



ActiveAir Manual



geistglobal.com



Table of Contents

Introduction	4
Welcome.....	4
About this Manual	7
Revision History.....	7
Organization of the Manual.....	7
Audience Profile.....	7
Online Documentation.....	8
Reporting Document Errors.....	8
Conventions.....	8
Software	8
Hardware	8
Safety	10
Figures	11
Tables	11
Chapter 1 - Product Specifications	12
Overview.....	12
Environmental	12
Temperature.....	12
Humidity	12
Elevation	13
Electrical	13
Electrical Specifications.....	13
Networking	13
Ethernet	13
Protocols	13
Regulatory Compliance	14
Underwriters Laboratories (UL).....	14
Federal Communications Commission (FCC).....	14
Chapter 2 - Pre-Installation	15
Rack Enclosure & Airflow Inspection Guidelines.....	15
Chapter 3 - Installation	17
Hardware.....	17
Parts List	17
Positioning the Chassis	18
Exhaust Duct Assembly	20
Install Host Controller	21
Install Fan Cartridges	22
Locate Pressure Sensor Hose	23
Host Controller Connections	24

Power Cord Retention	24
Front Panel Display	25
Initial Setup	26
Windows Configuration.....	26
MacOS X Leopard Configuration.....	26
Accessing Web Server.....	27
Web Interface Site Summary Page	29
Test & Configure Web Page.....	32
Fan Fail Test - Test & Configure Page	33
Admin Information	33
Accounts and Passwords	33
Setting up Row control for non-partitioned cabinets	35
Fan Control Settings	35
Assigning Friendly names	36
System Clock Configure Page	36
E-mail Configure Page	37
SNMP Configure Page	38
Test E-mail or SNMP - Test & Configure Page	38
Units - Test & Configure Page	39
Default Alarm Threshold Settings.....	39
System Threshold Settings	39
Remote Sensor Thresholds	40
Adjusting Settings & Enabling Alarms	41
Host controller reset to factory default IP address procedure.....	43
Firmware Updates.....	43
Chapter 4 - Final Checkout	44
Final Checkout.....	44
Accessories	44
Alternate Data Formats.....	44
Troubleshooting	44
Firmware Version.....	44
Service and Maintenance.....	44
Frequently Asked Questions	44
AA Capacity Meter Guideline.....	44
Checking Pressure Sensor Location.....	45
General & Physical Environment Questions	45
Cooling and Airflow Management	46
More Technical Support.....	49
Product-Specific Safety Notices.....	49
General Safety	49
Live Circuits Safety	49
Equipment Grounding	50
Electrostatic Discharge	50
Explosive Environment	50
Servicing and Adjustments	50
Repairs and Modifications	50

Introduction

Welcome

Notice to Users

Geist, a division of PCE, Inc., reserves the right to make changes to this document without notice to any user or reseller of this product. Geist, a division of PCE, Inc., also reserves the right to substitute or terminate distribution of this document, with no obligation to notify any person or party of such substitutions or terminations.

Copyrights

© 2017 - Geist, a division of
PCE, Inc. All Rights Reserved

Patents

U.S. Patent 9,681,587 - Geist, a division of PCE, Inc. All Rights Reserved

Trademarks

All Trademarks contained herein are registered to Geist, a division of PCE, Inc.

Use and Disclosure Restrictions

The software and documentation contained in this publication are copyrighted materials.

Recovery Act Buy American

Geist products adhere to the Buy American provisions of the American Recovery and Reinvestment Act of 2009 (Recovery Act). All Geist goods manufactured in our Lincoln, Nebraska, plant have undergone substantial transformation during production.

Trade Agreements Act (TAA)

Geist goods manufactured in our Lincoln, Nebraska, plant have undergone substantial transformation during production. These Geist products adhere to U.S. Trade Agreements Act and can be supplied for GSA Schedules and other government contracts.

Geist Policy on Conflict Minerals

This document details Geist's corporate policy regarding the use of conflict minerals. The policy expressed in this document should be considered to cover the Geist and Geist Europe divisions of PCE Inc.

Section 1502 of the Dodd-Frank Act which was passed by the US Congress in 2010 requires certain companies to annually disclose their use of conflict minerals. Conflict minerals covered under this act include tantalum, tin, tungsten, and gold.

Although Geist is not directly subjected to the requirements of the Dodd-Frank Act, Geist recognizes that all companies within the electronics manufacturing industry supply chain are impacted by this legislation. Geist supports the intent of the law, which is the reduction of violence within the Democratic Republic of the Congo and will take several actions to both advance the goals of the Dodd-Frank Act and to provide exceptional support to our customers.

- Geist will work with our direct suppliers to identify purchased components and materials that contain tin, tantalum, tungsten or gold.
- Geist will work with our direct suppliers to trace sources of any tin, tantalum, tungsten or gold used in our products back to the smelter.
- Geist will document our efforts to trace tin, tantalum, tungsten, and gold minerals back to the smelter and will accurately report the results to our customers.
- Geist will continue to monitor industry progress in identifying conflict-free smelters and will adjust corporate policy as the electronics supply chain becomes more fully documented.

Geist will not require that our direct suppliers source only conflict-free minerals until an adequate number of smelters has been reliably identified and audited by The Electronic Industry Citizenship Coalition (EICC) and the Global e-Sustainability Initiative (GeSI) to service the electronic industry supply chain. Mandating a conflict-free supply chain before an adequate number of smelters has been identified will prohibit the use of all tin, tantalum, tungsten, and gold originating in the Democratic Republic of the Congo and surrounding countries. This prohibition would cut off the sole income source for many artisanal miners within the region and may result in increased violence within the Democratic Republic of the Congo in direct opposition to the goals of the Dodd-Frank Act. Geist will work continuously with our direct suppliers in order to annually increase the percentage of documented conflict-free minerals that are used in our products until all products can be certified as conflict-free.

WEEE Declaration

Geist Europe is obligated to finance the cost of the collection, treatment, recovery and environmentally sound disposal of all products sold by Geist Europe into the UK market this includes:

- New WEEE (displaying 'the crossed out wheeled bin symbol') that Geist Europe has placed onto the market after the 13th August 2005.
- Historic WEEE (not displaying 'the crossed out wheeled bin symbol'), when Geist Europe is supplying new WEEE that is intended to replace the historic WEEE and is of equivalent type or fulfills the same function even if the historic WEEE was manufactured by a third party.

Please contact Geist Europe on 01823 275100 for further details or to arrange collection.
(UK Only)

Document Usage

All reasonable efforts have been made to assure the accuracy of this document from any technical or typographical errors or omissions. Geist, a division of PCE, Inc., and its affiliates disclaim responsibility for any labor, materials, or costs incurred as a result of usage of this document. Nor shall Geist, a division of PCE, Inc., and its affiliates be liable for any damages, inclusive of loss of profits or data, arising from the use of or in connection with this document.

Geist, a division of PCE, Inc., reserves the right to make changes to this document without notice to any user or reseller of this product. Geist, a division of PCE, Inc., also reserves the right to substitute or terminate distribution of this document, with no obligation to notify any person or party of such substitutions or terminations.

© 2017 - Geist, a division of
PCE, Inc. All Rights Reserved
Rev 06/30/2017

About this Manual

This document provides an overview of Geist product(s), the major topics covered include:

- Copyright, Trademarks, and Disclosure Restrictions.
- Instructions for installing, powering and using the equipment.
- Information that will aid in managing and maintaining the equipment.

Revision History

Revision	Date	Notes	Approved By
1.0	4/27/2008	Original Published Version	JB
1.1	6/18/2013	Updated Geist Branding	JB
1.2	3/11/2015	Updated ActiveAir Features	JB
1.3	3/10/2017	Updated Format	JB
1.4	6/30/2017	Updated Patent Information	JB

Organization of the Manual

This Geist document contains the following product information:

- Product Specifications - This chapter describes the major product characteristics and its functional role within the system. Where appropriate, reference to cabling among product components and to other Geist product(s) is provided.
- Pre-Installation - This chapter provides pre-installation information for the preparation and use of Geist product(s). Subjects discussed in this chapter must be considered prior to performing the installation of the Geist product.
- Installation - This chapter provides procedures required to adequately mechanically and electrically attach Geist product into supporting systems.
- Final Checkout - The final checkout/power-up procedures after product installation are provided in this chapter. The procedures in this chapter provide for an orderly system power-up sequence and ensure proper operation of this product.

Audience Profile

This document is intended for use by authorized technicians experienced with some of similar product types and for personnel requiring guidance for equipment installation, operation, maintenance, and support.

Online Documentation

This document is available online and within the corresponding [Geist Product Manuals](#). Additional Geist product supporting [Videos](#), [Product Literature](#) and [Case Studies](#) can be found on the [Geist Resource](#) page.

Product firmware updates can be found and downloaded from the [Geist Support](#) site, under [Firmware Updates](#).

Should this product fail within its warranty period and be in need of repair or replacement, a Return Material Authorization may be obtained on-line from the [RMA Form](#) link located within the [Geist Support](#) site.

Reporting Document Errors

Should you discover any error or identify a deficiency in this document, please take time to contact us at the following email address:

Geist-Documents@geistglobal.com

Please be sure to provide us with the document name, part number, and page number(s). Also please provide us with description of the error or the deficiency for the document. If you would like for us to contact you, please provide us with your name and contact information.

Thank you for your time. We appreciate any comments and feedback you can provide.

Conventions

The information contained within this document is established around the framework of various conventions, which are defined as follows:

Software

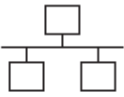

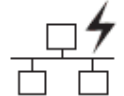














- Release Management: Product name, Version control ; (GU V 3.0.0)
 - Product Name: Name of Hardware Platform
 - Version control: V(ersion) Platform #, Major #, Minor #

Hardware

Product Classification

- Power Distribution Unit
 - Basic
 - Monitored only
 - Switched only
 - Monitored + Switched
- Environmental Monitoring
- Cooling
- Data Center Infrastructure Management (DCIM)

Figure 1 Overlay Symbology Guide

	Ethernet		Activity / Idle
	Power over Ethernet		Power
	Serial		Amps
	Remote Display		Reboot
	Remote Sensors		Silence
	Uplink		Scroll
	Temp		GU Right
	Sensor Configuration		GU Left
		GU Center	

The chart above depicts the symbols used on Geist overlays.

Safety

This document contains varying levels of alerts pertaining to product and user safety. The alerts are visually presented with graphics and text per Geist equipment guidelines.

The representations are:



DANGER

INDICATES AN **IMMINENT** HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN **DEATH OR SERIOUS INJURY**.



WARNING

INDICATES A **POTENTIAL** HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN **DEATH OR SERIOUS INJURY**.



CAUTION

INDICATES A **POTENTIAL** HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN **PRODUCT DAMAGE AND MINOR TO MODERATE INJURY**.



NOTE

Provides useful information that is beneficial for operation and usage of this product.

Figures

Figures presented in this document are identified and designated as follows:

'Figure:', Chapter # - Image #

Example:

Figure 1-1 Name and/or Title goes here



Tables

Tables presented in this document are identified and designated as follows:

'Table:', Chapter # - Image #

Example:

Table 1-1 Name and/or Title goes here

Column 1	Column 2	Column 3	Column 4	Column 5
Text	Text	Text	Text	Text
Text	Text	Text	Text	Text
Text	Text	Text	Text	Text
Text	Text	Text	Text	Text

Chapter 1 - Product Specifications

Overview

ActiveAir (AA) Containment Cooling is a pressure controlled system designed to eliminate bypass air and maintain rack to IT equipment airflow.

- Dual input power with auto-sensing logic.
- Auto-sensing 0-10, 0-20 kW or 0-30 kW redundant hot-swappable fan cartridges.
- Network capability for remote management and alarm notification through web or SNMP.
- Local display of status and alarm conditions.
- Floating connectors on host controller accept AA10, AA20 or AA30 fan cartridges.
- Modular and tool-less quick-swap enclosure.
- All cable connections retained or self-locking.
- Factory pre-set controls; install and connect to power for automatic operation.
- Web enabled and full SNMP communication for trending and alarms.
- AA Containment Cooling with optional Unity Cooling automates the entire data center cooling circuit.

Environmental

The operational environmental limits pertaining to Temperature, Humidity and Elevation are as defined below.

Temperature

Table 1-1 Temperature Limits

	Minimum	Maximum
Operating	10°C (50°F)	45°C (113°F)
Storage	-25°C (13°F)	65°C (149°F)

Humidity

Table 1-2 Humidity Limits

	Minimum	Maximum
Operating	5%	95% (non-condensing)
Storage	5%	95% (non-condensing)

Elevation

Table 1-3 Elevation Limits

	Minimum	Maximum
Operating	0 m (0 ft)	2,000 m (6,561 ft)
Storage	0 m (0 ft)	15,240 m (50,000 ft)

Electrical

Electrical product characteristics and performance are defined below. Also, please see the product nameplate for additional rating limits.

Electrical Specifications

The ActiveAir System operates with power inputs as shown in the following table.

Table 1-4 Electrical Specs

Input	Specifications
Input Power	100-208 Volt, 50-60 Hz, single phase or 208-240 Volt, 50-60 Hz single phase
Input Sources	2 C14
Input Power at 208V/230V	EC10: 130 W @ 80%, 230 W @ 100% / 110 W @ 80%, 210 W @ 100%
	EC20: 155 W @ 80%, 265 W @ 100% / 140 W @ 80%, 250 W @ 100%
	EC30: 175 W @ 80%, 310 W @ 100% / 165 W @ 80%, 300 W @ 100%
Input Receptacles	IEC-320 C14

Networking

The product communications requirements are identified below.

Ethernet

The Ethernet link speed for this product is: 10/100 Mb; full duplex.

Protocols

The communications protocols supported by this product include:

HTTP, HTTPS (SSL/TLS), SMTP, POP3, ICMP, DHCP, TCP/IP, NTP, FTP, Telnet, Syslog.

Regulatory Compliance

Geist products are regulated for Safety, Emissions and Environment Impact per the below agencies and policies.

Underwriters Laboratories (UL)

UL Standards are used to assess products; test components, materials, systems and performance; and evaluate environmentally sustainable products, renewable energies, food and water products, recycling systems and other innovative technologies.

The UL standards specific to this equipment are:

UL, cUL, CE, RCM Mark (EMC Only), FCC Part 15 Class A, METI DENAN (select models only)

Federal Communications Commission (FCC)

The Federal Communications Commission (FCC) regulates interstate and international communications by radio, television, wire, satellite, and cable in all 50 states, the District of Columbia and U.S. territories. An independent U.S. government agency overseen by Congress, the commission is the United States' primary authority for communications laws, regulation and technological innovation.

The FCC standards specific to this equipment are:

FCC Part 15 Class A

Chapter 2 - Pre-Installation

Tools Needed for Installation

- #2 Philips head screwdriver
- 3/8 in wrench

Equipment Cabinet Requirements

The AA system can be mounted on any equipment cabinet that meets the following requirements:

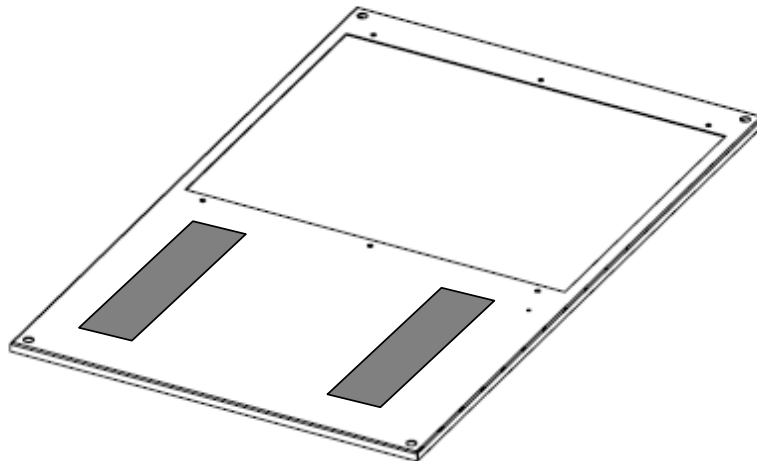
- Minimum width – 23.6 inches (600mm)
- Minimum depth – 42 inches (1066.8mm)

The AA system utilizes cabinet plenum pressure to control the exhaust fan speed. For proper operation, the equipment enclosure must have a solid rear door, side panels, top panel, bottom panel and front blanking panels for any unoccupied U spaces. Gaskets around the door, bottom or side panels are not required. Brush strips around cabling are recommended.

Rack Enclosure & Airflow Inspection Guidelines

Rack Top Panel

Figure 2-1 Rack Top Panel



Cable entry through the rack top panel should be made through brush strips to prevent cold air bypass into the rack, returning to the cooling units. Openings near the top of the rack will cause the AA units to run at a higher capacity that is required.

Rack Side Panels and Rear Door

Racks must be deployed with solid side panels and solid rear doors to contain heat and allow pressure control per an individual enclosure.

Rack Front Mounting Rails & Blanking Panels

Racks must be deployed with front rails and blanking panels that do not allow hot air to leak out at the front of the rack. Inspect rack for obvious leakage paths that are larger than 0.25 inches (6mm).

Chapter 3 - Installation

Hardware

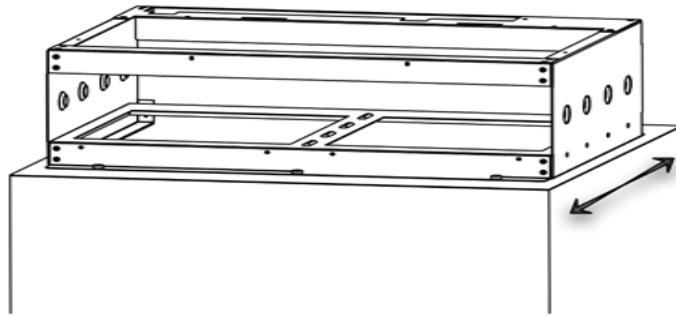
Follow these instructions to install the AA Containment Cooling system components.

Parts List

- 1 AA Chassis
- 2 AA Fan Cartridges
- 1 AA Host
- 4 Interlocking Duct Pieces (ordered separately)
- 1 AA Pressure Sensor Kit
- 1 Hardware Kit - containing fasteners needed for system installation
- Inter-duct Connectors (ordered separately if required)

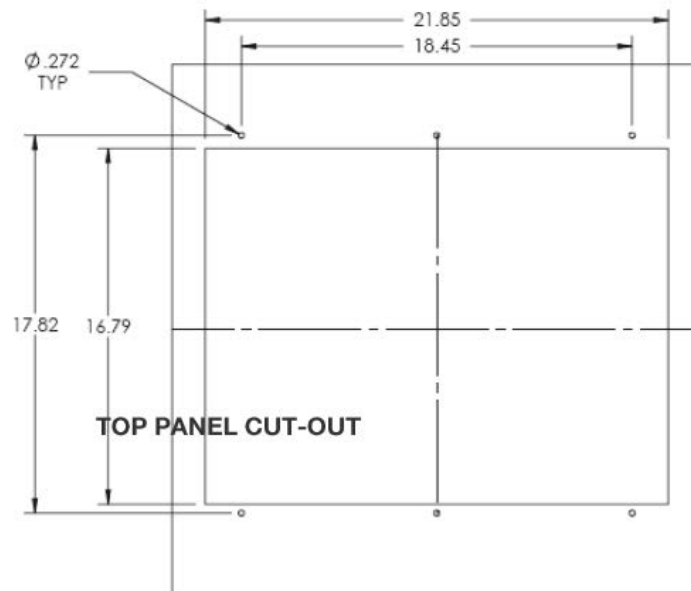
Positioning the Chassis

Figure 3-1 ActiveAir Chassis



The AA system mounts on the top the equipment cabinet as shown. The mounting location is user selectable; however optimal performance is achieved when the AA system is positioned at the rear of the cabinet.

Figure 3-2 Top Panel Cutout



The top panel of the equipment cabinet will need a pattern cut out of it to allow for the exhaust of hot air, as shown.

For new installations, the Geist top panel template can be provided to the cabinet manufacturer so that the cut out is made during the fabrication process and is in place upon receipt of the cabinet. For retrofit installations, replacement top panels with the cut out can be ordered from the cabinet manufacturer or Geist.

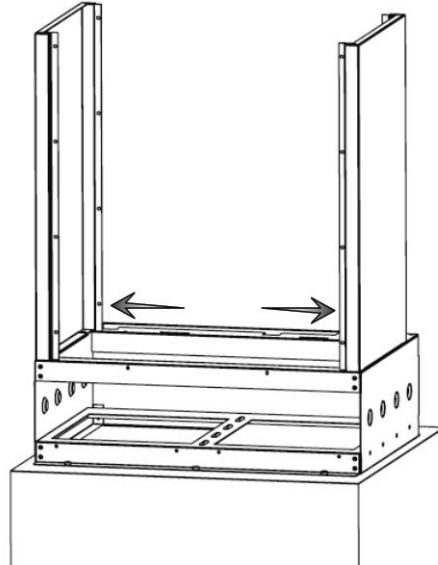
If the host power and communications module or the fan cartridges are installed, remove them to avoid damage or injury.

Place the chassis on top of the equipment cabinet with the fan cartridge bays facing the rear door. For shorter duct lengths, the duct can be attached to the chassis before placing the chassis on the rack.

Align the mounting holes of the chassis with those in the cabinet top panel and attach with the supplied hardware.

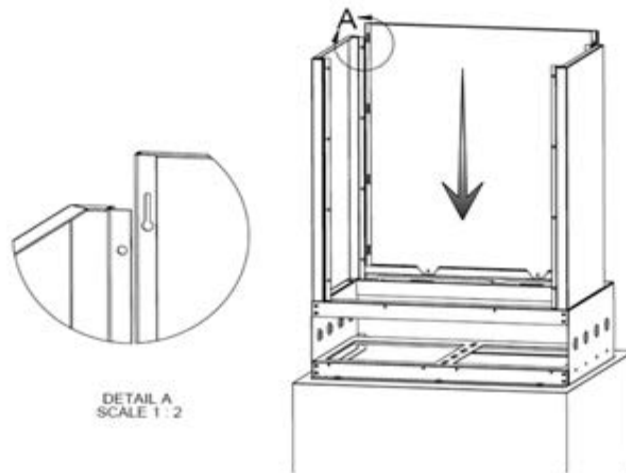
Exhaust Duct Assembly

Figure 3-3 Exhaust Duct Sides



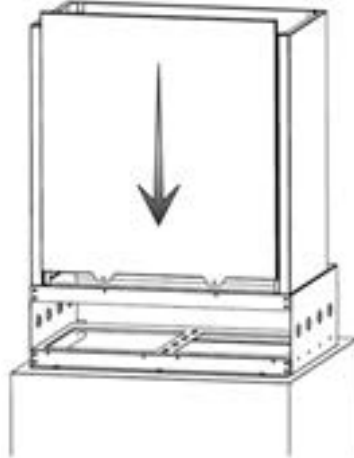
Install left and right side panels as shown. Ensure panels snap onto the chassis.

Figure 3-4 Exhaust Duct Rear Panel



Install rear duct panel by inserting the captive posts into the eyelet slots of both side panels, as shown in detail A. Slide panel down until tabs are completely fitted into slots and the lower edge is flush with the chassis.

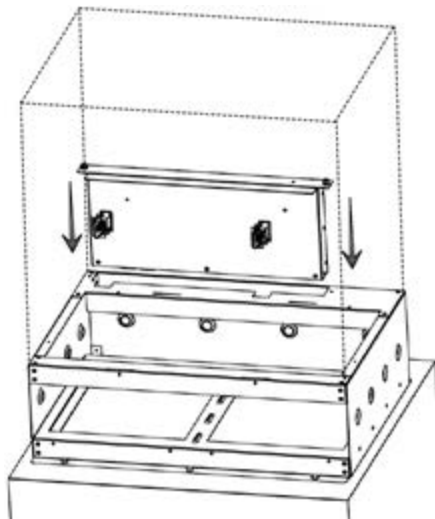
Figure 3-5 Exhaust Duct Front Panel



Install front duct panel by inserting the captive posts into the eyelet slots of both side panels, as shown. Slide panel down until tabs are completely fitted into slots and the lower edge is flush with the chassis. Secure panels to chassis by installing the two mounting screws (#6-32 x 3/8 black Phillips head)

Install Host Controller

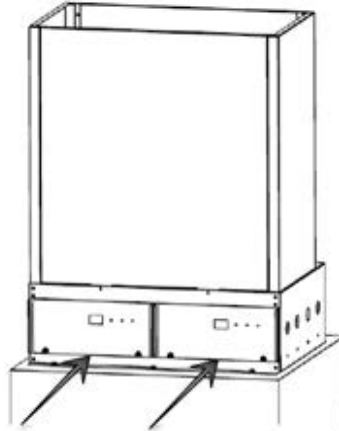
Figure 3-6 Install Host Controller



Insert host power and communications module into AA chassis as shown. Secure host power and communications module by tightening the two thumbscrews.

Install Fan Cartridges

Figure 3-7 Installing Fan Cartridges



Insert fan cartridges into AA chassis as shown. Secure fan cartridges by tightening the thumbscrews.

Locate Pressure Sensor Hose

The sensor hose is used to communicate the rack plenum pressure to the host module. Mounted on one end of the hose is a quick connect fitting to facilitate ease of installation to the AA Host Controller.

Figure 3-8 Pressure Sensor Hose Location



Locate the end of the sensor hose approximately at the mid-point of the IT load. Attach sensor hose to host control module inlet port. Place the sensing end of the hose at the desired location and secure to cabinet with zip ties.

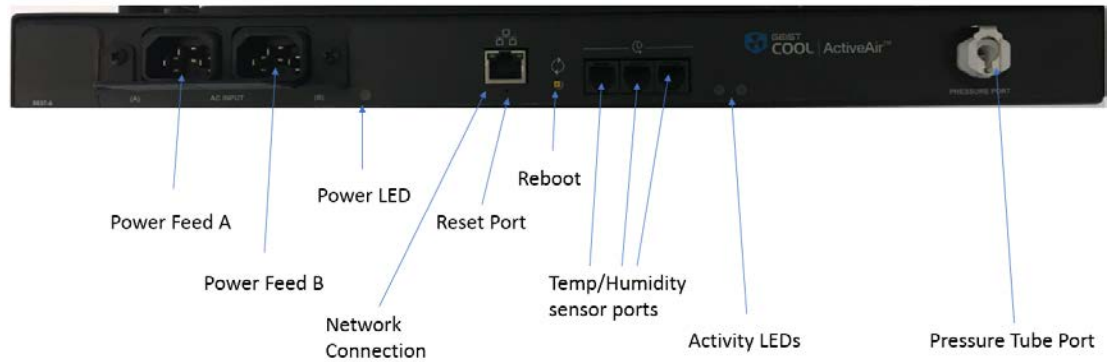


NOTE

Do not remove mechanical baffle from sensor hose as this will affect system performance.

Host Controller Connections

Figure 3-9 Host Controller connections



Illustrates the AA system connections.

Power Cord Retention

Figure 3-10 Power Cord Retention



The AA Host includes a power cable retention bracket as shown. The retention bracket is already installed at the factory for your convenience.

Front Panel Display

The front panel of each AA Fan Cartridge has two display elements, a numeric display and an LED Panel as shown. Each numeric display illuminates cooling capacity in GREEN, to indicate normal operation, cooling capacity or temperature alarm in RED to indicate an alarm condition. Each LED Panel has three LEDs that illuminate GREEN to indicate normal conditions, ORANGE to indicate warning conditions and RED to indicate alarm conditions.

Figure 3-11 Dual Fan Cartridge Front Panels



Table 3-1 Fan Cartridge Display reporting

Numeric Display	GREEN	RED	ALARM ACTION
Cooling Capacity	Within acceptable parameters	Exceeded alarm condition	Increase set point Increase fan size Add AA unit to row
Temperature	Within acceptable parameters	Exceeded alarm condition	Check set points Check rack hot air leak or cool air bypass

LED Panel	GREEN	ORANGE	FLASHING RED	ALARM ACTION
Capacity (cooling)	Within acceptable parameters	Exceeded warning threshold	Exceeded alarm threshold	Increase set point Increase fan size Add AA unit to row
Temp	Within acceptable parameters	Exceeded warning threshold	Exceeded alarm threshold	Check set points Check rack hot air leak or cool air bypass
System	System normal	N/A	1. Loss of A/B Power 2. Missing fan 3. Mismatched fan 4. Fan unit failed 5. Fan unit RPM 6. Fan end of life	1. Check power cord 2. Check fan insertion 3. Use same fan 4. Replace fan 5. Replace fan 6. Order spare fan

Initial Setup

Install a CAT5 Ethernet cable between the AA Host and the computer being used for device configuration. If connecting directly to the AA and not going through a hub, switch or router, a crossover cable may be required.

Windows Configuration

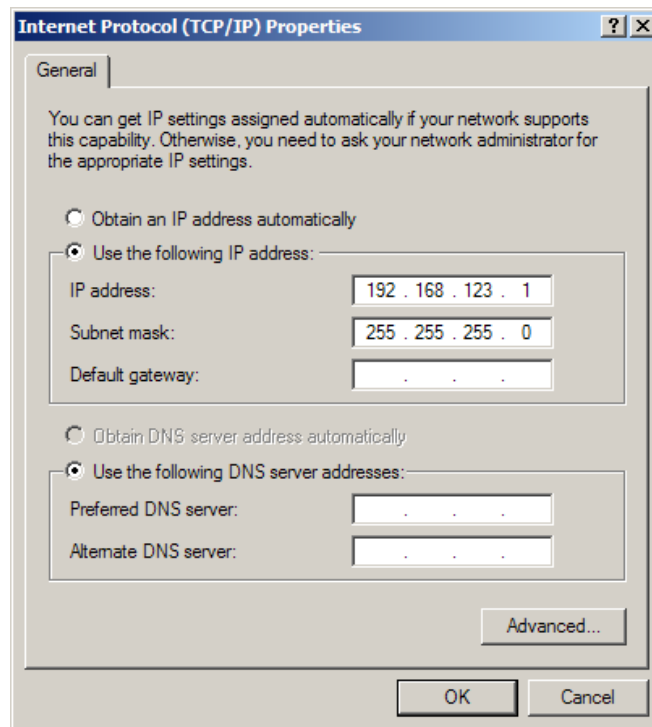
On your computer, go to “Start > Settings > Control Panel > Network and Dial Up Connections” Right click on “Local Area Connection” and select “Properties”
Select “Use the following IP address”. Use these settings:

- **IP Address:** 192.168.123.1
- **Subnet Mask:** 255.255.255.0
- **Gateway:** Leave blank

Click “OK” twice.

The unit should now be accessible in a web browser via the unit’s permanent IP address: <http://192.168.123.123/>. See Web Interface Site Summary Page for details.

Figure 3-12 Windows Network Settings



MacOS X Leopard Configuration

Open System Preferences via the Dock or the Apple menu.

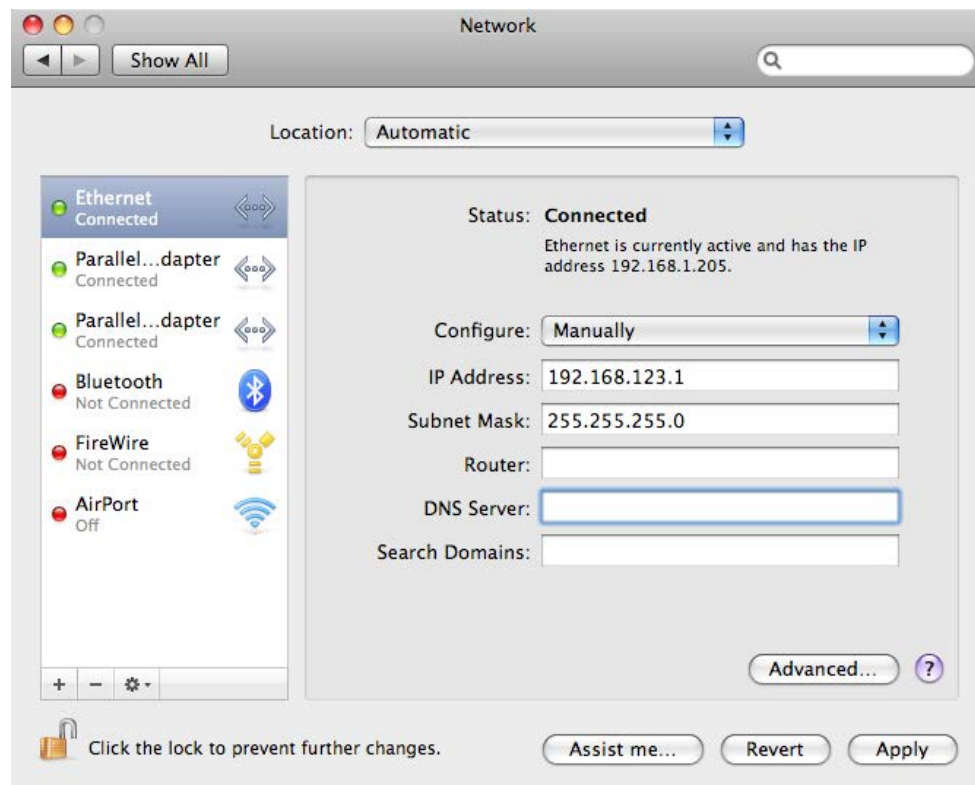
Select “Network” under “Internet & Network.”

Select “Ethernet” from the list on the left side of the window and enter these settings on the right side of the window:

- **Configure:** Manually
- **IP Address:** 192.168.123.1
- **Subnet Mask:** 255.255.255.0
- **Router:** Leave blank

Hit “Apply” and confirm the changes. The unit should now be accessible in a web browser via the unit’s permanent IP address: <http://192.168.123.123/>. See Web Interface Site Summary Page for details.

Figure 3-13 MacOS Network Settings



Accessing Web Server

Default IP Address

ActiveAir systems have a default IP address for initial setup and access to the unit if the assigned address is lost or forgotten.

IP Address: 192.168.123.123
Subnet Mask: 255.255.255.0
Gateway: 192.168.123.1

Reset to factory default IP address procedure

To restore the default IP address, press and hold the reset button located below the network connector for 20 seconds. The reset button is accessed through the white, circular hole located below the Ethernet jack.

Using a probe (even a medium size paper clip, straightened) place through the hole below the Ethernet jack (RJ45) to locate the soft feel push switch on the circuit board. You should be able to feel a slight click when you have it depressed.

Once the unit has rebooted, you will be able to connect (via crossover cable) using IP address 192.168.123.123, the factory default. Now you can set up all parameters as detailed in Unit Configuration.

**NOTE**

Pressing the reset button under the network connector will restore the default IP address and will also clear all password settings.

Web Interface Site Summary Page

The Site View page provides indication of system status using OK in GREEN to green to indicate normal operation, Caution in ORANGE to indicate warning conditions and ALARM in RED to indicate alarm conditions and has two key focal points for information;

Site Summary & Real-time/History Data

Figure 3-14 Site Summary Page

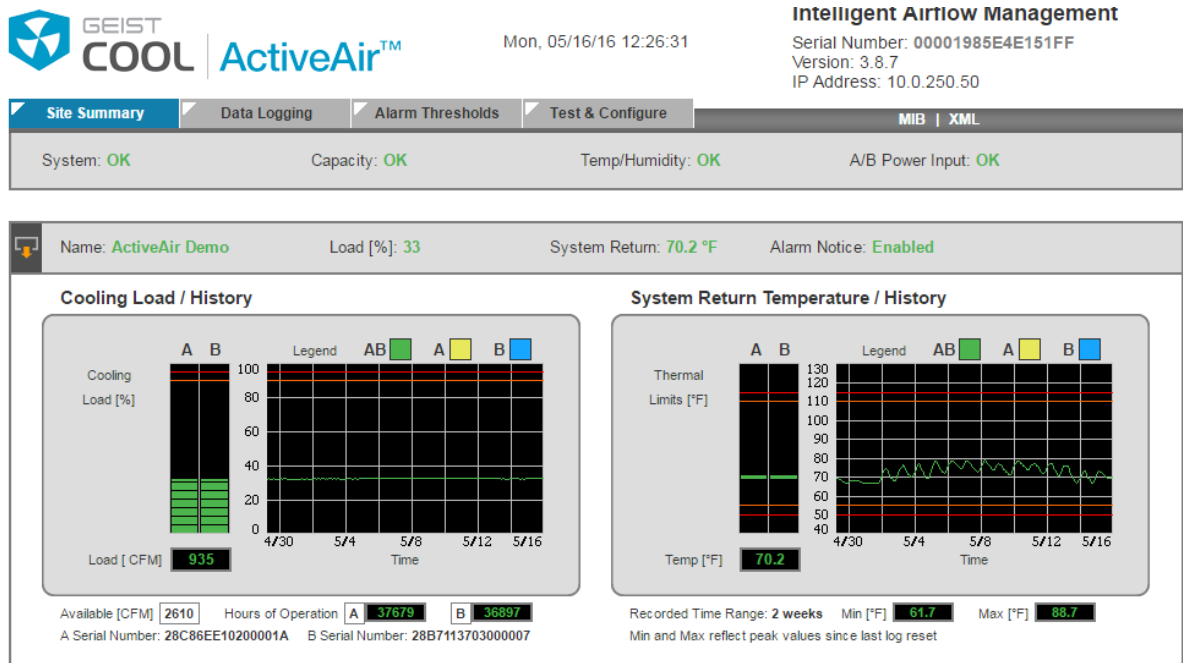


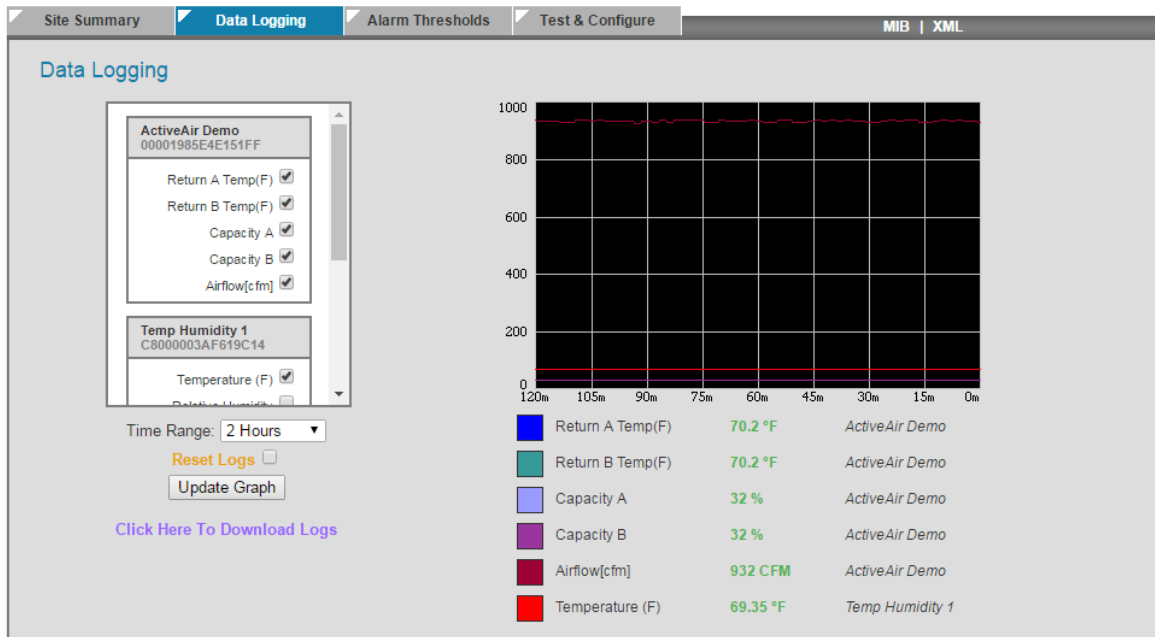
Table 3-2 Site Summary Page Reporting

Site Summary	OK (GREEN)	CAUTION (ORANGE)	ALARM (RED)	ALARM ACTION
System	System normal	N/A	<ol style="list-style-type: none"> 1. Loss of A/B Power 2. Missing fan 3. Mismatched fan 4. Fan unit failed 5. Fan unit RPM 6. Fan end of life 	<ol style="list-style-type: none"> 1. Check power cord 2. Check fan insertion 3. Use same fan 4. Replace fan 5. Replace fan 6. Order spare fan
Capacity	Within acceptable parameters	Exceeded warning threshold	Exceeded alarm threshold	Increase set point Increase fan size Add AA unit to row
Temp/Humidity	Within acceptable parameters	Exceeded warning threshold	Exceeded alarm threshold	Check set points Check rack hot air leak or cool air bypass
A/B Power Input	Both power feed available	N/A	A Feed or B Feed Only	Check power cord or feed
Real-time/History	VALUE (GREEN)	VALUE (ORANGE)	VALUE (RED)	ALARM ACTION
Cooling Load (capacity)	Value within acceptable parameters	Value exceeded warning threshold	Value exceeded alarm threshold	Increase set point Increase fan size Add AA unit to row
System Return (temp)	Value within acceptable parameters	Value exceeded warning threshold	Value exceeded alarm threshold	Adjust set point Reduce temp by lowering pressure set point
Remote Sensor (temp)	Value within acceptable parameters	Value exceeded warning threshold	Value exceeded alarm threshold	Adjust set point Check rack hot air leak or cool air bypass
Remote Sensor (humidity)	Value within acceptable parameters	Value exceeded warning threshold	Value exceeded alarm threshold	Adjust set point or cooling system

Web Interface Data Logging Page

AA collects historical data for up to one month. All system, capacity and environmental data is logged and can be displayed at various time scales from fifteen minutes to one month.

Figure 3-15 Data Logging Page



Unit Location: 1717
 Unit Description:
 Admin: John or Call
 Support: Manuals, support@geistglobal.com or Call 800.432.3219 / +1.402.474.3400
 Copyright © 2008-2015 Geist All Rights Reserved.

The vertical axis units scale adjusts based on the greatest units for a desired check-box. To achieve greater visibility, select units with the same ranges before updating graph. Selecting check-boxes for viewing does not affect data logging. All data available is logged and kept for the past one month. The horizontal axis date scale adjusts based on the latest available data that data has been collected up to one month.

Table 3-3 Data Logging Page Reporting

Data Logging	Steps
Viewing Data	Check boxes for the parameters desired and then select Time Range and then select Update Graph .
Download Logs	Select Click Here to Download Logs and save CSV file to a desire location for viewing later
Reset Logs	Select Reset Logs and then select Update Graph . This action will clear all logged data that was available for download and will clear all data from the visible graph.

Test & Configure Web Page

The Configuration page allows you to assign the network properties or use DHCP to connect to your network. Access to the unit requires the IP address to be known, so use of a Static IP or reserved DHCP is recommended.

- Enter the desired IP Address, Subnet Mask and Default Gateway information.
- Select 'Save Changes' for the modifications to be accepted and stored in non-volatile memory of the AA Host. Once an IP address is assigned to a unit, the default IP address is no longer active.
- If the network is running DHCP the AA can have the configuration settings automatically assigned. To enable this feature, select the 'Use DHCP to obtain IP/netmask/gateway' checkbox and save changes.

Figure 3-16 Test & Configure

The screenshot displays the 'Test & Configure' web page. At the top, there are navigation tabs: 'SiteX View', 'Data Logging', 'Alarm Thresholds', and 'Test & Configure' (which is active). On the right, there are links for 'MIB' and 'XML'. The main content area is titled 'System Configuration' and contains a 'Devices' section with a table of device information and a 'Save Changes' button.

Serial Number	Device Type	Friendly Name
00001985E00E99FF	fancontrol	<input type="text" value="Cab 1 (S-2 beta)"/>
16000003F4CC2114	Temp Humidity	<input type="text" value="Temp Humidity 1"/>
BA000003F4CB8914	Temp Humidity	<input type="text" value="Temp Humidity 2"/>
EE0000008759FF12	Temp Humidity	<input type="text" value="Temp Humidity 3"/>

Below the table is a checkbox labeled 'Remove all unplugged devices' and a 'Save Changes' button.

Below the 'Devices' section are three expandable sections: 'All Parameters', 'Reboot', and 'Network'. The 'Network' section is expanded, showing network configuration options.

Network Configuration Summary:
 IP: 192.168.150.220 Subnet: 255.255.255.0 Gateway: 192.168.150.254 DHCP: off

MAC Address: 00:19:85:E0:0E:99
 Use DHCP to obtain IP/netmask/gateway
 IP Address:
 Subnet Mask:
 Gateway:
 Save Changes



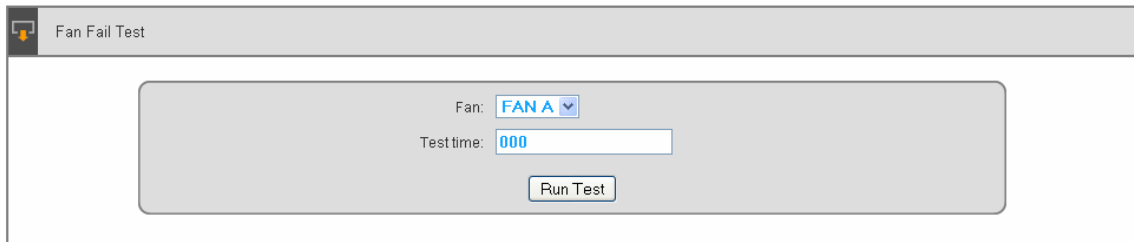
NOTE

Recommended practice is to manually program the AA IP address and 'friendly name' with the physical location or unique identifier during initial installation. Automatic assignment of the IP address via DHCP does not facilitate this process.

Fan Fail Test - Test & Configure Page

To determine the operational or environment effects of a single fan failure, select **FAN A** or **FAN B**, enter a **Test Time** in seconds and select **Run Test**. Operating and environment conditions can be observed remotely from the Site Summary or Data Logging page.

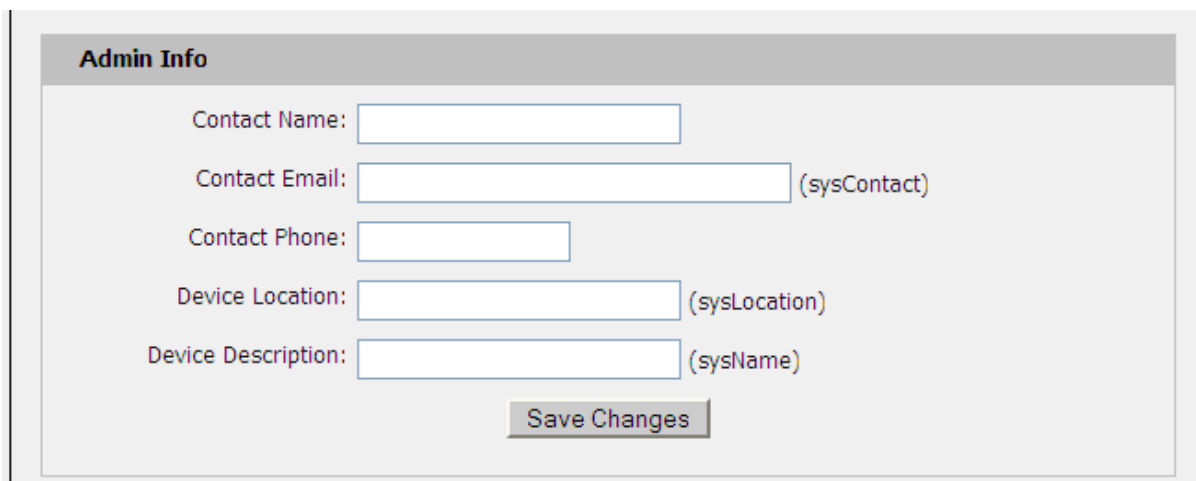
Figure 3-17 Fan Fail Test



The screenshot shows a web interface titled "Fan Fail Test". It features a dropdown menu for "Fan:" with "FAN A" selected. Below it is a text input field for "Test time:" containing the value "000". A "Run Test" button is positioned below the input field.

Admin Information

Figure 3-18 Admin Info



The screenshot shows a web interface titled "Admin Info". It contains five text input fields with labels: "Contact Name:", "Contact Email:", "Contact Phone:", "Device Location:", and "Device Description:". To the right of the "Contact Email:", "Device Location:", and "Device Description:" fields are the labels "(sysContact)", "(sysLocation)", and "(sysName)" respectively. A "Save Changes" button is located at the bottom of the form.

Information entered in the "Admin Info" section of the Admin tab of the Configuration page will show up at the bottom of the unit's web interface.

Accounts and Passwords

The unit offers account security options that are entered on the *Admin* tab of the *Configuration* page. There are three levels of account security:

Administrator: Password protects the Display, Alarms and Configuration pages.

Control Access: Password protects the Control Actions and Control Settings pages.

View-Only: Password protects the Sensors, PDA, WAP and XML pages.

User account names may include alphanumeric characters, spaces and underscores. Passwords may include alphanumeric characters and underscores.

Figure 3-19 Accounts and Passwords

Name and Password Configuration

NOTE 1: If Account currently has a password, leaving Old Password blank results in no changes to that account.
 NOTE 2: Administrator password may be used in the Old Password field of any account.
 NOTE 3: If setting New Password to blank, Account Name must also be blank.
 NOTE 4: If New Password is not blank, Account Name must not be blank.

Administrator Account Name

If blank, all access is granted without a password.

Old Password

New Password

New Password Again (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.

Control Account Name

If blank, Control and View Only access is granted without a password.

Old Password

New Password

New Password Again (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.

View Only Account Name

If blank, View access is granted without a password.

Old Password

New Password

New Password Again (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.



NOTE

The Administrator account must be active to enable the Control Access and View-Only accounts. The Control Access account must be active to enable the View-Only account. The account names "root" and "admin" are disabled for security reasons and cannot be re-enabled.



WARNING

RECORD YOUR PASSWORDS! TO RESET LOST PASSWORDS, FOLLOW THE INSTRUCTIONS FOR RESETTING THE UNIT'S IP ADDRESS AND PASSWORDS IN THE "HOST CONTROLLER RESET TO FACTORY DEFAULT IP ADDRESS PROCEDURE" SECTION.

Setting up Row control for non-partitioned cabinets

In Row Control mode, adjacent AA units can be set up to work as one unit to work together to control the pressure in commonly joined cabinets. This allows less than one AA per cabinet for controlling airflow in lower density situations.

Figure 3-20 Row Control Set Up

The screenshot shows a web interface titled "Master / Advisor Control Assignment". It contains the following elements:

- A checkbox labeled "Set EC Host as Master" which is checked.
- A "Target Pressure Differential" dropdown menu set to "0".
- A section for "Advisor IP Addresses" with ten input fields. The first three fields contain the IP addresses "192.168.150.221", "192.168.150.222", and "192.168.150.223". The remaining seven fields contain "0.0.0.0".
- A "Save Changes" button at the bottom.

Designate any of the AA units in the row as the “Master”, and then list all other IP addresses of units to be controlled as shown.

Fan Control Settings

Figure 3-21 Fan Control Settings

The screenshot shows a web interface titled "Fan Control Settings". It contains the following elements:

- A "Set Point" dropdown menu set to "0.002".
- A "Set Set-Point" button below the dropdown.
- A section with the instruction "Insert value between 30 and 100".
- A "Capacity %" input field containing "N/A".
- A "Set Capacity" button below the input field.

The AA fans can be controlled **automatically** by selecting the desired cabinet pressure setting from the Set set-point pull down menu. They can also be controlled **manually** by typing in the desired capacity % setting (from 30 to 100%) in the Set Capacity window.

Assigning Friendly names

Figure 3-22 Friendly Name Settings

The screenshot shows the 'System Configuration' page with the 'Test & Configure' tab selected. Under the 'Devices' section, there is a table with columns for 'Serial Number', 'Device Type', and 'Friendly Name'. Below the table is a checkbox for 'Remove all unplugged devices' and a 'Save Changes' button.

Serial Number	Device Type	Friendly Name
00001985E4E151FF	fancontrol	ActiveAir Demo
C8000003AF619C14	Temp Humidity	Temp Humidity 1
76000003AF6A1314	Temp Humidity	Temp Humidity 2
0A000003EB1FD514	Temp Humidity	Temp Humidity 3

Remove all unplugged devices

Save Changes

Modify **Friendly Names** to each **Device Type** (system and up to three remote sensors) and then select **Save Changes**.

System Clock Configure Page

Reset **System Clock** and then select **Save Changes**.

Figure 3-23 System Clock Settings

The screenshot shows the 'System Clock, set to GMT' configuration page. It includes a dropdown for 'Set Clock method' (NTP Server), a text field for 'GMT to local, (+/-)hh:mm' (-05:00), and input fields for 'Month' (09), 'Day' (07), 'Year' (09), 'Hour' (17), 'Minute' (44), and 'Second' (52). It also has fields for 'NTP primary server' (192.43.244.18), 'NTP secondary server' (129.6.15.28), and 'Sync to NTP server period (seconds)' (1800). A 'Save Changes' button is at the bottom.

System Clock, set to GMT

Set Clock method: NTP Server

GMT to local, (+/-)hh:mm: -05:00

Month: 09, Day: 07, Year: 09, Hour: 17, Minute: 44, Second: 52

NTP primary server: 192.43.244.18

NTP secondary server: 129.6.15.28

Sync to NTP server period (seconds): 1800

Save Changes

Setting clock is necessary for data logging capability. System clock settings are lost after a few weeks of the Host Controller not being powered.

E-mail Configure Page

Re-assigning **E-mail** with each email address corresponding to each checkbox in the **Alarm Thresholds** page and then select **Save Changes**.

Figure 3-24 Configure E-mail Settings

The screenshot shows the 'E-mail' configuration page. At the top, there are tabs for 'E-mail', 'SMTP:', 'POP3:', and 'Authentication: Disabled'. The main configuration area contains the following fields:

- SMTP Server:
- SMTP Port: Leaving the POP3 Server blank with the Username/Password filled in and using SMTP Port 465 enables ESMTP/SSL.
- "From" E-mail Address:
- To E-mail Address 1:
- To E-mail Address 2:
- To E-mail Address 3:
- To E-mail Address 4:
- To E-mail Address 5:
- POP3 Server: Leaving the POP3 Server blank with the Username/Password filled in enables ESMTP/TLS. No POP3 Server and no Username/Password enables no authentication.
- POP3 Port:
- Username:
- Password:

A 'Save Changes' button is located at the bottom of the configuration area.

To configure email notifications through SMTP enter the IP address of the server hosting the email service into the 'SMTP Server' field (in numeric form). The IP address can be discovered by sending a ping to the email server (e.g. ping mail.geistglobal.com).

- Enter a unique identifier into the 'From E-mail Address' field.
- Identify the individual(s) to receive the email notification by entering his or her address into the 'To E-mail Address' field. Enter only one address per field.

Some email servers require a POP3 connection to be established in order to accept email via SMTP. The last three fields are used for this purpose. Normally, the POP3 IP address will be the same as the SMTP Server IP address. As shown in the next diagram, configure trap directed notification over SNMP, enter the IP address of the SNMP manager into the 'Trap IP Address' field.

SNMP Configure Page

Figure 3-25 Configure SNMP



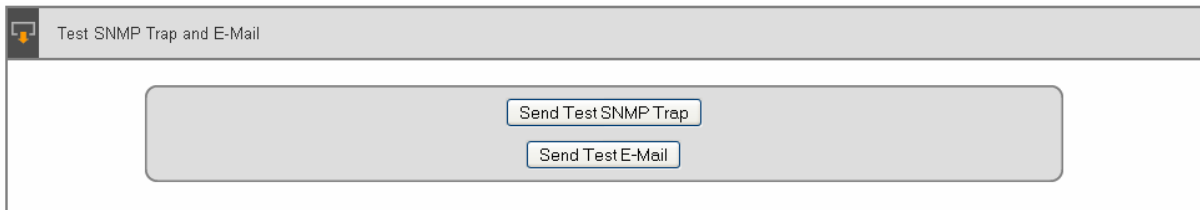
The screenshot shows the 'SNMP' configuration page. At the top, there are tabs for 'SNMP', 'Trap 1:', and 'Trap 2:'. The main content area contains the following fields and controls:

- Read Community:
- Listen port for GET:
- Trap Community:
- Write Community:
- Trap Type: (dropdown menu)
- Trap IP Address:Port 1:
- Trap IP Address:Port 2:
-

Re-assigning **SNMP** traps with each trap corresponding to each checkbox in the **Alarm Thresholds** page and then select **Save Changes**.

Test E-mail or SNMP - Test & Configure Page

Figure 3-26 Test E-mail or SNMP



The screenshot shows the 'Test SNMP Trap and E-Mail' page. The main content area contains two buttons:

-
-

After changing **E-mail** or **SNMP** trap address information select **Send** to test notification.

Units - Test & Configure Page

Figure 3-27 Select Units

Change **Units** to Imperial (Fahrenheit and CFM), Metric (Celsius and MCH) or Imperial/Metric (Celsius and CFM) and then select **Save Changes**.

Default Alarm Threshold Settings

The AA System is programmed and shipped from the factory with default alarm settings. Alarm threshold values and units can be changed as described in this section.

System Threshold Settings

Following are the default alarm settings:

Figure 3-28 Configure Threshold Settings

Source	Type	Threshold	E-mail	Traps
Capacity	High Alarm	95	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	High Warning	90	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Fan End of Service Warning	High Alarm	40000	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Return Temp(F)	High Alarm	115	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	High Warning	110	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Warning	55	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Alarm	50	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

The following table summarizes the System Thresholds Default Settings:

Table 3-4 Default Thresholds

System Threshold Setting	High Alarm	High Warning	Low Warning	Low Alarm
Capacity (%)	95	90	N/A	N/A
Fan End of Service Warning	. Fan cartridges retain their hours of operation even when not powered			
Return Temperature (°F)	115	110	55	50

Return Temp thresholds are widely set to prevent nuisance alarms. After facility operational knowledge, settings can be narrowed to provide valuable information about recirculation of hot air through IT equipment or bypass cooling through IT rack.

Remote Sensor Thresholds

Figure 3-29 Configure Remote Threshold Settings

Remote Sensor: **Top Rack Front**
Alarm Notice: **Enabled**

Sensor ID: 8B000002E01BDD14

Source	Type	Threshold	E-mail	Traps
Temperature (F)	High Alarm	90	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	High Warning	80	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Warning	64	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Alarm	58	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Relative Humidity	High Alarm	80	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	High Warning	60	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Warning	35	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Alarm	20	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

The following table summarizes the System Thresholds Default Settings:

Table 3-5 Default Thresholds

Remote Sensor Alarm Threshold	High Alarm	High Warning	Low Warning	Low Alarm
Remote Sensor Temp (°F)	90	80	64	58
Remote Sensor Humidity (Rh)	80	60	35	20

Remote Sensor Temperature and **Humidity** high/low alarms are set to the ASHRAE Allowable environment guidelines and high/low warnings are set to the ASHRAE Recommended environment guidelines for IT equipment intake air.

Adjusting Settings & Enabling Alarms

Notifications in the form of email and SNMP trap events are delivered when an alarm thresholds has been exceeded.

Figure 3-30 Alarm Threshold Page

The screenshot shows the 'Alarm Thresholds' configuration page. At the top right, the IP address is 192.168.150.50. The page has tabs for 'SiteX View', 'Data Logging', 'Alarm Thresholds' (selected), and 'Test & Configure'. Below the tabs is a 'System Alarm/Fault Notifications' section. It contains three rows of settings:

- AB Feed Error:** E-mail (checkbox checked), Traps (checkbox unchecked).
- Fan Cartridge Error:** E-mail (checkbox checked), Traps (checkbox unchecked).
- Disconnected External Sensor:** E-mail (checkbox checked), Traps (checkbox unchecked).

A 'Save Changes' button is located below these settings. At the bottom of the page, there are two buttons: 'Reset All Alarm Defaults' and 'System Threshold Settings'. To the right of the 'System Threshold Settings' button, it says 'Alarm Notice: Enabled'.

Select the desired email or trap notification by checking one or more the boxes to the right of the alarm type and **Save Changes**.

Figure 3-31 Changing Alarm Thresholds

Remote Sensor: **Top Rack Front**
Alarm Notice: **Enabled**

Sensor ID: 8B000002E01BDD14

Source	Type	Threshold	E-mail	Traps
Temperature (F)	High Alarm	<input style="width: 40px;" type="text" value="90"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	High Warning	<input style="width: 40px;" type="text" value="80"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Warning	<input style="width: 40px;" type="text" value="64"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Alarm	<input style="width: 40px;" type="text" value="58"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Relative Humidity	High Alarm	<input style="width: 40px;" type="text" value="80"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	High Warning	<input style="width: 40px;" type="text" value="60"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Warning	<input style="width: 40px;" type="text" value="35"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	Low Alarm	<input style="width: 40px;" type="text" value="20"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

To change threshold values, double click in the value window to highlight the existing value. Type in the new value and then select **Save Changes**.

Configuring notifications and alarm thresholds – Notifications in the form of email and SNMP trap events can be issued when one or more alarm thresholds have been exceeded. To set an alarm threshold and enable notifications, click the appropriate email and/or trap box as shown.

Host controller reset to factory default IP address procedure

Power host and wait until you see the 2 red activity LEDs begin to alternate.

Locate the small probe hole below the Ethernet (RJ45) jack.

Using a probe (even a medium size paper clip, straightened) place through the hole to located the soft feel push switch on the circuit board. You should be able to feel a slight click when you have it depressed.

Depress and hold the switch until the activity LEDs both freeze in the on mode, then release the switch. (This usually takes 10-15 seconds, but can vary)

Once the activity LEDs begin to alternate again, the unit has rebooted and you will be able to connect (via crossover cable) using IP address 192.168.123.123, factory default.

Now you can set up all parameters as detailed in the IOM guide.

Firmware Updates

Keep your unit updated with the latest firmware releases or sign up for notifications.

<http://www.geistglobal.com/support/cool/firmware>

Chapter 4 - Final Checkout

Final Checkout

Accessories

Alternate Data Formats

In addition to the full access, control and configuration available via a desktop web browser, Fan Controller Series products present data in multiple formats for easy integration with other monitoring systems. Data formats available via links on the unit's web page are:

Figure 4-1 Available Data Formats



PDA/Phone | XML | MIB

- **PDA/Phone:** Presents data in a format best-suited for PDA or cellular phone web browsers.
- **XML:** Extensible Markup Language. Presents data in a structured tree for use with automated scripts and monitoring systems.
- **MIB:** Management Information Base. Downloads the MIB for use with SNMP monitoring tools.

Troubleshooting

Firmware Version

The firmware version is located in the upper right section of the web interface header, represented by v3.y.xx. Before contacting support, it is recommended that the Fan Controller first be updated to the latest firmware version. If this is not possible, please have the existing firmware version number for the unit available when contacting technical support.

Figure 4-2 Unit Information

Intelligent Airflow Management

Serial Number: 00001985E4E151FF

Version: 3.16.4

IP Address: 10.0.250.50

Service and Maintenance

No service or maintenance is required. Do not attempt to open the RAC10 or you may void the warranty. No serviceable parts inside. It is recommended that power be removed from the unit before installing or removing any equipment.

Frequently Asked Questions

AA Capacity Meter Guideline

Q: Is it typically normal to have AA systems indicate different capacity for racks with exactly the same IT load?

A: It is quite common to have two racks with the same IT power load running at different flow rates – hence a different AA capacity. There are multiple reasons for varying airflow rates for the same IT power load. They are; IT equipment intake temperature variation, IT equipment chip temperature variation, IT equipment single power supply failure or excessive rack openings (such as blank panels missing) allowing cool air bypass.

Check the AA intake temperature graphs to rule out intake temperature as the cause. It is important to look at intake temperature at multiple rack heights. IT equipment at the top of the rack could be running higher airflow rates because of a higher temperature there. Often racks at the end of the row can see hot air at the intake – a condition that would only exist if a substantial number of the racks in the data center did not have an AA system installed.

For the same power load, if the intake temperature between two racks is the same but the exhaust temperature is different, it suggests the IT equipment in the rack has a different airflow rate versus the other or there is bypass cooling going through an open U space or through openings at the top panel of the rack, reducing the AA exhaust temperature. Higher IT equipment flow rates for the same power load or bypass cooling will cause the AA capacity to run higher.

If all reasons described here are ruled out, please call customer service.

Q: If the AA capacity keeps increasing when there is no load in the rack, do you need to unplug the AA unit or change its pressure set point to a higher value?

A: The AA system continually adjusts to maintain the set operating pressure. With no load in the rack, the AA system is trying to operate with an infinitely small pressure change. We recommend un-plugging the unit until a load is placed in the rack. In this condition, a small amount of cool air will bypass through the AA units that are off. Also, changing the fan operation pressure set point to a 0.008 positive value will reduce the fan speed.

Checking Pressure Sensor Location

The pressure sensor is used to communicate the rack plenum pressure to the host controller module. The pressure sensor should be located at approximately the mid-point of the cabinet. Front-to-rear sensor position with respect to the rear of the IT equipment will not affect operation. Do not mount the pressure sensor at a U height position where there is no IT equipment mounted. This will produce a slightly lower pressure reading and result in a slightly lower capacity than required. Do not mount the pressure sensor at a U height position where there may be a few servers that are excessively deeper than the other servers in the same rack. This will produce a slightly higher pressure reading and result in a slightly higher capacity than required.

General & Physical Environment Questions

Q: Where do I mount my pressure sensor?

A: The pressure sensor placement is at the rear of the rack located midway top to bottom of the IT equipment stack. For example; with IT equipment stacked to 30U from the bottom, the sensor height would be between 12-18U for accurate capacity operation. The sensor does not have to be directly behind the IT equipment and can be placed off to the side near the cabling or power strips if desired.

Q: What duct length do I need for a 12 foot height from the floor to the drop ceiling?

A: The duct length is calculated by subtracting the rack height and AA Chassis height from the 12 foot space then add 1.5 inches which allows the duct to pass through the drop ceiling by this amount. We have two AA Chassis heights; the standard Tall Chassis is 11.5 inches and the Low Clearance chassis

is 7.5 inches tall. *Example; 144 inches (12 foot space) – 84 inches (rack) – 7.5 inches + 1.5 inches = 54 inch duct*

Q: What is the longest duct Geist makes, and what if I need a longer one?

A: The longest duct we suggest is 72 inches. This would allow a drop ceiling height of 13 feet 10 inches when used with the tall AA Chassis. For ceiling heights above this, you can use a taller rack and/or use the AA Duct Cap that is made to couple with a 20" round duct. This 20" round duct would allow you to go to any ceiling height. See Geist's Submittal Drawings for further information.

Q: What types of fans are used in your system?

A: We are using 48V DC Electronically Commutated fans. Our fans are brushless and have a tube axial configuration.

Q: What is the MTBF of the AA Fans and System?

A: The MTBF is 60K hours for the fan itself, but we conservatively de-rate our system MTBF to 40K hours (4.5 yrs.) based on accepted de-rate rules for electronics.

Cooling and Airflow Management

Q: If I lose one fan, will the remaining fan handle the entire rack airflow requirements?

A: If the AA capacity reading is 50% or less when two fans are operational, then one fan is capable of handling the airflow requirements. The single fan will speed up to compensate for the fan that is off line. However, Geist does not recommend sizing the AA for airflow redundancy. The additional overhead for fan power, space required and costs are not justified.

The following is what to expect if one fan fails or is removed from the system:

- Capacity for the remaining fan will approximately double or reach 100% if the two fans were originally operating greater than 50%.
- A slight pressure in the rack will force a small amount of hot air leakage out the front rack rails and bottom of the rack due to this pressure. This is common with any passive system and will not cause issues since this should be the only rack with leakage due to no pressure control.
- The AA will send an alarm when a cartridge fails and a new alarm when the capacity exceeds the set capacity threshold.
- The AA Fan Cartridges can be swapped out while the rack is operational.

Q: We would like to reduce the exhaust temperature of the rack. Can we adjust the AA Fan Control setting to a negative pressure to accomplish this?

A: Yes, for example, when you are concerned about high heat return to DX CRAC units. We can control the amount of bypass air by simply changing the negative pressure set point. This pressure setting can be changed remotely and alarm thresholds can be set so you know if you have exceeded your desired temperature. Simply change the setting and then chart the performance over time.

Q: We would like to pull in cool air along the sides of network switches; can we adjust the AA Fan Control Settings to a negative pressure to accomplish this?

A: This can be accomplished for small 1U or large core switches.

Example for 1U switches; set the AA unit to -0.006 pressure and open a 2U space at the rack front opposite or just below the 1U switch height. Cool air then enters this space and washes across the 1U switch/s. The 2U open space at the front should be filled with the Geist Vented 2U Blank Panel which is clearly marked so someone doesn't come along and block up the opening. Adjustment to the negative pressure set points can be made to reduce or increase bypass airflow.

Example for large core switches; with the large core switch/s in a 750mm or 30 inch wide rack, make sure the left vertical rack rail is blocked from air bypassing and make sure the right vertical rail is open to allow bypass airflow. Set the AA unit to -0.006 pressure. Cool air then enters this space and washes across the switch/s. Place a remote temp/humidity sensor at the side intake of the core switch and monitor intake temperatures. Adjustment to the negative pressure set points can be made to reduce or increase bypass airflow.

Q: How do I safely raise my supply air temperature to 22-24 °C (72-76 °F) and not cause an increase in server airflow?

A: Geist AA systems maintain temperatures at all points in the data center within a few degrees of the supply air temperature. Geist systems also eliminate back pressure on server airflow to improve server fan efficiency.

Many legacy servers and servers shipping today increase their fan speeds at approximately 26°C (79 °F) to improve server cooling at higher intake temperatures. This can more than double, sometime 10X the server fan power consumption. While increased server fan power actually lowers your PUE metric, the overall power consumption in the data center increases significantly. More advanced energy star servers have fan speeds adjustments based on server internal temperatures. Because of this, server fan energy performance will also be subject to rack pressure since the pressure reduces airflow rates, a resulting increased temperature in the server will develop which the server fans will overcome with increased airflow.

Q: Should raising temperatures in data centers be carried out in a systematic manner to best determine where hot spots may occur and to possibly prevent the risk of shutdown because of high temperatures?

A: Due to possible site specific variables and unforeseen infrastructure conditions, it would be a recommended practice to take a systematic approach to raising supply air temperatures. One client had a '2 degree Tuesday' approach, raising his supply air 2 degrees every Tuesday until he was at 23°C. With the Geist AA system deployed on a substantial percentage of the IT load, there should be no hot spots or hot air contamination of the cool supply air. Geist allows you to safely raise the supply air without contamination and also allows the servers to run at minimum internal temperatures due to zero back pressure, allowing the maximum supply air temperature and maximum efficiency.

Q: If I raise the supply air, how much less time do I have if my cooling plant fails?

A: A published Geist study shows that at average loads of 5 kW per rack and conventional hot/cold aisle design you raise the temperature 9 °F every 20 seconds. If we are supplying at 74 °F versus 65 °F we would only have an additional 20 seconds. What we sometimes fail to recognize is that an average of 5 kW per rack with no cooling is a high heat load to continue to dissipate.

Geist cooling circuit significantly increases the time to adapt to cooling circuit failure. With Geist, the hot exhaust air is directed to a ceiling plenum return. Fans in the AA units are on UPS power and fans on the CRAC/CRAH units will start again when the generator comes on line (typically 8-12 seconds). Even without a chiller plant providing cooling, the IT heated exhaust air continues to move into the ceiling plenum, across the CRAC/CRAH coils and across the cold floor, giving additional time during cooling plant failure.

Q: I have multiple racks with exactly the same IT load but one AA system indicates a different capacity, is something wrong?

A: It is quite common to have two racks with the same IT load running at different flow rates – hence a different AA capacity. There are multiple reasons IT equipment can have different airflow rates for the same IT load; intake temperature, chip temperatures and server power supply failure. Check the AA temperature graphs to rule out intake temperature as the cause. It is important to look at temperature intake at multiple rack heights. Often racks at the end of the row can see hot air at the intake – this condition would only exist when all the racks in the data center do not have an AA system on them. If all three reasons mentioned as ruled out, please call customer service.

Q: Why did the AA capacity keep increasing when there is no load in the rack and what should I do about this?

A: The AA system continually adjusts to maintain the set operating pressure. With no load in the rack, the AA system is trying to operate with an infinitely small pressure change. We recommend un-plugging the unit until a load is placed in the rack. In this condition, a small amount of cool air will bypass through the AA units that are off.

Q: I made a mistake on the IP set up, how can I get back to the factory setting?

A: Press and hold the recessed reset button located under the Ethernet port until the red LED indicators both light up solid, then release. A small probe will be required to depress the reset button. This is detailed below in “Host controller reset to factory IP address procedure” .

Q: I have been getting nuisance alarms for temperature and capacity, how can I change these?

A: The Geist AA system ships with predefined alarm thresholds. These alarm setting should be changed to meet your site conditions and requirements.

Q: What SNMP versions do the AA systems support?

A: Versions 1 and 2.

Q: I noticed that some of my data logs had gaps of several minutes up to 2 hours, all at the same time one day. What could have caused this?

A: When AA systems are powered down they do not continue to collect data. Any time the power needs to be interrupted for servicing a cabinet, we suggest that the units' logs be downloaded before removing power so as not to lose any data.

More Technical Support

<http://www.geistglobal.com>
Email: support@geistglobal.com

Americas

- 1 888 630 4445

Europe and Middle East

- From within the UK 0845 026 3853
- From abroad +44 845 026 3853

Asia

- English +1 888 630 4445 (US number)
- Chinese +[86 755 8663 9505](tel:8675586639505)

Or contact your distributor.

Product-Specific Safety Notices


The specific procedural safety precautions relating to this product are stated below.

General Safety

Safety is a serious matter and all precautions should be taken to guarantee a safe work and operational environment. General safety precautions must be observed during all aspects of operation, service, and repair of equipment described in this document. Failure to comply with the safety warnings, procedures and guidelines as presented in this document is in violation of the safety standards of design, manufacture, and intended use of this equipment.

You are responsible for following the safety guidelines and warnings presented in this document for this equipment. Individuals using or maintaining Geist product(s) are expected to follow all the noted warnings and safety precautions necessary for safe operation of the equipment in your environment. Geist assumes no liability for failure to comply with these requirements.

Live Circuits Safety



DANGER
HAZARDOUS VOLTAGE, CURRENT, AND ENERGY LEVELS ARE PRESENT IN THIS PRODUCT. POWER SWITCHED CIRCUITS CAN HAVE HAZARDOUS VOLTAGES PRESENT EVEN WHEN THE SWITCH IS IN THE OFF POSITION. DO NOT OPERATE THE PRODUCT WITH ANY COVER PLATE REMOVED. ALWAYS MAKE SURE THAT PRODUCT IS FULLY ENCLOSED PRIOR TO USE.

Operating personnel must:

- Not remove equipment covers. Only Geist Authorized Service Personnel or other qualified maintenance personnel may remove equipment covers for internal sub-assembly, or component replacement, or any internal adjustment.
- Not replace any equipment component with power applied to the line cord. Under certain conditions, dangerous voltages may exist even with the input power cable disconnected. Any exceptions for 'Hot-Swap' modules will be specifically noted in this product document.
- Always disconnect input power and discharge circuits before touching any sub-assembly of circuit component.

Equipment Grounding

To minimize shock hazard, the equipment chassis and enclosure must be connected to an electrical earth ground. The input power cable must be either plugged into an industry electrical code compatible receptacle or wired directly into an electrical code compatible interface. The equipment earth ground wire (typically green) must be firmly connected to the facility electrical safety ground. The mating electrical interface to this equipment must comply with International Electromechanical Commission (IEC) standards.

Electrostatic Discharge

Geist strongly recommends that anti-static precautions be taken when installing, removing, or working on and around static sensitivity equipment. Industry approved anti-static devices such as wrist and heel straps, in conjunction with conductive foam pads, should be available and implemented only after verifying that they are in good working condition.

Electronic components such as memory modules, circuit boards, and LED displays, are sensitivity to Electro-Static Discharge (ESD). Handling of such components should be done only after proper anti-static workspace conditions have been established. Any static producing packing materials such as plastic, Styrofoam, and some cardboards, should be removed and discarded in a timely manner.

Explosive Environment

Do not operate this equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

Servicing and Adjustments

Do not attempt to service this equipment, there are no field serviceable parts or sub-assemblies. Any adjustments should be made by authorized service personnel only.

Repairs and Modifications

Because of the danger of electrocution and/or severe health hazard, do not install substitute parts or preform any unauthorized modifications of this equipment. It is best to contact Geist for Warranty and Repair Service to ensure that safety features are maintained.



GEIST
COOL

**Thank You For
Purchasing Geist**

