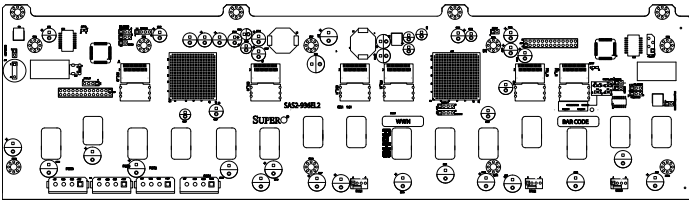




BPN-SAS2-936EL1/EL2



## USER'S GUIDE

1.0b

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**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.**

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## 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 SAS2-936EL series backplane.
- Make sure that the backplane is properly and securely on the motherboard to prevent damage to the system due to power outages.

## **1-3 An Important Note to Users**

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

## **1-4 Introduction to the SAS2-936EL Backplane**

The SAS2-936EL backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

This manual reflects SAS2-936EL 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.



## Chapter 2

### Connectors, Jumper and LEDs

#### 2-1 Front Connectors and Jumpers

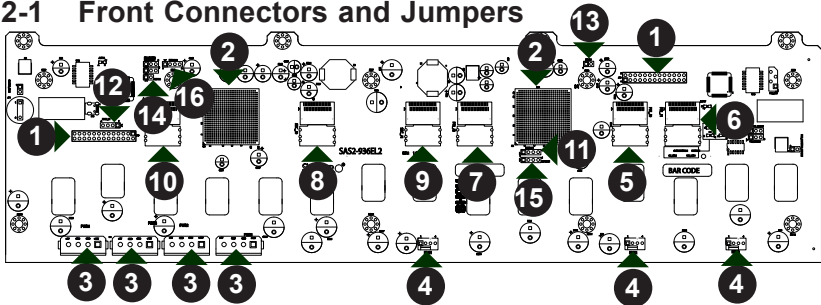


Figure 2-1: SAS2-936EL2 Connectors and Components

#### Front Connectors

- |   |  |
|---|--|
| 1. EPP connectors: J16 and J19  | 10. Secondary SAS connector: SEC_J2 (not available on EL1 single port backplane)               |
| 2. Primary and secondary expander chips   | 11. Primary UART connector: UART_P1 (no jumper required)                                       |
| 3. Power connectors: PWR1, PWR2, PWR3 and PWR4                                  | 12. Secondary UART connector: UART_S1 (no jumper required, not present on SAS2-936EL1)         |
| 4. Fan connectors: Fan1, Fan2, and Fan3   | 13. Primary MDIO connector: MDIO1 (Supermicro internal use only)                               |
| 5. Primary SAS connector: PRI_J0  | 14. Secondary MDIO connector: MDIO2 (Supermicro internal use only, not present on SAS2-936EL1) |
| 6. Primary SAS connector: PRI_J1  | 15. Primary debug connector: EXPDGB1 (Supermicro internal use only)                            |
| 7. Primary SAS connector: PRI_J2  | 16. Secondary debug connector: EXPDGB1 (Supermicro internal use only)                          |
| 8. Secondary SAS connector: SEC_J0 (not available on EL1 single port backplane) |  |
| 9. Secondary SAS connector: SEC_J1 (not available on EL1 single port backplane) |  |

## 2-2 Front Connector and Pin Definitions

### 1. EPP Ports

The EPP ports are used for manufacturer's diagnostic purposes only.

### 2. Primary and Secondary Expander Chips

This primary and secondary expander chips allow the backplane to support dual port, cascading, and failover configurations.

### 3. 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

### 4. Fan Connectors

The 4-pin connectors, designated Fan1, Fan2, and Fan3, provide power to the fans. See the table on the right for pin definitions.

Fan Connectors	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	No connection

### 5. - 10. SAS Ports

Primary and secondary SAS ports.

### 11. - 12. UART Connectors

Primary and secondary UART connectors. No jumper required. Secondary UART connector is not present on the SAS2-936EL1 backplane.

### 13. - 14. MDIO Connectors

Primary and secondary MDIO connectors. For Supermicro internal use only. Secondary MDIO connector is not present on the SAS2-936EL1 backplane.

### 15. - 16. Debug Connectors

Primary and secondary debug connectors. For Supermicro internal use only. Secondary debug connector is not present on the SAS2-936EL1 backplane.

## 2-3 Front Jumper Locations and Pin Definitions

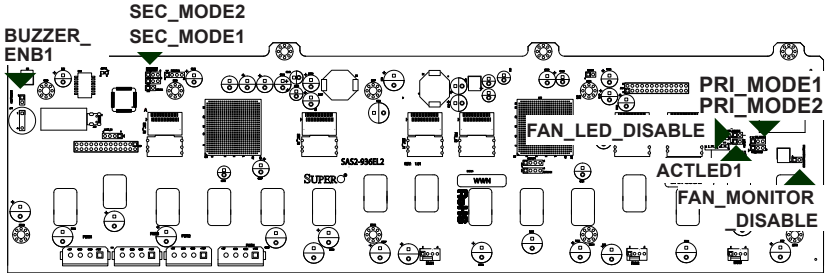
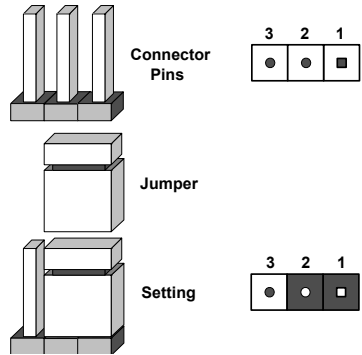


Figure 2-3: Front Jumpers

### 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.



General Jumper Settings		
Jumper	Jumper Settings	Note
PRI_MODE1	2-3	Factory setting do not change
PRI_MODE2	2-3	Factory setting do not change
SEC_MODE1	2-3	Factory setting do not change
SEC_MODE2	2-3	Factory setting do not change
FAN_MONITOR_DISABLE	Open: Enabled (Default) Closed: Disabled	Fan monitor reports
FAN_LED_DISABLE	Closed (Default)	Turns off the FANFAIL1 LED
BUZZER_ENB1	Open: Disable Closed: Enable (Default)	Buzzer disabled* Buzzer enabled*

\*The buzzer sound indicates that a condition requiring immediate attention has occurred.

***The buzzer alarm is triggered by the following conditions:***

1. Hard drive failure
2. Fan failure
3. System temperature over 45° Celsius.

Early versions of Supermicro SAS2 backplanes come equipped with a buzzer. New versions of these backplanes no longer support a buzzer. We recommend using the LSI MegaRAID Storage Manager or a similar management application to trigger an email alert instead.

## Front LED Indicators

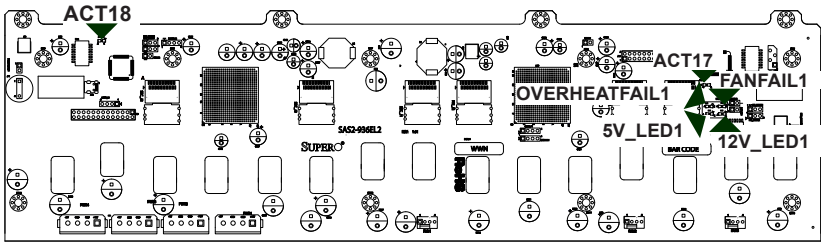


Figure 2-4: Front LEDs

Backplane LEDs		
LED	State	Specification
OVERHEATFAIL1	On	Overheat or drive failure
FANFAIL1	On	System fan failure
ACT17	On	Primary Ethernet Tx activity LED
ACT18	On	Secondary Ethernet Tx activity LED
5V_LED1	Off	Backplane power failure. Light is on during normal operation.
12V_LED1	Off	Backplane power failure. Light is on during normal operation.

## 2-4 Rear Connectors and LED Indicators

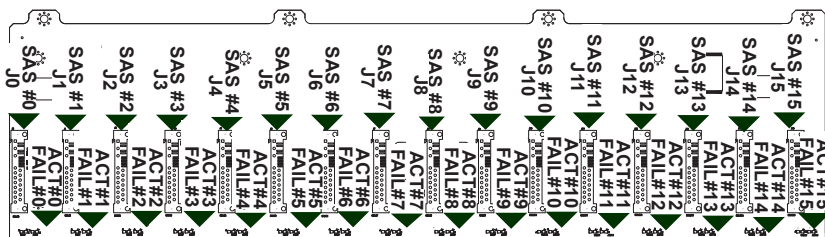


Figure 2-5: Rear Connectors and LEDs

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

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

## Chapter 3

### Dual Port and Cascading Configurations

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

##### Single Ports

SAS2-936EL1 backplanes have a single-port expander that accesses all drives and supports cascading.

##### Dual Ports

SAS2-936EL2 backplanes have dual-port expanders that access all drives. These dual-port expanders support cascading, failover, and recovery.

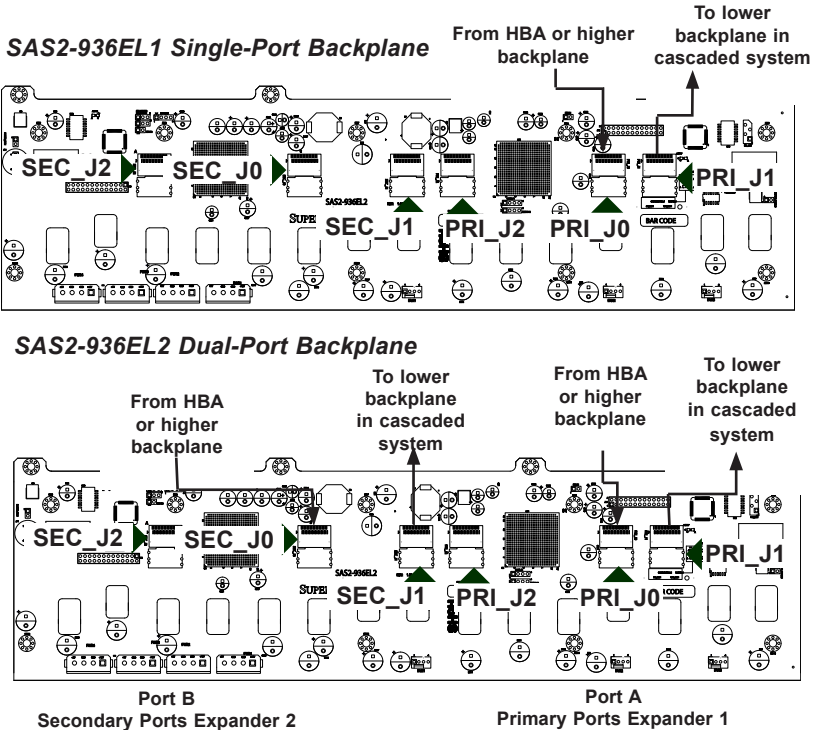


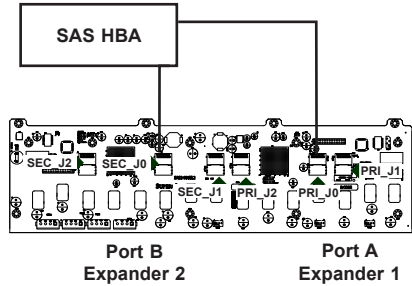
Figure 3-1: Single and Dual Port Expanders

### 3-2 Failover

The SAS2-936EL2 backplane has two expanders which allow effective failover and recovery.

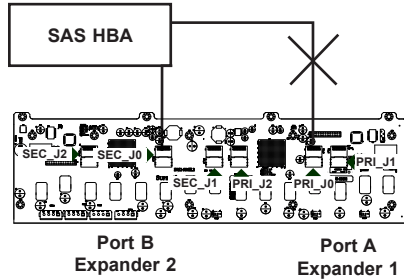
#### Single Host Bus Adapter

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



#### Single Host Bus Adapter Failover

If the expander or data path in Port A fails, the system will automatically fail over to Port B.





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

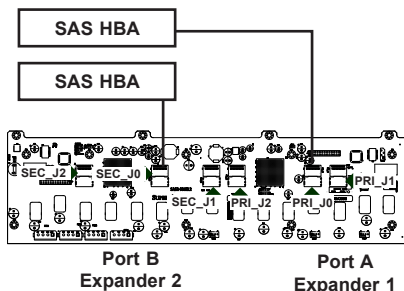
The SAS-936EL backplane may be configured for failover with multiple HBAs using either RAID controllers or HBAs to achieve failover protection.

**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.**

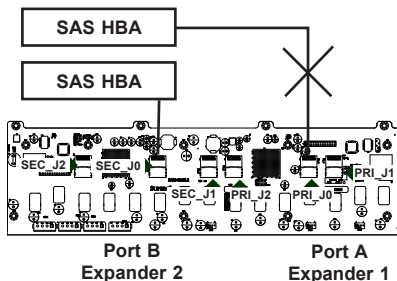
#### Dual Host Bus Adapter

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



#### Dual Host Bus Adapter Failover

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



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

## 3-4 Cables and Chassis Power Card

### Chassis Power Card

In a cascaded configuration, the first chassis includes a motherboard and at least one host bus adapter. Other servers in this enclosed system include a power card. This section describes the supported power card for the SAS2-936EL backplane system.

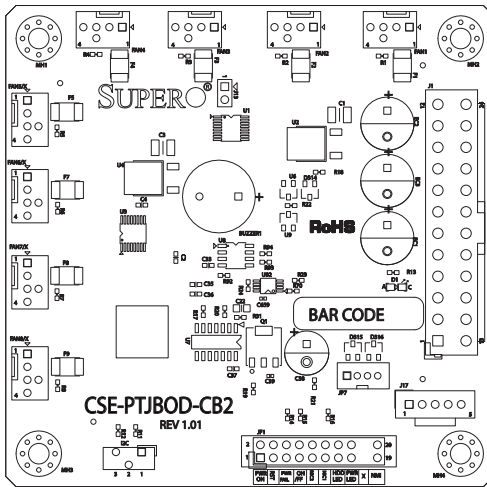


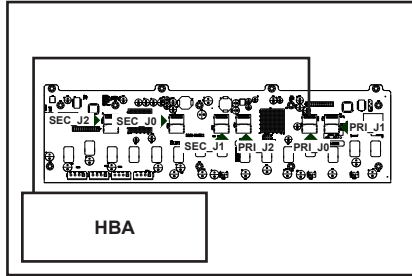
Figure 3-2: The CSE-PTJBOD-CB2 Power Card

Power Card		
Part Number	Part Type	Where Used
CSE-PTJBOD-CB2	Power Card	Allows the chassis to be used as a JBOD (Just a Bunch of Drives) system.

## Connecting an Internal Host Bus Adapter to the Backplane

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

### *Single Internal Host Bus Adapter*



### *Dual Internal Host Bus Adapter*

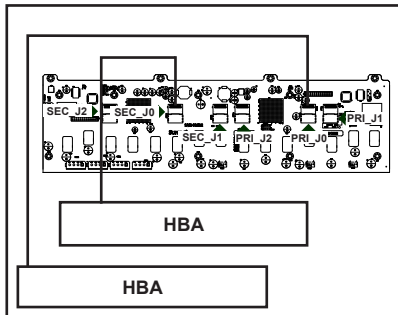


Figure 3-3: Connecting to Single and Dual Internal HBAs

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

## Supported Internal HBA to Backplane Cables

Use the following listed cables to create connections between the internal HBA and backplane. The cables required depend on the HBA connector.

**Cable Name:** iPass TO 4-LANE

**Part #:** CBL-0117

**Length:** 46 cm (18 inches)

**Description:** This cable has one SFF-8484 (32-pin) connector on one end and an iPass (SFF-8087/Mini-SAS) connector (36-pin) at the other. This cable connects from the HBA to the SAS2-936EL backplane.

**Cable Name:** SFF-8087 (Mini-SAS) TO SFF-8087 (Mini SAS)

**Part #:** CBL-0108L-02

**Length:** 39 cm (15 inches)

**Part #:** CBL-0109L-02

**Length:** 22 cm (9 inches)

**Part #:** CBL-0110L-02

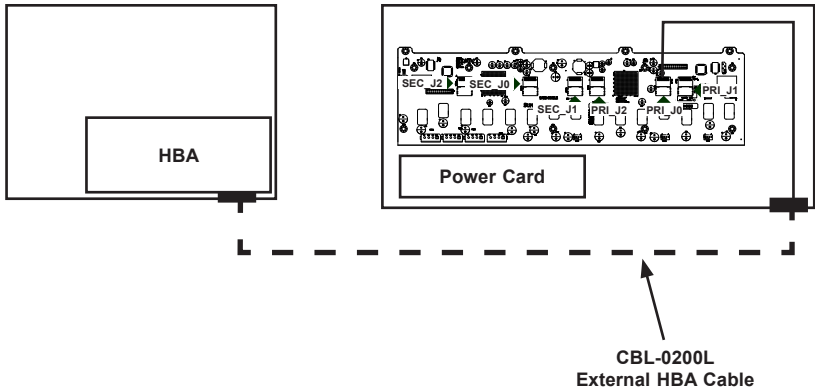
**Length:** 18 cm (7 inches)

**Description:** This cable has an iPass (SFF-8087/Mini-SAS) connector (36-pin) at each end. It connects from the HBA to the SAS2-936EL backplane.

## Connecting an External Host Bus Adapter to the Backplane

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

### Single External Host Bus Adapter



### Dual External Host Bus Adapter

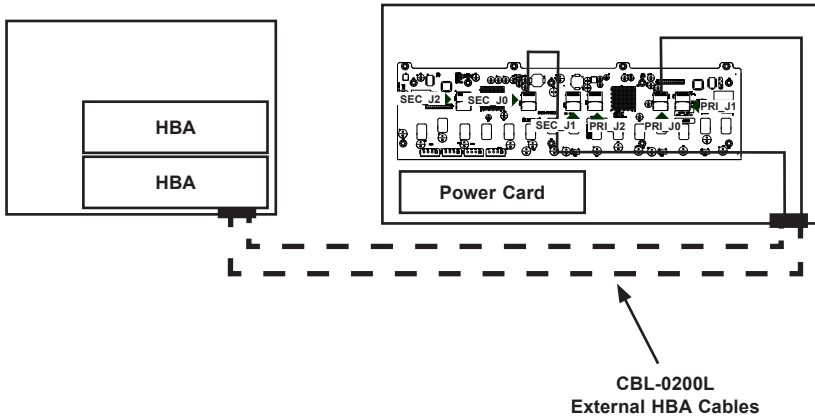


Figure 3-4: Connecting Single and Dual External HBAs

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

## Supported External HBA to Backplane Cable

Use the following cable if your external HBA has an InfiniBand connector.



**Figure 3-5: The CBL-0200L Cable**

**Cable Name:** SAS InfiniBand to Mini-SAS X4 1M cable, PBF.

**Part #:** CBL-0200L

**Length:** 1 meter

**Description:** This cable has an InfiniBand connector (SFF-8470) on one end and an SFF-8088-1X (26-pin) at the other end.

## Connecting Multiple Backplanes in a Single Channel Environment

This section describes the cables used when cascading from a single HBA. These connections use CBL-0167L internal cables and CBL-0166L external cables.

### Single HBA Configuration

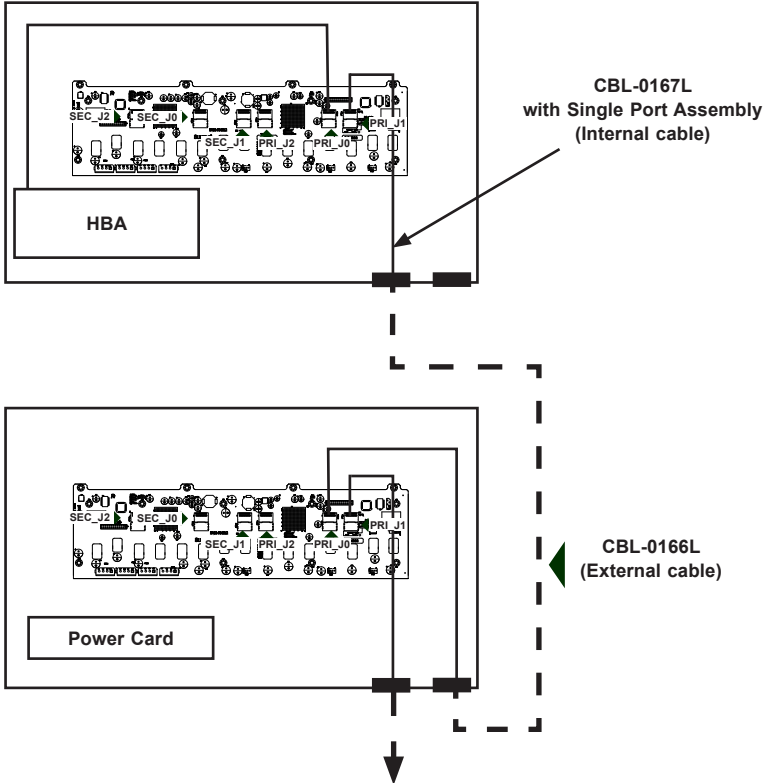


Figure 3-6: Single HBA Configuration

## Single HBA Configuration Cables

### Single Port Cable Assembly

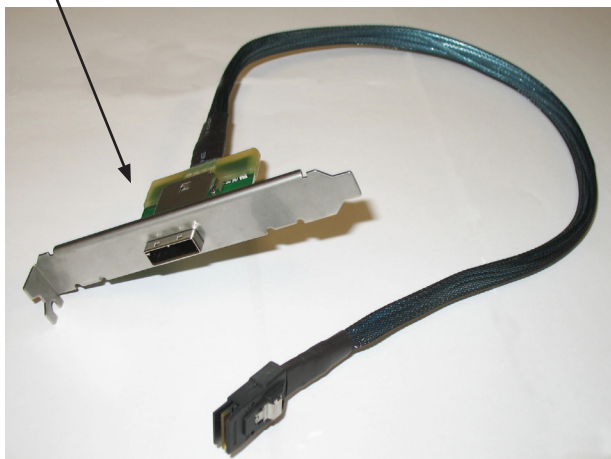


Figure 3-7: The CBL-0167L Cable

**Cable Name:** SAS EL2/EL1 Backplane Cable (Internal) w/ 2-port Cascading Cable, 68 cm

**Part #:** CBL-0167L (SFF-8087 to SFF-8088 x1)

**Ports:** Single

**Placement:** Internal cable

**Description:** Internal cable. Connects the backplane to the host bus adapter or external port. Used in single port environments.



Figure 3-8: The CBL-0166L Cable

**Cable Name:** SAS EL2/EL1 Cascading Cable (External), 68 cm

**Part #:** CBL-0166L (SFF-8088 x1 to SFF-8088 x1)

**Ports:** Single or Dual

**Placement:** External cable

**Description:** External cascading cable. Connects ports between servers. With most connectors, use one cable for single port connections and two cables for dual port connections.



## Connecting Multiple Backplanes in a Dual Channel Environment

This section describes the cables used when cascading from a single HBA. These connections use CBL-0168L internal cables and CBL-0166L external cables.

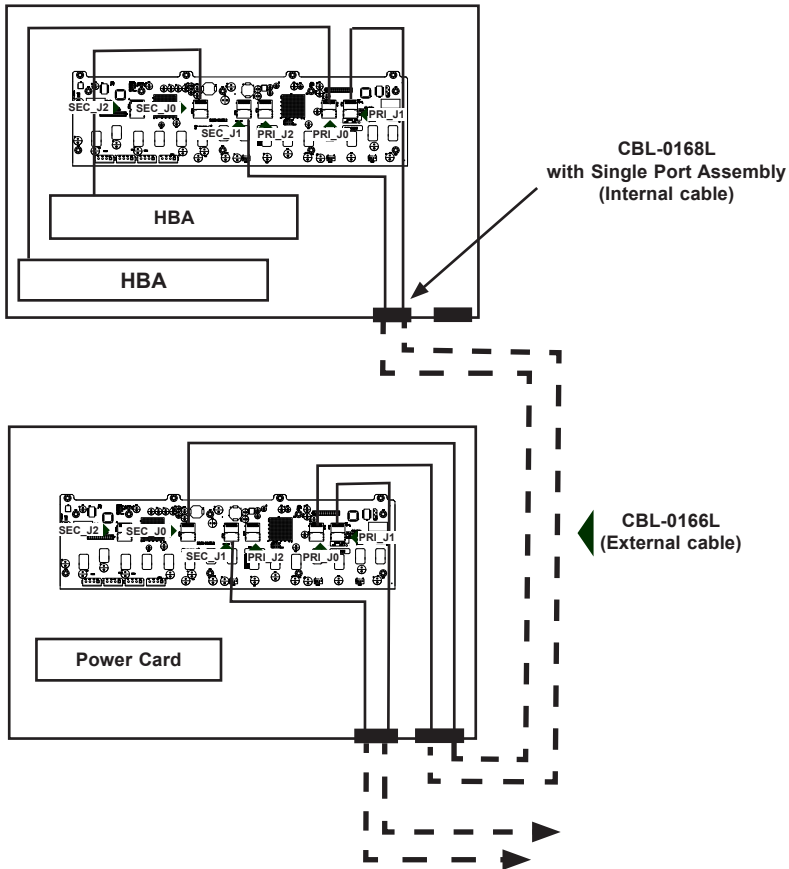


Figure 3-9: Connecting Multiple Backplanes when using Dual Channels

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

## Dual HBA Configuration Cables

Dual Port Cable  
Assembly



**Figure 3-10** The CBL-0168L Cable

**Cable Name:** SAS Dual-port Cable Assembly, 68/76 cm

**Part #:** CBL-0168L (SFF-8087 to SFF-8088 x2)

**Ports:** Dual

**Placement:** Internal cable

**Description:** Internal cascading cable. Connects the backplane to the host bus adapter or external port. Used in dual port environments.



**Figure 3-11** The CBL-0166L Cable

**Cable Name:** SAS EL2/EL1 Cascading Cable (External), 68cm

**Part #:** CBL-0166L (SFF-8088 x1 to SFF-8088 x1)

**Ports:** Single or dual

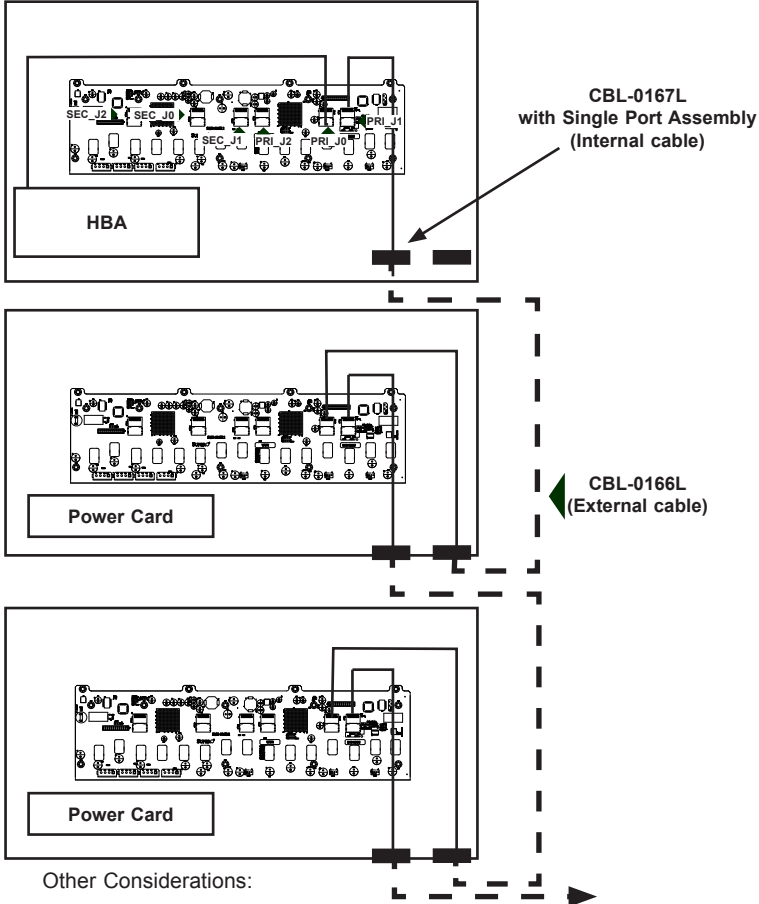
**Placement:** External cable

**Description:** External cascading cable. Connects ports between servers. Use one cable for single port connections and two cables for dual port connections.

### 3-5 Supported Cascading Configuration

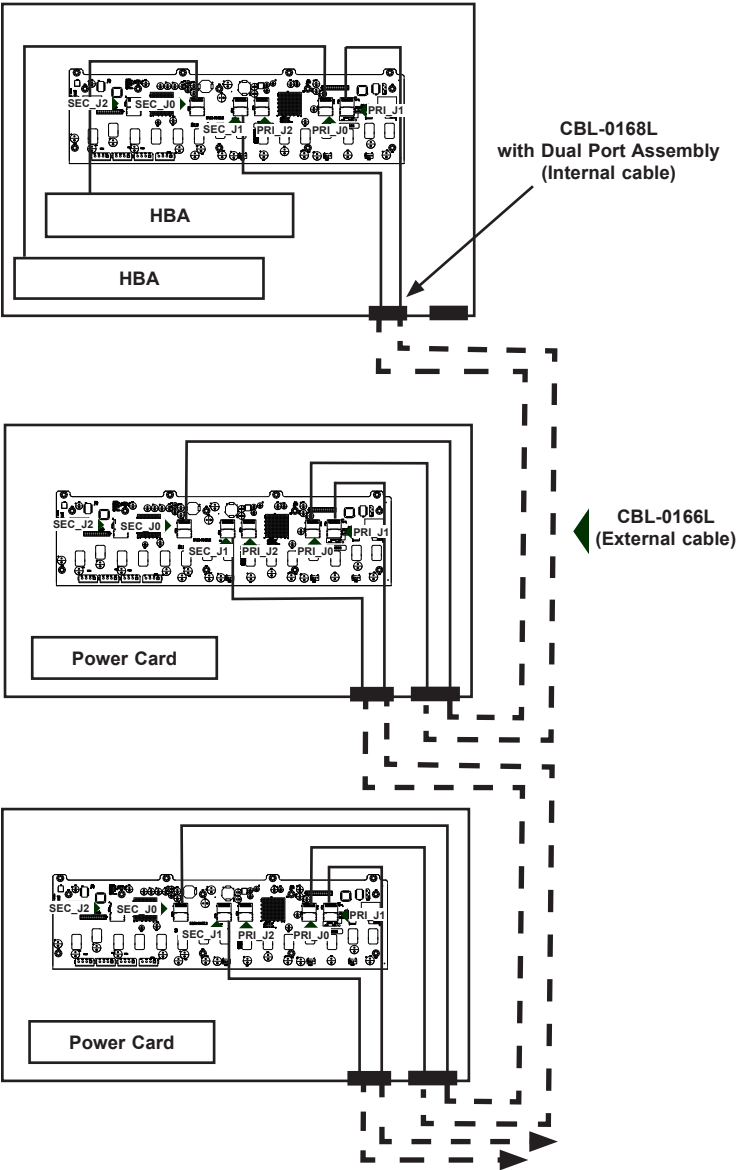
Cascading allows the system to access data at a faster rate by allowing several backplanes to share resources to reduce latency time.

The first backplane in a cascaded system requires a HBA hosted with a motherboard. Other servers require only a power control card without an HBA and without a motherboard.



- Cascading supports up to one hundred twenty-two hard drives.
- Use the same cables for all single port configurations.
- See page 3-7 if your HBA is external to your backplane.

### Server System with Dual SAS HBA and Cascading 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.)

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