aTCA-8505 Series

5U AdvancedTCA® Subsystem

User's Manual

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Using this Manual

Audience and Scope

This manual provides you with basic information about the premium ADLINK ATCA® chassis you selected. It also describes and illustrates how to install components to the chassis. This manual is intended for hardware engineers and/or system integrators with advanced knowledge in AdvancedTCA® configurations.

How this Manual is Organized

This manual is organized as follows:

Chapter 1 Introduction: Introduces the chassis features, specifications, and package contents.

Chapter 2 Hardware Information: Provides information on the chassis' physical features, dimensions, and pre-installed hardware components.

Chapter 3 Getting Started: Provides instructions on how to install components to the motherboard, access the BIOS Setup, and install an operating system.

Chapter 4 Chassis Maintenance: Provides information on how to remove and replace defective components to keep the chassis proper working condition.

Important Safety Instructions: Lists important NOTES, CUATIONS and WARNINGS users must observe when handling/operating equipment.

Warranty Policy: Presents the ADLINK Warranty Policy terms and coverages.

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Conventions

Take note of the following conventions used throughout this manual to make sure that you perform certain tasks and instructions properly.

NOTE: Additional information, aids, and tips that help you perform specific tasks.

IMPORTANT: Critical information that you MUST know and instructions that you MUST perform to complete a task.

WARNING: Information to prevent physical injury, data loss, component damage, program corruption etc. when trying to complete a specific task.

Related Documentation

The following product and/or software documentation may be used as reference when using the aTCA-8505 Series User's Manual:

- **aCMM-2000 User's Manual**: Provides information on the supported shelf management module. ADLINK Technology Inc., February 2007.

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Table of Contents

Table of Contents ..... **ix**

List of Figures ..... **xi**

1 Introduction **1**
- 1.1 Features 2
  - General Features 2
  - Ordering Information 2
- 1.2 Specifications 4
- 1.3 Package Contents 5

2 Hardware Information **7**
- 2.1 Physical Features 7
- 2.2 Mechanical Layout and Dimensions 9
- 2.3 Backplane and Bridge Board 11
  - Backplane 11
  - Bridge Board 13
  - Fan Boards 13
- 2.4 Cooling System 14
  - Fan Trays 14
  - Fans 15
  - Fan Control 17
  - Thermal Couple 17
- 2.5 Power System 18

3 Getting Started **19**
- 3.1 Installing ATCA® Boards 19
- 3.2 Installing Rear Transition Modules (RTMs) 22
- 3.3 Installing Shelf Management Modules 24
- 3.4 Powering Up the System 27
- 3.5 Managing the Chassis 29
  - aCMM-2000 Shelf Management Module 29
  - Serial Connection 30
  - LAN Connection 31
  - Thermal Couple 32

4 Chassis Maintenance **33**
- 4.1 Removing ATCA® Boards and RTMs 33

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4.2 Removing Shelf Management Modules 35
4.3 Removing and Replacing a Power Entry Module 36
4.4 Removing and Replacing Chassis Fan Trays 39
4.5 Removing and Replacing the Air Filter 43

Important Safety Instructions 45

Warranty Policy 47

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List of Figures

Figure 2-1: Front Panel 7
Figure 2-2: Rear Panel 8
Figure 2-3: Right Side View 8
Figure 2-4: Front Panel Dimensions 9
Figure 2-5: Side Dimensions 9
Figure 2-6: Top Dimensions 10
Figure 2-7: aTCA-8505 Series Installed in a Rack 10
Figure 2-8: cBP-5050 Backplane Layout 11
Figure 2-9: cBP-5050 Backplane Dimensions 12
Figure 2-10: aDB-1505 Bridge Board Layout 13
Figure 2-11: aDB-1506 Fan Board Layout 13
Figure 2-12: Delta FFC0912D-F00 Fan Dimensions 15
Figure 2-13: Delta AFb1512EH-4L49 Fan Dimensions 16

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1 Introduction

The aTCA-8505 Series is a 5U AdvancedTCA® rackmount system with five slots that support AdvancedTCA® modules and two slots that support two shelf management modules. Equipped with a 5-slot full mesh topology fabric interface and standard rear transition module (RTM) slots, the aTCA-8505 Series comes with dual, hot-swappable fan trays and dual -48 V DC power entry modules capable of filtering and monitoring up to 1200 watts of power.

Providing robust control, monitoring, and management of the aTCA-8505 Series is the optional aCMM-2000 module, a dual Pigeon Point Systems shelf manager (ShMC) that is designed to work in active or standby mode for efficient redundancy. With dual-IPMB buses and I2C in system buses, the aCMM-2000 can control all installed AdvancedTCA® blades and fan trays based on temperature and other built-in sensor readings.

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1.1 Features

General Features

- 19” rackmount with 5U height and 15.3” depth
- 5-slot full mesh topology fabric interface
- 5-slot standard rear transition module (RTM)
- Dual-IPMB bus
- Two I2C-controlled hot-swappable fan trays
- Two shelf manager slots for PPS-based ShMC
- Two power entry modules with -48 V DC

Ordering Information

aTCA-8505:
5U 5-slot Rackmount AdvancedTCA® system



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aTCA-8505A:
5U 5-slot Rackmount AdvancedTCA® system with single aCMM-2000 shelf management module



aTCA-8505AA:
5U 5-slot Rackmount AdvancedTCA® system with two aCMM-2000 shelf management modules



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1.2 Specifications

Form Factor	• 19” rackmount, 5U height, 15.3” depth • Fits inside a 600 mm-deep cabinet
Specification	• Supports up to five standard AdvancedTCA® blades and RTMs • Supports up to two shelf management modules
Shelf Management *(available only on selected models)*	Active/Standby mode for high availability Supports multiple management interfaces including: • Remote Management Control Protocol (RMCP) • Remote Procedure Call (RPC) • Simple Network Management Protocol (SNMP) • Command Line Interface (CLI) • Web-Base Interface Dual-10/100BASE-T Fast Ethernet ports and one serial console for management access
Cooling System	• Two hot-swappable I2C controlled fan trays • Right to left transverse airflow • Reusable and replaceable air filter
Backplane	• Dual-star topology base interface • Full mesh topology fabric interface • Updated channels for active/standby synchronization • Dual-IPMB bus
Power Filter	Dual -48 V DC power entry modules with redundancy Two fan trays with microswitch LED indicators
Weight (barebone)	8 kg (17.6 lb.)
Temperature	• Operating: 0° C to 50° C (depending on configuration) • Storage: -20° C to 80° C
Humidity	5% to 95%, non-condensing
Dimensions	19” x 5U x 15.3” (W x H x D)
Compliance	AdvancedTCA® Specification PICMG® 3.0 R2.0
Certifications	CE, FCC, designed for NEBS Level 3

NOTE: Specifications are subject to change without notice.

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1.3 Package Contents

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from the dealer before returning any product to ADLINK.

The following contents are included in the shipping carton:

- aTCA-8505 Series subsystem
- One/Two aCMM-2000 shelf management modules *(for aTCA-8505A and aTCA-8505AA models only)*
- Accessory package
  - Air Filter
  - Rackmount Handles
  - Retention Screws
- User's Manual

NOTE: aTCA-8505 Series subsystems **DO NOT** include front or rear slot filler panels. Front and rear slot filler panels are commercially available and may be purchased separately.



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2 Hardware Information

This chapter provides information on the physical features, dimensions, and pre-installed hardware components of aTCA-8505 Series subsystem.

2.1 Physical Features

NOTE: The following illustrations show a fully-configured aTCA-8505 Series chassis and are intended only for reference. The figures may not represent the actual chassis.

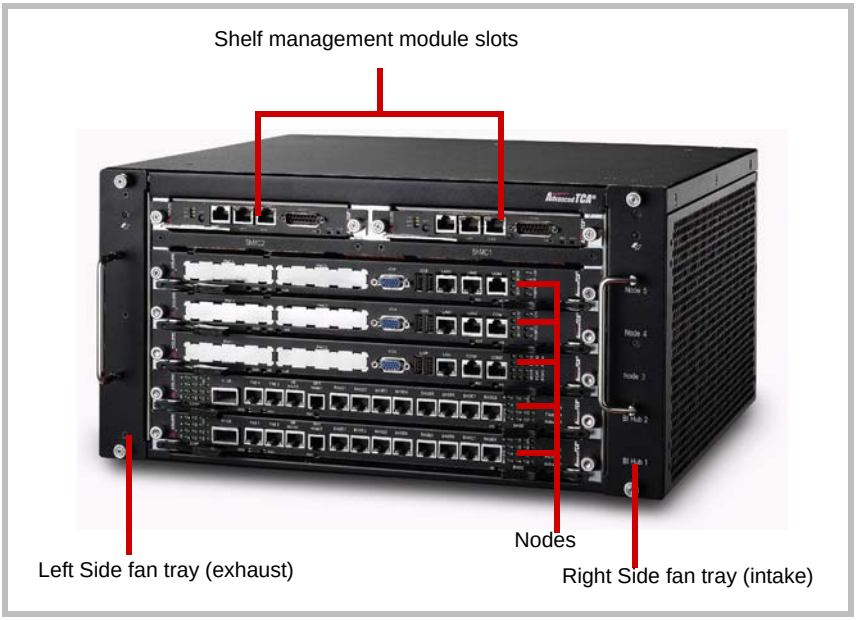


Figure 2-1: Front Panel

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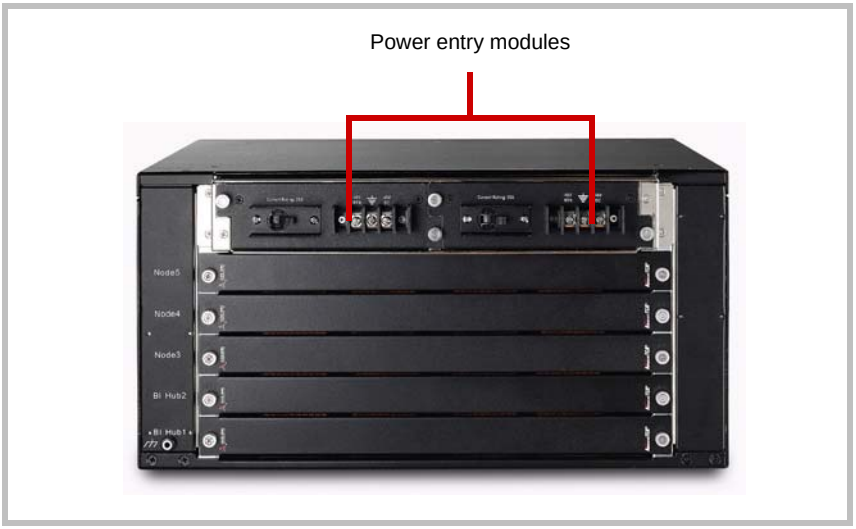


Figure 2-2: Rear Panel

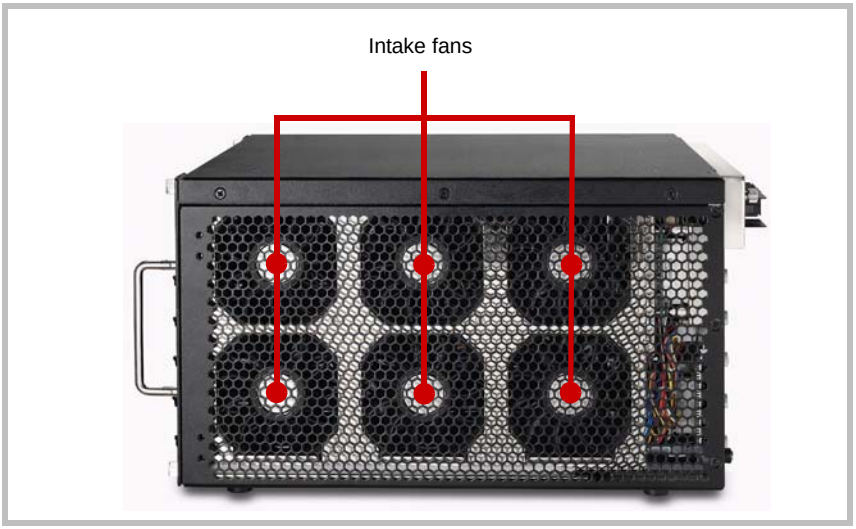


Figure 2-3: Right Side View

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2.2 Mechanical Layout and Dimensions

The following illustrations show the mechanical layout and dimensions of aTCA-8505 Series subsystem chassis.

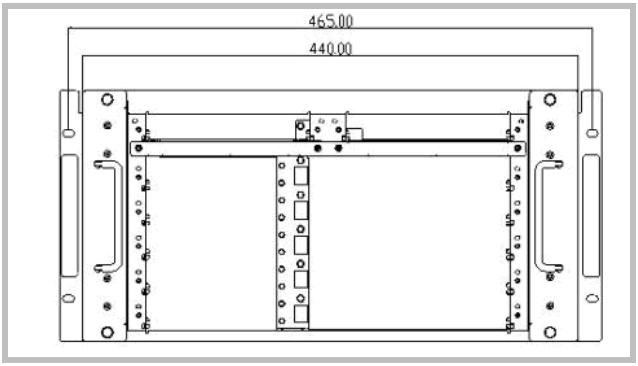


Figure 2-4: Front Panel Dimensions

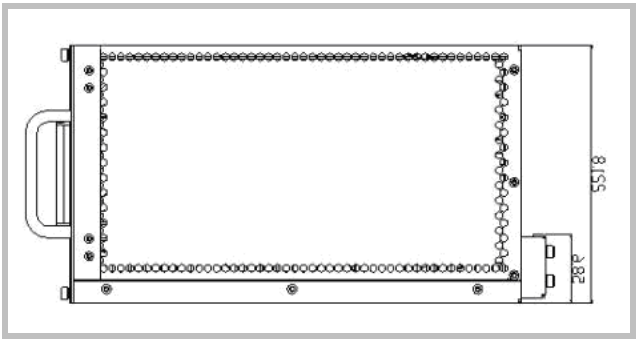


Figure 2-5: Side Dimensions

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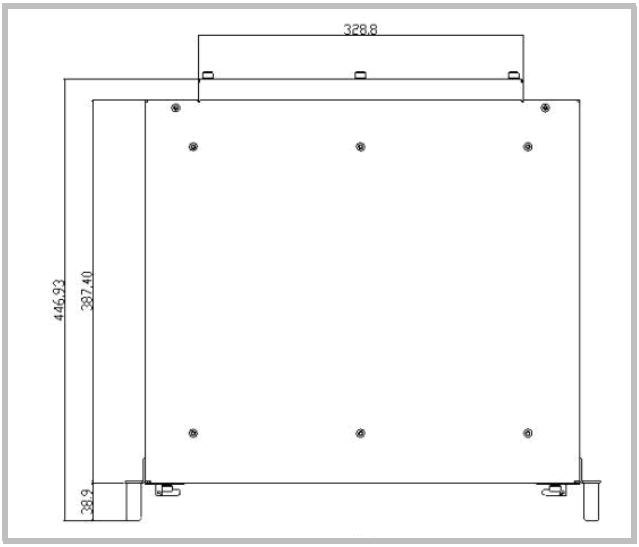


Figure 2-6: Top Dimensions

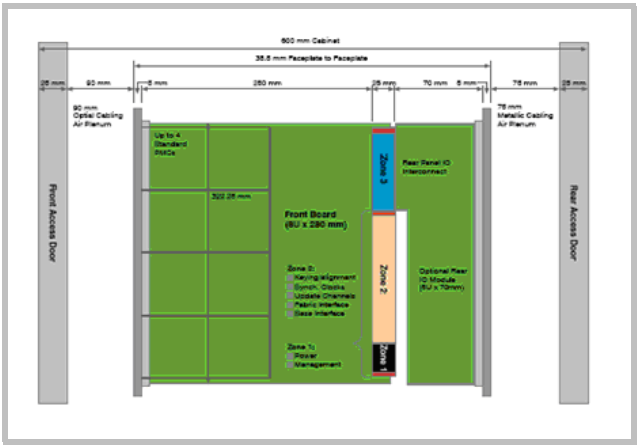


Figure 2-7: aTCA-8505 Series Installed in a Rack

2.3 Backplane and Bridge Board

Backplane

The aTCA-8505 Series subsystem comes with the cBP-5050 backplane featuring five AdvancedTCA® slots that support rear I/O functionality.

Features

- Dual-star topology base interface
- Full mesh topology fabric interface
- Updated channels for active/standby synchronization
- Dual-IPMB bus

Specifications

- AdvancedTCA®-compliant
- PICMG® 2.0 Advanced TCA® core specification R3.0
- PICMG® 2.1 Advanced TCA® hotswap R2.0
- PICMG® 2.5 Advanced TCA® Computer Telephony R1.0

Layout

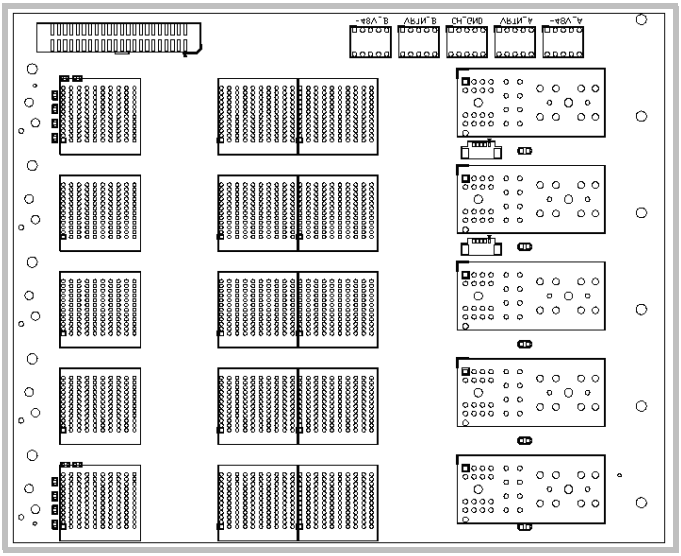


Figure 2-8: cBP-5050 Backplane Layout

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Dimensions

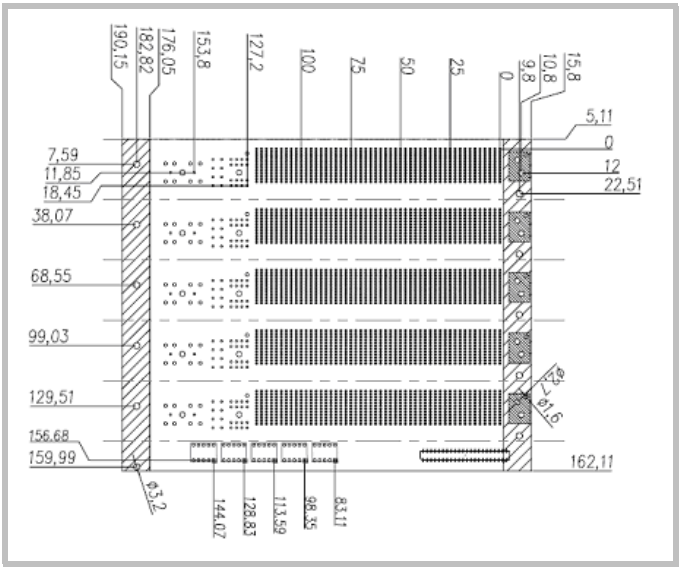


Figure 2-9: cBP-5050 Backplane Dimensions

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Bridge Board

The aDB-1505 bridge board, pre-installed in the aTCA-8505 Series, is designed for aCMM-2000 shelf management modules.

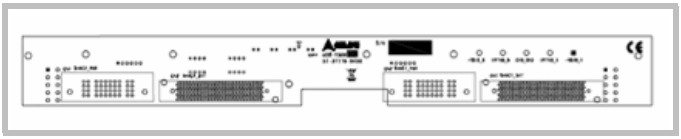


Figure 2-10: aDB-1505 Bridge Board Layout

Fan Boards

Providing the interface connectors for the fan tray modules are two aDB-1506 fan boards. The fan boards connect the right fan tray module (six fans) for air intake and the left fan tray module (two fans) for exhaust. Refer to section 2.4 for details on the aTCA-8505 Series thermal system.

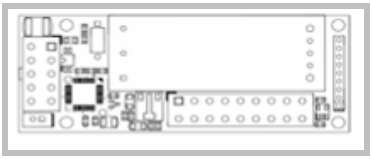


Figure 2-11: aDB-1506 Fan Board Layout

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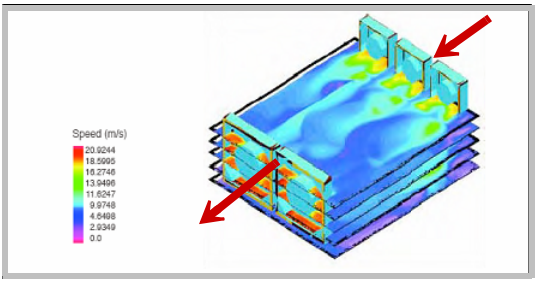
2.4 Cooling System

Fan Trays

The aTCA-8505 Series subsystem chassis is equipped with several fans to provide optimum cooling for AdvancedTCA® peripherals. There are two front-access, hot-swappable fan tray modules located at the left and right of the chassis. The right side intake fan tray module comes with a replaceable air filter.

NOTE: Refer to Chapter 3 for details on removing and replacing fan tray air filter.

The simulation diagram illustrates airflow information inside the aTCA-8505 Series chassis.



Fans

The right side fan tray module houses six Delta FFC0912D-F00 fans, while the left side fan tray module houses two Delta AFb1512EH-4L49 fans.

Specifications and dimensions

Left-side fans

Rated voltage	12 V DC
Operating voltage	7.0 to 13.8 V DC
Input current	0.88 A (1.05 A max)
Input power	10.56 W (12.60 W max)
Speed	5000 rpm (ref.)
Maximum airflow (at zero static pressure)	2.832 m^3/minute (2.549 m^3/minute minimum) 100 CFM (90.02 CFM minimum)
Maximum air pressure (at zero airflow)	14.40 mmH_20 (11.66 mmH_20 minimum) 0.567 $inchH_20$ (0.459 $inchH_20$ minimum)
Acoustical noise (average)	58.0 dBa (62.0 dBA maximum)
Insulation type	UL Class A

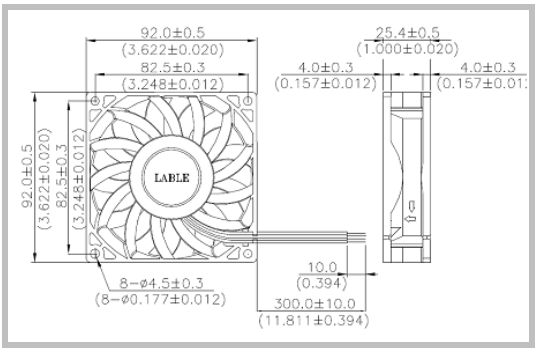


Figure 2-12: Delta FFC0912D-F00 Fan Dimensions

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Right side fans

Rated voltage	12 V DC
Operating voltage	10.0 to 13.2 V DC
Input current (average)	3.6 A (4.32 A max)
Input power	43.2 W (51.84 W max)
Speed	4300 rpm (ref.)
Maximum airflow (at zero static pressure)	8.230 m^3/minute (7.410 m^3/minute minimum) 290.64 CFM (261.68 CFM minimum)
Maximum air pressure (at zero airflow)	20.85 mmH_20 (16.89 mmH_20 minimum) 0.821 $inchH_20$ (0.665 $inchH_20$ minimum)
Acoustical noise (average)	61.5 dBa (65.5 dBA maximum)
Insulation type	UL Class A

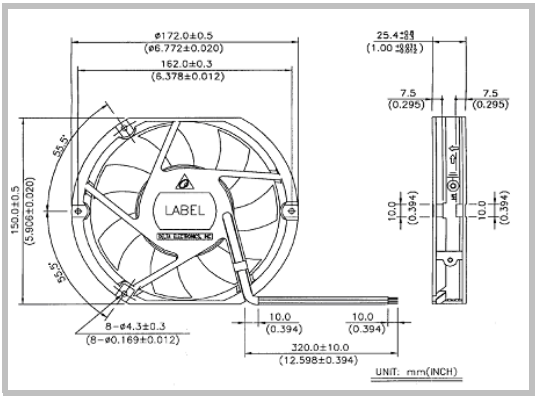


Figure 2-13: Delta AFb1512EH-4L49 Fan Dimensions

Fan Control

By default, the aCMM-2000 controls the fan tray modules at regular speed (Fan Level 8). The aCMM-2000 detects and adjusts the fans' speed based on two temperature sensors located inside the chassis.

Criteria	Fan Level
Lower than 30º C	8
Higher than 30º C	12
Higher than 40º C	15

Thermal Couple

The aTCA-8505 Series integrates two thermal couples located internally on the left and right side of the chassis cabinet. The aCMM-2000 can detect these sensors and automatically adjust fan speed to its proper level.

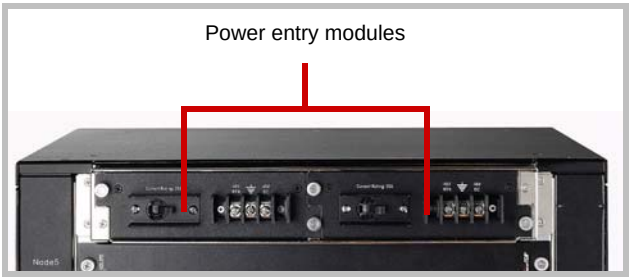
Criteria	Fan Level
Lower than 30º C	8
Higher than 30º C	12
Higher than 40º C	15

The system administrator may use the clia command (e.g. clia fans) to verify the fan level via the aCMM-2000.

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2.5 Power System

The aTCA-8505 Series comes with two Power Entry Modules (PEMs) that support hotswap operations.



NOTE: Refer to Chapter 3 for details on power connections and information on how to remove and reinstall PEMs.

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3 Getting Started

This chapter provides information on how to install components to the aTCA-8505 Series subsystem chassis.

3.1 Installing ATCA® Boards

The aTCA-8505 Series is designed with five slots that support ATCA® boards, modules, and controllers. ATCA® connectors are rigid and require careful handling and proper installation. ATCA® boards are equipped with locking handles and retention screws for easy installation and removal.

WARNING: Improper installation of ATCA® boards may damage the backplane.



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Installing an ATCA® controller board:

1. Check if all components are properly installed on the ATCA® controller board including the CPU, heatsink, and memory modules
2. Position the ATCA® board into the slot, then carefully slide its edges into the board guide rail. Make sure that the board is correctly aligned with the chassis to prevent damage to the board and/or backplane.



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3. Push the board into the slot until the handles come in contact with the chassis and the metal tacks insert into the chassis holes.
4. Push the handles inward until they ‘click’ in place.



5. Fasten the retention screws (turning in a clock-wise direction) on both sides of the board to secure it in place.



NOTE: To remove and replace an ATCA® board, refer to section 4.1.

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3.2 Installing Rear Transition Modules (RTMs)

Because RTMs are shorter than front boards, pay close attention when inserting or removing RTMs.

NOTE: Only models with an "R" at the end of the model number support RTMs.

1. Face the rear of the aTCA-8505 Series subsystem chassis to access the RTM slots.
2. Position the RTM into the slot, then carefully slide its edges along the slot guide rail. Make sure that the module is correctly aligned with the chassis to prevent damage to the module and/or backplane.

.



3. Push the module into the slot until the handles come in contact with the chassis and the metal tacks insert into the chassis holes.

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4. Push the handles inward until they ‘click’ in place. Fasten the retention screws (turning in a clock-wise direction) on both sides of the board to secure it in place.



NOTE: To remove and replace an RTM, refer to section 4.1.

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3.3 Installing Shelf Management Modules

The aCMM-2000 fits the shelf management module slot in aTCA-8505 Series chassis. The aCMM-2000 module facilitates tool-less installation with built-in retention screws and a locking lever.

NOTE: aTCA-8505 **DOES NOT** come with aCMM-2000 modules. This product has two shelf management module slot covers. To install aCMM-2000 modules, the slot covers must first be removed by locating and turning its retention screws counterclockwise.

aTCA-8505A comes with one aCMM-2000 module installed in ShMC slot 1 and a module slot cover installed in ShMC slot 2.

aTCA-8505AA comes with two aCMM-2000 pre-installed in ShMC slots 1 and 2.

When installing aCMM-2000 module(s) carefully hold the module on its edges and do not force the module into the slot to avoid component damage.

To install an aCMM-2000 module:

1. Locate the shelf management module slot.

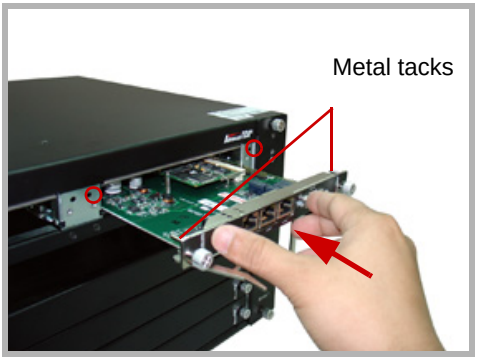


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2. Insert the aCMM-2000 module in the slot with the rear end of the module first.



3. Push the module into the slot until the module metal tacks are engaged with the chassis holes.



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4. Push the locking lever inward to set the module in place.



5. Turn the retention screws in a clockwise direction to tighten and secure the module.



The aCMM-2000 powers up instantly and the ACT LED lights up green. When two aCMM-2000 modules are installed, the ACT LED of the backup module blinks.

NOTE: To remove and replace an RTM, refer to section 4.2.

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3.4 Powering Up the System

After installing all necessary components, connecting cables, and peripherals, you are now ready to power up the system. The aTCA-8505 Series comes with two power entry modules (PEMs) that connect to the ADLINK aPRS-1120 (AC-DC Power Converter Equipment).

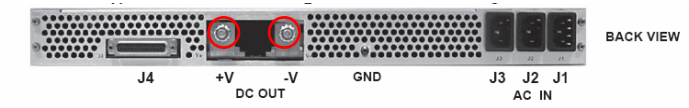
NOTE: The ADLINK aPRS-1120 (AC-DC Power Converter Equipment) is purchased separately.

The ADLINK aPRS-1120 accessory package includes two color-coded, one-meter length terminal wires. You will use these to connect the PEMs to the power converter.

WARNING: Before connecting the PEMs to the power converter, make sure that the PEMs are properly installed in the chassis and the PEM switches are turned off.

To connect the aTCA-8505 Series PEM to the power converter:

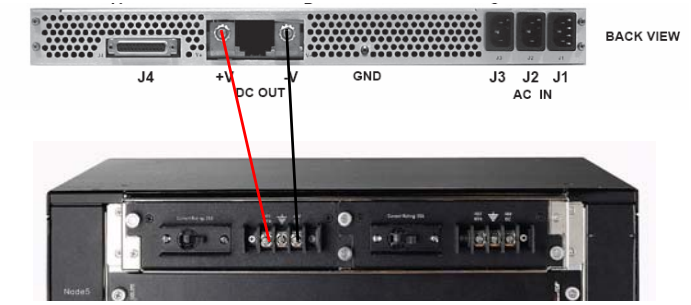
1. Loosen the aPRS-1120 DC OUT +V and -V terminal screws.



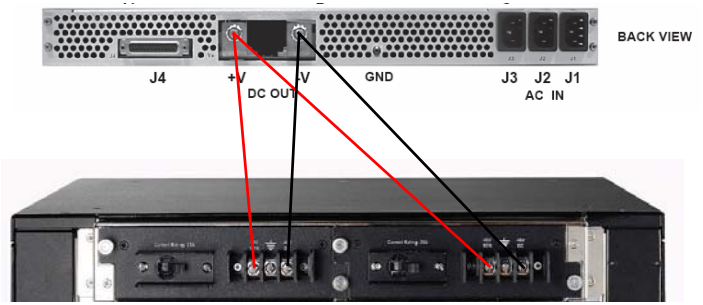
2. Connect the red wire to the +V terminal and the black wire to the -V terminal.

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3. Connect the other end of the red wire to the -48 V RTN terminal of the PEM, then connect the other end of the black wire to the -48 V DC terminal of the PEM. Refer to the following illustration.



When using dual-PEMs, use two sets of red and black wires to connect the power converter to the PEMs. Refer to the illustration below:



4. Check the aPRS-1120 configuration. If the power converter comes in default configuration (single 1200 W power supply unit), connect the AC power cord to the J2 connector.
5. Connect the other end of the AC power cord to a wall socket or power strip, then turn on the PEM switch(es) and all required peripherals.

NOTE: To remove and replace a power entry module, refer to section 4.3.

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3.5 Managing the Chassis

aCMM-2000 Shelf Management Module

The aTCA-8505A/aTCA-8505AA come with one/two aCMM-2000 shelf management module(s). The aTCA-8505AA is capable of providing redundant chassis management function.

NOTE: Without an installed aCMM-2000 module, all fans on both left and right fan tray modules rotate at full speed (Level 15).

To access fan, temperature, ATCA® board FRU (field replaceable unit), and power information, the installed aCMM-2000 must be connected to a host computer:

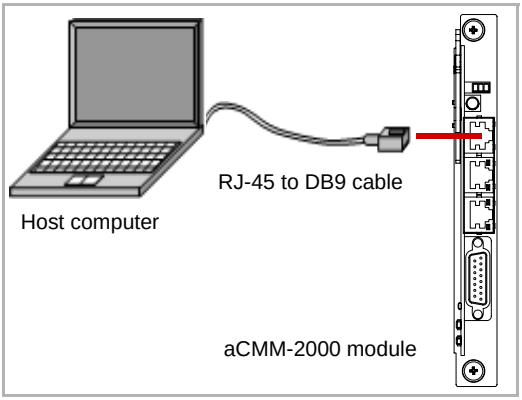
- serially using an RJ-45 to DB9 cable (bundled in the aCMM-2000 package),
- over a LAN using a standard RJ-45 cable, or
- network switch or hub.

Refer to the following sections for more information.

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Serial Connection

You may use the bundled RJ-45 to DB9 cable to connect the chassis serially to the host computer. Refer to the illustration below.



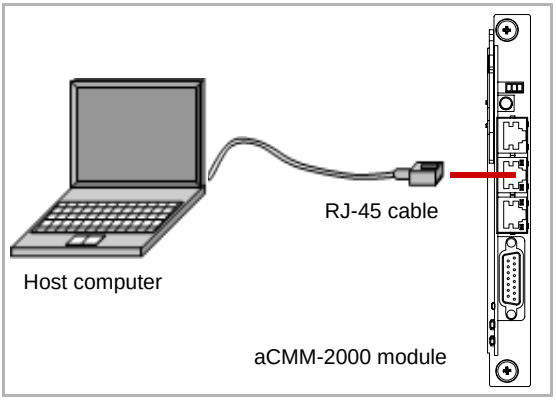
The aCMM-2000 COM port is set with the following parameters:

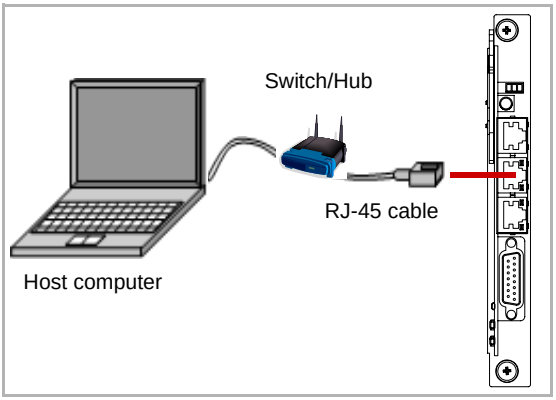
Type	RS232 (COM)
Baud Rate	115200bps
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

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LAN Connection

With Fast Ethernet bandwidth, you may connect the aCMM-2000 directly to a notebook or PC using an RJ-45 cable or to a network switch or router for high-speed remote management. Refer to the following illustrations.





By default, the LAN1 port has the following settings:

IP	172.16.13.201
Login name	root
Password	None

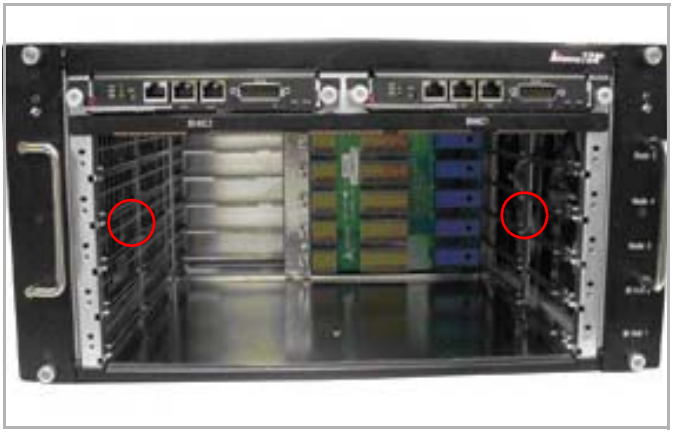
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Thermal Couple

The aTCA-8505 Series comes with two thermal couples installed on the internal left and right sides of the chassis. The aCMM-2000 automatically detects these sensors and dynamically adjusts the fans' speed depending on the chassis temperature.

Chassis Temperature	Fan Level
Lower than 30° C	8
Higher than 30° C	12
Higher than 40° C	15

System administrator may use the clia command (e.g. clia fans) to verify the fan speeds detected and adjusted by the aCMM-2000 module. The location of the aTCA-8505 Series thermal couple sensors is shown here.



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4 Chassis Maintenance

This chapter provides information on how to remove and replace defective components to keep the aTCA-8505 Series in best working condition.

WARNING: Turn off the aTCA-8505 Series power entry module before removing or replacing any component(s). Failure to do so may result in electrical shock and/or component damage.

4.1 Removing ATCA® Boards and RTMs

This section describes how to remove ATCA® boards and RTMs from the aTCA-8505 Series.

To remove an ATCA® board or RTM module:

1. Loosen the retention screws on both sides of the board/module.
2. Unlatch the ATCA® board/RTM handles by pulling them outward until the board/RTM disengages from the chassis.



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3. Carefully pull the board/RTM out from the chassis, then store in a safe place.



4. Install a front slot filler panel (not included, commercially available) if necessary.



NOTE: To install an ATCA® board, refer to section 3.1. To install an RTM, refer to section 3.2.

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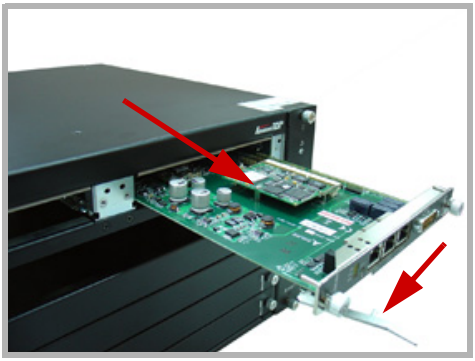
4.2 Removing Shelf Management Modules

To remove the aCMM-2000:

1. Loosen the retention screws located on both sides of the module.



2. Pull the module locking lever outward until the card disengages from the chassis.
3. Pull the module out from the slot, then store in a safe place.



NOTE: To install a shelf management module, refer to section 3.3.

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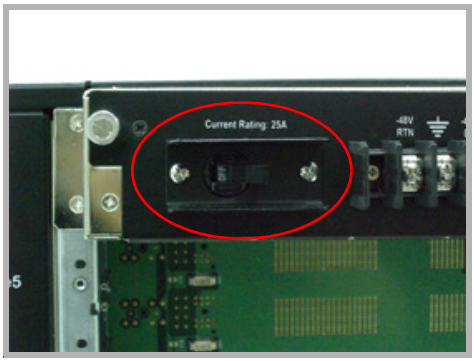
4.3 Removing and Replacing a Power Entry Module

This section provides information on how to remove and replace a defective power entry module (PEM).

WARNING: Turn off the power entry module(s) and the power converter before removing or replacing. Failure to do so may result in electrical shock or damage to equipment.

To remove a PEM:

1. Turn off the power entry module switch and the power converter.



2. Disconnect the wires from the -48 V DC and -48 V RTN terminals. Refer to section 3.4.
3. Loosen the retention screws on both sides of the module.



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4. Pull the module carefully out from the chassis, then store in a safe place..



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To replace a PEM:

1. Position the module on the PEM slot.
2. Insert the PEM into the slot along the guide rails, then push until it is completely flush with the slot opening.



3. Tighten the retention screws on both sides of the module to secure it in place.



4. Connect the PEM to the power converter. Refer to section 3.4.

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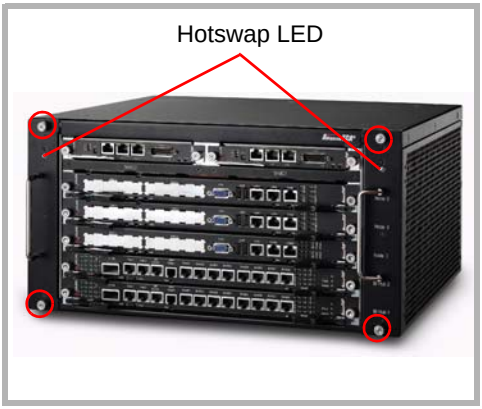
4.4 Removing and Replacing Chassis Fan Trays

This section provides information on how to remove and replace chassis fan trays which can be accessed from the chassis front panel. The fan trays are hot-swappable and may be replaced while the chassis is operating.

NOTE: To replace individual fan modules, contact ADLINK or your local distributor.

To remove the right-side intake or the left-side exhaust fan tray:

1. Loosen the retention screws on the top and bottom of the fan tray handles. The hotswap LED on the tray bezel lights up blue to indicate that the fan tray(s) is being replaced.



WARNING: Wait at least five seconds or until all fans stop rotating before removing fan trays to avoid injury.

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2. Pull the tray handle until the fan tray disengages from the fan board and the chassis.





3. Store fan tray in a safe place.

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Replacing the right-side intake and left-side exhaust fan trays:

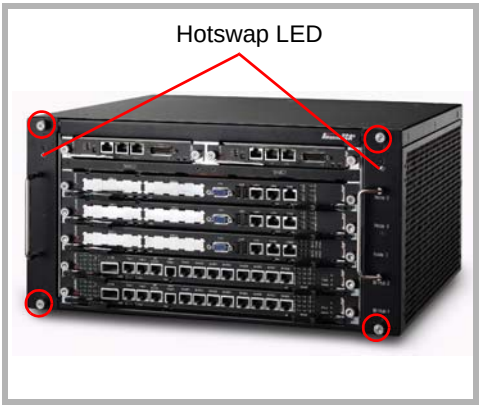
1. Line up the module at the fan tray opening. Insert the fan tray module and push it in until it is completely flush to the slot opening and connects to the fan board. The fan tray module hotswap LED will light up blue to confirm proper installation.





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2. Tighten the retention screws on the top and bottom of the fan tray handles to secure the module(s).



3. The hotswap LED turns off and the fans start to rotate.

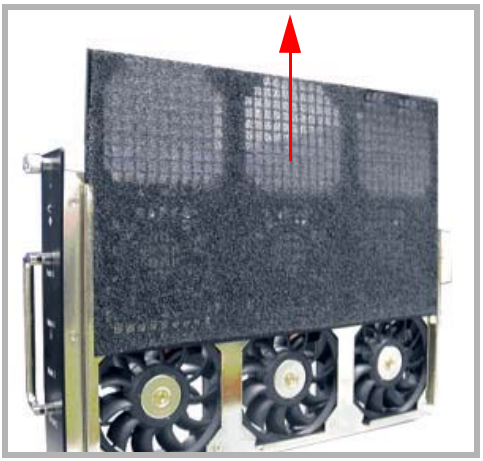
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4.5 Removing and Replacing the Air Filter

The right-side intake fan tray comes with a reusable and replaceable air filter to keep dust and moisture from entering the chassis. The air filter must be cleaned or replaced regularly.

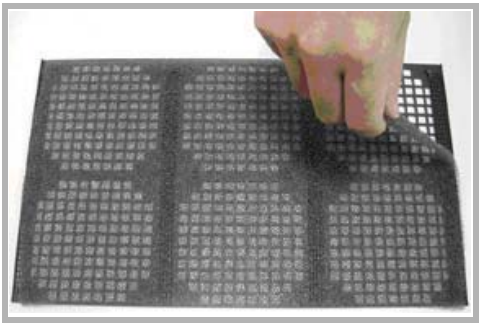
To remove and replace the air filter:

1. Remove the right-side fan tray module following the instructions from section 4.4.
2. Slowly pull up the air filter screen.

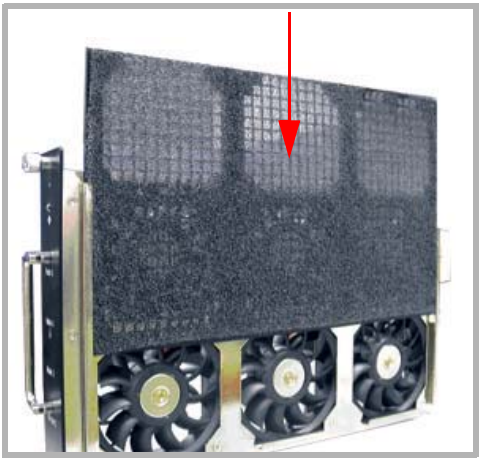


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3. Detach the air filter mat from the screen, then clean/ replace it.



4. Attach the cleaned/new air filter to the screen, then re-install it to the fan tray module.



5. Replace the fan tray module following the steps in section 4.4.

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Important Safety Instructions

Read and follow all instructions marked on the product and in the documentation before operating the system. Retain all safety and operating instructions for future use.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- The equipment should be operated in an ambient temperature between 0°C to 50°C.
- The equipment should be operated only from the type of power source indicated on the rating label. Make sure the voltage of the power source is correct when connecting the equipment to the power outlet.
- If the equipment has a voltage selector switch, make sure that the switch is set to the proper position for the area. The voltage selector switch is set at the factory to the correct voltage.
- For pluggable equipment, ensure they are installed near a socket-outlet that is easily accessible.
- Secure the power cord to prevent unnecessary accidents. Do not place anything over the power cord.
- If the equipment will not be in use for long periods of time, disconnect the equipment from the power outlet to avoid being damaged by transient overvoltage.
- All cautions and warnings on the equipment must be noted.
- Keep this equipment away from humidity.
- Do not use this equipment near water or a heat source.
- Place this equipment on a stable surface when installing to prevent injury.
- Never pour any liquid into the product to prevent fire or electrical shock.

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- Openings in the chassis are provided for ventilation. Do not block or cover these openings. Make sure there is adequate space around the system for ventilation when setting up the work area. Never insert objects of any kind into the ventilation holes.
- To avoid electrical shock, always unplug all power and modem cables from wall outlets before removing the system covers.
- A Lithium-type battery is provided for the real time clock.

  “CAUTION - Risk of explosion if battery is replaced by an incorrect type. Dispose used batteries as instructed.”

- The equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged.
  - Liquid has penetrated the equipment.
  - It has been exposed to moisture.
  - It is not functioning or does not function according to the user’s manual.
  - It has been dropped and damaged.
  - It has an obvious sign of breakage.
- Never attempt to fix the equipment. For safety reasons, the equipment should only be serviced by qualified personnel.

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Warranty Policy

Thank you for choosing ADLINK. To understand your rights and enjoy all the after-sales services we offer, please read the following carefully.

1. Before using ADLINK's products please read the user manual and follow the instructions exactly. When sending in damaged products for repair, please attach an RMA application form which can be downloaded from: http://rma.adlinktech.com/policy/
2. All ADLINK products come with a limited two-year guarantee, one year for products bought in China:
   - The warranty period starts on the day the product is shipped from ADLINK's factory.
   - Peripherals and third-party products not manufactured by ADLINK will be covered by the original manufacturers' warranty.
   - For products containing storage devices (hard drives, flash cards, etc.), please back up your data before sending them for repair. ADLINK is not responsible for loss of data.
   - Please ensure the use of properly licensed software with our systems. ADLINK does not condone the use of pirated software and will not service systems using such software. ADLINK will not be held legally responsible for products shipped with unlicensed software installed by the user.
   - For general repairs, please do not include peripheral accessories. If peripherals need to be included, be certain to specify which items you sent on the RMA Request & Confirmation Form. ADLINK is not responsible for items not listed on the RMA Request & Confirmation Form.

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3. Our repair service is not covered by ADLINK's guarantee in the following situations:
   - Damage caused by not following instructions in the User's Manual.
   - Damage caused by carelessness on the user's part during product transportation.
   - Damage caused by fire, earthquakes, floods, lightening, pollution, other acts of God, and/or incorrect usage of voltage transformers.
   - Damage caused by unsuitable storage environments (i.e. high temperatures, high humidity, or volatile chemicals).
   - Damage caused by leakage of battery fluid during or after change of batteries by customer/user.
   - Damage from improper repair by unauthorized ADLINK technicians.
   - Products with altered and/or damaged serial numbers are not entitled to our service.
   - This warranty is not transferable or extendible.
   - Other categories not protected under our warranty.
4. Customers are responsible for shipping costs to transport damaged products to ADLINK.

If you have any further questions, please E-mail our FAE staff: service@adlinktech.com.

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