VIAVI

mA-3A01

AXIe Mass Storage Module

Operation Guide

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Operation Guide

Rev. B0

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VIAVI recommends keeping a copy of the Declaration of Conformity that shipped with the unit with the device at all times.

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Warranty information for this product is available on the VIAVI website at https://www.viavisolutions.com/en-us/warranty-information.

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Contents

List of Tables

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About this Guide

The section is an introduction to content provided in this guide. This section contains the following information:

Purpose and Scope

This document contains safety information and installation instructions for the mA-3A01 AXIe Mass Storage Module. Refer to the mA-1302/1305 AXIe Chassis Operation Manual for chassis installation and operating instructions.

Intended Audience

This manual is intended for personnel who are familiar with the use of mass storage devices and associated terminology.

Terminology

The terms mA-3A01 and storage module are used to refer to the mA-3A01 AXIe Mass Storage Module.

The term mA-6806 VST is used to refer to the mA-6806 AXIe 6 GHz Vector Signal Transceiver.

The term mA-6A30 Downconverter is used to refer to the mA-6A30 AXIe 6 GHz VST with 30 GHz Downconverter.

Related Information

This document and other Configurable Modular Platform (CMP) publications can be found on the VIAVI website at https://www.viavisolutions.com/en-us/products/modular-axie.

The following publications are referenced in this document:

- mA-1302/mA-1305 AXIe Chassis Operation Manual, #141171
- CMP Memory Clearing and Sanitization, #141614

Contact Information

Contact Customer Service for technical support or with any questions regarding this or any other VIAVI products.

VIAVI Solutions

Customer Service Department

10200 West York Street

Wichita, KS 67215

Telephone: 800-835-2350

Fax: 316-529-5330

email: AvComm.Service@viavisolutions.com

Safety and Compliance Information

Conventions

The following symbols and markings are used throughout documentation and on the Chassis.

Table 1   Safety Conventions

	This symbol indicates a note that includes important supplemental information or tips related to the main text.
	This symbol represents a general hazard. It may be associated with either a DANGER, WARNING, CAUTION or ALERT message. Refer to accompanying information and/or documentation.
	This symbol indicates a toxic hazard. Item should only be handled by Qualified Service Personnel. Dispose of item in accordance with local regulations.
	This symbol indicates an item is sensitive to Electrostatic Discharge (ESD). An item identified as ESD sensitive should only be handled by Qualified Service Personnel.
	This symbol indicates the item meets the requirements of the applicable European Directives.

Table 2   Safety Definitions

Term	Definition
CAUTION	Identifies conditions or activities that, if ignored, can result in equipment or property damage, e.g., Fire.
Mise en Garde	Identifiez les conditions ou les activités qui, si ignorées, peuvent entraîner des dommages à l'équipement ou aux biens, p. ex. un incendie.
WARNING	Identifies conditions or activities that, if ignored, can result in personal injury or death.
Avertissement	Identifiez les conditions ou les activités qui, si ignorées, peuvent entraîner des blessures personnelles voire mortelles.

Safety Hazards

Toxic Hazards

WARNING

Some of the components used in this Device may include resins and other materials which give off toxic fumes if incinerated. Dispose of such items appropriately.

Avertissement

Certains des composants utilisés dans cet appareil peuvent comprendre des résines et d'autres matériaux qui produisent des émanations toxiques lorsqu'ils sont incinérés. Éliminez adéquatement de tels éléments.

Beryllia

Beryllia (beryllium oxide) is used in the construction of some of the components in this equipment.

This material, when in the form of fine dust or vapor and inhaled into the lungs, can cause a respiratory disease. In its solid form, as used here, it can be handled safely, however, avoid handling conditions which promote dust formation by surface abrasion.

Use care when removing and disposing of these components. Do not put them in the general industrial or domestic waste or dispatch them by post. They should be separately and securely packed and clearly identified to show the nature of the hazard and then disposed of in a safe manner by an authorized toxic waste contractor.

Beryllium Copper

> Some mechanical components within this instrument are manufactured from beryllium copper. Beryllium copper represents no risk in normal use. The material should not be machined, welded or subjected to any process where heat is involved.
>
> Beryllium copper must NOT be disposed of by incineration. Beryllium copper must be disposed of as "special waste" per local regulations.

Electrical Hazards

Grounding the Module

The Chassis is provided with a protective grounding lead that conforms with IEC Safety Class I. The supply lead must always be connected to the power supply via a grounded contact in order to maintain the grounding protection. The Chassis must be properly grounded to prevent damage to the device from electrostatic discharge (ESD).

> **CAUTION**
>
> The Chassis must be properly grounded to provide grounding protection to the modules installed in the Chassis. Refer to the Chassis user documentation for Chassis installation and grounding procedures.
>
> Modules are grounded via their connection to the Chassis Backplane Assembly. Modules must be securely seated to the Chassis Backplane Assembly connectors to ensure proper grounding protection.
>
> **Mise en Garde**
>
> Le châssis peut être correctement mis à la terre afin de fournir une protection de mise à la terre pour les modules installés dans le châssis. Consultez la documentation de l'utilisateur du châssis pour les procédures d'installation et de mise à la terre du châssis.
>
> Les modules sont mis à la terre via leur branchement à l'assemblage de la face arrière du châssis. Les modules doivent être placés de manière sécuritaire sur les connecteurs de l'assemblage de la face arrière du châssis pour assurer une protection de mise à la terre adéquate.

Equipment Usage

This Device is designed and tested to comply with the requirements of IEC/EN 61010-1, Safety requirements for electrical equipment for measurement, control and laboratory use' for Class I portable equipment and is for use in a pollution degree 2 environment..

> **WARNING**
>
> Operating this Device in a manner not specified in accompanying documentation may impair the safety protection built into the Device.
>
> **Avertissement**
>
> Utiliser cet appareil de manière non spécifiée dans la documentation d'accompagnement peut nuire au dispositif de protection de sécurité intégré dans l'appareil.

Electrostatic Discharge (ESD)

> **CAUTION**
>
> Modules are ESD sensitive and should only be installed, removed and/or serviced by Qualified Service Personnel.
>
> **Mise en Garde**
>
> Les modules sont sensibles aux DES et ils doivent seulement être installés, enlevés ou entretenus par du personnel de service qualifié.

Ventilation Requirements

Ensure the Chassis is properly ventilated to maintain Module operating temperatures. Refer to the Chassis user documentation for Chassis ventilation requirements.

> **CAUTION**
>
> Failure to provide proper ventilation may result in damage to the Chassis and any modules installed in the Chassis.
>
> **Mise en Garde**
>
> L'absence d'une ventilation adéquate peut endommager le châssis et tout module installé dedans.

Case/Cover Removal

⚠️ **CAUTION**

Do not operate this Device with the case/cover open. Opening the case/cover exposes the operator to electrical hazards which can result in electrical shock or damage to the Device.

Mise en Garde

N'utilisez pas cet appareil avec le boîtier/couvercle ouvert. L'ouverture du boîtier/couvercle expose l'utilisateur à des risques électriques qui peuvent entraîner un choc électrique ou des dommages à l'appareil.

⚠️ **CAUTION**

This Device does not contain user serviceable parts. Servicing should only be performed by Qualified Service Personnel.

Mise en Garde

Cet appareil ne contient pas de pièces pouvant être entretenues par l'utilisateur. L'entretien doit seulement être effectué par du personnel de service qualifié.

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1

Product Overview

This chapter provides a general description of the mA-3A01. The following information is included in this chapter:

About the mA-3A01

The mA-3A01 is an AXIe-based mass storage module that supports up to four NVMe (Non-Volatile Memory Express) Solid State Drives (SSDs). The mA-3A01 supports both large file streaming data and mass storage on the same solid state drives.

The mA-3A01 is designed to provide storage capability to an AXIe chassis (mA-1302 or mA-1305). mA-3A01 hardware configuration options allow for up to four 3.2 TB enterprise grade Micron U.2 2.5" form factor SSDs (12.8 TB).

The high write durability of the SSDs make them ideal for streaming data, while the large storage capacity also makes them useful for mass data storage. When used in combination with the mA-6806 VST or mA-6A30 Downconverter, and the mA-3011 Embedded Host Controller, the mA-3A01 supports streaming large file storage for RF signal captures, as well as extended playback via the mA-6806's arbitrary waveform generation.

Principles of Operation

The mA-3A01 interfaces to the AXIe PCIe fabric channel and is compliant to the AXIe-1 specification. The mA-3A01 connects to the AXIe backplane with port interface from a PEX8734 PCIe switch. The PEX8734 PCIe switch contains four downstream x4 wide ports. Each port is routed to a U.2 connector, giving each SSD a dedicated x4 wide port interface.

Each SSD presents to the host controller operating system as an independent storage device. The host controller operating system software may be configured to combine each SSD into single striped volume for increased read/write bandwidth

Figure 1-1   mA-3A01 AXIe Mass Storage Module
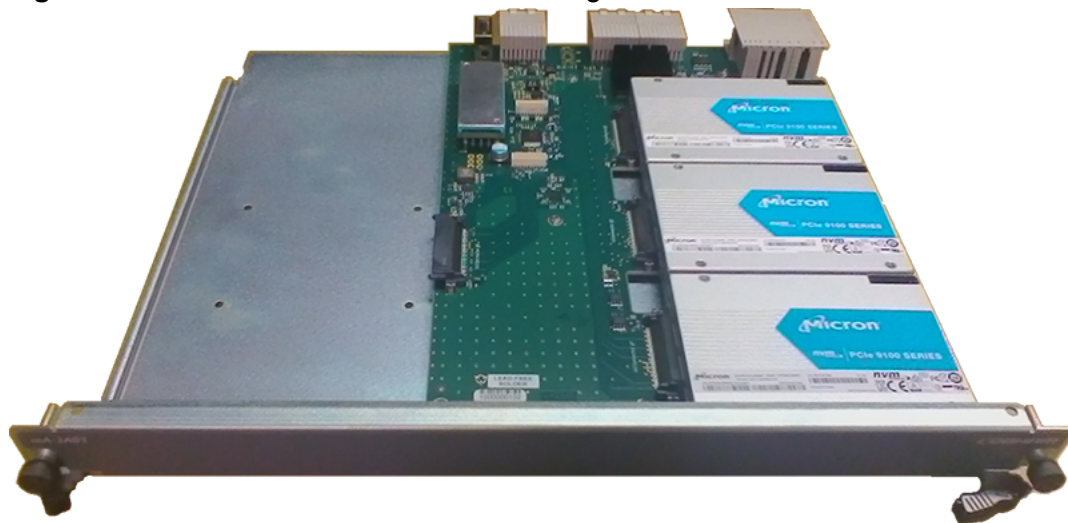
mA-3A01 Installation

This chapter describes how to install the mA-3A01. The topics discussed in this chapter are as follows:

> **NOTE**
>
> Refer to mA-1302/1305 AXIe Chassis user documentation for Chassis setup and operating instructions.

Upon Receipt

The mA-3A01 AXIe Mass Storage Module is typically received from the factory as part of a CMP system. Information in this section applies to instances in which the mA-3A01 is purchased as a standalone module (e.g. replacement module). Perform the following when the mA-3A01 is received from the factory:

Unpack the Module

Specially designed packing material protects the module during shipping. Avoid damaging the shipping container and packing material when unpacking the module; if necessary the shipping container and packing material can be reused to ship the module.

> **CAUTION**
>
> This Device is ESD sensitive and should only be unpacked by qualified personnel.
>
> **Mise en Garde**
>
> Cet appareil est sensible aux DES et il doit seulement être déballé par un personnel qualifié.

How to Unpack the Module

1   Cut and remove sealing tape on top of shipping container.

2   Open shipping container. Remove foam insert and module from shipping container.

3   Remove the module from between foam inserts.

4   Remove the module from ESD protective packaging.

5   Store packing material and shipping container for possible future use.

> **NOTE**
>
> Refer to for information and instructions for shipping the module.

Verify Contents

Refer to packing list to verify shipment is complete. Report any discrepancies to VIAVI Customer Service.

Inspect the Device

Inspect the module for possible damage incurred during shipment. Report any damage to VIAVI Customer Service.

Module Installation

Refer to the "Module Installation Procedure" on page 4-5 for instructions for installing the module.

Drivers, Firmware and Software Installation

The drivers and software required to support streaming from the mA-3A01 Storage Module to other Chassis modules depends on the type of Host Controller used in the system, the software applications installed in the host controller and the other modules installed in the Chassis.

If the mA-3A01 Storage Module is shipped from the factory as part of a CMP System that included an Embedded Host Module, the required drivers and software were installed in the Embedded Host Module prior to shipment.

If the mA-3A01 Storage Module was purchased separately from a CMP System, drivers and software applications (when applicable) need to be downloaded and installed in the host controller per system configuration requirements. Contact Customer Service for technical support to determine system driver and software requirements.

> **NOTE**
>
> The Linux driver developed for the mA-3A01 Module was developed for use with CMP AXIe products (i.e., mA-6806 AXIe Transceiver Module and mA-3011 AXIe Embedded Host Module); end users will need to develop a driver to support other manufacturer's operating system(s).

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3

Operation and Configuration

This chapter describes how to use the mA-3A01. This chapter contains the following information:

Powering the Module

Power On Procedure

The Module is powered on during the Chassis power up process. When the Chassis is powered on, power is routed from the AC power supply to the Module via the module's connection to the Chassis Backplane. To ensure proper module identification and enumeration, do not change external connections or interrupt the Chassis power up process. Refer to Chassis user documentation for the Chassis power up procedure.

Power Off Procedure

The Module is powered down during the Chassis power down procedure. Refer to Chassis user documentation for proper power down procedure.

CAUTION

Do not power down the Module by disconnecting the Chassis from the AC Power Supply. Failure to properly power down the Module may result in lost data and/or damage to the Module's operating system.

Mise en Garde

Ne mettez pas le module hors tension en débranchant le châssis de l'alimentation électrique CA. Une mise hors tension inadéquate du module peut entraîner des pertes de données ou endommager le système d'exploitation du module.

Accessing Module Content

The mA-3A01 appears to the Host Controller's operating systems as a large external storage device (Figure 3-2). The mA-3A01 directory is identified as /mnt/md0p1. The method used to access and configure the Module depends on the System configuration and the software application(s) installed on the host controller.

Figure 3-2   mA-3A01 Network Directory Identification: mnt/md0p1
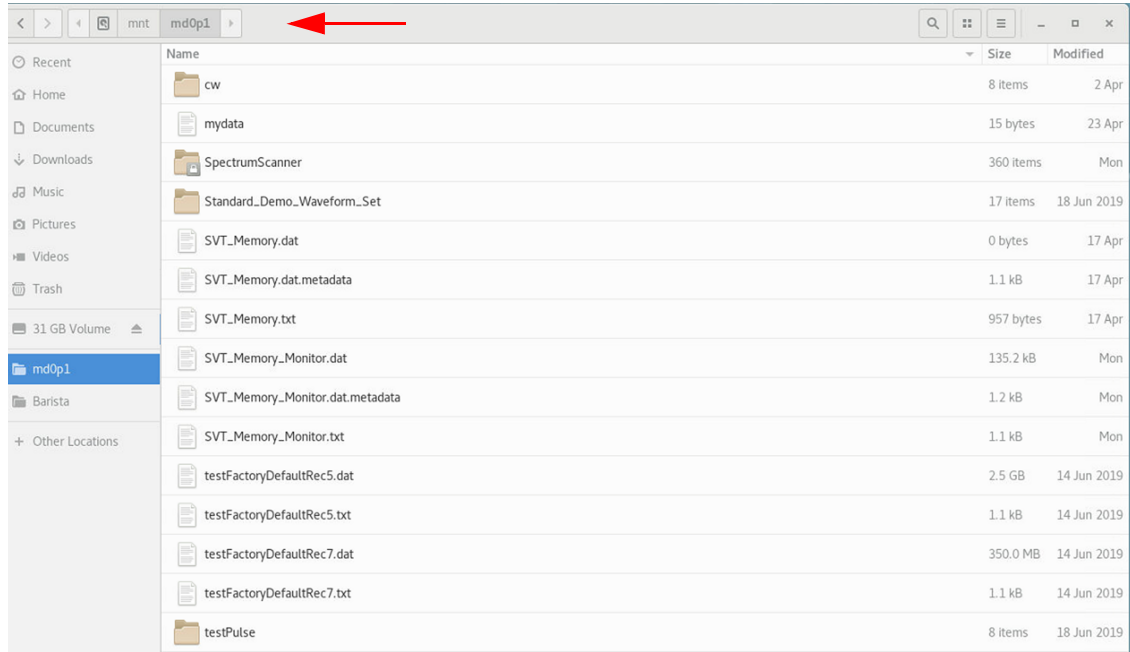
Module Configuration Application

The mA-3A01's configuration can be viewed and managed using the Storage Module Configuration application which is installed in the CMP system. The Module Configuration Application is also used to reconfigure and sanitize mA-3A01. See "Reconfiguring or Sanitizing the Module" on page 3-7 for information.

The Storage Module Configuration icon is used to open the application.

> **NOTE - System Sanitization**
>
> If there is a need to clear data from the CMP System, refer to the CMP Memory Clearing and Sanitization Procedure (see "Related Information" on page ii of the Preface).

Procedure Password

The procedures in this section require a password.

– password (lowercase, case sensitive): cpuc

Configuring the Module

When the mA-3A01 is shipped as part of a CMP system the module is configured for use prior to shipping from the factory. When the mA-3A01 is shipped separately from a CMP system (e.g. replacement module), the module must be configured after installation before it can be used.
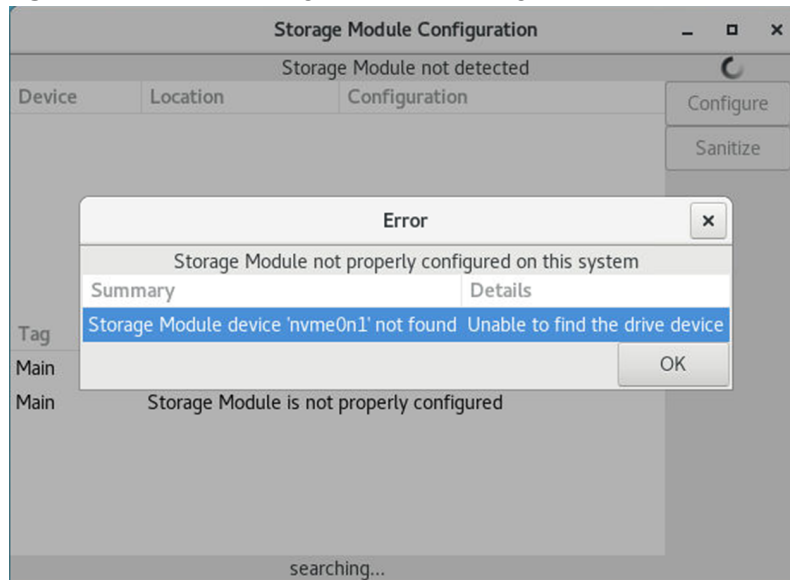
Configuration Procedure

The procedure configures the module for use by creating the file structure necessary to support CMP system operation.

To Configure the mA-3A01 Module

1   Power on the CMP System.

2   Open the Storage Module Configuration application.

3 A window will be displayed that resembles Figure 3-5.

Figure 3-3 Storage Module Configuration Application Window

4 Press the OK or "X" Button to close the dialog window.

5 Select the Configure button (located on the right side of the window).

6 An Authentication Required dialog window will appear. At prompt, enter the password in the field (see "Procedure Password" on page 3-4).

7 Press OK to continue.

8 Wait while the module is configured. When the process is finished, a message will be displayed indicating the process is complete.

9 Select OK. The window should resemble the example in Figure 3-4.

10 Verify the RAID 0 Volume directory has been created.

11 Verify the Tag / Details show the following status:

   –   Main: Ready

   –   Main: Found Storage Module

Figure 3-4   Storage Module Configuration Window - Configured
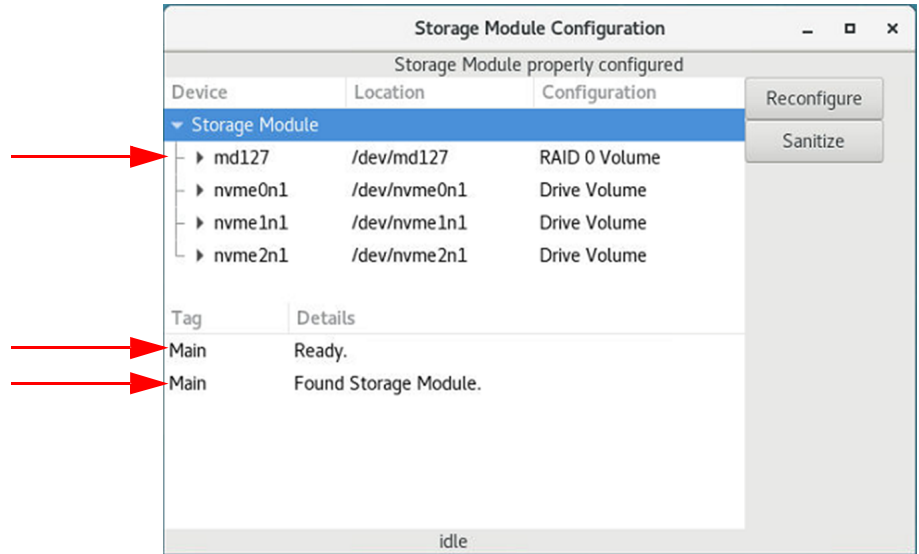
12 Open a File Manager.

13 Verify that the following directory exists and is empty: /mnt/md0p1.

14 The module is now ready for use. Files and folders can be added to /mnt/md0p1 directory.

Reconfiguring or Sanitizing the Module

> **NOTE - System Sanitization**
>
> If there is a need to clear data from the CMP System, refer to the CMP Memory Clearing and Sanitization Procedure (see "Related Information" on page ii of the Preface).

Reconfiguration Process

The reconfiguration process partitions the module's drives for the RAID configuration needed to use some of the software applications that have been developed for the SMP System.

Sanitization Process

Running the sanitization procedure securely erases the module's drives to where data cannot be recovered. When an mA-3A01 module has been sanitized, the module must be reconfigured before it can be used.

Reconfiguration and Sanitization Procedure

> **NOTE**
>
> Read this procedure in it's entirety before proceeding. If you have any questions regarding this procedure, contact VIAVI Customer Service with any questions **BEFORE** proceeding.

Preliminary Procedure

Back up all user files that are located on the mA-3A01 AXIe Mass Storage Module to a local storage device or network location.

> **CAUTION**
>
> This process erases all existing files and folders from the mA-3A01 AXIe Mass Storage Module. Any files that are not backed up will be deleted and non-recoverable upon completion of this procedure.

Procedure Steps

1   Power on the CMP System.

2   Open the Storage Module Configuration application.

3   A window will be displayed that resembles Figure 3-5.

Figure 3-5   Storage Module Configuration Application Window
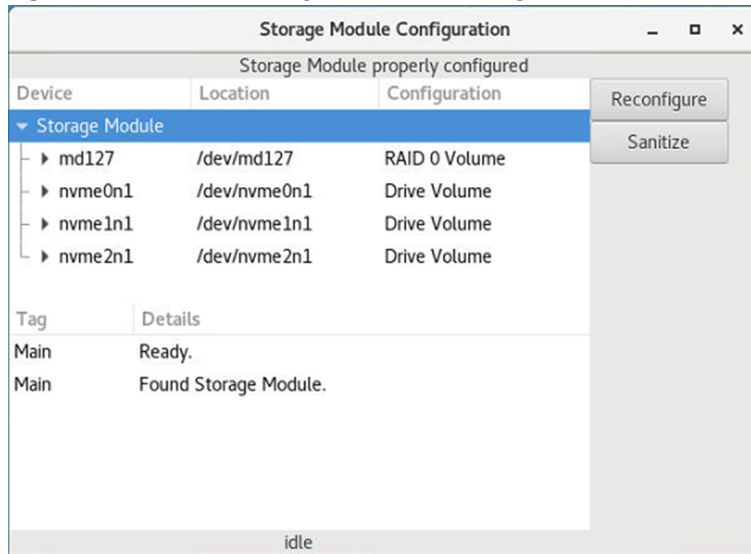
4   Verify the Tag / Details show the following status:
– Main: Ready
– Main: Found Storage Module

Figure 3-6   Storage Module Configuration Application Window
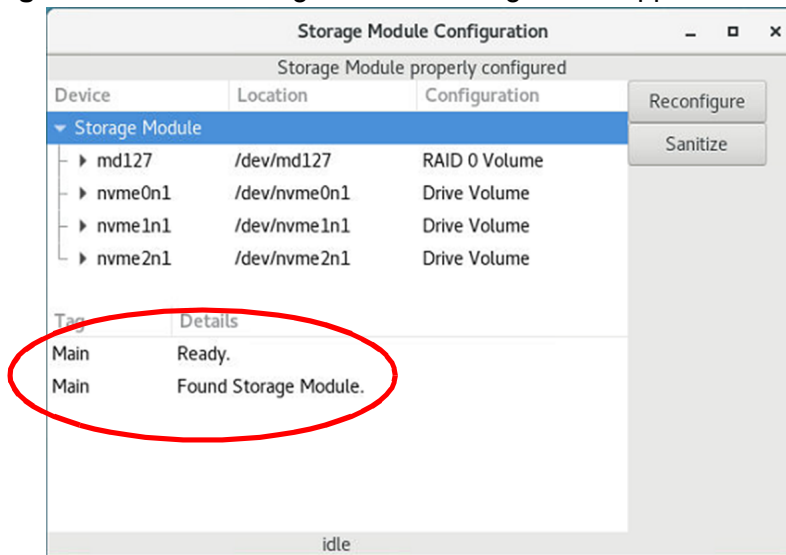
5   Depending on requirements, select either the Reconfigure button or Sanitize button (located on the right side of the window).

6   An Authentication Required dialog window will appear. At prompt, enter the password in the field (see "Procedure Password" on page 3-4).

7   Press OK to continue.

8   Wait while the module is reconfigured. When the process is finished, a message will be displayed indicating the process is complete.

9   Select OK.

10   Open a File Manager.

11   Verify that the following directory exists and is empty: /mnt/md0p1.

12   The module is now ready for use. Files and folders can be added to /mnt/md0p1 directory.

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4

Care and Maintenance

This chapter contains instructions for the care and maintenance of the mA-3A01. Instructions cover the following topics:

Maintaining the Device

The following are Operator Level procedures that may be performed by the user.

⚠️ **CAUTION**

This Device does not contain user serviceable parts. Servicing should only be performed by Qualified Service Personnel.

Mise en Garde

Cet appareil ne contient pas de pièces pouvant être entretenues par l'utilisateur. L'entretien doit seulement être effectué par du personnel de service qualifié.

Storing the Device

Module Installed in Chassis

To prepare the Chassis and Module for long-term storage:

*   Disconnect all accessory cords from Front and Rear Panel Connectors.
*   Cover the connectors with suitable dust cover to prevent tarnishing of connector contacts.
*   Refer to Chassis specifications for proper storage environment.

Module Removed from Chassis

To prepare the Module for long-term storage:

*   Remove Module from Chassis.
*   Place Module in ESD protective packaging.
*   Refer to Module specifications for proper storage environment.

Visual Inspections

Visual inspections should be performed periodically depending on operating environment, maintenance and use.

*   Check the presence and condition of all warning labels and markings and supplied safety information.

External Cleaning

The following procedure contains routine instructions for cleaning the exterior of the Device.

• Remove grease, fungus and ground-in dirt from surfaces with soft lint-free cloth dampened (not soaked) with isopropyl alcohol.

Firmware Updates

The mA-3A01 is shipped from the factory with firmware loaded. Regular checks should be performed to ensure the mA-3A01 contains the most current firmware.

Module firmware is updated through the CMP system. Refer to the mA-1302/1305 AXIe Chassis Operation Manual for system firmware and software update procedure.

Contact VIAVI Customer Service to check for the latest version of software, firmware and/or drivers.

Module Removal/Installation Procedures

This section covers removing and installing the module. The procedures in this section are intended for Qualified Service Personnel.

⚠️	**CAUTION** Modules are ESD sensitive and should only be installed, removed and/or serviced by Qualified Service Personnel. **Mise en Garde** Les modules sont sensibles aux DES et ils doivent seulement être installés, enlevés ou entretenus par du personnel de service qualifié.

Removing the Module

How to Remove Module

1   Power down the Chassis.

2   Fully loosen the captive screws on each side of the module.

3   Grasp the module Securing Latches and pull the Latches outwards and away from the module to disconnect the module from the Backplane Connectors.

4   Pull until the Securing Latches are at a 90° angle with the front of the module. See Figure 4-8 on page 4-6.

5   Grasp the module and pull to remove the module from the Chassis.

If the module is being returned to the factory for service, refer to section "Shipping the mA-3A01" on page 4-7 for important information.

Module Installation Procedure

The mA-3A01 is designed for installation in an AXIe Chassis compliant to AXIe-1 Base Architecture Specification, Revision 3.0.

> **CAUTION**
>
> Modules are not "hot -swappable." The Chassis must be powered down before installing or removing modules from the Chassis.
>
> **Mise en Garde**
>
> Les modules ne peuvent pas être « changés lorsque sous tension. » Le châssis doit être mis hors tension avant d'installer ou d'enlever des modules du châssis.

> **CAUTION**
>
> Use care when installing modules to avoid damaging any modules already installed in the Chassis.
>
> **Mise en Garde**
>
> Faites attention lors de l'installation de modules afin d'éviter d'endommager les modules déjà installés dans le châssis.

> **CAUTION**
>
> Modules are ESD sensitive and should only be installed, removed and/or serviced by Qualified Service Personnel.
>
> **Mise en Garde**
>
> Les modules sont sensibles aux DES et ils doivent seulement être installés, enlevés ou entretenus par du personnel de service qualifié.

Preliminary Procedures

Verify the following before beginning installation:

- Slot does not contain foreign objects or debris.
- Chassis Backplane connector pins are not bent or damaged.

How to Install the Module

1   Power down the Chassis.

2   If the module has securing latches, position the latches at a 90° angle to the front of the module.

> **NOTE**
>
> The securing latch must be placed in the unlocked position - pulled out and away from the latch mechanism - or module cannot be properly inserted and seated with the Chassis backplane connectors.

Figure 4-7   Securing Latch - Locked Position

Figure 4-8   Securing Latch - Unlocked Position

Figure 4-9   Securing Latch - Unlocked and Unlatched

3   Position the module on the Chassis Side Rails. Slide the module into the card cage.

> **NOTE**
>
> If the module does not slide smoothly along the side rails, remove the module, realign and reinsert the module.

4   Fully insert the module into Card Cage. Press firmly to securely connect module pins with Backplane Assembly Connectors.

5   Press the securing latches into the Locked Position.

6   Hand tighten the captive screw on each side of module. Securely tighten each captive screw to ensure module is properly grounded via the Chassis.

Shipping the mA-3A01

Any device returned to factory for calibration, service or repair must be repackaged and shipped subject to the following conditions:

Return Authorization (RA)

Do not return any products to the factory without prior authorization from VIAVI Customer Service.

Tagging the Device

All items shipped to VIAVI must be tagged with:

- Owner's Identification and contact information
- Nature of service or repair needed
- Model Number and Serial Number
- Return Authorization (RA) Number

Shipping Containers

Devices must be repackaged in original shipping containers using VIAVI packing materials. If original shipping containers and materials are not available, contact VIAVI Customer Service for shipping instructions.

Freight Costs

All freight costs on non-warranty shipments are assumed by the customer. VIAVI recommends that customers obtain freight insurance with the freight carrier when shipping the Device.

> **NOTE**
> VIAVI is not responsible for the cost of repairs for damages that occur during shipment on warranty or non-warranty items.

Packing Procedure

Devices must be repackaged in original shipping containers using VIAVI packing materials. If original shipping containers and materials are not available, contact VIAVI Customer Service for shipping instructions.

> **NOTE**
>
> VIAVI is not responsible for the cost of repairs for damages that occur during shipment on warranty or non-warranty items.

Contact Customer Service to obtain a Return Authorization number, return address and for questions about proper packaging.

Packaging Procedure

1   Place Module in ESD protective packaging/envelope.

2   Place Module between foam inserts.

3   Place secured module in shipping container

4   Seal shipping container for shipment.

Specifications

This appendix contains basic safety and compliance specifications. Refer to the mA-3A01 AXIe Mass Storage Module Data Sheet for complete product specifications.

Specifications in this appendix are as follows:

Hardware Specifications

Table A-1   Physical specifications

Parameter	Specification
Height	322.5 mm
Width	30 mm
Depth	280 mm
Weight	4 lbs (1.81 kg)
Form Factor	1 slot AXIe

Electrical Specifications

Table A-2   Power supply

Parameter	Specification
Operating Voltage	-48 VDC (supplied by Chassis)

Environmental

The following specifications have been tested in accordance with MIL-PRF-28800F:

Table A-3   Operating and storage environment

Parameter	Specification
Operating Temperature	0°C to 50°C
Storage Temperature	-40°C to 71°C
Humidity	80% relative, 31°C, decreasing linearly to 50% relative humidity at 40°C
Altitude	4600 M
Vibration	5 to 500 Hz
Functional Shock	30 G
Warm-up TIme	None

Regulatory and Compliance Standards

Table A-4	Safety Compliance
IEC/EN 61010-1	

Table A-5	EMC Compliance
EN 61326, Class A	
IEC/EN 61326-1	
IEC/EN 61000-3-2	
IEC/EN 61000-3-3	
MIL-PRF-28800F	

Table A-6	EU RoHS Directive
2011/65/EU	

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