Using MON51 on the Intel 8x93x Family USB Eval Board (Rev B) with the 8x931Ax/Hx USB Adapter Board (Rev A) APNT_119

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OVERVIEW

The Keil MON51 target monitor provides several advantages when compared to RISM51.

- **No Interrupts** are used by the MON51 Monitor kernel.
- The **interrupt status** is not modified by MON51.
- No **static on-chip ram** is required. Only 6 bytes of user stack space are used by the monitor.
- **Single stepping** in interrupt functions is possible.
- **Text outputs with the printf function** are possible to the 'serial output' window of dscope.

This application note shows you how to get started debugging with the Keil MON51 monitor on the Intel USB evaluation board. Support files for this application note may be downloaded from the Keil website at http://www.keil.com/download/c51/.

GETTING STARTED WITH THE RISM MONITOR

To get started using the Intel USB eval board with the Intel-supplied RISM monitor, you must:

1. Install the adapter board according to the instructions found in the *"8x931Ax, 8x931Hx Universal Serial Bus Adapter Board User's Guide"*. Use the *"U1 931 RISM Vx.x & HUB FIRMWARE"* in the EPROM socket.

2. Build the RISM51 project which is provided in the C51\EXAMPLES\HELLO\ directory of the Keil C51 Compiler package.

3. Start the dScope debugger and load the RISM monitor and the RISM example program.

For detailed information, refer to the *"Keil Quick Start Tutorial"* provided with the Intel 8x93x Family USB Eval Board.

NOTE
*The complete user code must be located within the von-Neumann wired area address range starting at 4000h. The RISM51.PRJ Project contains modified startup code (STARTUP.A51) which deviates from the standard startup code (found in the C51\LIB\ directory). The line "**CSEG AT 0h**" was replaced by "**CSEG AT 4000H**" to shift the absolute Reset Vector to 0x4000 (the von-Neumann wired area). You must also use the C51 directive **IV(0x4000)** to locate the Interrupt Vector table with the 4000h offset.*

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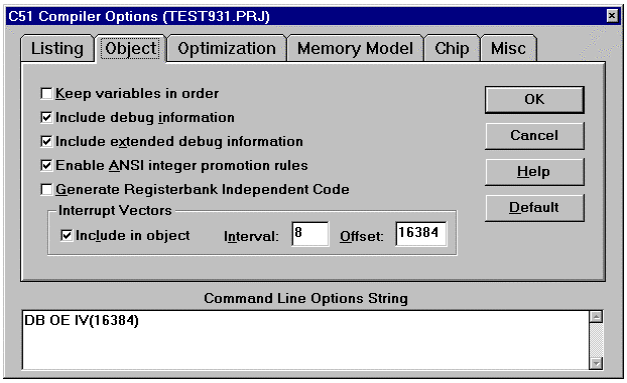
NOTE
XDATA and CODE memory are located at the same physical memory space (von-Neumann area). Therefore, you must avoid overlapping the XDATA and CODE segments in your program (or write to your variables could overwrite your program code). Use the ***CODE*** *and* ***XDATA*** *linker directives to specify where program CODE starts and where XDATA starts. Check the linker MAP file (*.M51) to determine the size of CODE and XDATA.*

GETTING STARTED WITH THE KEIL MON51 MONITOR

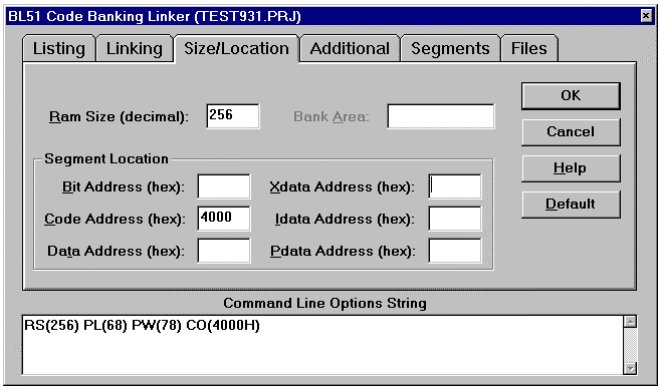
To use the Keil MON51 monitor with the Intel USB Eval board, you must program a standard 27C256 EPROM with the monitor program (MON51USB.HEX) and replace the RISM51 EPROM in SOCKET A of the Intel USB Family Board.

The TEST931.PRJ project file provided with this application note contains all the required options for a typical project. Load this project file into µVision and use the Build Project button to compile and link the program.

The Compiler and Linker settings are shown below:



µVision C51 Compiler Options Dialog Box



µVision BL51 Linker Options Dialog Box

Selecting the Serial Interface

The Intel USB Family Board has two serial interfaces (external and internal). The MON51 monitor for the USB board (MON51USB.HEX) supports both serial ports. Therefore, it is possible to use the following serial connections for the communication with the dScope debugger.

- UART EXT (19200 Baud)
- UART INT (4800 Baud)

NOTE
We recommended that you use the external UART since the on-chip clock for the built-in 931 UART may be modified by your program. Since this changes clock controls the baudrate of the internal serial port, changing it will cause dScope to lose connection with the target.

To start debugging with dScope, connect the PC to EXT UART. The UARTC DIP switch should be ON.

FILES PROVIDED WITH APNT_119.ZIP

The following files are provided with the APNT_119.ZIP file (available on the Keil website at http://www.keil.com/download/c51/apnt_119.zip).

File Name	Description
MON51USB.HEX	Monitor-51 Kernel in Intel HEX format
MON51USB\ REG931.H	SFR Include file for C51 Compiler
MON51USB\ REG931.INC	SFR Include file for A51 Assembler
TESTCODE\ TEST931.C	C Sourcefile
TESTCODE\ STARTUP.A51	Startup code for Test931
TESTCODE\ TEST931.PRJ	µVision Project file
TESTCODE\ TEST931.INI	Initialization file for dScope

The source for the monitor is provided in the MON_119.ZIP file (available on the Keil website at http://www.keil.com/download/c51/mon_119.zip).

GENERATING THE KEIL MONITOR

The MON51 monitor HEX file is provided with this application note. However, if any modifications are necessary with in the Monitor, you may create your own specific Monitor. The following files are required to generate MON51.

- The source file INST_USB.A51 and library MON51.LIB.
- DOS install utilities INST_USB.BAT, INSTALL.LNK (linker command file for DOS).
- µVision project file MON51USB.PRJ.

You must copy all files into a single directory, for example, \C51\MON51USB. Then, you can run the DOS installation batch file, **inst_usb.bat**. This generates a new MON51 file named MON51USB.HEX. The MON51 kernel can be programmed into a standard 27C256 EPROM.

Alternatively, you may use the µVision project MON51USB.PRJ to generate the MON51 HEX file.

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