



Planning Your Installation

Before you install your Cisco VG310 or Cisco VG320 Analog Voice Gateway, read the information provided in the following sections:

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Safety Recommendations

The following information is included to alert you about safety recommendations and best practices to be followed when working with this equipment.

General Safety Practices

Follow these guidelines to ensure personal safety and protect the equipment:

- Keep the area around the chassis clear of obstacles and free from dust during and after installation.
- If you remove a chassis during installation and maintenance, place the chassis cover in a safe place.
- Keep tools away from walk areas to prevent hazards such as slips, trips, and falls.
- Do not wear loose clothing that may get caught in the chassis.
- Wear safety glasses if you are working under conditions that might be hazardous to the eyes.

**Warning**

This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open, or both. Statement 1043

Safety Tips

Use these tips as safety guidelines when installing and working around this equipment:

- Locate the emergency power off switch for the room in which you are working in order to be able to quickly turn off power, if an electrical accident occurs.
- Disconnect all power before installing or removing a chassis.
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
 - Use caution; do not become a victim yourself.
 - Turn off power to the system.
 - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
 - Determine if the person needs rescue breathing or external cardiac compressions, and then take appropriate action.

Preventing Electrostatic Discharge Damage

Always follow ESD-prevention procedures when removing and replacing components. These procedures include:

- Ensure that the chassis is electrically connected to earth ground.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact.
- Connect a clip to the ESD-strap connection jack (to the left of the power switch on the rear of the chassis) or to an unpainted chassis frame surface.

**Caution**

For safety, periodically check the resistance value of the antistatic strap, which should be between 1 M Ω and 10 M Ω .

Temperature Control and Ventilation

The installation location (room, closet, or cabinet) for Cisco VG310 and Cisco VG320 should always be well ventilated and provide adequate air circulation to ensure proper cooling. The room temperature should be between 32 °F and 104 °F (0 °C to 40 °C).



Note The Cisco VG310 and Cisco VG320 analog voice gateway chassis is designed for back-to-front airflow.

Enclosed Racks



Note Enclosed racks must have adequate ventilation. An enclosed rack should never be overcrowded and should have louvers and a fan.

If the Cisco VG310 or Cisco VG320 analog voice gateway is installed in an enclosed rack with a ventilation fan at the top, make sure that heated air drawn upward from other equipment does not prevent adequate cooling.

If the chassis is installed using slide rails, check for blocked ventilation ports when it is in position in the rack or cabinet. Make sure that the ventilation ports of the unit are not blocked.



Note Baffles can help isolate exhaust air from intake air. Baffles also help draw cooling air through the cabinet. The best location for baffles depends on the airflow patterns in the rack. You can test the airflow by experimenting with different equipment arrangements.

Wall-Mounted

If Cisco VG310 or Cisco VG320 is installed on a wall, there should be plenty of space on both sides to ensure that there is adequate airflow through the chassis.

Bench-Mounted

If the unit is placed on a bench top, do not stack other equipment or paper on the chassis. Provide plenty of space for air circulation (front to back). Inadequate ventilation can result in overheating and damage.

Access to Chassis

Allow space at the rear of the chassis for cable connections. Also consider the need to access the chassis for future upgrades, maintenance, and troubleshooting.

Rack Requirements

Use the following information to plan your equipment-rack configuration:

- Allow clearance around the rack for maintenance.
- Enclosed racks must have adequate ventilation. Ensure that the rack is not congested, because each voice gateway generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air. Heat generated by equipment near the bottom of the rack can be drawn upward into the intake ports of the equipment above it.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the ports. If the chassis is installed on slides, check the position of the chassis when it is seated in the rack.

Chassis Grounding

Chassis grounding is provided through the power cable, which uses a standard grounding plug. However, the chassis also requires a reliable earth ground using the earth ground lug and hardware provided. For more information, see [Installing the Ground Connection](#).

Power Source

You can connect Cisco VG310 or Cisco VG320 to either an AC power source or a +12V DC power supply.

**Caution**

The chassis provides inputs for both AC and DC power. Design your installation to use only one type of power. *Do not use AC and DC power at the same time.* If you do, the unit stops operating, and you must reboot it with only a single power source.

For more information, see [Connecting Power](#).

Cable Types

The cable types are dependent on the Cisco VG310 or Cisco VG320 analog voice gateway that you are using. For more information, see [Interfaces and Service Capabilities of Cisco VG310 and Cisco VG320](#) and [Cable Specifications and Information](#).

Distance Limitations for Interface Cables

When planning your installation, consider distance limitations and potential electromagnetic interference (EMI) as defined by the Electronic Industries Association (EIA). Distance-limitation information is included for the following Voice Gateway ports:

- Gigabit Ethernet ports—The maximum segment distance for Gigabit Ethernet is 330 feet (100 meters) (specified in IEEE 802.3).
- FXS analog voice ports—The maximum distance is established by a total allowable loop resistance, including the phone or terminal equipment, of 600 Ohms.

Console Port and Auxiliary Port Considerations

Cisco VG310 and Cisco VG320 include an asynchronous serial console port and an auxiliary port. The console and auxiliary ports provide access to the unit either locally using a console terminal connected to the console port, or remotely, using a modem connected to the auxiliary port. This section discusses important cabling information to consider before connecting the unit to a console terminal or modem.

The main difference between the console and auxiliary ports is that the auxiliary port supports hardware flow control and the console port does not. Flow control paces the transmission of data between a sending device and a receiving device. Flow control ensures that the receiving device can absorb the data sent to it before the sending device sends more. When the buffers on the receiving device are full, a message is sent to the sending device to suspend transmission until the data in the buffers has been processed. Because the auxiliary port supports flow control, it is ideally suited for use with the high-speed transmissions of a modem. Console terminals send data at speeds slower than modems do; therefore, the console port is ideally suited for use with console terminals.

Console Port Connections

Cisco VG310 and Cisco VG320 have EIA/TIA-232 asynchronous (RJ-45) and USB 5-pin mini Type B, 2.0-compliant serial console ports. The console port do not have any hardware flow control. Shielded USB cables with properly terminated shields are recommended.

EIA/TIA-232

Depending on the cable and the adapter used, this port appears as a Data Terminal Equipment (DTE) or Data Circuit-Terminating Equipment (DCE) device at the end of the cable. Only one port can be used at the same time.

The default parameters for the console port are 9600 baud, 8 data bits, 1 stop bit, and no parity. The console port does not support hardware flow control.

USB Serial Console

Use the USB console port on the chassis to access the Cisco IOS CLI and perform configuration tasks. A terminal emulation program, such as Microsoft HyperTerminal for Windows, is required to establish communication between the voice gateway and a PC. The USB serial console port connects directly to the USB connector of a PC using a 5-pin mini USB Type A or USB Type-B cable. The USB console supports full-speed (12 Mbps) operation.



Note Always use shielded USB cables with a properly terminated shield.

The default parameters for the console port are 9600 baud, 8 data bits, no parity, and 1 stop bit. The USB console port does not support hardware flow control.

For operation with Microsoft Windows, the Cisco USB Console Driver must be installed on the PC connected to the console port. If the driver is not installed, a series of prompts guide you through a simple installation process.



Note You may encounter USB driver-related errors if you are using a PC with Microsoft Windows 7.0, 64-bit operating system to establish connectivity with a voice gateway. As a workaround, you can install the Cisco USB console driver from:

The Cisco USB Console Driver allows plugging and unplugging of the USB cable from the console port without affecting Microsoft HyperTerminal operations. No special drivers are needed for Mac OS X or Linux.

Only one console port can be active at a time. When a cable is plugged into the USB console port, the RJ-45 port becomes inactive. Conversely, when the USB cable is removed from the USB port, the RJ-45 port becomes active.

Baud rates for the USB console port are 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 bps.



Note 4-pin mini USB Type-B connectors are easily confused with 5-pin mini USB Type-B connectors. Only the 5-pin mini USB Type-B is supported.

USB Console OS Compatibility

- Microsoft Windows 7.0, 32 bit and 64 bit
- Microsoft Windows 2000, Microsoft Windows XP 32 bit, and Microsoft Windows Vista 32 bit
- Mac OS X Version 10.9
- Redhat 10 or Fedora 10 with kernel 2.6.27.5-117
- Ubuntu 8.10 with kernel 2.6.27-11
- Debian 5.0 with kernel 2.6
- SUSE 11.1 with kernel 2.6.27.7-9

Auxiliary Port Connections

The Cisco VG310 and Cisco VG320 have an EIA/TIA-232 asynchronous serial auxiliary port (RJ-45) that supports flow control. Depending on the cable and the adapter used, this port appears as a DTE or DCE device at the end of the cable.

For connection to a modem, your unit is provided with an RJ-45-to-DB-25 adapter cable. (A DB-9-to-DB-25 adapter is also included with the unit.) For more information, see [Connecting an Auxiliary Port to a Modem](#).

Interference Considerations

When you run cables for any significant distance in an electromagnetic field, interference can occur between the electromagnetic field and the signals on the cables. This has the following implications on the installation of terminal plant cabling:

- Unshielded plant cabling can emit radio interference.
- Strong electromagnetic interference (EMI), especially as caused by lightning or radio transmitters, can destroy the EIA/TIA-232 drivers and receivers in Cisco VG310 or Cisco VG320.

Consider the following guidelines:

- To prevent emitted radio interference, use twisted-pair cables with a good distribution of grounding conductors in your plant cabling.
- If you have cables exceeding recommended distances, or if you have cables that pass between buildings, give special consideration to the effect of lightning strikes or ground loops. If your site has these characteristics, consult experts in lightning suppression and shielding. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic devices. Take precautions to avoid these problems by providing a properly grounded and shielded environment and by installing electrical surge suppression.
- All module openings must be either occupied or covered to prevent electromagnetic interference—you must either install a module in its vacant slot or install a cover plate over the opening.
- Consult experts in radio-frequency interference (RFI) for advice on the prevention of electromagnetic interference.

Mounting Tools and Equipment

The following are the tools and parts required to install the voice gateway:

- ESD-preventive cord and wrist strap.
- Standard flat-blade screwdrivers—small (3/16-in. [4 mm to 5 mm]) and medium (1/4-in. [6 mm to 7 mm]):
 - To attach brackets to a rack or wall.
 - To install or remove modules.
 - To remove the cover if you are upgrading memory or other components.
- Phillips screwdriver for attaching brackets to the chassis.
- Mounting brackets and screws for 24-inch rack, if required:
 - Four Telco machine screws for installing the chassis in a rack (use the screw size required by the rack).
- Screws and anchors for wall-mounting, if required:
 - Eight wood screws or other fasteners for installing the chassis on a wall. An additional starter screw can be used to facilitate wall-mounting.

- Wire crimper.
- Wire for connecting the chassis to an earth ground:
 - AWG 14 (2 mm²) or larger wire for NEC-compliant chassis grounding.
 - AWG 18 (1 mm²) or larger wire for EN or IEC 60950-compliant chassis grounding.
 - For NEC-compliant grounding, an appropriate user-supplied ring terminal, with an inner diameter of 1/4 in. (5 mm to 7 mm).

In addition, depending on the type of modules you plan to use, you may need the following external equipment:

- Console terminal or personal computer with terminal emulation software.
- Cables for connecting to the WAN and LAN ports (dependent on configuration).
- PC-running terminal-emulation software for administrative access.
- Modem for remote access.
- Analog voice RJ-21 cable.
- Ethernet switch.
- Modem for remote configuration.

Keeping Track–Checklist

We recommend that you use an installation checklist and maintain a Site Log.

Installation Checklist

Include a copy of an installation checklist in your Site Log for each Cisco VG310 or Cisco VG320. The installation checklist provides a record of the tasks performed for installing a unit. Print a copy of this checklist and mark the entries as you complete each task.

Table 1: Installation Checklist

Installation Checklist for Site _____		
Cisco VG Name/Serial Number _____		
Task	Verified by	Date
Background information placed in Site Log		
Environmental specifications verified		
Site power voltages verified		
Installation site prepower check completed		

Installation Checklist for Site _____		
Cisco VG Name/Serial Number _____		
Required tools available		
Additional equipment available		
Cisco VG received		
Information packet, warranty card, and Cisco.com card received		
Software version verified		
Rack, desktop, or wall-mounting of chassis completed		
Initial electrical connections established		
ASCII terminal attached to console port		
Modem attached to console port (for remote configuration)		
Signal distance limits verified		
Startup sequence steps completed		
Initial operation verified		

Site Log

We recommend that you maintain a Site Log to record all the actions relevant to the system. Site Log entries can include the following:

- Installation—Print a copy of the Installation Checklist and include it into the Site Log
- Upgrades and maintenance—Use the Site Log to record ongoing maintenance and expansion history. Update the Site Log to display the following:
 - Configuration changes
 - Maintenance schedules, requirements, and procedures performed
 - Comments, notes, and problems
 - Changes and updates to Cisco IOS software

