



# 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.

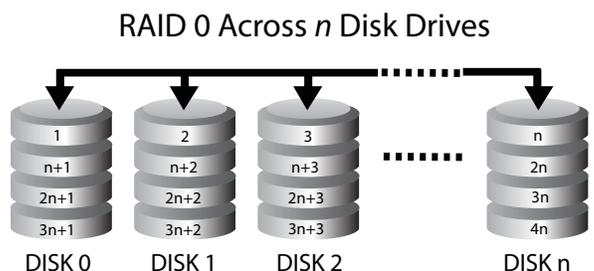
AlazarStream 600/1200/1800 systems use hardware-based RAID technology to stripe data across multiple disk drives. AlazarStream 600 uses 8 disk drives, AlazarStream 1200 uses 16 disk drives and AlazarStream 1800 uses 24 disk drives.

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



**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.

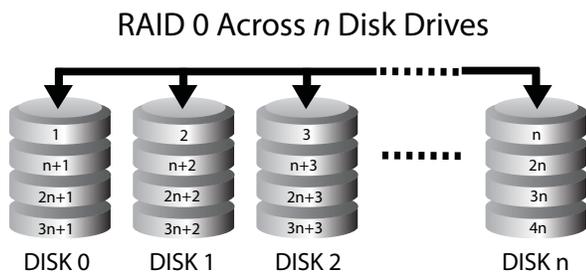


The power supply includes four separate +12V power circuits in order to provide stable distributed power to the disk drives.

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.



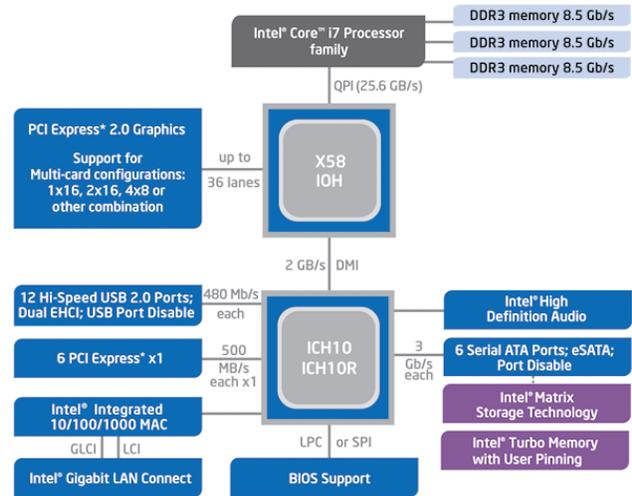
This parallel architecture increases data throughput in proportion to the number of disk drives being used.

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.

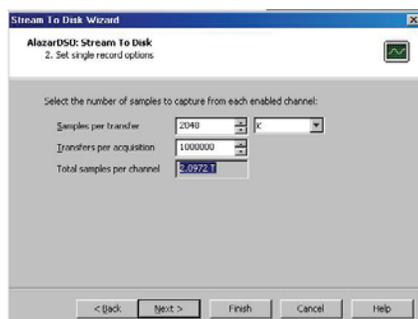
This special motherboard has been validated with the ATS9462 for 720 MB/s throughput to disk.

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.

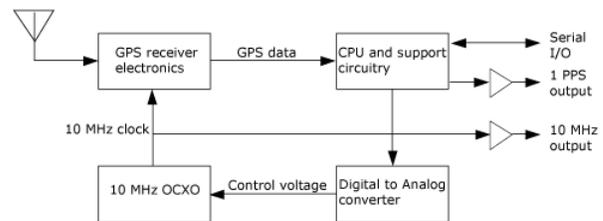
An example of such a Plug-In is the Acquire-At-Time Plug-In that allows the user to set an acquisition time based on GPS clock derived from a Trimble GPS module.

### 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



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

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



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

## 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:

### AlazarTech

6600 TRANS-CANADA HIGHWAY, SUITE 310  
POINTE-CLAIRE, QC, CANADA H9R 4S2

TOLL FREE: 1-877-7-ALAZAR  
TEL: (514) 426-4899 FAX: (514) 426-2723

E-MAIL: info@alazartech.com