Adrienne Electronics Corporation

"AEC-PCIe Board Troubleshooting Guide"

FIELD APPLICATION NOTE

Introduction:
This document describes how to troubleshoot most AEC-PCIe board installation problems. AEC-PCIe board hardware failures are almost non-existent. Host PC problems are fairly common. We thoroughly final test each and every AEC-PCIe board immediately before placing it inside an anti-static bag for shipment. We take much pride in the quality of our products. Unless you have damaged the board via careless handling, it is probably still working perfectly.

Troubleshooting Procedure:
Perform the following experiments in the order indicated. If you tell us an AEC-PCIe board is not working, we will ask you to perform all of these experiments anyway, then let us know what works and what doesn't.

Experiment #1: (not really an experiment)
Make sure that the metal bracket is rotated "exactly" 90 degrees from the printed circuit board. Most AEC-PCIe boards have two(2) metal tabs which attach the bracket to the board. Sometimes those tabs get bent during handling. Brackets which are not at 90 degrees tend to push the PCI Express edge connector away from the motherboard edge, and in some cases that can make the PCI Express connector contacts not line up properly (not good).

Experiment #2: (not really an experiment)
Unplug the Host PC, then use ESD-safe handling procedures to carefully install the AEC-PCIe board into any available PCI Express slot, then power up the PC.

Experiment #3:
Disconnect all I/O cables from the AEC-PCIe board, then look at the green status LED flash pattern. If the LED never comes ON, in more than one PC, you have a bad board, proceed no further, get an AEC RMA number. If the LED is ON most of the time, but blinks OFF about once per second, then the AEC-PCIe board is receiving power from the motherboard, the on-board power supplies are OK, the big black FPGA/uC/PCIe chip is OK, and the LED drive circuitry is OK, in which case you probably have a perfectly good AEC-PCIe board.

Experiment #4:
One at a time, connect a valid input signal to one of the AEC-PCIe board input connectors. If the green status LED is now solid ON, then your source signal, your cable(s), and the AEC-PCIe board analog input circuitry is OK. This is a very simple and quick input signal troubleshooting tool/technique. Input circuitry failures are extremely rare. Bad/intermittent cables are common.

Experiment #5:
Boot your PC to the AEC-PCIe CDROM which was shipped with your AEC-PCIe board. If you do not have the official CDROM, go to the "Downloads" or "Support" page at <www.adrielec.com>, download the AEC-PCIe bootable CDROM binary file, then burn your own CDROM. If your PC does not have a CDROM drive, then you will need to purchase a USB CDROM drive (or something similar). If your PC will not boot to the CDROM, then you may have to adjust the BIOS settings to enable booting from CDROM (before booting from the hard drive). A character based Adrienne Electronics test/demo program should appear on-screen. A time code data logging program and "final test" program are also available on this CDROM. See the "AEC Bootable Test Software Guide" (PDF) for full details. Use these programs to test the board, your signal sources, and your cables and connectors. If the bootable test software is OK, skip to Experiment #11.

Experiment #6: (do this now)
Update the BIOS firmware inside your Host PC. This step surprisingly solves many (if not most) AEC-PCIe board hardware installation problems. Many supposedly new PC's ship with "old BIOS" which has software bugs.

Experiment #7:
Try a different PCI Express slot. In fact, try them all if necessary, one at a time. Be sure to unplug the PC, and follow ESD-safe handling procedures, every time you move the AEC-PCIe board from one slot to the next. AEC-PCIe boards should work perfectly with any motherboard PCI Express x1, x4, x8, or x16 slot. There is no good reason why this step should be necessary, but on some motherboards, it does make a difference.

Experiment #8:
Use BIOS setups to select the use of "Legacy PCI Express" (or something similar) for some or all motherboard slots. Some newer PC's have newer generation PCI Express slots which may not be fully backwards compatible with older plug-in boards. There is no good reason why this step should be necessary, but on some motherboards, it does make a difference.

Experiment #9:
Try a different Host PC. Most AEC-PCIe board hardware installation problems which have been reported to us have occurred with high-end (very expensive) motherboards which have many PCI Express x8 and x16 slots. Find an old PC which has one or more PCI Express x1 slots. Use that to verify that your AEC-PCIe board hardware is good. Then you know that you have a good board. We then must only figure out why it doesn't work in the newer motherboard.

Experiment #10:
Try a different AEC-PCIe board. If you have the luxury of having another AEC-PCIe board, try installing it in place of the perceived "bad board". The chances of any given AEC-PCIe board being bad are extremely small. The chances of two similar AEC-PCIe boards both being bad is non-existent.

Experiment #11:
Boot normally to Windows, and follow the "AEC-PCIe Windows Guide" PDF document which is on the AEC-PCIe CDROM (in the Documentation subdirectory). You will need to install Windows driver software before Windows can do anything with the AEC-PCIe board. We do not have an automated process for doing this yet, so you will need to do it manually (sorry). Let us know whether or not Windows says that the driver software installed OK.

Experiment #12:
Run the "AecWinDemo" program on the AEC-PCIe CDROM (in the Windows Demo subdirectory). If the program finds the AEC-PCIe board and runs OK, then the Windows driver software installed OK, and your AEC-PCIe board is ready to work with any Windows application software which supports our AEC-PCIe board hardware. This program also tells you the exact AEC-PCIe board model number and firmware revision, which can be another useful diagnostic tool.

In Case All Of The Above Doesn't Work:
If you have honestly tried all of the above experiments, and still need help, please send the following information to <support@adrielec.com>:
1) Your name.
2) Your company name.
3) The model number of the AEC-PCIe board that you are having trouble with.
4) The make and model of the motherboard that you are having trouble with.
5) The BIOS revision of the motherboard that you are having trouble with.
6) A list of the experiments you have tried which are working OK.
   For example, something like "Experiments 1-5 work fine.".
7) A list of the experiments which are not working.
   For example, something like "The green status LED never comes ON.".

Remember, the more detailed information you can provide, the better we can help you. Well over 90% of returned "bad boards" have absolutely nothing wrong with them. It is much faster and much cheaper to fix the problem(s) via phone or e-mail. We want you to be a happy customer. Please give us a decent chance to make that happen.