

StorBlade™



1U SCSI JBOD 4-bay Rackmount Enclosure

Installation Guide

October 3, 2002 • Revision A

Patent Pending



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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 or power supplies 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® and StorBlade equipment generates, uses and can radiate radio frequency energy. If the FORTRA® or StorBlade Array is not installed and used properly (that is, in strict compliance with these instructions), it may cause interference to radio and television reception.

The FORTRA® and StorBlade 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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1. Introduction

The 4-bay **StorBlade™** 1U SCSI JBOD enclosure is designed for use with a host system to provide a high-end storage solution. The following is a summary of the 4-bay 1U enclosure features:

- The 4-bay **StorBlade™** 1U SCSI JBOD Rackmount enclosure is a four drive enclosure that supports up to four 3.5" LP (Low-Profile) SCA (80-pin) drives. It supports single-ended, Ultra2 SCSI, and Ultra 160 SCSI. The SCSI enclosure has two SE/LVD (single-ended/Low Voltage Differential) Channels.

2/4/6/8/10/12/15-bay Product Family Features

FORTRA® and **StorBlade™** are families of high-end enclosures designed for high-volume performance storage solutions. The following table shows the features of the **FORTRA®** 2/4/6/8/10/12/15-bay and the **StorBlade™** products:

	2-bay	4-bay ^{1,3}	6-bay ^{*1,3}	8-bay ¹	10-bay ^{*1,2}	12-bay	15-bay ^{*1,3}	StorBlade
Number of Device Bays	2	4	6	8	10	12	15	4
Number of Blowers	1	1	1 or 2	2	2	2	2	2
Number of Power Supplies	1	1	1 or 2	2	2	2	2	1 or 2
Number of I/O Channels (SCSI Only)	1	1	2	2	2		2	2
SCSI SE/LVD Supported	✓	✓	✓	✓	✓		✓	✓
Fibre Channel Supported		✓	✓	✓	✓		✓	✓
Hot-Swap Canisters	✓	✓	✓	✓	✓	✓	✓	✓
Removable Power Supplies	✓	✓	✓	✓	✓	✓	✓	Fibre only
Removable Blowers	✓	✓	✓	✓	✓	✓	✓	Fibre Only
N+1 Power Supplies			✓	✓	✓	✓	✓	Fibre only
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/SES Ready (Optional)			✓	✓	✓		✓	Fibre only
SAF-TE/SES Compatible			✓	✓	✓		✓	Fibre only
SCSI to SCSI RAID Support				✓	✓		✓	✓
Fibre to SCSI RAID Support					✓		✓	
Fibre to Fibre RAID Support					✓		✓	✓
Fibre to ATA RAID Support						✓		
SCSI to ATA RAID Support						✓		
(D)esktop/(T)ower/(R)ackmount	D	D	DTR	T	TR	R	TR	R
* 6/10/15-bay unit features apply to both Tower and Rackmount models								
1 Features are based on a standard configuration with no internal host controller(s) installed								
2 Fibre channel 10/15-bay enclosures have built-in SES								
3 Fibre Channel 2Gb Model available. 2Gb models use SFP transceivers.								



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StorBlade™ 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, Wide Ultra2 SCSI (LVD), and Ultra 160. Connections to a SCSI host can be made using a 68-pin (HD68) SCSI cable.

4-bay Rackmount Specifications

Dimensions/Weight

Unit Weight	35 lbs. (15.9kg)
Height	1-3/4" (1U) (44.45mm)
Width	19" (483mm)
Depth	22" (558.8mm)

Power Supply

Quantity:	1
Power:	200 Watts
Input:	100-240 VAC; 50-60Hz
Output:	+3.3V @ 14A +5V @ 20A +12V @ 6A

Blower

Quantity:	2
Size:	70mm (2.75") each
Air Flow:	11.3CFM (0.32m ³ /min) each
Noise:	38dB(A)

SCSI Features

Daisy Chaining

StorBlade™ 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 located on the I/O module. For specific connection and installation information, refer to [Chapter 4](#).



2. Hardware Specification

This chapter covers specification information for the 4-bay **StorBlade™** enclosures. The following matrix describes the identification codes for the available configurations for all **FORTRA®** and the **StorBlade™** enclosures.

FR XX X L 2 1 X 2 X XX X X	
	SINGLE/DUAL CONTROLLER S = Single Controller D = Dual Controller
	BACKPLANE TYPE - = 1 Gigabit Backplane 2 = 2 Gigabit Backplane
	CONTROLLER MANUFACTURER/MODEL#/INTERFACE - = None (Blank if at the end of P/N) H1 = Chaparral G5312/LVD Host/LVD Drives H2 = Chaparral G7313/Fibre Host/LVD Drives H3 = Chaparral K5312/LVD Host/LVD Drives H4 = Chaparral K7313/Fibre Host/LVD Drives H5 = Chaparral JSS122/LVD Host/LVD Drives H6 = Chaparral JFS124/Fibre Host/LVD Drives H8 = Chaparral JFS224/Fibre Host/LVD Drives FZ = Microtest FileZerver Network Attached/Ethernet/LVD Drives I2 = Infortrend Sentinel 2500-50/LVD Host/LVD Drives Infortrend Sentinel 2500-50 w/FT9282F/Fibre Host/LVD Drives I3 = Infortrend EonRAID 2500-50 w/FT9288B6B/Fibre Host/LVD Drives I4 = Infortrend EonRAID 5251F/2G Fibre Host/2G Fibre Drives I5 = Infortrend SentinelRAID 150/LVD Host/LVD Drives IS = Infortrend EonRAID 7250-12U3D SCSI Host/ATA Drives IF = Infortrend EonRAID 7250-12F2D Fibre Host/ATA Drives M3 = Mylex DAC-FFx/1G Fibre Host/1G Fibre Drives M5 = Mylex DAC-FFx2/2G Fibre Host/2G Fibre Drives
	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 or DC POWER SUPPLY - = AC Power Supply D = DC Power Supply
	COLOR - CANISTER/ACCENT 1 = Silver/Opal 2 = Black/Black 3 = Silver/Black 4 = Blue/Blue
	DRIVE I/O SCSI CHANNELS or FIBRE LOOPS # = A Number Equal to Drive I/O Channels
	ENCLOSURE I/O L = SCSI 3 Ultra 160 (LVD/SE Multimode, Fast-Wide, HD68) F = 1 or 2Gb/s Fibre Channel A = ATA
	FIBRE GBIC READY - = No GBIC Slots G = GBIC Ready
	NUMBER OF DRIVES # = Drives (02,04,06,08,10,12,15)
	FAMILY SERIES FR = Fortra Rackmount FT = Fortra Tower 1U = StorBlade Rackmount

u.s. Power cords Included
For International Models

Add Power Cord:
Australia = CBL-00602
Europe = CBL-00525
UK = CBL-00677



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Environmental Specifications

Operating Temperature: 5°C to 40°C (41°F to 104°F)

Storage Temperature: 0°C to 65°C (32°F to 149°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

StorBlade™ 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 2.

Packaging Specifications

StorBlade™ 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 and/or power supplies 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.

Each canister is pre-packaged in an anti-static bag. Do not throw the packaging away if the product is intended for re-shipping. When transporting or shipping a JMR approved shipping container must be used.

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 and/or power supplies installed in the enclosure 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.



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Thermal Specifications

StorBlade™ enclosures have been designed to meet the air-flow/cooling requirements for popular 7,200, 10,000 and 15,000 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

StorBlade™ enclosures have been designed to meet the rotation vibration/shock requirements for popular 7,200, 10,000 and 15,000 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](#) power supply and blowers.

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.



3. Device Installation

This chapter covers SCSI device installation for 4-bay 1U rackmount 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.

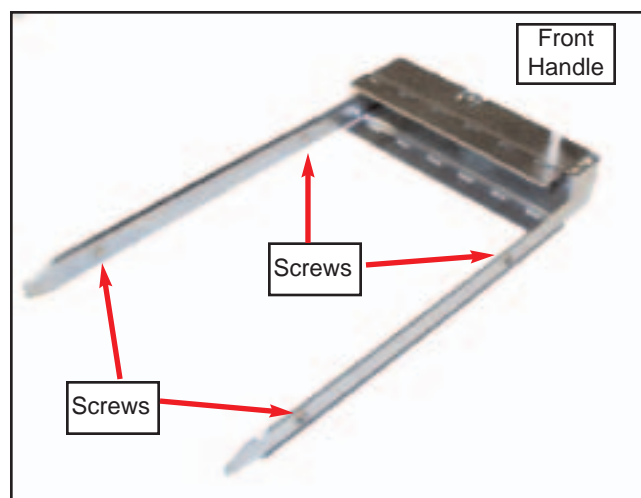
Canister Removal/Insertion

1. Pull the handle out to unlock the canister from the **StorBlade™** unit. Notice that the locking tab slides down as the handle is pulled out.
2. 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.

SAFETY TIP: After disengaging a device from the enclosure, allow 10 seconds before pulling the canister out of the unit. This allows the device to properly spin/shut down before transport.

Drive Installation



1. After removing the canister, place it on a static free surface along with the device to be installed.



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2. Place the device in the canister with the four screw holes aligned with the holes in the device. Mount the drive by using the screws included with the unit. (use all 4 screws to mount the drive).
3. Replace the canister into the unit.
4. Repeat steps 1 through 3 until all devices are installed.
5. Configure ID, and other options as required
6. Establish host connection



4. SCSI Setup

This chapter covers SCSI device setup and option settings. Please take note of the installation warnings below before beginning setup.

WARNING: Take care when connecting the unit to an AC power source to ensure that it is plugged-in to a circuit of the appropriate rating (110v or 220v). For safe operation, the circuit should have over-current protection to prevent damage to the unit in the event of circuit overloading.

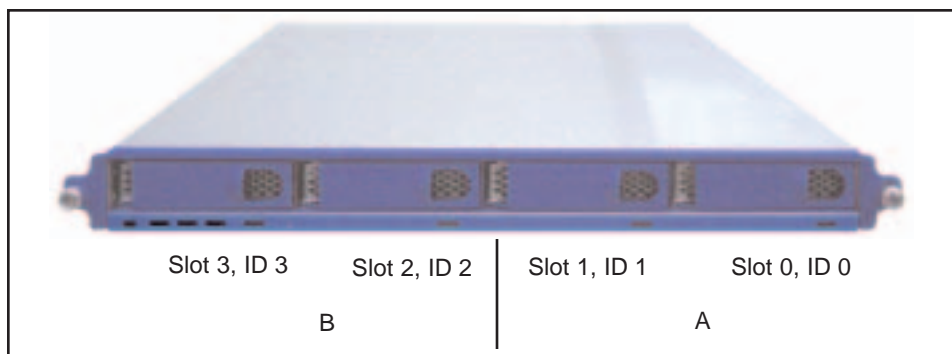
WARNUNG: Vergewissern Sie sich, daß die Netzspannung (220V / 110V) korrekt eingestellt ist, bevor Sie das Gerät mit dem Stromnetz verbinden. Zur Sicherheit sollte das Netz über einen Überspannungsschutz zur Vermeidung von Schäden im Falle einer Überlast verfügen.

WARNING: When connecting the unit to an AC outlet or power strip, ensure that the outlet has the proper connection for grounding. The AC power cables included with the unit have three prongs, one of which is used for the ground connection. Do not use a two prong AC cable with the unit since this will not allow for proper unit grounding and could cause problems with normal unit operation.

WARNUNG: Bei der Verbindung der Unit mit einer Steckdose oder einer Verteilerdose sollten sie auf eine korrekte Erdung derselben achten. Die mitgelieferten Kaltgeräteanschlußkabel habe 3 Kontakte, von denen einer zur Erdung verwendet wird. Verwenden Sie kein Stromkabel mit 2 Anschlüssen, da dieses keine korrekte Erdung ermöglicht und Probleme während des regulären Betriebs verursachen kann.

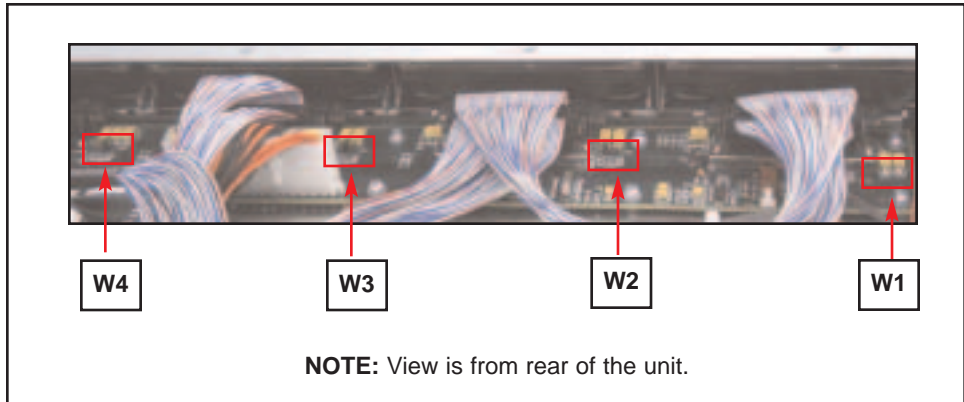
Basic Personality Card Setup

This section covers 4-bay 1U SCSI JBOD units using the basic personality card. This card does not have a controller interface built-in. The following Figure shows the slot numbering sequence used to refer to device bays and additionally shows the factory ID value for each slot. Slots 0-1 are on Channel A and Slots 2-3 are on Channel B.



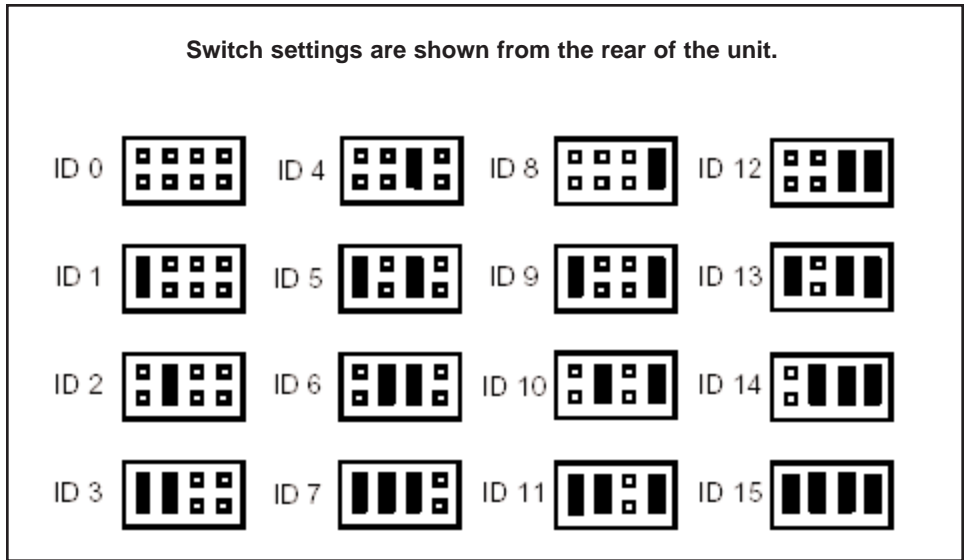
Setting ID

The basic personality card has jumpers available on the personality card to set the ID for each slot. To access the jumpers the top cover must be removed. The following picture indicates the location of jumpers W1-W4.



There are 4 jumpers on the personality card (W1, W2, W3, and W4) for hard setting the ID of each slot.

- Header W1 is for slot 3
- Header W2 is for slot 2
- Header W3 is for slot 1
- Header W4 is for slot 0



Available ID's

Each 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 always uses one ID. The Figure above shows all 0-15 possible ID settings.



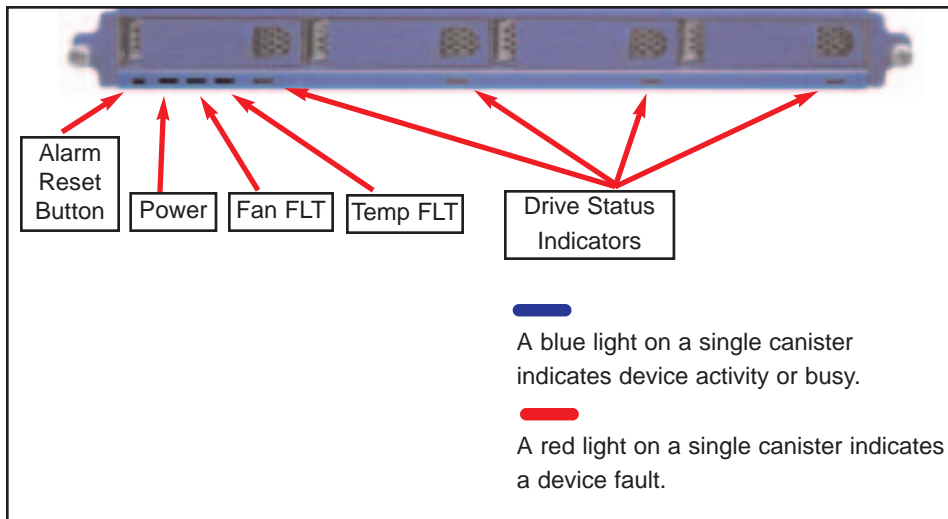
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ID Conflict

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.

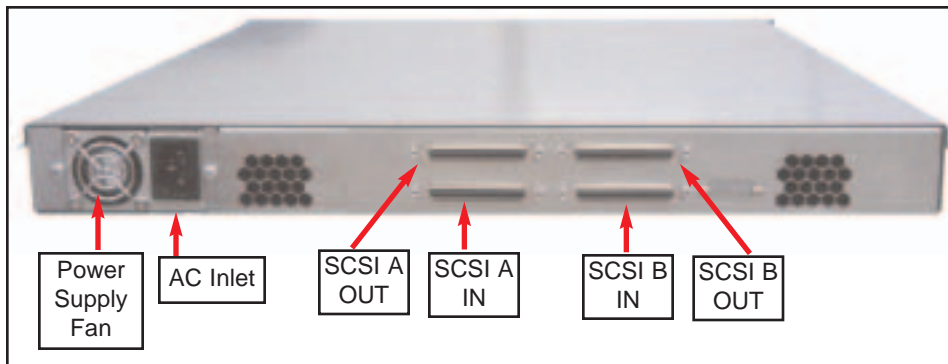
Front Status LEDs

A status indicator is located on each canister. A 'Blue' light indicates normal drive activity. A 'Red' light indicates a device fault. If all canisters display a 'Red' light that is blinking on and off it indicates that there is a system fault. A system fault is either a power supply or blower failure. The power supply and blowers are not field replaceable units. A fault with either the power supply or blowers will require replacement of the entire unit. Refer to [Chapter 5](#).



External I/O Connection

The external I/O connections are located on the back of the unit. The figure below shows the external I/O connections available.



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The SCSI In ports are used to connect to a host and require an external cable with a 68-pin High-Density male connector to mate at the enclosure side. Cables are not included.

Each SCSI channel must use a separate external cable connection from the rackmount to the host adapter or RAID controller. It is important that the external cable length and impedance is taken into consideration and is adequate for the devices and SCSI speeds being used.

JMR carries its own line of high quality external SCSI Cables.

Termination

Termination must be provided at the end and beginnings of each SCSI bus either internally or externally. Drive level termination is not recommended since the terminated device may be easily removed.

Termination is not automatic and the Channel A OUT and Channel B OUT connections must have LVD/SE termination if not used.

Daisy-Chaining

SCSI I/O Out ports are used to add other enclosures and devices to the SCSI bus. SCSI I/O Out ports require a cable with a 68-pin High-Density male connector to mate. When daisy chaining, the SCSI I/O Out port of the enclosure is connected to the SCSI I/O 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.

The devices or enclosures daisy-chained together must be compatible SCSI devices. Single-ended interface devices cannot be on the same daisy-chained bus 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 **StorBlade™** compatible SCSI SE and LVD terminators. The following Table lists JMR part numbers and descriptions. Please contact a JMR representative for current availability and pricing.

JMR SCSI TERMINATORS

JMR Part #	Ends	Connector Type	Terminator Type
CNA-01883	Molded	SCSI-3 (68-pin)	SE/LVD Multimode



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JMR carries its own line of high-quality external **StorBlade™** compatible SCSI cables. The following Table lists JMR part numbers and descriptions. Please contact a JMR representative for current availability and pricing.

JMR SCSI CABLES

<u>JMR Part #</u>	<u>Ends</u>	<u>Connector Type</u>	<u>Length(FT)</u>
CBL-00532	Molded	SCSI-3 to SCSI-3	3
CBL-00534	Molded	SCSI-3 to SCSI-3	6



5. Power Supply and Blowers

This section covers operation of the power supply and blowers.

Power Supply Removal/Insertion

In the 1U04 SCSI JBOD enclosure, the power supply is not a field replaceable unit (FRU). Therefore, if you have a power supply malfunction, contact Technical Support at JMR Electronics. See [Chapter 7](#) for contact information.

Blower Removal/Insertion

In the 1U04 SCSI JBOD enclosure, there are two blowers that are not field replaceable units. If a blower malfunction occurs, please contact JMR Electronics. See [Chapter 7](#) for contact information.



6. 1U04 Cabinet Installation

This chapter covers the installation of the Rackmount enclosure into a standard 19" (483mm) wide and 30" (762mm) to 36" (914mm) deep cabinet that meets the EMA/RETMA standards.

Before beginning rail installation, please take note of the following precautions:

NOTE: *When installing the unit into a cabinet or closed environment, the operating ambient temperature of the rack environment may be greater than the maximum recommended ambient temperature. Consideration must be taken to meet the maximum recommended ambient temperature (T_{mra}) for the best unit operation.*

HINWEIS: *Wenn das Gerät in einen Gehäuseschrank oder eine sonstige geschlossene Umgebung verbaut wird, kann die Umgebungstemperatur über die maximal zulässige Betriebstemperatur ansteigen. Maßnahmen bzgl. der maximalen, empfohlenen Betriebstemperatur (T_{mra}) müssen getroffen werden, um eine bestmögliche Funktion des Gerätes zu gewährleisten.*

WARNING: *Ensure that the front and back of the unit are not blocked when installing the unit into a cabinet or closed area. Blocking the front or back of the unit can cause reduced air-flow that will compromise the safe operating environment within the unit.*

WARNUNG: *Vergewissern Sie sich, daß das Gerät an Vorder- und Rückseite nicht abgedeckt ist, wenn das Gerät in einem Gehäuseschrank oder einer geschlossenen Umgebung verbaut wird. Abdeckung der Vorder- und Rückseite kann verminderte Kühlung zur Folge haben und somit sichere Betriebsbedingungen negativ beeinflussen.*

WARNING: *When loading the unit into a cabinet, ensure that a hazardous condition is not achieved due to uneven mechanical loading. To prevent injury, remove the power supplies and drives before loading, and re-install them after the unit has been secured in the cabinet.*

WARNUNG: *Vermeiden Sie während des Einbaus des Gerätes in einen Gehäuseschrank jegliche gefährliche Aktionen, selbst wenn diese nur mechanischer Art sind. Um Verletzungen zu vermeiden, entfernen Sie die Netzteile und Laufwerke vor der Montage und installieren Sie diese erst erneut, wenn das Gerät im Gehäuseschrank gesichert ist. Vergewissern Sie sich, daß das Gerät an Vorder- und Rückseite nicht abgedeckt ist.*



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Rail Mounting Kit Hardware

- Eight #10-32 Screws
- Four each #8-32 Screws/Washers/Nuts

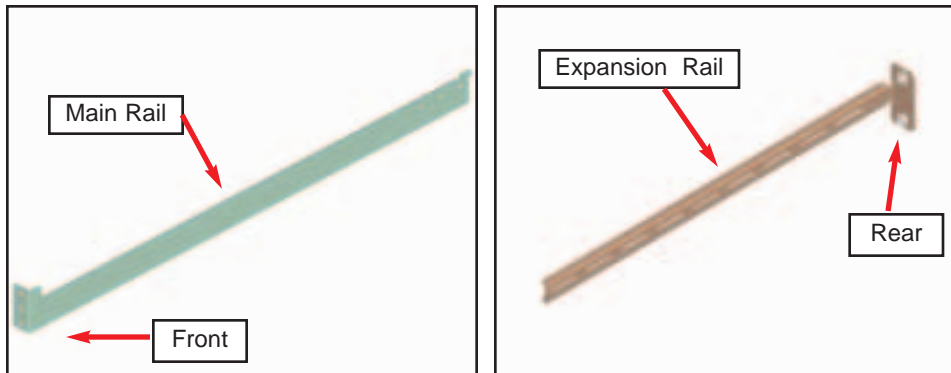


Spare Hardware Parts

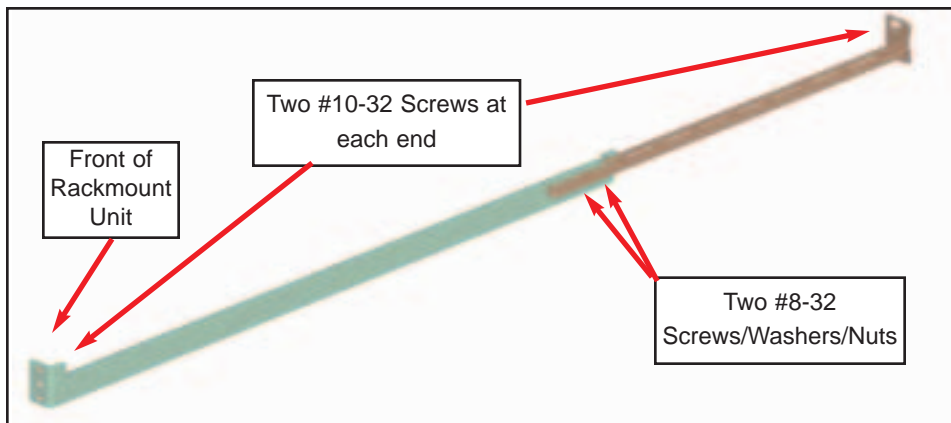
Check with a JMR Sales Representative for pricing and availability of spare hardware parts.

Description	JMR Part Number
#10-32 Screw	HDS-01580
#8-32 Screw	HDS-00350
#8-32 Nut	HDN-00040
#8-32 Washer	HDW-00080

Rail Installation



1. Affix the extension brackets to the main rail using the #8-32 screw/washer/nut assemblies. Adjust to the correct length for the cabinet depth being used.



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2. Affix the extension bracket to the rear of the unit using two #10-32 screws. There are 3 holes in the extension bracket for mounting. Depending on the hole pattern that is being used in the cabinet, two holes should always be available for securing the extension bracket.
3. The fronts of the rails have three holes. Two of the holes (top and bottom) are used to secure the rail to the cabinet. The middle hole is used to secure the enclosure to the rail and cabinet. Secure the front of each rail to the cabinet vertical rails using two #10-32 screws for each rail.
4. Slide the unit into the cabinet and secure it to the cabinet by tightening the two embedded thumb screws.



7. 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.

US Corporate Headquarters

JMR Electronics, Inc.

ATTN: Technical Support Division

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Office Hours: Monday-Friday 8:00 A.M. to 5:00 P.M., Pacific Standard Time

Internet: <http://www.jmr.com>

Manual Changes

Revision A - Initial Release



Appendix A. Drive and Controller Manufacturers

Drive Manufacturers

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

Seagate Technology

Internet Address: www.seagate.com

RAID Controller Manufacturers

Adaptec, Inc.

Internet Address: www.adaptec.com

Chaparral Network Storage

Internet Address: www.chaparralnet.com

Digi-Data Corporation

Internet Address: www.digidata.com

Infortrend Corporation

Internet Address: www.infortrend.com

Intel ICP VORTEX (Intelligent Computer Peripherals)

Internet Address: www.icp-vortex.com

Mylex Corporation

Internet Address: www.mylex.com

Silicon Image, CMD Storage Systems

Internet Address: www.cmd.com



StorBlade™

Host Bus Adapter Manufacturers

Adaptec, Inc.

Internet Address: www.adaptec.com

Antares Microsystems

Internet Address: www.atares.com

Emulex Corporation

Internet Address: www.emulex.com

JNI Corporation

Internet Address: www.jni.com

QLogic Corp.

Internet Address: www.qlogic.com

