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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.
Chapter 1

Guidelines

This chapter offers guidelines for personal and equipment safety, and notes about the BPN-SAS2-836EL version documented in this manual.

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 Information

The BPN-SAS2-836EL backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance. This manual reflects BPN-SAS2-836EL, Revision 1.03, the most current release available at the time of publication. Refer to the Supermicro Web site at www.supermicro.com for the latest updates, compatible parts and supported configurations.
2-1 Rear Connectors

1. Primary I²C connector: PRI_I2C1
2. Power connectors: PWR1, PWR2, PWR3 and PWR4
3. Primary expander chip
4. Secondary expander chip (Not available on SAS2-836EL1 backplane)
5. EPP connectors: J16 and J19
6. Fan connectors: FAN1, FAN2 and FAN3
7. Primary SAS connector: PRI_J1
8. Primary SAS connector: PRI_J2
9. Primary SAS connector: PRI_J3
10. Secondary SAS connector: SEC_J1 (Not available on SAS2-836EL1 backplane)
11. Secondary SAS connector SEC_J2 (Not available on SAS2-836EL1 backplane)
12. Secondary SAS connector SEC_J3 (Not available on SAS2-836EL1 backplane)
13. Primary UART connector: UART_P1 (Manufacturer's use only)
14. Secondary UART connector: UART_S1 (Manufacturer's use only, not present on SAS2-836EL1 backplane)
15. Primary debug connector: EXPDBG1 (Manufacturer's use only)
16. Secondary debug connector: EXPDBG2 (Manufacturer's use only, not present on SAS2-836EL1 backplane)
17. Primary MDIO connector: MDIO1 (Manufacturer's use only)
18. Secondary MDIO connector: MDIO2 (Manufacturer's use only, not present on SAS2-836EL1 backplane)
2-2 Rear Connector and Pin Definitions

1. Primary I^2C Connector
   The I^2C connector is used to monitor the power supply status and to control the fans. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>I^2C Connector Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

2. 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.

<table>
<thead>
<tr>
<th>Backplane Main Power 4-Pin Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2 and 3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

3. and 4. Primary and Secondary Expander Chips
   These primary and secondary expander chips allow the backplane to support dual ports, cascading, and failover.

5. EPP Ports
   The EPP ports are used for manufacturer diagnostic purposes only.
6. Fan Connectors
   The 4-pin connectors, designated FAN1 through FAN3, provide power to the fans. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Fan Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

7. - 12. SAS Connectors
   The primary and secondary sets of SAS connectors provide expander features including cascading and failover. From right to left the ports are Primary 1, Primary 2, Primary 3 and Secondary 1, Secondary 2 and Secondary 3. Note that secondary SAS ports are not present on the SAS2-836EL1 backplane.

13. - 14. UART Connectors
   The primary and secondary UART connectors are for manufacturer's diagnostic purposes only. (The secondary UART connector is not present on the SAS2-836EL1 model backplane)

15. - 16. Debug Connectors
   The primary and secondary EXPDBG1 and EXPDBG2 connectors are for manufacturer's diagnostic purposes only. (The secondary EXPDBG2 connector is not present on the SAS2-836EL1 model backplane)

17. - 18. MDIO Connectors
   The primary and secondary MDIO1 and MDIO2 connectors are for Supermicro's internal use only. (The secondary MDIO2 connector is not present on the SAS2-836EL1 model backplane)
2-3 Rear Jumper Locations and Settings

![Diagram of Rear Jumper Locations and Settings](image)

**Figure 2-2. Rear Jumper Locations and Settings**

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Jumper Settings</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRI_MODE1 and 2</td>
<td>Pin 2-3</td>
<td>Factory setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do not change</td>
</tr>
<tr>
<td>SEC_MODE1 and 2</td>
<td>Pin 2-3</td>
<td>Factory setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do not change</td>
</tr>
<tr>
<td>BUZZER_ENB1*</td>
<td>Open: Disabled (Default) Closed: Enabled</td>
<td>Buzzer settings</td>
</tr>
<tr>
<td>ACTLED1</td>
<td>Open: Disabled (Default) Closed: Enabled</td>
<td>Activity LED testing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Supermicro internal use only)</td>
</tr>
<tr>
<td>FAN_LED_DISABLE</td>
<td>Open: Enabled Closed: Disabled (Default)</td>
<td>Turns off the FANFAIL1 LED</td>
</tr>
<tr>
<td>FAN_MONITOR_DISABLE</td>
<td>Open: Enabled Closed: Disabled</td>
<td>Turns off fan speed reporting</td>
</tr>
</tbody>
</table>

* 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.

The buzzer alarm is triggered by one of the following conditions:

- Hard drive failure.
- Fan failure.
- System temperature over 45° Celsius.


**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 Rear LEDs

![Rear LEDs diagram]

**Figure 2-3. Rear LEDs**

<table>
<thead>
<tr>
<th>LED</th>
<th>Active State</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>FANFAIL1</td>
<td>On</td>
<td>Fan failure</td>
</tr>
<tr>
<td>5V_LED1</td>
<td>On</td>
<td>5V power on LED</td>
</tr>
<tr>
<td>12V_LED1</td>
<td>On</td>
<td>12V power on LED</td>
</tr>
<tr>
<td>ACT17</td>
<td>On</td>
<td>Primary Ethernet Tx activity LED</td>
</tr>
<tr>
<td>ACT18</td>
<td>On</td>
<td>Secondary Ethernet Tx activity LED</td>
</tr>
<tr>
<td>OVERHEATFAIL1</td>
<td>On</td>
<td>Overheat/Drive Failure LED Indicator (Red light: flashing, buzzer: on)</td>
</tr>
</tbody>
</table>
2-5 Front Connectors and LED Indicators

Figure 2-4. Front Connectors

<table>
<thead>
<tr>
<th>Connector</th>
<th>SAS/SATA Drive Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS #0</td>
<td>SAS/SATA HDD #0</td>
</tr>
<tr>
<td>SAS #1</td>
<td>SAS/SATA HDD #1</td>
</tr>
<tr>
<td>SAS #2</td>
<td>SAS/SATA HDD #2</td>
</tr>
<tr>
<td>SAS #3</td>
<td>SAS/SATA HDD #3</td>
</tr>
<tr>
<td>SAS #4</td>
<td>SAS/SATA HDD #4</td>
</tr>
<tr>
<td>SAS #5</td>
<td>SAS/SATA HDD #5</td>
</tr>
<tr>
<td>SAS #6</td>
<td>SAS/SATA HDD #6</td>
</tr>
<tr>
<td>SAS #7</td>
<td>SAS/SATA HDD #7</td>
</tr>
<tr>
<td>SAS #8</td>
<td>SAS/SATA HDD #8</td>
</tr>
<tr>
<td>SAS #9</td>
<td>SAS/SATA HDD #9</td>
</tr>
<tr>
<td>SAS #10</td>
<td>SAS/SATA HDD #10</td>
</tr>
<tr>
<td>SAS #11</td>
<td>SAS/SATA HDD #11</td>
</tr>
<tr>
<td>SAS #12</td>
<td>SAS/SATA HDD #12</td>
</tr>
<tr>
<td>SAS #13</td>
<td>SAS/SATA HDD #13</td>
</tr>
<tr>
<td>SAS #14</td>
<td>SAS/SATA HDD #14</td>
</tr>
<tr>
<td>SAS #15</td>
<td>SAS/SATA HDD #15</td>
</tr>
<tr>
<td>Connector</td>
<td>Hard Drive Activity LED</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>SAS #0</td>
<td>ACT #0</td>
</tr>
<tr>
<td>SAS #1</td>
<td>ACT #1</td>
</tr>
<tr>
<td>SAS #2</td>
<td>ACT #2</td>
</tr>
<tr>
<td>SAS #3</td>
<td>ACT #3</td>
</tr>
<tr>
<td>SAS #4</td>
<td>ACT #4</td>
</tr>
<tr>
<td>SAS #5</td>
<td>ACT #5</td>
</tr>
<tr>
<td>SAS #6</td>
<td>ACT #6</td>
</tr>
<tr>
<td>SAS #7</td>
<td>ACT #7</td>
</tr>
<tr>
<td>SAS #8</td>
<td>ACT #8</td>
</tr>
<tr>
<td>SAS #9</td>
<td>ACT #9</td>
</tr>
<tr>
<td>SAS #10</td>
<td>ACT #10</td>
</tr>
<tr>
<td>SAS #11</td>
<td>ACT #11</td>
</tr>
<tr>
<td>SAS #12</td>
<td>ACT #12</td>
</tr>
<tr>
<td>SAS #13</td>
<td>ACT #13</td>
</tr>
<tr>
<td>SAS #14</td>
<td>ACT #14</td>
</tr>
<tr>
<td>SAS #15</td>
<td>ACT #15</td>
</tr>
</tbody>
</table>
3-1 Single and Dual Port Expanders

Single Ports
SAS2-836EL1 backplanes have a single-port expander that accesses all hard drives and supports cascading.

Dual Ports
SAS2-836EL2 backplanes have dual-port expanders that access all the hard drives. These dual-port expanders support cascading, failover, and multipath functionality.

Figure 3-1: Dual Port Cascading Configurations
3-2 Failover

The SAS2-836EL2 backplane has two expanders which allow effective failover.

**Single Host Bus Adapter**

In a single host bus configuration, the backplane connects to one Host Bus Adapter (HBA).

**Single Host Bus Adapter Failover**

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

*Figure 3-2: Single and Dual HBAs*
3-3 Failover with RAID Cards and Multiple HBAs

The SAS-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 3-3: Dual HBA](image)

### 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 3-4: Dual HBA Failover](image)

**IMPORTANT:** For RAID controllers, redundancy is achieved through port failover. For multiple HBAs MPIO software is required to achieve failover protection.
3-4 Chassis Power Card and Support Cables

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 must have a power card. This section describes the supported power card for the SAS2-836EL series backplanes.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Part Type</th>
<th>Where Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE-PTJBOD-CB2</td>
<td>Power card</td>
<td>Allows the chassis to be used as a JBOD (Just a Bunch of Drives) system.</td>
</tr>
</tbody>
</table>

Figure 3-5: Chassis Power Card (Sold Separately)
Connecting an Internal Host Bus Adapter to the Backplane

The following section lists the most common cables used to connect the host bus adapter to the backplane.

![Diagram of connecting an Internal HBA to the Backplane](image)

**Figure 3-6: Connecting an Internal HBA to the Backplane**

**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 SAS2-836EL backplane. The cables required depend upon the HBA connector.

**Cable Name:** iPass to 4-lane

**Part #:** CBL-0117L  
**Length:** 46 cm (18 inches)

**Description:** This cable has one SFF-8484 (32-pin) connector on one end and one iPass (SFF-8087/Mini-SAS) connector (36-pin) at the other. This cable connects from the HBA to the SAS2-836EL backplane.
Description: This cable has an iPass (SFF-8087/Mini-SAS) connector (36-pin) at each end. It connects from the HBA to the SAS2-836EL backplane.

**Cable Name:** iPass (Mini-SAS) to iPass (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)
Connecting an External Host Bus Adapter 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 configuration system to connect to another system that has an HBA.

Single External Host Bus Adapter

Dual External Host Bus Adapter

Figure 3-7: Connecting Single and Dual HBAs to the Backplane

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.

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

**Part #:** CBL-0166L (SFF-8088 1x 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.

Figure 3-8: External Cable (CBL-0166L)
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.

Figure 3-9 Single HBA Configuration
Single HBA Configuration Cables

Single Port Cable Assembly

Figure 3-10: Single Port Internal Cable (CBL-0167L)

**Cable Name:** SAS EL2/EL1 Backplane Cable (Internal) with 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 HBA or external port. Used in single port environments.

Figure 3-11: External Cable (CBL-0166L)

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

**Part #:** CBL-0166L (SFF-8088 1x 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 dual HBAs. These connections use CBL-0168L internal cables and CBL-0166L external cables.

Figure 3-12: Multiple Backplanes in a Dual Channel Environment

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 3-13: Dual Port Internal Cable (CBL-0168L)

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

**Part #:** CBL-0168L  
**Placement:** Internal cable  
**Ports:** Dual

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

Figure 3-14: External Cable (CBL-0166L)

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

**Part #:** CBL-0166L  
**Placement:** External cable  
**Ports:** Single or Dual

**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 Configurations

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 motherboard and an HBA. Other servers require a power control card but with no motherboard and no HBA.

**Figure 3-15: Simple Cascaded Configurations**
Figure 3-16: Cascaded Configuration with Horizontal Branching
Dual SAS HBA and Cascaded Configuration

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

![Diagram of Dual SAS HBA and Cascaded Configuration](image)

_Figure 3-17: Dual SAS HBA with Cascaded Configuration_
Dual SAS HBA Cascaded Configuration with Branching

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

![Diagram of Dual SAS HBA Cascaded Configuration with Branching](image)

**Figure 3-18: Dual SAS HBA with Cascaded Configuration and Branching**
Notes
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