



AlazarStream 600/1200/1800 Ultra-Fast Disk Storage Systems

- Up to 1.8 GB/s sustained disk throughput
- Up to 16 Terabytes of total storage space
- Fully compatible with AlazarTech PCI Express waveform digitizers
- Fully integrated system containing CPU, data acquisition and disk storage
- Includes disk streaming software
- Compatible with GPS Timing modules
- No programming required
- Packaged in 5U rackmountable chassis



| Product | Bus | Operating System | Disk Throughput | Total Storage | Available Slots | Number of Disks | RAID Level |
|-------------------|---------|------------------|-----------------|---------------|-----------------|-----------------|------------|
| AlazarStream 600 | PCI | Windows 7 | 600 MB/s | 2 TB | 5 | 8 | 0 |
| AlazarStream 1200 | Express | 64 bit | 1.2 GB/s | 4 TB | 4 | 16 | |
| AlazarStream 1800 | | | 1.8 GB/s | 16 TB | 3 | 24 | |

Overview

AlazarStream 600/1200/1800 is a family of high performance disk storage systems that provide up to 1.8 GB/s disk throughput and have been designed for use with AlazarTech's family of PCI Express waveform digitizers.

Today's computers are not designed with the needs of the test & measurement and data acquisition industry in mind. As such, not all computers are able to handle these very high data rates.

AlazarTech has tested and qualified all the components that go into AlazarStream in order to guarantee the specified throughput to disk.

AlazarStream 600/1200/1800 units are complete systems that consists of an advanced motherboard with up to 7 PCI Express slots, a powerful CPU running the Windows Vista operating system and sufficient number of available slots for plugging in waveform digitizers or other cards.

AlazarStream 600/1200/1800 systems use hardware-based RAID technology to stripe data across multiple disk drives. AlazarStream 600 uses 8 disk drives, AlazarStream 1200 uses 16 disk drives and AlazarStream 1800 uses 24 disk drives.

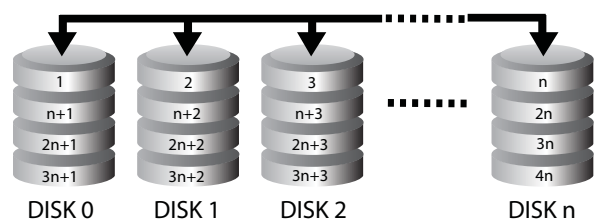
Built-in disk streaming software allows out-of-the-box operation without any need for custom programming.

The biggest advantage of using AlazarStream systems with AlazarTech's PCI Express waveform digitizers is that the disk throughput is guaranteed. No guesswork required.

Applications

- RF signal recording (SIGINT)
- Digital Video Broadcast (DVB)
- Optical Coherence Tomography (OCT)
- Terabyte Storage Oscilloscope

RAID 0 Across n Disk Drives



Disk Drives

Only the fastest and most reliable SATA II disk drives are used in AlazarStream systems.

According to benchmarks carried out at AlazarTech's laboratory, each individual disk drive provides close to 100 MB/s sustained writing capability.

It should be noted that AlazarTech reserves the right to change the type of disk drives used, if and when newer and better products become available.

Power Supply

In order to power so many disk drives, AlazarTech has selected a family of high power, reliable power supplies for AlazarStream 600/1200/1800.

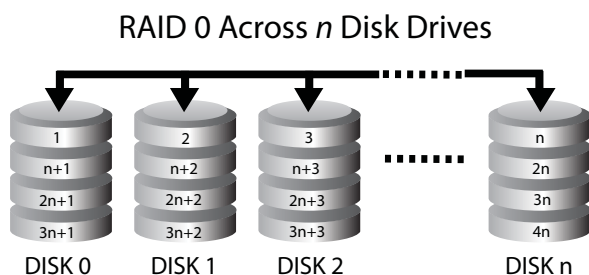


The power supply includes four separate +12V power circuits in order to provide stable distributed power to the disk drives.

The power supply has 100 to 240 VAC universal inputs and 47 to 60 Hz frequency.

Hardware RAID

Using hardware RAID (Level 0) technology, data is striped across multiple disk drives.



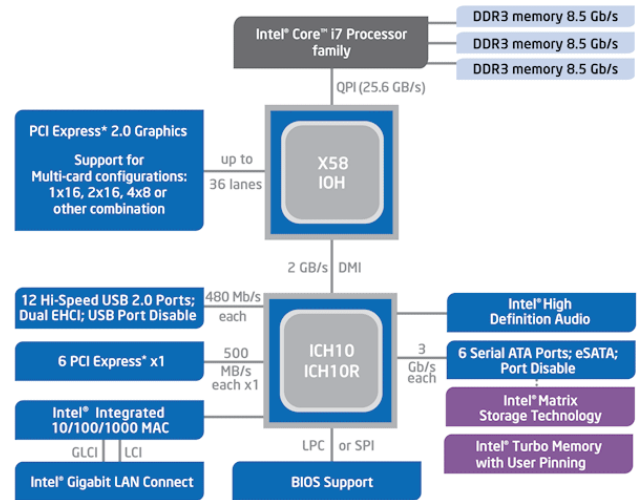
This parallel architecture increases data throughput in proportion to the number of disk drives being used.

Other RAID levels can be used for custom configurations. It should be noted, however, that RAID levels with redundancy will result in smaller total storage space and possibly slower sustained throughput.

Motherboard

AlazarStream 600/1200/1800 systems are based on the latest Core i7 processor and X58 chipset, which provides a large number of PCI Express slots, very

high data throughput to system memory and very fast multi-core processing.



One of the advantages of this architecture is that the X58 chipset communicates directly with PCI Express slots, thereby reducing system latencies and increasing sustained throughput.

The PCI Express Advantage

It is important to note that PCI Express lanes are point-to-point connections between an add-on board, such as an AlazarTech waveform digitizer, and system memory.

This means that overall bus throughput is not shared between multiple cards. For example, an ATS9870 waveform digitizer can transfer data to PC memory at a rate of 1.4 GB/s.

It is possible to plug in two ATS9870 waveform digitizers in the same motherboard and have them transfer data to computer memory at 1.4 GB/s each, i.e. a total data transfer rate of 2.8 GB/s!

This is very different than the legacy PCI bus, which was a shared bus and using multiple cards resulted in bus bandwidth reduction for all the cards.

Compatible Waveform Digitizers

The architecture of AlazarTech's PCI Express waveform digitizers has been designed for data streaming applications. Unlike other digitizers on the market, there is no requirement for data acquisition to be stopped before the acquired data can be transferred to computer memory.

In other words, AlazarTech's PCI Express waveform digitizers feature dual-port memory buffer: ADC data is written into one port, while the bus reads this data out of another port.

The following waveform digitizers are compatible with AlazarStream 600/1200/1800 systems:

| Waveform Digitizer | Specifications | Transfer Rate |
|--------------------|-------------------------|---------------|
| ATS9870 | 8 bit, 1 GS/s, 2 ch. | 1.6 GB/s |
| ATS9350 | 12 bit, 500 MS/s, 2 ch. | 1.6 GB/s |
| ATS9462 | 16 bit, 180 MS/s, 2 ch. | 600 MB/s |

Notice that ATS9462 is capable of streaming data at rates up to 720 MB/s, but the X58 chipset based AlazarStream systems cannot go higher than 600 MB/s.

This is because ATS9462 has a 4-lane PCI Express interface and the X58 chipset does not negotiate down to 4 lanes in an optimal manner.

Bundle AlazarStream with Digitizers

Customers can purchase an AlazarStream disk storage system bundled with one or more of AlazarTech's waveform digitizer cards.

Not only will this save a lot of installation hassles for users, it will also represent some savings. Contact AlazarTech or your local distributor for more details.

ATS9462 Friendly Motherboard

AlazarStream systems based on a special motherboard (based on the S5000P chipset) are available for customers who need to use ATS9462 at transfer rates higher than 600 MB/s.

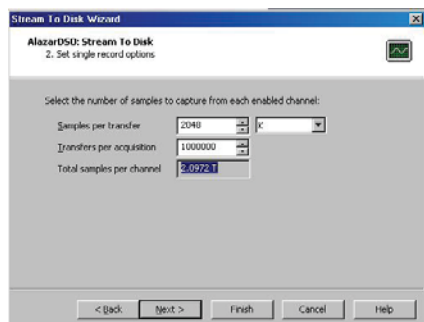
This special motherboard has been validated with the ATS9462 for 720 MB/s throughput to disk.

Note that only 600 MB/s and 1200 MB/s disk systems are offered with this ATS9462 friendly motherboard.

AlazarDSO Stream To Disk Software

AlazarStream 600/1200/1800 systems are supplied with AlazarDSO stream to disk software, which allows the user to setup the acquisition hardware and capture, display, process and archive the acquired signals.

For AlazarStream systems, the most important part of AlazarDSO software is its ability to allow the user to set up a very deep memory capture using an easy to use wizard.



AlazarDSO also allows FFT, cursors, math functions,

histograms, unattended archiving, signal file recall, on-line help, dual-port memory support and numerous other powerful features.

AlazarDSO Plug-Ins

AlazarDSO capabilities can be expanded using a Plug-In DLL that can do custom control and processing functions on captured data. AlazarDSO Plug-In Development Kit (sold separately) is required for writing a custom Plug-In.

This unique capability can be very useful for customers who want to create custom data analysis and display applications without investing months of software development effort.

The user-selected Plug-In DLL is called by AlazarDSO each time it receives a new buffer of data. The Plug-In can then modify the data in any way it wants and have AlazarDSO display it.

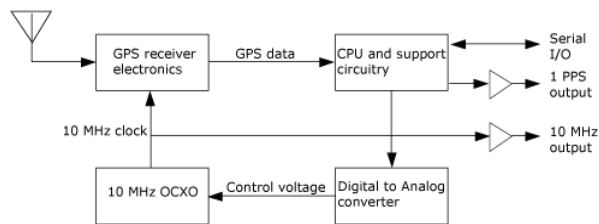
An example of such a Plug-In is the Acquire-At-Time Plug-In that allows the user to set an acquisition time based on GPS clock derived from a Trimble GPS module.

Compatible with GPS Timing Module

Many SIGINT applications require synchronous RF signal recording at different geographic locations.

Synchronous sampling is achieved by locking the sampling clock for each recording system to a GPS clock.

This GPS clock and associated trigger signal is provided by a GPS timing module, such as Trimble Mini-T.



For these applications, it is not only necessary to record the RF signal, but also the longitude and latitude of the location at which the recording was made.

AlazarStream customers who want to use the Trimble Mini-T timing module with AlazarStream must purchase a software plug-in called Acquire-At-Time in order to use it.

Customers must also purchase a USB to Serial port adapter, as the Mini-T requires a serial port and AlazarStream 600/1200/1800 does not have any serial ports.

Viewing Captured Data

AlazarStream software allows users to view the recorded signal one *buffer* at a time. The size of the



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buffer can be specified by the user.

For example, if the amount of data captured is 100 Gigasamples and the buffer size is set to be 8 Megasamples, then the recorded data is divided into 12500 *buffers* and the user can view one of these *buffers* at one time, i.e. no more than 8 million samples can be displayed on the screen at one time.

A user interface is provided for the user to easily select a different *buffer* for viewing.

Extracting Data from AlazarStream

Once signals are digitized and stored in the disk drives of AlazarStream 600/1200/1800 systems, the resulting files can be transferred to another computer or a network attached storage (NAS) device using the on-board Gigabit Ethernet port.

Alternatively, customers can connect AlazarStream 600/1200/1800 to their network using the dual Gigabit Ethernet ports and Windows Vista operating system.

Converting Data to MATLAB Format

AlazarStream 600/1200/1800 store the recorded data in a native binary format (ATB format). Users can set up the software to automatically convert the ATB file to MATLAB format immediately after the acquisition has finished resulting.

Physical

| | |
|-----------------|--|
| Chassis size | 17in. (W) x 8.5in. (H) x 27in. (D) Rackmount rails not included |
| Chassis height | 5U |
| Rackmount rails | Optional |

Environmental

| | |
|-----------------------|---|
| Operating temperature | + 10 to +50 degrees Celcius |
| Storage temperature | -20 to +60 degrees Celcius |
| Humidity | 5% to 95% @ 45 degrees Celcius, non-condensing |

Power Supply

| | |
|-------------------------|---|
| Input Voltage | 100 VAC ~ 240 VAC |
| Frequency | 47 ~ 63 Hz |
| Safety approval | UL, CSA, CUL, CE, CB, FCC Class B, TUV, CCC, C-tick, BSMI |
| Efficiency | Min. 75% at full load |
| Universal input | Yes (no manual switch) |
| Power Factor Correction | Active |

Input Current:

| | |
|-------------------|-----------------------------|
| AlazarStream 600 | 8A @ 115 VAC, 4A @ 230 VAC |
| AlazarStream 1200 | 10A @ 115 VAC, 5A @ 230 VAC |
| AlazarStream 1800 | 10A @ 115 VAC, 5A @ 230 VAC |

Output Current (Max. Load):

| | +5V | +3.3V | +12V | -12V |
|-------------------|-----|-------|------|------|
| AlazarStream 600 | 25A | 25A | 80A | 0.8A |
| AlazarStream 1200 | 25A | 25A | 100A | 0.8A |
| AlazarStream 1800 | 25A | 25A | 100A | 0.8A |

Total output wattage:

| | |
|-------------------|-----------|
| AlazarStream 600 | 500 Watts |
| AlazarStream 1200 | 750 Watts |
| AlazarStream 1800 | 750 Watts |

Standard Motherboard

| | |
|-----------------------|--|
| Form factor | EATX |
| Chipset | Intel X58 |
| Processor | Core i7 (Nehalem) |
| On-board graphics | No. One PCI Express slot is always used for graphics adapter |
| On-board Ethernet | Dual GbE |
| On-board eSATA | Dual eSATA (3 Gbps) |
| Memory technology | Triple channel DDR3 |
| Memory size | 6 GB standard Upgradeable to 12 GB |
| Total number of slots | 7 PCI Express x16 (5.0 Gbps) |

PCI Express slots available:

| | |
|-------------------|---|
| AlazarStream 600 | 5 |
| AlazarStream 1200 | 4 |
| AlazarStream 1800 | 3 |



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Optional (ATS9462 Friendly) Motherboard

| | |
|-----------------------|---|
| Form factor | EATX |
| Chipset | Intel S5000P |
| Processor | Xeon |
| On-board graphics | Yes. XGI Volari Z9S graphics chip |
| On-board Ethernet | Intel 82563EB Dual GbE |
| On-board eSATA | No |
| Memory technology | DDR2 FB-DIMM |
| Memory size | 8 GB standard Upgradeable to 64 GB |
| Total number of slots | 3 x PCI Express x8 (2.5 Gbps) 1 x PCI Express x4 (2.5 Gbps) 1 x PCI-X 133 MHz 2 x PCI Rev. 2.3 |

PCI & PCI Express slots available:

| | |
|--------------------|-----------------------------|
| AlazarStream 600A | 1 x PCIe x4 and 2 x PCIe x8 |
| AlazarStream 1200A | 1 x PCIe x4 and 1 x PCIe x8 |

Software Environment

| | |
|---------------------------|--|
| Operating system | Windows 7 64 bit |
| Signal recording software | AlazarDSO with Stream-to-disk |
| File format | ATB binary file format |
| MATLAB compatibility | User can set up the software to automatically convert the ATB file to MATLAB format immediately after the acquisition has finished |

Compatible Waveform Digitizers

| | |
|--------------------|---|
| AlazarStream 600 | ATS9462, ATS9350 and ATS9870 |
| AlazarStream 1200 | ATS9462, ATS9350 and ATS9870 |
| AlazarStream 1800 | ATS9462, ATS9350 and ATS9870 |
| AlazarStream 600A | PCIe: ATS9462,ATS9350&ATS9870 PCI: ATS460, ATS660 and ATS860 |
| AlazarStream 1200A | PCIe: ATS9462, ATS9870 PCI: ATS460, ATS660 and ATS860 |

Disk System

| | |
|---------------|------------------|
| Technology | Magnetic storage |
| Interface | SATA II (3 Gbps) |
| RAID Level | 0 (striping) |
| Hardware RAID | Yes |

Sustained throughput:

| | |
|-------------------|-----------|
| AlazarStream 600 | 600 MB/s |
| AlazarStream 1200 | 1200 MB/s |
| AlazarStream 1800 | 1800 MB/s |

Total data storage:

| | |
|-------------------|--------------|
| AlazarStream 600 | 2 Terabytes |
| AlazarStream 1200 | 4 Terabytes |
| AlazarStream 1800 | 16 Terabytes |

Mouse and Keyboard

| | |
|----------|---------------------------|
| Keyboard | Standard 101-key keyboard |
| Mouse | Optical mouse |

Optional Display Screen

| | |
|-------------|----------------|
| Screen type | Flat-panel LCD |
| Screen size | 22 inch |
| Resolution | 1024 x 768 |

Materials Supplied

- AlazarStream chassis
- Driver disks and manuals
- Keyboard and mouse

Certification and Compliances

CE Mark Compliance

RoHS compliant

CSA approved power supplies

All specifications are subject to change without notice

ORDERING INFORMATION

| | |
|------------------------------------|---------------|
| AlazarStream 600 | ATS-STR-600 |
| AlazarStream 1200 | ATS-STR-1200 |
| AlazarStream 1800 | ATS-STR-1800 |
| AlazarStream 600A | ATS-STR-600A |
| AlazarStream 1200A | ATS-STR-1200A |
| 6 GB to 12 GB Memory Upgrade | ATS-STR-100 |
| Optional Monitor | ATS-STR-101 |
| Windows SDK for AlazarTech Boards | ATS-SDK |
| LabVIEW VI for AlazarTech Boards | ATS-VI |
| AlazarDSO: Plug-In Dev Kit | ATS-DSO-PDK |
| AlazarDSO: Acquire-At-Time Plug-In | ATS-DSO-AAT |

Manufactured By:

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