

ATTO 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.

A.) Windows Operating Systems

→ The computer will not boot past its Power On Self Test when the host adapter is installed.

- The host adapter may be improperly seated. Power down the computer and reseat the host adapter.
- Try putting the host adapter in a different PCI slot.
- Disconnect any SCSI devices from the host adapter and reboot the computer. If this resolves the issue, investigate the SCSI cables or SCSI target devices as described in the section below.
- If the computer still does not boot, try installing the host adapter in a different computer. If the host adapter works in the new computer, report this as a possible interoperability issue between the host adapter and the computer. If the problem follows the host adapter, replace it with a new adapter.
- Verify that the latest version of the computer BIOS is installed. Use caution when updating the computer's BIOS. A mistake could leave the system in an unusable state.

→ The UL5D host adapter is installed in the computer but it does not appear during the system BIOS scan.

***Note:** The ATTO Technology banner should appear shortly after booting the computer.*

```
*****  
*   ATTO Express PCI™ Version 2.20   *  
*   Copyright © 2006  ATTO Technology, Inc. *  
*****
```

*** Press [Ctrl] [Z] for Setup Utility ***

```
Channel 0 EPCI UL5D I/O Addr 1000 Controlled by ExpressPCI  
Channel 1 EPCI UL5D I/O Addr 1400 Controlled by ExpressPCI
```

- The host adapter may be improperly seated. Power down the computer and reseat the host adapter.
- Try putting the host adapter in a different PCI slot.

- Verify that the latest version of the computer BIOS is installed. Use caution when updating the computer's BIOS. A mistake could leave the system in an unusable state.
- Remove any non-vital PCI cards from the system to determine if there is a PCI bus conflict.
- Disconnect any SCSI devices from the host adapter and reboot the computer. If this resolves the issue, investigate the SCSI cable or SCSI target devices as described in the section below.
- If the computer still does not boot, try installing the host adapter in a different computer. If the host adapter works in the new computer, try updating the flash on the host adapter as described in the "Installation and Operations" manual. Then try it again in the original computer.
 - If it still fails, report this as a possible interoperability issue between the host adapter and the computer.
 - If the problem follows the host adapter, replace it with a new adapter.

→ The computer freezes when the ATTO Banner is displayed during the system BIOS scan.

- Disconnect all devices from the SCSI card and reboot the system.

If the system still freezes:

- Remove any non-vital PCI cards from the system to determine if there is a PCI bus conflict.
- Remove the SCSI host adapter and test it in a different computer (not the same model). If the card works properly, enter the ATTO ExpressPCI Utility during the system BIOS scan by hitting Control-Z when prompted. Enter the host adapter configuration menu and disable the BIOS. There may be a BIOS conflict between the ATTO host adapter and the original computer. Place the host adapter back into the original machine and reboot.
 - If this resolves the issue, report this as a BIOS conflict. Note that you can continue to operate. Disabling the BIOS will only prevent the computer from booting from an external drive connected to the host adapter.
 - If the computer still hangs, replace the host adapter with a new one.

If the system no longer freezes after disconnecting the SCSI devices:

- 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.

- **Boot into Windows and use the ATTO Configuration Tool to verify the host adapter has its termination set properly. Instructions to do this can be found in the help portion of the ATTO Configuration Tool.**
- Verify the external terminator is the same SCSI type as the devices (certified 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 system's BIOS scan recognizes the UL5D host adapter, but it does not detect any of the connected SCSI devices.**

***Note:** The ATTO Technology banner should appear shortly after rebooting the computer. If the host adapter's BIOS is set to "enabled" or "scan only", the connected devices, SCSI ID and negotiated transfer rate for each of the SCSI busses will also be displayed.*

- The SCSI host adapter BIOS may have been set to disabled (factory default: BIOS enabled). Set it back to Enabled (if you need to boot from an external device connected to the host adapter) or Scan Only.
- 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.
- **Boot into Windows and use the ATTO Configuration Tool to verify the host adapter has its termination set properly.** Instructions to do this can be found in the help portion of the ATTO Configuration Tool.
- 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's BIOS scan recognizes the UL5D host adapter, but only detects connected SCSI devices on one of the busses. The other bus reports no devices.

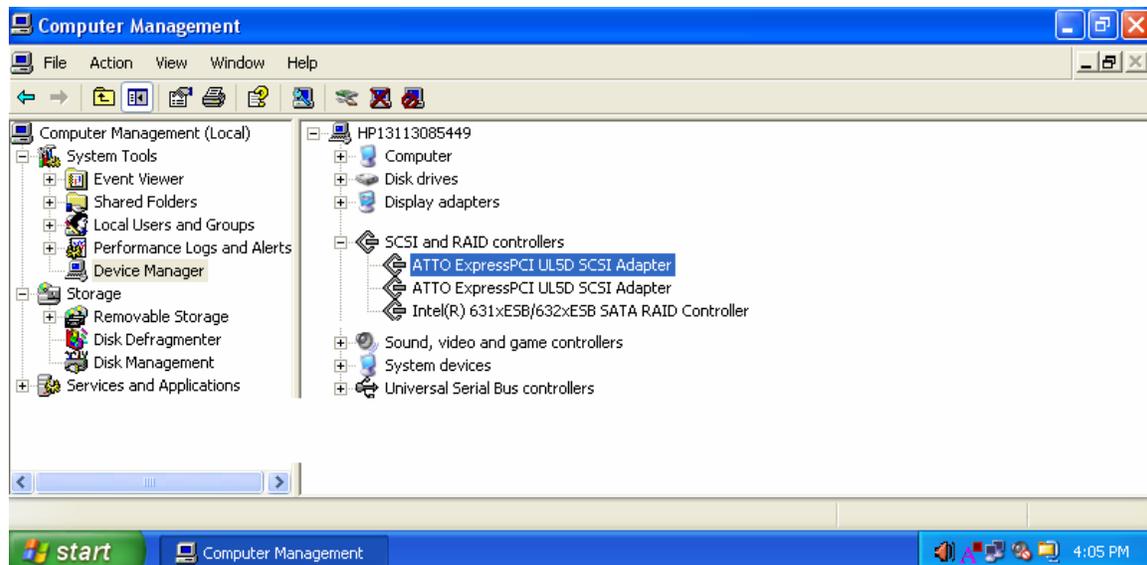
- Swap the devices **and cables** from the SCSI bus that appears to be working with the one having issues. If the issue follows the bus, replace the SCSI host adapter.

If the issue follows the attached SCSI devices, troubleshoot the attached devices:

- 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.
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- 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 UL5D host adapter is detected during the system's BIOS scan but it is not detected by the operating system.

Note: When working properly, the UL5D host adapter will show up in the device manager.



- The host adapter driver may not be properly installed. Please refer to the host adapter Installation and Operations manual for instructions on installing your OS driver.
- The firmware and driver may not be at compatible revision levels. The drivers are updated more frequently than the firmware, therefore the revision levels are seldom the same. There may be an occasion where the latest driver also requires a firmware update. Verify from the web site that the latest firmware and driver version are being used. The firmware version can be viewed when the host adapter is detected during the computer's BIOS scan. The driver version can be verified from within the Device Manager.

→ **The UL5D host adapter is detected by the operating system, it detects some of the connected devices on both SCSI busses, but does not detect all of the connected devices.**

- 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.
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- 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.

→ **Errors are reported while trying to flash new firmware onto the SCSI host adapter.**

- The ATTO Configuration Tool performs validations on the structure of the file. If it does not pass these validations, the file is rejected. The image file may be corrupted. Try downloading the image file from the support section of the website again.

→ **The SCSI host adapter fails its Power On Self Test.**

- The BIOS driver will perform several checks to verify that the host adapter is functioning. If the BIOS driver determines that the adapter has non-functioning hardware it will not complete the initialization of the OS driver. If the BIOS driver determines that the firmware on the adapter is not functioning, then it will complete the initialization in degraded mode. Under Windows, degraded mode will not perform I/O but it will allow the end user to flash the adapter with working FW. The POST failure will be recorded in the Windows Event Log. Try to re-flash the firmware using the Configuration Tool in Windows. If the problem persists, replace the host adapter.

→ **The software application being used to communicate with the attached SCSI devices reports Parity or communication errors.**

- Check your cables. There could be slight damage to one conductor causing intermittent failures. U320 SCSI requires high quality cables that are specifically rated for the U320 transmission speeds.
- Try slowing down the data transmission rate by lowering the sync rate for the drive in question. To do this, launch the ATTO Configuration Tool. Double click on the drive you want to change. The current sync rate will be displayed. Lower it then close and save the changes. Reboot. You can also modify the sync rates by entering the Control-Z SCSI setup program during boot. If this resolves the issue, the SCSI device may need to be replaced.
- If the issue is not resolved, enable the Event logs as described below and contact ATTO Technical Support.

→ **Errors are reported while using the ATTO Configuration Tool.**

***Note:** Sometimes when using the ATTO Configuration Tool, an error message describing an unexpected event or incorrect information discovered by the application will be displayed.*

- Use the help text presented with the error message to correct the issue.

The following conditions cause a warning or error message to be posted in the "Status" area of the configuration utility. These messages will be shown in red.

- *An error occurred loading NVRAM data* - The first time a host adapter channel is highlighted, the application makes an attempt to read NVRAM from the card. If the size of the NVRAM buffer does not match the expected size, or if the NVRAM buffer couldn't be retrieved at all, this message is displayed.
- *Warning: NVRAM could not be read, defaults returned* - This message occurs as a result of corrupt NVRAM. When the driver accesses the NVRAM, a continuity check is performed on the NVRAM to ensure the returned data is valid. If this check fails, the driver has no other alternative than to return a known NVRAM data buffer that represents card defaults. When this situation occurs the defaults are presented via the graphical user interface and the

user is informed that the values shown are defaults. These defaults must be committed in order to correct the state of the NVRAM.

- *An error occurred updating the NVRAM* - This message occurs during a committal of NVRAM to the card. If the driver is unable to put the new settings on the card, this message is displayed to the user and no changes are made to the card.
- *This is not a flash file, or it is corrupt* – Checks are performed to assure the proper file has been selected for flashing to the specific model of host adapter.

B.) 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 autoloading in Red Hat 4 Add the following line to **/etc/modprobe.conf** after installing the driver:
alias scsi_hostadapterX express2 Where X is the next available #.

To enable driver autoloading in Red Hat 3 Add the following line to **/etc/rc.modules** after installing the driver:

modprobe express2

(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.**

- 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. This is a known issue with the 2.4 kernel. 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, is the bus (always 0 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 UL5D host adapter is recognized, but it does not detect any 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.
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- 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.

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C.) 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 FW of the card.
- LOOP Records event notifications as reported by the FW.
- 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 **Windows** environment, please do the following:

- Click “**Start**” and “**Run**”.
- Type “**regedit**” to start the registry editor.
- Follow the tree structure to :
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\lexpress2\Parameters\ATTO
- Right-click the right hand pane and select “**New**” to create a new registry key.
- Select “**DWORD Value**”.
- Type “**EventLogMask**”.
- Double-click “**EventLogMask**” and enter the value of “**FFFFFFFF**”.
- Reboot your computer.

Advanced event logging is now enabled. To retrieve the log to provide to support personnel please do the following:

- Go to “**Computer Management**”.
- Select “**Event Viewer**”
- Select “**Application**”
- Save the file by clicking “**Action**” and “**Save Log File as**” [filename].
- This “[**Filename**]” is what you need to provide to support personnel.

Once you have provided the log and your issue is resolved you may delete the registry key by doing the following:

- Click “**Start**” and “**Run**”.
- Type “**regedit**” to start the registry editor.

- Follow the tree structure to :
\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\express2\Parameters\ATTO
- Highlight “**EventLogMask**”, right-click and select “**delete**”.

NOTE: be careful to only select this key as deleting other keys could harm your computer.

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**)
- 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.

D.) 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 and model number 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?	