Fortra™



4-bay Desktop Enclosure

Installation Guide

Patent Pending

JMR Electronics
www.jmr.com

4-bay Desktop Enclosure

Installation Guide

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Disclaimer
The original product packaging has been tested and is safe under normal shipping circumstances. Reshipping the product without using the original product packaging will void the warranty. Do not ship the unit with canisters installed as this will void the warranty and could cause damage to the unit and drives. The canisters should be packaged separately within the product packaging as provided.

FCC Information
The ***FORTRA ä*** equipment generates, uses and can radiate radio frequency energy. If the ***FORTRA ä*** Array is not installed and used properly(that is, to strict compliance with these instructions), it may cause interference to radio and television reception.

The ***FORTRA ä*** equipment and its contents are designed to comply with the limits for a Class A computing device in accordance with the specifications in Part 15 of FCC rules. These rules are designed to provide reasonable protection against radio interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures are necessary to correct the interference.

☒ ***WARNING:*** Changes or modifications, not expressly approved by the manufacturer, could void the user's authority to use the equipment.

WARNUNG: Nicht ausdrücklich durch den Hersteller genehmigte Änderungen oder Modifikationen können die Erlaubnis Zur benutzung der Produkte gefährden.

You may find the FCC booklet, How to Identify and Resolve Radio Interference Problems, helpful. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock #004-000-00345-4.

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Contents

1 Introduction

Introduction 7
2/4/6/8/10/20-bay Product Family Features 7
4-bay Desktop Specifications 8
Fibre Channel Features 8 (Not Yet Available)
SCSI Features 9

2 Hardware Specifications

Configuration Matrix 10
Environmental Specifications 10
Electrical Specifications 10
Agency Compliance 11
Packaging Specifications 11
Thermal Specifications 11
Rotation Vibration Specifications 11
Fault Indication Features 11

3 Device Installation

SCA Connection and Hot-Swapping 12
Locking/Unlocking 12
Canister Removal/Insertion 12
Drive Installation 13

4 SCSI Setup

Slot Sequence 16
Setting ID 16
  Default ID 16
  Available ID's 17
ID Conflict 17
Option Settings 17
  Delayed Start 17
  Remote Start 18
Front Status LEDs 18
External I/O Connection 18
Termination 19
Daisy Chaining 19
SCSI Accessories 19
S-Link 19

5 Fibre Channel Setup

Installation Steps 20
Default Slot ID 20
Setting Slot ID 20
Fibre ID Jumper Settings Table 21
Option Settings 23
    Remote Start 23
    Delayed Start 23
Rear I/O Connections 24

6 Blower Operation

Blower Removal/Installation 26
Blower Replacement 27

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7 Power Supply Operation

Power Supply Removal/Installation 28
Power Supply Replacement 29

8 Product Support

Contacting JMR 30
Manual Changes 30

Appendix A : Drive and Controller Manufacturers

Drive Manufacturers 31
RAID Controller Manufacturers 31

Appendix B : Drive and Controller Compatibility List

Drive Manufacturers 33
Host Bus Controller Manufacturers 33

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Thank you for choosing ***FORTRA ä***.

We are proud of this product, which has been developed to fill the growing needs of today's fast changing and expanding need for reliable data storage and retrieval.

This manual will introduce you to RAID technology and the ***FORTRA ä*** enclosure. Detailed instructions are given for the installation of your drives and operation.

Important Icons
These icons are used throughout the manual to promote safe and successful unit usage.

NOTE: Provides additional information regarding the procedure being performed.

HINWEIS: Gibt weitere Information zu der auszuführenden Prozedur.

SAFETY TIP: *Caution should be exercised, before and during this procedure.*

SICHERHEITSHINWEIS: *Die gesamte Prozedur sollte mit äußerster Vorsicht durchgeführt werden.*

WARNING: *Irreversible damage or critical changes will occur if this procedure is executed.*

WARNUNG: *Unwiderrufliche Beschädigungen oder kritische Änderungen können eintreten, wenn diese Prozedur ausgeführt wird.*

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1

Introduction

The 4-bay ***FORTRA ä*** enclosure is designed to be used with a host system to provide a high-end storage solution. The following is a summary of the 4-bay enclosure features:

- ❒ The **4-bay *FORTRA ä* Desktop** is a four drive enclosure that supports up to four 3.5" HH (Half-Height) or LP (Low-Profile) SCA 80-pin drives. It supports single-ended and Ultra2 (LVD) SCSI buses or Fibre Channel. The SCSI version has a single SE/LVD (single-ended/Low Voltage Differential) Channel. The Fibre Channel version has dual ports (A & B) and additional connections on each port for loop expansion. SAF-TE is supported through a host ***FORTRA ä*** enclosure that is using the JMR SAF-TE processor (6/8/10/20-bay).

2/4/6/8/10/20-bay Product Family Features

FORTRA ä is a family of high-end enclosures designed for high-volume performance storage solutions Table 1-1 shows the features of the ***FORTRA ä*** 2/4/6/8/10/20-bay products.

Table 1-1. Product Features

	2-bay	4-bay[1]	6-bay[1]	8-bay[1]	10-bay*[1]	20-bay[1]
Number of Device Bays	2	4	6	8	10	20
Number of Blowers	1	1	2	2	2	4
Number of Power Supplies	1	1	2	2	1 or 2	2 to 4
Number of I/O Channels(SCSI Only)	1	1	2	2	2	4
SCSI SE/LVD Supported	✓	✓	✓	✓	✓	✓
Fibre Channel Supported	✓	✓	✓	✓	✓	✓
Hot-Swap Canisters	✓	✓	✓	✓	✓	✓
Removable Power Supplies	✓	✓	✓	✓	✓	✓
Removable Blowers	✓	✓	✓	✓	✓	✓
N+1 Power Supplies			✓	✓	✓	✓
N+1 Blowers			✓	✓	✓	✓
MIA Support(FC Only)	✓	✓	✓	✓	✓	✓
Loop Expansion support(FC Only)	✓	✓	✓	✓	✓	✓
Daisy Chainable(SCSI Only)	✓	✓	✓	✓	✓	✓
Built-in Termination(SCSI Only)			✓	✓	✓	✓
Auto Termination(SCSI Only)			✓	✓	✓	✓
SAF-TE Ready(Optional)			✓	✓	✓	✓
SAF-TE Compatible	✓	✓	✓	✓	✓	✓
SCSI to SCSI	✓	✓	✓	✓	✓	✓
SCSI to Fibre	✓	✓	✓	✓	✓	✓
Fibre to Fibre	✓	✓	✓	✓	✓	✓

**10-bay unit features apply to both Desktop and Rackmount models*

[1] *Features are based on a standard configuration with no internal host controller(s) installed*

FORTRA ä products use advanced mid-plane technology developed by JMR, that allows power supplies, drives, and all other enclosure components to interface into a single board. This provides superior performance and easy connectivity.

The host interface supports single-ended Ultra SCSI-3, Wide Ultra2 SCSI (LVD), or FC (Fibre Channel) interfaces. Connection to a SCSI host can be made using a 68-pin SCSI cable. Connection to a Fibre Channel host can be made using a DB-9 copper fibre cable.

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NOTE: FORTRA ä enclosures do not support high-voltage differential (HVD) SCSI.

4-Bay Desktop Specifications

Tables 1-2 shows the dimensional and weight specifications of the 4-bay desktop enclosures:

Table 1-2. 4-Bay Desktop Specifications

	4-bay
Unit Weight	19.7 lbs. (9.0kg)
Height	11-1/2" (292mm)
Width	7-3/4" (197mm)
Depth	12-1/2" (318mm)

Power Supply:
Quantity: 1
Power: 300 Watts
Input: 115-230 VAC; 50-60Hz (auto-switching)
Output: +5V @ 20A
+12V @ 17A

Blower:
Quantity: 1
Size: 125mm (4.92") each
Air Flow: 27.2 CFM (0.76m^3/min)
Noise: 51dB(A)

Fibre Channel Features

Loop Expansion

FORTRA ä Fibre Channel enclosures include a loop expansion I/O connector on each port. When not in use, a loopback plug is used to terminate the connection. The loop expansion I/O connector may be used to connect the enclosure to another Fibre Channel device or host. For specific connection and installation information, refer to Chapter 5.

MIA Adapters

Fibre Channel enclosures support Media Interface Adapters (MIA) on all port I/O connectors including the I/O expansion ports. MIA adapters are used to convert the copper I/O signal to optical. For specific connection and installation information, refer to Chapter 5.

Dual Loops (A & B)

A single loop is required for unit operation however both loops can be used to connect to different hosts, dual host adapters, and other devices, for flexible and even redundant configurations.
For specific connection and installation information, refer to Chapter 5.

ID Selection

0-127 device ID addresses are addressable and can be easily set-up via ID jumpers for each slot.
For specific connection and installation information, refer to Chapter 5.

SES

SES is supported on Fibre Channel units and is installed by default.. Currently the firmware is disabled so check with JMR for the firmware availability date.

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SCSI Features

Daisy Chaining

FORTRA ä SCSI enclosures include a SCSI I/O OUT port to allow additional devices and enclosures to be daisy-chained easily onto the bus. The limit of devices and enclosures that can be added is only regulated by the maximum cable length and maximum number of devices as specified by the SCSI standard. For specific connection and installation information, refer to Chapter 4.

ID Selection

0-15 device ID addresses are addressable in SCSI wide configurations and can be easily set-up via ID jumpers for each slot. For specific connection and installation information, refer to Chapter 4.

S-Link

S-Link is a customizable port that can be used as an interface to the enclosure and is available for OEM use.

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2

Hardware Specifications

This chapter covers specification information for 4-bay ***FORTRA ä*** enclosures.

Configuration Matrix

Table 2-1 shows the available configurations for ***FORTRA ä*** desktop and tower enclosures.

Fortra Tower

FT 10-L21-2XXX

CONTROLLER MANUFACTURER/MODEL #/INTERFACES
- = None (Blank if at the end of P/N)
A1 = AMI/MegaRAID Explorer 500/Fibre Channel Host/ LVD Drive Channel
C1 = CMD/CRD5644/LVD Host/LVD Host
H1 = Chaparral/G5312/LVD/Host/LVD Drives
H2 = Chaparral/G7313/Fibre Host Channel/LVD Drives
H3 = Chaparral/K5312/LVD Host/LVD Drives
H4 = Chaparral/K7313/Fibre Host Channel//LVD Drives
I1 = Infortrend/IFT3102U2G/LVD Host Channel/LVD Drives
M1 = Mylex/ DACFL/Fibre Host Channel/LVD Drives
M2 = Mylex/DACFF/Fibre Host Channel/Fibre Channel Drives
M3 = Mylex/DACFFX/Fibre Host Channel/Fibre Drives Channel
O1 = One of Us/FC4400/Fibre Host Channel/Fibre Drive Channel

SAF-TE/SES
- = None (Blank if at the end of P/N)
S = SAF-TE/SES

POWER SUPPLY QUANTITY
= A Number Equal to Power Supplies in Enclosure

AC POWER CORD
- = U.S. Domestic (Black if at the end of P/N)
A = Australian
E = European

COLOR - CANISTER/ACCENT
1 = Silver/Black
2 = Black/Granite Gray/Black

DRIVE I/O SCSI CHANNELS OR FIBRE LOOPS
= A Number Equal to Drive I/O Channels

ENCLOSURE I/O
L = SCSI 3 (LVD/SE Multimode, Fast-Wide, HD68)
F = Fibre Channel

NUMBER OF DRIVES
= A Number Equal to Drives Mountable in the Enclosure

FAMILY SERIES
Fortra Rackmount

Table 2-1. Configuration Matrix

Environmental Specifications

Operating Temperature: 0°C to +50°C (32°F to 122°F)
Storage Temperature: 20°C to 85°C (68°F to 185°F)
Maximum ambient temperature is dependent on the recommended temperature to meet the MTBF rating as specified by the manufacturer of the installed devices.

Electrical Specifications

AC Inlet Type: IEC320/EN60320
Power Cord: NEMA5-15P
Power Supply: Auto-switching for 110/220V operation

Agency Compliance

FORTRA ä enclosures have been designed and built to comply with the FCC Class A, UL, CSA/TUV, CE, and C-Tick standards. For more information on FCC Class A compliance, see page 3.

Packaging Specifications

FORTRA ä packaging has been designed to be reusable and recyclable. Drives may be installed and shipped in the canisters as long as the canisters are in their original packaging location and are not installed in the enclosure. Shipping the unit with canisters installed in the enclosure may cause damage to the enclosure or to the drives and will void the warranty.

➢ ***SAFETY TIP:*** *Reshipping the enclosure with canisters, drives, or power supplies installed in the enclosure may cause damage to these components and will void the warranty.*

SICHERHEITSHINWEIS: *Der Versand des Gehäuses mit eingebauten Einschüben, Platten und Netzteilen kann zur Beschädigung dieser Komponenten führen und somit den Garantieanspruch gefährden.*

Packaging complies with ISTA (International Safe Transit Association) standards and has been ISTA certified.

Anti-static bags are pre-packaged with each canister to ensure that reshipping with an installed device is static safe. Do not throw the packaging away if the product is intended to be reshipped.

Disclaimer

The original product packaging has been tested and is safe under normal shipping circumstances. Reshipping the product without using the original product packaging will void the warranty. Do not ship the unit with canisters installed in the enclosure as this could cause damage to the unit and to the drives and will void the warranty. The canisters should be packaged separately within the product packaging as provided.

Thermal Specifications

FORTRA ä enclosures have been designed to meet the air-flow/cooling requirements for popular 7,200 and 10,000 RPM disk drives. Using a high performance blower, air is pulled in from all open vents and exhausted out the back of the unit.

Rotation Vibration Specifications

FORTRA ä enclosures have been designed to meet the rotation vibration/shock requirements for popular 7,200 and 10,000 RPM disk drives.

Fault Indication Features

This section reviews the indicators that will notify the user of a power supply or blower that is in a fault state. More information is available in Chapter 5 (blowers) and Chapter 6 (power supply).

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Fault Indicators

All slots will blink **Red** in color on a blower fault. On a power supply fault, the front power supply LED will blink on and off.

Audible Alert

On a blower or power supply fault, an audible alert will sound. Pressing the Alert Reset button on the back of the unit will turn the alert off.

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3

Device Installation

This chapter covers SCSI and Fibre Channel device installation for 6-bay desktop enclosures.

SCA Connection and Hot-Swapping

The unit uses SCA-2 type connectors which provide a safe means of connection/disconnection when hot-swapping devices. In order to utilize this feature, the host adapter or RAID controller and host operating software must support the feature. Any SCA drive is capable of plugging directly into the backplane of the unit and should not require any additional cabling or connections.

Locking/Unlocking

A front lock prevents unwanted removal of the canisters including the power supply canister. The lock and unlock positions are shown in Figure 3-1 below.



Unlocked Position Locked Position

Figure 3-1. Canister Removal/Insertion

Canister Removal/Insertion

Refer to Figure 3-2 for a picture example of canister removal & insertion and follow the steps below. These instructions apply to all ***FORTRA ä*** models.



Figure 3-2. Canister Removal/Insertion

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➢ ***SAFETY TIP:*** *After disengaging a device from the enclosure as shown in Step 3, allow 10 seconds before pulling the canister out of the unit as shown in Step 4. This allows the device to properly spin/shut down before transport.*

SICHERHEITSHINWEIS: *Nachdem ein Einschub vom Gehäuse wie in „Step 3“ gezeigt gelöst wurde, warten Sie bitte ca. 10 Sekunden bevor der Einschub wie in „Step 4“ gezeigt ganz heraus gezogen wird. Dies ermöglicht den Auslauf der Festplatte bis zum vollständigen Stillstand der rotierenden Scheiben für einen sicheren Transport.*

❶ Step 1 shows the canister in a locked position.
❷ Pull the handle out to unlock the canister from the ***FORTRA ä*** unit as shown in Step 2. Ensure that the thumb is placed below the line. Pressing the thumb against the Status LED lens could break it. Notice that the locking tab slides down as the handle is pulled out.
❸ Pull the canister straight out to remove. Ensure that any installed devices are spun down before full removal to prevent damage to the drive. Follow the steps in reverse to reinstall.

Drive Installation

Figure 3-3 shows the device canister parts that will be referred to for device installation.

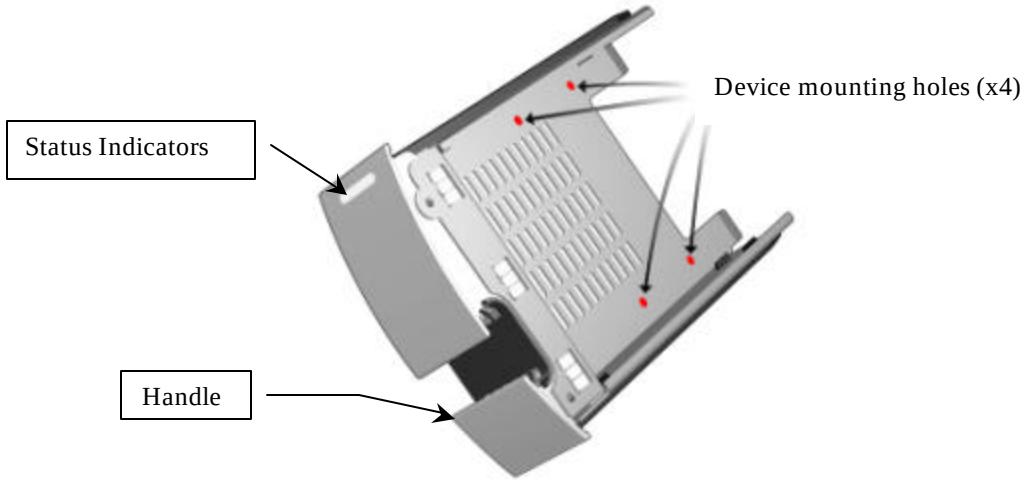


Figure 3-3. Device Canister

☒ ***WARNING:*** *Before device installation, alleviate any electro-static discharge by touching a grounded metal assembly. Static can be potentially damaging to enclosure components.*

WARNUNG: *Berühren Sie vor der Festplatteninstallation geerdete Metallgegenstände, um elektro-statische Aufladung abzuleiten. Statische Aufladung kann elektronische Gehäusekomponenten schwer beschädigen.*

6-32” device mounting screws are included with the unit for device mounting. The JMR part number for the screws is HDS-01906.

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☒ ***WARNING:*** *The 6-32 mounting screws that are provided have been specially designed to fit the canisters. Do not install the device using any other screws than the ones provided.*

WARNUNG: *Die mitgelieferten Befestigungsschrauben 6-32 wurden speziell für die Einschübe angefertigt und zur Befestigung der Festplatte sollten Sie keinesfalls andere als diese verwenden.*

During installation, refer to Figures 3-2 & 3-3.

❶ After removing the canister (see Figure 3-2), place it on a static free surface along with the device to be installed.
❷ Place the device in the canister and mount it using manufacturer-approved screws (Use 4 screws to mount the drive).
❸ Replace the canister into the unit by following the steps in Figure 3-2 in reverse order. during reinstallation, start by making sure the handle is fully open when inserting.
❹ Repeat steps 1 through 3 until all devices are installed, then move onto step 5 to complete unit setup and installation.
❺ Configure ID, and other options as required (see Chapter 4 for SCSI device setup and Chapter 5 for Fibre Channel setup).
❻ Install and configure S-Link or other optional features.
❼ Establish host connection (see Chapter 4 for SCSI host connection and Chapter 4 for Fibre Channel host connection).

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4

SCSI Setup

This chapter covers SCSI device setup and option settings.

Figure 4-1 shows the slot numbering sequence used to refer to device canisters and also shows the default SCSI ID value for each slot.

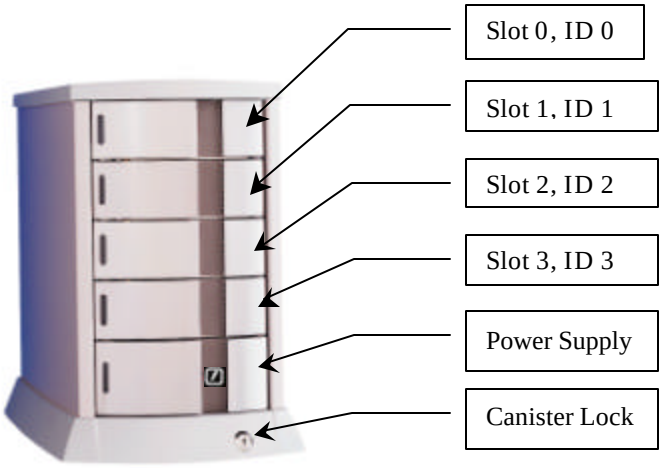


Figure 4-1. Slot Numbering Sequence

Setting ID

SCSI ID rotary switches are used to change the SCSI ID. There are four located on the back of the unit. Use the + or – button on the rotary switch to set the ID for the device slot as required. Figure 4-2 shows the location of the SCSI ID switches.

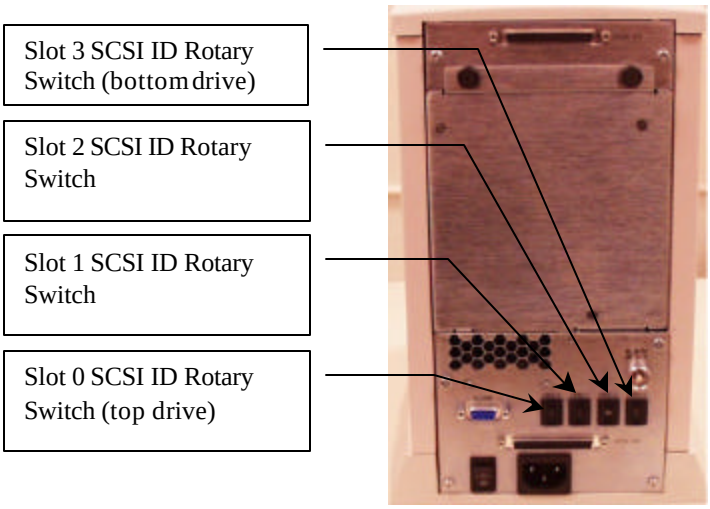


Figure 4-2. Rotary Switch Location

Default ID

ID Jumpers are factory set as shown in Figure 4-1 and Table 4-1. If the rotary switches are not connected, the ID's will automatically be assigned by the built-in microprocessor to the addressed shown in Table 4-1. Automatic ID selection will start at Slot 0 and increment by one for each slot after Slot 0. The default jumper ID settings are shown in Table 4-2.

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Table 4-1. Default Jumper ID Settings

Slot	Default SCSI ID
0	0
1	1
2	2
3	3

Available ID's

Each SCSI bus is allowed to have ID's that range from 0-15. No two devices on the same bus may share the same ID. Each host controller typically uses one ID. If the enclosure is connected to another enclosure, ensure that no devices in either enclosure share the same SCSI ID. If the S-Link is used for SAF-TE, ensure that the ID of the SAF-TE controller is not used for another device.

ID Conflict

When two devices share the same SCSI ID, a conflict occurs. This conflict must be corrected before the SCSI bus will work properly. If a conflict occurs, check all jumper settings to ensure that no devices on the bus share the same ID. Also check all other devices on the bus outside of the enclosure including the controller and SAF-TE board if used.

Option Settings

Option settings are device features that can be enabled or disabled by setting jumpers on the backplane. For information on these options, please contact the device manufacturer. See Figure 4-2 to access the option header.

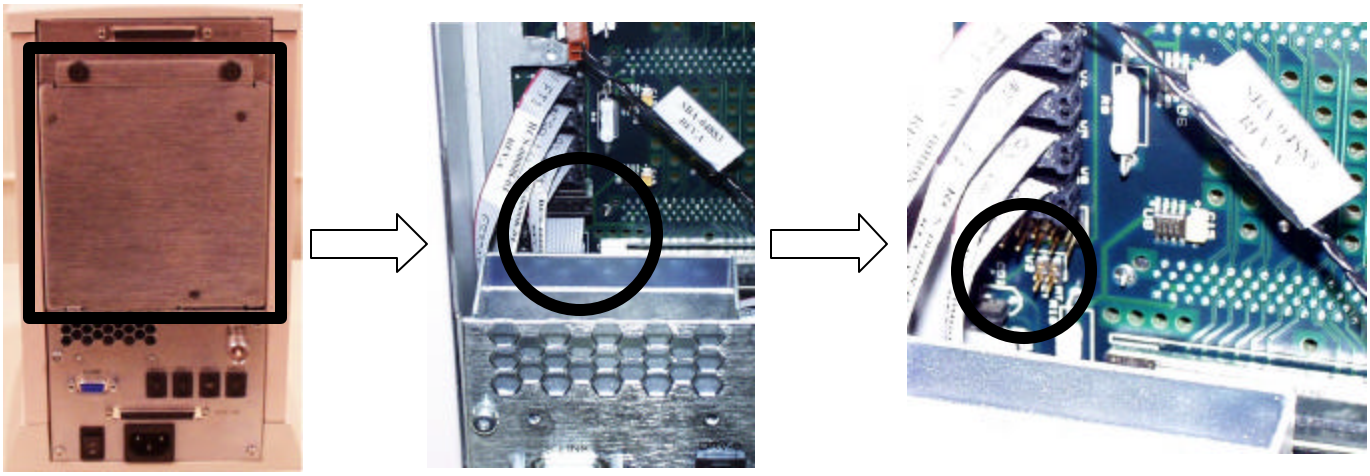
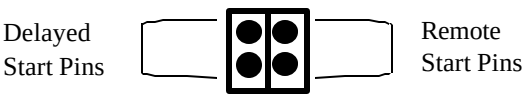


Figure 4-3. W2 Option Header

❶ Remove the blower by unfastening the two thumbscrews
❷ Remove the bottom ribbon cable to gain access to the jumpers located under the cable
❸ Set the jumpers accordingly then reinstall the cable that was removed in Step 2, and install the fan.



Delayed Start Option Jumper

Header W2 pins 1 & 2. Jumper on = enabled. Jumper off=disabled.

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Remote Start Option Jumper

Header W2 pins 3 & 4. Jumper on = enabled. Jumper off=disabled.

Front Status LEDs

Figure 4-4 show the location of the front status LED on the front of each canister. A '**Blue**' light indicates drive activity. A '**Red**' light indicates a device fault on SAF-TE enabled units only if supported. Standard SCSI units do not have the capability to detect a fault and will not light '**Red**' to indicate a device fault. If all device canisters display a '**Red**' light that is blinking on and off it indicates that there is a blower fault. On a power supply fault, the power supply LED will blink '**Red**' while the canister LEDs continue to function normally. Refer to Chapter 5 for blower fault information, and to Chapter 6 for power supply fault information.

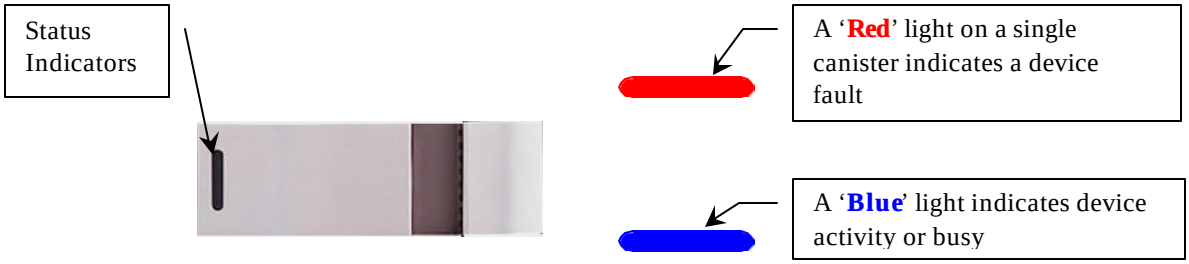


Figure 4-4. Front Status LEDs

External I/O Connection

The external I/O connections are located on the back of the unit. Figure 4-5 shows the back external I/O connections available.

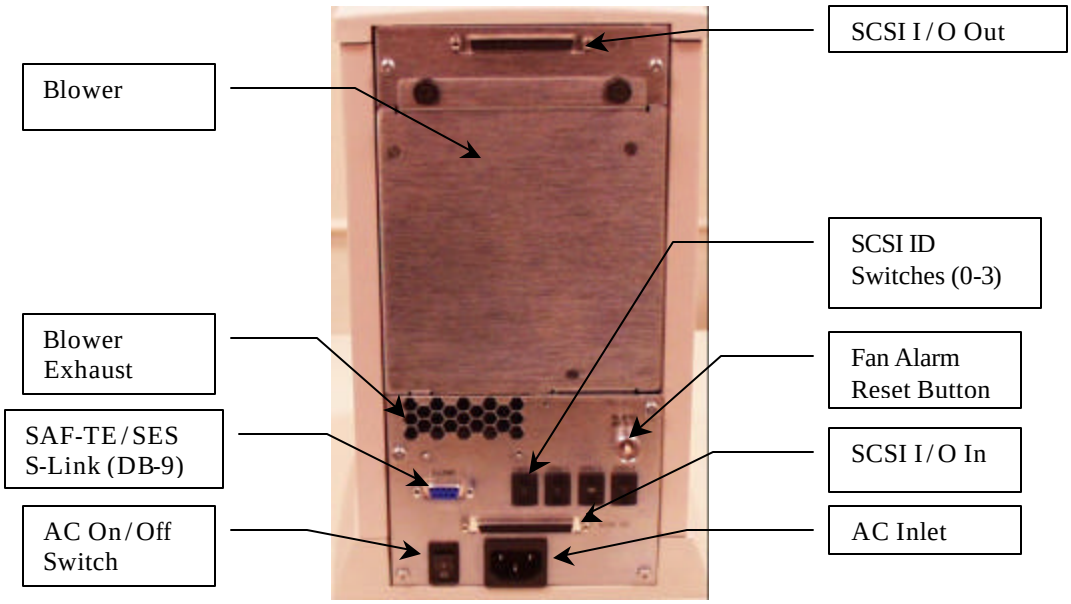


Figure 4-5. External I/O Connections

The SCSI I/O In port (see page 9) is used to connect to a host and requires an external cable with a 68-pin High-Density male connector to mate at the enclosure side.

It is important that the external cable length and impedance be taken into consideration and is adequate for the devices and SCSI speeds being used. JMR carries its own line of high quality external SCSI Cable shown in Table 4-3.

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Termination

Termination must be provided at the end and beginnings of each SCSI bus. Remove all termination jumpers from all drives in between the terminators.

Drive level termination is not recommended since the terminated device may be easily removed. If an external terminator is used, it should be connected to the SCSI I/O Out port. JMR carries its own line of external SCSI wide terminators shown in Table 4-2.

✎ ***NOTE:*** Both ends of the SCSI bus must be terminated. Ensure that the host is terminated as well as the last enclosure or device on the bus or if no other device is daisy chained, the SCSI I/O Out port should be connected to an external terminator.

Termination power is always supplied to the bus by the unit.

Daisy-Chaining

The SCSI Out port is used to add other enclosures and devices to the SCSI bus. The SCSI Out port requires a cable with a 68-pin High-Density male connector. When daisy chaining, the Out port of the enclosure is connected to the In port of the enclosure or device being added. Ensure that when new devices are added to the SCSI bus that the ID does not have a conflict. Once the units are connected together, termination must be moved to the last device or enclosure on the SCSI bus. See Figure 4-5 for SCSI Out locations.

The devices or enclosures daisy-chained together must be compatible SCSI devices. Single-ended interface devices cannot be on the same daisy-chain with differential interface devices. Up to 16 devices (including the host) may be daisy-chained together on the same bus.

SCSI Accessories

JMR carries its own line of external ***FORTRA ä*** compatible SCSI SE and LVD terminators. See Table 4-2 below for JMR part number and description. Please contact a JMR representative for current availability and pricing.

Table 4-2. JMR SCSI Terminators

JMR Part #	Ends	Connector Type	Terminator Type
CNA-01699	Molded	SCSI-3 (68-pin)	Active (SE)
CNA-01883	Molded	SCSI-3 (68-pin)	SE/LVD Multi-mode
CNA-01702	Molded	SCSI-3 (68-pin)	Intelligent Forced Perfect(FPT/SE)

JMR carries its own line of high-quality external ***FORTRA ä*** *compatible* SCSI cables. See Table 4-3 below for JMR part number and description. Please contact a JMR representative for current availability and pricing.

Table 4-3. JMR SCSI Cables

JMR Part #	Ends	Connector Type	Length(FT)
CBL-00528	Molded	SCSI-2 to SCSI-3	3
CBL-00529	Molded	SCSI-2 to SCSI-3	6
CBL-00531	Molded	Centronics 50 to SCSI-3	6
CBL-00532	Molded	SCSI-3 to SCSI-3	3
CBL-00534	Molded	SCSI-3 to SCSI-3	6
CBL-00535	Molded	Centronics 50 to SCSI-3	3
CBL-00661	Molded	DB-9 to DB-9 Copper Fibre	3 meters

S-Link

The S-Link port on the back of the unit can be customized for OEM use.

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5

Fibre Channel Setup

This chapter covers Fibre Channel device setup and option settings.

Installation Steps

❶ Install each drive into the device canisters provided and install into the top four bays of the enclosure. Ensure that the unit is in the unlock position.

❷ Install the power supply into the bottom slot of the unit.

❸ Remove the blower to access and set the ID for each device or skip this step and use the default ID settings shown below.

❹ Plug in the host cables and loop-back plugs to the rear of the unit. Loop-back plugs are included in the accessories box.

❺ Plug in the AC power cord and turn the unit on.

Default Slot ID

Drive Bay	Default ID/Jumper
Slot 1 (top)	ID 1 / W1
Slot 2	ID 2 / W2
Slot 3	ID 3 / W3
Slot 4 (bottom)	ID 4 / W4

Setting Slot ID

The ID for each slot can be set using jumpers located on the backplane of the unit. To access the jumpers the blower must be removed. See Figure 5-1 and Table 5-1.

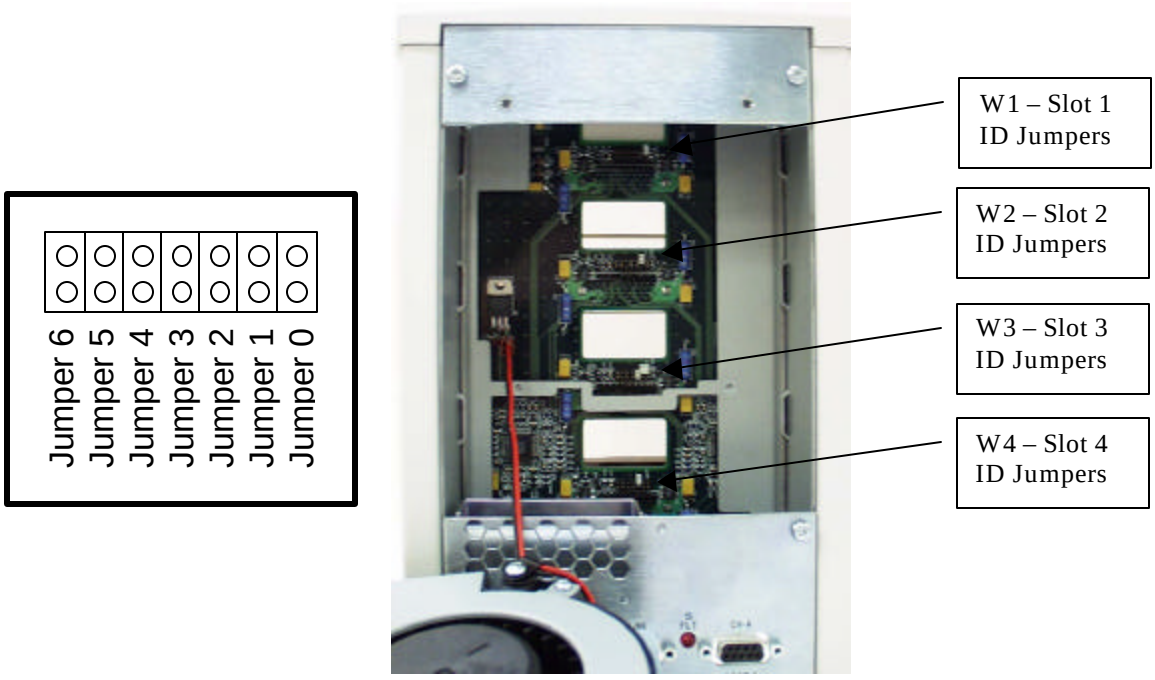


Figure 5-1. Slot ID Jumpers

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Table 5-1. W1-W4 Jumper Settings

FIBRE ID	JUMPER 0 (bin=1)	JUMPER 1 (bin=2)	JUMPER 2 (bin=4)	JUMPER 3 (bin=8)	JUMPER 4 (bin=16)	JUMPER 5 (bin=32)	JUMPER 6 (bin=64)
0	C	C	C	C	C	C	C
1	O	C	C	C	C	C	C
2	C	O	C	C	C	C	C
3	O	O	C	C	C	C	C
4	C	C	O	C	C	C	C
5	O	C	O	C	C	C	C
6	C	O	O	C	C	C	C
7	O	O	O	C	C	C	C
8	C	C	C	O	C	C	C
9	O	C	C	O	C	C	C
10	C	O	C	O	C	C	C
11	O	O	C	O	C	C	C
12	C	C	O	O	C	C	C
13	O	C	O	O	C	C	C
14	C	O	O	O	C	C	C
15	O	O	O	O	C	C	C
16	C	C	C	C	O	C	C
17	O	C	C	C	O	C	C
18	C	O	C	C	O	C	C
19	O	O	C	C	O	C	C
20	C	C	O	C	O	C	C
21	O	C	O	C	O	C	C
22	C	O	O	C	O	C	C
23	O	O	O	C	O	C	C
24	C	C	C	O	O	C	C
25	O	C	C	O	O	C	C
26	C	O	C	O	O	C	C
27	O	O	C	O	O	C	C
28	C	C	O	O	O	C	C
29	O	C	O	O	O	C	C
30	C	O	O	O	O	C	C
31	O	O	O	O	O	C	C
32	C	C	C	C	C	O	C
33	O	C	C	C	C	O	C
34	C	O	C	C	C	O	C
35	O	O	C	C	C	O	C
36	C	C	O	C	C	O	C
37	O	C	O	C	C	O	C
38	C	O	O	C	C	O	C
39	O	O	O	C	C	O	C
40	C	C	C	O	C	O	C
41	O	C	C	O	C	O	C
42	C	O	C	O	C	O	C
43	O	O	C	O	C	O	C
44	C	C	O	O	C	O	C
45	O	C	O	O	C	O	C
46	C	O	O	O	C	O	C
47	O	O	O	O	C	O	C
48	C	C	C	C	O	O	C
49	O	C	C	C	O	O	C
50	C	O	C	C	O	O	C
51	O	O	C	C	O	O	C
52	C	C	O	C	O	O	C

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53	O	C	O	C	O	O	C
54	C	O	O	C	O	O	C
55	O	O	O	C	O	O	C
56	C	C	C	O	O	O	C
57	O	C	C	O	O	O	C
58	C	O	C	O	O	O	C
59	O	O	C	O	O	O	C
60	C	C	O	O	O	O	C
61	O	C	O	O	O	O	C
62	C	O	O	O	O	O	C
63	O	O	O	O	O	O	C
64	C	C	C	C	C	C	O
65	O	C	C	C	C	C	O
66	C	O	C	C	C	C	O
67	O	O	C	C	C	C	O
68	C	C	O	C	C	C	O
69	O	C	O	C	C	C	O
70	C	O	O	C	C	C	O
71	O	O	O	C	C	C	O
72	C	C	C	O	C	C	O
73	O	C	C	O	C	C	O
74	C	O	C	O	C	C	O
75	O	O	C	O	C	C	O
76	C	C	O	O	C	C	O
77	O	C	O	O	C	C	O
78	C	O	O	O	C	C	O
79	O	O	O	O	C	C	O
80	C	C	C	C	O	C	O
81	O	C	C	C	O	C	O
82	C	O	C	C	O	C	O
83	O	O	C	C	O	C	O
84	C	C	O	C	O	C	O
85	O	C	O	C	O	C	O
86	C	O	O	C	O	C	O
87	O	O	O	C	O	C	O
88	C	C	C	O	O	C	O
89	O	C	C	O	O	C	O
90	C	O	C	O	O	C	O
91	O	O	C	O	O	C	O
92	C	C	O	O	O	C	O
93	O	C	O	O	O	C	O
94	C	O	O	O	O	C	O
95	O	O	O	O	O	C	O
96	C	C	C	C	C	O	O
97	O	C	C	C	C	O	O
98	C	O	C	C	C	O	O
99	O	O	C	C	C	O	O
100	C	C	O	C	C	O	O
101	O	C	O	C	C	O	O
102	C	O	O	C	C	O	O
103	O	O	O	C	C	O	O
104	C	C	C	O	C	O	O
105	O	C	C	O	C	O	O
106	C	O	C	O	C	O	O
107	O	O	C	O	C	O	O
108	C	C	O	O	C	O	O
109	O	C	O	O	C	O	O
110	C	O	O	O	C	O	O

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111	O	O	O	O	C	O	O
112	C	C	C	C	O	O	O
113	O	C	C	C	O	O	O
114	C	O	C	C	O	O	O
115	O	O	C	C	O	O	O
116	C	C	O	C	O	O	O
117	O	C	O	C	O	O	O
118	C	O	O	C	O	O	O
119	O	O	O	C	O	O	O
120	C	C	C	O	O	O	O
121	O	C	C	O	O	O	O
122	C	O	C	O	O	O	O
123	O	O	C	O	O	O	O
124	C	C	O	O	O	O	O
125	O	C	O	O	O	O	O
126	C	O	O	O	O	O	O
127	O	O	O	O	O	O	O

Legend: O = Open (no jumper) C = Closed (jumper on)

Option Settings

Additional drive option jumpers for remote and delayed start are located on the unit I/O board. They must be set at the factory.

Remote Start

This feature is disabled by default and can be enabled for OEM use.

Delayed Start

This feature is disabled by default and can be enabled for OEM use.

Accessories

Included Accessories: CNM-00752 loop-back plug and HDS-01906 device mounting screws. These parts are included as standard but additional parts can be ordered separately.

JMR also carries CBL-00661, a standard 3-meter DB-9 to DB-9 copper Fibre Channel cable that is not included and can be ordered separately.

For an optical connection part number KITS-027 is available. This kit includes an MIA adapter that will convert the DB-9 copper connection on the back of the unit to optical Fibre.

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Rear I/O Connections

The rear of the unit and the I/O connections are described below. See Figure's 5-2 and 5-3.

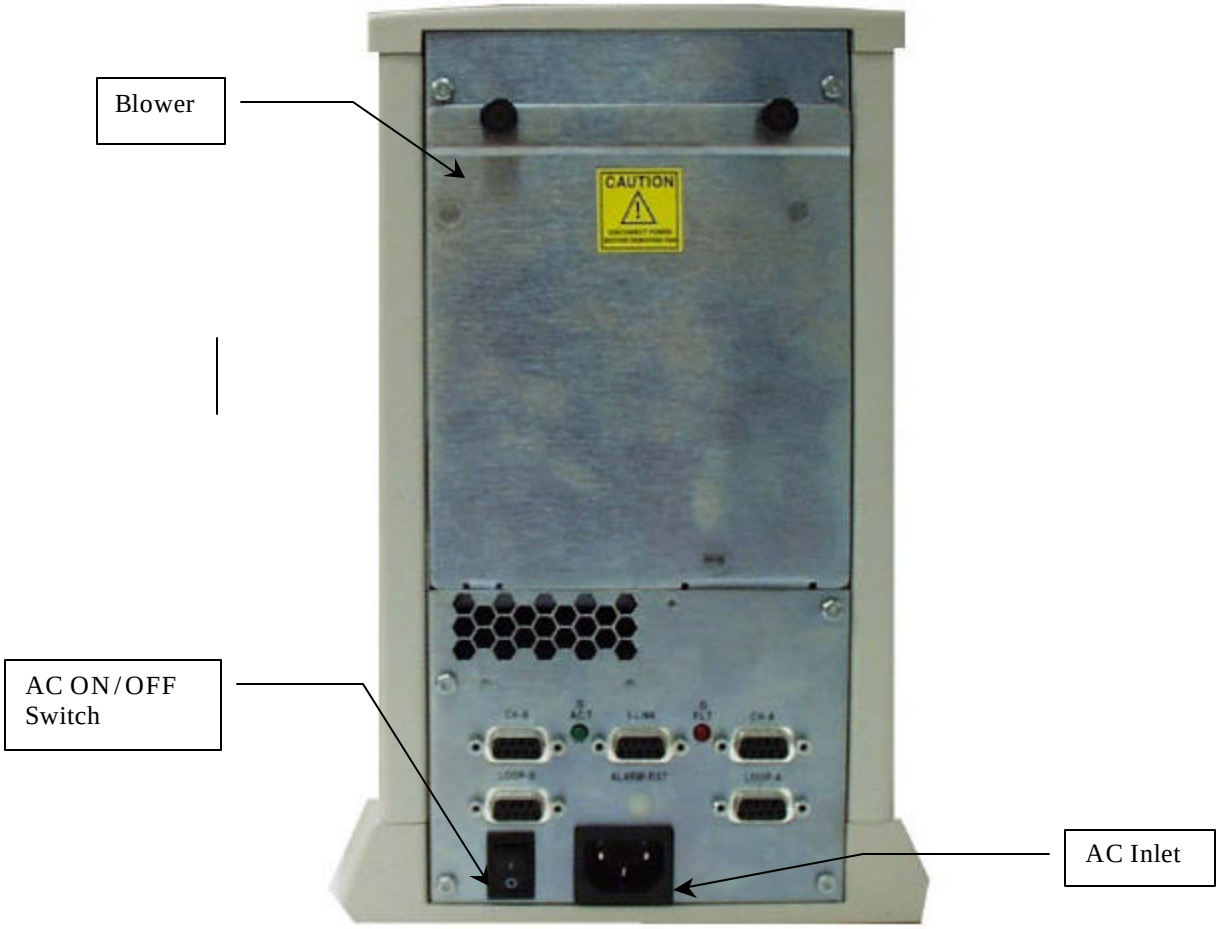


Figure 5-2. Rear unit view

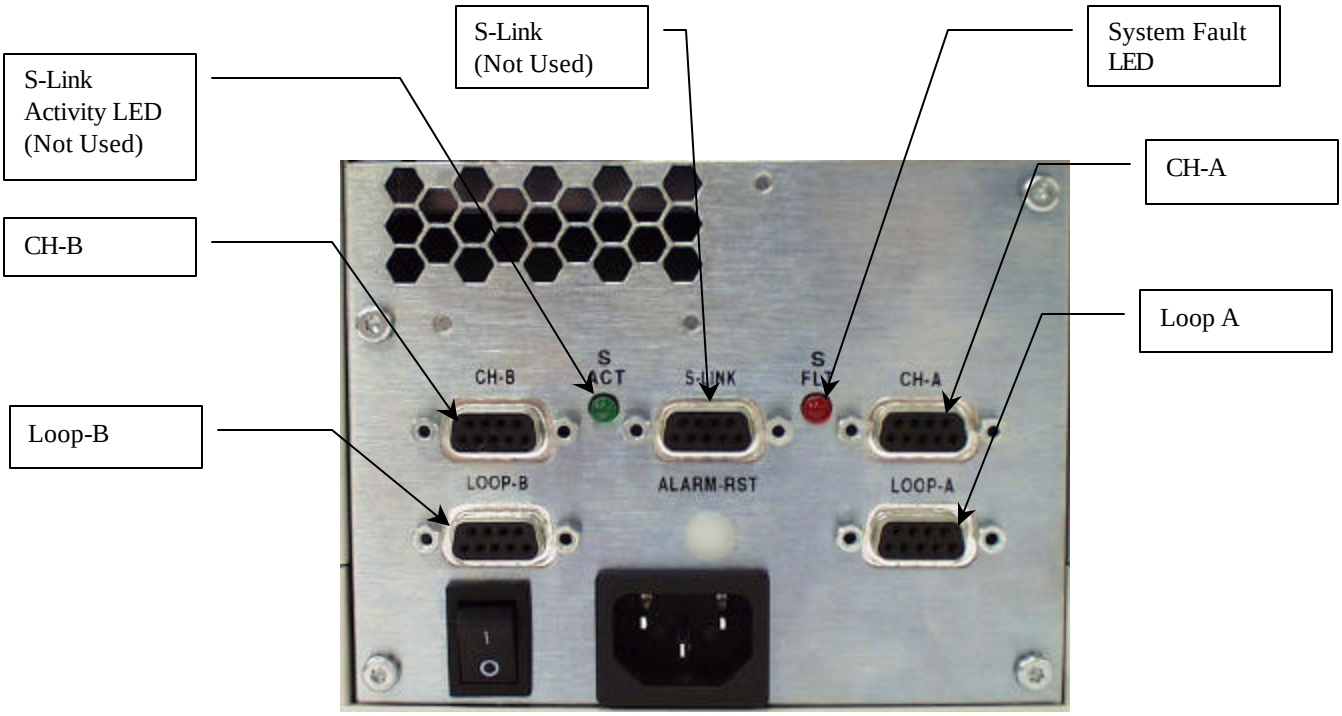


Figure 5-3. Rear I/O Connections

CH-A
Loop A connection 1. This is a DB-9 copper fibre channel connector used to connect to a host system or to an expansion chassis. If this port is not used to connect with a host system or another enclosure, the loop-back plug must be used to close the Fibre loop properly.

Loop-A
Loop A connection 2. This is a DB-9 copper fibre channel connector used to connect to a host system or to an expansion chassis. If this port is not used to connect with a host system or another enclosure, the loop-back plug must be used to close the Fibre loop properly.

CH-B
Loop B connection 1. This is a DB-9 copper fibre channel connector used to connect to a host system or to an expansion chassis. If this port is not used to connect with a host system or another enclosure, the loop-back plug must be used to close the Fibre loop properly.

Loop-B
Loop B connection 2. This is a DB-9 copper fibre channel connector used to connect to a host system or to an expansion chassis. If this port is not used to connect with a host system or another enclosure, the loop-back plug must be used to close the Fibre loop properly.

System Fault LED & Audible Alert
This red LED will light along with a buzzer if a system fault occurs. A system fault includes over temperature, power fault, or blower fault. The buzzer will sound off with a sequence of beeps to indicate the fault that has occurred. 1 beep = Temperature Fault; 3 beeps = Blower Fault;
5 beeps = Power Supply Fault.

Alarm Reset
This button will turn off the audible alert. Pressing this button will not reset power to the unit, it will only silence the alarm.

S-Link Activity LED
This LED is customizable for OEM use and typically used in conjunction with the S-Link port.

S-Link
This is a customizable port that is not used but can be programmed for OEM purposes.

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6

Blower Operation

This chapter covers all operations of the blower for 4-bay units. Refer to Chapter 1 for blower specifications. The blower is easily removable. Failure to replace a non-working blower within a reasonable period of time may expose drives to extreme heat that could cause loss of data.

☒ ***WARNING:*** *Failure to replace a non-working blower within a reasonable period of time may expose drives to extreme heat that could cause loss of data.*

The blower is located on the back of the unit. If there is a blower fault, both of the device canister status LEDs will blink red and an audible alert will sound. Pressing the Alarm Reset button located on the back of the unit will turn off the audible alert.

Blower Removal/Insertion

The blower may be easily installed and removed as shown in Figure 6-1.

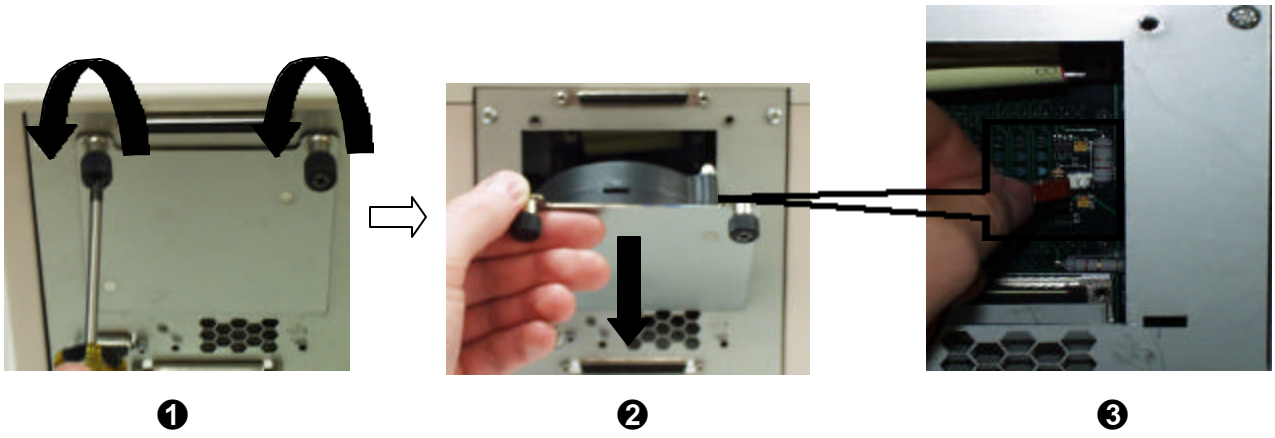


Figure 6-1. Blower Installation

☒ ***WARNING:*** *Because the blower continues to spin for a short while, the unit should be turned off at least 10 seconds before replacing the fan to prevent injury.*

WARNUNG: *Um Verletzungen zu vermeiden, sollte das Gerät wenigstens 10 Sekunden vor Entnahme der Gebläse ausgeschaltet werden, da die Flügelräder der Gebläse nachlaufen.*

❶ Unfasten both blower thumbscrews by turning counterclockwise. A Philips head screwdriver may be used if the thumbscrew is too tight to turn by hand.

❷ Remove the blower canister by pulling out on the thumbscrews and lifting it out of the bottom two slots.

❸ Unplug the blower from the backplane. The connector is keyed so that it can be reinstalled correctly and has also been placed through a holder on the fan bracket to keep it out of the way during fan installation and removal.

Reverse the steps to reinstall the blower.

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Figure 6-2 shows the blower intake access hole. Contact with the access hole must be avoided while the blower is running to prevent injury.

☒ ***WARNING:*** *Avoid direct contact with the blower intake access hole while the blower is running. The blower operates at high speeds and can cause injury.*



Figure 6-2. Blower Intake Access

Blower Replacement

If the blower has stopped running or the front device canister status LEDs are blinking red, the blower may need to be replaced.

Before replacing, the cable connection should be checked to ensure that the connector is firmly seated and that there is nothing blocking the blower intake blades that could cause interference.

If you believe a blower is in a nonfunctional state, please contact the place of purchase for repair or replacement.

The JMR part numbers for a replacement blower is shown in Table 6-1. Replacement parts include the canister with the fan.

Table 6-1. Replacement Blowers

Model	JMR Part Number
4-bay	FAD-00014

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7

Power Supply Operation

This chapter covers the operations of the power supply for 4-bay units. For operation, the AC cord (included) must be connected to the AC Inlet at the back of the unit, and the On/Off switch must be switched ON. The Status LED on the power supply will light to indicate the power supply is functioning properly. If the power supply experiences a problem and cannot operate within its normal specifications, the Status LED will light and blink red and an audible alert will sound. Pressing the Alarm Reset button located on the back of the unit will turn off the audible alert.

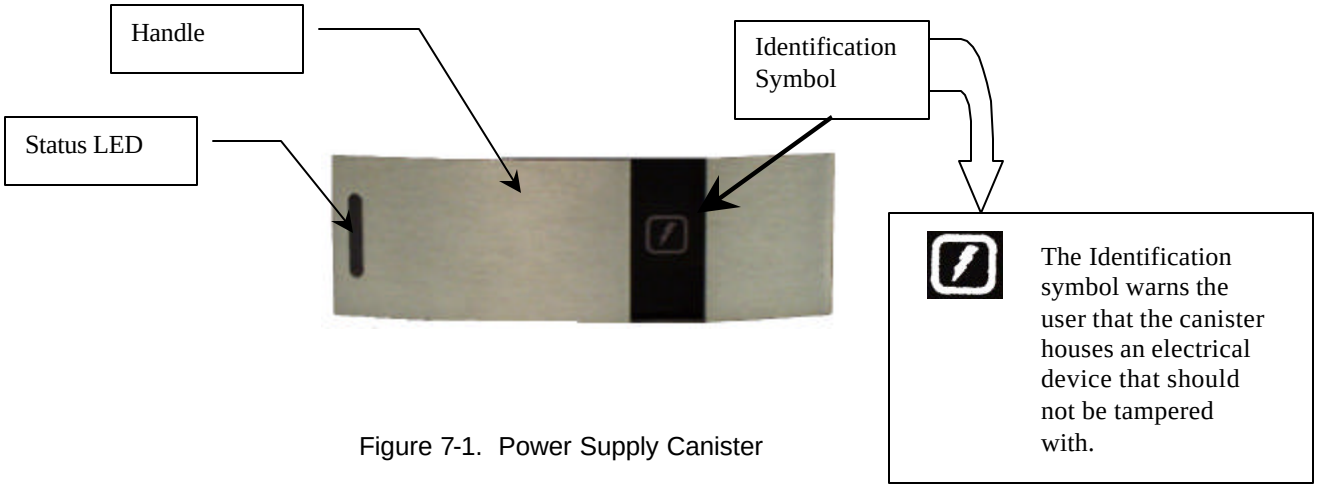


Figure 7-1. Power Supply Canister

Power Supply Removal/Insertion

Figure 7-2 shows the steps for removing or installing a power supply in a 4-bay unit.

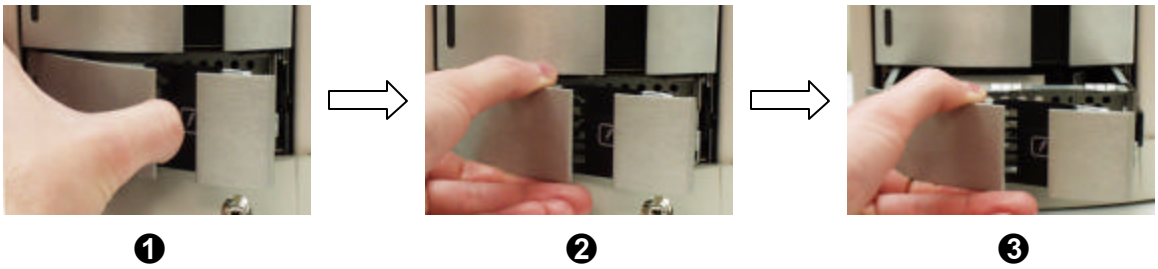


Figure 7-2. Power Supply Installation

❶ Unlock the unit (see Chapter 3, Figure 3-1.) & open the handle by pulling out. This action will disconnect the supply canister from the unit.
❷ Grab the handle and pull straight out.
❸ Carefully remove the supply from the unit. It is ok to grab the sides of the supply to fully remove it.

Reverse the steps to reinstall the power supply. See canister installation instructions and Figure 3-2 for additional instructions.

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Power Supply Replacement

If the Power supply Status LED indicator is blinking **red**, the power supply may need to be replaced. The unit should be reset (turned on & off), and the power supply should be removed and then reinstalled. The AC cable connection in the back of the unit should be checked to ensure that the plug is firmly seated in the power supply. If the Status LED indicator is still blinking **red**, then the power supply should be replaced.

If the enclosure blower is not functioning but the power supply still works, the blower should be replaced as soon as possible. Leaving the power supply running without the blower could cause the power supply to overheat and shutdown at any time and may cause damage to the supply and other installed devices.

If you believe a power supply is in a nonfunctional state, please contact the place of purchase for repair or replacement.

The JMR part number for a replacement power supply is shown in Table 7-1. Replacement parts include the canister with the power supply.

Table 7-1. Replacement Power Supplies

Model	JMR Part Number	Color
4-bay	DSSH-085	Silver
4-bay	DSSH-085-02	Black

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8

Product Support

For current information on this product including updates to the manual and technical support related issues, please contact the sales support section of our web page at www.jmr.com, or, you can contact our Technical Support division directly at the address below.

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ATTN: Technical Support Division
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Chatsworth, CA 91311
Customer Support: (818) 739-1140
Fax: (818) 993-9173
E-mail: techsupport@jmr.com
Office Hours: Monday-Friday 8:00 A.M. to 5:00 P.M., Pacific Standard Time

Internet Address: http://www.jmr.com

European Corporate Headquarters
JMR Electronics Europe
Tolzer Str. 4
D-83703
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Phone: 49 8022-705570
Fax: 49 8022-705550
Email: techsupport@jmr-europe.de

Manual Changes

Revision A – Initial Release
Revision B – Updated Illustrations
Revision C – Added Chapter 5, 'Fibre Channel Setup'

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Appendix A : Drive and Controller Manufacturers

Drive Manufacturers

Conner Peripherals, Inc.
See Seagate Technology or
Internet Address: www.conner.com

Fujitsu
Internet Address: www.fcpa.com

Hitachi
Internet Address: www.hitachi.com

IBM (International Business Machines Corporation)
Internet Address: www.ibm.com

Maxtor
Internet Address: www.maxtor.com

Quantum
Internet Address: www.quantum.com

Seagate Technology
Internet Address: www.seagate.com

Western Digital Corp.
Internet Address: www.westerndigital.com

RAID Controller Manufacturers

Adaptec, Inc.
Internet Address: www.adaptec.com

American Megatrends
Internet Address: www.ami.com

CMD Technology, Inc.
Internet Address: www.cmd.com

Digi-Data Corporation
Internet Address: www.digidata.com

DPT (Distributed Processing Technology)
Internet Address: www.dpt.com

Emulex Corporation
Internet Address: www.emulex.com

ICP VORTEX (Intelligent Computer Peripherals)
Internet Address: www.icp-vortex.com

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Infortrend Corporation
Internet Address: www.infortrend.com

Mylex Corporation
Internet Address: www.mylex.com

OneofUs Company Limited
Internet Address: www.oneofus.com

QLogic Corp.
Internet Address: www.qlc.com

Symbios Logic
Internet Address: www.symbios.com

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Appendix B : Drive and Controller Compatibility List

Drive Manufacturers & Model

Seagate Cheetah ST118202LC, 18.2GB, 10k rpm
Quantum Altas 10k, 9GB, Ultra 160/m

Host Bus and RAID Controller Manufacturers & Model

SCSI & PCI RAID Controllers
Adaptec 2940U2W
Adaptec AHA 3960D (Ultra 160/m, Dual Channel)
Atto Technology ExpressPCI-UL2S (EPCI-UL2S-000) (Single Channel)

ICP Vortex 32-bit Wide/Ultra2 LVDS RAID Controllers
ICP GDT6118RD (single channel Wide/Ultra2 controller, RAID 0,1)
ICP GDT6518RD (single channel Wide/Ultra2 controller, RAID 0,1,4,5,10)
ICP GDT6618RD (single channel Wide/Ultra2 Cluster controller, RAID 0,1,4,5,10)

ICP Vortex 64-bit Wide/Ultra2 LVDS RAID Controllers
ICP GDT7118RN (single channel Wide/Ultra2 controller, RAID 0,1)
ICP GDT7518RN (single channel Wide/Ultra2 controller, RAID 0,1,4,5,10)
ICP GDT7618RN (single channel Wide/Ultra2 Cluster controller, RAID 0,1,4,5,10)

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