



APPENDIX **C**

Maintaining the Cisco 1121 Secure Access Control System

The CSACS-1121 Series appliance is configured to order and is ready for installation when it leaves the factory. After you install and configure your appliance, you may have to perform specific maintenance procedures and operations to ensure that the appliance is operating properly.

These preventive procedures will maintain your appliance in good operating condition and minimize the need for costly, time-consuming service procedures.



Caution

To help prevent problems, before performing any procedures in this chapter, review [Safety Warnings, page -xii](#) and the [Safety Guidelines, page 3-1](#) sections.

The following sections discuss various environmental factors that can adversely affect appliance performance and longevity.

Maintaining Your Site Environment

Good preventive maintenance includes regular visual inspections of the appliance, including exterior cleaning and inspection.

This chapter contains:

- [General Exterior Cleaning and Inspection, page C-2](#)
- [Cooling, page C-3](#)
- [Temperature, page C-3](#)
- [Humidity, page C-4](#)
- [Altitude, page C-4](#)
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- [Electromagnetic and Radio Frequency Interference, page C-5](#)
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General Exterior Cleaning and Inspection

This section details the cleaning requirements for exterior surfaces of the appliance. It also provides information on inspecting cables and adapter cards.

**Caution**

Never spray cleaning solution on the surfaces of the appliance. Over spray can penetrate into the appliance and cause electrical problems and corrosion.

Appliance

Use a lint-free, nonabrasive cloth to perform cleaning. *Do not* use a solvent, abrasive cleaning agents, or tissue paper. If the appliance is dirty (for example, with thick dust), use a soft damp cloth and gently wipe the surface of the appliance.

Immediately wipe any water or liquid off from the appliance.

Dust and Particles

A clean operating environment can greatly reduce the negative effects of dust and other particles, which act as insulators and interfere with the operation of an appliance's mechanical components. In addition to regular cleaning, you should follow these guidelines to deter contamination of the appliance:

- Do not permit smoking anywhere near the appliance.
- Do not permit food or drink near the appliance.

Cables and Connectors

Periodically inspect cables and connectors to and from your appliance periodically to see if they are worn out or loose.

Adapter Cards

Check the connections on the adapter cards. Ensure that they are secured to the appliance and have not been jarred loose or mechanically damaged.

Corrosion

The oil from a person's fingers, or prolonged exposure to high temperature or humidity, can corrode the gold-plated edge connectors and pin connectors on adapter cards in the appliance. This corrosion on adapter card connectors is a gradual process that can eventually lead to intermittent failure of electrical circuits.

To prevent corrosion, you should avoid touching contacts on adapter cards. Protecting the appliance from corrosive elements is especially important in moist and salty environments, which tend to promote corrosion. Also, as a further deterrent to corrosion, the appliance should not be used in extreme temperatures, as explained in the [Temperature, page C-3](#) section.

Cooling

Exhaust fans in the power supply and in the appliance cool the power supply and the appliance by drawing air in through various openings in the front of the appliance and blowing it out the back.

However, the fans also draw dust and other particles into the appliance, causing contaminant buildup, which results in an increase in the appliance's internal temperature and interferes with the operation of various appliance components.

To avoid these conditions, we recommend keeping your work environment clean to reduce the amount of dust and dirt around the appliance, thereby reducing the amount of contaminants drawn into the appliance by the fans.

Temperature

Temperature extremes can cause a variety of problems, including premature aging and failure of integrated circuits (ICs) or mechanical failure of devices. Extreme temperature fluctuations can cause ICs to become loose in their sockets, causing expansion and contraction of disk drive platters, resulting in read or write data errors.

The heat emission of an ACS server would be in the range of 341 to 1,024 BTUs (100 to 300 W).

To minimize the negative effects of temperature on appliance performance, follow these guidelines:

- [Table C-1](#) lists the air temperature that you must maintain according to the altitude where your ACS server is placed.

Table C-1 Air Temperature Maintenance

Server State	Altitude	Air Temperature
On	0 to 914.4 m (3000 ft)	50.0° to 95.0°F (10° to 35°C)
On	914.4 m (3000 ft) to 2133.6 m (7000 ft)	50.0° to 89.6°F (10° to 32°C)
Off	Maximum altitude: 2133.6 m (7000 ft)	50.0° to 109.4°F (10° to 43°C)
Shipping	Maximum altitude: 2133.6 m (7000 ft)	-40° to 140°F (-40° to 60°C)

- Ensure that the appliance has adequate ventilation. Do not place it within a closed-in wall unit or on top of cloth, which can act as insulation. Do not place it where it will receive direct sunlight, particularly in the afternoon. Do not place it next to a heat source of any kind, including heating vents during winter.

Adequate ventilation is particularly important at high altitudes. Appliance performance may not be optimum when the appliance is operating at high temperatures as well as high altitudes. Do the following:

- Ensure that all slots and openings on the appliance remain unobstructed, especially the fan vents on the back of the appliance.
- Clean the appliance at regular intervals to avoid any buildup of dust and debris, which can cause the appliance to overheat.

- If the appliance has been exposed to abnormally cold temperatures, allow a 2-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

Humidity

High-humidity conditions can cause moisture migration and penetration into the appliance. This moisture can cause corrosion of internal components and degradation of properties such as electrical resistance, thermal conductivity, physical strength, and size. Extreme moisture buildup inside the appliance can result in electrical shorts, which can cause serious damage to the appliance.

Each appliance is rated to operate at 8 to 80 percent relative humidity, with a humidity gradation of 10 percent per hour. Buildings in which climate is controlled by air conditioning in the warmer months and by heat during the colder months usually maintain an acceptable level of humidity for appliances.

However, if an appliance is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range.

Altitude

Operating an appliance at high altitudes (low atmospheric pressure) reduces the efficiency of forced and convection cooling which can result in electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Electrostatic Discharge

Electrostatic discharge (ESD) results from the buildup of static electricity on the human body and certain other objects. This static electricity is often produced by simple movements, such as walking across a carpet.

ESD is a discharge of a static electrical charge that occurs when a person whose body contains such a charge touches a component in the appliance. This static discharge can cause components, especially ICs, to fail. ESD is a problem particularly in dry environments where the relative humidity is below 50 percent.

To reduce the effects of ESD, you should observe the following guidelines:

- Wear a grounding wrist strap. If a grounding wrist strap is unavailable, touch an unpainted metal surface on the appliance chassis periodically to neutralize any static charge.
- Keep components in their antistatic packaging until they are installed.
- Avoid wearing clothing made of wool or synthetic materials.

Electromagnetic and Radio Frequency Interference

Electromagnetic interference (EMI) and radio frequency interference (RFI) from an appliance can adversely affect devices such as radio and television receivers operating near the appliance. Radio frequencies emanating from an appliance can also interfere with cordless and low-power telephones.

RFI is defined as any EMI with a frequency above 10 kHz. This type of interference can travel from the appliance to other devices through the power cable and power source, or through the air, like transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of EMI and RFI emitted by computing equipment. Each appliance meets these FCC regulations.

To reduce the possibility of EMI and RFI, follow these guidelines:

- Operate the appliance only with the appliance cover installed.
- Ensure that the screws on all peripheral cable connectors are securely fastened to their corresponding connectors on the back of the appliance.
- Always use shielded cables with metal connector shells for attaching peripherals to the appliance.

Magnetism

Hard disk drives are susceptible to the effects of magnetism as they store data magnetically. Hard disk drives should never be stored near magnetic sources such as:

- Monitors
- Printers
- Telephones with real bells
- Fluorescent lights

Power Source Interruptions

Appliances are especially sensitive to variations in voltage supplied by the AC power source. Overvoltage, undervoltage, and transients (or spikes) can erase data from the memory or even cause components to fail. To protect against these types of problems, power cables should always be properly grounded and one, or both, of the following methods should be used:

- Place the appliance on a dedicated power circuit (rather than sharing a circuit with other electrical equipment). In general, do not allow the appliance to share a circuit with any of the following:
 - Copier machines
 - Teletype machines
 - Laser printers
 - Fax machines
 - Any other motorized equipment

Besides the above equipment, the greatest threats to an appliance's power supply are surges or blackouts caused by electrical storms.

If a blackout occurs—even a temporary one—while the appliance is turned on, turn off the appliance immediately and disconnect it from the electrical outlet. Leaving the appliance on may cause problems when the power is restored.

