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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

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

Electric Static 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 RAID card 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 An Important Note to Users

• All images and layouts shown in this user's guide are based upon the latest PCB 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.
Chapter 2
Jumper Settings and Pin Definitions

Front Connectors

1. CD-ROM/Floppy Drive Power: JP105 and JP106
2 and 3. Primary and Secondary I²C connectors (optional)
4. Power Connectors: PWR0, PWR1, PWR2, and PWR3
5. Primary and Secondary Expander Chip
6. Primary and Secondary Flash Chip
7. EPP Connectors: J16 and J17
8. Fan Connectors: Fan2, Fan3, and Fan4 (Fan1 is not used)
9. SAS Connectors: PRI_J0
10. SAS Connectors: PRI_J1
11. SAS Connectors: PRI_J2
12. SAS Connectors: SEC_J1 (not available in EL1 single port backplanes)
13. SAS Connectors: SEC_J0 (not available in EL1 single port backplanes)
14. SAS Connectors: SEC_J2 (not available in EL1 single port backplanes)
2-2 Front Connector and Pin Definitions

1. CD-ROM/Floppy 4-Pin Connectors

The 4-pin connectors, designated JP105 and JP106, provide power to the CD-ROM and floppy drives. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>+12V</td>
</tr>
</tbody>
</table>

4. Backplane Main Power Connectors

The 4-pin connectors, designated PWR0, PWR1, PWR2, and PWR3, provide power to the backplane. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+12V</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>+5V</td>
</tr>
</tbody>
</table>

5. Primary and Secondary Expander Chips

This Primary and Secondary Expander Chips allow the backplane to support dual ports, cascading, and failover.
6. Primary and Secondary Flash Chips

The Primary and Secondary Flash Chips enhance the backplane memory.

7. EPP Ports

The EPP ports are used for manufacturer diagnostic purposes only.

8. Fan Connectors

The 3-pin connectors, designated Fan2, Fan3, and Fan4, provide power to the fans.

A fan may be connected to Fan1; however, connector Fan1 is not fully supported by the backplane. Any fan connected to Fan1 will not be monitored.

See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground</td>
</tr>
<tr>
<td>2</td>
<td>+12V</td>
</tr>
<tr>
<td>3</td>
<td>Tachometer</td>
</tr>
</tbody>
</table>

9-14. SAS Ports

Note that the Primary and Secondary sets of SAS ports are in different order. From right to left the ports are Primary 0, 1, 2 and Secondary 1, 0, 2.
2-3 Front Jumper Locations and Pin Definitions

Figure 2-3: Backplane Jumper Settings

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.

<table>
<thead>
<tr>
<th>General Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumper</td>
</tr>
</tbody>
</table>
| PRI_MODE4     | 1-2             | Factory Setting  
Do not change |
| PRI_MODE5     | 2-3             | Factory Setting  
Do not change |
| SEC_MODE4     | 1-2             | Factory Setting  
Do not change |
| SEC_MODE5     | 2-3             | Factory Setting  
Do not change |
### General Jumper Settings

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Jumper Settings</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUZZER_ENB1</td>
<td>Open: Disable Closed: Enable</td>
<td>Buzzer Enable</td>
</tr>
<tr>
<td>FAN_ALERT_ENI</td>
<td>Open: Disable Closed: Enable</td>
<td>Fan Alert Enable</td>
</tr>
</tbody>
</table>

### Socket Settings

<table>
<thead>
<tr>
<th>Socket</th>
<th>Socket Setting</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>REMOTE_FAN_FAIL_SOCKET</td>
<td>Connected</td>
<td>Front Panel Fan Fail indicator (Optional)</td>
</tr>
</tbody>
</table>
Backplane LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>STATE</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERHEATFAIL1</td>
<td>ON</td>
<td>Overheat or Drive Failure</td>
</tr>
<tr>
<td>FANFAIL1</td>
<td>ON</td>
<td>Failure in System Fans</td>
</tr>
<tr>
<td>5V</td>
<td>OFF</td>
<td>Backplane power failure. Light is on during normal operation.</td>
</tr>
<tr>
<td>12V</td>
<td>OFF</td>
<td>Backplane power failure. Light is on during normal operation.</td>
</tr>
</tbody>
</table>

Figure 2-4: Backplane LED Indicators
2-4 Rear Connectors and LED Indicators

![Diagram of Rear Connectors and LED Indicators]

Figure 2-5: Rear Connectors and LED Indicators

### Rear SAS Connectors

<table>
<thead>
<tr>
<th>Rear Connector</th>
<th>SAS Drive Number</th>
<th>Rear Connector</th>
<th>SAS Drive Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS #0</td>
<td>SAS HDD #0</td>
<td>SAS #8</td>
<td>SAS HDD #8</td>
</tr>
<tr>
<td>SAS #1</td>
<td>SAS HDD #1</td>
<td>SAS #9</td>
<td>SAS HDD #9</td>
</tr>
<tr>
<td>SAS #2</td>
<td>SAS HDD #2</td>
<td>SAS #10</td>
<td>SAS HDD #10</td>
</tr>
<tr>
<td>SAS #3</td>
<td>SAS HDD #3</td>
<td>SAS #11</td>
<td>SAS HDD #11</td>
</tr>
<tr>
<td>SAS #4</td>
<td>SAS HDD #4</td>
<td>SAS #12</td>
<td>SAS HDD #12</td>
</tr>
<tr>
<td>SAS #5</td>
<td>SAS HDD #5</td>
<td>SAS #13</td>
<td>SAS HDD #13</td>
</tr>
<tr>
<td>SAS #6</td>
<td>SAS HDD #6</td>
<td>SAS #14</td>
<td>SAS HDD #14</td>
</tr>
<tr>
<td>SAS #7</td>
<td>SAS HDD #7</td>
<td>SAS #15</td>
<td>SAS HDD #15</td>
</tr>
</tbody>
</table>

### Rear LED Indicators

<table>
<thead>
<tr>
<th>Rear LED</th>
<th>Hard Drive Activity</th>
<th>Failure LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS #0</td>
<td>ACT #0</td>
<td>FAIL #0</td>
</tr>
<tr>
<td>SAS #1</td>
<td>ACT #1</td>
<td>FAIL #1</td>
</tr>
<tr>
<td>SAS #2</td>
<td>ACT #2</td>
<td>FAIL #2</td>
</tr>
<tr>
<td>SAS #3</td>
<td>ACT #3</td>
<td>FAIL #3</td>
</tr>
<tr>
<td>SAS #4</td>
<td>ACT #4</td>
<td>FAIL #4</td>
</tr>
<tr>
<td>SAS #5</td>
<td>ACT #5</td>
<td>FAIL #5</td>
</tr>
<tr>
<td>SAS #6</td>
<td>ACT #6</td>
<td>FAIL #6</td>
</tr>
<tr>
<td>SAS #7</td>
<td>ACT #7</td>
<td>FAIL #7</td>
</tr>
<tr>
<td>SAS #8</td>
<td>ACT #8</td>
<td>FAIL #8</td>
</tr>
<tr>
<td>SAS #9</td>
<td>ACT #9</td>
<td>FAIL #9</td>
</tr>
<tr>
<td>SAS #10</td>
<td>ACT #10</td>
<td>FAIL #10</td>
</tr>
<tr>
<td>Rear LED Indicators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>SAS #11</td>
<td>ACT #11</td>
<td></td>
</tr>
<tr>
<td>SAS #12</td>
<td>ACT #12</td>
<td></td>
</tr>
<tr>
<td>SAS #13</td>
<td>ACT #13</td>
<td></td>
</tr>
<tr>
<td>SAS #14</td>
<td>ACT #14</td>
<td></td>
</tr>
<tr>
<td>SAS #15</td>
<td>ACT #15</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 3

Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders

Single Ports
SAS-836EL1 backplanes have a single-port expander that access all 16 drives and supports cascading.

Dual Ports
SAS-836EL2 backplanes have dual-port expanders that access all 16 drives. These dual-port expanders support cascading, failover, and recovery.

Figure 3-1: SAS-836EL2 Dual Port Configuration

Figure 3-2: SAS-836EL1 Single Port Configuration
3-2 Failover

The SAS-836EL2 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 (HBA).

![Figure 3-3: Single HBA](image)

**Single Host Bus Adapter Failover**

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

![Figure 3-4: Single HBA Failover](image)

**Dual Host Bus Adapter**

In a Dual Host Bus Configuration, the backplane connects to two Host Bus Adapters (HBA).

![Figure 3-5: 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 3-6: Dual HBA Failover](image)
3-3  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 (HBA). Other servers in this enclosed system, include a power card. This section describes the supported power card for the SAS-836 series backplane.

For more information, see the PCC-JBPWR2 power card manual. This manual can be found at the http://www.supermicro.com or as an appendix in the SAS-836EL chassis manual.

<table>
<thead>
<tr>
<th>Power Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Number</td>
</tr>
<tr>
<td>CSE-PTJBO-CB1</td>
</tr>
</tbody>
</table>

Figure 3-7: 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 HBA to the backplane.

**Figure 3-8: Single Internal Host Bus Adapter**

**Figure 3-9: Dual Internal Host Bus Adapter**

**Supported Internal HBA to Backplane Cables**

Use the following listed cables to create connections between the internal HBA and SAS-836EL 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 ipass (SFF-8087/mini-sas) connector (36 pins) at the other. This cable connects from the HBA to the SAS-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)

Description: This cable has an ipass (SFF-8087/mini-sas) connector (36 pins) at each end. It connects from the HBA to the SAS-836EL backplane.
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 (Just a Bunch Of Drives) configuration from an existing system.
Supported External HBA to Backplane Cable

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

Figure 3-12: SAS InfiniBand Cable (CBL-0200L)

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-pins) 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.

**Figure 3-13: Single HBA Configuration**
Single HBA Configuration Cables

Single Port Cable Assembly

![Single Port Internal Cable (CBL-167L)](image1)

**Figure 3-14: Single Port Internal Cable (CBL-167L)**

**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 Host Bus Adapter (HBA) or external port. Used in single port environments.

![External Cable (CBL-166L)](image2)

**Figure 3-15: External Cable (CBL-166L)**

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

**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 3-16: Dual HBA Configuration
Dual HBA Configuration Cables

Dual Port Cable Assembly

Figure 3-17: Dual Port Internal Cable (CBL-168L)

Cable Name: SAS Dual-port Cable Assembly, 68/76cm
Part #: CBL-0168L  Placement: Internal cable
Ports: Dual
Description: Internal cascading cable. Connects the backplane to the Host Bus Adapter (HBA) or external port. Used in dual port environments.

Figure 3-18: External Cable (CBL-166L)

Cable Name: SAS EL2/EL1 Cascading Cable (External), 68cm
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.
3-4 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 HBA. Other servers require a power control card with no motherboard and no HBA. For more information, see the SC836 Chassis Manual available at www.supermicro.com.

Figure 3-19: Simple Cascaded Configuration
Server System with Single SAS HBA

The expanders allow horizontal branching. This configuration also applies to dual ports.

Figure 3-20: Cascaded Configuration with Horizontal Branching
Dual SAS HBA and Cascaded Configuration

Figure 3-21: Dual SAS HBA with Cascaded Configuration
Dual SAS HBA with Cascaded Configuration and Branching

Figure 3-22: Dual SAS HBA with Cascaded Configuration and Branching