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Manual Revision 1.0a
Release Date: June 25, 2015

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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.
Overview of the BPN-SAS2-213EL1 Backplane Assembly

The BPN-SAS2-213EL1 backplane assembly consists of a SAS2-213EB backplane (A) with one BPN-SAS2-213EL daughter card (B) mounted on the rear of the backplane.

Components on the front side of the SAS2-213EB backplane include sixteen SAS connectors and their respective activity and failure LEDs. Components on the rear side of the backplane include jumpers and power and fan connectors. The daughter card's components include SAS ports, flash and expander chips, and mode select jumpers.
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 the backplane 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 and daughter cards by their edges only; do not touch the components, peripheral chips, memory modules or gold contacts.

- When handling chips or modules, avoid touching their pins.

- Put the backplane 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 backplane you have received may or may not look exactly the same as the graphics shown in this manual.

1-4  Introduction to the BPN-SAS2-213EL1 Backplane

The BPN-SAS2-213EL1 backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

This manual reflects the SAS2-213EB Revision 1.01 backplane, the most current release available at the time of publication.

This manual also describes the BPN-SAS2-213EL daughter card, Revision 1.02, the most current release available at the time of publication. Always refer to the Supermicro Web site at www.supermicro.com for the latest updates, compatible parts and supported configurations.
Chapter 2
Connectors, Jumpers and LEDs

2-1 Connectors

1. Flash Chip
2. Expander Chip
3. SAS Port: PRI_J1
4. SAS Port: PRI_J2
5. SAS Port: PRI_J3
6. EPP Connectors: J2
7. Fan Connectors: Fan1, Fan2, and Fan3
9. Debug Connector: EXPDBG1
10. UART Connector: SMART_UART
11. Primary I²C Connector: PRI_I2C

Figure 2-1: Connectors on the Backplane and Daughter Cards
2-2 Front Connector and Pin Definitions

1. Flash Chips
   The flash chip enhances the backplane memory.

2. Expander Chips
   This expander chip allows the backplane to support dual ports, cascading, and failover.

3. - 5. SAS Ports
   SAS ports provide expander features including cascading. From bottom to top, ports are PRI_J1, PRI_J2 and PRI_J3.

6. EPP Port
   The EPP port is used for manufacturer's diagnostic purposes only.

7. 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.

8. Backplane Main Power Connectors
   The 4-pin connectors are designated PWR1, PWR3 and PWR4. They provide power to the backplane. See the table on the right for pin definitions.

9. Debug Connector
   The debug connector is designated EX-PDBG1 and is used for manufacturer's diagnostic purposes only.

10. UART Connector
    The UART connector is designated SMART_UART and is used for manufacturer's diagnostic purposes only.

11. I2C Connector
    The I2C connector is designated PRI_I2C.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FB</td>
</tr>
<tr>
<td>2</td>
<td>+12V</td>
</tr>
<tr>
<td>3</td>
<td>Tachometer</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+12V</td>
</tr>
<tr>
<td>2 and 3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>+5V</td>
</tr>
</tbody>
</table>
2-3  Jumper Locations and 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>Jumper</th>
<th>Jumper Settings</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRI_MODE1</td>
<td>Pins 2-3</td>
<td>Factory setting, do not change</td>
</tr>
<tr>
<td>PRI_MODE2</td>
<td>Pins 2-3</td>
<td>Factory setting do not change</td>
</tr>
<tr>
<td>FAN_MONITOR_DISABLE</td>
<td>Open: Enable (Default)</td>
<td>Enables/disables the fan speed reporting.</td>
</tr>
<tr>
<td></td>
<td>Closed: Disable</td>
<td></td>
</tr>
<tr>
<td>FANFAIL_LED_DISABLE</td>
<td>Open: Enable (Default)</td>
<td>Enables/disables the fan failure LED</td>
</tr>
<tr>
<td></td>
<td>Closed: Disable</td>
<td></td>
</tr>
<tr>
<td>BUZZER_ENB1</td>
<td>Open: Disable</td>
<td>Enables/disables buzzer*</td>
</tr>
<tr>
<td></td>
<td>Closed: Enable</td>
<td></td>
</tr>
</tbody>
</table>

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

The buzzer alarm is triggered by any of 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.
### Rear LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Fail State</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12V_LED1</td>
<td>Off</td>
<td>Green LED indicates backplane 12V power. Light is on during normal operation.</td>
</tr>
<tr>
<td>5V_LED1</td>
<td>Off</td>
<td>Blue LED indicates backplane 5V power. Light is on during normal operation.</td>
</tr>
<tr>
<td>FANFAIL1</td>
<td>On</td>
<td>Red LED indicates a fan failure. Light is off during normal operation.</td>
</tr>
<tr>
<td>OVERHEATFAIL1</td>
<td>On</td>
<td>Red LED indicates an overheat condition. Light is off during normal operation.</td>
</tr>
</tbody>
</table>
2-4 Front Connectors and LED Indicators

<table>
<thead>
<tr>
<th>Front SAS/SATA Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Front Connector</strong></td>
</tr>
<tr>
<td>SAS #J0</td>
</tr>
<tr>
<td>SAS #J1</td>
</tr>
<tr>
<td>SAS #J2</td>
</tr>
<tr>
<td>SAS #J3</td>
</tr>
<tr>
<td>SAS #J4</td>
</tr>
<tr>
<td>SAS #J5</td>
</tr>
<tr>
<td>SAS #J6</td>
</tr>
<tr>
<td>SAS #J7</td>
</tr>
</tbody>
</table>

Figure 2-4: Front Connectors and LED Indicators
## Front LED Indicators

<table>
<thead>
<tr>
<th>Front LED</th>
<th>Hard Drive Activity</th>
<th>Failure LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS #J0</td>
<td>ACT #0</td>
<td>FAIL #0</td>
</tr>
<tr>
<td>SAS #J1</td>
<td>ACT #1</td>
<td>FAIL #1</td>
</tr>
<tr>
<td>SAS #J2</td>
<td>ACT #2</td>
<td>FAIL #2</td>
</tr>
<tr>
<td>SAS #J3</td>
<td>ACT #3</td>
<td>FAIL #3</td>
</tr>
<tr>
<td>SAS #J4</td>
<td>ACT #4</td>
<td>FAIL #4</td>
</tr>
<tr>
<td>SAS #J5</td>
<td>ACT #5</td>
<td>FAIL #5</td>
</tr>
<tr>
<td>SAS #J6</td>
<td>ACT #6</td>
<td>FAIL #6</td>
</tr>
<tr>
<td>SAS #J7</td>
<td>ACT #7</td>
<td>FAIL #7</td>
</tr>
<tr>
<td>SAS #J8</td>
<td>ACT #8</td>
<td>FAIL #8</td>
</tr>
<tr>
<td>SAS #J9</td>
<td>ACT #9</td>
<td>FAIL #9</td>
</tr>
<tr>
<td>SAS #J10</td>
<td>ACT #10</td>
<td>FAIL #10</td>
</tr>
<tr>
<td>SAS #J11</td>
<td>ACT #11</td>
<td>FAIL #11</td>
</tr>
<tr>
<td>SAS #J12</td>
<td>ACT #12</td>
<td>FAIL #12</td>
</tr>
<tr>
<td>SAS #J13</td>
<td>ACT #13</td>
<td>FAIL #13</td>
</tr>
<tr>
<td>SAS #J14</td>
<td>ACT #14</td>
<td>FAIL #14</td>
</tr>
<tr>
<td>SAS #J15</td>
<td>ACT #15</td>
<td>FAIL #15</td>
</tr>
</tbody>
</table>
Notes
Chapter 3

Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders

Single Ports

BPN-SAS2-213EL1 model backplanes have a single-port expander on the daughter card that accesses all of the drives and supports cascading.

![Diagram of Port A Primary Ports Expander 1](image)

From HBA or higher backplane

To Lower Backplane in Cascaded System

Figure 3-1: BPN-SAS2-213EL1 Single Port Configuration
3-2 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 be equipped with a power card. This section describes the supported power card for the BPN-SAS2-213EL series backplane.

For more information, see the Supermicro Web site at http://www.supermicro.com.

Figure 3-2: Chassis Power Card (Sold Separately)

<table>
<thead>
<tr>
<th>Power Card</th>
<th>Part Number</th>
<th>Part Type</th>
<th>Where Used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<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>
Connecting an Internal HBA to the Backplane

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

![Diagram of HBA and Backplane](image)

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

**Supported Internal HBA Cables**

Use the following cables to create connections between the internal HBA and BPN-SAS2-213EL model backplane. The cables required depend upon the HBA connector.

**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-pin) at each end. It connects from the HBA to the BPN-SAS2-213EL 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 Drives) configuration from an existing system.

Single External Host Bus Adapter

![Diagram of Single External Host Bus Adapter](image)

Figure 3-4: Single External Host Adapter
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.

![Diagram of single HBA configuration]

**Figure 3-5: Single HBA Configuration**
Single HBA Configuration Cables

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 3-7: 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.
3-3 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 with no motherboard and no HBA. For more information, specific chassis manuals are available at www.supermicro.com.

Figure 3-8: Simple Cascaded Configuration
Server System with Single SAS HBA

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

Figure 3-9: Cascaded Configuration with Horizontal Branching
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