

VF2-350-SCW-RHD

MASS STORAGE SUBSYSTEM

Technical Information

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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.

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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 VF2-350-SCW-RHD module.

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 VF2-350-SCW-RHD.
- Chapter 4 **SCSI HARD DISK DETAILS**
Contains specific details about the hard disk drive used on the VF2-350-SCW-D.
- Chapter 5 **PRODUCT SUPPORT, SERVICE AND WARRANTY**
Describes what to do if you have trouble and how we will support you.

VF2-350-SCW-RHD Introduction

The VF2-350-SCW-RHD 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 Fast/Wide SCSI Host Adapter. Together with the processor, a complete system can be installed in only three standard VMEbus system slots. The VF2-350-SCW-RHD provides a removable 3.5 inch low profile disk in a 2 slot 6U VME module making it very convenient to have removable data storage. The drive used in the VF2-350-SCW-RHD was chosen for compatibility, ruggedness and reliability. The Fast Wide SCSI-2 bus can be connected to the module via the front panel 68 pin Wide SCSI connector or via the P2 connector, with pins used in the A and C rows of P2 for the SCSI data, control and parity signals.

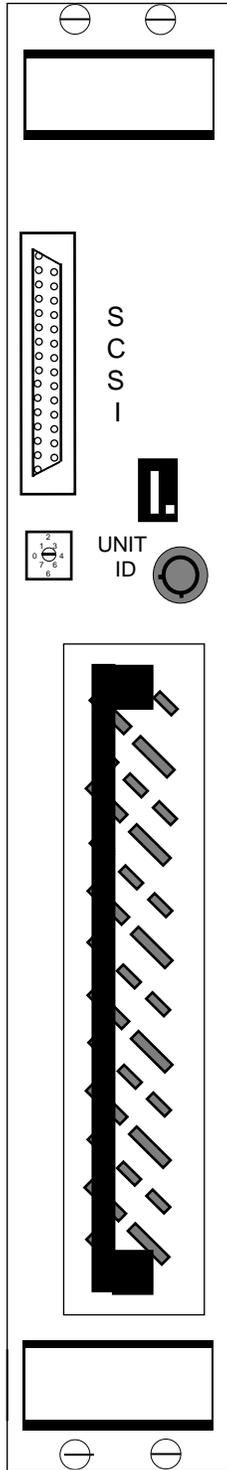


Figure 1-1: VX2-350-SCW-RHD Front Panel

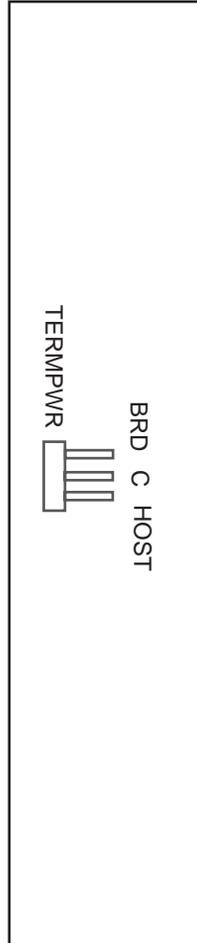


Figure 1-2: VX2-350-SCW-RHD Jumper Configuration

Chapter 2

Features and Specifications

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Scope

This chapter describes the overall features and specifications of the VF2-350-SCW-RHD.

Features

The VF2-350-SCW-RHD incorporates one very compact removable winchester disk drive within a single module. The hard disk drive 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 hard drive is a very high performer, with a 1-to-1 interleave and an average track-to-track access times of less than 10 milliseconds. It incorporates an embedded cache buffer which is operated in "look ahead" mode, providing buffering for sequential sector operations. The hard drive has been carefully packaged with suitable control and power distribution connectors for direct attachment to single board computers in the VME chassis or to external devices.

WIDE SCSI Interface Description

In order to provide a method of embedding the disk drive control electronics within the hard 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 eighteen feet. The specification provides all signals via a 68-pin header connector for use with standard 68 conductor cable and connectors. Table 2-2 is a description of the wide SCSI-2 pin definition. The direction indicated is relative to the host.

<u>Pin</u>	<u>Signal</u>	<u>Direction</u>	<u>Description</u>
35	-DB (12)	In/Out	Bidirectional data line 12
36	-DB (13)	In/Out	Bidirectional data line 13
37	-DB (14)	In/Out	Bidirectional data line 14
38	-DB (15)	In/Out	Bidirectional data line 15
39	-DB (P1)	In/Out	Bidirectional data line Parity1
40	-DB (0)	In/Out	Bidirectional data line 0
41	-DB (1)	In/Out	Bidirectional data line 1
42	-DB (2)	In/Out	Bidirectional data line 2
43	-DB (3)	In/Out	Bidirectional data line 3
44	-DB (4)	In/Out	Bidirectional data line 4
45	-DB (5)	In/Out	Bidirectional data line 5
46	-DB (6)	In/Out	Bidirectional data line 6
47	-DB (7)	In/Out	Bidirectional data line 7
48	-DB (P)	In/Out	Bidirectional data line Parity
49	GND	-	Ground reference
50	GND	-	Ground reference
51	TERMPWR	-	Terminator Power
52	TERMPWR	-	Terminator Power
53	RESERVED	-	Reserved for future use
54	GND	-	Ground reference
55	-ATN	In/Out	Attention
56	GND	-	Ground reference
57	-BSY	In/Out	Busy
58	-ACK	In	Acknowledge
59	-RST	In	Reset
60	-MSG	Out	Message
61	-SEL	In/Out	Select
62	-C/D	Out	Control/Data
63	-REQ	Out	Request
64	-I/O	Out	Input/Output
65	-DB (8)	In/Out	Bidirectional data line 8
66	-DB (9)	In/Out	Bidirectional data line 9
67	-DB (10)	In/Out	Bidirectional data line 10
68	-DB (11)	In/Out	Bidirectional data line 11

Table 2-2: SCSI Pin Definition

NOTES:

- (1) All pins 1-34 shall be connected to ground, except for pins 16=DIFFSENS, 17, 18=Tempwr, 19=Reserved
- (2) The minus sign next to the signals indicates active low.

VF2-350-SCW-RHD Specifications

The following table provides the specifications of the complete VF2-350-SCW-RHD. Individual disk drive specifications are given in their respective chapters.

General

Model:	VF2-350-SCW-RHD
Description:	Hard disk drive module compatible with SCSI commands.
Interface:	Fast Wide SCSI-2
Drive Type:	Particular type depends on capacity ordered. See Chapter 4 for drive details.
Hardware Compatibility:	VMEbus Double Eurocard (6Ux8HP)

Electrical

Power:	+5VDC 0.130A(max) in addition to drive current (See Chapter 4) +12VDC Depends on drive type (See Chapter 4)
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Physical

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

Environmental

Temperature:	5-50° C Inlet Air (Operating) -40 to 70° C (Non-operating)
Humidity:	8-90% RH, Non-condensing
Shock:	Unit will withstand shock exceeding the specifications of devices mounted)

P2 Connector Pin Definitions FAST/WIDE SCSI

SCSI P2 Signal	P2 Pin
-DB 0	A1
-DB 1	A2
-DB 2	A3
-DB 3	A4
-DB 4	A5
-DB 5	A6
-DB 6	A7
-DB 7	A8
-DPAR	A9
LTERMPOWER	A13
-ATN	A16
-BSY	A18
-SACK	A19
-RST	A20
-MSG	A21
-SEL	A22
-C/D	A23
-REQ	A24
-I/O	A25
GROUND	A10, A11, A12, A14, A15, A17, A32
P2NONL	A32
GROUND	B2, B12, B22, B31
-DB8	C9
-DB9	C10
-DB10	C11
-DB11	C12
-DB12	C13
-DB13	C14
-DB14	C15
-DB15	C16
-DPAR1	C17
HTERMPOWER	C18
P2WONL	C22

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 VF2-350-SCW-RHD mass storage subsystem module.

Drive Hardware Configuration

The drives on the VF2-350-SCW-RHD 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.

Hard Disk Drive Hardware Configuration

The hard 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 VF2-350-SCW-RHD utilizes the Fast/Wide SCSI-2 interface. It is possible to connect another type of SCSI device via the interface cable and to connect 14 other units to the SCSI interface if needed. (See Fig. 1-1) Please call Phoenix International Customer Support if you need assistance.

Considerations For Installation

There are several considerations before installing the VF2-350-SCW-RHD into your system.

VMEbus Slot Requirements

The VF2-350-SCW-RHD requires two adjacent slots in a standard VMEbus 6U card cage. Since the drives are mounted on an aluminum 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 VF2-350-SCW-RHD.

VMEbus Backplane Configuration

The VMEbus P1 connector supplies all operating power to the VF2-350-SCW-RHD 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 VF2-350-SCW-RHD.

Power Supply Requirements

Make sure that your VMEbus power supply has adequate capabilities to support the operation of the VF2-350-SCW-RHD 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 Chapter 2 and Chapter 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 to spin up during initial operation (approximately 5 seconds).

Installing the VF2-350-SCW-RHD

Make sure that all power is removed from the backplane before inserting the boards. Prior to inserting the VF2-350-SCW-RHD 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 VF2-350-SCW-RHD into the VME chassis and mate the P1 connector properly. The P2 connector should also be aligned. Then connect the VF2-350-SCW-RHD 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 VF2-350-SCW-RHD. 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.

Hard Drive Software Configuration

The hard 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 Fast/Wide SCSI-2 interface and has to be configured by the host operating system software for proper operation.

Terminator Power

Terminator power for the drives can be jumpered to route the Terminator Power from different sources. A jumper installed at **TERMPWR C** to BRD supplies power from the on board circuitry. Jumper **TERMPWR C** to HOST allows the SCSI bus Host to supply the Terminator Power to the unit and the P2 connector if they are so configured. (See Figure 1-2)

Termination

The active termination required for the SCSI-2 bus is on the VF2 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 68 pin 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

The VF2-350-SCW-RHD module has a removable disk drive carrier/drive module installed from the factory. The front panel keylock performs several functions. When the keylock is moved to the "Locked" (full counterclockwise) position, it physically locks the hard disk carrier into the module. It also applies power to the disk drive using a "Soft Power" circuit. This circuit applies voltage to the disk drive to activate its circuitry and then ramps the current to the drive to prevent a high inrush current condition. While the disk drive is spinning to operating speed, the ID LED indicator flashes the selected ID number. When the drive has reached operating speed and is ready to be accessed, the ID LED indicator stops flashing. When the keylock is moved to the "Unlock" position, the ID LED flashes to notify the operator that the disk is going into a non-operating mode. When the drive has spun down and can be safely removed from the module, the ID LED shows a "u" to indicate that the drive is unlocked, spun down and safe to be removed.

Once the VF2-350-SCW-RHD 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.