



**StreamStor PXI-808
Real-time Disk Controller
Installation and User Manual**

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TABLE OF CONTENTS

ABOUT THIS MANUAL	6
ABOUT THE AMAZON REAL-TIME STORAGE CONTROLLER.....	7
COMPONENTS	8
UNPACKING / HANDLING	9
DISK DRIVES.....	9
AMAZON BOARD.....	9
PLANNING YOUR INSTALLATION.....	10
CONTROLLER CARD	10
DRIVE CONFIGURATION	11
INSTALLING THE DRIVES.....	12
CONNECTING INTERFACE AND POWER CABLES	12
DRIVE AUTO CONFIGURATION	13
INSTALLING THE SOFTWARE.....	13
SOFTWARE FUNCTIONALITY	15
DAUGHTER BOARDS	ERROR! BOOKMARK NOT DEFINED.
TECHNICAL SUPPORT	16
CONTACTING TECHNICAL SUPPORT	18

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About This Manual

This manual is intended to serve the following purposes:

- * to provide an overview of the StreamStor PXI-808 Real-Time Storage Controller
- * to act as a guide for hardware installation
- * to act as a reference for the operator
- * to provide guidance on software capabilities and choices

It is suggested that you periodically check the Conduant web site for the most recent software updates, application notes, and technical bulletins.

If you are unable to locate the information you need, please feel free to contact us by e-mail or phone.

About the PXI-808 Real-Time Storage Controller

Thank you for purchasing a StreamStor PXI-808 Real-Time Storage System. Your StreamStor system is a disk-based, real-time recording system for PXI or CompactPCI (CPCI) bus systems. The StreamStor system consists of a controller card that plugs into the PXI/CPCI bus, high performance disk drives, device drivers, software development tools, and additional utility software.

The PXI/CPCI bus is a version of the PCI high performance I/O bus designed for attaching peripheral devices to the computer system. It is found in computing systems from many different manufacturers and is supported by most major operating systems. By utilizing the PCI bus instead of a proprietary bus interface, StreamStor provides an open platform recording system. Data acquisition cards (digital oscilloscopes, frame grabbers, telemetry interfaces, etc) are available from many manufacturers to collect data and record it to system memory in real time (as it is collected). StreamStor provides a large capacity and cost effective alternative to system memory for these applications.

The StreamStor Storage System is able to receive data over the PCI bus directly from the data acquisition device at very high average (sustained) data rates. Virtually all of the available PCI cards that can write data to system memory are compatible with StreamStor. Only minor software modifications are generally required to redirect data to the StreamStor card. This capability is often in the software provided by the manufacturers of data acquisition devices. Conduant maintains a list of tested configurations, please contact technical support for more information.

StreamStor was specifically designed to record sequential data without interruption at very high data rates. This is in contrast to traditional storage systems that are designed for data processing purposes and cannot sustain these high data rates. Unlike typical computer disk storage solutions that are designed for optimum performance during random data reads and writes, StreamStor has been designed for optimum performance in sequential read and write operations. The StreamStor system has also been designed to operate without host computer intervention. This eliminates any bottlenecks or interruptions in the data stream due to heavy computer loads or delays.

The StreamStor SDK includes the device drivers and API (Application Programming Interface) to provide a smooth integration of StreamStor with the data acquisition device and/or analysis software. Many examples are provided with the SDK and more are available upon request.


The StreamStor system is a flexible and powerful platform for high performance recording applications. Many custom and unique capabilities are available that are beyond the scope of this documentation so please contact Conduant with your questions and special requirements.

Components

A PXI-808 real-time storage system generally consists of the following components:

- PXI-808 board
- Disk drives
- Cables
- Software Development Kit
- User Manual

Some systems are delivered from Conduant completely installed in a chassis with a backplane and operating system. You can skip the installation section for these systems since all installation has been performed at the factory.

 **CAUTION:** *Please read the entire installation section before starting to install the hardware. This manual assumes that the user is knowledgeable and comfortable with basic computer work, including installation and safety considerations. If you are unsure as to how to proceed, please contact Conduant support.*

Unpacking / Handling

Carefully inspect all shipping packages for any sign of damage. In particular, look for wrinkled or bent corners, holes, or other signs of bad handling or abuse. If you notice any damage to the packaging, immediately open the boxes and inspect the contents for damage. Pay close attention to the components near the area where the packing material was damaged. Report any damage to the carrier and Conduant immediately.

Disk Drives

Hard disk drives such as those that have been included with your system are susceptible to damage from excess shock and careless handling. Please observe the following handling precautions:

- * Allow the disk drives to reach room temperature **BEFORE** installation. This may take several hours depending on shipping conditions. Disk drive damage can occur if the system is powered while the drives are at temperature extremes.
- * Do not drop, jar or bump the disk drives. Even setting the chassis on a hard surface too roughly can damage the recording surfaces, heads, or other mechanical components inside the disk drives.
- * Never disconnect/connect the interface cable while power is on.

The disk drives must be installed according to the manufacturer's instructions. Please check the manufacturer's website for the latest installation information.

PXI-808 Board

The StreamStor controller board is shipped in an antistatic box or bag to prevent electrostatic damage to the board. To avoid damage in handling the board, take the following precautions:

- * Ground yourself with a grounding strap or grasp a conductive, grounded object to dissipate any static charge while handling the board.
- * Always store the board in its antistatic package when not installed in a computer system.
- * Inspect the board carefully before installing in the computer. Do not install a damaged board into your computer.
- * Never touch any exposed connector pins or component leads.
- * Avoid bending or twisting the board.

Planning Your Installation

The StreamStor PXI-808 controller board uses multilane SATA interface cables (depending on the configuration) to connect the controller to up to 8 disk drives. Each cable supports 4 disk drives. The cables and system are generally compatible with standard multilane SATA disk systems but the PXI-808 pinout was defined prior to the existence of these systems so Conduant cables must be used. Your disk drives may be internal to the chassis or in an external chassis. Contact Conduant if you need help in choosing or designing an appropriate chassis or drive system.

The controller board can utilize the anywhere from 1 to 8 disk drives depending on the capacity and performance required. Various length cables are also offered to support most disk drive installations. The multilane SATA cables can be installed in any order but if only using 1-4 drives there will only be one cable and the upper connector should be used.

All StreamStor models are upgradeable for increased storage capacity and high sustained data rates. Please contact Conduant for more information on upgrades.

Controller Card

The PXI-808 StreamStor controller is a 3U PXI/CPCI card that meets the PCI 2.1 specification (figure 1). Installation requires a single open slot in the PXI/CPCI chassis. Clearance is also required for the drive cable(s) exiting from the controller card front panel. The card can be used in slots supporting 32 or 64 bits and 33 or 66 MHz. For maximum performance the card should be inserted into a 64 bit and/or 66 MHz slot. Consult your system documentation for more information. An illustration of the card is shown in Figure 1.

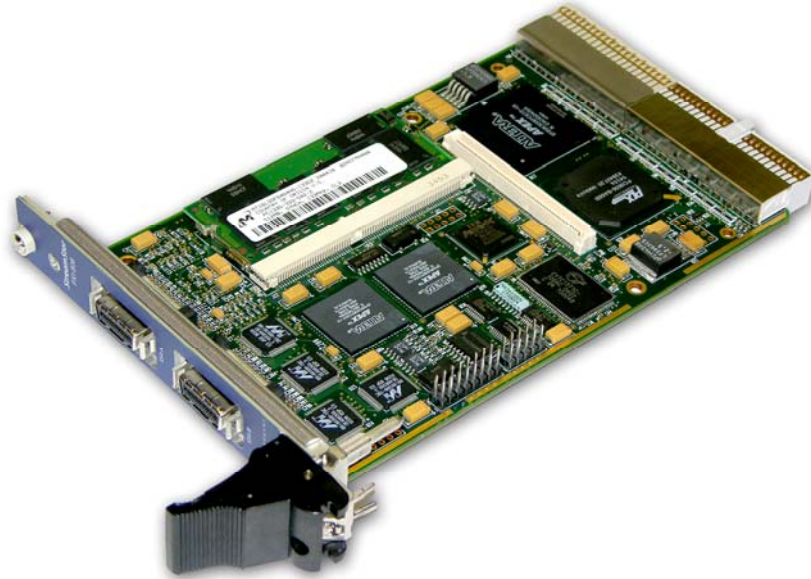


Figure 1 – PXI-808

The following are general instructions for installing your StreamStor controller. You should also consult your computer user manual or technical reference for more specific instructions and warnings.

⚠ CAUTION: *Over-flexing the circuit board will damage the controller.*

1. Turn off and unplug your system.
2. Remove any access covers or slot covers.
3. Open the handle on the PXI-808 by pressing the button on top of the handle and rotating the handle down.
4. Insert the StreamStor controller board into the chosen PXI/CPCI slot. Once the handle inject/eject tabs reach the chassis, rotate the handle until it locks.
5. For more security there are 2 screws at the top and bottom of the faceplate that can be secured to the chassis.
6. Proceed to drive installation and cabling.

Drive Configuration

The StreamStor controller and drives must be attached using multilane SATA cables. If your drives are not installed in a chassis with multilane SATA connections there is a breakout cable available to convert the PXI-808 connectors to standard SATA drive connectors (4 per cable). The PXI-808 interface is compatible with standard multilane SATA but the pinout was defined

prior to the standard implementation and only Conduant cables should be utilized. Both cable ends are identical and interchangeable. There are no jumpers or other settings on the disk drive to configure.

Be careful to match the connector orientation when connecting the drive chassis to the cable and never force the connection, as this could damage the disk drive or board.

Installing the Drives

The method used to mount the disk drives is left to you. Conduant can provide drive modules that are compatible with the chassis slots or the drive may be located in an external chassis. Please contact Conduant for more information. Be sure to follow the handling precautions described above in the unpacking/handling section when installing the hard drives.

Connecting Interface Cables

The multilane SATA cables are easily attached to the PXI-808 by simply pushing them into place until the side latches engage. The disk chassis end of the cable may utilize thumb screws instead of latches. To remove the cable pull the release handle or slide the connector casing away (depending on cable type) from the connector.

If you are using the break-out style cable you must connect the SATA cable to the drive which usually provides an integrated connector with both power and interface signals as shown in Figure 2. Be careful to correctly orient the connector, since they are all keyed to prevent incorrect insertion.

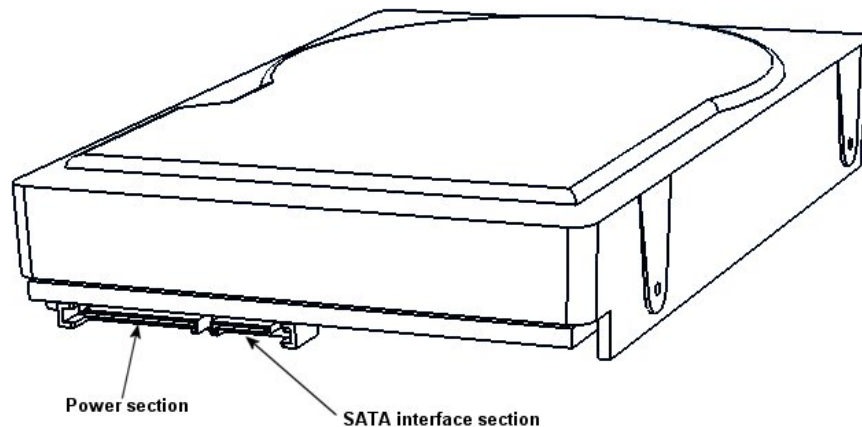


Figure 2 - SATA Drive

⚠ CAUTION: *The signal and power connectors are keyed to prevent incorrect insertion. Exerting excessive force with the connectors improperly*

aligned can cause damage. Even with the correct alignment, care should be taken to not apply excessive force or torque.

Some SATA disk drives include a second power connector separate from the integrated SATA power/signal connector. These connectors allow the drive to be powered from the old style power cabling instead of from the integrated connector. Do NOT use both connectors to power the drive. Your installation may also utilize a backplane to make the connections to the disk drives. The SATA interface cable must then be connected to the SATA connectors on the backplane. SATA interface cables are available with either separate or integrated power and signal sections. The SATA connector on the drive is designed to allow connection of independent or integrated cables.

Drive auto configuration

The StreamStor PXI-808 controller board supports auto configuration to the number of drives installed. It can support 1-8 attached drives. Always check that all expected drives are being recognized by the system using the `XLRGetDeviceInfo` function call. The `sscfg.exe` program also reports this information after initialization.

Installing the Software

Your StreamStor system was shipped with the Software Development Kit on CD-ROM. Install the software prior to installing the hardware if possible. On Windows systems, when ready, run the `setup.exe` program on the CD-ROM to start the installation process. On Linux systems, refer to the file `linux/docs/install.txt` on the CD-ROM.

Plug and play operating systems such as Windows will detect the installation of the StreamStor board and attempt to configure the boards using the hardware plug and play wizard program. The required installation information file for plug and play installation is included on the CD-ROM. Make sure the plug and play wizard includes the CD-ROM drive in its search so that the StreamStor drivers will be properly installed. You should not cancel the plug and play wizard since this can create hardware conflicts in the system when using the StreamStor controller. Note that the `setup.exe` program must still be executed to install the StreamStor SDK onto your system.

The software installation procedure will install the device drivers, library files, example programs and all other components of the SDK onto your system.

The StreamStor SDK does not include software interfaces or drivers used for the control of data acquisition cards made by other manufacturers. However, it does include some sample programs to help in your software development efforts. Other drivers and examples may be available depending on your choice of data acquisition hardware. Contact Conduant support for more information.

Always review the **readme.html** file included with the SDK for the latest information not included in this manual. Also, check the Conduant web site periodically for additional information.

Software Functionality

The PXI-808 StreamStor controller supports recording and reading from the PCI bus at up to 200 MB/s. The following API commands are supported by the controller:

- XLRApiVersion
- XLRAppend
- XLRCardReset
- XLRClearWriteProtect
- XLRClose
- XLRDeleteAppend
- XLRDeviceFind
- XLREdit/XLREditData
- XLERase
- XLRGetBaseAddr
- XLRGetBaseRange
- XLRGetDeviceInfo
- XLRGetDeviceStatus
- XLRGetDirectory
- XLRGetDriveInfo
- XLRGetDriveTemp
- XLRGetErrorMessage
- XLRGetLabel
- XLRGetLastError
- XLRGetLength
- XLRGetLengthPages
- XLRGetLengthLowHigh
- XLRGetMode
- XLRGetOption
- XLRGetPartitionInfo
- XLRGetPlayBufferStatus
- XLRGetPlayLength
- XLRGetSample
- XLRGetSystemAddr
- XLRGetUserDir
- XLRGetUserDirLength
- XLRGetVersion
- XLRGetWindowAddr
- XLRGetWrapLength
- XLROpen
- XLRPartitionCreate
- XLRPartitionResize
- XLRPartitionSelect
- XLRPlayback

- XLRRead, XLRReadData
- XLRReadImmed
- XLRReadSmartThresholds
- XLRReadSmartValues
- XLRReadStatus
- XLRRecord
- XLRRecoverData
- XLRReset
- XLRSelfTest
- XLRSetLabel
- XLRSetPlaybackLength
- XLRSetReadLimit
- XLRSetSampleMode
- XLRSetUserDir
- XLRSetWriteProtect
- XLRStop
- XLRTruncate
- XLRWrite, XLRWriteData

See the StreamStor SDK user manual for more information.

Technical Support

Conduant wants to be sure that your Amazon StreamStor system works correctly and stays working correctly. In the event, however, that you are unable to get your new system to work properly, or if a working system ceases to function, we will do all that we can to get your system back online.

Solving the problem is largely a matter of data collection and steps that must be taken one at a time. In order for us to better serve you, we ask that you take the time to perform the following steps prior to calling us. This way, you can provide us with the most meaningful information possible that will help us solve the problem.

Is the problem one that obviously requires replacement parts due to physical damage to the system? If yes, then please gather the information described below and report the problem to tech support, by phone or through the Conduant web site.

Have you confirmed that no cabling has been inadvertently disconnected or damaged while working around the equipment?

Is the StreamStor card properly seated in the PCI (CPCI/PXI) slot?

Do all the systems have good power connections and voltages?

Does the confidence test `sscfg.exe` (on Windows) or `ssopen/ssstest` (on Linux) run OK?

Has the software installation been corrupted? Try re-installing software.

Have you checked the Conduant web site for technical bulletins?

Have you recently installed a new Linux kernel or compiler or a new Windows Service Pack?

If the above steps did not resolve the problem, then please initiate a trouble ticket on the support section of the Conduant website at www.conduant.com. Please provide as much information about your system and the problem as possible. We will do all that we can to resolve the problem as quickly as possible.

Contacting Technical Support

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