



Product Manual

VC1-250

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Publication number: VC1-250 February 2012

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Contents

1.0	Scope.....	1
2.0	Applicable standards and reference documentation.....	2
2.1	Standards	
2.1.1	Electromagnetic compatibility	
2.1.1.1	Electromagnetic susceptibility	
2.1.2	European Union Restriction of Hazardous Substances (RoHS)	
2.2	Reference documents	
3.0	Description and specifications.....	3
3.1	SAS / SATA connection via front panel connector	
3.2	SAS / SATA connection via VME backplane	
4.0	Configuration, installation and operation.....	6
4.1	Handling and static-discharge precautions	
4.2	Considerations for Installation	
4.3	Installation	
4.4	Drive Software Configuration	
4.5	Operation	
5.0	Drive Specification and Details.....	8
6.0	Product Support, Service and Warranty	10
6.1	Warranty Statement	
6.2	If You Have a Problem	
6.3	Obtaining an RMA	
6.4	Shipping the Product	
6.5	Providing a Product Defect Report	
6.6	Warranty Repairs	
6.7	Non-warranty Repairs	
6.8	Product Updates	

1.0 Scope

This manual describes the Phoenix International VC1-250 conduction cooled VME SAS/SATA storage module.



VC1-250 VME Data Storage Module with SAS HDDs

2.0 Applicable Standards and Reference Documentation

The VC1-250 module has been developed to the highest standards of design and construction. The module and storage device(s) depends on its host equipment to provide adequate power and environment for optimum performance and compliance with applicable industry and governmental regulations. Special attention should be given in the areas of safety, power distribution, shielding, and temperature regulation.

2.2 Standards

The VC1-250 complies with the VME, SAS, and SATA specifications and standards as noted in the appropriate sections of this manual.

2.1.1 Electromagnetic compatibility

The VC1-250 module with drive(s), as delivered, is designed for system integration and installation into a suitable enclosure prior to use. The module is supplied as a subassembly and is not subject to Subpart B of Part 15 of the FCC Rules and Regulations or the Radio Interference Regulations of the Canadian Department of Communications.

The design characteristics of the module serve to minimize radiation when installed in an enclosure that provides reasonable shielding. The module is capable of meeting the Class B limits of the FCC Rules and Regulations of the Canadian Department of Communications when properly packaged; however, it is the user's responsibility to assure that the drive meets the appropriate EMI requirements in their system. Shielded I/O cables may be required if the enclosure does not provide adequate shielding. If the I/O cables are external to the enclosure, shielded cables should be used, with the shields grounded to the enclosure and to the host controller.

2.1.1.1 Electromagnetic susceptibility

As a component assembly, the VC1-250 is not required to meet any susceptibility performance requirements. It is the responsibility of those integrating the module within their systems to perform those tests required and design their system to ensure that equipment operating in the same system as the module or external to the system does not adversely affect the performance of the module and its disk drives.

2.1.2 European Union Restriction of Hazardous Substances (RoHS)

The European Union Restriction of Hazardous Substances (RoHS) Directive restricts the presence of chemical substances, including Lead (Pb), in electronic products effective July 2006. A number of parts and materials in Phoenix products are procured from external suppliers. We rely on the representations of our suppliers regarding the presence of RoHS substances in these parts and materials. Our supplier contracts require compliance with our chemical substance restrictions, and our suppliers document their compliance with our requirements by providing material content declarations for all parts and materials for the module documented in this publication. Current supplier declarations include disclosure of the inclusion of any RoHS-regulated substance in such parts or materials.

2.2 Reference documents

ANSI/VITA1 VME64
SFF-8223 2.5" Drive Form Factor with Serial Connector
SFF-8460 HSS Backplane Design Guidelines
SFF-8470 Multi Lane Copper Connector
ANSI INCITS Serial Attached SCSI (SAS) Standard (T10/1601-D)

3.0 Description and Specifications

The VC1-250 is a rugged 6U, single slot, conduction cooled, VMEbus mass storage plug-in module that houses one or two 2.5" form factor Serial Attached SCSI (SAS) or Serial ATA (SATA) rotating hard disk or solid state flash drives. It has been designed specifically to interface with VMEbus processors with an embedded SAS or SATA Host Adapter. Together with the processor, a complete system can be installed in only two standard VMEbus system slots. The VC1-250 can be configured for attachment to the SAS bus utilizing either the VME P2 connector or the front panel SAS 4-lane external connector receptacle. Both attachment methods provide contact for up to four physical links. A variety of SAS and SATA VME backplane P2 plug-in adapter cards are available from Phoenix International for host connection. There are 2 Green light-piped LEDs visible at the front panel, one for each drive, which indicate drive activity.

3.1 SAS / SATA Connection via Front Panel connector

For external host connection to the SAS bus via the front panel SAS receptacle use a high quality cable assembly from your preferred cable manufacturer or contact Phoenix International. This cable needs to have the SFF-8470 infiniband SAS external 4-lane plug connector on the end mating to the front panel connector. The other end of the cable is dependent upon your host adapter connection. Note that SAS can use cables up to 7.5 m (25 ft) long while SATA is limited to 0.7 m (2.3 ft). Pin assignments for the front panel receptacle, compliant with the ANSI INCITS SAS Standard (T10/1601-D), are as follows.

Table 1 SFF-8470 SAS Front Panel Connector Pin Definitions

<u>SIGNAL</u>	<u>PIN</u>
GND	G1
Rx 0 +	S1
Rx 0 -	S2
GND	G2
Rx 1 +	S3
Rx 1 -	S4
GND	G3
Rx 2 +	S5
Rx 2 -	S6
GND	G4
Rx 3 +	S7
Rx 3 -	S8
GND	G5
Tx 3 -	S9
Tx 3 +	S10
GND	G6
Tx 2 -	S11
Tx 2 +	S12
GND	G7
Tx 1 -	S13
Tx 1 +	S14
GND	G8
Tx 0 -	S15
Tx 0 +	S16
GND	G9

3.2 SAS / SATA Connection via VME Backplane

The VC1-250 can be configured for attachment to the SAS bus utilizing the VME P2 connector. An adapter card which plugs into the back of the VME backplane to connect to the SAS bus and cables to the host is typically required for this configuration.

Contact Phoenix International for the type of adapter card and cable(s) required to meet your needs. Pin assignments for the P2 VME connector are as follows.

Table 2 VME P2 Connector SAS/SATA and Adapter Card Pin Definitions

<u>DRIVE</u>	<u>VME P2 PIN</u>	<u>SAS SIGNAL</u>	<u>SATA SIGNAL</u>	<u>SATA ADAPTER PIN</u>
1	C1	GND	GND	J2-S7
1	C2	TP -	Tx -	J2-S5
1	C3	TP +	Tx +	J2-S6
1	C4	GND	GND	J2-S4
1	C5	RP +	Rx +	J2-S2
1	C6	RP -	Rx -	J2-S3
1	C7	GND	GND	J2-S1
1	C8	GND		
1	C9	TS -		
1	C10	TS +		
1	C11	GND		
1	C12	RS +		
1	C13	RS -		
1	C14	GND		
2	C15	GND	GND	J1-S7
2	C16	TP -	Tx -	J1-S5
2	C17	TP +	Tx +	J1-S6
2	C18	GND	GND	J1-S4
2	C19	RP +	Rx +	J1-S2
2	C20	RP -	Rx -	J1-S3
2	C21	GND	GND	J1-S1
2	C22	GND		
2	C23	TS -		
2	C24	TS +		
2	C25	GND		
2	C26	RS +		
2	C27	RS -		
2	C28	GND		

4.0 Configuration, Installation, and Operation

4.1 Handling and static-discharge precautions

After unpacking, and before installation, the module may be exposed to potential handling and electrostatic discharge (ESD) hazards. Observe the following standard handling and static-discharge precautions:

Caution -

- Be sure you are properly grounded before handling the module. Put on a grounded wrist strap, or ground yourself frequently by touching the metal chassis of a computer that is plugged into a grounded outlet. Wear a grounded wrist strap throughout the entire installation procedure.
- Handle the module by its edges or front panel only.
- Always rest the module on a padded, antistatic surface until you mount it in the enclosure.
- Do not touch the connector pins or any components on the printed circuit board.

4.2 Considerations For Installation

VMEbus Slot Requirements

The VC1-250 requires one slot in a standard VMEbus 6U card cage. Many drives have a steel cover, which could potentially cause a shorting problem. If you are going to have a VMEbus card located in the next adjacent slot, carefully check it to make sure that no leads are likely to touch the top of the drives mounted on the VC1-250 module.

VMEbus Backplane Configuration

The VMEbus P1 connector supplies all operating power to the VC1-250 as well as ground. No other signals are connected to the modules P1 connector. When configured for SAS to VME backplane the SAS bus is connected via the P2 connector (see Table 2 for pin-outs).

Power Supply Requirements

Make sure that your VMEbus power supply has adequate capabilities to support the operation of the drives mounted on the VC1-250 module while considering all other cards in your VMEbus system. The specifications listed in Chapter 5 should be consulted for the maximum current requirements. Your power supply must be capable of providing sufficient current for the drive during initial operation.

4.3 Installation

Assure that all power is removed from the VME backplane prior to inserting the VC1-250 module into the card cage. Align the VC1-250 module into its respective card cage slot card guides and slide the module in until the P1 and P2 connectors initially mate. Apply pressure to the ejector handles to fully seat the module / connectors.

Caution -

When seating the VC1-250 module into a card cage only apply pressure to the ejector handles or, if necessary, to the base of the front panel. Applying pressure to the top of the front panel could cause damage to the module.

Now connect the VC1-250 SAS bus to the host/processor with either (depending on configuration) an SFF-8470 4-lane SAS cable to the front panel or via the P2 connector on the backplane with the proper Phoenix International adapter module.

4.4 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 VC1-250. 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. The drive characteristics are described in detail in Chapter 5. It operates using the SAS or SATA interface and has to be configured by the host operating system software for proper operation.

4.5 Operation

Once the VC1-250 has been configured properly and the software has been set up, operation is identical to that of a standard SAS / SATA storage subsystem. No specialized software is required.

5.0 Drive Specifications and Details

6.0 Product Support, Service and Warranty

This section 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.

6.1 Warranty Statement

Phoenix International VMEbus products come with a "return-to-factory" warranty which covers defects in materials and workmanship for a period of two 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.

6.2 If You Have a Problem

If you are having a problem with a Phoenix International product, 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.

6.3 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 a written description of the claimed defect with the product.

6.4 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 #: _____

6.5 Providing a Product Defect Report

When 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:

6.6 Warranty Repairs

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

6.7 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.

6.8 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.