

**Alnico iSCSI Series RAID
Subsystem
Hardware Installation Guide
Version 1.1**

2008/10/04

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Regulatory information



This drive is in conformity with the EMC directive.

 **Federal Communications Commission (FCC)**
Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

Those limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antennas.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Warning:

A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

About This Hardware Installation Guide

Welcome to Hardware Installation Guide. This guide is designed to be used as step-by-step instructions for installation of your subsystem, and covers everything you need to know in learning how to operation, troubleshooting and future upgrades. For the detail about how to configure your subsystem, please refer to the Software Operation manual.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.



Caution

Caution

This icons indicates that failure to follow directions could result in personal injury, damage to your equipment or loss of information.



NOTE

Note

This icon presents commentary, sidelights, or interesting points of information. .

Important terms, commands and programs are put in **Boldface** font.

Screen text is given in `screen` font.

Contents

ABOUT THIS HARDWARE INSTALLATION GUIDE.....	IV
SYMBOLS IN TEXT.....	IV
CONTENTS.....	V
CHAPTER 1. INTRODUCTION	1
MODEL VARIATIONS.....	1
FEATURES	1
<i>Front Panel Overview</i>	3
<i>Rear Panel Overview</i>	5
CHAPTER 2. INSTALLATION.....	8
UNPACKING & CHECKING THE EQUIPMENT.....	8
WHAT ELSE YOU NEED	8
ESD PRECAUTION.....	9
INSTALLING HARD DISKS	9
INSTALL THE ALNICO JBOD SUBSYSTEM IN A RACK.....	10
SYSTEM CONNECTION.....	12
CHAPTER 3. TROUBLE SHOOTING	13
REPLACE THE CONTROLLER.....	13
REPLACING / UPGRADING DIMM.....	14
<i>Specifications:</i>	14
<i>Installing DIMM</i>	15
HOT SWAPPING TO REPLACE THE FAN MODULE.....	15
HOT SWAPPING TO REPLACE THE POWER MODULE.....	16
APPENDIX A	18
CONNECTORS	18
APPENDIX B.....	20
BATTERY BACKUP MODULE (BBM)	20
<i>BBM Components</i>	20
<i>BBM Specifications</i>	20
<i>Installation</i>	21
<i>Battery Backup Capacity</i>	22
<i>Operation</i>	22
<i>Removing the Battery Backup Module</i>	22

APPENDIX C. SPECIFICATION.....23

Chapter 1. INTRODUCTION

This chapter introduces the features and capabilities of Alnico series RAID subsystems.

You will find:

- ⇒ A full introduction to your Alnico RAID subsystem.
- ⇒ Details of key features and supplied accessories.

Model Variations

There are four available models in Alnico iSCSI RAID storage subsystem series; which utilize either four or dual gigabit Ethernet as Host interface, each with 8, 12, or 16 device bays.

<i>Model Name</i>	<i>Host Interface</i>	<i>Device bays</i>	<i>Controller Numbers</i>
AL-6080i	2 x Gb Ethernet	8 bays, SATA-II	1
AL-6120i	2 x Gb Ethernet	12 bays, SATA-II	1
AL-8121i	4 x Gb Ethernet	12 bays, SAS/SATA-II	1
AL-8161i	4 x Gb Ethernet	16 bays, SAS/SATA-II	1

Features

The Alnico iSCSI Series RAID Subsystem is designed to meet today's high volume, performance storage requirements from rapidly changing business environment. It provides a maximum data protection and exceptional performance in a storage subsystem. Target usage ranges are set from small business to departmental and corporate server needs. The RAID SYSTEM is designed for easy integration, smooth data expansion and server migration.

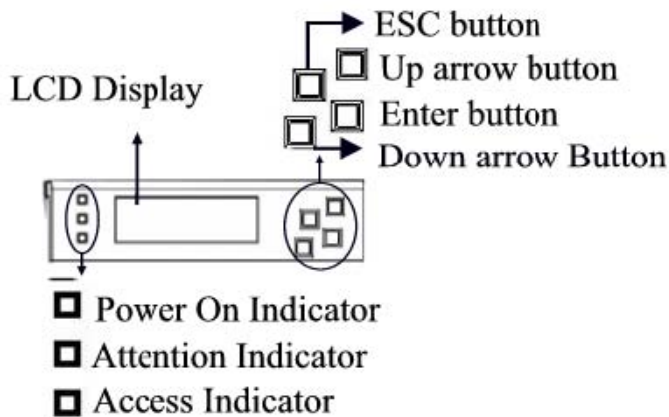
The Alnico iSCSI series supports the following features:

- * RAID 6 ready.
- * Snapshot / rollback.
- * Remote replication for Client
- * SAS support with SATA-II backward compatible.
- * N-way mirror.
- * On-line volume expansion and RAID level migration.
- * Global/dedicated cache configuration by volume.
- * S.M.A.R.T. enabled.
- * Support SES.
- * Support Microsoft VSS (Volume Shadow Copy Service).
(AL-8161i and AL-8121i only)
- * Disk roaming.
- * MPIO ready (initiator driver support needed).
- * MC/S ready (initiator driver support needed).
- * Support iSCSI header and data digest.
- * Support CHAP authentication.
- * Support Link Aggregation/ Trunking.

Understanding the Alnico RAID subsystem

Front Panel Overview

LCD Module



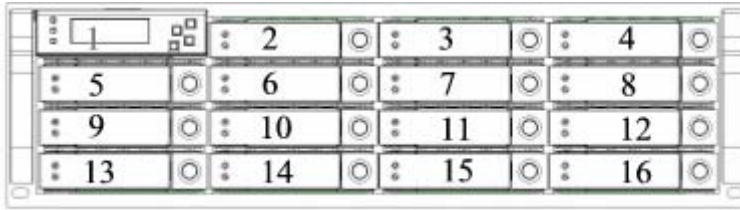
Function keys. (ENT, ESC, Scroll up, Scroll Down)

Keys	Descriptions
Up Arrow	To scroll upward through the menu items
Down Arrow	To scroll downward through the menu items
(ENT) Enter	To confirm a selected item
(ESC) ESC	To exit a sub-menu and return to previous menu.

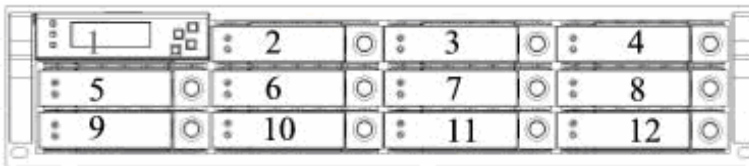
Driver Bay numbering convention

The enclosure bay numbering convention is shown in following figure. A bay is designed to house a single 1.0-inch high, 3,5-inch hard disk drive in his carrier module.

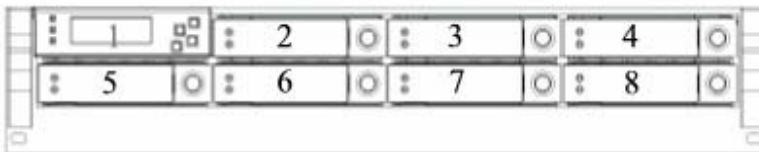
AL-8161i



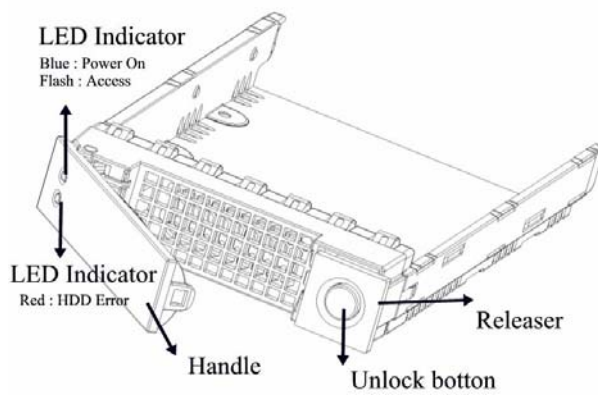
AL-6120i / AL-8121i



AL-6080i

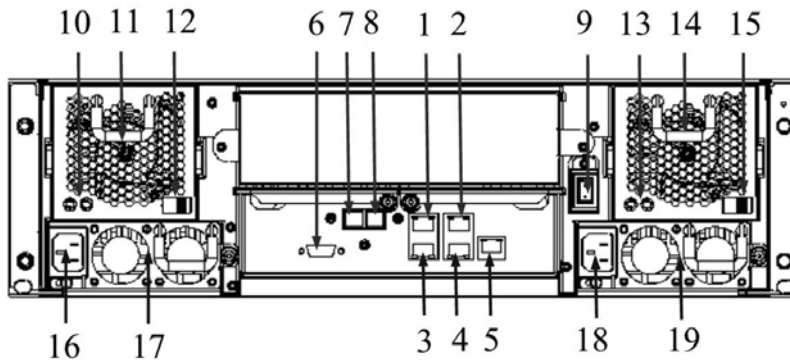


Drive Bay



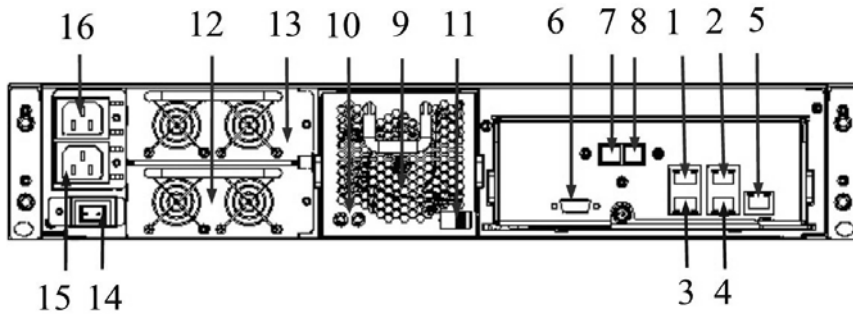
Rear Panel Overview

AL-8161i iSCSI-SAS/SATA RAID SUBSYSTEM



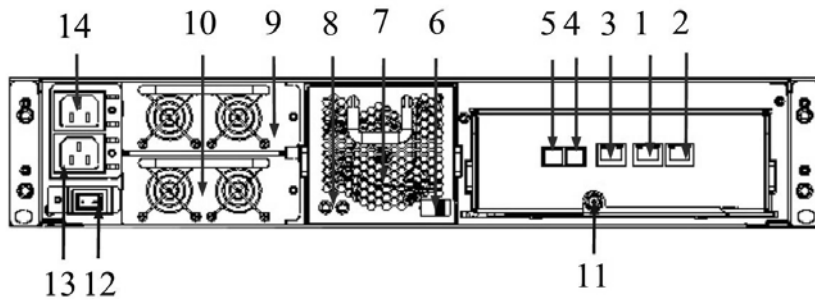
1. iSCSI LAN 1 Port
2. iSCSI LAN 3 Port
3. iSCSI LAN 2 Port
4. iSCSI LAN 4 Port
5. Manage Port
6. SAS Exp. Port
7. Console
8. UPS
9. Power Switch
10. FAN failure indicator (Rear / Front)
11. FAN Module /FAN Module 1
12. FAN Module /FAN Module 1 latch
13. FAN failure indicator (Rear / Front)
14. FAN Module /FAN Module 2
15. FAN Module /FAN Module 2 latch
16. AC inlet 1 & Latch
17. Power Module 1
18. AC inlet 2 & Latch
19. Power Module 2

AL-8121i iSCSI-SAS/SATA RAID SUBSYSTEM



1. iSCSI LAN 1 Port
2. iSCSI LAN 3 Port
3. iSCSI LAN 2 Port
4. iSCSI LAN 4 Port
5. Manage Port
6. SAS Exp. Port
7. Console Port
8. UPS Port
9. FAN Module /FAN Module 1
10. FAN failure indicator (Rear / Front)
11. FAN Module /FAN Module 1 latch
12. Power Module 1
13. Power Module 2
14. Power Switch
15. AC inlet 1 & Latch
16. AC inlet 2 & Latch

AL-6120i / AL-6080i iSCSI-SATA-II RAID SUBSYSTEM



1. iSCSI LAN 2
2. iSCSI LAN 1
3. Manage Port
4. UPS Port
5. Console
6. FAN Module /FAN Module 1 latch
7. FAN Module /FAN Module 1
8. FAN failure indicator (Rear / Front)
9. Power Module 2
10. Power Module 1
11. Thumb Screw
12. Power Switch
13. AC inlet 1 & Latch
14. AC inlet 2 & Latch

Chapter 2. INSTALLATION

This chapter presents:

- ⇒ **Instructions on unpacking & checking the equipment**
- ⇒ **Instructions on how to install Hard disk drive**
- ⇒ **Instructions on how to install Alnico iSCSI RAID in a Rack.**
- ⇒ **Instructions on how to connect Alnico iSCSI RAID.**

Unpacking & checking the Equipment

Before unpacking the Alnico iSCSI RAID subsystem, prepare a clean, stable surface to put on the contents of Alnico iSCSI RAID shipping container. Altogether, you should find following items in the package:

Alnico 8 iSCSI to SAS/SATA RAID Subsystem :

- Alnico iSCSI RAID subsystem x1
- CD-ROM x 1 (Includes Hardware Installation Guide, Software operation Manual & HTTP Proxy Server utility for Web browser-based Configuration).
- Serial cable x1
- Power Cord x 2
- Spare Fan x 1
- Spare Drive Bay x 1
- Rails for Rack
- Mounting screws (bag)

What else you need

- Hard disk drives (different RAID levels requires different numbers of HDDs. Refer to Software Operation manual for more detail information).
- Ethernet Switch .
- Dedicated terminal or PC with third party communication software that

supports ANSI terminal emulation (required for viewing Monitor Utility)

ESD Precaution

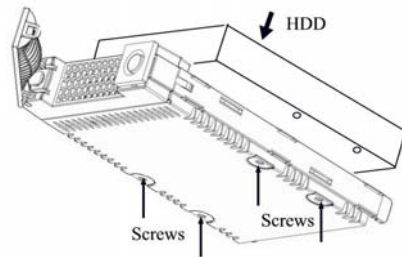
Use a suitable anti-static wrist or ankle strap and observe all conventional ESD precaution when handle Alnico RAID's modules and components. Avoid contact with backplane components and module connectors.

Installing hard disks

The Alnico RAID series includes 16 hot swappable drive bays. The following sections describe how to install disks into Alnico RAID subsystems.

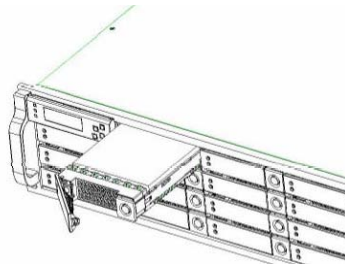
Loading Hard Disk to the drive bay.

1. Put HDD into the bay.
2. Fasten all 4 screws to mount HDD in the bay and make sure the HDD is properly tightened.



Place drive bays back into the system

1. Slide in drive bay, make sure the handle is open fully.
2. Close the handle to engage the drive bay into the slot.



NOTE

The hard drives in a RAID array should match in size and speed. All drives in any array should be identical models with the same firmware versions. RAID arrays can use any size drive, however the smallest drive will determine the size of the array.



Caution

Only use the screws offered with Alnico RAID subsystem. Longer screws might cause the drive damage.

All the drive bays (with or without hard drive) must be placed in the Alnico subsystem. Alnico's cooling system is designed with full of drive bays. Missing drive bays might cause the subsystem damage.

Install The Alnico JBOD subsystem in a Rack

You are shipped one rackmounting kit for each Alnico subsystem that you intend to rackmount. Alnico subsystem is designed for installation into a industry-standard 19-inch rackmount cabinet. Following the use of this section for installing the Alnico subsystem into a Rack

Install the Slide Rails

1. Combine Left slide rail and rear slide rail.
2. Measure the depth of the rack enclosure, then fasten 4 of P4*8M screws into M4 Locking nuts to fix the length.
3. Use T5*8M screws and PW14 washer to install the left slide on Front and rear Posts of Rack as Figure 1.
4. repeat procedure 1 ~ 3 to install the right Slide into the Rack.

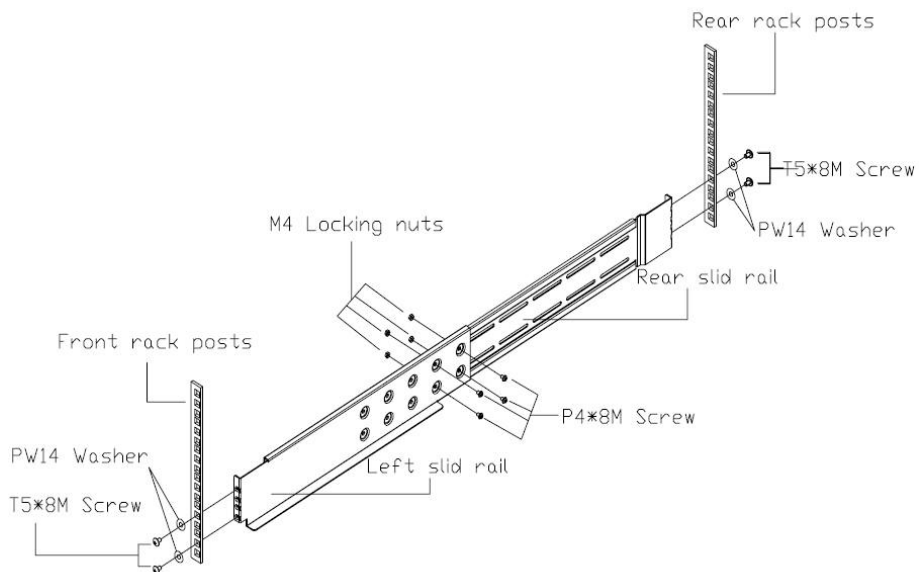


Figure 1.

Place the Alnico Subsystem into the rack

1. Lift the subsystem enclosure and slide it slowly and gently along the slide rail into the rack as Figure 2.

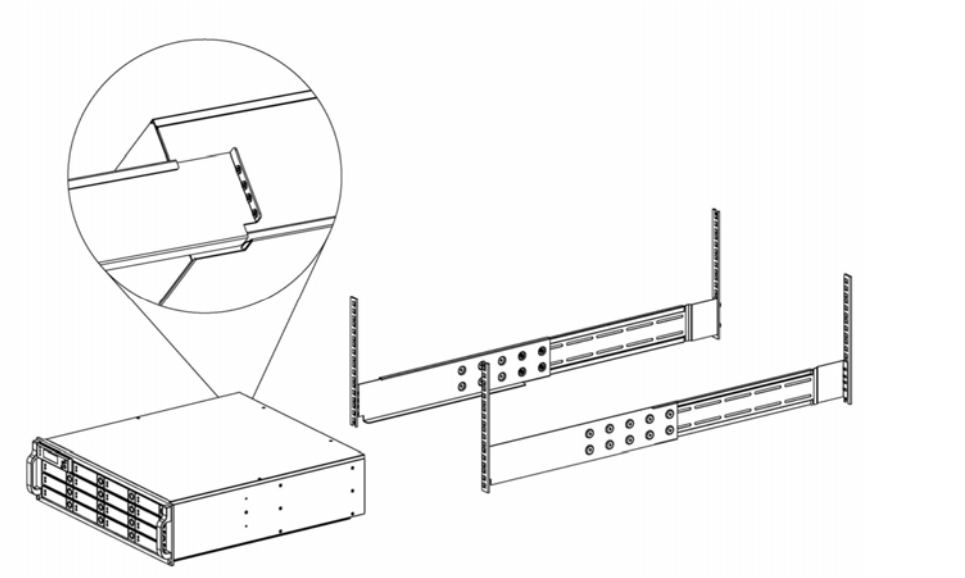


Figure 2.

- 2. Fasten two M5 screws through the chassis ears in the front side of the chassis to secure the Alnico subsystem in the rack as Figure 3.

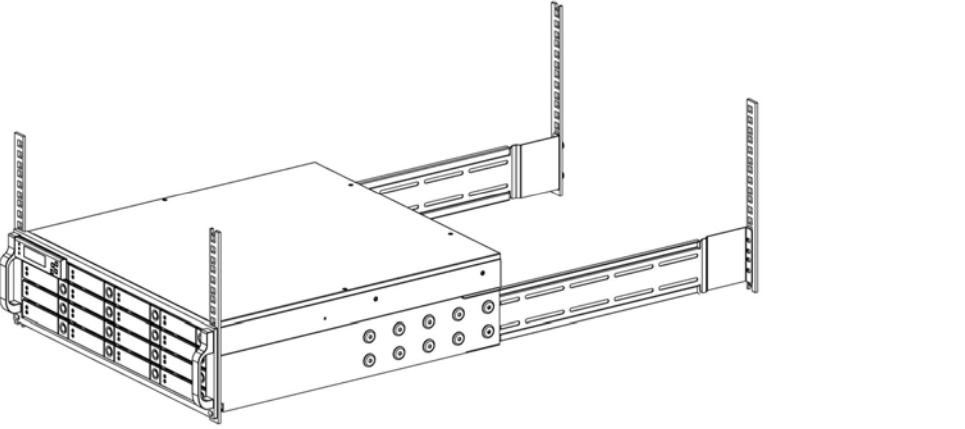


Figure 3.



Caution

The Alnico subsystem is heavy, two person are required to move the system in the procedure.

System Connection

Connect all cables and power cord as shown below :

Cable	Alnico RAID	Device	Purpose
Serial Cable	Terminal Port	ANSI Terminal ora PC with Terminal emulator.	Configuration Utility
Serial Cable	UPS Port	ATP UPS	To detect the UPS status.
Cat6 Cable	iSCSI Port	Switch or NIC	Host interface between RAID and Switch
Power Cord	Power inlet	A/C power outlet	A/C power input
RJ 45 Cable	Ethernet Port	Switch or HUB	Connect to Internet.
Mini SAS Cable	SAS Expander Port	Alnico JOB D System	Capacity Expansion via JBOD

Chapter 3. TROUBLE SHOOTING

This chapter contains trouble shooting procedures and suggestions to minimize their impact on the Alnico iSCSI RAID operation :

⇒ **Instructions on how to replace the components of Alnico RAID subsystem.**

If the fault LED on the front panel and LCD of Alnico iSCSI RAID lights red and LCD displays a error message , or if Alnico RAID’s Internet manager indicates a fault, determine the reason for this alert immediately. Examine the component LEDs to see if any indicates a fault, then replace it as soon as possible.

Replace the Controller



Caution

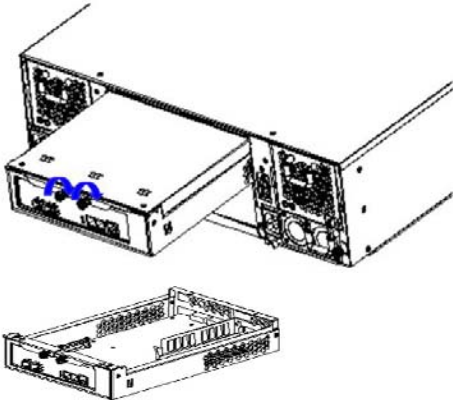
Read the replacing notices earlier in this chapter before proceeding with replacement.

This section provides instructions for the removal and installation of the RAID controller components indicated in the figure below. This section is for the reference of engineers. End users should not need to replace or remove components.

Removing the controller from Alnico RAID :

In order to access controller box, turn anti-clock wise to release three thumb screws, then use the eject bar to remove controller box.

Disconnect all cables, then unscrew four fasteners on controller and upward to remove it.



Installing the controller into Alnico

RAID:

Reverse the procedure of “**removing the controller**” to install the controller into Alnico RAID.

Then according to “Appendix C. Configuration table” on “Soft Operation Manual” to reconfigure your RAID

Replacing / Upgrading DIMM

Alnico AL-8161i / AL-8121i RAID are normally supplied with 1GB cache memory installed. And Alnico AL-6120i / AL-6080i are 512MB cache memory installed.

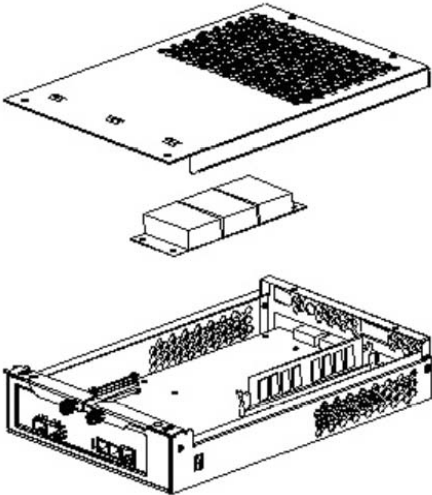
Specifications:

Type	◆ 240-pin DDR-II DIMM module (DDR II-667Mhz) ◆ ECC, without Register and Unbuffered.
Parity (ECC)	◆ With parity for data security.
Size	◆ From 512MB to 1GB and 2GB

Installing DIMM

To install a DIMM, ensure the system power is off and disconnected. Then:

- 1. Turn anti- lock wise to release two thumb screws, then use the eject bar to remove controller box, then open the cover.
- 2. Remove the BBM module.
- 3. Insert a memory card into the memory card socket so that the gold teeth of the card are no longer visible.
- 4. Press the card down firmly until the latches lock it into place.



Caution

Before starting any kind of hardware installation, please ensure that all power switches have been turned off and all power cords disconnected to prevent personal injury and damage to the hardware

Use screws provided with Alnico system only. Longer or shorter screws may cause electric shorting or un-proper installed.

Static electricity can damage electronic components. To guard against such damage:

Work in a static-free environment

Wear a grounded anti-static wrist strap

Store uninstalled components in anti-static bags

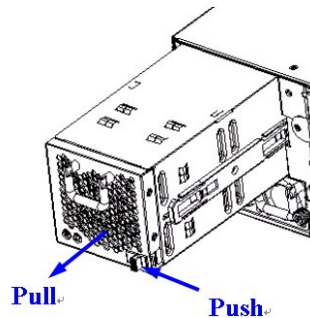
Handle PCBs by their edges and avoid touching chips and connectors.

Hot Swapping to replace the Fan Module

This section provides instructions for the removal and installation of the Fan Module indicated in the figure below.

Removing the Fan Module from Alnico :

Remove the Fan modules by slide the release button left and pull the module out of system.



Installing the Fan module into Alnico :

Insert a Fan module.

Replace the Fan in Fan module

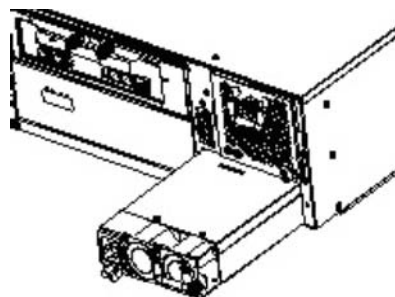
1. There are two failure LEDs on the rear of Fan module. Check which LED lights to yellow.
2. Remove the Fan modules by anti-clock wise to release the thumb screw then slide it back and lifting off.
3. Release the screw to remove the defect fan.
4. Insert the spare Fan and fasten the screw.

Hot Swapping to replace the Power Module

This section provides instructions for the removal and installation of the Power Module indicated in the figure below.

Removing the Power Module

Unscrew the thumb fastener, then push right the release button, slide it back and lifting off.



Installing the Power module into Alnico:

Insert a Power module then fasten the screw.



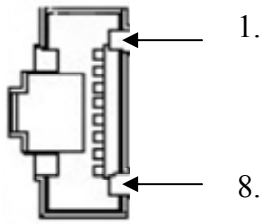
NOTE

The Power indicator will turn bright "Green" to indicate it has powered on

Appendix A

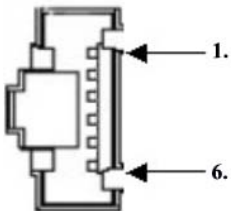
Connectors

Ethernet RJ-45 Connector



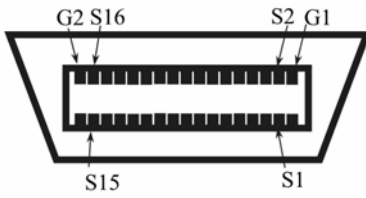
Pin#	Signal Name
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

RJ-11



Pin#	Signal	Pin#	Signal
1	NC	6	NC
2	GND		
3	RX		
4	TX		
5	CTS		

miniSAS



Pin#	Signal	Pin#	Signal
S1	RX0+	S14	TX1+
S2	RX0-	S15	TX0-
S3	RX1+	S16	TX0+
S4	RX1-	G1	Signal GND
S5	RX2+	G2	Signal GND
S6	RX2-	G3	Signal GND
S7	RX3+	G4	Signal GND
S8	RX3-	G5	Signal GND
S9	TX3-	G6	Signal GND
S10	TX3+	G7	Signal GND
S11	TX2-	G8	Signal GND
S12	TX2+	G9	Signal GND
S13	TX1-		

Appendix B

Battery Backup Module (BBM)

The external RAID controller operates using cache memory. The battery Backup Module is an add-on module that provides power to the external RAID controller cache memory in the event of a power failure. The Battery Backup Module monitors the write back cache on the external RAID controller, and provides power to the cache memory if it contains data not yet written to the hard drives when power failure occurs.

BBM Components



Battery Connector

BBM Specifications

BBM Connector

5 x Pins Connector

Installation

- . Make sure all power to the system is disconnected.
- . Remove the controller box.
- . Remove the memory.
- . Exchange 2screws to 2holding pole, as bellow :



- Install the BBM and fasten 8 screws.
- Plug in the BBM's connector into J6 of Controller.



Battery Backup Capacity

Battery backup capacity is defined as the maximum duration of a power failure for which data in the cache memory can be maintained by the battery. The BBM's backup capacity varied with the memory chips that installed on the external RAID controller

Capacity	Memory Type	Battery Backup duration (Hours)
512MB Memory	Normal	160
1GB Memory	Normal	105

Operation

- Battery conditioning is automatic. There are no manual procedures for battery conditioning or preconditioning to be performed by the user.
- Battery had a tendency to “remember” its capacity. In order to make sure of all the capacity of your battery cells, allow the battery cell to be fully charged when installed for the first time. The first time charge of battery cells takes about 24 hours to complete.

Removing the Battery Backup Module

The battery module will need to be removed for one of the following reason:

- Disconnect battery module if there is a long storage period before deployment
- The LI-ION battery will no longer accept a charge properly.

Appendix C. Specification

Model	AL-6080i	AL-6120i	AL-8121i	AL-8161i
Storage Processor	Intel Xscale 81341 I/O processor		Intel Xscale 81342 I/O processor	
RAID Features	<ul style="list-style-type: none"> * RAID Levels: 0, 1, 3, 5, 6, 0+1, 10, 30, 50, 60 & JBOD * Up to 2GB Memory support with ECC protection * N-way mirror supported * Global and dedicated hot spare disks * Online RAID level/stripe size migration * Offline Array roaming. * Auto drive insertion / removal detection and rebuilding. * Hardware iSCSI off-load engine support * Online capacity expansion and RAID level migration simultaneously * Disk auto spindown support * Windows VSS support (AL - 8121i / AL - 8161i only) * 1024 logical volumes in the system (AL-8121i / AL-8161i) * 256 logical volumes in the system (AL-6080i / AL-6120i) * SnapShot-on-the-box: Up to 16 LV supported with rollback enabled. Each Logical volume support up to 32 Snapshot volumes, total 512 snapshot volumes per system. 			
iSCSI Features	<ul style="list-style-type: none"> * iSCSI Jumbo frame support. * iSNS & DHCP support * CHAP authentication enabled. * Support Link aggregation/ Trunking * Microsoft MPIO & MC/S enabled. * iSCSI GbE ports support independent access, failover, and load-balancing * Header/Data digest support * LUN access control (read-write, read only) * Up to 32 host connections. * Up to 16 hosts clustered per volume. * Multiple iSCSI target nodes support (AL-8121i / AL-8161i only) 			
System Type	2U Rackmount		2U Rackmount	3U Rackmount
Host Interface	2 x iSCSI GbE ports		4 x iSCSI GbE ports	
Disk Interface	8 x SATA-II drives	12 x SATA-II drives	12 x SAS / SATA-II drives	16 x SAS / SATA-II drives
	No expansion port		One expansion port to connect up to 4 JBOD units. Up to 80 drives support	
Battery Back-Up Module	Optional , Supporting 72hours battery backup time			
RAID Management	<ul style="list-style-type: none"> * Management UI via firmware-embedded serial console, SSH telnet, HTTP Web UI, and secured Web UI (HTTPS). * Firmware-embedded manager through Front LCD control panel. * Field-upgradeable firmware in flash ROM. 			

Monitoring / Indicators	<ul style="list-style-type: none"> * All system status can be monitored via Firmware-embedded SSH telnet, HTTP & HTTPS based RAID manager. * All system status can be monitored via Syslog and Windows messenger * System status indication through LCD, LED and alarm buzzer. * All system events can be sent to multiple user alerts to be via "Plain English" e-mails. * Firmware-embedded SNMP agent allows remote to monitor events through LAN with no SNMP agent required. 		
Operating Systems	Windows, Linux, and Mac OS.		
Power Supply	<ul style="list-style-type: none"> * Redundant by Dual 375W (AL-6080i / AL-6120i / AL-8121i) * Redundant by Dual 460W (AL-8161i) * Power modules with PFC feature, Load sharing type and cable-less design 		
Electrical	AC Voltage 100-240 VAC / AC (+ - 10% Full Range) Frequency 50-60Hz		
Temperature	5 to 35 degree C. Non Operating Temperature : -40 to 60 degree C.		
Relative Humidity	20% to 80% non-condensing		
Dimensions	446.5mm(W) x 527mm(D) x 2U	446.5mm(W) x 527mm(D) x 2U	446.5mm(W) x 510mm(D) x 3U



NOTE

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