



# **A41612-ENC**

## **User's Manual**

**Document Number: 91-760203**  
**Version: A**



This document describes Astek's A44812-ENC storage enclosure and will remain the official reference source for all revisions/releases of this product until rescinded by an update.

To receive product literature, visit us at <http://www.astekcorp.com>.

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#### **REGULATORY COMPLIANCE**

**Notice: FCC and CE testing is pending. This enclosure is for ENGINEERING USE ONLY.**

Note: The A44812-ENC has been designed to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These Limits are designed to provide reasonable protection against harmful interference when the equipment is operated in its installation. This equipment generates, uses, can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. If this equipment does cause harmful interference the user will be required to correct the interference.

The A44812-ENC has been designed to meet the safety requirements of IEC/EN 60950-1.

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# 1 Introduction

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The A41612-ENC is a 12Gb/s SAS storage enclosure with 16 bays for Hard Disk Drives (HDD) and Solid State Drives (SSD). By using a SAS implementation the storage devices can have a SAS or SATA interface. The A41612-ENC uses the Astek A34812-ITX SAS expander board with SAS internal cables connected to the drive bay backplane. This implantation is ideal for a test environment since the expander board and backplane can be connected in many different ways.

# 2 Installation Procedures

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## Hardware Installation

**CAUTION**

Use proper ESD safety procedures whenever working with electronic equipment or parts.

Step 1: Secure chassis in rack mount or free standing on a flat level surface so that it cannot slide or move.



Step 2: Connect Mini-SAS HD cables to back of chassis.



Step 3: Insert Hard Drives



Step 4: Plug in external power supply to the back of the chassis and a power source.



Figure x shows the recommended configuration how the phys of the A34812-ITX expander board are connected to the storage backplane and external SAS connectors.

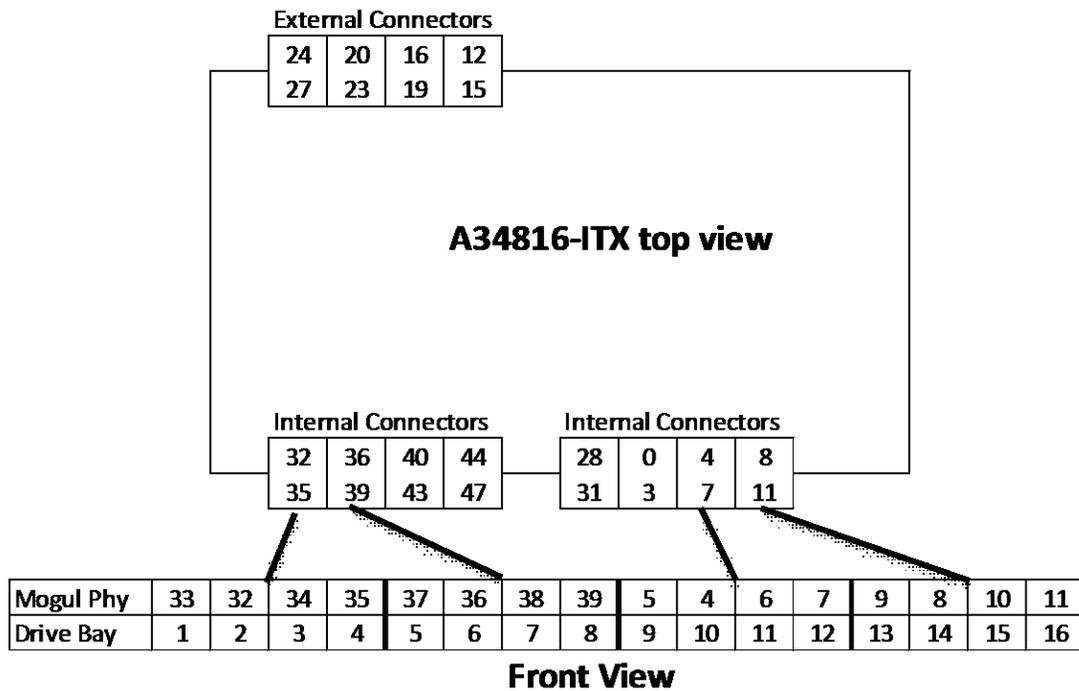
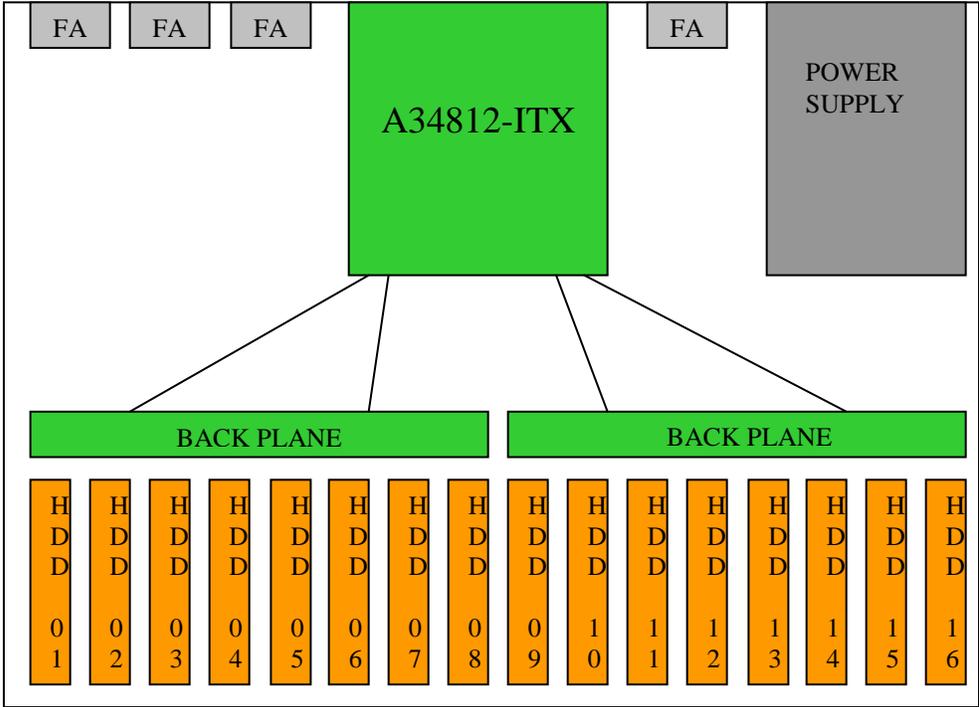


Figure x

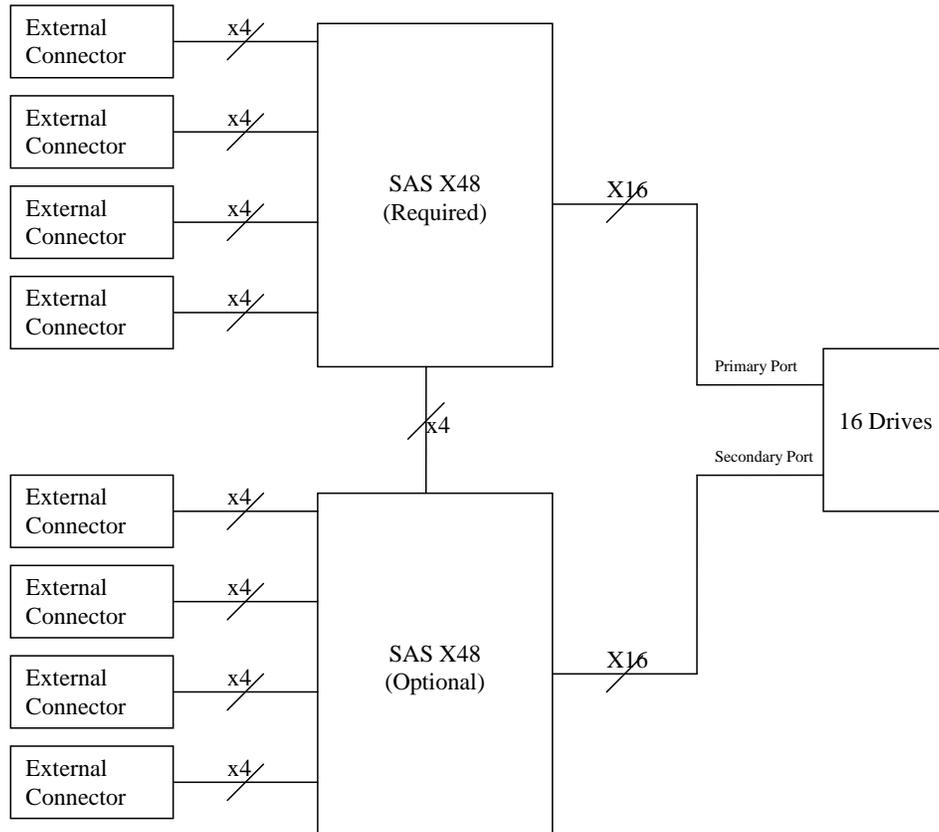
# Use Cases

## Typical implementation of a 16-bay storage enclosure



## Typical implementation of a 16-bay storage enclosure

A HA configuration can be configured to support a redundant system. In this configuration, the main expander is connected to the primary SAS port of all drives and the optional expander is connected to the secondary port of all drives, each expander contains two x4 external connector for cascading to multiple servers or other storage enclosures. This configuration is illustrated below.



### 3 A44812-ENC Technical Specifications

<b>Compliance</b>	ANSI T10 SAS specification 3.0	
<b>Data Transfer</b>	Up to 192Gb/s on external SFF-8644 connectors	
<b>Modes</b>	Direct-attach, cascaded attachment	
<b>SAS Bus</b>	Thirty-two 12Gb/s SAS/SATA ports	
<b>SAS Bandwidth</b>	<b>@6Gb/s</b>	<b>@12Gb/s</b>
Single Lane	600 MB/s	1200 MB/s
Wide Port (2 lanes)	1200 MB/s	2400 MB/s
Wide Port (4 lanes)	2400 MB/s	4800 MB/s
Wide Port (8 lanes)	4800 MB/s	9600 MB/s
<b>Connectors</b>	4 SFF-8644 Mini-SAS HD (single expander model)	
<b>Protocols</b>	SAS 2.0, SAS 2.1, SAS 3.0, SCSI SAM-4, SATA 3.0Gbps, SATA 6.0Gbps	
<b>Device Support</b>	16 target disks, SAS or SATA	
<b>Agency Approval</b>	RoHS Compliant (lead-free)	

#### Electrical Specifications

##### Power

- Operating Voltage: 110-240 VAC
- Typical Power Consumption: TBD
- Maximum Power Consumption: TBD
- Power Connector:

##### SAS/SATA

- SAS/SATA speeds: 3.0Gb/s 6.0Gb/s 12.0Gb/s
- Number of SAS/SATA ports: 48

##### Serial Port

- Connection Speed 38400
- Connection Parameters 8-N-1

#### Environmental Specifications

Agency Approval: RoHS Compliant (lead free)

### Operating Conditions

- Temperature: 0 °C to +55 °C
- Humidity: 5 to 90% non-condensing

### Storage Conditions

- Temperature: -45 °C to +55 °C
- Humidity: 5 to 90% non-condensing

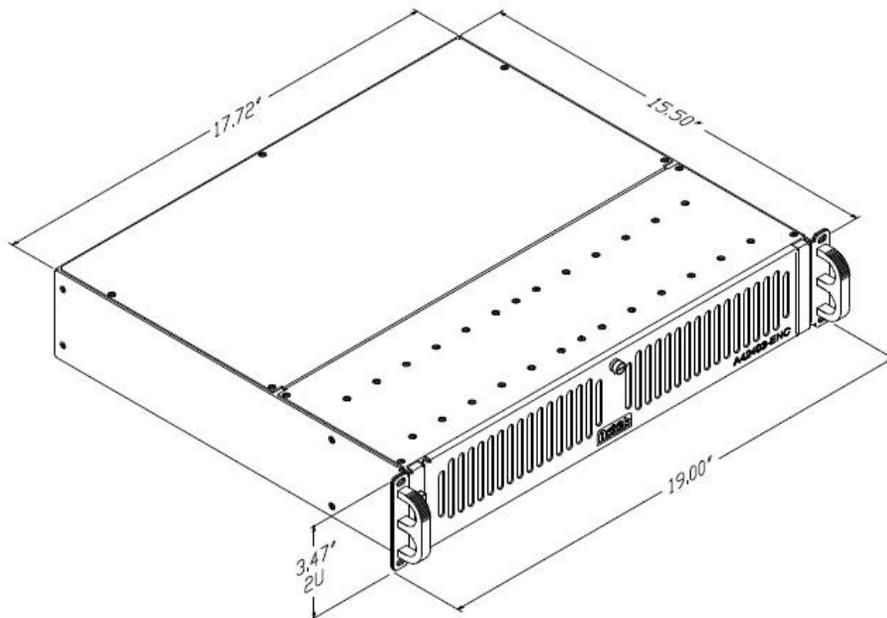
### Airflow

The A44812-ENC provides four fans to cool the board and chassis elements. By default all fan outputs will be configured for full speed operation at start. For information about software control over these fans, see the “A8S2XX16 Platform Developer’s Guide” document available separately from Astek.

#### CAUTION

Do not operate the A44812-ENC continuously without sufficient cooling. The default configuration does NOT support auto-shutdown due to exceeding thermal limits, and as such, damage may occur to your board if operated continuously without airflow.

### Mechanical Specifications



## 4 Troubleshooting

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### Diagnostics

The following diagnostic tests may be helpful in the event that the A44812-ENC board is not operating as expected.

- Verify that the front panel indicated LED shows power has been applied
- If this LED is off, and you are sure power is available to the chassis, check for a secondary hardware power ENCitch on the rear of the enclosure.
- Press and hold the power-on button for three (3) seconds, then release and wait thirty (30) seconds before depressing the power button again to attempt a hard power cycle.
- Remove the chassis panel covering the single-board computer to view the diagnostic LEDs located on the board:
- Verify that the green board heartbeat LED is blinking, this is D3 and is located near the DIMM slot.
- When connections are made to a SAS port, the green LED associated with the port should flicker and blink to indicate that communications are occurring.

### Support

For additional support, contact your Product Manager or email [support@astekcorp.com](mailto:support@astekcorp.com).

Astek can be contacted at (719) 260-1625 or toll-free at (800) 850-9055.