XVPX-9756

Single-Slot 3U VPX bus Bootable SATA/SAS Drive Module

USER'S MANUAL

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IMPORTANT SAFETY CONSIDERATIONS

It is very important for the user to consider the possible adverse effects of power, wiring, component, sensor, or software failures in designing any type of control or monitoring system. This is especially important where economic property loss or human life is involved. It is important that the user employ satisfactory overall system design. It is agreed between the Buyer and Acromag, that this is the Buyer's responsibility.

1.0 GENERAL INFORMATION

The XVPX-9756 is a bootable SATA/SAS storage module which supports dual Slim SATA drives or a single 2.5" drive, either rotating or solid state. The module connects directly to the CPU via SATA signals or by means of PCI Express signals through an on-board controller.

KEY FEATURES

- Supports 2.5" SATA or SAS drives.
- Supports SATA, SAS and PCIe x1 interfaces.
- Supports dual Slim SATA drives.
- RAID 0/1 configurable with dual Slim SATA drives
- Supports hardware "Purge" input from backplane for quick erasure of media on supporting drives.
- SATA/SAS drive activity LED.
- Front panel I/O for Air Cooled versions.
- Air and conduction cooled variants available.
- REDI covers supporting Vita 48 available.

Introduction

The XVPX-9756 can be configured to interface with the host processor in one of two modes.

1. Uses a 1x PCIe lane on the VPX bus to connect the on board SATA controller to the processor. This Configuration allows the drive to interface with the host processor without the use of additional hardware.
2. Uses a direct SATA connection across the VPX bus. This Configuration allows the drive to interface via a Rear Transition Module and external SATA cable or Custom backplane to the processor board.

Module and Backplane Profiles

- MOD3-PER1U-16.3.3-1 (when used with PCIe interface)
- MOD3-STO-1U-16.5.1-2 (when used with direct SATA interface)

2.0 Ordering Information

XVPX-9756-AB0-X	
A = Thermal	1 = Air-cooled
	2 = Conduction-cooled
	3 = REDI
B = Drive Connector type	0 = HD/SSD (SATA)
	1 = Dual Slim SATA
X = Solder	L = Lead solder
	LF = Lead-free solder

3.0 PREPARATION FOR USE

UNPACKING AND INSPECTION

Upon receipt of this product, inspect the shipping carton for evidence of mishandling during transit. If the shipping carton is badly damaged or water stained, request that the carrier's agent be present when the carton is opened.

If the carrier's agent is absent when the carton is opened and the contents of the carton are damaged, keep the carton and packing material for the agent's inspection.

For repairs to a product damaged in shipment, refer to the Acromag Service Policy to obtain return instructions. It is suggested that salvageable shipping cartons and packing material be saved for future use in the event the product must be shipped.

This board is physically protected with packing material and electrically protected with an anti-static bag during shipment. It is recommended that the board be visually inspected for evidence of mishandling prior to applying power.

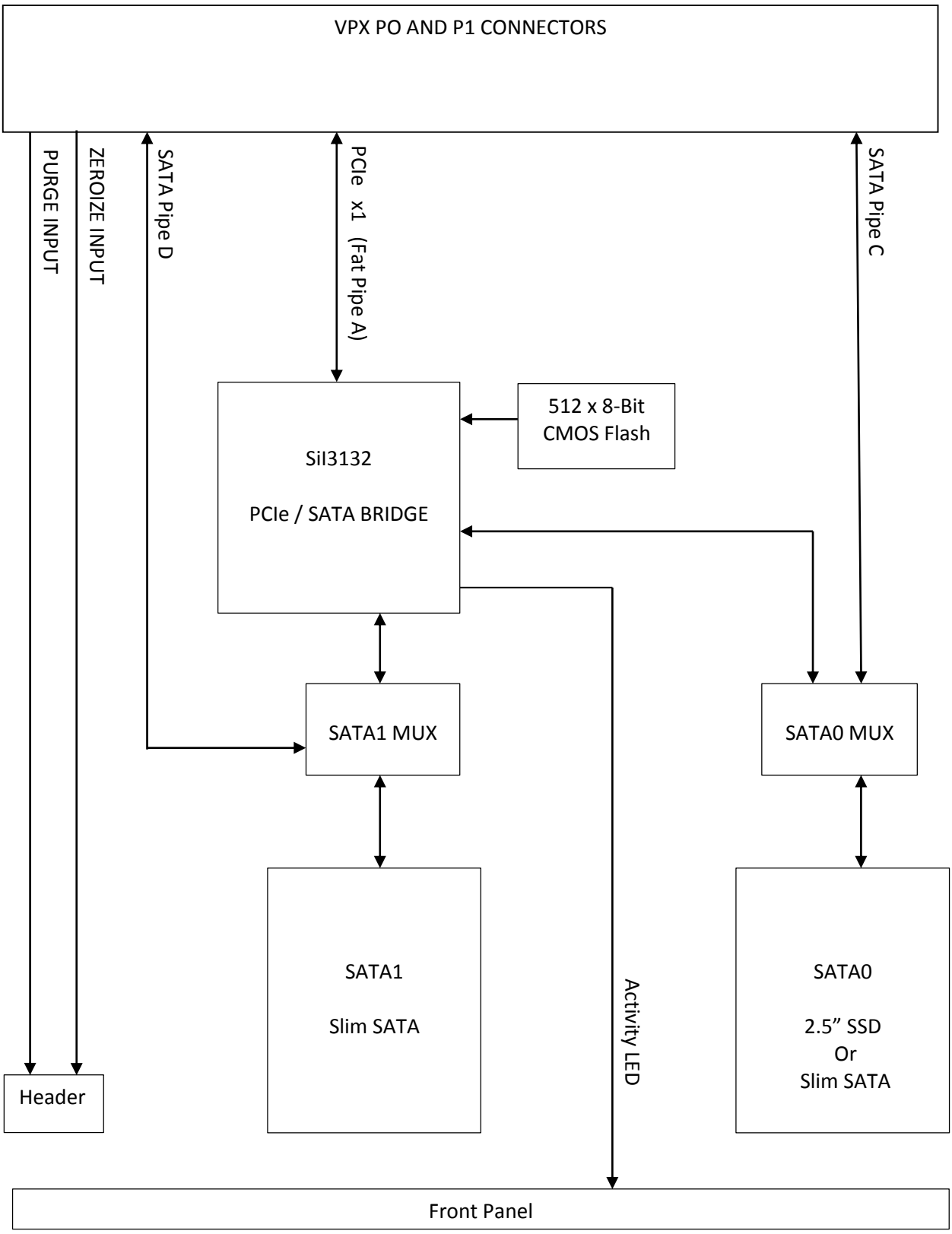
The board utilizes static sensitive components and should only be handled at a static-safe workstation.

IMPORTANT: Adequate air circulation must be provided to prevent a temperature rise above the maximum operating temperature.

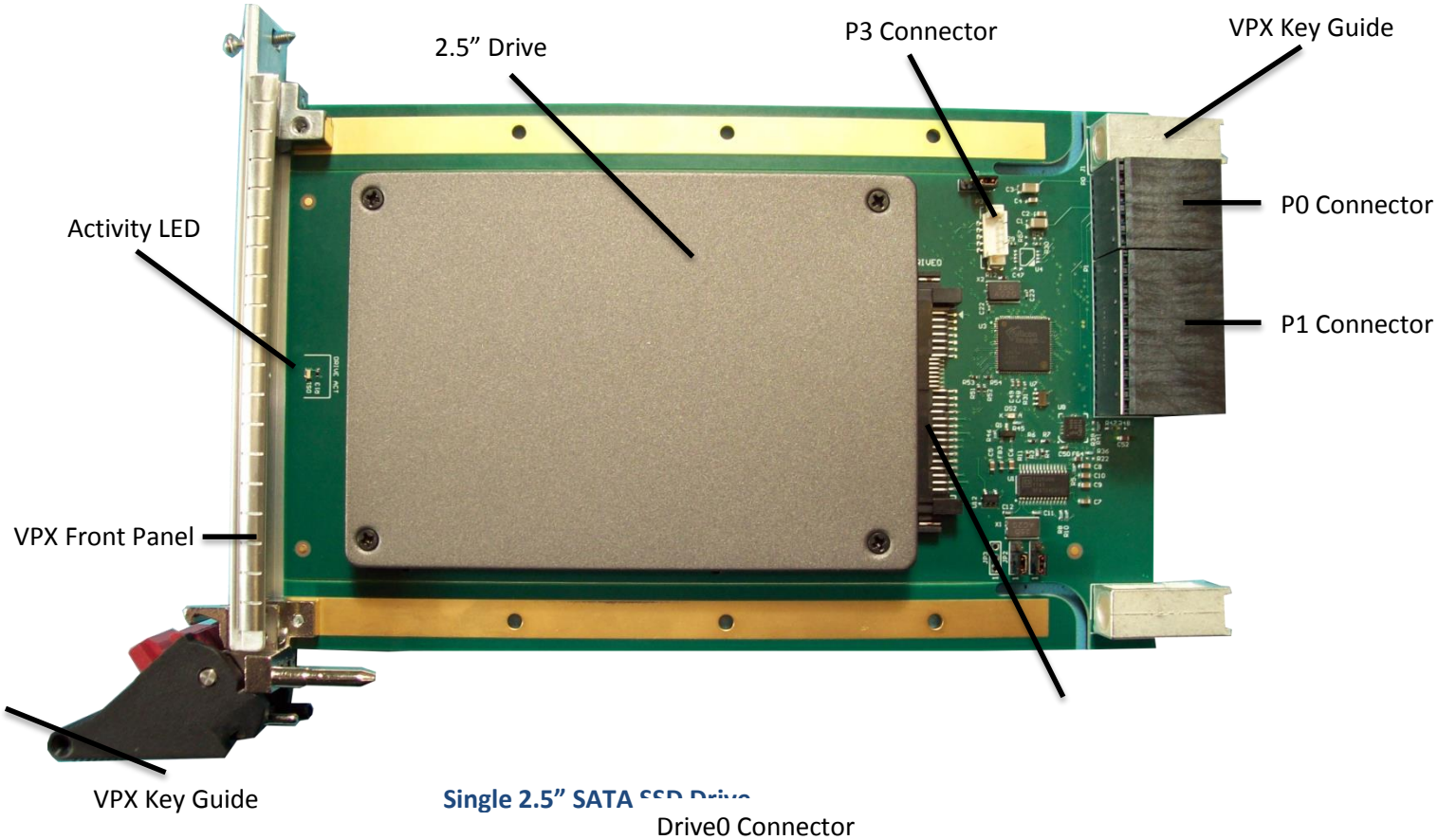
Adequate air circulation must be provided to prevent a temperature rise above the maximum operating temperature and to prolong the life of the electronics.

If the installation is in an industrial environment and the board is exposed to environmental air, careful consideration should be given to air-filtering.

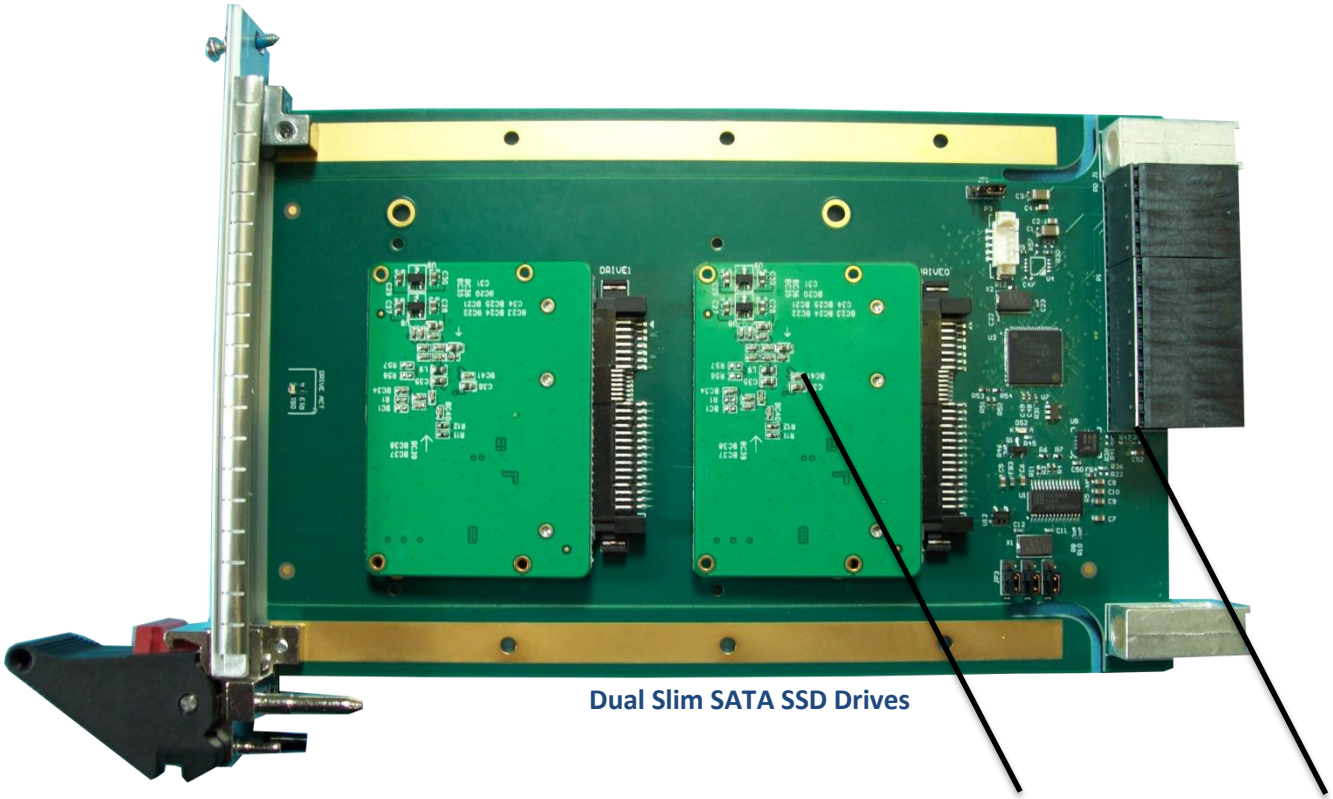
4.0 Operational Block Diagram



5.0 Board Layout



Single 2.5" SATA SSD Drive



Connectors

P0 Connector

P0 Wafer	A	B	C	D	E	F	G
1	+3.3 V	+3.3 V	+3.3 V	Unused	+12 V	+12 V	+12 V
2	+3.3 V	+3.3 V	+3.3 V	Unused	+12 V	+12 V	+12 V
3	+5 V	+5 V	+5 V	Unused	+5 V	+5 V	+5 V
4	NVRMO	SYSRESET#	GND	Unused	GND	Unused	Unused
5	SMB_DATA	SMB_CLK	GND	+3.3V AUX	GND	Unused	Unused
6	GA0#	GA1#	GND	Unused	GND	GA2#	Unused
7	Unused	Unused	GND	Unused	Unused	GND	Unused
8	GND	Unused	Unused	GND	PCIe VPX REF_CLK P	PCIe VPX REF_CLK N	GND

 # = Low true signal

P1 Connector

P1 Wafer	A	B	C	D	E	F	G
1	PCIE_P0_RXP	PCIE_P0_RXN	GND	PCIE_P0_TXP	PCIE_P0_TXN	GND	NC
2	GND	Unused	Unused	GND	Unused	Unused	GND
3	Unused	Unused	GND	Unused	Unused	GND	NC
4	GND	Unused	Unused	GND	Unused	Unused	GND
5	Unused	Unused	GND	Unused	Unused	GND	Unused
6	GND	Unused	Unused	GND	Unused	Unused	GND

7	Unused	Unused	GND	Unused	Unused	GND	Unused
8	GND	Unused	Unused	GND	Unused	Unused	GND
9	SATA_P0_RXP	SATA_P0_RXN	GND	SATA_P0_TXP	SATA_P0_TXN	GND	Activity LED
10	GND	Unused	Unused	GND	Unused	Unused	GND
11	Unused	Unused	GND	Unused	Unused	GND	PURGE#
12	GND	Unused	Unused	GND	Unused	Unused	GND
13	SATA_P1_RXP	SATA_P1_RXN	GND	SATA_P1_TXP	SATA_P1_TXN	GND	ZEROIZE#
14	GND	Unused	Unused	GND	Unused	Unused	GND
15	Unused	Unused	GND	Unused	Unused	GND	Unused
16	GND	Unused	Unused	GND	Unused	Unused	GND

RX is defined as a signal that is an input to the XVPX-9756.
TX is defined as a signal that is an output from the XVPX-9756.
 # = Low true signal

P3 Connector

Pin Number	Description
1	PURGE#
2	ZEROIZE#
3	GND
4	PURGE
5	ZEROIZE

Drive 0 Connector

Signal

Pin Number	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
8	GND
9	Unused
10	Unused
11	GND
12	Unused
13	Unused
14	GND

Power

Pin Number	Description
1	+3.3V
2	+3.3V
3	+3.3V
4	GND
5	GND
6	GND
7	+5V
8	+5V
9	+5V
10	GND
11	Unused
12	GND
13	+12V
14	+12V
15	+12V

Drive 1 Connector

Signal

Pin Number	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
8	GND
9	Unused
10	Unused
11	GND
12	Unused
13	Unused
14	GND

Power

Pin Number	Description
1	+3.3V
2	+3.3V
3	+3.3V
4	GND
5	GND
6	GND
7	+5V
8	+5V
9	+5V
10	GND
11	Unused
12	GND
13	+12V
14	+12V
15	+12V

Jumper Settings

The following describes the XVPX-9756 jumpers with their default positions and functions.

JP1 (Ground Select)	**1-2 (default)**	**(GND)** Digital ground is connected to Orb ground.
	2-3	**(ORBGND)** Digital ground is not connected to Orb ground.

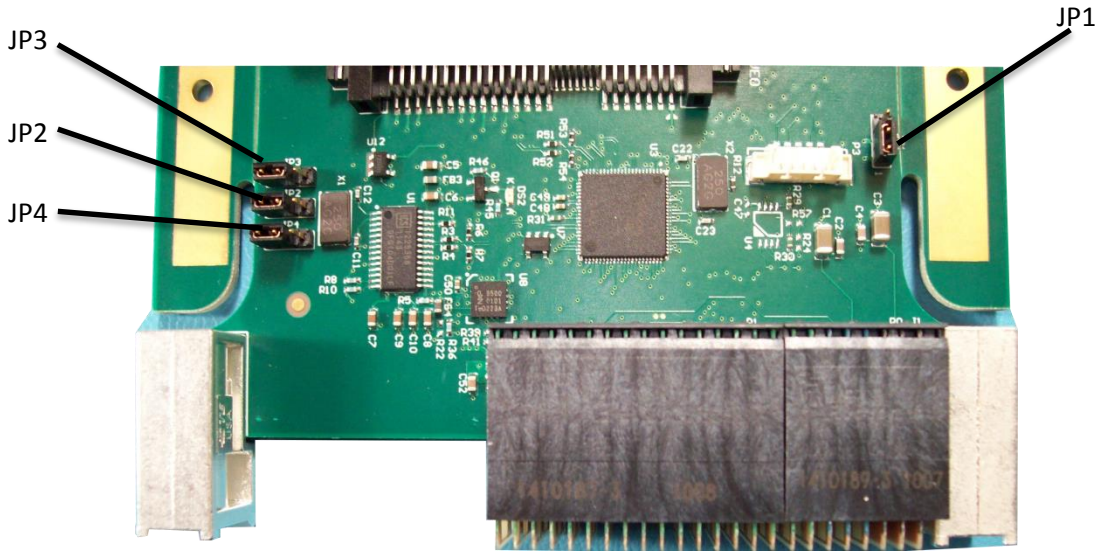
Orb ground is the outer shell of an I/O connector or the VPX key-guide.

JP2 (Controller Select) Drive 0	**1-2 (default)**	**(VPX Controller)** Direct SATA connection across the VPX bus.
	2-3	**(On-board controller)** Uses 1x PCIe lane to interface the onboard PCIe controller to interface the Drive.

JP3 (Controller Select) Drive 1	**1-2 (default)**	**VPX Controller)** Direct SATA connection across the VPX bus.
	2-3	(**On-board controller)** Uses 1x PCIe lane to interface the onboard PCIe controller to interface the Drive.

Not installed or used on single drive configurations.

JP4 (PCIe Clock Select)	**1-2 (default)**	**(Non-Common)** Uses the 100MHz reference clock generated on board for PCIe timing.
	2-3	**(Common)** Uses the 100MHz reference clock pins on the VPX bus generated by the CPU board for PCIe timing.



Jumper Location

Front Panel Layout

XVPX-9756 front panel

The activity LED comes on when the drive is accessed.

Handling

Modules should be handled in ESD-safe work areas in order to prevent damage to sensitive components from electrostatic discharges. These areas must be designed and maintained to prevent ESD damage.

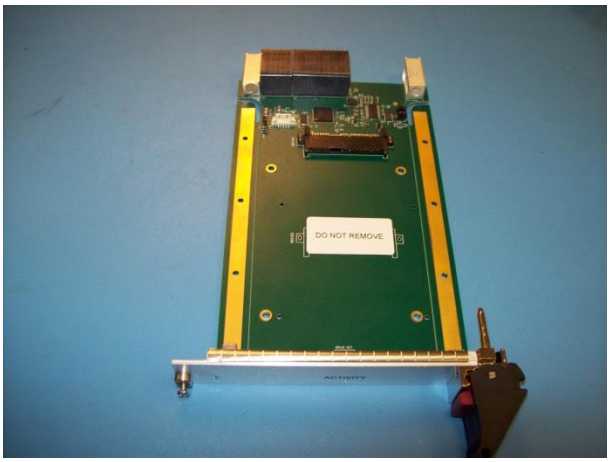
ESD Safe Work Area Guidelines

1. Module should be handled at properly designated work areas only.
2. Designated ESD safe work areas must be checked periodically to ensure their continued safety from ESD. The areas should be monitored for the following:
    a. Proper grounding methods.
    b. Static dissipation of work surfaces.
    c. Static dissipation of floor surfaces.
    d. Operation of ion blowers and ion air guns.
3. Designated work areas must be kept free of static generating materials such as styrofoam, vinyl, plastic, fabrics or any other static generating materials.
4. Work areas must be kept clean and neat in order to prevent contamination of the work area.
5. Modules should be handled by the edges. Avoid touching the component leads.
   NOTE: *When not installed in a system, modules must be enclosed in shielded bags or boxes. There are three types of ESD protective enclosure materials this module was shipped in an approved ESD bag.*
6. Whenever handling the module the operator must be properly grounded by one of the following:
    a. Wearing a wrist strap connected to earth ground.
    b. Wearing heel grounders and have both feet on a static dissipative floor surface.
7. Stacking of modules should be avoided to prevent physical damage.

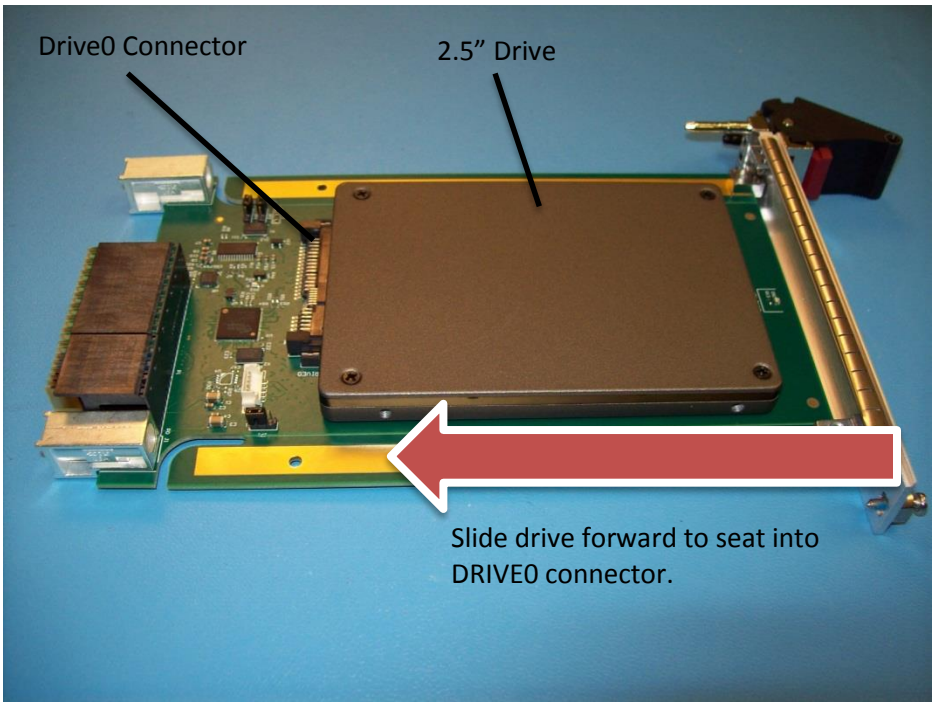
6.0 Drive Installation

2.5" hard disk drive installation

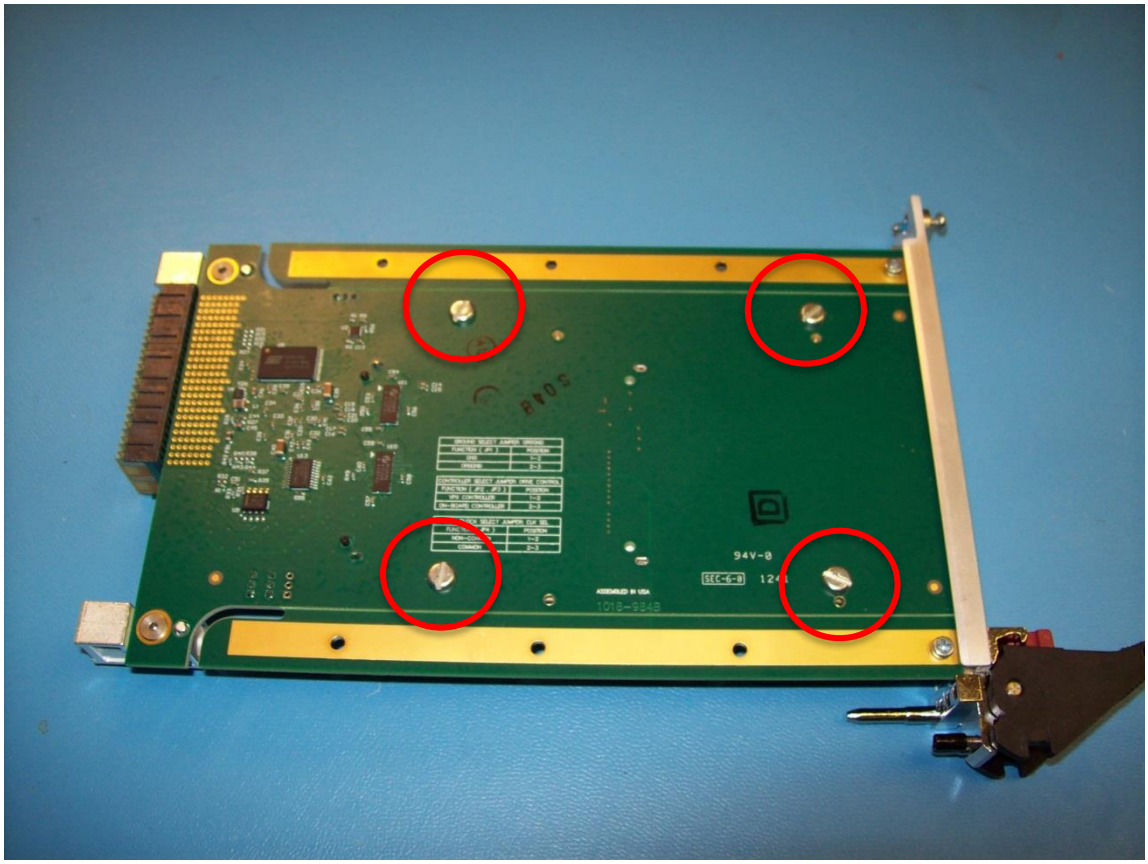
1. Place the XVPX-9756 on your work surface facing up.



2. Place the 2.5" drive onto the XVPX-9756 and slide forward to seat drive into the Drive0 connector.



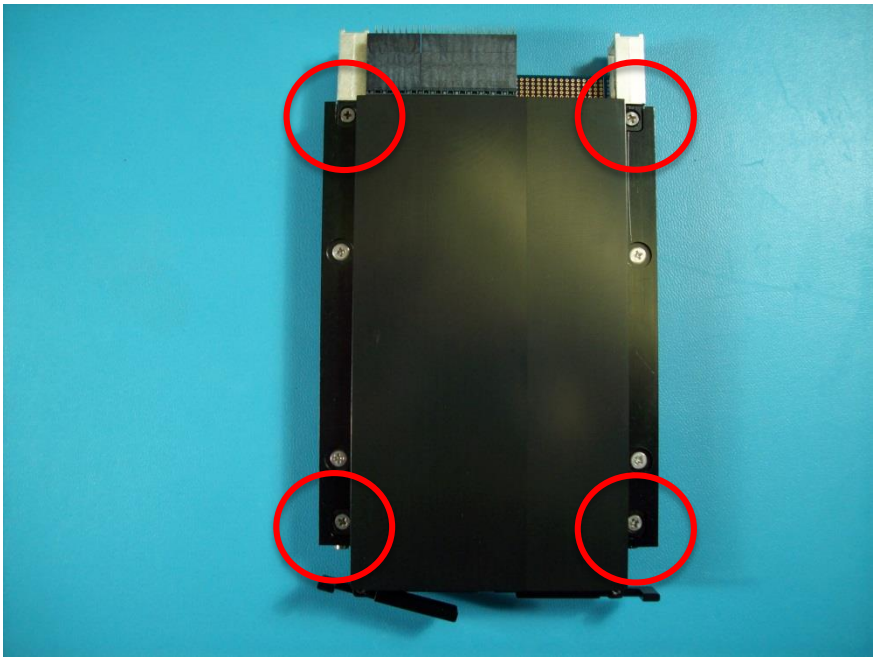
3. Turn the XVPX-9756 over and secure the drive to the XVPX-9756 by installing 4 Drive mounting screws.



2.5" Drive installation is complete.

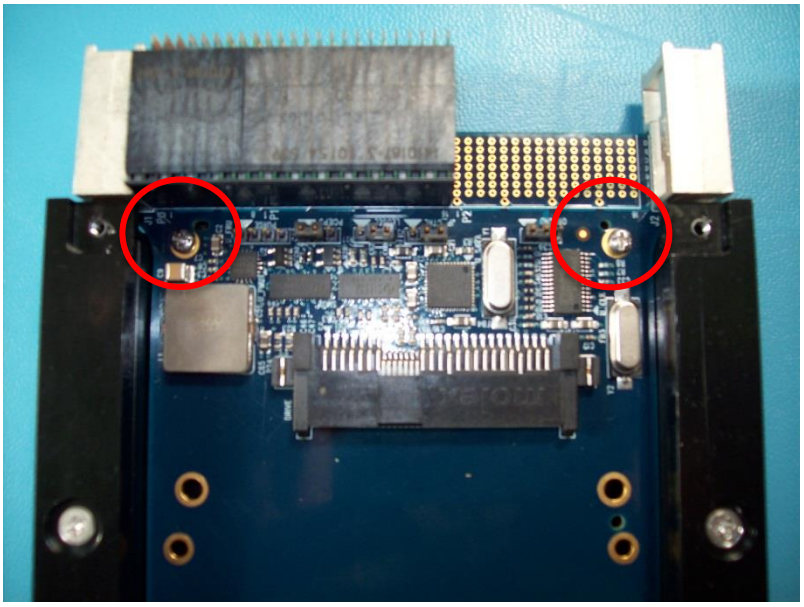
2.5" hard disk drive installation (REDI - Configuration)

1. Place REDI chassis on your work surface facing up (screw's showing) and remove the 4 screws that secure the TOP Cover.

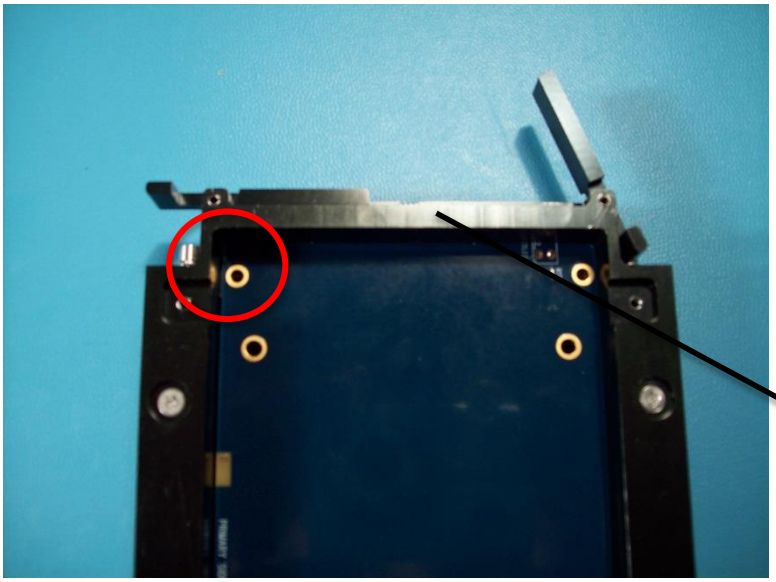


2. Remove the Top Cover exposing the printed circuit board (PCB).

3. Remove the 4 screws that secure the PCB to the REDI Chassi Frame.

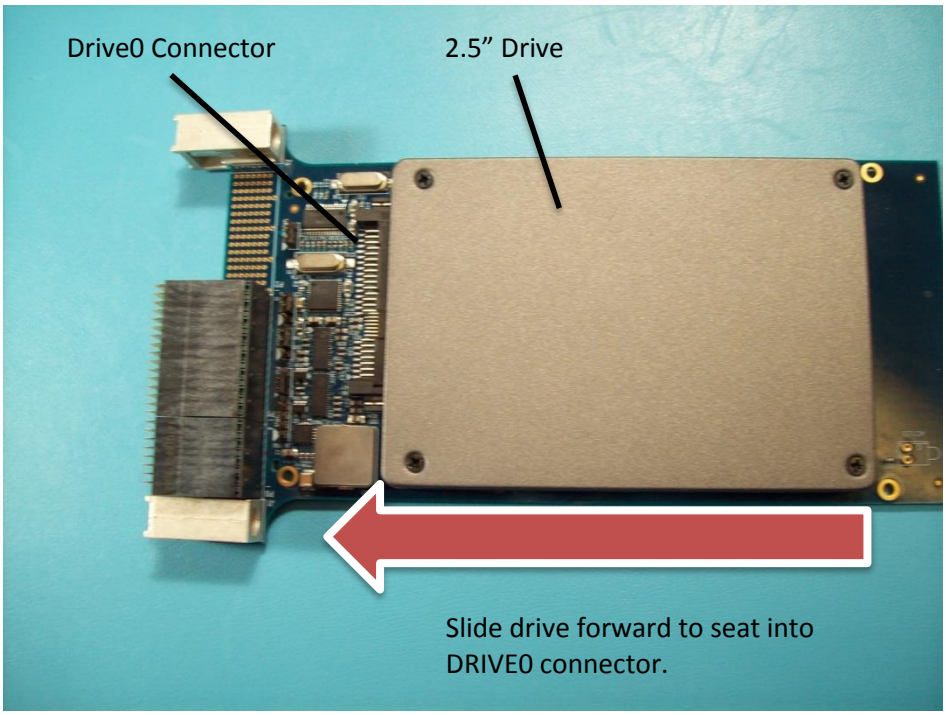


4. Carefully lift the XVPX-9756 as you slide the board out of the Chassis.

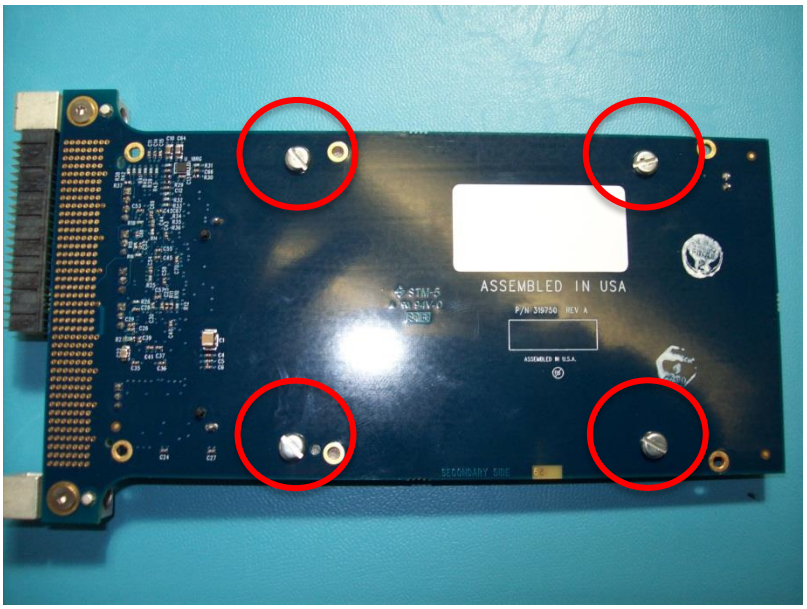


Caution
The board is under this edge of the chassis. Use caution when removing the PCB.

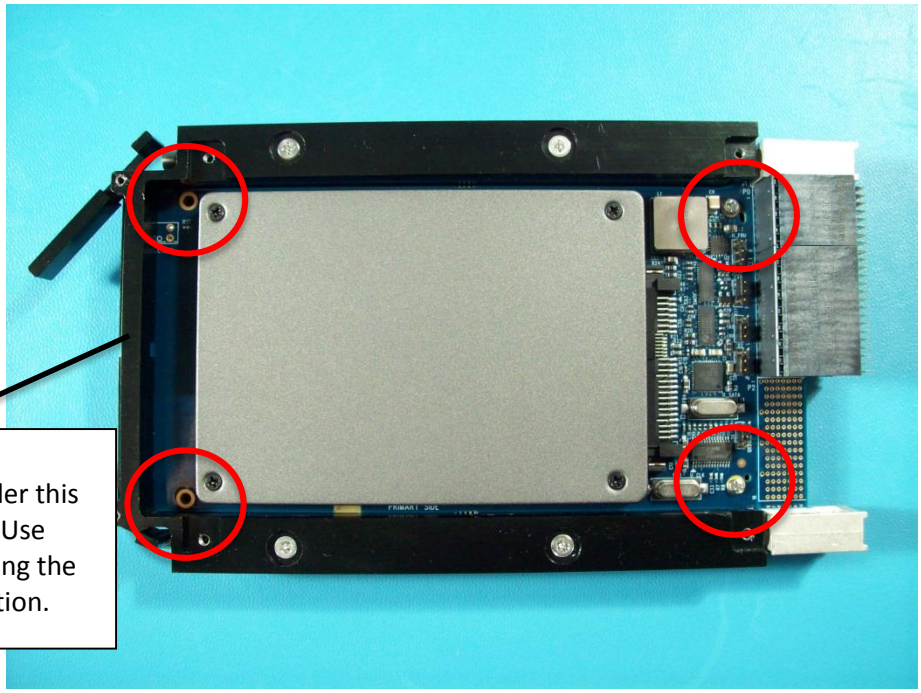
5. Place the 2.5" drive onto the XVPX-9756 and slide forward to seat drive into the Drive0 connector.



6. Turn the XVPX-9756 over and secure the drive to the XVPX-9756 by installing 4 Drive mounting Screws.

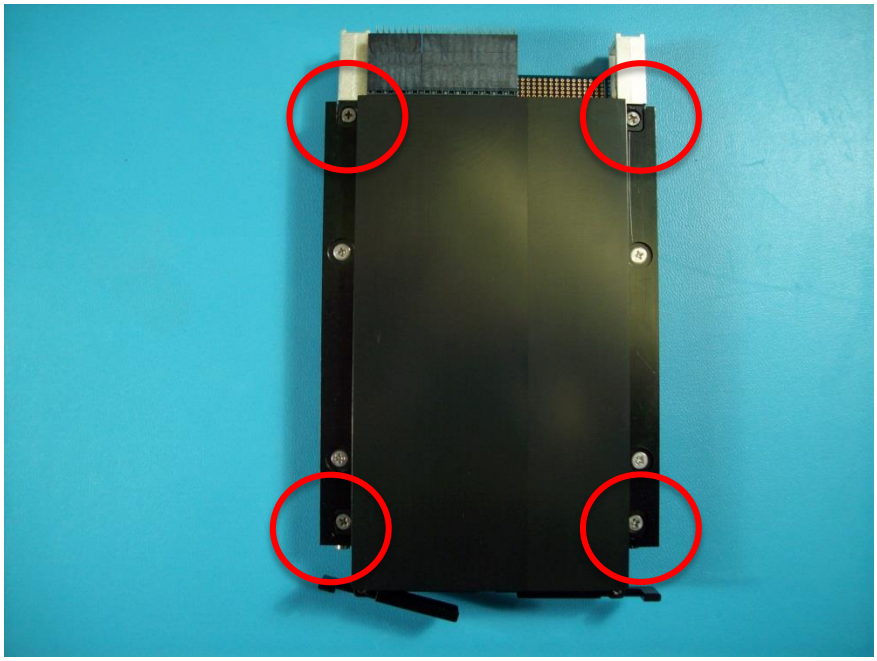


7. Place the XVPX-9756 back into the REDI Chassis and install the 4 screw that secure the PCB to the Chassis.



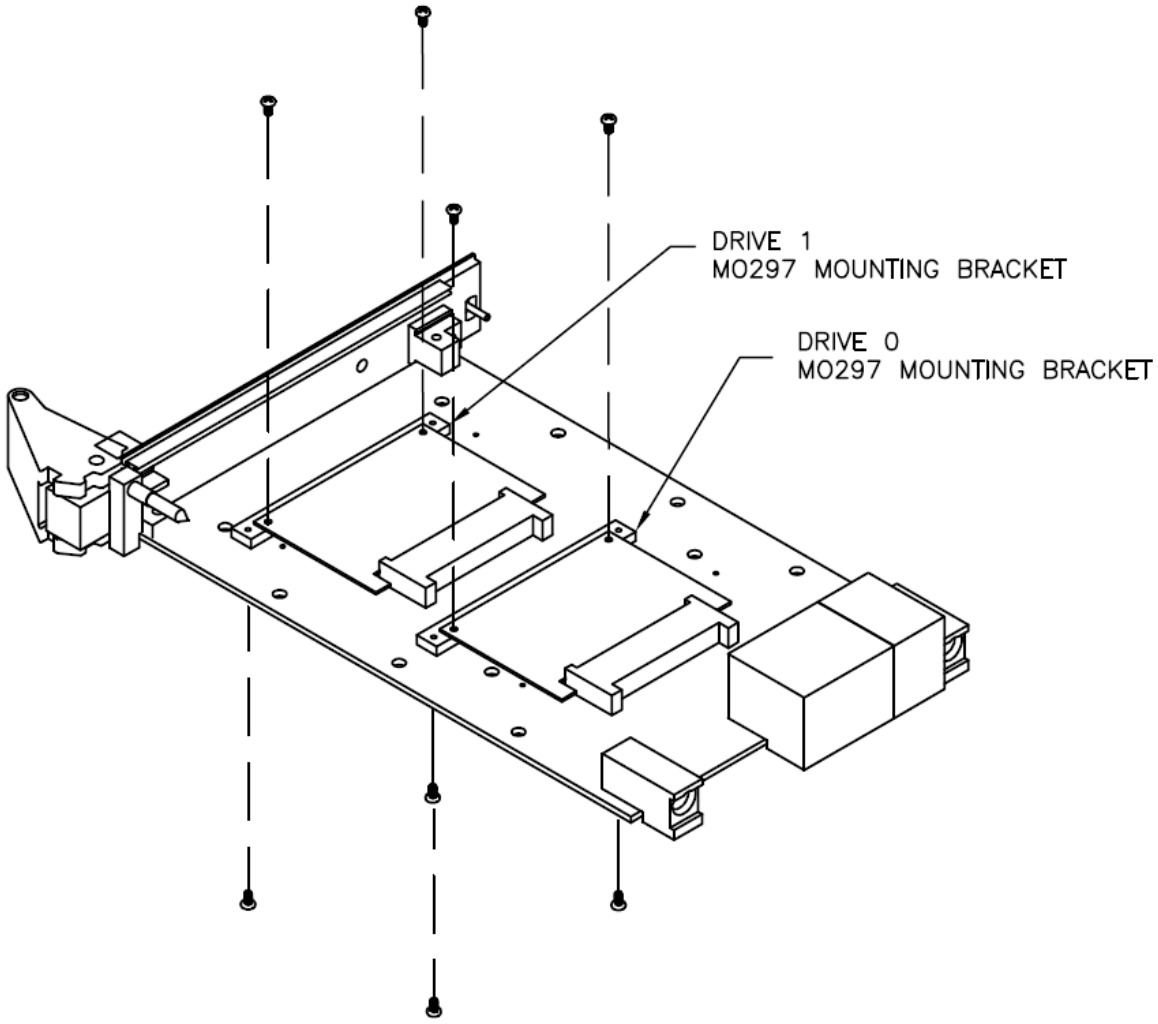
Caution
The board Slides under this edge of the chassis. Use caution when installing the XVPX-9756 into position.

8. Place Top Cover onto the Chassis and secure with 4 screws.



2.5" Drive installation (REDI Configuration) is complete.

1.8" SLIM (Lite) SATA Solid State drive installation



Install the MO297 Mounting Brackets and Drives to the board and secure with 8 screws as shown.

7.0 Installation

IMPORTANT: The XVPX-9756 has been specifically design for use with 3U VPX backplanes and my not be compatible with some 6U backplanes. Plugging the board into an unsupported 6U VPX backplane may cause permanent damage.

Consult the enclosure documentation to ensure that the XVPX-9756's power requirements are compatible with those supplied by the backplane.

Board Keying

The 3U VPX backplane specification requires all backplane slots to have two guide pins: one above the J0 connector and one below the J2 connector. As well as providing correct alignment, these pins are keyed to prevent cards from being inserted into incorrect backplane slot(s) to avoid electrical incompatibility.

The XVPX-9756 has receptacles for these guide pins (see the Connectors section). By default, these are not keyed. Please contact the factory to discuss keying requirements.

Installation Notes

1. Keying may dictate the backplane slot(s) into which the XVPX-9756 can be inserted.
2. Air-cooled versions have an ejector handle to ensure that the backplane connectors mate properly with the backplane. The captive screws at the top and bottom of the front panel allow the XVPX-9756 to be tightly secured in position, which provides continuity with system chassis ground.
3. Conduction-cooled and REDI versions have screw driven wedge locks at the top and bottom of the board to provide the necessary mechanical/thermal interface. Correct adjustment requires a calibrated torque wrench set to between 0.6 and 0.8 Nm.

8.0 Software Installation

To install Windows 7 or 8 on a raid array, please do the following:

1. Power up Computer.

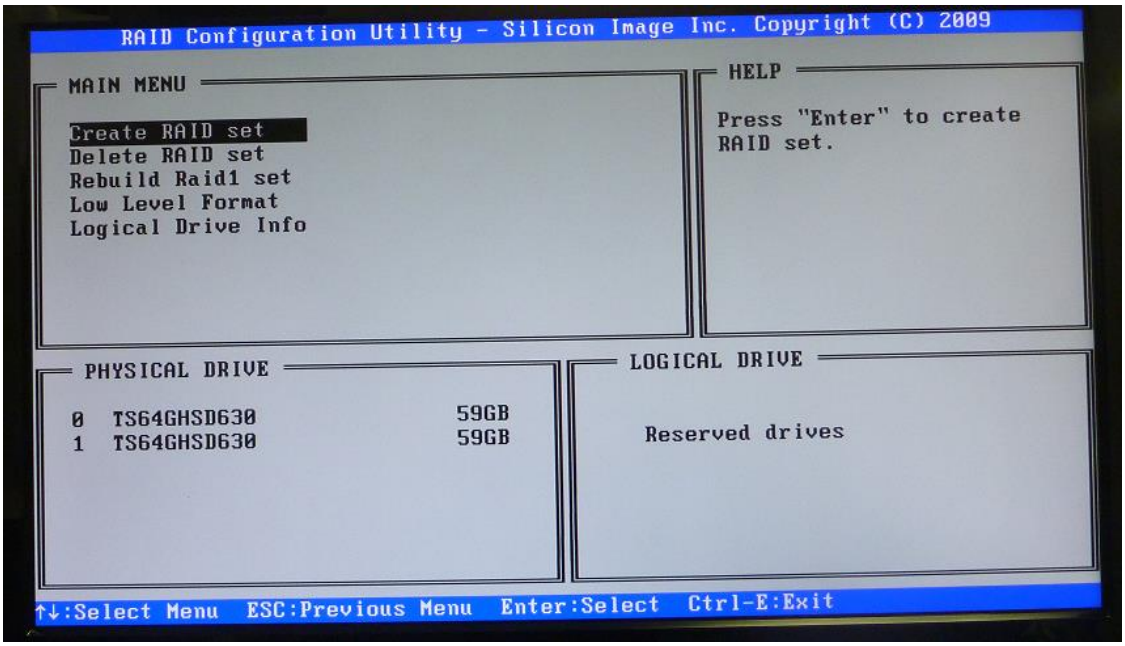
2. During the boot process, you should see a prompt similar to the one below:

   SiI 3132 SATARaid Bios Version 7.7.03
   Copyright © 1997-2009 Silicon Image, Inc.

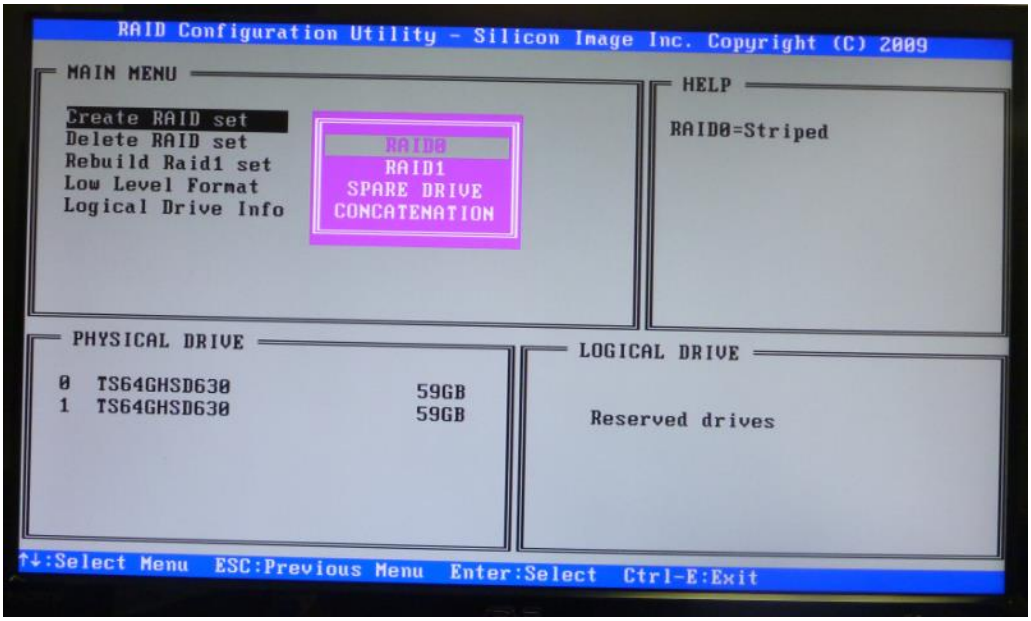
   Press <Ctrl+S> or F4 to enter RAID Utility
   0 TS64GHSD630 59 GB
   1 TS64GHSD630 59 GB

   Press <F4>.

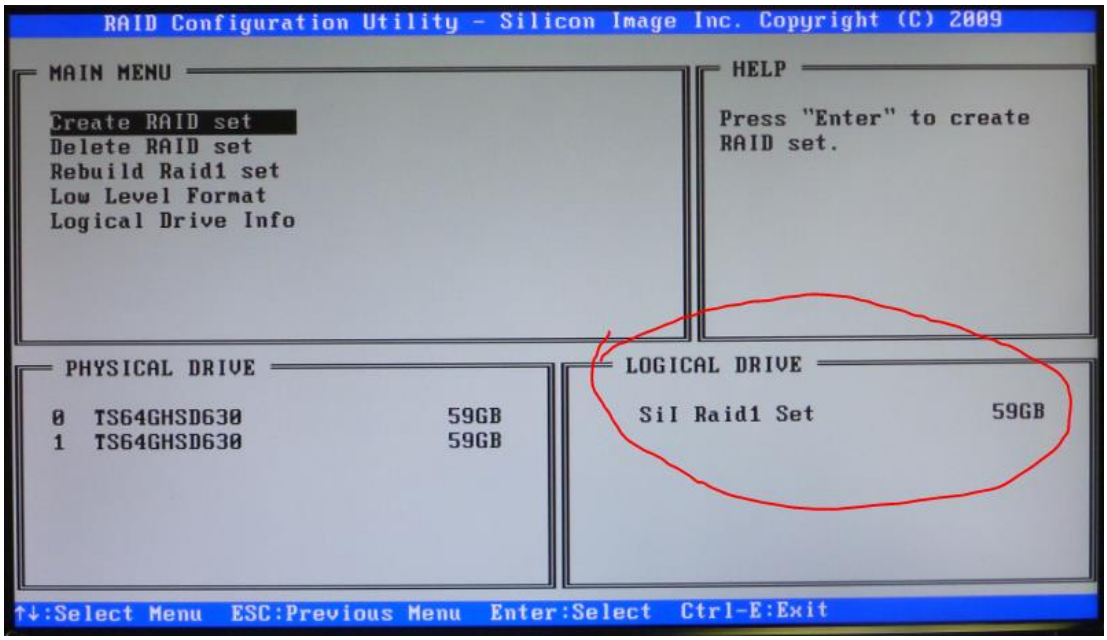
3. You should now get a menu similar to the one below:



4. Select Create RAID set and then select RAID1 for mirror.

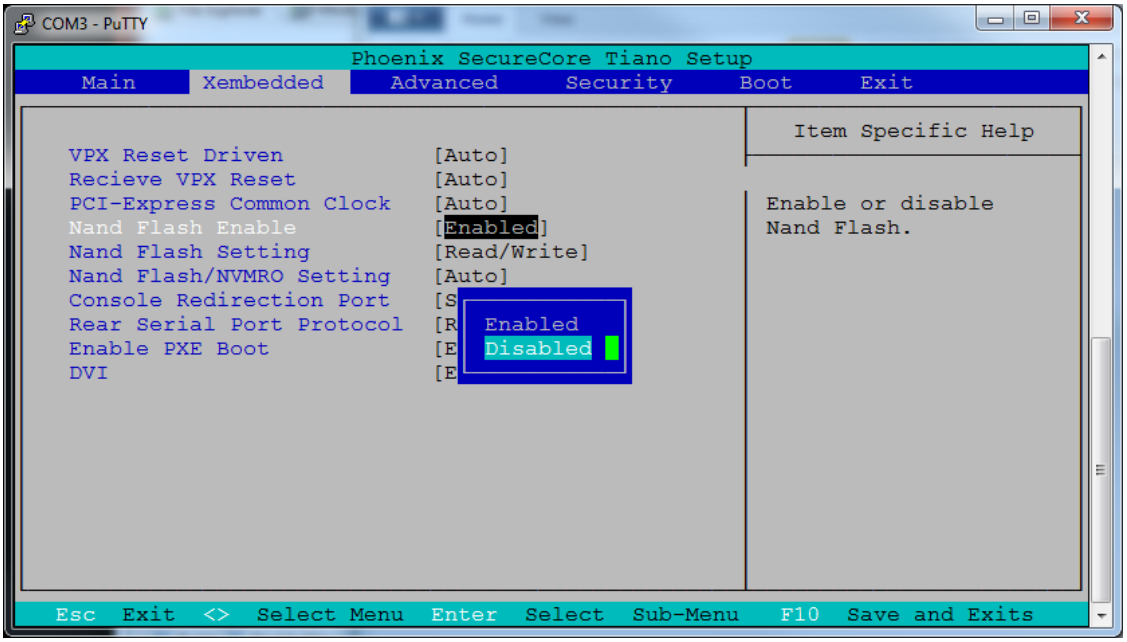


5. Select the physical drives to mirror. When done, you should see the following logical drives on the lower right.

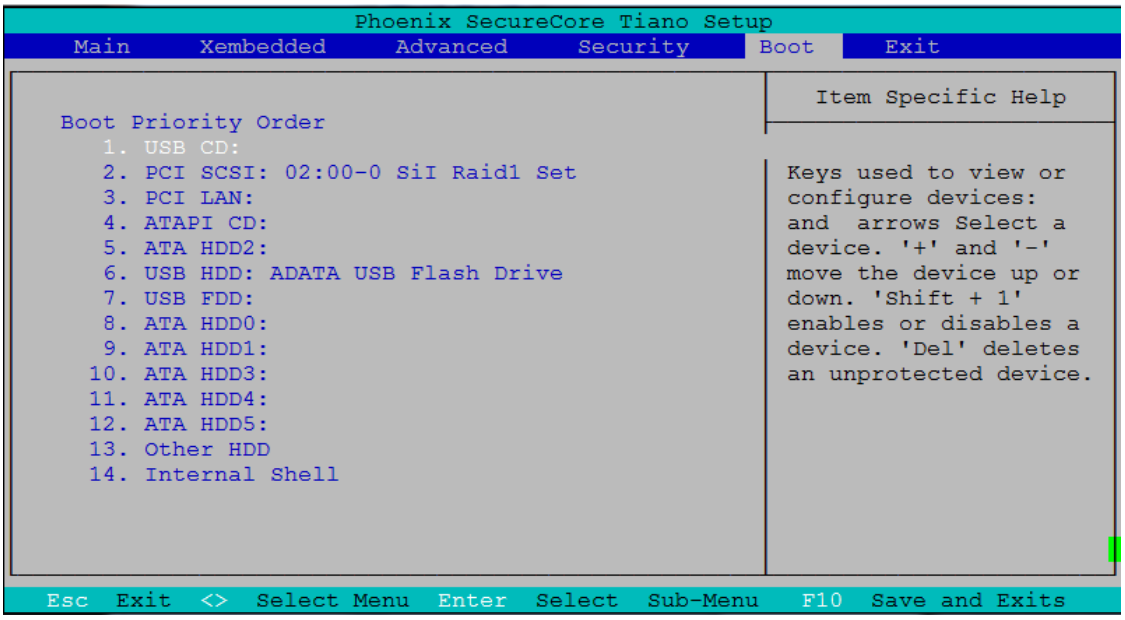


Exit the menu by pressing <Ctrl-E>.

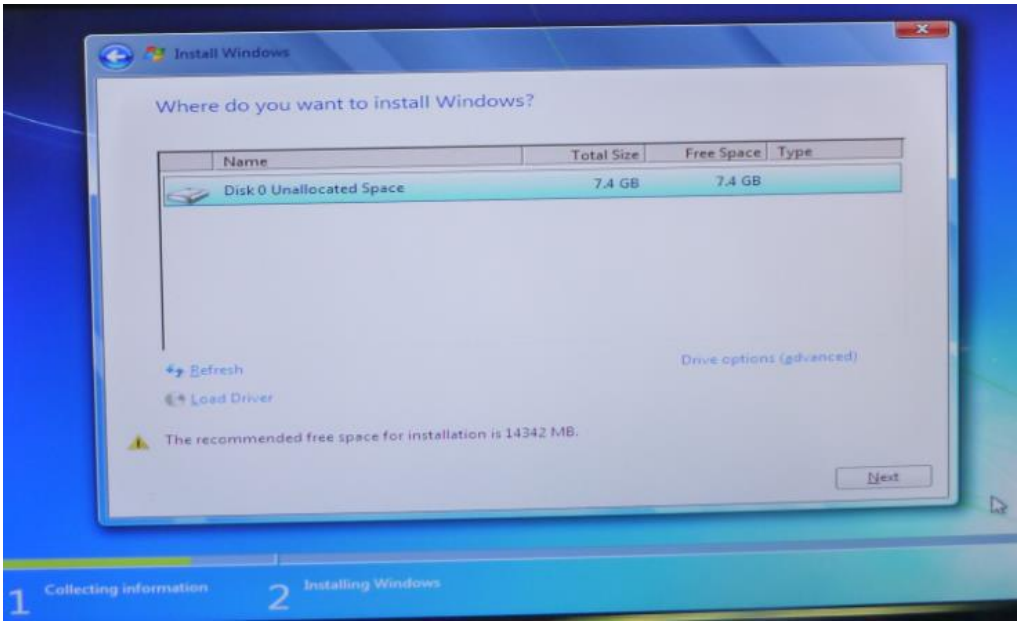
6. If you are using the XVPX-6300, go into the Xembedded tab in BIOS and disable NAND Flash



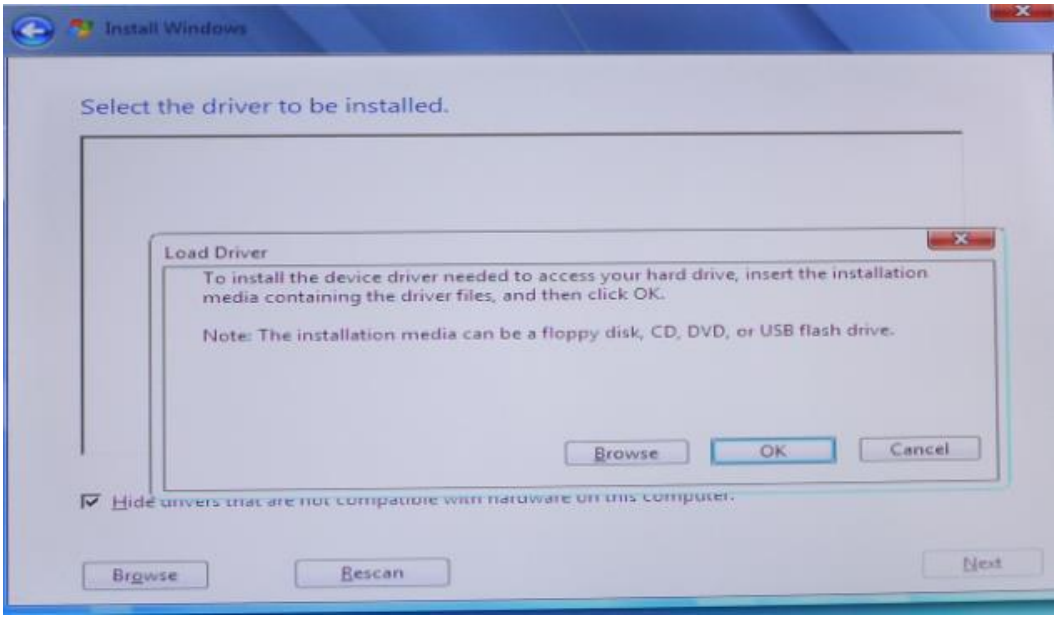
7. With any BIOS, please make sure that the CD/DVD that you are using to install Windows is the only device above the raid drive. Any other device will cause the Windows installation to fail. Save and Exit.



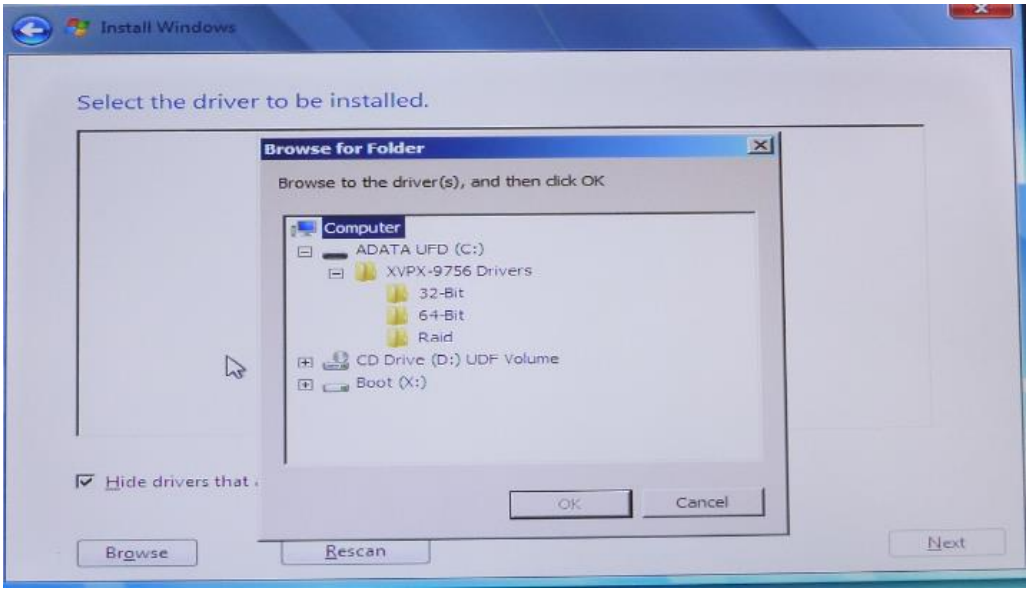
8. During Windows 7 or 8 installations, select <Load Driver>.



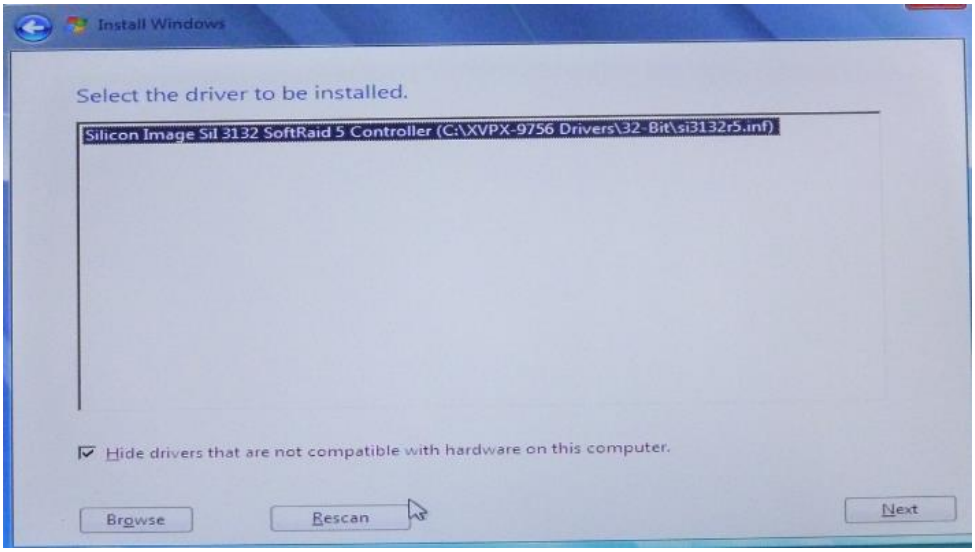
9. You will be then prompted with the following



10. Click <Browse> and select the appropriate <32-bit> or <64-bit> driver and click <OK>.



11. Select the driver to be installed from the list and click <Next>.



12. It should now show your RAID logical drive in the list. Select the drive and continue with Windows installation.

    After the Operating System installation is complete you can install the SATARAID5 Management utility. This can be found at http://www.acromag.com/ or can be downloaded directly from Silicon Image http://www.siliconimage.com/support/ (when downloading from Silicon image, search for keyword "SIL3132")

9.0 Specifications

Power Requirements

The XVPX-9756 requires +3.3V and +5V from the VPX backplane. The -/+12V supply is also required with use of some SAS drive modules.

The XVPX-9756 draws less than 1 Amps from the +3.3 V supply and does not draw any current from the 5V or 12V supplies other than the connected drive.

Power Consumption

The XVPX-9756 module draws very little current without a drive attached. For drive current requirements, consult your drive manufacturer's documentation.

Power-Up/Reset Sequence

From the application of 3.3V and 5V power to all components being out of reset typically takes 250ms.

Since the ramp up times of the 3.3 V and 5 V system power source and the onboard power source will vary with load, the time taken for the XVPX-9756 to come out of reset will vary from system to system. It is the software's responsibility to account for this.

Bus Compliance

Vita 46.0, 46.4, 46.9, 48 and 65
MIL Spec 217-F@ 105,000 Hrs

Form Factor

3U VPXbus 3.94" (100.01mm) x 6.3" (160mm)

Flammability

The circuit board is made by an UL recognized manufacturer and has a flammability rating of UL94V-1.

Weight

XVPX-9756-200-LF Weight = 0.4 Lbs

Environmental

Caution

The XVPX-9756 requires air-flow of at least 100 feet/minute for the **air cooled version**, plus what is required for the drive device installed on this module. If the **conduction cooled** version is operating on an extender card, it requires air-flow of at least 200 feet/minute across it. Versions using the **REDI covers** must not be operated outside of a fully configured and fully installed conduction cooled REDI system.

ENVIRONMENTAL SPECIFICATION	OPERATING	NON-OPERATING
THERMAL *Air-cooled* *Conduction-cooled* *REDI Cover, Conduction-cooled*	 0° to 70°C* -40° to 85°C*[1] -40° to 85°C*[2]	 -40° to 85°C -40° to 105°C -40° to 105°C
HUMIDITY	20% - 80% RH, non-condensing	
SHOCK	30 g peak acceleration, 11msec duration	50 g peak acceleration, 11msec duration
VIBRATION 20 - 2000 Hz	.015" (.38mm) peak-to-peak displacement 2.5 g max acceleration	.030" (.76mm) peak-to-peak displacement 5.0 g max acceleration

* w/ 200lfm airflow

[1] must operate in a fully installed conduction-cooled rack

[2] must operate in a fully installed conduction-cooled REDI rack

EMI/EMC Regulatory Compliance

Caution

This module generates, uses, and can radiate electromagnetic energy. It may cause, or be susceptible to EMI if not installed and used in a cabinet with adequate EMI protection.

The XVPX-9756 is designed using good EMC practices and, when used in a suitably EMC-compliant chassis, should maintain the compliance of the total system.

The XVPX-9756 also complies with EN60950 (product safety), which is essentially the requirement for the Low Voltage Directive (73/23/EEC).

Air-cooled build levels of the XVPX-9756 are designed for use in systems meeting VDE class B, EN and FCC regulations for EMC emissions and susceptibility.

Conduction cooled and REDI build levels of the XVPX-9756 are intended for integration into EMC hardened cabinets/boxes. In most cases I rotating drive will NOT meet the temperature requirements of a conduction cooled system, use a SSD drive for best results.

10.0 SERVICE AND REPAIR

SERVICE AND REPAIR ASSISTANCE

Surface-Mounted Technology (SMT) boards are generally difficult to repair. It is highly recommended that a non-functioning board be returned to Acromag for repair. The board can be damaged unless special SMT repair and service tools are used. Further, Acromag has automated test equipment that thoroughly checks the performance of each board.

Please refer to Acromag's Service Policy Bulletin or contact Acromag for complete details on how to obtain parts and repair.

PRELIMINARY SERVICE PROCEDURE

Before beginning repair, be sure that all of the procedures in section 3.0 PREPARATION FOR USE have been followed. Also, refer to the documentation of your carrier board to verify that it is correctly configured. Verify that there are no blown fuses. Replacement of the carrier and/or IP with one that is known to work correctly is a good technique to isolate a faulty board.

CAUTION: POWER MUST BE TURNED OFF BEFORE REMOVING OR INSERTING BOARDS

WHERE TO GET HELP

If you continue to have problems, your next step should be to visit the Acromag worldwide web site at http://www.acromag.com. Our web site contains the most up-to-date product and software information.

Go to the "Support" tab to access:

- Application Notes
- Frequently Asked Questions (FAQ's)
- Product Knowledge Base
- Tutorials
- Software Updates/Drivers

An email question can also be submitted from within the Knowledge Base or directly from the "Contact Us" tab.

Acromag's application engineers can also be contacted directly for technical assistance via telephone or FAX through the numbers listed below. When needed, complete repair services are also available.

Phone: 248-295-0310
Fax: 248-624-9234
Email: solutions@acromag.com

11.0 Revision History

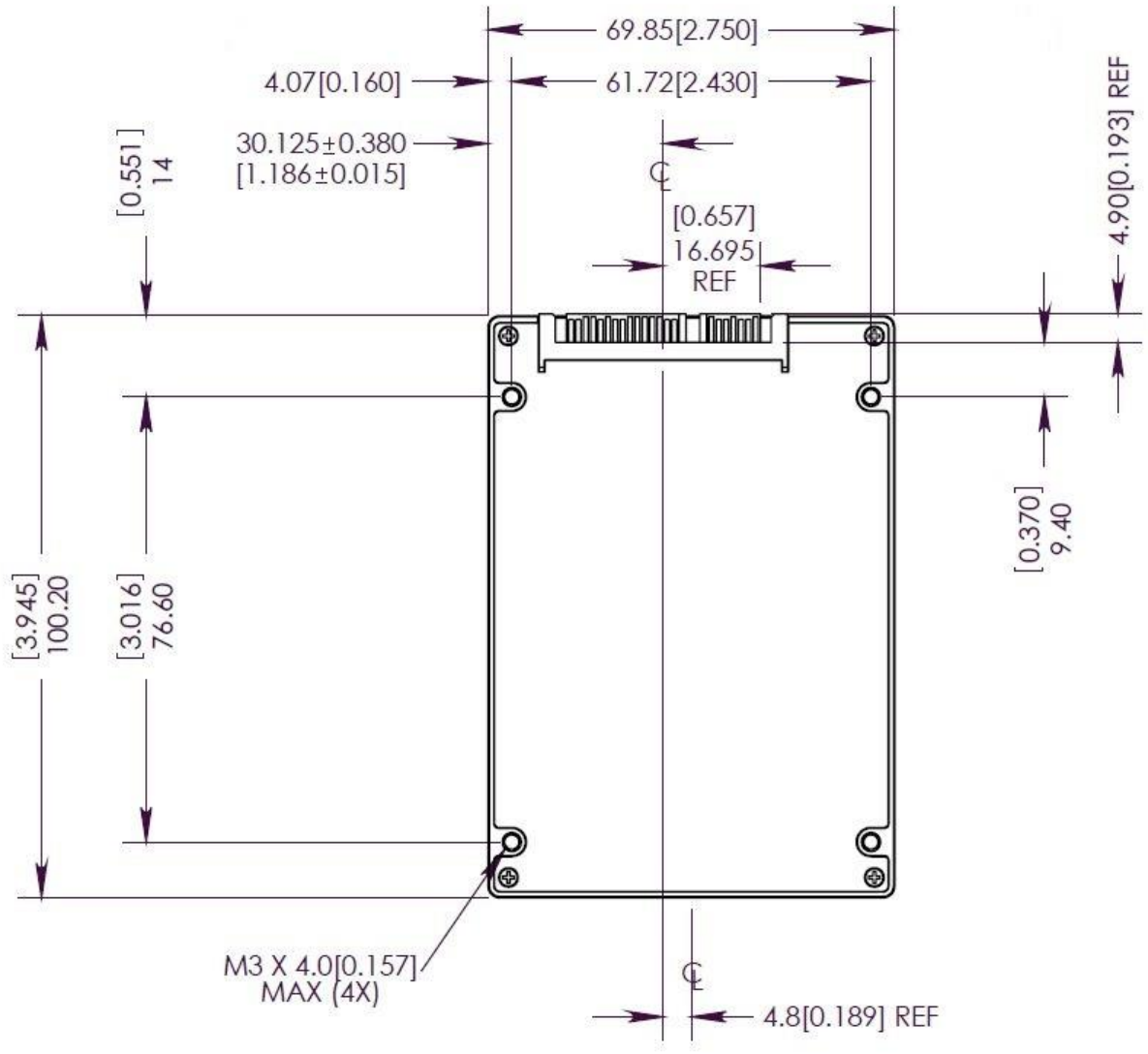
The following table shows the revision history for this document:

Release Date	Version	EGR/DOC	Description of Revision
18-DEC-13	A	PDG	Initial Acromag release.
03-AUG-15	B	ARP/DAG	Added weight for -200.

12.0 APPENDIX

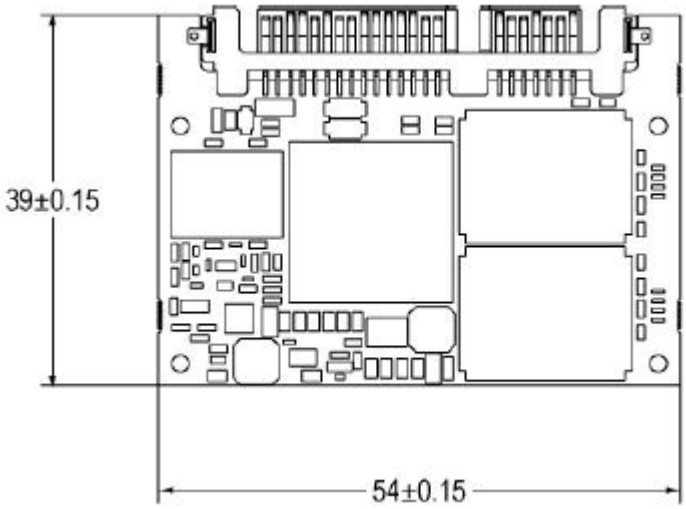
Drive Compatibility

The XVPX-9756 supports all 2.5" SATA Drives which include SAS, Solid state Drive and rotating media type Drives. The XVPX-9756 also supports Serial ATA II features, including 3.0 Gbps SATA II transfer speeds.



2.5" SATA HDD Mechanical

The XVPX-9756 Supports 1.8" SLIM (Lite) SATA Solid State drives, JEDEC -MO-297 industry standard.



1.8" Slim SATA Drive MO-297 Mechanical