

Using MON251 with the Intel Project Builder 251SB Target Board

APNT_102

OVERVIEW

This application note provides the information necessary for you to install the Keil 251 monitor program onto an 87C251SB16 microcontroller and operate that monitor in the Intel Project Builder 251SB Target Board. A sample program is also provided to verify that the board is operational and that code can be downloaded.

SOFTWARE REQUIREMENTS

- Keil 251 monitor file (MON251.HEX), provided as a hex file for use with a device programmer.
- Keil PC-Monitor interface program (MON251.EXE), included on this disk.
- The code example (FLASH_S.HEX) races through LED's 1-8 of DP1 in a rocking motion.

HARDWARE REQUIREMENTS

- The Intel 87C251SB Target Board, as shipped, with a 32Kx8 SRAM.
- An 87C251SB microcontroller programmed with the Keil 251 Monitor. Set Configuration Byte 0 = D5h and Configuration Byte 1 = F7h.
- A regulated power supply, rated at 5VDC +/- 5%, capable of supplying 500mA of current.
- A serial cable, 9 pin male to 9/25 pin male, to connect your PC to the target board.

SETUP

Place the 87C251SB microcontroller (programmed with the Keil 251 Monitor) in the U4 socket on the target board. Set the jumpers as shown in Table 1. Copy the Keil PC-Monitor interface program (MON251.EXE) to a convenient location on your hard drive. Connect the serial cable to the Target Board and to an available COM port on your PC. Connect the 5V power supply to JP4 on the Target Board.

WARNING

**Incorrect polarity or voltage applied to JP4 will damage components on the Target Board.
Verify the polarity and voltage of your supply prior to continuing.**

Energize the power supply. The LEDs 1-8 of DP1 should light. If jumper E12 is set to position A-B then LED 10 of DP10 will light also. Start the Keil PC-Monitor using the following command: `d:path mon251 br(nnnn) comx:.` (an example command line is shown below):

```
c:\c251\bin\mon251 br(9600) com2:
```

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Verify that you receive the copyright text and are greeted with the command prompt (#). To access the help file type HELP at the command prompt. To load the flash program (FLASH_S.HEX) type:

load d:\path\flash_s.hex (Example: load c:\temp\flash_s.hex) at the command prompt. Once loaded type pc=0xFF4000 at the command prompt. This sets the program counter to the beginning of the routine. Press G and then ENTER to start the program. To terminate the program and return to the command prompt press the RESET button on the Target Board. To exit the PC-Monitor press F1 and then Y.

Jumper	8K SRAM	32K SRAM	128K SRAM	Notes
E1	B-D	B-D	B-D	Chip select (CS#)
E2	A-B	A-B	A-B	Internal Execution
E3	B-D	B-D	B-D	OE# = PSEN#
E4	N/C	A-B	B-C	B-C: RD# = U6-2
E5	B-C	A-B	A-B	A-B: A13 = U6-28, B-C: V _{CC} = U6-28
E6	N/C	N/C	B-C	B-C: A15 = U6-31, A-B: WR# = U6-31 (flash)
E7	B-C	B-C	B-C	B-C: V _{CC} = U6-30 (SRAM)
E8	N/C	N/C	N/C	Open for SRAM
E9	B-C	B-C	B-C	B-C: WR# = U6-29 (SRAM)
E10	N/C	A-B	A-B	A-B: A14 = U6-3
E11	B-C	B-C	B-C	B-C: V _{PP} = V _{CC} (SRAM)
E12	B-C or A-B	B-C or A-B	B-C or A-B	A-B: DP1-10 is power ind., B-C: DP1-10 = INT1
E13*	N/C	A-B	B-C	A-B: GND = U9-2, B-C: RD# = U9-2
E14*	A-B	A-B	A-B	A-B: V _{CC} = U9-22
E15*	B-C	B-C	B-C	B-C: V _{CC} = U9-30
E16*	N/C	N/C	B-C	B-C: A15 = U9-31
E17*	N/C	A-B	A-B	A-B: A14 = U9-3
E18*	B-C	B-C	B-C	B-C: WR# = U9-29
E19*	B-C	A-B	A-B	A-B: A13 = U9-28, B-C: V _{CC} = U9-28

* Note: These jumpers are for the NON-PAGE mode device U9. They are shown here for continuity only. Their positions will not alter operation of the SRAM in U6.

TABLE 1

**Using MON251 with the Intel Project Builder
251SB Target Board**

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