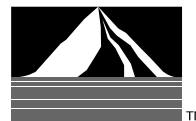


Mountain-ICE Emulator Hardware User's Guide



W H I T E M O U N T A I N D S P

The Design Center for Analog Devices DSP Tools

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Limited Warranty

The Mountain-ICE hardware is warranted against defects in materials and workmanship for a period of one year from the date of purchase from Analog Devices or from an authorized dealer.

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1. Introduction

Thank you for purchasing the Mountain-ICE™ ISA emulation system. The White Mountain DSP Mountain-ICE Universal Emulator system provides state-of-the-art emulation and support for the Analog Devices JTAG family of DSPs. It provides a controlled environment for observing, debugging, and testing activities in a target system by connecting directly to the target processor through the JTAG interface.

Features of the Mountain-ICE system are as follows:

- ▲ Runs with Windows®95/98 and Windows NT™
- ▲ Emulation for the industry standard Analog Devices JTAG families of DSPs
- ▲ Rugged high-speed JTAG emulation pod

2. Requirements

The PC host requirements for the Mountain-ICE are as follows:

- ▲ Pentium 166 MHz or greater
- ▲ Windows 95/98 or Windows NT 4.0 SP 3 or greater
- ▲ Minimum of 32 megabytes of PC-AT memory
- ▲ One ISA slot

3. Getting Started

This section provides all of the information required to install the Mountain-ICE ISA card and pod into your PC. To install the emulator software please refer to your Software User's Guide.

3.1 Installation

For specific instructions on installing an I/O card in your computer, you should consult the operation manual for that computer. In general you should be able to use the following instructions.



Important! The Mountain-ICE In-Circuit Emulator contains ESD (electrostatic discharge) sensitive devices. Electrostatic charges readily accumulate on the human body and equipment and can discharge without detection. Permanent damage may occur to devices subjected to high-energy discharges.

Proper ESD precautions are recommended to avoid performance degradation or loss of functionality.

3.2 Unpacking The Emulator

Remove the Mountain-ICE board and pod from the package. Care should be taken when handling these boards to avoid discharge of static electricity which may damage some components. Put the pod aside. The Mountain-ICE board must first be installed in your computer.

3.3 Removing The Cover From Your Computer

Make sure the power is off and all power cords are disconnected. You should also disconnect any other cables and externally attached devices from the main unit of the computer.

Remove the screws or clips that secure the cover to the unit and carefully remove the cover. The operation manual for your computer should contain detailed instructions for removing the cover.

3.4 Setting The I/O Base Address

The I/O base address is factory configured for 340h. Make sure that any expansion boards installed in your computer do not use this address. If this address is already used by another device, you must change the I/O base address of that device or of the Mountain-ICE board. If you wish to change this factory setting, use the table below to

determine the proper switch settings. Table 1 shows the switch settings for some recommended PC-AT I/O addresses.

Base Address (Hex)	SW1	SW2	SW3	SW4	SW5	SW6
200	OFF	ON	ON	ON	ON	ON
210	OFF	ON	ON	ON	ON	OFF
220	OFF	ON	ON	ON	OFF	ON
230	OFF	ON	ON	ON	OFF	OFF
240	OFF	ON	ON	OFF	ON	ON
250	OFF	ON	ON	OFF	ON	OFF
260	OFF	ON	ON	OFF	OFF	ON
270	OFF	ON	ON	OFF	OFF	OFF
280	OFF	ON	OFF	ON	ON	ON
2C0	OFF	ON	OFF	OFF	ON	ON
300	OFF	OFF	ON	ON	ON	ON
310	OFF	OFF	ON	ON	ON	OFF
320	OFF	OFF	ON	ON	OFF	ON
330	OFF	OFF	ON	ON	OFF	OFF
340	OFF	OFF	ON	OFF	ON	ON
350	OFF	OFF	ON	OFF	ON	OFF
380	OFF	OFF	OFF	ON	ON	ON
3C0	OFF	OFF	OFF	OFF	ON	ON

Table 1. PC I/O Base Address Switch Setting Examples

3.5 Installing The Mountain-ICE Board In Your Computer

After selecting a free expansion slot for the Mountain-ICE board, remove the cover plate from the back of the expansion slot. Hold the Mountain-ICE board firmly at the top and press it carefully into the expansion slot making sure that a good connection is made.

Secure the Mountain-ICE board to the computer chassis using the screw and hole used for holding the expansion cover plate.

Replace the cover to the computer's main unit and reconnect all cables and devices.

3.6 Configuring the Mountain-ICE Pod

Important Note: Before the pod is connected to the target system it is important to determine if the target is a 5 volt DSP or 3 volt DSP. The factory default setting for the pod is for a 3 volt DSP target. Section 3.6.2 explains how to configure the pod for a 3 volt target.

The Mountain-ICE pod contains four internal jumpers. These jumpers are accessed by removing the four screws on the bottom of the plastic enclosure and removing the top of the enclosure. The jumpers are shown in figure 1. The Mountain-ICE pod also contains 2 status LED's. The LED on the left is for voltage status (3v/5v) and the LED on the right is for emulator status. When the emulator is on the LED on the right is illuminated. The LED's are shown in figure 2.

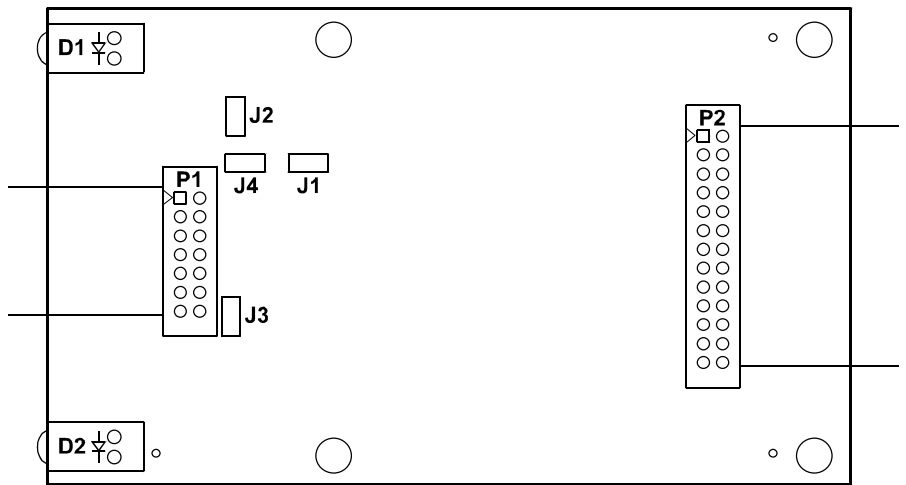


Figure 1. Jumpers

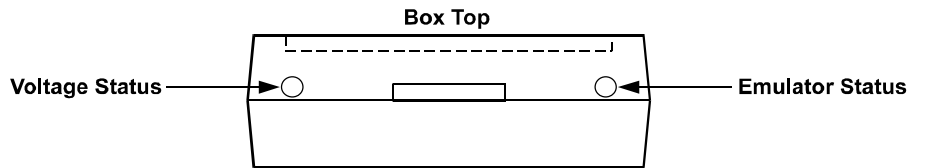


Figure 2. LED'S

3.6.1 Connecting to a 5 volt target

Jumper J1 is used to differentiate between a 5 volt or 3 volt target. This is the only jumper that most users will need to change. When the jumper is installed the JTAG signals are configured to connect to a 5 volt target (ex. ¹Blacktip™ or Snaggletooth™). When the jumper is installed the LED on the left side is not illuminated.

3.6.2 Connecting to a 3 volt target

When the jumper is not installed the JTAG signals are configured to connect to a 3 volt target (ex. LSI PCI/66). When the jumper is not installed the LED on the left is illuminated. This is the default setting.

¹Blacktip and Snaggletooth are trademarks of Bittware Research Systems.

3.6.3 Reducing noise issues on the JTAG signals

There are three jumpers provided to help reduce problems that may arise because of ringing and reflections on the JTAG signals on the target board. The default is that these jumpers are not installed. The three jumpers are J2, J3, and J4.

Jumpers J2 and J3 are used for adding a parallel terminator on the TDO and CLKIN signals. When the jumper is installed a parallel terminator of 120Ω and 91Ω is connected to the TDO and CLKIN signals. Figure 3 shows how the terminator is connected to the JTAG signals. It is important to note that your target MUST be able to drive a 51Ω load before these jumpers are installed. The DSP cannot drive this load directly, a driver should be inserted between the JTAG signals on the DSP and the JTAG signals on the header.

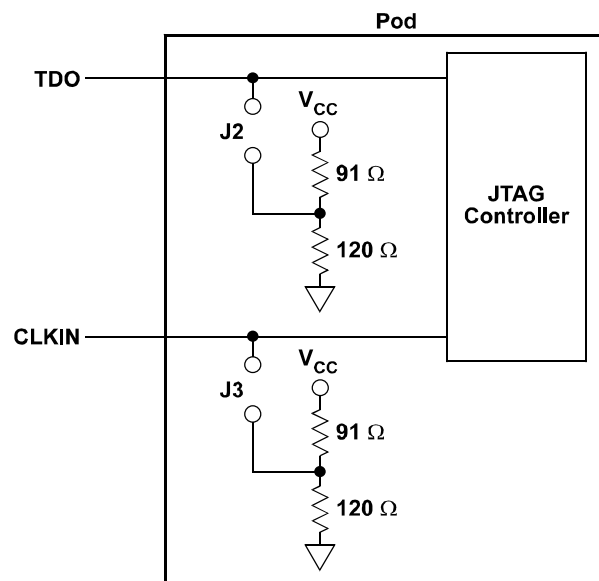


Figure 3. Terminators connected to the JTAG signals

Jumper J4 is provided to allow the board level test pins on the JTAG connector (BTMS, BTCK, BTRST, and BTDI) to be used as ground pins to allow for greater shielding on the JTAG cable connecting the

pod to the target. These pins should only be used as ground pins if they are not used on your target.

3.7 Windows NT Driver Installation

Please refer to the emulator's software installation guide for further detailed instructions.

3.8 Software Installation and Operation

To install and operate the debugger software, refer to the Software User's Guide included with the software distribution.

3.9 Connecting the Pod to the Mountain-Ice Board

The pod connects to the Mountain-ICE board through a shielded flat ribbon cable and a 25 pin connector. Connect the pod to the Mountain-ICE before applying power to the PC. The JTAG header on the opposite side of the pod can be connected/disconnected to a live (as well as unpowered) target system without damaging the pod system.



Important! Connect/disconnect the remote pod to/from the emulator card *only* with the power turned off. Failure to follow this precaution may result in damage to the pod or board.

3.10 Connecting the Pod to Your Target System

The pod connects to the target processor through the JTAG interface. The target board must be built with an appropriate JTAG connector. Please note the position of the key pin. The key pin should be used as a guide to connect the pod to the target. Included with the Mountain-ICE system are two extender connectors. These extenders are used to connect the Mountain-ICE system to a target, which was designed for use with the ADI ICEPAC. These extenders allow connection to the JTAG pins on the ICEPAC header.

4. Support

4.1 Technical Support

We fully support all of our products. For technical support of the Mountain-ICE, call (603) 883-2430 Monday - Friday during normal business hours or via e-mail at *support@wmdsp.com*. For direct support of the Analog Devices family of DSPs, call the Analog Devices' DSP Applications Engineering group at (781) 461-3672.

4.2 Quality Assurance

White Mountain DSP is committed to providing quality products and services. In efforts to continually provide this quality, please contact our Quality Assurance Department directly if you have any concerns at (603) 883-2430 Monday-Friday during normal business hours or via e-mail at *quality@wmdsp.com*. Our Quality Assurance Manager will listen to your concerns and provide an effective solution.

5. References

This section discusses other documentation resources you will need to develop your application.

- For information about your development platform, refer to your operating system manuals and hardware system manuals.
- For information about digital signal processing theory and application, you may want to consult:

Higgins. *Digital Signal Processing In VLSI*. Prentice-Hall, 1990.
Oppenheim and Schaffer. *Digital Signal Processing*. Prentice-Hall, 1975.

- For information on the emulator software, refer to the Software Users Guide.
- For information on designing the interface between an Analog Devices JTAG DSP and the emulation header on your custom DSP target board, refer to Analog Devices JTAG Emulation Technical Reference (2.0), EE68.