VL2-350-SC-SSD

MASS STORAGE SUBSYSTEM

Technical Information

PREFACE

A number of conventions are used throughout this manual in order to provide clarity and descriptive accuracy. These include:

1.   The use of an 'H' (character) suffix to a number indicates that the number reference is in hexadecimal notation.

2.   The use of a '-' (minus) postfix to a signal name indicates that the signal is either true when the signal is at a logic 0 level or that the signal initiates actions on a high-to-low signal transition.

DISCLAIMER

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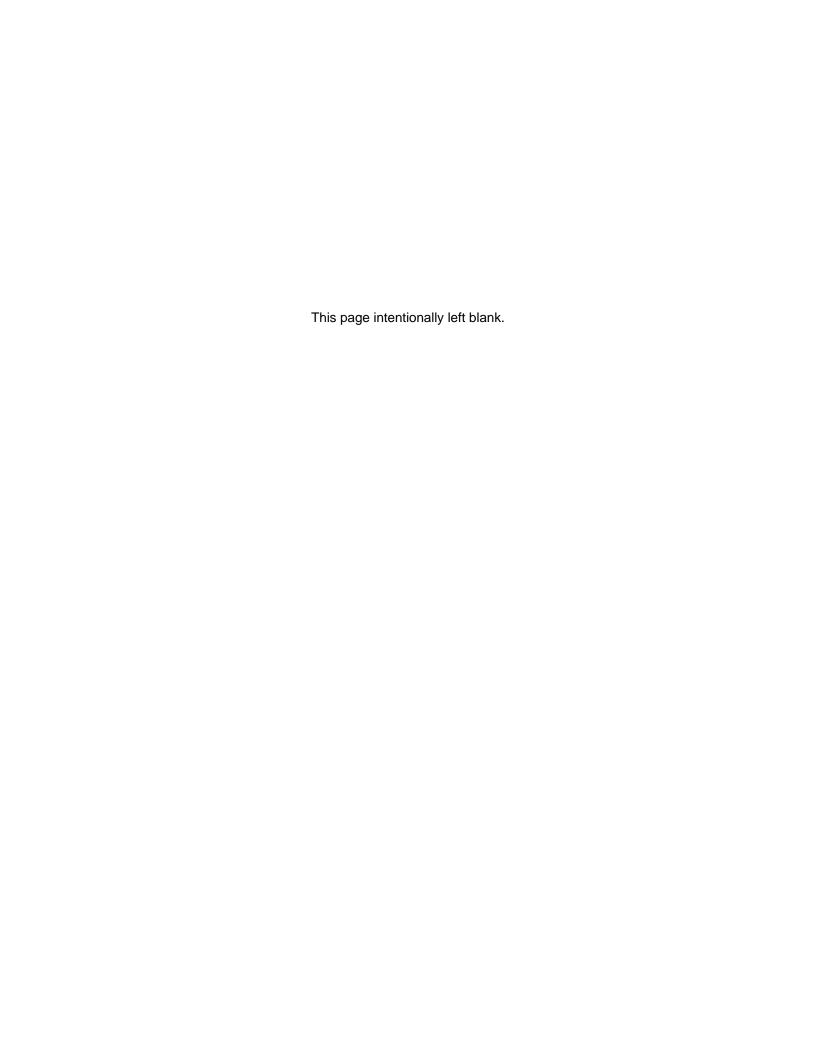

TRADEMARKS

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Chapter 1
Manual Organization and Introduction

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Scope

This chapter describes the organization of this manual and gives an overview of the VL2-350-SC-SSD.

Manual Organization

This manual is organized as follows:

Chapter 1   **MANUAL ORGANIZATION AND INTRODUCTION**
Contains an overview of the manual organization and provides a brief product description.

Chapter 2   **FEATURES AND SPECIFICATIONS**
Describes the product features, compatibility, and electrical specifications.

Chapter 3   **CONFIGURATION, INSTALLATION AND OPERATION**
Provides information on how to configure and install the VL2-350-SC-SSD .

Chapter 4   **SCSI DISK DRIVE DETAILS**
Contains specific details about the disk drive used on the VL2-350-SC-SSD .

Chapter 5   **PRODUCT SUPPORT, SERVICE AND WARRANTY**
Describes what to do if you have trouble and how we will support you.

VL2-350-SC-SSD Introduction

The VL2-350-SC-SSD has been designed to provide a complete disk drive subsystem which is mechanically compatible with the VMEbus. It has been designed specifically to interface with VMEbus processors with an embedded Ultra 320 SCSI Host Adapter. Together with the processor, a complete system can be installed in only three standard VMEbus system slots. The VL2-350-SC-SSD provides one or two disk drives within the same module making it very convenient to have fixed data storage. The drives used on board the VL2-350-SC-SSD were chosen for their compatibility, ruggedness and reliability. The Ultra 320 SCSI bus can be connected to the module via the front panel 68 pin Wide SCSI connector or via the P2 connector.
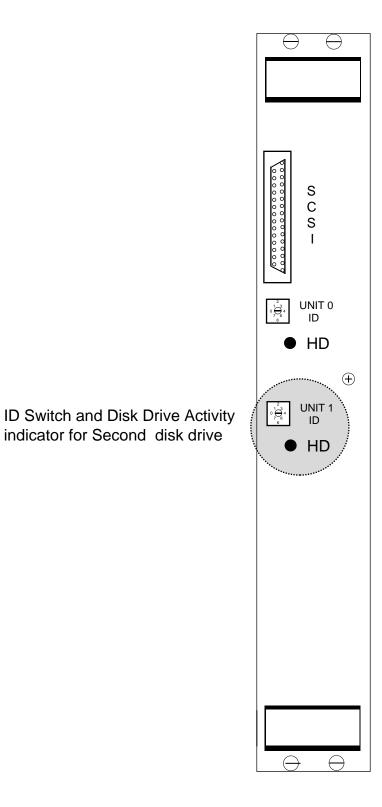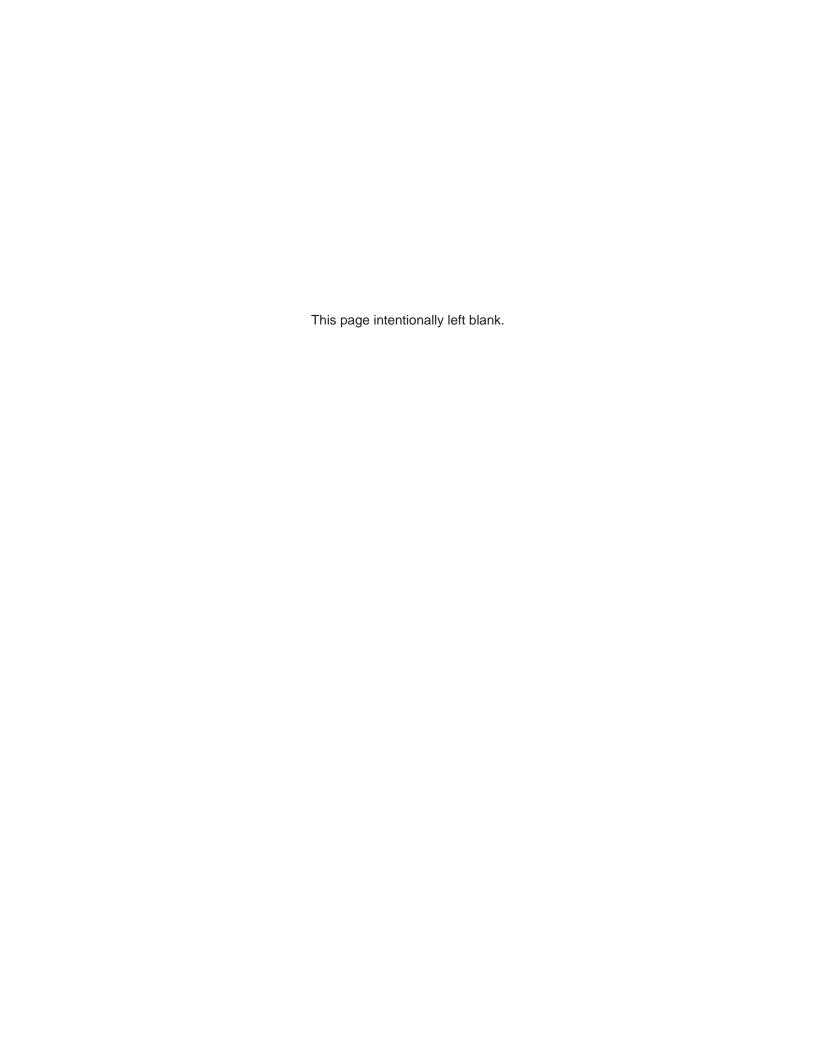
ID Switch and Disk Drive Activity
indicator for Second disk drive

S
C
S
I

UNIT 0
ID

● HD

UNIT 1
ID

● HD

Figure 1-1: VL2-350-SC-SSD Front Panel

Chapter 2
Features and Specifications

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Scope

This chapter describes the overall features and specifications of the VL2-350-SC-SSD .

Features

The VL2-350-SC-SSD incorporates one or two very compact winchester disk drives within a single module. The hard disk drive(s) is a high-performance winchester type with embedded disk drive control electronics. This microprocessor controlled embedded controller is on the hard disk and is compatible with ANSI X3.131-1986 SCSI commands. The disk drive is a very high performer, with a 1-to-1 interleave and an average track-to-track access times of 1 millisecond or less. It incorporates an embedded at least 8 megabytes of cache buffer which is operated in "look ahead" mode, providing buffering for sequential sector operations. The disk drive(s) has been carefully packaged with suitable control cables and power distribution connectors for direct attachment to single board computers in the VME chassis or to external devices.

Ultra 320 SCSI Interface Description

In order to provide a method of embedding the disk drive control electronics within the disk drive, several disk drive manufacturers jointly defined an interface specification. This specification for the *Small Computer System Interface* has become known throughout the industry as "SCSI". Basically, the SCSI interface consists of the required address, data and control signals from a wide SCSI Host Adapter. Since a goal of the specification is to allow the disk drive to be connected via standard cable, the specification required buffering of all signals so that the drive could be mounted a suitable distance from the board interface. This distance, however, is limited to twelve meters. The specification provides all signals via a 68-pin header connector for use with standard 68 conductor ribbon cable and connectors. Table 2-2 is a description of the Ultra320 SCSI pin definitions. The direction indicated is relative to the host.

Pin	Signal	Pin	Signal	Direction	Description
1	+DB(12)	35	-DB (12)	In/Out	Bidirectional data line 12
2	+DB(13)	36	-DB (13)	In/Out	Bidirectional data line 13
3	+DB(14)	37	-DB (14)	In/Out	Bidirectional data line 14
4	+DB(15)	38	-DB (15)	In/Out	Bidirectional data line 15
5	+DB(P1)	39	-DB (P1)	In/Out	Bidirectional data line parity1
6	+DB(0)	40	-DB (0)	In/Out	Bidirectional data line 0
7	+DB(1)	41	-DB (1)	In/Out	Bidirectional data line 1
8	+DB(2)	42	-DB (2)	In/Out	Bidirectional data line 2
9	+DB(3)	43	-DB (3) I	n/Out	Bidirectional data line 3
10	+DB(4)	44	-DB (4)	In/Out	Bidirectional data line 4
11	+DB(5)	45	-DB (5)	In/Out	Bidirectional data line 5
12	+DB(6)	46	-DB (6)	In/Out	Bidirectional data line 6
13	+DB(7)	47	-DB (7)	In/Out	Bidirectional data line 7
14	+DB(P)	48	-DB (P) I	n/Out	Bidirectional data line parity
15	GND	49	GND	-	Ground reference
16	DIFFSENS	50	GND	-	SCSI Sense/Ground reference
17	TERMPWR	51	TERMPWR	-	Terminator Power
18	TERMPWR	52	TERMPWR	-	Terminator Power
19	RESERVED	53	RESERVED	-	Reserved for future use
20	GND	54	GND	-	Ground reference
21	+ATN	55	-ATN	In/Out	Attention
22	GND	56	GND	-	Ground reference
23	+BSY	57	-BSY	In/Out	Busy
24	+ACK	58	-ACK -	In	Acknowledge
25	+RST	59	-RST	In	Reset
26	+MSG	60	-MSG	Out	Message
27	+SEL	61	-SEL	In/Out	Select
28	+C/D	62	-C/D	Out	Control/Data
29	+REQ	63	-REQ	Out	Request
30	+I/O	64	-I/O	Out	Input/Output
31	+DB(8)	65	-DB (8)	In/Out	Bidirectional data line 8
32	+DB(9)	66	-DB (9)	In/Out	Bidirectional data line 9
33	+DB(10)	67	-DB (10)	In/Out	Bidirectional data line 10
34	+DB(11)	68	-DB (11)	In/Out	Bidirectional data line 11

Table 2-2: SCSI Pin Definition

NOTES:
(1)   The minus sign next to the signals indicates active low.

VL2-350-SC-SSD Specifications

The following table provides the specifications of the complete VL2-350-SC-SSD . Individual disk drive specifications are given in their respective chapters.

General
Model: VL2-350-SC-SSD
Description: Hard disk drive module compatible with Ultra 320 SCSI commands.
Interface: Ultra 320 SCSI
Drive Type: Particular type depends on capacity ordered. See Chapter 4 for drive
                                details.
Hardware Compatibility: VMEbus Double Eurocard (6Ux8HP)

Electrical
Power: +5VDC 0.110A(max) plus current required by device
                                +12VDC (Applicable to mounted devices only))

Physical
Size: 160mm x 234mm (Double Eurocard)
                                8HP (2 Standard Slots)
Construction: Double-sided FR4 PCB and steel chassis

Environmental
Temperature: 0-75° C Inlet Air (Operating)

                                -30 to 80° C (Non-operating)
Humidity: 8-90% RH, Non-condensing
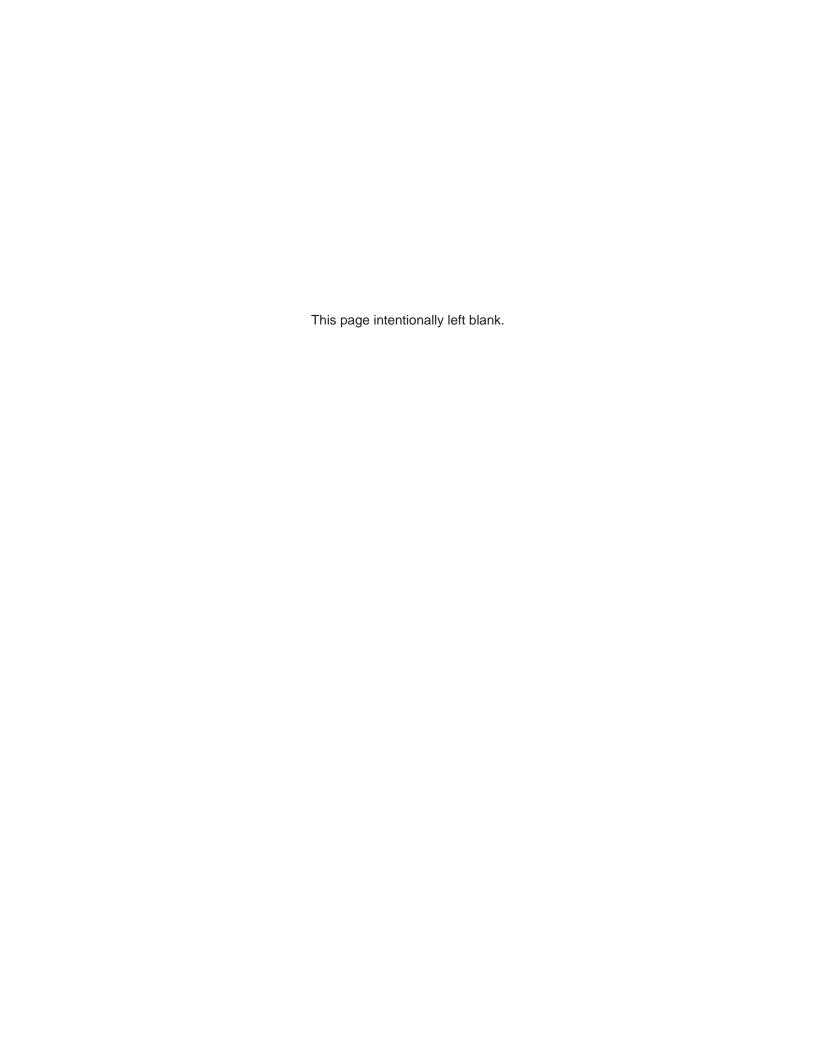Shock: Unit will withstand shock exceeding the specifications of
                                devices mounted)

P2 Connector Pin Definitions
Ultra 320 SCSI

P2 Pin	P2 SIGNAL	P2 Signal	P2 Pin
A1	+DB11	-DB 11	C1
A2	+DB10	-DB 10	C2
A3	+DB9	-DB 9	C3
A4	+DB8	-DB 8	C4
A5	+I/O	-I/O	C5
A6	+REQ	-REQ	C6
A7	+C/D	-C/D	C7
A8	+SEL	-SEL	C8
A9	+MSG	-MSG	C9
A10	+RST	-RST	C10
A11	+ACK	-ACK	C11
A12	+BSY	-BSY	C12
A13	GROUND	GROUND	C13
A14	+ATN	-ATN	C14
A15	GROUND	GROUND	C15
A16	TERMPOWER	TERMPOWER	C16
A17	DIFFSENS	DIFFSENS	C17
A18	+DBP	-DBP	C18
A19	+DB7	-DB7	C19
A20	+DB6	-DB6	C20
A21	+DB5	-DB5	C21
A22	+DB4	-DB4	C22
A23	+DB3	-DB3	C23
A24	+DB2	-DB2	C24
A25	+DB1	-DB1	C25
A26	+DB0	-DB0	C26
A27	+DBP1	-DBP1	C27
A28	+DB15	-DB15	C28
A29	+DB14	-DB14	C29
A30	+DB13	-DB13	C30
A31	+DB12	-DB12	C31
A32	GROUND	GROUND	C32

Table 2-3 P2 Pin Definitions

Chapter 3
Configuration, Installation, and Operation

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Scope

This chapter describes how to configure, install and operate the VL2-350-SC-SSD mass storage subsystem module.

Drive Hardware Configuration

The drives on the VL2-350-SC-SSD can be configured for normal operation as SCSI units 0-15 by setting the front panel switches with a small screwdriver.(**See Figure 1-1**) The particular configuration of the Unit ID's required depends upon the software and the application operating system.

Solid State Drive Hardware Configuration

The solid state drive can be set so that it is activated by the SCSI unit 0-15 ID, as is required to maintain compatibility with the SCSI software. The hard drive installed on the VL2-350-SC-SSD utilizes the Ultra 320 SCSI interface. It is possible to connect other Ultra 320 SCSI devices via the interface cable and to connect 14 other units to the SCSI interface if needed.

Considerations For Installation

There are several considerations before installing the VL2-350-SC-SSD into your system.

VMEbus Slot Requirements

The VL2-350-SC-SSD requires two adjacent slots in a standard VMEbus 6U card cage. Since the drives are mounted on an steel panel, this could potentially cause a shorting problem. If you are going to have a VMEbus card located in the next adjacent slot, you should carefully check it to make sure that no leads are likely to touch the VL2-350-SC-SSD .

VMEbus Backplane Configuration

The VMEbus P1 connector supplies all operating power to the VL2-350-SC-SSD and shunts the daisy-chain signals on the P1 connector. However, no other VME signals are connected on board. Therefore, you must check your VMEbus backplane for all daisy-chain signals continuity at the two slot positions occupied by the VL2-350-SC-SSD .

Power Supply Requirements

Make sure that your VMEbus power supply has adequate capabilities to support the operation of the VL2-350-SC-SSD when it is installed with all other cards in your VMEbus system. Pay particular attention to the +12 volt power requirement. The specifications listed in Chapters 2 and 4 should be consulted for the maximum current requirements. Your power supply must be capable of providing sufficient current for the hard disk drive motor(s) to spin up during initial operation (approximately 5 seconds).

Installing the VL2-350-SC-SSD

Make sure that all power is removed from the backplane before inserting the boards. Prior to inserting the VL2-350-SC-SSD into the card cage, it is necessary to verify the cable connections to the SCSI host/processor. Once you have connected and properly seated the associated cable assemblies, you should insert the host/processor into the VMEbus card cage. Now install the VL2-350-SC-SSD into the VME chassis and mate the P1 connector properly. The P2 connector should also be aligned. Then connect the VL2-350-SC-SSD to the SCSI host/processor with a 68 pin Micro-D cable or via the P2 connector on the backplane with the proper Phoenix International adapter module.

Drive Software Configuration

Initially you will need to run a device setup program in order to configure the software and hardware to properly recognize the drives on the VL2-350-SC-SSD . You should consult the host/processor manual and/or operating system manuals for a description of the utility required to properly format and use your mass storage subsystem.

Solid State Drive Software Configuration

The solid state disk drive can be installed as SCSI unit 0-15. The disk drive characteristics are described in detail in Chapter 4. It operates using the Ultra 320 SCSI interface and has to be configured by the host operating system software for proper operation.

Terminator Power

Terminator power for the drives is routed via cable from the SCSI bus Host adapter. This supplies the Terminator Power to the unit and the P2 connector pins for Terminator Power.(**See Figure 1-2**)
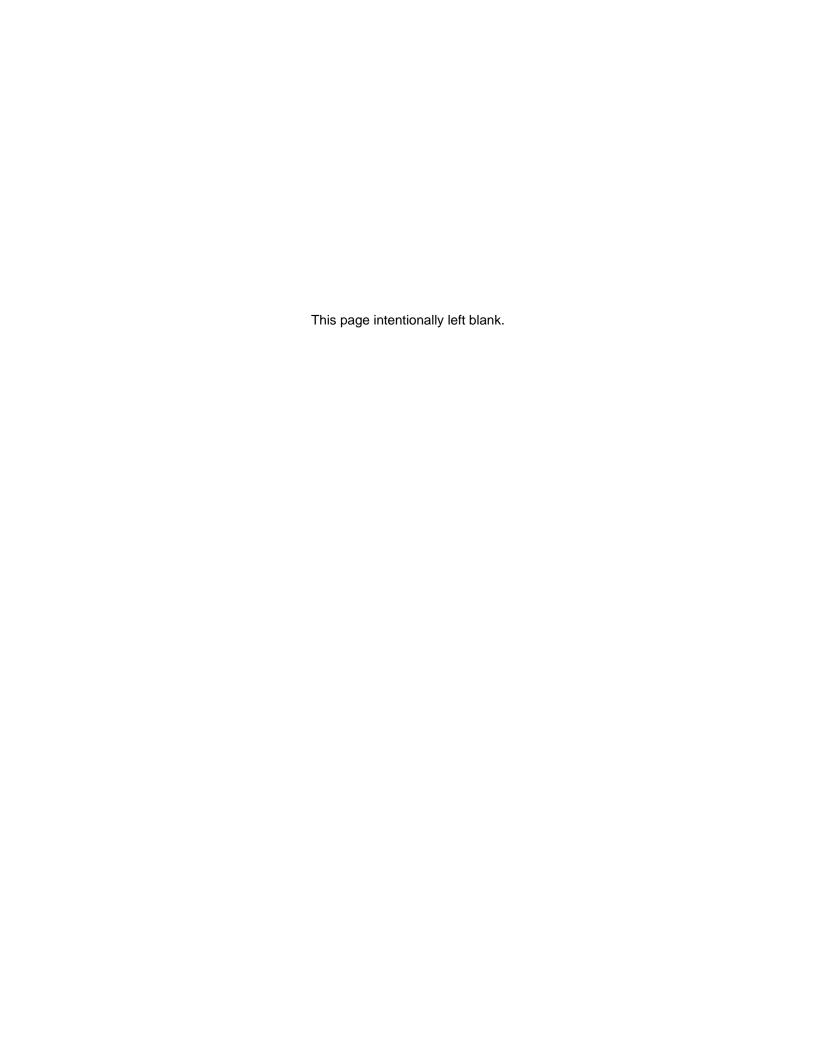
Termination

The active termination required for the SCSI-2 bus is on the VL2 module. The SensiTerm™ circuitry will automatically configure the termination for the SCSI bus. It determines if the SCSI bus signals are received from the P2 connector or from the Micro-D connector on the front panel and sets the termination at the correct end of the SCSI bus. If the module is in the middle of a SCSI bus route, the SensiTerm™ circuitry automatically disables all on board termination.

Operation

Once the VL2-350-SC-SSD has been configured properly and the software has been set up, operation is identical to that of a standard SCSI storage subsystem. No specialized software is required.

Chapter 5
Product Support, Service and Warranty

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Scope

This chapter describes Phoenix International's product support program. It states our product warranty and provides details about what to do if you have a problem with the product.

Warranty Statement

Phoenix International VMEbus products come with a "return-to-factory" warranty which covers defects in materials and workmanship for a period of three years from the date of product shipment to the customer, provided the product is unmodified and has been subject to normal and proper use. Warranty on non-Phoenix International manufactured devices incorporated into Phoenix VMEbus products is restricted to that provided by their manufacturer only.

If You Have a Problem

If you are having a problem with a Phoenix International product, you should call our main number, (714) 283-4800, and ask for Customer Service. Please be prepared to supply as much detail as you can concerning the nature of the problem and the conditions in which the problem appeared.

Obtaining an RMA

In order to return the product for repair, the following steps are necessary:

1. Obtain a return materials authorization number (RMA#) from Phoenix International Customer Service.

2. Ship the product prepaid to the designated repair point.

3. Provide with the product a written description of the claimed defect.

Shipping the Product

Any product returned to Phoenix International should be in its original shipping carton if possible. Otherwise the product should be carefully packaged in a conductive packing material and placed in a cushioned corrugated carton suitable for shipping. Please mark the shipping label with the RMA number and return it to:

Phoenix International

812 W. Southern Avenue

Orange, CA., 92865

Attn: Customer Service Department

RMA #:   _____

Providing a Product Defect Report

When you are returning a product for repair, it is very important to include a written report which details the nature of the problem in order to expedite the repair. Please make sure that the following information is included:

RMA #   _____
Product: _____
Serial Number: _____
Contact: _____
Phone: _____

Description of the problem/defect:

Warranty Repairs

Any product returned and found to be under warranty will be repaired or replaced at the discretion of Phoenix International within five working days of receipt and shipped freight prepaid to the Customer.

Non-warranty Repairs

If a product is found not to be under warranty, we will notify you of the non-warranty situation and provide you with a fixed cost and a schedule for the repair. Non-warranty repairs require that a purchase order be issued to Phoenix International for the amount of the repair before repairs are undertaken.

Product Updates

In an effort to improve product performance and reliability, Phoenix International reserves the right to make product modifications provided they do not negatively impact either the performance or operation of previous versions. If a product update is for the purpose of correcting a design flaw, all customers shall be notified in writing as to the nature of the flaw and the requirements for the update.