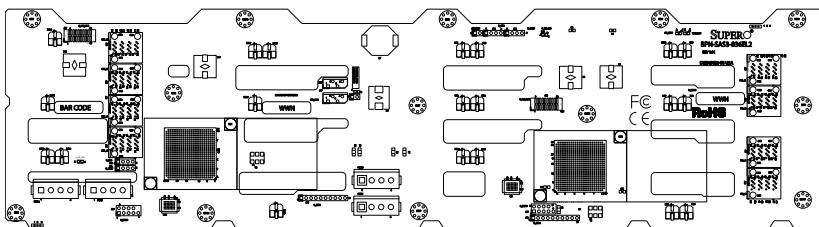


# SUPERO®



## BPN-SAS3-836EL Backplane

### USER'S GUIDE

1.0

The information in this User's Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. **Please Note: For the most up-to-date version of this manual, please see our web site at [www.supermicro.com](http://www.supermicro.com).**

Super Micro Computer, Inc. ("Supermicro") reserves the right to make changes to the product described in this manual at any time and without notice. This product, including software, if any, and documentation may not, in whole or in part, be copied, photocopied, reproduced, translated or reduced to any medium or machine without prior written consent.

IN NO EVENT WILL SUPERMICRO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, SPECULATIVE OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN PARTICULAR, SUPERMICRO SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA STORED OR USED WITH THE PRODUCT, INCLUDING THE COSTS OF REPAIRING, REPLACING, INTEGRATING, INSTALLING OR RECOVERING SUCH HARDWARE, SOFTWARE, OR DATA.

Any disputes arising between manufacturer and customer shall be governed by the laws of Santa Clara County in the State of California, USA. The State of California, County of Santa Clara shall be the exclusive venue for the resolution of any such disputes. Super Micro's total liability for all claims will not exceed the price paid for the hardware product.

FCC Statement: This equipment has been tested and found 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 a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"

---

**WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.**

---

Manual Revision 1.0  
Release Date: March 26, 2015

Unless you request and receive written permission from Super Micro Computer, Inc., you may not copy any part of this document.

Information in this document is subject to change without notice. Other products and companies referred to herein are trademarks or registered trademarks of their respective companies or mark holders.

Copyright © 2015 by Super Micro Computer, Inc.  
All rights reserved.

**Printed in the United States of America**

---



---

# Contents

Contacting Supermicro.....iv	iv
Returning Merchandise for Service.....v	v
<b>Chapter 1 Safety Guidelines</b>	
1-1 ESD Safety Guidelines .....	1-1
1-2 General Safety Guidelines .....	1-1
1-3 Version .....	1-2
<b>Chapter 2 Jumper Settings and Pin Definitions</b>	
2-1 Front Connectors Locations.....	2-1
2-2 Front Connector and Pin Definitions.....	2-2
2-3 Front Jumper Locations and Settings .....	2-3
Explanation of Jumpers .....	2-3
2-4 Front LED Indicators.....	2-4
2-5 Rear Connectors and LED Indicators.....	2-5
<b>Chapter 3 Dual Port and Cascading Configurations</b>	
3-1 Single and Dual Port Expanders.....	3-1
Single Ports.....	3-1
Dual Ports .....	3-1
3-2 Failover.....	3-2
Single Host Bus Adapter.....	3-2
Single Host Bus Adapter Failover.....	3-2
3-3 Failover with RAID Cards and Multiple HBAs .....	3-3
Dual Host Bus Adapter .....	3-3
Dual Host Bus Adapter Failover.....	3-3
3-4 Chassis Control Board.....	3-4
3-5 Support Cables .....	3-5
Connecting an Internal HBA to the Backplane .....	3-5
Supported Internal HBA Cables.....	3-6
Connecting an External HBA to the Backplane .....	3-7
Single External Host Bus Adapter .....	3-7
Dual External Host Bus Adapter .....	3-7
Connecting Multiple Backplanes in a Single Channel Environment.....	3-8
Single HBA Configuration Cables .....	3-9
Connecting Multiple Backplanes in a Dual Channel Environment .....	3-10

## Contacting Supermicro

### Headquarters

Address: Super Micro Computer, Inc.  
980 Rock Ave.  
San Jose, CA 95131 U.S.A.

Tel: +1 (408) 503-8000

Fax: +1 (408) 503-8008

Email: [marketing@supermicro.com](mailto:marketing@supermicro.com) (General Information)  
[support@supermicro.com](mailto:support@supermicro.com) (Technical Support)

Web Site: [www.supermicro.com](http://www.supermicro.com)

### Europe

Address: Super Micro Computer B.V.  
Het Sterrenbeeld 28, 5215 ML  
's-Hertogenbosch, The Netherlands

Tel: +31 (0) 73-6400390

Fax: +31 (0) 73-6416525

Email: [sales@supermicro.nl](mailto:sales@supermicro.nl) (General Information)  
[support@supermicro.nl](mailto:support@supermicro.nl) (Technical Support)  
[rma@supermicro.nl](mailto:rma@supermicro.nl) (Customer Support)

Web Site: [www.supermicro.nl](http://www.supermicro.nl)

### Asia-Pacific

Address: Super Micro Computer, Inc.  
3F, No. 150, Jian 1st Rd.  
Zhonghe Dist., New Taipei City 235  
Taiwan (R.O.C)

Tel: +886-(2) 8226-3990

Fax: +886-(2) 8226-3992

Email: [support@supermicro.com.tw](mailto:support@supermicro.com.tw)

Web Site: [www.supermicro.com.tw](http://www.supermicro.com.tw)

## Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (<http://www.supermicro.com/support/rma/>).

Whenever possible, repack the backplane in the original Supermicro box, using the original packaging materials. If these are no longer available, be sure to pack the backplane in an anti-static bag and inside the box. Make sure that there is enough packaging material surrounding the backplane so that it does not become damaged during shipping.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

## Notes

# Chapter 1

## Safety Guidelines

To avoid personal injury and property damage, carefully follow all the safety steps listed below when accessing your system or handling the components.

### 1-1 ESD Safety Guidelines

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the backplane by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the card and peripherals back into their antistatic bags when not in use.

### 1-2 General Safety Guidelines

- Always disconnect power cables before installing or removing any components from the computer, including the backplane.
- Disconnect the power cable before installing or removing any cables from the backplane.
- Make sure that the backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.

## 1-3 Version

The BPN-SAS3-836EL backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

This manual reflects SAS3-836EL1 and SAS3-836EL2 Revision 1.01, the most current release available at the time of publication. Always refer to the Supermicro Web site at [www.supermicro.com](http://www.supermicro.com) for the latest updates, compatible parts and supported configurations.

All images and layouts in this user's guide are based upon the latest PCB revision available at the time of publishing. The backplane you have received may not look exactly the same as the graphics in this manual.



## Chapter 2

### Jumper Settings and Pin Definitions

#### 2-1 Front Connectors Locations

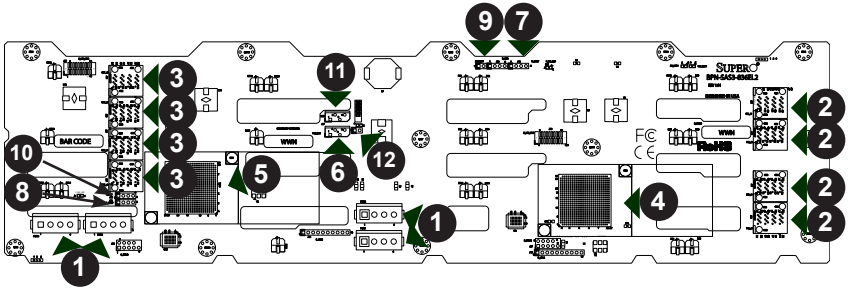


Figure 2-1. Front Connectors

- |                                                                                         |                                                   |
|-----------------------------------------------------------------------------------------|---------------------------------------------------|
| 1. Power connectors: PWR1, PWR2, PWR3 and PWR4 (4-pin)                                  | 6. I <sup>2</sup> C connector: PRI_I2C1 (4-pin)   |
| 2. Primary SAS connectors: PRI_J0 (J20), PRI_J1 (J21), PRI_J2 (J22), and PRI_J3 (J23)   | 7. Primary UART connector: UART_P1 (J19; 4-pin)   |
| 3. Secondary SAS connectors: SEC_J0 (J30), SEC_J1 (J31), SEC_J2 (J32), and SEC_J3 (J33) | 8. Secondary UART connector: UART_S1 (J35; 4-pin) |
| 4. Primary expander chip                                                                | 9. Primary SDB (J24, 4-pin)                       |
| 5. Secondary expander chip                                                              | 10. Secondary SDB (J36, 4-pin)                    |
|                                                                                         | 11. SMB connector: JBOD controller (J17, 4-pin)   |
|                                                                                         | 12. Overheat_Fail2 (2-pin)                        |

## 2-2 Front Connector and Pin Definitions

### 1. Backplane Main Power Connectors

The 4-pin connectors, designated PWR1, PWR2, PWR3 and PWR4, provide power to the backplane. See the table on the right for pin definitions.

Backplane Main Power 4-Pin Connector	
Pin#	Definition
1	+12V
2 and 3	Ground
4	+5V

### 2-3. SAS Connectors

The primary and secondary sets of SAS connectors provide expander features including cascading and failover.

### 4-5. Expander Chips

These primary and secondary expander chips allow the backplane to support dual ports, cascading, and failover.

### 6-10. I<sup>2</sup>C Connector, UART Connectors, SDB Connectors

The I<sup>2</sup>C connector, the UART connectors, and the SDB connectors are for manufacturing diagnostic purposes only.

### 11. SMB Connector

This header provides for a connection with an optional JBOD controller board.

### 12. OVERHEAT\_FAIL2 Connector

This header can be connected to an external overhear LED, if desired.

## 2-3 Front Jumper Locations and Settings

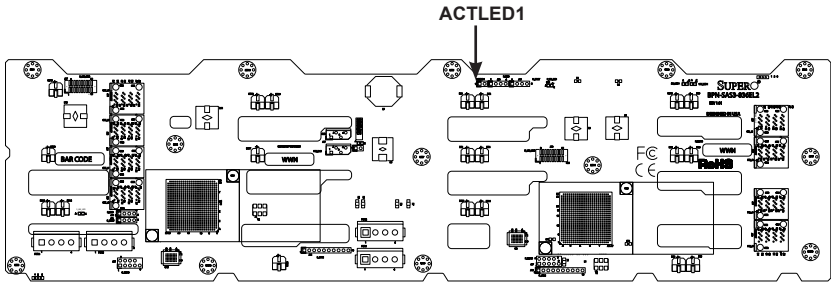
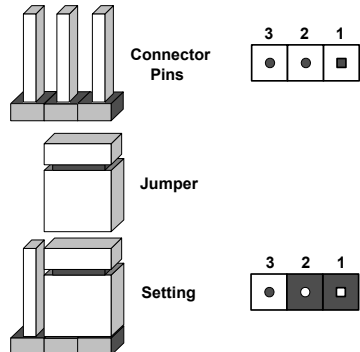


Figure 2-2. Front Jumper Locations and Settings

General Jumper Settings		
Jumper	Jumper Settings	Note
ACTLED1	Open: Disabled (Default) Closed: Enabled	Activity LED testing (Supermicro internal use only)

### Explanation of Jumpers

To modify the operation of the backplane, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



## 2-4 Front LED Indicators

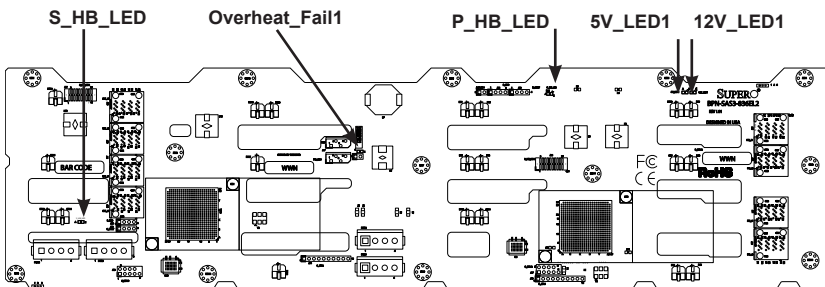


Figure 2-3. Front LEDs

Front LEDs		
LED	Normal State	Specification
S_HB_LED	Blinking	Secondary expander heartbeat indicator
OVERHEAT_FAIL1	Off	System overheating
P_HB_LED	Blinking	Primary expander heartbeat indicator
5V_LED1	On	5V power LED
12v_LED1	On	12V power LED

## 2-5 Rear Connectors and LED Indicators

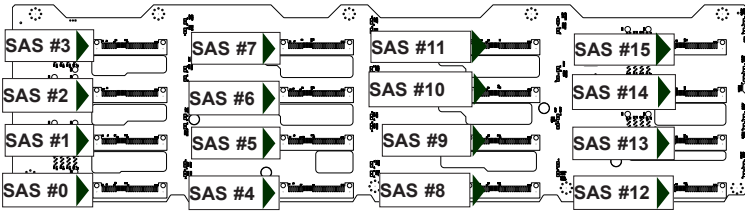


Figure 2-4. Rear Connectors

Rear SAS/SATA Connectors	
Rear Connector	SAS/SATA Drive Number
SAS #0	SAS/SATA HDD #0
SAS #1	SAS/SATA HDD #1
SAS #2	SAS/SATA HDD #2
SAS #3	SAS/SATA HDD #3
SAS #4	SAS/SATA HDD #4
SAS #5	SAS/SATA HDD #5
SAS #6	SAS/SATA HDD #6
SAS #7	SAS/SATA HDD #7
SAS #8	SAS/SATA HDD #8
SAS #9	SAS/SATA HDD #9
SAS #10	SAS/SATA HDD #10
SAS #11	SAS/SATA HDD #11
SAS #12	SAS/SATA HDD #12
SAS #13	SAS/SATA HDD #13
SAS #14	SAS/SATA HDD #14
SAS #15	SAS/SATA HDD #15

<b>Rear LED Indicators</b>		
<b>Rear Connector</b>	<b>Hard Drive Activity LED</b>	<b>Failure LED</b>
SAS #0	ACT #0	FAIL #0
SAS #1	ACT #1	FAIL #1
SAS #2	ACT #2	FAIL #2
SAS #3	ACT #3	FAIL #3
SAS #4	ACT #4	FAIL #4
SAS #5	ACT #5	FAIL #5
SAS #6	ACT #6	FAIL #6
SAS #7	ACT #7	FAIL #7
SAS #8	ACT #8	FAIL #8
SAS #9	ACT #9	FAIL #9
SAS #10	ACT #10	FAIL #10
SAS #11	ACT #11	FAIL #11
SAS #12	ACT #12	FAIL #12
SAS #13	ACT #13	FAIL #13
SAS #14	ACT #14	FAIL #14
SAS #15	ACT #15	FAIL #15

## Chapter 3

### Dual Port and Cascading Configurations

#### 3-1 Single and Dual Port Expanders

SAS connectors PRI-J1 to J4 and SEC-J1 to J4 are bidirectional and can be treated as input or output.

##### Single Ports

BPN-SAS3-836EL1 backplanes have a single port expander that accesses all of the drives and supports cascading.

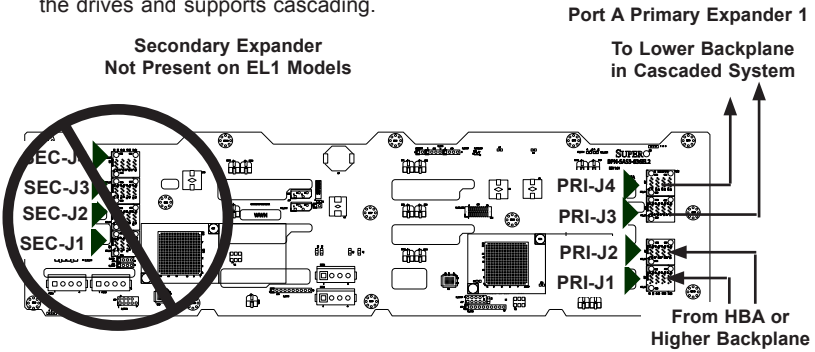


Figure 3-1. BPN-SAS3-836EL1 Single Port Configuration

##### Dual Ports

BPN-SAS3-836EL2 model backplanes have dual-port expanders that access all of the hard drives. These dual-port expanders support cascading, failover, and recovery.

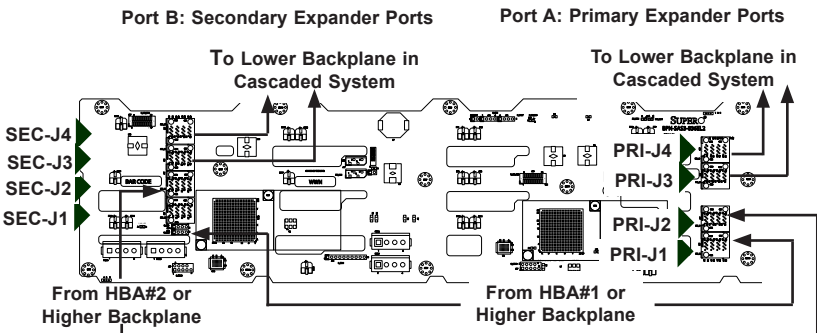


Figure 3-2. BPN-SAS3-836EL2 Dual Port Configuration

### 3-2 Failover

The BPN-SAS3-836EL2 model backplane has two expanders which enable effective failover and recovery.

#### Single Host Bus Adapter

In a single host bus configuration, the backplane connects to one host bus adapter.

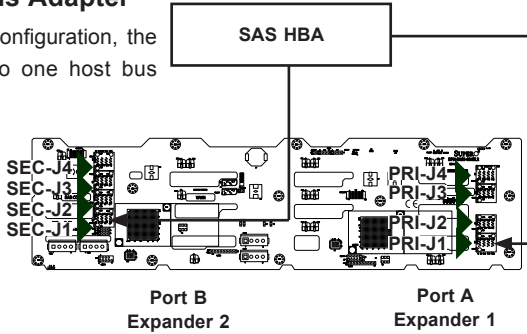


Figure 3-3. Single HBA

#### Single Host Bus Adapter Failover

If the expander or data path in Port A fails, the system automatically switches to Port B with application software or failover support.

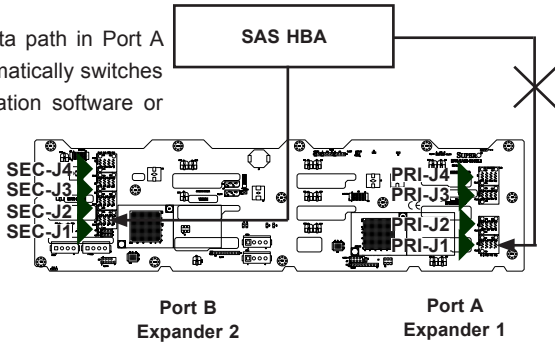


Figure 3-4. Single HBA Failover



### 3-3 Failover with RAID Cards and Multiple HBAs

The BPN-SAS3-836EL backplane may be configured for failover with multiple HBAs using either RAID controllers or HBAs to achieve failover protection.

**RAID Controllers:** If RAID controllers are used, then the failover is accomplished through port failover on the same RAID card.

**HBAs:** If multiple HBAs are used to achieve failover protection and load balancing, Linux MPIO software must be installed and correctly configured to perform the load balancing and failover tasks.

#### Dual Host Bus Adapter

In a dual host bus configuration, the backplane connects to two HBAs.

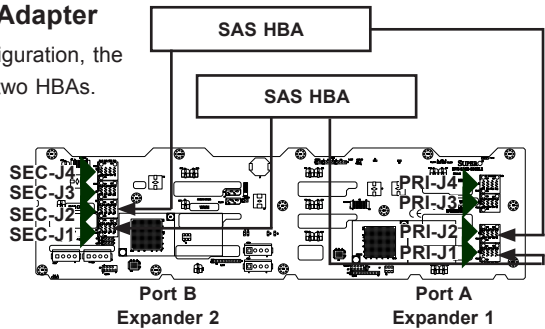


Figure 3-5. Dual HBA

#### Dual Host Bus Adapter Failover

If the expander or data path in Port A fails, the system automatically switches to Port B. This maintains a full connection to all drives.

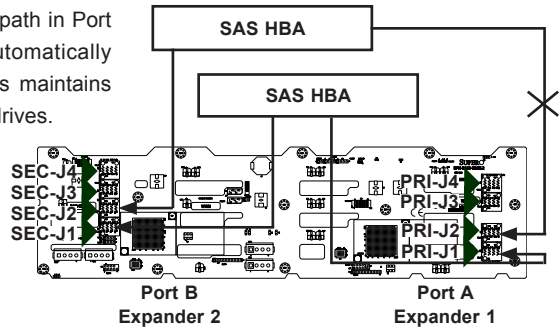


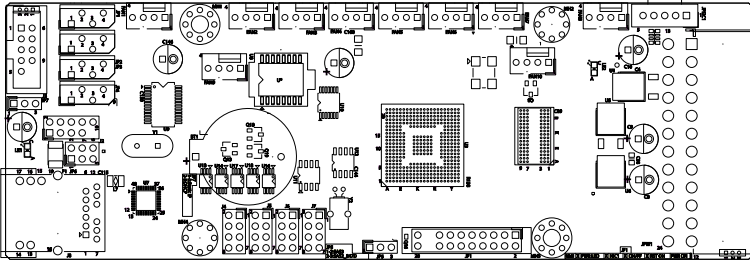
Figure 3-6. Dual HBA Failover

**Important:** For RAID controllers, redundancy is achieved through port failover. For multiple HBAs MPIO software is required to achieve failover protection.

### 3-4 Chassis Control Board

In a cascaded configuration, the first chassis includes a motherboard and at least one host bus adapter (HBA). Other JBODs in this enclosed system must be equipped with a control card. This section describes the supported control board for the BPN-SAS3-826EL series backplane.

For more information, see the Supermicro web site at [www.supermicro.com](http://www.supermicro.com).



**Figure 3-7. Chassis Control Board (Sold Separately)**

Power Card		
Part Number	Part Type	Where Used
CSE-PTJBOD-CB3	Control Board	Allows the chassis to be used as a JBOD (Just a Bunch of Disks) system, which supports IPMI for remote on/off control.

## 3-5 Support Cables

### Connecting an Internal HBA to the Backplane

The following section lists the most common cables used to connect the HBA to the backplane.

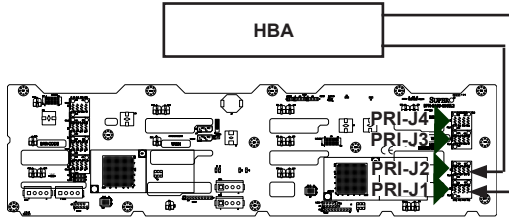


Figure 3-8. Single Internal Host Bus Adapter

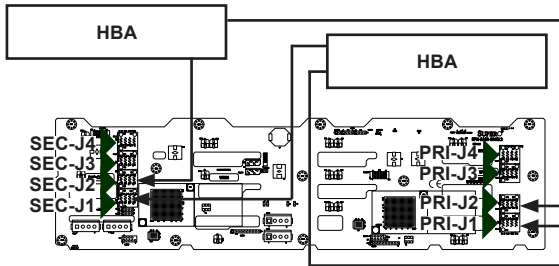


Figure 3-9. Dual Internal Host Bus Adapter

**IMPORTANT:** See Section 3-3 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.

## Supported Internal HBA Cables

Use the following cables to create connections between the internal HBA and BPN-SAS3-826EL model backplane. The cables required depend upon the HBA connector.

**Cable Name:** Internal iPass (Mini-SAS) to HD (Mini-SAS)

**Part #:** CBL-SAST-0508-01                      **Length:** 50 cm (19 inches)

**Part #:** CBL-SAST-0507-01                      **Length:** 80 cm (31 inches)

Description: This cable has an iPass (SFF-8087/Mini-SAS) connector (36-pin) at one end and a Mini-SAS HD (SFF-8643) connector at the other end. It connects from the SAS2 HBA to the BPN-SAS3-826EL model backplane.

**Cable Name:** Internal HD (Mini-SAS) to HD (Mini-SAS)

**Part #:** CBL-SAST-0568                      **Length:** 35 cm (13 inches)

**Part #:** CBL-SAST-0593                      **Length:** 60 cm (23 inches)

Description: This cable has a Mini-SAS HD (SFF-8643) connector at both ends. It connects from the SAS3 HBA to the BPN-SAS2-826EL model backplane.

## Connecting an External HBA to the Backplane

This backplane supports external host bus adapters. In this configuration, the HBA and the backplane are in different physical chassis. This allows a JBOD (Just a Bunch Of Disks) configuration from an existing system.

### Single External Host Bus Adapter

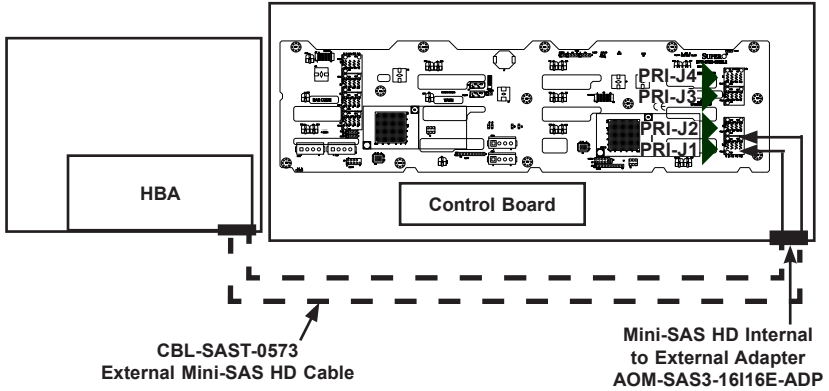


Figure 3-10. Single External Host Adapter

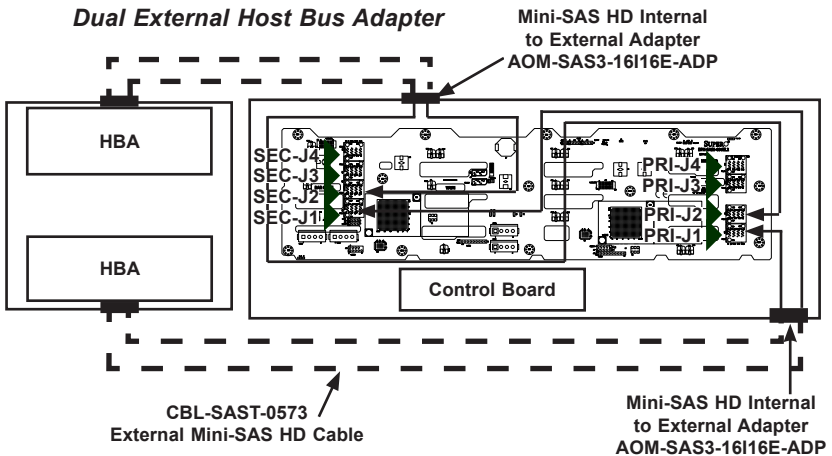


Figure 3-11. Dual External Host Bus Adapter

**IMPORTANT:** See Section 3-3 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.

## Connecting Multiple Backplanes in a Single Channel Environment

This section describes the cables used when cascading from a single HBA. These connections use CBL-SAST-0531 internal cables and CBL-SAST-0573 external cables.

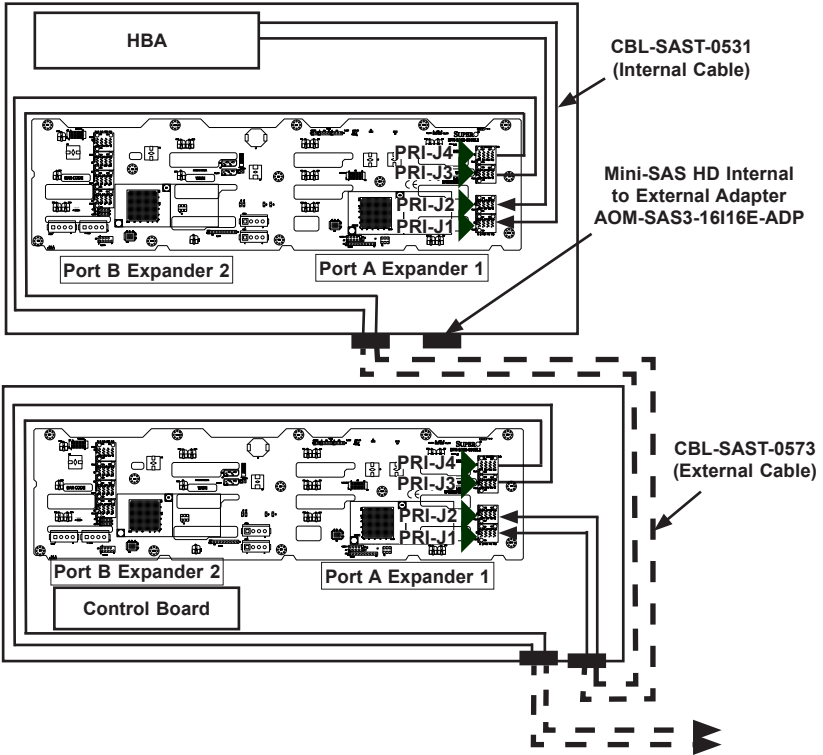


Figure 3-13. Single HBA Configuration

## Single HBA Configuration Cables



**Figure 3-14:** External Mini-SAS HD to External Mini-SAS HD Cable

**Cable Name:** 1 Meter External Mini-SAS HD to External Mini-SAS HD Cable

**Part #:** CBL-SAST-0573

**Ports:** Single

**Placement:** External Cable

**Description:** External cascading cable, connects ports between servers and JBODs.



**Figure 3-15:** Mini-SAS HD Internal to External Adapter

**Cable Name:** 16-port Mini-SAS HD Internal to External Cable Adapter with LP Bracket

**Part #:** AOM-SAS3-16I16E-ADP-LP

**Ports:** Four wide-ports (sixteen ports total)

**Placement:** Internal cable with adapter

**Description:** Internal cable, connects the SAS3 backplane to external ports.

## Connecting Multiple Backplanes in a Dual Channel Environment

This section describes the cables used when cascading from dual HBAs. These connections use CBL-SAST-0531 internal cables and CBL-SAST-0573 external cables.

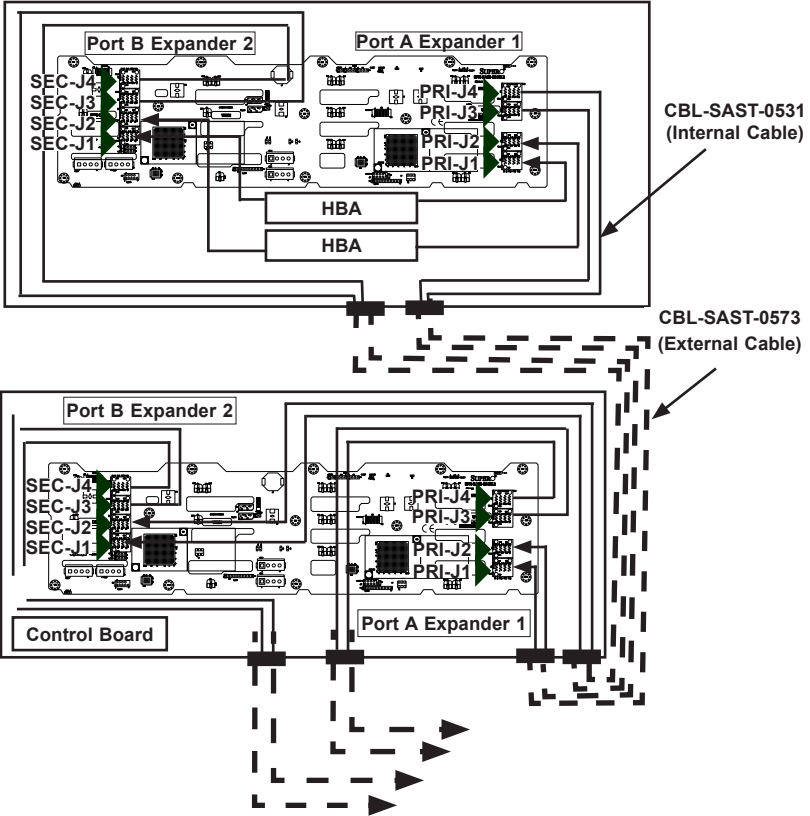


Figure 3-16. Dual HBA Configuration

**IMPORTANT:** See Section 3-3 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.



## Notes

Disclaimer (cont.)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.