SAS to SAS/SATA JBOD Subsystem

User Manual

Revision 1.1

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Chapter 1 Introduction

The Expansion Chassis

This JBOD subsystem is a 19-inch 2U rackmount JBOD unit with optimized solutions for servers and external storage systems. It features the latest SAS 3.0 12Gb/s interface and designed to fit in with the environments which needed highly reliable and relentless data growth. This JBOD subsystem incorporates the latest enhancements in SAS along with LSI DataBolt bandwidth optimizer technology (EDFB, End Device Frame Buffering). Using DataBolt, it delivers optimized throughput by allowing users to gain 12Gb/s host speeds with current-generation 6Gb/s drives. It is also a versatile SAS3 / SATA3 disk expansion system, ideal for high capacity and scalability storage in IT demands. The JBOD subsystem also supports dual JBOD controllers which provide better fault tolerance and higher reliability of system operation. It offers GUI management to monitor enclosure environmental conditions through a remote connection.

1.1 Features

Highest Density Available

- 2U chassis with 12 bays carriers

- Support the latest 2.5"/3.5"enterprise class SAS3/SATA3 HDD or SSD drives

High Availability

- Single / Dual SAS JBOD controller module

- Each SAS JBOD controller module consist of three 4x mini SAS HD ports

- Utilizes LSI DataBolt bandwidth optimizer technology

Power Supply

- Power supply and cooling system contained in 1 module for efficient cooling

- Two 300W redundant hot swappable power supplies

Enclosure

- Incorporates a cableless design for maximum signal integrity

- Utilizes industry-standard SCSI enclosure services(SES) to monitor enclosure and disk environmental conditions

Enclosure monitoring

- S.E.S. support for standard enclosure management

- System LED indications

- Fan speed monitoring

- Power supply monitoring

- System voltage monitoring

- System temperature monitoring

- System alarm

1.2 Technical Specifications

JBOD Controller	Single / Redundant
Host Interface	One 4x mini SAS HD (12Gb/s) / Two 4x mini SAS HD (12Gb/s)
Disk Interface	12Gb/s SAS, 6Gb/s SATA
SAS expansion	Two 4x mini SAS HD (12Gb/s) / Four 4x mini SAS HD (12Gb/s)
Enclosure	
Platform	Rackmount
Form Factor	2U
# of Hot Swap Trays	12
Disk Status Indicator	Access / Fail LED
Backplane	SAS / SATA Single BP
# of PS/Fan Modules	300W x 2 w/PFC
# of Fans	2
Power requirements	AC 90V ~ 264V Full Range, 8A ~ 4A, 47Hz ~ 63Hz
Environmental	
Relative Humidity	10% ~ 85% Non-condensing
Operating Temperature	10°C ~ 40°C (50°F ~ 104°F)
Physical Dimension	590(L) x 482 (W) x 88(H) mm
Weight (Without Disk)	18.2 / 19.7 Kgs

Specification is subject to change without notice.
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1.3   Unpacking the JBOD Expansion Chassis

The shipping package contains the following:

	JBOD Subsystem Unit
	Two (2) power cords
	One (1) serial cable for single JBOD controller Two (2) serial cables for dual JBOD controllers
	One (1) mini SAS HD cable for single JBOD controller Two (2) mini SAS HD cables for dual JBOD controllers
	One (1) Ethernet LAN cable for single JBOD controller Two (2) Ethernet LAN cables for dual JBOD controllers
	One(1) JBOD Controller Blanking Plate Note: For dual JBOD controllers
	One(1) PSFM Plate Cover
	User Manual

NOTE: If any damage is found, contact the dealer or vendor for assistance.

1.4 Identifying Parts of the Expansion Chassis

The illustrations below identify the various parts of the expansion chassis.

1.4.1 Front View

Disk Trays   **LCD Front Panel**

Slot 4	Slot 3	Slot 2	Slot 1
Slot 8	Slot 7	Slot 6	Slot 5
Slot 12	Slot 11	Slot 10	Slot 9

1.4.2 Rear View

Single Controller

JBOD Controller Module

Power Supply / Fan Module 1

Power Supply / Fan Module 2

Dual Controller

JBOD Controller 1

JBOD Controller 2

Power Supply / Fan Module 1

Power Supply / Fan Module 2
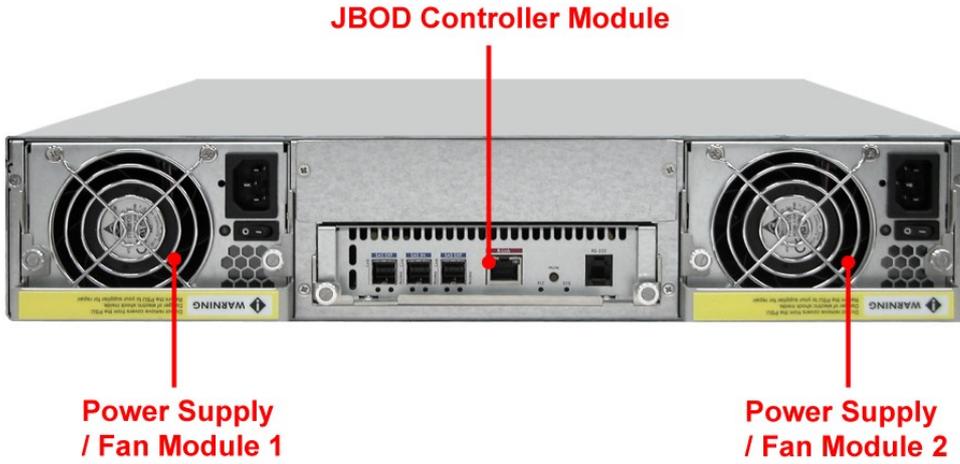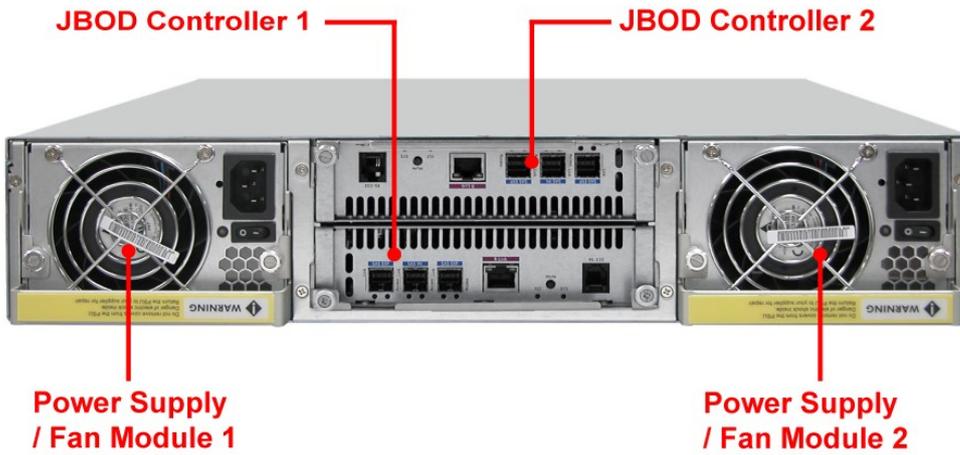
1.4.3 JBOD Controller Module

1.4.3.1 JBOD Controller Panel
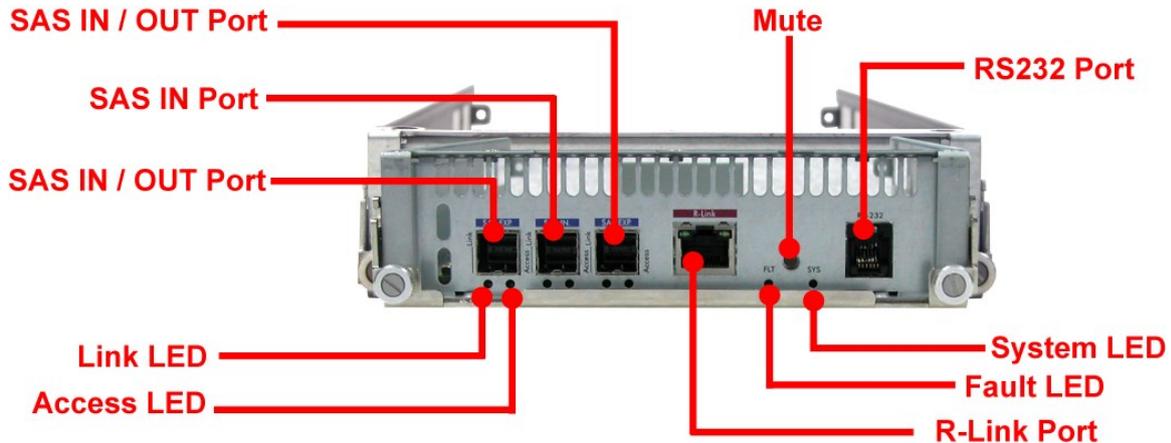
NOTE: SAS IN/OUT Port can be flexibly configured as either SAS IN PORT or SAS OUT PORT by customer's request

SAS IN Port: SAS cable must be connected to this port and to the SAS HBA, or other Expansion Chassis's SAS Expansion Port, if this chassis is connected in daisy-chain.

SAS OUT Port: SAS cable must be connected to these ports and to other SAS IN Port of other expansion chassis for daisy-chaining.

Link LED (SAS IN and SAS OUT): Green indicates SAS IN/OUT Port has connected or linked.

Access LED (SAS IN and SAS OUT): Blue indicates SAS IN/OUT Port is being accessed.

RS-232 Port: Used for upgrading the Firmware of JBOD controller in the Expansion Chassis.

Mute: Use this button to silence the alarm beeper. If another failure event happens, the alarm beeper will sound again and this button can be pressed again to silence alarm.

System LED: Green indicates Expansion Chassis is Powered On and Ready.

Fault LED: Red (LED is on) indicates there is problem within the Expansion Chassis. If LED is off, the Expansion Chassis is in normal condition.

R-Link Port: Use to connect to Telnet for upgrading the Firmware of JBOD controller

1.5 Power Supply / Fan Module (PSFM)

The JBOD subsystem contains **two 300W Power Supply / Fan Modules**. All PSFMs are inserted into the rear of the chassis.

1.5.1 PSFM Panel

Power On/Fail Indicator
Power On/Off Switch
AC Inlet Plug (Male)

The Power Supply/Fan Module panel has: Power On/Off Switch, the AC Inlet Plug, and a Power On/Fail Indicator showing the Power Status LED, indicating ready or fail.

Each fan within a PSFM is powered independently of the power supply within the same PSFM. So if the power supply of a PSFM fails, the fan associated with that PSFM will continue to operate and cool the enclosure.

1.5.2 Power Supply Module LED

Power On/Fail Indicator

When the power cord connected from main power source is inserted to the AC Power Inlet, the power status LED becomes RED. When the switch of the PSFM is turned on, the LED will turn GREEN. When the Power On/Fail LED is GREEN, the PSFM is functioning normally.

1.5.3 Fans of PSFM

Fan

NOTE: Each PSFM has 1 fan. In the LCD display, Power Supply Unit 1 is shown as "Fan01", and Power Supply Unit 2 is "Fan02".

## 1.6   LCD Display Panel

1.6.1   LCD Panel LED

Parts	Function
Power LED	Green indicates power is ON.
Power Fail LED	If one of the redundant power supply unit fails, this LED will turn to RED and alarm will sound.
Fan Fail LED	Turn RED when fan 1 or 2 fails, or speed is lower than 3000 RPM
Over Temperature LED	If system temperature is over 70ºC or disk temperatures exceed 55ºC, the Over Temperature LED will turn RED and alarm will sound.
Voltage Warning LED	An alarm will sound if detected voltage in the controller is abnormal and LED will turn RED.

1.6.2 LCD Panel Function Buttons

Parts		Function
Up and Down Arrow buttons	▲ ▼	Use the Up or Down arrow keys to go through the information on the LCD screen. This is also used to move between each menu.
Select button	✔	This is used to enter the option you have selected.
Exit button	EXIT	Press this button to return to the previous menu. NOTE: This button can also be used to silence the alarm beeper when in main menu. If you are in submenu and a failure event happens, press the EXIT button few times as necessary to go back to main menu, and press again to silence the alarm.

1.6.3 Menu Diagram

Model-Name
xxx.xxx.xxx.xxx

↓

ID: xxxxxxxxx
F/W V x.x.xx

↓

Temperature ⟶ **Enclosure 30'C**
Chip   35'C
HDD01   33'C

↓

:

↓

HDD12   30'C

Power Status ⟶ **Power01 : Good**
Good **Power02 : Good**

↓

FAN Status ⟶ **Fan01: 3970 rpm**
Good **Fan02: 3970 rpm**

Voltage Status ⟶ **1V_   1.03V**
Good **5V_   4.94V**
3.3V_   3.24V
B12V_ 12.48V

Alarm Status ⟶ **Disable / Enable Alarm**
Enabled

↓

System Reset ⟶ **Enter Password**
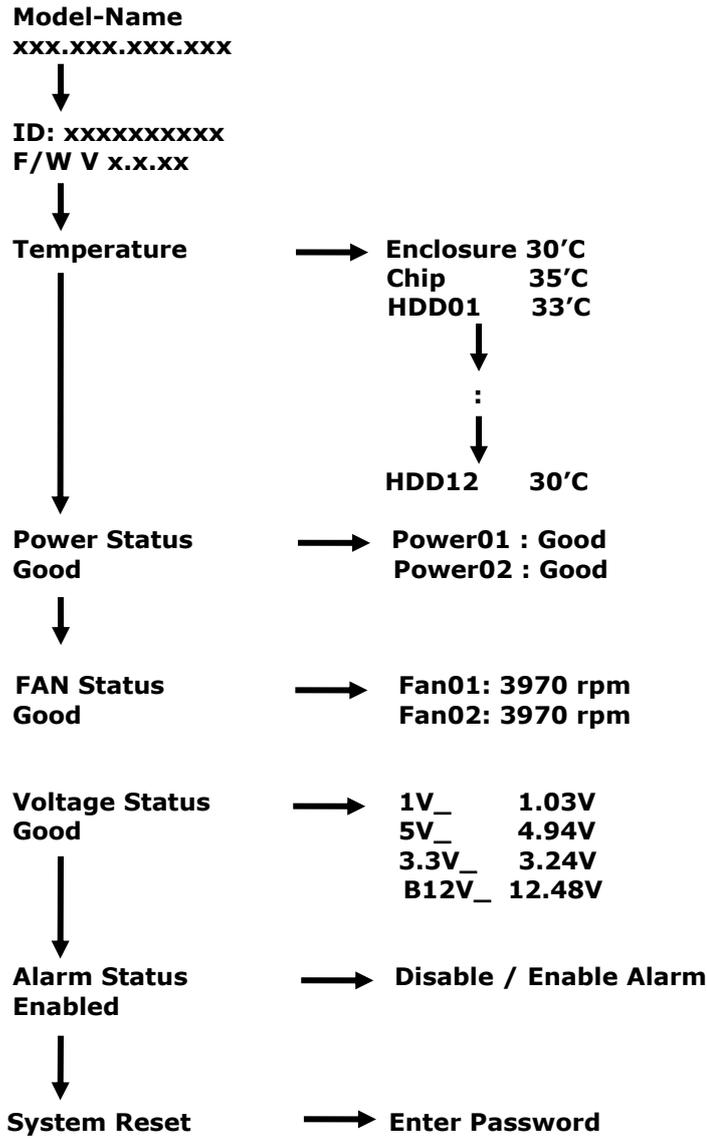
1.7 Drive Carrier Module

The Drive Carrier Module houses a 3.5 inch hard disk drive. It is designed for maximum airflow and incorporates a carrier locking mechanism to prevent unauthorized access to the HDD.

1.7.1 Disk Drive Status Indicators

Every Drive Carrier has 2 status indicator lights. One indicator light is the hard disk drive access light. The other status indicator light is used for Power On/Error.
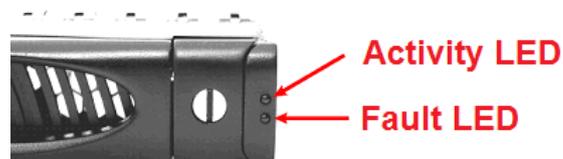
Part	Function
HDD Activity LED	This LED will blink blue when the hard drive is being accessed.
HDD Fault LED	Green LED indicates power is on and hard drive status is good for this slot. If there is no hard drive, the LED is Red. If hard drive defected in this slot or the hard drive is failure, the LED is blinking red.

1.7.2 Drive Carrier Lock Indicator

Every Drive Carrier is lockable and is fitted with a lock indicator to indicate whether or not the carrier is locked into the chassis or not. Each carrier is also fitted with an ergonomic handle for easy carrier removal.
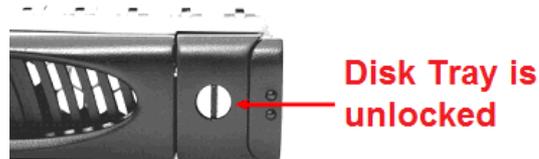
When the Lock Groove is vertical, then the Drive Carrier is unlocked.
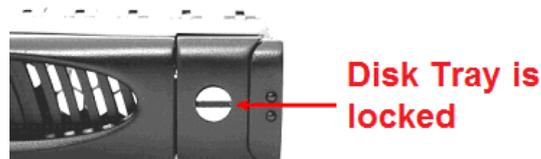
When the Lock Groove is horizontal, this indicates that the Drive Carrier is locked.

Lock and unlock the Drive Carriers by using a flat-head screw driver.

Chapter 2   Installation of JBOD Subsystem

2.1   Powering On

1. Plug in the power cords into the AC Power Input Socket located at the rear of the subsystem.
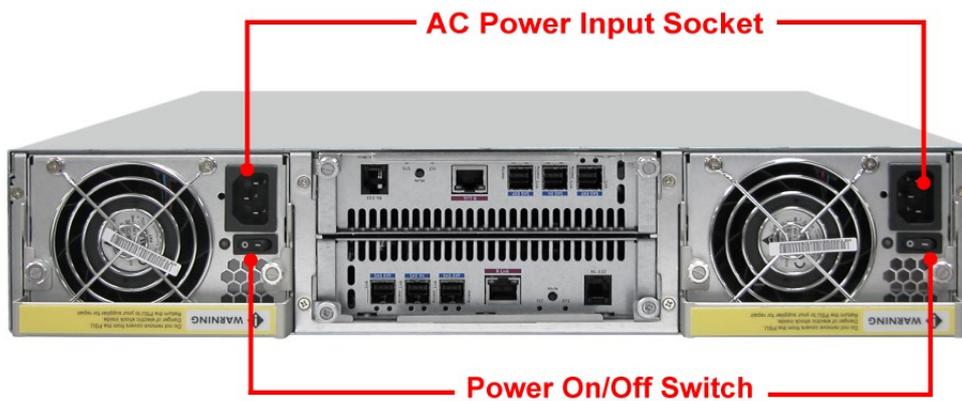
NOTE: The subsystem is equipped with redundant, full range power supplies with PFC (power factor correction). The system will automatically select voltage.

2. Turn on each Power On/Off Switch to power on the subsystem.

3. The Power LED on the front Panel will turn green.

2.2   Disk Drive Installation

This section describes the physical locations of the hard drives supported by the subsystem and give instructions on installing a hard drive. The subsystem supports hot-swapping allowing you to install or replace a hard drive while the subsystem is running.

2.2.1   Installing 3.5" SAS Disk Drive in a Disk Tray

NOTE: These steps are the same when installing SATA disk drive in Single Controller Mode.

1. Unlock the Disk Trays using a flat-head screw driver by rotating the Lock Groove.

Disk Tray is unlocked
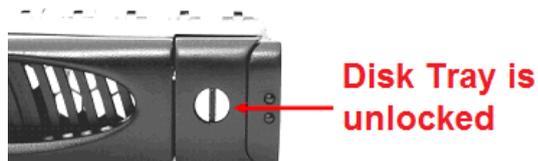
2. Press the Tray Open button and the Disk Tray handle will flip open.

Tray Open Button

3. Pull out an empty disk tray.

4. Place the hard drive in the disk tray. Turn the disk tray upside down. Align the four screw holes of the SAS disk drive in the four Hole A of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.


NOTE: The mounting hole locations of the new 6-disk are different from the existing drives.

3-, 4-, and 5-disk	6-disk
Four bottom mounting holes of drive	Four bottom mounting holes of drive

Tray Hole A

Tray Hole A

Different screw positions: Comparing 6-Disk Drive to existing Drive
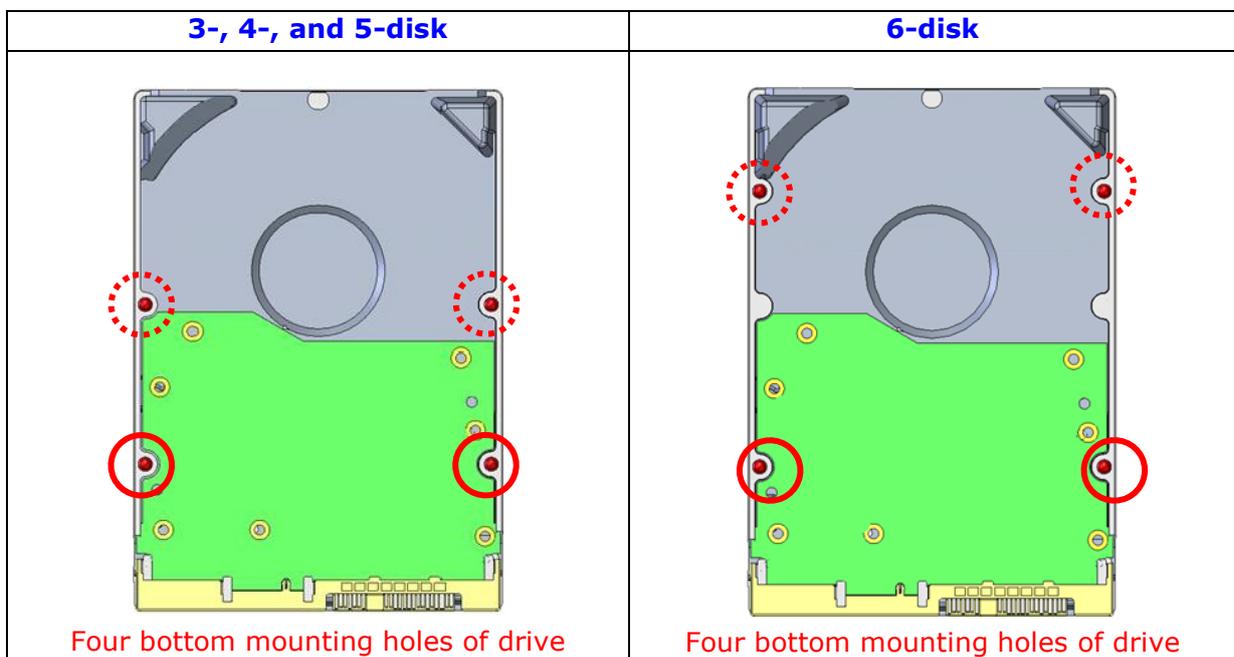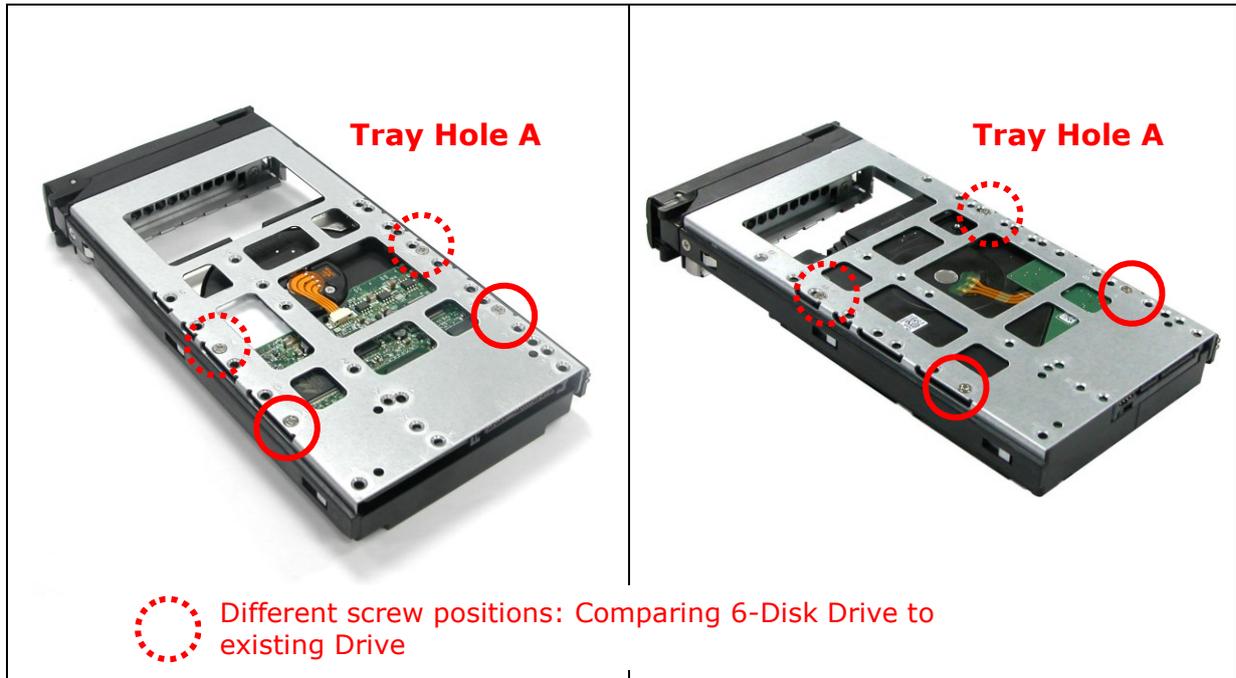
NOTE: All the disk tray holes are labelled accordingly.

5. Slide the tray into a slot.

6. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

7. If necessary, lock the Disk Tray by turning the Lock Groove.

2.2.2 Installing 2.5" Disk Drive in a Disk Tray

1. Remove an empty disk tray from the subsystem.

2. Place the disk drive in the disk tray. Turn the disk tray upside down. Align the four screw holes of the disk drive in the four *Hole w* of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.
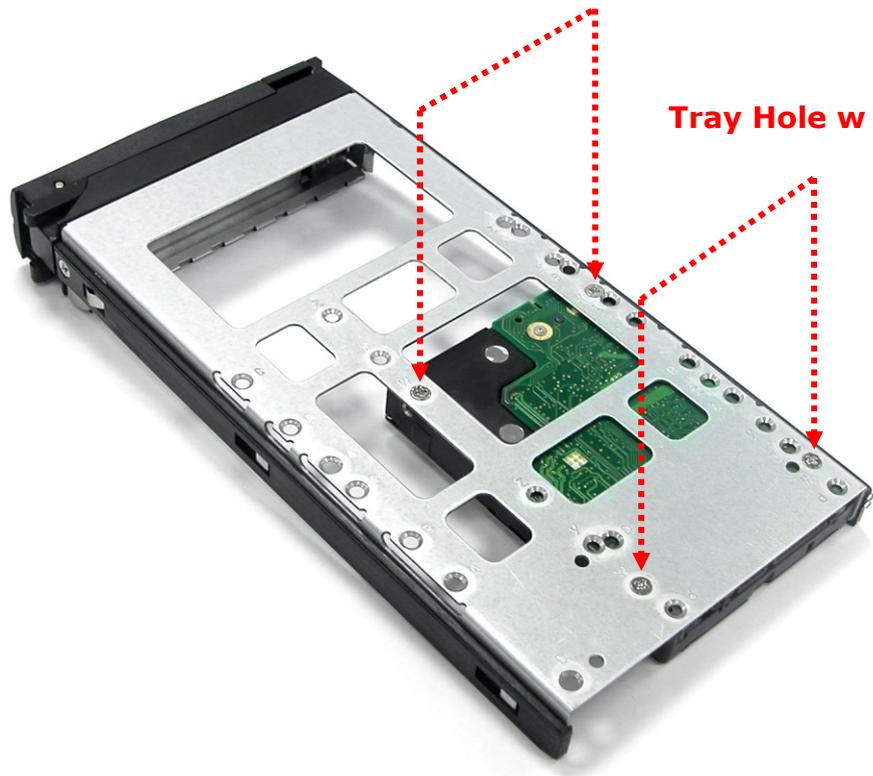
Tray Hole w

NOTE: All the disk tray holes are labelled accordingly.

3. Slide the tray into a slot.

4. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

2.2.3 Installing 3.5" SATA Disk Drive (Dual Controller Mode) in a Disk Tray

5. Remove an empty disk tray from the subsystem.

6. Prepare the dongle board, the Fixed Bracket, and screws.
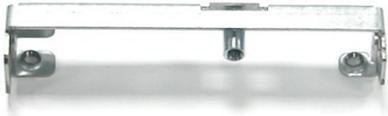
	Fixed Bracket
	Dongle Board
	Screws

7. Attach the dongle board in the Fixed Bracket with a screw.

8. Place the Fixed Bracket with the dongle board in the disk tray as shown.
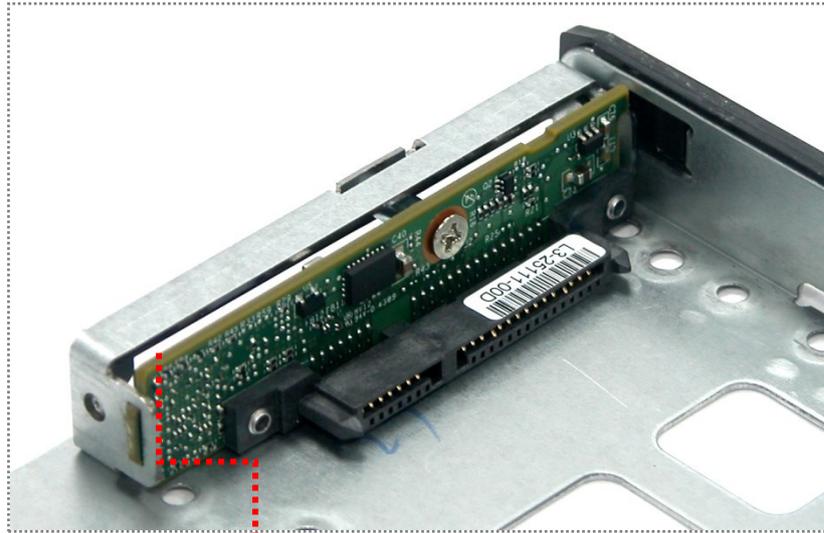
9. Turn the tray upside down. Align the holes of the Fixed Bracket in the two *Hole d* of the disk tray. Tighten two screws to secure the Fixed Bracket into the disk tray.
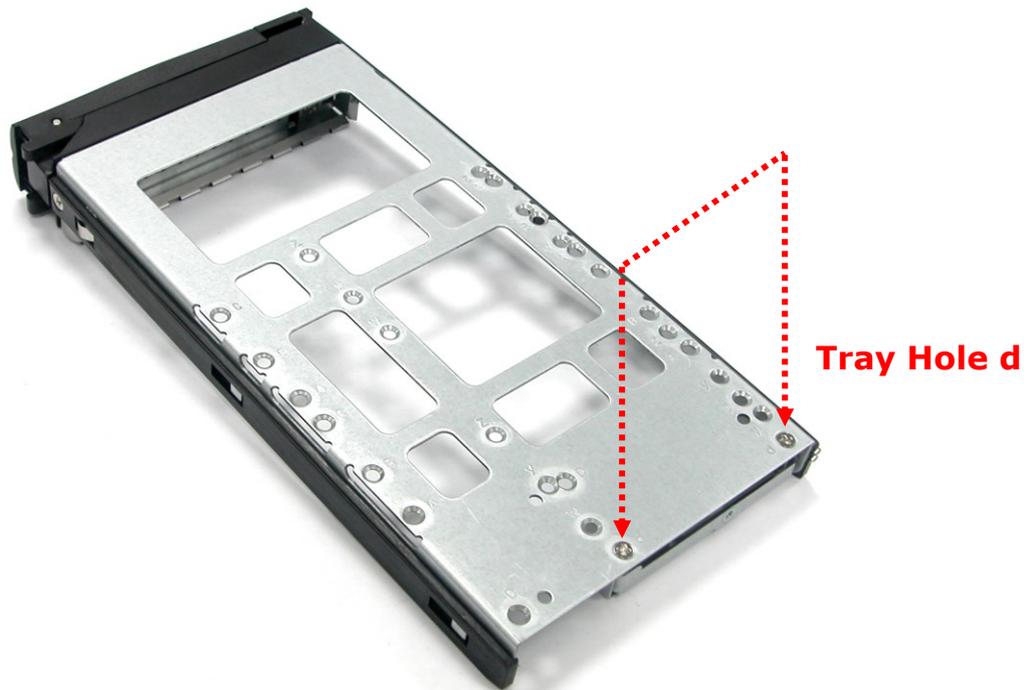
Tray Hole d

NOTE: All the disk tray holes are labelled accordingly.

10. Place the SATA disk drive into the disk tray. Slide the disk drive towards the dongle board.

11. Turn the disk tray upside down. Align the four screw holes of the SATA disk drive in the four Hole B of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.

NOTE: The mounting hole locations of the new 6-disk are different from the existing drives.

3-, 4-, and 5-disk	6-disk
Four bottom mounting holes of drive	Four bottom mounting holes of drive
Tray Hole B	Tray Hole B

Different screw positions: Comparing 6-Disk Drive to existing Drive
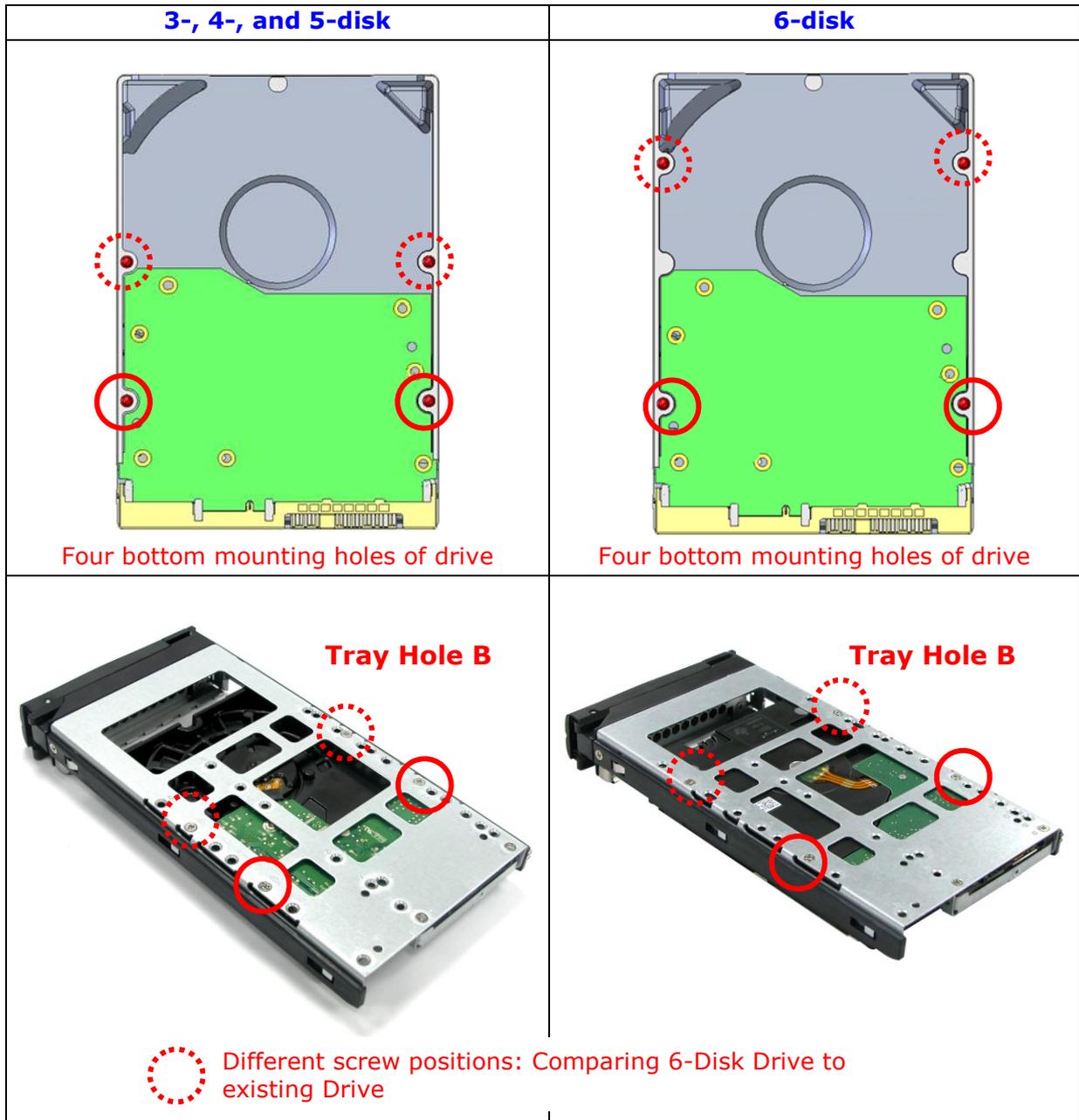
NOTE: All the disk tray holes are labelled accordingly.

12. Insert the disk tray into the subsystem.

2.2.4   Installing 2.5" SATA Disk Drive (Dual Controller Mode) in a Disk Tray

1. Remove an empty disk tray from the subsystem.

2. Prepare the dongle board, the Fixed Bracket, and screws.
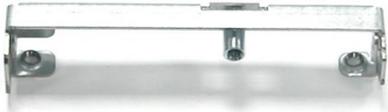
	Fixed Bracket
	Dongle Board
	Screws

3. Attach the dongle board in the Fixed Bracket with a screw.

4. Place the Fixed Bracket with the dongle board in the disk tray as shown.
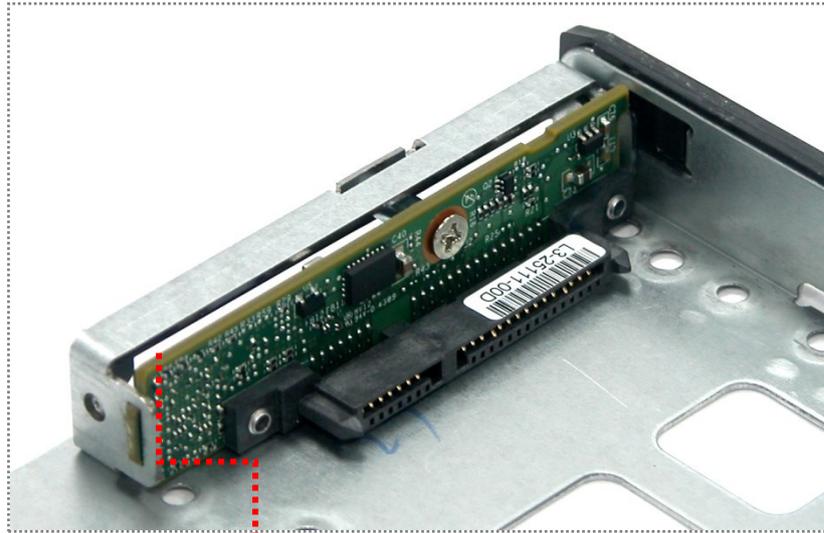
5. Turn the tray upside down. Align the holes of the Fixed Bracket in the two *Hole d* of the disk tray. Tighten two screws to secure the Fixed Bracket into the disk tray.
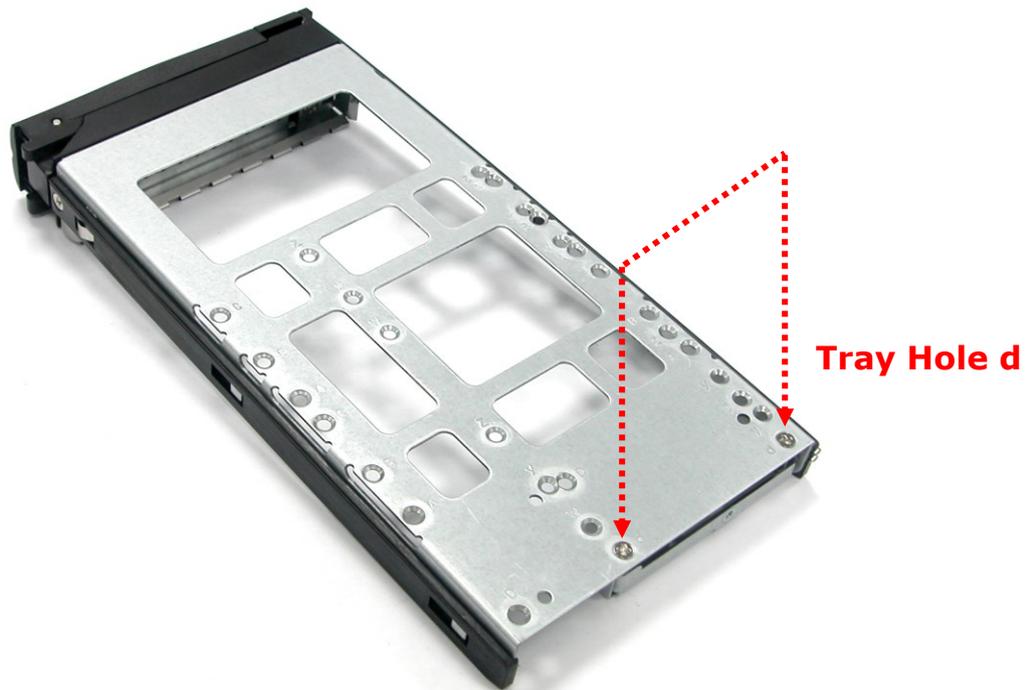
Tray Hole d

NOTE: All the disk tray holes are labelled accordingly.

6. Place the 2.5" SATA disk drive into the disk tray. Slide the disk drive towards the dongle board.

7. Turn the disk tray upside down. Align the four screw holes of the 2.5" SATA disk drive in the four *Hole y* of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.
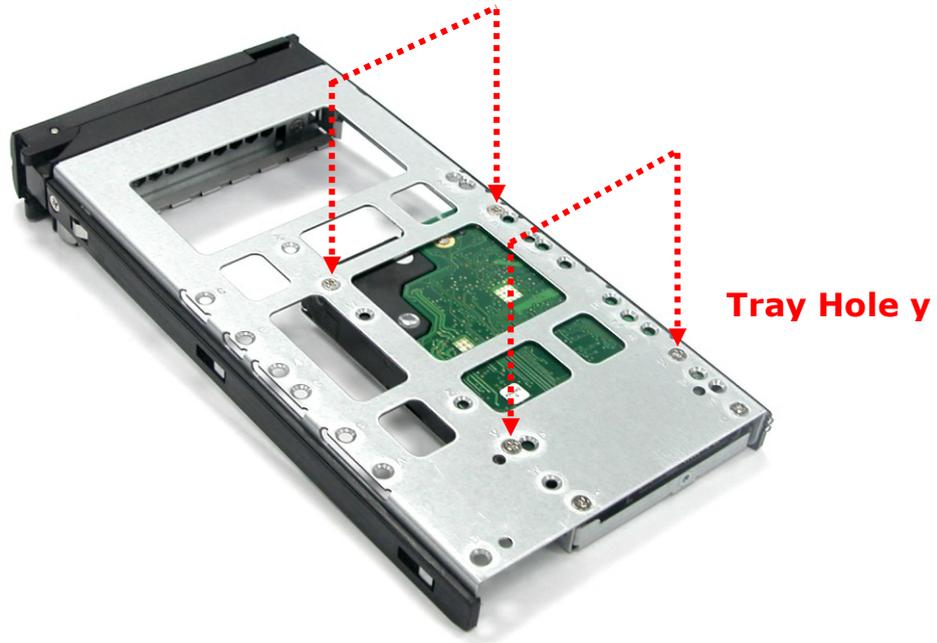
Tray Hole y

NOTE: All the disk tray holes are labelled accordingly.

8. Insert the disk tray into the subsystem.

2.3 Connecting the JBOD Subsystem

2.3.1 Connecting to SAS HBA

The JBOD Subsystem supports SAS interface which provides fast 1,200MB data transfer rate using SAS phy. Attach one end of the SAS cable to the SAS IN Port and the other end to the host bus adapter's (HBA) external SAS connector or to the SAS Switch. (The host bus adapter is installed in your Host computer system.)

2.3.2 Connecting to RAID Subsystem

Attach one end of the SAS cable to the SAS IN Port of the JBOD controller module and the other end to the SAS Expansion Port on the RAID controller of RAID subsystem. If configured in redundant mode, connect the other SAS cable to the SAS IN Port of the other JBOD controller, and the other end to the SAS Expansion Port on the other RAID controller of RAID subsystem.

Chapter 3   JBOD Firmware Upgrade

Upgrading Firmware

IMPORTANT: Before upgrade the JBOD firmware, please shut down server first or make sure no array setting on the JBOD disks. The new Firmware will effective after JBOD power cycle.

NOTE: Upgrading the firmware must be done from Master JBOD Controller (JBOD Controller 1) if the JBOD Subsystem has redundant JBOD Controllers.

Steps:

1. Please use the RS232 cable (RJ-11 to DB9) to JBOD Controller #1 and to connect JBOD RS232 Port and PC COM1 Port (or change to other COM Port as necessary).

2. Open Windows HyperTerminal Program. Connect using COM1 (COM Port used in Step1), Baud Rate: 115200, n, 8, 1, Flow Control: None.

3. Please type "system upgrade", than press "Enter" in command line.

4. Select Transfer & Send File.

You must finish within 25 seconds
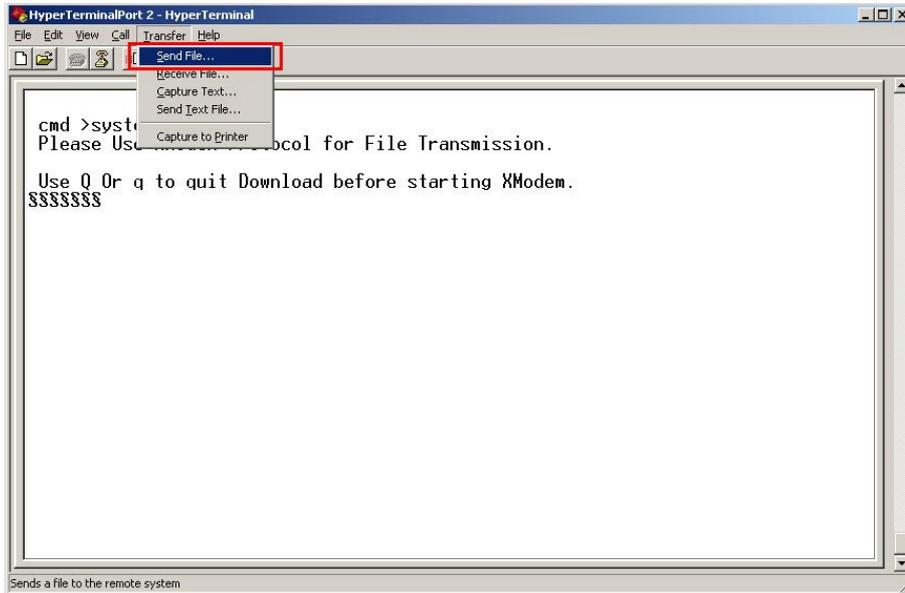
5. Select your firmware file path, and select Xmodem in the communication protocol, and click transfer button.

6. Wait for the transfer of file to complete.
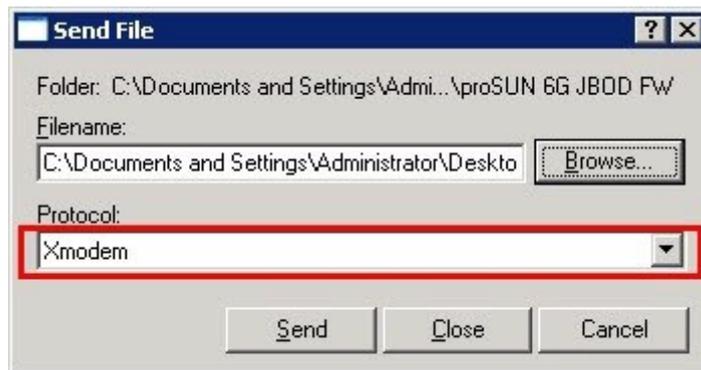
7. When the transfer and firmware update is complete, please power cycle the JBOD.
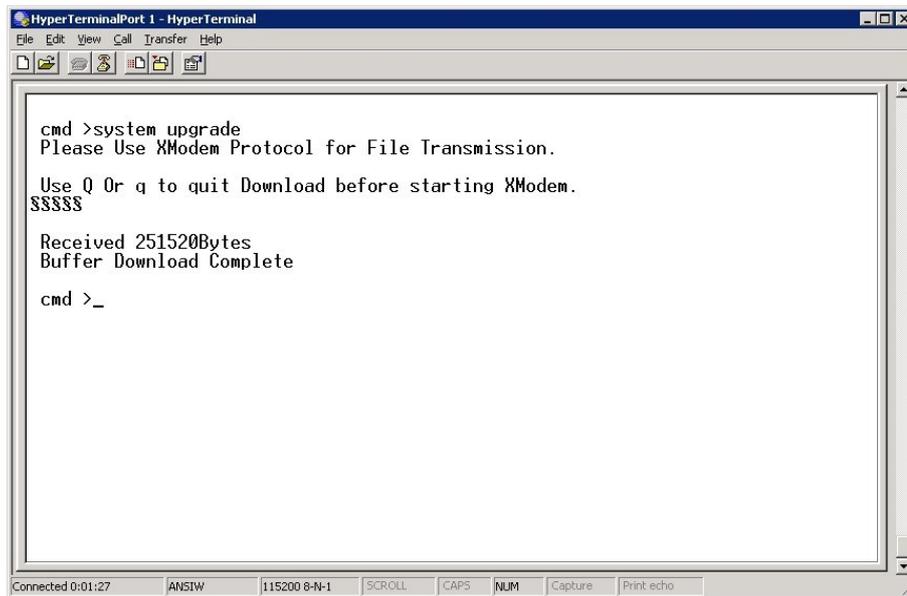
8. In command line, type "system info", you can see the Expander firmware version.