Acer Altos S300

User's guide

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Model Number : _____

Serial Number: _____

Purchase Date: _____

Place of Purchase: _____

Warranty/Limitation of Liability

Basic Warranty

In the absence of any optional warranty or continuing provisions by formal agreement, Acer warrants its products in accordance with the schedules listed below. Purchaser hereafter mentioned refers at all times to the customer who purchased Acer product(s).

Altos S300 Warranty

Acer warrants Altos S300 products of its manufacture to be free from defect in material and workmanship for a period of three (3) years from the date of shipment. During this period, if the customer experiences difficulties with a Acer Altos S300 system and is unable to resolve the problem via phone with Acer Technical Support a Return Material Authorization (RMA) number will be issued for the faulty component. Following receipt of an RMA, the Purchaser is responsible for returning the product to Acer, freight prepaid. Acer, upon verification of warranty, will repair or replace at its option the Altos S300 component in question, and will then return the product to the Purchaser, freight prepaid.

Cable Warranty

All Acer provided cables are warranted for ninety (90) days from the time of shipment. Questionable cables should be returned to Acer, freight prepaid where they will be repaired or replaced by Acer at its option and returned to the Purchaser, freight prepaid.

The above warranties shall not apply to expendable components such as fuses, bulbs, and the like, nor to connectors, adapters, and other items not a part of the basic product. Acer shall have no obligation to make repairs or to cause replacement required through normal wear and tear or necessitated in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized use of the product, or use of the product in such a manner for which it was not designed, or by causes external to the product, such as, but not limited to, power failure or air conditioning. Acer's sole obligation hereunder shall be to repair or replace any defective product, and unless stated, pay return

transportation costs for such replacement.
Purchaser shall provide labor for removal of the defective product, shipping charges for return to Acer and installation of its replacement. On-site services are not a part of this warranty. Above warranties are subject to change without notice.

Warranty claims must be received by Acer within the applicable warranty period. A replaced product, or part thereof, shall become the property of Acer and shall be returned to Acer at Purchaser's expense. All returned material must be accompanied by a Return Materials Authorization (RMA) number assigned by Acer. For more information, please contact your product supplier or Acer branch offices.

THE EXPRESSED WARRANTIES SET FORTH IN THIS AGREEMENT ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ALL SUCH OTHER WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY ACER. THESE STANDARD EXPRESS WARRANTIES ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF ACER FOR DAMAGES, INCLUDING BUT NOT LIMITED TO SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THE PRODUCT.

Notices

FCC notice

This device has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. residential installation. This device 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 device does cause harmful interference to radio or television reception, which can be determined by turning the device 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 antenna

• Increase the separation between the device and receiver

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

• Consult the dealer or an experienced radio/television technician for help

Notice: Shielded cables

All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations.

Notice: Peripheral devices

Only peripherals (input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this equipment. Operation with noncertified peripherals is likely to result in interference to radio and TV reception.

Caution! Changes or modifications not expressly approved by the manufacturer could void the user's authority, which is granted by the Federal Communications Commission, to operate this computer.

Use conditions

This part complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Community Statement

This equipment complies with the following European directives:

- EMC Directive 89/336/EEC and amending Directives 92/31/EEC and 93/68/EEC.
- Low Voltage Directive 73/23/EEC and amending Directive 93/68/EEC.

Notice: Canadian users

This Class A digital apparatus meets all requirements of the Canadian ICES-003.

Remarque à l'intention des utilisateurs canadiens

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

VCCI

This Class A product is based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment. If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

BSMI

In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Important safety instructions

Read these instructions carefully. Save these instructions for future reference.

1. Follow all warnings and instructions marked on the product.

2. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

3. Do not use this product near water.

4. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

5. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.

6. This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

7. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.

8. If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.

9. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

10. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.

11. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

  a When the power cord or plug is damaged or frayed

  b If liquid has been spilled into the product

  c If the product has been exposed to rain or water

  d If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.

  e If the product has been dropped or the cabinet has been damaged

  f If the product exhibits a distinct change in performance, indicating a need for service.

12. Replace the battery with the same type as the product's battery we recommend. Use of another battery may present a risk of fire or explosion. Refer battery replacement to a qualified serviceman.

13. Warning! Batteries may explode if not handled properly. Do not disassemble or dispose of them in fire. Keep them away from children and dispose of used batteries promptly.

14. Use only the proper type of power supply cord set (provided in your accessories box) for this unit. It should be a detachable type: UL listed/CSA certified, type SVT, rated 7A 125V minimum, VDE approved or its equivalent. Maximum length is 15 feet (4.6 meters).

Contents

1 Introduction

This chapter introduces the Altos S300 series of storage arrays. The main features are described along with a list of the options and configurations that are available.

About the Altos S300 series storage array

The Altos S300 series is a new concept in data storage that provides the optimum in investment protection and versatility. The Altos S300 series will meet the performance, capacity, and high availability needs of the widest variety of applications, such as video, imaging, prepress, data warehouse, OLTP, and web servers.

Features

- Fourteen disk drive slots.
- Redundant AC power supplies.
- Redundant input power cords.
- A total of four fans in two Advanced Cooling Modules (ACM) providing n+1 redundancy on fans.
- Two rear removable I/O option modules provide active/passive failure redundancy on environmental monitoring, or per Bus Monitoring.
- Multi-MODE SCSI Interface Ultra 160.
- Hot plug of power supplies and ACM's.
- Maximum configurations of drives supported with one or two power supplies.
- Failure indication of all Field Replaceable Units (FRU) via LEDs and audible alarm (with alarm mute button).
- Disk drive hot plug support.
- Auto-sense termination at end of bus (busses) if no cable present.
- Auto bus split, if two cables are present.
- Up to 10M of LVD SCSI cable.
- SCSI I.D.'s hard-wired.
- Global remote spinup enable capability.
- Global delayed spinup enable capability.
- Rail Kit mounting for 19" equipment racks.
- Carrier cam lever allows controlled insertion and extraction of disk carriers.

Disk drive carrier

The disk drive carrier supports a one inch disk drive with support for 10K RPM drives and higher (15K). The Altos S300 series enclosure holds up to fourteen disk drive carriers. The disk drives can be hot swapped and the disk drive carriers provide for blind mating.
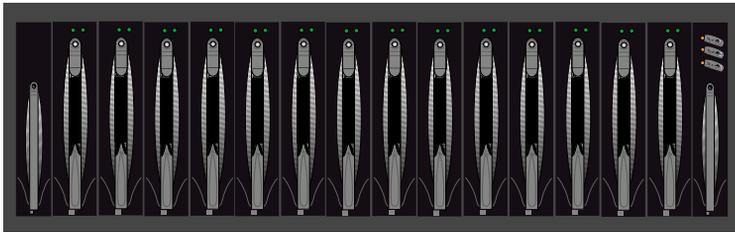
Power supplies

The Altos S300 series uses two AC power supplies for normal operation, providing redundancy of the power system. The power supplies can be hot swapped. The power supplies provide 673 Watts continuous output power and 853 Watts peak output power. The power supplies provide active current sharing, power factor correction, over current and over voltage protection is also provided. The power supplies have individual power inputs.

Power Supplies
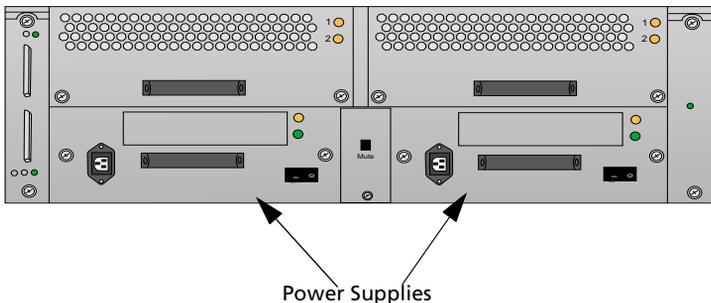
Cooling system

Cooling is provided by the two Advanced Cooling Modules (ACMs) located at the rear of the enclosure. Each of the ACM units contain two variable speed fans. The enclosure requires four fans for normal operation, but will operate correctly when one fan fails to function (redundancy is lost if one fan is failed in either ACM), however, it is recommended that the failed fan be replaced as soon as possible. The ACM units can be hot swapped. The I/O Option Module (ESM and TSM described later) monitors and controls the speed of each fan. The speed is set depending on the ambient temperature and failed status. The fans are set to full speed, if one fan fails to function.

ACMs

Fans 3 & 4   Fans 1 & 2
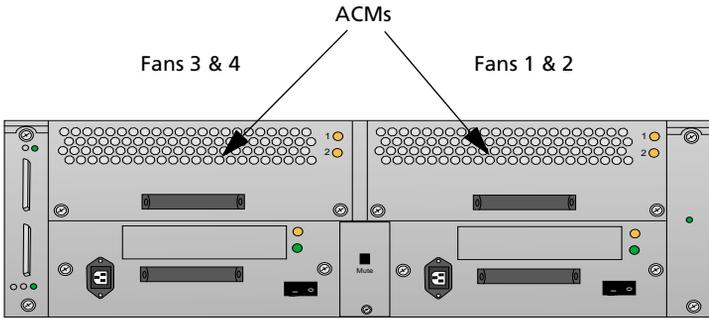
The following table shows how the fan speed relates to temperature change.

ACM Speed	Ambient Temp (^{o}C)
Speed 1	0 to 26
Speed 2	26 to 28
Speed 3	28 to 30
Full Speed	30 +

Note: All fans are set to the same speed.

I/O modules

There are two I/O option slots located at the rear of the enclosure.
**One of these must contain an Enclosure Services Module (ESM)
or a Concentrator Services module (CSM)** and the other slot must
contain the **Terminating Services Module (TSM) or a second
Concentrator Services Module (CSM)** for dual CSM configuration.

The I/O slot located on the left of the enclosure as viewed from the
back is called I/O Slot A and the I/O slot located on the right is called I/O
Slot B. **The I/O modules can be inserted into either of the I/O
slots**.

I/O Module   The I/O Modules can be inserted into either I/O slot   I/O Module
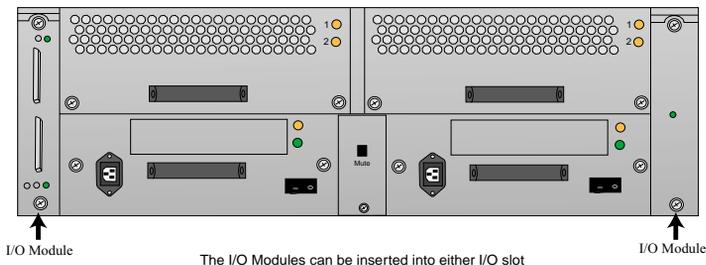
Note: For a detailed information of the I/O modules, see page 20.

The following sections will describe the modules and how they should
be used.

Enclosure Services Module

The Enclosure Services Module (ESM) has three primary functions. It
acts as a SCSI bus pass-through from external cabling to the internal
busses. Secondly, it terminates the end of the SCSI bus in joined mode.
Finally, it provides monitoring, reporting and control of the system
storage enclosure. The ESM reports status and receives control
information via the SCSI bus per the SCSI-3 Enclosure Services
specification and also the SAF-TE specification.

Terminating Services Module

The Terminating Services Module (TSM) has no external connectors and as such cannot have cables connected to it. Instead it can either terminate or join the SCSI busses based on the cable configuration on the ESM. The TSM reports status and receives control information via the SCSI bus per the SCSI-3 Enclosure Services specification and also the SAF-TE specification.

Concentrator Services Module

The Concentrator Services Module (CSM) includes the same functionality as the ESM, in addition to giving the enclosure Clustering capabilities. With a CSM installed in one I/O Slot and either a CSM or a TSM installed in the second I/O slot then a Cluster Configuration is possible.

This means that each external SCSI connector can have 25 meters of SCSI cable attached, with each cable connected from the I/O module to a host. When a host is disconnected from the enclosure, the CSM isolates the disconnected host from the internal storage and remaining attached host. This means that one host can be taken "off-line" without data disruption to the other host.

Note: For information on how to configure your Altos S300

2 Installation
precautions

This chapter discusses the important safety instructions along with the electrical, mechanical and environmental precautions that need to be taken when installing the Altos S300 series enclosure.

ESD precautions

Note: Before you install or operate the Altos S300 series enclosure, we recommend that you read the following instructions.

Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a computer component:

1. Do not remove a component from its protective packaging until you are ready to install it.

2. Wear a wrist grounding strap and attach it to a metal part of the computer before handling components. If a wrist strap is not available, maintain contact with the computer throughout any procedure requiring ESD protection.

Safety precautions

Always observe the following before you install or operate the Altos S300. For language translations of these statements refer to Appendix B.

1. This device is intended for installation in a restricted access location only.

2. If any of the components are removed, the resulting hole must be blocked, by installing a component blank or replacing the component. Failure to do so can seriously restrict air flow and cooling.

3. This device should be connected to a power source which carries a fuse or circuit breaker that is greater than the rating of the shelf, but also complies with national wiring standards.

4. Allow disk drives and power supplies to reach room ambient temperature before powering on the shelf.

5. It is recommended that, if interconnecting equipment resided within more than one equipment rack cabinets, these equipment racks should be at the same ground potential.

6. Warning! A possible shock hazard may exist in the area of the fan connection.

7. Warning! Disconnect both power supply inlets before opening this equipment for servicing.

8. Warning! Disconnect both power cables before servicing this equipment.

Unpacking and initial setup

Carefully unpack the carton and remove the contents. If the exterior packaging or items are missing or damaged, contact your dealer immediately.

Note: The disk drives are packaged in anti-static packaging, precautions must be observed prior to removal.

Rack installation precautions

Before installing the Altos S300 series enclosure in an equipment rack, it is essential that the following guidelines are complied with, to ensure the safe and efficient operation of the system. The Altos S300 series can be installed in open or closed equipment racks, with a front width of 19 inch, by observing the environmental, electrical, and mechanical precautions described below.

Environmental consideration

When installing the Altos S300 series enclosure the following environmental considerations must be applied.

Ambient temperature

Installation of the rack system in a standard 19 inch cabinet may lead to a differential between the room ambient temperature and the internal ambient temperature of the rack environment. The operating temperature of the Altos S300 series is between $5^{o}C$ and $40^{o}C$. However, it is not recommended that the system be continuously run at these extreme temperatures. Consideration should therefore be given to ensure that the room ambient temperature is compatible with these specifications.

Air flow

To ensure that the internal heat build up is properly dissipated into the room environment, air flow should in no way be restricted. It is essential that no air vents are blocked, and that the system is a minimum of one meter from a solid surface such as a wall or partition. Air flow through the Altos S300 series enclosure is from front to rear.

Electrical consideration

When installing the Altos S300 series enclosure the following electrical consideration must be applied.

Circuit overloading

Care should be taken to ensure that the current does not exceed the rating of the power source circuitry. This includes cabling, power distribution units, filters and any other devices through which the main current flows. The electrical power rating of the enclosure is 100 - 240 VAC, 10 - 5 Amps (50/60 Hz) and must be added to the power demands of any other electrical devices installed in the equipment rack to arrive at a total power consumption figure. In addition, surge currents must be catered for. Disk drives may consume twice the amount of current at start-up time as they do during steady state operation.

Mechanical consideration

When installing the Altos S300 series enclosure the following mechanical consideration must be applied.

Mechanical loading

Consideration should be given to the loading of the equipment rack. To maintain a low centre of gravity (thus reducing the likelihood of instability) racks should be loaded (where possible) from the bottom of the equipment rack upwards. This is recommended to ensure personal safety.

Caution: When installing or removing a rack mount enclosure, remove all disk drives. It is recommended that you work with at least one other person when installing an enclosure. This is necessary to prevent personal injury and damage to the enclosure.

3 Cabling and configuration

This chapter describes how to cable and configure your Altos S300 series enclosure. Detailed information on how and where to connect the cables will be provided along with information on the SCSI ID assignments.

Altos S300 series SCSI ID assignments

The SCSI ID's for the Altos S300 series enclosure are hard set and cannot be changed in any way. The Altos S300 series enclosure has two modes of operation: Single (Joined) SCSI bus mode (1x14), and Dual (Split) SCSI bus mode (1x7 and 1x7). The I/O Modules are set at ID 15 in all cases and SCSI ID 7 is reserved for the host. The figure below shows how the SCSI ID's are assigned.

Both rear I/O Modules are at SCSI ID 15 in all configurations
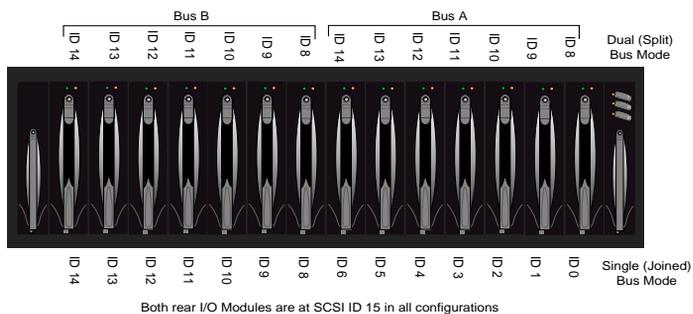
I/O module LEDs

There are LEDs mounted on the ESM, CSM and TSM. This section will explain what these LEDs mean.

ESM/CSM LEDs
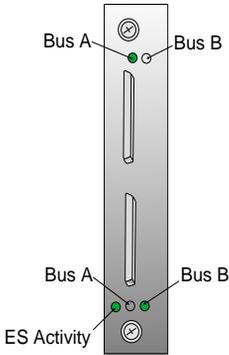
There are 5 LEDs in total on the ESM/CSM located as shown. The ES Activity LED shows, if the ES block of the ESM/CSM is active or in standby mode. If the LED is ON, the ES block is active, and if it is OFF, the ES block is in standby mode. The Bus A and Bus B LEDs show which bus each connector is associated with, e.g. in single (joined) bus mode both Bus A LEDs would be on, and in dual (split) bus mode Bus A would be on for one connector and Bus B would be on for the other connector.

TSM LED
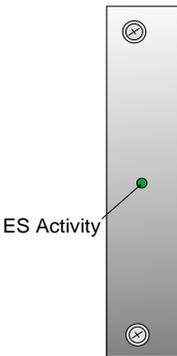
The ES Activity LED shows if the ES Block of the TSM is active or in standby mode. If the LED is on the ES block of the TSM is active and if it is off the ES block is in standby mode.

Cabling the Altos S300 series enclosure

The Altos S300 series enclosure can operate in three main configurations: Single ESM and TSM, Single CSM and TSM and Dual CSM configurations. This enclosure can sense the cable arrangement and split or join the SCSI bus as appropriate. The following sections describe how to cable these configurations.

Single ESM and TSM configuration

This configuration can be cabled as either a Single (Joined) SCSI Bus or as a Dual (Split) SCSI Bus configuration.

Cabling the single (joined) SCSI bus configuration

One host cable is required for this configuration. The length of the host cable may be a maximum of 10 meters in length. When viewed from the rear there should be an ESM installed in one I/O slot and a TSM in the other.

Follow the procedures below to connect the cable (see figure below):

1. Power off the enclosure and the host system.

2. Attach one end of the cable to the connector on the ESM.

3. Attach the other end of this cable to the host.
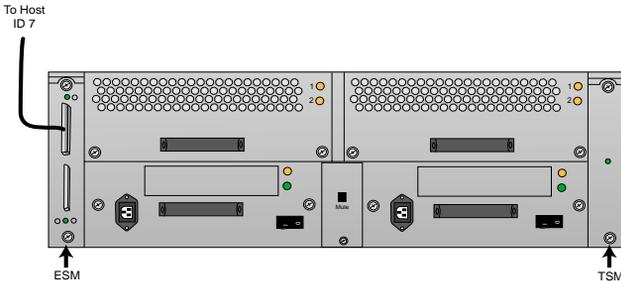
The ESM and TSM can be in either I/O slot of the enclosure.

ID 15	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 6	ID 5	ID 4	ID 3	ID 2	ID 1	ID 0	ID 15
I/O Module	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	I/O Module

SCSI ID Assignments shown from front of enclosure.

Note: For more information on the host connectors, refer to the documentation supplied with the host system.

The Bus A LED will be **ON**[1] to indicate that all disks are on Bus A. The Environmental Services (ES) LED is **ON** for the TSM in this example to show that its ES block is the active block.

> **Note:** Both I/O modules are at ID 15. Only one module will be active at any one time and the other will be in standby mode. If the active I/O module fails the standby will take over.
>
> For information on the I/O module LED, see page 20.

Cabling the dual (split) SCSI bus configuration

Two host cables are required for this configuration. The length of each cable may be a maximum of 10 meters. When viewed from the rear there should be an ESM installed in one I/O slot and a TSM in the other.

Follow the procedures below to connect the cables (see figure on page 24):

1. Power off the enclosure and the host system.

2. Attach one end of the cable to one connector on the ESM.

3. Attach the other end of this cable to a host.

4. Attach one end of the second cable to the second connector on the ESM.

5. Attach the other end of this cable to a host.

> **Note:** For more information on the host connectors, refer to the documentation supplied with the host system.

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[1]   Enclosure must be powered on to see the LEDs.
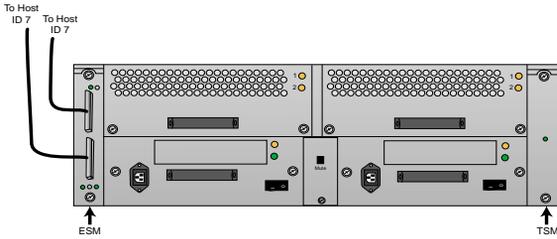
The ESM and TSM can be in either I/O slot of the enclosure.

BUS B								BUS A							
ID 15	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 15
I/O Module	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	I/O Module

SCSI ID Assignments shown from front of enclosure.

The Bus A LED[2] will be on for top connector to indicate that first seven disks are on Bus A. The Bus B LED will be on for bottom connector to indicate that remaining seven disks are on Bus B. The Environmental Services (ES) LED is **ON** for both the ESM and TSM, to show that both of their ES blocks are active.

Note: Both I/O modules are at ID 15. These modules actively monitor one of the two buses, respectively.

For information on the I/O module LED, see page 20.

---
[2]   Enclosure must be powered on to see the LEDs.

Single CSM and TSM Configuration

This configuration can be cabled as either a Single (Joined) SCSI Bus or as a Dual (Split) SCSI Bus configuration.

Cabling the single (joined) SCSI bus configuration

One host cable is required for this configuration. The length of the host cable may be a maximum of 25 meters in length. When viewed from the rear there should be a CSM installed in one I/O slot and a TSM in the other.
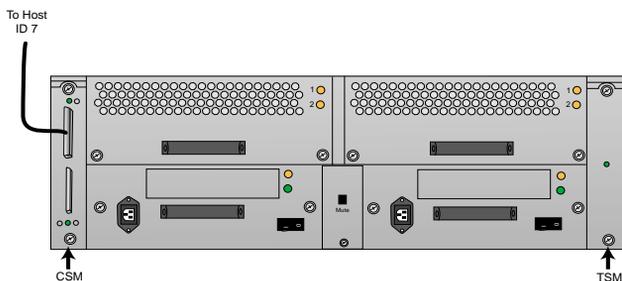
Follow the procedures below to connect the cable (see figure below):

1. Power off the enclosure and the host system.

2. Attach one end of the cable to the connector on the CSM.

3. Attach the other end of this cable to the host.

The CSM and TSM can be in either I/O slot of the enclosure.

ID 15	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 6	ID 5	ID 4	ID 3	ID 2	ID 1	ID 0	ID 15
I/O Module	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	I/O Module

SCSI ID Assignments shown from front of enclosure.

Note: For information on the host connectors, refer to the documentation supplied with it.

The Bus A LED will be **ON**[3] to indicate that all disks are on Bus A. The Environmental Services (ES) LED is **ON** for the TSM in this example to show that its ES block is the active block.

> **Note:** Both I/O modules are at ID 15. Only one module will be active at any one time and the other will be on standby. If the active ES block fails the standby will take over.
>
> For information on the I/O module LED, see page 20.

Cabling the dual (split) SCSI bus configuration

Two host cables are required for this configuration. The length of each cable may be a maximum of 25 meters. When viewed from the rear there should be a CSM installed in one I/O slot and a TSM in the other.
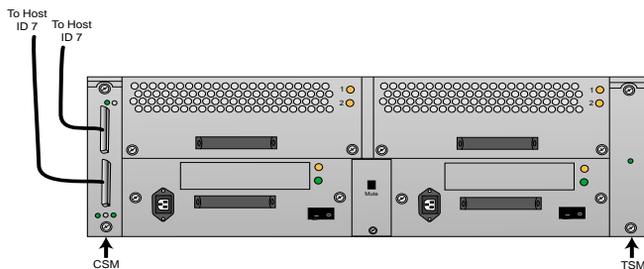
The SCSI bus needs to be set in the 'forced split' mode to do this configuration. A jumper must be installed at jumper location JP10 on the CSM PCB. To do this,

1. Remove the CSM from the enclosure and remove the top cover.
2. Locate JP10 and install a jumper.
3. Replace the top cover.
4. Insert the CSM in to the enclosure.

Follow the procedures below to connect the cables (see figure page 27):

1. Power off the enclosure and the host system.
2. Attach one end of the first cable to one connector on the CSM.
3. Attach the other end of this cable to a host.
4. Attach one end of the second cable to the other connector on the CSM.
5. Attach the other end of this cable to a host.

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[3] Enclosure must be powered on to see the LEDs.

The CSM and TSM can be in either I/O slot of the enclosure.

BUS B								BUS A							
ID 15	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 15
I/O Module	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	I/O Module

SCSI ID Assignments shown from front of enclosure.

Note: For information on the host connectors, refer to the documentation supplied with the host system.

The Bus A LED[4] will be on for the top connector, to indicate the first seven disks are on Bus A. The Bus B LED will be on for bottom connector to indicate that the remaining seven disks are on Bus B. The Environmental Services (ES) LED is **ON** for both the CSM and TSM, to show that both of their ES blocks are active.

Note: Both I/O modules are at ID 15. These modules actively monitor one of the two buses, respectively.

For information on the I/O module LED, see page 20.

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4 Enclosure must be powered on to see the LEDs.

Dual CSM configuration

For this dual CSM configuration, there **must** be a Concentrator Services Module (CSM) installed in both I/O Option Slots.

Dual concentrator services modules

Four host cables are required for this configuration. These cables must not exceed 25 meters in length.

When viewed from the rear there should be a CSM installed both I/O slots.

Follow the procedures below to connect the cables (see figure page 29):

1.   Ensure all power to the enclosure and host systems are switched off.

2.   Attach a cable to the top connector of one CSM.

3.   Attach the other end of this cable to the master/active host system (Cluster 1).

4.   Attach a second cable to the bottom connector of the same CSM.

5.   Attach the other end of this cable to the slave/standby host system (Cluster 1).

6.   Attach the third cable to the top connector of the second CSM.

7.   Attach the other end of this cable to the second master/active host system (Cluster 2).

8.   Attach the fourth cable to the bottom connector of the second CSM.

9.   Attach the other end of this cable to the slave/standby host system (Cluster 2).
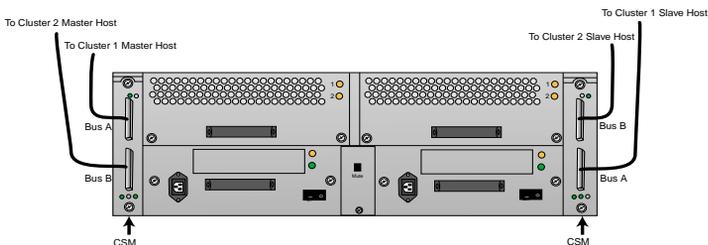
BUS B								BUS A							
ID 15	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 15
I/O Module	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	Disk	I/O Module

SCSI ID Assignments shown from front of enclosure

In this configuration the SCSI bus is split, with each of the connectors attached to a host. If a host is disconnected from the enclosure, the CSM isolates the disconnected host from the internal storage and remaining hosts. This allows a host to be taken offline without data disruption to the other hosts. For left side CSM, the Bus A LED is on for top connector and Bus B LED is on for bottom connector. For right side CSM, the Bus B LED is on for top connector and Bus A LED is on for bottom connector. The ES LED is on for both CSM's.

Note: For information on the I/O module LED, see page 20.

Join/Split bus jumper

The ESM/CSM has a jumper located on it that forces the SCSI bus into joined or split mode. This jumper is located on the ESM/CSM PCB at location JP10.

To access the jumper:

1. Remove the ESM/CSM from the enclosure.

2. Remove the top cover from the ESM/CSM and locate jumper JP10.

The following table explains the jumper settings:

i/O Module	Jumper JP 10	Bus State
ESM[a]	Installed	2 cables attached, bus is Force Joined
	Removed	Depends on c able configuration
CSM[b]	Installed	2 cables attached, bus is Force Split
	Removed	Depends on c able configuration

a. The overall cable length in joined bus mode is 10 meters. Any combination of cable lengths is allowed, so long as 10 meters is not exceeded.
b. The overall cable length can be 50 meters (25 meters from each I/O module connector to the host system.

Powering on the Altos S300 series enclosure

This section describes how the Altos S300 series enclosure is powered on. Jumpers installed on the I/O modules determine how the enclosure powers up and how the disk drives spin up. The following section describe the jumper settings.

Altos S300 series jumper settings

The Altos S300 series enclosure jumpers are located on the I/O Modules (ESM and CSM). By installing or removing these jumpers the following options may be set.

Note: For information on the I/O module LED, see page 20.

Power up

With this option enabled, the enclosure will power up automatically when the host system is powered on.

To power up the enclosure with this feature enabled:

1. Connect the cables between the enclosure and the host system.
2. Switch on the enclosure (switches on PSU's at rear of enclosure).
3. Power on the host system and the enclosure will power on also.

To disable this option, install a jumper at location JP13 on the ESM and CSM (whichever is installed). If two CSMs are installed, the jumper should be installed on both CSMs.

Remote start up

If you select this option, the disk drives will not spin up until a spin up command is issued by the host system (even though the enclosure is powered on). To enable this feature, install a jumper at location JP12 on the ESM and CSM (whichever is installed). If two CSMs are installed, the jumper should be installed on both CSMs.

Delayed Start

If you select this option, the disk drives will spin up sequentially i.e. not all together. To enable this feature, install a jumper at location JP11 on the ESM and CSM (whichever is installed). If two CSMs are installed, the jumper should be installed on both CSMs.

Powering on an AC enclosure

1. Ensure all cables have been attached as described in the preceding sections.

2. Attach the AC power cords to the power supplies and turn the power supply switches to the On (-) position (see figure below).

Insert Power cords into power connectors
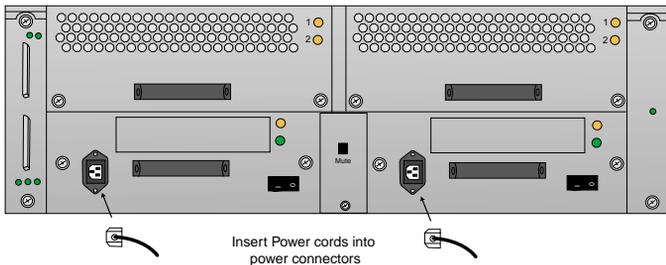
3. Power on the host system and the Altos S300 series enclosure will power on also.

> **Note:** Powering off all the attached host systems will power off the Altos S300 series enclosure also. Refer to "Power up" on page 31 (jumper JP13).

> **Warning! This equipment must be connected to an earthed mains socket outlet. Ensure the power cabling provides earthing continuity to the equipment.**

4 System monitoring

This chapter describes the devices used to monitor the Altos S300 Series. The location of the monitoring LEDs and how to interpret them is provided.

Overview

The Altos S300 series enclosure uses LEDs and an audible alarm to report the enclosure status. The LEDs are located on the enclosure modules such as the disk drive carriers, Advanced Cooling Modules (ACM), power supply modules, and enclosure front LED panel. The enclosure status is monitored by the Environmental Status (ES) block of the Altos S300 series. The Environmental Status block is built into the I/O Modules (ESM, CSM and TSM). All these monitoring devices are discussed in the following sections.

Environmental status (ES) block

I/O Module   The I/O Modules can be inserted into either I/O slot   I/O Module
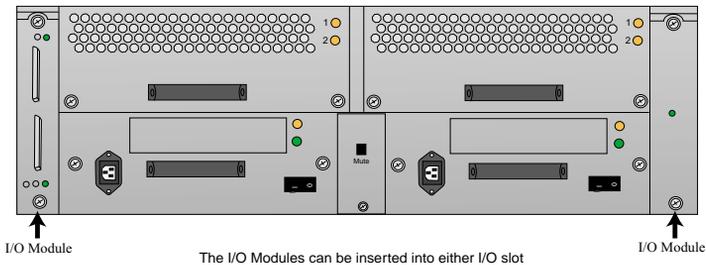
The I/O Modules can be inserted into either I/O slot.

A fully configured Altos S300 series enclosure will include two ES blocks, one located on each I/O Module. Each ES block will continuously monitor the enclosure. If the enclosure is configured as a single (or joined) SCSI bus, one ES block will act as a master and will have the responsibility of reporting enclosure information via the SCSI bus and performing all functions for the enclosure. If the other ES block detects the loss of the master ES block then it will assume responsibility for reporting and control.

In a dual (or split) SCSI bus configuration, each ES block will report enclosure information over the SCSI bus to which it is physically connected.

Features

The ES block built into the ESM, CSM and TSM has the following features:

- Monitoring/control for 14 SCSI disk drives.
- Control over one bi-color LED for each disk drive carrier.
- Monitoring/control for 2 power supplies and 4 fans (2 per ACM).
- Control of 3 Front Panel system LEDs, to indicate module failure, split/join mode and power.
- Reports status and receives control information via the SCSI bus.
- Microcontroller for data processing, control, and communications.
- Volatile and non-volatile memory for the microcontroller.

- Two line serial buses for communication to all components.
- Temperature sensor.
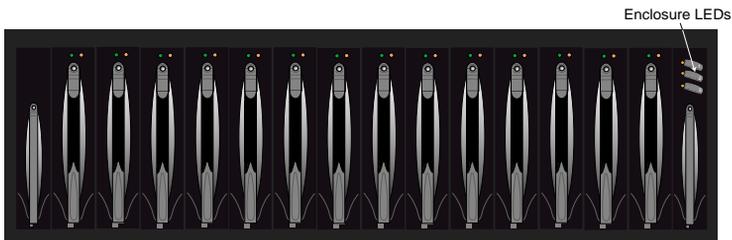- Failover logic to communicate with the other ES module.

Alarm buzzer mute

The alarm buzzer can be muted by pressing the alarm mute button located on the rear of the enclosure.

Alarm Mute Button
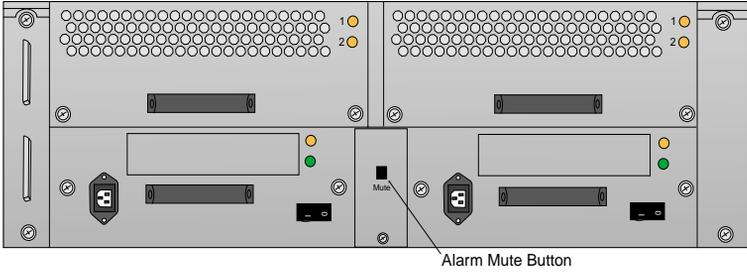
Enclosure front panel LEDs

The Altos S300 series enclosure has three LEDs on the front panel..

Enclosure LEDs

These LEDs display information about the enclosure as described in the following table:

	Description	Color	Indication
LED 1	Power On	Green	Normally ON, indicated power is applied to the enclosure. OFF, indicates no power is applied.
LED 2	Bus Split	Green	When ON, indicates that the Bus is split, when OFF, indicates that the bus is joined.
LED 3	Shelf Fault	Amber	Normally OFF, indicated no faults exist in the enclosure. ON, indicates that the enclosure has a fault.

Disk drive carrier LEDs

Each of the 14 disk drive carriers have two LEDs - green and bicolor, indicators visible from the front of the enclosure.

Disk Drive Ready
(Green)

Disk Drive Activity
Bicolor LED
(Green/Amber)
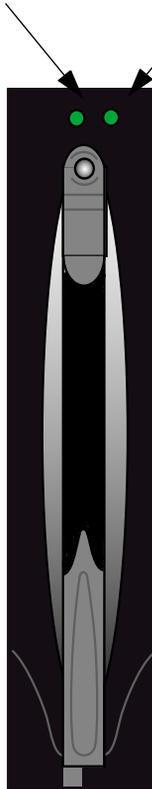
Green LED is the disk drive ready LED. The disk drive has control over this LED. While bicolor LED is controlled by the Altos S300 ES module (for ES module information refer to page 36).

The following table describes how to interpret the bicolor
(ES controlled) LED.

Bicolor LED Showing Green	Bicolor LED Showing Amber	Condition
ON	OFF	Drive online
ON 125 ms [1] OFF 125 ms	OFF OFF	Drive identify **Note:** After 30 sec., the LED pattern will change to default pattern.
ON 250 ms OFF 250 ms	OFF OFF	Prepare for removing the drive. **Note:** After 30 sec., the LED pattern will change to default pattern.
ON 500 ms OFF 125 ms	OFF OFF	Rebuild the drive
OFF OFF	ON 125 ms OFF 125 ms	Drive failed
ON 500 ms OFF 500 ms OFF 1000 ms	OFF 500 ms ON 500 ms OFF 1000 ms	Predicted failure in the drive.

1. ms - milli-seconds

Note: The alarm buzzer can be muted using the alarm mute button located on rear of the enclosure.
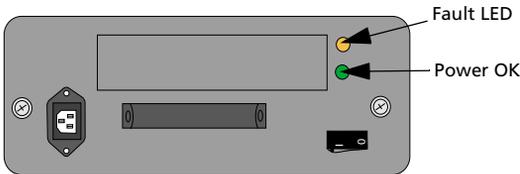
Power supply LEDs

The Altos S300 series power supply provides power factor correction, over current and over voltage protection. The power supply has 853 Watts peak power with 673 Watts continuous power and input voltage fail detection.

The power supply has two LED indicators, which are visible from the rear of the enclosure. The green Power OK LED is ON when the power supply is operating normally. This green LED is controlled by the power supply, and indicates that the power supply output voltages are operating normally. The power supply amber Fault LED is controlled by the Altos S300 series ES block (for information on the ES block refer to page 36). This amber LED is ON when the ES block detects a power supply fault, or it will flash when the power supply Locate feature is selected[1].

Note: The audible alarm will sound when an error is detected. The alarm can be muted using the Alarm Mute Button.


Fault LED

Power OK

---

[1]   Power supply 'Locate' is a feature of Spheras Storage Manager software.

# Advanced cooling module (ACM) LEDs

The Altos S300 series has two variable speed fans per advanced cooling module.   Each of the two ACMs on the rear of the Altos S300 series enclosure has two fault LEDs visible from the rear. The LEDs are labeled **1** and **2** to correspond with the two fans inside the ACM assembly. These LEDs are normally off, and will only be on when a fault is detected in a fan by the ES block.

> **Note:** The audible alarm will sound when an error is detected. The alarm can be muted using the Alarm Mute Button.

Fan 1 Fault

Fan 2 Fault

Front of ACM

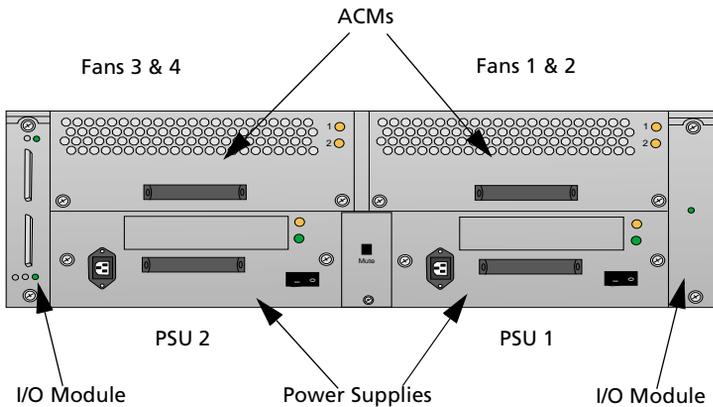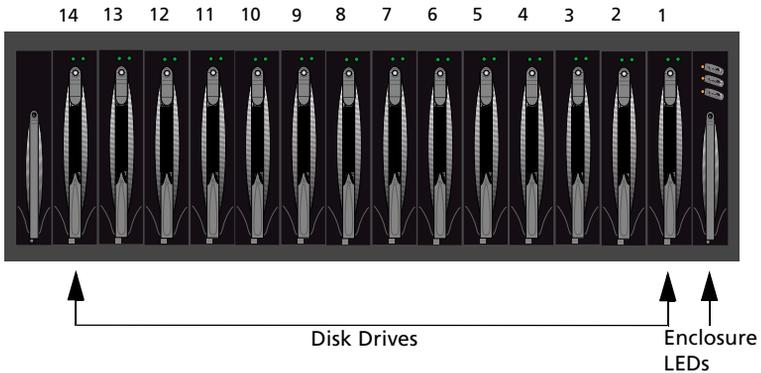Fan1

Fan2
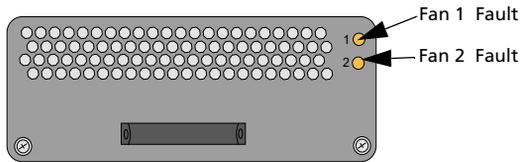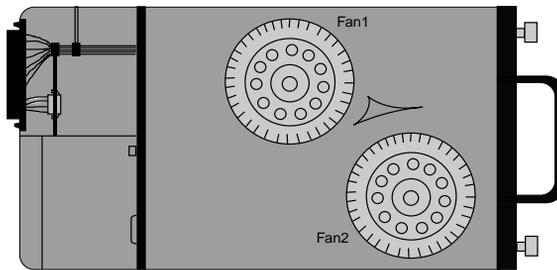
Fan Location within ACM

5 Installing and removing components

This chapter describes the procedures for installing and removing the replaceable components in the Altos S300 series.

Location of the Components

Warning! The module handles are to facilitate the easy insertion and removal of the modules, they should not be used to lift and/or carry the enclosure.

| 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

Disk Drives

Enclosure LEDs

ACMs

Fans 3 & 4

Fans 1 & 2

PSU 2

PSU 1

I/O Module

Power Supplies

I/O Module

Installing and removing a disk drive carrier

The disk drive carriers are located in the front of the enclosure. Follow these procedures to install and remove the disk drive carrier.

Push locking tab in this direction to open.

Cam Lever
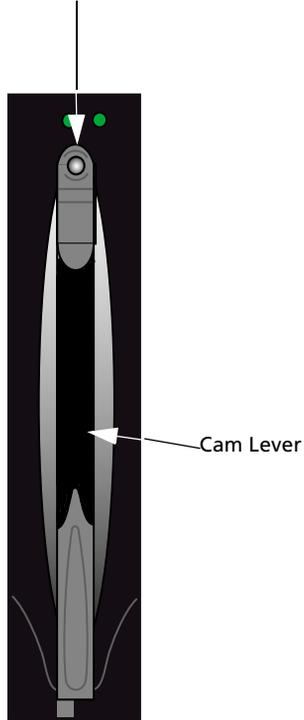
Installing a disk drive carrier

1. Select the disk drive slot into which the disk drive carrier is to be installed and remove the carrier blank, if there is one installed.

2. Orient the disk drive carrier such that the LEDs are on the top.

3. With the cam lever fully open, slide the carrier into the slot until the lever starts to close (see figure on page 48).

4. Fully close the cam lever. The lever is fully closed, and the drive locked in place, when the lever **clicks** into position.

Removing a disk drive carrier

1. Using your finger, release the locking tab by pressing it in the direction shown on page 48, and pull the cam lever towards you.

2. Fully open the cam lever (approximately 90° to enclosure).

3. With the cam lever open, wait for at least one minute to allow the disk drive to spin down fully before removing it.

4. Gently, pull the disk drive carrier out of the enclosure.

Caution: Immediately replace the disk drive carrier or install a disk drive carrier blank to maintain correct airflow.

Note: This procedure applies to installing and removing the front enclosure LED module also.

Installing and removing a power supply

The power supplies are located in the rear of the enclosure. Follow these procedures to install and remove the power supplies.
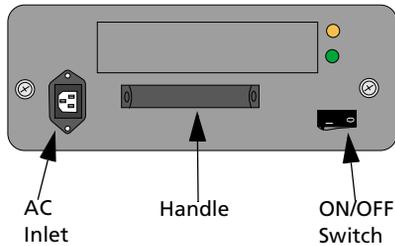
Installing a Power Supply

1. Select the power supply slot into which the power supply is to be inserted.

2. Orient the power supply, such that the LEDs are on the right.

3. Gently slide the power supply into the empty power supply slot.

4. Secure in place using the two fixing screws (torque setting 0.3Nm).

5. Install the power cable into the power connector.

Removing a Power Supply

1. Turn off the power supply using the switch located on the power supply unit, and remove the power cable.

2. Loosen the two fixing screws.

3. Using the power supply handle, gently slide it out of the enclosure.

   Caution: Immediately replace the power supply carrier after removal to maintain correct airflow.

Installing and removing an advanced cooling module (ACM)

The advanced cooling modules are located in the rear of the enclosure. Follow these procedures to install and remove the advanced cooling modules.
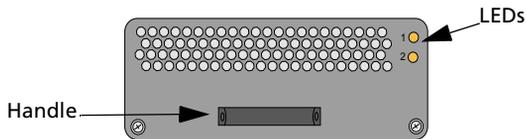
Warning! Fans continue to rotate after removal of power from the ACM for approximately fifteen (15) seconds.

Installing an advanced cooling module (ACM)

1. Select the advanced cooling module slot into which the module is to be installed.

2. Orient the module, such that the LEDs are on the right.

3. Gently slide the ACM into the empty ACM slot.

4. Secure in place using the two fixing screws (torque setting 0.3Nm).

Removing an advanced cooling module (ACM)

1. Loosen the two fixing screws.

2. Using the advanced cooling module handle, gently slide it out of the enclosure.

    Caution: Immediately replace the ACM after removal to maintain correct airflow.

Installing and removing an I/O option module

The I/O option modules (ESM and TSM) are located in the rear of the enclosure. Follow these procedures to install and remove the module.

Installing an I/O option module

1. Power off the host system and enclosure.
2. Gently insert the I/O option module into the slot.
3. Secure in place using the two fixing screws (torque setting 0.3Nm).
4. Connect the cables as described in page 17.

Removing an I/O option module

1. Power off the host system and enclosure.
2. Disconnect all cables connected to the I/O module to be removed.
3. Loosen the two fixing screws.
4. Using the module handle, gently slide the I/O option module out of the slot.

Appendix A: Technical specifications

This appendix lists the general specifications of Altos S300.

System

- Drives per enclosure : Maximum of 14 drives

Redundant components

- Two Environmental Services blocks located on the I/O modules (one on each).
- Two power supplies.
- Two advanced cooling modules.
- One front LED module.
- Up to 14 disk drives.
- Two independent power inlets.

Hot swappable components

- Two power supplies, removable from the rear.
- Two advanced cooling modules, removable from the rear.
- One front LED module, removable from the front.
- Up to 14 disk drives, removable from the front.

Cable lengths supported

The **total** external cable length[1] supported is 10 meters total for a Altos S300 series enclosure in Ultra-3 LVD and Ultra-160/m LVD.

Physical dimensions

- Rack enclosure
  - Height: 5.22 inches (13.3cm)
  - Width: 17.5 inches (44.5cm)
  - Depth: 20 inches (50.8cm)
  - Weight: 75 lbs (34kg) maximum

Warranty

- Three (3) years

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[1] Total external cable length means that the sum lenght of all external cables should not exceed 10 meters (e.g. 1x10m, 2x5m, etc.).

Monitoring

Temperature, advanced cooling modules, power supplies, disk drives, and I/O option modules are all monitored by the Environmental Services block built into the ESM and TSM.

Disk Drives

• Support for 3.5" SCSI disk drives of 1.0" height

• Support for 10K RPM and higher (15K, 30W/slot peak)

Power supply

• AC power supply input

    • Input voltage: 85 - 264 VAC

    • Current rating: 10 - 5 Amps

    • Input frequency: 47 - 63 Hz

    • Maximum peak output power: 853 Watts

    • Maximum average output power: 673 Watts

Temperature

• Operating Temperature: 5°C to +40°C

• Storage Temperature: -40°C to +70°C

• Maximum rate of temperature change: 20°C per hour

Humidity

• Relative operating humidity: 10% to 80%, non-condensing

• Relative storage humidity: 10% to 95%, non-condensing

Altitude

• Operating Altitude: -61m to 3,047m (-200 to 10,000 feet)

• Storage Altitude: -61m to 12,187m (-200 to 40,000 feet)

Operational shock

Half sine shock: 3G half sine shock with a pulse duration of 11 milliseconds or less. No permanent damage will occur at or below this level.

Operational vibration

Sinusoidal vibration from 5 to 350Hz at 0.3G (0 to peak) at a sweep rate of 1/2 octave per minute. No permanent damage will occur at or below this level.

Regulatory and Agency Approvals

- Safety
  - NEMKO: CB Report
  - NEMKO: CB Certificate
  - NEMKO: Certification for NEMKO Mark
  - TUV: Report and GS Certification
  - UL: Report
  - CSA: Report / Certification
- Standards
  - UL 1950
  - EN 60950
  - IEC 60950
  - CSA 22.2 No 950
- EMC
  - FCC Part 15 Class A
  - Industry Canada: ICES-003 Class A
  - European Emission - EN55022 Class A
  - - Harmonics Currents/Voltage Fluctuations (EN61000-3-2, EN61000-3-3)
  - - DC Conducted (ETS300 386-2)
  - European Immunity - EN55024
  - BSMI CNS13438

- **VCCI V-2/01.04**

Appendix B: Safety statements

This appendix lists the safety statements of Altos S300.

The following are safety statements for Altos S300:

Caution: This equipment is intended only for installation in a restricted access location.

Achtung: Dieses Gerät sollte nur an einem Ort mit Zugangskontrolle installiert werden.

Försiktighet: Denna utrustning får endast installeras på ställe med begränsad åtkomst.

Varoitus: Laitteisto on tarkoitettu asennettavaksi ainoastaan sivullisilta suojattuun paikkaan.

Forsigtig: Dette udstyr er kun beregnet til installation i et område med begrænset adgang.

Obs: Dette utstyret er bare beregnet for installering på steder med adgangsbegrensning.

Caution: Allow disk drives and power supplies to reach room ambient temperature before powering on the shelf.

Achtung: Ehe Laufwerke und Netzteile an die Stromversorgung angeschlossen werden, sollten sie sich an die Raumtemperatur angepasst haben.

Försiktighet: Låt skivdrivenheter och strömtillförsel nå rumstemperatur innan strömförsörjningen slås på.

Varoitus: Ennen kuin kytket virran hyllyyn sijoitettuihin levyasemiin ja teholähteisiin, odota, että laitteet saavuttavat huoneiston lämpötilan.

Forsigtig: Sørg for, at drev og strømforsyninger har opnået rumtemperaturer, før strømmen tilsluttes hylden.

Obs: La diskstasjoner og strømforsyninger nå romtemperatur før du slår på strømmen til hyllen.

Caution: It is recommended that if interconnecting equipment resides within more than one equipment rack cabinet, these rack cabinets should be at the same ground potential.

Achtung: Befinden sich Verbindungselemente in mehr als einem Rack-Gehäuse, sollten die Racks dasselbe Massepotential aufweisen.

Försiktighet: Vi rekommenderar, om förbindelseutrustning finns i mer än ett utrustningshyllskåp, att dessa hyllskåp ligger på samma jordpotential.

Varoitus: Jos toisiinsa yhdistettyjä laitteita sijaitsee useammassa kuin yhdessä kehyksessä, on suositeltavaa sijoittaa kyseiset kehykset samalle tasolle.

Forsigtig: Hvis der i mere end ét udstyrsrackkabinet er indbyrdes forbundet udstyr, bør disse kabinetter have samme grundspænding.

Obs: Dersom sammenkoblingsutstyr er montert i mer enn ett kabinett i utstyrsrack, anbefales det at kabinettene blir montert slik at de har samme jordingspotensial.

Caution: Before attempting to install or remove any of the components, ensure that anti-static precautions have been taken. The minimum requirement is a properly grounded anti-static wrist strap and grounding wire.

Achtung: Vor dem Entfernen oder Installieren einer Komponente sollte sichergestellt werden, dass antistatische Vorsichtsmaßnahmen ergriffen wurden. Mindestanforderung sind ein ordnungsgemäß geerdetes Antistatik-Armband und ein Erdungskabel.

Försiktighet: Se till att antistatiska åtgärder vidtages innan någon av komponenterna installeras eller avlägsnas. Minimikravet är ett ordentligt jordat antistatiskt armband och jordledning.

Varoitus: Ennen komponenttien asentamista tai poistamista varmista, että antistaattisista varotoimenpiteistä on huolehdittu. Vähimmäisvaatimuksina on asianmukaisesti maadoitettu antistaattinen rannehihna ja maadoitusjohto.

Forsigtig: Før du forsøger at installere eller fjerne en af komponenterne, skal du tage antistatiske forholdsregler.

Minimumskravet er en korrekt jordet, antistatisk håndledsrem og en afleder.

Obs: Før det blir gjort forsøk på installere eller fjerne komponenter, må det tas forholdsregler for å avverge statisk elektrisitet. Minimumskravet er riktig jordet antistatisk håndleddstropp og jordingsledning.

Caution: When installing or removing a rackmount shelf, remove all power supplies and disk drives. It is recommended that you work with at least one other person when installing a disk shelf. This is necessary to prevent personal injury and damage to the shelf.

Achtung: Vor der Installation oder dem Entfernen eines Rackmontagefachs müssen alle Netzteile und Laufwerke entfernt werden. Es wird empfohlen, die Installation des Laufwerkfachs von mindestens zwei Personen vornehmen zu lassen. Dies ist notwendig, um Verletzungen bzw. Schäden am Fach zu vermeiden.

Försiktighet: När en utrustningshylla installeras eller avlägsnas ska all strömtillförsel bortkopplas och alla skivdrivenheter avlägsnas. Det rekommenderas att du arbetar med minst en person till när en skivhylla ska installeras. Detta är nödvändigt för att förhindra personliga skador och skador på hyllan.

Varoitus: Poista kaikki teholähteet ja levyasemat ennen hyllyn asentamista kehykseen tai poistamista kehyksestä. Levyhyllyä asennettaessa on suositeltavaa käyttää ainakin yhtä avustajaa. Tämä on välttämätöntä loukkaantumisten ja hyllyn vaurioitumisen välttämiseksi.

Forsigtig: Når en rackmonteret hylde installeres eller fjernes, skal al strømforsyning og alle drev fjernes. Det anbefales, at der mindst er én anden person til stede, når en drevhylde installeres. Det er nødvendigt for at undgå personskade og beskadigelse af hylden.

Obs: Når hylle for rackmontering blir installert eller fjernet, må alle strømforsyninger og diskstasjoner fjernes. Det anbefales at du arbeider sammen med minst én annen person når du installerer en diskhylle. Dette er nødvendig for å hindre personskade og skade på hyllen.

Caution: After removing the Module the resulting hole must be blocked by installing a blanking plate or by installing a replacement Module. Failure to do this can disrupt airflow and seriously reduce cooling.

Achtung: Nach dem Entfernen des Module muss die entstehende Lücke durch eine Blende oder durch die Installation eines anderen Module geschlossen werden. Wird dies nicht beachtet, kann es zu Unterbrechung der Luftzufuhr und zu stark verminderter Kühlung kommen.

Försiktighet: När en Module avlägsnas skall utrymmet som blir kvar blockeras genom att en blindplåt installeras eller genom att sätta in en ny Module. Ett allvarligt avbrott i luftflödet kan orsakas och därmed reducera kylningen om detta inte görs.

Varoitus: Module-valvontayksikön poistamisen seurauksena syntyvä aukko on peitettävä suojalevyllä tai asentamalla uusi valvontayksikkö entisen tilalle. Muussa tapauksessa ilmavirran kulku saattaa häiriintyä, mikä heikentää jäähdytystä merkittävästi.

Forsigtig: Når Module er fjernet, skal det hul, der opstår, dækkes. Det gøres enten ved at påsætte en udstanset plade eller ved at installere en anden Module til erstatning. Hvis du ikke gør det, kan det give forstyrrelser i luftstrømningerne og reducere afkølingen alvorligt.

Obs: Når en Module er fjernet, må hullet blokkeres ved å installere en maskeringsplate eller ved å sette inn en annen Module. Dersom dette ikke gjøres, kan det forstyrre lufttilstrømningen og gi sterkt redusert kjøling.

Warning! A possible shock hazard may exist in the area of the fan connection.

Vorsicht! Im Bereich des Lüftungsanschlusses besteht Stromschlaggefahr.

Varning! Det finns risk för elstötar i området runt fläktanslutningen.

Vaara! Tuuletinliitännän ympäristössä voi olla sähköiskun vaara.

Advarsel! Der er fare for stød i området, hvor ventilatoren er tilsluttet.

Advarsel! Det kan være en viss risiko for elektrisk støt i nærheten av tilkoblingspunktet for viften.

Index