- Asynchronous timer.

2. PROBLEMS CLOSING AVR STUDIO.

AVR STUDIO will on some installations generate a General Protection Fault when the source window is closed while a program is running in an emulator.

PROBLEM FIX/WORKAROUND:

Make sure that the program is stopped before the source window is closed.

3. EXTERNAL LEVEL INTERRUPTS.

In simulator the External Interrupt Flags may be set even if level interrupts are enabled. This is different from the actual parts.

PROBLEM FIX/WORKAROUND:

The flags gets automatically cleared when the interrupt condition disappears, so this will not cause any problems during simulation.

4. UART SIMULATION.

When typing a value into the UDR during simulation of a UART Receive interrupt, the value changes to 0x00 in the next clock cycle. The reason is that the UDR register is actually two physically separate registers sharing the same I/O address. When writing to the register, the UART Transmit Data register is written. When reading from UDR, the UART Receive Data register is read.

PROBLEM FIX/WORKAROUND:

Start the interrupt execution by clicking receive complete. Then, in the interrupt service routine, change the value in the register location into where the UDR has been read.

5. XRAM SIMULATION

The Simulator can set up devices which supports external memory to simulate that 64KBytes is available, but this is regarded as internal memory with respect to timing and the use of the Ports.

PROBLEM FIX/WORKAROUND:

No workaround.

AVR PROG VERSION 1.25:

1. SYNCHRONIZATION LOSS:

Sometimes, when using the development board for debugging purposes, the board and AVR Prog will lose synchronization.

PROBLEM FIX/WORKAROUND:

- Close AVR PROG, then reset the development board, then restart AVR PROG.
- Use the MS-DOS software.

2. HELP ABOUT STILL SAYS VERSION 1.21 EVEN IF VERSION 1.25 IS INSTALLED:

If avrprog.exe version 1.25 is copied over a previous version of the same program, it will still say that it is the old version.

PROBLEM FIX/WORKAROUND:

Completely remove old version using the uninstall tools, then install AVRPROG version 1.25.

3. NO TICK-BOX FOR FASTSTART OF AT90S2323.

When AT90S2323 is selected, there is no tick-box for faststart. Instead, there is a tick box called RC-ENABLE.

PROBLEM FIX/WORKAROUND:

Ignore the RC-Enable tick box.

4. AT90S2343 MISSING IN THE DEVICE MENU.

AT90S2343 can not be selected from the device menu.

PROBLEM FIX/WORKAROUND:

Select AT90S2323 instead. For AVR PROG, there is no difference between these parts.

ICEPRO VERSION 1.31

If you have already installed a version with trace support, version 1.31 can be installed from AVR STUDIO.

**NOTE: THIS WILL ONLY WORK FOR
EMULATORS WITH SUPPORT FOR
TRACE-BUFFER!**

ICEPRO owners without trace-buffer support can order a free update kit from the nearest sales office.

Installing version 1.31 will correct the following problems from earlier versions:

- ICEPRO OUTPUT LEVELS.
- SRAM MEMORY VIEW AND EDIT OF AT90S2313.
- GLOBAL INTERRUPT FLAG GETS CLEARED.
- FAILURE RUNNING THE SPI.
- READ EXTERNAL MEMORY FROM AVR STUDIO.
- UART OF AT90S8515.
- SPI OF AT90S8515.

Installing version 1.31 and three additional straps described in the upgrade document will correct the following problems:

- EEPROM INTERRUPT OF AT90S8535 NEVER OCCURS.
- ADC INTERRUPT OF AT90S8535 NEVER OCCURS.
- ANALOG COMPARATOR INTERRUPT OF AT90S8535 NEVER OCCURS.
- SPURIOUS INTERRUPTS WHEN EMULATING AT90S8535 OR AT90S4434.

Emulation of tiny devices differs from actual device in 3 ways:

1. No HW stack. A stack can be set up in SRAM like this:
 ldi r16,0x65
 out 0x3D,r16
2. IR special function pin of tiny19 and tiny28 can source 16 mA in ICEPRO (24 mA in device).
3. Instructions valid in AT90S8515, but not in tiny devices will work in this emulator.

The following problems still exist:

1. EEPROM WRAP OF AT90S4414:

The 4414 EEPROM wraps around at 512 bytes, not at 256 as in the actual device.

PROBLEM FIX/WORKAROUND:
Avoid writing the EEARH-register.

2. RESET TIED TO VCC:

On emulators with old pods, the emulator is not able to reset when the /RESET line is tied directly to VCC.

PROBLEM FIX/WORKAROUND:

- Upgrade to the AT90ADCPD.
- Connect ICEPRO /RESET to application /RESET through a schottky diode.
- Use a pull-up resistor between /RESET and VCC

3. TRISTATING OF I/O-LINES:

When I/O lines are tristated, there still remains a weak pullup of approximately 1 MΩ to VCC.

PROBLEM FIX/WORKAROUND:

In a 5V system the pull-up resistors can be removed. For further information, contact avr@atmel.com.

4. APPLICATION RESET DURING ICE RESET:

When the application reset is active (low) during ICEPRO reset, the ICEPRO will not reset properly.

PROBLEM FIX/WORKAROUND:

- Ensure that the application reset is inactive (high) during ICEPRO reset.

5. WATCHDOG RESET PERIOD:

The watchdog time-out can vary from the value defined in WDTCR. The watchdog will reset the part early or late, in steps of ± 16 ms from the selected time-out.

PROBLEM FIX/WORKAROUND:

When selecting time-out period, add margin for the variations in watchdog time-out.

6. WATCHDOG RESET FROM SLEEP SWITCH CORE:

When repeatedly waking the AT90S8515 from idle sleep mode using the watchdog time-out, the emulator sometimes changes to AT90S1200 core.

PROBLEM FIX/WORKAROUND:

- When the core has been changed, change configuration in Emulator options to restore the AT90S8515 core.
- To avoid core change, avoid watchdog time-out resets when in sleep mode.

7. FAIL TO TRACE INTO AND RUN TO CURSOR.

Changing the frequency in the emulator can cause 'Trace Into' and 'Run to cursor' to fail.

PROBLEM FIX/WORKAROUND:

Close the project and reopen for the frequency change to take effect, and the breakpoints to behave correctly.

8. THE SPI FAILS IN SLAVE MODE.

In some ICEPROs the SPI gets out of synchronization due to noise on the /SS pin.

PROBLEM FIX/WORKAROUND:

No known workaround.

9. PROBLEMS WITH RUNNING FROM EXTERNAL XTAL

Due to long wires, it can be a problem to run the ICEPRO from an external XTAL.

PROBLEM FIX/WORKAROUND:

-On emulators with AT90ADCPOD, use the crystal socket on the pod. If necessary, upgrade to this pod.

-In many applications, it is possible to run on the internal clock. If the AVR clock is needed in the target application, this signal can be found on the logic analyzer connector. The internal clock is selectable between 400khz and 20Mhz

10. ALE NOISE ON EXTERNAL MEMORY INTERFACE

Due to ALE noise on the External memory interface, random addresses in external RAM can be altered.

PROBLEM FIX/WORKAROUND:

-Decouple the ALE line with a capacitor. Frequencies above 50 MHz should be filtered. Try using 680pF as a start value.

11. ERROR RESETTNG EMULATOR:

In the emulator, the external reset line needs to be low 250 clock cycles before the reset is executed. In the actual device two clock cycles are sufficient.

PROBLEM FIX/WORKAROUND:

No known workaround.

12. RESETTNG THE WATCHDOG TIMER MAY NOT WORK AT HIGH FREQUENCIES

WDR is only held for one Fclk cycle, which will be too short for the 1MHz watchdog circuitry if the emulator is running at high speed.

PROBLEM FIX/WORKAROUND:

Issue two or more consecutive WDR commands (one WDR per MHz to be safe).

13. READING ADC DATA REGISTER IMMEDIATELY AFTER THE ADSC BIT IS CLEARED

Reading ADC Data Register immediately after the ADSC bit in ADCSR is cleared will give the result of the latest conversion in the ICEPRO. In the actual device, the result of the previous conversion is read.

PROBLEM FIX/WORKAROUND:

-No Known Workaround.

-The situation can be avoided by polling on the ADIF flag before reading the result of the conversion.

MEGAICE VERSION 1.11

Installing version 1.11 will correct the following problems:

- RESETTING THE WATCHDOG TIMER MAY NOT WORK AT HIGH FREQUENCIES
- THE OUTPUT LEVELS FROM THE MEGAICE ARE TTL LEVELS

The following problems still exist:

1. RESET TIED TO VCC:

The emulator is not able to reset, when the /RESET line is tied directly to VCC.

PROBLEM FIX/WORKAROUND:

Connect ICEPRO /RESET to application /RESET through schottky diode.

2. TRISTATING OF I/O-LINES:

When I/O lines are tristated, there still remains a weak pull-up of approximately 1 M Ω to VCC.

PROBLEM FIX/WORKAROUND:

In a 5V system the pull-up resistors can be removed. For further information, contact avr@atmel.com.

3. APPLICATION RESET DURING ICE RESET:

When the application reset is active (low) during emulator reset, the emulator will not reset properly.

PROBLEM FIX/WORKAROUND:

Ensure that the application reset is inactive (high) during ICEPRO reset.

5. WATCHDOG RESET PERIOD:

The watchdog time-out can vary from the value defined in WDTCR. The watchdog will reset the part early or late, in steps of ± 16 ms from the selected time-out.

PROBLEM FIX/WORKAROUND:

When selecting time-out period, add margin for the variations in watchdog time-out.

6. FAIL TO TRACE INTO AND RUN TO CURSOR.

Changing the frequency in the emulator can cause 'Trace Into' and 'Run to cursor' to fail.

PROBLEM FIX/WORKAROUND:

Close the project and reopen for the frequency change to take effect, and the breakpoints to behave correctly.

7. THE SPI FAILS IN SLAVE MODE.

In some emulators the SPI gets out of synchronization due to noise on the /SS pin.

PROBLEM FIX/WORKAROUND:

No known workaround.

8. PROBLEMS WITH RUNNING FROM EXTERNAL XTAL

Due to long wires, it can be a problem to run the emulator from an external XTAL.

PROBLEM FIX/WORKAROUND:

-In many applications, it is possible to run on the internal clock. If the AVR clock is needed in the target application, this signal can be found on the logic analyzer connector.

-It is also possible to shorten the wires by placing the crystal on the POD. On the megaICE, the crystal (or a socket) has to be soldered directly on the pod.

9. ALE NOISE ON EXTERNAL MEMORY INTERFACE

Due to ALE noise on the External memory interface, random addresses in external RAM can be altered.

PROBLEM FIX/WORKAROUND:

-Decouple the ALE line with a capacitor. Frequencies above 50 MHz should be filtered. Try using 680pF as a start value.

10. ERROR RESETTNG EMULATOR:

In the emulator, the external reset line needs to be low 250 clock cycles before the reset is executed. In the actual device two clock cycles are sufficient.

PROBLEM FIX/WORKAROUND:

No known workaround.

IAR ASSEMBLER VERSION 1.30

1. PROBLEM DEBUGGING ASSEMBLY FILES IN AVR STUDIO

While debugging programs written in assembly, it can be a problem to see which source line is currently executed in AVR STUDIO. The reason is that there is a bug in the way the tabs are expanded.

PROBLEM FIX/WORKAROUND:

- Use an editor that automatically expands tabs with spaces.
- Avoid using tabs