ATTO UL4D & UL5D Troubleshooting Guide

This document describes troubleshooting techniques that can be used to identify and resolve issues associated with the ATTO Ultra320 dual channel SCSI host adapter. Some of these techniques may seem simplistic or overly obvious, but these are the ones that are commonly overlooked and can take several hours of frustration to find. It is important to only try one technique at a time. While changing multiple variables may seem to be a time saver, it usually complicates the troubleshooting process.

Linux Operating Systems

➔ **The host adapter driver was loaded properly and everything was working, but the devices do not show up after the computer was rebooted. On some Red Hat Linux distributions, the driver may not automatically load when the system is booted.**

- To enable driver autoload in Red Hat Enterprise Linux 3, 4, and 5, add the following line to **/etc/rc.modules** after installing the driver:

    modprobe express2 <Enter>

    (Note: you may need to create /etc/rc.modules and make it executable with 'chmod +x /etc/rc.modules')

➔ **The host adapter can detect the target device at LUN 0 but not the devices at LUN 1 or higher in Red Hat Linux version 3 with kernel 2.4. (sometimes other distributions and kernels as well depending on how the kernel was built)**

- When using version 2.4 of the Linux kernel (eg. Red Hat 3), devices on LUN 1 or higher may not be detected automatically when the driver is loaded. To manually detect such devices, issue the following command:

    $ echo "scsi add-single-device <h> <b> <t> <l>" > /proc/scsi/scsi

    Where <h> is the host, <b> is the bus (always 0 or 1 for ATTO drivers), <t> is the target, and <l> is the LUN. You can confirm that the device has been detected by checking for it in /proc/scsi/scsi.

➔ **On certain 64-bit platforms, the driver Makefile may be unable to detect the correct CPU architecture. When compiling the driver, an error such as** *"cc1 : error : CPU you selected does not support x86_64 instruction set".*

- This can be resolved by specifying the correct architecture when running the make command. For example: **$make install ARCH=x86_64**

→ **The connected SCSI devices aren't detected by the operating system.**
- Verify the driver is loaded by examining the output of the **lsmod** command for "express2".
- Check **/proc/scsi/scsi** to see a list of devices that are known by the operating system. This will only list the device at LUN 0 and it's negotiated speed.

→ **The ULxD host adapter is recognized, but it does not detect <u>any</u> of the connected SCSI devices. The command *dmesg* can be used to see what devices are detected when the driver loads. It will list each device per SCSI bus.**

- Verify the SCSI devices are powered on.
- Check the SCSI devices to make sure that they are all set to different SCSI ID's. Each device on each SCSI bus must use a unique ID, including the host adapter. Devices on Bus 1 can have the same IDs as those on Bus 2. By default, the host adapter uses SCSI ID 7, so devices should use ID's 0 through 6, or 8 through 15.
- Check cable integrity. Check the cables for solid connections. Make sure they are screwed down. Inspect cable ends for bent pins. U320 SCSI requires high quality cables that are specifically rated for the U320 transmission speeds.
- Verify the external terminator is the same SCSI type as the devices (certified as usable for Ultra320 SCSI or lower) and does not have damaged pins.
- Try attaching SCSI devices one at a time with different cables, adding drives and cables until the problem occurs. This will help pinpoint the device or cable causing the problem.
- Watch the LED indicators on the SCSI devices before, during, and after startup. Drive lights should also flash at startup as the SCSI bus is scanned. This may give a clue as to the root cause of the issue.
- Try putting the host adapter in a different PCI slot.
- Try updating the firmware on the host adapter as described in the "Installation and Operations" manual.
- If all else fails, replace the SCSI host adapter.

→ **The computer recognizes the ULxD host adapter, but <u>only detects</u> connected SCSI devices on <u>one</u> of the busses. The other bus reports no devices. The command *dmesg* can be used to see what devices are detected on each SCSI bus.**

- Swap the devices and cables from the SCSI bus that appears to be working with the one having issues. If the issue follows the bus, replace the SCSI host adapter.

If the issue follows the attached SCSI devices, troubleshoot the attached devices / cables / terminator:

- Verify the SCSI devices are powered on.
- Check the SCSI devices to make sure that they are all set to different SCSI ID's. Each device on each SCSI bus must use a unique ID, including the host adapter. Devices on Bus 1 can have the same IDs as those on Bus 2. By default, the host adapter uses SCSI ID 7, so devices should use ID's 0 through 6, or 8 through 15.
- Check cable integrity. Check the cables for solid connections. Make sure they are screwed down. Inspect cable ends for bent pins. U320 SCSI requires high quality cables that are specifically rated for the U320 transmission speeds.
- Verify the external terminator is the same SCSI type as the devices (certified as usable for Ultra320 SCSI or lower) and does not have damaged pins.
- Try attaching SCSI devices one at a time with different cables, adding drives and cables until the problem occurs. This will help pinpoint the device or cable causing the problem.
- Watch the LED indicators on the SCSI devices before, during, and after startup. Drive lights should also flash at startup as the SCSI bus is scanned. This may give a clue as to the root cause of the issue.

→ **The ULxD host adapter is detected by the operating system, it <u>detects some</u> of the connected devices on both SCSI busses, but <u>does not detect all</u> of the connected devices. The command *dmesg* can be used to see what devices are detected on each SCSI bus.**

- Verify the SCSI devices are powered on.
- Check the SCSI devices to make sure that they are all set to different SCSI ID's. Each device on each SCSI bus must use a unique ID, including the host adapter. Devices on Bus 1 can have the same IDs as those on Bus 2. By default, the host adapter uses SCSI ID 7, so devices should use ID's 0 through 6, or 8 through 15.
- Check cable integrity. Check the cables for solid connections. Make sure they are screwed down. Inspect cable ends for bent pins. U320 SCSI requires high quality cables that are specifically rated for the U320 transmission speeds.
- Verify the external terminator is the same SCSI type as the devices (certified as usable for Ultra320 SCSI or lower) and does not have damaged pins.
- Try attaching SCSI devices one at a time with different cables, adding drives and cables until the problem occurs. This will help pinpoint the device or cable causing the problem.
- Watch the LED indicators on the SCSI devices before, during, and after startup. Drive lights should also flash at startup as the SCSI bus is scanned. This may give a clue as to the root cause of the issue.

Error Log Capabilities

The ATTO Ultra320 SCSI host adapter driver logs all failure related information to an event log. The user can control the classification of events that are recorded via a registry setting for Windows and a command line argument for Linux.

The driver records events broken into the following classifications.
- FATAL   Records various fatal situations within the driver and card.
- SCSI   Records SCSI errors as reported by the card.
- ISP   Records errors as reported by the firmware on the card.
- LOOP   Records event notifications as reported by the firmware.
- INFO   Records events related to the starting and restarting of the driver.

We recommend Event Logging only be active for troubleshooting purposes as performance will be affected and that when in this mode of operation, all flags be enabled.

To enable the advanced event logging features of the ATTO U320 Dual Channel SCSI Host Adapter in a *Linux* environment please do the following:

- Remove the driver (**rmmod express2**)
- Load the driver with event logging enabled
  modprobe express2 event_log_mask=0xffffffff (Hint: 0x followed by 8 f's.)
- The output can be obtained from **dmesg.**

To disable event logging under Linux, simply remove the driver with the event log mask and reload the driver normally (or reboot).

Additional information can be obtained about the driver version, attached devices detected, driver optional settings, and negotiated device parameters. First, find out the SCSI channel number of interest by executing **cat /proc/scsi/scsi.** Note the number on the line of interest displaying scsi0, scsi1, scsi2, etc. Append this number to the end of the command **cat /proc/express2/x,** where "x" is the number.

Escalating issues to Tech Support.

When an error is encountered, please insure you have an answer to each of the following questions when reporting it as an issue:

QUESTION	ANSWERED
1. Computer Model:	
2. Operating System:	
3. OS Patch Level:	
4. PCI slot # and type:	
5. ATTO driver version:	
6. ATTO firmware revision:	
7. List all of the devices attached to the ATTO HBA. Include the manufacturer, model number, and associated SCSI ID for each device:	
8. Did it ever work? Is this a new error that just started happening, or is this an error that has been around since the first use.	
9. Does it happen when you try it with a second host adapter (if possible)? For example, swap out one host adapter for another and see if error still occurs.	
10. Is the latest firmware and driver being used?	
11. Is the device in default mode? Are there settings that have been adjusted that may be causing the problem? Do settings need to be adjusted to allow the device to function properly?	
12. How duplicable is the error? Does the error occur sporadically/randomly, or can it be reproduced each and every time?	
13. If the system was working previously, what changed about the configuration?	