Server Technology

Solutions for the Data Center Equipment Cabinet

Sentry

DC Power Distribution Unit

- PDU4xx

Installation Manual

Instructions

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Dangerous Voltage

This symbol is intended to alert the user to the presence of un-insulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Protective Grounding Terminal

This symbol indicates a terminal that must be connected to earth ground prior to making any other connections to the equipment.

Life-Support Policy

As a general policy, Server Technology does not recommend the use of any of its products in the following situations:

- life-support applications where failure or malfunction of the Server Technology product can be reasonably expected to cause failure of the life-support device or to significantly affect its safety or effectiveness.
- direct patient care.

Server Technology will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to Server Technology that:

- the risks of injury or damage have been minimized,
- the customer assumes all such risks, and
- the liability of Server Technology is adequately protected under the circumstances.

The term life-support device includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief or other purposes), auto-transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults or infants), anesthesia ventilators, infusion pumps, and any other devices designated as "critical" by the U.S. FDA.

Compliance

Units have been safety tested/certified to the following standards: USA and Canada to UL 1950 and CAN/CSA 22.2 No. 950-95, European Union to EN60950, NEBS GR-63-Core and GR-1089-Core.

USA Notification

Warning: Changes or modifications to these units not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment under FCC rules.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment is a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Notification

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Japanese Notification

　　この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Introduction

Features and Benefits

Power Distribution

Sentry DC Power Distribution Units distribute a maximum of 400A DC power (dependant on model) across up to forty attached devices.

Quick Start Guide

The following instructions will help you quickly install and configure your Sentry Power Distribution Unit for use on your network. For detailed information on each step, go to the page number listed to the right.

Installation

Before installing your Sentry Power Distribution Unit, refer to the following lists to ensure that you have all the items shipped with the unit as well as all other items required for proper installation.
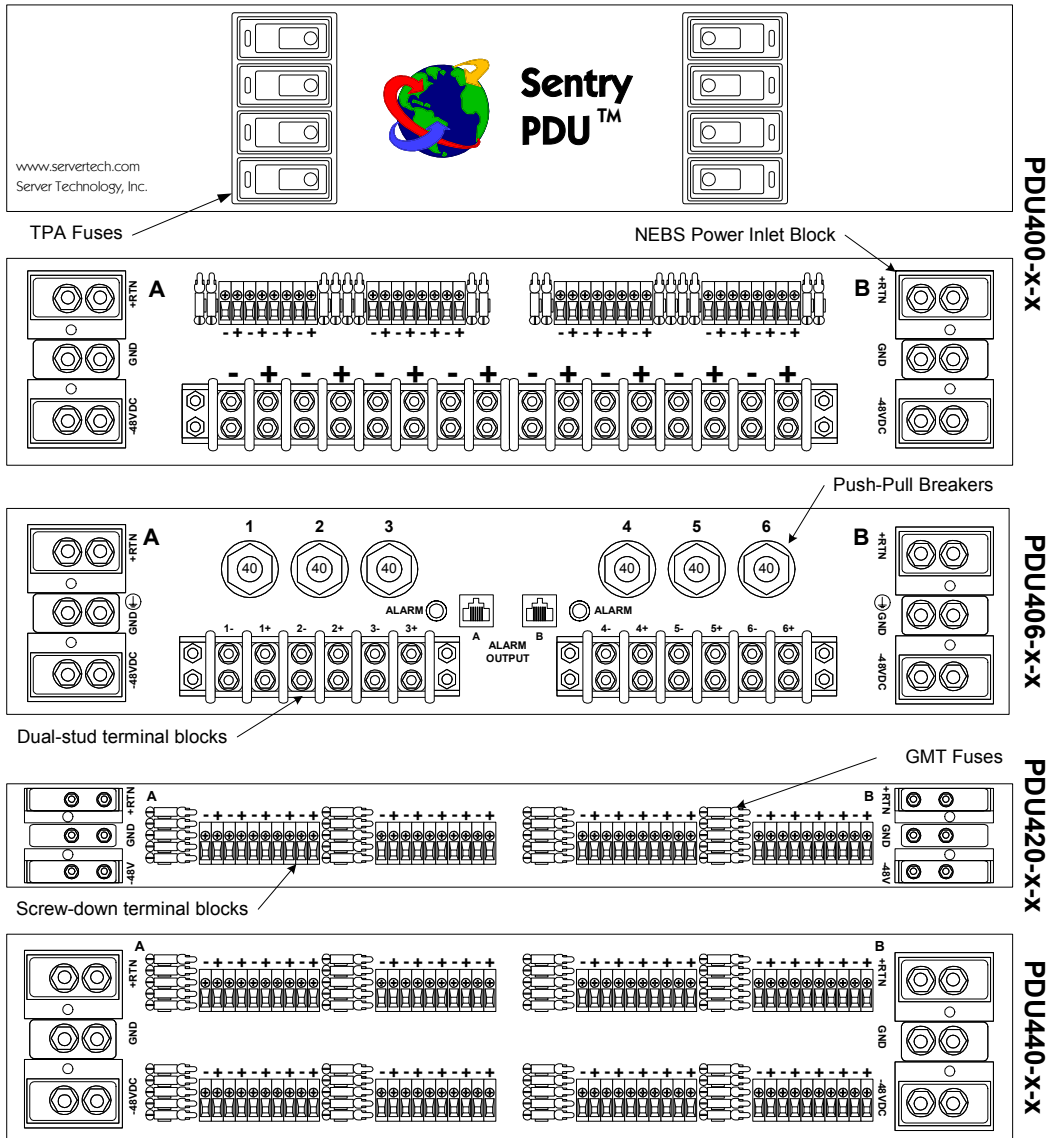
Standard Accessories

- Mounting hardware - two mounting brackets and four screws

Additional Required Items

- Flathead and Phillip screwdriver
- 7mm and 10mm socket wrench or nut-drive
- Screws, washers and nuts to attach the Sentry to your rack

Equipment Overview

- A number designator is printed above each terminal pair.
- The power inlet connects to the electrical power source.

Safety Precautions

This section contains important safety and regulatory information that should be reviewed before installing and using the Sentry product. For input and output current ratings, see *Ratings* on page 6.

	Only for installation and use in a Service Access Location in accordance with the following installation and use instructions.	*Destiné à l'installation et l'utilisation dans le cadre de Service Access Location selon les instructions d'installation et d'utilisation.*	Nur für Installation und Gebrauch an Anschlusszugriffspunkten gemäß der folgenden Installations- und Gebrauchsanweisungen.
	WARNING! High leakage current! Earth connection is essential before connecting supply!	*ATTENTION ! Haut fuite très possible ! Une connection de masse est essentielle avant de connecter l'alimentation !*	ACHTUNG! Hoher Verluststrom! Ein Erdungsanschluss ist vor dem Einschalten der Stromzufuhr erforderlich!
	Always disconnect all power supply cords before opening to avoid electrical shock.	*Afin d'éviter tout choc électrique, assurez-vous de toujours débrancher les câbles d'alimentation électrique avant d'ouvrir.*	Ziehen Sie vor dem Öffnen immer die Netzkabel heraus, um die Gefahr eines elektrischen Schlags zu vermeiden.
	Connect to VDC source that is electrically isolated from the AC source and reliably connected to earth.	*Brancher à une source de tension continue isolée de la source de tension alternative et mise à la terre adéquatement.*	Schließen Sie das Gerät an eine Gleichstromquelle an, die von der Wechselstromquelle galvanisch getrennt und sachgemäß geerdet ist.
	Grounding wire should be bare copper and one size larger than the inlet cables.	*Le fil de mise à la terre doit être en cuivre nu et d'une taille supérieure aux câbles d'entrée.*	Verwenden Sie zur Erdung einen Kupferdraht, der um eine Stärke stärker ist als die Eingangskabel.
	Remove fuses/open circuit breakers for terminal pairs prior to connecting inlets to power source.	*Retirer les fusibles et ouvrir les disjoncteurs pour connecter les paires de bornes avant de brancher les câbles d'entrée à la source d'alimentation.*	Entfernen Sie die Sicherungen/schalten Sie die Leistungsschalter für die Klemmenpaare aus, bevor Sie die Eingänge an die Stromquelle anschließen.
	Inlet & outlet safety covers must be installed for safe operation.	*Pour une utilisation sécuritaire, les couvercles de sûreté des prises d'entrée et de sortie doivent être installés.*	Zum sicheren Betrieb müssen die Ein- und Ausgangsabdeckungen installiert sein.

Mounting

1. Select the appropriate bracket mounting points for proper mounting depth within the rack.
2. Attach the brackets to these mounting points with two screws for each bracket.
3. Install the enclosure into your rack, using the slots in each bracket. The slots allow about ¼ inch of horizontal adaptability to align with the mounting holes of your rack.

NOTE: A mounting bracket kit for 23" wide racks or cabinets is available. Contact your Server Technology Sales Representative for more information.

Connecting to the Power Source

NOTE: Reverse polarity will damage the Sentry Remote Power Manager. Verify proper polarity before connecting to a power source.

1. Verify power source polarity and remove the fuses/open circuit breakers for all outlet terminal pairs.
2. Attach the appropriate input power cable(s) for your installation's operating voltage.
3. Attach the opposite end of the power cable(s) to the power source.

Connecting Devices

To avoid the possibility of noise due to arcing:

1. Keep the device's on/off switch in the off position until after it is properly attached to the output terminals, or
   Log in to the Sentry and turn the output terminals off before connecting the devices to the unit(s).
2. Connect devices to the output terminals.

Always disconnect the power supply cord before opening to avoid electrical shock.
Afin d'éviter les chocs électriques, débranchez le cable électrique avant d'ouvrir.
Immer Netzleitung auskuppeln vor den Aufmachen um elektrischen Schlag zu vermeiden.

Technical Specifications

Models

Standard Models

Model	Voltage	Inlet*	Outlets*	Outlet Circuit Protection
PDU400-0-2	-48 VDC	2 blocks (CL)	16 pairs (SD) 8 pairs (DS)	GMT fuse TPA fuse
PDU400-0-3	-48 VDC	2 blocks (CL)	16 pairs (SD) 8 pairs (DS)	GMT fuse TPA fuse
PDU406-0-3	-48 VDC	2 blocks (CL)	6 pairs (DS)	Push-Pull Breaker
PDU420-0-1	-48 VDC	2 blocks (CL)	20 pairs (SD)	GMT fuse
PDU440-0-2	-48 VDC	2 blocks (CL)	40 pairs (SD)	GMT fuse

*CL-Compression Lug, DS-Dual Stud, SD-Screw down

Failsafe Models

Model	Voltage	Inlet*	Outlets*	Outlet Circuit Protection
PDU400-F-2	-48 VDC	2 blocks (CL)	16 pairs (SD) 8 pairs (DS)	GMT fuse TPA fuse
PDU400-F-3	-48 VDC	2 blocks (CL)	16 pairs (SD) 8 pairs (DS)	GMT fuse TPA fuse
PDU406-F-3	-48 VDC	2 blocks (CL)	6 pairs (DS)	Push-Pull Breaker
PDU420-F-1	-48 VDC	2 blocks (CL)	20 pairs (SD)	GMT fuse
PDU440-F-2	-48 VDC	2 blocks (CL)	40 pairs (SD)	GMT fuse

*CL-Compression Lug, DS-Dual Stud, SD-Screw down

Ratings

Model *Modele* Modell	Input Current Ratings[1] *L'indice du courant d'entrée* Eingangsstromstärke		Output Current Ratings *L'indice du courant de sortie* Ausgangsstromstärke			
	Voltage *Tension* Spannung	Current *Courrant* Strom		Outlet *Prise* Anschlussstelle	Branch	Total *Total* Insgesamt
PDU400-0-2		2x 100	A11, A12, A13, A14, A21, A22, A23, A24 A31, A32, A33, A34 B11, B12,B13, B14, B21, B22, B23, B24 B31, B32, B33, B34	15 50 15 50	100 100 100 100	100 100
PDU400-0-3	A,B	2x 200	A11, A12, A13, A14, A21, A22, A23, A24 A31, A32, A33, A34 B11, B12,B13, B14, B21, B22, B23, B24 B31, B32, B33, B34	15 50 15 50	100 100 100 100	200 200
PDU406-0-3	-48 V DC		A1, A2, A3 B1, B2, B3	40	n/a	200 200
PDU420-0-1		2x 50	A1, A2, A3, A4, A5, A6, A7, A8, A9, A10 B1, B2, B3, B4, B5, B6, B7, B8, B9, B10	15	30 30	50 50
PDU440-0-2		2x 100	A1, A2, A3, A4, A5, A6, A7, A8, A9, A10 A11, A12, A13, A14, A15, A16, A17, A18, A19, A20 B1, B2, B3, B4, B5, B6, B7, B8, B9, B10	15	30 30 30 30	100 100
PDU400-F-2		2x 100	A11, A12, A13, A14, A21, A22, A23, A24 A31, A32, A33, A34 B11, B12,B13, B14, B21, B22, B23, B24 B31, B32, B33, B34	15 50 15 50	100 100 100 100	100
PDU400-F-3	A,B	2x 200	A11, A12, A13, A14, A21, A22, A23, A24 A31, A32, A33, A34 B11, B12,B13, B14, B21, B22, B23, B24 B31, B32, B33, B34	15 50 15 50	100 100 100 100	200
PDU406-F-3	-48 V DC		A1, A2, A3 B1, B2, B3	40	n/a	200
PDU420-F-1		2x 50	A1, A2, A3, A4, A5, A6, A7, A8, A9, A10 B1, B2, B3, B4, B5, B6, B7, B8, B9, B10	15	30 30	50
PDU440-F-2		2x 100	A1, A2, A3, A4, A5, A6, A7, A8, A9, A10 A11, A12, A13, A14, A15, A16, A17, A18, A19, A20 B1, B2, B3, B4, B5, B6, B7, B8, B9, B10	15	30 30 30 30	100

NOTE: On -F- units, if operating all outputs from one input, total output must NOT exceed the maximum capacity of a single input.

Physical Specifications

Model	PDU4xx-x	-01	-02, -03
Physical	**Size** (H x W x D)	1.75 x 10.0 x 17.0 in.	3.5 x 10.0 x 17.0 in.
	Weight	7.5 lbs.	15.9 lbs.
Temperature	**Operating**	0° to 50° C (32° to 122° F)	
	Storage	-40° to 85° C (-40° to 185° F)	
Elevation	**Operating**	0 to 10,000 ft (0 to 3000 m)	
(above MSL)	**Storage**	0 to 50,000 ft (0 to 15 000 m)	
Relative Humidity	**Operating**	10 to 90%, non-condensing	
	Storage	10 to 90%, non-condensing	
Approvals		cCSAus, TUV-GS, NEBS[1]	

[1] cTUVus - UL 1950, CAN/CSA 22.2 No. 950-95
TUV-GS - EN60950
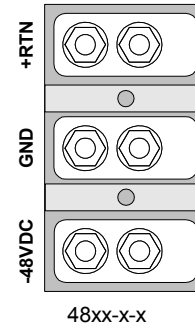NEBS - GR-63-Core, GR-1089-Core

Inlet Connections

The Sentry PDU is equipped with two input blocks, each containing three clearly labeled terminal positions. Connections are made using two-hole copper compression lugs for dual-stud blocks.

WARNING: Reverse polarity will damage the Sentry Remote Power Manager! Verify proper polarity before connecting to a power source!
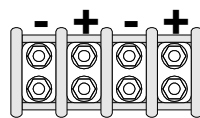
Two-hole Copper Compression Lugs

Cable Size(AWG)	Stud Size	Color Code	Thomas&Betts Model	Grainger Stock
#10-14	#10	n/a	256-31426-3	
#8 str	#10	Red	54204	3LL90
#6 str.	¼"	Blue	54205	3LL91
#4 str	¼"	Gray	54206	3LL92
#2 str	¼"	Brown	54207	3LL93
#1 str	¼"	Green	54208	3LL94
2/0 AWG	5/16"	Black	54261	
1/0 AWG	5/16"	Pink	CTL10-2516	
1/0 AWG	5/16"	Pink	54860BE	
1/0 AWG	5/16"	Pink	54255	3LM04
#1 str	5/16"	Green	LCN1-516	
#1 str	5/16"	Green	CTL1-2516	
#1 str	5/16"	Green	54858BE	

Grainger catalog #390 (1999-2000)
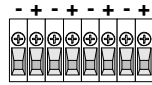

48xx-x-x

Outlet Connections

The Sentry PDU is equipped with four to sixteen terminal outlet pairs each containing clearly labeled terminal positions. Connections are made using two-hole copper compression lugs for dual-stud blocks, and bare stripped wire for high-density screw-down blocks. For the dual stud lugs, please reference the table above.

Dual Stud Terminal   Screw -down Terminal
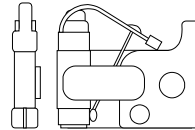
Output Circuit Protection

GMT Fuse

- Fast-acting
- Positive visual indication for blown fuse
- Easily replaceable without special tools
- Protective splatter-cap safety cover
- Color-coded current ratings from .5A to 15A for use with a Sentry PDU

GMT Fast-Acting Indicating Fuses

Ampere Rating	Color Code	Bussman Part Number
1	Gray	GMT-1A
2	Orange	GMT-2A
5	Green	GMT-5A
10	Red/White	GMT-10A
15	Red/Blue	GMT-15A

CooperBussman product data-sheet #5008.
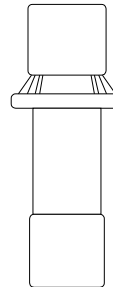*See data-sheet for complete listing of available GMT fuses.*

TPA Fuse

- Recognized branch circuit protection
- Current-limiting
- 100,000A interrupt rating
- LED indicator for blown fuse
- Easily replaceable without special tools

TPA Telpower® DC Power Distribution Fuses

Ampere Rating	Bussman Part Number
15	TPA-15
20	TPA-20
25	TPA-25
30	TPA-30
40	TPA-40
50	TPA-50

CooperBussman product data-sheet #5012.
See data-sheet for complete listing of available TPA fuses.

Push-Pull Circuit Breaker

- 1,000A interrupt rating
- Positive visual trip indication

The PDU406-x-3 Sentry Power Distribution Unit is equipped with Push-Pull circuit breakers for circuit protection.

NOTE: This type of circuit breaker may used as a local on/off switch however Server Technology does NOT recommend using the breaker in this fashion for any newly attached device.

Alarm Circuit

PDU406 models features an Alarm circuit to provide visual indication and external alarm support for blown circuits or loss of power. The circuit features a two-color LED indicator and RJ12 alarm signal connector for each infeed.

LED Indicator

The PDU406 Alarm circuit features an LED indicator for each infeed. The LED indicates the presence of power at the infeed and detected fault conditions.

- LED A and LED B indicate OFF with BOTH A and B infeeds are not powered
- LED A indicates GREEN when there are no A-side fuses open and A infeed is powered.
- LED A indicates RED when any A-side fuse opens or A infeed is not powered.
- LED B indicates GREEN when there are no B-side fuses open and B infeed is powered.
- LED B indicates RED when any B-side fuse opens or B infeed is not powered.
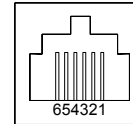
Alarm Port

The PDU406 external Alarm ports are supported by dual-pull dual-throw electromechanical relays providing dry contact state changes when fault conditions occur. Connections to external alarm circuits are made using standard RJ12 cabling.

NOTE: Input signal must not exceed 0.3A/110VAC or 1.0A/24VDC.

Pin	Fault	No Fault
1	Open	Closed
2	Common	Common
3	Closed	Open
4	Closed	Open
5	Common	Common
6	Open	Closed

654321

Warranty, Product Registration and Support

Warranty and Limitation of Liability

Server Technology, Inc. agrees to repair or replace Products that fail due to a defect within twelve (12) months after the shipment date of each Product unit to Buyer ("Warranty Period"). For purposes of this Agreement the term "defect" shall mean the Product fails to operate or fails to conform to its applicable specifications. Any claim made pursuant to this Agreement shall be asserted or made in writing only by Buyer. Buyer shall comply with Server Technology's Standard Return Merchandise Authorization ("RMA") procedure for all warranty claims as set forth in Server Technology's operation manual. **Buyer must return Products in original packaging and in good condition.** This limited warranty does not include labor, transportation, or other expenses to repair or reinstall warranted Products on site or at Buyer's premises.

Server Technology reserves the right to investigate any warranty claims to promptly resolve the problem or to determine whether such claims are proper. In the event that after repeated efforts Server Technology is unable to repair or replace a defective Product, then Buyer's exclusive remedy and Server Technology's entire liability in contract, tort, or otherwise shall be the payment by Server Technology of Buyer's actual damages after mitigation, but shall not exceed the purchase price actually paid by Buyer for the defective Product.

Server Technology shall have no responsibility or liability for any Product, or part thereof, that (a) has had the Serial Number, Model Number, or other identification markings altered, removed or rendered illegible; (b) has been damaged by or subject to improper installation or operation, misuse, accident, neglect and/or has been used in any way other than in strict compliance with Server Technology's operation and installation manual; (c) has become defective or inoperative due to its integration or assembly with any equipment or products not supplied by Server Technology; (d) has been repaired, modified or otherwise altered by anyone other than Server Technology and/or has been subject to the opening of any sealed cabinet boxes without Server Technology's prior written consent. If any warranty claim by Buyer falls within any of the foregoing exceptions, Buyer shall pay Server Technology its then current rates and charges for such services.

THE ABOVE WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. SERVER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, OR EXEMPLARY DAMAGES; EVEN OF IT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

For warranty issues, contact the Product Support Department at the number listed above. All repair and return shipments must be approved by Server and must be accompanied by a RMA (Return Merchandise Authorization) number and dated proof of purchase.

Product Registration

Registration is your key to special offers and services reserved for Registered Users.

- Excellent Technical Support Services
- Special Update and Upgrade Programs
- Warranty Protection
- Extended Warranty Service
- New Product Information

Register your products online today!

www.servertech.com

Technical Support

Server Technology understands that there are often questions when installing and/or using a new product. Free Technical Support is provided from 8:30 AM to 5:00 PM, Monday-Friday, Pacific Time.

Server Technology, Inc.
1040 Sandhill Drive   Tel: 775.284.2000   Web: www.servertech.com
Reno, Nevada 89521 USA   Fax: 775.284.2065   Email: support@servertech.com

Return Merchandise Authorization

If you have a unit that is not functioning properly and is in need of technical assistance or repair:

Submit a request for support by phone at the above number, or via the web at www.servertech.com/forms/techrequest.htm.

Be ready to provide: Company Name
                           Contact Name, Phone Number, and Email address
                           Model or Part Number (from the label on the equipment)
                           Server Technology Serial Number
                           Version of code (type 'vers' at the Sentry: prompt)
                           Description of problem

1. Technical Support will work to diagnose/resolve the problem remotely, if possible. If the problem cannot be resolved, Technical Support will then issue an RMA# for the return/repair of the equipment in question. RMA#'s are valid for 30 days only from the issue date.

2. Shipping charges for the return of the equipment to Server Technology shall be the responsibility of the customer. For warranty repairs, Server Technology shall assume return shipping charges but for non-warranty repairs, the shipping charges shall be billed.

3. The RMA# shall be placed conspicuously on all shipping documentation, associated correspondence, and the shipping container.

4. Equipment must be returned in proper/original packaging to protect the equipment in transit. The customer shall be financially responsible for any damage/destruction of the equipment due to improper packaging.

5. Equipment shall typically be turned around within 48-72 hours of receipt at Server Technology. Equipment under warranty shall be repaired at no cost. Equipment NOT under warranty shall be repaired at the standard labor rate plus parts. Upon diagnosis of the equipment, the customer shall be notified of estimated charges prior to repair.

6. For non-warranty repairs, return of the equipment will be expedited with the inclusion of a Purchase Order or credit card number for incurred charges.

Server Technology, Inc.