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Find the *Phoenix International VM2-350-SC-DF* at our website: ***Click HERE***

VX2-350-SC-DF

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.

DISCLAIMER

The information contained within this document has been carefully checked and is believed to be entirely reliable and consistent with the product that it describes. However, no responsibility is assumed for inaccuracies. Nor does Phoenix International assume any liability arising out of the application or use of any product or circuit described herein. Phoenix International reserves the right to make changes to any product and product documentation in an effort to improve performance, reliability or design. Furthermore, the information contained herein is of a proprietary nature and is not to be reproduced without prior written consent of Phoenix International.

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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 VX2-350-SC-DF with the "**X**" in the model number referring to the particular P2 wiring of the module. A V**F**2-350-SC-DF has P2 wired for a Force type processor wiring scheme. A V**M**2-350-SC-DF has the P2 connector wired to accept the Motorola configuration of the P2 wiring.

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 VX2-350-SC-DF.

Chapter 4 **SCSI HARD DISK DETAILS**
Contains specific details about the fixed hard disk drive used on the VX2-350-SC-DF.

Chapter 5 **TEAC 235-HS FLOPPY DISK DETAILS**
Provides specific details about the floppy disk drive used on the VX2-350-SC-DF.

Chapter 6 **PRODUCT SUPPORT, SERVICE AND WARRANTY**
Describes what to do if you have trouble and how we will support you.

VX2-350-SC-DF Introduction

The VX2-350-SC-DF 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 SCSI Host Adapter. Together with the processor, a complete system can be installed in only three standard VMEbus system slots. The VX2-350-SC-DF provides a floppy disk drive and a hard disk drive within the same module making it very convenient to have fixed and removable data storage. The drives used on board the VX2-350-SC-DF were chosen for their compatibility, ruggedness and reliability.

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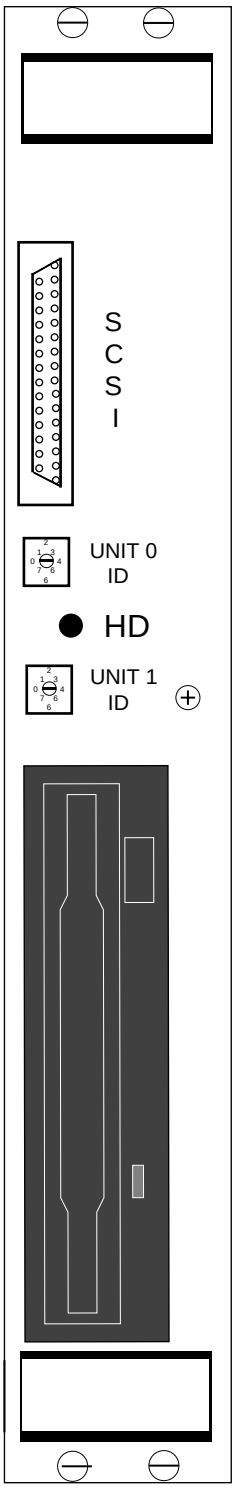


Figure 1-1: VX2-350-SC-DF Front Panel

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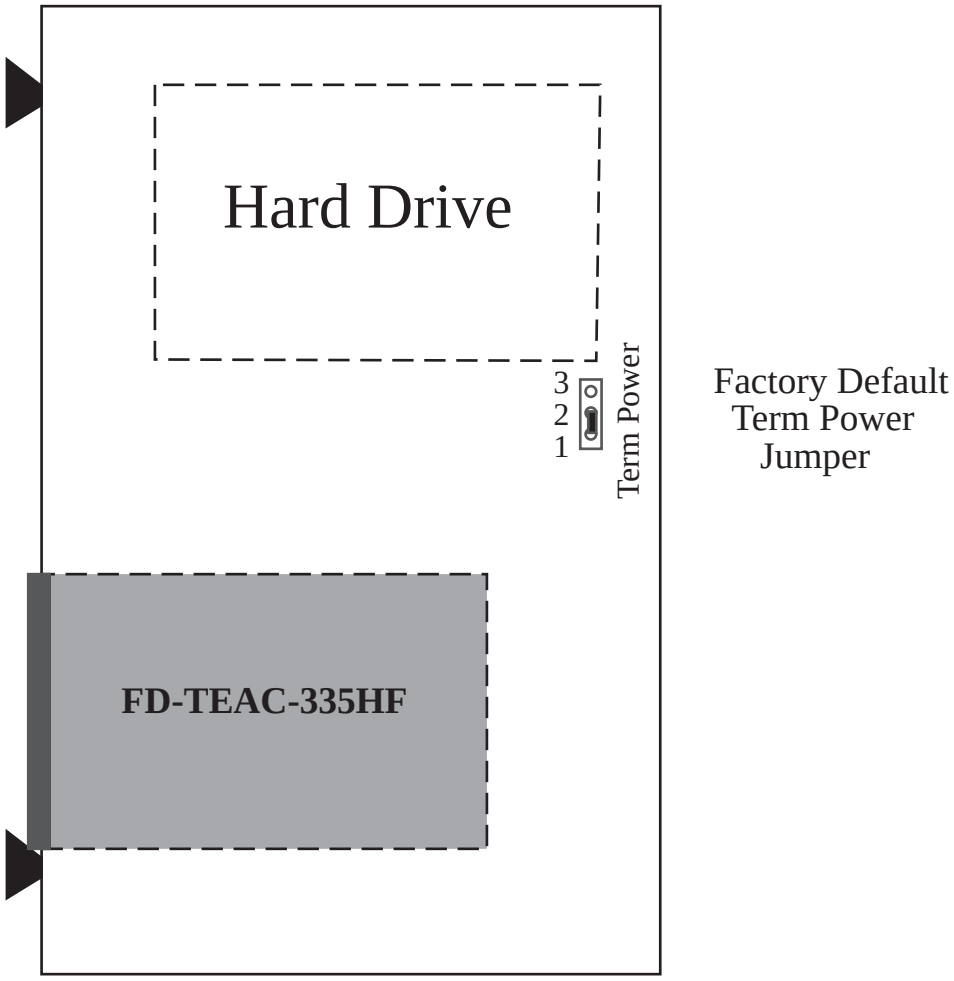


Figure 1-2: VX2-350-SC-DF Jumper Configuration

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Chapter 2
Features and Specifications

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Scope

This chapter describes the overall features and specifications of the VX2-350-SC-DF.

Features

The VX2-350-SC-DF incorporates a very compact winchester disk drive and a one inch high floppy disk drive within a single module. The floppy drive utilizes a double sided floppy and provides a total formatted storage capacity of 720 Kbytes/1.44Mbytes. The floppy drive is physically compact, occupying only 1" of panel height. The hard disk drive is a high-performance winchester type with embedded disk drive control electronics. This embedded controller is on the hard disk and the floppy drive are microprocessor controlled and 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 10 milliseconds. It incorporates an embedded 256 kilobyte buffer which is operated in "look ahead" mode, providing buffering for sequential sector operations. The drive shares its footprint and low profile with that of the tape drive. Both the hard drive and the tape drive have 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.

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 an 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 fifty-pin header connector for use with standard fifty conductor ribbon cable and connectors. Table 2-2 is a description of the SCSI-2 pin definition. The direction indicated is relative to the host.

Pin	Signal	Direction	Description
26	-DB (0)	In/Out	Bidirectional data line 0
27	-DB (1)	In/Out	Bidirectional data line 1
28	-DB (2)	In/Out	Bidirectional data line 2
29	-DB (3)	In/Out	Bidirectional data line 3
30	-DB (4)	In/Out	Bidirectional data line 4
31	-DB (5)	In/Out	Bidirectional data line 5
32	-DB (6)	In/Out	Bidirectional data line 6
33	-DB (7)	In/Out	Bidirectional data line 7
34	-DB (P)	In/Out	Parity
35	GND	-	Ground reference
36	GND	-	Ground reference
37	RESERVED	-	Reserved for future use
38	TERMPWR	-	Terminator Power
39	RESERVED	-	Reserved for future use
40	GND	-	Ground reference
41	-ATN	In/Out	Attention
42	GND	-	Ground reference
43	-BSY	In/Out	Busy
44	-ACK -	In	Acknowledge
45	-RST	In	Reset
46	-MSG	Out	Message
47	-SEL	In/Out	Select
48	-C/D	Out	Control/Data
49	-REQ	Out	Request
50	-I/O	Out	Input/Output

Table 2-2: SCSI Pin Definition

IN = From Host to Disk
OUT = From Disk to Host

NOTES:

(1) All pins 1-25 shall be connected to ground, except for pins 12 - 14. These pins should be left open. Some products designed prior to the generation of this standard connected these pins to ground.

(2) The minus sign next to the signals indicates active low.

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VX2-350-SC-DF Specifications

The following table provides the specifications of the complete VX2-350-SC-DF. Individual disk drive specifications are given in their respective chapters.

General

Model:	VX2-350-SC-DF
Description:	Hard disk/Tape drive module compatible with SCSI commands.
Interface:	Floppy drive: SCSI Hard Drive:SCSI
Drive Type:	Floppy Drive: TEAC FD-235-HS Hard Drive: (depends on capacity ordered)
Hardware Compatibility:	VMEbus Double Eurocard (6Ux8HP)

Electrical

Power:	+5VDC 2.65A(max) +12VDC 2.25A(max) Power figures are with both drives R/W

Physical

Size:	160mm x 234mm (Double Eurocard) 8HP (2 Standard Slots)
Construction:	Double-sided Printed Circuit

Environmental

Temperature:	0-55^{o} C Inlet Air (Operating) -20 to 60^{o} C (Non-operating)
Humidity:	8-80% RH, Non-condensing
Shock:	15G Max (Operating), 150G Max (Non-oper.)

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P2 Connector Pin Definitions

Force P2 Signal	Motorola P2 Signal	P2 Pin
-DB 0	-DB 0	A1
-DB 1	-DB 1	A2
-DB 2	-DB 2	A3
-DB 3	-DB 3	A4
-DB 4	-DB 4	A5
-DB 5	-DB 5	A6
-DB 6	-DB 6	A7
-DB 7	-DB 7	A8
-DPAR	-DPAR	A9
GROUND	-ATN	A10
GROUND	-BSY	A11
GROUND	-ACK	A12
TERM POWER	-RST	A13
GROUND	-MSG	A14
GROUND	-SEL	A15
-ATN	-C/D	A16
GROUND	-REQ	A17
-BSY	-IO	A18
-ACK		A19
-RST		A20
-MSG		A21
-SEL		A22
-C/D		A23
-REQ		A24
-IO		A25
GROUND		A32

Table 2-3 P2 Pin Definitions

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Chapter 3
Configuration, Installation, and Operation

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Scope

This chapter describes how to configure, install and operate the VX2-350-SC-DF disk drive module.

Drive Hardware Configuration

The drives on the VX2-350-SC-DF can be configured for normal operation as SCSI units 0-7 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.

Floppy Disk Drive Hardware Configuration

The floppy disk drive can be set so that it is activated by the SCSI unit 0-7, as is required to maintain compatibility with the SCSI software. The drive installed on the VX2-350-SC-DF utilizes the SCSI interface. It is possible to connect another type of SCSI device via the interface cable and to connect 5 other units to the SCSI interface if needed. Please call Phoenix International Customer Support if you need assistance.

Hard Disk Drive Hardware Configuration

The hard drive can be set so that it is activated by the SCSI unit 0-7, as is required to maintain compatibility with the SCSI software. The hard drive installed on the VX2-350-SC-DF utilizes the Fast SCSI-2 interface. It is possible to connect another type of SCSI device via the interface cable and to connect 5 other units to the SCSI interface if needed. Please call Phoenix International Customer Support if you need assistance.

Considerations For Installation

There are several considerations before installing the VX2-350-SC-DF into your system.

VMEbus Slot Requirements

The VX2-350-SC-DF requires two adjacent slots in a standard VMEbus 6U card cage. Since the disk 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 VX2-350-SC-DF.

VMEbus Backplane Configuration

The VMEbus P1 connector supplies all operating power to the VX2-350-SC-DF 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 VX2-350-SC-DF.

Power Supply Requirements

Make sure that your VMEbus power supply has adequate capabilities to support the operation of the VX2-350-SC-DF 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 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).

Termination

The active termination required for the SCSI-2 bus is on the VX2 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.

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Terminator Power

Terminator power for the disk drives can be jumpered to route the Terminator Power from different sources. A jumper installed on pins **1-2** supplies power from the on board circuitry. A jumper installed on pins **2-3** supplies power from the P2 connector. Jumpers **Removed** allows the disk drives to supply their own Terminator Power if they are so configured.(**See Figure 1-2**)

Installing the VX2-350-SC-DF

Make sure that all power is removed from the backplane before inserting the boards. Prior to inserting the VX2-350-SC-DF 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 cable assembly, you should insert the host/processor into the VMEbus card cage. Now install the VX2-350-SC-DF into the VME chassis and mate the P1 connector properly. The P2 connector should also be aligned. Then connect the VX2-350-SC-DF to the SCSI host/processor with a 50 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 VX2-350-SC-DF. 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.

Floppy Drive Software Configuration

The floppy disk drive can be installed as SCSI unit 0-7. It is double-sided and has a formatted storage capacity of 720 kilobytes, or 1.44 megabytes You can assign the logical unit designation from the SCSI setup utility.

Hard Drive Software Configuration

The hard disk drive can be installed as SCSI unit 0-7. The disk drive characteristics are described in detail in Chapter 4. It operates using the SCSI-2 interface and has to be configured by the host operating system software for proper operation.

Operation

Once the VX2-350-SC-DF has been configured properly and the software has been properly set up, operation is identical to that of a standard SCSI disk subsystem. No specialized software is required.

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Chapter 5
TEAC 235-HS Floppy Disk Drive Details

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Scope

This chapter describes the TEAC-235HS floppy disk drive in detail.

Introduction

The TEAC-235HS is a high performance 3.5” low-profile microfloppy disk drive with low power consumption and reliable operation. The drive’s 1” height provides space savings with drastic weight and space reduction. The drive uses the industry standard *small computer system interface* (SCSI).

Key Features

- Low power requirements enabling operation in portable applications.
- Double headed.
- High capacity, 720K,1.44 megabytes(MFM)
- High shock resistance.

Physical Configuration

Number of Disks:	1
Data Surfaces:	2
Data Heads:	2
Tracks per Surface:	80
Track Density:	135 TPI
Capacity:	Formatted: 720K bytes/1.44 megabytes

Drive Performance

Access Time:	Track-to-track: 3ms
Rotation Speed:	300 RPM
Media Data Transfer Rate:	250K Byte/second
Start Time:	500 ms (typ)

Read/Write Performance

Interface:	Small Computer System Interface (SCSI)
Recording Method:	FM, MFM
Recording Density:	17434 BPI

Power Requirements

Mode	+12V	+5V
Read Mode	80ma	260ma typ
Write Mode	80ma	300ma typ
Seek Mode	210ma	280ma typ
Spin-up Mode	220ma	300ma max

Physical Characteristics

Height:	1.31”
Length:	6.38”
Width:	4.00”
Weight:	1.10 lbs.

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Environmental Characteristics

Temperature:	5 C to 55 C (operating)
	-20C to +80C (non operating)
Thermal Gradient:	20 C per hour maximum
Humidity:	10% to 80% non-condensing
Altitude:	-200 to 10,000 feet (operating)
	40,000 feet (non-operating)

Reliability

MTBF:	20,000 hours (POH)
MTTR:	10 minutes (typ)

Shock

Non-operating shock:	50 G's
Operating shock:	10 G's

Functional Description

The TEAC-235HS contains all necessary mechanical and electronic parts to interpret control signals, position the recording heads over the desired track, read and write data.

Option Jumpers

ID strap settings perform SCSI ID settings with "ID0", "ID1", and "ID2"on the PCBA. "ID0 ~ ID2" are all connected to the front panel switch for device ID selection.

SCSI ID ADDRESS	ID2	ID1	ID0
0	ON	ON	ON
1	ON	ON	OFF
2	ON	OFF	ON
3	ON	OFF	OFF
4	OFF	ON	ON
5	OFF	ON	OFF
6	OFF	OFF	ON
7	OFF	OFF	OFF

SCSI Parity strap: "PAR" on the PCBA is the parity strap. When "PAR" is "ON", the 235-HS performs parity checking (odd number) of input data (-DB0 ~ -DB7, -DBP). Parity checking does not take place when "PAR" is OFF. It is factory set to "ON"

Power Connector

The TEAC-235HS has a 4-pin DC power connector. It is labeled J2 and uses a mating connector, AMP 171822-4. The pinout for the power connectors is as follows:

DC Supply	J2 Pin
+5 VDC	1
+12VDC	4
GND	2, 3

Host Interface Connector

The TEAC-235HS has a 50 pin connector. Two drives may be daisy chained together with a maximum cable length of eighteen feet.

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Chapter 6
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 seven 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 #: _____

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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.

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